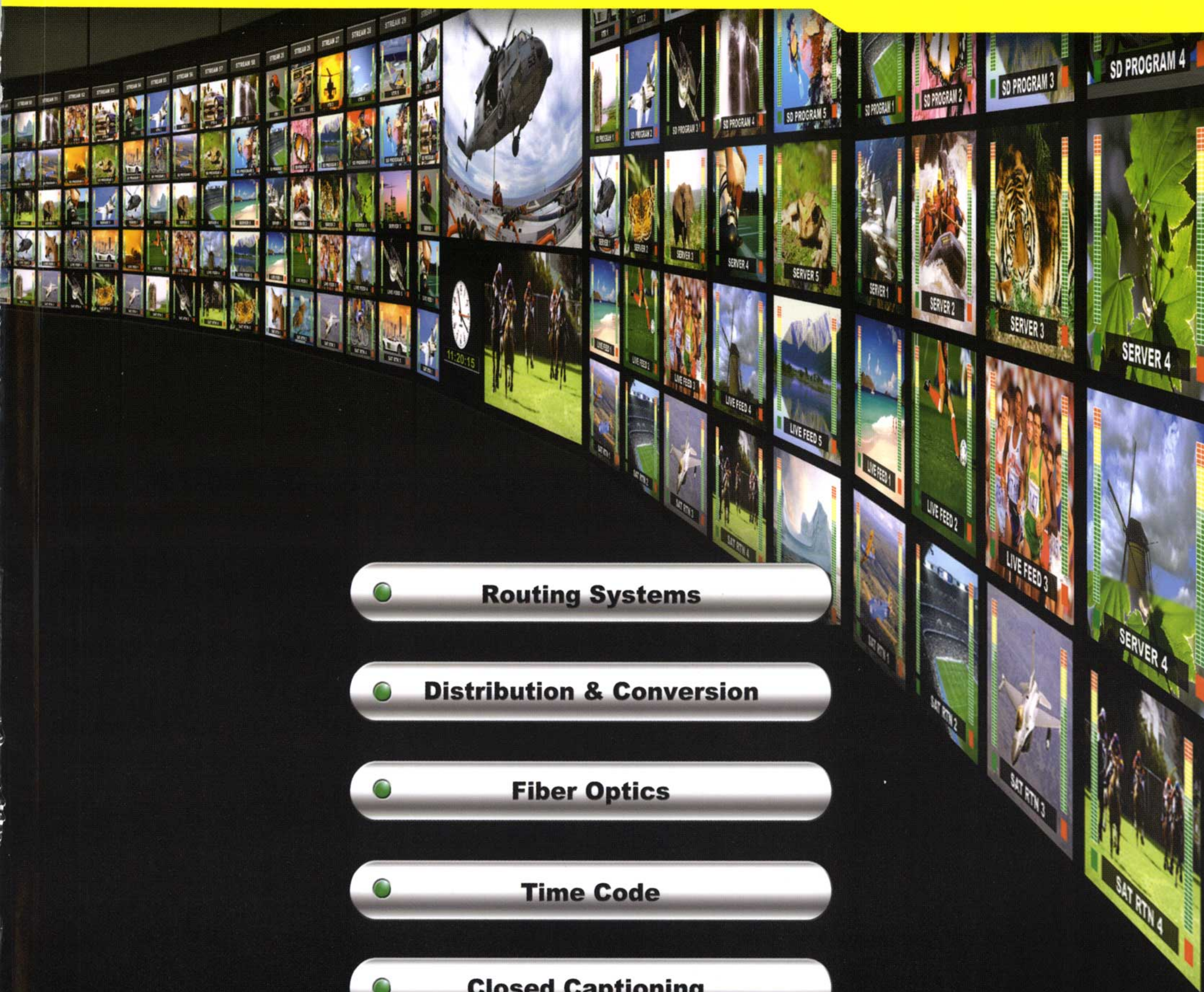


# THE LEADER IN HDTV & IPTV

HD/SD Multi-Format Routers - from 32x32 up to 576x576



Routing Systems

Distribution & Conversion

Fiber Optics

Time Code

Closed Captioning

Production/Post Production

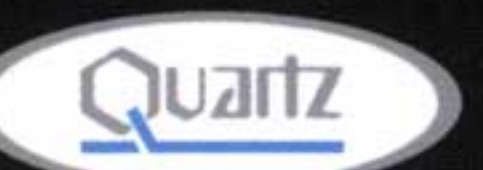
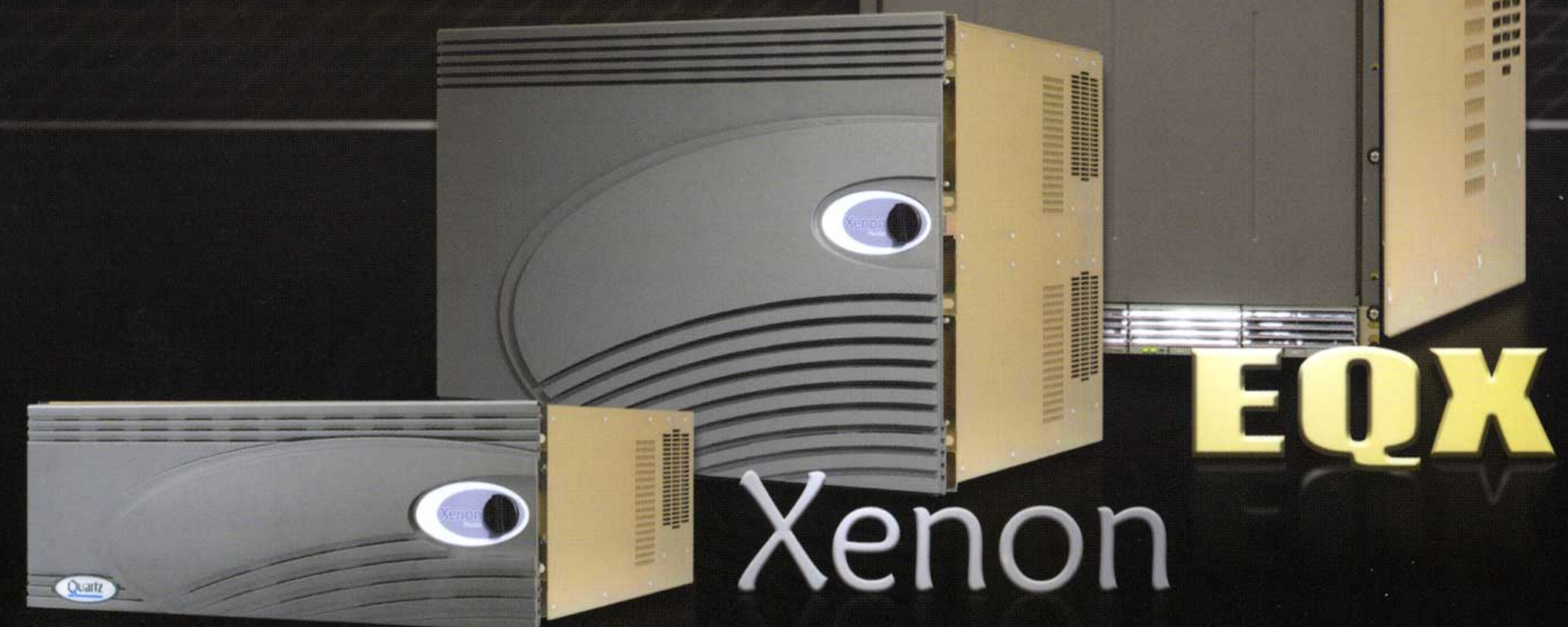
Multiviewers

Fully Integrated Master Control

## QMC

## MVP

- The Xenon is a powerful and highly flexible 'Signal Processing' router essential for your broadcast, production or AV facility
- Xenon is available in 4RU or 8RU with matrix sizes ranging from 32x32 to 128x128
- Find out how Xenon can power your operation - call for a demo now!
- The new EQX platform - up to 576x576 in 1 frame!

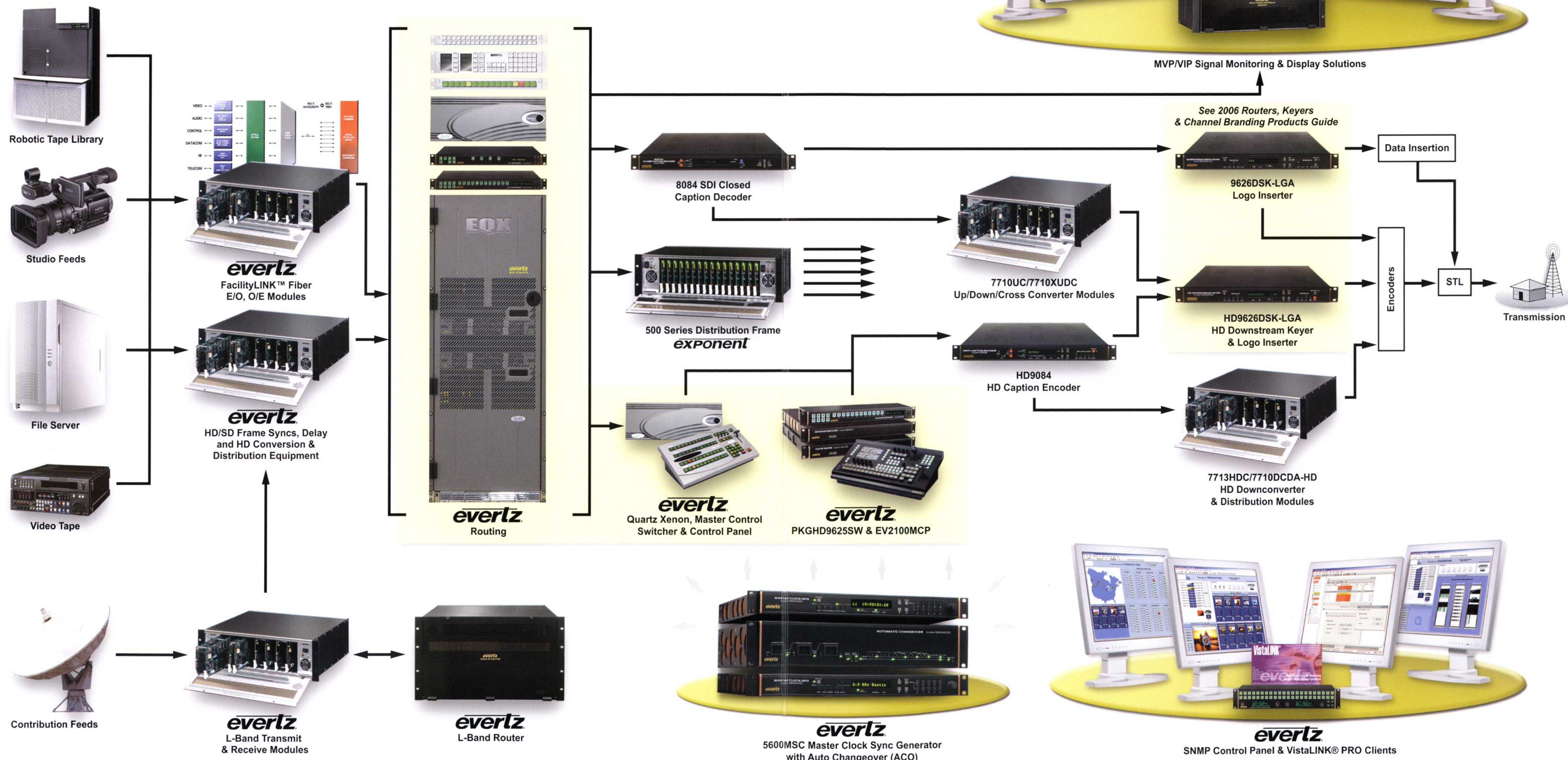


*The Leaders in HDTV and now the Leaders in Routing & Master Control*





# Your Complete HD & Digital Solution





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7732DVP-HD	HD Dual Link Processor	-441

## Reference and Test Generators:

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7751TG2-CF-HD	HD Test Signal Generator with Trouble Slide	-265
7750SRG-HD	HD Tri-Level Sync Generator	-267
7750TG-TS	SMPTE 310M/DVB ASI Transport Stream Generator	-268
7750TG	SDI Test Signal Generator	-269
PKG7752RGTS-HD	HD Reference Generator/Test Set System	-270
5600MSC	Master SPG / Master Clock System	-403-406
5600ACO/ACO2	Automatic Changeover	-407-408

## Closed Caption and XDS Monitoring

7760CCM	SDI Closed Caption & XDS Decoder, EIA608 Analyzer with VistaLINK® support	-271-272
7760CCM-T	EIA608 - EIA708 Translator (includes basic function of 7760CCM) with VistaLINK® support	-271-272
7760CCM-HD	HD-SDI Closed Caption Monitor and EIA608/EIA708 Translator	-273

# SECTION 7: COMPACT MODULAR - 500 EXPONENT & 400 SERIES

## Frames & Control

### 400 Series

400FR	Compact High Density Balanced Audio Distribution Frame	-274
400ADA-AUD	Analog Audio Distribution Amplifier (1 x 9)	-275
400DA-AESB	Balanced AES Audio Distribution Amplifier (1x9)	-276



**500 Series**

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S501FR	Standalone Enclosure	-277-278
500FR-L-A	Compact High Density Analog Looping Distribution Frame	-279-280
500FC	Frame Controller	-281
500DA-HD/500FC-DA-HD	HD/SD Reclocking DA and Frame Controller with HD/SD Reclocking DA	-282

**500 Series with Looping**

500ADA-EQ-L	Analog Video Distribution Amplifier with Cable Equalization for Looping Analog Frame	-283
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**HD**

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**SDI & AES & Monitoring**

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500VMDA	SDI Monitoring Reclocking Distribution Amplifier	-290
500DA-AESB	Balanced AES Audio Distribution Amplifier (1x4)	-291
500DA-AESU	Unbalanced AES Audio Distribution Amplifier (1x9)	-292
500DA2Q-AESU	Dual Unbalanced AES Audio Distribution Amplifier (2 - 1x4)	-293
500AMDA-AESU	AES Monitoring Distribution Amplifier (5 AES out & 2 balanced analog out)	-294

**ANALOG**

500ADA	Analog Video Distribution Amplifier (1x9)	-295
500ADA-EQ	Analog Video Distribution Amplifier with Cable Equalization (1x9)	-296
500ADA-AUD	Analog Audio Distribution Amplifier (1x4)	-297
500ADA-W	Word Clock Distribution Amplifier (1x9)	-298
520DARS-W	Unbalanced AES Word Clock Extractor Audio Distribution Amplifier	-299
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520AD4-DD-HD	HD Audio De-embedder & Dolby® E Decoder	-304-305
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**SECTION 8: ROUTERS****X-SERIES BYPASS ROUTERS (4x1 to 12x2)**

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X-0601H-444	6x1 HDTV Dual Link Router with Quad 6x1 AES Audio	-312-313
X-1201H/AES/AES4/HSS	12X1 HD Router (optional Dual or Quad AES support)	-314-315
X-1202H/AES/AES4/HSS	12X2 HD Router (optional Dual or Quad AES support)	-316-317
X-0401S	4x1 SDI Router (optional AES SoftSwitch™, Quad AES support)	-318-319
X-1201S	12X1 SDI Router (optional AES SoftSwitch™, Quad AES support)	-320-321
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**QUARTZ ROUTERS****XENON ROUTERS**

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XE8-3232S	Xenon 8RU 32x32 to 128x128 Serial Video Router	-325-326
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**ANALOG & AUDIO ROUTERS****TOPAZ SERIES ROUTERS**

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QT-1616S	16 x 16 SD router	-329-330
QT-3232S	32 x 32 SD router	-329-330
QT-1616N	16 x 16 Analog Video router	-331-332
QT-3232N	32 x 32 Analog Video router	-331-332



QT-1616-AA	16 x 16 Analog Audio router	-333-334
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## Q-SERIES ROUTERS

### LARGE ROUTERS

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Q6400-N	Analog Video Router	-339-340
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Q1601, 1602, 0802	HD/SD Analog Video & Audio Routers, 16x1 to 16x2 & 8x2	-345-346
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### DATA ROUTERS

Q32-PR & Q64-PR	Port-to-Port Data Routers	-355-356
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TR-3200A	Tally Data Router	-359

## CONTROL PANELS FOR QUARTZ SERIES ROUTERS

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CP-1604	Remote multi-mode panel, 20 button per source	-362
CP-2032A	Intelligent Remote Panel, 1RU 32 buttons	-363
CP-2024A	Intelligent Remote Panel, 1RU 24 buttons	-364
CP-2048A	Intelligent Remote Panel, 1RU 48 buttons	-365
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CP-6401	Remote multi-mode panel, 80 button per source	-371
CP-6402,6404,6406,6408	Remote Control Panel, 2,4,6 & 8 destinations	-372

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## QUARTZ PARALLEL INTERFACES

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CI-0003	RS232/422 Control Panel Serial Card	-375
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SI-0001	Serial Interface Adapter	-375
SI-0004	Q-Link Isolator/Repeater	-375

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X-3216G-F	32 x 16 G-LINK Router, 32 Electrical inputs, 16 Fiber outputs	-378-379
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8083XDS-AD	Analog & SDI XDS Encoder	-386



7760CCM	SDI Closed Caption & XDS Decoder, EIA608 Analyzer with VistaLINK™ support	-271-272
7760CCM-T	EIA608 - EIA708 Translator (includes basic function of 7760CCM) with VistaLINK™ support	-271-272
ProCAP	Offline Closed Caption Authoring System	-388-389
3410	Multivert (10 SDI to Analog Monitoring Converter)	-390-391

## SECTION 10: SPG's, TIME CODE, CLOCK DISPLAYS and SOURCE ID

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1212	12" Diameter Analog Clock Display	-394-395
1216	16" Diameter Analog Clock Display	-394-395
1275A	9" Digital Clock Display	-396

### ANALOG TIME CODE

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5010-24Fps	LTC Time Code Gen/Reader Character Inserter (with 24Fps)	-397-398
5010-VITC	LTC and VITC Time Code Gen/Reader/Character Inserter	-397-398
5010-VITC-24Fps	LTC and VITC Time Code Gen/Reader/Character Inserter (with 24Fps)	-397-398
5010-GPSII	Time Code Generator with GPS	-399
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5150	Afterburner II LTC/VITC Reader/Character Inserter	-400
5300	Time Code Analyzer	-401
5950	VITC/LTC Time Code Reader/Character Inserter	-402

### MASTER SPG, MASTER CLOCK & TEST SET & ACO SYSTEM

5600MSC	Master SPG / Master Clock System	-403-406
5600ACO/ACO2	Automatic Changeover	-407-408
500ACO2-HD/SD	Dual HD & SD Digital Video Signal Change Over	-285

### DIGITAL TIME CODE

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8010TM-IRIG	SDI Time Code Master with IRIG Reader	-411-412
HD9010TM	HD Time Code Generator/Reader	-413-414
HD9010TM-IRIG	HD Time Code Master with IRIG Reader	-415-416
8150	SDI Afterburner	-452

### OTHER TIME CODE

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622-VCG	VITC to LTC Translator with VCG & Source ID Decoder	-418
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## SECTION 11: MINIATURE SERIES/MOBILE

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2405OE	SDI Miniature Optical Receiver, 19.4Mb/s and 143-540Mb/s	-420
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2405OE-HD	HD Miniature Optical Receiver, 19.4Mb/s - 1.5Gb/s	-422
2407DVIT	DVI/KVM Miniature Fiber Receiver	-423-424
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2407RGBT	RGBHV/DVI/KVM Miniature Fiber Transmitter	-427-428
2407RGBR	RGBHV/DVI/KVM Miniature Fiber Receiver	-429-430
2430DAC-HD	HD Miniature D to A Converter: YPrPb/RGB/VGA via High Density DB	-431
2430GDAC	GLink™ Digital to Analog Converter	-432
2430GDAC-WARP	GLink™ Digital to Analog Converter	-432
2410MD-HSN	HD Miniature Monitoring Downconverter with 24sF processing	-433
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PKG7700MFOS-2	Mobile Fiber Optic System Dual	-434-435
7700PCO	Power Changeover Unit	-436

## SECTION 12: PRODUCTION POST PRODUCTION & TELECINE TOOLS

### PRODUCTION POST PRODUCTION

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7750SRG-HD	HDTV Tri-Level Sync Generator	-267



ECAS-HD	Fiber Camera Adapter	-437-438
5600MSC	Master SPG / Master Clock System	-403-406
HD9690	HD Graticule Generator	-439-440
HD9690-444	4:4:4 Graticule Generator	-439-440
7732DVP-HD	HD Dual Link Processor	-441
9590	SDI Digital Graticule Generator	-442
HDSD9155Q	HD/SD Afterburner	-443-444

KEYCODE READERS

5550	Universal Decoder	-445-446
5550/KR-16/35	5550 Decoder with KR16/35 head & 10ft cable	-445-446
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5550/UVT-3	5550 Decoder with UVT-3 (Touchless) Head & 20 ft. cable	-445-446

FILM FOOTAGE ENCODERS

HDSD9045TR	HD/SD 4:4:4 Film Footage Encoder	-447-448
HD9045PVE	4:4:4 HD Production VANC Encoder including KeyLog™ Tracker	-449-450

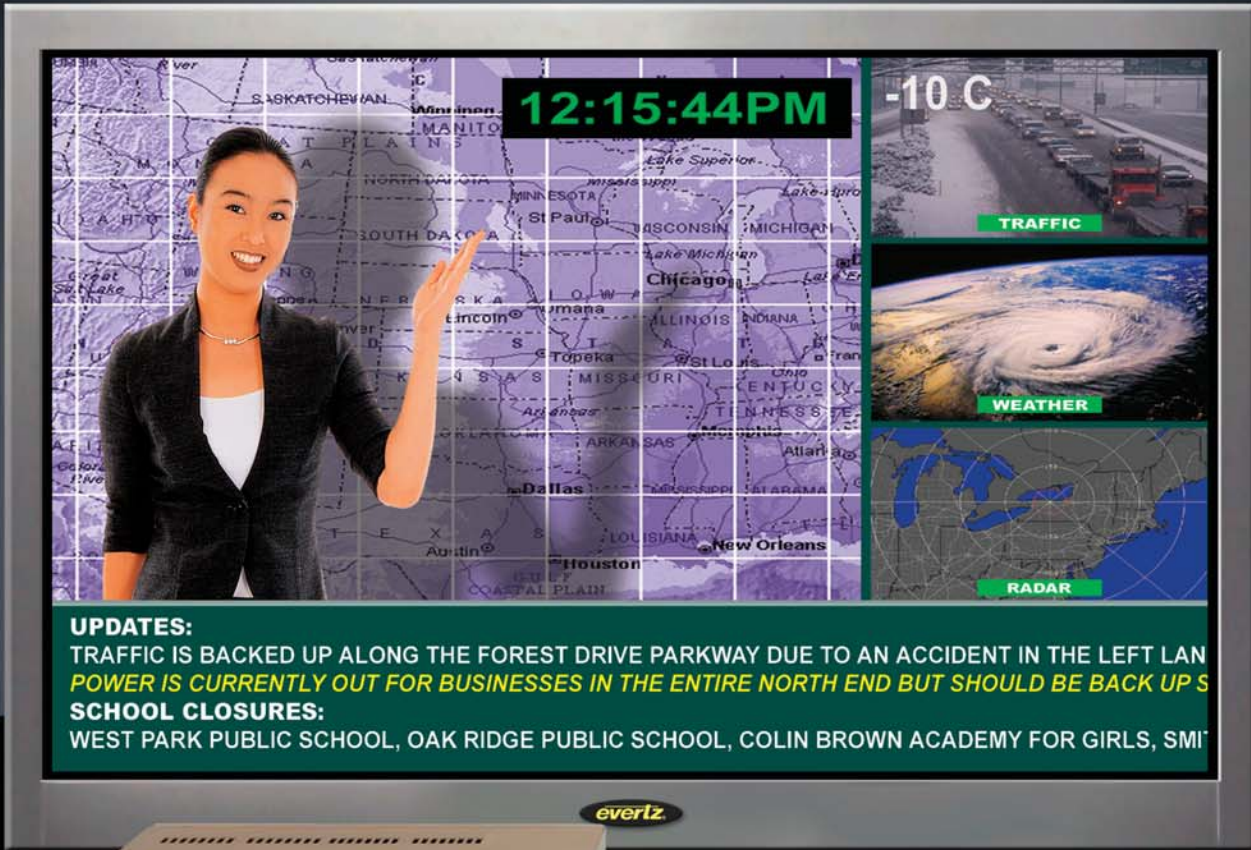
POST PRODUCTION ACCESSORIES

KeyLog Tracker	Telecine Logging & Configuration Mgmt Tool	-451
5150/8150	Analog Afterburner & SDI Afterburner	-452
7732PFT-HD	HDTV Progressive Format Translator (1080p/24sF-1080i/60)	-118

Index		-453-463
Warranty		-464







**UPDATES:**

TRAFFIC IS BACKED UP ALONG THE FOREST DRIVE PARKWAY DUE TO AN ACCIDENT IN THE LEFT LANE  
**POWER IS CURRENTLY OUT FOR BUSINESSES IN THE ENTIRE NORTH END BUT SHOULD BE BACK UP S**  
**SCHOOL CLOSURES:**

WEST PARK PUBLIC SCHOOL, OAK RIDGE PUBLIC SCHOOL, COLIN BROWN ACADEMY FOR GIRLS, SMI



The QMC range is a family of related products, offering intelligent solutions to the challenges of Master Control in today's ever-changing transmission environments.

Master Control is the heart of a broadcast facility. Traditional demands for reliability, signal protection, and serviceability continue to be essential. QMC offers bypass and emergency inputs, hot-swap boards, power supplies and runs solid field-proven software. QMC builds on this foundation to meet the latest playout and branding needs. Multiple keyers, internal DVEs, built-in Logo Store, a wide range of transitions and full audio capabilities.

QMC offers a unique approach to Master Control. With SD and HD channels, many options, and a broad selection of configurable control panels, Master Control systems can be assembled to meet any need and any size as systems can scale from a single channel, up to complex multi-channel installations. QMC allows all of this power to be easily controlled under automation, or with familiar manual control panels. Quartz's use of intelligent control panels with LCD pushbuttons gives operators a high level of flexibility in panel layout and function.

QMC Systems comprise an upstream router feeding a number of processing channels. Two different channel types are available and these may be used in any combination.

### QMC-MCS:

Each QMC-MCS provides a complete program channel and a full "lookahead" preview of the next transition. Up to four linear key levels may be fitted, one fed from an optional internal Logo Store and the others fed from external key and fill sources. An internal dual-channel DVE may also be added with independent preview and program channels. Embedded and AES audio I/O is standard, with two independent stereo voice-overs that can be mapped to any or all of the output channels. Analogue audio I/O's can be added as an option. The QMC-MCS frame is 3RU and can hold an additional board which provides a second independent channel.

### QMC-2:

QMC-2 supports high definition as well as standard definition video formats. This allows HD channels to be fully integrated into a QMC system. Each QMC-2 processes a complete 1.5Gb/s High Definition preset and program channel and provides a full "lookahead" preview of the next transition. Multiple standards are supported, including 720p and 1080i. With similar video capabilities to the QMC-MCS, the QMC-2 model also has enhanced audio, handling 16 channels as standard. QMC-2 also supports Dolby E signals, with the option of fitting Internal Dolby E decoders and encoders. The QMC-2 frame is also 3RU and can hold an additional board to add a complete second HD/SD channel.

### QMC-2+MG:

The QMC-2+MG utilizes the Master Control features of the QMC and adds a complete Logo and Audio Insertion package that will key one, or many, static/animated "bugs" over a HD/SDI or SDI video signal. It will also "Duck" insert preformatted audio clips. Media created in BMP, Tiff, TGA or Wave file formats can be imported into the Evertz Overture software and transferred to the QMC-2+MG via Ethernet. Media is stored in flash memory and can be quickly recalled. With the removable Compact Flash option you can have access of up to 2 Gigabytes of on-line media storage space and virtually unlimited archived media storage.

The QMC-2+MG has been designed to manage and store multiple logos. The size of each logo is variable and ranges from 1/25th to full screen. The position of the logo, fade rates, clip association and animation rates are user controllable. Up to 16 logos can be keyed simultaneously with independent fade control for each logo. The onboard preview allows you to cue your logos for position and content verification prior to going "On Air".

## Key Operational Features

### Transitions

The standard QMC configuration includes a number of video and audio transitions such as Mixes, V-Fades and Split audio/video as well as optional wipe transitions. The video and audio transitions can be controlled via the QMC control panel or the automation system and can be customized at any time.

### Keyers

Up to three key layers may be fitted to all QMC models. One keyer is standard while two additional keyers can be optionally added. They have a full range of user adjustments which are stored and recalled on a source-by-source basis. Keyers may be taken on and off air with other key levels or independently.

### DVE

The DVE option provides live and dynamic visual effects, such as picture sizing and positioning, and is fully integrated within the QMC. The DVE may be controlled manually or from the automation system and is independent of the keys and logo (bug) layers.

### Logo

The Logo store for the QMC is optional. It allows a station, channel or program ident to be keyed over the Program output. Logos can be transitioned onto the program output at any time using any of the standard video transitions. Multiple logos are stored within the QMC and can be called up from an automation system or from the control panel.

## Control

### Manual Control

Quartz designed the QMC system for ease of use in live and automated environments. The range of QMC control panels has been optimized for size and ease of use in single and multi-channel playout applications.

All QMC panels use LCD buttons, providing a dynamic control environment. Every button is user configurable. The panel layout and operation can be configured to suit individual needs with many aspects of the QMC operation user definable.

### Automated Control

Each QMC channel can connect to an automation system through a dedicated serial port located on every channel. This gives low latency and maximum protection against on air problems. Crosspoint control of upstream routers is handled directly by the QMC so only a single port on the automation system is required for each active channel.



QMC-2 with Control Panel



## Specifications - QMC-2 & QMC-2+MG

### Video Connections:

#### Inputs:

- 7 standard:** Program, Preset, Keyer-1 Fill, Keyer-1 Key Emergency, Program Bypass, Auxiliary Bypass
- 5 optional:** Keyer-2 Fill, Keyer-2 Key  
Keyer-3 Fill, Keyer-3 Key  
DVE Background

#### Outputs:

- 3 standard (dual):** Program, Preview, Auxiliary

### Standard Definition (QMC-2-SD):

#### Video Inputs (apart from bypass inputs)

- Signals supported:** SMPTE 259M 1997
- Signal Level:** 800mV p-p nominal
- Impedance:** 75Ω terminating
- Return Loss:** 5 - 270MHz: 15dB typical
- Cable equalization:** Belden 8281
- BBC PSF1/2:** 250m min
- BBC PSF1/3:** 150m min
- Timing window:** ± ½ line w.r.t. Reference input
- Connectors:** BNC, 75ohm terminating

#### Video Outputs:

- Signal Level:** 800mV p-p ± 10%
- Impedance:** 75Ω terminating
- Return Loss:** 5 - 270MHz: 15dB typical
- D.C. offset:** 0 ± 0.5V
- Rise/fall times:** <0.4ns
- Output jitter:** 0.2UI p-p
- Connectors:** BNC, 75Ω

### Switching Reference:

- Reference input:** Analog 525/625
- Signal level:** 1V p-p ± 3dB
- Connector:** BNC, 75Ω with looping connector

### High Definition (QMC-2-HD):

#### Video Inputs (apart from bypass)

- Signals supported:** SMPTE 292M-1998
- Signal Level:** 800mV p-p nominal
- Impedance:** 75Ω terminating
- Return Loss:** 5 - 1485MHz: 15dB typical
- Cable equalization:** Belden 1694AA: 90m min
- Timing window:** ± ½ line w.r.t. Reference input
- Connectors:** BNC, 75 ohm terminating

#### Video Outputs:

- Signal Level:** 800mV p-p ± 10%
- Impedance:** 75Ω terminating
- Return Loss:** 5 - 1485MHz: 15dB typical
- DC offset:** 0 ± 0.5V
- Connectors:** BNC, 75ohm
- Rise/fall times:** <0.270ns
- Output jitter:** 0.2UI p-p at 100kHz, 1UI at 10Hz

### Switching Reference:

- Reference input (HD/SD):** Analog 525/625 or Tri-level 50/59.94/60Hz
- Signal level:** 1V p-p ± 3dB
- Connector:** BNC, 75Ω with looping connector

### Audio Connections (Balanced frame):

#### Inputs:

- 18 standard:** Program (A1/A2, A3/A4, A5/A6, A7/A8)  
Preset (A1/A2, A3/A4, A5/A6, A7/A8)  
Emergency (A1/A2, A3/A4, A5/A6, A7/A8)  
Voice Over-1 (A1/A2, A3/A4)  
Voice Over-2 (A1/A2, A3/A4)  
Program Bypass (A1/A2, A3/A4)

#### Outputs:

- 8 standard:** Program (A1/A2, A3/A4, A5/A6, A7/A8)  
Preview (A1/A2, A3/A4, A5/A6, A7/A8)

### Audio Inputs:

- Signals supported:** AES-3
- Signal Frequency:** 32 - 96kHz
- Audio Resolution:** 24bit
- Signal Level:** 200mV - 10V p-p
- Impedance:** 110Ω terminating
- Return Loss:** 0.1 - 6MHz: >20dB
- Connectors:** D50 female

### Audio Outputs:

- Signal Level:** 2V - 7V, nominally 5V p-p ± 10%
- Signal Frequency:** 48kHz
- Impedance:** 110Ω
- Return Loss:** 0.1 - 6MHz: 20dB typical
- Intrinsic Jitter:** <.025UI
- Connectors:** D50 female

### Audio Connections (Unbalanced frame):

#### Inputs:

- 10 Standard:** Program (A1/A2, A3/A4), Preset (A1/A2, A3/A4), Emergency (A1/A2, A3/A4)  
Voice Over-1 (A1/A2), Voice Over-2 (A1/A2)  
Program Bypass (A1/A2, A3/A4)

#### Outputs:

- 8 Standard:** Program (A1/A2, A3/A4), Preview (A1/A2, A3/A4), Program (A1/A2, A3/A4)

### Audio Inputs:

- Signals supported:** AES-3id, SMPTE 276M unbalanced
- Signal Frequency:** 32 - 96kHz
- Audio Resolution:** 24bit
- Signal Level:** 320mV - 1.2V p-p
- Impedance:** 75Ω terminating
- Return Loss:** 0.1 - 6MHz: >15dB
- Connectors:** BNC, 75ohm

### Audio Outputs:

- Signal Level:** 1V p-p ± 20%
- Signal Frequency:** 48kHz
- Impedance:** 75Ω
- Return Loss:** 0.1 - 6MHz: 15dB typical
- Intrinsic Jitter:** <.025UI
- Connectors:** BNC

### Metadata Connections (with Dolby-E decoder option):

- Serial:** 2 x 8 pin RJ45 RS232/ RS422 link selectable

### Control:

- Q-Link:** 2 x BNC with loop-through connections, 75Ω (max length 500m)
- Serial:** 1x D9 female, 3 x 8 pin RJ45 RS232/RS422 link selectable.

### Ethernet 10BaseT:

- Tally:** 1x D25 female
- Inputs:** 7 or 8 TTL inputs, <0.8V for logic low, >3.5V for logic high
- Outputs:** 7 or 8 normally open contact pairs  
Contact rating 24A @0.5A D.C.  
resistive load

### Bypass control and Alarm:

- 4 way Klippon, mating connector supplied



## Specifications - QMC-2

### Physical:

**Height:** 3RU, 133mm  
**Width:** 19" Rack mount  
**Depth:** 485mm  
**Weight:**  
     Single channel: 9Kg  
     Dual channel: 10.5Kg  
**Operating Temperature:** 0 - 40°C  
**Ventilation:** Fan cooled, air drawn from front, exhaust at rear and sides

### Electrical:

**Supply:** 90-264VAC universal 50/60Hz  
**Power:**  
     Single channel: 125 Watts  
     Dual channel: 250 Watts  
**Backup:** Optional  
**EMC:** Meets CE requirements

### Ordering Information:

<b>QMC-2-SD-U</b>	SD Master Control Switcher Single channel SDI switcher/mixer unbalanced
<b>QMC-2-SD-B</b>	SD Master Control Switcher Single channel SDI switcher/mixer balanced
<b>QMC-2-SD-CH2</b>	Additional Switcher/Mixer Channel
<b>QMC-2-HD-U</b>	HD Master Control Switcher Single channel HD SDI switcher/mixer unbalanced
<b>QMC-2-HD-B</b>	HD Master Control Switcher Single channel HD SDI switcher/mixer balanced AES audio
<b>QMC-2-HD-CH2</b>	Additional Switcher/Mixer Channel

### Ordering Options:

<b>+AES8</b>	Upgrade to 8 mono AES audio I/O's Only available for the balanced QMC-2 frame (QMC-2-SD-B)
<b>+DVE</b>	DVE Option for QMC-2-SD Includes Background Option
<b>+KEY1</b>	Additional Key Layer Add a 2nd level of Key & Fill
<b>+KEY2</b>	2 Additional Key Layers Adds a 2nd & 3rd level of Key & Fill. Note: cannot be ordered with +KEY1 option
<b>+LG</b>	Internal Logo store & keyer. (NOTE: Maximum 2 logos per channel) Stores logos and keys onto PGM output. Includes 256 MB Media Store
<b>+MG</b>	Media insertion option
<b>+WIPE</b>	Wipes Option Horizontal, vertical and diagonal wipes with colored borders with hard or soft edges
<b>+DD</b>	Dolby E decoder Option (Program & Preview Pair) Decodes an incoming Dolby E signal. Must be ordered in pairs. Up to two pairs can be fitted to each QMC-2 channel
<b>+2PS</b>	Power Supply - QMC Master Control Switcher May be used as redundant power supply or as a spare
<b>QMC-CP-A</b>	QMC Control Panel Standard panel using buttons with integral LCD ten character displays. 2RU rack-mount
<b>QMC-CP-1000A</b>	QMC Auxiliary Control Panel Fully programmable panel using buttons with integral LCD ten character displays. 1RU rack-mount
<b>QMC-CP-FS-FP</b>	QMC FS Control Panel Traditional style control panel with integral LCD multi character displays. T-bar fader arm and user assignable rotary controls. Redundant power supply
<b>QMC-2-MG-Upgrade</b>	Exiting QMC-2 upgrade to add media insertion capability





## Specifications - QMC-MCS

### Video Connections Inputs:

<b>6 standard:</b>	Program, Preset, Keyer-1 Fill, Keyer-1 Key Emergency, Program Bypass
<b>4 optional:</b>	Keyer-2 Fill, Keyer-2 Key, Keyer-3 Fill Keyer-3 Key

### Video Connections Outputs:

<b>3 standard (dual):</b>	Program, Preview, Auxiliary
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### Standard Definition Video Inputs (apart from bypass input):

<b>Signals supported:</b>	SMPTE 259M 1997
<b>Signal Level:</b>	800mV p-p nominal
<b>Impedance:</b>	75Ω, terminating
<b>Return Loss:</b>	5 - 270MHz: 15dB typical
<b>Cable equalization:</b>	Belden 8281
<b>BBC PSF1/2:</b>	250m min
<b>BBC PSF1/3:</b>	150m min
<b>Timing window:</b>	± ½ line w.r.t. Reference input
<b>Connectors:</b>	BNC, 75Ω, terminating

### Video Outputs:

<b>Signal Level:</b>	800mV p-p ± 10%
<b>Impedance:</b>	75Ω, terminating
<b>Return Loss:</b>	5 - 270MHz: 15dB typical
<b>D.C. offset:</b>	0 ± 0.5V
<b>Rise/fall times:</b>	<0.4ns
<b>Output jitter:</b>	0.2UI p-p
<b>Connectors:</b>	BNC, 75ohm

### Switching Reference:

<b>Reference input:</b>	Digital - SDI 525/625
<b>Signal level:</b>	800m V p-p nominal
<b>Connector:</b>	BNC, 75Ω, terminating

### Audio Connections (Balanced):

<b>Inputs:</b>	Program (A1/2, A3/4) Preset (A1/A2, A3/A4) Emergency (A1/A2, A3/A4) Voice Over-1 (A1/A2) Voice Over-2 (A1/A2) Program Bypass (A1/A2, A3/A4)
<b>Outputs:</b>	Program (A1/A2, A3/A4) Preview (A1/A2, A3/A4)

### Audio Inputs:

<b>Signals supported:</b>	AES-3
<b>Signal Frequency:</b>	32 - 48kHz
<b>Audio Resolution:</b>	20bit
<b>Signal Level:</b>	200mV - 10V p-p
<b>Impedance:</b>	110Ω, terminating
<b>Return Loss:</b>	0.1 - 6MHz: >20dB
<b>Connectors:</b>	D50 female

### Audio Outputs:

<b>Signal Level:</b>	2V - 7V, nominally 5V p-p ± 10%
<b>Signal Frequency:</b>	48kHz
<b>Impedance:</b>	110Ω,
<b>Return Loss:</b>	0.1 - 6MHz

<b>Intrinsic Jitter:</b>	<.025UI
<b>Connectors:</b>	D50 female

### Control:

<b>Q-Link:</b>	2 x BNC with loop-through connections, 75Ω, (max length 500m)
<b>Serial:</b>	1x D9 female, 3 x 8 pin RJ45 RS232/RS422 link selectable
<b>Tally:</b>	1x D25 female

<b>Inputs:</b>	7 or 8 TTL inputs <0.8V for logic low, >3.5V for logic high
<b>Outputs:</b>	7 or 8 normally open contact pairs Contact rating 24A @0.5A D.C. resistive load

<b>Bypass control and Alarm:</b>	4 way Klippon, mating connector supplied
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### Physical:

<b>Height:</b>	3RU, 133mm
<b>Width:</b>	19" Rack mount
<b>Depth:</b>	485mm
<b>Weight:</b>	
<b>Single channel:</b>	10Kg
<b>Dual channel:</b>	12Kg
<b>Operating Temp:</b>	0 - 40°C
<b>Ventilation:</b>	Fan cooled, air drawn from front, exhaust at rear and sides

### Electrical:

<b>Supply:</b>	90-264 VAC universal 50/60Hz
<b>Power:</b>	Single Channel 60W Dual Channel 120W
<b>Backup:</b>	Optional
<b>EMC:</b>	Meets CE requirements

### Ordering Information:

<b>QMC-MCS</b>	Master Control Switcher
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### Ordering Options:

<b>QMC-CH2</b>	Additional Switcher/Mixer Channel. Adds second channel, available with same options as first channel. Supplied complete with controller module
<b>+KEY</b>	Additional Key Layer. Up to two additional key layers may be added to each switcher/mixer channel unless the DVE is fitted then only one additional key layer may be added
<b>+AA</b>	Analog Audio Option. Adds four channel analog audio PGM & PST plus stereo voice-over inputs, plus four channel PGM & PV outputs
<b>+LG</b>	Logo OptionStores logos and keys onto PGM output
<b>+2PS</b>	Power Supply - QMC Master Control SwitcherMay be used as redundant power supply or as a spare.
<b>+DVE</b>	DVE OptionDual channel 2D DVE including colored borders with hard or soft edges. Includes two input simms.
<b>+WIPE</b>	Wipes OptionHorizontal, vertical and diagonal wipes with colored borders with hard or soft edges.
<b>QMC-CP-A</b>	QMC Control PanelStandard panel using buttons with integral LCD ten character displays. 2RU rack-mount.
<b>QMC-CP-1000A</b>	QMC Auxiliary Control Panel Fully programmable panel using buttons with integral LCD ten character displays.
<b>QMC-CP-FS-FP</b>	QMC FS Control Panel Traditional style control panel with integral LCD multi character displays. T-bar fader arm and user assignable rotary controls. Redundant power supply.







## HD SDI, SDI, Analog

### Scalable, Modular Mixing & Branding Processors

Trusted by the largest networks and production facilities, the Evertz family of Keyers, Logo Inserters, Media Inserters and Switchers offers the compatibility and features required in a modern broadcast environment. Our star line-up of equipment has the answer to your HD, SD or Analog requirements. Evertz's attention to details regarding storage, graphic capabilities and audio mixing are all key reasons for this stature. The flexibility to work well with both remote control panels and automation makes Evertz your logical choice when you need to address branding and master control.



### Downstream Keyers

**HD9626DSK & 9625DSK-LGA**

The Downstream Keyer System incorporates the latest technology to provide an advanced fully digital keyer. The Evertz Downstream Keyer is ideal for mixing key and fill signals in the "On-Air" environment. The system also features letter boxing, wipes, fades and more, and provides storage and retrieval capabilities of several user setups and presets from the front panel, or from the optional rackmount or desktop remote control panel.



### Media Inserters

**HD9725LGA, 9725LGA, HD9625LGA & 9625LGA**

The Media Keyer System is a complete Logo and Audio Insertion package that will key one, or many, static/animated "bugs" over a full bandwidth program video signal. It will also "duck" insert preformatted "wave" audio clips. With the removable Compact Flash option you can have access up to 2 Gigabytes of on-line media storage space and virtually unlimited archived media storage.



### Logo Inserters

**HD9725LG, 9725LG, HD9625LG & 9625LG**

The Logo Inserter System is a complete package that will key one or many "bugs" over a full bandwidth program video signal. Logos created in BMP, Tiff, or TGA file formats can be imported into the Overture™ software and uploaded to the Logo Inserter via Ethernet. Logos are stored in flash memory and can be quickly accessed via front panel quick select keys, GPI inputs or automation.



### Mini Master Control Switchers

**PKGHD9625SW & PKG9625SW**

The Mini Master Control Switcher includes all of the functionality found in our X Series Router, seamlessly married together with our advanced logo inserter and downstream keyer. This complete system allows you to fully control up to 12 input video signals and up to 48 AES audio inputs. You can perform voice-overs, wipes, fades, fade to black and a host of other features, all from the convenience of the single remote control panel.





### Logo Insertion with Overture™

The Evertz logo inserters combined with the Overture™ software can produce some astounding graphics for many different branding and logo insertion applications, including Post Production, Channel Branding and Government Mandated Insertions.



### Post Production

Since the beginning of HD content creation, Evertz's logo inserter products have been used for the insertion of slate information to include:

- Scene
- Take
- Date of Production
- Transfer Facility
- Producer
- Roll Number



### Channel Branding

Identify your content to ensure your signal will not be rebroadcast without your consent. Also familiarize the viewer with your unique look and feel using:

- Watermarks
- Animated Logos
- Station Identification
- Text Teasers
- Information Crawls
- Analog & Digital Clocks
- Date Logos
- Temperature Logos



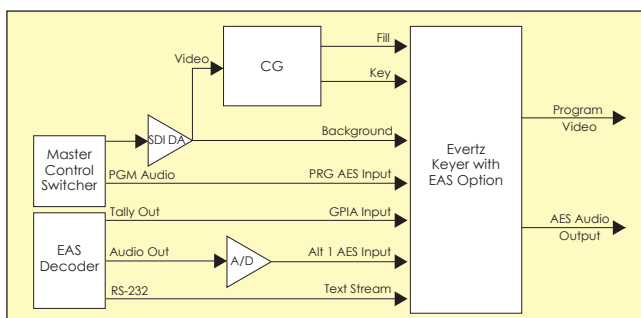
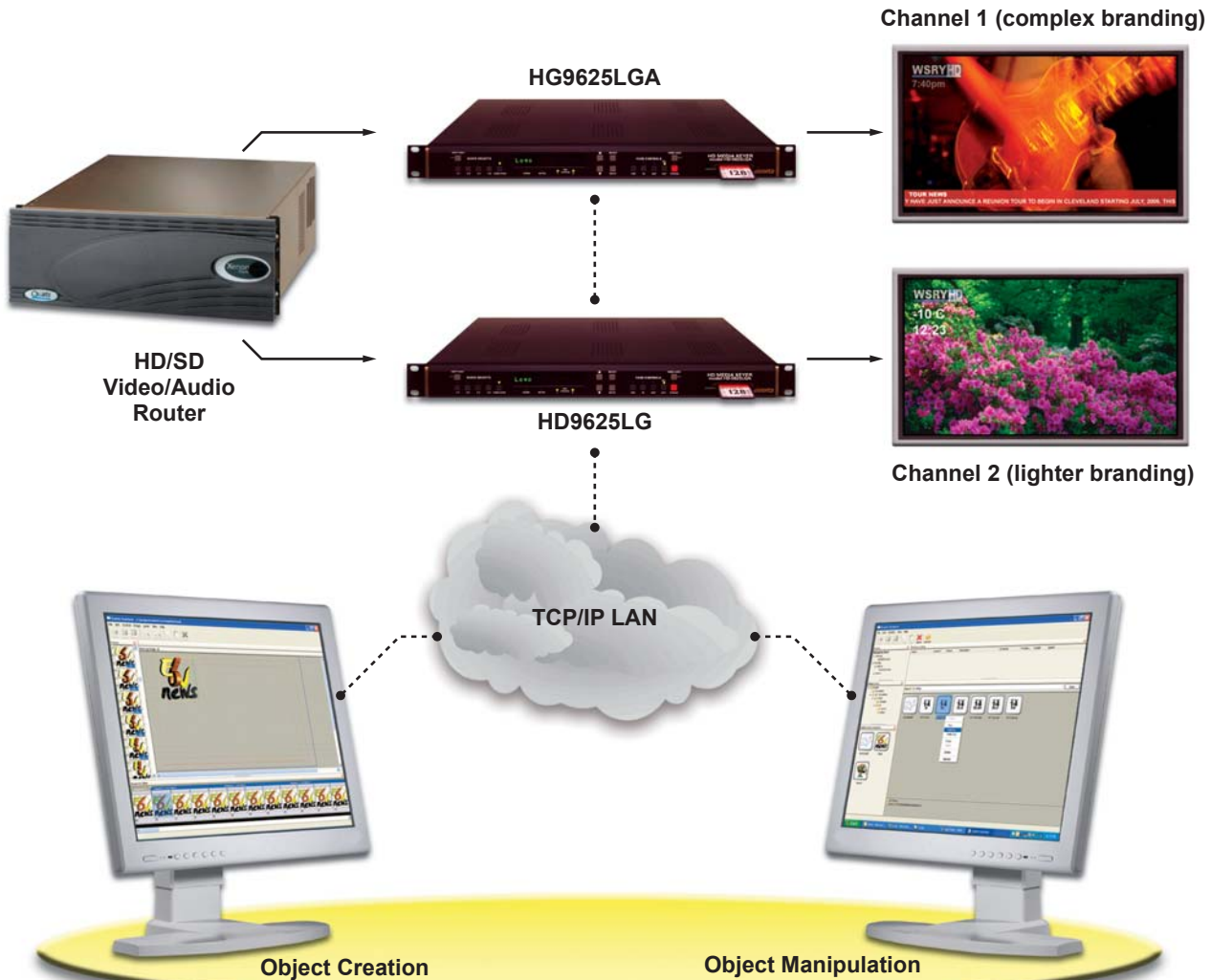
### Government Mandated Alerts

Nobody likes "Big Brother", however, you'll like the fines even less. Ensure that you are meeting all of your FCC and other legislative requirements for your broadcast signal using:

- EAS Crawls & Audio
- V-Chip Logos
- Amber Alerts
- Educational/Instructional Programming Logos



All Evertz Master Control and Channel Branding units are network ready. Standard units ship with an Ethernet port allowing instant access using any network-connected PC. Graphics created in your graphics department can be uploaded to any unit and confirmed for content, transparency and placement. Use the Overture™ application to drag and drop the branding element to the entire network connected Master Control and Channel Branding devices. Use a network storage location for archival storage of all of your branding elements. The Ethernet architecture is designed for rapid deployment and easy maintenance.



## EAS Emergency Alert System

The EAS is a system designed to provide Emergency messages to the public in times of natural and man-made disasters. The information is acquired from two sources and relayed to the public based on a detailed breakdown of geographic locations. The system is able to provide for weather information as well as other national or local emergency information. The broadcasters volunteer their participation in the program, but they must have the equipment in place for any national disasters that the president authorizes.



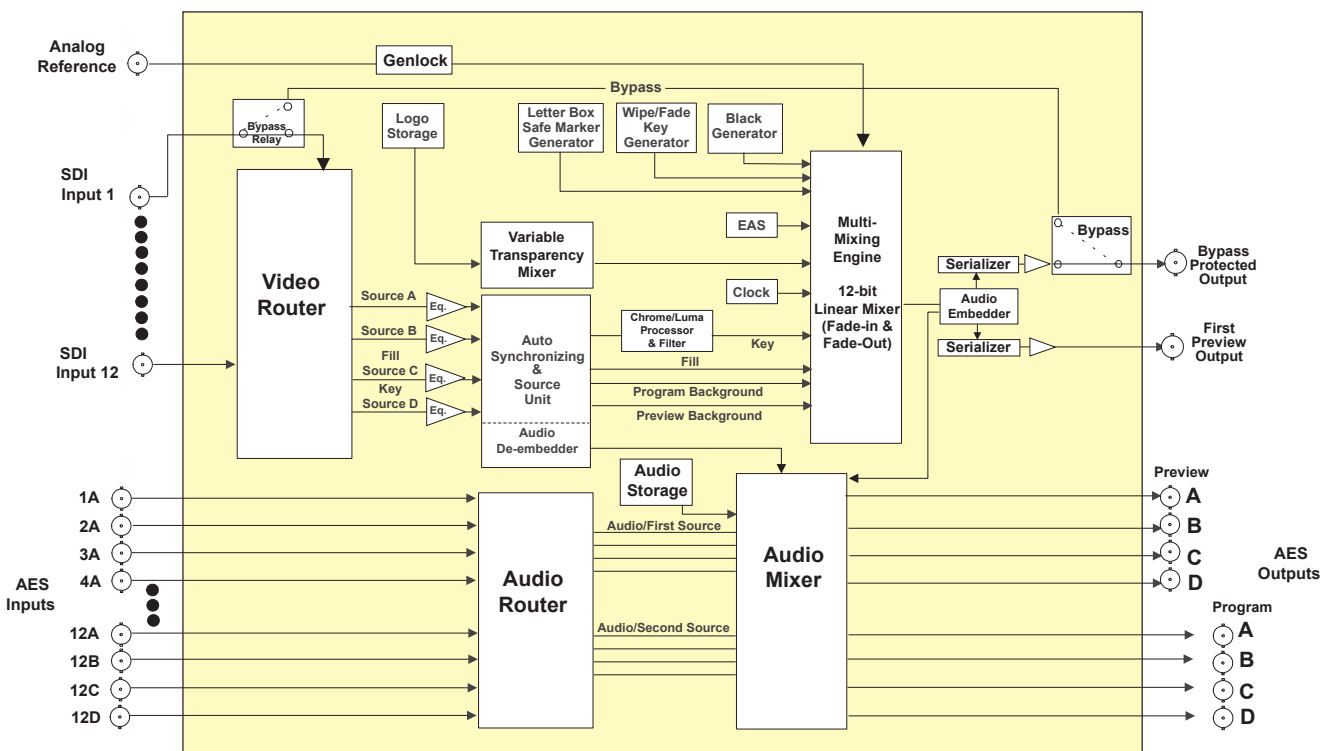
## Compact Size

Evertz Mini Master Control Switchers are an excellent addition to your broadcast facility. As you reduce cost and increase revenue it is important to use the same rack space for more distribution channels. These 2RU units offer ample features for the most demanding environments in a very compact solution. Full automation support from many vendors using the industry standard M2100 automation protocol guarantees easy installation and full integration within your existing infrastructure.



## Video Inputs & Outputs

Each Mini Master Control Switcher incorporates an Evertz 1200 series video router, providing ample inputs from digital servers, upstream feeds, cart machines, live cameras and VTR units. The separate program and preview output paths allow you to preview content prior to going to air. Separate Key and Fill inputs allow the insertion of external CG data from any capable source and does not interfere with the Logo Insertion keyer layer.





## Logo Insertion

All Mini Master Control Switchers are logo enabled. They incorporate the complete keyer functionality found in the standard Logo Inserter products. This includes full screen logo payout, animated logos, static logos, time & temperature logos as well as crawling text and EAS insertion.

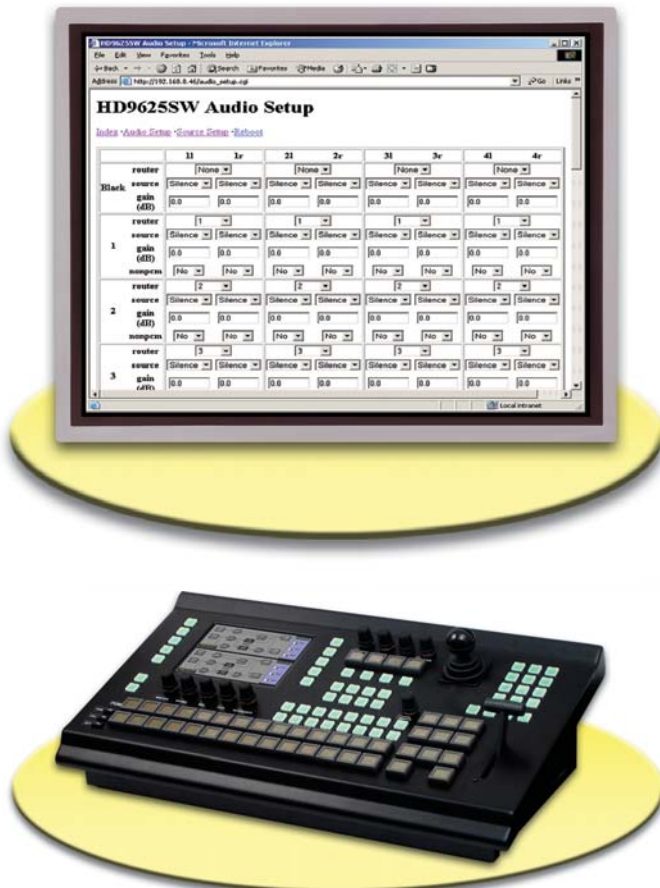


## Audio Processing

The Mini Master Control Switchers incorporate the latest in audio processing. Source selection is defined on an input-by-input basis. Each input can be either embedded or discrete as each unit has support for 8 channels of associated audio. Transition switching from embedded to discrete inputs is married to the video transition rate and handled internally by the system processor. The robust audio processing is successfully being used for multi language broadcasts, channel remapping, 5.1 audio mixing, SAP programming, EAS audio voice-over insertion, live news and weather, secondary audio channel device control and a host of other audio processing situations. All audio configurations are done from the internal HTML configuration server.

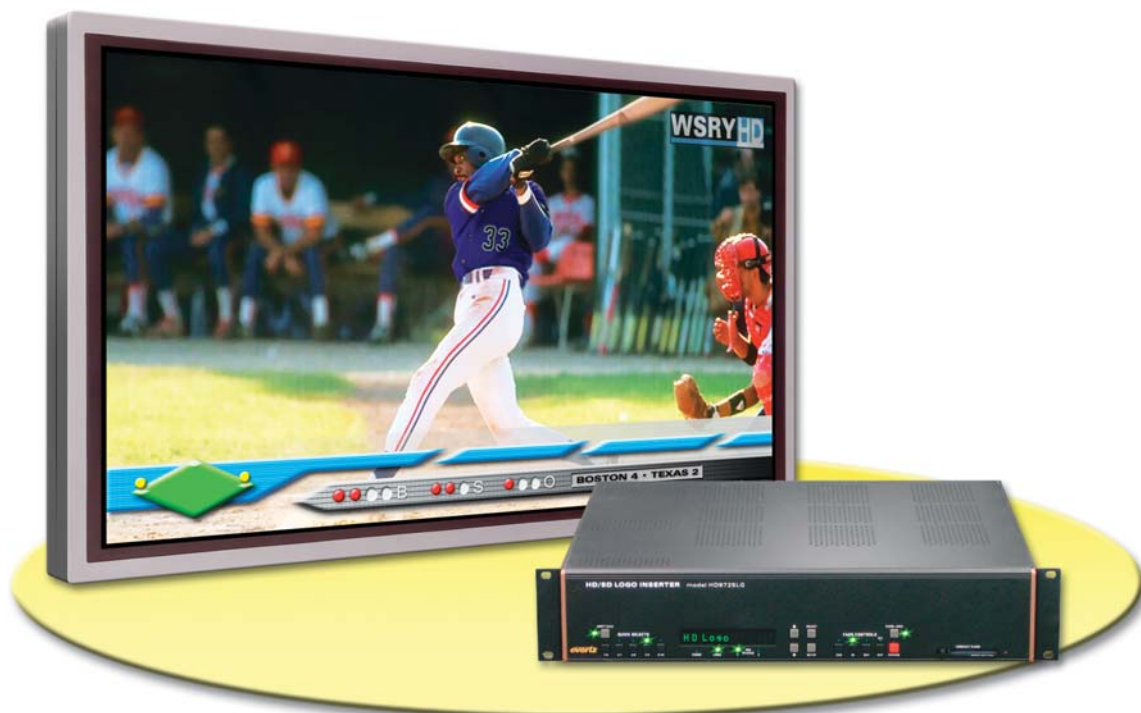
## User Interfaces & Control

The Mini Master Control Switchers host a variety of control options. Each unit ships with the standard 1RU control panel. Evertz also offers the new EV2100MCP panel for a more robust control panel for installation where operator control is required. The switchers units also support the GVG110, M2100 and M2100 Mini Master Control Panels. Automation control is offered through the 10XL automation protocol as well as the M2100 protocol, Quartz Protocol and XY for logo control only. This full range of automation interfaces guarantees easy installation and facility compatibility.





### HD9725LG & HD9725LGA



The HD9725LG Logo Inserter system is a complete Logo Insertion package that will key one, or many, static/animated "bugs" over an HDTV or SDI video signal. Logos created in BMP, Tiff, TGA or Wave file formats can be imported into the Evertz Overture software and transferred to the HD9725LG via Ethernet. Logos are stored in flash memory and can be quickly accessed via front panel, quick select keys, GPI inputs, automation and MetaCast. With the removable Compact Flash option you can have access of up to 2 Gigabytes of on-line logo storage space and virtually unlimited archived media storage.

The HD9725LGA Media Inserter system is a complete Logo and Audio insertion package that will key one, or many, static/animated "bugs" over a HDSDI or SDI video signal. It will also duck program audio, insert preformatted audio clips (WAV files), and voiceovers.

The HD9725LGA has been designed to manage and store multiple logos. The size of each logo is variable and ranges from 1/25th to full screen. The position of the logo, fade rates, clip association and animation rates are user controllable. Up to 16 logos can be keyed simultaneously with independent fade control for each logo. The onboard preview allows you to cue your logos for position and content verification prior to going "On Air". The Media Inserter Voice Over audio input allows for 1 button audio switching.

The EAS crawl support allows for connection to an existing EAS decoder. This RS232 connection allows weekly tests (white text on green), watch alerts (white on yellow) and warnings (white on red) to be scrolled across the analog video with no need for format conversion. The variable height text font can be positioned anywhere on the screen and rendered with any True Type font. A GPI can be used to insert the EAS audio on the 9725LGA.

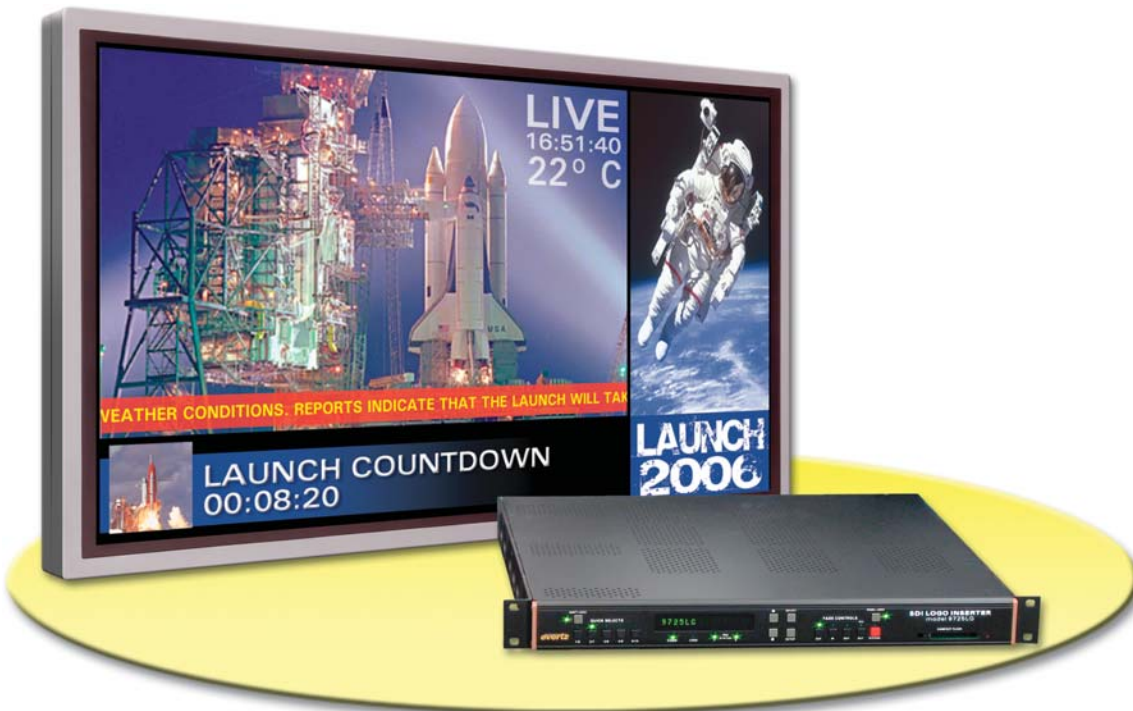
The TXT option allows for the creation of custom text messages that can be displayed as crawls or fixed position fields on top of keyed graphic logos. These user defined elements can be dynamically updated by Ethernet using the Overture software. Text crawls and fields retain display information such as background/foreground transparency, color, position and font while the dynamic text may be changed without re-creating the associated logo graphics.

#### Features

- Stores and inserts static or animated logos
- Multiple simultaneous logos can be keyed directly into SDI video and audio clips
- Incorporates a 12 bit linear keyer that provides various transparency levels to your logos
- Multi-layer logo keying
- Provides independent fade control for each logo
- 32 programmable GPI contact closures
- 16 programmable GPO outputs
- Download media from a standard Windows PC running Overture software
- Associate audio clips to play when logos are faded in
- 1 button alternate audio voice overs
- FTP file transfer and maintenance using Overture software
- Fade All Out capability provided on program video output
- Standard 256MB flash storage with 1GB playout cache
- Program output bypass relay protected
- Preview/Program or key/fill output modes
- Optional redundant power supply
- Optional rackmount or desktop remote control panels
- Optional EAS crawl support for Sage, TFT and DASDEC decoders
- EAS supports all new alert codes including AMBER alerts
- Optional 1GB or 2GB internal flash storage space
- Optional additional removable memory 256MB, 1GB or 2GB
- Optional TXT for scrolling and dynamic text titling
- Up to 8Gb playout memory options



## 9725LG & 9725LGA



The 9725LG Logo Inserter is a complete SDI Logo Insertion package that will key one, or many, static/animated "bugs" over SDI video signal. Logos created in BMP, Tiff, TGA file formats can be imported into the Evertz Overture software and transferred to the 9725LG via Ethernet. Logos are stored in flash memory and can be quickly accessed via front panel, quick select keys, GPI inputs, automation and MetaCast. With the removable Compact Flash option you can have access of up to 2 Gigabytes of on-line logo storage space and virtually unlimited archived media storage.

The 9725LGA Media Inserter is a complete Logo and Audio insertion package that will key one, or many, static/animated "bugs" over an SDI video signal. It will also "Duck" insert preformatted audio clips (WAV files).

The 9725LG and 9725LGA have been designed to manage and store multiple logos. The size of each logo is variable and ranges from 1/25th to full screen. The position of the logo, fade rates, clip association and animation rates are user controllable. Up to 16 logos can be keyed simultaneously with independent fade control for each logo. The onboard preview allows you to cue your logos for position and content verification prior to going "On Air". The Media Inserter Voice Over audio input allows for 1 button audio switching.

The EAS crawl support allows for connection to an existing EAS decoder. This RS232 connection allows weekly tests (white text on green), watch alerts (white on yellow) and warnings (white on red) to be scrolled across the analog video with no need for format conversion. The variable height text font can be positioned anywhere on the screen and rendered with any True Type font.

The TXT option allows for the creation of custom text messages that can be displayed as crawls or fixed position fields on top of keyed graphic logos. These user defined elements can be dynamically updated by Ethernet using the OVERTURE software. Text crawls and fields retain display information such as background/foreground transparency, color, position and font while the dynamic text may be changed without re-creating the associated logo graphics.

### Features

- Stores and inserts static or animated logos
- Multiple simultaneous logos can be keyed directly into SDI video
- Incorporates a linear keyer that provides various transparency to your logos
- Multi-layer keying
- Provides independent fade control for each logo
- 32 programmable GPI contact closures
- 16 programmable GPO outputs
- Download media from a standard Windows PC running Overture™ software
- Associate audio clips to play when logos are faded in
- 1 button alternate audio voice overs
- Quad AES inputs and outputs for discreet 5.1 Dolby®
- FTP file transfer and maintenance using Overture™ software
- Fade all out capability provided on program video output
- Standard 256MB flash storage with 512MB playout cache
- Program output bypass relay protected
- Ppreview/Program or key/fill output modes
- Optional redundant power supply
- Optional rackmount or desktop remote control panels
- Optional EAS crawl support for Sage, TFT and DASDEC Decoders
- EAS supports all new alert codes including amber alerts
- Optional 1GB or 2GB internal flash storage space
- Optional additional removable memory 256MB, 1GB or 2GB
- Optional TXT features for scrolling and dynamic text titling (snipes) and crawls



## AN9725LG



The AN9725LG Logo Inserter system is a complete analog logo insertion package that will key one or many static/animated "bugs" over a composite analog video signal. Logos created in BMP, Tiff, TGA file formats can be imported into the Evertz Overture software and transferred to the AN9725LG via Ethernet. Logos are stored in flash memory and can be quickly accessed via front panel, quick select keys, GPI inputs, automation and MetaCast. With the removable Compact Flash option you can have access of up to 2 Gigabytes of on-line logo storage space and virtually unlimited archived media storage.

The AN9725LG has been designed to manage and store multiple logos. The size of each logo is variable and ranges from 1/25th to full screen. The position of the logo, fade rates and animation rates are user controllable. Up to 16 logos can be keyed simultaneously with independent fade control for each logo. The onboard preview allows you to cue your logos for position and content verification prior to going "On Air".

The EAS crawl support allows for connection to an existing EAS decoder. This RS232 connection allows weekly tests (white text on green), watch alerts (white on yellow) and warnings (white on red) to be scrolled across the analog video with no need for format conversion. The variable height text font can be positioned anywhere on the screen and rendered with any True Type font.

The TXT option allows for the creation of custom text messages that can be displayed as crawls or fixed position fields on top of keyed graphic logos. These user defined elements can be dynamically updated by Ethernet using the Overture software. Text crawls and fields retain display information such as background/foreground transparency, color, position and font while the dynamic text may be changed without re-creating the associated logo graphics.

### Features

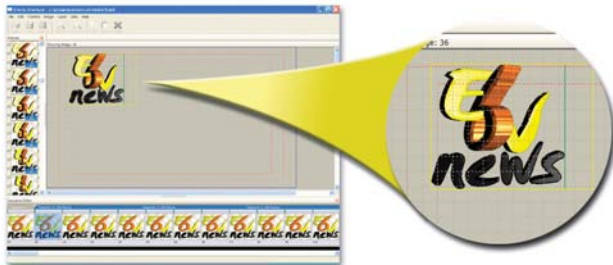
- Stores and inserts static or animated logos
- Multiple simultaneous logos can be keyed directly into composite analog video
- Incorporates a linear keyer that provides various transparency levels to your logos
- Provides independent fade rates for each logo
- 32 programmable GPI contact closures
- 16 programmable GPO outputs
- Download media from a standard Windows PC running OVERTURE™
- EAS supports all new alert codes including child abduction emergency
- FTP file transfer and maintenance using Overture™ software
- Fade all out capability provided on program video output
- Standard 256MB flash storage with 512MB playout cache
- Program output bypass relay protected
- Matches logo to input video  $\pm 3\text{dB}$  range
- Can correct video levels  $\pm 3\text{dB}$
- Multi-layer keying
- Preview/Program or key/fill output modes
- Optional 1GByte or 2GByte internal flash storage space
- Optional additional removable memory 256MB, 1GByte or 2GBytes compact flash storage
- Optional rackmount or desktop remote control panels
- Optional EAS crawl support for Sage, TFT and DAS DEC Decoders
- Optional TXT for scrolling and dynamic text titling
- Optional redundant power supply
- SDI upgrade by factory retrofit
- Up to 4Gb Playout memory options



## Overture™ Software

All Evertz logo enabled keyer products ship with the Overture™ program used to create logo files for video insertion. This easy to use software can import graphic files created in the Tiff, Targe, BMP, Gig or JPG format from professional graphics programs and transfer them to the logo inserter. The software is a utility for converting existing files from RGB to the YCbCr or YPbPr format used in the video domain.

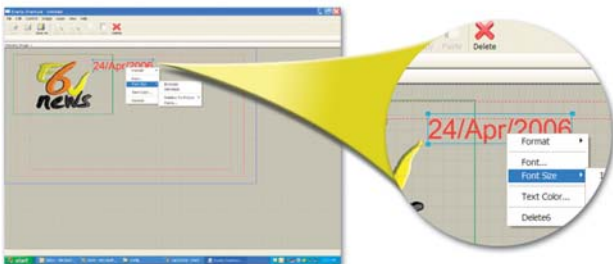
### Overture™ can create the following logos:



**Static or Animated** - Static logos are fixed position/fixed transparency images. Animated logos have an active position and active transparency series of images displayed at any size up to full screen. Duration of playout depends on storage size and playout memory installed.

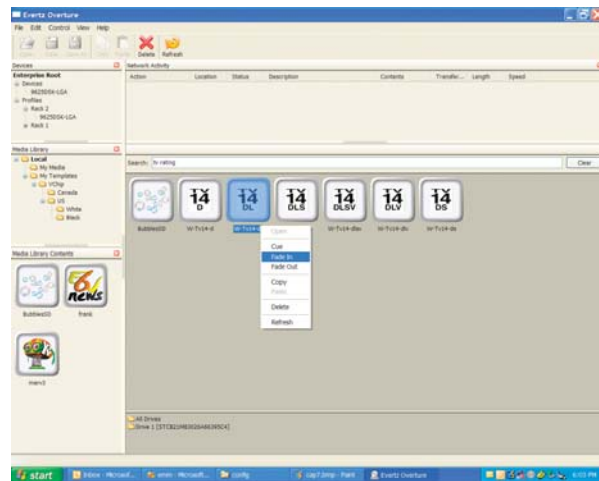


**Analog or Digital Clock** - The analog clock has a video inserted rendering of a traditional wall clock, driven from internal real time clock or saved to the LTC input. The digital clock has video inserted digital clock characters, rendered using the internal device CG. Time display options include HH:MM, HH:MM:SS, 12 or 24 hour styles. Up and down counters are also included.



**Date and Temperature** - Video inserted date and ambient air temperatures are rendered using the internal device CG. Internal date values run from either the internal real time clock or slaved to the LTC output if date information available. Great for rebroadcasting of date specific material. Temperature display options include Celsius or Fahrenheit, with or without degree symbol. *Temperature logos require the purchase of the optional external temperature probe.*

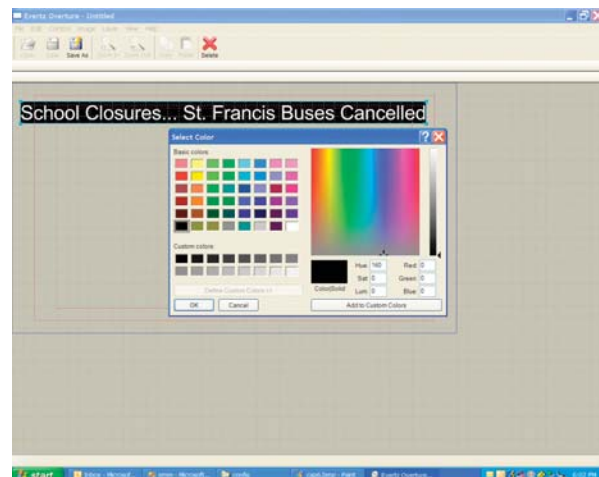
## Outline of Overture™ Functions



**Media Management** - Drag-and-drop logo, wave, font and position files from the local PC, connected network space, or between channel branding devices. Files can be uploaded, downloaded, archived or deleted using the easy "right-click" functionality.

**Object Properties** - "Right-click" on any EVL file to display properties and view a thumbnail of the associated logo. Thumbnail views can be displayed from the connected device as well as on the local PC or network storage space. Properties displayed include H&V, gain, and clock parameters.

**Play-out Control** - "Right-click" displays a selection menu and allows quick access to a host of features including the "fade-in" and "fade-out" functions. This allows media control from remote access points.



**Crawl Creation** - Crawl features include foreground and background color & transparency. Set the rate, display position and have the data displayed using any True Type font. Crawls can automatically transfer and fade in with the simple click of a button.



## Specifications

	PKGHD9625SW	PKG9625SW	HD9625DSK	9625DSK-LGA	HD9625LGA	9625LGA	HD9625LG	9625LG	HD9725MS
Specifications									
Serial Digital Video Input Standard	SMPTE 292M 1.485Gb/s, 1080i/59.94, 1080i/50, 720p/59.94	Serial component SMPTE 259M-C	SMPTE 292M 1.485Gb/s, 1080i/59.94, 1080i/50, 720p/59.94	Serial component SMPTE 259M-C	SMPTE 292M 1.485Gb/s, 1080i/59.94, 1080i/50, 720p/59.94	Serial component SMPTE 259M-C	SMPTE 292M 1.485Gb/s, 1080i/59.94, 1080i/50, 720p/59.94	Serial component SMPTE 259M-C	SMPTE 292M 1.485Gb/s, 1080i/59.94, 1080i/50, 720p/59.94
Number of Inputs	12	12	3	3	1	1	1	1	1
Connector	BNC per IEC 60169-8 Amendment 2								
Equalization	Automatic up to 100m @ 1.5Gb/s with Belden 1694 (or equivalent), 25m with +HBP option	Automatic up to 200m @ 270Mb/s with Belden 8281 (or equivalent)	Automatic up to 100m @ 1.5Gb/s with Belden 1694 (or equivalent), 25m with +HBP option	Automatic up to 200m @ 270Mb/s with Belden 8281 (or equivalent)	Automatic up to 100m @ 1.5Gb/s with Belden 1694 (or equivalent), 25m with +HBP option	Automatic up to 200m @ 270Mb/s with Belden 8281 (or equivalent)	Automatic up to 100m @ 1.5Gb/s with Belden 1694 (or equivalent), 25m with +HBP option	Automatic up to 200m @ 270Mb/s with Belden 8281 (or equivalent)	Automatic up to 100m @ 1.5Gb/s with Belden 1694 (or equivalent), 25m with +HBP option
Signal Level	800mV ±10%								
Impedance	75Ω								
Serial Digital Video Output Standard	Same as input								
Outputs	1 Program, 1 Preview	1 Program, 1 Preview	1 Program bypass protected, 1 Preview	1 Program bypass protected, 1 Preview	2 Program (1 output bypass protected with +HBP option), 1 Preview	2 Program (1 output bypass protected), 1 Preview	2 Program (1 output bypass protected with +HBP option), 1 Preview	2 Program (1 output bypass protected), 1 Preview	
Connector	BNC per IEC 60169-8 Amendment 2								
Signal Level	800mV nominal								
DC Offset	0V ±0.5V								
Rise/Fall Time	200ps nominal								
Overshoot	< 10% of amplitude								
Wideband Jitter	< 0.2UI								
Impedance	75Ω								
AES Audio Input Standard	SMPTE 276M single ended AES	SMPTE 276M single ended AES		SMPTE 276M single ended AES	SMPTE 276M single ended AES	SMPTE 276M single ended AES	SMPTE 276M single ended AES	SMPTE 276M single ended AES	SMPTE 276M single ended AES
Number of Inputs	12 per bus, 4 busses	12 per bus, 4 busses		4 Program, 4 Alternate	4 Program, 4 Alternate	4 Program, 4 Alternate			4 Program, 4 Alternate
Connector	BNC per IEC 60169-8 Amendment 2 on 2 breakout panels provided								
Signal Level	1V p-p ±10%								
AES Audio Output Standard	SMPTE 276M single ended AES								
Number of Outputs	4 Program, 4 Preview								
Connector	BNC per IEC 60169-8 Amendment 2 on 2 breakout panels provided								
Signal Level	1V p-p								
Video Reference Type	Composite Bi-level sync (525i/59.94 or 625i/50) 300mV	NTSC or PAL colour black 1V p-p composite b-level sync (525 or 625 line)		NTSC or PAL colour black 1V p-p composite b-level sync (525 or 625 line)	Composite Bi-level sync (525i/59.94 or 625i/50) 300mV	NTSC or PAL colour black 1V p-p composite b-level sync (525 or 625 line)	Composite Bi-level sync (525i/59.94 or 625i/50) 300mV	NTSC or PAL colour black 1V p-p composite b-level sync (525 or 625 line)	Composite Bi-level sync (525i/59.94 or 625i/50) 300mV
Number of Inputs	2	2	0	1	1	1	1	1	1
Connector	BNC per IEC 60169-8 Amendment 2								
Termination	High impedance loop through								
General Purpose Input/Output									
Number of Inputs	8	8	8	8	8	8	8	8	32
Number of Outputs	4	4	4	4	4	4	4	4	16

## Ordering Information

PKGHD9625SW	+2PS	+HBP	+CF	+CLH	+1G	+TP	+E	CF128	CF1G	WA-1525					
PKG9625SW	+2PS	Included	+CF	+CWL	+1G	+TP	+E	CF128	CF1G	WA-1525					
HD9625DSK	+2PS										+RCP	+DCP			
9625DSK-LGA	+2PS	Included	+CF	+CWL	+1G	+TP	+E	CF128	CF1G	WA-1525	+RCP	+DCP			
HD9625LGA	+2PS	+HBP	+CF	+CLH	+1G	+TP	+E	CF128	CF1G	WA-1525	+RCP	+DCP		EAS-UPGRADE	
9625LGA	+2PS	Included	+CF	+CWL	+1G	+TP	+E	CF128	CF1G	WA-1525	+RCP	+DCP			
HD9625LG	+2PS	+HBP	+CF	+CLH	+1G	+TP	+E	CF128	CF1G	WA-1525	+RCP	+DCP		EAS-UPGRADE	
9625LG	+2PS	Included	+CF	+CWL	+1G	+TP	+E	CF128	CF1G	WA-1525	+RCP	+DCP			
HD9725MS	+2PS	+HBP	+CF	+CLH	+2G	+TP	+E	NA	CF2G	WA-1525	+RCP	+DCP		EAS-UPGRADE	
MIS1000	Media Ingest Station														

## Legend

+2PS	Redundant power supply
+HBP	Bypass relay
+CF	Compact Flash Hardware (does not include compact flash memory card)
+CLH	Crawl support for HD products
+CWL	Crawl support
+1G	Internal flash expansion to 1GB
+TP	Air Temperature Probe
+E	EAS Crawl Insertion

+RCP	Rack mount remote control panel
+DCP	Desktop remote control unit
EAS-UPGRADE	Upgrade of existing LG/LGA/MS to LG/LGA/MS+E

### Accessories

CF128	Compact flash expansion port with 128MB card
CF1G	Compact flash expansion port with 1GB card
9600LG-TP	Air temperature probe for all 9625 & HD9625 products (for existing hardware)
WA-1525	15-25 Pin Adapter for all 9625 & HD9625 products





With effective, simple to use graphics, unparalleled drill down information, external notification tools and a network efficient SNMP monitoring & configuration architecture, VistaLINK® PRO PLUS provides you with all the details!





## VistaLINK® PRO

**Configuration Management** - VistaLINK® PRO configuration software (VLPRO-C) is provided free to users allowing unlimited configuration capabilities for Evertz VistaLINK® - capable equipment.

**Alarm-Event Notification Client** - Expand the VistaLINK® PRO configuration tool by adding centralized alarm management. Define and set critical alarms, alarm severities and filters. Built-in external alarm notification tools include audible alerts, "smart" email notification and/or contact closure triggers.

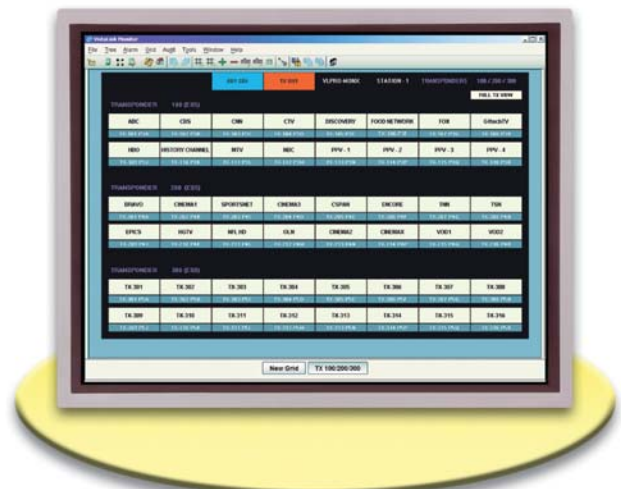
**Monitoring Grid Client** - Generate "services" consisting of different channels, modules, frames or locations, and then group to provide quick status and configuration.

## VistaLINK® PRO PLUS

Building on the standard VistaLINK® PRO configuration and monitoring clients, add user-configurable pictorial representations of your broadcast facility, local and remote. Start with global perspectives and drill down to specific rack and frame layouts or consolidate important status information and direct configuration control on a single display. Import facility block diagrams or generate an off-line simulation using virtual equipment and graphics from the VistaLINK™ media library. Link multiple views for the most effective facility or application representation. Integrate your VistaLINK® PRO PLUS graphic screens with a VIP™ or MVP™ and get the best of both on-screen signal display and network monitoring and configuration.



VLPRO PLUS module configuration slider tools & single "salvo" configuration change icons



Monitoring/Grid Client view designed to match monitor wall (MVP™) applications



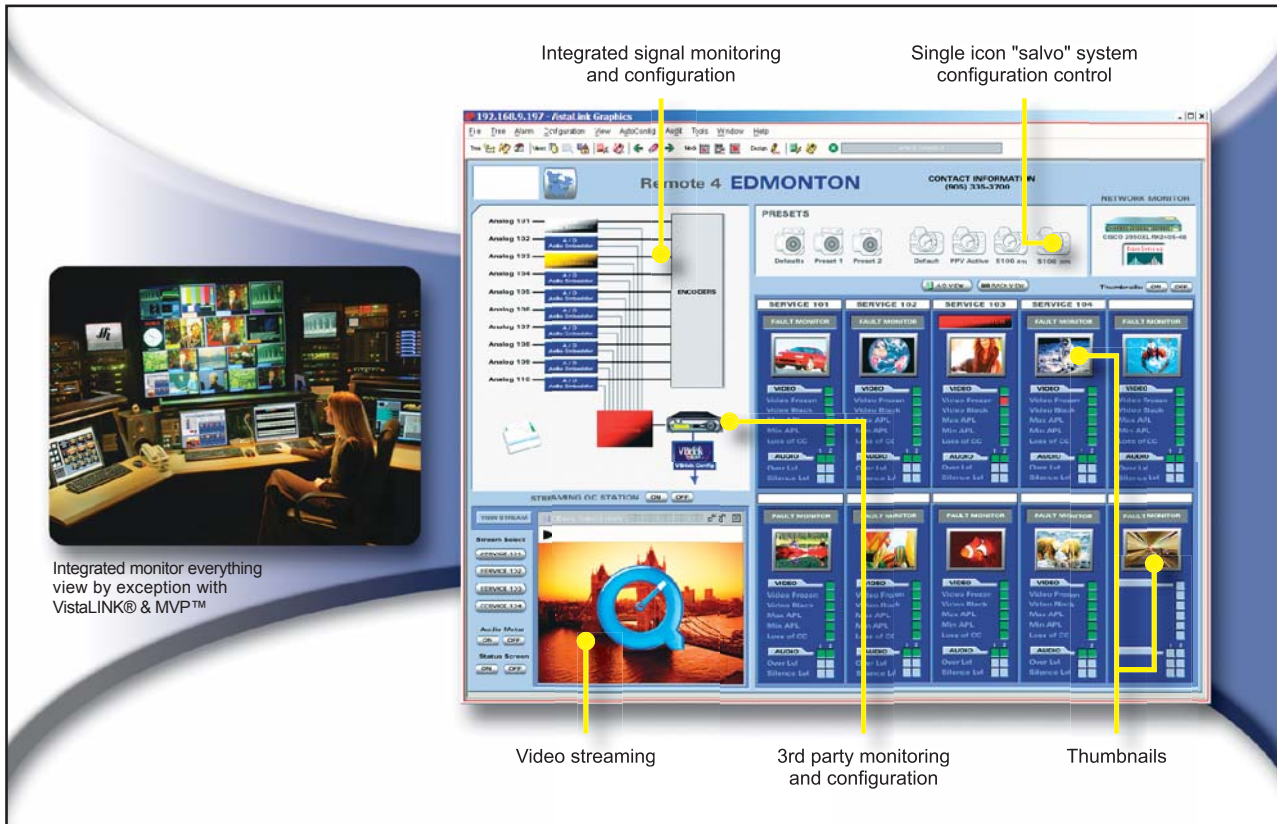
**Streaming** • Video, audio and data signal monitoring is further enhanced in VistaLINK® through the ability of streaming from a remote location to a central facility.

**Scheduling & Auto-Configuration** • Automate facility monitoring & configuration operations or limit over-alarms by scheduling changes based on times/dates or events.

**Third-Party Monitoring & Interfacing** • For 3rd party SNMP-enabled or legacy equipment monitoring and configuration, Evertz VistaLINK® solution may be extended to unify all your system monitoring needs in one package.

**Monitor Everything by Exception** • Through built in "signal sniffer" modules and with VistaLINK® monitoring all signals 24/7 and sending fault notifications while displaying only these signals as they occur further increases performance and cost efficiency.

**Monitor Web Clients** • Unlock the capability of a remote system or facility health monitoring solution through VistaLINK® PRO + WEB clients. Go beyond a firewall and monitor your facility conveniently through a browser, while receiving email and pager fault notifications as they occur.



## Network Control Panels

The 1RU 9000NCP and 2RU 9000NCP2 VistaLINK® Network Control Panels are low-powered, rack mounted control panel interfaces to VistaLINK®-capable modules, allowing for real-time selection and configuration control of enabled parameters through SNMP.

The NCP units can be used to control a subset of an enabled module's full parameter set - usually the "proc amp" and operational parameters such as video & audio level adjustments and gain control. An updated list of NCP-controlled modules and parameters can be found on the Evertz web site.

NCP units connect to the network via Ethernet and can further be customized with user-specific labels and preset quick access configuration buttons.



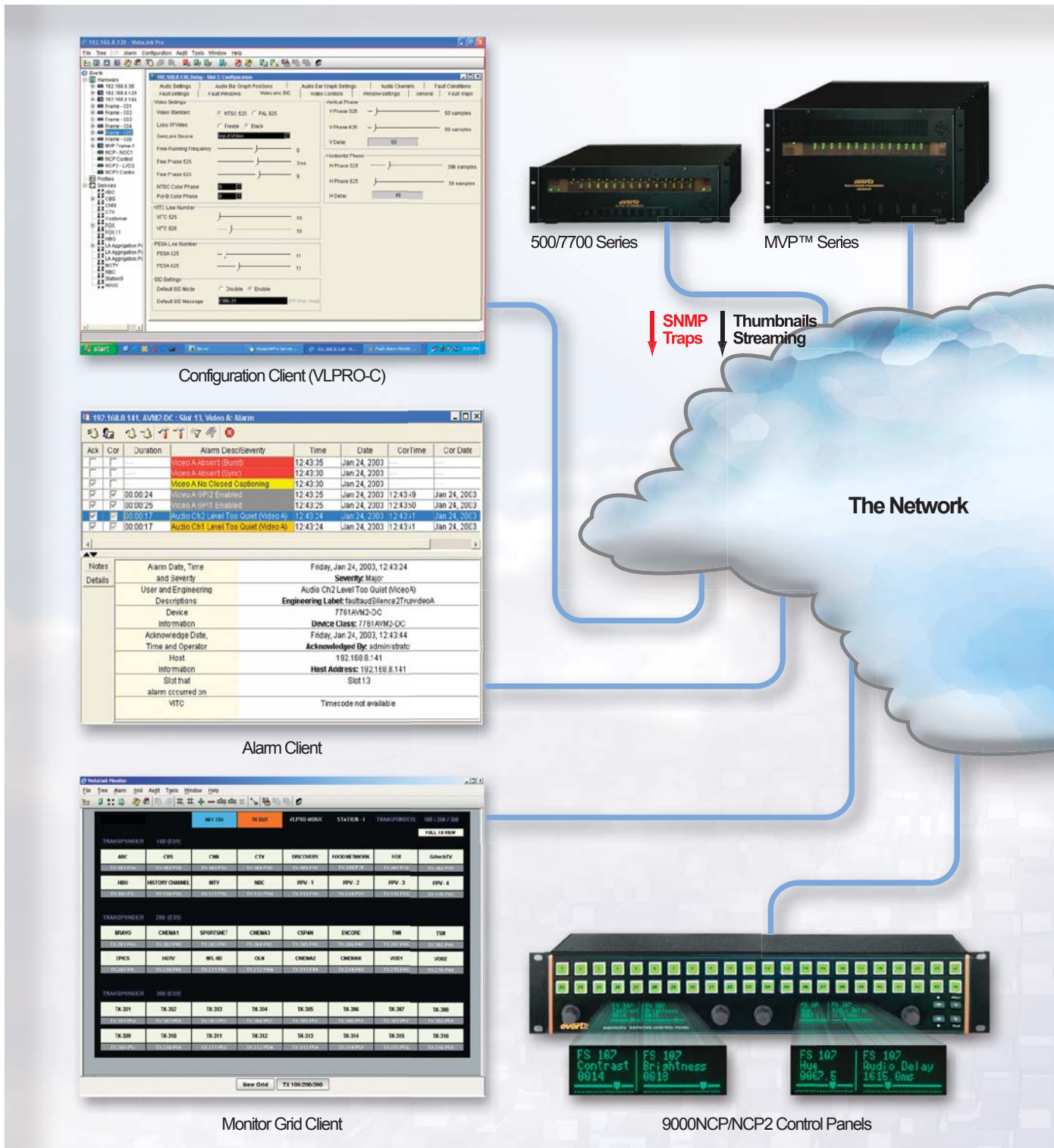
9000NCP2 Configuration Control via split screen display

## Ordering Information

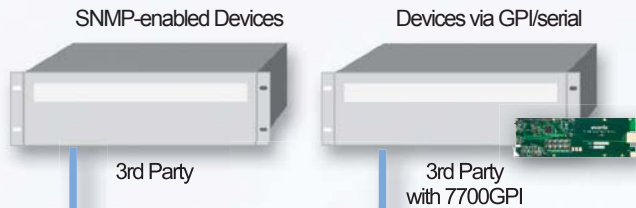
<b>9000NCP</b>	VistaLINK® Network Control Panel (1RU)
<b>9000NCP2</b>	VistaLINK® Network Control Panel (2RU)



The real "plus" of SNMP is its simplicity. Through Evertz VistaLINK®, thousands of network nodes are monitored and configured world-wide via SNMP. VistaLINK® PRO and VistaLINK® PRO PLUS unite all SNMP-based equipment from Evertz and beyond providing monitoring and configuration capabilities for your mission critical needs. VistaLINK® is the most complete and comprehensive all SNMP-based signal monitoring and equipment configuration solution.

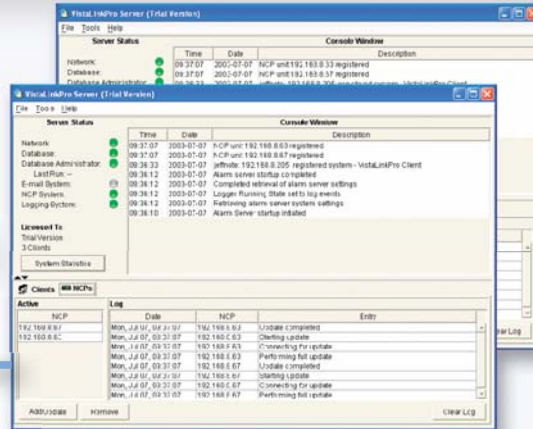






SNMP

(LAN, WAN, VPN)



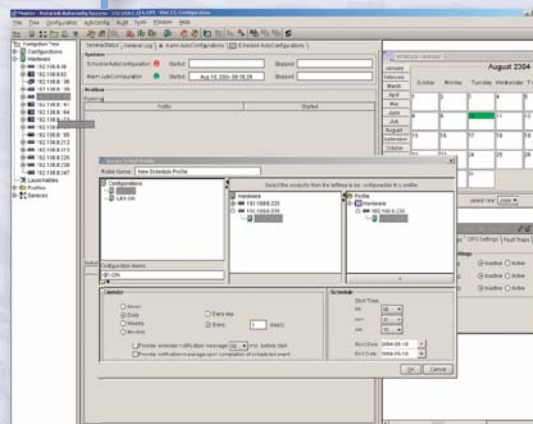
VLPRO Server (+ Redundancy)



HTTP Web Client



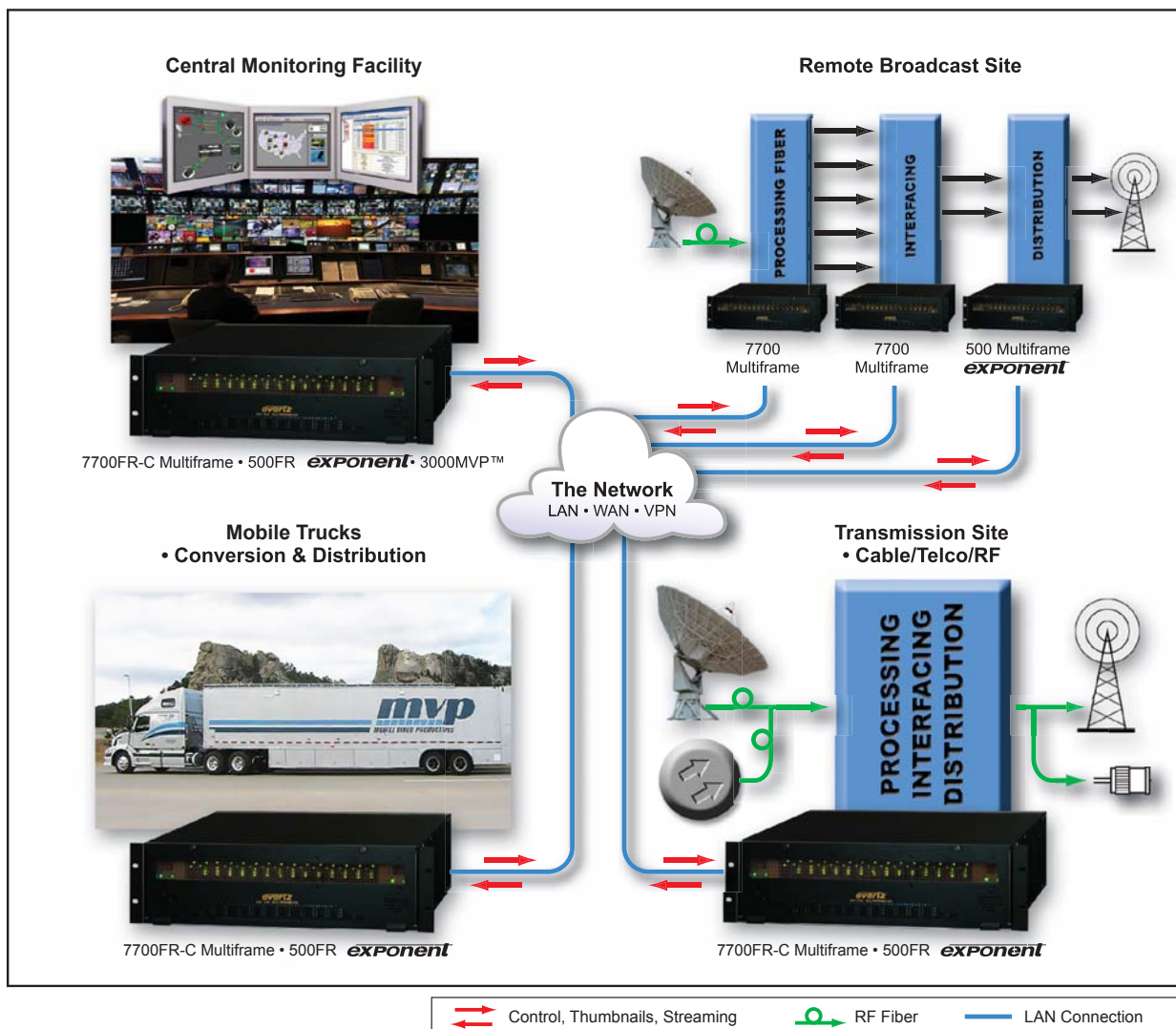
VistaLINK® PRO PLUS (Graphics) Client



Auto Configuration and Scheduler Client



Simple, reliable, secure and efficient network monitoring and control for your facility equipment through VistaLINK® and SNMP. All Evertz VistaLINK® -capable products have built-in Probing and Monitoring.



## Ordering Information

**VLPRO** VistaLINK® PRO SNMP alarm monitoring, email notification & configuration (1 client, 1 year)

**VLPRO PLUS** VistaLINK® PRO PLUS SNMP alarm monitoring, email notification & configuration (1 client, 1 year)

### Ordering Options

**+C** VistaLINK® PRO SNMP configuration-only - free with every 7700FC, 500FC or 3000FC module

**+SCH** VistaLINK® PRO automated configuration & scheduler software

**+web-1** Remote site client VistaLINK® system monitoring using Internet browser

**+web-5** Remote site VistaLINK® system monitoring clients (5) using Internet browser

**+RSERV** Redundant VistaLINK® PRO server

**+TSERV**

Thumbnail Server option

**+TPD**

Third Party TRAP monitoring option

### Upgrade Options VLPRO PLUS UPGRADE

Upgrade existing VistaLINK® PRO client to VistaLINK® PRO PLUS (1 client, 1 year)

### VLPRO-SCH UPGRADE

Upgrade existing VLPRO to include automated configuration & scheduling software

### VLPRO-WEB1 UPGRADE

Upgrade for existing VLPRO to include remote site VistaLINK® system monitoring

### Training & Yearly Subscriptions

#### VLPRO Set-up VLPRO Training

VistaLINK® configuration & training session (per Diem)

#### VLPRO-SER/SUP/LIC 1, 2 or 3 YEAR

Extra 1, 2 or 3 year VistaLINK® PRO PLUS license & support per client





**Meeting and exceeding your signal display,  
monitoring and configuration needs  
...now and in the future!**



## MVP™ • Expect the Best, Accept no Substitutes!

The MVP™ is the next generation in Multi-Image Display Processor technology, boasting the most flexible and feature rich platform available, making it ideal for all applications where video/audio monitoring and display are required. The MVP™ architecture is revolutionary in it's approach to NOT use a PC platform at the core of its operation, by doing so the MVP™ platform is "bulletproof" and well suited for 24/7 mission critical environments. Combine its "bulletproof" architecture with the simple and intuitive control interface and you have a system perfect for any control room.

Evertz now also offers a completely integrated Master Control environment when interfacing the MVP™ with the Quartz line of Master Control products plus the facility monitoring capability of VistaLINK® PRO software.

### Key MVP™ Features & Benefits:

- Modular based architecture - expand to hundreds of inputs in a single system displayed on many outputs.
- All inputs auto-sensing: HD/SD/analog
- High Resolution output modules with DVI/VGA outputs up to UXGA (1600x1200) including 1920x1080 and 1400x1050
- True hot swappable architecture allows for seamless swap of any module or power supply during operation of system, made simple with front loading frame
- Multiple HD decoding features:
  - 708 Caption Decoding
  - HD VITC/Source ID (RP-188)
  - 708/608 XDS data decode
- Extract & display all Dolby® E Metadata information such as:
  - Dial norm
  - Channel line-up
  - Dolby® surround and more...
- Support of all aspect ratio control standards including WSS, Video Index (RP-186) and Advanced Format Descriptor (AFD), with automatic video window aspect ratio reconfiguration and on-screen status display
- Inputs can be "thumbnailed" and transported via IP to VistaLINK® PRO for remote monitoring applications
- Easy integration with complex router systems for simple global preset loading and cross point control
- True SNMP-based alarming and control allows MVP™ to monitor and be controlled by VistaLINK® PRO
- Integrate MVP™ with the QMC product line and VLPRO, and you have a fully integrated master control environment
- Simple and intuitive real-time drag and drop preset design using MVP™ Maestro™ GUI
- Analog, AES and embedded audio level metering
- Static and dynamic UMDs, borders and clocks - all with stylized borders and fonts

- VBI data (Closed Captioning, Program Rating, etc.) signal decoding, monitoring & display

- On-screen clocks and counters, with external LTC reference & configurable offsets

- Up to 120 unique inputs displayed on a single output

- Auto-sensing HD/SD /Analog video input on same BNC

- Selectable or detectable aspect ratios for customized display of video inputs

- Aspect ratio markers

- Computer graphic inputs up to UXGA resolution

- Multiple, user-configurable static/dynamic UMD's, on-screen text, tallys, fault messages, borders, background images with transparency control

- Up to 4 AES or 4 stereo analog pair audio level with phase correlation metering with configurable orientation, colors and fault monitoring

- Dolby® E metadata decode and display





## Multi-Input Format Display & Monitoring



- Auto-sensing HD/SD/Analog video input on same BNC
- DVI/RGB

- NTSC/PAL
- 525i/625i
- 1080i/60
- 1080i/59.94

- 1080i/50
- 1080p/24sF
- 1080p/23.98sF
- 720p/60

- 720p/59.94
- 720p/50
- 480p/60
- 480p/59.94

## Flexible Output Options



### Output Resolutions Supported:

- XGA (1024x768)
- WARP (768x1280)
- UXGA (1600x1200)

- 720P (1280x720)
- WARP 2 (768x1366)
- HD (1920x1080)

- 480P (720x480)
- WXGA (1280x768)
- SXGA (1280x1024)

- 576P (720x576)
- WXGA 2 (1366x768)
- SXGA+ (1400x1050)

## Complete Ancillary Data Monitoring and Decode



### Decode:

- XDS - Program Rating
- HD and SD VITC/Source ID
- WSS/AFD adjust/display

- Detect Encoded Audio (AC3/Dolby® E)
- EIA-608 - SD Captions
- EIA-708 - HD Captions

- WST - World Standard Teletext
- Source Standard
- Decode/Display Dolby® E Metadata

## Extensive Graphic Components



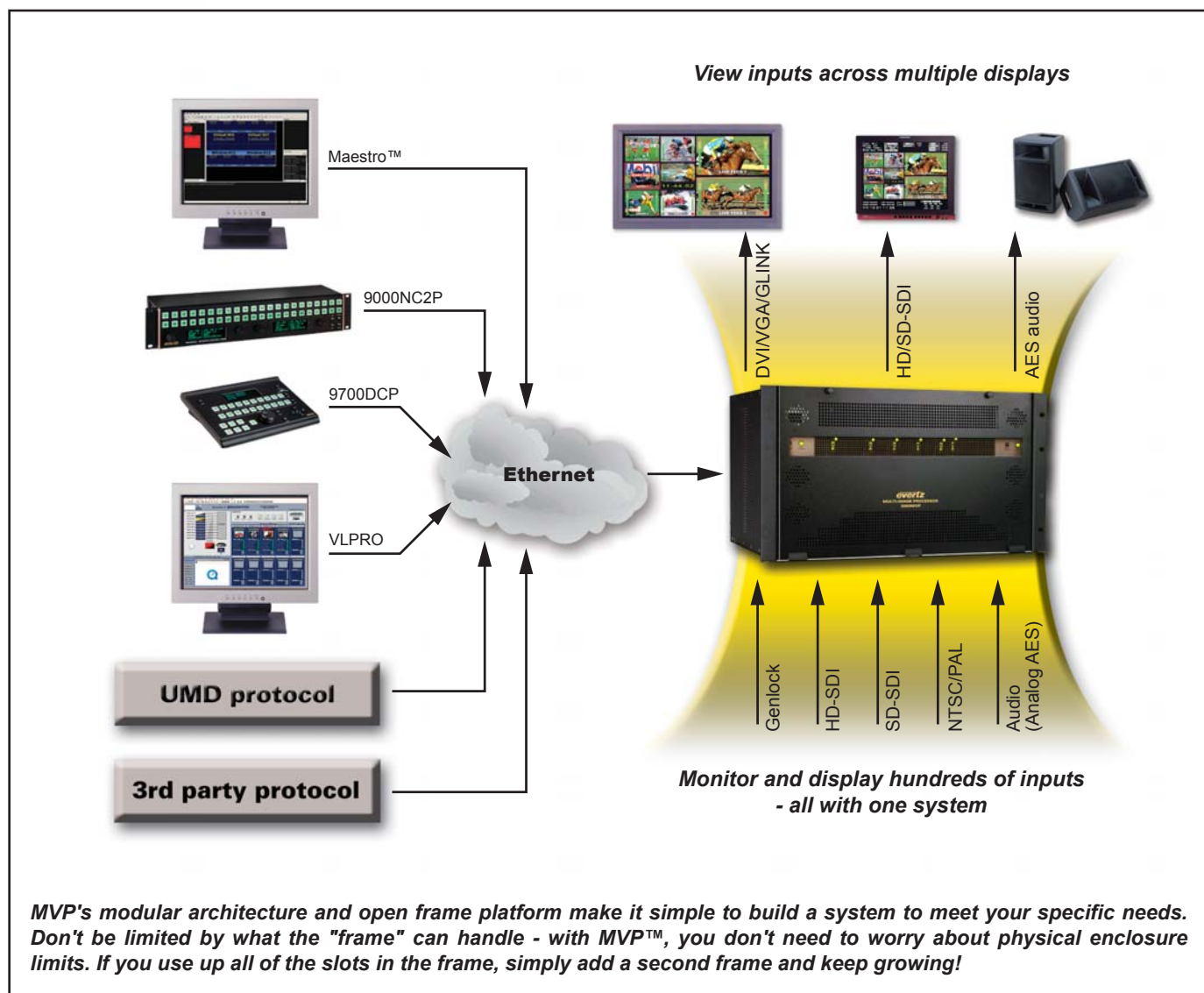
- On-screen time of day clocks (analog and digital with external LTC reference and configurable offsets)
- Up/Down timers

- User-definable labels
- Dynamic UMD's & tally from routers and switchers



## Comprehensive Signal and Data Monitoring

- Loss of video
- Active picture levels
- EDH errors
- Frozen or black video
- Motion detection
- Video format detection
- Loss of audio channels
- Mono audio detection
- VITC missing
- Phase reversal
- Audio too loud or too quiet
- Loss of closed captioning
- Loss of text channels
- Loss of program rating
- Source ID missing
- Dolby® E Metadata decode





## System Specifications

### Auto-detecting video inputs

*Analog Video*

- NTSC/PAL

*Digital Video*

- SD-SDI (SMPTE 259M-C)
- HD-SDI (SMPTE 292M, 1.5Gb/s)
- Built-in embedded audio extraction (up to 2 groups)

*HD Formats*

- 1080i/60
- 1080i/59.94
- 1080i/50
- 1080p/24sF
- 1080p/23.98sF
- 720p/60
- 720p/59.94
- 480p/60
- 480p/59.94

### Computer Graphic Video Inputs

- Two or four input module
- From 640x480 (VGA) to 1600x1200 (UXGA) resolution
- DVI or 15-pin D-sub via adapter

### Audio

- Balanced/Unbalanced AES
- Balanced analog stereo
- On-screen display of level and phase bars
- Audio monitoring output, 2 groups (AES/EBU)

### Frame

- 6RU, 15-module agnostic slots
- Rack mountable
- Front access
- Dual redundant PSU, hot-swappable

### AUX Inputs/Outputs

- Up to 64 GPI inputs and 44 GPO outputs
- LTC for clock/timer reference
- RS-232/422 serial interface

*Configuration Control*

- Maestro™ graphic interface for design & control
- DCP desktop control panel via Ethernet

### Electrical

- Dual redundant power supplies with separate AC inlets
- Auto-ranging voltage, 100-240V AC, 50/60Hz
- Maximum power dissipation: 625W
- Typical power dissipation: 350W, 8A

### Genlock

- Separate NTSC (SMPTE 170M) and PAL (ITU624-4), color black via BNC

### Front Panel Indicators

- PSU status LED and local error/failure LED

### Tally Output (GROC)

- 4-pin terminal, relay N/O, N/C for status/fault alarm

### Video Outputs

- Single, dual and multiple output support for XGA up to HD resolution
- DVI-I connector, BNC and/or fiber interfaces (module dependent)

## Ordering Information

### SDTV/Analog Packages

*Single Display*

Package	Inputs
PKG3000MVP-8-SN	8 CH
PKG3000MVP-16-SN	16 CH
PKG3000MVP-24-SN	24 CH
PKG3000MVP-32-SN	32 CH
PKG3000MVP-40-SN	40 CH
PKG3000MVP-48-SN	48 CH
PKG3000MVP-56-SN	56 CH
PKG3000MVP-64-SN	64 CH
PKG3000MVP-72-SN	72 CH

*Description*

8-72 auto-detecting SD-SDI (with embedded audio as a standard feature) and Composite Analog (NTSC, PAL) video inputs, with frame and frame controller, single power supply and single processor/output display module.

### HDTV/SDTV/Analog Packages

*Single Display*

Package	Inputs
PKG3000MVP-8-HSN	8 CH
PKG3000MVP-16-HSN	16 CH
PKG3000MVP-24-HSN	24 CH
PKG3000MVP-32-HSN	32 CH
PKG3000MVP-40-HSN	40 CH
PKG3000MVP-48-HSN	48 CH
PKG3000MVP-56-HSN	56 CH
PKG3000MVP-64-HSN	64 CH
PKG3000MVP-72-HSN	72 CH

*Description*

8-72 auto-detecting HD-SDI, SD-SDI (with embedded audio as a standard feature) and Composite Analog (NTSC, PAL) video inputs, with frame and frame controller, single power supply and single processor/output display module.

With the MVP™, there are many different possible I/O combinations including dual, quad and octo-output display solutions along with redundancy to meet your multi-signal monitoring & display needs. \*For systems that exceed the standard package input counts, please contact your MVP™ specialist to discuss your options.

For a multi-viewer in a smaller form factor, also ask about the VIP™ - the mini-MVP™ - in our popular 7700 series frame.

## Accessories

### 3000MVP-GI

- Dual (2) or Quad (4) computer video inputs per input module

### 3000MVP-AI

- Monitor up to 4 analog pairs or 4 AES/EBU audio channels per video input

### 3000BHP-U

- 1RU breakout bulkhead panel to support unbalanced AES/EBU digital audio

### 3000BHP-BAL

- 2RU breakout bulkhead panel to support either balanced stereo analog inputs or balanced AES/EBU audio

### 3000BHP-AUX

- Breakout bulkhead panel for GPI/O, LTC input, and serial communications

### 7700PTX-MVP

- Protocol Translator. Connect multiple serial input devices to MVP™

### 3000MKT-AUX

- Rackmount panel for AUX breakout board

### 2430GDAC

- GLink™ to DVI converter

### 2430GDAC-WARP

- GLink™ to DVI converter, with 90 degree display rotation support

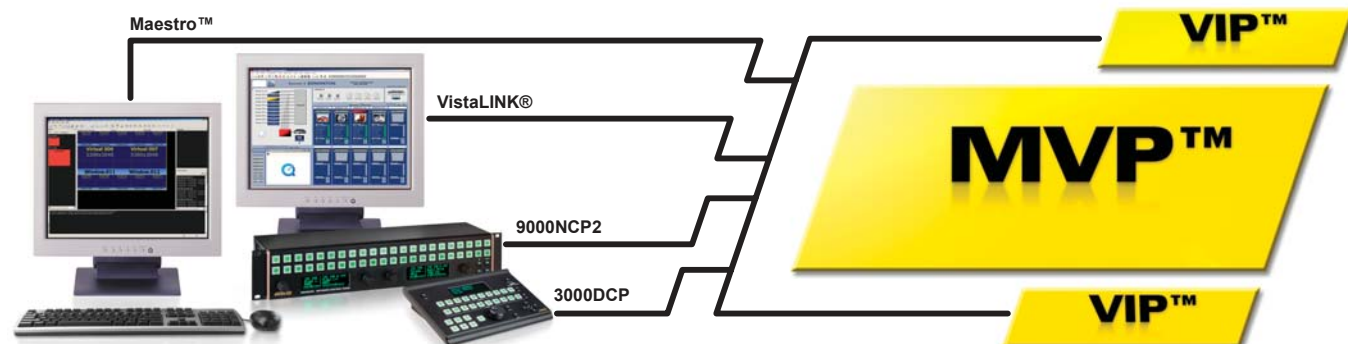
### 3000DCP

- Allows you to change your display's presets from a selection of possibilities

### 3000MVP-OE/EO-5

- PLink™/GLink™ Optical to Electrical/Electrical Optical converter

Now control both the MVP™ and VIP™ using a single point of control, allowing for a fully integrated mixed hardware system. Perfect for control room environments where large MVP™ display walls are required with smaller VIP™ agile displays.



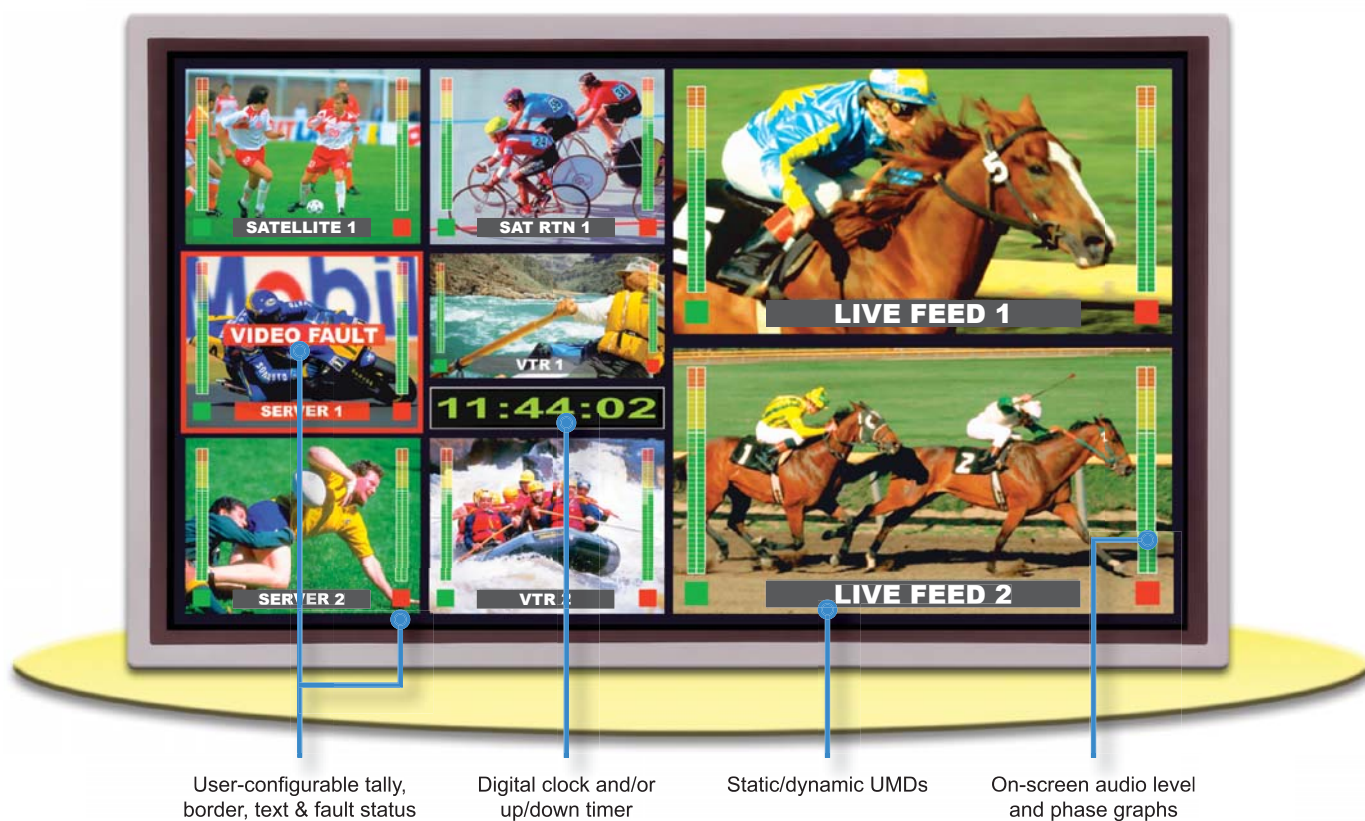


## VIP™ • Compact Multi-Image Display Processor

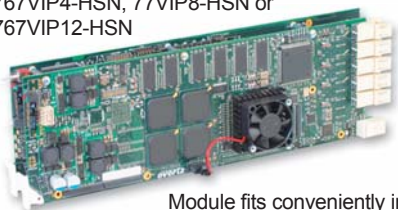
The VIP™ series of multi-input display and signal monitoring products is based on MVP™ technology and is ideally suited for dedicated signal monitoring applications with limited rack space and/or number of signals. Displaying up to WUXGA (1920x1200) resolution, the VIP™ module accepts up to 12 inputs and conveniently fits into Evertz widely-installed 7700FR-C universal 3RU frame (or 1RU option).

### Key VIP™ Features & Benefits:

- Accepts up to 4 (VIP4), 8 (VIP 8 ) or 12 (VIP 12) video inputs with support for embedded or discrete audio
- Auto-sensing HD/SD and Composite Analog inputs
- Extra computer input for dynamically updated background images
- Built-in video, audio & data fault monitoring
- Output display up to WUXGA (1920x1200) resolution or HD/SD serial output & optional fiber output
- User-configurable display presets, borders, tallies and UMDs
- Module conveniently fits into Evertz widely installed, universal 7700FR-C frame (3RU)
- Thumbnails of any or all selected inputs
- VistaLINK® -capable for configuration and monitoring via SNMP
- Modules are cascable for more inputs
- Up to 40 signals in a 3RU frame



7767VIP4-HSN, 77VIP8-HSN or 7767VIP12-HSN



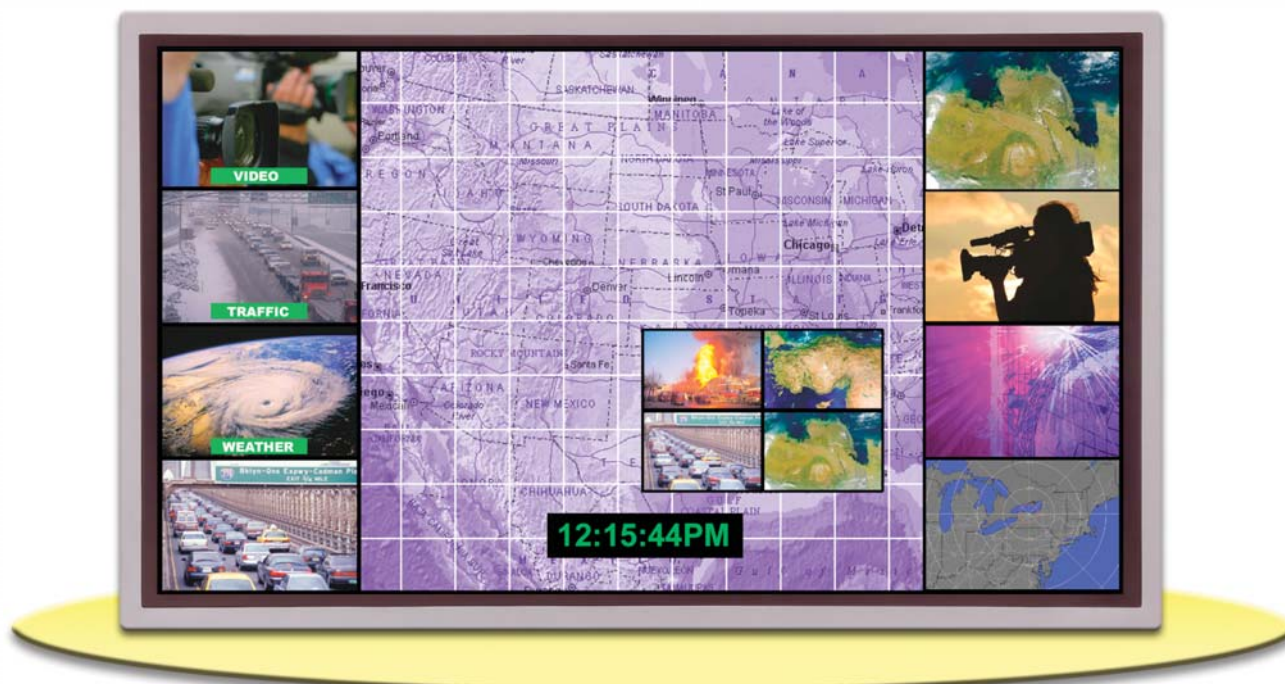
Module fits conveniently into the Evertz 7700FR-C frame (3RU)





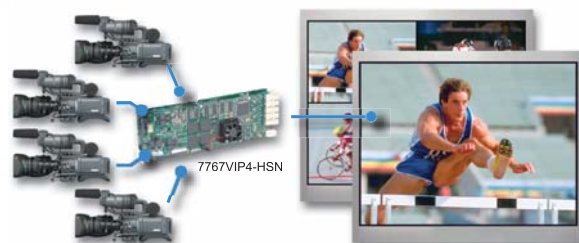
## Multi-featured, Multi-input Display Solution

- Up to 12 HD/SD/Composite inputs on auto-sensing BNCs
- Support for embedded, discrete audio inputs
- User re-configurable HD/SD serial and optional fiber output
- Output display up to WUXGA (1920x1200) resolution with on-screen display graphics (borders, UMDs and tallys)
- Fits Evertz's widely-installed universal 7700FR-C frame



## Production Display Solution

- Auto-sensing HD, SD and NTSC inputs, including 23.98sF or 24psF
- Eliminates color matching of numerous monitors
- Provides an HD-SDI output (720p, 1080i, or 1920x1080p over DVI at 50 or 60Hz)
- User controlled and positionable on-screen display elements
- Easily select any single input to a full resolution output



## Integrated Video, Audio, Data, VistaLINK® (SNMP) & Thumbnailing Solution

- Built-in video, audio and data signal monitoring
- Integrated thumbnail output from selectable inputs
- Additional computer input for dynamically updated background images
- VistaLINK®-enabled for configuration and monitoring

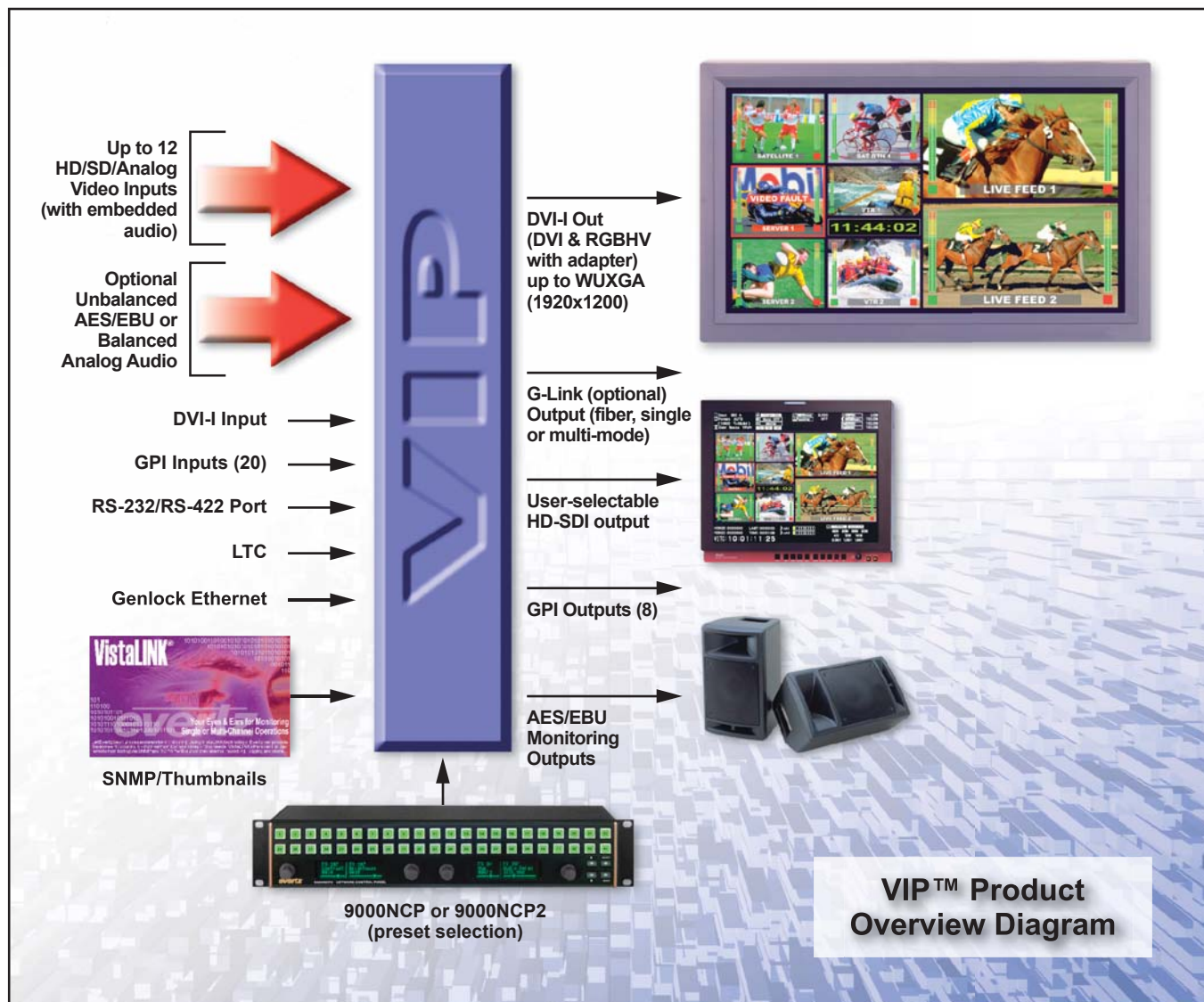


## Compact Video & Graphic Display Solution

- Compact 1RU unit with 4x composite analog or 4x S-Video and 4x DVI-I inputs - a total of 8 inputs on a single display
- Additional background DVI-I input
- Freely position windows and add various on-screen graphic display elements
- Front panel control for preset selection

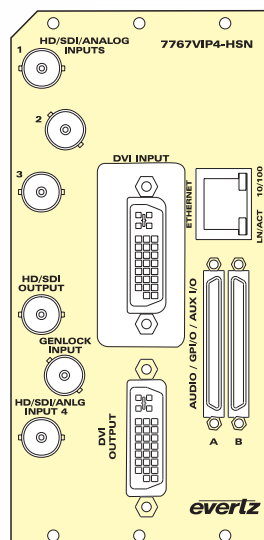




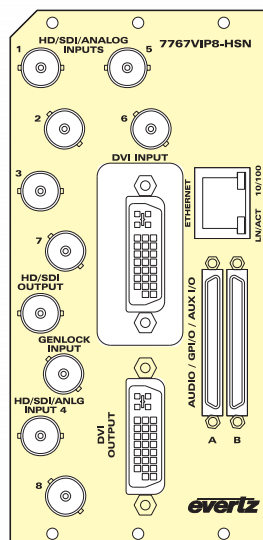


## VIP™ Rear Panels

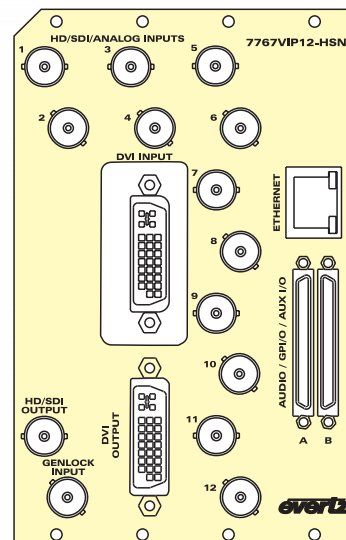
### 7767VIP4-HSN



### 7767VIP8-HSN



### 7767VIP12-HSN





## Auto-detecting video inputs

**Analog Video**  
• NTSC/PAL

**Digital Video**  
• SD-SDI (SMPTE 259M-C)  
• HD-SDI (SMPTE 292M, 1.5Gb/s)  
• Built-in embedded audio extraction (up to 2 groups)

**HD Formats**

• 1080i/60	• 1080i/59.94	• 1080i/50
• 1080p/24sF	• 1080p/23.98sF	• 720p/60
• 720p/59.94	• 480p/60	• 480p/59.94

## Computer Graphic Video Inputs

• From 640x480 (VGA) to 1600x1200 (UXGA) resolution  
• DVI or 15-pin D-sub via adapter

## Audio

• Unbalanced AES  
• Balanced analog stereo  
• On-screen display of level and phase bars  
• Audio monitoring output, 1 group (AES/EBU)

## Video Outputs

• Single output support for XGA up to WUXGA resolution  
• DVI-I connector, BNC and/or fiber interfaces (module dependent)

## Frame

• 3RU, 15-module agnostic slots  
• Rack mountable  
• Front access, modules and power supply units

## AUX Inputs/Outputs

• Up to 20 GPI inputs and 8 GPI outputs (GPO) (16 GPI on 7767BHP-AUX)  
• LTC for clock/timer reference  
• RS-232/422 serial interface

## Configuration Control

• Maestro™ VIP™ graphic interface

## Electrical

• Dual redundant power supplies with separate AC inlets  
• Auto-ranging voltage, 100-240V AC, 50/60Hz

## Genlock

• Separate NTSC (SMPTE 170M) and PAL (ITU624-4), color black via BNC

## Front Panel Indicators

• PSU status LED and local error/failure LED

## Accessories

<b>7767VIP-AI-BAL</b>	Discrete balanced analog audio input support with breakout panel
<b>7767VIP-AI-U</b>	Discrete unbalanced AES/EBU audio input (4 AES per video input) support with breakout panel
<b>3000MKT-AUX</b>	Rackmount panel for AUX breakout board

## VIP™ Ordering Information

<b>7767VIP4-HSN</b>	Up to four asynchronous HD/SD/NTSC/PAL inputs with embedded audio, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitor output. Includes VistaLINK® VLPRO-C software configuration tool, GPI/O break-out panel (BHP-AUX) and Maestro-VIP display layout GUI.
<b>7767VIP4-HSN-G</b>	Same as 7767VIP4-HSN including a single built-in fiber output (requires 2430GDAC on Rx end to display).
<b>7767VIP4-SN</b>	Up to four asynchronous SD/NTSC/PAL inputs with embedded audio, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitor output. Includes VistaLINK® VLPRO-C software configuration tool, GPI/O break-out panel (BHP-AUX) and Maestro-VIP display layout GUI.
<b>7767VIP8-HSN</b>	Up to eight asynchronous HD/SD/NTSC/PAL inputs with embedded audio, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitor output. Includes VistaLINK® VLPRO-C software configuration tool, GPI/O break-out panel (BHP-AUX) and Maestro-VIP display layout GUI.
<b>7767VIP8-HSN-G</b>	Same as 7767VIP8-HSN including a single built-in fiber output (requires 2430GDAC on Rx end to display).
<b>7767VIP8-SN</b>	Up to eight asynchronous SD/NTSC/PAL inputs with embedded audio, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitor output. Includes VistaLINK® VLPRO-C software configuration tool, GPI/O break-out panel (BHP-AUX) and Maestro-VIP display layout GUI.
<b>7767VIP12-HSN</b>	Up to twelve asynchronous HD/SD/NTSC/PAL inputs with embedded audio, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitor output. Includes VistaLINK® VLPRO-C software configuration tool, GPI/O break-out panel (BHP-AUX) and Maestro-VIP display layout GUI.
<b>7767VIP12-HSN-G</b>	Same as 7767VIP12-HSN including a single built-in fiber output (requires 2430GDAC on Rx end to display).
<b>7767VIP12-SN</b>	Up to twelve asynchronous SD/NTSC/PAL inputs with embedded audio, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitor output. Includes VistaLINK® VLPRO-C software configuration tool, GPI/O break-out panel (BHP-AUX) and Maestro-VIP display layout GUI.
<b>7767VIP12-SN-G</b> <b>7767VIP12-N</b>	Same as 7767VIP12-SN including a single built-in fiber output (requires 2430GDAC on Rx end to display).
<b>9767VIP8-NGI</b>	Up to four asynchronous DVI-I (DVI-D or RGBHV with adapter) inputs and four NTSC/PAL (or S-Video) inputs, one background DVI-I (DVI-D or RGBHV with adapter) or one serial monitoring output. Includes VistaLINK® VLPRO-C software configuration tool and Maestro-VIP display layout GUI.

<b>2430GDAC</b>	GLink™ to DVI converter
<b>2430GDAC-WARP</b>	GLink™ to DVI converter, with 90° display rotation support
<b>7700FR-C</b>	3RU Multiframe which holds up to 15 single slot modules with AC power supply
<b>7700PS</b>	Additional power supply for 7700FR-C



## Quattro™

In addition to multi-display processors and signal monitoring solutions, Evertz offers a number of discrete input signal monitoring and display solutions. All have built-in user configurable signal monitoring fault notification features, fit conveniently into the 3RU 7700FR-C frame, and are VistaLINK® -capable for monitoring and configuration.

### Quattro™ & Analog Quattro™

- Four SDI/601 525 line or 625 line, 270 Mb/s component digital video inputs with embedded audio on 7765AVM-4 versions & embedded or external AES/EBU audio on 7765AVM-4A versions
- 4 composite analog (NTSC/PAL auto-detecting) inputs (BNC-type)
- Optional 4 S-Video inputs
- Quad-split or full-screen output mode with UMDs, fault monitoring, SNMP output to HD, SDI NTSC/PAL and computer displays



### SDI Video & Audio Monitor/Conversion

- 1 SDI 525 or 625, 270 MB/s component digital video input
- 4 adjustable analog audio outputs available for content monitoring
- Decodes & monitors Video Indexing, AFD, subtitle and teletext
- An extensive list of error conditions can be monitored and fault conditions can be configured from these errors



### Ordering Information

- |                                       |  |
|---------------------------------------|--|
| <b>7765AVM-4-X &amp; 7765AVM-4A-X</b> | Quattro™, 4 SDI video quad split display with digital audio monitoring (embedded & discrete audio options) |
| <b>7766AVM-4A-X</b>                   | Analog Quattro™ 4 composite analog video (BNC) and analog audio monitoring                                 |

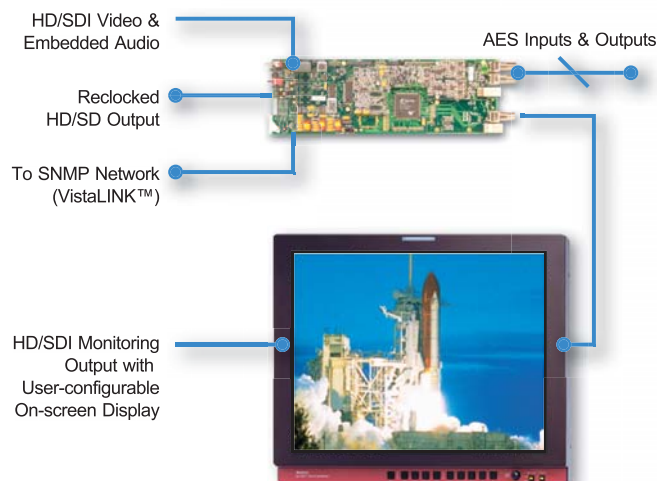
### Dual Channel Composite Analog

- 2 independent composite analog (NTSC/PAL) video or S-video inputs
- Decodes vertical interval time code (VITC), VBI source ID and Closed Captioning into the picture
- Provides peak video (Average Picture Level) and black level status and fault monitoring
- Flexible configuration of on-screen text and audio bar graph information displays



### HD/SD Video & Audio Monitor/Conversion



- 1 HD/SD serial digital video input and 1 reclocked HD/SD output
- Decodes vertical interval time code (VITC) and Source ID burning it into the picture
- Decodes & monitors Video Indexing, AFD and subtitle
- An extensive list of error conditions can be monitored and fault conditions can be configured from these errors



- |                    |  |
|--------------------|--|
| <b>7761AVM2-X</b>  | Dual channel video & analog audio monitoring; dual output  |
| <b>7760AVM2</b>    | SDI video & audio monitor/conversion with on-screen display (single slot) with Teletext subtitle decoder |
| <b>7767AVM2-HD</b> | HD video & audio monitor/conversion with on-screen display (single slot)                                 |



# MVP™, VIP™, QUATTRO AVM Product Line Comparison Chart

			
Points of Comparison	MVP	VIP	Quattro
Video Input Format	Auto detecting format HD, SDI, Composite on the same card	Auto detecting format HD, SDI, Composite on the same card	SD-SDI (525 or 625) input or Composite Analog input (NTSC or PAL)
No. Of inputs / video Card	8 inputs per video card including HD	4, 8 or 12 video inputs + 1 std. DVI background input	Up to 4
No. Of inputs / Graphics Card	selection of 2 or 4 inputs per card	4 on GI version, 1 std. DVI background	None
Limitation on Input cards	No Limitation on No. of Input Cards; each frame has 15 agnostic slots	Self contained module fits 7700FR-C frame	Self contained module fits 7700FR-C frame
No. of Inputs per Display	Modular design up to 104 inputs - ability to scale same input multiple times (fan-out)	Up to 4 or up to 12, module dependent with user configurable or selectable factory presets	Up to 4; user selectable factory presets
Input aspect ratio	4:3, 16:9	4:3, 16:9	4:3, 16:9 (module firmware dependent)
No of outputs	Variable; standard system can drive up to 4 outputs per output module and drive 8 displays simultaneously; larger systems possible	Single DVI-I (DVI and RGBHV) display up to WUXGA (1920 x 1200) resolution, offers simultaneous serial output of same content or input selection tool	Single display up to 1920x540p resolution for multi-sync or XGA (1280x768) resolution for standard monitors
Output formats	Graphics, SDI, HD-SDI, built-in Fiber Optics option	Graphics, SDI, HD-SDI, built-in Fiber Optics option on same module	Graphics, SD, Composite Analog and HD-SDI on different modules
Router control	Optional Interface	N/A	N/A
Dynamic UMDs	Image Video, TSL, ASCII and XY protocol built-in; others optional	Image Video, TSL built-in; others optional	Optional serial interface, contact factory
GPI inputs/outputs	64 in & 44 out occupy NO Slot	20 in & 8 out built-in	12/4 and 4, module dependent
Analog Audio Cards	Selection between one card can handle 16 Channels of Analogue and AES/EBU both dual group; Evertz - up to 2 groups per video input embedded or discrete, with both analog and discrete inputs on same audio module	Optional interface with breakout panel	Built into specific to Analog Quattro module option (-4A)
AES/EBU Audio Cards	16 channel AES/EBU Dual groups	Optional interface with breakout panel	Built into specific to Quattro module option (-4A)
Embedded Audio Support	Standard	Standard	Standard with 7765 Quattro series (-4, -4A)
Limitation on Audio Cards	No Limitation	Single audio interface module per VIP	N/A
Audio Break out panel	Optional	Optional	Optional
GPI break out panel	Standard	Standard	Optional
Other display elements	Analog and digital clocks, count up/down timers, UMDs, tallies, bitmaps from files, closed captioning text, VITC	Digital clocks, count up/down timers, UMDs, tallies	UMDs and tallies
Video Monitoring	Loss of video sync (analog), burst (analog), video (digital), Change of video source, APL level, Max APL over detection, Min APL under detection, Peak video level, Black level, AP and FF EDH error, Frozen video, Motion detector/Non-frozen video, Black video	Loss of video sync (analog), burst (analog), video (digital), Change of video source, APL level, Max APL over detection, Min APL under detection, Peak video level, Black level, AP and FF EDH error, Frozen video, Motion detector/Non-frozen video, Black video	Loss of video sync (analog), burst (analog), video (digital), Change of video source, APL level, Max APL over detection, Min APL under detection, Peak video level, Black level, AP and FF EDH error, Frozen video, Motion detector/Non-frozen video, Black video
Audio Monitoring	Phase Reversal - Channels ½, ¼, 5/6, 7/8, Stereo/Mono Detection - Channels ½, ¼, 5/6, 7/8, Loss of : VITC, Source ID (embedded): UMD (if routing from external source), Program Rating (V-Chip), Program Rating (V-chip) & loss of Closed Captioning	Phase Reversal - Channels ½, ¼, 5/6, 7/8, Stereo/Mono Detection - Channels ½, ¼, 5/6, 7/8, Loss of : VITC, Source ID (embedded): UMD (if routing from external source), Program Rating (V-Chip), Program Rating (V-chip) & loss of Closed Captioning	Phase Reversal - Channels ½, ¼, 5/6, 7/8, Stereo/Mono Detection - Channels ½, ¼, 5/6, 7/8, Loss of : VITC, Source ID (embedded): UMD (if routing from external source), Program Rating (V-Chip), Program Rating (V-chip) & loss of Closed Captioning
Layout Configuration control	Maestro and DCP, VistaLINK and GPI	VIP Maestro and layouts via VistaLINK or GPI	Fixed layouts via VistaLINK or GPI
Control Panel	DCP, NCP, NCP2	NCP, NCP2, DCP	NCP, NCP2
On screen display graphics	Yes - tally, border, UMDs, audio bar graphs, analog and digital clock/timers	Yes - tally, border, UMDs, audio bar graphs, digital clock and timers	UMDs and tallies
Card-edge configuration control	No	Partial - no layout creation control	Yes - all selection
SNMP/VistaLINK enabled	Yes - presets, UMD and fault configuration	Yes - presets, UMD and fault configuration	Yes - all parameters
Processing delay	~2.5 frames	<1 frame	<1 frame
Portrait display mode	Possible through G-Link with 2430GDAC-WARP	Possible through G-Link with 2430GDAC-WARP	N/A
LTC input	Yes	Yes	None
Closed Caption decode	Available, 608, 708	No, presence detection only	No, presence detection only
Frame type	3000FR, 6RU	7700FR-C, 3RU	7700FR-C, 3RU
Number of slots	1-3 module dependent	3 or 4, module dependent	2
System design	Evertz 3000 frame has 15 agnostic slots which can be filled with combinations of input and output modules providing the most flexibility	Standard 7700FR-C frame has 15 agnostic slots which can be filled with numerous VIP modules	Standard 7700FR-C frame has 15 agnostic slots which can be filled with numerous Quattro modules





Building on the popularity of the MVP™ series, Evertz's new 7767VIP4 signal monitoring module simultaneously accepts, auto-detects, analyzes and displays four synchronous or asynchronous HD/SD/Analog video signals. An additional fifth input is a computer graphic input for display of a dynamic background image. Ultimately displaying up to WUXGA (1920 x 1200) resolution, the 7767VIP4 module fits conveniently into Evertz's universally installed 7700FR-C frame and provides a cost-effective and space-efficient signal monitoring and display solution.

The 7767VIP4 module is VistaLINK®-capable, offering remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP). This product feature offers another solution to manage operations including signal monitoring and module configuration from SNMP-capable control systems (Manager or NMS) locally or remotely.

### 3

#### Features

##### Video Inputs:

- Up to four auto-sensing HD/SD/NTSC/PAL inputs (same BNC)
- Accepts either 4:3 or 16:9
- Auto-detects 525/625 format SD inputs (single frame rate conversion)
- A fifth input, (DVI-I up to UXGA resolution) source is used for background display, signal analyzer tools or for cascading multiple VIP modules together

##### Audio Inputs:

- Handles embedded, discrete unbalanced AES/EBU, and balanced analog audio (up to 16 AES and 4 L/R) via break-out panel
- VU/PPM level indicators

##### Video Output:

- One DVI-I output: Drive a single DVI-D and a single RGBHV (VGA-type) display simultaneously with same content up to WUXGA (1920x1200 resolution)
- One selectable HD/SD serial digital (BNC) video output, same content as DVI-I output, or select from input
- Minimal processing delay (~1 frame)
- Optional fiber output (-G option)
- Optional support for "portrait" display via 2430GDAC-WARP
- Thumbnails of any or all selected inputs to VistaLINK® PRO thumbnail server (or equivalent)

##### Graphics:

- User-configurable tally indicators and configurable UMD static and/or dynamically updated text, background colors
- User configurable borders
- LTC input drives digital clock display
- Count-up or down timer displays (GPI triggered)

##### Signal Monitoring:

- Extensive list of user-configurable signal fault conditions with "logic" settings
- Detects frozen video (patent pending) and black video
- User-configurable fault condition alert messages per video input with configurable background colors, thresholds and duration settings
- Closed caption presence detection

##### Auxiliary Inputs:

- RS-232/RS-422 communication port interface to common UMD protocols - TSL, Image Video
- 20 assignable general purpose inputs, 8 general purpose outputs

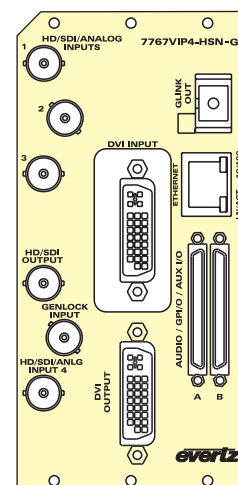
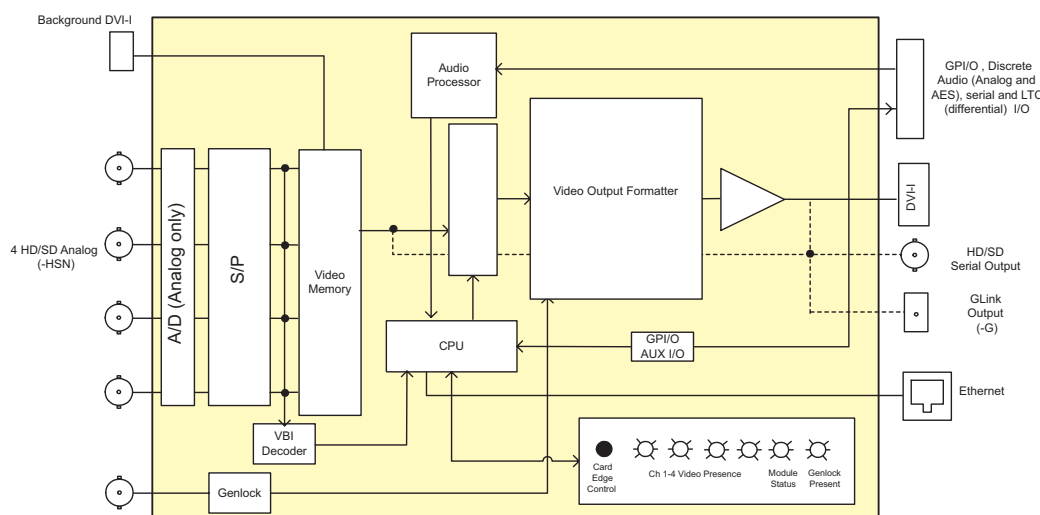
##### Physical:

- Number of slots - 3
- Genlock reference loop input for proper timing - 1 NTSC/PAL
- Fast power-cycle time (<30 seconds)

##### Network Management:

- Built-in VistaLINK® support for remote monitoring and control via SNMP (using VistaLINK® PRO)
- The 7767VIP module does not require a 7700FC VistaLINK® Frame Controller. A direct Ethernet connection to the network for VistaLINK® operations must be provided by user
- Screen configurations via Maestro VIP GUI software (included)
- Web browser interface allows for simple configuration without the need for additional software

#### 7767VIP4 Block Diagram & Rear Panel





### Specifications

#### Serial Video Inputs:

<b>Standard:</b>	Auto-sensing HD-SDI (SMPTE 292M), SD-SDI (SMPTE 259M-C)
<b>Number of Inputs:</b>	Up to 4
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Equalization:</b>	Automatic to 100m (Belden 1694AA)
<b>Return Loss:</b>	> 15 dB up to 270 Mb/s
<b>Embedded Audio:</b>	SMPTE 272M-A

#### Composite Analog Video Inputs:

<b>Standard:</b>	NTSC (SMPTE 170M), PAL (ITU624-4)
<b>Number of Inputs:</b>	Up to 4
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1V nominal
<b>DC Offset:</b>	0V ±0.1V
<b>Input Impedance:</b>	75Ω
<b>Return Loss:</b>	40dB up to 5MHz

#### Background (Computer) Video Input:

<b>Standard:</b>	Auto-detecting, VESA (DVI-I, for DVI and RGBHV inputs)
<b>Number of Inputs:</b>	1
<b>Connector:</b>	DVI-I (Female)
<b>Input Resolution:</b>	640 x 480 (VGA) to 1600 x 1200 (UXGA)
<b>Signal Level:</b>	1V nominal

#### Discrete Digital AES Audio Inputs:

<b>Standard:</b>	SMPTE 276M
<b>Number of Inputs:</b>	4 AES per video input
<b>Connector:</b>	Dual SCSI (F)
<b>Resolution:</b>	24-bit
<b>Sampling Rate:</b>	48 kHz
<b>Impedance:</b>	75Ω unbalanced

#### Discrete Analog Audio Inputs:

<b>Number of Inputs:</b>	12 balanced stereo audio pairs
<b>Connector:</b>	Dual SCSI (F)
<b>Input Impedance:</b>	20 kΩ minimum (differential)
<b>Sampling Frequency:</b>	48kHz
<b>Peak Signal and Common Mode Level:</b>	30 dBu

#### Display Video Output:

<b>Standard:</b>	VESA (DVI-I) up to WUXGA (1920 x 1200)
<b>Number of Outputs:</b>	1
<b>Connector:</b>	DVI (with DVI to RGBHV Adapter)
<b>Video:</b>	1Vp-p YPrPb/RGB or 0.7Vp-p VGA, 60Hz refresh
<b>Impedance:</b>	75Ω

#### Serial Video Output:

<b>Standard:</b>	Selectable HD/SD serial monitoring output (720p, 1080i, 625i, 525i)
<b>Number of Outputs:</b>	1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V ±0.5V
<b>Rise and Fall Time:</b>	200ps nominal (HD), 740ps nominal (SD)
<b>Overshoot:</b>	<10% of amplitude

#### Genlock Input:

<b>Type:</b>	NTSC/PAL color black
<b>Level:</b>	1V p-p nominal
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2

#### General Purpose Interface I/O (GPI/GPO):

<b>Number of Inputs:</b>	20 (16 via 7767BHP-AUX breakout panel)
<b>Number of Outputs:</b>	8
<b>Type:</b>	
GPI	Opto-isolated, active low with internal pull-ups to +5V
GPO	Relay closure to ground
<b>Connector:</b>	Breakout panel Terminal Blocks via SCSI connection to dual SCSI (F)
<b>Input Signal:</b>	Closure to ground

#### Data Input/Output Serial Port:

<b>Number of Ports:</b>	1 RS-232 or 1 RS-422
<b>Connector:</b>	Breakout panel TBlocks via SCSI connection to dual SCSI (F)
<b>Baud Rate:</b>	Up to 1Mbaud
<b>Format:</b>	Configurable for various UMD interfaces

#### Ethernet:

<b>Network Type:</b>	Fast Ethernet 100 Base-TX IEEE 802.3U standard for 100Mbps baseband CSMA/CD local area network
<b>Connector:</b>	RJ-45

#### Electrical:

<b>Voltage:</b>	+12 VDC
<b>Safety:</b>	ETL Listed, complies with EU low voltage directive
<b>Power:</b>	< 34 Watts
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

<b>Number of Slots:</b>	3
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#### Ordering Information:

<b>7767VIP4-HSN</b>	Up to four asynchronous HD/SD/NTSC/PAL inputs with embedded audio, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitor output. Includes VistaLINK® VLPRO-C software configuration tool, GPI/O break-out panel (BHP-AUX) and Maestro-VIP display layout GUI
<b>7767VIP4-HSN-G</b>	Up to four asynchronous HD/SD/NTSC/PAL inputs with embedded audio, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitor output. Includes VistaLINK® VLPRO-C software configuration tool, GPI/O break-out panel (BHP-AUX) and Maestro-VIP display layout GUI. Single built-in fiber output (requires 2430GDAC on Rx end to display)
<b>7767VIP4-SN</b>	Up to four asynchronous SD/NTSC/PAL inputs with embedded audio, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitor output. Includes VistaLINK® VLPRO-C software configuration tool, GPI/O break-out panel (BHP-AUX) and Maestro-VIP display layout GUI

#### Ordering Options & Accessories

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix +3RU

3RU Rear Plate for use with 7700FR-C Multiframe

#### 2430GDAC

GLink to DVI converter (extender requires -G module)

#### 2430GDAC-WARP

GLink to DVI converter (extender and portrait mode display, requires -G module)

#### 7767VIP-AI-U

Discrete unbalanced AES/EBU audio input (4 AES per video input) support with breakout panel

#### 7767VIP-AI-BAL

Discrete balanced analog audio input support with breakout panel

#### 3000MKT-AUX

Dual BHP-AUX auxiliary GPI/O and serial break-out panel rack mounting kit

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7702FR</b>	Standalone enclosure



# VIP™ Eight Input Video Monitoring and Display

## 7767VIP8-HSN/HSN-G/SN



Building on the popularity of the MVP™ series, Evertz's new 7767VIP8-HSN signal monitoring module simultaneously accepts, auto-detects, analyzes and displays eight synchronous or asynchronous HD/SD/Analog video signals. An additional ninth input is a computer graphic input for display of a dynamic background image. Ultimately displaying up to WUXGA (1920 x 1200) resolution, the 7767VIP8-HSN module fits conveniently into Evertz's universally installed 7700FR-C frame and provides a cost-effective and space-efficient signal monitoring and display solution.

The 7767VIP8-HSN module is VistaLINK®- capable, offering remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP). This product feature offers another solution to manage operations including signal monitoring and module configuration from SNMP- capable control systems (Manager or NMS) locally or remotely.

3

### Features

#### Video Inputs:

- Up to eight auto-sensing HD/SD/NTSC/PAL inputs (same BNC)
- Accepts either 4:3 or 16:9
- Auto-detects 525/625 format SD inputs (single frame rate conversion)
- A ninth input, (DVI-I up to UXGA resolution) is used for background display, signal analyzer tools or for cascading multiple VIP modules together

#### Audio Inputs:

- Handles embedded, discrete unbalanced AES/EBU, and balanced analog audio via break-out panel
- VU/PPM level indicators

#### Video Output:

- One DVI-I output
  - Drive a single DVI-D and a single RGBHV (VGA-type) display simultaneously with same content up to WUXGA (1920x1200 resolution)
- One selectable HD/SD serial digital (BNC) video output, same content as DVI-I output, or select from input
- Minimal processing delay (~1 frame)
- Optional fiber output
- Optional support for "portrait" display via 2430GDAC-WARP
- Thumbnails of any or all selected inputs to VistaLINK® PRO thumbnail server (or equivalent)

#### Graphics:

- User-configurable tally indicators and configurable UMD static and/or dynamically updated text, background colors
- User configurable borders

- LTC input drives digital clock display
- Count-up or down timer displays (GPI triggered)

#### Signal Monitoring:

- Extensive list of user-configurable signal fault conditions with "logic" settings
- Detects frozen video (patent pending) and black video
- User-configurable fault condition alert messages per video input with configurable background colors, opacities, thresholds and duration settings
- Closed caption presence detection
- WSS/AFD detection

#### Auxiliary Inputs:

- RS-232/RS-422 communication port interface to common UMD protocols - TSL, Image Video
- 20 assignable GP inputs, 8 GP outputs

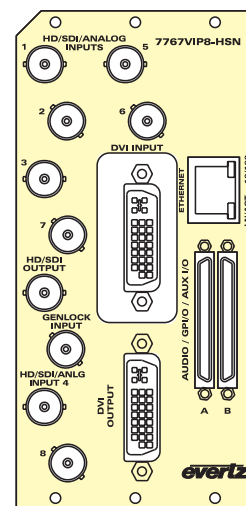
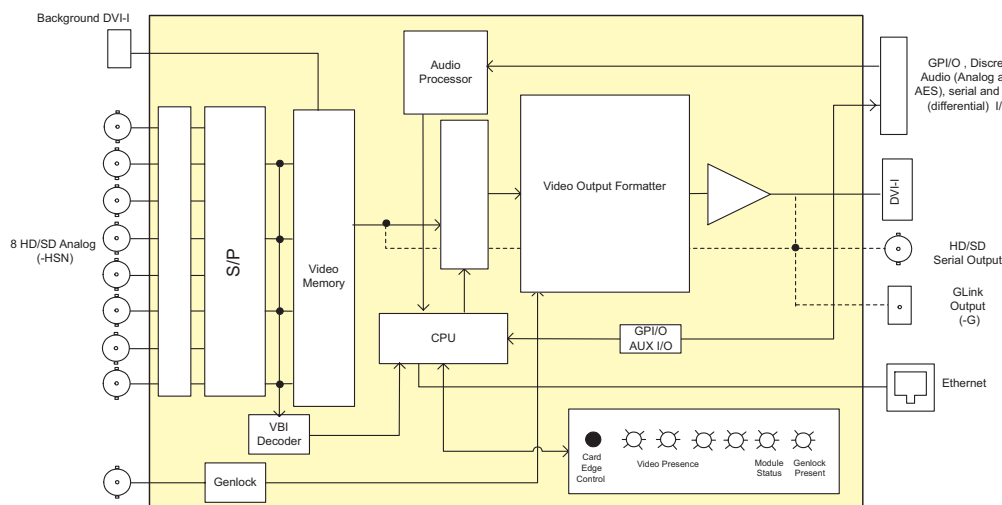
#### Physical:

- Number of slots - 3
- Genlock reference loop input for proper timing - 1 NTSC/PAL
- Fast power-cycle time (<30 seconds)

#### Network Management:

- Built-in VistaLINK® support for remote monitoring and control via SNMP (using VistaLINK® PRO)
- The 7767VIP module does not require a 7700FC VistaLINK® Frame Controller. A direct Ethernet connection to the network for VistaLINK® operations must be provided by user
- Screen configurations via Maestro VIP GUI software (included)
- Web browser interface allows for simple configuration without the need for additional software

### 7767VIP8-HSN Block Diagram & Rear Panel





### Specifications

#### Serial Video Inputs:

<b>Standard:</b>	Auto-sensing HD-SDI (SMPTE 292M), SD-SDI (SMPTE 259M-C)
<b>Number of Inputs:</b>	Up to 8
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Equalization:</b>	Automatic to 100m (Belden 1694AA) HD-SDI
<b>Return Loss:</b>	> 15 dB up to 270 Mb/s
<b>Embedded Audio:</b>	SMPTE 272M-A

#### Composite Analog Video Inputs:

<b>Standard:</b>	NTSC (SMPTE 170M), PAL (ITU624-4)
<b>Number of Inputs:</b>	Up to 8
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1V nominal
<b>DC Offset:</b>	0V $\pm$ 0.1V
<b>Input Impedance:</b>	75 $\Omega$
<b>Return Loss:</b>	40dB up to 5MHz

#### Background (Computer) Video Input:

<b>Standard:</b>	Auto-detecting, VESA (DVI-I, for DVI and RGBHV inputs)
<b>Number of Inputs:</b>	1
<b>Connector:</b>	DVI-I (Female)
<b>Input Resolution:</b>	640 x 480 (VGA) to 1600 x 1200 (UXGA)
<b>Signal Level:</b>	1V nominal

#### Discrete Digital AES Audio Inputs:

<b>Standard:</b>	SMPTE 276M
<b>Number of Inputs:</b>	4 AES per video input
<b>Connector:</b>	Dual SCSI (F)
<b>Resolution:</b>	24-bit
<b>Sampling Rate:</b>	48 kHz
<b>Impedance:</b>	75 $\Omega$ unbalanced

#### Discrete Analog Audio Inputs:

<b>Number of Inputs:</b>	12 balanced stereo audio pairs
<b>Connector:</b>	Dual SCSI (F)
<b>Input Impedance:</b>	20 k $\Omega$ minimum (differential)
<b>Sampling Frequency:</b>	48kHz
<b>Peak Signal and Common Mode Level:</b>	30 dBu

#### Display Video Output:

<b>Standard:</b>	VESA (DVI-I) up to WUXGA (1920 x 1200)
<b>Number of Outputs:</b>	1
<b>Connector:</b>	DVI (with DVI to RGBHV Adapter)
<b>Video:</b>	1Vp-p YPrPb/RGB or 0.7Vp-p VGA, 60Hz refresh
<b>Impedance:</b>	75 $\Omega$

#### Serial Video Output:

<b>Standard:</b>	Selectable HD/SD serial monitoring output (720p, 1080i, 625i, 525i)
<b>Number of Outputs:</b>	1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V $\pm$ 0.5V
<b>Rise and Fall Time:</b>	200ps nominal (HD), 740ps nominal (SD)
<b>Overshoot:</b>	<10% of amplitude

#### Genlock Input:

<b>Type:</b>	NTSC/PAL color black
<b>Level:</b>	1V p-p nominal
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2

#### General Purpose Interface I/O (GPI/GPO):

<b>Number of Inputs:</b>	20 (16 via 7767BHP-AUX breakout panel)
<b>Number of Outputs:</b>	8
<b>Type:</b>	
GPI	1 Opto-isolated, active low with internal pull-ups to +5V
GPO	1 Relay closure to ground
<b>Connector:</b>	Breakout panel Terminal Blocks via SCSI connection to dual SCSI (F)
<b>Input Signal:</b>	Closure to ground

#### Data Input/Output Serial Port:

<b>Number of Ports:</b>	1 RS-232 or 1 RS-422
<b>Connector:</b>	Breakout panel TBlocks via SCSI connection to dual SCSI (F)
<b>Baud Rate:</b>	Up to 1Mbaud
<b>Format:</b>	Configurable for various UMD interfaces

#### Ethernet:

<b>Network Type:</b>	Fast Ethernet 100 Base-TX 1EEE 802.3U standard for 100Mbps baseband CSMA/CD local area network
<b>Connector:</b>	RJ-45

#### Electrical:

<b>Voltage:</b>	+12 VDC
<b>Power:</b>	< 39 Watts
<b>Safety:</b>	ETL Listed, complies with EU safety directives
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

<b>Number of Slots:</b>	3
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#### Ordering Information:

<b>7767VIP8-HSN</b>	Up to eight asynchronous HD/SD/NTSC/PAL inputs with embedded audio, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitor output. Includes VistaLINK VLPRO-C software configuration tool, GPI/O break-out panel (BHP-AUX) and Maestro-VIP display layout GUI
<b>7767VIP8-HSN-G</b>	Up to eight asynchronous HD/SD/NTSC/PAL inputs with embedded audio, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitor output. Includes VistaLINK VLPRO-C software configuration tool, GPI/O break-out panel (BHP-AUX) and Maestro-VIP display layout GUI
<b>7767VIP8-SN</b>	Up to eight asynchronous SD/NTSC/PAL inputs with embedded audio, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitor output. Includes VistaLINK VLPRO-C software configuration tool, GPI/O break-out panel (BHP-AUX) and Maestro-VIP display layout GUI

#### Ordering Options & Accessories

Rear Plate must be specified at time of order  
Eg: Model +3RU

<b>Rear Plate Suffix +3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>2430GDAC</b>	GLink to DVI converter (extender requires -G module)
<b>2430GDAC-WARP</b>	GLink to DVI converter (extender and portrait mode display, requires -G module)
<b>7767VIP-AI-U</b>	Discrete unbalanced AES/EBU audio input (4 AES per video input) support with breakout panel
<b>7767VIP-AI-BAL</b>	Discrete balanced analog audio input support with breakout panel
<b>3000MKT-AUX</b>	Dual BHP-AUX auxiliary GPI/O and serial break-out panel rack mounting kit

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7702FR</b>	Standalone enclosure





Building on the popularity of the MVP™ series, Evertz's new 7767VIP12 signal monitoring module simultaneously accepts, auto-detects, analyzes and displays twelve synchronous or asynchronous HD/SD/Analog video signals. Ultimately displaying up to WUXGA (1920 x 1200) resolution, the 7767VIP12 module fits conveniently into Evertz's universally installed 7700FR-C frame and provides a cost-effective and space-efficient signal monitoring and display solution.

The 7767VIP12 module is VistaLINK®-capable, offering remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP). This product feature offers another solution to manage operations including signal monitoring and module configuration from SNMP-capable control systems (Manager or NMS) locally or remotely.

3

### Features

#### Video Inputs

- Twelve auto-sensing HD/SD/analog video inputs
- Accepts either 4:3 or 16:9
- Auto-detects 525/625 format SD inputs (single frame rate conversion)
- Computer graphic video input (DVI-I up to UXGA) for background display, signal analyzer tools or cascading multiple VIP modules

#### Audio Inputs

- Handles embedded or unbalanced AES/EBU, and balanced analog audio (up to 48 AES and 12 L/R) via break-out panel
- VU/PPM level indicators

#### Video Output

- One DVI-I output
  - Drive a single DVI-D and a single RGBHV (VGA-type) display simultaneously with same content up to WUXGA (1920x1200 resolution)
- One selectable HD/SD serial digital (BNC) video output, also carrying same content as DVI-I output or select from input
- Minimal processing delay (~1 frame)
- Optional fiber output
- Optional support for "portrait" display via 2430GDAC-WARP
- Thumbnails of any or all selected inputs to VistaLINK® PRO Thumbnail Server (or equivalent)

#### Graphics

- User-configurable tally indicators and configurable UMD static and/or dynamically updated text, background colors
- User configurable borders
- LTC input drives digital clock display
- Count-up or down timer displays (GPI triggered)

#### Signal Monitoring

- Extensive list of user-configurable signal fault conditions with logic settings
- On screen messages triggered by fault conditions
- Detects frozen video (patent pending) and black video
- User-configurable fault condition alert messages per video input with configurable background colors, opacities, thresholds and durations
- Closed caption presence detection

#### Auxiliary Inputs

- RS-232/RS-422 communication port Interface to common UMD protocols - TSL, Image Video
- 20 assignable GP inputs, 8 GP outputs

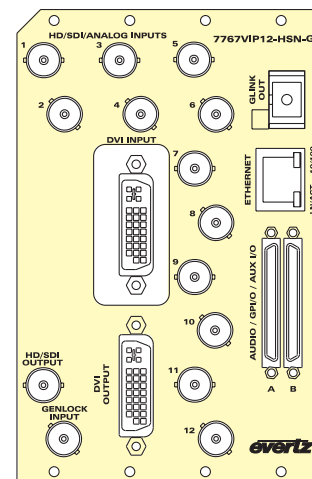
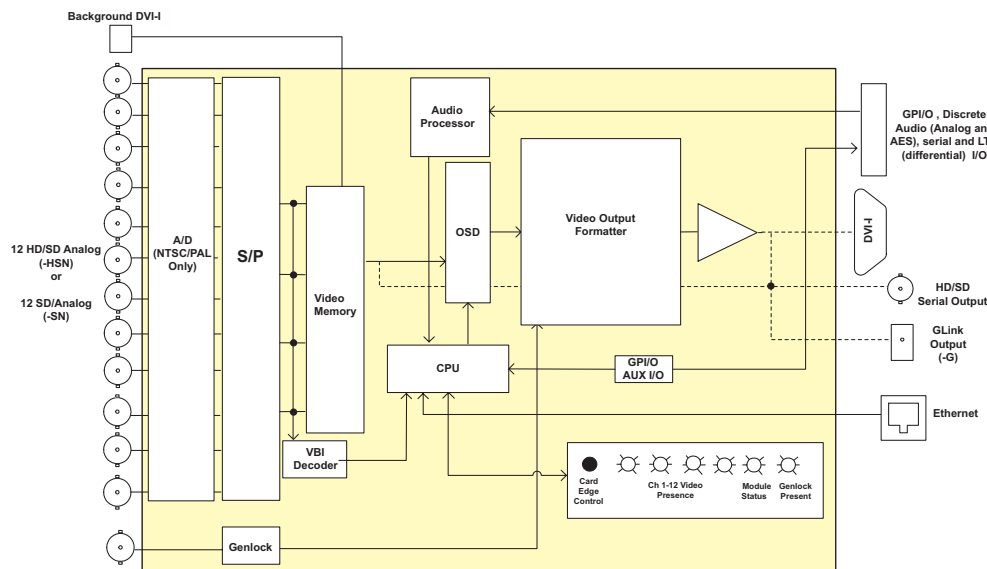
#### Physical

- Number of slots - 4
- Genlock reference loop input for proper timing - 1 NTSC/PAL
- Fast power-cycle time (<3 seconds)

#### Network Management:

- Built-in VistaLINK® support for remote monitoring and control via SNMP (using VistaLINK® PRO)
- The 7767VIP module does not require a 7700FC VistaLINK® Frame Controller. A direct Ethernet connection to the network for VistaLINK® operations must be provided by user
- Screen configurations via Maestro VIP GUI software (included)
- Web browser interface allows for simple configuration without the need for additional software

### 7767VIP12 Block Diagram & Rear Panel





### Specifications

#### Serial Video Inputs :

<b>Standard:</b>	HD-SDI (SMPTE 292M), and/or SD-SDI (SMPTE259M-C)
<b>Number of Inputs:</b>	12
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Equalization:</b>	Automatic to 100m (Belden 1694AA)
<b>Return Loss:</b>	> 15dB up to 270 Mb/s
<b>Embedded Audio:</b>	SMPTE 272M-A

#### Composite Analog Video Inputs:

<b>Standard:</b>	NTSC (SMPTE 170M), PAL (ITU624-4)
<b>Number of Inputs:</b>	12
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1V nominal
<b>DC Offset:</b>	0V ±0.1V
<b>Input Impedance:</b>	75Ω
<b>Return Loss:</b>	40dB up to 5MHz

#### Background (Computer) Video Input:

<b>Standard:</b>	Auto-detecting, VESA (DVI-I, for DVI and RGBHV inputs)
<b>Number of Inputs:</b>	1
<b>Connector:</b>	DVI-I (Female)
<b>Input Resolution:</b>	640 x 480 (VGA) to 1600 x 1200 (UXGA)
<b>Signal Level:</b>	1V nominal

#### Discrete Digital AES Audio Inputs:

<b>Standard:</b>	SMPTE 276M
<b>Number of Inputs:</b>	4 AES per video input
<b>Connector:</b>	Dual SCSI (F) with BHP
<b>Resolution:</b>	24-bit
<b>Sampling Rate:</b>	48 kHz
<b>Impedance:</b>	75Ω unbalanced

#### Discrete Analog Audio Inputs:

<b>Number of Inputs:</b>	12 balanced stereo audio pairs
<b>Connector:</b>	Dual SCSI (F) with BHP
<b>Input Impedance:</b>	20kΩ min. (differential)
<b>Sampling Frequency:</b>	48kHz
<b>Peak Signal and Common Model Level:</b>	30dBu

#### Display Video Output:

<b>Standard:</b>	VESA (DVI-I) up to WUXGA (1920 x 1200)
<b>Number of Outputs:</b>	1
<b>Connector:</b>	DVI (with DVI to RGBHV Adapter)
<b>Video:</b>	1Vp-p YPrPb/RGB or 0.7Vp-p VGA, 60Hz refresh
<b>Impedance:</b>	75Ω

#### Serial Video Output:

<b>Standard:</b>	Selectable HD/SD serial monitoring output (720p, 1080i, 625i, 525i)
<b>Number of Outputs:</b>	1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V ±0.5V
<b>Rise and Fall Time:</b>	200ps nominal (HD), 740ps nominal (SD)
<b>Overshoot:</b>	<10% of amplitude

#### Genlock Input:

<b>Type:</b>	NTSC/PAL color black
<b>Level:</b>	1V p-p nominal
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2

#### General Purpose Interface I/O (GPI/GPO):

<b>Number of Inputs:</b>	20 (16 on 7767BHP-AUX)
<b>Number of Outputs:</b>	8
<b>Type:</b>	
GPI	1 Opto-isolated, active low with internal pull-ups to +5V
GPO	1 Relay closure to ground

<b>Connector:</b>	Breakout panel TBlocks via SCSI connection to dual SCSI (F)
<b>Input Signal:</b>	Closure to ground

#### Input/Output Serial Port:

<b>Number of Ports:</b>	1 RS-232 or 1 RS-422
<b>Connector:</b>	Breakout panel TBlocks via SCSI connection to dual SCSI (F)
<b>Baud Rate:</b>	Up to 1Mbaud
<b>Format:</b>	Configurable for various UMD interfaces

#### Ethernet:

<b>Network Type:</b>	Fast Ethernet 100 Base-TX 1EEE 802.3U standard for 100Mbps baseband CSMA/CD local area network
<b>Connector:</b>	RJ-45

#### Electrical:

<b>Voltage:</b>	+12VDC
<b>Power:</b>	<50 Watts

#### EMI/RFI:

Complies with FCC Part 15, Class A EU EMC Directive
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#### Physical:

<b>Number of Slots:</b>	4
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#### Ordering Information:

<b>7767VIP12-HSN</b>	Up to twelve asynchronous HD/SD/NTSC/PAL inputs with embedded audio, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitor output. Includes VistaLINK® VLPRO-C software configuration tool, GPI/O break-out panel (BHP-AUX) and Maestro VIP display layout GUI.
<b>7767VIP12-HSN-G</b>	Up to twelve asynchronous HD/SD/NTSC/PAL inputs with embedded audio, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitor output. Includes VistaLINK® VLPRO-C software configuration tool, GPI/O break-out panel (BHP-AUX) and Maestro-VIP display layout GUI. Single built-in fiber output (requires 2430GDAC on Rx end to display).
<b>7767VIP12-SN</b>	Up to twelve asynchronous SD/NTSC/PAL inputs with embedded audio, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitor output. Includes VistaLINK VLPRO-C software configuration tool, GPI/O break-out panel (BHP-AUX) and Maestro-VIP display layout GUI.

#### Ordering Options & Accessories

Rear Plate must be specified at time of order  
Eg: Model +3RU

<b>Rear Plate Suffix +3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>2430GDAC</b>	GLink to DVI converter (extender requires -G module)
<b>2430GDAC-WARP</b>	GLink to DVI converter (extender and portrait mode display, requires -G module)
<b>7767VIP-AI-U</b>	Discrete unbalanced AES/EBU audio input (4 AES per video input) support with breakout panel
<b>7767VIP-AI-BAL</b>	Discrete balanced analog audio input support with breakout panel
<b>3000MKT-AUX</b>	Dual BHP-AUX auxiliary GPI/O and serial break-out panel rack mounting kit

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
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The 9767VIP8-NGI takes the popular VIP series of multi-image display processor and controller and combines video and graphics into one, and displays up to 8 inputs on a single monitor. Ideal for control rooms, surveillance and video teleconferencing applications, the 9767VIP8-NGI is a 1RU, rack mountable multi-image processor and controller.

Based on Evertz's MVP™ architecture, this VIP unit combines up to in 4 composite analog (NTSC/PAL) or S-Video inputs and 4 DVI/VGA computer/graphic inputs, along with a dynamically updated background DVI-I input and offers outstanding image quality up to WUXGA (1920 x 1200) resolution, built-in signal monitoring (on screen displays and SNMP), dynamic window sizing, borders, tally, text and digital clocks.

If additional video or computer inputs are required, VIP units (whether this 1RU version or modular 3RU VIPs) can be cascaded together, providing more windows to the ultimate display. With both factory and user-configurable (front panel and/or Maestro VIP software GUI) presets, serial port and contact closures, the VIP series provides an integrated, cost-efficient solution to display various video formats. The 9767VIP8-NGI is VistaLINK® -enabled, offering remote monitoring of faults as well as control and configuration through Simple Network Management Protocol (SNMP).

### Features

#### Video Inputs:

- Four video inputs (NTSC/PAL) or four S-Video inputs and 4 graphic inputs
- Additional computer graphic video input (DVI-I up to WUXGA) for background display, signal analyzer tools or cascading multiple VIP units

#### Audio Inputs:

- Discrete balanced analog audio (1L/R per video)
- VU/PPM level indicators

#### Video Output:

- One DVI-I output
  - Drive a single DVI-D and a single RGBHV (VGA-type) display simultaneously with same content up to WUXGA (1920x1200 resolution)
- One selectable HD/SD serial digital (BNC) video output, also carrying same content as DVI-I output or select from input
- Minimal processing delay (~1 frame)
- Optional fiber output (contact factory)
- Thumbnails of any or all selected inputs to VistaLINK™ PRO Thumbnail Server (or equivalent)

#### Graphics:

- User-configurable tally indicators and configurable UMD static and/or dynamically updated text, background colors
- User configurable borders
- LTC input drives digital clock display
- Count-up or down timer displays (GPI triggered)

#### Signal Monitoring:

- Extensive list of user-configurable signal fault conditions with logic settings
- On screen messages triggered by fault conditions
- Detects frozen video (patent pending) and black video
- User-configurable fault condition alert messages per video input with configurable background colors, thresholds and durations

#### Auxiliary Inputs:

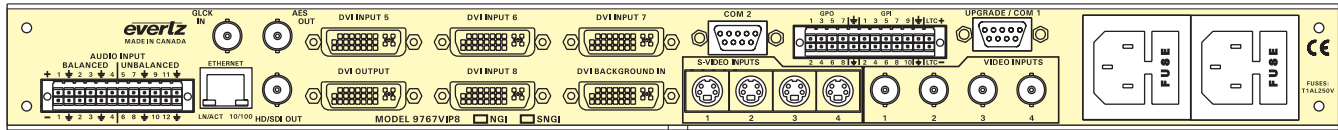
- RS-232/RS-422 communication port Interface to common UMD protocols
  - TSL, Image Video
- 20 assignable GPI inputs, 8 GPI outputs

#### Physical:

- 1RU
- Genlock reference input for proper timing - 1 NTSC/PAL
- Fast power-cycle time (<3 seconds)
- Built-in VistaLINK® support for remote monitoring and control via SNMP (using VistaLINK®PRO)
- The 9767VIP unit has a direct Ethernet connection to the network for VistaLINK® User must provide network cable. Screen configurations via Maestro GUI software (included)



## 9767VIP8-NGI Connection



### Specifications

#### Composite Analog Video Inputs (-N):

**Standard:** NTSC (SMPTE 170M), PAL (ITU-R BT.1700-1)  
**Number of Inputs:** 4  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 1V nominal  
**DC Offset:** 0V  $\pm$ 0.1V  
**Input Impedance:** 75 $\Omega$   
**Return Loss:** 40dB up to 5MHz

#### S Video Inputs:

**Number of Inputs:** 4 + 1 background  
**Connector:** IEC 933-S (4 pin mini DIN)  
**Signal Level:** 1V nominal  
**Input Impedance:** 75 $\Omega$

#### Background (Computer) Video Input:

**Standard:** Auto-detecting, VESA (DVI-I, for DVI and RGBHV inputs)  
**Number of Inputs:** 4  
**Connector:** DVI-I (Female)  
**Input Resolution:** 640 x 480 (VGA) to 1920 x 1200 (WUXGA)  
**Signal Level:** 1V nominal

#### Discrete Analog Audio Inputs:

**Number of Inputs:** 1 L/R pair per video input  
**Connector:** Terminal Block  
**Input Impedance:** 20k $\Omega$  min. (differential)  
**Sampling Frequency:** 48kHz  
**Peak Signal and Common Model Level:** 30dBu

#### Display Video Output:

**Standard:** VESA (DVI-I) up to WUXGA (1920 x 1200)  
**Number of Outputs:** 1  
**Connector:** DVI-I (with DVI to RGBHV Adapter)  
**Video:** 1Vp-p YPrPb/RGB or 0.7Vp-p VGA, 60Hz refresh  
**Impedance:** 75 $\Omega$

#### Serial Video Output:

**Standard:** Selectable HD/SD serial monitoring output (720p, 1080i, 625i, 525i)  
**Number of Outputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V  $\pm$ 0.5V  
**Rise and Fall Time:** 200ps nominal (HD), 740ps nominal (SD)  
**Overshoot:** <10% of amplitude

#### Genlock Input:

**Type:** NTSC/PAL color black  
**Level:** 1V p-p nominal  
**Connector:** BNC per IEC 60169-8 Amendment 2

#### General Purpose Interface I/O (GPI/GPO):

**Number of Inputs:** 20  
**Number of Outputs:** 8  
**Type:**  
**GPI** Opto-isolated, active low with internal pull-ups to +5V  
**GPO** Relay closure to ground  
**Connector:** Terminal Block  
**Input Signal:** Closure to ground

#### Input/Output Serial Port:

**Number of Ports:** 1 RS-232 or 1 RS-422  
**Connector:** Terminal Block  
**Baud Rate:** Up to 1Mbaud  
**Format:** Configurable for various UMD interfaces

#### Ethernet:

**Network Type:** Fast Ethernet 100 Base-TX 1EEE 802.3U standard for 100Mbps baseband CSMA/CD local area network  
**Connector:** RJ-45

#### Electrical:

**Voltage:** Auto-ranging 100-240 VAC 40 Watts  
**Safety:** ETL Listed, complies with EU low voltage directive  
**EMI/RFI:** Complies with FCC Part 15, Class A EU EMC Directive

#### Ordering Information:

##### 9767VIP8-NGI

Up to four asynchronous DVI-I (DVI-D or RGBHV with adapter) inputs and four NTSC/PAL (or S-Video) inputs, one background DVI-I (DVI-D or RGBHV with adapter) input. Single DVI-I (DVI-D or RGBHV with adapter) or one serial monitoring output. Includes VistaLINK® VLPRO-C software configuration tool and Maestro-VIP display layout GUI



# Quattro™, Four SDI Video Quad Split Display with Digital Audio Monitoring

## 7765AVM-4/4A



Building on the popularity of the 7760AVM series of audio, video and data monitoring cards, Evertz's Quattro™ 7765AVM-4 SDI monitoring card increases the monitoring capacity by simultaneously accepting and analyzing four individual SDI/601 video signals. One multiplexed video output displays video, status and user-configurable fault condition alerts for each input in a 2x2-matrix format. Subsequently, the Quattro™ 7765AVM-4 SDI monitoring card provides a cost-effective solution not only for monitoring multiple channels in a broadcast facility, but also by offering facility managers the choice of using legacy or new output displays.

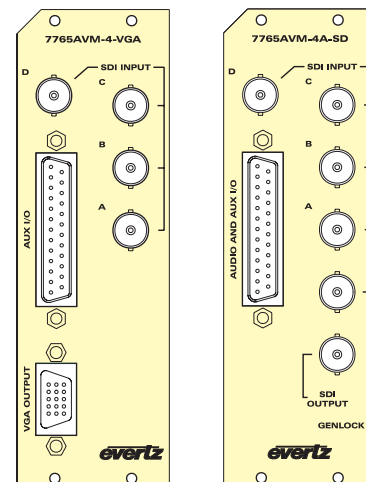
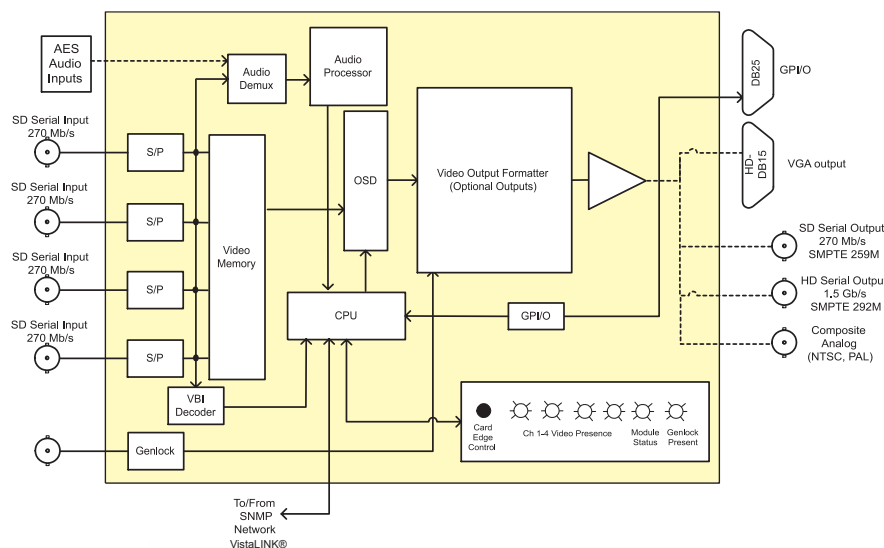
Equipped with standard audio and video (AVM) monitoring features including an on-screen, menu-driven display, user configurable audio level bar graphs and status windows, the 7765AVM-4 "Quattro" can simultaneously display four SDI/601 video signals with embedded audio through an HD (7765AVM-4-HD), SD (7765AVM-4-SD), Composite Analog (7765AVM-4-CA) or VGA (7765AVM-4-VGA) output, supporting 4:3 and 16:9 aspect ratios. Furthermore, the 7765AVM-4A "Quattro" series monitors the signal status of either embedded audio or externally supplied AES/EBU audio (3 AES/EBU inputs per video channel supported). Upon setting parameter thresholds and enabling fault conditions, any adverse behavior of any one input stream results in a clearly recognizable, user configurable on-screen, or GPI, fault alert message, immediately notifying operators of potential problems. The two-slot 7765AVM-4 and 7765AVM-4A cards fit conveniently into Evertz's 7700FR-C frame.

The 7765AVM-4 and -4A cards are also VistaLINK® -capable, offering remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP). This product feature offers another solution to manage operations including signal monitoring and module configuration from SNMP-capable control systems (Manager or NMS) locally or remotely.

### Features

- Four SDI/601 525 line or 625 line, 270 Mb/s component digital video inputs with embedded audio on 7765AVM-4 versions and embedded or external AES/EBU audio on 7765AVM-4A versions. (-VGA -CA and -SD versions support either 525 or 625 line inputs, 525 line inputs for -HD version.)
- One group (4 channels of audio) is demultiplexed from the SDI source and VU/PPM level and phase graphs are keyed next to the video picture
- Genlock reference input for proper timing (N/A on -VGA version)
- Decodes vertical interval time code (VITC) and "burns" the time code into the picture
- Decodes PESA format Source ID (8 characters) or VITC Source ID (5 or 9 characters) and burns the ID into the picture
- Decodes and displays Line 21 XDS packets containing network name, call letters, program name and time of day
- A comprehensive on screen display is available to configure the various features of the module
- User-configurable on screen display for source ID/UMD
- An extensive list of error conditions can be monitored and fault conditions can be configured from these conditions
- On screen messages triggered by fault conditions
- Fault condition logic menu option
- Detects frozen video (patent pending) and black video
- Four user-configurable fault condition alert messages per video input with configurable background colors and opacities
- User-configurable tally indicators on source ID messages
- H/V delay viewing configuration
- Standard HD-SDI, SD-SDI, Composite Analog and VGA-type outputs
- Support for 4:3 or 16:9 video inputs and output video displays
- Twelve GPI inputs are available to modify the display characteristics (4 GPI inputs available on 7765AVM-4A versions)
- Four GPO outputs to indicate user definable fault conditions
- External AES audio and GPI I/Os are available on a DB-25 connector
- RS-232 or RS-422 serial port (jumper configurable) for interface to common UMD protocols
- Optional Bulkhead Breakout Panel accessory that provides a convenient connection for AES/EBU audio and GPI I/O signals into the DB-25 on 7765AVM-4A modules
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® PRO) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

### 7765AVM-4/4A Block Diagram & Rear Panels





### Specifications

#### Serial Video Input:

<b>Standard:</b>	SMPTE 259M-C - 525 or 625 lines (525 only on -HD)
<b>Number of Inputs:</b>	4
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Equalization:</b>	Automatic to 225m @ 270 Mb/s with Belden equivalent)
<b>Return Loss:</b>	> 15 dB up to 270 Mb/s
<b>Embedded Audio:</b>	SMPTE 272M-A

#### Digital AES Audio Inputs (-4A):

<b>Standard:</b>	SMPTE 276M, single ended AES
<b>Number of Inputs:</b>	3 per video input (total 12 inputs)
<b>Connector:</b>	Female DB-25
<b>Resolution:</b>	24-bit
<b>Sampling Rate:</b>	48 kHz
<b>Impedance:</b>	75Ω unbalanced

#### Serial Video Output (7765AVM-4-HD and 7765AVM-4A-HD):

<b>Standard:</b>	SMPTE 292M
<b>Number of Outputs:</b>	1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V ±0.5V
<b>Rise and Fall Time:</b>	200ps nominal
<b>Overshoot:</b>	<10% of amplitude

#### Serial Video Output (7765AVM-4-SD and 7765AVM-4A-SD):

<b>Standard:</b>	SMPTE 259M-C
<b>Number of Outputs:</b>	1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V ±0.5V
<b>Rise and Fall Time:</b>	470ps nominal
<b>Overshoot:</b>	<10% of amplitude

#### Analog Video Output (7765AVM-4-CA and 7765AVM-4A-CA):

<b>Standard:</b>	NTSC, SMPTE 170M, PAL ITU624-4
<b>Number of Outputs:</b>	1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1V nominal
<b>DC Offset:</b>	0V ± 0.1V
<b>Return Loss:</b>	>35dB up to 5MHz
<b>Frequency Response:</b>	0.8dB to 4MHz
<b>Differential Phase:</b>	<0.9° (<0.6° typical)
<b>Differential Gain:</b>	<0.9% (<0.5% typical)
<b>SNR:</b>	>56dB to 5MHz (shallow ramp)

#### Analog RGB Video Output (-VGA):

<b>Standard:</b>	VGA
<b>Number of Outputs:</b>	1
<b>Connector:</b>	Female, High Density DB-15
<b>Video:</b>	1Vp-p YPrPb/RGB or 0.7Vp-p VGA, 60Hz refresh
<b>Sync:</b>	300 mV or 4V
<b>Impedance:</b>	75Ω

#### Genlock Input (-HD, -SD, -CA only):

<b>Type:</b>	NTSC (SMPTE 170M) color black
<b>Level:</b>	1V p-p nominal
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2

#### Audio Bar Graph Ballistics:

<b>Number of Graphs:</b>	4 (1 group) per video input
<b>Ballistics:</b>	AES/EBU, DIN, BBC, Nordic N9

#### General Purpose Interface I/O (GPI/GPO):

<b>Number of Inputs:</b>	12 (-4), 4 (-4A)
<b>Number of Outputs:</b>	4
<b>Type:</b>	Opto-isolated, active low with internal pull-ups to +5V
<b>Connector:</b>	Female DB-25
<b>Output Signal Level:</b>	+5V nominal (high), 0V (low)
<b>Input Signal:</b>	Closure to ground

#### Data Input/Output Serial Port:

<b>Number of Ports:</b>	1 RS-232 or 1 RS-422 (jumper configurable)
<b>Connector:</b>	Female DB-25
<b>Baud Rate:</b>	Up to 1Mbaud
<b>Format:</b>	RS-232: 8 bits, no parity, 2 stop bits and no flow control

#### Electrical:

<b>Voltage:</b>	+12 VDC
<b>Power:</b>	24 Watts
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

<b>Number of Slots:</b>	2
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#### Ordering Information:

7765AVM-4-HD	}	Quattro™, Four SDI Video Quad Split Display with Digital Audio Monitoring (Embedded Audio)
7765AVM-4-VGA		
7765AVM-4-SD		
7765AVM-4-CA		
7765AVM-4A-HD	}	Quattro™, Four SDI Video Quad Split Display with Digital Audio Monitoring (Embedded and/or External AES/EBU)
7765AVM-4A-VGA		
7765AVM-4A-SD		
7765AVM-4A-CA		

#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Accessories:

<b>7765AVM-4A-BHP-7</b>	Bulkhead Breakout Panel for 7x 7765AVM-4A (includes 7-3ft cables)
<b>7700FC</b>	VistaLINK® Frame Controller
<b>9000NCP</b>	1RU VistaLINK® General Purpose Network Control Panel
<b>9000NCP2</b>	2RU VistaLINK® General Purpose Network Control Panel

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone enclosure





Evertz's 7766AVM-4A and 7766AVM-S4A Analog Quattro™ audio and video monitoring cards simultaneously accept and analyze up to four composite analog or S-Video inputs and optionally display up to four signals with alarm, status and audio level monitoring in a 2x2 matrix format. High resolution serial SD, analog RGB and composite analog outputs are available.

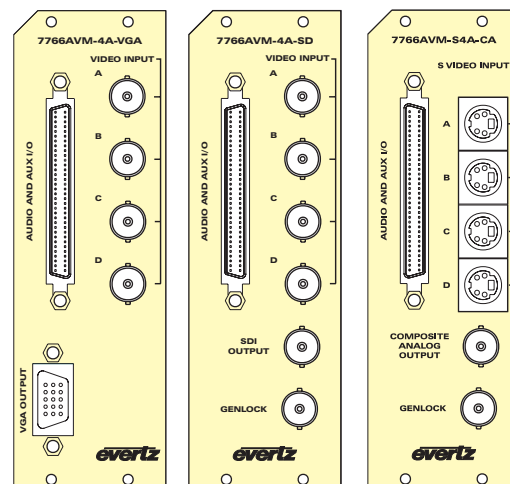
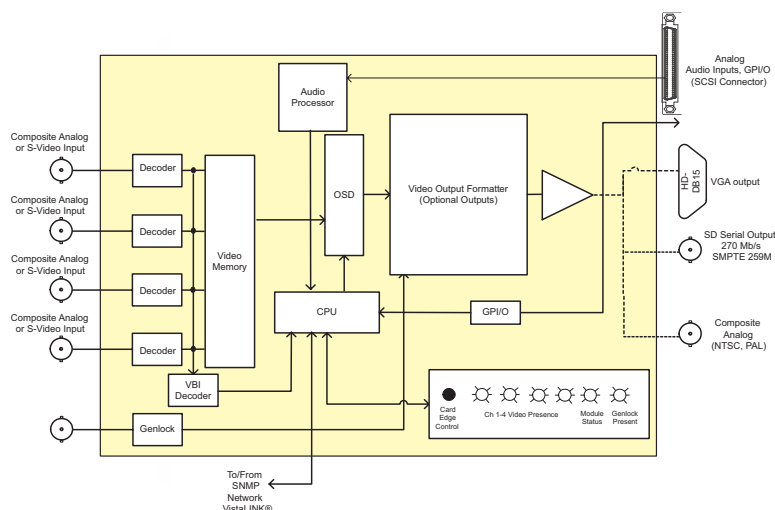
Equipped with standard features including an on-screen, menu-driven display, user configurable audio level and phase bar graphs, and status windows, the 7766AVM-4A/-S4A can simultaneously display four video signals and external analog audio with on-screen audio, video and data status information through SD, analog RGB and composite analog outputs. Upon setting parameter thresholds and enabling fault conditions, any adverse behavior of any one input stream results in a clearly recognizable, user configurable on-screen, or GPI fault alert message, immediately notifying operators of potential problems. The two-slot 7766AVM-4A/-S4A card fits conveniently into Evertz's 7700FR-C frame. Up to 28 signals can be monitored from the single 3RU frame.

The 7766AVM-4A/-S4A cards are VistaLINK® enabled offering remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage operations including signal monitoring and card configuration from SNMP-capable control systems (Manager or NMS) locally or remotely.

### Features

- Four composite analog (NTSC/PAL auto-detecting) inputs (BNC-type)
- Optional four S-Video inputs
- One analog RGB or Composite Analog output
- 4 balanced audio inputs per video input channel is analyzed and VU/PPM level indicators are keyed as bar graphs beside the video output (16 analog audio channels per card)
- H/V delay viewing configuration
- Quadrant view or expanded display modes
- Detects frozen and black video
- Decodes vertical interval time code (VITC) and "burns" the time code into the picture
- Decodes VITC Source ID (5 or 9 characters), PESa format Source ID (8 characters) or user-configurable default message (when not decoded) and burns the ID into the picture
- A comprehensive on screen display is available to configure the various features of the module
- Flexible configuration of the text and audio bar graph information displays
- An extensive list of error conditions can be monitored and fault conditions can be configured from these conditions
- Four user-configurable fault condition alert messages with independent fault threshold and duration settings
- On screen messages can be triggered by the configured fault conditions
- User-configurable tally indicators and configurable SID/UMD text and background colors
- RS-232/RS-422 serial port (jumper configurable) for interface to common UMD protocols
- Four GPI inputs (unassigned)
- Four GPO outputs (dedicated 1 per video quadrant)
- Audio and GPI/Os are available through SCSI connector
- Fault condition logic menu option
- VistaLINK® -capable for remote monitoring and control via SNMP (using VistaLINK® PRO) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

### 7766AVM-4A Block Diagram & Rear Panels





### Specifications

#### Analog Video Input:

Standard:	NTSC (SMPTE 170M) PAL (ITU624-4)
Number of Inputs:	4
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	1V nominal
DC Offset:	0V ±1V
Input Impedance:	75Ω
Return Loss:	> 40 dB up to 5MHz

#### S-Video Input (7766AVM-S4A-x):

Number of Inputs:	4
Connector:	4-pin mini DIN
Signal Level:	Y: 1.0 Vp-p, C: 0.286 Vp-p
Input Impedance:	75Ω, sync negative, 75Ω terminated

#### Analog Audio Input:

Number of Inputs:	16 (2 balanced pair per video input)
Connector:	68-pin SCSI
Type:	Balanced analog audio
Input Impedance:	20kΩ minimum (differential)
Sampling Frequency:	48kHz
Peak Signal and Common Mode Level:	30dBu

#### Serial Video Output (7766AVM-4A-SD & 7766AVM-S4A-SD):

Standard:	SMPTE 259M-C
Number of Outputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	470ps nominal
Overshoot:	<10% of amplitude

#### Analog Video Output (7766AVM-4A-CA & 7766AVM-S4A-CA):

Standard:	NTSC (SMPTE 170M), PAL (ITU624-4)
Number of Outputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	1V nominal
DC Offset:	0V ±0.1V
Return Loss:	> 35dB up to 5MHz
Frequency Response:	0.8dB to 4MHz
Differential Phase:	< 0.9° (< 0.6° typical)
Differential Gain:	< 0.9% (< 0.5% typical)
SNR:	> 56dB to 5MHz (shallow ramp)

#### Analog Video Output (7766AVM-4A-VGA & 7766AVM-S4A-VGA):

Standard:	VESA
Number of Outputs:	1
Connector:	Female, high density DB-15
Video:	1Vp-p YPrPb/RGB or 0.7Vp-p VGA, 60Hz refresh
Impedance:	75Ω
Sync:	300 mV or 4V

#### Genlock Input:

Type:	NTSC (SMPTE 170M) color black
Level:	1Vp-p nominal
Connector:	BNC per IEC 60169-8 Amendment 2

#### Audio Bar Graphs (per video output):

Number of Graphs:	4 (1 group) per video input channel, 2 phase meters
Ballistics:	DIN, BBC and Nordic N9

#### General Purpose In/Out (GPI/GPO):

Number of Inputs:	4 (configurable)
Number of Outputs:	4 (dedicated)
Connector:	68-pin SCSI

Type:	Opto-isolated, active low with internal pull-ups to +5V
Input Signal:	Closure to ground
Signal Level:	+5V nominal

#### Data Input/Output Serial Port:

Standard:	1 RS-232 or 1 RS-422 (jumper selectable)
Connector:	68-pin SCSI
Baud Rate:	Up to 1 Mbaud
Format:	RS-232: 8 bits, no parity, 2 stop bits and no flow control

#### Electrical:

Voltage:	+12V DC
Power:	24 Watts
EM/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

#### Physical:

Number of slots:	2
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#### Ordering Information:

7766AVM-4A-VGA	Analog Quattro™ Four Composite Analog Video (BNC) and Analog Audio Monitoring with analog RGB output
7766AVM-4A-CA	Analog Quattro™ Four Composite Analog Video (BNC) and Analog Audio Monitoring with Composite Analog output
7766AVM-4A-SD	Analog Quattro™ Four Composite Analog Video (BNC) and Analog Audio Monitoring with Serial Digital output
7766AVM-S4A-VGA	Analog Quattro™ Four S-Video and Analog Audio Monitoring with analog RGB output
7766AVM-S4A-CA	Analog Quattro™ Four S-Video and Analog Audio Monitoring with Composite Analog output
7766AVM-S4A-SD	Analog Quattro™ Four S-Video and Analog Audio Monitoring with Serial Digital output

#### Ordering Options:

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Accessories:

7766AVM-4A-BHP-4	Bulkhead breakout panel, linking audio, GPI/O and comm port to up to four 7766AVM-4A/-S4A
7766AVM-4A-BHP-1	Bulkhead breakout panel, linking audio, GPI/O and comm port to one 7766AVM-4A/-S4A (included with every 7766AVM-4A and 7766AVM-S4A product)
WSCS133PEX4	Breakout cable (3ft) for 7766AVM-4A-BHP (will work for both "-4" or "-1" BHP models)
7700FC	VistaLINK® Frame Controller
9000NCP	1RU VistaLINK® General Purpose Network Control Panel
9000NCP2	2RU VistaLINK® General Purpose Network Control Panel

#### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure





The 7760AVM2 series of video and audio monitoring cards perform a number of quality control and monitoring functions associated with a modern high definition and standard definition serial digital television facility. They perform audio and ancillary data (for HD) or vertical blanking interval (VBI) data (for SDI) demultiplexing from the incoming digital video, analyze the data and display key information about the data on the output video. The outputs are either analog and/or digital video with analog or digital audio.

The 7760AVM2 series modules are available in SD-only versions (7760AVM2-A and 7760AVM2-B) and a combination HD/SD version (7760AVM2-HD).

The 7760AVM2 series modules can be ordered with a 7760AVM-BHP Bulkhead Breakout Panel. This panel is an accessory that provides a convenient way of connecting the audio and GPIO signals into the high-density DB-15 connectors on the rear of the modules. This panel is available for five or ten 7760AVM2's and includes 3 ft. cables to connect to the 7760AVM2 modules.

The 7760AVM2 series modules occupy one card slot in the 3RU frame (7700FR-C), which will hold up to 15 modules or one slot in the 1RU frame (7701FR), which will hold up to three modules. The 7760AVM2 series modules may also be used in a standalone unit (S7701FR).

VistaLINK® enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as Evertz VistaLINK® Pro locally or remotely.

### Features:

- One group (4 channels of audio) is demultiplexed from the incoming digital video and VU/PPM level Indicators are keyed as bar graphs in over the picture
- 4 analog audio outputs available for content monitoring.
- Analog audio output levels are adjustable
- Analog audio outputs can be set so both are mono mix of the selected channel pair
- Decodes Line 21 XDS packets from SD signals and displays network name, call letters, program name and time of day
- Decodes Widescreen Signaling (WSS), Video Indexing, Active Format Description (AFD), subtitles, and teletext for monitoring.
- Displays program rating (V-Chip)
- Decodes EIA-608 closed captions from SD signals and displays on screen.
- Decodes vertical interval time code (VITC) from SD signals and "burns" the time code into the picture
- A comprehensive on screen display is available to configure the various features of the module
- Flexible configuration of the text and audio bar graph information displays.
- An extensive list of error conditions can be monitored and fault conditions can be configured from these conditions
- On screen messages can be triggered by the configured fault conditions.
- Two GPI inputs are available to modify the display characteristics
- GPO output to indicate user definable fault conditions
- Audio and GPIOs are available on a high density DB15 connector
- 7760AVM-BHP bulkhead panel is available to facilitate wiring to the high density DB15 connector. (up to 10 AVM2 modules can be wired using each bulkhead panel)
- RS-232 Data logging port to log fault conditions
- VistaLINK® - enabled offering remote control and configuration capabilities via SNMP using VistaLINK® Pro, 9000NCP or 9000NCP2 Network Control Panel. VistaLINK® is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller

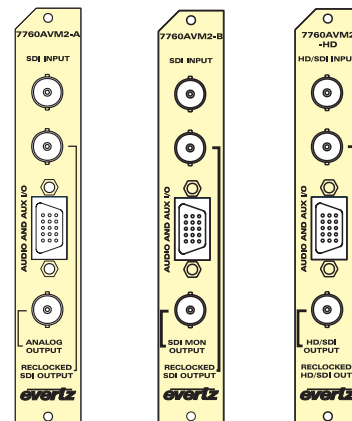
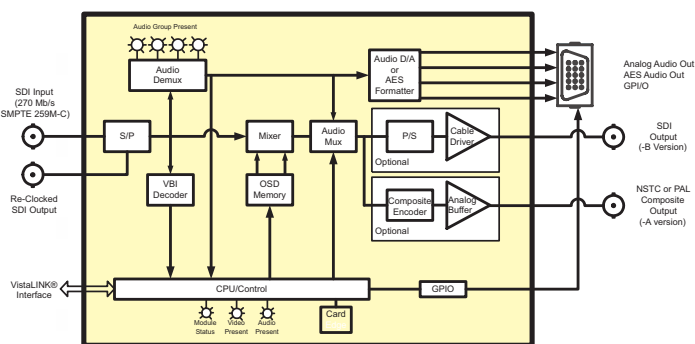
### Features (7760AVM2-A and -B versions only):

- One 270 Mb/s SDI 525i/59.94 or 625i/50 video input
- One re-clocked SDI video output
- One SDI video output with superimposed monitoring information (-B version only)
- Composite analog output video with superimposed monitoring information (-A version only)
- Decodes PESA format Source ID (8 characters) or Evertz format VITC Source ID (5 or 9 characters) from SDI signals and burns the ID into the picture

### Features: (7760AVM2-HD versions only):

- One auto sensing video input - supports 1080i/60, 1080i/59.94, 1080i/50, 720p/60, 720p/59.94, 720p/50, 525i/59.94 or 625i/50
- One re-clocked HD or SD video output (same as input)
- One HD or SD (same as input) video output with superimposed monitoring information
- Decodes RP188 Ancillary time code (ATC) from HD signals or vertical interval time code (VITC) from SD signals and "burns" the time code into the picture
- Optionally decodes PESA format Source ID (8 characters) or Evertz format VITC Source ID from SDI signals, or Evertz format ATC Source ID from HD signals and burns the ID into the picture. (with +SID option)
- Decodes EIA-708 closed captions from HD signals and displays on screen.

### 7760AVM2 Block Diagram & Rear Panels





### Specifications

#### Serial Video Digital Input:

<b>Standards:</b>	Auto detect or menu selectable SMPTE 292M (1.5Gb/s): 1080i/60, 1080i/59.94, 1080i/50, 720p/60, 720p/59.94 and 720p/50 - <b>7760AVM2-HD only</b> SMPTE 259M-C (270 Mb/s): 525i/59.94 or 625i/50
<b>Number of Inputs:</b>	1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Input Equalization:</b>	Automatic to 200m @ 270Mb/s with Belden 8281 or equivalent cable. Automatic to 115m @ 1.5Gb/s with Belden 1694A or equivalent cable.
<b>Return Loss:</b>	
<b>SD Standards:</b>	>15 dB up to 270Mb/s
<b>HD Standards:</b>	>15 dB up to 1.5Gb/s

#### Serial Video Digital Output:

<b>Standard:</b>	Same as input
<b>Number of Outputs:</b>	1 Reclocked (all models) 1 Monitored (7760AVM2-B and 7760AVM2-HD)
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V $\pm$ 0.5V
<b>Rise and Fall Time:</b>	
<b>SD Standards:</b>	470ps nominal
<b>HD Standards:</b>	200ps nominal
<b>Overshoot:</b>	<10% of amplitude

#### Analog Video Output (7760AVM2-A only):

<b>Standard:</b>	NSTC, SMPTE 170M; PAL, ITU-R BT.1700
<b>Number of Outputs:</b>	1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1V nominal
<b>DC Offset:</b>	0V $\pm$ 0.1V
<b>Return Loss:</b>	>35dB up to 5MHz
<b>Frequency Response:</b>	0.8dB to 4 MHz
<b>Differential Phase:</b>	< 0.9° (<0.6° typical)
<b>Differential Gain:</b>	< 0.9% (<0.5% typical)
<b>SNR:</b>	>56dB to 5 MHz (shallow ramp)

#### Analog Audio Outputs:

<b>Number of Outputs:</b>	4
<b>Type:</b>	Balanced Analog Audio
<b>Connectors:</b>	Female High Density DB-15
<b>Output Impedance:</b>	33 $\Omega$
<b>Sampling Frequency:</b>	48kHz
<b>Signal Level:</b>	0dB FS => 8 to 24dBu (user settable) NOTE: High impedance loads only (10 kW) Not good for low impedance loads (i.e. 600 W)
<b>Frequency Response:</b>	50Hz to 20kHz: $\pm$ 0.20dB
<b>SNR:</b>	>85dB (50Hz to 20 kHz)
<b>THD+N:</b>	65 dB @ 1kHz, 0 dB FS, typical

#### AES Audio Outputs:

<b>Number of Outputs:</b>	2
<b>Standard:</b>	SMPTE 276M compatible, single ended synchronous or asynchronous AES
<b>Connectors:</b>	High-density female DB-15
<b>Resolution:</b>	24 bits
<b>Sampling Rate:</b>	48 kHz
<b>Impedance:</b>	75 $\Omega$ unbalanced

#### Audio Bar Graphs:

<b>Number of Graphs:</b>	4 (1 group)
<b>Ballistics:</b>	AES/EBU, DIN, BBC and Nordic N9

#### General Purpose Interface I/O (GPI/GPO):

<b>Number of Inputs:</b>	2 (behavior is assigned via On screen menu items)
<b>Number of Outputs:</b>	1 (behavior is programmable via On screen menu items)
<b>Type:</b>	Opto-isolated, active low with internal pull-ups to +5V
<b>Connector:</b>	Female High Density DB-15
<b>Signal Level:</b>	+5V nominal

#### Data Logging Serial Port:

<b>Standard:</b>	RS-232
<b>Connector:</b>	Female High Density DB-15
<b>Baud Rate:</b>	57600
<b>Format:</b>	8-bits, no parity, 2 stop bits and no flow control

#### Physical:

<b>Number of slots:</b>	1
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#### Electrical:

<b>Voltage:</b>	+12VDC
<b>Power:</b>	12 Watts
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC Directive

#### Ordering Information:

<b>7760AVM2-A to B</b>	SDI Video & Audio Monitor/Conversion with On Screen Display (Single Slot) with Teletext subtitle decoder
<b>7760AVM2-HD</b>	HD Video & Audio Monitoring

#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

<b>+SID</b>	Source ID Decoder option for 7760AVM2-HD
<b>Rear Plate Suffix</b>	
<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Accessories:

<b>7760AVM-BHP-10</b>	Bulkhead Breakout panel for 10 AVMs includes 10 WPAVMIO-1-0-3F - 3' cables
<b>7760AVM-BHP-5</b>	Bulkhead Breakout panel for 5 AVMs includes 5 WPAVMIO-1-0-3F - 3' cables
<b>7700FC</b>	VistaLINK® Frame Controller
<b>9000NCP</b>	1RU VistaLINK® General Purpose Network Control Panel
<b>9000NCP2</b>	2RU VistaLINK® General Purpose Network Control Panel

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone enclosure



# SDI Video and Audio Monitoring/Conversion (without on screen display)

## 7760AVM-LITE

The 7760AVM-Lite Audio/Video Monitor provides a convenient low cost solution for composite analog monitoring of a 270Mb/s serial digital video signal, and provides analog conversion of 1 group of embedded or external AES audio\*.

The digital component video is converted to analog composite (NTSC/PAL-B). Closed captioning can be keyed onto the output composite video.

SMPTE 272M allows for up to four groups of AES audio (4 channels/group) to be embedded within a serial digital signal. The 7760AVM-Lite can de-multiplex one group and convert all 4 channels to low impedance balanced analog audio through 24-bit DAC's. In addition, the same audio is available simultaneously as 75Ω unbalanced digital AES on the 7760AVM-Lite A.

\*The 7760AVM-Lite B allows for monitoring of external or embedded AES audio but does not supply de-multiplexed AES audio out.

### Features

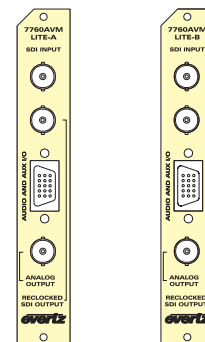
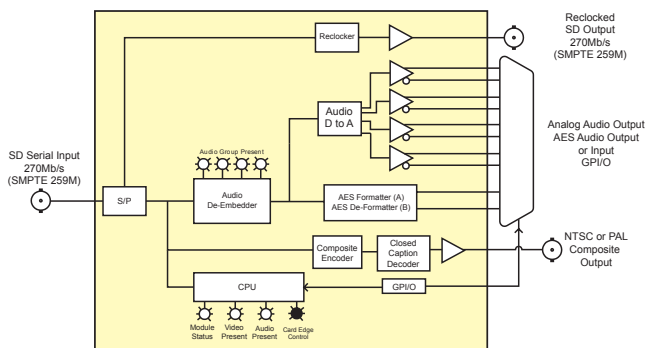
- 1 Reclocked SDI output
- Composite analog (NTSC/PAL-B) output
- 4 Balanced analog audio outputs
- 2 AES digital audio outputs or inputs
- 1 General purpose output to indicate the loss of video and/or audio
- Built in closed caption decoder with on/off control via dip switch and GPI
- Audio group selection via card edge DIP switches
- Selectable analog audio output levels

- Audio channel swapping selection via card edge DIP switches
- Selectable NTSC pedestal on/off

### Card Edge LED's:

- Module Status
- Local Fault
- Video Signal Presence
- Audio groups present in input video
- Selected audio group presence

### 7760AVM-LITE Block Diagram & Rear Panels



### Specifications

#### Serial Video Input:

Standard:

SMPTE 259M-C 525 or 625 line component

Connector:

BNC per IEC 60169-8 Amendment 2

Equalization:

Automatic 200m @ 270 Mb/s with Belden 8281 (or equivalent)

Return Loss:

>15 dB up to 270 Mb/s

#### Serial Video Output:

Standard:

Same as input

Connector:

BNC per IEC 60169-8 Amendment 2

Signal Level:

800mV nominal

DC Offset:

0V ±0.5V

Rise and Fall Time:

470ps nominal

Overshoot:

<10% of amplitude

Return Loss:

>15 dB up to 270 Mb/s

Wide Band Jitter:

<0.2 UI

#### AES Audio Inputs:

Number of Inputs:

2 on version B

Standard:

SMPTE 276M, single ended AES

Connectors:

Female High Density DB-15

Resolution:

24-bit

Sampling Rate:

48 kHz

Impedance:

75 Ω unbalanced

#### AES Audio Outputs:

Number of Outputs:

2 on version A

Standard:

SMPTE 276M, single ended AES

Connectors:

Female High Density DB-15

Resolution:

24-bit

Sampling Rate:

48 kHz

Impedance:

75Ω unbalanced

#### Analog Video Output:

Type:

NTSC, (SMPTE 170M) or PAL-B, (ITU 624-4)

Connector:

BNC per IEC 60169-8 Amendment 2

Signal Level:

1V nominal

DC Offset:

0V ±0.1V

Return Loss:

>35dB up to 5MHz

Frequency Resp:

0.8dB to 4 MHz

Differential Phase:

<9° (typical <0.5%)

Differential Gain:

<0.9% (typical <0.5%)

SNR:

>56dB to 5 MHz (shallow ramp)

Processing Delay:

1.9µs

### Analog Audio Outputs:

Number of Outputs:

4

Type:

Balanced analog audio

Connector:

Female High Density DB-15

Output Impedance:

33Ω

Sampling Frequency:

48kHz

Signal Level:

0dB FS => 20 dBu, 22dBu, 24dBu

NOTE: High impedance loads only (>10kΩ)

Not good for low impedance loads (i.e. 600Ω)

50Hz to 20kHz: ± 0.20dB

>85dB (50Hz to 20 kHz)

65 dB@ 1kHz, 0 dBFS, typical

24-bit

### Frequency Resp.:

SNR:

THD+N:

Resolution:

### Electrical:

Voltage:

+12VDC

Power:

6 Watts

EMI/RFI:

Complies with FCC Part 15 Class A

EU EMC Directive

### Physical:

Number of Slots:

1

### Ordering Information:

7760AVM-LiteX

SDI Video & Audio Monitoring/Conversion

X = A or B (A - AES Output), (B - AES Input)

### Ordering Options

Rear Plate must be specified at time of order

Eg: Model +3RU

### Rear Plate Suffix

+3RU

3RU Rear Plate for use with 7700FR-C

Multiframe

+1RU

1RU Rear Plate for use with 7701FR

Multiframe

+SA

Standalone Enclosure Rear Plate

### Enclosures:

7700FR-C

3RU Multiframe which holds 15 modules

7701FR

1RU Multiframe which holds 3 modules

S7701FR

Standalone enclosure





The 7760VMS-HD is a Video Monitoring tool for two 1.5 Gb/s HDTV serial digital video signals. The 7760VMS-HD has a HDTV split screen output from two input signals and also provides a monitoring downconverted split screen. The 7760VMS-HD accepts all the popular international SMPTE 292M video formats.

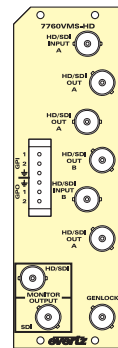
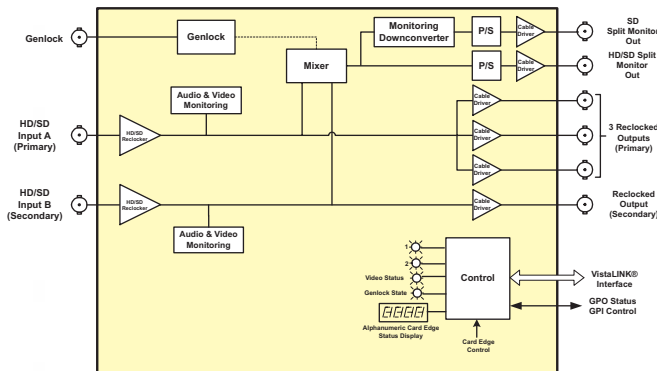
This 7700 series module provides 3 reclocked primary outputs and 1 reclocked secondary output.

The 7760VMS-HD occupies two card slots in the 3 RU frame, which will hold up to 7 modules or 1 slot in the 1RU frame, which will hold up to three modules.

## Features

- Two Serial digital 1.5 Gb/s HD inputs per SMPTE 292M
- 3 Rclocked DA outputs from input 1 and 1 reclocked DA output from input 2
- Mixer takes left half of input 1 and right half of input 2 and keys them together to form the HD Program Output
- Monitoring downconverter for SDI monitoring of split signal
- Occupies two card slots in the 3 RU frame, which will hold up to 7 modules or the 1 RU frame, which will hold up to three modules
- Card edge LEDS indicate module health, video present
- Tally output on Frame Status bus upon loss of input signals
- VistaLINK® - enabled offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame

## 7760VMS-HD Block Diagram & Rear Panel



## Specifications

### Serial Video Inputs:

**Standard:** 1.485 Gb/sec SMPTE 292M - auto-detects standard SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M

**Connector:** 2 BNC per IEC 60169-8 Amendment 2

**Input Equalization:** Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable

**Return Loss:** >20 dB up to 270 MHz  
>12 dB up to 1.5GHz

### Connector:

### Signal Level:

6 pins removable terminal block  
Closure to ground

### Electrical:

### Voltage:

+12VDC

### Power:

14 Watts

### EMI/RFI:

Complies with FCC regulations for Class A devices  
Complies with EU EMC directive

### Reclocked Serial Video Outputs:

**Standard:** Same as input

**Number of Outputs:** 3 outputs from input A, 1 output from input B, reclocked

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V ±0.5V

**Rise and Fall Time:** 200ps nominal for HD

**Overshoot:** <10% of amplitude

**Return Loss:** >20 dB up to 270 MHz, > 15 dB at 1.5 Gb/s

**Jitter:** < 0.16UI

### Physical:

### 7700 frame mounting:

**Number of slots:** 2

### 7701 frame mounting:

**Number of slots:** 1

### Downconverted Serial Video Output:

**Standard:** SMPTE 259M-C (270 Mb/s)

**Number of Outputs:** 1

**Connector:** BNC per IEC 60169-8 Amendment 2.

**Signal Level:** 800mV nominal

**DC Offset:** 0V ±0.5V

**Rise and Fall Time:** 750ps nominal

**Overshoot:** <10% of amplitude

**Return Loss:** > 15 dB at 270 Mb/s

**Jitter:** < 0.2 UI

### Genlock Input:

**Type:** NTSC or PAL Color Black 1 V p-p

**Connector:** BNC per IEC 60169-8 Amendment 2

**Termination:** High impedance or internal 75Ω termination (jumper selectable)

### GPIO Control Port:

**Type:** Opto-isolated, active low with internal pull-ups to +5 or +12V (jumper settable)

## Ordering Information:

**7760VMS-HD** HD Video Monitoring Splitter

### Ordering Options:

Rear Plate must be specified at time of order

Eg: Model +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe

**+1RU** 1RU Rear Plate for use with 7701FR Multiframe

### Accessories:

**7700FC** VistaLINK® Frame Controller

**9000NCP** 1RU VistaLINK® General Purpose Network Control Panel

**9000NCP2** 2RU VistaLINK® General Purpose Network Control Panel

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules

**7701FR** 1RU Multiframe which holds 3 modules



## Dual Channel Video and Analog Audio Monitoring 7761AVM2-DC & 7761AVM2-SDC



The 7761AVM2-DC Dual Channel Composite Video and Analog Audio and 7761AVM2-SDC Dual S-Video and Analog Audio monitoring cards perform a number of video, audio and vertical blanking interval (VBI) data analysis, quality control and monitoring functions similar to that of the 7760AVM line of audio/video monitoring cards. Incoming composite analog video or S-video is analyzed and key information about the signal is displayed on the output video. Both 7761AVM2-DC and 7761AVM2-SDC cards have two independent, composite analog video outputs. The 7761AVM2-DC and 7761AVM2-SDC are configurable both locally, through a card-edge push-button toggle with an on-screen display menu, and remotely, through the SNMP communication channel - known as VistaLINK®.

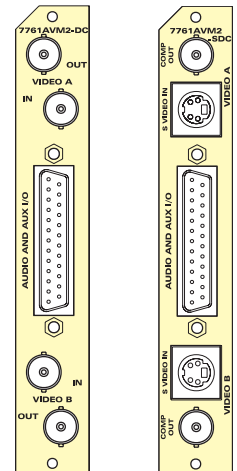
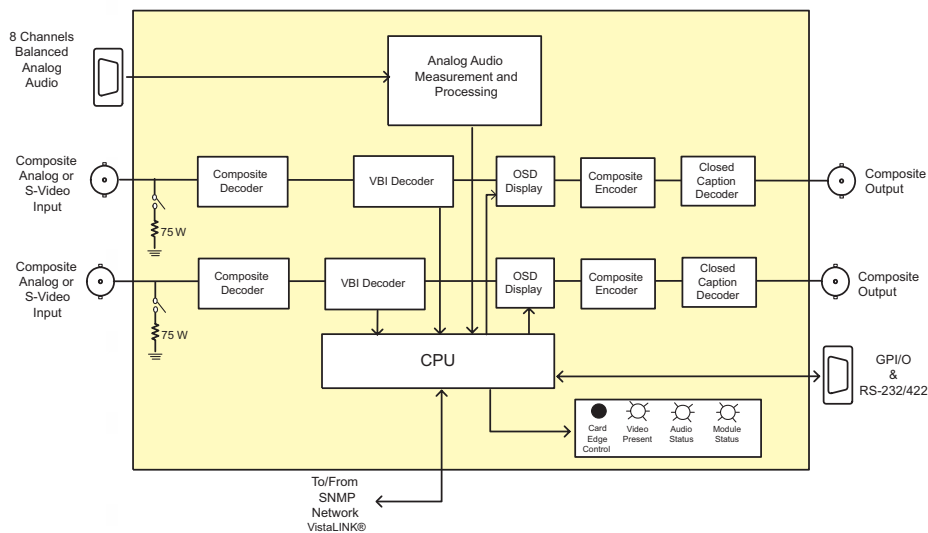
VistaLINK® offers remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP) giving the flexibility to manage operations, including signal monitoring and module configuration, from SNMP-capable control systems (Manager or NMS).

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### Features

- Two independent, composite analog (NTSC/PAL) video inputs (7761AVM2-DC)
- Two independent, S-Video inputs (7761AVM2-SDC) for direct connection to satellite IRD's for improved picture display quality
- Dual S-video output version (coming soon)
- One group (4 balanced audio inputs) per video input channel is analyzed and VU/PPM level indicators are keyed as bar graphs in over the video output
- Decodes vertical interval time code (VITC), VBI Source ID and Closed Captioning into the picture
- Provides peak video (Average Picture Level) and black level status and fault monitoring
- A comprehensive on screen display (OSD) is available to configure the various features of the module
- Flexible configuration of the text and audio bar graph information displays
- An extensive list of error conditions can be monitored and fault conditions can be configured from these conditions
- On screen messages can be triggered by the configured fault conditions
- Two independent composite analog (NTSC/PAL) video outputs
- Video output "black-out" option while maintaining audio, video and data parameter monitoring
- Two GPI inputs per video input are available to modify the display characteristics
- GPO output per video output is available to indicate user definable fault conditions
- Audio and GPI/Os are available on a female DB-25 connector
- RS-232 data logging port to log fault conditions
- 7761AVM-DC-BHP-15 Bulkhead Breakout Panel is available to facilitate wiring to the DB-25 connector (Up to 15 7761AVM2-DC or 7761AVM2-SDC cards can be wired per 3RU bulkhead panel)
- VistaLINK® -capable for remote monitoring and control via SNMP (using VistaLINK® PRO) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

### 7761AVM2-DC/-SDC Block Diagram & Rear Panels





### Specifications

#### Analog Video Input:

**Standard:** NTSC (SMPTE 170M), PAL (ITU-R BT. 1700)  
**Number of Inputs:** 2  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 1V nominal  
**DC Offset:** 0V  $\pm$  1V  
**Input Impedance:** 75 $\Omega$   
**Return Loss:** >40dB up to 5MHz

#### S-Video Input (7761AVM2-SDC)

**Number of Inputs:** 2  
**Connector:** IEC 933-5 (4-pin mini-DIN)  
**Signal Level:** Y: 1.0Vp-p, C: 0.286Vp-p  
**Input Impedance:** 75 $\Omega$

#### Analog Audio Input:

**Number of Inputs:** 8 (4 balanced inputs per video input channel)  
**Connector:** Female DB-25  
**Input Impedance:** 20 k $\Omega$  minimum (differential)  
**Sampling Frequency:** 48kHz  
**Peak Signal and Common Mode Level:** 30 dBu

#### Analog Video Output:

**Standard:** NTSC (SMPTE 170M) PAL (ITU-R BT. 1700)  
**Number of Outputs:** 2  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 1V nominal  
**DC Offset:** 0V  $\pm$  0.1V  
**Return Loss:** >35dB up to 5 MHz  
**Frequency Response:** 0.8dB to 4 MHz  
**Differential Phase:** <0.9° (<0.6° typical)  
**Differential Gain:** <0.9% (<0.5 % typical)  
**SNR:** >56dB to 5 MHz (shallow ramp)

#### Audio Bar Graphs:

**Number of Graphs:** 4 (1 group) per video input channel, 2 phase meters  
**Ballistics:** DIN, BBC and Nordic N9

#### General Purpose In/Out:

**Number of Inputs:** 1 or 2 (configurable) per video input  
**Number of Outputs:** 1 or 2 (configurable) per video output  
**Type:** Opto-isolated, active low with internal pull-ups to +5V  
**Connector:** Female DB-25  
**Signal Level:** +5V nominal (high), 0V (low)

#### Data Logging Serial Port:

**Standard:** RS-232  
**Connector:** Female DB-25  
**Baud Rate:** 57600  
**Format:** 8 bits, no parity, 2 stop bits and no flow control

#### Electrical:

**Voltage:** + 12VDC  
**Power:** 13 W  
**EMI/RFI:** Complies with FCC Part 15 class A  
 EU EMC Directive

#### Physical:

**Number of slots:** 1

#### Ordering Information:

**7761AVM2-DC** Dual Channel Video & Analog Audio Monitoring  
**7761AVM2-SDC** Dual S-Video & Analog Audio Monitoring  
**7761AVM2-SDC-S** Dual S-Video & Analog Audio Monitoring with Dual S-Video Outputs

#### Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Accessories:

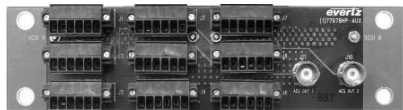
**7761AVM-BHP-15** Bulkhead Breakout Panel for 15 x 7761AVM-DC cards (includes 15-3ft cables)  
**WA7761AVMBHP3F** Breakout cable (3ft) for 7761AVM-DC models  
**7700FC** VistaLINK® Frame Controller  
**9000NCP** 1RU VistaLINK® General Purpose Network Control Panel  
**9000NCP2** 2RU VistaLINK® General Purpose Network Control Panel

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



Bulkhead Breakout Panels (BHP) provide a convenient way of connecting audio and auxiliary input and output signals to the VIP module. BHPs may be outfitted with BNCs and/or terminal strips, extending AES, GPI/O, Tx/Rx, Analog Audio and GND connections as described below. BHPs occupy 1/2RU, 1RU or 2RU of rack space and are designed for mounting at the rear of the rack panel. BHPs are included with specific line item order options as defined below.



The 7767BHP-AUX is outfitted with eight terminal blocks and provides connectivity for GPI (20), GPI (8), LTC, serial RS-232/422 and one group AES outputs. The 7767BHP-AUX is included with every VIP4, VIP8 and VIP12 module.

**7767BHP-AUX (included with every VIP4 or VIP12 module)**



**7767BHP-BAUX (included with 7767VIP-AI-BAL)**

The 7767BHP-BAUX provides terminal blocks for mappable balanced analog audio inputs to the VIP module. In addition, this breakout panel is also outfitted with the complete set of GPI (20), GPO (8), LTC differential inputs, serial ports (RS-232/RS-422) and one group AES outputs. It is possible to provide up to 4 unbalanced AES/EBU inputs per video input channel on the VIP. This breakout panel replaces the 7767BHP-AUX.



**7767BHP-UAUX (included with 7767VIP-AI-U)**

The 7767BHP-UAUX provides unbalanced AES/EBU inputs via BNCs to the VIP module. It is possible to provide up to 4 unbalanced AES/EBU inputs per video input channel on the VIP. In addition, this breakout panel is also outfitted with the complete set of GPI(20), GPI (8), LTC differential inputs one serial port (RS-232/RS-422) and one group AES output. This breakout panel replaces the 7767BHP-AUX.



**3000MKT-AUX**

For mounting convenience, a BHP mounting kit (3000MKT-AUX) is available with mounting hardware. It is shown in the picture above with two mounted AUX-BHPs.



**7760AVM-BHP-5, 7760AVM-BHP-10,**

The 7760AVM-BHP Bulkhead Breakout Panel can be used to connect up to five or ten 7760AVM, 7760AVM2 and 7735AVC-LB modules. Each of the ten sets of connectors on the breakout panel is fitted with two BNCs for audio in or out, two six position terminal strips for the 4 channels of analog audio, and one six position terminal strip for the GPI I/O and RS-232 signals.



**7761AVM-DC-BHP-15**

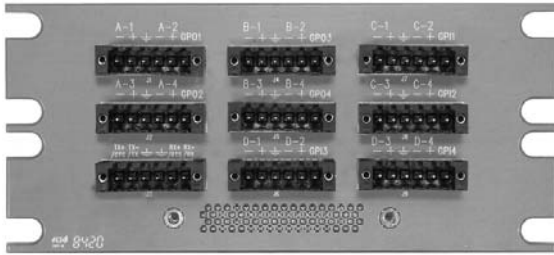
The 7761AVM-4A-BHP Bulkhead Breakout Panel is available to facilitate wiring to the DB-25 connector. This 3RU panel allows for convenient audio, GPI/O and RS-232 connections for up to fifteen 7761AVM-DC modules.



**7765AVM-4A-BHP-7**

The 7765AVM-4A-BHP Bulkhead Breakout Panel provides a convenient way of connecting AES/EBU audio and GPI I/O signals into the DB-25 on up to seven 7765AVM-4A modules.





**7766AVM-4A-BHP-1**



**7766AVM-4A-BHP-4**

The 7766AVM-1 & 4-BHP Bulkhead Breakout Panels provides a convenient interconnection to the 7766AVM-4A Analog Quattro™ and Analog Multiviewer modules, 68 pin rear plate SCSI connector. This is used to link analog audio inputs and AUX I/O signals to the module.

**Ordering Information:**

<b>7760AVM-BHP-5</b>	Bulkhead Breakout Panel for 5 x 7760AVMs (includes 5-3ft cables)
<b>7760AVM-BHP-10</b>	Bulkhead Breakout Panel for 10 x 7760AVMs (includes 10-3ft cables) (Optional Cables - WPAVMIO-1-0-1F (1' Adapter Cable) WPAVMIO-1-0-3F (3' Adapter Cable) WPAVMIO-1-0-6F (6' Adapter Cable)
<b>7761AVM-DC-BHP-15</b>	Bulkhead Breakout Panel for 15 x 7761AVM-DCs (includes 15-3ft cables)
<b>7765AVM-4A-BHP-7</b>	Bulkhead Breakout Panel for 7 x 7765AVM-4A (includes 7-3ft cables)
<b>7766AVM-4A-BHP-4</b>	Bulkhead Breakout Panel for 4 x 7766AVM-4A (includes 4-3ft cables)
<b>7766AVM-4A-BHP-1</b>	Bulkhead Breakout Panel for 1 x 7766AVM-4A (includes 1-3ft cable)
<b>7767VIP-AI-U</b>	Discrete unbalanced AES/EBU audio input (4 AES per video input) support with breakout panel
<b>7767VIP-AI-BAL</b>	Discrete balanced analog audio input support with breakout panel
<b>3000MKT-AUX</b>	Dual BHP-AUX auxiliary GPI/O and serial break-out panel rack mounting kit

If additional breakout panels are required, contact factory for ordering information





**7700FR-C**



**7701FR**



**S7701FR (with rackmount tray)**

The Evertz 7700FR-C, 7701FR & S7701FR Multiframes are ideal solutions to today's vast digital video and audio processing and distribution requirements. They provide flexibility to handle the high-speed requirements of HDTV as well as Analog and SDTV. The Multiframes support extraction of the modules from the front without compromising performance even at 1.5Gb/s. Hot extraction is supported on various types of interfaces including VIDEO, AUDIO and FIBER.

The 7700FR-C Multiframes are 3RU frames designed to house up to 15 single slot modules, the 7701FR Multiframe is a 1RU frame designed to house up to 3 single or dual slot modules both in various combinations and configurations and the S7701FR Multiframe is a single frame designed to house 1 single slot module or dual slot module.

#### **Features**

- Power supply and cooling fan are front extractable
- Houses up to 15 front loading processing modules with I/O for the 7700FR-C and 3 for the 7701FR
- Each slot has individually configurable inputs and outputs
- Monitoring window for verifying modules status and power supply status
- 7700FR-C can house a 7700FC VistaLINK® Frame Controller in slot 1 which will allow for remote control and monitoring of VistaLINK® - enabled products via SNMP over TCP/IP
- Frame status contact closure/open on power supply failure, fan failures and user selectable module alarms
- A relay based contact closure is provided with common, ground, normally open and normally closed contacts
- High-speed bussing and control system provided for modular applications
- No recabling required when hot swapping modules
- Optional redundant power supply for the 3RU 7700FR-C and 1RU 7701FR
- 7700FR-C may be ordered with 48VDC power supplies

#### **Single Module Standalone Enclosure:**

- Portable
- Powered by an external 12V DC adapter (included)
- Supports both single slot and dual slot modules
- Optional rack mount panel mounts 3 S7701FR enclosures in 1RU rack space



**Specifications**

**Electrical :**

**Power Supply Configuration:**

<b>7700FR-C:</b>	Dual, redundant, separate AC inlets
<b>7700FR-C-48VDC:</b>	Dual, redundant, separate DC inlets on terminal strips
<b>7701FR:</b>	Standard single, optional external redundant
<b>S7701FR:</b>	External power supply adapter

**Voltage:**

<b>7700FR-C:</b>	Auto ranging, 100 to 240 VAC, 50/60 Hz
<b>7700FR-C-48VDC:</b>	36V to 60VDC
<b>7701FR:</b>	Auto ranging, 100 to 240 VAC, 50/60 Hz
<b>S7701FR:</b>	12VDC Nominal
	Auto ranging, 100 to 240VAC power adapter included

**Maximum Module Load:**

<b>7700FR-C:</b>	2.0A (@120 VAC), 1.8A (@240 VAC)
<b>7700FR-C-48VDC:</b>	5.2A (@48 VDC)

**Maximum Power Consumption:**

<b>7700FR:</b>	250 W
<b>7700FR-C-48VDC:</b>	250 W
<b>7700FR:</b>	100 W
<b>S7701FR:</b>	36 W

**Fuses:**

<b>7700FR-C:</b>	4 amp, 250 Volt time delay 5x20mm - line and neutral
<b>7700FR-C-48VDC:</b>	10 amp, 250 Volt time delay 5x20mm
<b>7701FR:</b>	2 amp, 250 Volt time delay 5x20mm - line and neutral
<b>S7701FR:</b>	Internal self resetting fuse

**Connectors:**

<b>7700FR-C:</b>	IEC 60320
<b>7700FR-C-48VDC:</b>	3 position terminal strip
<b>7701FR:</b>	IEC 60320
<b>S7701FR:</b>	2.5 mm DC power jack

**Certification:**

<b>Safety:</b>	CSA Listed Complies with EU Safety Directive
<b>EMC:</b>	Complies with FCC part 15, Class A Complies with EU EMC Directives

**Front Panel Indicators:**

PSU status LED, Local Error/Failure  
4 pin terminal, relay N/O,  
N/C for status/fault alarm

**Tally Output:**

**Physical:**

**Dimensions:**

<b>7700FR-C:</b>	19"W x 5.25"H x 14.5"D (483mm W x 133mm H x 368mm D)
<b>7700FR-C-48VDC:</b>	19"W x 5.25"H x 14.5"D (483mm W x 133mm H x 368mm D)
<b>7701FR:</b>	19"W x 1.75"H x 14.5"D (483mm W x 45mm H x 368mm D)
<b>S7701FR:</b>	5"W x 1.75"H x 14.5"D 127mm W x 45mm h x 368mm D

**Temperature:**

0-40°C

**Module Capacity:**

<b>7700FR-C:</b>	15 single slot modules
<b>7700FR-C-48VDC:</b>	15 single slot modules
<b>7701FR:</b>	3 single or dual slot modules
<b>S7701FR:</b>	1 single or dual slot module

**Weight:**

<b>7700FR-C:</b>	32 lbs. (14.5 Kg) (Full) 17.4 lbs (8 Kg) (Empty)
<b>7700FR-C-48VDC:</b>	32 lbs. (14.5 Kg) (Full) 17.4 lbs (8 Kg) (Empty)
<b>7701FR:</b>	10 lbs. (4.5 Kg) (Full) 7 lbs. (3.1 Kg) (Empty)
<b>S7701FR:</b>	1.3 lbs. (.58 Kg)

**Ordering Information:**

<b>7700FR-C</b>	3RU Multiframe which holds up to 15 single slot modules with AC power supply
<b>7700FR-CR</b>	3RU Multiframe which holds up to 15 single slot modules without power supply
<b>7700FR-C-48VDC</b>	3RU Multiframe which holds up to 15 single slot modules with 48DC power supply
<b>7701FR</b>	1RU Multiframe which holds up to 3 single or dual slot modules
<b>S7701FR</b>	Standalone frame which holds 1 single slot or 1 dual slot module with power supply
<b>S7702FR</b>	Standalone frame which holds 1 - 3 lot module with power supply

**Ordering Options and Accessories:**

**For 7700FR-C & 7700FR-C-48-VDC Frames:**

<b>+7PS</b>	Redundant power supply for 7700FR-C
<b>7700PS</b>	Additional power supply for 7700FR
<b>+48PS</b>	Redundant power supply for 7700FR-C-48VDC
<b>7700PS-48VDC</b>	Additional power supply for 7700FR-C-48VDC

**For 7701FR Frame:**

<b>+PSX</b>	Optional external redundant power supply for 7701FR when ordered with frame
<b>7701PSX</b>	Optional external power supply for 7701FR for existing hardware
<b>7701PS</b>	Internal power supply for 7701FR (replacement or spare orders only)

**For S7701FR Frame:**

<b>S7701P</b>	Rear connector plate for Standalone frame (price applies when ordered separately; discounted when ordered with module)
<b>S7701FR-RP</b>	Rackmount panel mounts 3 S7701FR enclosures in 1RU rack space

**Note:** Some 7700 series modules cannot be accommodated in the 1RU standalone enclosure. See individual product brochure or contact factory.



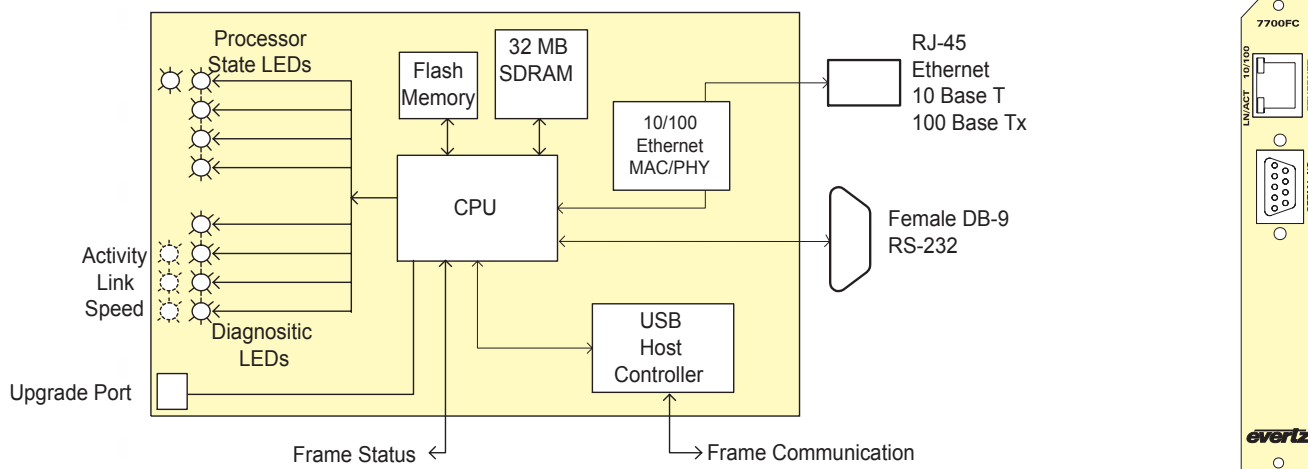


The 7700FC VistaLINK® Frame Controller card provides a single point of access to communicate with VistaLINK®-capable modules. The 7700FC VistaLINK® Frame Controller provides a 10Base-T/100Base-TX Ethernet port and communication is facilitated through the use of Simple Network Management Protocol (SNMP). The 7700FC VistaLINK® Frame Controller handles all SNMP communications between the frame (7700FR-C) and the network manager (NMS), and serves as a gateway to individual cards in the frame. The 7700FC VistaLINK® Frame Controller also provides an RS-232 serial port interface for customer configurations.

### Features

- Complies with IEEE 802.3 100Base-TX and 10Base-T Ethernet standards
- 100 Mbps Fast Ethernet or 10 Mbps Ethernet data transfer, selected by auto-negotiation
- Full duplex or half-duplex operation, selected by auto negotiation
- RJ-45 connector for network cable connection
- RS-232 serial control port for configuration
- Card edge LEDs indicate module fault, microprocessor state, activity and link status
- Rear panel LEDs indicate Ethernet link, activity and speed
- Supports "ftp" upgrades for frame-wide firmware upgrades (product specific)
- Includes VistaLINK® PRO (VLPRO-C) module software configuration tool
- Provides frame/chassis status information through VistaLINK® including power supply status, frame status, card insertion/removal counters, 7700FC software version number and LED control

### 7700FC VistaLINK® Frame Controller Block Diagram & Rear Panel



### Specifications

#### Ethernet:

**Network Type:** Fast Ethernet 100 Base-TX IEEE 802.3u standard for 100 Mbps baseband CSMA/CD local area network  
Ethernet 10 Base-T IEEE 802.3 standard for 10Mbps baseband CSMA/CD local area network

**Connector:** RJ-45

#### Serial I/O:

**Standard:** RS-232

**Connector:** Female DB-9

**Baud Rate:** 57600

**Format:** 8 bits, no parity, 2 stop bits, no flow control

#### Electrical:

**Voltage:** + 12VDC

**Power:** 7 Watts

**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC directive

#### Physical:

**Number of slots:** 1

#### Ordering Information:

**7700FC:** VistaLINK® Frame Controller

#### Ordering Options:

**Rear Plate Suffix**  
**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe

#### Enclosure:

**7700FR-C** 3RU Multiframe only





The 7700GPI VistaLINK® General Purpose Interface module links third-party equipment and Evertz VistaLINK® Network Management System (NMS). Third-party equipment with fault alarming capabilities through General Purpose Interface outputs (GPO) can communicate fault alarm conditions to the VistaLINK® application software through this GPO to SNMP translator thereby extending fault monitoring capabilities across the broadcast network.

Equipped with a Linear Time Code (LTC) input, the 7700GPI module can synchronize logged fault alarms within the VistaLINK® application software with the facility clock for accurate alarm acknowledgement and record-keeping. In addition it is possible to label each GPI input for easier notification. The label follows the fault message (trap) through to the VistaLINK® PRO server and onto email/pager notifications (if enabled).

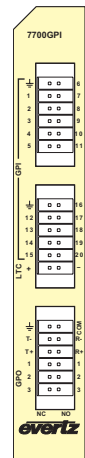
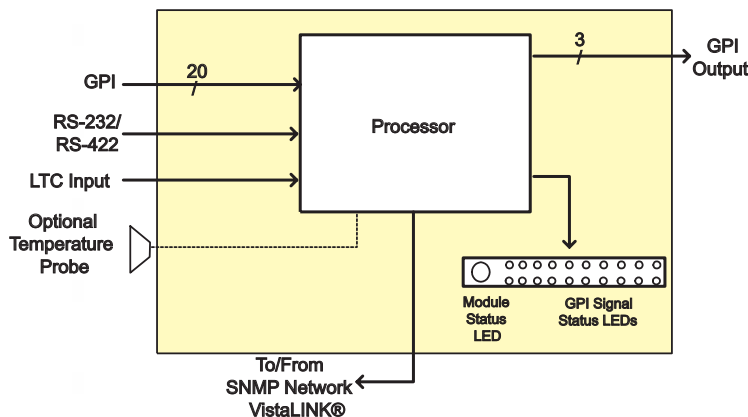
The GPI module is also equipped with three NC/NO GPI outputs (GPO) and can be utilized to relay a "message" from the VistaLINK® system to connected gear. Configuration changes or additional fault alarming are possible through this interface.

VistaLINK® offers remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP) giving the flexibility to manage operations, including signal monitoring and module configuration from SNMP-capable control systems (Manager or NMS).

### Features

- 20 opto-isolated General Purpose Interface inputs (GPI)
- Enabled GPI inputs/alerts translated and reported to Network Management System (NMS) user interface via SNMP
- Selectable +5V or +12V supply for driving GPI over longer cable runs
- 3 relay closure General Purpose Interface outputs (GPO)
- GPI/GPO easily accessed through pin-headers (2x6 Pheonix Terminal Blocks) on rear plate
- 1 LTC input for module synchronization of fault alarms to facility time
- Modular, conveniently fits into 7700FR-C 3RU frame
- Module status LED and 20 GPI LEDs for simple GPI input diagnostics
- Frame status trigger
- Jumper-configurable RS-232/RS-422 input serial COM port for serial protocol interface translation
- VistaLINK® -capable for remote monitoring and control via SNMP (using VistaLINK® PRO) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

### 7700GPI Block Diagram & Rear Panel



### Specifications

#### General Purpose Interface Input:

**Number of Inputs:** 20  
**Type:** Opto-isolated, active low with jumper selectable +5V or +12V supplied voltage  
**Connector:** Pheonix Terminal Block (2x6)  
**Signal Level:** Jumper selectable +5V or +12V

#### General Purpose Interface Output:

**Number of Outputs:** 3  
**Type:** "Dry Contact" relay closure  
**Connector:** 2 pins per output on Phoenix Terminal Block (2x6)  
**Signal Level:** Normally closed and normally open

#### LTC Input:

**Number of Inputs:** 1(± pair)  
**Type:** Balanced  
**Level:** 100 mVp-p  
**Connector:** Pheonix Terminal Block pins (2x6)

#### Data Input Serial Port:

**Number of Ports:** 1 RS-232 or 1 RS-422 (jumper selectable)  
**Connector:** Pheonix Terminal Block pins (2x6)  
**Baud Rate:** Up to 1 Mbaud

#### Electrical:

**Voltage:** + 12VDC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

#### Physical:

**Number of slots:** 1

#### Ordering Information:

**7700GPI** VistaLINK® General Purpose Interface

#### Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules





The 7700PTX Universal Protocol Translator module provides the ability for Evertz VistaLINK® and MVP™ software to interface directly to third party UMD devices and routers.

The 7700PTX communicates with the router and UMD protocols either via one of four serial ports or using a built in Ethernet port. All ports both serial and Ethernet are bi-directional allowing the device complete flexibility for communication. The 7700PTX is equipped with 20 general purpose inputs and 8 general purpose outputs that can be used to connect to third party devices for the purpose of alarming or tally. A single LTC port allows the 7700PTX to connect to external time of day references.

The following protocols are supported by the specified version of 7700PTX card:

**7700PTX-MVP** Image Video, TSL, Leitch UDT5700, and GPI/O protocol support  
**7700PTX-SX** Miranda PressMaster protocol support  
**7700PTX-XY** Leitch XY Integrator protocol support  
**7700PTX-CTP** Contribution Tally Protocol support (GVG Switcher, Ross Switcher)  
**7700PTX-10XL** GVG 10XL protocol support for router control  
**7700PTX-D28** Datatek D2800 protocol support for router control  
**7700PTX-D20** Datatek D2000 protocol support for router control  
**7700PTX-RCL** Router Control Language protocol (GVG Encore) for router control

**7700PTX-NV** Nvision router and server protocol support for router control  
**7700PTX-VMSI** VMSI protocol support (GVG Jupiter) for router control  
**7700PTX-AP** Andromeda UMD/tally protocol support (GVG ASCII plus)  
**7700PTX-PESA** Pesa CPU link protocol No. 1 support for router control  
**7700PTX-QUTZ** Quartz router switcher remote control protocol type 1 support for router control

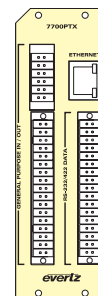
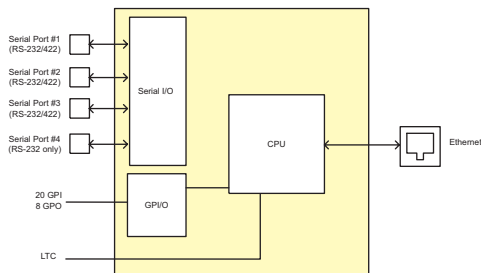
For router protocols not listed here please contact the factory.

### Features

- 4 serial ports RS232/422 selectable
- 20 opto-isolated General Purpose inputs (GPI)
- Selectable +5V or +12V supply for driving GPI over longer cable runs
- 8 relay closure General Purpose Interface outputs (GPO)
- GPI/GPO easily accessed through pin-headers (2x6 Phoenix Terminal Blocks) on rear plate

- 1 LTC input for module synchronization of fault alarms to facility time (feature not available at time of printing)
- Modular, conveniently fits into 7700FR-C 3RU frame
- Module status LED and 20 GPI LEDs for simple GPI input diagnostics
- Frame status trigger
- VistaLINK® -enabled for remote monitoring and control via SNMP (using VistaLINK® PRO)

### 7700PTX Block Diagram & Rear Panel



### Specifications

#### General Purpose Interface Input:

Number of Inputs: 20

Type: Opto-isolated, active low with jumper selectable +5V or +12V supplied voltage

Connector: Phoenix Terminal Block

Signal Level: Jumper selectable +5V or +12V

#### General Purpose Interface Output:

Number of Outputs: 8

Type: "Dry Contact" relay closure

Connector: 2 pins per output on Phoenix Terminal Block

Signal Level: Normally closed and normally open

#### LTC Input:

Number of Inputs: 1(± pair)

Type: Balanced

Level: 0.2 to 4V p-p balanced or unbalanced

Connector: Phoenix Terminal Block pins

#### Data Input Serial Port:

Number of Ports: 4 RS-232 or 3 RS-422

Connector: Phoenix Terminal Block pins

Baud Rate: Up to 1 Mbaud

#### Electrical:

Voltage: + 12VDC

Power: <6W

Safety: ETL Listed, complies with EU safety directives

EMI/RFI: Complies with FCC Part 15, Class A

EU EMC Directive

#### Physical:

Number of slots: 2

### Ordering Information:

**7700PTX-MVP** PTX which drives UMDs  
**7700PTX-SX** PTX which interfaces with Miranda Press Station  
**7700PTX-XY** PTX which interfaces with Leitch-XY integrator  
**7700PTX-CTP** PTX which interfaces with Ross switcher  
**7700PTX-10XL** PTX which controls 10XL-based routers  
**7700PTX-D28** PTX which controls Datatek D-2800 based router  
**7700PTX-D20** PTX which controls Datatek D-2000 based router  
**7700PTX-RCL** PTX which controls GVC RCL based router  
**7700PTX-NV** PTX which controls NVISION based router  
**7700PTX-VMSI** PTS which controls VMSI based router  
**7700PTX-AP** PTX which controls UMD/tally based router  
**7700PTX-PESA** PTX which controls Pesa protocol based router

### Ordering Options

Rear Plate must be specified at time of order

Eg: Model +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure





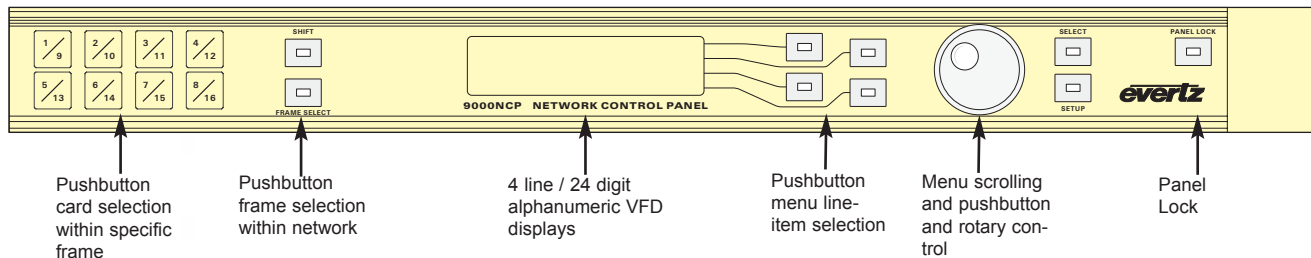
The 1RU 9000NCP VistaLINK® Network Control Panel (NCP) is a low-powered, rack mounted control panel interfacing to VistaLINK®-capable frames and modules, allowing for real-time selection and configuration control of enabled parameters.

The 9000NCP connects to the network via Ethernet and communicates via Simple Network Management Protocol (SNMP). In its simplest network configuration, the 9000NCP can be directly connected to a single frame's 7700FC VistaLINK® Frame Controller via a cross-over network cable.

The 9000NCP is used to control a subset of an enabled module's full parameter set. Specifically "proc amp" functions such as video & audio level adjustments and gain control are adjustable through the 9000NCP.

### Features

- Low power, rack-mountable and compact 1RU control panel
- Single, 4-line, 24 alphanumeric digit per line vacuum fluorescent display (VFD) featuring very high brightness and widest viewing angles
- 16 (8+Shift Key) illuminated, tactile and full-size quick-access pushbuttons with position and selector rotary control (shaft encoder)
- Built-in Simple Network Management Protocol (SNMP) communication interface over Ethernet connection
- Operational configuration control of key VistaLINK® -capable product parameters (visit [www.evertz.com](http://www.evertz.com) for updated list of modules and parameters)
- Quick access preset button, frame and card labels, and configuration privileges control available via VistaLINK®



### Specifications

#### Serial I/O (COM1):

**Standard:** RS-232  
**Connector:** Female DB-9  
**Baud Rate:** 57600  
**Format:** 8 bits, no parity, 2 stop bits, no hardware flow control (COM2 not available)

**Physical:** 19" W x 4 3/8" D x 1 1/4" H  
 (483mm x 111mm x 45mm)  
**Weight:** 3 lbs. (1.36 kg)  
**Temperature:** 0 to 50 deg. C. (Operating)

#### Ethernet Input/Output:

**Standard:** IEEE 802.3 (10BaseT), IEEE 8002.3u (100BaseTx)  
**Connector:** 1 RJ45

#### Cable Requirements:

10 Base T: UTP category 3, 4 or 5 cable up to 328ft/100m (2 pairs)  
 100 Base Tx: UTP category 5 cable up to 328ft/100m (2 pairs)

#### Electrical:

**Voltage:** + 12VDC  
 Auto ranging, 100 to 240 VAC, power adapter provided  
**Power:** 9 Watts  
**EMI/RFI:** Complies with FCC Part 15, class A  
 EU EMC Directive

#### Ordering Information:

**9000NCP** VistaLINK® Network Control Panel (1RU)



# VistaLINK® Network Control Panel (2RU) 9000NCP2

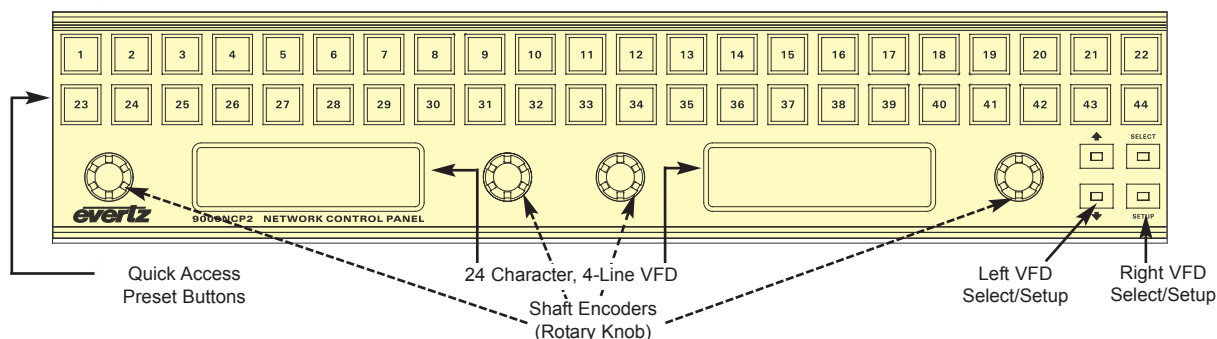


The 2RU 9000NCP2 VistaLINK® Network Control Panel (NCP) is a low-powered, rack mounted control panel interfacing to VistaLINK® -capable frames and modules, allowing for real-time selection and configuration control of enabled parameters.

The 9000NCP2 NCP connects to the network via Ethernet and communicates via Simple Network Management Protocol (SNMP). In its simplest network configuration, the NCP2 can be directly connected to a single frame via the frame controller using a cross-over network cable. In advanced systems, multiple NCPs can be connected within the same network, each capable of configuring all addressable parameters in every networked frame, or limited to a certain, user-defined set of frames, cards or parameters. With Evertz VistaLINK® PRO server running on the same network, NCP units are further enabled with custom labels, preset quick-access configuration buttons and masking/privilege control.

## Features

- Low power, rack-mountable, 2RU control panel
- Two, 4-line, 24 alphanumeric digit per line vacuum fluorescent display (VFD) featuring very high brightness and widest viewing angles
- 44 illuminated, tactile and full-size quick access pushbuttons with four position and selector rotary controls (shaft encoders)
- Provides convenient and fast configuration access for up to 4 simultaneous proc controls via split-screen display feature
- Built-in Simple Network Management Protocol (SNMP) communication interface over Ethernet connection
- Operational configuration control of key VistaLINK® -capable product parameters (visit [www.evertz.com](http://www.evertz.com) for updated list of modules and parameters)
- Quick access preset button, frame and card labels, and configuration privileges control available via VistaLINK®



## Specifications

### Serial I/O (COM1):

**Standard:** RS-232  
**Connector:** Female DB-9  
**Baud Rate:** 57600  
**Format:** 8 bits, no parity, 2 stop bits, no hardware flow control (COM2 not available)

**Physical:** 19" W x 4 3/8" D x 3 1/2" H  
 (483mm x 111mm x 89mm)  
**Weight:** 9000NCP2 - 4 lbs. (1.81 kg)  
**Temperature:** 0 to 50 deg. C. (Operating)

### Ethernet Input/Output:

**Standard:** IEEE 802.3 (10BaseT), IEEE 8002.3u (100BaseTx)  
**Connector:** 1 RJ45  
**Cable Requirements:**

10 Base T: UTP category 3, 4 or 5 cable up to 328ft/100m (2 pairs)  
 100 Base Tx: UTP category 5 cable up to 328ft/100m (2 pairs)

### Electrical:

**Voltage:** + 12VDC  
 Auto ranging, 100 to 240 VAC, power adapter provided  
**Power:** 11 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

### Ordering Information:

**9000NCP2** VistaLINK® Network Control Panel (2RU)







The 7700R2x2 series modules are bypass protection routers for high definition 1.5 Gb/s or standard definition 270 Mb/s serial digital video signals. These modules have two SD/HD compatible inputs signals (program and back-up) that support all popular SMPTE 292M video formats as well as 525/625 line SMPTE 259M-C video formats. These modules also provide three re-clocked primary outputs, and one re-clocked backup output. Based on a programmable set of input signal monitors, the main program or the back-up input signals can be automatically be routed to the primary program outputs to ensure the delivery of a valid program output in the case of an input signal fault. Switching can also be controlled and monitored through the use of module GPIOs, card edge controls or remotely using either network control panels (9000NCP, 9000NCP2) or VistaLINK® PRO. The program output is bypass relay protected and provides protection on the program path. If the module is removed from the enclosure or power to the module is lost, the program path is maintained.

The 7700R2X2-HES incorporates Evertz proprietary SoftSwitch™ technology, for clean video and "popless" embedded audio switching. Line synchronizers on the video inputs can accommodate differences in timing of up to +/- ½ a line on the video inputs. The 7700RD2X2-HD provides two monitoring down-converted outputs.

The 7700R2X2-HD and 7700R2X2-HES occupy one card slot and can be housed in the 3RU 7700FR frame, which will hold up to 15 single-slot modules, or one slot within the 1RU frame, which will hold up to three modules. The 7700RD2X2-HD modules occupy two slots within the 3RU 7700FR frame and one slot within the 1RU frame.

### Features:

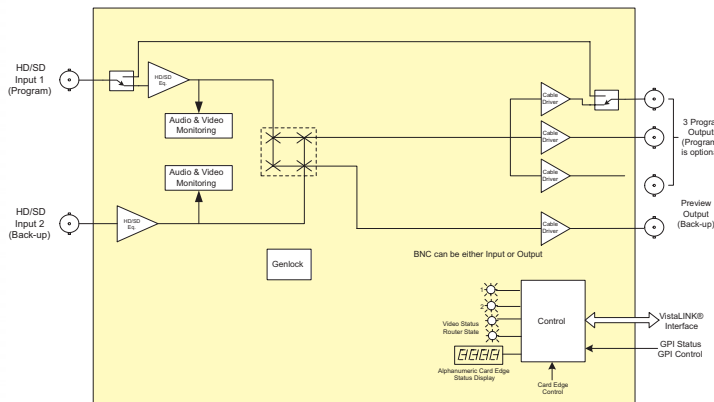
- Support for HD and SD SDI inputs per SMPTE 292M and SMPTE 259M-C
- Auto sensing of HD and SD input formats
- Supports both 525i/59.94 or 625i/50 SD video formats
- Automatic change-over based on programmable input signal monitors
- Generation of three re-clocked program outputs and one preview output (HD if HD inputs are applied, SD if SD inputs are applied)
- GPI control inputs for manual routing control
- GPO status outputs for reporting selector cross-point status
- Card edge menu control for configuration of operating modes
- Card edge LEDs for reporting signal presence, router state, module status
- Remote monitoring through NCP panels or VistaLINK® PRO.
- Bypass relay protection on program output
- Controllable switch point when a Genlock reference is provided

### Additional features on 7700RD2X2-HD model only:

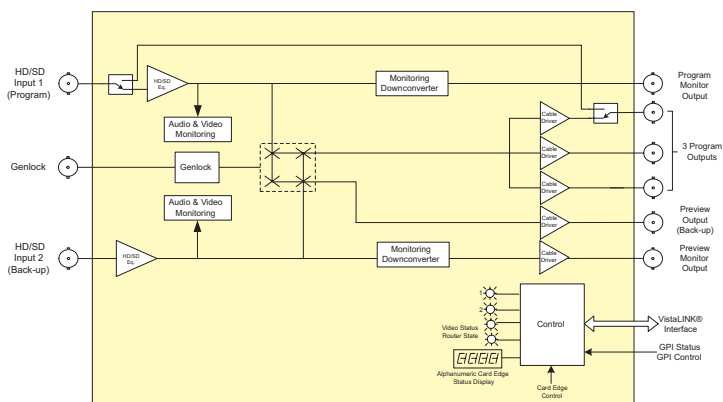
- Program and preview monitoring SDI outputs (down-converted from HD if HD input applied, relocked SD if SD input applied)
- Support for 16:9 letterbox, 4:3 center crop, and 4:3 anamorphic squeeze aspect ratio conversions
- HD to SD colour space conversion (ITU rec. 709 to ITU rec. 601)

### Additional features on 7700R2X2-HES model only:

- Integrated SoftSwitch technology for clean video and "popless" embedded audio switching
- Dolby-E® compliant
- VistaLINK® capable for offering remote monitoring, control, and configuration via SNMP. **Note:** VistaLINK® is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame using the Model 9000NCP Network Control Panel or Evertz VistaLINK® PRO or other third-party SNMP manager software.

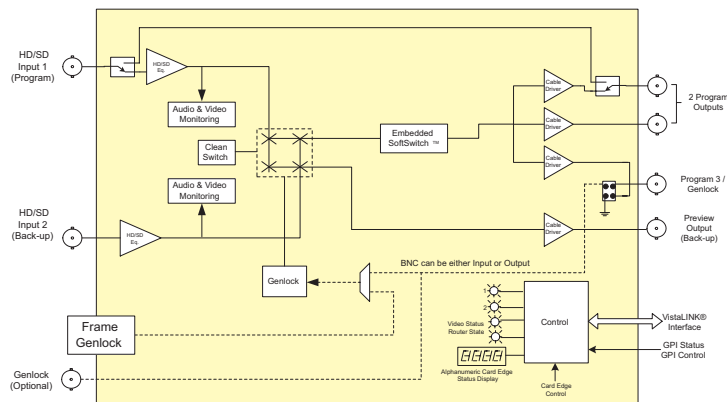


7700R2X2-HD Block Diagram



7700RD2X2-HD Block Diagram





**7700R2X2-HES Block Diagram**

### Specifications

#### Serial Video Input:

**Standard:** Auto-detects standard 1.485 Gb/sec SMPTE 292M (1080i/59.94, 1080i/50, 720p/59.94, 720p/50) SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M (HD or SD carrier) 270 Mb/s SMPTE 259M-C (525i/59.94 or 625i/50)

**Connector:** 2 BNC per IEC 60169-8 Amendment 2.

**Input Equalization:** Automatic to 100m @ 1.5Gb/s with Belden 1694 or equivalent cable

**Return Loss:** >20 dB up to 270 MHz  
>12 dB up to 1.5GHz

#### Reclocked Serial Video Router Outputs:

**Standard:** Same as input

**Number of Outputs:** 3 Program outputs relocked, (1 output is bypass relay protected)  
1 preview output

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V  $\pm$ 0.5V

**Rise and Fall Time:** 200ps nominal for HD  
900ps nominal for SD

**Overshoot:** <10% of amplitude

**Return Loss:** >20 dB up to 270 MHz  
> 15 dB at 1.5 Gb/s

**Jitter:** < 0.16UI (HD) or < 0.10UI (SD)

#### Downconverted Serial Video Outputs (7700RD2x2-HD-only):

**Standard:** SMPTE 259M-C, 270 Mb/s

**Number of Outputs:** 1 Program 1 preview

**Connector:** BNC per IEC 60169-8 Amendment 2.

**Signal Level:** 800mV nominal

**DC Offset:** 0V  $\pm$ 0.5V

**Rise and Fall Time:** 750ps nominal

**Overshoot:** <10% of amplitude

**Return Loss:** > 15 dB at 270 Mb/s

**Jitter:** < 0.2 UI

#### Genlock Input:

**Type:** NTSC or PAL Colour Black 1 V p-p  
HD Tri-Level Sync

**Connector:** BNC per IEC 60169-8 Amendment 2

**Termination:** High impedance or internal 75 $\Omega$  (jumper selectable)

#### GPIO Control Port:

**Number of Inputs:** 2

**Number of Outputs:** 2

**Type:** Opto-isolated, active low with internal pull-ups to +5 or +12V (jumper settable)

**Connector:** 6 pins removable terminal block

**Signal Level:** Closure to ground

#### Input to Output Processing Delay (HD input video on (7700RD2x2-HD only):

##### Downconverter Video Delay:

Approximately 1 to 2 frames depending on input video format, processing mode

#### Electrical:

**Voltage:** +12VDC

**Power:**

7700R2x2-HD	10 Watts
7700R2x2-HES-HD	10 Watts
7700RD2x2-HD	14 Watts

**EMI/RFI:** Complies with FCC regulations for class A devices  
Complies with EU EMC directive

#### Physical:

**Number of slots**

**7700 frame mounting:**

7700R2x2-HD	1
7700R2x2-HES-HD	1
7700RD2x2-HD	2

**7701 frame mounting:**

**All versions:** 1

#### Ordering Information:

7700R2x2-HD	2x2 HD/SD Router
7700R2x2-HES-HD	2x2 HD/SD Router with SoftSwitch™
7700RD2x2-HD	2x2 HD/SD Router with dual HD Downconverter

#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone Enclosure





The 7700 HD series Distribution Amplifiers provide reliable distribution of your 1.5 Gb/s HDTV and 270Mb/s Standard Definition serial digital signal. The 7700DA7-HD features one auto-equalized input with seven reclocked outputs. The 7700DA7-HD is housed in the Evertz 7700FR-C Multiframe, which is available in either a 3RU or 1RU version. The DA has been designed to reclock at 1.5Gb/s and 270Mb/s. In non-reclocking mode it can be used as a SMPTE 310M or SMPTE 259M/292M distribution product.

### Features

- Reclocking mode for SMPTE 292M (1.5 Gb/s), SMPTE 259M (270Mb/s), DVB-ASI or HD/SD auto sensing
- Non-reclocking mode for SMPTE 310M (also SMPTE 259M, 292M)
- VistaLINK® control

### Status LEDs:

- Signal presence
- Module Health Status

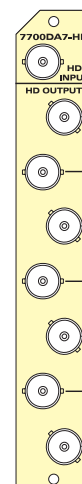
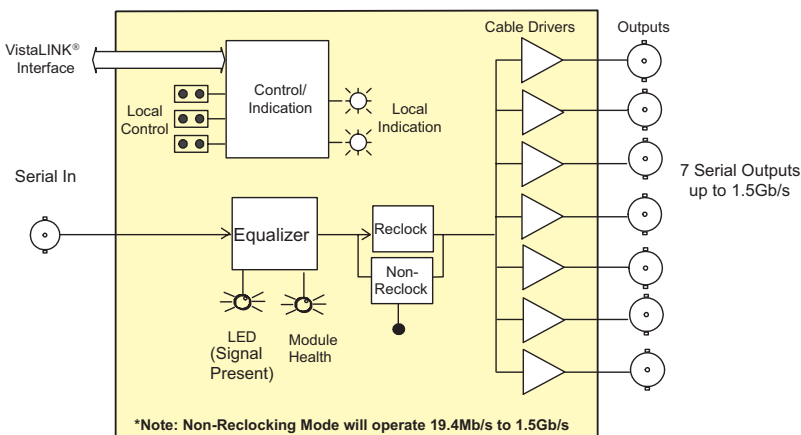
### Input:

- SMPTE 292M (1.5 Gb/s) Reclocking mode
- SMPTE259M (270Mb/s) DVB-ASI - Reclocking mode
- SMPTE 310M - Non-reclocking mode
- Auto equalization to 130m (Belden 1694A)

### Output:

- 7 reclocked outputs
- Wideband jitter <0.2UI

### 7700DA7-HD Block Diagram & Rear Panel



### Specifications

#### Serial Video Input:

<b>Standard:</b>	SMPTE 292M, SMPTE 259M-A, B, C, D, DVB-ASI or M2S
<b>In Non-Reclock Mode:</b>	SMPTE 310M (also SMPTE 259M, 292M)
<b>Connector:</b>	1 BNC per IEC 60169-8 Amendment 2
<b>Equalization:</b>	Automatic to 130m @ 1.5Gb/s with Belden 1694A (or equivalent)
<b>Return Loss:</b>	>15dB to 1.56 Gb/s,

#### Serial Video Outputs:

<b>Number of Outputs:</b>	7 Per Card
<b>Standard:</b>	SMPTE 292M, SMPTE 259M-A, B, C, D M2S, DVB-ASI
<b>In Non-Reclock Mode:</b>	SMPTE 310M (also SMPTE 259M, 292M)
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V ±0.5V
<b>Rise and Fall Time:</b>	200ps nominal
<b>Overshoot:</b>	<10% of amplitude
<b>Return Loss:</b>	>15dB to 1.56 Gb/s
<b>Wideband jitter:</b>	<0.2UI

#### Physical:

<b>Number of Slots:</b>	1
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#### Electrical:

<b>Voltage:</b>	+ 12V DC
<b>Power:</b>	5 Watts
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC Directive

#### Ordering Information:

<b>7700DA7-HD</b>	HD/SD Distribution Amplifier, 7 outputs
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#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone enclosure



# HD SDI Reclocking Distribution Amplifier

## 7700DA-HD & 7700DA8-HD

The 7700 HD series Distribution Amplifiers provide reliable distribution of your 1.5 Gb/s HDTV serial digital signal. The DA's feature one auto-equalized input with either four or eight reclocked outputs. The 7700 HD DA's are housed in the Evertz Multiframe, which is available in either a 3RU or 1RU version. The DA has been designed to reclock at 1.5Gb/s. However, in non-reclocking mode it can also be used as a SMPTE 292M, SMPTE 310M, DVB-ASI, M2S or SMPTE 259M distribution product.

### Features

- Reclocking mode for SMPTE 292M (1.5 Gb/s) signals
- Non-reclocking mode for SMPTE 292M, SMPTE 310M DA (nominal 19.4 Mb/s), SMPTE 259M, DVB-ASI or M2S
- Tally output upon loss of signal for quality monitoring

### Status LEDs:

- Signal presence
- Max. Equalization Warning
- Module Health Status

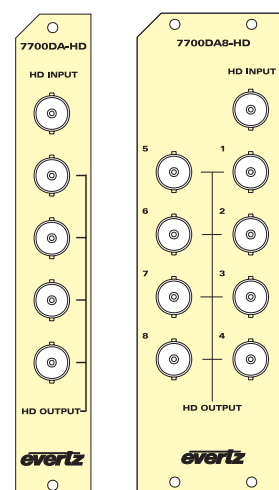
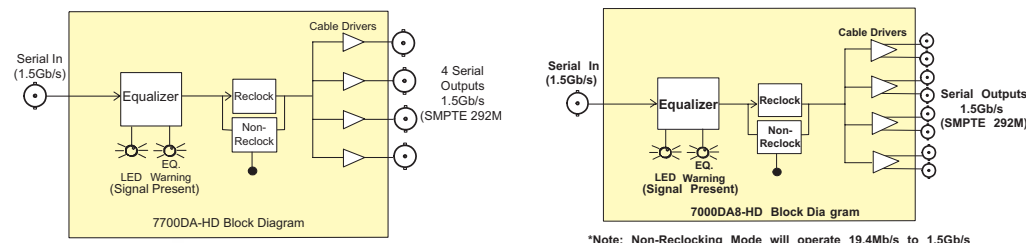
### Input:

- SMPTE 292M (1.5 Gb/s) - Reclocking mode
- SMPTE 292M, SMPTE310M, SMPTE259M, M2S or DVB-ASI - Non-reclocking mode
- Auto equalization to 130m (Belden 1694A)

### Output:

- 4 or 8 reclocked outputs
- Wideband jitter <0.2UI

### 7700DA-HD & 7700DA8-HD Block Diagram & Rear Panels



### Specifications

#### Serial Video Input:

**Standard:** SMPTE 292M  
**In Non-Reclock Mode:** SMPTE 292M, SMPTE 310M, SMPTE 259M-A, B, C, D, DVB-ASI or M2S  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 130m @ 1.5Gb/s with Belden 1694A (or equivalent)  
**Return Loss:** >15dB to 1.0 Gb/s, >12db up to 1.5 Gb/s

#### Serial Video Outputs:

**Number of Outputs:** 4 or 8 Per Card  
**Standard:** SMPTE 292M  
**In Non-Reclock Mode:** SMPTE 292M, SMPTE 310M, SMPTE 259M-A, B, C, D, M2S, DVB-ASI  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 200ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** >15dB to 1.0 Gb/s, >12db up to 1.5 Gb/s

#### Wideband jitter:

<0.2UI

#### Physical:

**Number of Slots:** 1 (7700DA-HD)  
2 (7700DA8-HD)

#### Electrical:

**Voltage:** + 12V DC  
**Power:** 5 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC Directive

#### Ordering Information:

**7700DA-HD** HD SDI reclocking DA, 4 outputs  
**7700DA8-HD** HD SDI reclocking DA, 8 outputs

#### Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure





## 7700ACO-HD

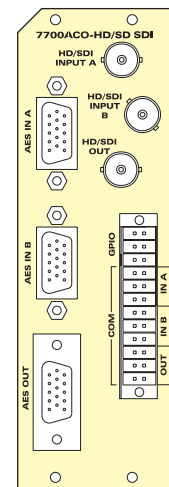
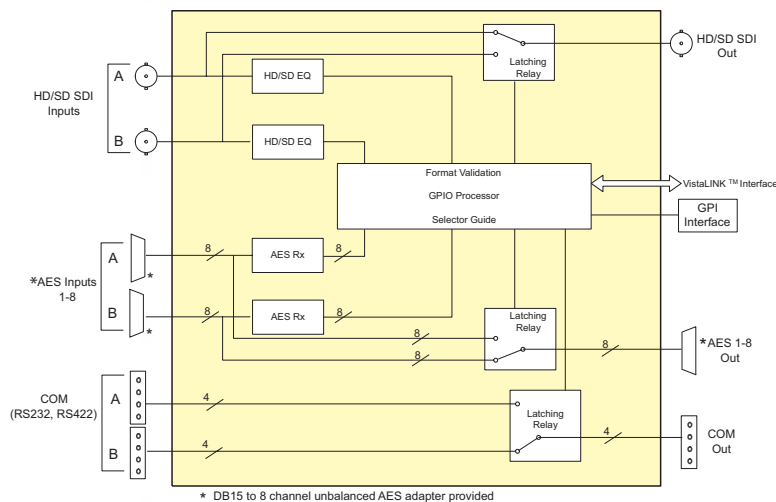
The Evertz 7700ACO-HD HD/SDI Auto Change Over is designed to provide a HD/SD SDI video, multi channel AES audio and RS422/RS232 change over in one device. The unit can be controlled via GPI, remotely via VistaLINK® PRO or set in auto changeover mode. It is an all-in-one ACO package aimed towards protecting a complete channel (ie. protecting the video, 8 channels of discrete AES and associated control channel (RS232 or RS422)). The unit features latching relays that maintain state through loss of power.

### Features

- Auto detection of signal standard
- Four modes of operation
  - Auto changeover - two standalone auto changeovers
  - Manual DIP switch control - two independently controlled 2x1 switchers
  - GPI Control - two independently GPI controlled 2x1 switchers
  - Tally output provided
- Protection for 8 channels of AES
- Control channels

- Protection (on HD (1.5Gb/s) or SD (270Mb/s))
- Changeover conditions are based on signal presence of: HD/SDI (TRS timing, CRC and EDH) DVB-ASI (SMPTE sync word); Sync (H timing) and AES (sync word)
- VistaLINK® - capable offering remote monitoring, control and configuration capabilities via SNMP. VistaLINK® is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame

### 7700ACO-HD Block Diagram & Rear Panel



### Specifications

#### Serial Video Inputs:

**Standards:** SMPTE 292M (1.5Gb/s), SMPTE 259M-A, B, C, D (143 to 540 Mb/s) or DVB-ASI

**Connector:** 2 BNC per IEC 60169-8 Amendment 2

**Maximum Cable Length:** 100m of Belden 1694AA or equivalent cable combined input and output

**Return Loss:** 10 dB up to 1.5 Gb/s

#### Serial Video Output:

**Number of Outputs:** 1 passive relay output

**Connector:** BNC per IEC 60169-8 Amendment 2

**Maximum Cable Length:** 60m of Belden 1694AA or equivalent cable combined input and output

**DC Offset:** 0V ±0.5V

**Return Loss:** 10 dB up to 1.5 Gb/s

#### General Purpose Inputs and Outputs:

##### Type:

**Inputs:** Opto-isolated input with internal pull-up to + 5Volts  
**Outputs:** Normally 10k internal pull-up to + 5Volts. Ground to rear panel when relay is in active position

**Connector:** Screw down terminal blocks

**Signal Level:** +5V nominal

#### Communications and Control:

**Serial Port:** RS232/RS422 - 4 wire, terminal block

**Connector:** 4 pins on removable terminal block

#### AES Input:

**Standard:** SMPTE 276M

**Number of Inputs:** 8 unbalanced AES

**Connector:** Female High Density DB-15 (breakout cable to BNC provided)

**Input Level:** 1V p-p

**Input Impedance:** 75Ω

**Return Loss:** >25dB 100kHz to 600MHz

**Equalization:** Automatic to 1500m with Belden 1694AA (or equivalent) @ 48kHz AES signal

#### AES Output:

**Number of Outputs:** 8 Unbalanced AES

**Connector:** Female High Density DB-15 (breakout cable to BNC provided)

**Output Level:** 1V p-p

**Output Impedance:** 75Ω

**Return Loss:** >25dB 100kHz to 6MHz

#### Physical:

**Number of slots:** 2

#### Electrical:

**Voltage:** +12VDC

**Power:** 6 Watts

**EMI/RFI:** Complies with FCC Part 15 Class A  
EU EMC Directive

#### Ordering Information:

**7700ACO-HD** HD/SD SDI, 8 Channel AES & RS232/422 Auto Change Over

#### Accessories:

**WPAES8-BNCM-6F** AES Audio Breakout Cable

#### Enclosures:

**7700FR-C** 3RU Multiframe, which holds 15 modules

**7701FR** 1RU Multiframe, which holds 3 modules

**S7701FR** Standalone Enclosure



# SDI Monitoring Reclocking Distribution Amplifier

## 7700VMDA & 7700VMDA-2Q



The 7700VMDA Reclocking Distribution Amplifier provides inexpensive distribution and composite encoder monitoring of your SMPTE 259M (270MB/s) serial digital video signal. The 7700VMDA features an auto-equalized input with seven outputs that can be selected as either SDI or composite analog. The 7700VMDA-2Q has 2 channels, each with 3 selectable outputs or can be used as a single input DA with six outputs.

The 7700VMDA and 7700VMDA-2Q occupy one card slot each and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

### Features

- Features independent isolated output drivers to ensure no cross channel loading effects (i.e. no need to terminate unused outputs)
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller

### Input:

- Supports SMPTE 259M-C (270Mb/s) video with embedded audio
- Return loss > 15dB up to 540Mb/s
- 300m auto eq. at 270Mb/s (Belden 8281)

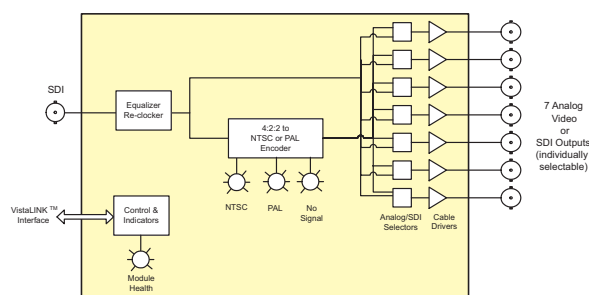
### Outputs:

- Selectable reclocked/composite encoder outputs
- Return loss > 15dB up to 540Mb/s
- Wideband jitter < 0.2 UI
- Passes embedded audio to SDI output

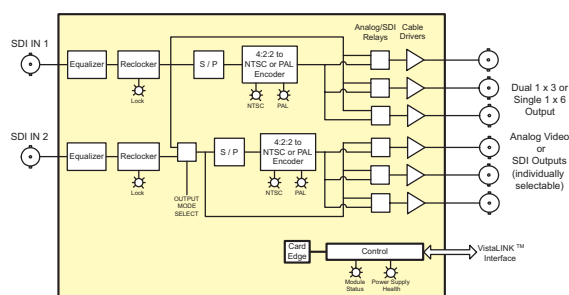
### Card Edge LEDs:

- Signal presence
- Module Health Status

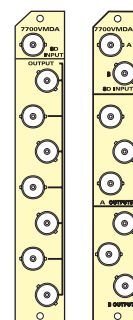
### 7700VMDA/7700VMDA-2Q Block Diagrams & Rear Panels



7700VMDA



7700VMDA-2Q



### Specifications

#### Serial Video Input:

**Standard:** SMPTE 259M  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 300m @ 270Mb/s with Belden 8281 (or equivalent)  
**Return Loss:** > 15dB up to 540Mb/s  
**Embedded Audio:** SMPTE 272M-A

#### Serial Video Output:

**Number of Outputs:** Up to 7 (jumper selectable)(7700VMDA)  
 3 per channel (7700VMDA-2Q)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ± 0.5V  
**Rise and Fall Time:** 740ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** >15 dB up to 540Mb/s  
**Wideband Jitter:** <0.2 UI

#### Analog Video Output:

**Number of Outputs:** Up to 7 (jumper selectable)(7700VMDA)  
 3 per channel (7700VMDA-2Q)  
**Standards:** NTSC, SMPTE 170M if input is 525i/59.94  
 PAL-B ITY 624-4 if input is 625i/50  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 1 V p-p nominal  
**DC Offset:** 0V ±0.1V  
**Return Loss:** > 35 dB up to 5 MHz

### Physical:

**Number of Slots:** 1

### Electrical:

**Voltage:** +12VDC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

### Ordering Information:

**7700VMDA** Video Monitoring Reclocking DA, 1 channel, 7 outputs  
**7700VMDA-2Q** Video Monitoring Reclocking DA, 2 channels, 3 outputs per channel

### Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



## 7700DA-DS3

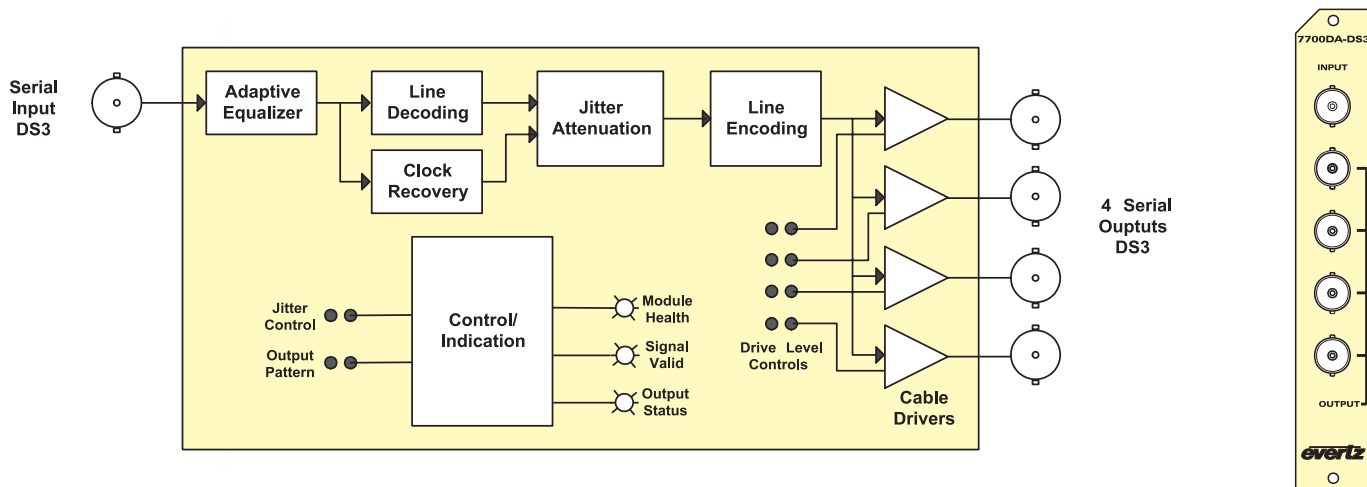
The 7700DA-DS3 Distribution Amplifier provides automatic coaxial cable equalization, reclocking and signal distribution of DS3 (44.736 Mb/s), signals. The 7700DA-DS3 accepts a B3ZS-encoded Alternate Mark Inversion (AMI) input signal and provides four reclocked outputs.

The 7700DA-DS3 occupies one card slot and can be housed in either a 1RU frame that will hold up to three modules or a 3RU frame that will hold up to 15 modules.

### Features

- Supports DS3 (44.736 Mb/s)
- Accepts B3ZS AMI input signals
- Automatic cable equalization for up to 1000ft of high quality 75Ω cable
- Signal reclocking and optional jitter attenuator
- Output wave shaping for DS3 standards compliance
- High/Low output amplitude setting for long/short cable lengths
- Loss of signal (LOS) detection/indication
- Outputs 1's pattern generation upon loss of input signal
- Electrical output drive level control for enhanced distance
- Transformer coupled inputs/outputs
- Input/output transient protection

### 7700DA-DS3 Block Diagram & Rear Panel



### Specifications

#### Inputs:

**Standard:** DS3 (44.7346 Mb/s)  
**Number of Inputs:** 1  
**Connector:** Isolated BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 300m with Belden 8281 or equivalent cable  
**Return Loss:** > 20 dB up to 44 Mb/s

#### Outputs:

**Number of Outputs:** 4 Per Card Reclocked  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Waveform:** Conforms to G.703 compliant masks  
**Return Loss:** > 18 dB up to 44 Mb/s

#### Physical:

**Number of Slots:** 1

#### Electrical:

**Voltage:** +12VDC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 Complies with EU EMC Directive

### Ordering Information:

**7700DA-DS3** DS3 Distribution Amplifier

### Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



# 143-540Mb/s, DVB-ASI, SMPTE 310M Reclocking Distribution Amplifier 7700DA

The Evertz 7700 series Distribution Amplifier provides inexpensive distribution of your serial digital video signal at rates of 19.4 Mb/s and 143 Mb/s to 540 Mb/s. The DA features an auto-equalized input with four reclocked outputs. The 7700DA has been designed for use as a SMPTE 310M (19.4 Mb/s), DVB-ASI, M2S or SMPTE 259M distribution product. SMPTE 310M support is selected by setting a rate select jumper.

## Features

- Mode to run SMPTE 310M DA (nominal 19.4 Mb/s with reclocking)
- Supports up to 540Mb/s operation
- DVB-ASI compatible
- Tally output upon loss of signal for quality monitoring
- Features independent isolated output drivers to ensure no cross channel loading effects (i.e. no need to terminate unused outputs)

## Input:

- SMPTE 259M (143 Mb/s to 540Mb/s), DVB-ASI, M2S, SMPTE 310M (19.4 Mb/s)
- Return loss > 15dB up to 540Mb/s
- 300m auto eq. at 270Mb/s (Belden 8281)
- 210m auto eq. at 540Mb/s (Belden 8281)

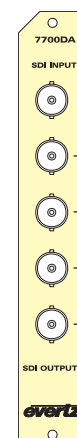
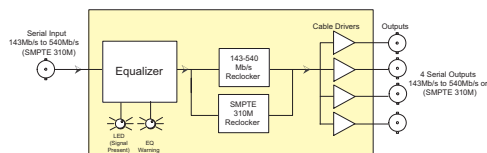
## Outputs:

- 4 reclocked outputs
- Return loss > 15dB up to 540Mb/s
- Wideband jitter < 0.2 UI

## Card Edge LEDs:

- Signal presence
- Max. Equalization Warning
- Module Health Status

## 7700DA Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

**Standard:** SMPTE 259M A, B, C, D, DVB-ASI, M2S, SMPTE 310M (19.4Mb/s-jumper selected)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 300m @ 270Mb/s with Belden 8281 (or equivalent)  
**Return Loss:** > 15dB up to 540Mb/s

### Serial Video Output:

**Number of Outputs:** 4 Per Card Reclocked  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ± 0.5V  
**Rise and Fall Time:** 740ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** >15 dB up to 540Mb/s  
**Wideband Jitter:** <0.2 UI

### Physical:

**Number of Slots:** 1

### Electrical:

**Voltage:** +12VDC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

### Ordering Information:

**7700DA** 143-540 Mb/s, DVB-ASI, SMPTE 310M, M2S Reclocking Distribution Amplifier (with 4 outputs)

### Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure





The 7700 series Distribution Amplifier provides inexpensive distribution of your serial digital video signal at rates of 19.4 Mb/s and 143 Mb/s to 540 Mb/s. The 7700DA7 features an auto-equalized input with seven reclocked outputs. The 7700DA7 has been designed for use as a SMPTE 310M (19.4 Mb/s), DVB-ASI, M2S or SMPTE 259M distribution product. SMPTE 310M support is selected by setting a rate select jumper.

### Features

- Supports up to 540Mb/s operation
- DVB-ASI compatible
- Non reclocking mode for SMPTE 310M
- Features independent isolated output drivers to ensure no cross channel loading effects (i.e. no need to terminate unused outputs)
- VistaLINK® - capable offering remote monitoring, control and configuration capabilities via SNMP. VistaLINK® is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame

### Input:

- SMPTE 259M (143 Mb/s to 540Mb/s), DVB-ASI, M2S, SMPTE 310M (19.4 Mb/s) - Non-reclocking mode

- Return loss > 15dB up to 540Mb/s
- 300m auto eq. at 270Mb/s (Belden 8281)
- 210m auto eq. at 540Mb/s (Belden 8281)

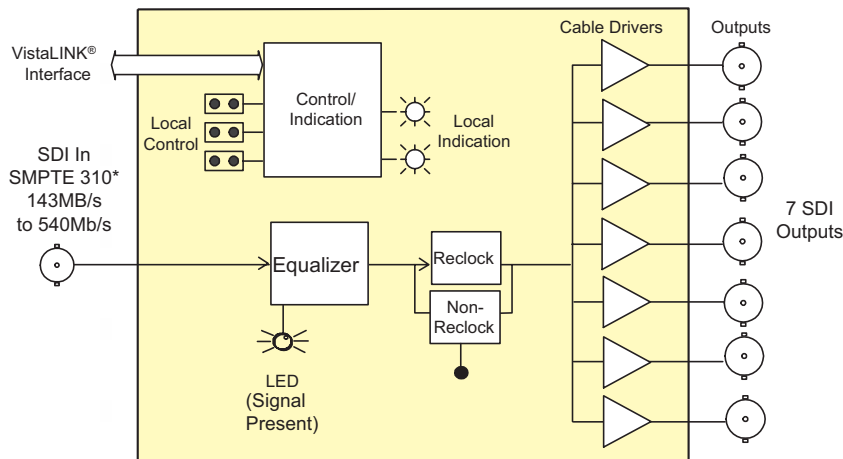
### Outputs:

- 7 reclocked outputs
- Return loss > 15dB up to 540Mb/s
- Wideband jitter < 0.2 UI

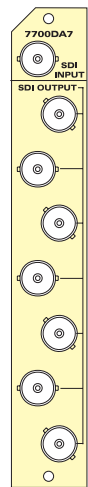
### Card Edge LEDs:

- Signal presence
- Module Health Status

### 7700DA7 Block Diagram & Rear Panel



\*Note: Non-Reclocking Mode will operate 19.4Mb/s to 540Mb/s



### Specifications

#### Serial Video Input:

**Standard:** SMPTE 259M A, B, C, D, DVB-ASI, M2S, SMPTE 310M (19.4Mb/s-jumper selected)

**Connector:** BNC per IEC 60169-8 Amendment 2

**Equalization:** Automatic to 300m @ 270Mb/s with Belden 8281 (or equivalent)

**Return Loss:** > 15dB up to 540Mb/s

#### Serial Video Output:

**Number of Outputs:** 7

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V ± 0.5V

**Rise and Fall Time:** 740ps nominal

**Overshoot:** <10% of amplitude

**Return Loss:** >15 dB up to 540Mb/s

**Wideband Jitter:** <0.2 UI

#### Physical:

**Number of Slots:** 1

#### Electrical:

**Voltage:** +12VDC

#### Power:

#### EMI/RFI:

6 Watts

Complies with FCC Part 15, Class A  
EU EMC Directive

#### Ordering Information:

##### 7700DA7

143-540 Mb/s, DVB-ASI, SMPTE 310M, M2S  
Reclocking Distribution Amplifier (with 7  
outputs)

#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

##### +3RU

3RU Rear Plate for use with 7700FR-C  
Multiframe

##### +1RU

1RU Rear Plate for use with 7701FR  
Multiframe

##### +SA

Standalone Enclosure Rear Plate

#### Enclosures:

##### 7700FR-C

3RU Multiframe which holds 15 modules

##### 7701FR

1RU Multiframe which holds 3 modules

##### S7701FR

Standalone enclosure



# Auto Equalizing Unbalanced AES/EBU Distribution Amplifier

## 7700DA-AESU

The 7700DA-AESU is a five output reclocking and auto equalizing DA for 75Ω unbalanced AES signals. The DA will automatically equalize AES signals on Belden 1694AA coax to 1500m. The DA will reclock data with sampling frequencies of 32kHz, 44.1kHz, 48kHz and 96kHz.

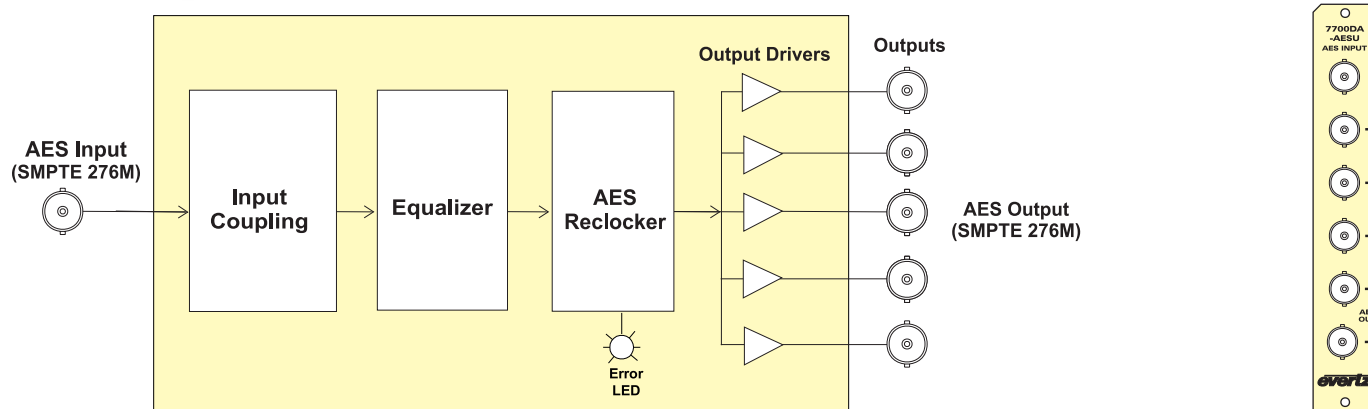
The 7700DA-AESU card edge LED indicators provide quick and accurate assessment of the incoming signal integrity. The 7700DA-AESU also provides a contact closure output that can be configured using on-board jumpers to assert when an input error condition exists.

### Features

- SMPTE 276M standard for AES audio on 75Ω coax
- Transformer coupled 75Ω unbalanced input (selectable Hi-Z)
- Data reclocking provides jitter reduction
- Automatic equalization
- EQ and reclock provide extended cable length compensation (>1500m)
- Five 75Ω coax outputs
- Error LED indication for input PLL out of lock, parity error or biphasic coding error
- External indication of input error condition using contact closure output

4

### 7700DA-AESU Block Diagram & Rear Panel



### Specifications

#### AES Input:

Standard:	SMPTE 276M
Number of Inputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2
Input Level:	1V p-p
Coupling:	Transformer
Input Impedance:	75Ω (Selectable Hi-Z)
Return Loss:	>25dB at 100kHz to 6MHz
Equalization:	Automatic to 1500m with Belden 1694AA (or equivalent) @ 48kHz AES signal
Sampling Frequency:	32kHz, 44.1kHz, 48kHz and 96kHz

#### AES Output:

Number of Outputs:	5 Per Card Reclocked
Connector:	BNC per IEC 60169-8 Amendment 2
Output Level:	1V p-p
Output Impedance:	75Ω
Return Loss:	>25dB 100kHz to 6MHz

#### Physical:

Number of Slots:	1
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#### Electrical:

Voltage:	+12VDC
Power:	1.2 Watts
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC Directive

### Ordering Information:

<b>7700DA-AESU</b>	Auto Equalizing Unbalanced AES/EBU Distribution Amplifier
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#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone enclosure



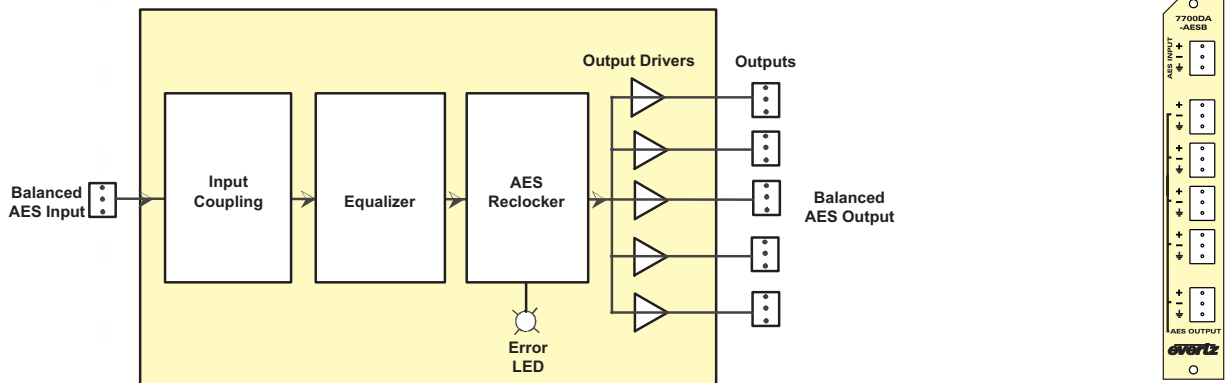
The 7700DA-AESB is a five output DA with auto equalizing input and reclocking for 110Ω balanced AES signals. The DA will automatically equalize AES signals on Belden 1800B cable when the drive signal is 7V p-p. The DA will reclock data with sampling frequencies of 32kHz, 44.1kHz, 48kHz and 96kHz.

The 7700DA-AESB card edge LED indicators provide quick and accurate assessment of the incoming signal integrity. The 7700DA-AESB also provides a contact closure output that can be configured using on-board jumpers to assert when an input error condition exists.

### Features

- AES3-1992 standard for AES audio on 110Ω twisted pair cable
- Transformer coupled 110Ω balanced input (selectable Hi-Z)
- Data reclocking provides jitter reduction
- Automatic equalization
- EQ and reclock provide extended cable length compensation
- Five 110Ω balanced outputs
- Error LED indication for input PLL out of lock, parity error or biphasic coding error
- External indication of input error condition using contact closure output

### 7700DA-AESB Block Diagram & Rear Panel



### Specifications

#### AES Input:

**Standard:** AES3-1992  
**Connector:** 3 pin removable terminal strip  
**Number of inputs:** 1  
**Input Level:** 2 to 7V p-p  
**Coupling:** Transformer  
**Input Impedance:** 110Ω (selectable Hi-Z)  
**Return Loss:** >14dB 100kHz to 6MHz  
**Equalization:** Automatic to 300m with Belden 1800B (or equivalent) @ 48kHz AES signal  
**Sampling Frequency:** 32kHz, 44.1kHz, 48kHz and 96kHz

#### AES Output:

**Number of Outputs:** 5 Per Card Reclocked  
**Connector:** 3 pin removable terminal strip  
**Output Level:** 5 V p-p  
**Output Impedance:** 110Ω  
**Return Loss:** 30 dB 100 kHz to 6 MHz

#### Electrical:

**Voltage:** +12VDC  
**Power:** 1.8 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

#### Physical:

**Number of Slots:** 1

### Ordering Information:

**7700DA-AESB** Autoequalizing Balanced AES/EBU Distribution Amplifier

#### Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



# Analog Video Distribution Amplifier 7700ADA

The 7700ADA Analog Distribution Amplifier is a general purpose amplifier for distributing analog signals. The 7700ADA features one balanced input with four outputs. The 7700ADA has been designed to distribute a wide range of analog video signals. It can also distribute other pulses and signals that do not exceed 2Vp-p.

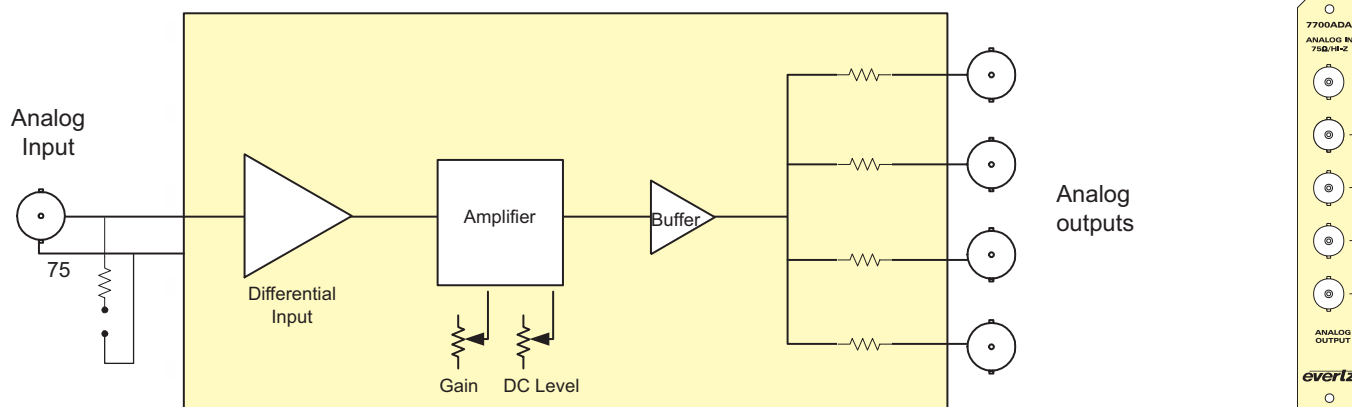
## Features

- 75  $\Omega$  or high impedance input (jumper selectable)
- Looping feature with external "T" connector
- Consistent input impedance if card power is lost
- High common mode range and common mode rejection ratio (CMRR)

## Card Edge LEDs:

- Module status/Local Fault
- Power supply status

## 7700ADA Block Diagram & Rear Panel



## Specifications

### Analog Video Input:

Standard:	Any analog video format up to 2Vp-p and 30MHz bandwidth
Number of Inputs:	1
Connector:	1 BNC per IEC 60169-8 Amendment 2
Equalization:	None
Common mode range:	6Vp-p
CMRR:	>75dB at 60Hz >45dB at 100kHz
Return Loss:	>30dB up to 30MHz
Signal Amplitude:	2.5Vp-p max

### Analog Video Outputs:

Number of Outputs:	4 per card
Connector:	BNC per IEC 60169-8 Amendment 2
Gain Level:	1x +3.5dB, -2.5dB
DC Offset:	0V $\pm$ 200mV (Adjustable)

### Electrical:

Voltage:	+12VDC
Power:	1.2 Watts
EMI/RFI:	Complies with FCC Part 15, Class A, EU EMC Directive

### Physical:

Number of Slots:	1
------------------	---

## Ordering Information:

<b>7700ADA</b>	Analog Video Distribution Amplifier
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## Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

## Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

## Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone enclosure





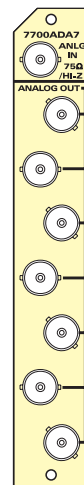
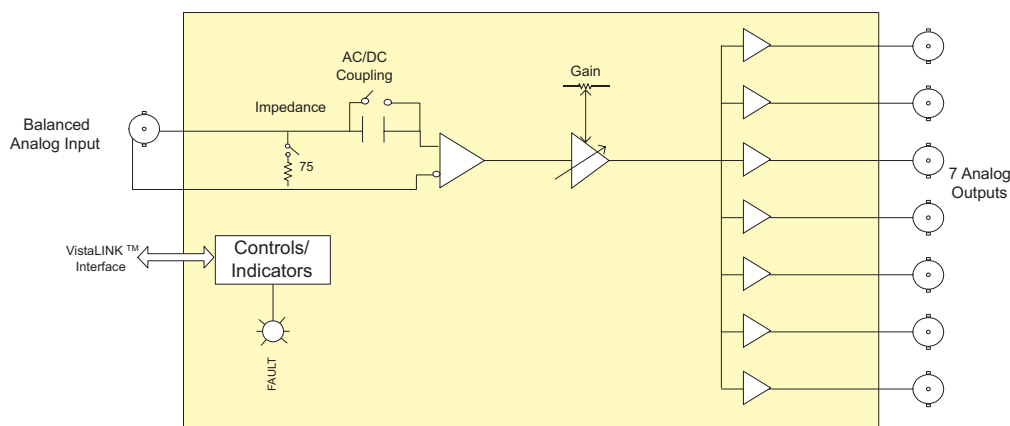
The 7700ADA7 Analog Distribution Amplifier is a general purpose amplifier for distributing analog video signals. The 7700ADA7 features one balanced input with seven outputs. The 7700ADA7 amplifier has been designed to distribute a wide range of analog video signals. It can also distribute other pulses and signals that are less than 2Vp-p.

The 7700ADA7 occupies one card slot in the 3RU frame, which will hold up to 15 modules or the 1RU frame, which will hold up to three modules.

### Features

- 75Ω or high impedance input (jumper selectable)
- High common mode range and common mode rejection ratio (CMMR)
- Gain control
- Jumper selectable AC or DC coupling
- Looping feature with external "T" connector
- Consistent input impedance if card power is lost
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller

### 7700ADA7 Block Diagram & Rear Panel



### Specifications

#### Analog Video Input:

<b>Standards:</b>	Any analog video format, up to 2Vp-p and 30MHz bandwidth
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Common mode range:</b>	>6Vp-p
<b>CMRR:</b>	> 70dB to 1kHz
<b>Signal amplitude:</b>	2.5Vp-p max
<b>Impedance:</b>	75Ω terminated, 35kΩ Hi-Z (jumper selectable)
<b>Coupling:</b>	AC or DC (jumper selectable)
<b>Return loss:</b>	>40dB to 10MHz, >30dB to 30MHz

#### Analog Video Outputs:

<b>Number of Outputs:</b>	7 Per Card
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Output impedance:</b>	75Ω
<b>Gain control range:</b>	± 5dB
<b>DC level</b>	
<b>(DC Coupling active):</b>	< ± 100mV
<b>Freq. Response:</b>	<±0.05dB (to 5.5MHz)
<b>Differential Gain:</b>	<0.17 %
<b>Differential Phase:</b>	< 0.19 deg
<b>C/L gain inequality:</b>	<±0.1%
<b>C/L Delay:</b>	<±2nsec
<b>Output isolation:</b>	42dB to 10MHz, 32 dB to 30MHz
<b>Output return loss:</b>	>40dB to 30MHz
<b>Noise performance:</b>	<-78dB RMS NTC7 weighting, <-70dB RMS 15kHz to 5.5MHz

#### Electrical:

<b>Voltage:</b>	+ 12VDC
<b>Power:</b>	1.2 Watts
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A, EU EMC Directive

#### Physical:

<b>Number of Slots:</b>	1
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#### Ordering Information:

<b>7700ADA7</b>	Analog Video Distribution Amplifier
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#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone enclosure



# Analog Video Equalizing Distribution Amplifier

## 7700ADA-EQ

The 7700ADA-EQ Equalizing Analog Distribution Amplifier is a general purpose amplifier for distributing analog video signals. The 7700ADA-EQ features one balanced equalized input with four outputs. The 7700ADA-EQ amplifier has been designed to distribute a wide range of analog video signals. It can also distribute other pulses and signals that do not exceed 2Vp-p.

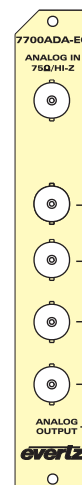
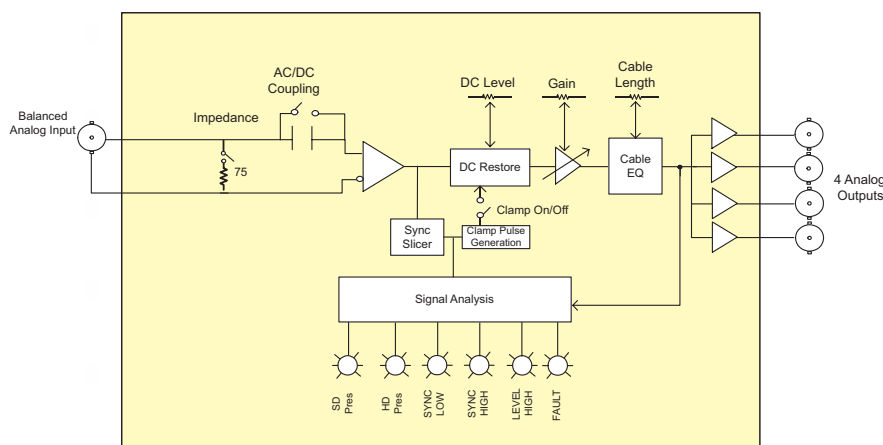
### Features

- 75Ω or high impedance input (jumper selectable)
- High common mode range and common mode rejection ratio (CMMR)
- Gain control
- Jumper selectable AC or DC coupling
- Jumper selectable fast or slow back porch clamp
- DC level control when clamp is enabled
- Cable equalizer adjustment range: 0 to 300m of 8281 or 1694A
- Looping feature with external "T" connector
- Consistent input impedance if card power is lost

### Card Edge LEDs:

- Module status/Local Fault
- Power supply status
- EQ Warning

### 7700ADA-EQ Block Diagram & Rear Panel



### Specifications

#### Analog Video Input:

<b>Standards:</b>	Any analog video format, up to 2Vp-p and 30MHz bandwidth
<b>Connector:</b>	1 BNC per IEC 60169-8 Amendment 2
<b>Common mode range:</b>	>6Vp-p
<b>CMRR:</b>	>70dB to 1kHz
<b>Signal amplitude:</b>	2.5Vp-p max
<b>Cable equalizer:</b>	0 to 300m of Belden 8281 or 1694A cable
<b>Impedance:</b>	75Ω terminated, 35kΩ Hi-Z (jumper selectable)
<b>Coupling:</b>	AC or DC (jumper selectable)
<b>Return loss:</b>	> 40dB to 10MHz, >30dB to 30MHz
<b>Clamp range:</b>	>± 600mV
<b>Fast clamp attenuation of 60Hz:</b>	>36dB

#### Analog Video Outputs:

<b>Number of Outputs:</b>	4 Per Card
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Output impedance:</b>	75Ω
<b>Gain control range:</b>	± 5dB
<b>DC level:</b>	< ± 100mV (with DC Coupling active and back porch clamp disabled)
<b>DC level Control range:</b>	< ± 200mV (with back porch clamp enabled)
<b>Freq. Response:</b>	< ± 0.05dB no equalization (to 5.5MHz) < ± 0.09dB for 5 to 100m Belden 8281 or 1694A (to 5.5MHz) < ± 0.15dB for 100 to 300m Belden 8281 or 1694A (to 5.5MHz)
<b>Differential Gain:</b>	< 0.17 % 0 to 300m
<b>Differential Phase:</b>	< 0.19 deg 0 to 300m
<b>C/L gain inequality:</b>	< ± 0.1% for all cable lengths

<b>C/L Delay:</b>	< ± 2ns
<b>Output isolation:</b>	> 42dB to 10MHz, > 32 dB to 30MHz
<b>Output return loss:</b>	> 40dB to 30MHz
<b>Noise performance:</b>	< -78dB RMS NTC7 weighting, < -70dB RMS 15kHz to 5.5MHz

#### Electrical:

<b>Voltage:</b>	+12VDC
<b>Power:</b>	1.2 Watts
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A, EU EMC Directive

#### Physical:

<b>Number of Slots:</b>	1
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#### Ordering Information:

<b>7700ADA-EQ</b>	Analog Video Equalizing Distribution Amplifier
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#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone enclosure





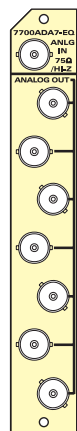
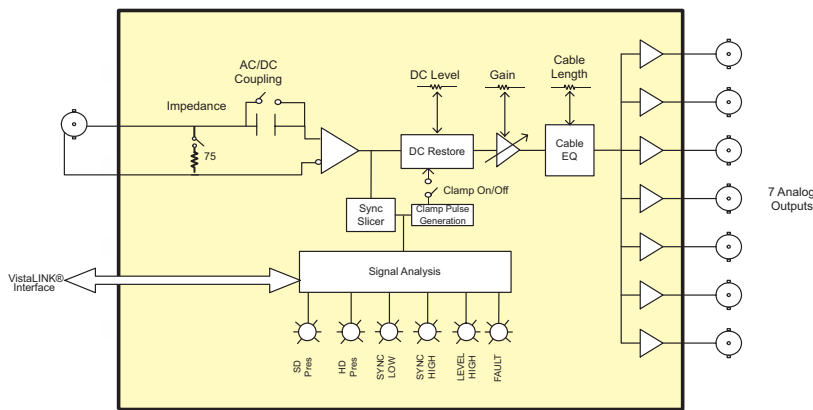
The 7700ADA7-EQ Equalizing Analog Distribution Amplifier is a general purpose amplifier for distributing analog video signals. The 7700ADA7-EQ features one balanced equalized input with seven outputs. The 7700ADA7-EQ amplifier has been designed to distribute a wide range of analog video signals. It can also distribute other pulses and signals that are less than 2Vp-p.

The 7700ADA7-EQ is housed in the 3 RU frame, which will hold up to 15 modules or the 1RU frame, which will hold up to three modules.

### Features

- 75Ω or high impedance input (jumper selectable)
- High common mode range and common mode rejection ratio (CMRR)
- Gain control
- Jumper selectable AC or DC coupling
- Jumper selectable fast or slow back porch clamp
- DC level control when clamp is enabled
- Cable equalizer adjustment range: 0 to 300m of 8281 or 1694AA
- Looping feature with external "T" connector and external termination
- Consistent input impedance if card power is lost
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller

### 7700ADA7-EQ Block Diagram & Rear Panel



### Specifications

#### Analog Video Input:

**Standards:** Any analog video format, up to 2Vp-p and 30MHz bandwidth

**Connector:** BNC input per IEC 60169-8 Amendment 2

**Common mode range:** >6Vp-p

**CMRR:** >70dB to 1kHz

**Signal amplitude:** 2.5Vp-p max

**Cable equalizer:** 0 to 300m of Belden 8281 or 1694AA cable

**Impedance:** 75Ω terminated, 35kΩ Hi-Z (jumper selectable)

**Coupling:** AC or DC (jumper selectable)

**Return loss:** > 40dB to 10MHz, >30dB to 30MHz

**Clamp range:** >± 600mV

**Fast clamp attenuation of 60Hz:** >36dB

#### Analog Video Outputs:

**Number of Outputs:** 7

**Connector:** BNC per IEC 60169-8 Amendment 2

**Output impedance:** 75Ω

**Gain control range:** ± 5dB

**DC level:** < ± 100mV (with DC Coupling active and back porch clamp disabled)

**DC level Control range:** < ± 200mV (with back porch clamp enabled)

**Freq. Response:** < ±0.05dB no equalization (to 5.5MHz)  
< ±0.09dB for 5 to 100m Belden 8281 or 1694A (to 5.5Mhz)  
< ±0.15dB for 100 to 300m Belden 8281 or 1694A (to 5.5Mhz)  
< 0.17 % 0 to 300m  
< 0.19 deg 0 to 300m

**Differential Gain:** <±0.1% for all cablelengths

**Differential Phase:** <±2nsec

**C/L gain inequality:** <±0.1% for all cablelengths

**C/L Delay:** <±2nsec

**Output isolation:** >42dB to 10MHz, >32 dB to 30MHz

**Output return loss:** >40dB to 30MHz

**Noise performance:** <-78dB RMS NTC7 weighting  
<-70dB RMS 15kHz to 5.5MHz

#### Electrical:

**Voltage:** + 12VDC

**Power:** 5 Watts

#### Physical:

**Number of slots:** 1

#### Ordering Information:

**7700ADA7-EQ** Analog Video Equalizing Distribution Amplifier, with 7 outputs

#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe

**+1RU** 1RU Rear Plate for use with 7701FR Multiframe

**+SA** Standalone Enclosure Rear Plate

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules

**7701FR** 1RU Multiframe which holds 3 modules

**S7701FR** Standalone enclosure



# Dual Analog Audio Distribution Amplifier

## 7700ADA-AUD

The 7700ADA-AUD Dual Analog Audio distribution amplifier is a general purpose amplifier for distributing analog audio signals. It can be operated as two independent 4 output amplifiers for stereo signals, or as a single amplifier with 8 outputs where higher fanout is required. The 7700ADA-AUD can be operated with either differential or single ended inputs and offers a wide range of gain adjustment to handle a wide variety of input signals.

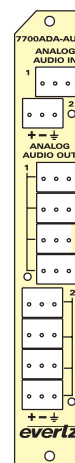
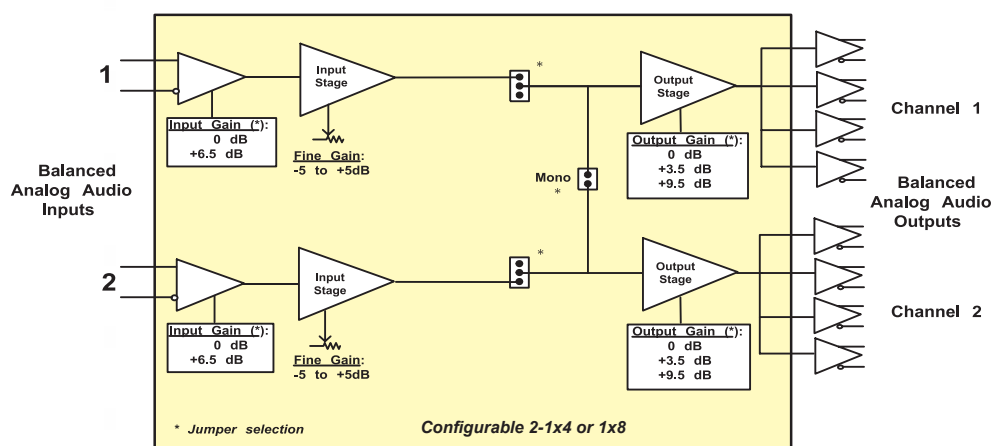
### Features

- Differential and single ended input (automatic single ended to differential conversion)
- Configurable for stereo (2-1x4) or mono (1x8)
- High impedance input
- Low impedance outputs
- Wide gain adjustment range
- High common mode range and common mode rejection ratio (CMRR)
- Very high SNR
- Very low THD+N

### Card Edge LEDs

- Module status/Local fault

### 7700ADA-AUD Block Diagram & Rear Panel



### Specifications

#### Analog Audio Input:

<b>Standards:</b>	Any analog audio signal
<b>Number of inputs:</b>	2 (Balanced or Single ended)
<b>Connectors:</b>	3 pin removable terminal strips
<b>Input step gain:</b>	0 dB or +6.5 dB (configurable with jumpers)
<b>Fine gain control:</b>	-6.5 to +9.5 dB (card edge pot adjustable)
<b>Maximum input level:</b>	
0 dB input gain	+34 dBu
+6.5 dB input gain	+28 dBu
<b>Noise floor:</b>	-87 dBu (0 dB input gain), -91 dBu (+6.5 dB input gain jumper setup)
<b>Common mode rejection:</b>	> 115 dB @ 60 Hz, 90 dB @ 20 kHz (tested with +28 dBu CM input)
<b>Common mode range:</b>	
0 dB input gain	> ±22 V
+6.5 dB input gain	> ±7 V
<b>Input impedance:</b>	
0 dB input gain	33 kΩ
+6.5 dB input gain	15 kΩ

#### Analog Audio Outputs:

<b>Number of Outputs:</b>	
<b>Stereo Mode:</b>	4 outputs each on left and right channels
<b>Mono Mode:</b>	8 Outputs
<b>Connectors:</b>	3 pin removable terminal strips
<b>Output step gain:</b>	0, 3.5 or 9.5 dB (configurable with jumpers)
<b>Maximum output level:</b>	+28 dBu across hi-impedance load +24 dBm into 600Ω load
<b>Output impedance:</b>	66Ω
<b>Frequency Response:</b>	±0.02 dB 20 Hz to 20 kHz
<b>Stereo phase mismatch:</b>	< 1° @ 20 kHz
<b>SNR:</b>	
0dB input gain	115 dB
+6.5 dB input gain	119 dB

#### THD+ Noise:

0.001% 20 Hz to 20 kHz @ 28 dBu, unweighted RMS, Hi-Z load  
0.01% with 600Ω up to 24dBm

#### Intermodulation Distortion:

0.001% - SMPTE @ 18 dBu

#### Stereo crosstalk:

>115 dB @ 1 kHz, >93 dB @ 20 kHz

#### Output Isolation:

> 110 dB @ 1 kHz, 100 dB @ 20 kHz

#### Electrical:

<b>Voltage:</b>	+12VDC
<b>Power:</b>	12 Watts
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A, EU EMC Directive

#### Physical:

**Number of Slots:** 1

#### Ordering Information:

**7700ADA-AUD** Balanced Analog Audio Distribution Amplifier (Configurable 1x8 or 2-1x4)

#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone enclosure





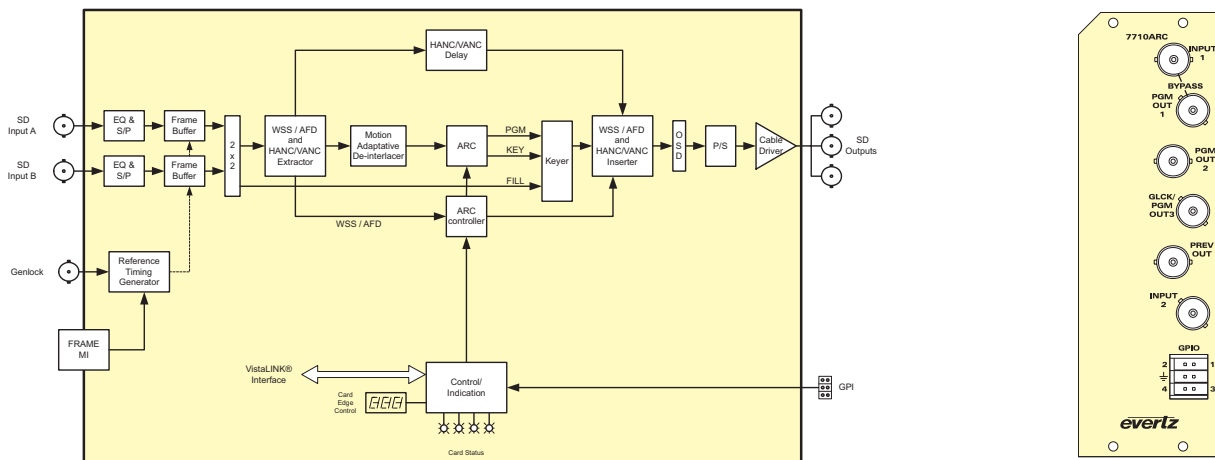
The 7710ARC series are a dual standard (525/625) serial digital 270Mb/s high quality motion adaptive video aspect ratio converter designed for use in facilities where 4x3 content is to be used in a 16x9 infrastructure.

With full 10-bit processing, the 7710ARC series converts any aspect ratio picture input to any aspect ratio picture output maintaining excellent image quality. The 7710ARC series supports input side Wide Screen Signaling (WSS) and Active Format Description (AFD) to automatically steer aspect ratio conversion. The module also supports WSS and AFD insertion capability on the output side, along with transparent handling of other HANC and VANC from the input to the output. All parameters may be controlled by use of the on screen display menu.

#### Features

- Any aspect ratio to any aspect ratio, with standard support for 16:9 letterbox, 14:9 letterbox, 4:3 center crop, and 4:3 anamorphic squeeze aspect ratio conversions
- Flexible ARC control: slave to incoming WSS or AFD; fixed output WSS or AFD; via GPI; or remote configuration
- Motion adaptive de-interlace for exceptional vertical resolution
- High quality 10-bit video processing
- Full VANC and HANC transfer from input to output with provisionable delay
- 8 user presets for storing custom module configurations
- GPI input to recall module configuration
- Configurable output data paths allowing application specific definition
- On screen display used to configure the operating modes
- Card Edge LEDs for signal presence, input and output modes, module status
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® Pro, 9000NCP2 or 9000NCP Network Control Panel) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

#### 7710ARC Block Diagram & Rear Panel



#### Specifications

##### Serial Video Input:

**Standard:** SMPTE 259M  
**Connectors:** 2 BNC per IEC 60169-8 Amendment 2  
**Input Equalization:** Automatic to 100m @ 1.5Gb/s with Belden 1694AAA or equivalent cable  
**Return Loss:** >15dB up to 270MHz

##### Serial Video Outputs:

**Standard:** SMPTE 259M  
**Number of Outputs:** 3 Per module  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V  $\pm 0.5V$   
**Rise and Fall Time:** 750ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** >15dB up to 270MHz  
**Jitter:** < 0.2 UI

##### Genlock Input:

**Standards:** NTSC, PAL, black or tri-level autodetect  
**Number of Inputs:** 1  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Impedance:** Hi-Z or 75 $\Omega$  (jumper configurable)  
**Return Loss:** >40dB up to 10MHz

##### GPI Inputs/Outputs:

**Number:** 4 (configurable as inputs or outputs)  
**Type:** Opto-isolated, active low with internal pull-ups to +5 or +12V (jumper settable)  
**Connector:** 6 pin removable terminal block  
**Signal Level:** Closure to ground  
**Function:**  
**Inputs:** User Preset select  
**Outputs:** Tally (key on air)

##### Electrical:

**Voltage:** +12VDC  
**Power:** --  
**EMI/RFI:** Complies with FCC Part 15 Class A  
EU EMC Directive

##### Physical:

**Number of Slots:** 2  
**7700 frame mounting:** 2  
**7701 frame mounting:** 1

##### Ordering Information:

**7710ARC** SD Aspect Ratio Converter

##### Ordering Options:

Rear Plate must be specified at time of order  
Eg. Model +3RU

##### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

##### Accessories:

**7700FC** VistaLINK® Frame Controller  
**9000NCP** 1RU VistaLINK® General Purpose Network Control Panel  
**9000NCP2** 2RU VistaLINK® General Purpose Network Control Panel

##### Enclosures:

**7700FR-C** 3RU Multiframe, which holds 15 modules  
**7701FR** 1RU Multiframe, which holds 3 modules  
**S7701FR** Standalone Enclosure



# HD Down Converter and Distribution Amplifier

## 7710DCDA-HD



The 7710DCDA-HD is a reclocking high definition serial digital video distribution amplifier and a high quality downconverter for 1.5 Gb/s HDTV signals. It can also function as a monitoring distribution amplifier for standard definition (480i) 270 Mb/s signals. The 7710DCDA-HD provides 4 reclocked DA outputs and 3 downconverted SDI or composite analog NTSC/PAL outputs (selectable). The 7710DCDA-HD accepts all the popular international SMPTE 292M video formats. When the 7710DCDA-HD down converts 1080p/23.98sF input video to 525i/59.94 with a 3:2 pull-down, the 3:2 pulldown cadence can be free running or locked to embedded RP188 time code.

The 7710DCDA-HD has color space conversion from ITU rec. 709 to ITU rec. 601, and will provide various down converted formats such as 16:9 letterbox, 14:9 letterbox, 13:9 letterbox, 4:3 center crop, and 4:3 anamorphic squeeze. The 7710DCDA-HD supports Widescreen Signaling (WSS) on the output to handle various aspect ratios of program material. Full 10 bit processing is provided throughout the signal path to achieve excellent downconversion quality. The module allows for selectable horizontal and vertical filters to control picture sharpness. It also de-embeds two groups of audio and re-embeds the audio on the SDI output in time with the video. All parameters may be controlled by use of the on screen display menu.

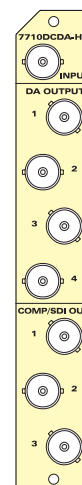
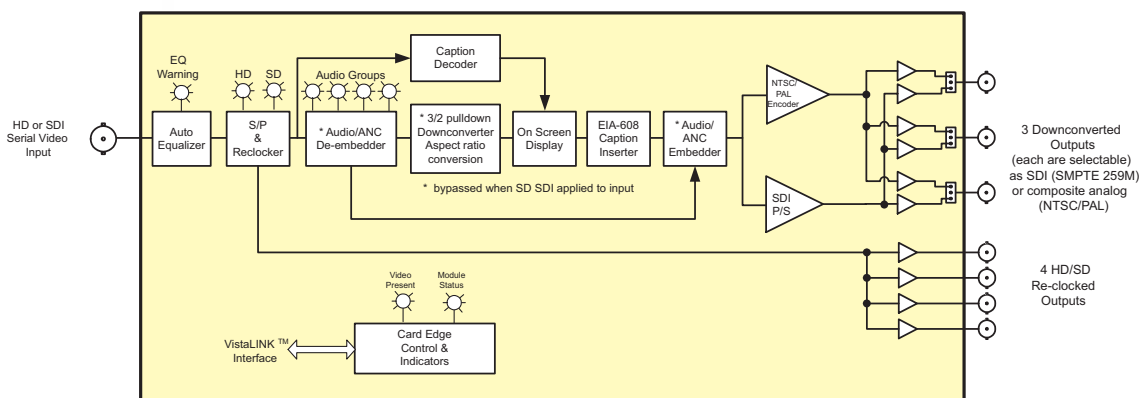
The 7710DCDA-HD has a closed caption monitoring capability that decodes EIA-608 or EIA-708 captions that have been encoded into the VANC data space of an HD video input, or EIA-608 captions from a SD video input.

The 7710DCDA-HD provides card edge LEDs to indicate signal present and audio groups present. The 7710DCDA-HD occupies one card slot in the 3RU frame, which will hold up to 15 modules or the 1RU frame, which will hold up to three modules.

### Features

- Serial digital 1.5 Gb/s HD input per SMPTE 292M
- Supports most international standards including 1080i/60, 1080i/59.94, 1080i/50, 1080p/24, 1080p/23.98, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94, 480p/60, and 480p/59.94
- Will also accept 270 Mb/s SD (480i) input SDI per SMPTE 259M in a pass through mode - auto senses HD or SD inputs
- 4 Reclocked DA outputs (HD if HD inputs applied, SD if SD inputs applied)
- 3 Selectable SDI or Composite Outputs (downconverted from HD if HD input applied), (from reclocked SD if SD input applied)
- High quality HD -> SD down conversion
- Supports 16:9 letterbox, 14:9 letterbox, 13:9 letterbox, 4:3 center crop, and 4:3 anamorphic squeeze aspect ratio conversions
- 1080p/23.98sF conversion to 525i/59.94 with 3:2 pulldown sequence
- HD to SD color space conversion (ITU rec. 709 to ITU rec. 601)
- On screen display used to configure the operating modes
- De-embeds Audio from HD video and embeds into standard definition SDI video (2 groups)
- Moves ANC data (e.g. captioning, timecode) from HD video to standard definition SDI video
- Decodes and displays EIA-608 or EIA-708 captions from incoming video
- On Screen aspect ratio marker
- Support for Widescreen Signaling (WSS) on output
- Card Edge LEDs for signal presence, equalization warning, audio groups present, module status
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller

### 7710DCDA-HD Block Diagram and Rear Panel





### Specifications

#### Serial Video Input:

<b>Standard:</b>	SMPTE 259M - Pass through mode SMPTE 292M (1.5 Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/60, 1080i/50, 1080p/30sF, 1080p/25sF, 1080p/24sF, 1035i/60, 720p/60, 480p/60 and the 1/1.001 divisor versions where applicable software selectable or autodetect
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Input Equalization:</b>	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
<b>Return Loss:</b>	>15 dB up to 1.5GHz

#### Reclocked Serial Video DA Outputs:

<b>Standard:</b>	Same as input (SMPTE 259M or SMPTE 292M)
<b>Number of Outputs:</b>	4 Per Card reclocked
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V ±0.5V
<b>Rise and Fall Time:</b>	200ps nominal for HD 750ps nominal for SD
<b>Overshoot:</b>	<10% of amplitude
<b>Return Loss:</b>	>15 dB up to 1.0GHz, >10dB up to 1.5GHz
<b>Jitter:</b>	< 0.2 UI

#### Downconverted Serial Video Outputs:

<b>Standard:</b>	SMPTE 259M-C (270 Mb/s)
<b>Number of Outputs:</b>	Up to 3 Per Card (jumper selectable)
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V ±0.5V
<b>Rise and Fall Time:</b>	750ps nominal
<b>Overshoot:</b>	<10% of amplitude
<b>Return Loss:</b>	> 15 dB at 270 Mb/s
<b>Jitter:</b>	< 0.2 UI

#### Downconverted Composite Analog Video Outputs:

<b>Standards:</b>	Analog composite NTSC (SMPTE 170M) or Analog composite PAL (ITU-R BT.470)
<b>Number of Outputs:</b>	Up to 3 Per Card (jumper selectable)
<b>Connectors:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1 V p-p nominal
<b>DC Offset:</b>	0V ±0.1V
<b>Return Loss:</b>	>35dB up to 5 MHz
<b>Frequency Response:</b>	0.1dB to 4 MHz, 0.15dB to 5.5 MHz
<b>Differential Phase:</b>	<0.5°(<0.3° typical)
<b>Differential Gain:</b>	<0.8% (<0.5 % typical)
<b>SNR:</b>	>78dB to 5 MHz (shallow ramp)
<b>Impedance:</b>	75 Ω

#### Input to Output Processing Delay:

<b>Video Delay:</b>	Just less than 1 to 2 frames depending on input video format, processing mode and phase setting (refer to table 3 in manual), ie: with 1080i/59.94 input the delay is <1 Frame delay)
<b>Audio Delay:</b>	Audio is delayed and re-embedded in time with the output picture

#### Electrical:

<b>Voltage:</b>	+12VDC
<b>Power:</b>	10 Watts
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

<b>Number of slots:</b>	1
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#### Ordering Information:

<b>7710DCDA-HD</b>	HD Down Converter and Distribution Amplifier (4 HD reclocked 1.5Gb/s, selectable 3 SD SDI outputs or 3 composite analog outputs)
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#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Accessories:

<b>7700FC</b>	VistaLINK® Frame Controller
<b>9000NCP</b>	1RU VistaLINK® General Purpose Network Control Panel
<b>9000NCP2</b>	2RU VistaLINK® General Purpose Network Control Panel

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone enclosure



# HD Key/Fill Up Converter

## 7710UC-KF



The 7710UC-KF is designed to solve the problems of adapting to different HDTV formats, by offering high quality up conversion of Key and Fill signals.

The 7710UC-KF Key and Fill Up Converter is re-configurable to provide high quality up conversion of your standard definition key and fill signals to common 1.5 Gb/s high definition (SMPTE 292M) video formats

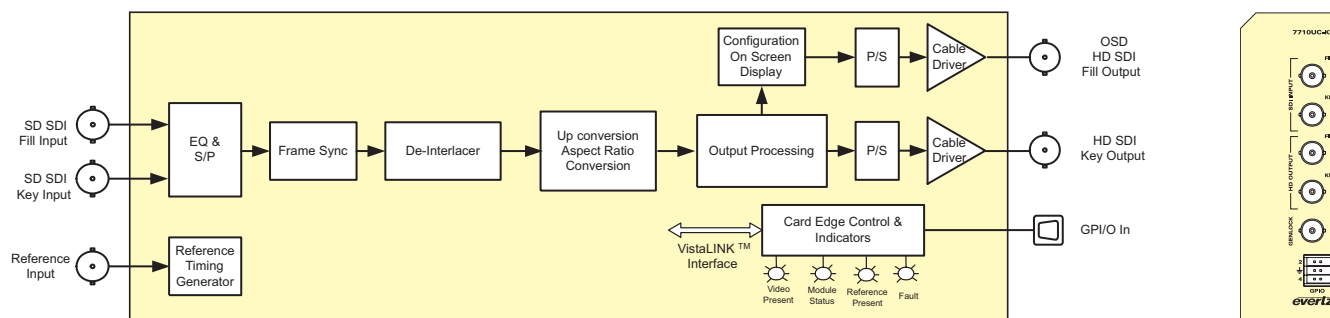
The units occupy two card slots in the 3 RU frame, which will hold up to seven 2 slot modules. It occupies one slot in the 1RU frame, which will hold up to three modules.

The units also provide card edge LEDs to indicate signal present and genlock present.

### Features

- High quality SD -> HD up conversion
- Supports standard aspect ratio conversions plus all user definable
- Supports all necessary color space conversions (ITU rec. 601 to ITU rec.709) for fill channel
- Full video processing functions, GBR gain YCrCb gain and offset and hue adjustment for fill channel
- Reference input allows for phasing of output video
- Module supports min. delay or variable delay for video output with out reference
- Module supports video output referenced to genlock with variable delay
- Output on screen display used (OSD) to configure the operation of the device
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® Pro, 9000NCP2 or 9000NCP Network Control Panel) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

### 7710UC-KF Block Diagram & Rear Panel



#### Serial Digital Inputs:

**Standards:** 270Mb/s SMPTE 259M  
**Number of Inputs:** 1 Key, 1 Fill  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Input Equalization:** Automatic to 300m @ 270Mb/s with Belden 8281 or equivalent cable.  
**Return Loss:** >15 dB up to 540Mb/s

#### Serial Digital Outputs:

**Standard:** 1.485 Gb/s SMPTE 292M.  
**Number of Outputs:** 1 Key, 1 Fill  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 200ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 15 dB at 1.5 GHz

#### Genlock Input:

**Type:** HD Tri-Level sync, NTSC or PAL Color Black 1 V p-p  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Termination:** 75Ω (jumper selectable)

#### General Purpose Inputs and Outputs:

**Number:** 4 (configurable as inputs or outputs)  
**Type:** Opto-isolated, active low with internal pull-ups to +5 or +12V (jumper settable)  
**Connector:** 6 pin removable terminal block  
**Signal Level:** closure to ground  
**Function:**  
**Inputs:** 2, 1 fill, 1 key  
**Outputs:** 2, 1 fill, 1 key

#### Electrical:

**Voltage:** +12VDC  
**Power:** 20 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

#### Physical:

**Number of slots:**  
**7700 frame mounting:** 2  
**7701 frame mounting:** 1

#### Ordering Information:

**7710UC-KF** HD Key/Fill Upconverter

#### Ordering Options:

Rear Plate must be specified at time of order  
 Eg. Model +3RU

#### Accessories:

##### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

##### 7700FC

VistaLINK® Frame Controller  
 1RU VistaLINK® General Purpose Network Control Panel

##### 9000NCP2

2RU VistaLINK® General Purpose Network Control Panel

#### Enclosures:

**7700FR-C** 3RU Multiframe, which holds 15 modules  
**7701FR** 1RU Multiframe, which holds 3 modules  
**S7701FR** Standalone Enclosure





The 7710NR-HD Noise Reducer with Image Enhancement provides high quality and cost effective noise reduction for HD video signals. The 7710NR-HD is ideal for use in television production facilities, mobile broadcast vehicles, production and post-production facilities.

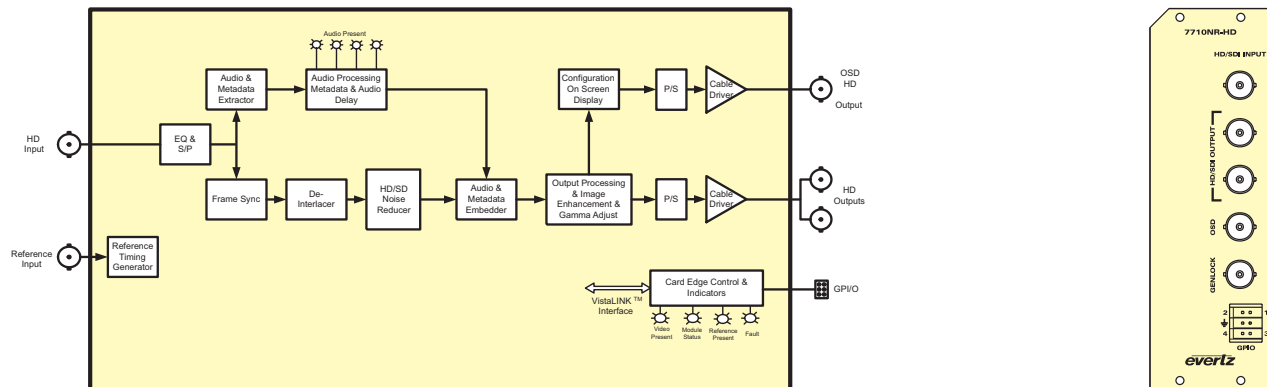
The 7710NR-HD allows the user to remove random Gaussian noise, impulsive noise, and other temporal varying artifacts. The 7710NR-HD uses proprietary noise reduction processing that consists of five distinct filters and a complex motion adaptive algorithm to combine and control the filtered results based on two motion sensors.

The 7710NR-HD also provides user adjustable image enhancements to sharpen image details.

### Features

- One 1.5 Gb/s HD input (per SMPTE 292M)
- Full 10-bit I/O processing
- Gaussian, impulsive and temporal artifact noise reduction
- Image enhancements - user adjustable
- User presets to store noise reducer and image enhancement settings
- Split Screen comparison mode
- Transparent handlings of embedded audio, VANC data, and closed captioning
- On screen display for card configuration
- Card edge control and LEDs for video and audio presence and module status
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® Pro) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

### 7710NR-HD Block Diagram & Rear Panel



### Specifications

#### Serial Video Input:

**Standard:** SMPTE 292M 1.485 Gb/s , auto detects standard

**Connector:** 1 BNC per IEC 60169-8 Amendment 2

**Input Equalization:** Automatic to 100m @ 1.5 Gb/s with Belden 1694A or equivalent cable

#### On Screen Display Video Output:

**Standard:** Same as input

**Number of outputs:** 1 per module

**Connector:** 1 BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V +0.5V

#### Noise Reduced Video Outputs:

**Standard:** Same as input

**Number of outputs:** 2 per module

**Connector:** 1 BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V +0.5V

#### General Purpose Inputs and Outputs:

**Number of inputs:** 4 per module (configurable as inputs or outputs)

**Standard:** Opto-isolated, active low with internal pull-ups to +5V or +12V (jumper settable)

**Connector:** 6 pin removable terminal block

**Signal Level:** Closure to ground

**Function Inputs:** User presets for noise reducer and image enhancement settings

#### Electrical:

**Voltage:** +12VDC

**Power:** 25 Watts

**EMI/RFI:** Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

**Number of slots:**

**7700 frame mounting:** 2

**7701 frame mounting:** 1

#### Ordering information:

**7710NR-HD** HD Noise Reducer with Image Enhancement

#### Ordering Options & Accessories:

Rear Plate must be specified at time of order  
Eg. Model +3RU

#### Rear Plate Suffix:

**+3RU:** 3RU rear plate for use with 7700FR-C Multiframe

**+1RU:** 1RU rear plate for use with 7701FR Multiframe

#### Enclosures:

**7700FR-C:** 3RU Multiframe, which holds 15 modules

**7701FR:** 1RU Multiframe, which holds 3 modules



# HD Cross Converter with VANC and Embedded Audio support

## 7710XC-HD, 7710XC-AES4-HD



The 7710XC series of products is designed to solve the problems of adapting to different HDTV formats:

MODEL #	Input	Outputs		Conversion	Audio Processing	
		PGM	OSD		Embedded	AES
<b>7710XC-HD</b> HD Format Translator/Cross Converter	HD	2 HD	1 HD	1080 ⇔ 720	2 groups	---
<b>7710XC-AES4-HD</b> HD Format Translator/Cross Converter with external AES	HD	2 HD	1 HD	1080 ⇔ 720	2 groups	4

The 7710XC-HD High Definition Format Translator/Cross Converter provides high quality conversion of your high definition (SMPTE 292M) signals to other common 1.5 Gb/s high definition (SMPTE 292M) video formats. The 7710XC-HD has 10-bit processing, and 2 HD Serial Digital outputs and 1 OSD output, plus external genlock.

The 7710XC-AES4-HD High Definition Format Translator/Cross Converter with external AES provides high quality conversion of your high definition (SMPTE 292M) signals to other common 1.5 Gb/s high definition (SMPTE 292M) video formats.

The 7710XC-AES4-HD accepts 2 groups of SMPTE 299M embedded audio on the input or optionally external (separate) 4 AES audio and re-embeds them into the serial video output and provides 4 AES audio output mirroring the embedder. The re-embedded audio is compliant to SMPTE 299M with delay adjust and has the appropriate delay added to compensate for video delay incurred by the conversion process, thus avoiding the need for external de-embedding and re-embedding of audio. The audio is also available as 4 unbalanced AES outputs.

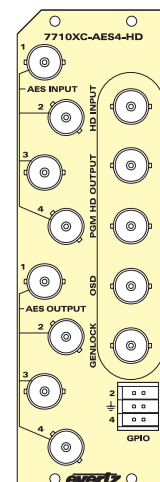
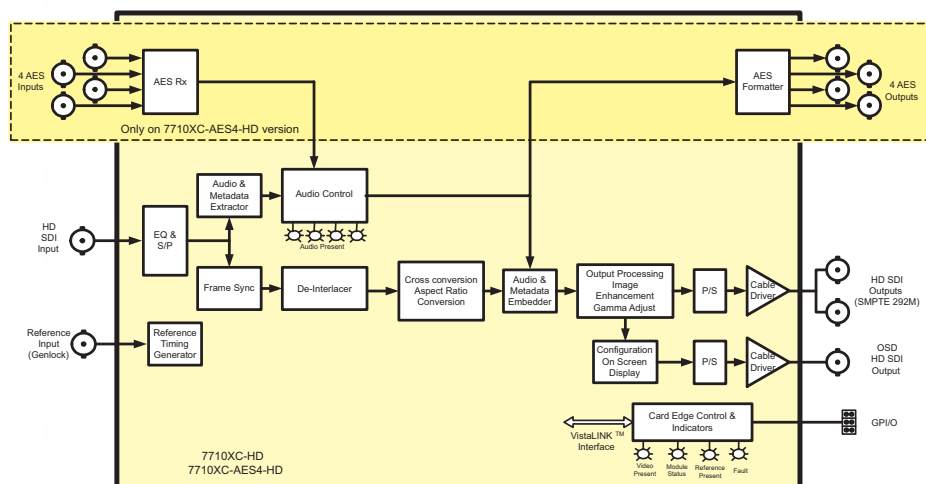
The units also transport the closed caption and time code information from input to output performing all necessary HD to HD translations and time code recalculations.

All 7710XC-HD series modules occupy two card slots in the 3RU frame, which will hold up to 15 modules. The modules are also available for the 1RU frame, which will hold up to three modules. The units also provide card edge LEDs to indicate signal present, genlock present and audio groups present.

### Features

- High quality HD to HD cross conversion
- Support all necessary color space conversions (ITU rec. 601 to ITU rec. 709)
- Full video proc functions, GBR gain YCrCb gain and offset, hue adjustment and RGB color limiter.
- Reference input allows for phasing of output video
- Module supports min. delay or variable delay for video output without reference
- Module supports video output referenced to genlock with variable delay
- Output on screen display used to configure the operating modes
- De-embeds Audio from HD video input and embeds into HD video output (2 groups)
- Supports retimed external 4 AES inputs and outputs (7710XC-AES4-HD only)
- Moves RP-188 VITC and LTC from HD input to HD output, recalculated for frame rate changes.
- Moves HD closed captions from HD input to HD output.
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel. VistaLINK® is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller

### 7710XC-HD Block Diagram and Rear Panels





### Specifications

#### HD-SDI Video Inputs:

<b>Standard:</b>	1.485 Gb/s SMPTE 292M - menu selectable. SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M
<b>Number of Inputs:</b>	1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Input Equalization:</b>	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
<b>Return Loss:</b>	>10 dB up to 1.5Gb/s

#### HD-SDI Serial Video Outputs:

<b>Standard:</b>	1.5 Gb/s SMPTE 292M
<b>Number of Outputs:</b>	3 Per Card
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V $\pm$ 0.5V
<b>Rise and Fall Time:</b>	200ps nominal
<b>Overshoot:</b>	<10% of amplitude
<b>Return Loss:</b>	> 10 dB at 1.5 GHz

#### AES Audio Inputs:

<b>Number of Inputs:</b>	4
<b>Standard:</b>	SMPTE 276M, single ended synchronous or asynchronous AES
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Resolution:</b>	24 bits
<b>Sampling Rate:</b>	48 kHz
<b>Impedance:</b>	75 $\Omega$
<b>Signal Level:</b>	1 V p-p nominal

#### AES Audio Output:

<b>Number of Outputs:</b>	4
<b>Standard:</b>	SMPTE 276M, single ended synchronous AES
<b>Connectors:</b>	BNC per IEC 60169-8 Amendment 2
<b>Resolution:</b>	24 bits
<b>Sampling Rate:</b>	48 kHz
<b>Impedance:</b>	75 $\Omega$
<b>Signal Level:</b>	1 V p-p nominal

#### General Purpose Inputs and Outputs:

<b>Number:</b>	4 (configurable as inputs or outputs)
<b>Type:</b>	Opto-isolated, active low with internal pull-ups to +5 or +12V (jumper settable)
<b>Connector:</b>	6 pin removable terminal block
<b>Signal Level:</b>	Closure to ground

#### Function:

<b>Inputs:</b>	User Preset select, fade or cut for keyer, fade to black
<b>Outputs:</b>	Tally (key on air)

#### Genlock Input:

<b>Type:</b>	HD Tri-Level sync, NTSC or PAL Color Black 1 V p-p
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Termination:</b>	75 $\Omega$ (jumper selectable)

#### Electrical:

<b>Voltage:</b>	+12VDC
<b>Power:</b>	26 Watts
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

<b>Number of slots:</b>	
<b>7700 frame mounting:</b>	2
<b>7701 frame mounting:</b>	1

#### Ordering Information:

<b>7710XC-HD</b>	HD Cross Converter with VANC and Embedded Audio support
<b>7710XC-AES4-HD</b>	HD Cross Converter with VANC, Embedded Audio and discrete AES support

#### Ordering Options & Accessories:

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix:

<b>+3RU:</b>	3RU rear plate for use with 7700FR-C Multiframe
<b>+1RU:</b>	1RU rear plate for use with 7701FR Multiframe

#### Enclosures:

<b>7700FR-C:</b>	3RU Multiframe which holds 15 modules
<b>7701FR:</b>	1RU Multiframe which holds 3 modules



# HD Up/Down/Cross Converters (with optional external AES)

## 7710XUC-HD/AES4-HD & 7710XUDC-AES4-HD

The 7710XUC-HD and 7710XUC-AES4-HD High Definition Format Up/Cross Converter are re-configurable to provide high quality up conversion of your standard definition signals with noise reduction to common 1.5 Gb/s high definition (SMPTE 292M) video formats, or high quality conversion of your high definition (SMPTE 292M) signals to other common 1.5 Gb/s high definition (SMPTE 292M) video formats. The modules also do high definition (SMPTE 292M) to standard definition (SMPTE 296M) down conversion with detail enhancement and gamma correction. The 7710XUC-HD has 10-bit processing, and 2 HD Serial Digital outputs and 1 OSD output, plus external genlock. The 7710XUC-AES4-HD has the same outputs and genlock, but also provides 2 composite analog video outputs.

The 7710XUDC-AES4-HD High Definition Format Up/Down/Cross Converter is similar to the 7710XUC-HD but provides **simultaneous** cross and down conversion. It also has 2 SD Serial Digital outputs and 2 composite analog video outputs.

All the modules accept 2 groups of embedded audio on the input and re-embed them into the serial video outputs. The "-AES4" versions also accept 4 external discrete unbalanced AES inputs and provide 4 AES outputs with the same audio that is being embedded. In the case of the 7710XUDC-AES4-HD, the 4 AES outputs with the same audio are embedded on the output SD video signals, since they share one common audio processor. The 7710XUC-AES4-HD has a separate audio processor for the 4 AES outputs.

The re-embedded audio normally has the appropriate delay added to compensate for video delay incurred by the conversion process, thus avoiding the need for external de-embedding and re-embedding of audio. An additional audio delay adjustment can also be made for lip sync correction.

The units also transfer the closed caption and time code information from input to output performing all necessary HD to SD and SD to HD translation and time code recalculations.

The 7710XUC-HD and 7710XUC-AES4-HD occupies two card slots in the 3RU frame (7700FR-C), which will hold up to 15 1-slot modules or one slot in the 1RU frame (7701FR), which will hold up to three modules. The 7710XUDC-AES4-HD occupies three card slots in a 3RU frame (7700FR-C), which will hold up to 15 1-slot modules. The units also provide card edge LEDs to indicate signal present, genlock present and audio groups present. All the modules provide card edge LEDs to indicate signal present, genlock present and audio groups present.

All 7710XC-HD series modules occupy two card slots in the 3RU frame, which will hold up to 15 modules. The modules are also available for the 1RU frame, which will hold up to three modules. The units also provide card edge LEDs to indicate signal present, genlock present and audio groups present.

### Features

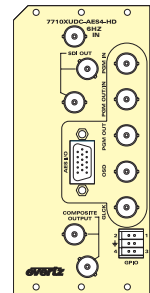
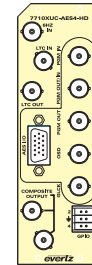
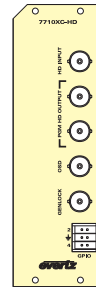
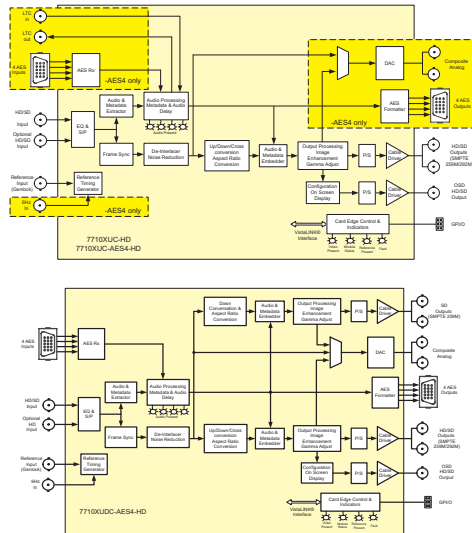
- High quality HD to HD cross conversion
- High quality SD to HD up conversion with Noise Reduction
- High quality HD to SD down conversion (simultaneous cross and down conversion with 7710XUDC-AES4-HD)
- Image Enhancement for HD and SD
- Supports standard aspect ratio conversions plus all user definable
- Support all necessary color space conversions (ITU rec. 601 to ITU rec. 709) and SMPTE 240M (for 1035i)
- Full video processing functions: RGB gain, YCrCb gain and offset, hue adjustment, RGB gamma correction, and RGB color limited
- Reference input allows for phasing of output video
- Module supports minimum delay or variable delay for video output without reference
- Module supports video output referenced to genlock with variable delay
- Output on screen display (OSD) used to configure the operating modes
- De-embeds Audio from HD/SD video input and embeds into HD/SD video output (2 groups)
- Supports re-timed external 4 AES inputs and outputs (on "-AES4" versions only)
- Moves VITC time code and Line 21 captions from the SD video into the HD video ancillary data
- Moves RP-188 VITC and LTC from HD input to HD output, recalculated for frame rate changes
- Moves HD closed captions from HD input to HD output

MODEL #	Input	Outputs		Conversion	Audio Processing	
		PGM	OSD		Embedded	AES
<b>7710XUC-HD</b> <i>HD Format Up/Cross Converter</i>	HD	2 HD	1 HD	1080 ⇔ 720	2 groups	-
		2 SD	1 SD	1080/720 ⇒ 525/625	2 groups	-
	SD	2 HD	1 HD	525/625 ⇒ 1080/720	2 groups	-
		2 SD	1 SD	525/625 ⇔ 525/625 (ARC)	2 groups	-
<b>7710XUC-AES4-HD</b> <i>HD Format Up/Down/Cross Converter with external AES</i>	HD	2 HD	1 HD	1080 ⇔ 720	2 groups	4
		2 SD	1 SD	1080/720 ⇒ 525/625	2 groups	4
	SD	2 HD	1 HD	525/625 ⇒ 1080/720	2 groups	4
		2 SD	1 SD	525/625 ⇔ 525/625 (ARC)	2 groups	4
<b>7710XUDC-AES4-HD</b> <i>HD Format Up/Down/Cross Converter with external AES</i>	HD	2 HD & 2 SD & 2 NTSC/PAL	1 HD	1080 ⇔ 720 & 1080/720 ⇒ 525/625	2 groups	4
	SD	2 HD & 2 SD & 2 NTSC/PAL	1 HD	525/625 ⇔ 525/625 (ARC) & 525/625 ⇒ 1080/720	2 groups	4



# HD Up/Down/Cross Converters (with optional external AES) 7710XUC-HD/AES4-HD & 7710XUDC-AES4-HD

## 7710XUC-HD Block Diagrams & Rear Panels



### Specifications

#### Serial Digital Video Inputs:

**Standards:** 270Mb/sec SMPTE 292M or 1.485 Gb/s  
SMPTE 292M - menu selectable  
SMPTE 260M, SMPTE 274M  
SMPTE 296M, SMPTE 349M

**Number of Inputs:** 1 or 2 (optional based on PGM IN/OUT configuration)

**Connector:** BNC per IEC 60169-8 Amendment 2

**Input Equalization:** Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable

**Return Loss:**

**SD:** >15 dB up to 540Mb/s

**HD:** >15 dB up to 1.5Gb/s

#### Serial Digital Video Outputs:

**Standard:** SMPTE 292M 270Mb/s or SMPTE 292M 1.485 Gb/s

**Number of Outputs:** 3 Per Card (or 2 based on PGM IN/OUT configuration)  
2 Per Card SD Only (7710XUDC-AES4-HD only)

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V  $\pm$ 0.5V

**Rise and Fall Time:**

**SD:** 740ps nominal

**HD:** 200ps nominal

**Overshoot:** <10% of amplitude

**Return Loss:**

**SD:** > 15 dB at 540MHz

**HD:** > 15 dB at 1.5 GHz

#### AES Audio Inputs (-AES4 models):

**Number of Inputs:** 4

**Standard:** SMPTE 276M, single ended synchronous or asynchronous AES

**Connector:** DB15

**Resolution:** 24 bits

**Sampling Rate:** 48 kHz

**Impedance:** 75 $\Omega$

**Signal Level:** 1 V p-p nominal

#### AES Audio Output (-AES4 models):

**Number of Outputs:** 4

**Standard:** SMPTE 276M, single ended synchronous AES

**Connectors:** DB15

**Resolution:** 24 bits

**Sampling Rate:** 48 kHz

**Impedance:** 75  $\Omega$

**Signal Level:** 1 V p-p nominal

#### General Purpose Inputs and Outputs:

**Number:** 4 (configurable as inputs or outputs)

**Type:** Opto-isolated, active low with internal pull-ups to +5 or +12V (jumper settable)

**Connector:** 6 pin removable terminal block

**Signal Level:** Closure to ground

#### Genlock Input:

**Type:** HD Tri-Level sync, NTSC or PAL Color Black 1 V p-p

**Connector:** BNC per IEC 60169-8 Amendment 2

**Termination:** 75 $\Omega$  (jumper selectable)

#### 6Hz INPUT:

**Standard:** 6Hz TTL Pulse

**Number of Inputs:** 1 (only on "-AES4" versions)

**Connector:** BNC per IEC 60169-8 Amendment 2

**Termination:** 75 $\Omega$  (jumper selectable)

#### LTC Input:

**Standard:** SMPTE 12M

**Number of Inputs:** 1 (7710XUC-AES4-HD only)

**Connector:** BNC per IEC 60169-8 Amendment 2

**Termination:** 75 $\Omega$  (jumper selectable)

#### LTC Output:

**Standard:** SMPTE 12M

**Number of Inputs:** 1 (7710XUC-AES4-HD only)

**Connector:** BNC per IEC 60169-8 Amendment 2

**Termination:** 75 $\Omega$  (jumper selectable)

#### Electrical:

**Voltage:** +12VDC

**Power:** 26 Watts (7710XUC-HD & 7710XUC-AES4-HD)  
35 Watts (7710XUDC-AES4-HD)

**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC Directive

#### Physical:

**Number of slots:** 2 (7710XUC-HD & 7710XUC-AES4-HD)  
3 (7710XUDC-AES4-HD)

**7700 frame mounting:** 2 (7710XUC-HD & 7710XUC-AES4-HD)  
3 (7710XUDC-AES4-HD)

**7701 frame mounting:** 1 (7710XUC-HD & 7710XUC-AES4-HD only)

#### Ordering Information:

**7710XUC-HD** HD Format Up/Cross Converter

**7710XUC-AES4-HD** HD Format Up/Down/Cross Converter with external AES

**7710XUDC-AES4-HD** HD Format Up/Down/Cross Converter with external AES

#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix:

**+3RU:** 3RU rear plate for use with 7700FR-C Multiframe

#### Note:(Only for the 7710XUC-HD & 7710XUC-AES4-HD)

**+1RU:** 1RU rear plate for use with 7701FR Multiframe

#### Accessories:

WPAES8-BNCM-6F cable (included)

#### Enclosures:

**7700FR-C:** RU Multiframe which holds 15 modules

**7701FR:** RU Multiframe which holds 3 modules



The 7711UC-HD High Definition Format Up Converter is a configurable module to provide high quality conversion of your standard definition signals with noise reduction and image enhancement to common 1.5 Gb/s high definition (SMPTE 292M) video formats. The 7711UC-HD has 10-bit processing, and 2 HD Serial Digital outputs and 1 OSD output, plus external genlock.

The 7711UC-HD can accept 2 groups of SMPTE 272M embedded audio on the input and re-embed them into the serial video output. The re-embedded audio is compliant to SMPTE 299M with delay adjust and has the appropriate delay added to compensate for video delay incurred by the conversion process, thus avoiding the need for external de-embedding and re-embedding of audio.

The module also transports the closed caption and time code information from input to output performing all necessary SD to HD translation and time code recalculations.

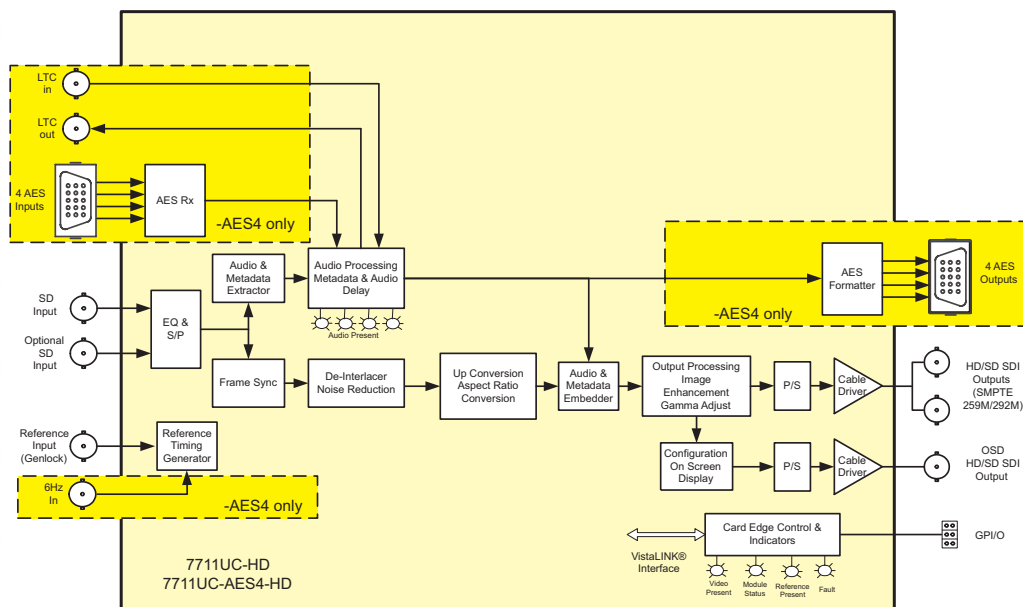
The -AES4 version also accepts 4 external discrete unbalanced AES inputs and provides 4 AES outputs with the same audio that is being embedded. The 7711UC-AES4-HD has a separate audio processor for the 4 AES outputs.

The 7711UC-HD module occupies two card slots in the 3RU frame, which will hold up to 15 modules. The module has card edge LEDs to indicate signal present, genlock present and audio groups present.

### Features

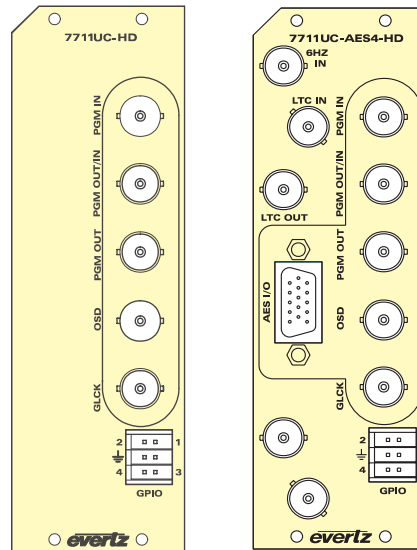
- High quality SD to HD up conversion with Noise Reduction and Image Enhancement
- Supports standard aspect ratio conversions plus all user-definable
- Flexible ARC Control; supporting Active Format Description (AFD) proposed standard
- Support all necessary color space conversions (ITU rec. 601 to ITU rec. 709)
- Full video proc functions, GBR gain YCrCb gain and offset, hue adjustment and RGB color limiter
- Reference input allows for phasing of output video
- Module supports min. delay or variable delay for video output without reference
- Module supports video output referenced to genlock with variable delay
- Supports re-timed external 4 AES inputs and outputs (-AES4 version only)
- Output on screen display used to configure the operating modes
- De-embeds audio from video input and embeds into video output (2 groups)
- Moves VITC time code and Line 21 captions from the SD video into the HD video ancillary data
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel. VistaLINK® is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller

### 7711UC-HD Block Diagram





## 7711UC-HD Rear Panels



### Specifications

#### Serial Video Inputs:

<b>Standard:</b>	SMPTE 259M 270 Mb/s, 525/625 compliant SMPTE 260M, SMPTE 274M, SMPTE 349M
<b>Number of Inputs:</b>	1 normal, optional 2 (for conversion)
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Input Equalization:</b>	Automatic to 300m @ 270 Mb/s with Belden 1694A or equivalent cable
<b>Return Loss:</b>	>15 dB up to 270 MHz

#### HD-SDI Serial Video Outputs:

<b>Standard:</b>	1.5 Gb/s SMPTE 292M, 270Mb/s, SMPTE 296M
<b>Number of Outputs:</b>	3 Per Card, optional 2 with 2nd input from converter)
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V $\pm$ 0.5V
<b>Rise and Fall Time:</b>	200ps nominal
<b>Overshoot:</b>	<10% of amplitude
<b>Return Loss:</b>	> 10 dB at 1.5 GHz

#### AES Audio Inputs (-AES4 models):

<b>Number of Inputs:</b>	4
<b>Standard:</b>	SMPTE 276M, single ended synchronous or asynchronous AES
<b>Connector:</b>	DB15
<b>Resolution:</b>	24 bits
<b>Sampling Rate:</b>	48 kHz
<b>Impedance:</b>	75 $\Omega$
<b>Signal Level:</b>	1 V p-p nominal

#### AES Audio Output (-AES4 models):

<b>Number of Outputs:</b>	4
<b>Standard:</b>	SMPTE 276M, single ended synchronous AES
<b>Connectors:</b>	DB15
<b>Resolution:</b>	24 bits
<b>Sampling Rate:</b>	48 kHz
<b>Impedance:</b>	75 $\Omega$
<b>Signal Level:</b>	1 V p-p nominal

#### General Purpose Inputs and Outputs:

<b>Number:</b>	4 (configurable as inputs or outputs)
<b>Type:</b>	Opto-isolated, active low with internal pull- ups to +5 or +12V (jumper settable)
<b>Connector:</b>	6 pin removable terminal block
<b>Signal Level:</b>	Closure to ground
<b>Function:</b>	
<b>Inputs:</b>	User Preset select
<b>Outputs:</b>	Tally (key on air)

#### Genlock Input:

<b>Type:</b>	HD Tri-Level sync, NTSC or PAL Color Black 1 V p-p
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Termination:</b>	75 $\Omega$ (jumper selectable)

#### Electrical:

<b>Voltage:</b>	+12VDC
<b>Power:</b>	25 Watts
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

<b>Number of slots:</b>	2
<b>7700 frame mounting:</b>	2

#### Ordering Information:

<b>7711UC-HD</b>	HD Up Converter (with Noise Reduction and Image Enhancement)
<b>7711UC-AES4-HD</b>	HD Up Converter (with Noise Reduction and Image Enhancement) and external AES

#### Ordering Options & Accessories:

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix:

<b>+3RU:</b>	3RU rear plate for use with 7700FR-C Multiframe
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#### Enclosures:

<b>7700FR-C:</b>	3RU Multiframe which holds 15 modules
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# High Quality Downconverter with Image Enhancement

## 7713HDC



The 7713HDC is a reclocking high definition serial digital video distribution amplifier and a high quality downconverter for 1.5 Gb/s HDTV signals. The 7713HDC incorporates Evertz proprietary detail enhancement algorithms and gamma correction. It can also function as a monitoring distribution amplifier for standard definition 270 Mb/s signals. The 7713HDC provides 4 reclocked DA outputs and 3 downconverted SDI or composite analog NTSC/PAL outputs (selectable).

The 7713HDC accepts all the popular international SMPTE 292M video formats. When the 7713HDC down converts 1080p/23.98sF input video to 525i/59.94 with 3:2 pulldown, the 3:2 pulldown cadence can be free running or locked to embedded RP188 time code or an external 6Hz input.

The 7713HDC also de-embeds two groups of audio and re-embeds the audio on the SDI output in time with the video. It can also reassign audio channels within the groups. All parameters may be controlled by use of the on screen display menu or through VistaLINK® PRO. The re-embedded audio has the appropriate delay added to compensate for video delay incurred by the conversion process, thus avoiding the need for external de-embedding and re-embedding of audio. An additional audio delay adjustment can also be made for lip sync correction.

The 7713HDC has color space conversion from ITU rec. 709 to ITU rec. 601, and will provide various down converted formats such as 16:9 letterbox, 14:9 letterbox, 13:9 letterbox, 4:3 center crop, and 4:3 anamorphic squeeze. The 7713HDC supports Widescreen Signaling (WSS) on the output to handle various aspect ratios of program material. It also provides on screen 4:3 aspect ratio markers (or indicators).

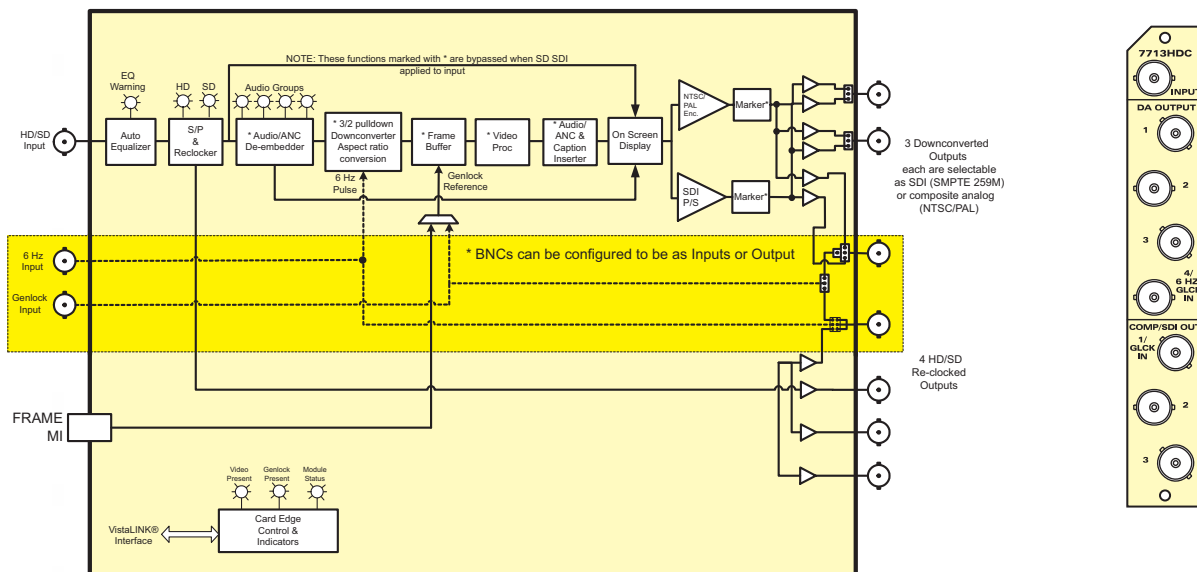
The module also transfers the closed caption and timecode information from input to output performing all necessary HD to SD translation and time code recalculations.

The 7713HDC provides card edge LEDs to indicate signal present and audio groups present. The 7713HDC occupies one card slot in the 3RU frame which will hold up to 15 modules, the 1RU frame which will hold up to three modules or as a standalone.

### Features

- High quality HD -> SD down conversions
- Evertz proprietary detail enhancement algorithms
- Supports standard aspect ratio conversions plus user defined modes
- Supports most international standards including 1080i/60, 1080i/59.94, 1080i/50, 1080p/24, 1080p/23.98, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94, 720p/50, 480p/60 and 480p/59.94
- Will also accept 270Mb/s SD input per SMPTE 259M in a pass through mode - auto senses HD or SD input
- Support all necessary colour space conversions (ITU rec. 601 to ITU rec.709)
- Full video processing functions gamma correction, GBR gain YCrCb gain and offset, hue adjustment and RGB colour limiter
- Reference input from card or 7700FR-G Frame reference allows for phasing of output video
- Line buffer on input to allow clean switching between genlocked video sources that have a phase offset of  $\pm 1/4$  line
- 1080p/23.98sF conversion to 525i/59.94 with 3:2 pulldown sequence - time code or 6Hz reference
- Output on screen display used to configure the operating modes
- On screen 4:3 aspect ratio marker
- De-embeds audio from HD video input and embeds into SD video output (2 groups)
- Moves RP-188 VITC and LTC from HD input to SD output, recalculated for frame rate change
- Support for widescreen signalling (WSS) on output
- Card Edge LEDs for signal presence, genlock presence, equalization warning, audio groups present and module status
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller

### 7713HDC Block Diagram & Rear Panel





### Specifications

#### Serial Video Input:

<b>Standard:</b>	270 Mb/s SMPTE 259M - pass through mode 1.485 Gb/s SMPTE 292M - auto- detects standard SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Input Equalization:</b>	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable
<b>Return Loss:</b>	>15 dB up to 1.5GHz

#### Reclocked Serial Video DA Outputs:

<b>Standard:</b>	Same as input
<b>Number of Outputs:</b>	4 relocked
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V $\pm$ 0.5V
<b>Rise and Fall Time:</b>	200ps nominal for HD 750ps nominal for SD
<b>Overshoot:</b>	<10% of amplitude
<b>Return Loss:</b>	> 15 dB at 1.5 Gb/s
<b>Jitter:</b>	< 0.2 UI

#### Downconverted Serial Video Outputs:

<b>Standard:</b>	SMPTE 259M-C (270 Mb/s)
<b>Number of Outputs:</b>	up to 3 Per Card (jumper selectable)
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2.
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V $\pm$ 0.5V
<b>Rise and Fall Time:</b>	750ps nominal
<b>Overshoot:</b>	<10% of amplitude
<b>Return Loss:</b>	> 15 dB at 270 Mb/s
<b>Jitter:</b>	< 0.2 UI

#### Downconverted Composite Analog Video Outputs:

<b>Standards:</b>	Analog composite NTSC (SMPTE 170M) or Analog composite PAL (ITU-R BT.470)
<b>Number of Outputs:</b>	up to 3 Per Card (jumper selectable)
<b>Connectors:</b>	BNC per IEC 60169-8 Amendment 2.
<b>Signal Level:</b>	1 V p-p nominal
<b>DC Offset:</b>	0V $\pm$ 0.1V
<b>Return Loss:</b>	>35dB up to 5 MHz
<b>Frequency Response:</b>	0.1dB to 4 MHz, 0.15dB to 5.5 MHz
<b>Differential Phase:</b>	<0.5°(<0.3° typical)
<b>Differential Gain:</b>	<0.8% (<0.5 % typical)
<b>SNR:</b>	>78dB to 5 MHz (shallow ramp)
<b>Impedance:</b>	75 $\Omega$
<b>Genlock Input:</b>	
<b>Type:</b>	NTSC or PAL Color Black 1 V p-p
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2 or Frame Genlock on 7700FR-G frames (selectable)
<b>Termination:</b>	High impedance or internal 75 $\Omega$ termination (jumper selectable)

#### 6 HZ Input:

<b>Type:</b>	TTL level active high pulse 1/30 second wide
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2 (jumper selectable)
<b>Termination:</b>	500 $\Omega$

#### Input to Output Processing Delay (HD Input Video)

<b>Video Delay:</b>	Approximately 1 to 2 frames depending on input video format, processing mode and phase setting
<b>Audio Delay:</b>	Audio is delayed and re-embedded in time with the output picture
<b>Electrical:</b>	
<b>Voltage:</b>	+12VDC
<b>Power:</b>	10 Watts
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

<b>Number of slots:</b>	1
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#### Ordering Information:

<b>7713HDC</b>	High Quality Downconverter with Image Enhancement
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#### Ordering Options:

Rear Plate must be specified at time of order  
Eg. Model +3RU +SC

#### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Accessories:

<b>7700FC</b>	VistaLINK® Frame Controller
<b>9000NCP</b>	1RU VistaLINK® General Purpose Network Control Panel
<b>9000NCP2</b>	2RU VistaLINK® General Purpose Network Control Panel

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe, which holds 15 modules
<b>7701FR</b>	1RU Multiframe, which holds 3 modules
<b>S7701FR</b>	Standalone Enclosure





The 7714HDC High Quality Down Converter provides high quality down conversion of your high definition (SMPTE 292M) signals to standard definition (SMPTE 259M) signals. The 7714HDC incorporates Evertz proprietary detail enhancement algorithms and gamma correction. The 7714HDC has up to 4 SD Serial Digital outputs or up to 2 composite analog video outputs. Of the 4 outputs, 2 have OSD output. The module supports low processing latency (down to 30 lines) for delay sensitive applications.

The 7714HDC has an external genlock input and allows for phasing of the output video. The 7714HDC accepts all the popular international SMPTE 292M video formats. When the 7714HDC down converts 1080p/23.98sF input video to 525i/59.94 with a 3:2 pulldown, the 3:2 pulldown cadence can be free running or locked to embedded RP188 time code or an external 6Hz input.

The module accepts 2 groups of embedded audio on the input and re-embeds them into the serial video outputs. As a standard feature, the 7714HDC also accepts 4 discrete unbalanced AES inputs and provides 4 AES outputs with the same audio that is being embedded. It can also reassign audio channels within the groups. The re-embedded audio has the appropriate delay added to compensate for video delay incurred by the conversion process, thus avoiding the need for external de-embedding and re-embedding of audio. An additional audio delay adjustment can also be made for lip sync correction.

The 7714HDC has color space conversion from ITU rec. 709 to ITU rec. 601, and will provide various down converted formats such as 16:9 letterbox, 14:9 letterbox, 13:9 letterbox, 4:3 center crop, and 4:3 anamorphic squeeze. The 7714HDC supports Widescreen Signaling (WSS) on the output to handle various aspect ratios of program material. It also provides on screen 4:3 aspect ratio markers (or indicators).

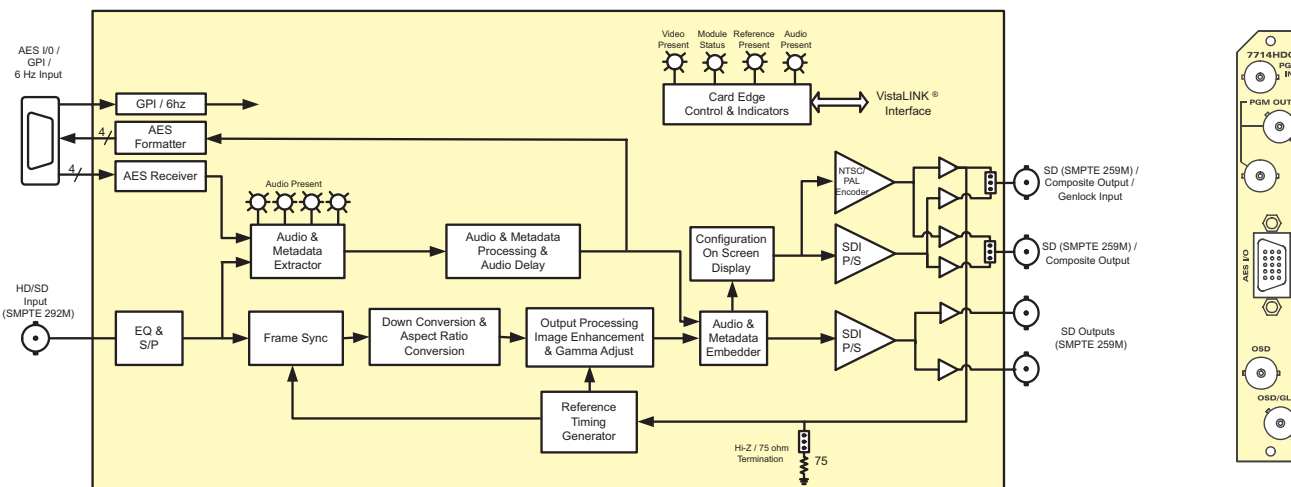
The module also transfers the closed caption and time code information from input to output performing all necessary HD to SD translation and time code recalculations.

The 7714HDC provides card edge LEDs to indicate signal present and audio groups present. The 7714HDC occupies one card slot in the 3RU frame which will hold up to 15 modules, the 1RU frame which will hold up to three modules or as a standalone.

## Features

- High quality HD -> SD down conversions
- Evertz proprietary detail enhancement algorithms
- Input frame synchronizer
- Reference input allows for phasing of output video
- Low processing latency for delay sensitive applications (down to 30 lines)
- Standard support for both embedded and discrete AES (4 x AES)
- Supports standard aspect ratio conversions plus user defined modes
- Supports most international standards including 1080i/60, 1080i/59.94, 1080i/50, 1080p/24, 1080p/23.98, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94, 720p/50, 480p/60 and 480p/59.94
- Will also accept 270Mb/s SD input per SMPTE 259M in a pass through mode - auto senses HD or SD input
- Support all necessary colour space conversions (ITU rec. 601 to ITU rec.709)
- Full video processing functions gamma correction, GBR gain YCrCb gain and offset, hue adjustment and RGB colour limiter
- Line buffer on input to allow clean switching between genlocked video sources that have a phase offset of  $\pm 1/4$  line
- 1080p/23.98sF conversion to 525i/59.94 with 3:2 pulldown sequence - time code or 6Hz reference
- Output on screen display used to configure the operating modes
- On screen 4:3 aspect ratio marker
- De-embeds audio from HD video input and embeds into SD video output (2 groups)
- Supports 4 retimed external AES input and outputs
- Moves RP-188 VITC and LTC from HD input to SD output, recalculated for frame rate change
- Support for widescreen signalling (WSS) on output
- Card Edge LEDs for signal presence, genlock presence, equalization warning, audio groups present and module status
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller

## 7714HDC Block Diagram and Rear Panel





### Specifications

**Standard:** 270Mb/sec SMPTE 259M or 1.485 Gb/sec SMPTE 292M  
SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M

**Number of Inputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Input Equalization:** Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable

**Return Loss:**  
**SD Standards:** >15 dB up to 540Mb/s  
**HD Standards:** >15 dB up to 1.5Gb/s

### Downconverted Serial Video Outputs:

**Standard:** 270Mb/sec SMPTE 259M  
**Number of Outputs:** 4 Per Card  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V  $\pm$  0.5V  
**Rise and Fall Time:** 740ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 15 dB at 540MHz

### Downconverted Composite Analog Video Outputs:

**Standard:** SMPTE 170M (NTSC), ITU-R BT470-6 (PAL)  
**Number of Outputs:** 2  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 1V nominal  
**Output Impedance:** 75 $\Omega$   
**DC Offset:** 0V  $\pm$  50mV  
**Return Loss:** >45dB to 10MHz  
**Freq. Response:** <+/- 0.1dB to 4 MHz (response will depend on selected filtering)

**Differential Phase:** < 0.5° (< 0.3° typical)  
**Differential Gain:** < 0.5% (< 0.3% typical)  
**SNR:** >75dB (black video, 100kHz to 5MHz)

**Output level control range:**  $\pm$ 10%  
**Black level control range:**  $\pm$ 7.5 IRE  
**Chroma level control range:**  $\pm$ 10%  
**Hue control range:**  $\pm$ 15 deg. (NTSC only)

### Genlock Input:

**Type:** HD Tri-Level sync, NTSC or PAL Color Black  
1 V p-p  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Termination:** 75 $\Omega$  (jumper selectable)

### AES Audio Inputs & Outputs:

**Number of Inputs:** 4  
**Number of Outputs:** 4  
**Standard:** SMPTE 276M, single ended synchronous AES  
**Connectors:** DB15 or BNC per IEC 60169-8 Amendment 2  
**Resolution:** 24 bits  
**Sampling Rate:** 48 kHz  
**Impedance:** 75 $\Omega$   
**Signal Level:** 1 V p-p nominal

### Input to Output Processing Delay (HD Input Video):

**Video Delay:** <1 frames depending on input video format, processing mode and phase setting (down to 30 lines)  
**Audio Delay:** Audio is delayed and re-embedded in time with the output picture

### Electrical:

**Voltage:** +12VDC  
**Power:** 10 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC Directive

### Physical:

**Number of slots:** 1

### Ordering Information:

**7714HDC** High Quality Downconverter with Image Enhancement, Low Latency & External AES

### Ordering Options:

Rear Plate must be specified at time of order  
Eg. Model +3RU +SC

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Accessories:

WPAES8-BNCM-6F cable (included)

### 7700FC

VistaLINK® Frame Controller

### 9000NCP

1RU VistaLINK® General Purpose Network Control Panel

### 9000NCP2

2RU VistaLINK® General Purpose Network Control Panel

### Enclosures:

#### 7700FR-C

3RU Multiframe, which holds 15 modules

#### 7701FR

1RU Multiframe, which holds 3 modules

#### S7701FR

Standalone Enclosure



# Quad Analog Audio to Dual AES Converter

## 7720ADC-A4



The 7720ADC-A4 is a high-quality, 24-bit, analog to digital audio converter which provides digital conversion of 4 balanced analog audio channels and provides 2 unbalanced AES/EBU channels out.

The sampling clock may free run at 48kHz or may be locked to either a DARS (Digital Audio Reference Signal) reference or composite video reference. Level control is provided via a card edge toggle switch. The input gain level can be read out from a card edge display for convenience. The full scale digital signal can be calibrated to accommodate peak levels ranging from 8dBu to 27dBu with 0.5 dB resolution.

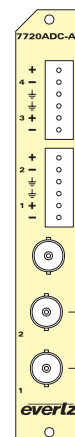
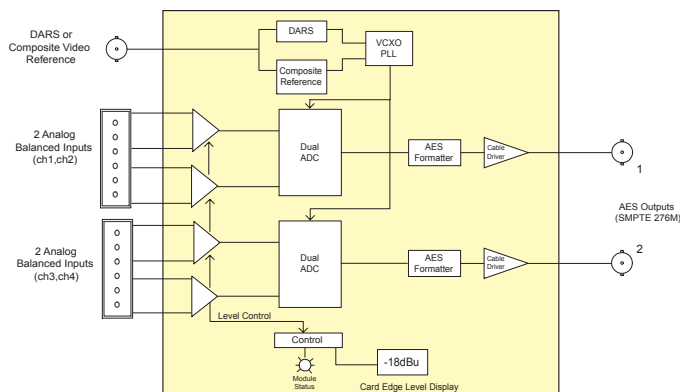
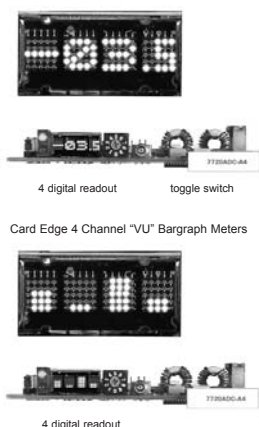
The audio ADC features a card edge VU meter for quick confidence monitoring. Four separate level indicators are provided via bargraphs for quick validation of audio program material.

### Features

- Auto detect composite video or DARS on the reference input
- 24-bit, high-quality analog to digital audio conversion
- Support for 4 channels of analog audio (2 AES/EBU)
- Local card edge display and control of input gain
- 0dBFS programmable from 8dBu to 27dBu
- A card edge display provides a 4 channel bargraph type level indicator display for confidence monitoring
- Automatic DC removal
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel. VistaLINK® is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller

### 7720ADC-A4 Block Diagram & Rear Panel

Card Edge Audio Level Adjust Display



### Specifications

#### Analog Audio Input:

**Number of Inputs:** 4

**Type:** Balanced analog audio

**Connector:** Removable terminal strip

**Input Impedance:** 10kΩ minimum (differential)

**Sampling Frequency:** 48kHz (freerun or locked to the reference)

**Signal Level:** 0dB FS = 8dBu to 27dBu (programmable via 0dB/+6dB jumper and card edge fine gain with -10dB +10dB range)

#### Frequency Response:

**SNR:** +/- 0.1dB (20Hz to 20kHz)

**THD+N:** 100dB with input at -1dBFS

**CMRR:** <0.001% (>100dB) @ 20Hz to 20kHz, -1 dB FS

**Crosstalk:** >100dB @ 1kHz

**Inter-channel Phase error:** < 1°, 20Hz-20kHz

#### Reference Input:

**Standard:** NTSC (SMPTE 170M), PAL (ITU624-4), DARS

**Number of Inputs:** 1

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:**

**Video:** Max: 2Vp-p video (composite only)  
Min: Sync level 150m (composite only)

**DARS:** SMPTE 276M, 1Vp-p

**Frequency Lock Range:** ±100ppm from nominal

**Input Impedance:** High impedance

**Return Loss:** >25dB to 10MHz (with external 75Ω termination)

#### AES Audio Output:

**Standard:** SMPTE 276M single ended AES

**Number of Outputs:** 2

**Connectors:** BNC per IEC 60169-8 Amendment 2

**Resolution:** 24-bits

**Sampling Rate:** 48 kHz

**Impedance:** 75Ω unbalanced

**I/O Delay:** 0.87ms

#### Electrical:

**Voltage:** +12VDC

**Power:** 10 Watts (nominal)

**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC Directive

#### Physical:

**Number of slots:** 1

#### Ordering Information:

**7720ADC-A4:** Quad Analog Audio to Dual AES Converter

#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe

**+1RU** 1RU Rear Plate for use with 7701FR Multiframe

**+SA** Standalone Enclosure Rear Plate

#### Accessories:

**7700FC** VistaLINK® Frame Controller

**9000NCP** 1RU VistaLINK® General Purpose Network Control Panel

**9000NCP2** 2RU VistaLINK® General Purpose Network Control Panel

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules

**7701FR** 1RU Multiframe which holds 3 modules

**S7701FR** Standalone enclosure





The 7720DAC-A4 is a high-quality, 24-bit, digital to analog audio converter which converts 2 AES/EBU digital signals to 4 balanced analog audio signals. The 7720DAC-A4 has two independent AES/EBU converters. The input sample rates supported are 44.1kHz and 48kHz. All analog audio outputs levels may be set individually from the front panel.

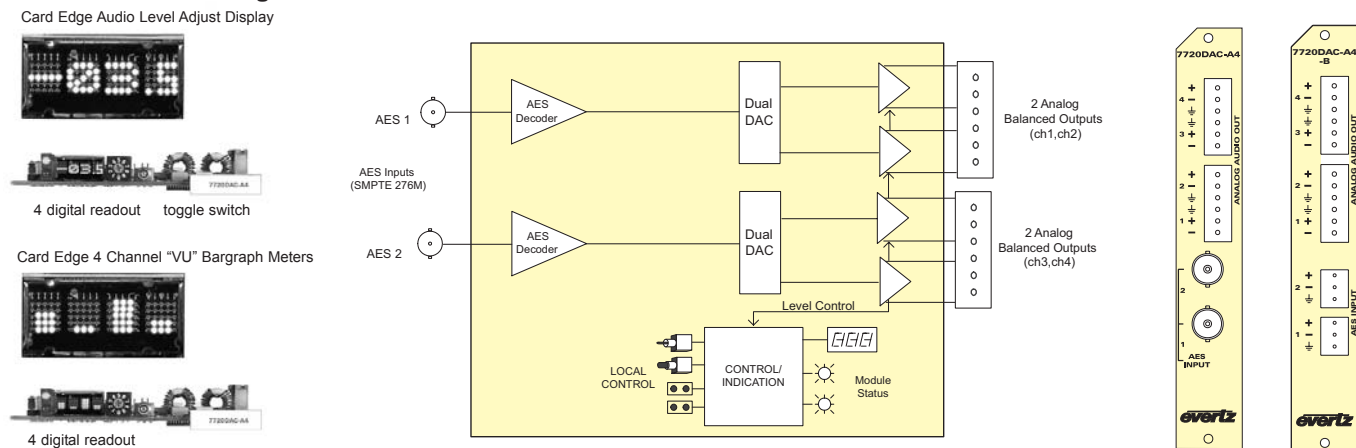
Level control is provided via a card edge toggle and the set gain level can be read out from a card edge display for convenience. The full scale digital signal can be calibrated to product analog peak levels ranging from 12dBu to 25dBu with 0.1 dB resolution.

The audio DAC features a card edge VU meter for quick confidence monitoring. Four separate level indicators are provided via bargraphs for quick validation of audio program material.

### Features

- AES3/IEC-958 or AES3/SMPTE276/S/PDIF
- 24-bit, high-quality conversion
- 44.1 and 48kHz sampling rate
- 0dBFS programmable from 12dBu to 25dBu
- Support for 4 channels of balanced analog audio (2 AES/EBU)
- Clock recovery via VCXO for extra stable sample clock generation
- A card edge display provides a 4 channel bargraph type level indicator display for confidence monitoring
- Local card edge display for level setup
- Drives directly 600Ω loads
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel. VistaLINK® is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller

### 7720DAC-A4 Block Diagram & Rear Panels



### Specifications

#### AES Audio Inputs (7720DAC-A4):

Number of inputs:	2
Standard:	SMPTE 276M, AES3-2001
Connector:	BNC per IEC 60169-8 Amendment 2
Input type:	Unbalanced, isolated ground
Impedance:	75Ω, -25 dB return loss to 6MHz
Accepted levels:	0.1Vp-p to 2.5Vp-p
Cable distance:	> 4000 ft. (with 1Vp-p cable drive)
Sample rates:	48kHz and 44.1kHz +/-100ppm

#### AES Audio Inputs (7720DAC-A4-B):

Number of inputs:	2
Standard:	AES3-1992 (ANSI S4.40-1992), IEC-958 (except connectors)
Connector:	3 pin removable terminal strip
Input type:	Balanced pair, shield, transformer-coupled
Equalization:	>400m @48kHz with 2 to 10 Vp-p drive and Belden 1800B or equivalent shielded twisted pair cable
Impedance:	110Ω, +/-10%
Accepted signal levels:	0.2Vp-p to 10Vp-p
Cable distance:	> 1300 ft. (with 2Vp-p to 7Vp-p cable drive)
Sample rates:	48kHz and 44.1kHz +/-100ppm

#### Analog Audio Outputs:

Number of Outputs:	4 balanced
Connector:	Two 6 pin removable terminal strips
Output Impedance:	66Ω
Output Loads:	Hi-Z or 600Ω
Peak Conversion Level:	0dB FS =>12 to 25dBu (user settable)
Frequency Response:	< ± 0.05dB (20Hz to 20kHz)
Dynamic Range:	24 bits
THD+N:	<0.001% (>100dB) @ 20Hz to 20kHz, @-1dB FS, unweighted
Crosstalk:	110dB (20Hz to 20kHz)
DC Offset:	< ± 30mV
SNR:	> 110dB "A" weighted
Inter-Channel Phase Error:	< ± 1° (20Hz to 20kHz)
Digital to Analog Delay:	0.95ms

#### Electrical:

Voltage:	+12V DC
Power:	12 Watts
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

Number of Slots:	1
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#### Ordering Information:

7720DAC-A4:	Dual AES to Quad Analog Audio Converter with unbalanced AES inputs
7720DAC-A4-B:	Dual AES to Quad Analog Audio Converter with balanced AES inputs

#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Accessories:

7700FC	VistaLINK® Frame Controller
9000NCP	1RU VistaLINK® General Purpose Network Control Panel
9000NCP2	2RU VistaLINK® General Purpose Network Control Panel

#### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure





The 7720AM-AES4 Audio Mixer accepts 4 AES/EBU digital audio inputs (eight channels) and synchronously mixes all channels and routes them to any of the four AES outputs. The 7720AM-AES4 performs channel swapping, over mixes, mix downs and on-air breakaways. All processing is at 24-bit resolution.

The 7720AM-AES4 provides eight channels of independent audio delay control making it ideal for retiming AES audio.

A non-PCM data mode is provided in order to pass Dolby-E or AC3 data. In this mode, channel swapping and delay is supported (mixing is not) with the requirement that the inputs are 48kHz synchronous and locked (a reference is required to be used in this mode)

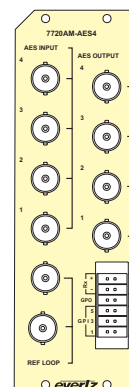
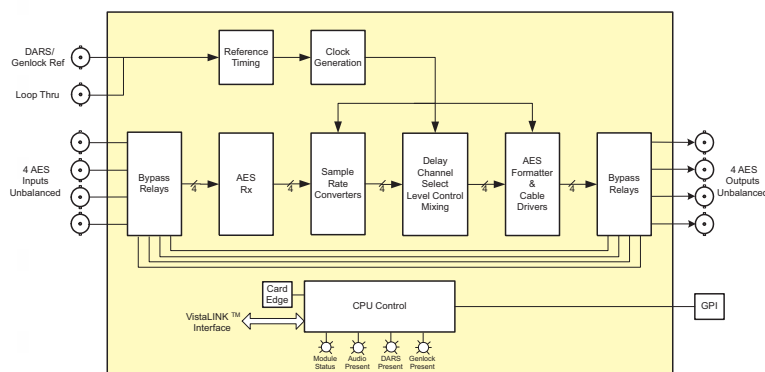
### Features

- 24-bit audio processing for high fidelity
- Flexible sample rate of 28 kHz to 108kHz (will be resampled to 48kHz locked to reference on output)
- Audio Sample Rate Converters can be disabled
- GPI control
- Dolby-E/AC3 pass through mode
- Card edge LEDs indicate: module fault, audio, genlock and DARS present
- Maximum delay of 2.54 seconds with sample accuracy
- Bypass relay outputs at the loss of power

### Additional Features when controlled through VistaLINK®:

- Provides 2:1 audio mixing capability, ideal for "ducking" audio or voiceovers
- Can be used at the inputs of an audio console to expand inputs and add mixing capacity
- Performs voice overs, mix downs and on-air breakaways
- Reassignment of audio channels
- +12 to -12dB gain control on each mixer input in 0.25 dB steps
- Continuous and independent channel delay adjustment up to 2.54 seconds
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller

### 7720AM-AES4 Block Diagram & Rear Panel



### Specifications

#### AES Audio Inputs and Outputs:

Number of Inputs:	4
Number of Outputs:	4
Standard:	SMPTE 276M, single ended synchronous or asynchronous AES
Connectors:	BNC per IEC 60169-8 Amendment 2
Resolution:	24 bits
Sampling Rate:	48 kHz
Impedance:	75Ω unbalanced
Signal Level:	1 V p-p nominal

#### Genlock Input:

Type:	HD Tri-level syncs, NTSC or PAL Color Black 1 V p-p, or Composite bi-level sync (525i/59.94 or 625i/50) 300 mV
Connector:	BNC loop per IEC 60169-8 Amendment 2
Termination:	75Ω (jumper selectable)

#### DARS Reference:

Type:	Digital Audio Signal with 48kHz sample rate.
Standard:	SMPTE 276M-1995 single ended AES, AES-11
Connectors:	BNC loop per IEC 60169-8 Amendment 2
Termination:	75Ω (jumper selectable)

#### Input to Output Processing:

Gain:	+/- 12 dB in 0.25 dB steps
Delay:	Min 7 samples with sample rate converters disabled Min 92 samples with sample rate converters enabled Adjustable to approximately 2.54 seconds

#### General Purpose In/Out:

GP Inputs:	Load user preset configurations
GP Output:	GPO1: Low when video input is missing
Type:	Opto-isolated, active low with internal pull-ups to +5V
Connector:	8 pins on 12 pin removable terminal block
Signal Level:	+5V nominal

#### Data Logging Serial Port:

Standard:	RS 422
Connector:	5 pins on 12 pin removable terminal block (not used at this time)
Function:	

#### Electrical:

Voltage:	+12VDC
Power:	8 Watts
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

7700 frame mounting:	
Number of slots:	2
7701 frame mounting:	
Number of slots:	1

#### Ordering Information:

7720AM-AES4	AES Audio Mixer, Delay, Audio Swapper (Requires 7700FC for full module control)
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#### Ordering Options:

Rear Plate must be specified at time of order  
Eg. Model +3RU

#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe

#### Accessories:

7700FC	VistaLINK® Frame Controller
9000NCP	1RU VistaLINK® General Purpose Network Control Panel
9000NCP2	2RU VistaLINK® General Purpose Network Control Panel

#### Enclosures:

7700FR-C	3RU Multiframe, which holds 15 modules
7701FR	1RU Multiframe, which holds 3 modules

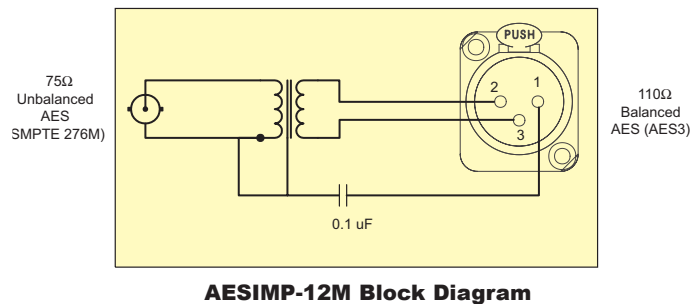
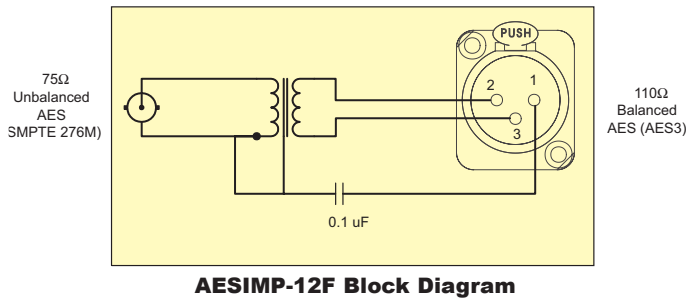


The AESIMP-12 series impedance converters allow transmission of AES/EBU digital audio signals, with sampling rates ranging from 22 kHz to 96 kHz, over 75Ω coaxial cables. The conversion transformer changes a balanced 110Ω transmission line to an unbalanced 75Ω transmission line.

The AESIMP-12 series provides twelve XLR-3 type connectors (male or female) on the balanced side and BNC type connector on the unbalanced side. Two versions of the AESIMP-12 are available. The AESIMP6F6M give 6 converters in each direction. The AESIMP-1M is a single channel converter.

PART NUMBER	110Ω CONNECTOR		75Ω CONNECTOR
	3 PIN XLR FEMALE	3 PIN XLR MALE	
AESIMP-1M		1	1 BNC
AESIMP-6F6M	6	6	12 BNC
AESIMP-12F	12	BNC	12 BNC
AESIMP-12M		12	12 BNC

The rack mounting ears may be reversed to orient the panel for the greatest ease of installation. An identification strip holder is provided over the BNC connectors to assist in labeling sources and/or destinations.



### Specifications

**Number of Channels:** 12  
**Coupling:** Transformer  
**Turns Ratio:** 1.22:1

### Unbalanced AES:

**Standard:** SMPTE 276M, single ended AES  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** Approx. balanced level x 0.8,  
 5 V p-p maximum  
**Impedance:** 75Ω unbalanced

### Balanced AES:

**Standard:** AES3-1992 balanced AES  
**Connectors:** 3 pin Male XLR (AESIMP-12M) or 3 pin  
 Female XLR (AESIMP12F)  
**Signal Level:** Approx. unbalanced level x 1.22,  
 5 V p-p maximum  
**Impedance:** 110Ω balanced

### Ordering Information:

**AESIMP-1M** In-line transformer with a single BNC to a single male XLR  
**AESIMP-6F6M** AES Impedance changer for mobile fiber systems 6 Female and 6 Male XLR to BNC  
**AESIMP-12F** 12 Channel female XLR to BNC AES Impedance Matching Panel  
**AESIMP-12M** 12 Channel male XLR to BNC AES Impedance Matching Panel





### 7721AE4-HD

The 7721AE4-HD Audio Embedder inserts AES audio signals into a 1.5Gb/s HD video signal as specified in SMPTE 299M. The companion 7721AD4-HD Audio De-embedder facilitates audio demultiplexing at the destination.

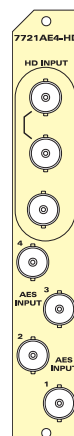
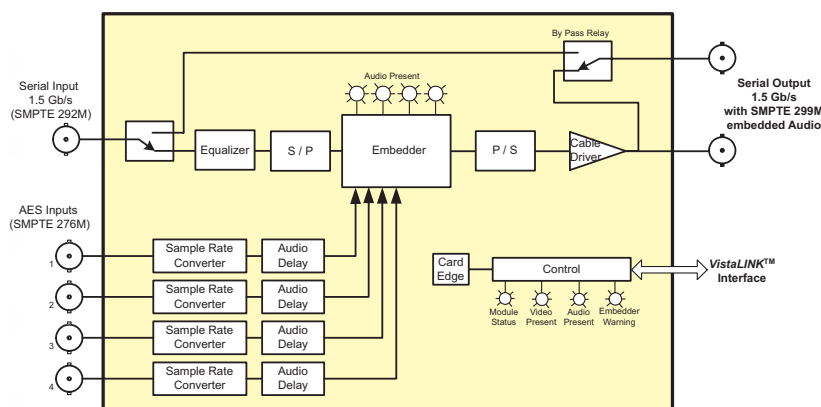
SMPTE 299M allocates four groups of four audio pairs that can be embedded into the SMPTE 292M bitstream. The 7721AE4-HD embeds up to 4 AES audio signals into two groups on the HD-SDI outputs for discrete 5.1 audio applications. The 7721AE4-HD is Dolby E compliant when the sample rate converters are turned off.

VistaLINK® enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as VistaLINK® PRO locally or remotely.

#### Features

- Automatic detection of video standard
- Bypass relay protection on one SDI output for power failures
- 24-bit AES inputs and audio embedding
- Individual audio group assignment for each group
- Group lock mode maintains phase relationship between the groups for 5.1 audio applications
- Sample rate conversion disable on AES inputs to permit Dolby E embedding
- Programmable audio delays (up to 7 frames in ½ video field increments using DIP switches or up to 1.3 seconds in 1 sample increments, with VistaLINK® control)
- Ancillary packet cleaning mode removes all audio before embedding
- Ancillary packet reformatting mode left justifies and removes unused packets before embedding
- Embeds audio on internally generated black or blue video when there is no video input
- Card edge LEDs indicate video and audio signal presence, and module fault
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® Pro) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

#### 7721AE4-HD Block Diagram & Rear Panel



#### Specifications

##### Serial Video Input:

**Standard:** SMPTE 292M (1.5Gb/s), (1080i/60, 1080i/59.94, 1080i/50, 1080p/30sF, 1080p/29.97sF, 1080p/25sF, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94)  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic 100m @ 1.5Gb/s with Belden 1694A or equivalent cable  
**Return Loss:** > 10 dB up to 1.5Gb/s

##### Serial Video Outputs with Embedded Audio:

**Standard:** Same as input  
**Number of Outputs:** 2 (1 output bypass relay protected)  
**Embedded Audio:** SMPTE 299M - 24 bit 48 kHz synchronous  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 200ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 10 dB up to 1.5Gb/s  
**Wide Band Jitter:** < 0.2 UI

##### AES Audio Inputs:

**Number of Inputs:** 4  
**Standard:** SMPTE 276M, single ended AES  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Resolution:** 24 bits  
**Sampling Rate:** 32 to 96 kHz synchronous or asynchronous (48 kHz synchronous AES required when sample rate converter is disabled.)  
**Impedance:** 75Ω unbalanced  
**Signal Level:** 1V p-p ±0.1V

##### System Performance:

**Embedding Latency:** 1.3 to 3 ms  
**Audio Delay:**  
**DIP Switch Control:** Up to 7 frames, ½ frame increments (delay applied to all AES channels)  
**VistaLINK® or Serial Port Control:** Up to 1.35 seconds in 1 sample increments (independent control of delay for each channel)

##### Electrical:

**Voltage:** +12VDC  
**Power:** 11 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

##### Physical:

**7700 or 7701 frame mounting:**  
**Number of slots:** 1

##### Ordering Information:

**7721AE4-HD** HD 4 AES Pair Audio Embedder

##### Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

##### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

##### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure





The 7721AD-HD series Audio De-Embedders extract embedded audio as specified by SMPTE 299M from a 1.5 Gb/s serial HDTV video signal. The companion 7721AE4-HD Audio Embedder facilitates audio multiplexing at the source. The 7721AD-HD is available in 2 different versions.

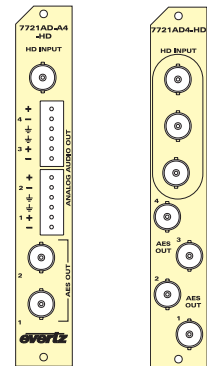
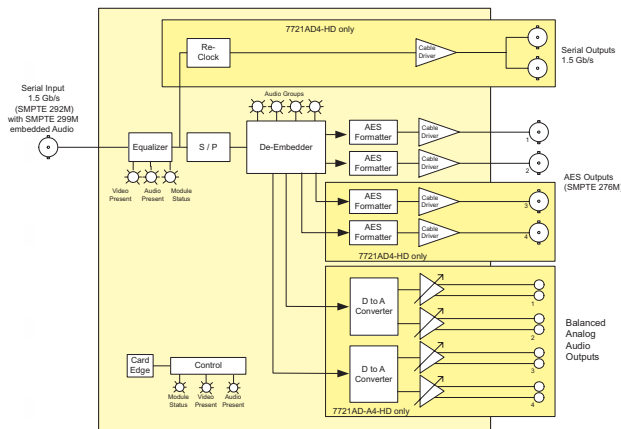
SMPTE 299M allows for up to four groups (4 channels/group) to be embedded within a serial digital signal. The 7721AD4-HD can de-embed two audio groups onto four unbalanced AES outputs. The 7721AD-A4-HD can de-embed one audio group onto two unbalanced AES outputs and 4 balanced analog audio outputs.

Model	Audio Outputs		Video 1.5Gb/s Reclocked
	AES	Analog	
7721AD4-HD	4	--	2
7721AD-A4-HD	2	4	--

## Features

- Automatic detection of video input format
- Card edge LEDs indicating module status, video presence, selected audio group data is present
- LED indication for the presence of each of the 4 audio groups within the input video
- Audio group selection via card edge DIP switches
- 7721AD-A4-HD has independent volume controls for each of the audio channel outputs
- VistaLINK® - capable for remote monitoring and control via SNMP. (using VistaLINK® PRO) when installed in the 7700FR-C frame with a 7700FC VistaLINK® Frame Controller

## 7721AD-A4-HD, 7721AD4-HD Block Diagram & Rear Panels



## Specifications

### Serial Video Input:

**Standard:** SMPTE 292M, (1080i/60, 1080i/59.94, 1080i/50, 1080p/30(sF), 1080p/29.97(sF), 1080p/25(sF), 1080p/24(sF), 1080/23.98(sF), 720p/60, 720p/59.94, 1035i/60, 1035i/59.94  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic 100m @ 1.5Gb/s with Belden 1694A (or equivalent)  
**Return Loss:** > 10 dB up to 1.5 Gb/s

### Reclocked Serial Video Output (7721AD4-HD only):

**Standard:** Same as input  
**Number of Outputs:** 2  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 200ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 10 dB up to 1.5 Gb/s  
**Wide Band Jitter:** <0.2 UI

### AES Audio Output:

**Standard:** SMPTE 276M, single ended synchronous or asynchronous AES  
**Number of Outputs:** 4 on 7721AD4-HD & 2 on 7721AD-A4-HD  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Sampling Rate:** 48kHz  
**Impedance:** 75Ω  
**Delay:** 9 samples to approx. 3 seconds (user adjustable)  
**Resolution:** 24-bit

### Analog Audio Output (7721AD-A4-HD Only):

**Number of Outputs:** 4  
**Type:** Balanced analog audio  
**Connector:** Two 6 pin terminal strip  
**Output Impedance:** 66Ω balanced  
**Sampling Frequency:** 48kHz  
**Signal Level:** 0dB FS =>8 to 24dBu into 10kΩ load (user settable)  
0dB FS =>8 to 22dBu into 600Ω load (user settable)

**Frequency Response:** < ± 0.1dB (20Hz to 20kHz)

**Dynamic Range:** 24-bit

**THD+N:** > 90dB RMS @ 1kHz with 24dBu output

**Crosstalk:** > 90dB RMS (20Hz to 20kHz)

### System Performance:

#### De-embedding Latency:

**HD SDI to AES:** 1.35ms (7721AD-A4-HD), 600μs (7721AD4-HD)

### Electrical:

**Voltage:** +12V DC  
**Power:** 8 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC Directive

### Physical:

**Number of Slots:** 1

### Ordering Information:

**7721AD-A4-HD** HD SDI Audio De-embedder with 2 unbalanced AES and 4 analog audio outputs  
**7721AD4-HD** HD SDI Audio De-embedder with 4 unbalanced AES outputs (2 audio groups)

### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



# HD/SD 8 AES (16 Channel) Audio Embedder 7721AE8-HD



The 7721AE8-HD Audio Embedder inserts 8 AES audio signals into 1.5Gb/s HD or 270Mb/s SD video signals as specified in SMPTE 299M or 272M respectively. The companion 7721AD8-HD Audio De-embedder facilitates audio demultiplexing at the destination.

The 7721AE8-HD embeds up to 8 AES audio signals into four groups on the HD/SD outputs enabling support for dual 5.1 audio applications. The module supports 24-bit AES audio embedding for HD and 20-bit audio embedding for SD. In addition, a full 16x16 audio channel router is available for channel re-mapping.

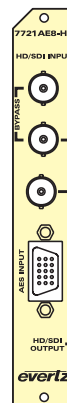
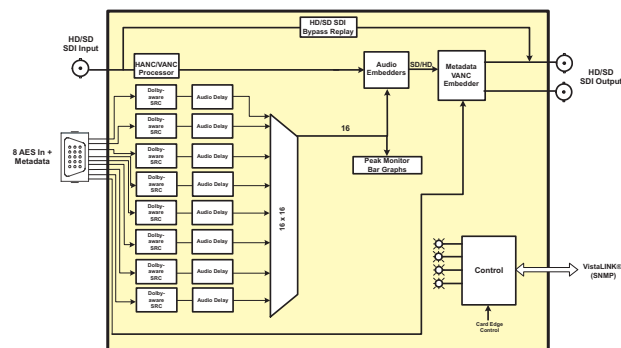
The 7721AE8-HD is Dolby® E compliant and automatically disables sample rate conversion on AES inputs to permit seamless Dolby E embedding.

VistaLINK® enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration locally or remotely.

## Features

- Audio embedding into 1.5 Gbs HD or 270 Mbs SD video
- Automatic detection of input video standard
- Two 1.5 Gbs HD or 270 Mbs SD serial video outputs
- By-pass relay protection for main program output
- Supports 24-bit AES audio embedding for HD and 20-bit AES audio embedding for SD
- Flexible 16x16 audio channel routing for channel re-mapping
- Dolby E compliant with automatic sample rate conversion disable on AES inputs to permit seamless Dolby E embedding
- Miniature bargraph display to monitor audio content activity
- Numerous signal monitoring aids
- Ancillary packet cleaner removes any interfering audio groups prior to embedding
- User control to force removal of additional audio groups
- Embeds audio on internally generated black or blue video when there is no video input
- Card edge LEDs indicate video and audio signal presence and module fault
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® Pro) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

## 7721AE8-HD Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

**Standard:** SMPTE 292M (1.5Gb/s), (1080i/60, 1080i/59.94, 1080i/50, 1080p/30sF, 1080p/29.97sF, 1080p/25sF, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94), 1035i/60, 1035i/59.94, 1080p/30, 1080p/29.97, 1080p/25, 1080p/24, 1080p/23.98, 720p/50  
SMPTE 259M (270Mb/s), 525 or 625 line  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2

### Serial Video Outputs with Embedded Audio:

**Standard:** same as input  
**Number of Outputs:** 2 (1 output bypass relay protected)  
**Embedded Audio:** SMPTE 299M - 24 bit 48 kHz synchronous/SMPTE 272M- 20-bit  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Return Loss:** > 15dB to 1.5Gb/s  
**Wideband Jitter:** < 0.20 UI

### AES Audio Inputs:

**Number of Inputs:** 8  
**Standard:** SMPTE 276M, single ended AES  
**Connector:** BNC per IEC 60169-8 Amendment 2 (with DB15 to BNC 6ft Breakout cable)  
**Resolution:** 24 bits  
**Sampling Rate:** 48 kHz synchronous or asynchronous (48 kHz synchronous AES required when sample rate converter is disabled.)  
**Impedance:** 75Ω unbalanced  
**Signal Level:** 1V p-p ±0.1V @ termination load

### Metadata Input/Output:

**Type:** Dolby-E® Metadata  
**Standard:** RS-422  
**Baud Rate:** 115,200 baud

### System Performance:

**SRC THD+N:** -140dB  
**Embedding Latency:** 0.3 ms (HD), 0.7ms (SD), 3 ms (with SRC)  
**Audio Delay:** Up to 1.35 seconds in 1 sample increments (independent control of delay for each channel)

### Electrical:

**Voltage:** + 12VDC  
**Power:** 7 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC Directive

### Physical:

**7700 or 7701 frame mounting:**  
**Number of slots:** 1

### Ordering Information:

**7721AE8-HD** HD/SD 8 AES (16 Channel) Audio Embedder

### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Accessories:

WPAES8-BNCM-6F cable (included)

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure





The 7721AD8-HD Audio De-embedder extracts embedded audio from all 4 groups of a 1.5 Gbs HD or a 270 Mbs SD video signal as specified in SMPTE 299M or 272M respectively. The module supports 24-bit AES audio de-embedding for HD and 20-bit audio de-embedding for SD. Up to 16 selected channels may be de-embedded and directed to 8 AES outputs. In addition, a full 16x16 audio channel router is available for channel re-mapping.

The 7721AD8-HD is Dolby® E compliant and handles Dolby E metadata. Metadata is optionally de-embedded from VANC and can be provided as an output for downstream devices like Dolby E or Dolby AC3 Encoders.

VistaLINK® enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration locally or remotely.

## Features

- Audio de-embedding from 1.5 Gbs HD or 270 Mbs SD video
- Automatic detection of input video standard
- Two 1.5 Gbs HD or 270 Mbs SD serial video outputs
- Supports 24-bit AES audio de-embedding for HD and 20-bit AES audio de-embedding for SD
- Flexible 16x16 audio channel routing for channel re-mapping Dolby E compliant with VANC decode and output of Dolby™ metadata
- Card edge display for status and miniature bargraphs for audio peak levels
- Card edge LEDs indicate video and audio signal presence and module fault
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® Pro) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

## Inputs:

- 1.5 Gbs HD or 270 Mbs SD serial video

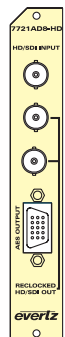
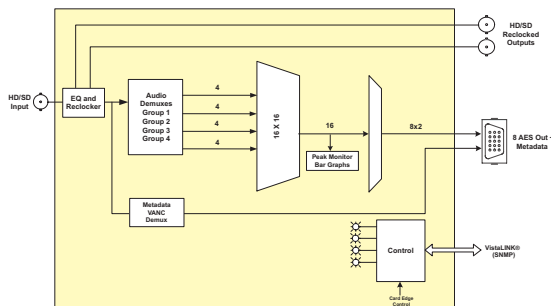
## Outputs:

- Dolby Metadata output (RS422/485)
- 8 AES de-embedded outputs
- 2 re-clocked HD/SD serial video outputs

## Controls:

- Audio channel routing selection
- VANC decoder line, DID, and sDID

## 7721AD8-HD Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

**Standard:** SMPTE 292M (1.5Gb/s), (1080i/60, 1080i/59.94, 1080i/50, 1080p/30sF, 1080p/29.97sF, 1080p/25sF, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94), 1035i/60, 1035i/59.94, 1080p/30, 1080p/29.97, 1080p/25, 1080p/24, 1080p/23.98, 720p/50  
SMPTE 259M (270Mb/s), 525 or 625 line

**Connector:** 1 BNC per IEC 60169-8 Amendment 2

### Embedded Audio Input:

**Standard:** SMPTE 299M - 24 bit 48 kHz synchronous  
SMPTE 272M - 20 bit 48 kHz synchronous

### Metadata Output:

**Type:** Dolby E Metadata (RS422)  
**Connector:** BNC per IEC 60169-8 Amendment 2 (with DB15 to BNC 6ft breakout cable)  
**Baud Rate:** 115,200 baud (as per Dolby E usage)

### Serial Video Outputs Re-clocked:

**Standard:** Same as input  
**Number of Outputs:** 2  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Return Loss:** > 15 dB up to 1.5Gb/s  
**Wide Band Jitter:** < 0.2 UI

### AES Audio Outputs:

**Standard:** SMPTE 276M, single ended AES  
**Number of Outputs:** 8  
**Connector:** BNC per IEC 60169-8 Amendment 2 (with DB15 to BNC 6ft breakout cable)  
**Sampling Rate:** 48 kHz  
**Impedance:** 75Ω unbalanced

**Resolution:** Up to 24-bit  
**Signal Level:** 1V p-p ±0.1V @termination load

### System Performance:

**De-embedding Latency:** 0.2ms (HD), 0.7ms (SD)

### Electrical:

**Voltage:** +12VDC  
**Power:** 11 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC Directive

### Physical:

**7700 or 7701 frame mounting:**  
**Number of slots:** 1

### Ordering Information:

**7721AD8-HD** HD/SD 8 AES (16 Channel) Audio De-embedder

### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Accessories:

WPAES8-BNCM-6F cable (included)

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure





The 7721AE-A4-HD Analog Audio Embedder performs A/D conversion on 4 balanced pairs of analog audio (as one audio group) and embeds them into a 1.5 Gb/s serial HD input video signal or a 270 Mb/s serial SD input video signal as specified by SMPTE 299M/272M. The companion 7721AD-A4-HD Audio De-embedder facilitates audio de-multiplexing at the destination.

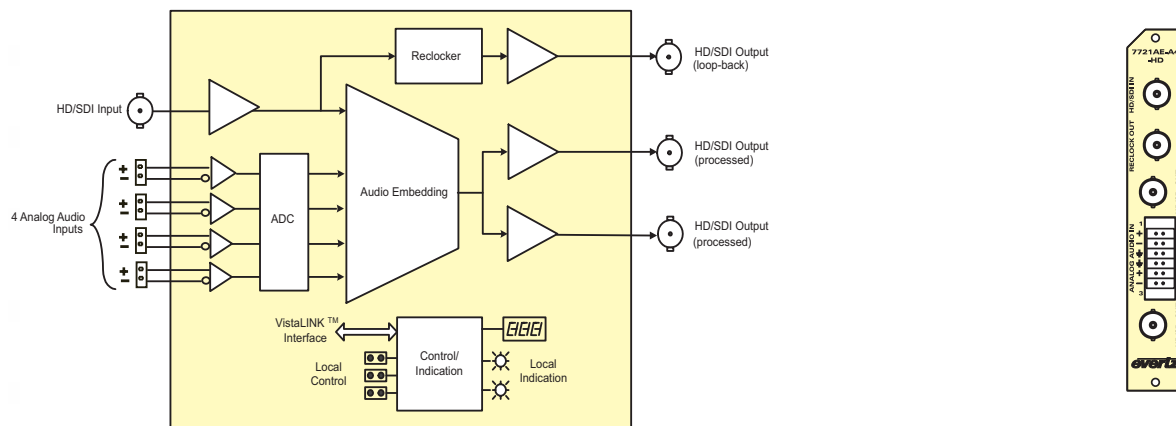
The 7721AE-A4-HD occupies one card slot in the 3RU frame (7700FR-C), which will hold up to 15 1-slot modules or one slot in the 1RU frame (7701FR), which will hold up to three modules. The 7721AE-A4-HD also comes in a standalone unit (S7701FR).

VistaLINK® enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as Evertz VistaLINK®.

### Features

- Automatic detection of video input format
- Supports 1.5 Gb/s HD per SMPTE 292M, 270Mb/s SD per SMPTE 259M-C, and SDTi per SMPTE 305M
- Programmable audio delays (up to 5 frames or 84 milliseconds)
- Selectable ancillary packet cleaning mode removes all audio before embedding
- Individual audio channel assignment for embedded audio group
- Audio mixer per audio channel to provide voice-over
- Upstream embedded Dolby E compatible (passed through)
- Monitoring headphone jack for audio input and embedded audio output
- Comprehensive signal and card status monitoring via four-character card-edge display and LEDs
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® Pro) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

### 7721AE-A4-HD Block Diagram & Rear Panel



### Specifications

#### Serial Video Input:

**Standard:** Auto detect  
1.5 Gb/s SMPTE 292M or  
270 Mb/s SMPTE 259M-C, 525 or 625 line component,  
SMPTE 305M, (SDTi)

**Connector:** 1 BNC per IEC 60169-8 Amendment 2

**Equalization:** Automatic to 300m @ 270 Mb/s with Belden 1694A or  
equivalent cable, 110m @ 1.5Gb/s

**Return Loss:** > 15dB up to 1.5GHz

#### Serial Video Output:

**Number of Outputs:** 1 Reclocked Loopback  
2 same as input with embedded audio

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V ± 0.5V

**Rise and Fall Time:** 900ps nominal

**Overshoot:** <10% of amplitude

**Return Loss:** >15 dB at 270 Mb/s

**Wide Band Jitter:** <0.2 UI

#### Analog Audio Inputs:

**Number of Inputs:** 4

**Type:** Balanced analog audio

**Connector:** 12 pin removal terminal block

**Input impedance:** High Impedance (>20KΩ)

**Freq. Response:** +/-0.1 dB, 20Hz to 20 kHz

**THD 20Hz-20kHz:** < 0.005%

**Channel Phase Diff.:** +/- 1°

**SNR (weighted):** > 85dB with input @24dBu (nominal)

#### Max. Audio Input

**Level:** +24 dBu

**Signal Quantization:** 24 bits

#### Electrical:

**Voltage:** +12VDC

**Power:** 10 Watts

**EMI/RFI:** Complies with FCC Part 15, Class A

EU EMC directive

#### Physical:

**Number of slots:** 1

#### Ordering Information:

**7721AE-A4-HD** HD/SD Analog Audio Embedder

#### Ordering Options

Rear must be specified at time of order

Eg: Model +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe

**+1RU** 1RU Rear Plate for use with 7701FR Multiframe

**+SA** Standalone Enclosure Rear Plate

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules

**7701FR** 1RU Multiframe which holds 3 modules

**S7701FR** Standalone Enclosure



The 7721DE4-HD Quad Serial data embedder inserts 4 x RS-232 or RS422 serial data streams and GPI contact closure information into a 270 Mb/s SD-SDI or 1.5Gb/s HD-SDI video signal. The RS-232/422 serial data and GPI information are first formatted into an AES audio signal, then embedded into the video stream according to SMPTE 272M-A for SD-SDI and SMPTE 292M for HD-SDI. A data error detection and correction scheme is also applied to maintain data integrity for the data de-embedder at the receiver end. At the embedded packet layer, data packets resemble and have the same group DIDs as embedded audio packets. The data is packetized and inserted into the AES sub-frame according to SMPTE 337M.

Adding the +GPI option to the encoder (model 7721DE4-HD+GPI) allows the user to encode remote control contact closure information in VITC (SD) or RP188 ATC (HD) user bits instead of encoding the GPI information into the AES embedded data stream. This feature allows the user to use the six parallel remote control inputs to set one of the six remote control user bit patterns. At the decoder end the model 7721DD4-HD+GPI Decoder module decodes the remote control user bits and outputs them on six open collector outputs.

The 7721DE4-HD series modules occupy one card slots in the 3RU frame (7700FR-C), which will hold up to 15 modules or one slot in the 1RU frame (7701FR), which will hold up to three modules. The 7721DE4-HD series modules may also be used in a standalone unit (S7701FR).

## Features

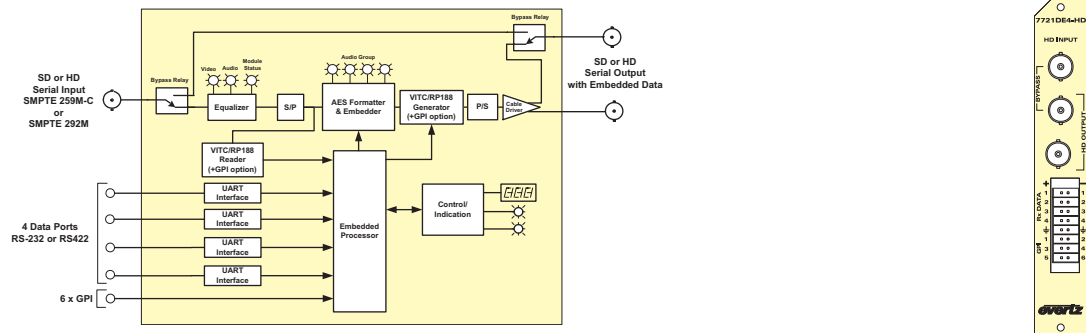
- Automatic detection of SD-SDI or HD-SDI video input
- 4 x RS232/422 serial inputs with selectable baud rate
- Parity selection: none, even or odd
- Support serial input with BREAK character according to SMPTE 207M
- Packetize data into sub-frame AES format according to SMPTE 337M
- Share the same group DIDs as for embedded audio, selectable from group 1 to 4
- Group selection for mapping data into one of four Audio Groups
- Redundant data transmission to allow data error detection and correction at the receiver end

- Automatically remove the existing embedded packets when the conflict of group DID occurs
- Six GPI inputs to embed simple control information into the video input
- Card edge LEDs indicate video signal and data presence, cable equalization and module fault

## Additional Features with +GPI option installed

- Transmits remote control contact closure information in VITC or ATC user bits (instead of encoding the GPI information into AES data)

## 7721DE4-HD Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

**Standard:** SMPTE 259M C, SMPTE 292M  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic 300m @ 270 Mb/s, 100m@1.5Gb/s with Belden 1694A or equivalent cable  
**Return Loss:** > 15 dB up to 1.5Gb/s

### Serial Video Outputs with Embedded Data:

**Number of Outputs:** 2 outputs (1 with bypass relay protected)  
**Standard:** Same as input  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 600ps nominal SD-SDI  
 200ps nominal HD-SDI  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 15 dB up to 1.5Gb/s (Relay Protected)  
 > 10 dB up to 1.5Gb/s  
**Wide Band Jitter:** < 0.2 UI

### Data Input:

**Standard:** 4 x RS-232 or RS-422  
**Connector:** Terminal Block  
**Baud Rate:** 110, 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, or 115200  
**Format:** 8 data bits, parity (none, even or odd), 1 or 2 stop bits

### General Purpose Inputs:

**Number of Inputs:** 6  
**Type:** Normally open relay contact  
**Connector:** Terminal Block  
**Signal Level:** Internal pullup to +5V or +12V nominal (jumper selectable)

### Time Code (+GPI OPTION ONLY):

#### Ancillary Time Code Generator/Reader (ATC) - HD video standards only:

**Standard:** SMPTE RP188  
**Generator Lines:** VITC packets - Line 9, 571; LTC packets - Line 10 as per RP188  
**Reader Line:** Autodetect

#### Vertical Interval Time Code Generator/Reader (VITC) - SD video standards only:

**Standard:** SMPTE 12M, SMPTE 266M D-VITC  
**Line Range:** 525i/59.94: 10 to 21  
 625i/50: 6 to 22  
**Generator Lines:** Follows input VITC or user selectable when no input VITC  
**Reader Line:** Autodetect or user selectable

#### Embedding Delay:

**Video I/O Delay** Approximately 12ms

#### Delay Embedding Delay - Serial Ports

**Average latency:** 1200µs +/- 20% (All Baud rates)

#### Delay For Data Embedding - GPI Signals

**Average latency:** 20µs +/- 10%

#### Delay For Time Code Embedding - GPI signals (+GPI option only)

**Encoding latency:** 1 frame plus GPI sampling delay (GPI inputs sampled once per frame at beginning of field 1)

#### Electrical:

**Voltage:** +12VDC  
**Power:** 12 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

### Ordering Information:

**7721DE4-HD** Quad Serial Data Embedder

### Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

#### +GPI

Encode GPI into VITC/RP188ATC

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



# Quad Serial Data De-embedder

## 7721DD4-HD

The 7721DD4-HD Quad Serial data de-embedder extracts 4 x RS-232 or RS422 serial data streams and GPI contact closure information from a 270 Mb/s SD-SDI or 1.5Gb/s HD-SDI video signal. A data error detection and correction scheme is also applied to maintain data integrity on the output of the data de-embedder. At the embedded packet layer, data packets resemble and have the same group DIDs as embedded audio packets. The data is un-packetized and extracted from the AES sub-frame according to SMPTE 337M.

Adding the +GPI option to the decoder (model 7721DD4-HD+GPI) allows the user to decode remote control contact closure information from VITC (SD) or RP188 ATC (HD) user bits instead of decoding the GPI information from the AES embedded data stream. This feature allows the user to use remote control user bit patterns to control the six GPO relay outputs. At the encoder end the 7721DE4-HD+GPI GPI Encoder module encodes the remote control user bits in VITC or RP188 ATC.

The 7721DE4-HD series modules occupy one card slots in the 3RU frame (7700FR-C), which will hold up to 15 modules or one slot in the 1RU frame (7701FR), which will hold up to three modules. The 7721DE4-HD series modules may also be used in a standalone unit (S7701FR).

### Features

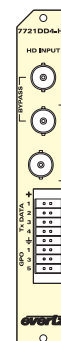
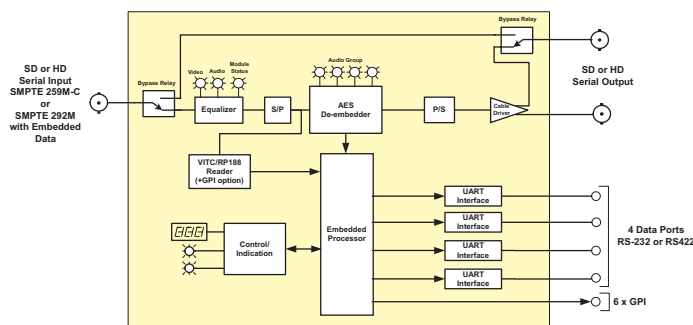
- Automatic detection of SD-SDI or HD-SDI video input
- 4 x RS232/422 serial outputs with selectable baud rate
- Parity selection: none, even or odd
- Support serial output with BREAK character according to SMPTE 207M
- Packetize data into sub-frame AES format according to SMPTE 337M
- Share the same group DIDs as for embedded audio, selectable from group 1 to 4
- Group selection for extracting data from one of four Audio Groups

- Redundant data transmission to allow data error detection and correction
- Automatically remove the existing embedded packets when the conflict of group DID occurs
- Six GPI outputs to embed simple control information into the video input
- Card edge LEDs indicate video signal and data presence, cable equalization and module fault

### Additional Features with +GPI option installed

- Decodes GPO relay contact closure information from VITC or ATC user bits (instead of decoding the GPI information from AES data)

### 7721DD4-HD Block Diagram & Rear Panel



### Specifications

#### Serial Video Input:

Standard:	SMPTE 259M C, SMPTE 292M
Connector:	BNC per IEC 60169-8 Amendment 2
Equalization:	Automatic 300m @ 270 Mb/s, 100m@1.5Gb/s with Belden 1694A or equivalent cable
Return Loss:	> 15 dB up to 1.5Gb/s

#### Serial Video Outputs with Embedded Data:

Number of Outputs:	2 outputs (1 with bypass relay protected)
Standard:	Same as input
Connectors:	BNC per IEC 60169-8 Amendment 2
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	600ps nominal SD-SDI 200ps nominal HD-SDI
Overshoot:	<10% of amplitude
Return Loss:	> 15 dB up to 1.5Gb/s (Relay Protected) > 10 dB up to 1.5Gb/s
Wide Band Jitter:	< 0.2 UI

#### Data Output:

Standard:	4 x RS-232 or RS-422
Connector:	Terminal Block
Baud Rate:	110, 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, or 115200
Format:	8 data bits, parity (none, even or odd), 1 or 2 stop bits

#### General Purpose Outputs:

Number of Inputs:	6
Type:	Normally open relay contact
Connector:	Terminal Block
Signal Level:	Internal pullup to +5V or +12V nominal (jumper selectable) For other voltages up to 50VDC remove jumper
Max Current:	2A

#### Time Code (+GPI OPTION ONLY):

##### Ancillary Time Code Generator/Reader (ATC) - HD video Standards only:

Standard:	SMPTE RP188
Reader Line:	Autodetect

##### Vertical Interval Time Code Generator/Reader (VITC) - SD video Standards only:

Standard:	SMPTE 12M, SMPTE 266M D-VITC
Line Range:	525I/59.94: 10 to 21 625I/50: 6 to 22
Reader Line:	Autodetect or user selectable

#### Embedding Delay:

Video I/O Delay	Approximately 12ms
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#### Delay De-embedding Delay - Serial Ports

Average latency (μs):	1200 +/- 20% (All Baud rates)
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#### Delay For Data De-embedding - GPO Outputs

Average latency (μs):	1200 +/- 10%
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#### Delay For Time Code Embedding - GPO Outputs (+GPI option only)

Decoding latency:	1 frame
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#### Electrical:

Voltage:	+12VDC
Power:	12 Watts
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

Number of slots:	1
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#### Ordering Information:

7721DD4-HD	Quad Serial Data De-embedder
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#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

+GPI	GPI option for 7721DD4-HD
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#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure



The 7721AE-A4 Analog Audio Embedder performs A/D conversion on 4 balanced pairs of analog audio (as one audio group) and embeds them into a 270 Mb/s serial SD input video signal as specified by SMPTE 272M. The companion 7720AD-A4 Audio De-embedder facilitates audio de-multiplexing at the destination.

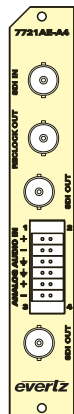
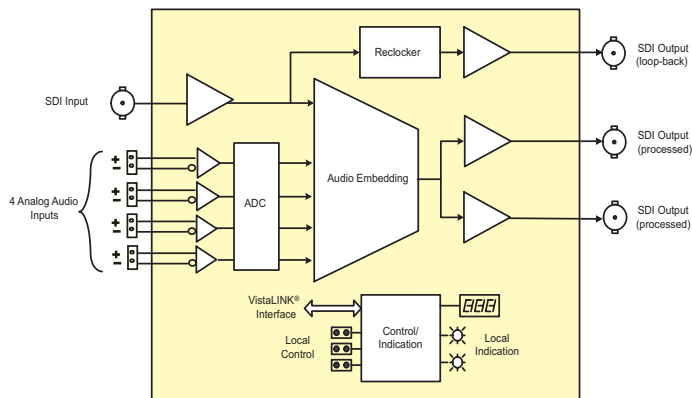
The 7721AE-A4 occupies one card slot in the 3RU frame (7700FR-C), which will hold up to 15 1-slot modules or one slot in the 1RU frame (7701FR), which will hold up to three modules. The 7721AE-A4 also comes in a standalone unit (S7701FR).

VistaLINK® enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as Evertz VistaLINK® PRO.

## Features

- Automatic detection of video input format
- Supports 270Mb/s SD per SMPTE 59M-C, and SDTi per SMPTE 305M
- Programmable audio delays (up to 5 frames or 84 milliseconds)
- Selectable ancillary packet cleaning mode removes all audio before embedding
- Individual audio channel assignment for embedded audio group
- Audio mixer per audio channel to provide voice-over
- Upstream embedded Dolby E compatible (passed through)
- Monitoring headphone jack for audio input and embedded audio output
- Comprehensive signal and card status monitoring via four-character card-edge display and LEDs
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® Pro) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

## 7721AE-A4 Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

**Standard:** Auto detect  
270 Mb/s SMPTE 259M-C, 525 or 625 line component, SMPTE 305M, (SDTi)

**Connector:** 1 BNC per IEC 60169-8 Amendment 2

**Equalization:** Automatic to 300m @ 270 Mb/s with Belden 1694A or equivalent cable

**Return Loss:** > 15 dB up to 270 Mb/s

### Serial Video Output:

**Number of Outputs:** 1 Reclocked Loopback  
2 same as input with embedded audio

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V ± 0.5V

**Rise and Fall Time:** 900ps nominal

**Overshoot:** <10% of amplitude

**Return Loss:** >15 dB at 270 Mb/s

**Wide Band Jitter:** <0.2 UI

### Analog Audio Inputs:

**Number of Inputs:** 4

**Type:** Balanced analog audio

**Connector:** 12 pin removal terminal block

**Input impedance:** High Impedance (>20kΩ)

**Freq. Response:** +/-0.1 dB, 20Hz to 20kHz

**THD 20Hz-20kHz:** < 0.005%

**Channel Phase Diff.:** +/- 1°

**SNR (weighted):** >85dB with input @24dBu (nominal)

### Max. Audio Input

**Level:** +24 dBu

**Signal Quantization:** 20 bits

### Electrical:

**Voltage:** +12VDC

**Power:** 10 Watts

**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC directive

### Physical:

**Number of slots:** 1

### Ordering Information:

**7721AE-A4** SD Analog Audio Embedder

### Ordering Options

Rear must be specified at time of order  
Eg: Model +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe

**+1RU** 1RU Rear Plate for use with 7701FR Multiframe

**+SA** Standalone Enclosure Rear Plate

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules

**7701FR** 1RU Multiframe which holds 3 modules

**S7701FR** Standalone Enclosure



# SDI 4 AES Pair Audio Embedder 7720AE4

The 7720AE4 Audio Embedder inserts AES audio signals into a 270 Mb/s SDI video signal as specified in SMPTE 272M. The companion 7720AD4 Audio De-embedder facilitates audio demultiplexing at the destination.

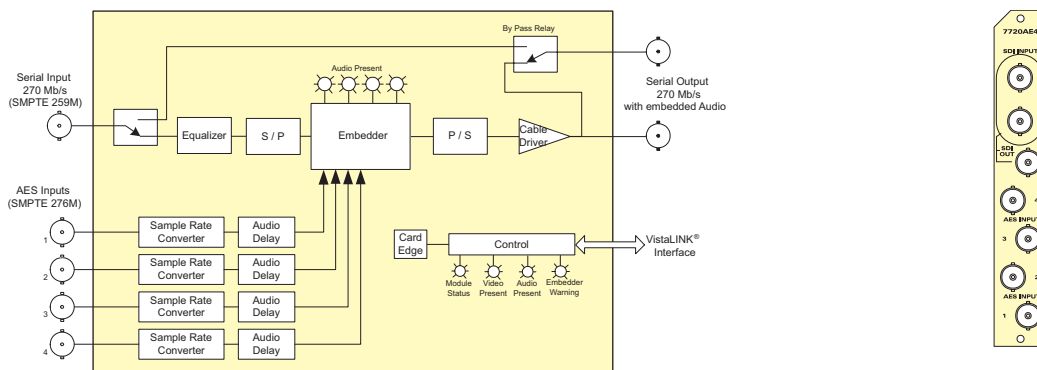
SMPTE 272M allocates four groups of four audio channels that can be embedded into the SMPTE 259M bitstream. The 7720AE4 embeds up to 4 AES audio signals into two groups on the SDI outputs for discrete 5.1 audio applications. The 7720AE4 is Dolby E compliant when the sample rate converters are turned off.

VistaLINK® enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as Evertz VistaLINK® PRO locally or remotely.

## Features

- Automatic detection of 525 line and 625 line input
- Bypass relay protection on one SDI output for power failures
- 20-bit AES input and audio embedding
- Individual audio group assignment for each group
- Group lock mode maintains phase relationship between the groups for 5.1 audio applications
- Sample rate conversion disable on AES inputs to permit Dolby E embedding
- Programmable audio delays (up to 7 frames in ½ video field increments using DIP switches or up to 1.3 sec in 1 sample increments with VistaLINK® control)
- Ancillary packet cleaning mode removes all audio before embedding
- Ancillary packet reformatting mode left justifies and removes unused packets before embedding
- Embeds audio on internally generated black or blue video when there is no video input
- Card edge LEDs indicate video and audio signal presence, and module fault
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

## 7720AE4 Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

Standard: SMPTE 259M-C (270 Mb/s) 525 or 625 line component  
Connector: 1 BNC per IEC 60169-8 Amendment 2  
Equalization: Automatic 210m @ 270 Mb/s with Belden 8281 or equivalent cable  
Return Loss: > 15 dB up to 540 Mb/s

### Serial Video Outputs with Embedded Audio:

Standard: Same as input  
Number of Outputs: 2 (1 output bypass relay protected)  
Embedded Audio: SMPTE 272M - 20 bit 48 kHz synchronous  
Connectors: BNC per IEC 60169-8 Amendment 2  
Signal Level: 800mV nominal  
DC Offset: 0V ±0.5V  
Rise and Fall Time: 900ps nominal  
Overshoot: <10% of amplitude  
Return Loss: > 15 dB up to 540 Mb/s  
Wide Band Jitter: < 0.2 UI

### AES Audio Inputs:

Number of Inputs: 4  
Standard: SMPTE 276M, single ended AES  
Connector: BNC per IEC 60169-8 Amendment 2  
Resolution: 20 bits  
Sampling Rate: 32 to 96 kHz synchronous or asynchronous (48 kHz synchronous AES required when sample rate converter is disabled)  
Impedance: 75Ω unbalanced  
Signal Level: 1V p-p ±0.1V

### System Performance:

Embedding Latency: 1.3 to 3 ms  
Audio Delay  
DIP Switch Control: Up to 7 frames, ½ frame increments (delay applied to all AES channels)  
VistaLINK® or Serial Port Control: Up to 1.35 seconds in 1 sample increments (independent control of delay for each channel)

### Electrical:

Voltage: +12VDC  
Power: 9 Watts  
EMI/RFI: Complies with FCC Part 15, Class A  
EU EMC Directive

### Physical:

7700 or 7701 frame mounting:  
Number of slots: 1

### Ordering Information:

7720AE4 SDI 4 AES Pair Audio Embedder

### Ordering Options:

Rear Plate must be specified at time of order  
Eg: Model +3RU

### Rear Plate Suffix

+3RU 3RU Rear Plate for use with 7700FR-C Multiframe  
+1RU 1RU Rear Plate for use with 7701FR Multiframe  
+SA Standalone Enclosure Rear Plate

### Accessories:

7700FC VistaLINK® Frame Controller  
9000NCP 1RU VistaLINK® General Purpose Network Control Panel  
9000NCP2 2RU VistaLINK® General Purpose Network Control Panel

### Enclosures:

7700FR-C 3RU Multiframe which holds 15 modules  
7701FR 1RU Multiframe which holds 3 modules  
S7701FR Standalone enclosure

	Audio Outputs		Video 270Mb/s SDI Re-clocked Outputs
Model	AES	Analog	
7720AD-A4	2 Unbalanced	4	--
7720AD-B-A4-LTC	2 Balanced	3 +LTC or 4	--
7720AD4	4 Unbalanced	--	2
7720AD4-B	4 Balanced	--	1

- 7720AD-B-A4-LTC has 4 balanced audio outputs or 3 audio outputs and one VITC to LTC translator output - selection of VITC reader line
- With exception of the 7720AD-B-A4-LTC, all cards are VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® PRO) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

The diagram illustrates the system architecture for the 7720AD4 & 7720AD4-B only configuration. It shows the flow of data from a serial input through various processing blocks to multiple output types.

**Serial Input:** 270 Mb/s (SMPTE 259M) with embedded Audio.

**Processing Blocks:**

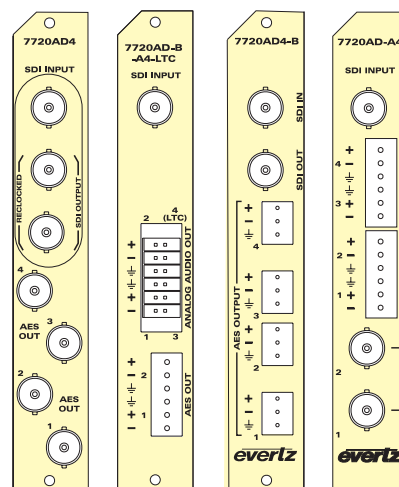
- Equalizer:** Receives the serial input.
- S / P:** Serial to Parallel converter.
- De-Embedder:** Receives audio groups from the S/P block and outputs to AES Formatters and D to A Converters.
- AES Formatters:** Four AES Formatters (2 for 7720AD4, 2 for 7720AD4-B) output to Cable Drivers.
- D to A Converters:** Two D to A Converters (for 7720AD-A4 and 7720AD-B-A4-LTC only) output to Balanced Analog Audio Outputs.

**Outputs:**

- Serial Outputs:** 270 Mb/s. 7720AD4 has 2 outputs, 7720AD4-B has 1 output.
- AES Outputs:** All cards 75 Ohm BNC except 7720AD4-B and 7720AD-B-A4-LTC which are balanced.
- Balanced Analog Audio Outputs:** Four balanced analog audio outputs.

**Control and Interface:**

- Control:** Receives VistALINK® Interface signals and outputs to Card Edge.
- Card Edge:** Outputs Module Status, Video Present, and Audio Present signals.





# SDI AES Pair Audio De-embedder

## 7720AD-A4/AD4/AD4-B & 7720AD-B-A4-LTC

### Specifications

#### Serial Video Input:

**Standard:** SMPTE 259M C - 525 and 625 component  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic 300m @ 270 Mb/s with Belden 8281 or equivalent cable  
**Return Loss:** > 15 dB up to 540 Mb/s

#### Reclocked Serial Video Outputs:

**Standard:** Same as input  
**Number of Outputs:** 1 on 7720AD4-B, 2 on 7720AD4  
 0 on 7720AD-A4 & 7720AD-B-A4-LTC  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V  $\pm$ 0.5V  
**Rise and Fall Time:** 700ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 15 dB up to 270 Mb/s  
**Wide Band Jitter:** < 0.2 UI

#### Unbalanced AES Audio Outputs (Not on -B versions):

**Standard:** SMPTE 276M, single ended synchronous AES  
**Number of Outputs:** 2 on 7720AD-A4, 4 on 7720AD4  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Sampling Rate:** 48 kHz  
**Impedance:** 75  $\Omega$  unbalanced  
**Dynamic Range:** 20-bit

#### Balanced AES Audio Outputs (B-versions only):

**Standard:** AES3-1992  
**Number of Outputs:** 2 on 7720AD-B-A4-LTC  
 4 on 7720AD4-B  
**Connector:** Terminal strip  
**Sampling Rate:** 48 kHz  
**Impedance:** 110 $\Omega$   
**Dynamic Range:** 20-bit

#### Input to Output Processing Delay:

**SDI to AES:** 1.35 ms (A4 versions)  
 600  $\mu$ s all other versions  
**SDI to Analog:** 2.25 ms (A4 versions)

#### Analog Audio Outputs (A4 Versions Only):

**Number of Outputs:** 4  
**Type:** Balanced analog audio  
**Connector:** Terminal strip  
**Output Impedance:** 66  $\Omega$  balanced  
**Sampling Frequency:** 48kHz  
**Signal Level:** 0dB FS =>8 to 24dBu into 10 k $\Omega$  loads (user settable)  
 0dB FS =>8 to 22dBu into 600  $\Omega$  loads (user settable)  
**Frequency Response:** <  $\pm$  0.1dB (20Hz to 20kHz)  
**THD+N:** > 90dB RMS @ 1kHz, with 24dBu output  
 > 100dB RMS @ 20Hz to 20kHz, with 24dBu output  
**Crosstalk isolation:** > 100dB RMS (20Hz to 20kHz)

#### Electrical:

**Voltage:** +12VDC  
**Power:** 12 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

#### Physical:

**Number of slots:** 1

#### Ordering Information:

**7720AD-A4** SDI AES Audio De-embedder with 2 unbalanced AES outputs and 4 analog audio outputs  
**7720AD-B-A4-LTC** SDI AES Audio De-embedder with 2 balanced AES outputs, 4 analog audio outputs and VITC to LTC Translator  
**7720AD4** SDI AES Audio De-embedder with 4 unbalanced AES outputs (2 audio groups)  
**7720AD4-B** SDI AES Audio De-embedder with 4 balanced AES outputs (2 audio groups)

#### Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



The 7720AD8-DD-HD Audio De-embedder and Dolby® Decoder & Re-embedder extracts embedded audio from 4 specified groups as defined by SMPTE 299M from a 1.5 Gb/s serial HDTV or as defined by SMPTE 272M from a 270Mb/s serial SDTV video signal.

One selected channel is processed by the on-card Dolby Decoder. If the channel contains Dolby E or Dolby Digital (AC3), it will yield up to 8 additional discrete audio channels, 2 channels of stereo downmix and the associated Dolby E metadata. Up to 16 selected channels may be optionally delayed up to 1.2 seconds and re-embedded into the output video and/or directed to AES outputs. Video output may be optionally delayed to help with lip sync. If PCM audio is embedded, the device acts as a simple 4 group audio de-embedder.

This device also handles the Dolby E Metadata. Metadata is optionally embedded in VANC and can be provided as an output for downstream devices (i.e. Dolby Encoders, Multichannel Audio Tool, etc.). Metadata can be monitored using VistaLINK® and dial norm parameters can be modified.

For lip sync cohesion and ease of editing, Dolby-E data is organized in blocks with lengths matching the associated video frame. The decoder will match the beginning of each output block with the start of video, as provided with the genlock input. Additional delay can be dialed up by the user, up to 1.2 secs. The 8 AES inputs can be configured as a backup, in the event the primary is lost, or as a voice-over source.

VistaLINK® enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as Evertz VistaLINK® PRO locally or remotely.

### Features

- Audio de-embedder and re-embedder for 4 groups of audio
- Dolby® E/AC3 decoding for selected audio source
- Dolby Metadata is embedded in HD VANC for downstream device decoding
- 8 AES inputs for backup, voice-over or Dolby E/AC3 content
- Adjustable video delay to match Dolby decoder audio delay
- Automatic switchover to backup audio source on loss of selected Dolby stream
- Headphone jack for monitoring stereo down-mix or any input source
- Two full audio mixers with 16 output channels
- Card edge display
- VistaLINK® - capable offering remote monitoring, control and configuration capabilities via SNMP. VistaLINK® is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame

### Inputs:

- Program input supporting both HD (1.5Gb/s) and SD (270Mb/s)
- Reference input supporting NTSCM, PAL-B and tri-level for meta data phasing
- 8 AES inputs for backup/voice-over source
- Metadata input

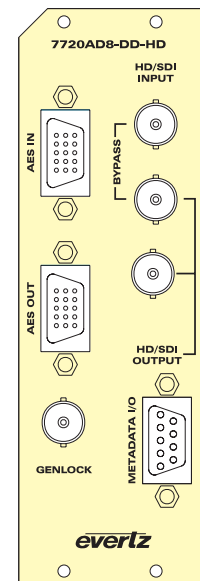
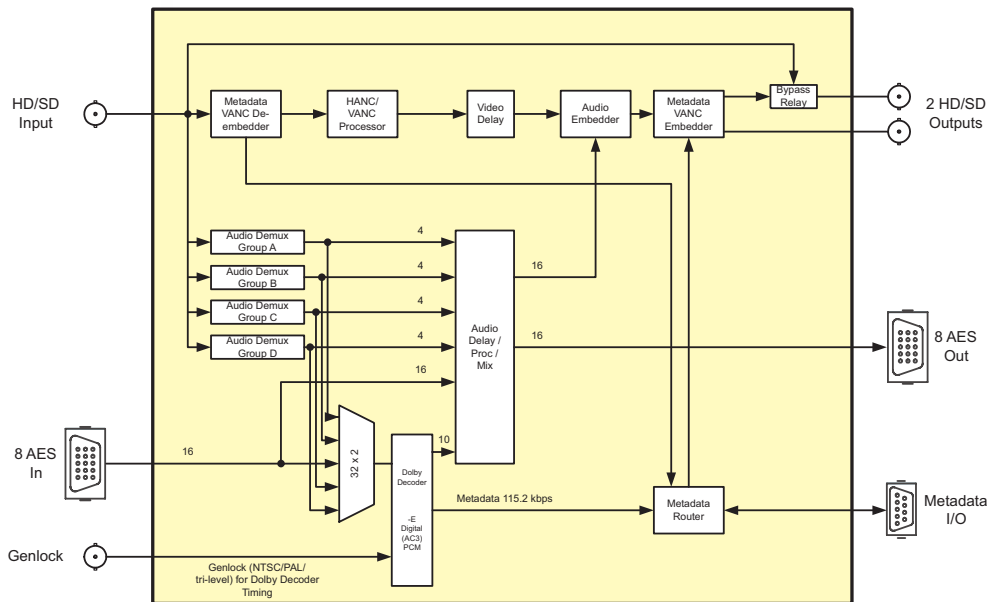
### Outputs:

- 2 processed HD outputs (1 protected with bypass relay)
- 8 AES de-embedded and processed outputs
- 1 DB-9 Dolby metadata (RS422/485) on same connector as input

### Card Edge LED's:

- Module Status
- Video Signal presence
- Selected audio group presence
- Dolby decoder processing status
- Genlock health/compatibility
- AES signal presence

### 7720AD8-DD-HD Block Diagram & Rear Panel



\*DB15 to 8 channel unbalanced AES adapter provided



# HD/SD Audio De-embedder & Dolby E/AC-3 Decoder & Re-embedder

## 7720AD8-DD-HD

### Specifications

#### Serial Video Input:

Standard:	SMPTE 292M, (1080i/60, 1080i/59.94, 1080i/50, 1080p/30(sF), 1080p/29.97(sF), 1080p/25(sF), 1080p/24(sF), 1080p/23.98(sF), 720p/50, 720p/60, 720p/59.94, 1035i/60, 1035i/59.94) SMPTE 259M-C (270Mb/s) 525 or 625 line component
Connector:	BNC per IEC 60169-8 Amendment 2
Equalization:	
HD:	115m @1.5Gb/s with Belden 1694A
SD:	300m @270MB/s with Belden 1694A

#### Processed Serial Video Output:

Standard:	Same as input or user controlled
Number of Outputs:	2
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	800mV nominal
DC Offset:	0V $\pm$ 0.5V
Rise and Fall Time:	Per standard
Overshoot:	<10% of amplitude
Wide Band Jitter:	
HD:	<0.16 UI
SD:	<0.10 UI

#### Metadata I/O:

Type:	Dolby E Metadata
Connector:	Female DB-9
Baud Rate:	115,200 baud

#### AES Audio Input:

Standard:	SMPTE 276M
Number of Inputs:	8 unbalanced
Connector:	Female High Density DB-15 (breakout cable to BNC provided)
Input Level:	0.1 to 2.5 Vp-p (5Vp-p tolerant)
Input Impedance:	75 $\Omega$
Return Loss:	>25dB 100kHz to 6MHz
Equalization:	Automatic to 1000m with Belden 1694A (or equivalent) @ 48kHz AES signal
Sample Rate:	32kHz to 48kHz

#### AES Audio Output:

Standard:	SMPTE 276M, single ended AES
Number of Outputs:	8 unbalanced
Connector:	Female High Density DB-15 (breakout cable to BNC provided)
Sample Rate:	48kHz
Impedance:	75 $\Omega$
Resolution:	Up to 24-bit

#### Genlock Input:

Type:	NTSC, PAL, black or any tri-level, all autodetect
Connector:	1 BNC per IEC 60169-8 Amendment 2
Impedance:	hi-Z or 75 $\Omega$ (jumper configurable)
Return Loss:	>40dB to 10MHz

#### System Performance:

AC3 Decode Delay:	32ms nominal
Dolby E Decode Delay:	1 frame nominal
De-embedding Latency:	600 $\mu$ s nominal
Additional Audio Delay:	0 to maximum video delay +1 frame
Additional Video Delay:	0 to 12 frames (interlace) 0 to 28 frames (progressive)

#### Electrical:

Voltage:	+12V DC
Power:	21 Watts
EMI/RFI:	Complies with FCC Part 15 Class A, EU EMC Directive

#### Physical:

Number of Slots:	
7700 frame mounting:	2
7701 frame mounting:	1

#### Ordering Information:

7720AD8-DD-HD	HD/SD Audio De-embedder & Dolby E/AC-3 Decoder & Re-embedder
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#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Accessories:

WPAES8-BNCM-6F cable (included)

#### Enclosures:

7700FR-C	3RU Multiframe, which holds 15 modules
7701FR	1RU Multiframe, which holds 3 modules
S7701FR	Standalone Enclosure



The 7720AE8-DE-HD Audio Embedder & Dolby E Encoder inserts 8 AES inputs as 4 embedded audio groups into a 1.5Gb/s HD or a 270Mb/s SD video signal as specified by SMPTE 299M or 272M respectively.

Eight channels can be processed by the on-card Dolby Encoder. The encoder will transform the 8 discrete channels into 2 channels containing Dolby E and the associated Dolby E metadata. The 2 channels of Dolby E can be embedded into the video output or output to an AES. This device also handles the Dolby E Metadata. Metadata is optionally embedded in VANC and can be provided as an output for downstream devices (i.e. Dolby Encoders, Multichannel Audio Tool, etc.).

Up to 16 selected channels may be optionally delayed up to 1.2 seconds and embedded into the output video and/or directed to AES outputs. Video output may be optionally delayed to help with lip sync.

For lip sync cohesion and ease of editing, Dolby E data is organized in blocks with lengths matching the associated video frame. The encoder will match the beginning of each output block with the start of video, as provided with the genlock input. Up to 1.2 seconds of additional delay can be dialed up by the user.

VistaLINK® enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as Evertz VistaLINK® PRO locally or remotely.

## Features

- Automatic switchover to backup audio source on loss of selected Dolby stream
- Adjustable video delay to match Dolby Encoder audio delay
- Headphone jack with monitoring stereo down-mix or any input source
- Dolby Metadata is embedded in HD VANC for downstream device decoding
- 8 AES output for backup or Dolby E content
- Card edge display
- Flexible audio channel mixer

## Inputs:

- Program output bypass relay protected
- SMPTE 292M - (1.5Gb/s serial digital), or SMPTE 259M
- Genlock NTSC-M, PAL-B, any tri-level
- 8 AES inputs
- Metadata input

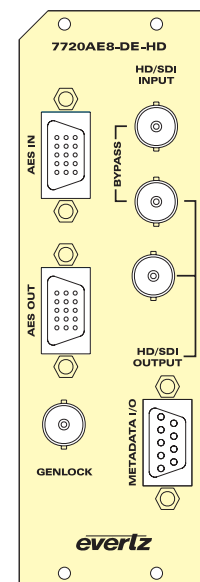
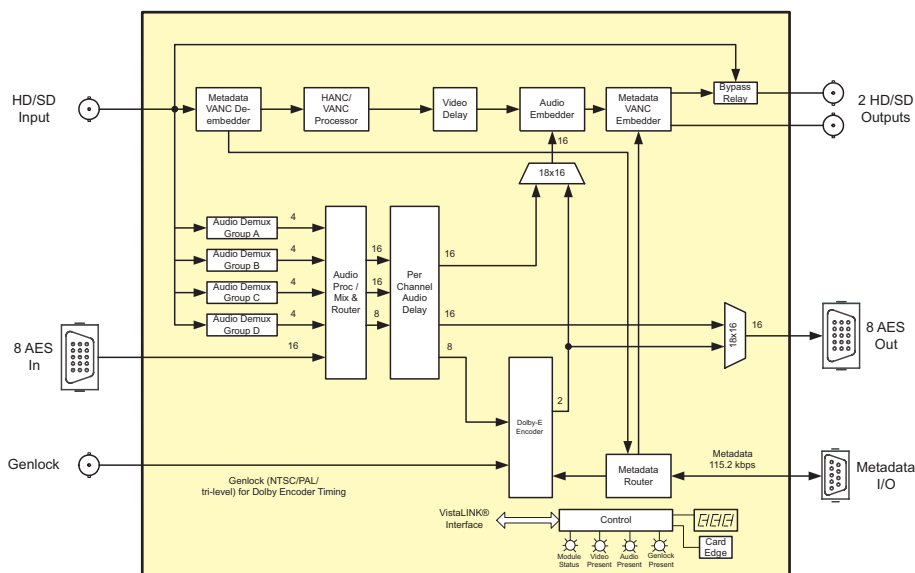
## Outputs:

- 2 processed HD outputs (1 protected with bypass relay)
- 8 AES de-embedded and processed outputs (for backup or Dolby E content)
- 1 DB-9 Dolby metadata (RS422/485) on same connector as input

## Card Edge LED's:

- Module Status
- Video Signal presence
- Selected audio group presence
- Dolby encoder processing status
- Genlock health/compatibility
- AES signal presence

## 7720AE8-DE-HD Block Diagram & Rear Panel



\*DB15 to 8 channel unbalanced AES adapter provided



## Specifications

### Serial Video Input:

Standard:	SMPTE 292M, (1080i/60, 1080i/59.94, 1080i/50, 1080p/30(sF), 1080p/29.97(sF), 1080p/25(sF), 1080p/24(sF), 1080p/23.98(sF), 720p/50, 720p/60, 720p/59.94, 1035i/60, 1035i/59.94) SMPTE 259M-C (270Mb/s) 525 or 625 line component BNC per IEC 60169-8 Amendment 2
Connector:	
Equalization:	
HD:	115m @1.5Gb/s with Belden 1694A
SD:	300m @270MB/s with Belden 1694A

### Processed Serial Video Output:

Standard:	Same as input or user controlled
Number of Outputs:	2
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	800mV nominal
DC Offset:	0V $\pm$ 0.5V
Rise and Fall Time:	Per standard
Overshoot:	<10% of amplitude
Wide Band Jitter:	
HD:	<0.16 UI
SD:	<0.10 UI

### Metadata I/O:

Type:	Dolby E Metadata
Connector:	Female DB-9
Baud Rate:	115,200 baud

### AES Audio Input:

Standard:	SMPTE 276M
Number of Inputs:	8 unbalanced
Connector:	Female High Density DB-15 (breakout cable to BNC provided)
Input Level:	0.1 to 2.5 Vp-p (5Vp-p tolerant)
Input Impedance:	75 $\Omega$
Return Loss:	>25dB 100kHz to 6MHz
Equalization:	Automatic to 1000m with Belden 1694A (or equivalent) @ 48kHz AES signal
Sample Rate:	48kHz $\pm$ 100ppm

### AES Audio Output:

Standard:	SMPTE 276M, single ended AES
Number of Outputs:	8 unbalanced
Connector:	Female High Density DB-15 (breakout cable to BNC provided)
Sample Rate:	48kHz
Impedance:	75 $\Omega$
Resolution:	Up to 24-bit

### Genlock Input:

Type:	NTSC, PAL, black or any tri-level, all autodetect
Connector:	1 BNC per IEC 60169-8 Amendment 2
Impedance:	hi-Z or 75 $\Omega$ (jumper configurable)
Return Loss:	>40dB to 10MHz

### Electrical:

Voltage:	+12V DC
Power:	21 Watts
EMI/RFI:	Complies with FCC Part 15 Class A, EU EMC Directive

### Number of Slots:

7700 frame mounting:	2
7701 frame mounting:	1

### Ordering Information:

7720AE8-DE-HD	HD/SD Audio Embedder & Dolby E Encoder & Re-embedder
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### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

### Accessories:

WPAES8-BNCM-6F cable (included)

### Enclosures:

7700FR-C	3RU Multiframe, which holds 15 modules
7701FR	1RU Multiframe, which holds 3 modules
S7701FR	Standalone Enclosure

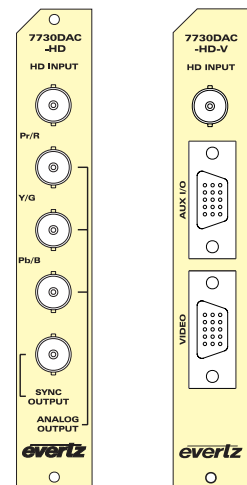
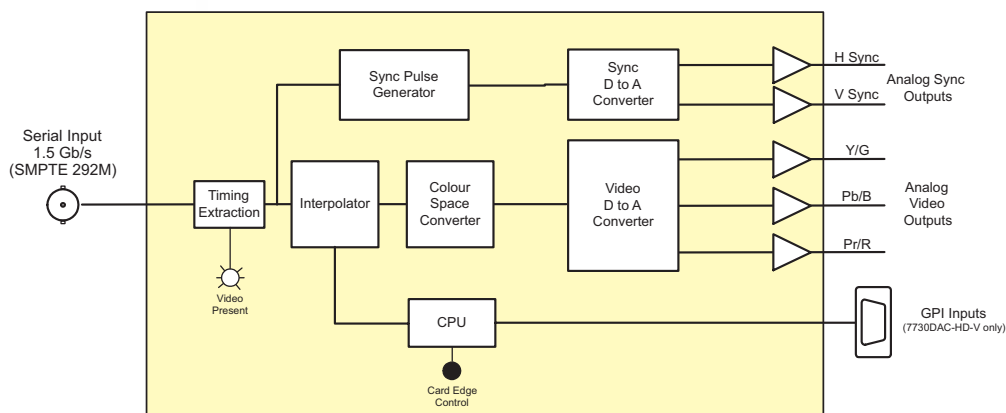
The 7730DAC-HD is a professional quality digital to analog converter for HDTV. The 7730DAC-HD supports all signal standards specified in SMPTE 274M and SMPTE 296M.

Card edge control allows the user to select RGB, YPrPb or VGA outputs. User controlled 4:3 alignment markers also allow for convenient framing of the video signal. The 7730DAC-HD is available in two versions to easily interface to standard broadcast monitors or VGA computer monitors.

### Features

- Support for all SMPTE 274M and 296M video formats
- Full 10-bit Broadcast quality
- 4:4:4 Interpolated Component Output
- Card edge selectable YPrPb/RGB/VGA outputs
- GPI controllable 4:3 alignment markers
- Optional rear connector plates for use with VGA computer monitors

### 7730DAC-HD Block Diagram & Rear Panels



### Specifications

#### Serial Video Input:

**Standard:** SMPTE 292M  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic 125m @ 1.5Gb/s with Belden 1694A (or equivalent)

#### Analog Video Outputs:

**Standard:** SMPTE 274M, 296M per nominal  
**Video:** 1V p-p YPrPb/RGB or 0.7V p-p VGA  
**Sync:** 300mV or 4V per nominal  
**Impedance:** 75Ω  
**Connector:** 4 BNC per IEC 60169-8 Amendment 2 (7730DAC-HD)  
 Female High Density DB15 (7730DAC-HD-V)  
**DC Offset:** 0V ±0.1V

#### General Purpose Inputs (7730DAC-HD-V only):

**Number of Inputs:** 4  
**Type:** Opto-isolated, active low with internal pull-ups to Vext pin  
 May be internally jumped to +5V  
**Connector:** Male High Density DB-15  
**Signal Level:** +5V nominal

#### Electrical:

**Voltage:** +12V DC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

#### Physical:

**Number of Slots:** 1

#### Ordering Information:

**7730DAC-HD:** HD D to A Converter, YPrPb/RGB +Sync via BNC Outputs

#### Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

**+V** VGA output

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Accessories:

**WPVGABNC5:** VGA to BNC - 6' Monitor Adapter Cable

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



# SDI D to A Component Analog Video Converter 7730DAC & 7730DAC-A4



The 7730DAC line of serial digital video to component analog converters are broadcast quality D to A's with an extensive list of additional features. High quality digital to analog conversion of audio can be packaged with the video to create a D to A frame synchronizer with audio demux. In addition, Evertz fault monitoring processing will analyze and report video and audio problems via an On-Screen-Display, or remotely via VistaLINK® SNMP.

## Features

### D to A process:

- 12 bit, over sampled video DACs
- SMPTE/EBU N10, Betacam, MII and NTSC specific standards supported
- Y, Pb, Pr or G, B, R output format
- Selectable setup pedestal
- Black level and gain controls of all components
- 300mV separate composite sync output

- An extensive list of error conditions can be monitored and fault conditions can be configured from these conditions
- On screen messages can be triggered by the configured fault conditions
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® PRO) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

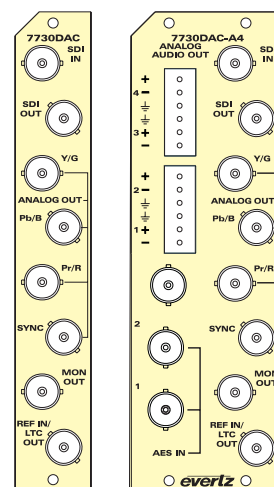
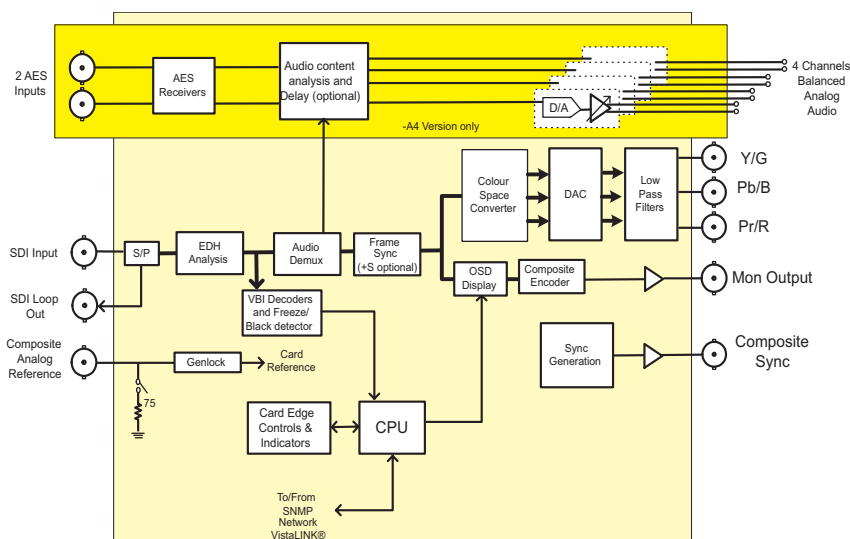
### The Features of all 7730DAC's are:

- SDI 525 or 625, 270 Mb/s component digital video input
- One 270 Mb/s re-clocked SDI output
- Four output BNCs for Y, Pb, Pr or G, B, R and composite sync
- One composite analog output on BNC for monitoring and control
- One frame video synchronizer (with +S option)
- Infinitely variable output phase (27MHz clock increments)
- Freeze modes: black, freeze, pass
- Menu adjustable free running frequency
- VU/PPM bargraph level Indicators
- Decodes vertical interval time code (VITC), and "burns" the time code into the monitoring output picture
- A comprehensive on screen display is available to configure the various features of the module
- Flexible configuration of the text and audio bar graph information displays

### The Features of "-A4" option are:

- One group (4 channels) of synchronous 20-bit audio is de-multiplexed from the incoming digital video
- 2 unbalanced AES audio inputs (up to 48kHz, 24 bits) on BNC
- User selects EITHER the de-embedded audio or the input AES audio
- The selected audio is delayed equivalently to the video delay with the +S option
- 4 high quality 24 bit audio channels are output (analog) as balanced on 2 removable barrier strips
- Low impedance outputs (66Ω)
- Analog audio output levels are adjustable
- Additional audio delay of up to 5 seconds
- Additional audio advance of up to 1 frame, depending on video delay
- Loss of video modes: pass audio, mute audio

## 7730DAC Block Diagram & Rear Panels



### Specifications

#### Serial Video Input:

Standard:	SMPTE 259M-C - 525 or 625 line component
Number of Inputs:	1
Number of Reclocked Outputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2
Return Loss:	>15dB to 270MHz
Embedded Audio:	SMPTE 272M-A
Frequency Lock Range:	±75ppm from nominal

#### Analog Video Output:

Standards:	SMPTE/EBU N10, Betacam, MII and NTSC specific standards. GBR or YPbPr formats with or without setup
Number of outputs:	1
Connectors:	4 BNCs per IEC 169-8
Video signal Level:	1V nominal
Sync signal Level:	300mV nominal
Output level control range:	>± 7.5% (All components)
Black level control range:	±10 IRE
Input Impedance:	75Ω
Return loss:	>40dB to 10MHz

#### Reference Video Input:

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Inputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	1V nominal
Frequency Lock Range:	±75ppm from nominal
Input Impedance:	75Ω or High impedance (jumper selectable)
Return Loss:	>35dB to 10MHz

#### Video Performance:

Frequency Response:	<±0.1dB (100kHz to 4.1MHz)
Noise Floor:	< -73dBms (15kHz to 5MHz)
Inter-channel Delay:	<±5ns
Minimum Delay:	3μs
Maximum Delay:	1 frame plus 3μs

#### Analog Audio Outputs (-A4 only):

Number of Outputs:	4
Type:	Balanced analog audio
Connector:	Two 6 pin removable terminal strips
Output Impedance:	66Ω balanced
Sampling Frequency:	48kHz
Signal Level:	0dBFS => 12 to 25dBu (user settable)
Frequency Response:	<± 0.05dB (20Hz to 20kHz)
Dynamic range:	24 bits when AES inputs selected, 20 bits when embedded audio selected
THD+N:	<0.001% (>100dB) @ 1kHz, -1dBFS
Crosstalk:	<-105dB (20Hz to 20kHz)
DC Offset:	<± 30mV
SNR:	>110dB "A" Weighting
Inter-Channel Phase Error:	<± 1° (20Hz to 20kHz)

#### AES Audio Inputs (-A4 only):

Number of Inputs:	2
Input Standard:	SMPTE 276M, single ended synchronous or asynchronous PCM AES
Connector:	BNC per IEC 60169-8 Amendment 2
Resolution:	24 bits when AES inputs selected, 20 bits when embedded audio is selected
Input Sampling Rate:	32kHz to 48 kHz when AES inputs selected, Synchronous 48kHz when embedded audio is selected
Minimum I/O Delay:	3.5 ms

#### Electrical:

Voltage:	+12VDC
Power:	10 Watts DAC + 7.5 Watts (-A4 option) = 17.5 Watts
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

7700 frame mounting:	1 for non-audio versions
Number of slots:	2 for audio versions (-A4)

#### Stand Alone Enclosure:

Dimensions:	14 " L x 4.5 " W x 1.9 " H (355 mm L x 114 mm W x 48 mm H)
Weight:	Approx. 1.5 lbs. (0.7 Kg)

#### Ordering Information:

7730DAC:	SDI D to A Component Analog Video Converter
7730DAC-A4:	SDI D to A Component Analog Video Converter with a four-channel Analog Audio converter/embedder

#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

+S	Optional frame synchronizer
Rear Plate Suffix	
+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure



# Component Analog Video to SDI Converter

## 7730ADC & 7730ADC-A4



The 7730ADC line of component analog video to serial digital converters are broadcast quality A to Ds with an extensive list of additional features. High quality analog to digital conversion of audio inputs can be packaged with the video to create a A to D frame synchronizer with audio embedder. In addition, Evertz fault monitoring processing will analyze and report video and audio problems via an On-Screen-Display, or remotely via VistaLINK® SNMP.

The 7730ADC (1 slot module) and the 7730ADC-A4 (2 slot module) are housed in the 7700FR-C (15 slots) or in the 7701FR Multiframe (houses 3 modules).

### Features

#### A to D process:

- 10 bit, 54MHz sampling of input video
- Internal processing to maintain 10 bit digital video quality
- Y, Pb, Pr or G, B, R input support
- Black level clamp on all components
- User adjustable input video processing functions: black level control on all 3 components, gain control on all 3 components, inter-channel delay control in 18 ns increments
- Sync on green or separate sync input
- 300mV or 4V separate sync support

#### Features of all 7730ADC's are:

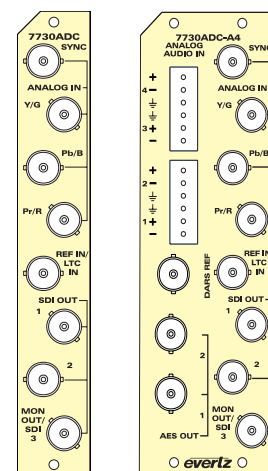
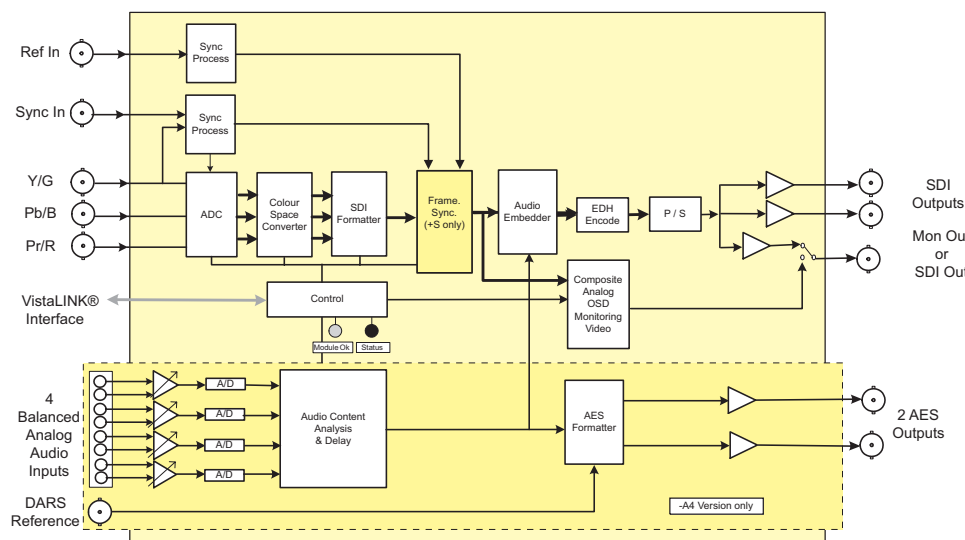
- Three input BNCs for YPbPr or RGB input
- One sync input BNC for separate sync
- Two SDI 525 or 625, 270Mb/s component digital video output WITHOUT OSD text or audio bargraphs
- One combination output that can either be an extra SDI output or composite analog video output. When configured as a composite analog output it can either be a clean output (no OSD), or have the OSD text and bargraph graphics for monitoring
- EDH encoding on SDI output
- One combination input BNC that can either be an LTC input or a composite analog reference input (NTSC or PAL-B). 75Ω or high-Z, jumper configurable input impedance
- One frame video synchronizer (with +S option)
- Infinitely variable output phase (27MHz clock increments)
- Freeze modes: black, freeze, pass
- Menu adjustable free running frequency

- VU/PPM bargraph level Indicators
- Decodes vertical interval time code (VITC) and "burns" the time code into the OSD Monitoring output
- A comprehensive on screen display is available to configure the various features of the module
- Flexible configuration of the text and audio bar graph information displays
- An extensive list of error conditions can be monitored and fault conditions can be configured from these conditions
- On screen messages can be triggered by the configured fault conditions
- Fault conditions are reported via VistaLINK® SNMP
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® PRO) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

#### Features of -A4 option are:

- 4 balanced analog audio inputs on 2 removable barrier strips
- High impedance inputs (user supplies termination resistors for other impedance's)
- Analog audio input levels are adjustable. Jumpers set coarse input levels, fine input levels are set by software control
- Audio delay equivalent video delay (with +S option)
- Additional audio delay of up to 5 seconds
- Audio advance of up to 1 frame less 3 microseconds
- One group (4 channels of audio) is multiplexed on the outgoing digital video
- 2 unbalanced AES audio outputs delayed equivalently to the video delay
- 75Ω coaxial (unbalanced) DARS reference input on BNC
- Loss of video modes: pass audio, mute audio

### 7730ADC Block Diagram & Rear Panels



### Specifications

#### Analog Video Input:

**Standard:** Y, Pb, Pr or G, B, R : SMPTE/EBU N10, Betacam™, MII, and other NTSC related

**Number of Inputs:** 1

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 1V nominal

**Frequency Lock Range:** ±75ppm from nominal

**Input level control range:** ±15%

**Black level control range:** ±5 IRE

**Input Impedance:** 75Ω

**Return Loss:** >30dB to 30MHz

#### Reference Video Input:

**Standard:** NTSC (SMPTE 170M), PAL (ITU624-4)

**Number of Inputs:** 1

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 1V nominal

**Frequency Lock Range:** ±75ppm from nominal

**Input Impedance:** 75Ω or High impedance (jumper selectable)

**Return Loss:** >35dB to 10MHz

#### Analog Video Output:

**Standard:** NTSC (SMPTE 170M), PAL (ITU624-4)

**Number of Outputs:** 1

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 1V nominal

**Output Impedance:** 75Ω

**Return Loss:** >35dB to 10MHz

#### Serial Video Output:

**Standard:** SMPTE 259M-C - 525 or 625 line component

**Number of Outputs:** 3

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V ±0.5V

**Rise and Fall Time:** 900ps nominal

**Overshoot:** <10% of amplitude

**Return Loss:** >15dB to 270MHz

**Embedded Audio:** SMPTE 272M-A

#### Video Performance (SDI outputs only):

**Inter-channel Delay:** <±9ns

**Minimum Delay:** 3 μs

**Maximum Delay:** 1 frame plus 3 μs

#### Analog Audio Input (-A4 only):

**Number of Inputs:** 4

**Type:** Balanced analog audio

**Connector:** Removable terminal strip

**Input Impedance:** 20kΩ minimum (differential)

**Sampling Frequency:** 48kHz

**Signal Level:** 0dB FS => 18 or 24dBu (jumper selectable)

**Level Control Range:** ± 10dB

**Frequency Response:** ± 0.1dB (20Hz to 20kHz) (broadcast quality)

**SNR:** 100dB with input at -0.5dBFS

**THD+N:** <0.001% (>100dB) @ 20Hz to 20kHz, -0.5 dB FS (input video locked to genlock video)

**CMRR:** >100dB @ 1kHz

#### AES Outputs (-A4 only):

**Number of Outputs:** 2

**Output Standard:** SMPTE 276M, single ended synchronous AES 48kHz

**Connectors:** BNC per IEC 60169-8 Amendment 2

**Resolution:** 24 bits

**Sampling Rate:** Synchronous 48kHz

**User Bits:** Transferred to output in a non-real-time, non-block-contiguous manner

**Minimum I/O Delay:** 2.1 ms

**Maximum I/O Delay:** 5 seconds

#### Electrical:

**Voltage:** + 12VDC

**Power:** 11 Watts ADC + 9 Watts (-A4 option) = 20 Watts total

**EMI/RFI:** Complies with FCC Part 15, class A EU EMC Directive

#### Physical:

**7700 frame mounting:**

**Number of slots:** 1 for non-audio versions  
2 for audio version (-A4)

**Stand Alone Enclosure:**

**Dimensions:** 14 " L x 4.5 " W x 1.9 " H  
(355 mm L x 114 mm W x 48 mm H)

**Weight:** Approx. 1.5 lbs. (0.7 Kg)

#### Ordering Information:

**7730ADC:** Component Analog Video to SDI Converter

**7730ADC-A4:** Component Analog Video to SDI Converter with a four-channel Analog Audio Converter/Embedder

#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

**+S** Optional frame synchronizer

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe

**+1RU** 1RU Rear Plate for use with 7701FR Multiframe

**+SA** Standalone Enclosure Rear Plate

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules

**7701FR** 1RU Multiframe which holds 3 modules

**S7701FR** Standalone enclosure





The 7730ADC-HD line of component analog video to serial digital converters are broadcast quality high definition A to Ds with an extensive list of additional features. High quality analog to digital conversion of audio or AES inputs can be packaged with the video to create an A to D with audio embedder. In addition, Evertz fault monitoring processing will analyze and report video and audio problems via an On-Screen-Display, or remotely via VistaLINK® SNMP.

### Features

#### The Features of the A to D process:

- 10 bit, 74.25MHz/(1.001) sampling of input video
- Internal processing to maintain 10 bit digital video quality
- Y, Pb, Pr or G, B, R input support
- Black level clamp on all components
- User adjustable input video processing functions: black level control on all components, gain control on all components, inter-channel delay and picture position control in 13.5ns increments
- Sync on green or separate sync input

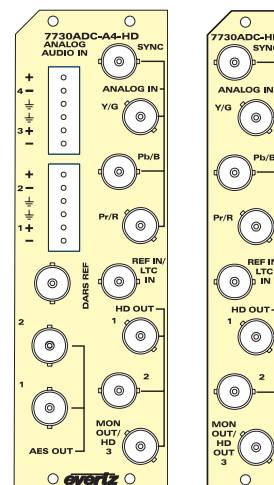
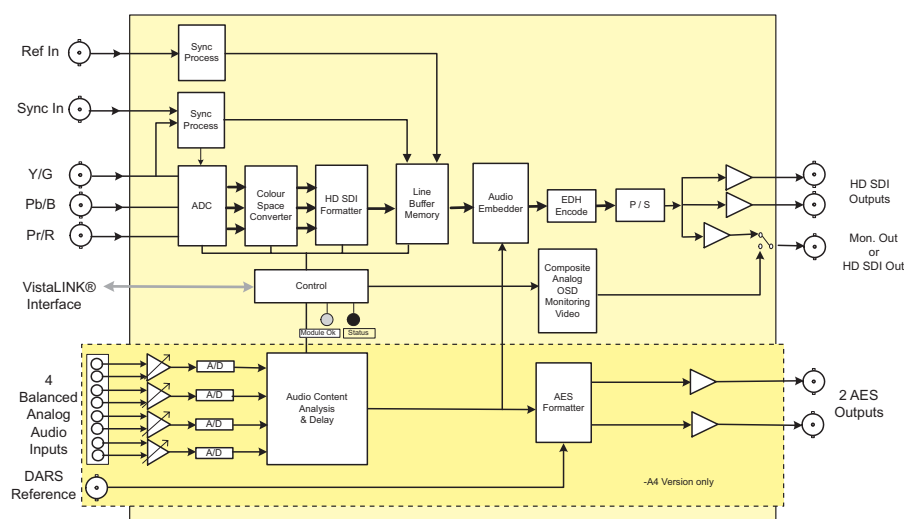
#### The Features of all 7730ADC-HD's are:

- Three input BNCs for Y, Pb, Pr or G, B, R input
- One sync input BNC for separate sync
- Two HD SDI 74.25 or 74.176 Mb/s component digital video output WITHOUT OSD text or audio bargraphs
- One combination output that can either be an extra HD SDI output or composite analog video output. When configured as a composite analog output it will be a clean output (no picture), and have the OSD text and bargraph graphics for monitoring
- One line video synchronizer
- Variable output phase (in clock increments)
- Loss of video modes: black, pass
- A comprehensive on screen display is available to configure the various features of the module
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® PRO) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

#### The Features of "-A4" option are:

- 4 balanced analog audio inputs on 2 removable barrier strips
- High impedance inputs (user supplies termination resistors for other impedance's)
- Analog audio input levels are adjustable. Jumpers set coarse input levels, fine input levels are set by software control
- Audio delay of up to 5 seconds
- One group (4 channels of audio) is multiplexed on the outgoing digital video
- 2 unbalanced AES audio outputs delayed equivalently to the embedded audio delay
- 75Ω coaxial (unbalanced) DARS reference input on BNC.
- Loss of video modes: pass audio, mute audio

### 7730ADC-HD Block Diagram & Rear Panels



### Specifications

#### Analog Video Input:

<b>Standard:</b>	SMPTE 274M, 296M(analog), 1080i/59.94, 720p/59.94, 1080i/50 GBR or YPbPr
<b>Input formats:</b>	
<b>Number of Inputs:</b>	1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1V nominal
<b>Frequency Lock Range:</b>	±75ppm from nominal
<b>Input level control range:</b>	>±15%
<b>Black level control range:</b>	>±10 IRE
<b>Input Impedance:</b>	75Ω
<b>Return Loss:</b>	>30dB to 30MHz

#### Reference Video Input:

<b>Standard:</b>	Tri-level sync, analog SMPTE 274M, 296M NTSC (SMPTE 170M), PAL (ITU624-4)
<b>Number of Inputs:</b>	1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1V nominal
<b>Frequency Lock Range:</b>	±75ppm from nominal
<b>Input Impedance:</b>	75Ω or High impedance (jumper selectable)
<b>Return Loss:</b>	>35dB to 10MHz

#### Monitoring Analog Video Output:

<b>Standard:</b>	NTSC, SMPTE 170M PAL, ITU624-4
<b>Number of Outputs:</b>	1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1V nominal
<b>Output Impedance:</b>	75Ω
<b>Return Loss:</b>	>30dB to 10MHz

#### Serial Video Output:

<b>Standard:</b>	SMPTE 292M (274M, 296M)
<b>Number of Outputs:</b>	2+1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V ±0.5V
<b>Rise and Fall Time:</b>	180ps nominal
<b>Overshoot:</b>	<10% of amplitude
<b>Return Loss:</b>	>13dB to 1.5GHz
<b>Embedded Audio:</b>	SMPTE 299M

#### Video Performance (HD SDI outputs only):

<b>Frequency Response:</b>	(Y, Pb, Pr input)
<b>Y:</b>	<±0.05dB to 30MHz
<b>Cb, Cr:</b>	<±0.05dB to 15MHz
<b>Inter-channel Delay:</b>	<±5ns
<b>Minimum Delay:</b>	0.5 μs
<b>Maximum Delay:</b>	1 line plus 0.5 μs

#### Analog Audio Input(-A4 only):

<b>Number of Inputs:</b>	4
<b>Type:</b>	Balanced analog audio
<b>Connector:</b>	Removable terminal strip
<b>Input Impedance:</b>	20kΩ minimum (differential)
<b>Sampling Frequency:</b>	48kHz
<b>Signal Level:</b>	0dB FS => 18 or 24dBu (jumper selectable)
<b>Level Control Range:</b>	± 10dB
<b>Frequency Response:</b>	± 0.1dB (20Hz to 20kHz) (broadcast quality)
<b>SNR:</b>	100dB with input at -0.5dBFS
<b>THD+N:</b>	<0.001% (>100dB) @ 1kHz, -0.5 dB FS (rev 2) <0.001% (>100dB) @ 20Hz to 20kHz, -0.5 dB FS (input video locked to genlock video)
<b>CMRR:</b>	>100dB @ 1kHz

#### AES Outputs (-A4 only):

<b>Number of Outputs:</b>	2
<b>Output Standard:</b>	SMPTE 276M, single ended synchronous AES 48kHz
<b>Connectors:</b>	BNC per IEC 60169-8 Amendment 2
<b>Resolution:</b>	24 bits
<b>Sampling Rate:</b>	Synchronous 48kHz
<b>User Bits:</b>	Transferred to output in a non-real- time, non-block-contiguous manner
<b>Minimum I/O Delay:</b>	2.1ms
<b>Maximum I/O Delay:</b>	5 seconds

#### Electrical:

<b>Voltage:</b>	+12VDC
<b>Power:</b>	14 Watts ADC + 9 Watts (-A4 option) = 23 Watts
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

<b>7700 frame mounting:</b>	
<b>Number of slots:</b>	1 for non-audio versions 2 for audio versions (-A4)

#### Stand Alone Enclosure:

<b>Dimensions:</b>	14 " L x 4.5 " W x 1.9 " H 355 mm L x 114 mm W x 48 mm H)
<b>Weight:</b>	Approx. 1.5 lbs. (0.7 Kg)

#### Ordering Information:

<b>7730ADC-HD:</b>	HD Component Analog Video to HD SDI Converter
<b>7730ADC-A4-HD:</b>	HD Component Analog Video to HD SDI Converter with a four-channel Analog Audio converter/embedder

#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

<b>Rear Plate Suffix</b>	
<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone enclosure



# HDTV Progressive Format Translator

## 7732PFT-HD

The 7732PFT-HD Progressive Format Translator converts 1.5 Gb/s HDTV digital video in the 1080p/24sF (1080p/23.98sF) format to 1080i/60 (1080i/59.94), thus allowing the source material to be viewed at a higher video refresh eliminating the 24 Hz flicker. The 7732PFT-HD inserts extra fields to create a 3:2 pulldown of the picture content thus, increasing the video frame rate from 24 to 30 frames per second.

When an input video feed of 1080p/24sF (1080p/23.98sF) is detected, a 3:2 pulldown of the picture is inserted resulting in a 1080i/60 (1080i/59.94) output. Determination of the output sequence of the fields is determined from a 6 Hz input pulse or from RP188 ancillary time code if it is present. DIP switches allow the user to determine how the output pulldown aligns to the 6 Hz input or ancillary time code. If an input video feed of any other HD format is detected, it is simply passed through. When the 3:2 pulldown mode is turned off with a DIP switch or GPI input, the output video remains the same as the input video. An output tally indicates when the 3:2 pulldown mode is active and may be used to control external audio delay devices.

### Features

- Automatic detection of 1080p/24sF video or 1080i/60 video input
- 3:2 cadence of output set from 6 Hz pulse input or incoming RP188 ANC time code
- 4:3 and 2.4:1 aspect ratio markers
- GPI Control of pulldown & aspect ratio markers
- Tally output indicates 3:2 pulldown insertion

### Input:

- SMPTE 292M - 1.5Gb/s serial digital 1080p/24sF (23.98Fps)
- Transparent pass-through input for all other SMPTE 292M HD video formats
- Auto equalization to 130m

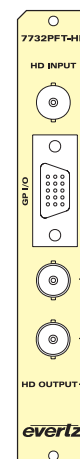
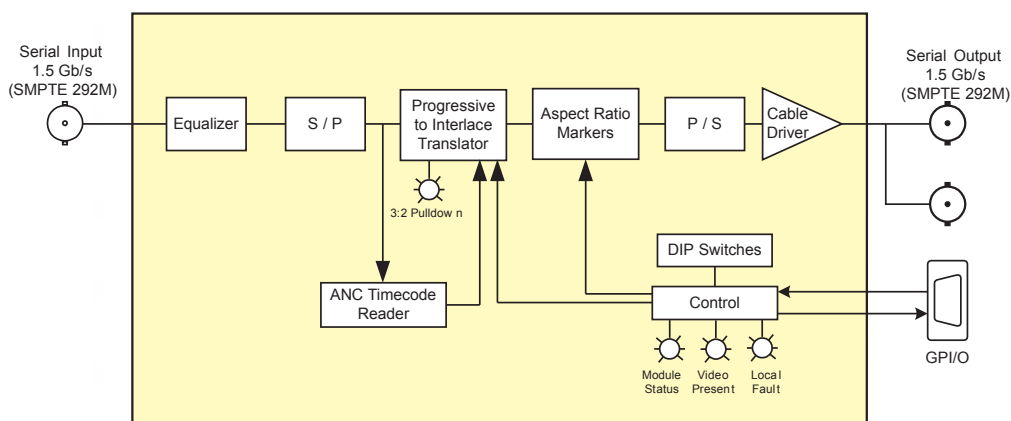
### Outputs:

- 2 serial HD SDI processed outputs
- When 3:2 pull down mode is active the 1080p/24sF (23.98Fps) input video is format converted to 1080i/60 (29.97Fps) on the output

### Card Edge LEDs

- Video signal presence
- Pull down active
- Module status
- Local fault

### 7732PFT-HD Block Diagram & Rear Panel



### Specifications

#### Serial Video Input (1080p/24sF):

**Standard:** SMPTE 292M  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 130m @ 1.5Gb/s with Belden 1694A (or equivalent)

#### Serial Video Outputs with 3:2 pulldown (1080i/60):

**Connectors:** 2 BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 200ps nominal  
**Overshoot:** <10% of amplitude  
**Wide Band Jitter:** <0.2UI

#### GPI/O:

**Connector:** Female High Density DB-15  
**Impedance:** Opto- isolated, High-Z  
**Inputs:** 2 for Aspect Ratio markers  
 1 for 6 Hz input or pulldown disable  
**Outputs:** 1 for 3:2 pulldown tally

### Electrical:

**Voltage:** +12VDC  
**Power:** 6 watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

### Physical:

**Number of Slots:** 1

### Ordering Information:

**7732PFT-HD** HDTV Progressive Format Translator

### Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



The 7736CEM line of component serial digital to composite analog video converters are broadcast quality encoders with an extensive list of additional features. An audio de-embedder with high quality audio digital to analog conversion can be packaged with the encoder to create a video/audio frame synchronizer/conversion package.

The 7736CEM product features various video processing functions such as VITC, closed captioning and SID extraction during the encoding process, as well as monitoring video for black and freeze conditions. The modules feature a clean (asynchronous) and a fast (synchronous) input video lock mode to handle upstream switches. The audio is processed, to extract level information for creating and displaying level and phase bar graphs. In addition, the audio is analyzed for periods of high level, silence, mono, and out-of-phase conditions. All of this status information is displayed on the monitoring analog output via on-screen display (OSD) overlay.

VistaLINK® enables remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage operations including signal monitoring and module configuration from SNMP enabled control systems (Manager or NMS) locally or remotely.

### Features

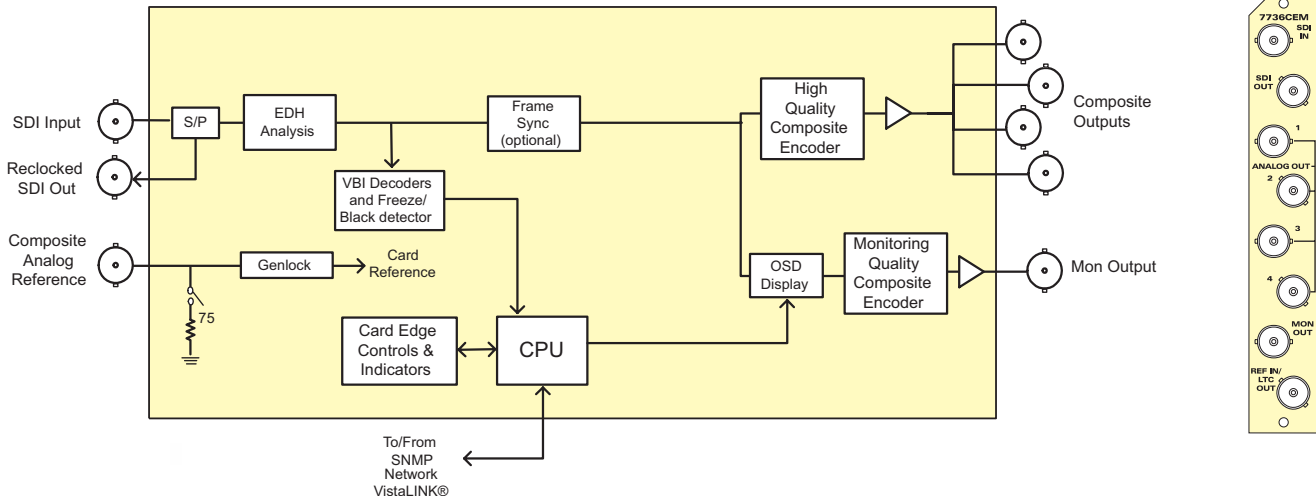
- One component serial digital input (525 or 625)
- One re-clocked component serial digital output
- EDH analysis on SDI input
- Four composite analog video outputs WITHOUT OSD text or audio bargraphs
- Internal processing to maintain 10 bit digital video quality
- 12 bit output video digital to analog conversion
- One monitoring quality video output with OSD text and bargraph graphics
- User adjustable output video processing functions: black level (brightness), gain (contrast), hue, and saturation
- User selectable luminance and chrominance filters for different applications (i.e. broadcast vs. studio)
- User selectable horizontal blanking interval width: narrow, normal
- One composite analog reference input (NTSC or PAL-B) on BNC 75Ω or high-Z, jumper configurable input impedance
- One frame video synchronizer (with +S option)
- Infinitely variable output phase
- Freeze modes: black, freeze
- Input video lock mode: clean or fast
- Adjustable free running frequency
- Built-in color bar generator
- VU/PPM bargraph level Indicators
- Decodes vertical interval time code (VITC) and "burns" the time code into the picture
- Decodes PESA format Source ID (8 characters) or Evertz format VITC Source ID (5 or 9 characters) and burns the ID into the picture
- A comprehensive on screen display is available to configure the various features of the module

- Flexible configuration of the text and audio bar graph information displays
- An extensive list of error conditions can be monitored and fault conditions can be configured from these conditions
- On screen messages can be triggered by the configured fault conditions
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

### Features of "-A4" version are:

- One group (4 channels) of synchronous 20-bit audio is de-multiplexed from the incoming digital video
- 2 unbalanced AES audio inputs (up to 48kHz, 24 bits) on BNC terminal strip
- User selects EITHER the de-embedded audio or the input AES audio
- The selected audio is delayed equivalently to the video delay with the +S option
- 4 high quality 24 bit audio channels are output (analog) as balanced on 2 removable barrier strips
- Low impedance outputs (66Ω)
- Analog audio output levels are adjustable
- Additional audio delay of up to 5 seconds
- Additional audio advance of up to 1 frame, depending on video delay
- Loss of video modes: pass audio, mute audio
- Optional balanced AES audio inputs (+B option)

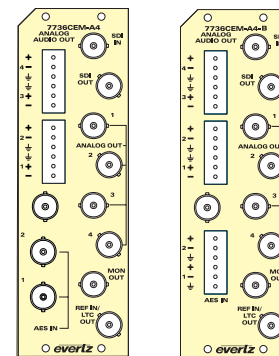
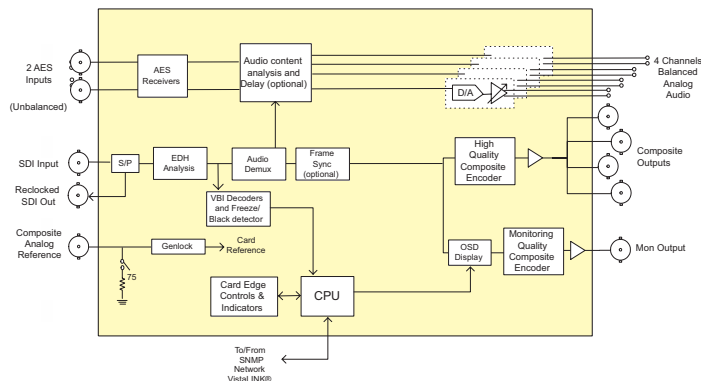
### 7736CEM Block Diagram and Rear Panel





# Component SDI to Composite Analog Video Encoder with Optional Frame Synchronizer 7736CEM (-A4)

## 7736CEM-A4 Block Diagram and Rear Panels



### Specifications

#### Serial Video Input:

Standard:	SMPT 259M-C - 525 or 625 line component
Number of Inputs:	1
Number of Reclocked Inputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	800mV nominal
DC Offset:	0V $\pm$ 0.5V
Rise and Fall Time:	900ps nominal
Overshoot:	<10% of amplitude
Return Loss:	>15dB to 270MHz
Embedded Audio:	SMPT 272M-A
Frequency Lock Range:	$\pm$ 75ppm from nominal
Lock up time on a hot switch:	None or 7 frames (based on lock mode)

#### Analog Broadcast Video Output:

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Inputs:	4
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	1V nominal
Output Impedance:	75 $\Omega$
DC Offset:	0V $\pm$ 50mV
Return Loss:	>35dB to 10MHz
Frequency Response:	0.1dB to 4 MHz (response will depend on selected filtering)
Differential Phase:	< 0.5° (< 0.3° typical)
Differential Gain:	< 0.5% (< 0.3% typical)
SNR:	>75dB (black video, 100kHz to 5MHz)
Output level control range:	$\pm$ 10%
Black level control range:	$\pm$ 7.5 IRE
Chroma level control range:	$\pm$ 10%
Hue control range:	$\pm$ 15° (NTSC only)
Minimum Delay:	3 $\mu$ s
Maximum Delay:	1 frame + 3 $\mu$ s (+S option only)

#### Reference Video Input:

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Inputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	1V nominal (0.5V to 1.5V)
Frequency Lock Range:	$\pm$ 75ppm from nominal
Input Impedance:	75 $\Omega$ or High impedance (jumper selectable)
Return Loss:	>25dB to 10MHz
Max Subcarrier Jitter:	< 3°
Free-Running Frequency Control Range:	> $\pm$ 10 ppm (> $\pm$ 270Hz)

#### Analog Monitoring Video Output:

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Outputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	1V nominal
Output Impedance:	75 $\Omega$
Return Loss:	>35dB to 10MHz

#### Analog Audio Outputs (-A4 version only):

Number of Outputs:	4
Type:	Balanced analog audio
Connector:	Two 6 pin removable terminal strips
Output Impedance:	66 $\Omega$ balanced
Sampling Frequency:	48kHz
Signal Level:	0dBFS $\Rightarrow$ 12 to 25dBu (user settable)
Frequency Response:	$\pm$ 0.05dB (20Hz to 20kHz)
Dynamic range:	24 bits when AES inputs selected, 20 bits when embedded audio selected
THD+N:	<0.001% (>100dB) @ 1kHz, -1dBFS
Crosstalk:	<-105dB (20Hz to 20kHz)
DC Offset:	$\pm$ 30mV
SNR:	>110dB "A" Weighting
Inter-Channel Phase Error:	$\pm$ 1° (20Hz to 20kHz)

#### Unbalanced AES Audio Inputs (-A4 version only):

Number of Inputs:	2
Input Standard:	SMPT 276M, single ended synchronous or asynchronous PCM AES
Connector:	BNC per IEC 60169-8 Amendment 2
Resolution:	24 bits when AES inputs selected, 20 bits when embedded audio is selected
Input Sampling Rate:	32kHz to 48 kHz when AES inputs selected, Synchronous 48kHz when embedded audio is selected
Minimum I/O Delay:	3.5 $\mu$ s

#### Balanced AES Audio Inputs (+B option):

Number of Inputs:	2
Input Standard:	AES3-1992, balanced synchronous or asynchronous PCM AES
Connectors:	One 6 pin removable terminal strip
Impedance:	110 $\Omega$
Resolution:	Up to 24 bits
Sampling Rate:	32kHz to 48 kHz
Input Level:	2V to 7V p-p
Minimum I/O Delay:	3.5ms

#### Electrical:

Voltage:	+12VDC
Power:	9.25 Watts CEM + 16.75 Watts (-A4 or +B option)
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

7700 frame mounting:	2
7701 frame mounting:	1

#### Ordering Information:

7736CEM	Component SDI to composite analog video encoder (optional Frame Synchronizer available)
7736CEM-A4	Component SDI to composite analog video encoder with quad audio DAC (audio source is embedded or from dual unbalanced AES inputs) (optional Frame Synchronizer available)

#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

+B	Balanced audio on 7736CEM-A4
+S	Optional frame synchronizer

#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Accessories:

7700FC	VistaLINK® Frame Controller
9000NCP	1RU VistaLINK® General Purpose Network Control Panel
9000NCP2	2RU VistaLINK® General Purpose Network Control Panel

#### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure



The 7736CE2 component serial digital to composite analog video converters are broadcast quality encoders with an extensive list of additional features. An audio de-embedder with high quality audio digital to analog conversion can be purchased with the encoder to create a video/audio frame synchronizer/conversion package. The module features a clean (asynchronous) and a fast (synchronous) input video lock modes to handle upstream switches. In addition, control of card is via an On-Screen-Display or remotely via VistaLINK®.

## Features

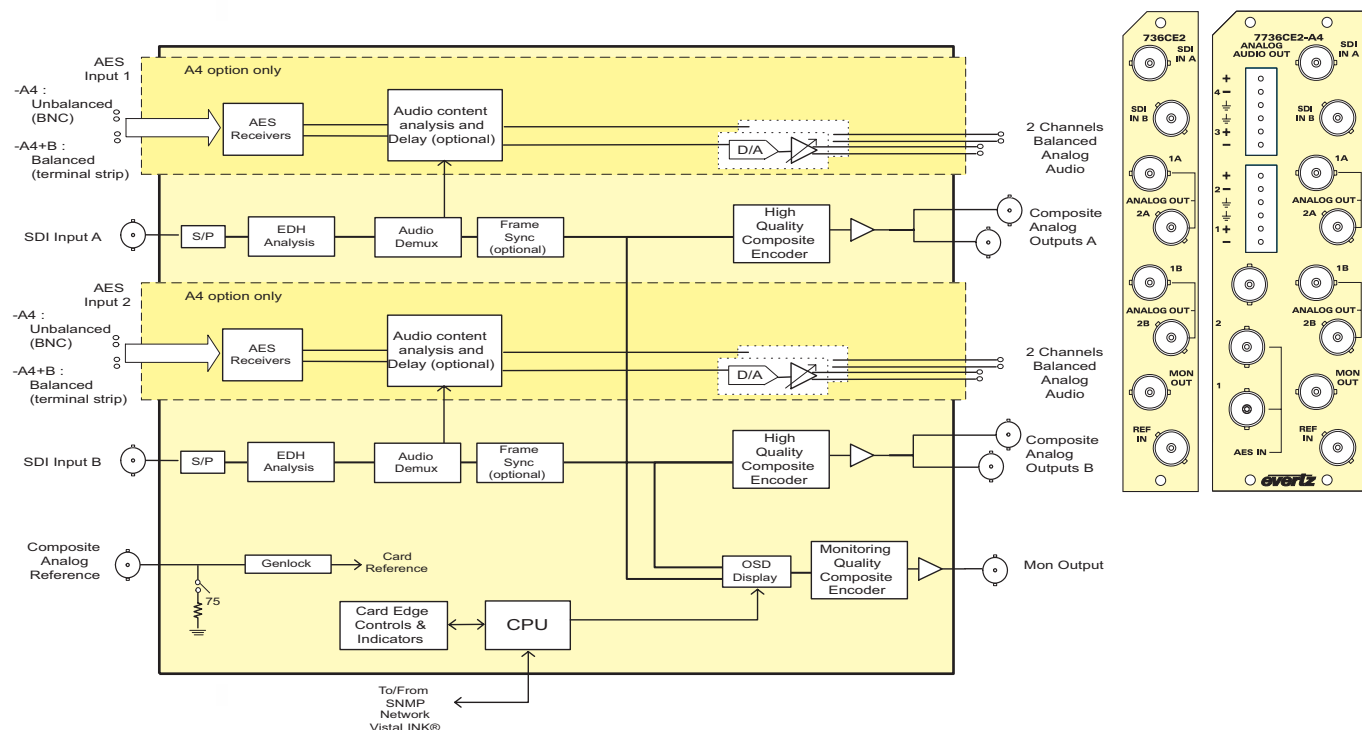
- Two component serial digital inputs (525 or 625)
- One composite analog video output per channel WITHOUT OSD text
- Internal processing to maintain 10 bit digital video quality
- 12 bit output video digital to analog conversion
- One monitoring quality video output with OSD text for card configuration
- User adjustable output video processing functions: black level (brightness), gain (contrast), hue, and saturation
- User selectable luminance and chrominance filters for different applications (i.e. broadcast vs. studio)
- User selectable horizontal blanking interval width: narrow, normal.
- One composite analog reference input (NTSC or PAL-B) on BNC 75Ω or high-Z, jumper configurable input impedance
- Video Frame synchronizer (with +S option)
- Infinitely variable output phase
- Freeze modes: black, freeze
- Input video lock mode: clean or fast
- Adjustable free running frequency. Both channels must be free running to be able to adjust frequency
- A comprehensive on screen display is available to configure the various features of the module

## The Features of "-A4" Option:

Note: These are the features for each associated video channel

- One half group (2 channels) of synchronous 20-bit audio is de-multiplexed from the incoming digital video
- 1 unbalanced (or balanced) AES audio input (up to 48kHz, 24 bits) on BNC (or terminal strip for balanced audio)
- User selects EITHER the de-embedded audio or the input AES audio.
- The selected audio is delayed equivalently to the video delay with the +S option
- 2 high quality 24 bit audio channels are output (analog) as balanced on 2 removable barrier strips
- Low impedance outputs (66Ω)
- Analog audio output levels are adjustable
- Additional audio delay of up to 2.5 seconds
- Additional audio advance of up to 1 frame, depending on video delay
- Loss of video modes: pass audio, mute audio

## 7736CE2 Block Diagram and Rear Panels





## Dual Composite Encoder 7736CE2 & 7736CE-A4

### Serial Video Input:

<b>Standard:</b>	SMPTE 259M-C - 525 or 625 line component
<b>Number of Inputs:</b>	2
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Return Loss:</b>	>15dB to 270MHz
<b>Embedded Audio:</b>	SMPTE 272M-A
<b>Frequency Lock Range:</b>	±75ppm from nominal
<b>Lock up time on a hot switch:</b>	None or 7 frames (based on lock mode)

### Analog Broadcast Video Output:

<b>Standard:</b>	NTSC, SMPTE 170M PAL, ITU624-4
<b>Number of Inputs:</b>	2 per input video
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1V nominal
<b>Output Impedance:</b>	75Ω
<b>DC Offset:</b>	0V ± 50mV
<b>Return Loss:</b>	>45dB to 10MHz
<b>Frequency Response:</b>	<± 0.1dB to 4 MHz (response will depend on selected filtering)

<b>Differential Phase:</b>	< 0.5° (< 0.3° typical)
<b>Differential Gain:</b>	< 0.5% (< 0.3% typical)
<b>SNR:</b>	>75dB (both channels black video, 100kHz to 5MHz)

<b>Output level control range:</b>	±10%
<b>Black level control range:</b>	±7.5 IRE
<b>Chroma level control range:</b>	±10%
<b>Hue control range:</b>	±15° (NTSC only)
<b>Minimum Delay:</b>	3 μs
<b>Maximum Delay:</b>	1 frame + 3 μs (+S option only)

### Reference Video Input:

<b>Standard:</b>	NTSC, SMPTE 170M PAL, ITU624-4
<b>Number of Inputs:</b>	1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1V nominal (0.5V to 1.5V)
<b>Frequency Lock Range:</b>	±75ppm from nominal
<b>Input Impedance:</b>	75Ω or High impedance (jumper selectable)
<b>Return Loss:</b>	>25dB to 10MHz
<b>Max Subcarrier Jitter:</b>	< 3°
<b>Free-Running Frequency Control Range:</b>	> ± 10ppm (> ± 270Hz)

### Analog Monitoring Video Output:

<b>Standard:</b>	NTSC, SMPTE 170M PAL, ITU624-4
<b>Number of Outputs:</b>	1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1V nominal
<b>Output Impedance:</b>	75Ω
<b>Return Loss:</b>	>35dB to 10MHz

### Analog Audio Outputs (-A4 only):

<b>Number of Outputs:</b>	4 (2 per video channel)
<b>Type:</b>	Balanced analog audio
<b>Connector:</b>	Two 6 pin removable terminal strips
<b>Output Impedance:</b>	66Ω balanced
<b>Sampling Frequency:</b>	48kHz
<b>Signal Level:</b>	0dBFS => 12 to 25dBu (user settable)
<b>Frequency Response:</b>	<± 0.05dB (20Hz to 20kHz)
<b>Dynamic range:</b>	24 bits when AES inputs selected, 20 bits when embedded audio selected

<b>THD+N:</b>	<0.001% (>100dB) @ 1kHz, -1dBFS
<b>Crosstalk:</b>	<-105dB (20Hz to 20kHz)
<b>DC Offset:</b>	<± 30mV
<b>SNR:</b>	>110dB "A" Weighting
<b>Inter-Channel Phase Error:</b>	<± 1° (20Hz to 20kHz)

### Unbalanced AES Audio Inputs (-A4 only)

<b>Number of Inputs:</b>	2
<b>Input Standard:</b>	SMPTE 276M, single ended synchronous or asynchronous PCM AES
<b>Connectors:</b>	BNC per IEC 60169-8 Amendment 2
<b>Resolution:</b>	Up to 24 bits
<b>Input Sampling Rate:</b>	32kHz to 48 kHz
<b>Minimum I/O Delay:</b>	3.5ms

### Balanced AES Audio Inputs (-A4+B only)

<b>Number of Inputs:</b>	2
<b>Input Standard:</b>	AES3-1992, balanced synchronous or asynchronous PCM AES
<b>Connectors:</b>	One 6 pin removable terminal strip
<b>Impedance:</b>	110Ω
<b>Resolution:</b>	Up to 24 bits
<b>Sampling Rate:</b>	32kHz to 48 kHz
<b>Input Level:</b>	2V to 7V p-p
<b>Minimum I/O Delay:</b>	3.5ms

### Electical:

<b>Voltage:</b>	+12VDC
<b>Power:</b>	10.2 Watts (7736CE2) 17.75 Watts (-A4 or -A4+B option)
<b>EMI/RFI:</b>	Complies with FCC Part 15, class A and EU EMC directive.

### Physical:

<b>7700 frame mounting:</b>	2
<b>7701 frame mounting:</b>	1

### Ordering Information:

<b>7736CE2</b>	Dual Composite Encoder
<b>7736CE2-A4</b>	Dual Composite Encoder with 4 analog outputs

### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

<b>+S</b>	Optional Frame Synchronizer
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### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone enclosure



The 7736CDM line of composite analog video to serial digital converters are broadcast quality decoders with an extensive list of additional features. High quality audio analog to digital conversion can be packaged with the decoder to create a video/audio frame synchronizer with audio embedder.

Faroudja 2D adaptive comb filtering technology has been chosen to not introduce moving artifacts from the decoding process. This makes it ideal for use in applications where the signal is destined to enter MPEG compressors. "The low level of moving artifacts reduces the bit-rate required to digitally encode the signal for a given picture quality level by up to 20%." <sup>1</sup>

Traditional adaptive and non-adaptive 2D comb filters can introduce artifacts in areas of high detail. However, "by using adaptive processing incorporating Faroudja's patented H-logic and V-logic interpolation algorithms to control both the comb filter itself and the narrow and wide band chroma filters, these artifacts are substantially reduced not only on horizontal and vertical edges, but on diagonal edges too. In this way, the chroma filters reduce chroma noise without blurring the signal at sharp transitions in any direction."<sup>2</sup>

In addition, Evertz fault monitoring processing will analyze and report video and audio problems via an On-Screen-Display, or remotely via VistaLINK® SNMP.

<sup>1, 2</sup> Faroudja Laboratories Inc., FLJ2000S Data Sheet

### Feature

#### The Features of the decoding process:

- 10 bit, 8fsc sampling of input video
- Internal processing to maintain 10 bit digital video quality
- Patented Faroudja adaptive 2D comb filtering technology
- Mode for support of non-time base corrected signals
- User configurable luma and chroma detail enhancement
- User selectable noise reduction
- Chroma AGC available, if desired
- User adjustable input video processing functions: black level, gain, hue, and saturation (when chroma AGC is enabled)

#### The Features of all 7736CDM's are:

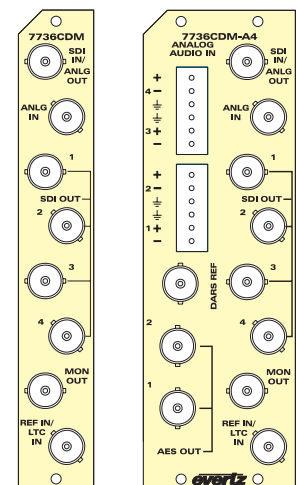
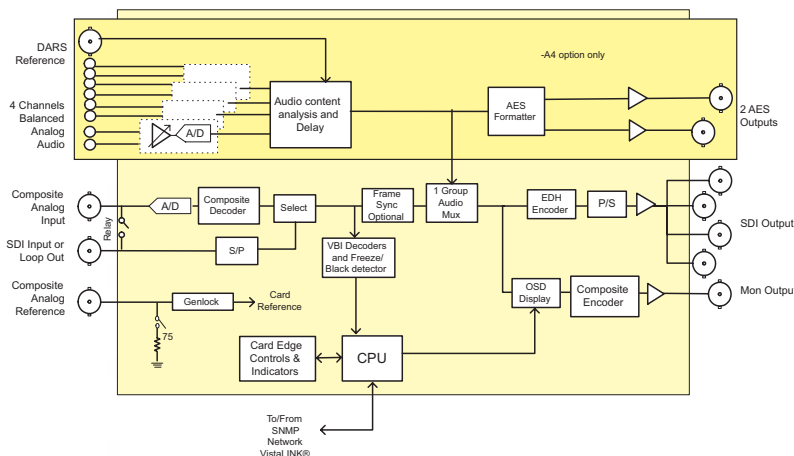
- Flexible input options for hybrid analog and digital plants/studios. Two input BNCs that can be configured either as; one composite analog loop input (NTSC or PAL-B) or a dual input with one channel of SDI and one channel of composite analog video (selectable)
- Four SDI 525 or 625, 270 Mb/s component digital video output WITH OUT OSD text or audio bargraphs
- One composite analog video output with OSD text and bargraph graphics
- EDH encoding on SDI output
- One composite analog reference input (NTSC or PAL-B) on BNC. 75Ω or high-Z, jumper configurable input impedance
- One frame video synchronizer (with +S option)
- Infinitely variable output phase (27MHz clock increments)
- Freeze modes: black, freeze
- Adjustable free running frequency via OSD
- VU/PPM bargraph level Indicators
- Decodes vertical interval time code (VITC) and "burns" the time code into the picture

- Decodes PESA format Source ID (8 characters) or Evertz format VITC Source ID (5 or 9 characters) and burns the ID into the picture
- A comprehensive on screen display is available to configure the various features of the module
- Flexible configuration of the text and audio bar graph information displays
- An extensive list of error conditions can be monitored and fault conditions can be configured from these conditions
- On screen messages can be triggered by the configured fault conditions
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

#### The Features of "-A4" option are:

- 4 balanced analog audio inputs on 2 removable barrier strips
- High impedance inputs (user supplies termination resistors for other impedance's)
- Analog audio input levels are adjustable. Jumpers set coarse input levels, fine input levels are set by software control
- Audio delay equivalent video delay (with +S option)
- Additional audio delay of up to 5 seconds
- Audio advance of up to 1 frame less 3 microseconds
- One group (4 channels of audio) is multiplexed on the outgoing digital video
- 2 unbalanced AES audio outputs delayed equivalently to the video delay
- 75Ω coaxial (unbalanced) DARS reference input on BNC
- Loss of video modes: pass audio, mute audio

### 7736CDM Block Diagram & Rear Panels





# Composite Analog Video A to D Converter with Optional Frame Synchronizer

## 7736CDM / 7736CDM-A4

### Specifications

#### Analog Video Input:

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Inputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	1V nominal
Frequency Lock Range:	±75ppm from nominal
Input level control range:	±5dB
Black level control range:	±5 IRE
Chroma level control range:	±20% (only available if chroma AGC enabled)
Hue control range:	±20° (NTSC only)
Input Impedance:	75Ω or High impedance (depending on input mode)
Return Loss:	>35dB to 10MHz
Lock up time on a hot switch:	Between 15 and 45 frames (may be longer with noisy signals)

#### Serial Video Inputs:

Standard:	SMPTE 259M-C - 525 or 625 line component.
Number of Inputs:	1
Number of re-clocked outputs:	0
Connector:	BNC per IEC 60169-8 Amendment 2
Return Loss:	>15dB to 300MHz
Embedded Audio:	SMPTE 272M-A
Frequency Lock Range:	±75ppm from nominal

#### Reference Video Input:

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Inputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	1V nominal
Frequency Lock Range:	±75ppm from nominal
Input Impedance:	75Ω or High impedance (jumper selectable)
Return Loss:	>25dB to 10MHz

#### Analog Monitoring Video Output:

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Outputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	1V nominal
Output Impedance:	75Ω
Return Loss:	>35dB to 10MHz

#### Serial Video Output:

Standard:	SMPTE 259M-C - 525 or 625 line component.
Number of Outputs:	4
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	900ps nominal
Overshoot:	<10% of amplitude
Return Loss:	>15dB to 270MHz
Embedded Audio:	SMPTE 272M-A

#### Decoder Performance (SDI output only):

Frequency Response:	<±0.1dB (100kHz to 4.2MHz)
Differential Gain:	<±0.5% typical
Differential Phase:	<±0.2° typical
Noise Floor:	< -56dBms (black video, 15kHz to 5MHz) < -60dBms (VBI lines, black video, 15kHz to 5MHz)
C/L Gain:	<±0.5%
C/L Delay:	<±9ns
Minimum Delay:	3.25 lines
Maximum Delay:	1 frame plus 3.25 lines (+S option only)

#### Analog Audio Input (-A4 only):

Number of Inputs:	4
Type:	Balanced analog audio
Connector:	Removable terminal strip
Input Impedance:	20kΩ minimum (differential)
Sampling Frequency:	48kHz
Signal Level:	0dB FS => 18 or 24dBu (jumper selectable)
Level Control Range:	+/- 10dB
Frequency Response:	+/- 0.1dB (20Hz to 20kHz) (broadcast quality)
SNR:	100dB with input at -0.5dBFS
THD+N:	<0.001% (>100dB) @ 20Hz to 20kHz, -0.5 dB FS (input video locked to genlock video)
CMRR:	>100dB @ 1kHz

#### AES Audio Outputs (-A4 version only):

Number of Outputs:	2
Output Standard:	SMPTE 276M, single ended synchronous AES
Connectors:	BNC per IEC 60169-8 Amendment 2
Resolution:	24 bits
Sampling Rate:	synchronous 48kHz
Minimum I/O Delay:	2.1ms
Maximum I/O Delay:	5 seconds

#### Electrical:

Voltage:	+12VDC
Power:	10 Watts CDM + 9 Watts (-A4 option) = 19 Watts total
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

7700 frame mounting:	2
7701 frame mounting:	1

#### Stand Alone Enclosure:

Dimensions:	14 " L x 4.5 " W x 1.9 " H (355 mm L x 114 mm W x 48 mm H)
Weight:	approx. 1.5 lbs. (0.7 Kg)

#### Ordering Information:

7736CDM	Composite analog video to SDI decoder with auxiliary SDI input with optional frame synchronizer
7736CDM-A4	Composite analog video to SDI decoder with auxiliary SDI input, analog audio to embedded and AES with optional frame synchronizer

#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

+S	Optional frame synchronizer
Rear Plate Suffix	
+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Accessories:

7700FC	VistaLINK® Frame Controller
9000NCP	1RU VistaLINK® General Purpose Network Control Panel
9000NCP2	2RU VistaLINK® General Purpose Network Control Panel

#### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure



The 7736CD2 line of composite analog video to serial digital converters are dual broadcast quality decoders. High quality audio analog to digital conversion can be packaged with the decoder to create a video/audio frame synchronizer with audio embedder. Faroudja 2D adaptive comb filtering technology has been chosen so as not to introduce moving artifacts from the decoding process. This makes it ideal for use in applications where the signal is destined to enter MPEG compressors. "The low level of moving artifacts reduces the bit-rate required to digitally encode the signal for a given picture quality level by up to 20%."<sup>1</sup>

Traditional adaptive and non-adaptive 2D comb filters can introduce artifacts in areas of high detail. However, "by using adaptive processing incorporating Faroudja's patented H-logic and V-logic interpolation algorithms to control both the comb filter itself and the narrow and wide band chroma filters, these artifacts are substantially reduced not only on horizontal and vertical edges, but on diagonal edges too. In this way, the chroma filters reduce chroma noise without blurring the signal at sharp transitions in any direction".<sup>2</sup>

<sup>1, 2</sup> Faroudja Laboratories Inc., FLI2000S Data Sheet

In addition, control of the card is via an On-Screen-Display, or remotely via VistaLINK® SNMP.

## Features

- One input BNC per channel. 75Ω or Hi-Z, jumper configurable input impedance
- Two SDI 525 or 625, 270 Mb/s component digital video output per channel WITHOUT OSD text
- EDH encoding on SDI outputs
- One composite analog video output with OSD text for card control
- One composite analog reference input (NTSC or PAL-B) on BNC. 75Ω or Hi-Z, jumper configurable input impedance. One time base for both channels
- Video frame synchronizer (with +S option)
- Infinitely variable output phase (27MHz clock increments)
- Freeze modes: black, freeze
- Adjustable free running frequency via OSD. Both channels must be free-running to be able to adjust frequency
- A comprehensive on screen display is available to configure the various features of the module

- User configurable luma and chroma detail enhancement
- User selectable noise reduction
- Chroma AGC available, if desired
- User adjustable input video processing functions: black level, gain, hue, and saturation (when chroma AGC is enabled)

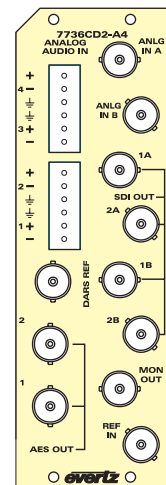
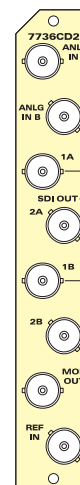
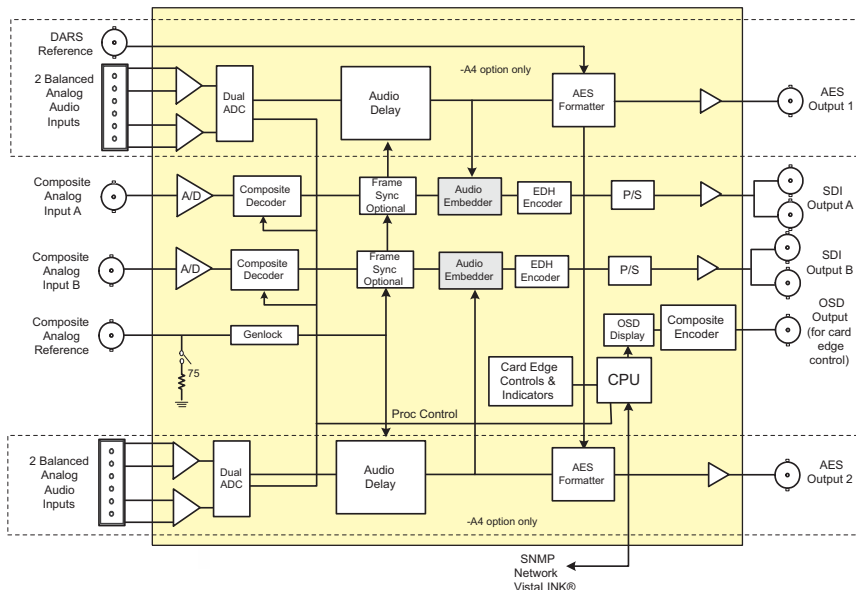
## The Features of "-A4" Option:

- 4 balanced analog audio inputs (two stereo pair) on 2 removable barrier strips
- High impedance inputs (user supplies termination resistors for other impedance's)
- Analog audio input levels are adjustable. Jumpers set coarse input levels, fine input levels are set by software control
- Audio delay equivalent video delay (with +S option)
- Additional audio delay of up to 5 seconds
- Audio advance of up to 1 frame less 2.5 microseconds
- 2 channels (1/2 group) of audio is multiplexed onto each of the outgoing digital video
- 2 unbalanced AES audio outputs delayed equivalently to the associated video
- 75Ω coaxial (unbalanced) DARS reference input on BNC
- Loss of video modes: pass audio, mute audio

## The Features of the Decoding Process:

- 12 bit, 8fsc sampling of input video.
- Internal processing to maintain 10 bit digital video quality
- Patented Faroudja adaptive 2D comb filtering technology
- Mode for support of non-time base corrected signals

## 7736CD2 Block Diagram





# Dual Composite Decoder

## 7736CD2 & 7736CD2-A4

### Specifications

#### Analog Video Input:

<b>Standard:</b>	NTSC, SMPTE 170M PAL, ITU624-4
<b>Number of Inputs:</b>	1
<b>Connector:</b>	1 BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1V nominal
<b>Frequency Lock Range:</b>	±75ppm from nominal
<b>Input level control range:</b>	±4dB
<b>Black level control range:</b>	±5 IRE
<b>Chroma level control range:</b>	±20% (only available if chroma AGC enabled)
<b>Hue control range:</b>	±20° (NTSC only)
<b>Input Impedance:</b>	75Ω or High impedance (jumper selectable)
<b>Return Loss:</b>	>35dB to 10MHz
<b>Lock up time on a hot switch:</b>	Between 15 and 45 frames (may be longer with noisy signals)

#### Reference Video Input:

<b>Standard:</b>	NTSC, SMPTE 170M PAL, ITU624-4
<b>Number of Inputs:</b>	1
<b>Connector:</b>	1 BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1V nominal
<b>Frequency Lock Range:</b>	±75ppm from nominal
<b>Input Impedance:</b>	75Ω or High impedance (jumper selectable)
<b>Return Loss:</b>	>25dB to 10MHz

#### Analog Monitoring Video Output:

<b>Standard:</b>	NTSC, SMPTE 170M PAL, ITU624-4
<b>Number of Outputs:</b>	1
<b>Connector:</b>	1 BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1V nominal
<b>Output Impedance:</b>	75Ω
<b>Return Loss:</b>	>35dB to 10MHz

#### Serial Video Output:

<b>Standard:</b>	SMPTE 259M-C - 525 or 625 line component.
<b>Number of Outputs:</b>	4 (2 per channel)
<b>Connector:</b>	1 BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V ±0.5V
<b>Rise and Fall Time:</b>	900ps nominal
<b>Overshoot:</b>	<10% of amplitude
<b>Return Loss:</b>	>15dB to 270MHz
<b>Jitter:</b>	<0.09 UI (all outputs)
<b>Embedded Audio:</b>	SMPTE 272M-A

#### Decoder Performance (SDI outputs only):

<b>Frequency Response:</b>	<±0.1dB (100kHz to 4.2MHz)
<b>Differential Gain:</b>	<±0.5% typical
<b>Differential Phase:</b>	<±0.2° typical
<b>Noise Floor:</b>	< -57dB rms (black video, 15kHz to 5MHz) < -60dB rms (VBI lines, black video, 15kHz to 5MHz)
<b>C/L Gain:</b>	<±0.5%
<b>C/L Delay:</b>	<±9ns
<b>Minimum Delay:</b>	3.25 lines
<b>Maximum Delay:</b>	1 frame plus 3.25 lines
<b>Inter-channel crosstalk:</b>	Within noise floor measurement

#### Analog Audio Input (-A4 only):

<b>Number of Inputs:</b>	4 (2 per video channel)
<b>Type:</b>	Balanced analog audio
<b>Connector:</b>	Removable terminal strip
<b>Input Impedance:</b>	20kΩ minimum (differential)
<b>Sampling Frequency:</b>	48kHz
<b>Signal Level:</b>	0dB FS => 18 or 24dBu (jumper selectable)
<b>Level Control Range:</b>	+/- 10dB
<b>Frequency Response:</b>	+/- 0.1dB (20Hz to 20kHz) (broadcast quality)
<b>SNR:</b>	100dB with input at -0.5dBFS
<b>THD+N:</b>	<0.001% (>100dB) @ 1kHz, -0.5 dB FS (rev 2) <0.001% (>100dB) @ 20Hz to 20kHz, -0.5 dB FS (input video locked to genlock video)
<b>CMRR:</b>	>100dB @ 1kHz

#### AES Audio Outputs:

<b>Number of Outputs:</b>	2 (1 per channel)
<b>Output Standard:</b>	SMPTE 276M, single ended synchronous AES
<b>Connectors:</b>	1 BNC per IEC 60169-8 Amendment 2
<b>Resolution:</b>	24 bits
<b>Sampling Rate:</b>	synchronous 48kHz
<b>Minimum I/O Delay:</b>	2.1ms
<b>Maximum I/O Delay:</b>	2.5 seconds

#### Electrical:

<b>Voltage:</b>	+12VDC
<b>Power:</b>	12 Watts CD2 + 9 Watts (-A4 option) = 21 Watts total
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC directive

#### Physical:

<b>7700 frame mounting:</b>	2
<b>7701 frame mounting:</b>	1

#### Ordering Information:

<b>7736CD2</b>	Dual Composite Decoder
<b>7736CD2-A4</b>	Dual Composite Decoder with 4 analog outputs

#### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

<b>+S</b>	Optional Frame Synchronizer
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#### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone enclosure



The 7746FSE series SD Frame Synchronizers are designed to re-time a SMPTE259M (625i/50, 525i/59.94 ) input to a local sync signal. When necessary, frames are repeated or dropped to maintain synchronization. During the synchronizing process the video delay varies from 3 lines through to 1 frame plus 3 lines. Additional delay can be added to the synchronizing process in 1 frame increments.

The 7746FSE is currently available in two versions to suit various application requirements.

Model	Synchronizes			AES Audio	
	Video	Embedded Audio	AES Audio	Inputs	Outputs
7746FSE	Yes	Demux and mux 2 Groups	No	-	--
7746FS-EAES4	Yes	Demux and mux 2 Groups	4	4	4

On the 7746FSE version the video and embedded audio is synchronized. On the 7746FS-EAES4 version, the user can choose to have either 2 groups from the upstream embedded audio or audio from the 4 AES inputs embedded on the output video and output as AES. Both versions can also pass all VANC data. When the input video is lost, it will pass the input AES or mute if embedded audio is selected for synchronizing. The frame synchronizers also have the ability to set the audio delay independently from the video delay.

The frame synchronizers have the ability to adjust video parameters such as brightness, contrast, saturation and hue. The 7746FSE products can adjust audio parameters such as gain, mixing stereo pairs into monaural and reassignment of audio channels.

The card functions can be controlled from the card edge or through the VistaLINK® interface.

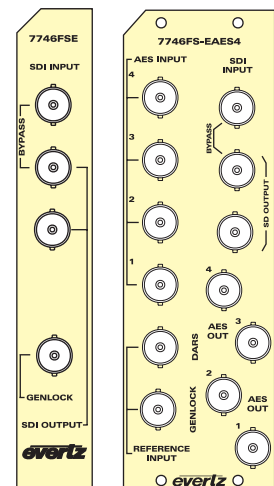
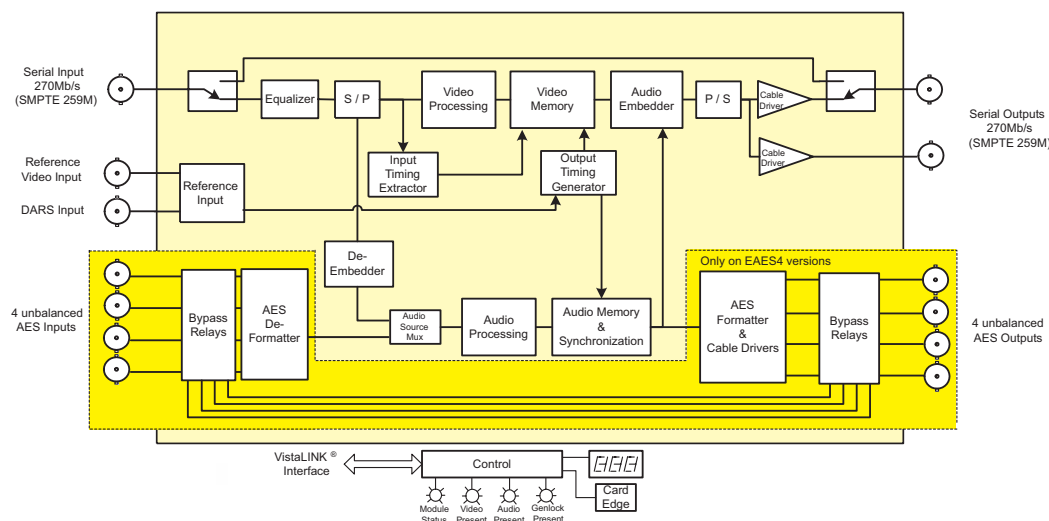
## Features

- Synchronizes 525i/59.94 or 625i/50
- Minimum video input to output delay - 3 lines
- Maximum video input to output delay - 1 frame plus 3 lines
- 12 additional frames of delay can be added for interlaced video formats
- Program Video output bypass relay protected on power loss
- Programmable output phase with respect to reference input
- Freeze on last good frame, or field, go to black on loss of video or pass input
- Synchronizes 2 groups of embedded audio and re-embeds 2 groups
- Audio Sample Rate Converters can be disabled for Dolby E support
- Independently adjustable audio levels on all channels
- Ability to combine stereo pairs to monaural
- Reassignment of audio channels within the embedded groups
- Front panel LEDs indicate: module fault, video and audio present
- Serial remote data logging
- Adjustable video black level (brightness), Y level (contrast) and chroma level (saturation), color (hue)
- Maximum audio input to output delay - equivalent to additional frames of video delay
- Separate control of video and audio delay
- Audio Sample Rate Converters can be disabled
- Independently adjustable audio levels on all channels
- Ability to combine stereo pairs to monaural
- Reassignment of audio channels
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame

## Additional Features for -EAES4 versions:

- Synchronizes four external AES signals
- Synchronized audio is output as 4 AES signals
- AES outputs bypass relay protected on power loss

## 7746FSE Block Diagram and Rear Panels





# SD Frame Synchronizers

## 7746FSE & 7746FS-EAES4

### Specifications

#### Serial Video Input:

Standard:	SMPTE 259M-C 525i/59.94 or 625i/50
Connector:	BNC per IEC 60169-8 Amendment 2
Input Equalization:	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return Loss:	>15 dB up to 270 MHz

#### Serial Video Outputs:

Number of Outputs:	2 (1 output is bypass relay protected)
Connectors:	BNC per IEC 60169-8 Amendment 2
Signal Level:	800mV nominal
DC Offset:	0V $\pm$ 0.5V
Rise and Fall Time:	900ps nominal
Overshoot:	<10% of amplitude
Wide Band Jitter:	< 0.10 UI

#### Genlock Input:

Type:	NTSC or PAL Color Black 1 V p-p, or Composite bi-level sync (525i/59.94 or 625i/50) 300 mV
Connector:	BNC per IEC 60169-8 Amendment 2
Termination:	75 $\Omega$ (jumper selectable)

#### AES Audio Input and Output (7746FS-EAES4):

Number of Inputs:	4
Number of Outputs:	4
Standard:	SMPTE 276M, single ended synchronous or asynchronous AES
Connectors:	BNC per IEC 60169-8 Amendment 2
Resolution:	24 bits
Sampling Rate:	48 kHz
Impedance:	75 $\Omega$ unbalanced
Signal Level:	1 V p-p nominal

#### Processing Functions:

Video:	
Black Level:	$\pm$ 7%
Luminance Gain:	$\pm$ 6dB
Chrominance Gain:	$\pm$ 6dB
Hue:	$\pm$ 20°
Audio:	
Gain:	$\pm$ 24dB
Remapping:	Any input or mono mix of any L/R pair to any output

#### Input To Output Processing Delay:

Video Processing Delay	
Minimum Delay Mode:	3 lines to 1 frame plus 3 lines
Additional Delay Mode:	Up to 12 frames of additional delay (1 frame increments)

#### Data Logging Serial Port:

Standard:	RS 232
Connector:	Software upgrade cable female DB-9
Baud Rate:	57600
Format:	8 bits, no parity, and 2 stop bits

#### Electrical:

Voltage:	+12VDC
Power:	
7746FSE	12 Watts
7746FS-EAES4	15.5 Watts
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

7700 frame mounting:	
Number of slots:	1 for 7746FSE 2 for 7746FS-EAES4
7701 frame mounting:	
Number of slots:	1 for 7746FSE 1 for 7746FS-EAES4

#### Ordering Information:

7746FSE	SD Frame Synchronizer
7746FS-EAES4	SD Frame Synchronizer with 4 AES audio pairs and embedded audio processing & AES Support

#### Ordering Options:

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Accessories:

7700FC	VistaLINK® Frame Controller
9000NCP	1RU VistaLINK® General Purpose Network Control Panel
9000NCP2	2RU VistaLINK® General Purpose Network Control Panel

#### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure



The 7746FSE-HD series HD/SD Frame Synchronizers are designed to re-time a SMPTE 292M (1080i/60, 1080i/59.94, 1080i/50, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94, or 480p/59.94) or SMPTE259M (625i/50, 525i/59.94) input to a local reference tri-level or composite sync signal. When necessary, frames are repeated or dropped to maintain synchronization. During the synchronizing process the video delay varies from 3 lines through to 1 frame plus 3 lines. Additional delay can be added to the synchronizing process in 1 frame increments.

The 7746FSE-HD is currently available in two versions to suit various application requirements.

Model	Synchronizes			AES Audio	
	Video	Embedded Audio	AES Audio	Inputs	Outputs
7746FSE-HD	Yes	Demux and mux 2 Groups	No	-	--
7746FS-EAES4-HD	Yes	Demux and mux 2 Groups	4	4	4

On the 7746FSE-HD version the video and any embedded audio present is synchronized. On the 7746FS-EAES4-HD version, the user can choose to have either 2 groups from the upstream embedded audio or audio from the 4 AES inputs embedded on the output video and output as AES. Both versions can also pass all VANC data. When the input video is lost, it will pass the input AES or mute if embedded audio is selected for synchronizing. The frame synchronizers also have the ability to set the audio delay independently from the video delay.

The frame synchronizers have the ability to adjust video parameters such as brightness, contrast and saturation. Hue control is available for SD standards (525i/59.94 and 625i/50). They can also adjust audio parameters such as gain, mixing stereo pairs into monaural and reassignment of audio channels.

The card functions can be controlled from the card edge or through the VistaLINK® interface.

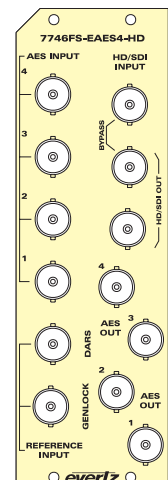
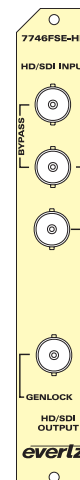
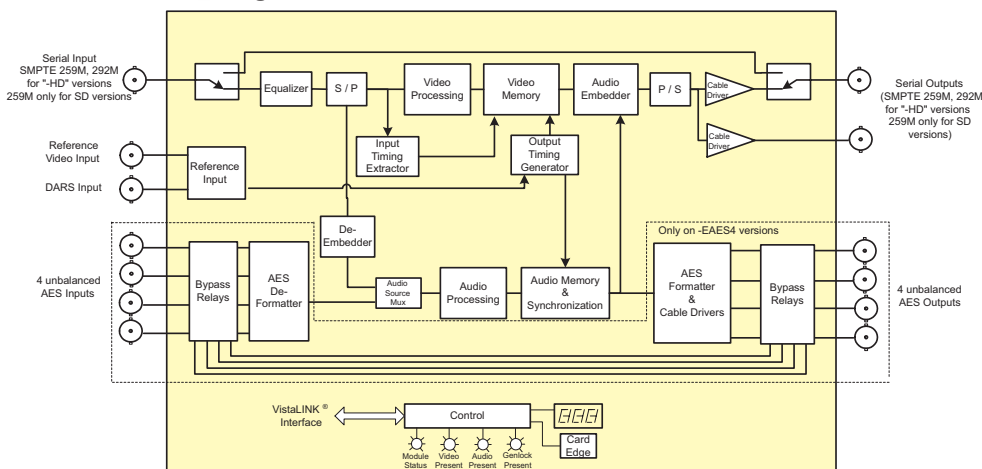
## Features

- Synchronizes 1080i/60, 1080i/59.94, 1080i/50, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94, 480p/59.94, 525i/59.94 or 625i/50
- Minimum video input to output delay - 3 lines
- Maximum video input to output delay - 1 frame plus 3 lines
- 12 additional frames of delay can be added for interlaced video formats, 28 frames for progressive formats.
- Program Video output bypass relay protected on power loss
- Programmable output phase with respect to reference input
- Freeze on last good frame, or field, go to black on loss of video or pass input
- Synchronizes 2 groups of embedded audio and re-embeds 2 groups
- Front panel LEDs indicate: module fault, video and audio present
- Serial remote data logging
- Adjustable video black level (brightness), Y level (contrast) and chroma level (saturation)
- Adjustable hue control for SD video standards
- Maximum audio input to output delay - equivalent to additional frames of video delay
- Synchronizes VANC data starting after switch line
- Synchronizes RP188 time codes
- Separate control of video and audio delay
- Audio Sample Rate Converters can be disabled for Dolby support
- Independently adjustable audio levels on all channels
- Ability to combine stereo pairs to monaural
- Reassignment of audio channels
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame

## Additional Features for -EAES4 versions:

- Synchronizes four external AES signals
- Synchronized audio is output as 4 AES signals
- AES outputs bypass relay protected on power loss

## 7746FSE-HD Block Diagram and Rear Panels





### Specifications

#### Serial Video Input:

**Standard:** DIP switch selectable  
1.485 Gb/s SMPTE 292M -SMPTE 274M,  
SMPTE 296M, SMPTE 349M  
270 Mb/sec SMPTE 259M-C 525i/59.94 or  
625i/50  
**Connector:** BNC per IEC 60169-8 Amendment 2.

#### Input Equalization:

**SD** Automatic to 300m @ 270Mb/s with Belden  
1694A or equivalent cable  
**HD** Automatic to 115m @ 1.5Gb/s with Belden  
1694A or equivalent cable.

#### Return Loss:

**SD** >15 dB up to 270 MHz  
**HD** >13 dB up to 1.5 GHz

#### Serial Video Outputs:

**Number of Outputs:** 2 (1 output is bypass relay protected)  
**Connectors:** BNC per IEC 60169-8 Amendment 2.  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V  $\pm$ 0.5V  
**Rise and Fall Time:** 200ps nominal (HD) or 900ps nominal (SD)  
**Overshoot:** <10% of amplitude  
**Wide Band Jitter:** < 0.16 UI (HD) or < 0.10 UI (SD)

#### Genlock Input:

**Type:** HD Tri-level Sync  
NTSC or PAL Color Black 1 V p-p, or  
Composite bi-level sync (525i/59.94 or  
625i/50) 300 mV

**Connector:** BNC per IEC 60169-8 Amendment 2.  
**Termination:** 75 $\Omega$  (jumper selectable)

#### AES Audio Input and Output (7746FS-EAES4-HD):

**Number of Inputs:** 4  
**Number of Outputs:** 4  
**Standard:** SMPTE 276M, single ended synchronous or  
asynchronous AES  
**Connectors:** BNC per IEC 60169-8 Amendment 2.  
**Resolution:** 24 bits  
**Sampling Rate:** 48 kHz  
**Impedance:** 75 $\Omega$  unbalanced  
**Signal Level:** 1 V p-p nominal

#### Processing Functions:

**Video:**  
**Black Level:** +/- 7%  
**Luminance Gain:** +/- 6dB  
**Chrominance Gain:** +/- 6dB  
**Hue:** +/- 20° (SD)  
**Audio**  
**Gain:** +/- 24dB  
**Remapping:** Any input or mono mix of any L/R pair to any  
output

#### Input To Output Processing Delay:

**Video Processing Delay**  
**Minimum Delay Mode:** 3 lines to 1 frame plus 3 lines  
**Additional Delay Mode:** Up to 12 frames for interlaced formats (28  
frames for progressive formats) of additional  
delay (1 frame increments)

#### Data Logging Serial Port:

**Standard:** RS 232  
**Connector:** Software upgrade cable female DB-9  
**Baud Rate:** 115200  
**Format:** 8 bits, no parity, and 2 stop bits

#### Electrical:

**Voltage:** +12VDC  
**Power:**  
**7746FSE-HD** 13.5 Watts  
**7746FS-EAES4-HD** 15.5 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC Directive

#### Physical:

**7700 frame mounting:**  
**Number of slots:** 1 for 7746FSE-HD  
2 for 7746FS-EAES4-HD  
**7701 frame mounting:**  
**Number of slots:** 1

#### Ordering Information:

**7746FSE-HD** HD/SD Frame Synchronizer  
**7746FS-EAES4-HD** HD/SD Frame Synchronizer with 4 AES  
audio pairs and embedded audio processing  
& AES Support

#### Ordering Options:

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C  
Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Accessories:

**7700FC** VistaLINK® Frame Controller  
**9000NCP** 1RU VistaLINK® General Purpose Network  
Control Panel  
**9000NCP2** 2RU VistaLINK® General Purpose Network  
Control Panel

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



The 7746FS-EAES8-HD HD/SD Frame Synchronizer is designed to re-time a SMPTE 292M (1080i/60, 1080i/59.94, 1080i/50, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94, 720p/50, 1035i/59.94, 1035i/60, or 480p/59.94) or SMPTE259M (625i/50, 525i/59.94) input to a local reference tri-level or composite sync signal. When necessary, frames are repeated or dropped to maintain synchronization. During the synchronizing process the video delay varies from 3 lines through to 1 frame plus 3 lines. Additional delay can be added to the synchronizing process in 1 frame increments.

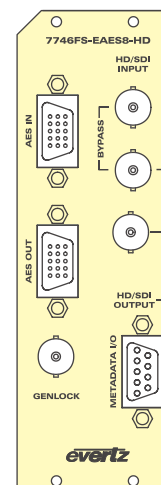
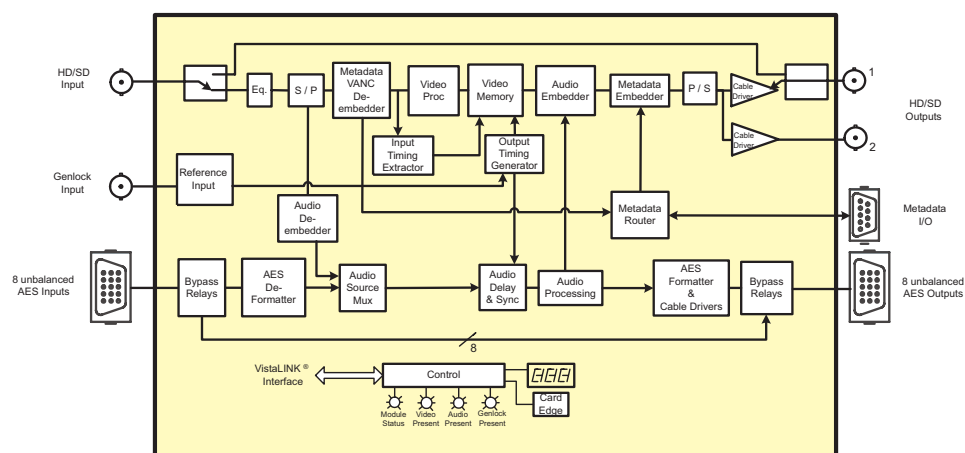
On the 7746FS-EAES8-HD version, the user can choose to have 8 stereo pairs from 4 groups in the upstream embedded audio and from the 8 AES inputs embedded on the output video and output as AES. The module can also pass all VANC data after switching line. When the input video is lost, it will pass the input AES or mute if embedded audio is selected for synchronizing. The frame synchronizers also have the ability to set the audio delay independently from the video delay.

The frame synchronizers have the ability to adjust video parameters such as brightness, contrast and saturation. Hue control is available for SD standards (525i/59.94 and 625i/50). They can also adjust audio parameters such as gain, invert, two-channel mixing, and reassignment of audio channels. The embedder and AES outputs can individually choose between two independent audio mixers.

### Features

- Synchronizes 1080i/60, 1080i/59.94, 1080i/50, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94, 720p/50, 1035i/59.94, 1035i/60, 480p/59.94, 525i/59.94 or 625i/50
- Minimum video input to output delay - 3 lines
- Maximum video input to output delay - 1 frame plus 3 lines
- 12 additional frames of delay can be added for interlaced video formats, 28 frames for progressive formats.
- Program Video output bypass relay protected on power loss
- Programmable output phase with respect to reference input
- Freeze on last good frame, or field, go to black on loss of video or pass input
- Synchronizes 4 groups of embedded audio and re-embeds 4 groups
- Front panel LEDs indicate: module fault, video and embedded group presence, and AES input presense
- Serial remote data logging
- Adjustable video black level (brightness), Y level (contrast) and chroma level (saturation)
- Adjustable hue control for SD video standards
- Maximum audio input to output delay - equivalent to additional frames of video delay
- Synchronizes VANC data starting after switch line
- Synchronizes RP188 time codes
- Separate control of video and audio delay
- Audio Sample Rate Converters can be disabled, or set to automatically detect non-PCM data (i.e. Dolby® E) and disable on a per-input basis
- Independently adjustable audio levels and inversion on all channels
- Ability to combine any two inputs to any output (including monoaural down-mixes of all input stereo pairs)
- Reassignment of audio channels
- Synchronizes eight external AES signals
- Synchronized audio is output as 8 AES signals
- AES and embedded outputs can choose from two independent mixers
- AES outputs bypass relay protected on power loss
- De-embeds and embeds Dolby-E metadata to and from video VANC space
- Metadata monitoring thru VistaLINK® and modification of dial norm "parameter"
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame

### 7746FS-EAES8-HD Block Diagram & Rear Panel





### Specifications

#### Serial Video Input:

**Standard:** Auto detectable/user selectable  
SMPTE 292M (1.5Gb/s), 1080i/60,  
1080i/59.94, 1080i/50, 1080p/24sF,  
1080p/23.94, 720p/60, 720p/59.94,  
1035i/59.94, 1035i/60 or 480p/59.94  
SMPTE 259M-C (270Mb/s), 525 or 625  
line component  
BNC per IEC 60169-8 Amendment 2.

#### Connector:

##### Input Equalization:

###### SD

Automatic to 300m @ 270Mb/s with  
Belden 1694A or equivalent cable  
Automatic to 125m @ 1.5Gb/s with  
Belden 1694A or equivalent cable.

###### HD

#### Return Loss:

###### SD

>15 dB up to 270 Mb/s

###### HD

>15 dB up to 1.5 Gb/s

#### Serial Video Outputs:

##### Number of Outputs:

2 (1 output is bypass relay protected)

##### Connectors:

BNC per IEC 60169-8 Amendment 2.

##### Signal Level:

800mV nominal

##### DC Offset:

0V  $\pm$ 0.5V

##### Rise and Fall Time:

200ps nominal (HD)  
or 740ps nominal (SD)

##### Overshoot:

<10% of amplitude

##### Wide Band Jitter:

< 0.16 UI (HD) or < 0.10 UI (SD)

#### Genlock Input:

##### Type:

HD Tri-level Sync  
NTSC or PAL Color Black 1 V p-p, or  
Composite bi-level sync (525i/59.94 or  
625i/50) 300 mV

#### Connector:

##### Termination:

BNC per IEC 60169-8 Amendment 2.  
75 $\Omega$  (jumper selectable)

#### AES Audio Input:

##### Standard:

SMPTE 276M, single ended AES

##### Number of Inputs:

8 unbalanced

##### Connector:

Female High Density DB-15 (breakout  
cable to BNC provided)

##### Input Level:

0.1 to 2.5 Vp-p (5Vp-p tolerant)

##### Input Impedance:

75 $\Omega$

##### Return Loss:

>25dB 100kHz to 6MHz

##### Equalization:

Automatic to 1000m with Belden 1694A  
(or equivalent) @ 48kHz AES signal  
32KHz to 48KHz

##### Sample Rate:

32KHz to 48KHz

#### AES Audio Output:

##### Standard:

SMPTE 276M, single ended AES

##### Number of Outputs:

8 unbalanced

##### Connector:

Female High Density DB-15 (breakout  
cable to BNC provided)

##### Sample Rate:

48kHz

##### Impedance:

75 $\Omega$

##### Resolution:

24-bit

#### Metadata Input/Output:

##### Type:

Dolby E Metadata

##### Standard:

RS-422

##### Connector:

Female DB-9

##### Baud Rate:

115,200 baud

#### Delay:

##### AC3 Decode Delay:

32ms nominal

##### Dolby E Decode Delay:

1 frame nominal

##### De-embedding Latency:

600 $\mu$ s nominal

##### Additional Audio Delay:

0 to maximum video delay plus 1 frame

##### Additional Video Delay:

0 to 12 frames (interlace)

0 to 28 frames (progressive)

#### Data Logging Serial Port:

##### Standard:

RS 232

##### Connector:

Software upgrade cable female DB-9

##### Baud Rate:

115200

##### Format:

8 bits, no parity, and 2 stop bits

#### Electrical:

##### Voltage:

+12VDC

##### Power:

19 Watts

##### EMI/RFI:

Complies with FCC Part 15, Class A  
EU EMC Directive

#### Physical:

##### 7700 frame mounting:

2

##### 7701 frame mounting:

1

#### Ordering Information:

##### 7746FS-EAES8-HD

HD/SD Frame Synchronizer with 8 AES  
audio pairs and embedded audio  
processing & AES Support

#### Ordering Options:

Rear Plate must be specified at time of order

Eg: Model +3RU

#### Rear Plate Suffix

##### +3RU

3RU Rear Plate for use with 7700FR-C  
Multiframe

##### +1RU

1RU Rear Plate for use with 7701FR  
Multiframe

##### +SA

Standalone Enclosure Rear Plate

#### Accessories:

WPAES8-BNCM-6F cable (included)

##### 7700FC

VistaLINK® Frame Controller

##### 9000NCP

1RU VistaLINK® General Purpose  
Network Control Panel

##### 9000NCP2

2RU VistaLINK® General Purpose  
Network Control Panel

#### Enclosures:

##### 7700FR-C

3RU Multiframe which holds 15 modules

##### 7701FR

1RU Multiframe which holds 3 modules

##### S7701FR

Standalone enclosure



The 7746FS-EAES8-DD-HD HD/SD Frame Synchronizer is designed to re-time a SMPTE 292M (1080i/60, 1080i/59.94, 1080i/50, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94, 720p/50, 1035i/59.94, 1035i/60, or 480p/59.94) or SMPTE259M (625i/50, 525i/59.94) input to a local reference tri-level or composite sync signal. When necessary, frames are repeated or dropped to maintain synchronization. During the synchronizing process the video delay varies from 3 lines through to 1 frame plus 3 lines. Additional delay can be added to the synchronizing process in 1 frame increments.

On the 7746FS-EAES8-DD-HD version, the user can choose to have 8 stereo pairs from 4 groups in the upstream embedded audio and from the 8 AES inputs embedded on the output video and output as AES. The module can also pass all VANC data after switching line. When the input video is lost, it will pass the input AES or mute if embedded audio is selected for synchronizing. The frame synchronizers also have the ability to set the audio delay independently from the video delay.

The frame synchronizers have the ability to adjust video parameters such as brightness, contrast and saturation. Hue control is available for SD standards (525i/59.94 and 625i/50). They can also adjust audio parameters such as gain, invert, two-channel mixing, and reassignment of audio channels. The embedder and AES outputs can individually choose between two independent audio mixers.

One selected channel is processed by the on-card Dolby Decoder. If the channel contains Dolby E or Dolby Digital (AC3), it will yield up to 8 additional discrete audio channels, 2 channels of stereo downmix and the associated Dolby E metadata. Up to 16 selected channels may be optionally delayed up to 1.2 seconds and re-embedded into the output video and/or directed to AES outputs. Video output may be optionally delayed to help with lip sync. If PCM audio is embedded, the device acts as a simple 4 group audio de-embedder.

This device also handles the Dolby E Metadata. Metadata is optionally embedded in VANC and can be provided as an output for downstream devices (i.e. Dolby Encoders, Multichannel Audio Tool, etc.).

For lip sync cohesion and ease of editing, Dolby-E data is organized in blocks with lengths matching the associated video frame. The decoder will match the beginning of each output block with the start of video, as provided with the genlock input. Additional delay can be dialed up by the user, up to 1.2 seconds. The 8 AES inputs can be configured as a backup, in the event the primary is lost, or as a voice-over source.

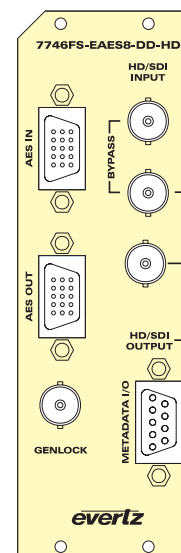
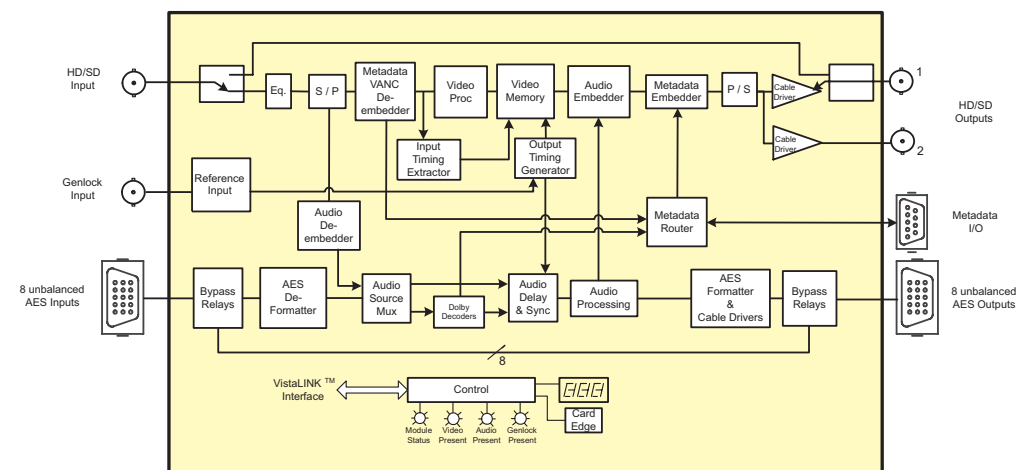
VistaLINK® enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as Evertz VistaLINK® PRO locally or remotely.

## Features

- Synchronizes 1080i/60, 1080i/59.94, 1080i/50, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94, 720p/50, 1035i/59.94, 1035i/60, 480p/59.94, 525i/59.94 or 625i/50
- Minimum video input to output delay - 3 lines
- Maximum video input to output delay - 1 frame plus 3 lines
- 12 additional frames of delay can be added for interlaced video formats, 28 frames for progressive formats.
- Program Video output bypass relay protected on power loss
- Programmable output phase with respect to reference input
- Freeze on last good frame, or field, go to black on loss of video or pass input
- Synchronizes 4 groups of embedded audio and re-embeds 4 groups
- Front panel LEDs indicate: module fault, video and embedded group presence, and AES input presence
- Serial remote data logging
- Adjustable video black level (brightness), Y level (contrast) and chroma level (saturation)
- Adjustable hue control for SD video standards
- Maximum audio input to output delay - equivalent to additional frames of video delay
- Synchronizes VANC data starting after switch line
- Synchronizes RP188 time codes
- Separate control of video and audio delay
- Audio Sample Rate Converters can be disabled, or set to automatically detect non-PCM data (i.e. Dolby-E) and disable on a per-input basis
- Independently adjustable audio levels and inversion on all channels
- Ability to combine any two inputs to any output (including monoaural down-mixes of all input stereo pairs)
- Reassignment of audio channels
- Synchronizes eight external AES signals
- Synchronized audio is output as 8 AES signals
- AES and embedded outputs can choose from two independent mixers
- AES outputs bypass relay protected on power loss
- De-embeds and embeds Dolby-E meta data to and from video VANC space
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame



## 7746FS-EAES8-DD-HD Block Diagram & Rear Panel



### Specifications

#### Serial Video Input:

##### Standard:

DIP switch selectable  
1.485 Gb/s SMPTE 292M - SMPTE 274M,  
SMPTE 296M, SMPTE 349M  
270 Mb/s SMPTE 259M-C 525i/59.94 or 625i/50  
BNC per IEC 60169-8 Amendment 2

#### Connector:

##### Input Equalization:

##### SD

Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable

##### HD

Automatic to 115m @ 1.5Gb/s with Belden 1694A or equivalent cable.

#### Return Loss:

##### SD

>15 dB up to 270 MHz

##### HD

>13 dB up to 1.5 GHz

#### Serial Video Outputs:

##### Number of Outputs:

2 (1 output is bypass relay protected)

##### Connectors:

BNC per IEC 60169-8 Amendment 2.

##### Signal Level:

800mV nominal

##### DC Offset:

0V  $\pm$  0.5V

##### Rise and Fall Time:

200ps nominal (HD)  
or 900ps nominal (SD)

##### Overshoot:

<10% of amplitude

##### Wide Band Jitter:

< 0.16 UI (HD) or < 0.10 UI (SD)

#### Genlock Input:

##### Type:

HD Tri-level Sync  
NTSC or PAL Color Black 1 V p-p, or  
Composite bi-level sync (525i/59.94 or 625i/50) 300 mV  
BNC per IEC 60169-8 Amendment 2  
75 $\Omega$  (jumper selectable)

#### Connector:

##### Termination:

#### AES Audio Input:

##### Standard:

SMPTE 276M

##### Number of Inputs:

8 unbalanced

##### Connector:

Female High Density DB-15 (breakout cable to BNC provided)

##### Input Level:

0.1 to 2.5 Vp-p (5Vp-p tolerant)

##### Input Impedance:

75 $\Omega$

##### Return Loss:

>25dB 100kHz to 6MHz

##### Equalization:

Automatic to 1000m with Belden 1694A (or equivalent) @  
48kHz AES signal  
48kHz  $\pm$  100ppm

##### Sample Rate:

#### AES Audio Output:

##### Standard:

SMPTE 276M, single ended AES

##### Number of Outputs:

8 unbalanced

##### Connector:

Female High Density DB-15 (breakout cable to BNC provided)

##### Sample Rate:

48kHz

##### Impedance:

75 $\Omega$

##### Resolution:

24-bit

#### Meta-Data:

##### Type:

Dolby E Metadata

##### Standard:

RS-422

##### Connector:

Female DB-9

##### Baud Rate:

115,200 baud

### Processing Functions:

#### Video:

**Black Level:**  $\pm$  7%

**Luminance Gain:**  $\pm$  6dB

**Chrominance Gain:**  $\pm$  6dB

#### Hue:

$\pm$  20° (SD)

#### Audio:

**Gain:**  $\pm$  24dB (including invert)

**Remapping:** Any input or mix of any two inputs to any output

### Input To Output Processing Delay:

#### Video Processing Delay

**Minimum Delay Mode:** 3 lines to 1 frame plus 3 lines

**Additional Delay Mode:** Up to 12 frames for interlaced formats (28 frames for progressive formats) of additional delay (1 frame increments)

### Data Logging Serial Port:

#### Standard:

RS 232

#### Connector:

Software upgrade cable female DB-9

#### Baud Rate:

115200

#### Format:

8 bits, no parity, and 2 stop bits

### Electrical:

#### Voltage:

+12VDC

#### Power:

15.5 Watts

#### EMI/RFI:

Complies with FCC Part 15, Class A  
EU EMC Directive

### Physical:

**7700 frame mounting:** 2 slots

**7701 frame mounting:** 1 slot

### Ordering Information:

**7746FS-EAES8-DD-HD** HD/SD Frame Synchronizer with 8 AES audio pairs and embedded audio processing, Dolby E Decoder

### Ordering Options:

Rear Plate must be specified at time of order

Eg: Model +3RU

### Rear Plate Suffix

#### +3RU

3RU Rear Plate for use with 7700FR-C Multiframe

#### +1RU

1RU Rear Plate for use with 7701FR Multiframe

#### +SA

Standalone Enclosure Rear Plate

### Accessories:

#### 7700FC

WPAES8-BNCM-6F cable (included)

#### 9000NCP

VistaLINK® Frame Controller

#### 9000NCP2

1RU VistaLINK® General Purpose Network Control Panel

2RU VistaLINK® General Purpose Network Control Panel

### Enclosures:

#### 7700FR-C

3RU Multiframe which holds 15 modules

#### 7701FR

1RU Multiframe which holds 3 modules

#### 7701FR

Standalone enclosure



The 7743DLY-HD is a full function HD/SD Video Delay module designed for applications such as: satellite uplink, signal re-entry on master control inputs, at cable headends, mobile vehicle outputs, broadcast transmitter inputs, virtual sets and matching delays caused by multi-channel audio compression.

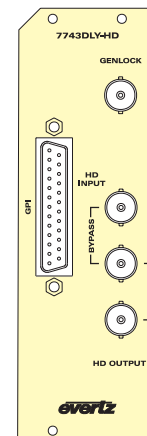
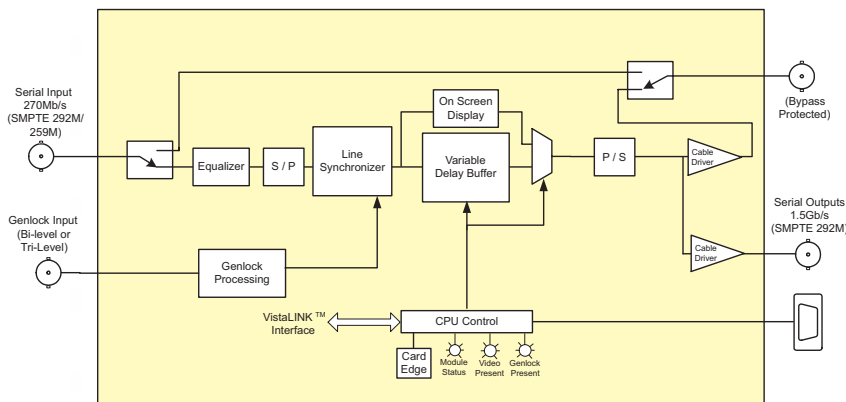
The 7743DLY-HD can act as a delay for SD video (SMPTE 259M) or for HD video (SMPTE 292M). The same technology built on our clean switch router line (X-series) is utilized here.

The 7743DLY-HD is capable of up to 3.2 seconds of delay for HD and up to 16.5 seconds of delay for SD. With the broadcast environment in mind, the modules feature bypass relay protection on output. The 7743DLY-HD module is housed in a 3RU frame that will hold up to 7-7743DLY-HD modules or a 1RU frame that will hold up to 3 modules.

## Features

- Full signal delay capability including VBI and ANC DATA for SMPTE 292M (1.5Gb/s) signals
- 7743DLY-HD also supports full signal delay capability including VBI for SMPTE 259M (270Mb/s) signals
- Delay programmable in video units (frames, lines, and samples) or as time units (seconds)
- Auto senses video standard
- Bypass relay for program path protection on power loss
- Up to 3.2 seconds delay for HD
- Up to 16.5 seconds delay for SD
- Card edge controls operate on screen menu system to program delay settings
- Input circuit features a line buffer which is suitable for "deglitching" hot switches on upstream equipment (very useful for HD equipment)
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame

## 7743DLY-HD Block Diagram & Rear Panels



## Specifications

### High Definition Serial Digital Video:

**Standard:** SMPTE 292M (1.5 Gb/s) or SMPTE 259M (270Mb/s)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 75m @ 1.5Gb/s with Belden 1694A or equivalent cable  
**Return Loss:** > 15 dB up to 1.0 Gb/s  
 > 10 dB up to 1.5 Gb/s (with relay)

### Standard Definition Serial Digital Video:

**Standard:** SMPTE 259M (270 Mb/s)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Return Loss:** > 15 dB up to 270 Mb/s

### Serial Video Outputs:

**Number of Outputs:** 1 with relay bypass, 1 additional output  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 200ps nominal (HD), 740ps nominal (SD)  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 15 dB up to 1.5Gb/s (HD), > 15 dB up to 540Mb/s  
**Wide Band Jitter:** < 0.2 UI

### Genlock Input:

**Type:** HD Tri-level Sync, (See Table 3 in manual)  
 NTSC or PAL Color Black 1 V p-p, or Composite bi-level sync (525i/59.94 or 625i/50) 300 mV  
**Connector:** BNC per IEC 60169-8 Amendment 2.  
**Termination:** 75Ω (jumper selectable)

### Functional:

**Minimum Delay:** 65.5 ms (1770 samples) for standard definition, 37.7 ms (2800 samples) for high definition  
**Maximum Delay:** approx. 16.5 seconds for standard definition, approx. 3.2 seconds for high definition

### Electrical:

**Voltage:** +12VDC  
**Power:** 20 watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

### Physical:

**7700 frame mounting:** 2 slots  
**7701 frame mounting:** 1 slot

### Stand Alone Enclosure:

**Dimensions:** 14 " L x 4.5 " W x 1.9 " H  
 (355 mm L x 114 mm W x 48 mm H)  
**Weight:** Approx. 1.5 lbs. (0.7 Kg)

### Ordering Information:

**7743DLY-HD** HD/SD Video Delay

### Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Accessories:

**7700FC** VistaLINK® Frame Controller  
**9000NCP** 1RU VistaLINK® General Purpose Network Control Panel  
**9000NCP2** 2RU VistaLINK® General Purpose Network Control Panel

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone Enclosure





In live shows, there is always the risk that certain actions on the part of an artist or an intruder, might be offensive to certain viewers. The Evertz HDSD9545DLY-PRO Profanity Protection device has been designed to give an operator complete control over the program content being broadcast to air.

This new product, enables the operator to insert the desired time delay, via a front panel control and display panel. There are two program paths which are HD and SD compatible. The main program feed will usually be focused on the main detailed action. The secondary back-up path, will generally offer a wide angle shot or some suitable alternative picture to the main content. Both channels are delayed by the same amount. If an unscheduled offensive event occurs, the operator has only to hit one remote button to cause the program video and audio output to be clean switched to the alternative back-up channel. When the offending material is no longer present, the output can be returned to the main detailed image, without the audience noticing that an edit has occurred.

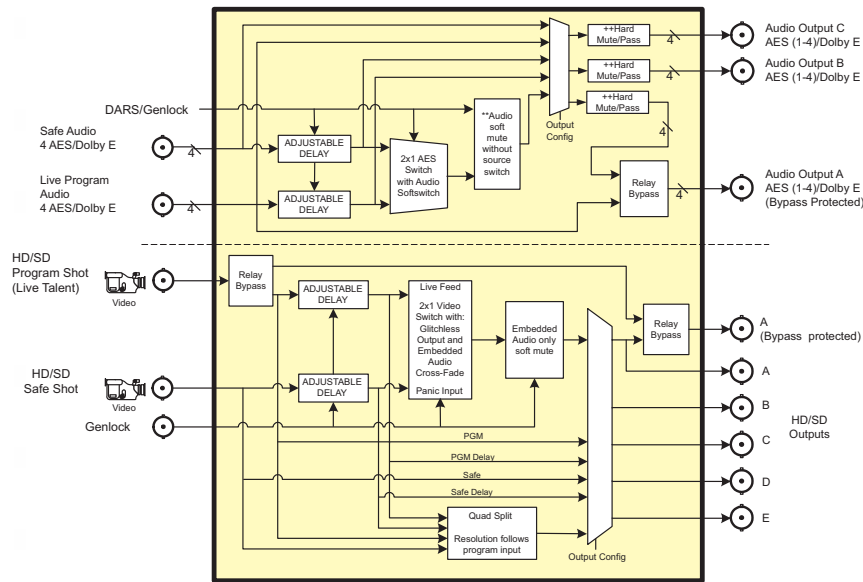
The delay can be adjusted from a minimum 2 frame program or safe delay to a maximum of 40 seconds for HDTV or 240 seconds for SDTV (with the HD40 option). This max delay can be allocated to primary and secondary paths as allocated by the user.

The HDSD9545DLY-PRO includes dual power supplies and a built-in HD/SD Quattro™ card which shows all four pictures on a single screen. The four pictures are as follows:

- Main program
- Delayed Main program
- Safe input
- Delayed safe input

### Features

- HD or SD SDI compatible
- Embedded Audio and Discrete (4ch AES) Audio Support
- Monitoring outputs of delayed program and delayed backup can be provided
- Selectable quad split monitoring outputs
- Safe input frame capture
- Clean transition between program and backup feed
  - \* SoftSwitch™ audio (patent pending)
  - \* Clean switch video
- Relay bypass protection for video and audio
- Delay memory is solid state (no moving parts)
- No hard drive to fail or maintain
- Contact closure inputs for bypass triggering
- Programmable pre-trigger reaction time
- Delay on HDSD9545DLY-PRO:
  - 24 seconds for HD Delay or 24 seconds for SD Delay
- Delay on HDSD9545DLY-PRO-HD40:
  - 40 seconds for HD Delay or 240 seconds for SD Delay
- Delay is user allocated between primary & secondary back-up paths
- Dual power supplies
- Min. 2 frame PGM delay and 2 frame safe delay



### Specifications

#### Serial Digital Video Inputs

<b>Standard:</b>	SMPTE 292M (1.5 Gb/s) - 1080i/59.94, 1080i/50, 720p/59.94
	SMPTE 259M (270Mb/s) - 525i/59.94, 625i/50
<b>Embedded Audio:</b>	SMPTE 299M (HD) SMPTE 272M (SD)
<b>Number of Inputs:</b>	2
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2.
<b>Equalization:</b>	
<b>HD Video Stds:</b>	Automatic up to 50m with Belden 1694A or equivalent cable
<b>SD Video Stds:</b>	Automatic up to 250m with Belden 8281 or equivalent cable
<b>Return Loss:</b>	> 15 dB up to 1.0 Gb/s, >10dB at 1.5 Gb/s

#### Serial Digital Video Outputs:

<b>Standard:</b>	Same as Inputs
<b>Number of Outputs:</b>	5 outputs (2 copies of Output A) Input A bypass protected to output A1
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V $\pm$ 0.5V
<b>Rise and Fall Time:</b>	
<b>HD Video Stds:</b>	200ps nominal
<b>SD Video Stds:</b>	650ps nominal
<b>Overshoot:</b>	<10% of amplitude
<b>Wide Band Jitter:</b>	< 0.2 UI
<b>Output Return Loss:</b>	
<b>A1</b>	> 10 dB up to 1.5 Gb/s
<b>Out A2, B, C, D, E</b>	> 15 dB up to 1.5 Gb/s
<b>Output Phase</b>	0 to a full frame of offset - separate H and V phase adjustments

#### Video Reference

<b>Type:</b>	NTSC or PAL Color Black 1 V p-p Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV HD Tri-level Sync
<b>Connectors:</b>	BNC per IEC 60169-8 Amendment 2
<b>Termination:</b>	High impedance loop through or High impedance non-looping or 75 ohm non looping (jumper selectable)

#### AES Audio Inputs:

<b>Standards:</b>	SMPTE 276M single ended AES
<b>Number of Inputs:</b>	2 Groups of 4
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2.
<b>Signal Level:</b>	1 V p-p $\pm$ 10%
<b>Return Loss:</b>	> 25 dB up to 6 MHz

#### AES Audio Outputs

<b>Standards:</b>	SMPTE 276M single ended AES
<b>Number of Outputs:</b>	3 buses, 4 outputs per bus Safe AES Inputs bypass protected to AES A outputs when bypass relay option is installed
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	1 Vp-p
<b>Return Loss:</b>	> 35 dB up to 6 MHz
<b>Reference:</b>	From Video Reference

#### GPI Control Port:

<b>Number of Inputs:</b>	8 opto-isolated, active high or active low, programmable functions
<b>Number of Outputs:</b>	4 sets of relay contacts, normally closed, programmable functions
<b>Relay Max Current:</b>	1 A at 30 V DC

#### Functional:

<b>Maximum Total Delay(configurable between live and safe inputs):</b>	
<b>HDSD9545DLY-PRO</b>	24 seconds of HD or SD delay
<b>HDSD9545DLY-PRO-HD40</b>	40 seconds of HD delay or 240 seconds of SD delay

#### Electrical:

<b>Voltage:</b>	Auto ranging 100 to 240 Volts AC, 50/60 Hz - dual redundant power supplies
<b>Fuse Rating:</b>	250 V, 1amp time delay
<b>Power:</b>	40 watts
<b>Safety:</b>	ETL Listed, complies with EU safety directives
<b>EMI/RFI:</b>	Complies with FCC Part 15 Class A regulations Complies with EU EMC directive

#### Physical:

<b>Dimensions:</b>	19" W x 3.5" H x 7.75" D. (483mm W x 89mm H x 196mm D)
<b>Weight:</b>	8 lbs. (3.5Kg)

#### Ordering Information:

<b>HDSD9545DLY-PRO</b>	HD/SD Video and Audio Delay/Profanity Protection System with 24 seconds of HD or SD delay
<b>HDSD9545DLY-PRO-HD40</b>	HD/SD Video and Audio Delay/Profanity Protection System with 40 seconds of HD delay or 240 seconds of SD Delay



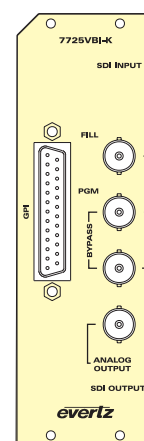
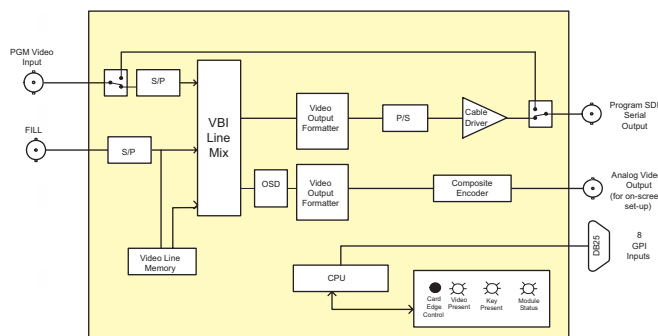
The 7725VBI-K module is a multi-function VBI keyer. Every program input vertical interval video line can be programmed to pass upstream video, blank the line, insert any VBI line from the SDI Key input, insert a selectable VITS (vertical interval test signal), or insert a user captured test signal. The unit provides the capability to store different VBI configurations as presets and recall them from the card edge control or via 8 opto-isolated GPI inputs. The 7725VBI-K is setup via a card edge control and an on screen display.

This unit is often used in critical on-air applications and hence bypass relay protection of the program video path is provided.

### Features

- One SDI 525 or 625, 270 Mb/s component digital program video input
- Video input relay bypass for power failure bypass protection
- One SDI 525 or 625, 270 Mb/s component digital Key video input
- One composite analog video output with On Screen Menu text
- A comprehensive on screen menu is available to configure the various features of the module
- 128 different Preset VBI keying configurations
- Up to 64 line patterns may be captured from any line and stored in User Memories for later insertion on any VBI line
- Extensive library of Factory preset test signals
- Each line of VBI independently programmable to pass, blank, insert from key signal, insert from user memory or insert factory test signals
- On Air Preset configuration selected with GPI or Menu selection
- Non-volatile memory protects current configuration in case of power loss
- Fully hot swappable from front of frame.

### 7725VBI-K Block Diagram and Rear Panel



### Specifications

#### Serial Video Input:

**Standard:** SMPTE 259M-C  
**Number of Inputs:** 1 for Program video (PGM)  
 1 for Key Signal to insert (FILL)  
 PGM and FILL need to be synchronous and timed w.r.t. each other (+/- 1/2 line)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic 250m (min) @ 270Mb/s with Belden 8281 or equivalent cable  
**Return Loss:** > 15dB

#### Serial Video Output:

**Number of Outputs:** 1 (Bypass Protected)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 740ps nominal  
**Overshoot:** 10% of amplitude  
**Wide Band Jitter:** < 0.2 UI (Reclocked)  
**Return Loss:** > 15dB

#### Analog Video Output:

**Standard:** NTSC (SMPTE 170M), PAL (ITU624-4)  
**Number of Outputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 1V nominal  
**DC Offset:** 0V +/- 0.1V  
**Return Loss:** >35dB up to 5MHz  
**Frequency Response:** 0.8dB to 4 MHz  
**Differential Phase:** <0.9° (<0.6° typical)  
**Differential Gain:** <0.9% (<0.5% typical)  
**SNR:** >56dB to 5MHz (shallow ramp)

#### General Purpose In/Out:

**Number of Inputs:** 8  
**Type:** Opto-isolated, active low with internal pull-ups to +5V  
**Connector:** Female DB-25  
**Input signal:** Closure to ground  
**Signal Level:** +5V nominal

#### Electrical:

**Voltage:** +12VDC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15 Class A EU EMC directive

#### Physical:

**7700 frame mounting:** 2 slots  
**7701 frame mounting:** 1 slot

#### Ordering Information:

**7725VBI-K** SDI VBI Sidechain Bridge

#### Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

#### Rear Plate Suffix

**+3RU** Multiframe 3RU Rear Plate for use with 7700FR-C  
**+1RU** Multiframe 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



The 7725VBI-K-HD module is a multi-function VBI keyer. Every program input vertical interval video line can be programmed to pass upstream video, blank the line, insert any VBI line from the HD/SD Key input, insert a selectable VITS (vertical interval test signal) for SD, and insert user selected data such as Wide Screen Signaling (WSS) and Active Format Description (AFD). The 7725VBI-K-HD allows for up to 70 lines to be programmed. The module provides the capability to store different VBI configurations as presets and recall them from the On-Screen Display (via Program Monitor Out), VistaLINK®, or via 8 opto-isolated GPI inputs.

The 7725VBI-K-HD has two re-clocked program outputs and one program monitor output. The module is often used in critical on-air applications and hence bypass relay protection of the program video path is provided. The 7725VBI-K-HD is setup via the On-Screen Display or VistaLINK®.

VistaLINK® enables remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage operations including signal monitoring and module configuration from SNMP enabled control systems (Manager or NMS) locally or remotely.

The 7725VBI-K-HD occupies one card slot in the 3RU 7700FR-C frame, which will hold up to 15 1-slot modules or the 1RU 7701FR frame, which will hold up to three 1-slot modules.

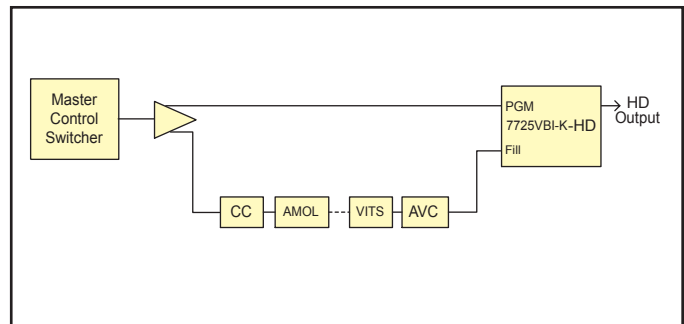
## Features

- One serial digital 1.5 Gb/s HD input per SMPTE 292M, or 270Mb/s SD input per SMPTE 259M
- Two re-clocked HD or SD program outputs
- Video input relay bypass for power failure bypass protection
- One HD input or SD input digital Key video input
- One HD or SD monitor program output with On-Screen Display
- A comprehensive on screen menu is available to configure the various features of the module.
- 128 different presets for storing VBI keying configurations
- Up to 16 line patterns may be captured from any key input line and stored in User Memories for later insertion on any VBI line
- Up to 70 lines of output video can be programmed
- Each line of VBI independently programmable to pass, blank, insert from key signal, insert from user memory or insert factory test signal
- On Air Preset configuration selected with GPI, OSD, or VistaLINK® selection
- Non-volatile memory protects current configuration in case of power loss.
- Fully hot swappable from front of frame.
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® Pro) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

## 7725VBI-K-HD Applications

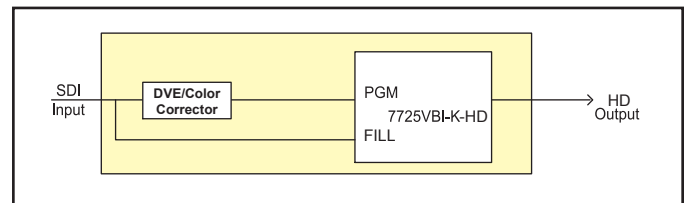
### Master control output chain protection

Typically there are several units "chained" together on the output of a master control switcher. Units such as caption encoders, AMOL, encoders, VITS inserters, data encoders, etc. are typically connected in series in the program output so that if one unit fails the network output will fail. The 7725VBI-K-HD allows you to have one point of insertion in the program output path.



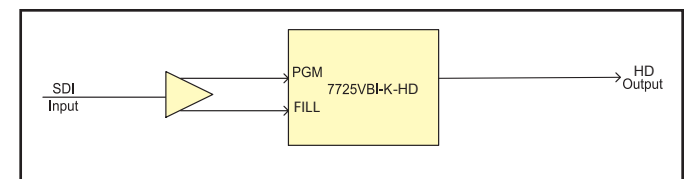
### VANC Bridging

Some processing devices modify or destroy VBI data such as captioning or VITC. An example of this occurs with some DVE's during a squeeze back application or with HD color correction. The 7725VBI-K-HD device will provide a bypass of VBI around the processing device.



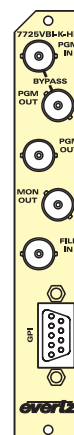
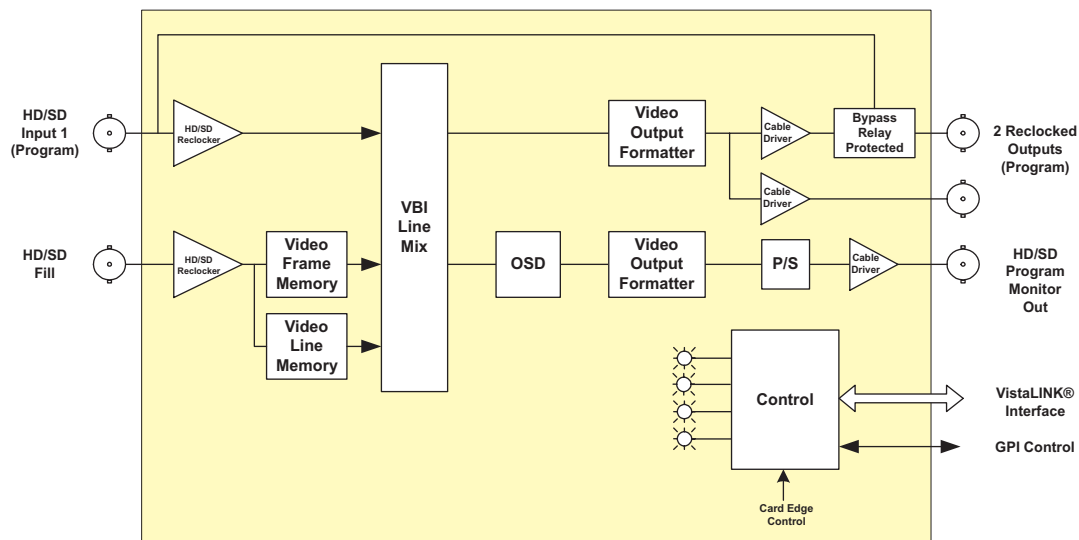
### VBI Line Shuffler

By providing the same feed to both inputs of the 7725VBI-K-HD the unit will allow the user to modify the VBI and move lines as necessary.





### 7725VBI-K-HD Block Diagram & Rear Panel



#### Specifications

##### Serial Video Input:

###### Standard:

Auto-detect  
SMPTE 292M (1080i/59.94, 1080i/60, 1080i/50, 1080p/23.98, 1080p/23.98sF, 720p/59.94, 720p/60, and 720p/50)  
SMPTE 259M-C (525i/59.94, 625i/50)

###### Number of Inputs:

1 for Program video (PGM)  
1 for Key Signal to insert (FILL)  
PGM and FILL need to be synchronous and timed w.r.t. each other (+/- 1/2 line)

###### Connector:

BNC input per IEC 60169-8 Amendment 2

###### Equalization:

Automatic 100m @ 1.5 Gb/s with Belden 8281 or equivalent cable

###### Return Loss:

> 15dB (PGM input)

##### Serial Video Output:

**Number of Outputs:** 3 (re-clocked for program, 1 bypass protection) same as input

1 (program monitor) same as input

###### Connector:

BNC per IEC 60169-8 Amendment 2

###### Signal Level:

800mV nominal

###### DC Offset:

0V ±0.5V

###### Rise and Fall Time:

200ps nominal

###### Overshoot:

<10% of amplitude

###### Wide Band Jitter:

< 0.20 UI

###### Return Loss:

> 15 dB

##### Electrical:

###### Voltage:

+12VDC

###### Power:

9.5 Watts

###### EMI/RFI:

Complies with FCC Part 15 Class A  
EU EMC directive

##### Physical:

###### Number of slots:

1

##### Ordering Information:

**7725VBI-K-HD** HD/SD VBI Sidechain Bridge

##### Ordering Options:

Rear Plate must be specified at time of order

Eg: Model +3RU

##### Rear Plate Suffix

###### +3RU

3RU Rear Plate for use with 7700FR-C Multiframe

###### +1RU

1RU Rear Plate for use with 7701FR Multiframe

###### +SA

Standalone Enclosure Rear Plate

##### Enclosures:

###### 7700FR-C

3RU Multiframe which holds 15 modules

###### 7701FR

1RU Multiframe which holds 3 modules

###### S7701FR

Standalone enclosure

##### General Purpose Inputs:

###### Number of Inputs:

8

###### Type:

Opto-isolated, active low with internal pull-ups to +5 or +12V (jumper settable)

###### Connector:

Female DB-9

###### Input signal:

Closure to ground

# 10MHz-3GHz RF 1x4 Active Splitter 7702DA4-RF & 7703DA4-RF



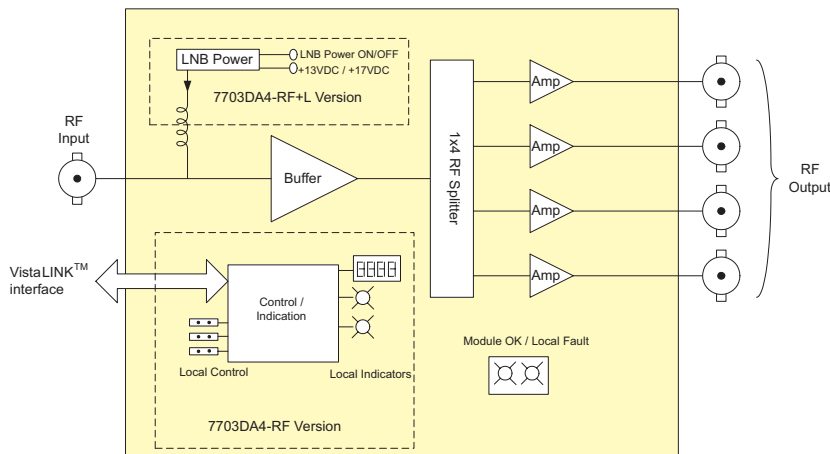
The 7702DA4-RF / 7703DA4-RF 1x4 Active Splitters provide inexpensive amplification and distribution of RF signals from 10MHz to 3GHz. The 7702DA4-RF / 7703DA4-RF handle any RF input modulation format and provide 4 buffered isolated outputs for further signal distribution. Typical applications include amplification and distribution of 950MHz - 2150MHz L Band and 70MHz-140MHz IF signals. Monitoring of RF input power, card status and control of gain / attenuation is provided remotely via VistaLINK® capability on the 7703DA4-RF version. Optional LNB power is available at the input connector on the 7703DA4-RF version.

The 7702DA4-RF / 7703DA4-RF occupy one card slot and can be housed in either a 1RU frame which holds up to 3 modules, a 3RU frame which holds up to 15 modules or a standalone enclosure which holds 1 module.

## Features

- Low noise amplification and distribution of RF signals from 10MHz to 3GHz
- Wide dynamic range ( -10 to -60dBm )
- Adjustable output gain of -8dB to +14dB on 7703DA4-RF version. Fixed gain of 0dB on 7702DA4-RF version.
- Protocol independent - handles all modulation formats
- Input RF signal strength indication on 7703DA4-RF version
- Fully hot-swappable from front of frame
- Optional LNB power ( at +13 or +17Vdc with built in current limiting) into RF input cable on 7703DA4-RF version
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

## 7702DA4-RF & 7703DA4-RF Block Diagram & Rear Panels



## Specifications

### RF Input:

Connector:	1 BNC per IEC 60169-8 Amendment 2 (F-Type optional)
I/O Impedance:	75Ω
Return Loss:	>12dB
Input Frequency Range:	
Standard:	10MHz - 3GHz
+L option:	950MHz - 3GHz
Input Power Range:	-10 to -60dBm

### RF Output:

Number of outputs:	4
Connector:	BNC per IEC 60169-8 Amendment 2 (F-Type optional)
I/O Impedance:	75Ω
Return Loss	
10MHz to 2200MHz:	>15dB
2200MHz to 3GHz:	>10dB
Gain:	
7702DA4-RF:	0dB
7703DA4-RF:	-8dB to +14dB
Intermodulation Products:	<-50dBc (@ -20dBm input power)
Signal To Noise:	>55dB (@ -20dBm input power)
Frequency Response	
Standard Version:	
10MHz to 2.7GHz:	<±1.5dB
2.7GHz to 3GHz:	<±2dB
+L Version:	
950MHz to 2.7GHz	<±1.5dB
2.7GHz to 3GHz	<±2dB
Isolation (Output to Output):	
10MHz to 350MHz:	>15dB
350MHz to 3GHz:	>20dB

### Physical:

Number of Slots:	1
------------------	---

### Electrical:

Voltage:	+12VDC
Power:	6 Watts

### Ordering Information:

7702DA4-RF	10MHz - 3GHz RF 1x4 Active Splitter
7703DA4-RF	10MHz - 3GHz RF 1x4 Active Splitter with VistaLINK® Monitoring

### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

### LNB Power Suffix:

+L	LNB Power option (L Band Operation only) (7703DA4-RF version only)
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### Connector Suffix

+F75	75Ω, F-Type rear connector
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### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure



# 10MHz-3GHz RF 1x4 Active Splitter 7702DA8-RF & 7703DA8-RF



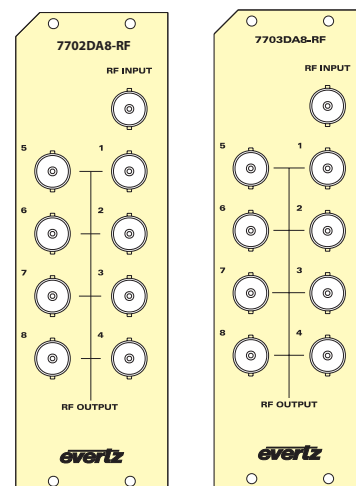
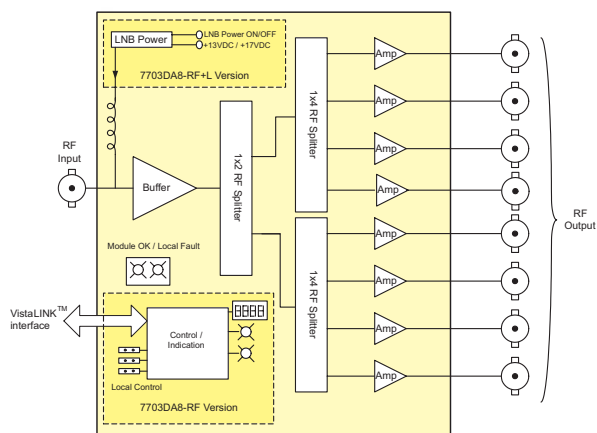
The 7702DA8-RF / 7703DA8-RF 1x 8 Active Splitters provide inexpensive amplification and distribution of RF signals from 10MHz to 3GHz. The 7702DA8-RF / 7703DA8-RF handle any RF input modulation format and provide 8 buffered isolated outputs for further signal distribution. Typical applications include amplification and distribution of 950MHz - 2150MHz L Band and 70MHz-140MHz IF signals. Monitoring of RF input power, card status and control of gain / attenuation is provided remotely via VistaLink capability on the 7703DA8-RF version. Optional LNB power is available at the input connector on the 7703DA8-RF version.

The 7702DA8-RF / 7703DA8-RF occupy two card slots and can be housed in either a 1RU frame which holds up to 3 modules, a 3RU frame which holds up to 15 modules or a standalone enclosure which holds 1 module.

## Features

- Low noise amplification and distribution of RF signals from 10MHz to 3GHz
- Wide dynamic range ( -10 to -60dBm )
- Adjustable output gain of -8dB to +14dB on 7703DA8-RF version. Fixed gain of 0dB on 7702DA8-RF version.
- Protocol independent - handles all modulation formats
- Input RF signal strength indication on 7703DA8-RF version
- Fully hot-swappable from front of frame
- Optional LNB power ( at +13 or +17Vdc with built in current limiting) into RF input cable on 7703DA8-RF version
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

## 7702DA8-RF & 7703DA8-RF Block Diagram & Rear Panels



## Specifications

### RF Input:

Connector: 1 BNC per IEC 60169-8 Amendment 2 (F-Type optional)  
I/O Impedance: 75Ω  
Return Loss: >12dB

### Input Frequency Range:

Standard: 10MHz - 3GHz  
+L option: 950MHz-3GHz  
Input Power Range: -10 to -60dBm

### RF Output:

Number of outputs: 8  
Connector: BNC per IEC 60169-8 Amendment 2 (F-Type optional)  
I/O Impedance: 75Ω  
Return Loss: >15dB

10MHz to 2200MHz: >15dB  
2200MHz to 3GHz: >10dB

### Gain:

7702DA8-RF: 0dB  
7703DA8-RF: -8dB to +14dB

Intermodulation Products: <-50dBc (@ -20dBm input power)

Signal To Noise: >55dB (@ -20dBm input power)

### Frequency Response

Standard Version:  
10MHz to 2.7GHz: <±1.5dB  
2.7GHz to 3GHz: <±2dB

### +L Version:

950MHz to 2.7GHz: <±1.5dB  
2.7GHz to 3GHz: <±2dB

### Isolation (Output to Output):

10MHz to 350MHz: >15dB  
350MHz to 3GHz: >20dB

### Physical:

Number of Slots: 2

### Electrical:

Voltage: +12VDC  
Power: 10 Watts

### Ordering Information:

7702DA8-RF: 10MHz - 3GHz RF 1x8 Active Splitter  
7703DA8-RF: 10MHz - 3GHz RF 1x8 Active Splitter with VistaLINK® Monitoring

### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

### Rear Plate Suffix

+3RU: 3RU Rear Plate for use with 7700FR-C Multiframe  
+1RU: 1RU Rear Plate for use with 7701FR Multiframe  
+SA: Standalone Enclosure Rear Plate

### LNB Power Suffix:

+L: LNB Power option (L Band Operation only) (7703DA8-RF version only)

### Connector Suffix

+F75: 75Ω, F-Type rear connector

### Enclosures:

7700FR-C: 3RU Multiframe which holds 15 modules  
7701FR: 1RU Multiframe which holds 3 modules  
S7701FR: Standalone enclosure



The 7702BPX-IF and 7703BPX-IF 2 x 1 RF protection switches for IF frequencies provide automatic changeover functionality to protect against link failure for RF signals from 10MHz to 850MHz. Typical applications include failover protection for 70/140MHz applications.

The 7703BPX-IF has integrated VistaLINK® technology for remote control and monitoring capability via SNMP. This provides the ability to locally or remotely configure and monitor parameters such as module status, selected input, power level and switching threshold.

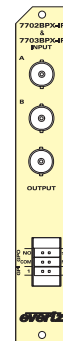
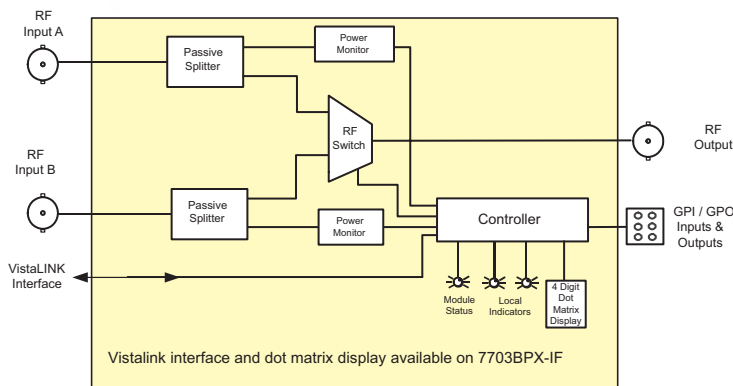
In the application of automatic changeover, the 7702BPX-IF and 7703BPX-IF can be configured to have a MAIN input and a STANDBY input. In this configuration, it will automatically switch to the Standby input when the Main input power is weak or lost. It can be also be configured to have auto or manual switch back to the Main input when the signal is re-established.

The 7702BPX-IF and 7703BPX-IF occupy one card slot and can be housed in either a 1RU frame which holds up to 3 modules, a 3RU frame which holds up to 15 modules or a standalone enclosure which holds 1 module.

## Features

- Wide operating frequency range, 10MHz to 850MHz
- Intelligent auto switching with input power detection
- User definable threshold levels on 7703BPX-IF version
- Maintains switch state and RF channel on loss of power to card or frame
- Supports automatic or manual control via GPI or SNMP on 7703BPX-IF
- Switch state indication via GPO
- Card edge LEDs indicate active input channels, output channel and power levels below threshold
- Fully hot swappable from front of frame
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

## 7702 & 7703BPX-IF Block Diagram & Rear Panel



## Specifications

### RF Input/Output:

Inputs:	2
Outputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2 (F-type optional)
I/O Impedance:	75Ω
Frequency Response:	
10-200MHz	<±0.25dB
10-850MHz	<±0.5dB
Insertion Loss:	<4dB
Return Loss:	
10-200MHz	<15dB
10-850MHz	<17dB
Isolation:	>50dB (10-850MHz)
Input Power Range:	0dBm to -50dBm

### General Purpose Inputs:

Number of Inputs:	2
Type:	Opto-isolated, active low with internal pull-ups to +5V
Connector:	2 pins plus ground on 6 pin terminal strip
Signal Level:	
+5V Pullup:	Low: -5 to +2.5 VDC, High: 3.5 to 10 VDC
+12V Pullup:	Low: -5 to +9.5 VDC, High: 10.5 to 15 VDC
Max Sink Current:	(input shorted to ground) 15 mA
Max Leakage Current for input High:	200 μA

### General Purpose Outputs:

Number of Outputs:	1
Type:	"Dry Contact" relay contacts - normally open & normally closed contact provided
Connector:	3 pins on 6 pin terminal strip

### Electrical:

Voltage:	+12V DC
Power:	3 Watts

### Physical:

Number of Slots:	1
------------------	---

### Ordering Information:

7702BPX-IF:	2 x 1 RF Protection Switch for IF Frequencies
7703BPX-IF:	2 x 1 RF Protection Switch for IF Frequencies, with VistaLINK® monitoring

### Ordering Options

Rear Plate and optional connector type must be specified at time of order  
Eg: Model +3RU (if 75Ω F-type connector required, order optional +F75)

### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

### Connector Suffix:

+F75	75Ω, F-Type Rear Connector
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### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure



## 2x1 RF Protection Switch for L-Band Frequencies 7702BPX-LB & 7703BPX-LB

### 7702BPX-LB & 7703BPX-LB



The 7702BPX-LB and 7703BPX-LB 2 x 1 RF protection switches for L-Band frequencies provide automatic changeover functionality to protect against link failure for RF signals from 950MHz to 2250MHz.

The 7703BPX-LB has integrated VistaLINK® technology for remote control and monitoring capability via SNMP. This provides the ability to locally or remotely configure and monitor parameters such as module status, selected input, power level and switching threshold.

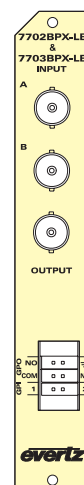
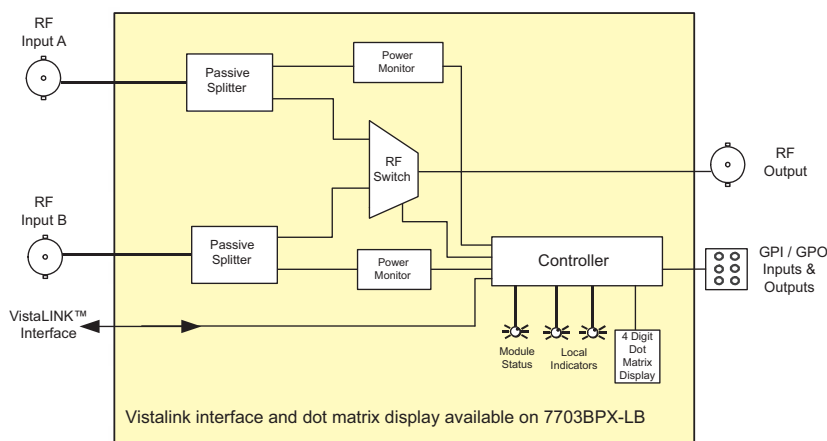
In the application of automatic changeover, the 7702BPX-LB and 7703BPX-LB can be configured to have a MAIN input and a STANDBY input. In this configuration, it will automatically switch to the Standby input when the Main input power is weak or lost. It can be also be configured to have auto or manual switch back to the Main input when the signal is re-established.

The 7702BPX-LB and 7703BPX-LB occupy one card slot and can be housed in either a 1RU frame which holds up to 3 modules, a 3RU frame which holds up to 15 modules or a standalone enclosure which holds 1 module.

#### Features

- Wide operating frequency range, 950MHz - 2250MHz
- Intelligent auto switching with input power detection
- User definable threshold levels on 7703BPX-LB version
- Maintains switch state and RF channel on loss of power to card or frame
- Supports automatic or manual control via GPI or SNMP on 7703BPX-LB
- Switch state indication via GPO
- Card edge LEDs indicate active input channels, output channel and power levels below threshold
- Fully hot swappable from front of frame
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

#### 7702 & 7703BPX-LB Block Diagram & Rear Panel



#### Specifications

##### RF Input/Output:

Inputs:	2
Outputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2 (F-type optional)
I/O Impedance:	75Ω
Frequency Response:	
950MHz to 2250MHz	<±1.5dB
Insertion Loss:	<4dB
Return Loss:	>10dB
Isolation:	>50dB
Input Power Range:	0dBm to -50dBm

##### General Purpose Inputs:

Number of Inputs:	2
Type:	Opto-isolated, active low with internal pull-ups to +5V
Connector:	2 pins plus ground on 6 pin terminal strip
Signal Level:	
+5V Pullup:	Low: -5 to +2.5 VDC, High: 3.5 to 10 VDC
+12V Pullup:	Low: -5 to +9.5 VDC, High: 10.5 to 15 VDC
Max Sink Current:	(input shorted to ground) 15 mA
Max Leakage Current for input High:	200 μA

##### General Purpose Outputs:

Number of Outputs:	1
Type:	"Dry Contact" relay contacts - normally open & normally closed contact provided
Connector:	3 pins on 6 pin terminal strip

##### Electrical:

Voltage:	+12V DC
Power:	4 Watts

##### Physical:

Number of Slots:	1
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##### Ordering Information:

7702BPX-LB:	2 x 1 RF Protection Switch for L-Band Frequencies
7703BPX-LB:	2 x 1 RF Protection Switch for L-Band Frequencies, with VistaLINK® Monitoring

##### Ordering Options

Rear Plate and optional connector type must be specified at time of order  
Eg: Model +3RU (if 75Ω F-type connector required, order optional +F75)

##### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

##### Connector Suffix:

+F75	75Ω, F-Type Rear Connector
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##### Enclosures:

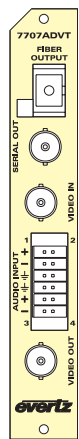
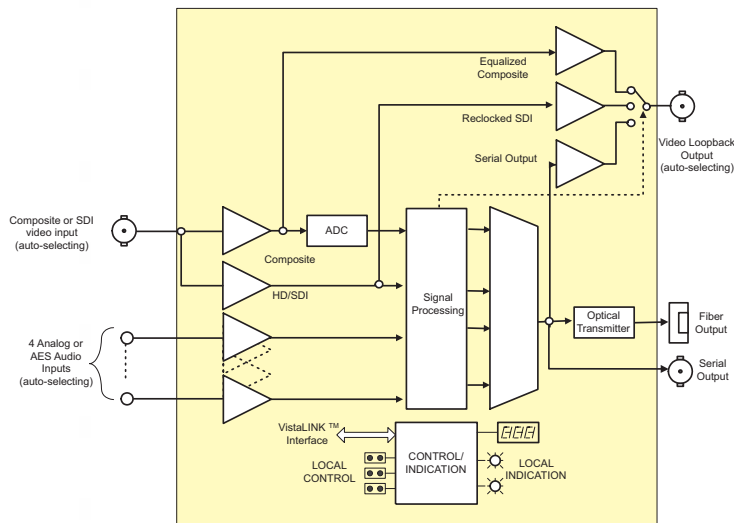
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
7701FR	Standalone enclosure



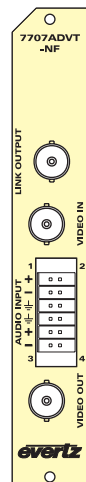
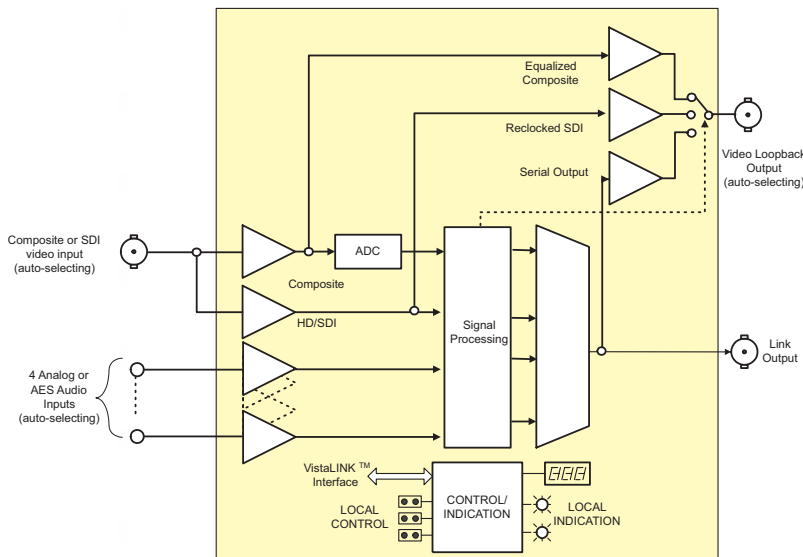
### Features

- Single card fiber optic transmitter for one composite Analog or SDI video and four analog or AES audio signals
- Auto-sensing (analog or digital) video and audio inputs
- Supports both NTSC and PAL analog or 4:2:2 component digital video
- Supports Analog to Digital and Digital to Analog audio conversion
- Broadcast quality analog video and audio performance
- Meets or exceeds EIA/TIA RS250-C short haul specifications for analog video and audio transport
- Supports 32, 44.1, 48kHz AES audio inputs
- Dolby E compatible
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Adjustable gain equalization for analog video for up to 250m of Belden 1694A coaxial cable
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths at 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU G 694.2 compliant)
- DWDM wavelengths also available (ITU G.694.1 compliant)
- Outputs available with fiber optics and BNC or BNC's only (-NF version)

### 7707ADVT Block Diagram & Rear Panel



### 7707ADVT-NF Block Diagram & Rear Panel





# Analog or SDI Video with 4-Channel or AES Audio Fiber Transmitter 7707ADVT

## Specifications

### Analog Video Input:

Standards:	SMPTE 170M (NTSC), ITU-R 624-2 (PAL)
Number of Inputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2.
Signal Quantization:	12 bit
System Bandwidth:	>5.5MHz
Input Level:	2 Vp-p (Maximum)
Gain Equalization:	Up to 250m of Belden 1694A or equivalent (adjustable)

Input impedance:	75Ω
Return Loss:	> 30dB to 5.5 MHz
Signal/Noise Ratio:	> 70dB
Differential Gain:	< 1.0 %
Differential Phase:	< 0.7°
Passband Ripple:	

NTSC:	< ± 0.1dB to 4.1 MHz < ± 0.2dB to 5.5 MHz
PAL:	< ± 0.1dB to 4.8 MHz < ± 0.2dB to 5.8 MHz

Chroma/Luma Gain:	98% to 103%
Chroma/Luma Delay:	
NTSC:	< 5 ns
PAL:	< 12 ns
Line Time Distortion:	1.2%

### Serial Video Input:

Standard:	SMPTE 259M-C (525 or 625 line component), SMPTE 305M (SDTi), DVB-ASI (without separate audio)
Connector:	1 BNC per IEC 60169-8 Amendment 2
Equalization:	Automatic to 300m @ 270 Mb/s with Belden 1694A or equivalent cable
Return Loss:	> 15 dB up to 270 Mb/s

### Analog Video Output:

Standard:	Same as Analog Video Input
Number of Outputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2.
Output Level:	1V p-p
Output Impedance:	75Ω
Return Loss:	> 30 dB to 5.5 MHz

### Serial Video Output:

Number of Outputs:	2 (1 loopback, 1 serial)
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	800mV nominal
DC Offset:	0V ± 0.5V
Rise and Fall Time:	900ps nominal
Overshoot:	<10% of amplitude
Return Loss:	>15 dB at 270 Mb/s
Wide Band Jitter:	<0.2 UI

### Analog Audio Inputs:

Number of Inputs:	4
Type:	Balanced analog audio
Connector:	12 pin removable terminal block
Input impedance:	High Impedance (>20K Ω)
Freq. Response:	±0.1 dB, 20Hz to 20 kHz
THD 20Hz-20kHz:	< 0.005%
Channel Phase Diff.:	± 1 deg
SNR (weighted):	> 85 dB
Max. Audio Input Level:	+24 dBu
Signal Quantization:	24 Bits

### AES Audio Inputs:

Number of Inputs:	4 (auto-sensing for balanced or unbalanced input)
Standard:	
Unbalanced AES:	SMPTE 276M
Balanced AES:	AES3-1992
Other:	Dolby E compatible
Connector:	12 pin removable terminal block
Input Return Loss:	>15dB (1MHz to 6MHz)
Signal Level:	
Unbalanced:	1.2V p-p ±0.1V
Balanced:	1 to 7Vp-p

### Equalization:

Unbalanced:	450m of Belden 1800D cable
Balanced:	1500m of Belden 1694A cable
Resolution:	Up to 24 bits
Sampling Rate:	32, 44.1, 48 kHz
Impedance:	
Unbalanced:	75 Ω
Balanced:	110 Ω

### Optical Outputs:

Number of Outputs:	1
Connector:	Female SC/PC, ST/PC or FC/PC
Return Loss:	> 14 dB
Rise and Fall Time:	200ps nominal
Fiber Size:	9 μm core / 125 μm overall
Wavelengths:	
Standard	1310nm, 1550nm (nominal)
CWDM:	See Ordering Information
DWDM:	See Ordering Information
Output Power:	
1310nm FP (Standard)	-7dBm ± 1dBm
1310nm FP (M version)	0dBm ± 1dBm
1550 & CWDM DFB	0dBm ± 1dBm
DWDM DFB	+7dBm ± 1dBm

### Electrical:

Voltage:	+12VDC
Power:	10 Watts (Non DWDM), 12 Watts (DWDM)

### Physical:

Number of slots:	1
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### Compliance:

Electrical Safety:	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive Class 1 laser product Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
Laser Safety:	Complies with FCC Part 15, Class A EU EMC directive
EMI/RFI:	

### Ordering Information:

7707ADVT13:	1310nm FP Laser (-7dBm launch power)
7707ADVT13M:	1310nm FP Laser (0dBm launch power)
7707ADVT15:	1550nm DFB Laser
7707ADVT-NF:	Electrical output only

### For CWDM applications please refer to the end of the fiber section for details

7707ADVTxx	Analog or SDI Video & 4 Analog or 4 AES audio fiber transmitter, CWDM Laser, VistaLINK®
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### For DWDM applications please refer to the end of the fiber section for details

7707ADVTDyyy	Analog or SDI Video & 4 Analog or 4 AES audio fiber transmitter, DWDM Laser, VistaLINK®
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### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

### Enclosures:

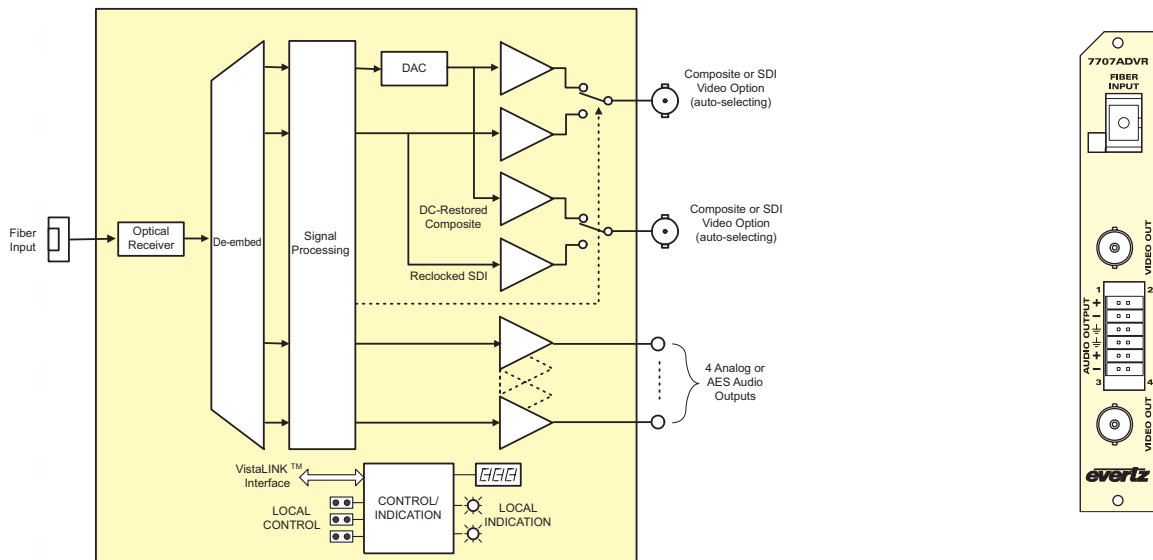
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone Enclosure



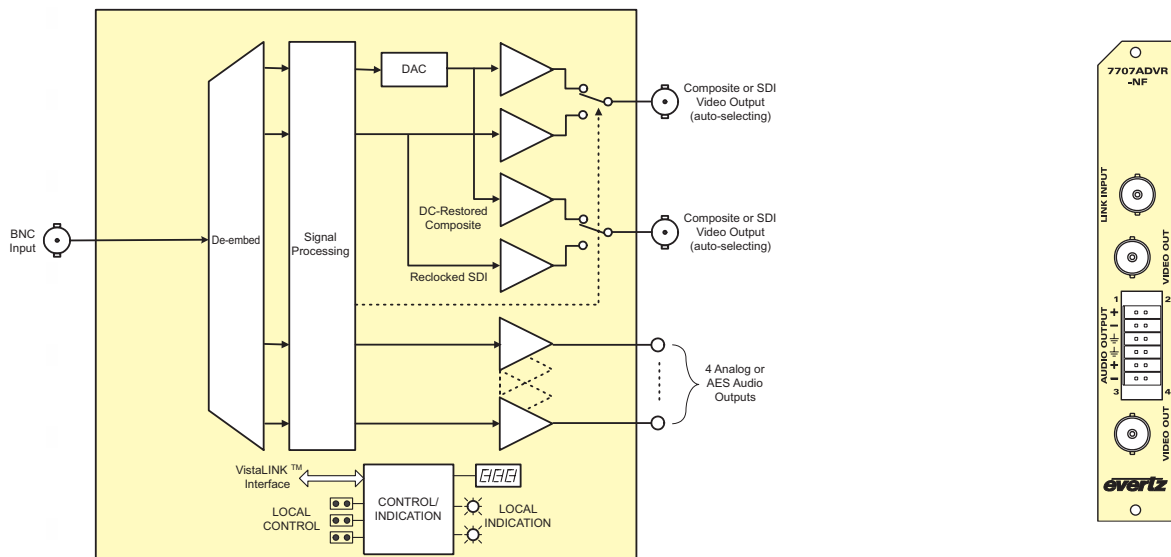
### Features

- Single card fiber optic receiver for one composite Analog or SDI video and four analog or AES audio signals
- Auto sensing (analog or digital) video and audio outputs
- Supports both NTSC and PAL analog or 4:2:2 component digital video
- Supports Analog to Digital and Digital to Analog audio conversion
- Broadcast quality analog video and audio performance
- Meets or exceeds EIA/TIA RS250-C short haul specifications for analog video and audio transport
- Supports 32, 44.1, 48kHz AES audio
- Dolby E compatible
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Adjustable gain, DC offset and pre-emphasis for driving up to 250m of Belden 1694A coaxial cable
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Input available with fiber optics or BNC (-NF version)
- Wideband optical input (1270nm-1610nm)

### 7707ADVR Block Diagram & Rear Panel



### 7707ADVR-NF Block Diagram & Rear Panel





## Specifications

### Analog Video Outputs:

<b>Standard:</b>	SMPTE 170M, (NTSC), ITU-R 624-2 (PAL)
<b>Number of Outputs:</b>	2 BNC per IEC 60169-8 Amendment 2.
<b>System bandwidth:</b>	> 5.5 MHz
<b>Output Level:</b>	1 Vp-p (nominal), 2 Vp-p (maximum)
<b>Gain:</b>	Unity gain nominal, adjustable 50% to 150%
<b>Output Impedance:</b>	75Ω
<b>Return Loss:</b>	> 30dB to 5.5MHz
<b>SNR:</b>	> 70dB
<b>Differential Gain:</b>	< 1.0%
<b>Differential Phase:</b>	< 0.7°
<b>Pre-Emphasis:</b>	Adjustable cable loss compensation for up to 250m of Belden 1694A

### Passband Ripple:

<b>NTSC:</b>	< ±0.1dB to 4.1MHz and < ±0.2dB to 5.5MHz
<b>PAL:</b>	< ±0.1dB to 4.8MHz and < ±0.2dB to 5.8MHz
<b>Chroma/Luma Gain:</b>	98% - 103%

### Chroma/Luma Delay:

<b>NTSC:</b>	<5ns
<b>PAL:</b>	<12ns
<b>Line Time Distortion:</b>	1.2%

### Serial Video Output:

<b>Number of Outputs:</b>	2 regenerated
<b>Standard:</b>	SMPTE 259M-C (525 or 625 line components) SMPTE 305M (SDTi), DVB-ASI (without separate audio)
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Equalization:</b>	Automatic to 300m with Belden 1694A (or equivalent)
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V ±0.5V
<b>Rise and Fall Time:</b>	900ps nominal
<b>Overshoot:</b>	<10% of amplitude
<b>Return Loss:</b>	> 15dB at 270Mb/s
<b>Wide Band Jitter:</b>	< 0.2UI

### Analog Audio Outputs:

<b>Number of Outputs:</b>	4
<b>Type:</b>	Balanced analog audio
<b>Connector:</b>	12 pin removable terminal block
<b>Output impedance:</b>	66Ω
<b>Freq. Response:</b>	± 0.1dB, 20Hz to 20 kHz
<b>THD 20Hz-20kHz:</b>	< 0.005%
<b>Channel Phase Diff.</b>	± 1 deg
<b>SNR (weighted):</b>	> 85dB
<b>Output Level Adj:</b>	-20dB to +3dB
<b>Max Output Level:</b>	+24 dBu into 10kΩ loads

### AES Audio Outputs:

<b>Number of Outputs:</b>	4 regenerated (selectable for balanced or unbalanced)
<b>Standard:</b>	
<b>Unbalanced AES:</b>	SMPTE 276M
<b>Balanced AES:</b>	AES3-1992
<b>Other:</b>	Dolby E compatible
<b>Connector:</b>	12 pin removable terminal block
<b>Input Return Loss:</b>	>15dB (1MHz to 6MHz)
<b>Signal Level:</b>	
<b>Unbalanced:</b>	1 Vp-p ±0.1Vp-p
<b>Balanced:</b>	2 Vp-p ±0.1Vp-p

<b>Resolution:</b>	Up to 24-bits
<b>Sampling Rate:</b>	32, 44.1, 48 kHz
<b>Output Jitter:</b>	<0.1UI
<b>Impedance:</b>	
<b>Unbalanced:</b>	75Ω
<b>Balanced:</b>	110Ω

### Optical Input:

<b>Number of Inputs:</b>	1
<b>Connector:</b>	Female SC/PC, ST/PC, FC/PC
<b>Operating Wavelength:</b>	1270nm to 1610nm
<b>Maximum Input Power:</b>	0dBm
<b>Optical Sensitivity:</b>	-32dBm

### Electrical:

<b>Voltage:</b>	+12VDC
<b>Power:</b>	12Watts
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC Directive

### Physical:

<b>Number of slots:</b>	1
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### Ordering Information:

<b>7707ADVR:</b>	Analog/SDI video & analog/AES audio fiber optic receiver
<b>7707ADVR-NF:</b>	Electrical input only

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

### Connector Suffix

<b>+SC</b>	SC/PC
<b>+ST</b>	ST/PC
<b>+FC</b>	FC/PC

### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone Enclosure

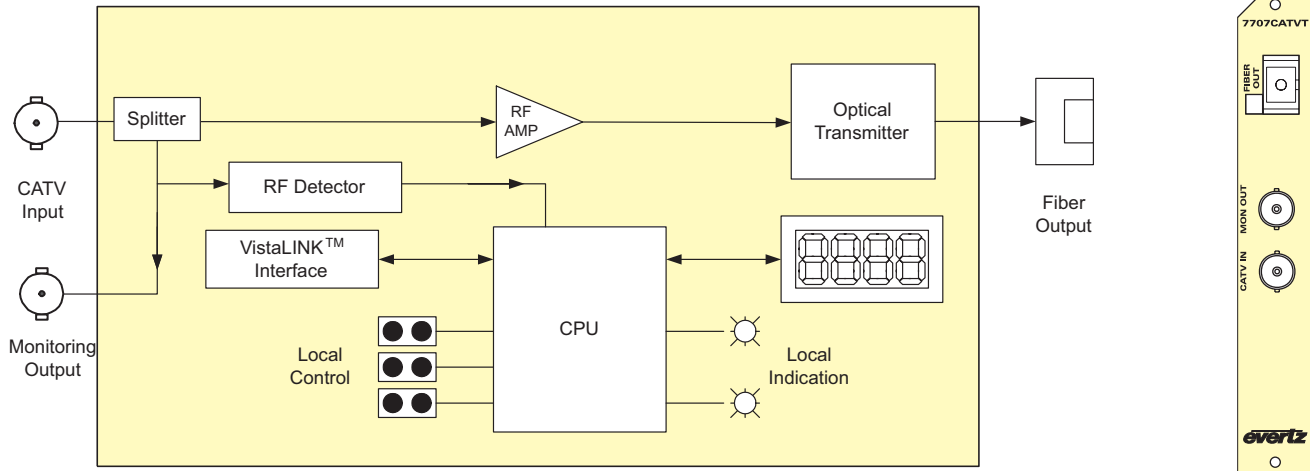


### Specifications

- 80/110 Channel PAL/NTSC CATV fiber optic transmitter
- 50-850 MHz operational bandwidth
- Low CSO and CTB intermod products
- Supports single mode fiber
- Fully hot swappable from front of frame
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.

- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Provides up to 35km extension of CATV systems
- RF input power monitoring and alarm thresholds
- Two setting adjustable optical output power level
- Two optical output power versions available at 1310nm wavelength, +11dBm and +8dBm

### 7707CATVT Block Diagram & Rear Panel



### Specifications

**CATV Input:**  
**Number of Inputs:** 1, 80/110 channel, PAL/NTSC CATV signal  
**Bandwidth:** 50-850 MHz  
**RF Drive Level/channel:** 40dBmV/channel for full 80 PAL/110 NTSC channel load  
**Connector:** 1 F-Type (BNC optional)  
**I/O Impedance:** 75Ω  
**Return Loss:** >18dB

**Monitoring Output:**  
**Number of Outputs:** 1  
**Connector:** F-Type (BNC optional)  
**I/O Impedance:** 75Ω  
**Signal Level:** (Input) -25dB  
**RF Flatness:** ± 1dB (50 - 850MHz)

**Optical Output:**  
**Connector:** 1 SC/APC  
**Operating Wavelength** 1310nm  
**Output Power**  
**110-11:** +11dBm ± 1dBm  
**110-8:** +8dBm ± 1dBm  
**Fiber Size:** 9µm core / 125µm overall

### CATV Channel Performance (7707CATVT & 7707CATVR):

**Flatness:** ± 1dB, (50 - 850MHz)\*  
**CNR:** > 50dB\*  
**CSO:** < -65dBc\*  
**CTB:** < -67dBc\*

\* Measured with fully loaded CATV spectrum with 40dBmV/channel input to 7707CATVT and 0dBm optical power input to 7707CATVR with 0dB gain setting on 7707CATVR

### Electrical:

**Voltage:** +12VDC  
**Power:** 12 Watts

### Physical:

**Number of slots:** 1

### Physical:

**Number of slots:** 1

### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
 Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC directive

### Ordering Information:

**7707CATVT13-110-8** 1310nm, DFB Laser, +8dBm output power, 80/110 channel PAL/NTSC  
**7707CATVT13-110-11** 1310nm, DFB Laser, +11dBm output power, 80/110 channel PAL/NTSC

### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
 Eg. Model +3RU +SC

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Optical Connector Suffix

**+AP+FC** FC/APC (Angle Polished)  
**+AP+SC** SC/APC (Angle Polished)

### RF Connector Suffix

**+BNC** BNC Connector

### Enclosures:

**7700FR-C** 3RU Multiframe, which holds 15 modules  
**7701FR** 1RU Multiframe, which holds 3 modules  
**S7701FR** Standalone Enclosure

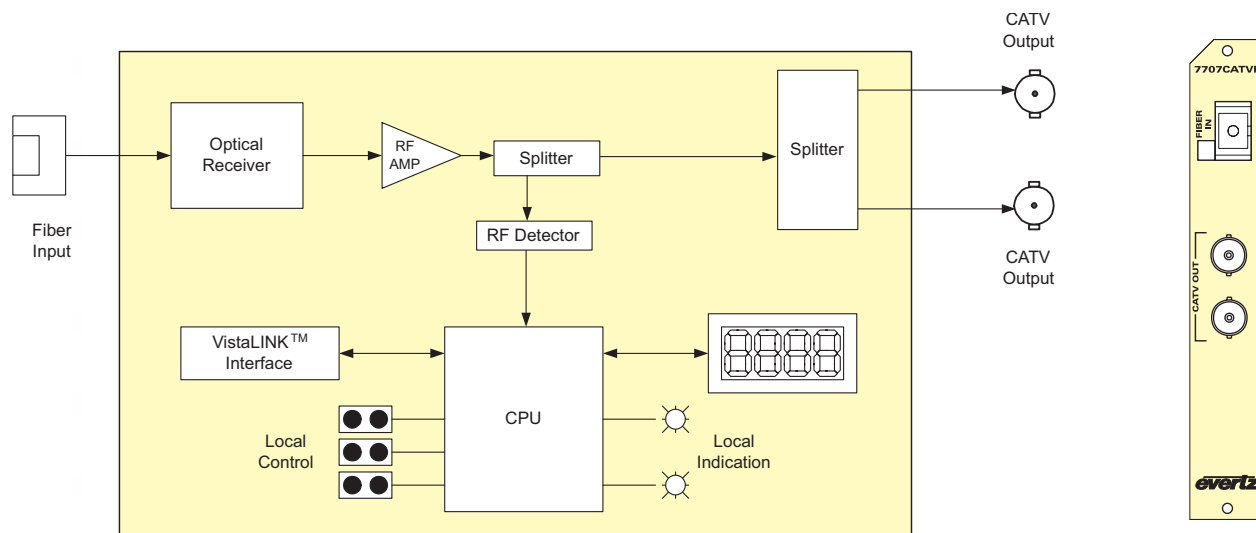




### Features

- 80/110 Channel PAL/NTSC CATV fiber optic receiver
- 50-850 MHz operational bandwidth
- Low CSO and CTB intermod products
- Supports single mode fiber
- Fully hot swappable from front of frame
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Provides up to 35km extension of CATV systems
- Two RF outputs for extra signal distribution or monitoring functions
- Optical power monitoring and alarm thresholds
- RF output power monitoring and alarm thresholds

### 7707CATVR Block Diagram & Rear Panel



### Specifications

#### CATV Outputs:

Connector:	2 F-Type (BNC optional)
I/O Impedance:	75Ω
Return Loss:	> 17dB
CSO:	<-64dB*
CTB:	<-67dB*
CNR:	>50dB*
RF Flatness:	± 1dB* (50 - 850MHz)

\* Measured with fully loaded CATV spectrum with 40dBmV/channel input to 7707CATVT and 0dBm optical power input to 7707CATVR with 0dB gain setting on 7707CATVR

#### Optical Input:

Connector:	1 SC/APC
Operating Wavelength:	1310nm
Optical Link Budget:	14dB (Using 7707CATVT - 110-11 transmitter) 11dB (Using 7707CATVT - 110-8 transmitter)

#### Electrical:

Voltage:	+12VDC
Power:	5 Watts
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

Number of slots:	1
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### Ordering Information:

<b>7707CATVR</b>	80/110 Channel PAL/NTSC CATV Fiber Receiver, SC/APC connector, VistaLINK®
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#### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg. Model +3RU +SC

#### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Optical Connector Suffix

<b>+AP+SC</b>	SC/APC (Angle Polished)
<b>+AP+FC</b>	FC/APC (Angle Polished)

#### RF Connector Suffix

<b>+BNC</b>	BNC Connector
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#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe, which holds 15 modules
<b>7701FR</b>	1RU Multiframe, which holds 3 modules
<b>S7701FR</b>	Standalone enclosure



The 7707CVDT and 7707CVDT-A4 are VistaLINK® -capable composite analog video and bi-directional RS232/422 fiber optic transmitters for broadcast quality video signals. The "-A4" version adds 4 channels of broadcast quality analog audio.

These products are ideal for analog VTR link extension or camera PTZ applications.

The 7707CVDT and 7707CVDT-A4 occupy one card slot and can be housed in a 1RU frame which holds up to 3 modules, a 3RU frame which holds up to 15 modules or a standalone enclosure which holds one module.

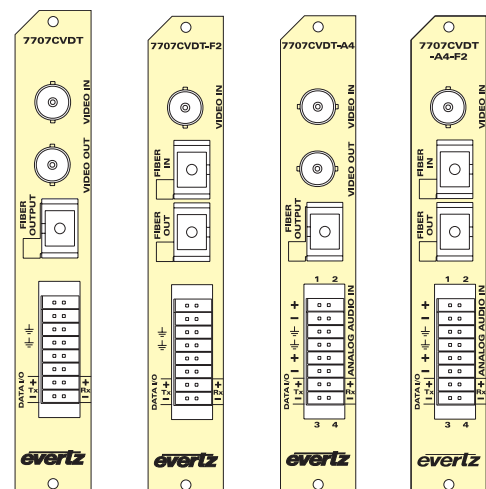
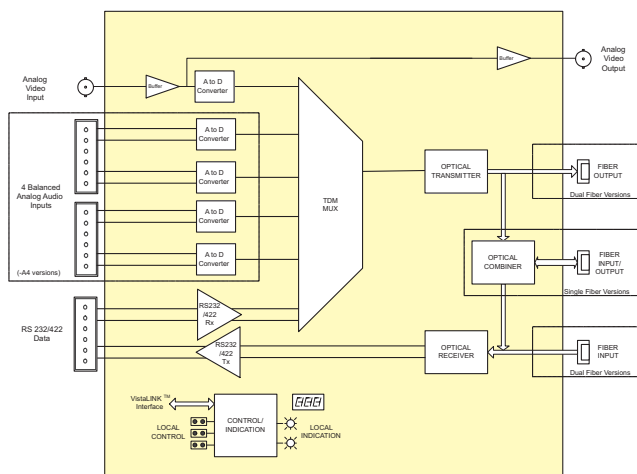
## Features

- Single card fiber optic transmitter for analog video, four analog audio (-A4 version) and bi-directional RS232/422
- Supports both NTSC and PAL video signals
- Broadcast quality analog video and audio performance
- 2 bi-directional RS232 or 1 bi-directional RS422
- Superior digital data transmission
- Signal transport over fiber uninterrupted by loss of input video, audio or data feeds
- Adjustable gain equalization for up to 300m of Belden 1694A coaxial cable
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Fully hot-swappable from front of frame with no fiber disconnect/reconnect required
- Optical output wavelengths of 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available

## 7707CVDT Application Configurations(use -A4 version if audio is required)

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<1km	7707CVDT13-F2	-7dBm	7707CVDR13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	2	21dB/60km	7707CVDT13-F2	-7dBm	7707CVDR13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	1(WDM)	25dB/70km	7707CVDT15-W	-1dBm	7707CVDR13M-W	-26dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	24dB/95km**	7707CVDTxx-F2	0dBm	7707CVDRyy-F2	-28dBm	Different CWDM wavelengths on Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	30dB/120km***	7707CVDTDxxx-F2	+7dBm	7707CVDRDyyy-F2	-28dBm	Different DWDM wavelengths on Tx & Rx, with 8 channel DWDM Mux/Demux***
**Assumes 8 Ch CWD Mus/Demux loss of 3.5dB				Tx Power/Rx Sensitivity are nominal values $\pm 1$ dBm			
***Assumes 8 Ch DWDM Mux/Demux loss of 5dB				Fiber loss= 0.35/0.25dB per km @1310nm/1550nm			

## 7707CVDT/7707CVDT-A4 Block Diagram & Rear Panels





## Specifications

### Analog Video Input:

Standards:	NTSC, SMPTE 170M, PAL, ITU-R 624-4
Number of Inputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Quantization:	12 bits
System Bandwidth:	5.5MHz
Input Level:	2 Vp-p (Maximum)
Gain Equalization:	Up to 300m of Belden 1694A or equivalent (adjustable)
Input impedance:	75Ω
Return Loss:	> 30 dB to 5.5 MHz

### Analog Video Outputs (Not available on -F2 versions):

Standard:	NTSC, SMPTE 170M, PAL, ITU-R 624-4
Number of Outputs:	1 buffered version of input
Connector:	BNC per IEC 60169-8 Amendment 2.
Output Level:	1V p-p
Output Impedance:	75Ω
Return Loss:	> 30 dB to 5.5 MHz

### Analog Audio Inputs (-A4 version):

Number of Inputs:	4
Type:	Balanced analog audio
Connector:	12 pin removable terminal block
Input impedance:	High Impedance (>20K Ω)
Max. Audio Input Level:	+24 dBu
Signal Quantization:	24 Bits
Freq. Response:	±0.1 dB, 20Hz to 20 kHz

### Serial Data Ports:

Number of Ports:	1 RS422 or 2 RS232 - Jumper Selectable
Connector:	4 pins (plus ground) on 16pin removable terminal block
Baud Rate:	Up to 3 Mb/s (Determined by incoming data)

### Optical Input:

Number of Inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Operating Wavelength:	1270nm to 1610nm
Maximum Input Power:	0dBm
Optical Sensitivity:	See Application Configuration Chart

### Optical Output:

Number of Outputs:	1
Connector:	Female SC/PC, ST/PC or FC/PC
Return Loss:	> 14 dB
Rise and Fall Time:	200ps nominal
Fiber Size:	9 μm core / 125 μm overall
Wavelength:	See Ordering Information
Output Power:	See Application Configuration Chart

### System Performance (7707CVDT + 7707CVDR):

Video Input to Video Output Delay:	< 10μs
Audio Input to Audio Output Delay (-A4 Version):	< 1.9ms

### Electrical:

Voltage:	+12VDC
Power:	12Watts (Non-DWDM), 15Watts (DWDM)

### Physical:

Number of slots:	1
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### Compliance:

Electrical Safety:	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive Class 1 laser product
Laser Safety:	Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC directive

### Ordering Information:

7707CVDT13-F2	Analog Video + Bi-di RS-232/422 Fiber Transmitter, dual fiber, 1310nm TX & RX
7707CVDT13-A4-F2	Analog Video + Audio + Bi-di RS-232/422 Fiber Transmitter, dual fiber, 1310nm TX & RX
7707CVDT15-W	Analog Video + Bi-di RS-232/422 Fiber Transmitter, single fiber, 1550nm TX, RX on 1310nm
7707CVDT15-W-A4	Analog Video + Audio + Bi-di RS-232/422 Fiber Transmitter, single fiber, 1550nm TX, RX on 1310nm

### For CWDM, please refer to end of fiber section for ordering information

7707CVDTxx-F2	Analog Video + Bi-di RS-232/422 Fiber Transmitter, dual fiber, CWDM Laser
7707CVDTxx-A4-F2	Analog Video + Audio + Bi-di RS-232/422 Fiber Transmitter, dual fiber, CWDM Laser

### For DWDM, please refer to end of fiber section for ordering information

7707CVDT Dyyy-F2	Analog Video + Bi-di RS-232/422 Fiber Transmitter, dual fiber, DWDM Laser
7707CVDT Dyyy-A4-F2	Analog Video + Audio + Bi-di RS-232/422 Fiber Transmitter, dual fiber, DWDM Laser

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone Enclosure



The 7707CVDR and 7707CVDR-A4 are VistaLINK® -capable composite analog video and bi-directional RS232/422 fiber optic receivers for broadcast quality video signals. The "-A4" version adds 4 channels of broadcast quality analog audio.

These products are ideal for analog VTR link extension or camera PTZ applications.

The 7707CVDR and 7707CVDR-A4 occupy one card slot and can be housed in a 1RU frame which holds up to 3 modules, a 3RU frame which holds up to 15 modules or a standalone enclosure which holds one module.

## Features

- Single card fiber optic receiver for analog video, four analog audio (-A4 version) and bi-directional RS232/422 signals
- Supports both NTSC and PAL video signals
- Broadcast quality analog video and audio performance
- 2 bi-directional RS232 or 1 bi-directional RS422
- Superior digital data transmission
- Signal transport over fiber uninterrupted by loss of input video, audio or data feeds
- Adjustable gain, DC offset, and pre-emphasis for up to 300m of Belden 1694A coaxial cable
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Fully hot-swappable from front of frame with no fiber disconnect/reconnect required
- Optical output wavelengths of 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available

## 7707CVDR Application Configurations (use -A4 version if audio is required)

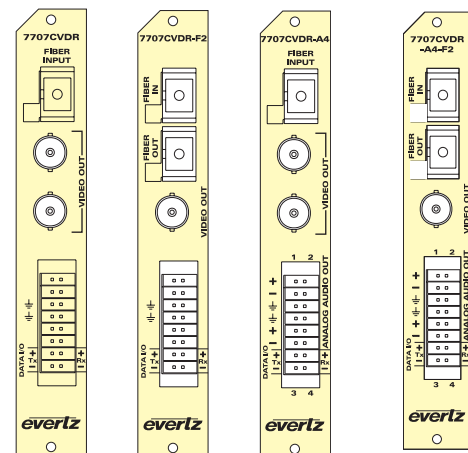
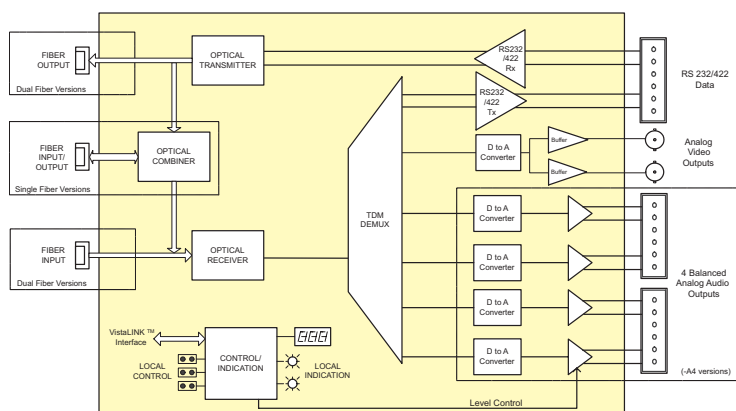
FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<1km	7707CVDT13-F2	-7dBm	7707CVDR13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	2	21dB/60km	7707CVDT13-F2	-7dBm	7707CVDR13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	1(WDM)	25dB/70km	7707CVDT15-W	-1dBm	7707CVDR13M-W	-26dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	24dB/95km**	7707CVDTxx-F2	0dBm	7707CVDRyy-F2	-28dBm	Different CWDM wavelengths on Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	30dB/120km***	7707CVDTDxxx-F2	+7dBm	7707CVDRDyyy-F2	-28dBm	Different DWDM wavelengths on Tx & Rx, with 8 channel DWDM

\*\* Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB

\*\*\*Assumes 8 Ch DWDM Mux/Demux loss of 5dB

Tx Power/Rx Sensitivity are nominal values  $\pm 1$ dBm  
Fiber loss= 0.35/0.25dB per km @1310nm/1550nm

## 7707CVDR/7707CVDR-A4 Block Diagram & Rear Panels





# Analog Video, 4-Channel Audio (A-4) and RS232/422 Fiber Receiver 7707CVDR/CVDR-A4

## Specifications

### Optical Input:

Number of Inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Operating Wavelength:	1270nm to 1610nm
Maximum Input Power:	0dBm
Optical Sensitivity:	See Application Configuration Chart

### Optical Output:

Number of Outputs:	1
Connector:	Female SC/PC, ST/PC or FC/PC
Return Loss:	> 14 dB
Rise and Fall Time:	200ps nominal
Fiber Size:	9 $\mu$ m core / 125 $\mu$ m overall
Wavelength:	See Ordering Information
Output Power:	See Application Configuration Chart

### Analog Video Outputs:

Standard:	NTSC, SMPTE 170M, PAL, ITU-R624-4
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Resolution:	12 bits
System bandwidth:	5.5 MHz
Output Level:	1 Vp-p (nominal), 2 Vp-p maximum
Gain:	Unity gain nominal, adjustable 50% to 150%
Output Impedance:	75 $\Omega$
Return Loss:	> 20 dB
Signal/Noise:	> 67dB
Differential Gain:	< 1.0%
Differential Phase:	< 1.0°
Passband Ripple:	$\leq \pm 0.1$ dB to 4.7Mhz (Equalization set to 0 m) $\leq \pm 0.2$ dB to 4.7Mhz (Equalization set to maximum)

**Pre-Emphasis:** Cable loss compensation for up to 300m of Belden 1694A (each output adjustable separately)

**Chroma/Luma Delay:** <11 ns  
**Line time distortion:** <1% (.5% typical)

### Analog Audio Outputs (-A4 version):

Number of Outputs:	4
Type:	Balanced analog audio
Connector:	12 pin removable terminal block
Output impedance:	66 $\Omega$
Freq. Response:	$\pm 0.1$ dB, 20Hz to 20 kHz
THD 20Hz-20kHz:	< 0.005%
Channel Phase Diff.	$\pm 1$ deg
SNR (weighted):	> 85dB
Output Level Adj:	-20dB to +3dB
Max Output Level:	+24 dBU into 10k $\Omega$ loads

### Serial Data Ports:

Number of Ports:	1 RS422 or 2 RS232 - Jumper Selectable
Connector:	4 pins (plus ground) on 16pin removable terminal block
Baud Rate:	Up to 3 Mb/s (Determined by incoming data)

### System Performance (7707CVDT + 7707CVDR):

Video Input to Video Output Delay:	<10 $\mu$ s
Audio Input to Audio Output Delay (-A4 version):	< 1.9ms

### Electrical:

Voltage:	+12VDC
Power:	12 Watts (Non DWDM), 15 Watts (DWDM)

### Physical:

Number of slots:	1
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### Compliance:

Electrical Safety:	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive
Laser Safety:	Class 1 laser product Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC directive

### Ordering Information:

7707CVDR13-F2	Analog Video + Bi-di RS-232/422 Fiber Receiver, dual fiber, 1310nm TX & RX
7707CVDR13-A4-F2	Analog Video + Audio + Bi-di RS-232/422 Fiber Receiver, dual fiber, 1310nm TX & RX
7707CVDR13M-W	Analog Video + Bi-di RS-232/422 Fiber Receiver, single fiber, 1310nm TX @0dBm, RX on 1550nm
7707CVDR13M-W-A4	Analog Video + Audio + Bi-di RS-232/422 Fiber Receiver, single fiber, 1310nm TX @ 0dBm, RX on 1550nm

### For CWDM, please refer to the end of the fiber section for ordering information

7707CVDRxx-F2	Analog Video + Bi-di RS-232/422 Fiber Receiver, dual fiber, CWDM Laser
7707CVDRxx-A4-F2	Analog Video + Audio + Bi-di RS-232/422 Fiber Receiver, dual fiber, CWDM Laser

### For DWDM, please refer to the end of the fiber section for ordering information

7707CVDRDyyy-F2	Analog Video + Bi-di RS-232/422 Fiber Receiver, dual fiber, DWDM Laser
7707CVDRDyyy-A4-F2	Analog Video + Audio + Bi-di RS-232/422 Fiber Receiver, dual fiber, DWDM Laser

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone Enclosure



The 7707CVTA is a VistaLINK® -capable, composite analog video and analog audio fiber transmitter for broadcast quality video and audio signals. This single card module accepts one NTSC or PAL analog video input with up to four analog audio inputs, performs analog to digital conversion and transmits them over a single fiber. The companion 7707CVRA Composite Video and Analog Audio Fiber Receiver demultiplexes the signals and converts them back to analog form.

The 7707CVTA-2 Dual Composite Video and Analog Audio fiber transmitter is a dual channel version that digitizes and multiplexes two analog video and up to four analog audio signals and converts them to an optical signal for transmission. The companion 7707CVRA-2 Dual Composite Video and Analog Audio Fiber Receiver accepts a fiber optic input, demultiplexes the signals, performs D to A conversion and outputs two NTSC or PAL analog video signals and up to four balanced analog audio signals.

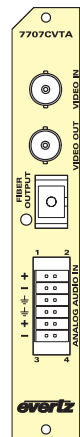
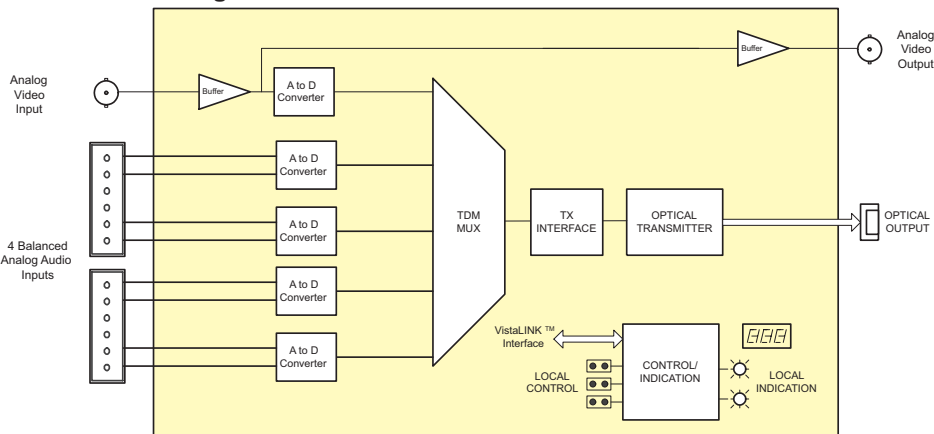
The fiber optic output of the 7707CVTA and 7707CVTA-2 is available in an assortment of optical wavelengths, accommodating 1310nm/1550nm, CWDM and DWDM transmission schemes.

The 7707CVTA and 7707CVTA-2 occupy one card slot and can be housed in a 1RU frame, which will hold up to three modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure that will hold 1 module.

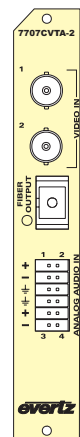
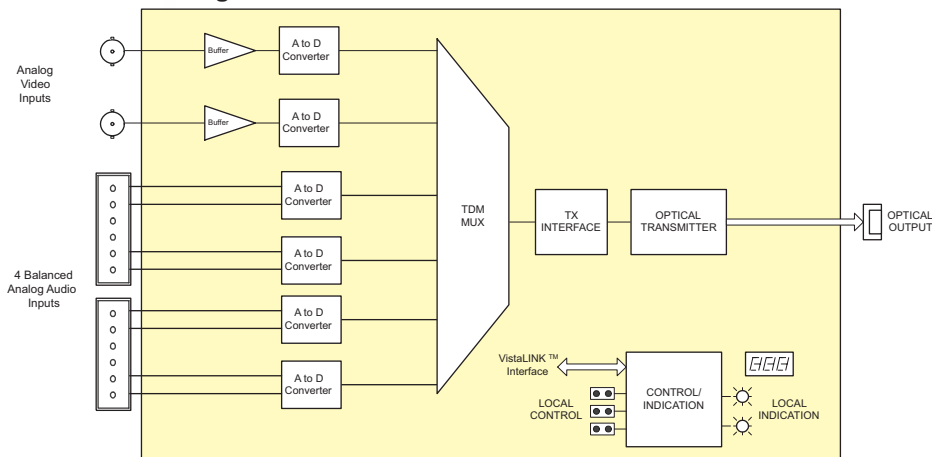
## Features

- Single card fiber optic transmitter for one or two analog video and four analog audio signals
- Supports both NTSC and PAL video signals
- Broadcast quality analog video and audio performance
- Meets or exceeds EIA/TIA RS250-C short haul specifications for analog video and audio transport
- Superior digital data transmission
- Video loop-through for additional signal distribution or monitoring (7707CVTA only)
- Signal transport over fiber is uninterrupted by loss of input video or audio feeds
- Low Audio to Video latency
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Adjustable gain equalization for up to 250m of Belden 1694A coaxial cable
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available

## 7707CVTA Block Diagram & Rear Panel



## 7707CVTA-2 Block Diagram





# Single/Dual Analog Video with 4-Channel Analog Audio Fiber Transmitter 7707CVTA & 7707CVTA-2

## Specifications

### Analog Video Input:

<b>Standards:</b>	NTSC, SMPTE 170M, PAL, ITU-R 624-4
<b>Number of Inputs:</b>	1 on 7707CVTA, 2 on 7707CVTA-2
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2.
<b>Signal Quantization:</b>	12 bits
<b>System Bandwidth:</b>	5.5MHz
<b>Input Level:</b>	2 Vp-p (Maximum)
<b>Gain Equalization:</b>	up to 250m of Belden 1694A or equivalent (adjustable)
<b>Input impedance:</b>	75Ω
<b>Return Loss:</b>	> 30 dB to 5.5 MHz
<b>Signal/Noise Ratio:</b>	> 70 dB
<b>Differential Gain:</b>	< 1.0 %
<b>Differential Phase:</b>	< 0.7 °
<b>Passband Ripple:</b>	
<b>NTSC:</b>	< ± 0.1dB to 4.1 MHz < ± 0.2dB to 5.5 MHz
<b>PAL:</b>	< ± 0.1dB to 4.8 MHz < ± 0.2dB to 5.8 MHz
<b>Chroma/Luma Gain:</b>	98% to 103%
<b>Chroma/Luma Delay:</b>	
<b>NTSC:</b>	< 5 ns
<b>PAL:</b>	< 12 ns
<b>Line Time Distortion:</b>	1.2%

### Analog Video Outputs: (7707CVTA only)

<b>Standard:</b>	NTSC, SMPTE 170M, PAL, ITU-R 624-4
<b>Number of Outputs:</b>	1 buffered version of input
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2.
<b>Output Level:</b>	1V p-p
<b>Output Impedance:</b>	75Ω
<b>Return Loss:</b>	> 30 dB to 5.5 MHz

### Analog Audio Inputs:

<b>Number of Inputs:</b>	4
<b>Type:</b>	Balanced analog audio
<b>Connector:</b>	12 pin removable terminal block
<b>Input impedance:</b>	High Impedance (>20K Ω)
<b>Freq. Response:</b>	±0.1 dB, 20Hz to 20 kHz
<b>THD 20Hz-20kHz:</b>	< 0.005%
<b>Channel Phase Diff.:</b>	± 1 deg
<b>SNR (weighted):</b>	> 85 dB
<b>Max. Audio Input Level:</b>	+24 dBu
<b>Signal Quantization:</b>	24 Bits

### Optical Outputs:

<b>Number of Outputs:</b>	1
<b>Connector:</b>	Female SC/PC, SC/PC, ST/PC or FC/PC
<b>Return Loss:</b>	> 14 dB
<b>Wavelengths:</b>	
<b>Standard</b>	1310nm, 1550nm (nominal)
<b>CWDM:</b>	See Ordering Information
<b>DWDM:</b>	See Ordering Information

### Output Power:

<b>1310nm FP (Standard)</b>	-7dBm ± 1dBm
<b>1310nm FP (M version)</b>	0dBm ± 1dBm
<b>1550 &amp; CWDM DFB</b>	0dBm ± 1dBm
<b>DWDM:</b>	+7dBm ± 1dBm

### System Performance (7707CVTA + 7707VCRA or 7707CVTA-2 + 7707CVRA-2):

<b>Video Input to Output Delay:</b>	< 10μs
<b>Audio Input to Output Delay:</b>	< 1.9ms

### Electrical:

<b>Voltage:</b>	+12VDC
<b>Power:</b>	11/12 Watts (Non-DWDM), 13/14Watts (DWDM)

### Physical:

<b>7700 or 7701 frame mounting:</b>	
<b>Number of slots:</b>	1

### Compliance:

<b>Electrical Safety:</b>	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive
<b>Laser Safety:</b>	Class 1 laser product Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC directive

### Ordering Information:

<b>7707CVTA13</b>	Analog Video with 4-channel Analog Audio Fiber Transmitter 1310nm FP Laser, VistaLINK®
<b>7707CVTA13M</b>	Analog Video with 4-channel Analog Audio Fiber Transmitter 1310nm FP Laser (0dBm launch), VistaLINK®
<b>7707CVTA13-2</b>	Dual Analog Video with 4-channel Analog Audio Fiber Transmitter, 1310nm FP Laser, VistaLINK®
<b>7707CVTA13M-2</b>	Dual Analog Video with 4-channel Analog Audio Fiber Transmitter, 1310nm FP Laser, (0dBm launch), VistaLINK®
<b>7707CVTA15</b>	Analog Video with 4-channel Analog Audio Fiber Transmitter 1550nm DFB Laser, VistaLINK®
<b>7707CVTA15-2</b>	Dual Analog Video with 4-channel Analog Audio Fiber Transmitter, 1550nm DFB Laser, VistaLINK®

### For CWDM, please refer to the end of the fiber section for ordering information

<b>7707CVTAxx</b>	Analog Video with 4-channel Analog Audio Fiber Transmitter CWDM DFB Laser, VistaLINK®
<b>7707CVTAxx-2</b>	Dual Analog Video with 4-channel Analog Audio Fiber Transmitter CWDM DFB Laser, VistaLINK®

### For DWDM, please refer to the end of the fiber section for ordering information

<b>7707CVTADyyy</b>	Analog Video with 4-channel Analog Audio Fiber Transmitter DWDM DFB Laser, VistaLINK®
<b>7707CVTADyyy-2</b>	Dual Analog Video with 4-channel Analog Audio Fiber Transmitter DWDM DFB Laser, VistaLINK®

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

### Connector Suffix

<b>+SC</b>	SC/PC
<b>+ST</b>	ST/PC
<b>+FC</b>	FC/PC

### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone Enclosure



The 7707CVT-4 is a VistaLINK® -capable, composite analog video fiber transmitter for broadcast analog video signals. This single card module accepts up to four NTSC or PAL analog video inputs, performs analog to digital conversion and transmits them over a single fiber. The companion 7707CVR-4 Composite Video Fiber Receiver demultiplexes the signals and converts them back to analog form.

The fiber optic output of the 7707CVT-4 is available in an assortment of optical wavelengths, accommodating 1310nm/1550nm, CWDM and DWDM transmission schemes.

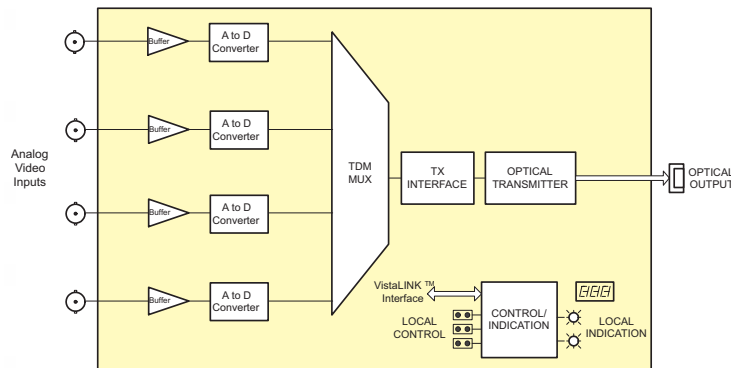
The 7707CVT-4 occupies one card slot and can be housed in a 1RU frame which will hold up to three modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure that will hold 1 module.

### Features

- Single card fiber optic transmitter for up to four analog video signals
- Supports both NTSC and PAL video signals
- Broadcast quality analog video performance
- Meets or exceeds EIA/TIA RS250-C short haul specifications for analog video transport
- Signal transport over fiber is uninterrupted by loss of input video feeds
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.

- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Adjustable equalization for up to 250m of Belden 1694A coaxial cable
- Fully hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available

### 7707CVT-4 Block Diagram & Rear Panel



### Specifications

#### Analog Video Input:

Standards:	NTSC, SMPTE 170M, PAL, ITU-R 624-4
Number of Inputs:	4
Connector:	BNC per IEC 60169-8 Amendment 2.
Signal Quantization:	12 bits
System Bandwidth:	5.5MHz
Input Level:	2 Vp-p (Maximum)
Gain Equalization:	up to 250m of Belden 1694A or equivalent (adjustable)
Input impedance:	75Ω
Return Loss:	> 30dB to 5.5 MHz
Signal/Noise Ratio:	> 70dB
Differential Gain:	< 1.0 %
Differential Phase:	< 0.7 °
Passband Ripple:	
NTSC:	< ± 0.1dB to 4.1 MHz < ± 0.2dB to 5.5 MHz
PAL:	< ± 0.1dB to 4.8 MHz < ± 0.2dB to 5.8 MHz
Chroma/Luma Gain:	98% to 103%
Chroma/Luma Delay:	
NTSC:	< 5 ns
PAL:	< 12 ns
Line Time Distortion:	1.2%

#### Optical Outputs:

Number of Outputs:	1
Connector:	Female SC/PC, SC/PC, ST/PC or FC/PC
Return Loss:	> 14 dB
Wavelengths:	
Standard	1310nm, 1550nm (nominal)
CWDM:	See Ordering Information
DWDM:	See Ordering Information
Output Power:	
1310nm FP (Standard)	-7dBm ± 1dBm
1310nm FP (M Version)	0dBm ± 1dBm
1550 & CWDM DFB	0dBm ± 1dBm
DWDM:	+7dBm ± 1dBm

#### Electrical:

Voltage:	+12VDC
Power:	11/12 Watts (Non-DWDM) 13/14Watts (DWDM)

#### Physical:

Number of slots:	1
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#### Compliance:

##### Electrical Safety:

CSA Listed to UL 60065-03, IEC 60065  
Complies with CE Low voltage Directive  
Class 1 laser product

##### Laser Safety:

Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1  
Complies with FCC Part 15, Class A  
EU EMC directive

##### EMI/RFI:

#### Ordering Information:

7707CVT13-4	Quad Analog Video Fiber Transmitter 1310nm FP Laser, VistaLINK®
7707CVT15-4	Quad Analog Video Fiber Transmitter 1550nm DFB Laser, VistaLINK®

#### For CWDM, please refer to the end of the fiber section for ordering information

7707CVTxx-4	Quad Analog Video Fiber Transmitter CWDM DFB Laser, VistaLINK®
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#### For DWDM, please refer to the end of the fiber section for ordering information

7707CVTDyyy-4	Quad Analog Video Fiber Transmitter DWDM DFB Laser, VistaLINK®
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#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

#### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone Enclosure



# Dual S-Video Fiber Transmitter

## 7707SVT-2



The 7707SVT-2 is a VistaLINK® - capable, S-Video fiber transmitter for broadcast quality signals. This single card module accepts up to two S-Video inputs, performs analog to digital conversion and transmits them over a single fiber. The companion 7707SVR-2 S-Video Fiber Receiver demultiplexes the signals and converts them back to analog form.

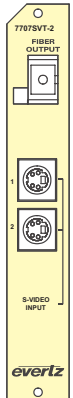
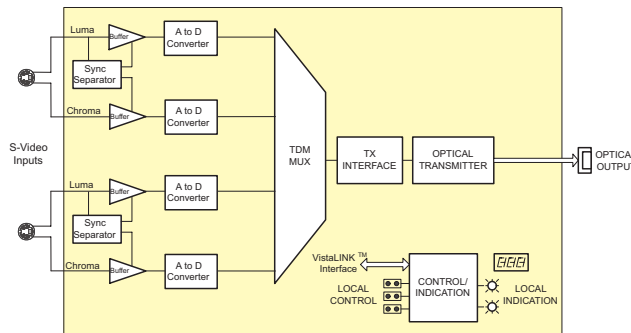
The fiber output of the 7707SVT-2 is available in an assortment of optical wavelengths accommodating 1310nm/1550nm, CWDM and DWDM transmission schemes.

The 7707SVT-2 occupies one card slot and can be housed in a 1RU frame which will hold up to three modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure that will hold 1 module.

### Features

- Single card fiber optic transmitter for up to two S-Video signals
- Supports both NTSC and PAL video signals
- Broadcast quality S-Video performance
- Meets or exceeds EIA/TIA RS250-C short haul specifications for analog video transport
- Superior digital data transmission
- Signal transport over fiber is uninterrupted by loss of input video feeds
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available

### 7707SVT-2 Block Diagram & Rear Panel



### Specifications

#### Analog S-Video Input:

Standards:	NTSC, SMPTE 170M, PAL, ITU-R 624-4
Number of Inputs:	2
Connector:	IEC 933-5 (4-pin mini-DIN)
Signal Quantization:	12 bits
System Bandwidth:	5.5MHz
Input Level:	Y: 1.0Vp-p, C: 0.286Vp-p
Input Impedance:	75Ω
Return Loss:	> 30dB to 5.5 MHz
Signal/Noise Ratio:	> 70dB
Differential Gain:	< 1.0 %
Differential Phase:	< 0.7°
Passband Ripple:	
NTSC:	< ± 0.1dB to 4.1 MHz < ± 0.2dB to 5.5 MHz < ± 0.1dB to 4.8 MHz < ± 0.2dB to 5.8 MHz

PAL:	< ± 0.1dB to 4.1 MHz < ± 0.2dB to 5.5 MHz < ± 0.1dB to 4.8 MHz < ± 0.2dB to 5.8 MHz
Line Time Distortion:	1.2%

#### Optical Outputs:

Number of Outputs:	1
Connector:	Female SC/PC, ST/PC or FC/PC
Return Loss:	> 14 dB
Wavelengths:	
Standard	1310nm, 1550nm (nominal)
CWDM:	See Ordering Information
DWDM:	See Ordering Information
Output Power:	
1310nm FP (Standard)	-7dBm ± 1dBm
1550 & CWDM DFB	0dBm ± 1dBm
DWDM:	+7dBm ± 1dBm

#### System Performance (7707SVT-2 + 7707SVR-2):

Video Input to Output Delay: < 10μs

#### Electrical:

Voltage:	+12VDC
Power:	11/12 Watts (Non-DWDM), 13/14 Watts (DWDM)

#### Physical:

Number of slots:	1
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#### Compliance:

##### Electrical Safety:

CSA Listed to UL 60065-03, IEC 60065  
Complies with CE Low voltage Directive  
Class 1 laser product  
Complies with 24 CFR 1040.10 and 1040.11  
IEC 60825-1  
Complies with FCC Part 15, Class A  
EU EMC directive

##### Laser Safety:

##### EMI/RFI:

#### Ordering Information:

7707SVT13-2	Dual S- Video Fiber Transmitter, 1310nm FP Laser, VistaLINK®
7707SVT15-2	Dual S- Video Fiber Transmitter, 1550nm DFB Laser, VistaLINK®

#### For CWDM, please refer to the end of the fiber section for ordering information

7707SVTxx-2	Dual S-Video Fiber Transmitter CWDM DFB Laser, VistaLINK®
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#### For DWDM, please refer to the end of the fiber section for ordering information

7707SVTDyyy-2	Dual S-Video Fiber Transmitter DWDM DFB Laser, VistaLINK®
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#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

#### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone Enclosure



The 7707CVRA is a VistaLINK® -capable, composite analog video and analog audio fiber receiver for broadcast quality video signals. This single card module accepts a fiber optic input from the companion 7707CVTA Composite Video and Analog Audio Fiber Transmitter, demultiplexes the signals, performs D to A conversion and outputs NTSC or PAL analog video and up to four balanced analog audio signals.

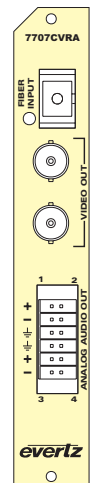
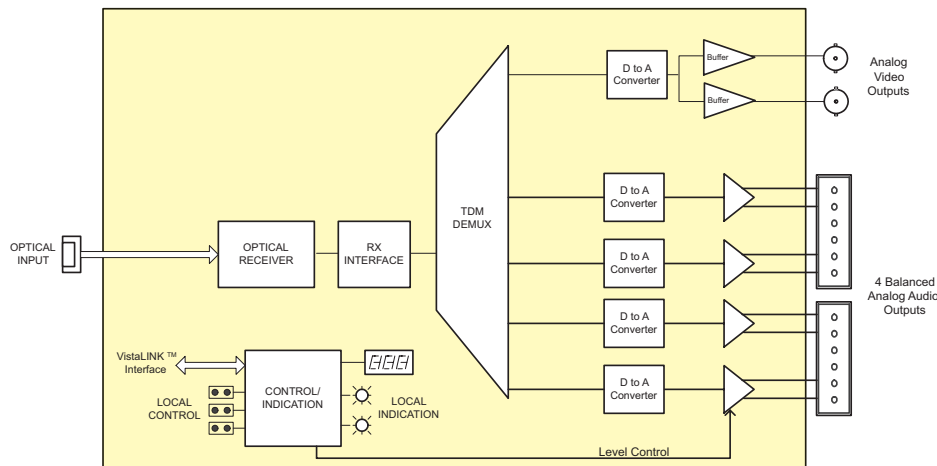
The 7707CVRA-2 Dual Composite Video and Analog Audio Fiber Receiver is a dual channel version that accepts a fiber optic input from the companion 7707CVTA-2 transmitter, demultiplexes the signals, performs D to A conversion and outputs 2 NTSC or PAL analog video signals and up to four balanced analog audio signals.

The 7707CVRA and 7707CVRA-2 occupy one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3 RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

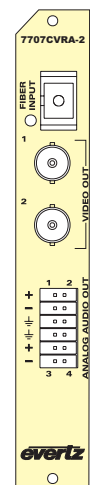
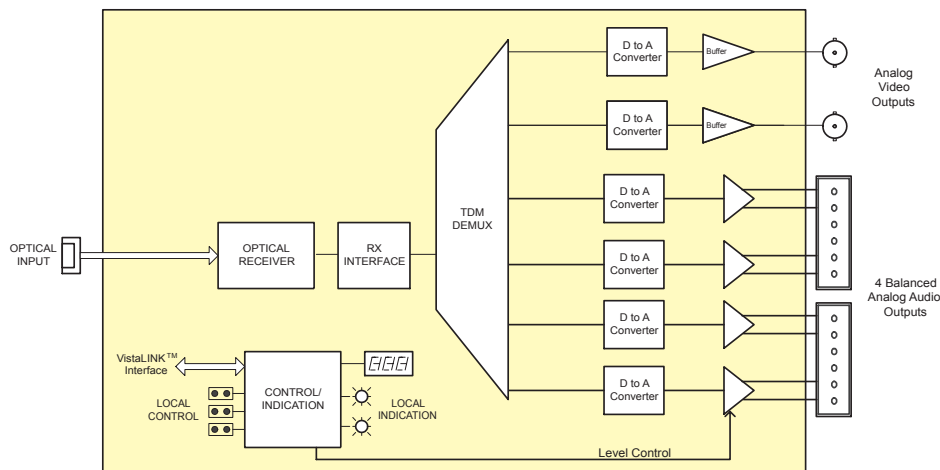
## Features

- Single card fiber optic receiver for one or two analog video and four analog audio signals
- Supports both NTSC and PAL video signals
- Broadcast quality analog video and audio performance
- Meets or exceeds EIA/TIA RS250-C short haul specifications for analog video and audio transport
- Adjustable gain, DC offset and pre-emphasis for up to 250m of Belden 1694A coaxial cable
- Low Audio to Video latency
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range

## 7707CVRA Block Diagram & Rear Panel



## 7707CVRA-2 Block Diagram & Rear Panel





# Single/Dual Analog Video with 4-Channel Analog Audio Fiber Receiver

## 7707CVRA & 7707CVRA-2

### Specifications

#### Optical Input:

Number of Inputs: 1  
Connector: Female SC/PC, ST/PC, FC/PC  
Operating Wavelength: 1270nm to 1610nm  
Maximum Input Power: 0dBm  
Optical Sensitivity: -28dBm

#### Analog Video Outputs:

Standards: NTSC, SMPTE 170M, PAL, ITU-R624-4  
Number of Outputs: 2 on 7707CVRA  
2 (1 per video channel) on 7707CVRA-2  
Connector: BNC per IEC 60169-8 Amendment 2  
System bandwidth: 5.5 MHz  
Output Level: 1 Vp-p (nominal), 2 Vp-p maximum  
Gain: Unity gain nominal, adjustable 50% to 150%  
Output Impedance: 75Ω  
Return Loss: > 20dB  
SNR: > 70dB  
Differential Gain: < 1.0%  
Differential Phase: < 0.7°  
Pre-Emphasis: Cable loss compensation for up to 250m of Belden 1694A (each output adjustable separately)

#### Passband Ripple:

NTSC: < ±0.1dB to 4.1MHz and  
< ±0.2dB to 5.5MHz  
PAL: < ±0.1dB to 4.8MHz and  
< ±0.2dB to 5.8MHz

#### Chroma/Luma Gain:

98% - 103%

#### Chroma/Luma Delay:

NTSC: <5ns  
PAL: <12ns

Line Time Distortion: 1.2%

#### Analog Audio Outputs:

Number of Outputs: 4  
Type: Balanced analog audio  
Connector: 12 pin removable terminal block  
Output impedance: 66Ω  
Freq. Response: ± 0.1dB, 20Hz to 20 kHz  
THD 20Hz-20kHz: < 0.005%  
Channel Phase Diff. ± 1°  
SNR (weighted): > 85dB  
Output Level Adj: -20dB to +3dB  
Max Output Level: +24 dBu into 10kΩ loads

#### System Performance (7707CVTA + 7707CVRA or 7707CVTA-2 + 7707CVRA-2):

Video Input to  
Output Delay: <10μs  
Audio Input to  
Output Delay: <1.9ms

#### Electrical:

Voltage: +12VDC  
Power: 12 Watts  
EMI/RFI: Complies with FCC Part 15, Class A  
EU EMC directive

#### Physical:

Number of slots: 1

#### Ordering Information:

7707CVRA Analog Video with 4-Channel Analog Audio  
Fiber Receiver, VistaLINK®  
7707CVRA-2 Dual Analog Video with 4-Channel Analog  
Audio Fiber Receiver, VistaLINK®

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix

+3RU 3RU Rear Plate for use with 7700FR-C  
Multiframe  
+1RU 1RU Rear Plate for use with 7701FR  
Multiframe  
+SA Standalone Enclosure Rear Plate

#### Connector Suffix

+SC SC/PC  
+ST ST/PC  
+FC FC/PC

#### Enclosures:

7700FR-C 3RU Multiframe which holds 15 modules  
7701FR 1RU Multiframe which holds 3 modules  
S7701FR Standalone Enclosure



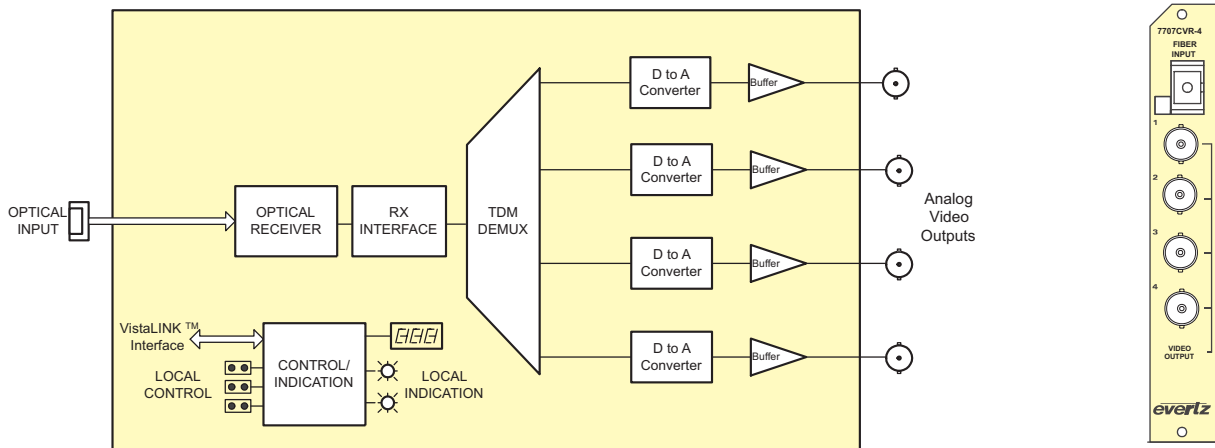
The 7707CVR-4 is a VistaLINK® -capable, composite analog video fiber receiver for broadcast quality video signals. This single card module accepts a fiber optic input from the companion 7707CVT-4 composite analog video fiber transmitter, demultiplexes the signals, performs D to A conversion and outputs NTSC or PAL analog video.

The 7707CVR-4 occupies one card slot and can be housed in a 1RU frame which will hold up to 3 modules, a 3 RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

### Features

- Single card fiber optic receiver for up to four analog video signals
- Supports both NTSC and PAL video signals
- Broadcast quality analog video performance
- Meets or exceeds EIA/TIA RS250-C short haul specifications for analog video transport
- Adjustable gain, DC offset and pre-emphasis for up to 250m of Belden 1694A coaxial cable
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range

### 7707CVR-4 Block Diagram & Rear Panel



### Specifications

#### Optical Input:

Number of Inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Operating Wavelength:	1270nm to 1610nm
Maximum Input Power:	0dBm
Optical Sensitivity:	-28dBm

#### Analog Video Outputs:

Standards:	NTSC, SMPTE 170M, PAL, ITU-R624-4
Number of Outputs:	4
Connector:	BNC per IEC 60169-8 Amendment 2
System bandwidth:	5.5 MHz
Output Level:	1 Vp-p (nominal), 2 Vp-p maximum
Gain:	Unity gain nominal, adjustable 50% to 150%
Output Impedance:	75Ω
Return Loss:	> 20dB
SNR:	> 70dB
Differential Gain:	< 1.0%
Differential Phase:	< 0.7°
Pre-Emphasis:	Cable loss compensation for up to 250m of Belden 1694A (each output adjustable separately)

#### Passband Ripple:

NTSC:	< ±0.1dB to 4.1MHz and < ±0.2dB to 5.5MHz
PAL:	< ±0.1dB to 4.8MHz and < ±0.2dB to 5.8MHz

Chroma/Luma Gain: 98% - 103%

#### Chroma/Luma Delay:

NTSC:	<5ns
PAL:	<12ns

Line Time Distortion: 1.2%

#### Electrical:

Voltage:	+12VDC
Power:	12 Watts

#### Physical:

Number of slots:	1
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#### Ordering Information:

**7707CVR-4** Quad Analog Video Fiber Receiver, VistaLINK®

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Connector Suffix

<b>+SC</b>	SC/PC
<b>+ST</b>	ST/PC
<b>+FC</b>	FC/PC

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone Enclosure



# Dual S-Video Fiber Receiver

## 7707SVR-2



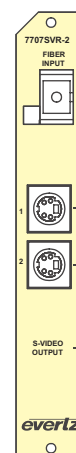
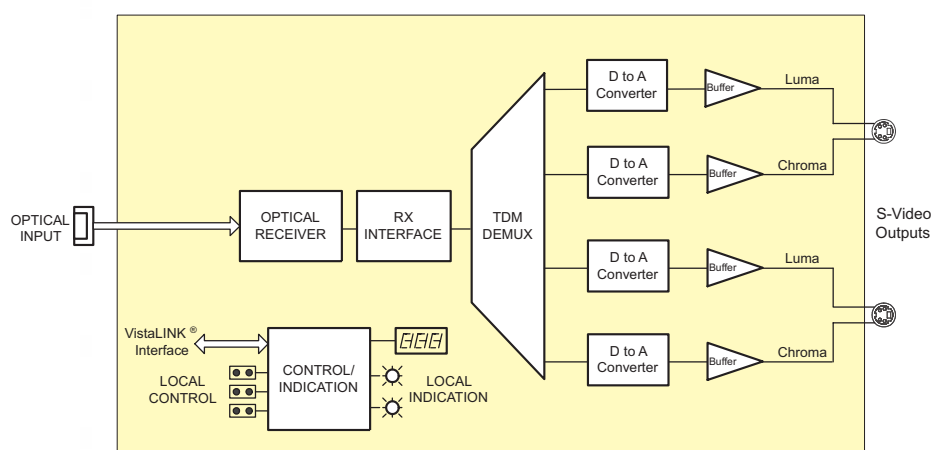
The 7707SVR-2 is a VistaLINK® - capable, S-Video fiber receiver for broadcast quality video signals. This single card module accepts a fiber optic input from the companion 7707SVT-2 S-Video Fiber Transmitter, demultiplexes the signals, performs D to A conversion and outputs NTSC or PAL S-Video signals.

The 7707SVR-2 occupies one card slot and can be housed in a 1RU frame which will hold up to 3 modules, a 3 RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

### Features

- Single card fiber optic receiver for up to two S-Video signals
- Supports both NTSC and PAL video signals
- Broadcast quality S-Video performance
- Meets or exceeds EIA/TIA RS250-C short haul specifications for analog video transport
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range

### 7707SVR-2 Block Diagram & Rear Panel



### Specifications

#### Optical Input:

Number of Inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Operating Wavelength:	1270nm to 1610nm
Maximum Input Power:	0dBm
Optical Sensitivity:	-28dBm

#### S-Video Outputs:

Standards:	NTSC, SMPTE 170M, PAL, ITU-R624-4
Number of Outputs:	2
Connector:	IEC 933-5 (4-pin mini-DIN)
System bandwidth:	5.5 MHz
Output Level:	Y: 1.0Vp-p, C: 0.286Vp-p
Output Impedance:	75Ω
Return Loss:	> 20dB
SNR:	> 70dB
Differential Gain:	< 1.0%
Differential Phase:	< 0.7°
Passband Ripple:	
NTSC:	< ±0.1dB to 4.1MHz and < ±0.2dB to 5.5MHz
PAL:	< ±0.1dB to 4.8MHz and < ±0.2dB to 5.8MHz

#### System Performance (7707SVT-2 + 7707SVR-2):

Video Input to	
Output Delay:	<10μs

#### Electrical:

Voltage:	+12VDC
Power:	12 Watts
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC directive

#### Physical:

Number of slots:	1
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#### Ordering Information:

<b>7707SVR-2</b>	Dual S-Video Fiber Receiver, VistaLINK®
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#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Connector Suffix

<b>+SC</b>	SC/PC
<b>+ST</b>	ST/PC
<b>+FC</b>	FC/PC

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone Enclosure





The 7707RGBT is a VistaLINK® SNMP -capable RGBHV/DVI/KVM fiber transmitter for high resolution/high quality video signals. This single card module accepts one analog RGBHV or digital DVI video input up to WUXGA resolution and transmits them over a single fiber or coax cable. The 7707RGBT is also available with analog audio, keyboard + mouse, serial and USB options. The companion 7707RGBR RGBHV/DVI/KVM Fiber Receiver demultiplexes the signals and converts them back to analog RGBHV and digital DVI.

The -C version provides an electrical I/O path via coax in addition to the fiber I/O path. This allows the cards to interface with electrical devices supporting 3Gb/s (i.e. electrical router) while providing the capability to convert the electrical signal back to optical on the same card.

The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm, CWDM and DWDM transmission schemes.

The 7707RGBT series occupy one, two or three card slots. (See the physical specifications for the slot count of the specific card) They can be housed in a 1RU frame, which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules, or a standalone enclosure which will hold 1 module. 7707RGBT13-A2KM-C-F2 and 7707RGBT13-A2KM-USB-C-F2 versions can be housed in the 3RU frame only.

## Features

- Supports DVI or RGBHV transport over a single fiber or coax (-C version)
- Both RGBHV and DVI outputs available simultaneously on companion 7707RGBR Receiver
- VESA video resolutions supported up to WUXGA
- Full 24 bits per pixel color resolution
- Ideal for use with high resolution LCD, plasma, and projection screens
- Superior digital data transmission
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Fully hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths at 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Optional 2 channel stereo analog audio
- Optional keyboard, mouse and serial
- Optional USB interface
- Optional coaxial BNC connectors with additional optical/electrical conversion
- Optional G-Link support for use with Evertz VIP™ & MVP™ Multi-display products
- Optional coax I/O for Tx & Rx

## 7707RGBT Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<500m	7707RGBT13-A2KM-USB-F2	-7dBm	7707RGBR13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	2	12dB/34km	7707RGBT13-A2KM-USB-F2	-7dBm	7707RGBR13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	1	8dB/20km*	7707RGBT15-A2KM-W	-1dBm	7707RGBR13-A2KM-W	-17dBm	1310nm/1550nm WDM bi-directional, one fiber
Single-Mode	1(CWDM)	15.5dB/60km**	7707RGBTxx-A2KM-USB-F2	0dBm	7707RGBRyy-A2KM-USB-F2	-19dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDMux/Demux**
Single-Mode	1(DWDM)	21dB/80km***	7707RGBTDxxx-A2KM-USB-F2	+7dBm	7707RGBRDyyy-A2KM-USB-F2	-19dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDMx/Demux**

\* With >20dB return loss on fiber interface

\*\* Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB

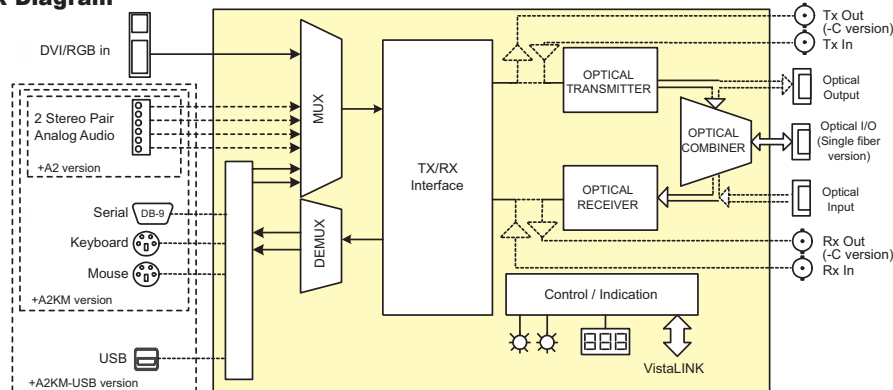
\*\*\* Assumes 8 Ch DWDM Mux/Demux loss of 5dB

Tx Power/Rx Sensitivity are nominal values  $\pm 1$ dBm

Fiber loss= 0.35/0.25dB per km @1310nm/1550nm

Note: Same TX power & Rx sensitivity applies for -C versions with Fiber I/O

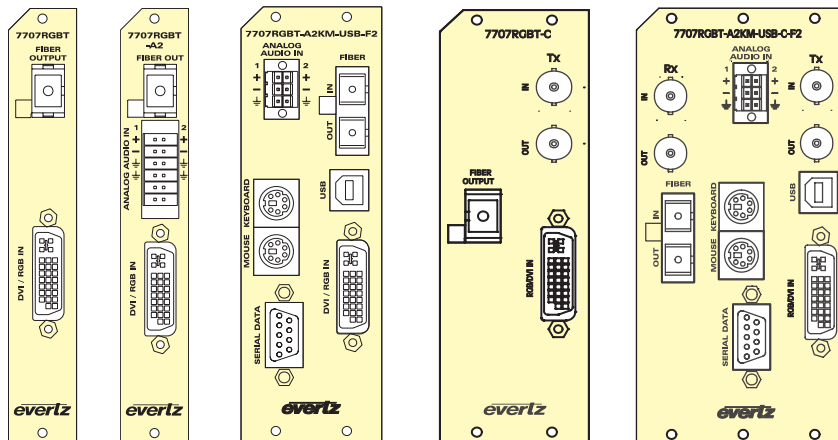
## 7707RGBT Block Diagram





# RGBHV/DVI/KVM Fiber Transmitter

## 7707RGBT



### Specifications

<b>Video Input:</b>	
<b>Standards:</b>	DVI 1.0, VESA
<b>Number of Inputs:</b>	1
<b>Connectors:</b>	28-pin DVI with Analog
<b>Video Resolution:</b>	Up to WUXGA (1920x1200) at 75Hz
<b>Video Bandwidth:</b>	500MHz
<b>Color Resolution:</b>	24 bits
<b>Analog Output Level:</b>	1 Vp-p (maximum)
<b>Analog Output Impedance:</b>	75Ω
<b>Signal/Noise Ratio:</b>	> 55 dB

### Analog Audio Input (A2, A2KM & A2KM-USB versions):

<b>Number of Inputs:</b>	2
<b>Type:</b>	Balanced analog audio
<b>Connector:</b>	12 pin removable terminal block
<b>Impedance:</b>	High Impedance (> 20kΩ)
<b>Frequency Response:</b>	±0.1dB (20Hz to 20kHz)
<b>THD:</b>	< 0.005% (20Hz to 20kHz)
<b>Channel Phase Diff:</b>	< ±1°
<b>SNR:</b>	> 85dB
<b>Maximum Input Level:</b>	+24dBu
<b>Signal Quantization:</b>	24 bits

### Serial, Keyboard/Mouse, USB Input/Output (A2KM & A2KM-USB versions):

<b>Standards:</b>	USB 1.1
<b>Number:</b>	3 (A2KM versions), 4 (USB versions)
<b>Connector:</b>	2 PS2 for keyboard & mouse 1 USB Type B, 1DB-9F serial

### Coaxial Output (-C, -C2 & -GC versions):

<b>Number of Outputs:</b>	1 or 2
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2

### Optical Output:

<b>Number of Outputs:</b>	1
<b>Connector:</b>	Female SC/PC, ST/PC or FC/PC
<b>Wavelengths:</b>	See Ordering Information
<b>Output Power:</b>	See Application Configuration Chart

### Coaxial Input (-C & -C2 versions):

<b>Number of Inputs:</b>	1 or 2
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2

### Optical Inputs:

<b>Number of Inputs:</b>	1
<b>Connector:</b>	Female SC/PC, ST/PC, FC/PC
<b>Wavelength:</b>	1270 to 1610nm
<b>Maximum Power:</b>	0dBm
<b>Optical Sensitivity:</b>	See Application Configuration Chart

### Electrical:

<b>Voltage:</b>	+12 VDC
<b>Power:</b>	11 Watts (Non-DWDM), 14 Watts (DWDM)

### Physical:

<b>Number of Slots:</b>	1 (Standard and A2 versions) 2 (RGBT-C, A2KM, and A2KM-USB versions) 3 (A2KM-C, and A2KM-USB-C versions)
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### Compliance:

<b>Electrical Safety:</b>	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive Class 1 laser product Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
<b>Laser Safety:</b>	Complies with FCC Part 15, Class A EU EMC directive
<b>EMI/RFI:</b>	

### Ordering Information:

<b>7707RGBT13</b>	RGBHV/DVI Fiber Transmitter, 1310nm FP
<b>7707RGBT-C</b>	RGBHV/DVI Coaxial Transmitter
<b>7707RGBT13-C</b>	RGBHV/DVI Coax Transmitter + E to O converter, 1310nm FP
<b>7707RGBT-GC</b>	RGBHV/DVI G-Link Coaxial Transmitter
<b>7707RGBT-GF</b>	RGBHV/DVI G-Link Fiber Transmitter, 1310nm FP Laser
<b>7707RGBT13-A2</b>	RGBHV/DVI + 2 Analog Audio Fiber Transmitter, 1310nm FP Laser
<b>7707RGBT13-A2-C</b>	RGBHV/DVI + 2 Analog Audio Coax Transmitter + E to O converter, 1310nm FP Laser
<b>7707RGBT-A2-C</b>	RGBHV/DVI + 2 Analog Audio, Coaxial Transmitter
<b>7707RGBT-A2-GC</b>	RGBHV/DVI + 2 Analog Audio, G-Link Coaxial Transmitter
<b>7707RGBT-A2-GF</b>	RGBHV/DVI + 2 Analog Audio, G-Link Fiber Transmitter, 1310nm FP Laser
<b>7707RGBT13-A2KM-F2</b>	RGBHV/DVI + 2 Analog Audio + Bi-di Keyboard and Mouse Fiber Transmitter, dual fiber, 1310nm TX & RX
<b>7707RGBT-A2KM-C2</b>	RGBHV/DVI + 2 Analog Audio + Bi-di Keyboard and Mouse Coaxial Transmitter, dual coax, TX & RX
<b>7707RGBT13-A2KM-USB-C-F2</b>	RGBHV/DVI + 2 Analog Audio + Bi-di Keyboard and Mouse + USB Coaxial Transmitter + E to O converter, dual fiber/coax, 1310nm TX & RX
<b>7707RGBT13-A2KM-USB-F2</b>	RGBHV/DVI + 2 Analog Audio + Bi-di Keyboard and Mouse + USB Fiber Transmitter, dual fiber, 1310nm TX & RX
<b>7707RGBT-A2KM-USB-C2</b>	RGBHV/DVI + 2 Analog Audio + Bi-di Keyboard and Mouse + USB Coaxial Transmitter, dual coax, TX & RX
<b>7707RGBT13-A2KM-USB-C-F2</b>	RGBHV/DVI + 2 Analog Audio + Bi-di Keyboard and Mouse + USB Coaxial Transmitter + E to O/O to E converter, dual fiber/coax, 1310nm TX & RX
<b>7707RGBT15-A2KM-W</b>	RGBHV/DVI + 2 Analog Audio + Bi-di Keyboard and Mouse Fiber Transmitter, single fiber, TX on 1550nm, RX on 1310nm
<b>7707RGBT15-A2KM-USB-W</b>	RGBHV/DVI/KVM + 2 Analog Audio + Bi-di Keyboard and Mouse + USB Fiber Transmitter, single fiber, TX on 1550nm, RX on 1310nm

### For CWDM, please refer to the end of the fiber section for ordering information

<b>7707RGBTxx</b>	RGBHV/DVI Fiber Transmitter, CWDM Laser
<b>7707RGBTxx-A2</b>	RGBHV/DVI + 2 Analog Audio Fiber Transmitter, CWDM Laser
<b>7707RGBTxx-A2KM-F2</b>	RGBHV/DVI + 2 Analog Audio + Bi-di Keyboard and Mouse Fiber Transmitter, dual fiber, CWDM Laser
<b>7707RGBTxx-A2KM-USB-F2</b>	RGBHV/DVI/KVM + 2 Analog Audio + Bi-di Keyboard Mouse + USB Fiber Transmitter, dual fiber, CWDM Laser

### For DWDM, please refer to the end of the fiber section for ordering information

<b>7707RGBTDxxx</b>	RGBHV/DVI Fiber Transmitter, DWDM Laser
<b>7707RGBTDxxx-A2</b>	RGBHV/DVI + 2 Analog Audio Fiber Transmitter, DWDM Laser
<b>7707RGBTDxxx-A2KM-F2</b>	RGBHV/DVI + 2 Analog Audio + Bi-di Keyboard and Mouse Fiber Transmitter, dual fiber, DWDM Laser
<b>7707RGBTDxxx-A2KM-USB-F2</b>	RGBHV/DVI + 2 Analog Audio + Bi-di Keyboard Mouse+ USB Fiber Transmitter, dual fiber, DWDM Laser

### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

### Rear Plate Suffix:

<b>+3RU:</b>	3RU rear plate for use with 7700FR-C Multiframe
<b>+1RU:</b>	1RU rear plate for use with 7701FR Multiframe
<b>+SA:</b>	Standalone Enclosure Rear Plate

### Connector Suffix:

<b>+SC:</b>	SC/PC
<b>+ST:</b>	ST/PC
<b>+FC:</b>	FC/PC

### Enclosures:

<b>7700FR-C:</b>	3RU Multiframe which holds 15 modules
<b>7701FR:</b>	1RU Multiframe which holds 3 modules
<b>S7701FR:</b>	Standalone enclosure

## 7707RGRB



The 7707RGRB is a VistaLINK® SNMP - capable RGBHV/DVI/KVM receiver for high resolution/high quality video signals. Available in fiber optic and coaxial versions, this single card module accepts an input from the companion 7707RGRB RGBHV/DVI/KVM Transmitter and outputs both analog RGBHV and digital DVI video. The 7707RGRB is also available with analog audio, keyboard + mouse, serial and USB options.

The 7707RGRB occupies one card slot (two card slots for the A2KM and A2KM-USB versions) and can be housed in a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

### Features

- Supports DVI or RGBHV transport over a single fiber or coax (-C version)
- Provides both RGBHV and DVI outputs simultaneously
- VESA video resolutions supported up to WUXGA
- Full 24 bits per pixel color resolution
- Ideal for use with high resolution LCD, plasma, and projection screens
- Superior digital data transmission
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Fully hot-swappable from front of frame with no fiber disconnect/re-connect required
- Supports single-mode and multi-mode fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range
- Optional 2 channel stereo analog audio
- Optional keyboard, mouse and serial
- Optional USB interface
- Optional G-Link support for use with Evertz VIP™ & MVP™ Multi-display products
- Optional coax I/O for Tx & Rx

### 7707RGRB Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<500m	7707RGRB13-A2KM-USB-F2	-7dBm	7707RGRB13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	2	12dB/34km	7707RGRB13-A2KM-USB-F2	-7dBm	7707RGRB13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	1	8dB/20km*	7707RGRB15-A2KM-W	-1dBm	7707RGRB13M-A2KM-W	-17dBm	1310nm/1550nm WDM bi-directional, one fiber
Single-Mode	1(CWDM)	15.5dB/60km**	7707RGRBxx-A2KM-USB-F2	0dBm	7707RGRByy-A2KM-USB-F2	-19dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	21dB/80km***	7707RGRBDyyy-A2KM-USB-F2	+7dBm	7707RGRBDyyy-A2KM-USB-F2	-19dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux**

\* With >20dB return loss on fiber interface

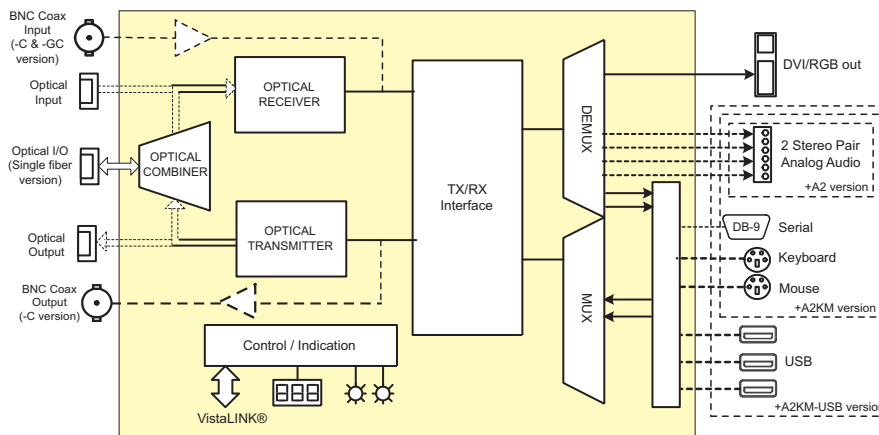
\*\* Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB

\*\*\* Assumes 8 Ch DWDM Mux/Demux loss of 5dB

Tx Power/Rx Sensitivity are nominal values  $\pm 1$ dBm

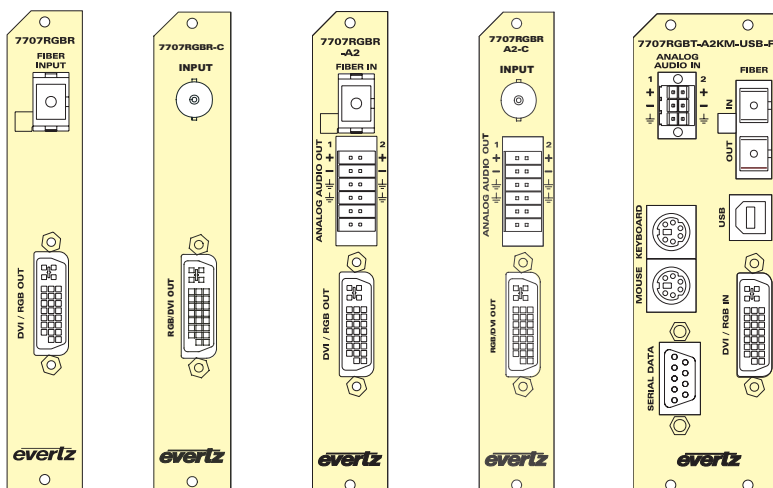
Fiber loss= 0.35/0.25dB per km @1310nm/1550nm

### 7707RGRB Block Diagram





## 7707RGR Rear Panels



### Specifications

#### Video Output:

Standards:	DVI 1.0, VESA
Number of Outputs:	1
Connectors:	28-pin DVI with Analog
Video Resolution:	Up to WUXGA (1920x1200) at 75Hz
Video Bandwidth:	500MHz
Color Resolution:	24 bits
Analog Output Level:	1.4 Vp-p (maximum)
Analog Output Impedance:	75Ω
Signal/Noise Ratio:	> 55 dB

#### Analog Audio Output (A2, A2KM & A2KM-USB-F2 versions):

Number of Outputs:	2
Type:	Balanced analog audio
Connector:	12 pin removable terminal block
Impedance:	High Impedance (> 20kΩ)
Frequency Response:	±0.1dB (20Hz to 20kHz)
THD:	< 0.005% (20Hz to 20kHz)
Channel Phase Diff:	< ±1°
SNR:	> 85dB
Level:	-20dB to +3dB
Maximum Output Level:	+24dBu into 10kΩ loads

#### Serial, Keyboard/Mouse, USB Input/Output (A2KM & A2KM-USB versions):

Standards:	USB 1.1
Number:	3 (A2KM versions), 6 (USB versions)
Connector:	2 PS2 for keyboard & mouse 3 USB Type A, 1 DB-9F serial

#### Optical Input:

Number of Inputs:	1
Connector:	Female SC/PC, ST/PC or FC/PC
Operating Wavelength:	1270nm - 1610nm
Max Input Power:	0dBm
Optical Sensitivity:	See Application Configuration chart

#### Coaxial Input (-C, -C2, and -GC versions):

Number of Inputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2

#### Optical Output (A2KM & A2KM-USB-F2 versions):

Number of Outputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Wavelengths:	See Ordering Information
Power:	See Application Configuration Chart

#### Coaxial Output (-C2 versions):

Number of Outputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2

#### Electrical:

Voltage:	+12 VDC
Power:	11 Watts (Non-DWDM), 14 Watts (DWDM)

#### Physical:

Number of Slots:	1 (Standard versions) 2 (A2KM versions)
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### Compliance:

#### Electrical Safety:

CSA Listed to UL 60065-03, IEC 60065  
Complies with CE Low voltage Directive  
Class 1 laser product

#### Laser Safety:

Complies with 24 CFR 1040.10 and 1040.11  
IEC 60825-1

#### EMI/RFI:

Complies with FCC Part 15, Class A  
EU EMC directive

### Ordering Information:

<b>7707RGR</b>	RGBHV/DVI Fiber Receiver
<b>7707RGR-C</b>	RGBHV/DVI Coaxial Receiver
<b>7707RGR-GC</b>	RGBHV/DVI G-Link Coaxial Receiver
<b>7707RGR-GF</b>	RGBHV/DVI G-Link Fiber Receiver
<b>7707RGR-A2</b>	RGBHV/DVI +2 Analog Audio Fiber Receiver
<b>7707RGR-A2-GC</b>	RGBHV/DVI +2 Analog Audio, G-Link Coaxial Receiver
<b>7707RGR-A2-GF</b>	RGBHV/DVI +2 Analog Audio, G-Link Fiber Receiver
<b>7707RGR13-A2KM-F2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Fiber Receiver, dual fiber, 1310nm TX & RX
<b>7707RGR-A2KM-C2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Coaxial Receiver, dual coax, TX & RX
<b>7707RGR13-A2KM-USB-F2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse + USB, Fiber Receiver, dual fiber, 1310nm TX & RX
<b>7707RGR-A2KM-USB-C2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse + USB Coaxial Receiver, dual coax, TX & RX
<b>7707RGR13M-A2KM-W</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Fiber Receiver, single fiber, 1310nm TX, RX on 1550nm
<b>7707RGR13M-A2KM-USB-W</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse + USB Fiber Receiver, single fiber, 1310nm TX, RX on 1550nm

#### For CWDM, please refer to the end of the fiber section for ordering information

<b>7707RGR-yy-A2KM-F2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Fiber Receiver, dual fiber, CWDM Laser
<b>7707RGR-yy-A2KM-USB-F2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse + USB Fiber Receiver, dual fiber, CWDM Laser

#### For DWDM, please refer to the end of the fiber section for ordering information

<b>7707RGR-Dyyy-A2KM-F2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Fiber Receiver, dual fiber, DWDM Laser
<b>7707RGR-Dyyy-A2KM-USB-F2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse and USB Fiber Receiver, dual fiber, DWDM Laser

### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix:

<b>+3RU:</b>	3RU rear plate for use with 7700FR-C Multiframe
<b>+1RU:</b>	1RU rear plate for use with 7701FR Multiframe
<b>+SA:</b>	Standalone Enclosure Rear Plate

#### Connector Suffix:

<b>+SC:</b>	SC/PC
<b>+ST:</b>	ST/PC
<b>+FC:</b>	FC/PC

### Enclosures:

<b>7700FR-C:</b>	3RU Multiframe which holds 15 modules
<b>7701FR:</b>	1RU Multiframe which holds 3 modules
<b>S7701FR:</b>	Standalone enclosure



The 7707DVIT is a VistaLINK® SNMP - capable DVI/KVM transmitter for high resolution/high quality video signals. Available in fiber optic and coaxial versions, this single card module accepts one DVI video input up to WUXGA resolution and transmits it over a single fiber for coax cable. The 7707DVIT is also available with analog audio, keyboard + mouse, serial and USB options. The companion 7707DVIR DVI/KVM Fiber Receiver demultiplexes the signals and converts them back to digital DVI. The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm, CWDM and DWDM transmission schemes.

The 7707DVIT occupies one card slot (two card slots for the A2KM and A2KM-USB versions) and can be housed in a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

## Features

- Supports DVI transport over a single fiber or coax (-C versions)
- VESA video resolutions supported up to WUXGA
- Full 24 bits per pixel color resolution
- Ideal for use with high resolution LCD, plasma, and projection screens
- Superior digital data transmission
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Fully hot-swappable from front of frame with no fiber or coax disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths at 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Optional 2 channel stereo analog audio
- Optional keyboard, mouse and serial
- Optional USB interface
- Optional G-LINK support for use with Evertz VIP™ & MVP™ Multi-display products
- Optional coax I/O for Tx & Rx

## 7707DVIT Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<500m	7707DVIT13-A2KM-USB-F2	-7dBm	7707DVIR13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	2	12dB/34km	7707DVIT13-A2KM-USB-F2	-7dBm	7707DVIR13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	1	8dB/20km*	7707DVIT15-A2KM-USB-W	-1dBm	7707DVIR13-A2KM-USB-W	-17dBm	1310nm/1550nm WDM bi-directional, one fiber
Single-Mode	1(CWDM)	15.5dB/60km**	7707DVITxx-A2KM-USB-F2	0dBm	7707DVIRyy-A2KM-USB-F2	-19dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	21dB/80km***	7707DVITDxxx-A2KM-USB-F2	+7dBm	7707DVIRDyyy-A2KM-USB-F2	-19dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux**

\* With >20dB return loss on fiber interface

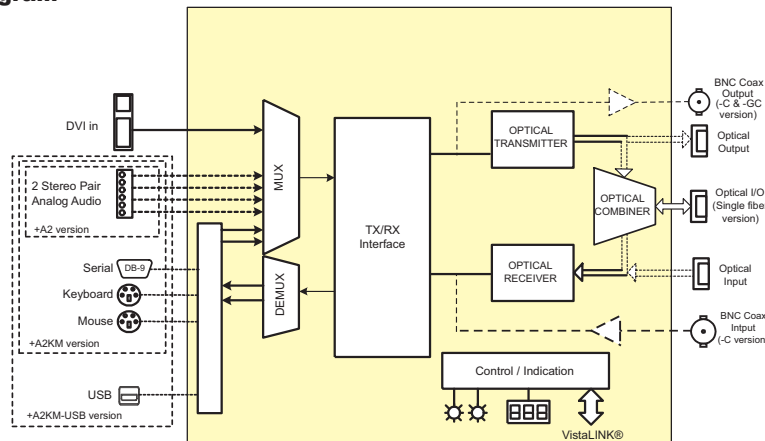
\*\* Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB

\*\*\*Assumes 8 Ch DWDM Mux/Demux loss of 5dB

Tx Power/Rx Sensitivity are nominal values  $\pm 1$ dBm

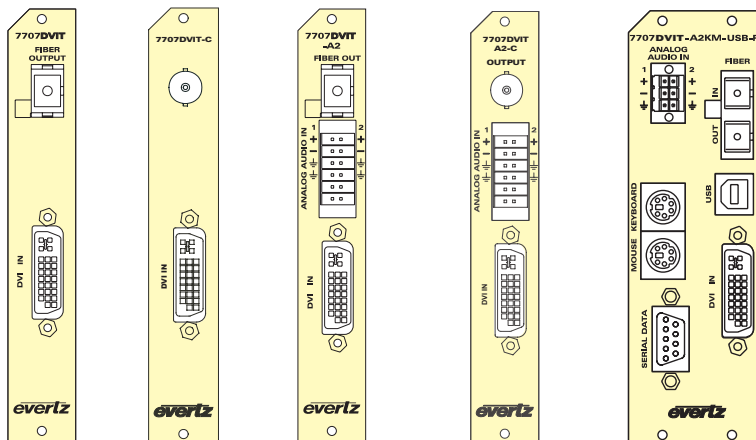
Fiber loss= 0.35/0.25dB per km @1310nm/1550nm

## 7707DVIT Block Diagram





### 7707DVIT Rear Panels



#### Specifications

##### Video Input:

Standards:	DVI 1.0
Number of Inputs:	1
Connectors:	28-pin DVI
Video Resolution:	Up to WUXGA (1920x1200) at 75Hz
Color Resolution:	24 bits

##### Analog Audio Input (A2, A2KM & A2KM-USB versions):

Number of Inputs:	2
Type:	Balanced analog audio
Connector:	Removable terminal block
Impedance:	High Impedance (> 20kΩ)
Frequency Response:	±0.1dB (20Hz to 20kHz)
THD:	< 0.005% (20Hz to 20kHz)
Channel Phase Diff:	< ±1°
SNR:	> 85dB
Maximum Input Level:	+24dBu
Signal Quantization:	24 bits

##### Serial USB, Keyboard/Mouse Input/Output (A2KM & A2KM-USB versions):

Standards:	USB 1.1
Number:	3 (A2KM), 4 (A2KM-USB)
Connector:	DB-9F serial, 1 PS2 for each keyboard & mouse, 1 USB type B (A2KM-USB only)

##### Coaxial Output (-C, -C2 & -GC versions):

Number of Outputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2

##### Optical Output:

Number of Outputs:	1
Connector:	Female SC/PC, ST/PC or FC/PC
Wavelengths:	See Ordering Information
Output Power:	See Application Configuration Chart

##### Coaxial Input (-C2 versions):

Number of Inputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2

##### Optical Input (A2KM & A2KM-USB-F2 versions):

Number of Inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Wavelength:	1270 to 1610nm
Maximum Power:	0dBm
Optical Sensitivity:	See Application Configuration Chart

##### Electrical:

Voltage:	+12 VDC
Power:	11 Watts (Non-DWDM), 14 Watts (DWDM)

##### Physical:

Number of Slots:	1 (Standard and A2 versions) 2 (A2KM and A2KM-USB versions)
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##### Compliance:

Electrical Safety:	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive Class 1 laser product Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
Laser Safety:	Complies with FCC Part 15, Class A EU EMC directive
EMI/RFI:	

#### Ordering Information:

7707DVIT13	DVI Fiber Transmitter, 1310nm FP
7707DVIT-C	DVI Coaxial Transmitter
7707DVIT-GC	DVI G-Link Coaxial Transmitter
7707DVIT-GF	DVI G-Link Fiber Transmitter, 1310nm FP Laser
7707DVIT13-A2	DVI + 2 Analog Audio Fiber Transmitter, 1310nm FP Laser
7707DVIT-A2-C	DVI + 2 Analog Audio, Coaxial Transmitter
7707DVIT-A2-GC	DVI + 2 Analog Audio, G-Link Coaxial Transmitter
7707DVIT-A2-GF	DVI + 2 Analog Audio, G-Link Fiber Transmitter, 1310nm FP Laser
7707DVIT13-A2KM-F2	DVI + 2 Analog Audio + Bi-di Keyboard and Mouse Fiber Transmitter, dual fiber, 1310nm TX & RX
7707DVIT-A2KM-C2	DVI + 2 Analog Audio + Bi-di Keyboard and Mouse Coaxial Transmitter, dual coax, TX & RX
7707DVIT13-A2KM-USB-F2	DVI + 2 Analog Audio + Bi-di Keyboard and Mouse + USB Fiber Transmitter, dual fiber, 1310nm TX & RX
7707DVIT-A2KM-USB-C2	DVI + 2 Analog Audio + Bi-di Keyboard and Mouse + USB Coaxial Transmitter, dual coax, TX & RX
7707DVIT15-A2KM-W	DVI + 2 Analog Audio + Bi-di Keyboard and Mouse Fiber Transmitter, single fiber, TX on 1550nm, RX on 1310nm
7707DVIT15-A2KM-USB-W	DVI/KVM + 2 Analog Audio + Bi-di Keyboard and Mouse + USB Fiber Transmitter, single fiber, TX on 1550nm, RX on 1310nm

#### For CWDM, please refer to the end of the fiber section for ordering information

7707DVITxx	DVI Fiber Transmitter, CWDM Laser
7707DVITxx-A2	DVI + 2 Analog Audio Fiber Transmitter, CWDM Laser
7707DVITxx-A2KM-F2	DVI + 2 Analog Audio + Bi-di Keyboard and Mouse Fiber Transmitter, dual fiber, CWDM Laser
7707DVITxx-A2KM-USB-F2	DVI/KVM + 2 Analog Audio + Bi-di Keyboard and Mouse + USB Fiber Transmitter, dual fiber, CWDM Laser

#### For DWDM, please refer to the end of the fiber section for ordering information

7707DVITDxxx	DVI Fiber Transmitter, DWDM Laser
7707DVITDxxx-A2	DVI + 2 Analog Audio Fiber Transmitter, DWDM Laser
7707DVITDxxx-A2KM-F2	DVI + 2 Analog Audio + Bi-di Keyboard and Mouse Fiber Transmitter, dual fiber, DWDM Laser
7707DVITDxxx-A2KM-USB-F2	DVI + 2 Analog Audio + Bi-di Keyboard and Mouse + USB Fiber Transmitter, dual fiber, DWDM Laser

#### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix:

+3RU:	3RU rear plate for use with 7700FR-C Multiframe
+1RU:	1RU rear plate for use with 7701FR Multiframe
+SA:	Standalone Enclosure Rear Plate

#### Connector Suffix:

+SC:	SC/PC
+ST:	ST/PC
+FC:	FC/PC

#### Enclosures:

7700FR-C:	3RU Multiframe which holds 15 modules
7701FR:	1RU Multiframe which holds 3 modules
S7701FR:	Standalone enclosure



The 7707DVIR is a VistaLINK® SNMP - capable DVI/KVM receiver for high resolution/high quality video signals. Available in fiber optic and coaxial versions, this single card module accepts an input from the companion 7707DVIT DVI/KVM Transmitter and outputs digital DVI video. The 7707DVIR is also available with analog audio, keyboard + mouse, serial and USB options.

The 7707DVIR occupies one card slot (two card slots for the A2KM and A2KM-USB versions) and can be housed in a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

## Features

- Supports DVI transport over a single fiber or coax (-C version)
- VESA video resolutions supported up to WUXGA
- Full 24 bits per pixel color resolution
- Ideal for use with high resolution LCD, plasma, and projection screens
- Superior digital data transmission
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Fully hot-swappable from front of frame with no fiber disconnect/re-connect required
- Supports single-mode and multi-mode fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range
- Optional 2 channel stereo analog audio
- Optional keyboard, mouse and serial
- Optional USB interface
- Optional G-LINK support for use with Evertz VIP™ & MVP™ Multi-display products
- Optional coax I/O for Tx & Rx

## 7707DVIR Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<500m	7707DVIT13-A2KM-USB-F2	-7dBm	7707DVIR13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	2	12dB/34km	7707DVIT13-A2KM-USB-F2	-7dBm	7707DVIR13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	1	8dB/20km*	7707DVIT15-A2KM-USB-W	-1dBm	7707DVIR13-A2KM-USB-W	-17dBm	1310nm/1550nm WDM bi-directional, one fiber
Single-Mode	1(CWDM)	15.5dB/60km**	7707DVITxx-A2KM-USB-F2	0dBm	7707DVIRyy-A2KM-USB-F2	-19dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	21dB/80km***	7707DVITDxxx-A2KM-USB-F2	+7dBm	7707DVIRDyyy-A2KM-USB-F2	-19dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux**

\* With >20dB return loss on fiber interface

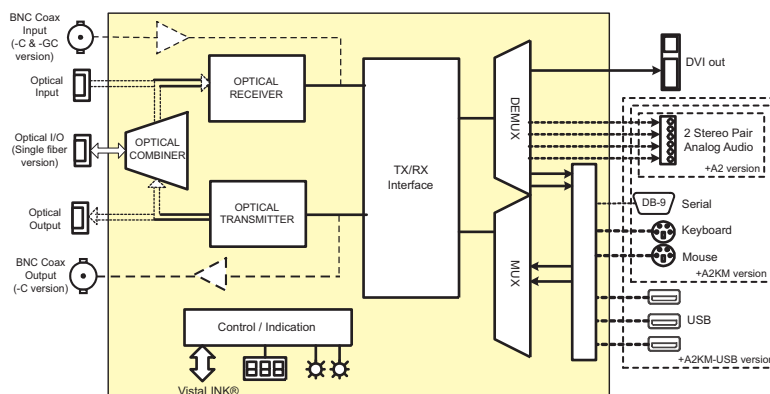
\*\* Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB

\*\*\* Assumes 8 Ch DWDM Mux/Demux loss of 5dB

Tx Power/Rx Sensitivity are nominal values  $\pm 1$ dBm

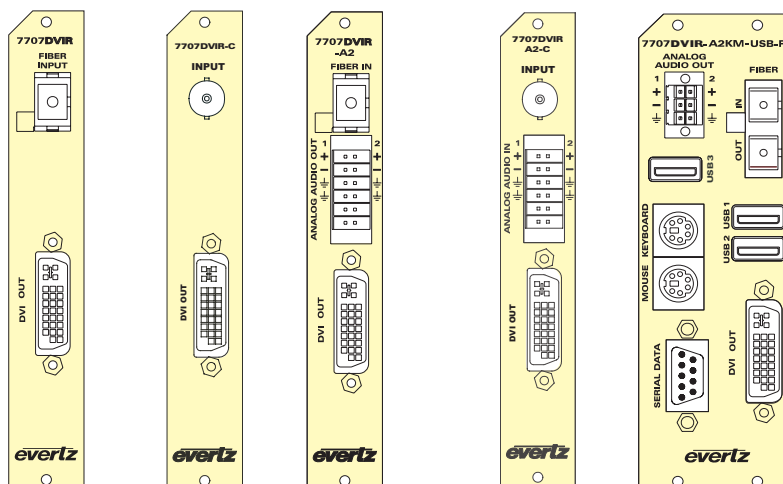
Fiber loss = 0.35/0.25dB per km @1310nm/1550nm

## 7707DVIR Block Diagram





### 7707DVIR Rear Panels



#### Specifications

##### Video Output:

Standards:	DVI 1.0
Number of Outputs:	1
Connectors:	28-pin DVI
Video Resolution:	Up to WUXGA (1920x1200) at 75Hz
Color Resolution:	24 bits

##### Analog Audio Output (A2, A2KM & A2KM-USB versions):

Number of Outputs:	2
Type:	Balanced analog audio
Connector:	Removable terminal block
Impedance:	High Impedance (> 20kΩ)
Frequency Response:	±0.1dB (20Hz to 20kHz)
THD:	< 0.005% (20Hz to 20kHz)
Channel Phase Diff:	< ±1°
SNR:	> 85dB
Level:	-20dB to +3dB
Maximum Output Level:	+24dBu into 10kΩ loads

##### Serial, USB, Keyboard/Mouse Input/Output (A2KM & A2KM-USB versions):

Standards:	USB 1.1
Number:	3 (A2KM), 6 (A2KM-USB)
Connector:	1 DB-9M serial, 1 PS2 for each keyboard & mouse 3 USB type A (A2KM-USB only)

##### Coaxial Input (-C, -C2, and -GC versions):

Number of Inputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2

##### Optical Input:

Number of Outputs:	1
Connector:	Female SC/PC, ST/PC or FC/PC
Operating Wavelength:	1270nm - 1610nm
Max Input Power:	0dBm
Optical Sensitivity:	See Application Configuration chart

##### Coaxial Output (-C2 versions):

Number of Outputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2

##### Optical Output (A2KM & A2KM-USB-F2 versions):

Number of Inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Wavelengths:	See Ordering Information
Power:	See Application Configuration Chart

##### Electrical:

Voltage:	+12 VDC
Power:	11 Watts (Non-DWDM), 14 Watts (DWDM)

##### Physical:

Number of Slots:	1 (Standard and A2 versions) 2 (A2KM and A2KM-USB versions)
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#### Compliance:

##### Electrical Safety:

CSA Listed to UL 60065-03, IEC 60065  
Complies with CE Low voltage Directive  
Class 1 laser product  
Complies with 24 CFR 1040.10 and 1040.11  
IEC 60825-1  
Complies with FCC Part 15, Class A  
EU EMC directive

##### Laser Safety:

##### EMI/RFI:

#### Ordering Information:

<b>7707DVIR</b>	DVI Fiber Receiver
<b>7707DVIR-C</b>	DVI Receiver, coaxial connector
<b>7707DVIR-GC</b>	DVI G-Link Receiver, coaxial connector
<b>7707DVIR-GF</b>	DVI G-Link Fiber Receiver
<b>7707DVIR-A2</b>	DVI + 2 Analog Audio Fiber Receiver
<b>7707DVIR-A2-C</b>	DVI + 2 Analog Audio, Receiver, coaxial connector
<b>7707DVIR-A2-GC</b>	DVI + 2 Analog Audio, G-Link Receiver, coaxial connector
<b>7707DVIR-A2-GF</b>	DVI + 2 Analog Audio, G-Link Fiber Receiver
<b>7707DVIR13-A2KM-F2</b>	DVI/KVM + 2 Analog Audio + Bi-di Keyboard and Mouse Fiber Receiver, dual fiber, 1310nm TX & RX
<b>7707DVIR13-A2KM-C2</b>	DVI/KVM + 2 Analog Audio + Bi-di Keyboard and Mouse Coaxial Receiver, dual coax, TX & RX
<b>7707DVIR13-A2KM-USB-F2</b>	DVI/KVM + 2 Analog Audio + Bi-di Keyboard and Mouse + USB Fiber Receiver, dual fiber, 1310nm TX & RX
<b>7707DVIR13-A2KM-USB-C2</b>	DVI/KVM + 2 Analog Audio + Bi-di Keyboard and Mouse + USB Coaxial Receiver, dual coax, TX & RX
<b>7707DVIR13-A2KM-W</b>	DVI/KVM + 2 Analog Audio + Bi-di Keyboard and Mouse Fiber Receiver, single fiber, 1310nm TX, RX on 1550nm
<b>7707DVIR13-A2KM-USB-W</b>	DVI/KVM + 2 Analog Audio + Bi-di Keyboard, Mouse and USB Fiber Receiver, single fiber, 1310nm TX, RX on 1550nm

#### For CWDM, please refer to the end of the fiber section for ordering information

<b>7707DVIRyy-A2KM-F2</b>	DVI/KVM + 2 Analog Audio + Bi-di Keyboard and Mouse Fiber Receiver, dual fiber, CWDM Laser
<b>7707DVIRyy-A2KM-USB-F2</b>	DVI/KVM + 2 Analog Audio + Bi-di Keyboard, Mouse and USB Fiber Receiver, dual fiber, CWDM Laser

#### For DWDM, please refer to the end of the fiber section for ordering information

<b>7707DVIRDyyy-A2KM-F2</b>	DVI/KVM + 2 Analog Audio + Bi-di Keyboard and Mouse Fiber Receiver, dual fiber, DWDM Laser
<b>7707DVIRDyyy-A2KM-USB-F2</b>	DVI/KVM + 2 Analog Audio + Bi-di Keyboard, Mouse and USB Fiber Receiver, dual fiber, DWDM Laser

#### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

##### Rear Plate Suffix:

<b>+3RU:</b>	3RU rear plate for use with 7700FR-C Multiframe
<b>+1RU:</b>	1RU rear plate for use with 7701FR Multiframe
<b>+SA:</b>	Standalone Enclosure Rear Plate

##### Connector Suffix:

<b>+SC:</b>	SC/PC
<b>+ST:</b>	ST/PC
<b>+FC:</b>	FC/PC

### Features

- Triple SDI electrical to optical converter for 3 independent channels
- Provides 45 independent channels of optical conversion, in a single 3RU frame
- Supports all SMPTE259M standards with operation from 143Mb/s-360Mb/s
- Supports additional standards of SMPTE305M (SDTi), SMPTE310M (19.4Mb/s), SMPTE344M (540Mb/s), M2S and DVB-ASI (270Mb/s)
- Supports multi-mode or single-mode fiber
- Fully hot swappable from front of frame, with no fiber or BNC disconnect/reconnect required
- Occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules or a 3RU frame which will hold up to 15 modules or a standalone frame which will hold 1 module
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.

- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

### Inputs:

- Three independent serial digital BNC inputs, each providing cable equalization to >300m @270Mb/s (Belden 8281)

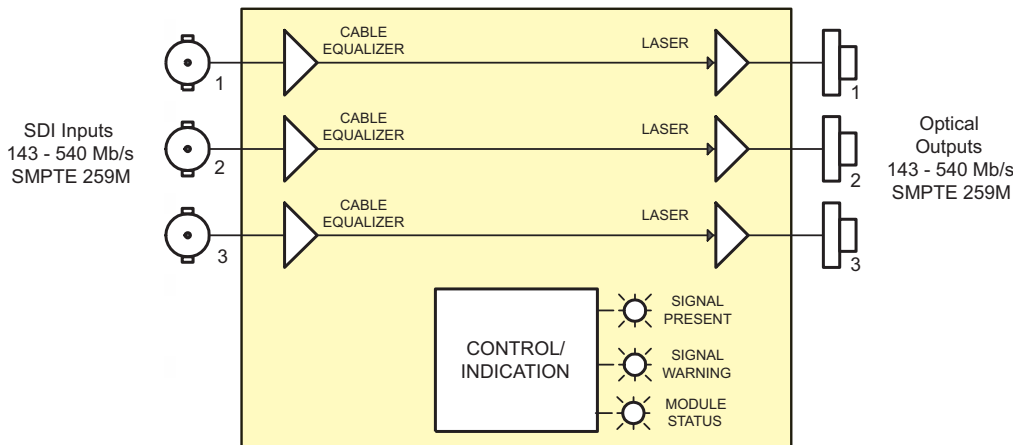
### Outputs:

- Three independent fiber outputs
- Optical output wavelength of 1310nm
- SC/PC, ST/PC, FC/PC connector options

### Status LEDs:

- Signal presence indication for each channel
- Laser status indication for each channel
- Module status indication

### 7705EO-3 Block Diagram & Rear Panel



### Specifications

#### Standards:

SMPTE 259M A, B, C, D, SMPTE 297M,  
SMPTE 305M, SMPTE 310M,  
SMPTE344M, M2S, DVB-ASI

#### Serial Video Input:

**Number of Inputs:** 3 (independent channels)  
**Connector:** 3 BNC inputs per IEC 169-8  
**Equalization:** Automatic to 300m @270Mb/s, with Belden 8281 (or equivalent)  
**Return Loss:** >15dB up to 540Mb/s

#### Optical Outputs:

**Number of Outputs:** 3 (independent channels)  
**Connector:** SC/PC, ST/PC, FC/PC female housing  
**Return Loss:** >14dB  
**Rise/Fall Time:** 400-700ps  
**Jitter:** <0.2UI  
**Nominal Wavelength:** 1310nm  
**Optical Power:** -7dBm ±1dBm

#### Electrical:

**Voltage:** +12V DC  
**Power:** 6 Watts

#### Physical:

**Number of Slots:** 1

#### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
Complies with CE Low voltage Directive  
Class 1 laser product  
Complies with 24 CFR 1040.10 and 1040.11  
IEC 60825-1  
**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC directive

#### Ordering Information:

7705EO13-3

**Triple SDI Electrical to Optical Converter,  
19.4Mb/s or 143-540Mb/s, 1310nm, FP laser**

#### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg. Model +3RU +SC

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

#### Fiber Optic Patch Cable:

**CB-FP1M-SCPC** Single mode fiber cable, 1m, SC/PC male termination  
**CB-FP1M-STPC** Single mode fiber cable, 1m, ST/PC male termination  
**CB-FP5M-SCPC** Single mode fiber cable, 5m, SC/PC male termination  
**CB-FP5M-STPC** Single mode fiber cable, 5m, ST/PC male termination  
**CB-FP10M-SCPC** Single mode fiber cable, 10m, SC/PC male termination  
**CB-FP10M-STPC** Single mode fiber cable, 10m, ST/PC male termination

#### Enclosures:

**7700FR-C** 3RU Multiframe, which holds 15 modules  
**7701FR** 1RU Multiframe, which holds 3 modules  
**S7701FR** Standalone enclosure



### 7705OE-3

#### Features

- Triple SDI optical to electrical converter for 3 independent channels
- Provides 45 independent channels of optical conversion, in a single 3RU frame
- Supports all SMPTE259M standards with operation from 143Mb/s-360Mb/s
- Supports additional standards of SMPTE305M (SDTi), SMPTE310M (19.4Mb/s), SMPTE344M (540Mb/s), M2S and DVB-ASI (270Mb/s)
- Supports multi-mode or single-mode fiber
- Fully hot swappable from front of frame, with no fiber or BNC disconnect /reconnect required
- Occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules or a 3RU frame which will hold up to 15 modules or a standalone frame which will hold 1 module
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.

- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

#### Inputs:

- Three independent fiber inputs
- 1270nm to 1610nm input wavelength range
- Input sensitivity to -32dBm
- SC/PC, ST/PC, FC/PC connector options.

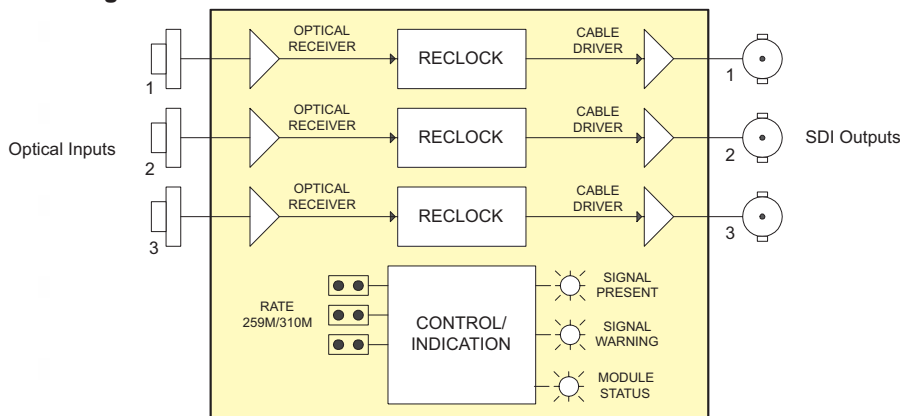
#### Outputs:

- Three independent, reclocked, serial digital BNC outputs.
- Wideband jitter < 0.2UI

#### Status LEDs:

- Signal presence indication for each channel
- Input carrier weak indication for each channel
- Module status indication

#### 7705OE-3 Block Diagram & Rear Panel



#### Specifications

##### Standards:

SMPTE 259M A, B, C, D, SMPTE 297M, SMPTE 305M, SMPTE 310M, SMPTE344M, M2S, DVB-ASI

##### Optical Inputs:

**Number of Inputs:** 3 (independent channels)  
**Connector:** SC/PC, ST/PC, FC/PC female housing  
**Operating Wavelength:** 1270nm to 1610nm  
**Maximum Input Power:** 0dBm  
**Optical Sensitivity:** -32dBm

##### Serial Video Outputs:

**Number of Outputs:** 3 reclocked (independent channels)  
 3 (1 per input channel) Reclocked  
**Connector:** 800mV nominal  
**Signal Level:** 0V±0.5V  
**DC Offset:** 900ps nominal  
**Rise/Fall Time:** < 10% of amplitude  
**Overshoot:** > 15dB up to 540Mb/s  
**Return Loss:** < 0.2UI  
**Jitter:** < 0.2UI

##### Electrical:

**Voltage:** +12V DC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

##### Physical:

**Number of Slots:** 1

#### Ordering Information:

##### 7705OE-3

Triple SDI Optical to Electrical Converter  
 19.4Mb/s or 143-540Mb/s

#### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
 Eg. Model +3RU +SC

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

#### Enclosures:

**7700FR-C** 3RU Multiframe, which holds 15 modules  
**7701FR** 1RU Multiframe, which holds 3 modules  
**S7701FR** Standalone enclosure

#### Fiber Optic Patch Cable:

**CB-FP1M-SCPC** Single mode fiber cable, 1m, SC/PC male termination  
**CB-FP1M-STPC** Single mode fiber cable, 1m, ST/PC male termination  
**CB-FP5M-SCPC** Single mode fiber cable, 5m, SC/PC male termination  
**CB-FP5M-STPC** Single mode fiber cable, 5m, ST/PC male termination  
**CB-FP10M-SCPC** Single mode fiber cable, 10m, SC/PC male termination  
**CB-FP10M-STPC** Single mode fiber cable, 10m, ST/PC male termination

#### Enclosures:

**7700FR-C** 3RU Multiframe, which holds 15 modules  
**7701FR** 1RU Multiframe, which holds 3 modules  
**S7701FR** Standalone enclosure

### Features

- Electrical to optical converter for all SMPTE 259M standards with operation from 143Mb/s - 360Mb/s
- Supports additional standards of SMPTE 305M (SDTi) SMPTE 310M (19.4Mb/s), SMPTE 344M(540Mb/s), M2S and DVB-ASI (270Mb/s)
- Compatible with multi-mode or single-mode fiber
- Fully hot swappable from front of frame with no fiber or BNC disconnect/reconnect required
- Occupies one card slot and can be housed in either a 1RU frame which will hold up to three modules, a 3RU frame which will hold up to 15 modules or a standalone frame which will hold 1 module
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.

- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

### Input:

- Automatic input cable equalization to >300m @270Mb/s (Belden 8281)

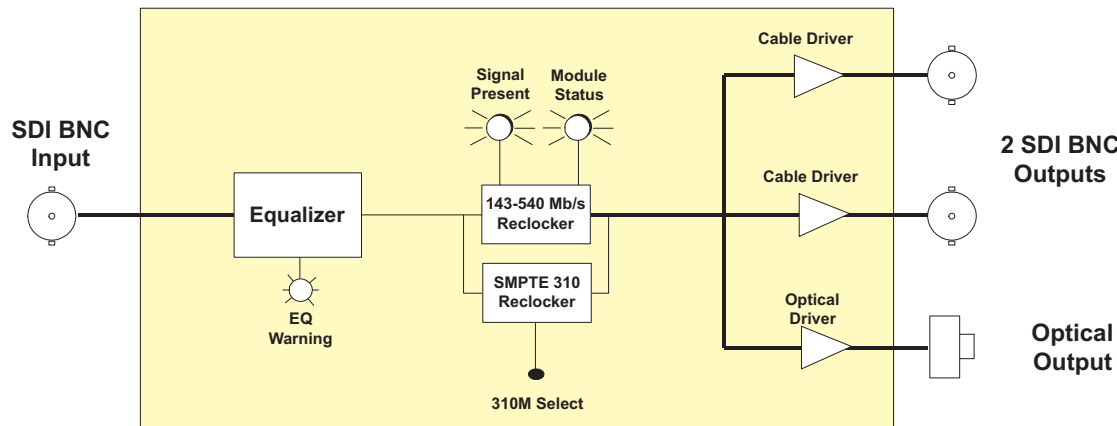
### Outputs:

- Two reclocked serial digital BNC outputs for loop-through or monitoring
- One reclocked fiber output available in 1310nm or 1550nm
- Wideband Jitter < 0.2 UI
- SC/PC, ST/PC, FC/PC connector options

### Status LEDs:

- Signal presence indication
- Maximum equalization warning indication
- Module status indication

### 7705EO Block Diagram & Rear Panel



### Specifications

#### Standards:

SMPTE 259M A, B, C, D, SMPTE 297M, SMPTE 305M, SMPTE 310M, SMPTE 344M, M2S, DVB-ASI

#### Serial Video Input:

##### Connector:

1 BNC per IEC 60169-8 Amendment 2

##### Equalization:

Automatic to 300m @ 270Mb/s with Belden 8281

(or equivalent)

Return Loss: >15dB up to 540Mb/s

#### Serial Video Outputs:

Number of Outputs: 2 per card-reclocked

Connector: BNC per IEC 60169-8 Amendment 2

Signal Level: 800mV nominal

DC Offset: 0V ± 0.5V

Rise and Fall Time: 900ps nominal

Overshoot: < 10% of amplitude

Return Loss: > 15dB up to 540Mb/s

Wideband Jitter: < 0.2 UI

#### Optical Outputs:

Number of Outputs: 1

Connector: SC/PC, ST/PC, FC/PC female housing

Return Loss: > 14dB

Wavelength: 1310nm, 1550nm

#### Optical Power:

1310nm FP: -7 dBm ± 1dBm

1550nm DFB: 0 dBm ± 1dBm

#### Electrical:

Voltage: +12V DC

Power: 6 Watts

#### Physical:

Number of Slots: 1

### Compliance:

#### Electrical Safety:

CSA Listed to UL 60065-03, IEC 60065  
Complies with CE Low voltage Directive  
Class 1 laser product  
Complies with 24 CFR 1040.10 and 1040.11  
IEC 60825-1  
Complies with FCC Part 15, Class A  
EU EMC directive

#### Laser Safety:

#### EMI/RFI:

### Ordering Information:

7705EO13

SDI Electrical to Optical Converter, 19.4Mb/s or 143-540Mb/s, 1310nm, FP Laser

7705EO15

SDI Electrical to Optical Converter, 19.4Mb/s or 143-540Mb/s, 1550nm, DFB Laser

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix

+3RU  
Multiframe

3RU Rear Plate for use with 7700FR-C

+1RU

1RU Rear Plate for use with 7701FR Multiframe

+SA

Standalone Enclosure Rear Plate

#### Connector Suffix

+SC

SC/PC

+ST

ST/PC

+FC

FC/PC

### Enclosures:

7700FR-C

3RU Multiframe which holds 15 modules

7701FR

1RU Multiframe which holds 3 modules

S7701FR

Standalone enclosure



### Features

- Optical to electrical converter for all SMPTE 259M standards with operation from 143Mb/s - 360Mb/s
- Supports additional standards of SMPTE 305M (SDTi), SMPTE 310M (19.4Mb/s), SMPTE 344M(540Mb/s), M2S and DVB-ASI (270Mb/s)
- Supports multi-mode or single-mode fiber
- Fully hot swappable from front of frame with no fiber or BNC disconnect/reconnect required
- Occupies one card slot and can be housed in either a 1RU frame which will hold up to three modules or a 3RU frame which will hold 1 module
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.

- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

### Input:

- Optical input range from 1270nm to 1610nm
- Input sensitivity to -32dBm
- SC/PC, ST/PC, FC/PC connector options

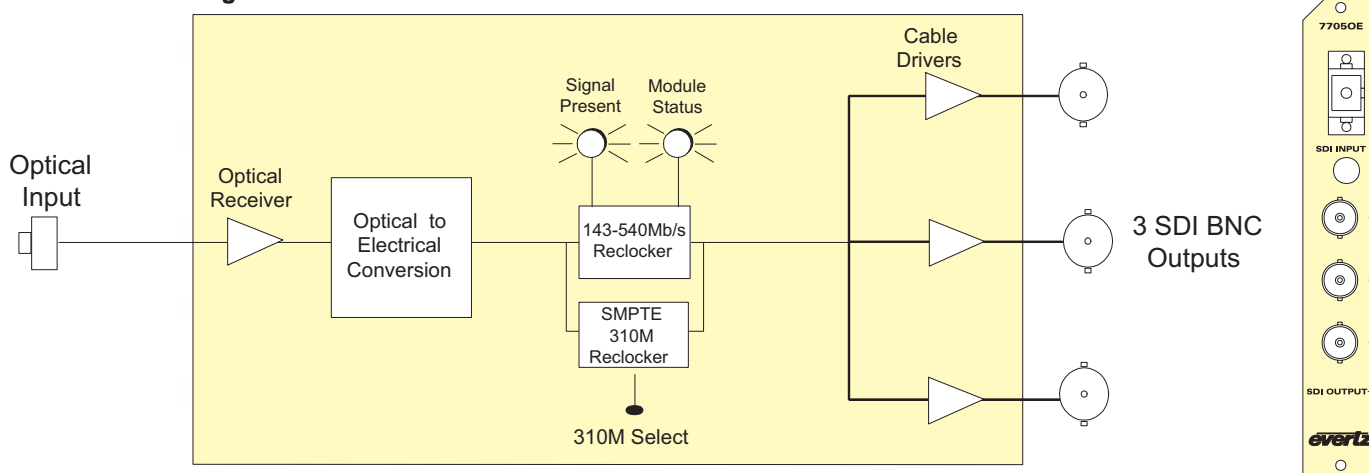
### Outputs:

- Three serial digital BNC outputs for loop-through or monitoring
- Wideband Jitter < 0.2 UI

### Status LEDs:

- Signal presence indication
- Module status indication

### 7705OE Block Diagram & Rear Panel



### Specifications

#### Standards:

SMPTE 259M A, B, C, D, SMPTE 297M, SMPTE 305M, SMPTE 310M, SMPTE 344M M2S, DVB-ASI

#### Optical Input:

Number of Inputs: 1  
Connector: SC/PC, ST/PC, FC/PC Female Housing  
Operating Wavelength: 1270nm to 1610nm  
Optical Sensitivity: -32dBm  
Maximum Input Power: 0dBm

#### Serial Video Outputs:

Number of Outputs: 3 per card reclocked  
Connector: BNC per IEC 60169-8 Amendment 2  
Signal Level: 800mV nominal  
DC Offset: 0V ± 0.5V  
Rise and Fall Time: 900ps nominal  
Overshoot: <10% of amplitude  
Return Loss: >15dB up to 540Mb/s  
Wideband Jitter: <0.2 UI

#### Electrical:

Voltage: +12V DC  
Power: 6 Watts  
EMI/RFI: Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

Number of Slots: 1

### Ordering Information:

**7705OE** SDI Optical to Electrical Converter, 19.4Mb/s or 143-540Mb/s

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

#### Fiber Optic Patch Cable:

**CB-FP1M-SCPC** Single mode fiber cable, 1m, SC/PC male termination  
**CB-FP1M-STPC** Single mode fiber cable, 1m, ST/PC male termination  
**CB-FP5M-SCPC** Single mode fiber cable, 5m, SC/PC male termination  
**CB-FP5M-STPC** Single mode fiber cable, 5m, ST/PC male termination  
**CB-FP10M-SCPC** Single mode fiber cable, 10m, SC/PC male termination  
**CB-FP10M-STPC** Single mode fiber cable, 10m, ST/PC male termination

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



### Features

- Triple SDI electrical to optical converter for 3 independent channels
- Provides 45 independent channels of optical conversion, in a single 3RU frame
- Supports all SMPTE259M standards with operation from 143Mb/s - 360Mb/s
- Supports additional standards of SMPTE305M (SDTi), SMPTE310M (19.4Mb/s), SMPTE344M (540Mb/s), M2S and DVB-ASI (270Mb/s)
- Supports multi-mode or single-mode fiber
- Fully hot swappable from front of frame, with no fiber or BNC disconnect /reconnect required
- Occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules or a 3RU frame which will hold up to 15 modules or a standalone frame which will hold 1 module
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.

- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

### Inputs:

- Three independent serial digital BNC inputs, each providing cable equalization to >300m @270Mb/s (Belden 8281)

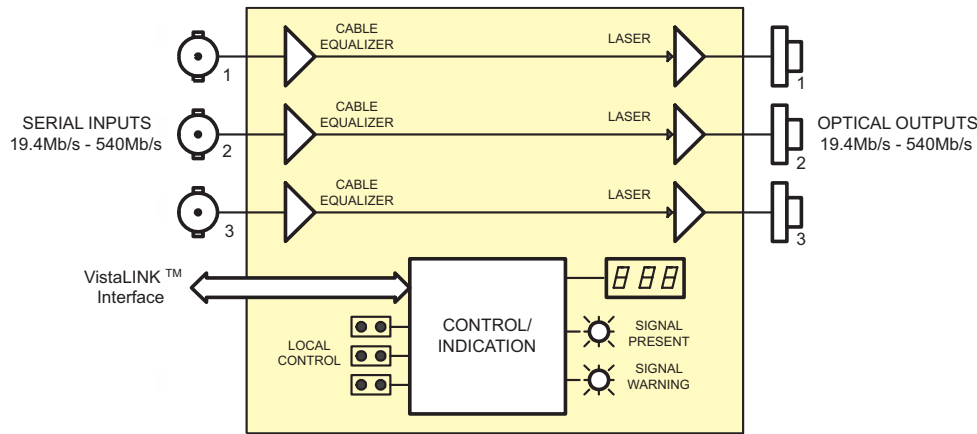
### Outputs:

- Three independent fiber outputs
- Optical output wavelength of 1310nm
- SC/PC, ST/PC, FC/PC connector options

### Status LEDs:

- Signal presence indication for each channel
- Laser status indication for each channel
- Module status indication

### 7707EO-3 Block Diagram & Rear Panel



### Specifications

#### Standards:

SMPTE 259M A, B, C, D, SMPTE 297M, SMPTE 305M, SMPTE 310M, SMPTE344M, M2S, DVB-ASI

#### Serial Video Input:

**Number of Inputs:** 3 (independent channels)  
**Connector:** 3 BNC inputs per IEC 169-8  
**Equalization:** Automatic to 300m @270Mb/s, with Belden 8281 (or equivalent)  
**Return Loss:** >15dB up to 540Mb/s

#### Optical Outputs:

**Number of Outputs:** 3 (independent channels)  
**Connector:** SC/PC, ST/PC, FC/PC female housing  
**Return Loss:** >14dB  
**Rise/Fall Time:** 400-700ps  
**Jitter:** <0.2UI  
**Nominal Wavelength:** 1310nm  
**Optical Power:** -7dBm ±1dBm

#### Electrical:

**Voltage:** +12V DC  
**Power:** 7 Watts

#### Physical:

**Number of Slots:** 1

#### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
 Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC directive

### Ordering Information:

#### 7707EO13-3

Triple SDI Electrical to Optical Converter,  
 19.4Mb/s or 143-540Mb/s, 1310nm, FP laser  
 VistaLINK® Monitoring

### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
 Eg. Model +3RU +SC

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

### Fiber Optic Patch Cable:

**CB-FP1M-SCPC** Single mode fiber cable, 1m, SC/PC male termination  
**CB-FP1M-STPC** Single mode fiber cable, 1m, ST/PC male termination  
**CB-FP5M-SCPC** Single mode fiber cable, 5m, SC/PC male termination  
**CB-FP5M-STPC** Single mode fiber cable, 5m, ST/PC male termination  
**CB-FP10M-SCPC** Single mode fiber cable, 10m, SC/PC male termination  
**CB-FP10M-STPC** Single mode fiber cable, 10m, ST/PC male termination

### Enclosures:

**7700FR-C** 3RU Multiframe, which holds 15 modules  
**7701FR** 1RU Multiframe, which holds 3 modules  
**S7701FR** Standalone enclosure



# Triple SDI Electrical to Optical Converter, 19.4Mb/s or 143-540Mb/s 7707OE-3



## Features

- Triple SDI optical to electrical converter for 3 independent channels
- Provides 45 independent channels of optical conversion, in a single 3RU frame
- Supports all SMPTE259M standards with operation from 143Mb/s - 360Mb/s
- Supports additional standards of SMPTE305M (SDTi), SMPTE310M (19.4Mb/s), SMPTE344M (540Mb/s), M2S and DVB-ASI (270Mb/s)
- Supports multi-mode or single-mode fiber
- Fully hot swappable from front of frame, with no fiber or BNC disconnect/reconnect required
- Occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules or a 3RU frame which will hold up to 15 modules or a standalone frame which will hold 1 module
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.

- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

## Inputs:

- Three independent fiber inputs
- 1270nm to 1610nm input wavelength range
- Input sensitivity to -30dBm
- SC/PC, ST/PC, FC/PC connector options

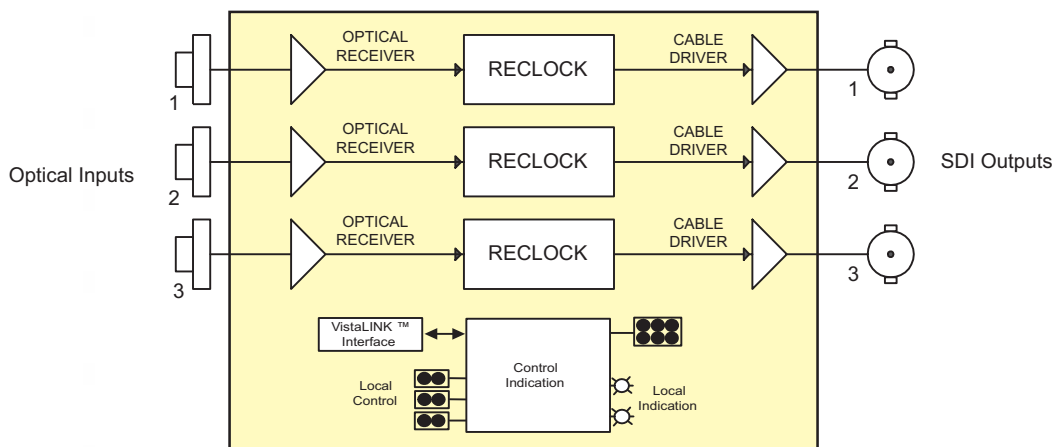
## Outputs:

- Three independent, reclocked, serial digital BNC outputs

## Status LEDs:

- Signal presence indication for each channel
- Input carrier weak indication for each channel
- Module status indication

## 7707OE-3 Block Diagram & Rear Panel



## Specifications

### Standards:

SMPTE 259M A, B, C, D, SMPTE 297M, SMPTE 305M, SMPTE 310M, SMPTE344M, M2S, DVB-ASI

### Optical Inputs:

**Number of Inputs:** 3 (independent channels)  
**Connector:** SC/PC, ST/PC, FC/PC female housing  
**Operating Wavelength:** 1270nm to 1610nm  
**Maximum Input Power:** 0dBm  
**Optical Sensitivity:** -30dBm

### Serial Video Outputs:

**Number of Outputs:** 3 reclocked (independent channels)  
**Connector:** 3 BNC inputs per IEC 169-8  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V±0.5V  
**Rise/Fall Time:** 900ps nominal  
**Overshoot:** < 10% of amplitude  
**Return Loss:** > 15dB up to 540Mb/s  
**Jitter:** < 0.2UI

### Electrical:

**Voltage:** +12V DC  
**Power:** 7 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC Directive

### Physical:

**Number of Slots:** 1

## Ordering Information:

### 7707OE-3

Triple SDI Optical to Electrical Converter  
19.4Mb/s or 143-540Mb/s, VistaLINK® Monitoring

## Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg. Model +3RU +SC

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

### Fiber Optic Patch Cable:

**CB-FP1M-SCPC** Single mode fiber cable, 1m, SC/PC male termination  
**CB-FP1M-STPC** Single mode fiber cable, 1m, ST/PC male termination  
**CB-FP5M-SCPC** Single mode fiber cable, 5m, SC/PC male termination  
**CB-FP5M-STPC** Single mode fiber cable, 5m, ST/PC male termination  
**CB-FP10M-SCPC** Single mode fiber cable, 10m, SC/PC male termination  
**CB-FP10M-STPC** Single mode fiber cable, 10m, ST/PC male termination

## Enclosures:

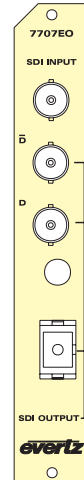
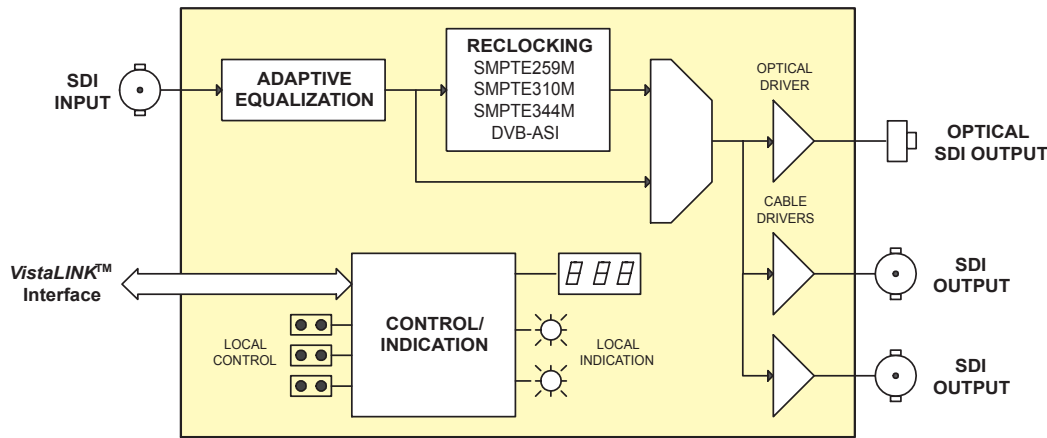
**7700FR-C** 3RU Multiframe, which holds 15 modules  
**7701FR** 1RU Multiframe, which holds 3 modules  
**S7701FR** Standalone enclosure



### Features

- Electrical to optical converter for all SMPTE 259M standards with operation from 143Mb/s - 360Mb/s
- Supports SMPTE 310M (19.4Mb/s), M2S, DVB-ASI (270Mb/s), SMPTE 344M (540Mb/s) and SMPTE 305M (SDTi) rates
- Detection and display of input equalization, video format and EDH errors
- Automatic coaxial input equalization up to 275m at 270Mb/s (Belden 8281)
- Reclocked optical and electrical outputs
- Optical output wavelengths of 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Supports multi-mode and single-mode fiber
- Fully hot swappable from front of frame
- Occupies one card slot and can be housed in either a 1RU frame which will hold up to three modules, a 3RU frame which will hold up to 15 modules, or a standalone enclosure which will hold one module
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

### 7707EO Block Diagram & Rear Panel



### Specifications

#### Standards:

#### Reclocked:

SMPTE 259M A, B, C, D, SMPTE 297M, SMPTE 344M, SMPTE 310M, SMPTE 305M, M2S or DVB-ASI  
Any bi-level signal type at rates of 19.4 - 540Mb/s

#### Non-Reclocked:

#### Serial Video Input:

#### Connector:

1 BNC per IEC 60169-8 Amendment 2

#### Equalization:

Automatic up to 275m @270Mb/s with Belden 8281(or equivalent cable)

#### Return Loss:

> 15 dB up to 540 Mb/s

#### Serial Video Output:

#### Number of Outputs:

2 per card (1 output DVB-ASI/M2S compliant)

#### Connectors:

BNC per IEC 60169-8 Amendment 2

#### Signal Level:

800mV nominal

#### DC Offset:

0V ±0.5V

#### Rise and Fall Time:

900ps nominal

#### Overshoot:

< 10% of amplitude

#### Return Loss:

> 15 dB up to 270 Mb/s

#### Wide Band Jitter:

< 0.2 UI

#### Optical Output:

#### Standard:

SMPTE 297M

#### Connector:

1 Female SC/PC, ST/PC or FC/PC

#### Return Loss:

> 14 dB

#### Rise and Fall Time:

400-700 ps

#### Wide Band Jitter:

< 0.2 UI

#### Wavelengths:

See Ordering Information

#### Output Power:

#### 1310nm FP:

-7dBm ± 1dBm

#### 1550nm &

#### CWDM:

0dBm ± 1dBm

#### DWDM DFB:

7dBm ± 1dBm

#### Electrical:

#### Voltage:

+12V DC

#### Power:

6 Watts (Non-DWDM), 9 Watts (DWDM)

#### Physical:

#### Number of slots:

1

#### Compliance:

#### Electrical Safety:

CSA Listed to UL 60065-03, IEC 60065  
Complies with CE Low voltage Directive  
Class 1 laser product  
Complies with 24 CFR 1040.10 and 1040.11  
IEC 60825-1  
Complies with FCC Part 15, Class A  
EU EMC directive

#### Laser Safety:

#### EMI/RFI:

#### Ordering Information:

#### 7707EO13:

SDI Electrical to Optical Converter 19.4Mb/s or 143-540Mb/s, 1310nm, FP Laser

#### 7707EO15:

SDI Electrical to Optical Converter 19.4Mb/s or 143-540Mb/s, 1550nm, DFB Laser

#### For CWDM, please refer to the end of the fiber section for ordering information

#### 7707EOxx

SDI Electrical to Optical Converter 19.4Mb/s or 143-540Mb/s, CWDM DFB Laser

#### For DWDM, please refer to the end of the fiber section for ordering information

#### 7707EODyyy

SDI Electrical to Optical Converter, 19.4Mb/s or 143-540Mb/s, DWDM Laser, +7dBm

#### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order

Eg: Model +SC +3RU

#### Rear Plate Suffix

#### +3RU

3RU Rear Plate for use with 7700FR-C Multiframe

#### +1RU

1RU Rear Plate for use with 7701FR Multiframe

#### +SA

Standalone Enclosure Rear Plate

#### Connector Suffix

#### +SC

SC/PC

#### +ST

ST/PC

#### +FC

FC/PC

#### Enclosures:

#### 7700FR-C

3RU Multiframe which holds 15 modules

#### 7701FR

1RU Multiframe which holds 3 modules

#### S7701FR

Standalone Enclosure

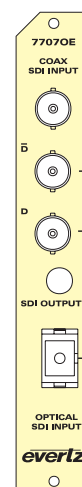
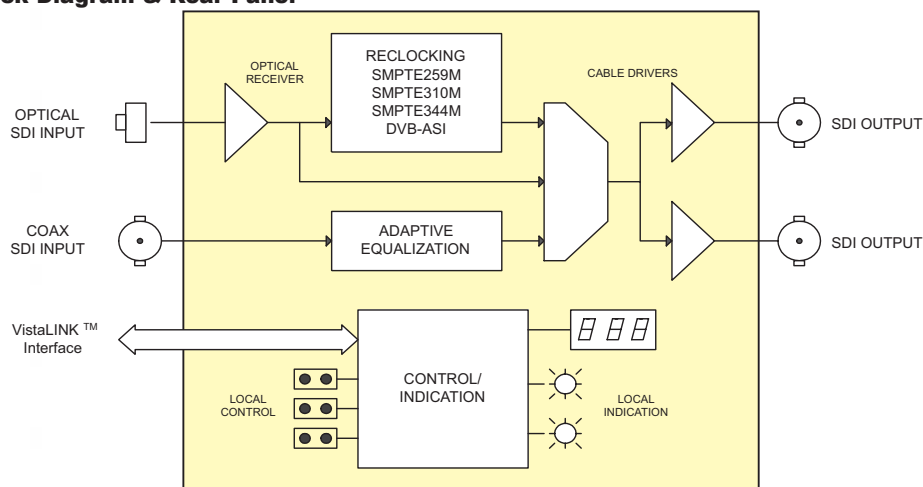




## Features

- Optical to electrical converter for all SMPTE 259M standards with operation from 143Mb/s - 360Mb/s
- Supports SMPTE 310M (19.4Mb/s), M2S, DVB-ASI (270Mb/s), SMPTE 344M (540Mb/s) and SMPTE 305M (SDTi) rates
- Detection and display of optical input power, video format and EDH errors
- Reclocked optical input, with selectable non-reclocked mode
- Wide range optical input (1270nm to 1610nm)
- Supports multi-mode and single-mode fiber
- Redundant second SDI input for automatic failure switching applications
- Automatic input cable equalization to 275m at 270Mb/s (Belden 8281) on coaxial input
- Fully hot swappable from front of frame
- Occupies one card slot and can be housed in either a 1RU frame which will hold up to three modules, a 3RU frame which will hold up to 15 modules, or a standalone enclosure which will hold 1 module
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

## 7707OE Block Diagram & Rear Panel



## Specifications

### Standards:

#### Reclocked:

305M,

#### Non-Reclocked:

540Mb/s

SMPTE 259M A, B, C, D, SMPTE 297M, SMPTE SMPTE 310M, SMPTE 344M, M2S or DVB-ASI

Any bi-level signal type at rates of 19.4Mb/s to

### Optical Input:

#### Connector:

1 Female SC/PC, ST/PC or FC/PC

#### Wavelength:

1270nm to 1610nm

#### Optical Sensitivity

-32dBm @ 270Mb/s

#### Max. Input Power:

0dBm

### Coaxial Input:

#### Connector:

1 BNC per IEC 60169-8 Amendment 2

#### Impedance:

75Ω (nominal)

#### Equalization:

Automatic to 275m @ 270Mb/s with Belden 8281

cable

#### Return Loss:

> 15dB to 540Mb/s

### Serial Video Outputs:

#### Number of Outputs:

2 per card (1 output DVB-ASI/M2S compliant)

#### Connector:

BNC per IEC 60169-8 Amendment 2

#### Impedance:

75Ω (nominal)

#### Signal Level:

800mV nominal

#### DC Offset:

0V ±0.5V

#### Rise and Fall Time:

900ps nominal

#### Overshoot:

< 10% of amplitude

#### Return Loss:

> 15 dB up to 540 Mb/s

#### Wide Band Jitter:

< 0.20 UI

### Electrical:

#### Voltage:

+12V DC

#### Power:

6 Watts

#### EMI/RFI:

Complies with FCC Part 15, Class A  
EU EMC Directive

### Physical:

#### Number of slots:

1

### Ordering Information:

#### 7707OE:

SDI Optical to Electrical Converter, 19.4Mb/s  
or 143-540Mb/s, VistaLINK® Monitoring

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order

Eg: Model +SC +3RU

### Rear Plate Suffix

#### +3RU

3RU Rear Plate for use with 7700FR-C  
Multiframe

#### +1RU

1RU Rear Plate for use with 7701FR Multiframe

#### +SA

Standalone Enclosure Rear Plate

### Connector Suffix

#### +SC

SC/PC

#### +ST

ST/PC

#### +FC

FC/PC

### Fiber Optic Patch Cable:

#### CB-FP1M-SCPC

Single mode fiber cable, 1m, SC/PC male termination

#### CB-FP1M-STPC

Single mode fiber cable, 1m, ST/PC male termination

#### CB-FP5M-SCPC

Single mode fiber cable, 5m, SC/PC male termination

#### CB-FP5M-STPC

Single mode fiber cable, 5m, ST/PC male termination

#### CB-FP10M-SCPC

Single mode fiber cable, 10m, SC/PC male  
termination

#### CB-FP10M-STPC

Single mode fiber cable, 10m, ST/PC male  
termination

### Enclosures:

#### 7700FR-C

3RU Multiframe which holds 15 modules

#### 7701FR

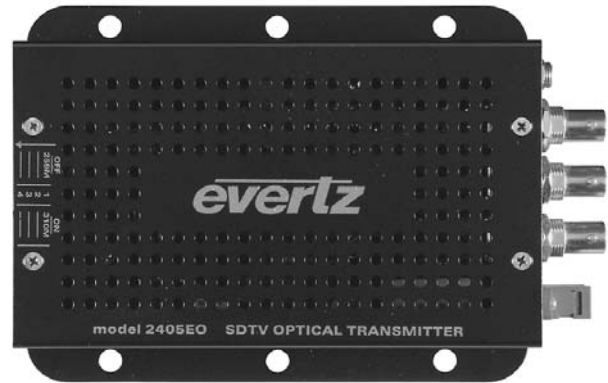
1RU Multiframe which holds 3 modules

#### S7701FR

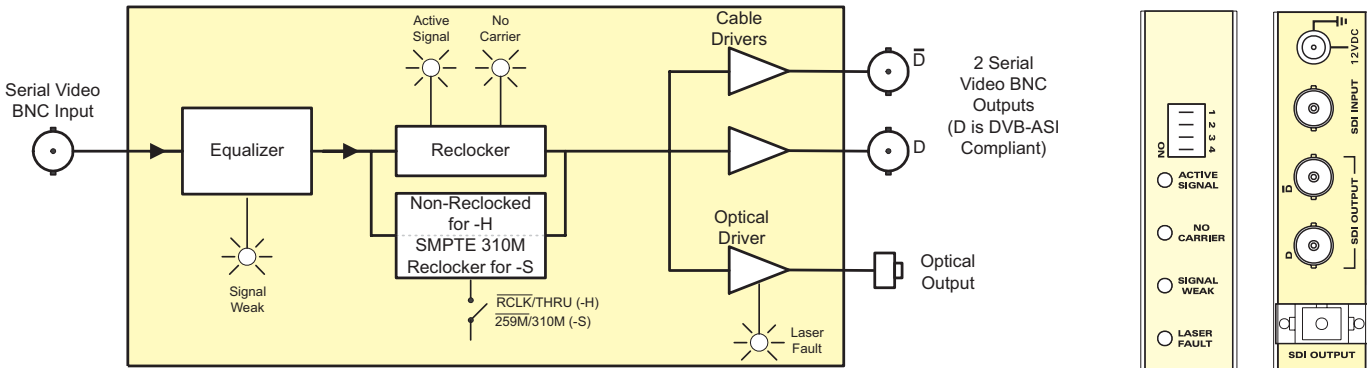
Standalone Enclosure

## Features

- Reclocking for all for SDTV video rates including SMPTE 259M (143Mb/s-360Mb/s), SMPTE 310M (19.4Mb/s), SMPTE 344M(540Mb/s), M2S and DVB-ASI (270Mb/s)
- Available in 1310nm, 1550nm and up to sixteen different CWDM wave lengths (ITU-T G.694.2 compliant)
- Automatic laser shutdown on absence of input signal for extended laser life
- Supports single-mode and multi-mode fiber optic cable
- Immunity to video Pathological signals
- Long reach transmission capability
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation



## 2405EO Block Diagram & Rear Panels



## Specifications

**Standards:** SMPTE 259M (A, B, C, D), SMPTE 297M, SMPTE 310M, SMPTE 344M, M2S, & DVB-ASI

### Serial Video BNC Input:

**Number of Inputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 300m @ 270Mb/s with Belden 8281 (or equivalent)  
**Return Loss:** > 15dB up to 540MHz

### Serial Video BNC Output:

**Number of Outputs:** 2 (1 output DVB-ASI/M2S compliant)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ± 0.5V  
**Rise, Fall Time:** 900ps nominal  
**Overshoot:** < 10% of amplitude  
**Return Loss:** > 15dB up to 540MHz  
**Wideband Jitter:** < 0.2 UI

### Optical Output:

**Number of Outputs:** 1  
**Connector:** SC/PC, ST/PC, FC/PC Female  
**Return Loss:** > 14 dB  
**Rise, Fall Time:** 400-700ps  
**Jitter:** < 0.2UI  
**Optical Power:**  
 1310nm FP: -7dBm± 1dBm  
 1550nm DFB: 0 dBm± 1dBm  
 CWDM DFB: 0 dBm± 1dBm

### Physical:

**Dimensions:** With Flanges: 6"L x 4"W x 1"H (152mm L x 114mm W x 25mm H)  
**Weight:** 0.5 lbs (0.28Kg)

### Electrical:

**Voltage:** +12V DC  
**Power:** 6 Watts

### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
 Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
 Complies with FCC Part 15, Class A  
 EU EMC directive

### Laser Safety:

### EMI/RFI:

### Ordering Information:

**2405EO3F** SDI Miniature Optical Transmitter 1310nm FP, Laser  
**2405EO5D** SDI Miniature Optical Transmitter 1550nm DFB Laser

### For CWDM, please refer to the end of the fiber section for ordering information:

**2405EOxx** SDI Miniature Optical Transmitter CWDM DFB Laser

All 2405 modules include power supply

### Ordering Options

Fiber Connector must be specified at time of order  
 Eg: Model + SC

### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

### Fiber Optic Patch Cable:

**CB-FP1M-SCPC** Single mode fiber cable, 1m, SC/PC male termination  
**CB-FP1M-STPC** Single mode fiber cable, 1m, ST/PC male termination  
**CB-FP5M-SCPC** Single mode fiber cable, 5m, SC/PC male termination  
**CB-FP5M-STPC** Single mode fiber cable, 5m, ST/PC male termination  
**CB-FP10M-SCPC** Single mode fiber cable, 10m, SC/PC male termination  
**CB-FP10M-STPC** Single mode fiber cable, 10m, ST/PC male termination



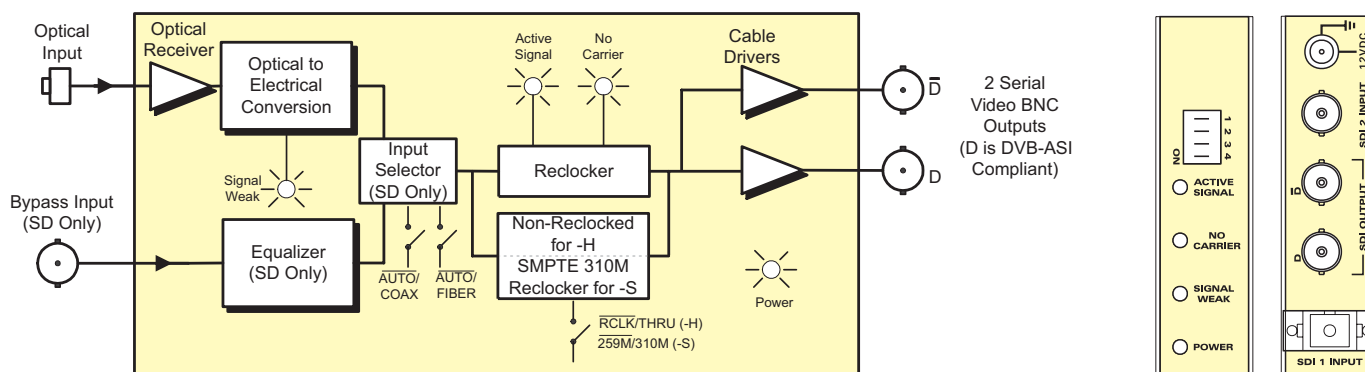
## 2405OE

### Features

- Reclocking for all SDTV video rates including SMPTE 259M (143Mb/s-540Mb/s), SMPTE 310M (19.4Mb/s), SMPTE 344M(540Mb/s), M2S and DVB-ASI (270Mb/s)
- Automatic signal failure switching for optical input
- Immunity to video Pathological signals
- Supports single-mode and multi-mode fiber optic cable
- High optical input sensitivity
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation



### 2405OE Block Diagram & Rear Panels



### Specifications

**Standards:** SMPTE 259M (A, B, C, D), SMPTE 297M, SMPTE 310M, SMPTE 344M, M2S, DVB-ASI

#### Serial Video BNC Input:

**Number of Inputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 300m @ 270Mb/s with Belden 8281 (or equivalent)  
**Return Loss:** > 15dB up to 540MHz

#### Optical Input:

**Number of Inputs:** 1  
**Operating Wavelength:** 1270nm to 1610nm  
**Maximum Input Power:** 0dBm  
**Optical Sensitivity:** -32 dBm  
**Connector:** SC/PC, ST/PC, FC/PC Female Housing

#### Serial Video BNC Output:

**Number of Outputs:** 2 (1 output DVB-ASI/M2S compliant)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ± 0.5V  
**Rise, Fall Time:** 900ps nominal  
**Overshoot:** < 10% of amplitude  
**Return Loss:** > 15dB up to 540MHz  
**Wideband Jitter:** < 0.2 UI

#### Physical:

**Dimensions:** With Flanges: 6"L x 4"W x 1"H  
 (152mm L x 114mm W x 25mm H)  
**Weight:** 0.5 lbs (0.28Kg)

#### Electrical:

**Voltage:** +12V DC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

### Ordering Information:

**2405OE** SDI Miniature Optical Receiver, 19.4Mb/s or 143-540Mb/s

All 2405 modules include power supply

#### Ordering Options

Fiber Connector must be specified at time of order  
 Eg: Model + SC

#### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

#### Fiber Optic Patch Cable:

<b>CB-FP1M-SCPC</b>	Single mode fiber cable, 1m, SC/PC male termination
<b>CB-FP1M-STPC</b>	Single mode fiber cable, 1m, ST/PC male termination
<b>CB-FP5M-SCPC</b>	Single mode fiber cable, 5m, SC/PC male termination
<b>CB-FP5M-STPC</b>	Single mode fiber cable, 5m, ST/PC male termination
<b>CB-FP10M-SCPC</b>	Single mode fiber cable, 10m, SC/PC male termination
<b>CB-FP10M-STPC</b>	Single mode fiber cable, 10m, ST/PC male termination

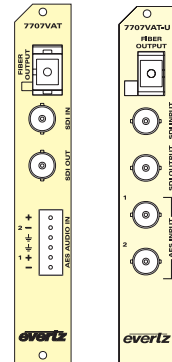
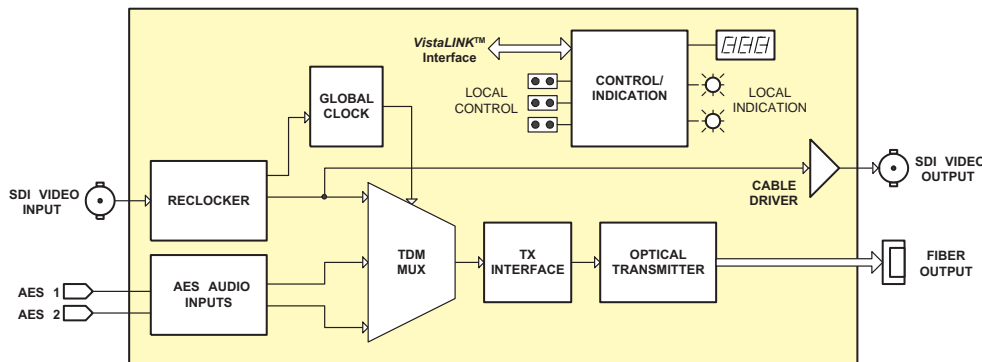


### Features

- SDI video and 2 AES audio fiber optic transmitter
- Supports 270Mb/s on 525 or 625 line 4:2:2 component SDI and SDTi (SMPTE 305M) video signals
- Supports 32, 44.1, 48 kHz AES audio inputs
- Dolby E compatible
- AES audio inputs can be synchronous or asynchronous to each other and/or to input video
- Reclocked SDI output for additional signal distribution or monitoring
- Signal transport over fiber uninterrupted by loss of SDI or AES audio input feeds
- Low audio to video latency over transport interface
- Local display of input SDI signal strength, video format, and EDH errors
- Automatic coaxial input equalization up to 300m at 270Mb/s (Belden 1694A)

- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Supports single-mode and multi-mode fiber optic cable
- Occupies one card slot and can be housed in either a 1RU frame, which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module

### 7707VAT Block Diagram & Rear Panels



### Specifications

#### Serial Video Input:

**Standard:** SMPTE 259M-C, 525 or 625 line component, SMPTE 305M, (SDTi)  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 300m @ 270 Mb/s with Belden 1694A or equivalent cable  
**Return Loss:** > 15 dB up to 270 Mb/s

#### Serial Video Output:

**Number of Outputs:** 1 Per Card reclocked  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ± 0.5V  
**Rise and Fall Time:** 900ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** >15 dB at 270 Mb/s  
**Wide Band Jitter:** <0.2 UI

#### AES Audio Inputs (7707VAT & 7707VAT-U):

**Number of Inputs:** 2 (Jumper selectable for balanced or unbalanced input)  
**Standard:** SMPTE 276M  
**Unbalanced AES:** AES3-1992  
**Balanced AES:** Dolby E compatible  
**Other:** Dolby E compatible  
**Connector:** 7707VAT-U: BNC per IEC 60169-8 Amendment 2  
 7707VAT: 6 pin terminal strip  
**Signal Level:** Balanced: 2 to 7Vp-p with level jumper set to HI, 1 to 2Vp-p set to LO  
 Unbalanced: 1V p-p ±0.1V  
**Equalization:** Balanced: 500m @ 48kHz with Belden 1800B or equivalent cable  
 Unbalanced: 2200m @ 48kHz with Belden 8281 or equivalent cable  
**Resolution:** Up to 24 bits  
**Sampling Rate:** 32, 44.1, 48 kHz  
**Impedance:** Unbalanced: 75 Ω  
 Balanced: 110 Ω

#### Optical Output:

**Number:** 1  
**Connector:** Female SC/PC, ST/PC or FC/PC  
**Return Loss:** > 14 dB  
**Rise and Fall Time:** 200ps nominal  
**Wavelengths:** See Ordering Information  
**Output Power:** 1310nm FP(Standard) -7dBm ± 1dBm  
 1310nm FP(M version) 0dBm ± 1dBm  
 1550nm & CWDM DFB 0dBm ± 1dBm  
 DWDM DFB 7dBm ± 1dBm  
**Fiber Size:** 9 μm core / 125 μm overall

#### System Performance: (7707VAT + 7707VAR)

**Video Input To Output Delay:** < 1.5 μs  
**Audio to Video delay:** < 1μs with SoftSwitch™ disabled on 7707VAR  
 < 2ms with SoftSwitch™ enabled on 7707VAR

#### Electrical:

**Voltage:** +12VDC  
**Power:** 10 Watts (Non-DWDM) 13 Watts (DWDM)

#### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
 Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
 Complies with FCC Part 15, Class A  
 EU EMC directive

#### Laser Safety:

#### EMI/RFI:

#### Ordering Information:

**7707VAT13** SDI with 2 AES Audio Fiber Transmitter, 1310nm, FP Laser, VistaLINK® Monitoring  
**7707VAT13M** SDI with 2 AES Audio Fiber Transmitter, 1310nm Higher Power (0dBm), FP Laser, VistaLINK® Monitoring  
**7707VAT15** SDI with 2 AES Audio Fiber Transmitter, 1550nm, DFB Laser, VistaLINK® Monitoring

#### For CWDM, please refer to the end of the fiber section for ordering information

**7707VATxx** SDI with 2 AES Audio Fiber Transmitter, CWDM DFB Laser, VistaLINK® Monitoring

#### For DWDM, please refer to the end of the fiber section for ordering information

**7707VATyyy** SDI with 2 AES Audio Fiber Transmitter, DWDM wavelength, VistaLINK® Monitoring

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

**+U** Unbalanced AES Audio

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



# SDi with 2 AES Audio Fiber Receiver 7707VAR

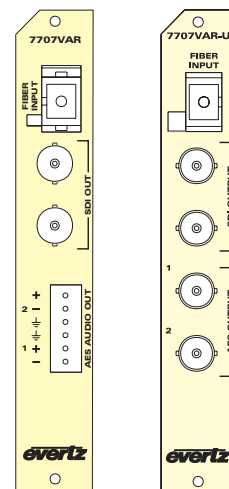
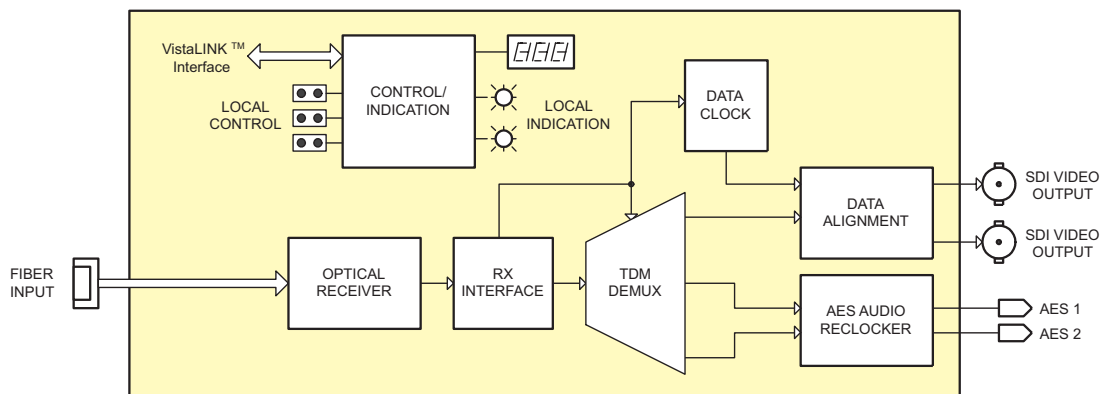


## Features

- SDi video and 2 AES audio fiber optic receiver
- Supports 270Mbps on 525 or 625 line 4:2:2 component SDi and SDTi (SMPTE 305M) video signals
- Supports 32, 44.1, 48 kHz AES audio inputs
- Dolby E compatible
- Incorporates Evertz SoftSwitch™ (Patent Pending) technology for virtually glitch-free AES Audio outputs when upstream SDi or AES feeds are switched
- User selectable SoftSwitch™ bypass
- Low Audio to Video latency
- Output AES "Mute" on loss of AES or fiber optic input signals
- SDi Video regeneration for jitter reduction
- Output Video "Black" or "Blue" (selectable) on loss of video or fiber optic input signals

- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Local display of optical signal strength, video and audio presence, video and AES formats, EDH errors
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range
- Occupies one card slot and can be housed in either a 1RU frame, which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module

## 7707VAR Block Diagram & Rear Panels



## Specifications

### Optical Input:

Number of Inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Return Loss:	>25dB
Operating Wavelength:	1270nm to 1610nm
Maximum Input Power:	0dBm
Optical Sensitivity:	-28dBm

### Serial Video Outputs:

Number of Outputs:	2 regenerated
Standard:	SMPTE 259M-C (525 or 625 line component) SMPTE 305M (SDTi)
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	900ps nominal
Overshoot:	<10% of amplitude
Return Loss:	> 15dB at 270Mb/s
Wide Band Jitter:	< 0.15UI

### AES Audio Outputs:

Number of Outputs:	2 regenerated
Standard:	Jumper selectable for balanced or unbalanced output SMPTE 276M
Unbalanced AES:	AES3-1992 balanced AES
Balanced AES:	AES3-1992 balanced AES
Connector:	BNC per IEC 60169-8 Amendment 2
7707VAR-U:	6 pin terminal strip
7707VAR:	6 pin terminal strip
Signal Level:	
Unbalanced:	1V p-p
Balanced:	5 Vp-p
Resolution:	up to 24 bits
Sampling Rate:	32, 44.1, 48 kHz
Intrinsic Jitter:	< 20ns
Impedance:	
Unbalanced:	75Ω
Balanced:	110Ω

### System Performance: (7707VAR + 7707VAR)

Video Input To Output Delay:	< 1.5 μs
Audio to Video delay:	< 1μs with SoftSwitch™ disabled < 2ms with SoftSwitch™ enabled

### Electrical:

Voltage:	+12VDC
Power:	10 Watts
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC Directive

### Physical:

Number of slots:	1
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### Ordering Information:

7707VAR	SDi with 2 AES Audio Fiber Receiver, VistaLINK® Monitoring
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### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

+U	Unbalanced AES Audio
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### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

### Fiber Optic Patch Cable:

CB-FP1M-SCPC	Single mode fiber cable, 1m, SC/PC male termination
CB-FP1M-STPC	Single mode fiber cable, 1m, ST/PC male termination
CB-FP5M-SCPC	Single mode fiber cable, 5m, SC/PC male termination
CB-FP5M-STPC	Single mode fiber cable, 5m, ST/PC male termination
CB-FP10M-SCPC	Single mode fiber cable, 10m, SC/PC male termination
CB-FP10M-STPC	Single mode fiber cable, 10m, ST/PC male termination

### Enclosures:

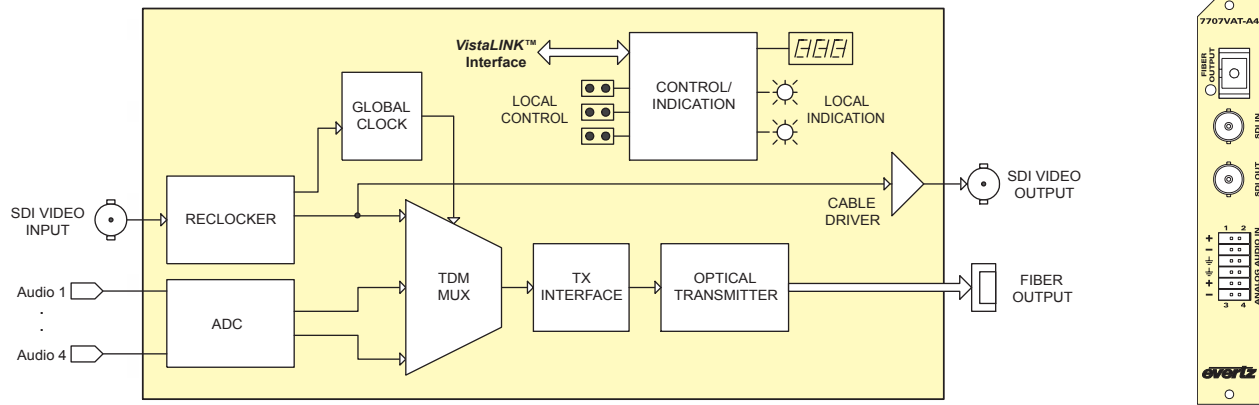
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure



- SDI Video and 4 broadcast quality analog audio fiber optic transmitter
- Supports 525 or 625 line 4:2:2 component SDI signals
- Analog audio inputs can be synchronous or asynchronous to each other and/or to input video
- Reclocked SDI output for additional signal distribution or monitoring
- Signal transport over fiber uninterrupted by loss of SDI or Analog audio input feeds
- Low Audio to Video latency over transport interface
- Local display of input SDI signal strength, video format, and EDH errors
- Automatic coaxial input equalization to 300m at 270Mb/s (Belden 8281)

- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules, or a standalone enclosure which will hold 1 module

### 7707VAT-A4 Block Diagram & Block Diagram



#### Specifications

##### Serial Video Input:

**Standard:** SMPTE 259M-C  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 300m @ 270 Mb/s with Belden 8281 or equivalent cable  
**Return Loss:** > 15 dB up to 270 Mb/s

##### Serial Video Output:

**Number of Outputs:** 1 Per Card relocked  
**Standard:** SMPTE 259M-C  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ± 0.5V  
**Rise and Fall Time:** 900ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** >15 dB at 270 Mb/s  
**Wide Band Jitter:** <0.2 UI

##### Analog Audio Inputs:

**Number of Inputs:** 4  
**Type:** Balanced analog audio  
**Connector:** 12 pin removable terminal block  
**Input Impedance:** High Impedance (>20 KΩ)  
**Freq. Response:** ±0.1 dB, 20Hz to 20 kHz  
**THD 20Hz-20kHz:** < 0.005%  
**Channel Phase Diff.:** ± 1 deg  
**SNR (weighted):** > 85 dB  
**Max. Audio Input Level:** +24 dBu  
**Signal Quantization:** 24 Bits

##### Optical Output:

**Number:** 1  
**Connector:** Female SC/PC, ST/PC or FC/PC  
**Return Loss:** > 14dB  
**Rise and Fall Time:** 200ps nominal  
**Wavelengths:** See Ordering Information  
**Output Power:**  
 1310nm FP(Standard) -7dBm ± 1dBm  
 1310nm FP(M version) 0dBm ± 1dBm  
 1550nm and CWDM DFB 0dBm ± 1dBm  
 DWDM DFB 7dBm ± 1dBm

##### System Performance: (7707VAT-A4 + 7707VAR-A4)

**Video Input To Output Delay:** < 2µs  
**Audio Input to Output delay:** <1.9ms

#### Electrical:

**Voltage:** +12VDC  
**Power:** 11 Watts(Non-DWDM), 13 Watts(DWDM)

#### Compliance:

**Electrical Safety:** CSA Listed to CSA C22.2 No. 60065-03, UL 60065-03  
 IEC 60065-(2001-12) 7th Edition  
 Complies with CE Low voltage Directive 93/68/EEC  
 Complies with 24 CFR 1040.10 and 1040.11 except for deviations pursuant to LN No. 50, dated July 26, 2001  
 Complies with IEC 60825-1, Am. 2  
**Laser Safety:** Complies with FCC regulations for class A devices.  
**EMI/RFI:** Complies with EU EMC directive.

#### Ordering Information:

**7707VAT13-A4** SDI with 4 Analog Audio Fiber Transmitter, 1310nm, FP Laser, VistaLINK® Monitoring  
**7707VAT13M-A4** SDI with 4 Analog Audio Fiber Transmitter, 1310nm Higher Power (0dBm), FP Laser, VistaLINK® Monitoring  
**7707VAT15-A4** SDI with 4 Analog Audio Fiber Transmitter, 1550nm, DFB Laser, VistaLINK® Monitoring

#### For CWDM, please refer to the end of the fiber section for ordering information

**7707VATxx-A4** SDI with 4 Analog Audio Fiber Transmitter, CWDM DFB Laser, VistaLINK® Monitoring

#### For DWDM, please refer to the end of the fiber section for ordering information

**7707VATyyy-A4** SDI with 4 Analog Audio Fiber Transmitter, DWDM DFB Laser, VistaLINK® Monitoring

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone Enclosure



# SDI with 4 Analog Audio Fiber Receiver

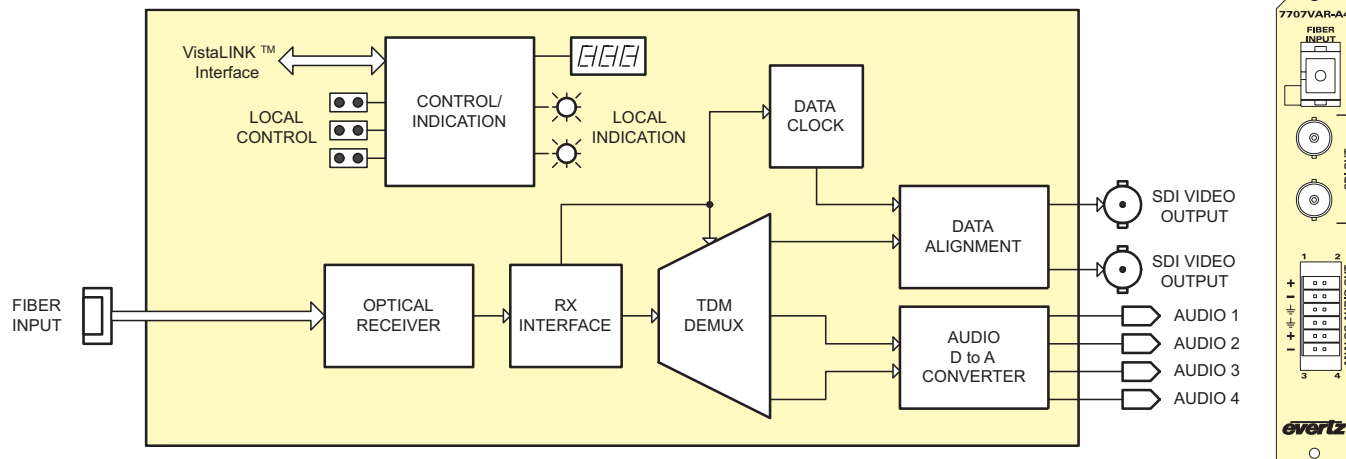
## 7707VAR-A4



### Features

- SDI video and four broadcast quality analog audio fiber optic receiver
- Supports 525 or 625 line 4:2:2 component SDI signals
- Low Audio to Video latency
- Output Video "Black" or "Blue" (selectable) on loss of video or fiber optic input signals
- Built-in jitter attenuation
- Local display of optical signal strength, video and audio presence, video format and EDH errors
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Supports single mode and multi mode fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range
- Occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules, or a standalone enclosure which will hold 1 module

### 7707VAR-A4 Block Diagram & Rear Panel



### Specifications

#### Optical Input:

Number of Inputs: 1  
 Connector: Female SC/PC, ST/PC, FC/PC  
 Operating Wavelength: 1270nm to 1610nm  
 Maximum Input Power: 0dBm  
 Optical Sensitivity: -28dBm

#### Serial Video Outputs:

Number of Outputs: 2 regenerated  
 Standard: SMPTE 259M-C  
 Connector: BNC per IEC 60169-8 Amendment 2  
 Signal Level: 800mV nominal  
 DC Offset: 0V  $\pm$  0.5V  
 Rise and Fall Time: 900ps nominal  
 Overshoot: <10% of amplitude  
 Return Loss: > 15 dB at 270 Mb/s  
 Wide Band Jitter: < 0.2 UI

#### Analog Audio Outputs:

Number of Outputs: 4  
 Type: Balanced analog audio  
 Connector: 12 pin removable terminal block  
 Output impedance: < 100  $\Omega$   
 Freq. Response:  $\pm$  0.1dB, 20Hz to 20 kHz  
 THD 20Hz-20kHz: < 0.005%  
 Channel Phase Diff.  $\pm$  1 deg  
 SNR (weighted): > 85 dB  
 Output Level: Adjustable to +24dBu  
 Audio Headroom: +24dBu

#### System Performance: (7707VAT-A4 + 7707VAR-A4)

Video Input To Output Delay: < 2 $\mu$ s  
 Audio Input to Output delay: < 1.9ms

#### Electrical:

Voltage: +12VDC  
 Power: 11 Watts  
 EMI/RFI: Complies with FCC Part 15, Class A  
 EU EMC directive

#### Physical:

Number of slots: 1

#### Ordering Information:

**7707VAR-A4** SDI with 4 Analog Audio Fiber Receiver, VistaLINK® Monitoring

#### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
 Eg. Model +SC + 3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

#### Enclosures:

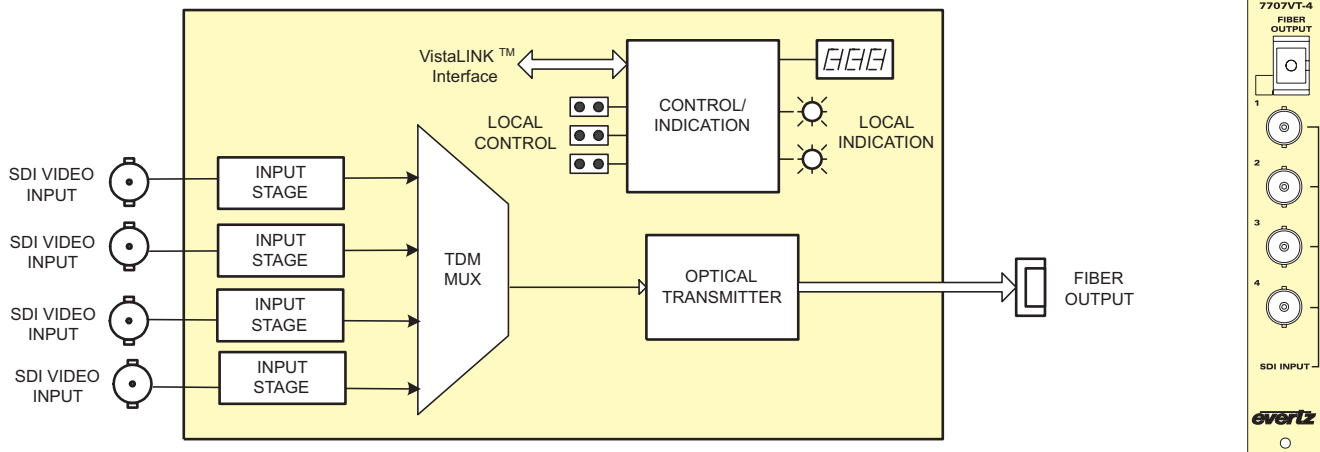
**7700FR-C** 3RU Multiframe, which holds 15 modules  
**7701FR** 1RU Multiframe, which holds 3 modules  
**S7701FR** Standalone enclosure



### Features

- Single card TDM multiplexer for four synchronous or asynchronous 270Mb/s SDI, SDTi or DVB-ASI video signals
- Signal transport over fiber uninterrupted by loss of any SDI, SDTi or DVB-ASI input feed
- Transparently passes embedded AES or any other data in the horizontal or vertical ancillary data space
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Automatic coaxial input equalization up to 250m at 270Mb/s (Belden 8281)
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- SC/PC, ST/PC, FC/PC connector options
- Occupies one card slot & can be housed in a standalone frame, a 1RU frame holding up to 3 modules or a 3RU frame holding up to 15 modules

### 7707VT-4 Block Diagram & Rear Panel



#### Serial Video Input:

**Standard:** SMPTE 259M-C, SMPTE 305M, DVB-ASI  
**Number of Inputs:** 4 independent SDI or DVB-ASI 270Mb/s signals  
**Connector:** 4 BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 250m @ 270 Mb/s with Belden 8281 or equivalent cable  
**Return Loss:** > 15 dB up to 270 Mb/s

#### Optical Output:

**Number:** 1  
**Connector:** Female SC/PC, ST/PC or FC/PC  
**Return Loss:** > 14 dB  
**Rise and Fall Time:** 200ps nominal  
**Wideband Jitter:** < 0.2 UI  
**Fiber Size:** 9µm core / 125 µm overall  
**Wavelengths:**  
**Standard:** 1310nm, 1550nm (nominal)  
**CWDM:** 1270nm to 1610nm (See Ordering Information)  
**DWDM:** C-Band (ITU-T G.694.1 compliant) (See Ordering Information)  
**Output Power:**  
 1310nm FP(Standard) -7dBm ± 1dBm  
 1550nm & CWDM DFB 0dBm ± 1dBm  
 DWDM DFB 7dBm ± 1dBm

#### Electrical:

**Voltage:** +12VDC  
**Power:** 10 Watts (Non DWDM), 13 Watts (DWDM)

#### Physical:

**Number of slots:** 1

#### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
**Laser Safety:** Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC directive

#### Ordering Information:

**7707VT13-4** Quad SDI/ASI Mux Fiber Transmitter, 1310nm FP, VistaLINK®  
**7707VT15-4** Quad SDI/ASI Mux Fiber Transmitter, 1550nm DFB, VistaLINK®

#### For CWDM, please refer to the end of the fiber section for ordering information

**7707VTxx-4** Quad SDI/ASI Mux Fiber Transmitter, CWDM Laser, VistaLINK®

#### For DWDM, please refer to the end of the fiber section for ordering information

**7707VTDyyy-4** Quad SDI/ASI Mux Fiber Transmitter, DWDM Laser, VistaLINK®

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure

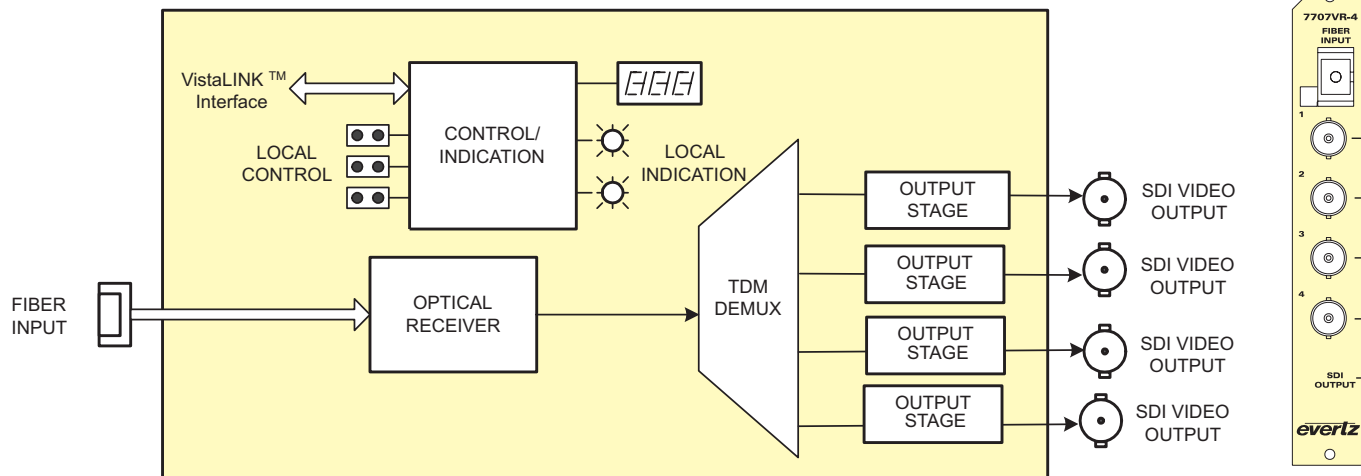


### 7707VR-4

#### Features

- Single card demultiplexer for four synchronous or asynchronous 270Mb/s SDI, SDTi or DVB-ASI video signals
- Low jitter SDI outputs
- Independent signal outputs unaffected by loss of any other SDI or DVB-ASI input feed
- Transparently passes embedded AES or any other data in the horizontal or vertical ancillary data space
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range
- SC/PC, ST/PC, FC/PC connector options
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Occupies one card slot & can be housed in a standalone frame, a 1RU frame holding up to 3 modules or a 3RU frame holding up to 15 modules

#### 7707VR-4 Block Diagram & Rear Panel



#### Specifications

##### Optical Input:

**Number of Inputs:** 1  
**Connector:** Female SC/PC, ST/PC, FC/PC  
**Return Loss:** >25dB  
**Operating Wavelength:** 1270nm to 1610nm  
**Maximum Input Power:**  
     Standard Version: -1dBm  
     -H Version: -8dBm

##### Optical Sensitivity

**Standard Version:** -23dBm  
**-H Version:** -28dBm

##### Serial Video Outputs:

**Standards:** SMPTE 259M-C, SMPTE 305M, DVB-ASI  
**Number of Outputs:** 4 independent SDI, SDTi or DVB-ASI 270Mb/s signals  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 900ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 15dB up to 270Mb/s  
**Wide Band Jitter:** < 0.2UI

##### Electrical:

**Voltage:** +12VDC  
**Power:** 10 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A EU EMC directive

##### Physical:

**Number of slots:** 1

#### Ordering Information:

**7707VR-4** Quad SDI/ASI Demux Fiber Receiver, VistaLINK®  
**7707VR-4-H** Quad SDI/ASI Demux Fiber Receiver, High sensitivity RX (-28dBm), VistaLINK®

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

#### Enclosures:

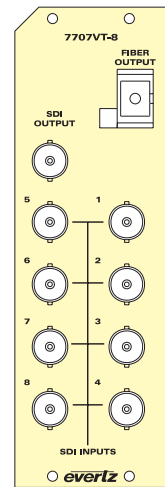
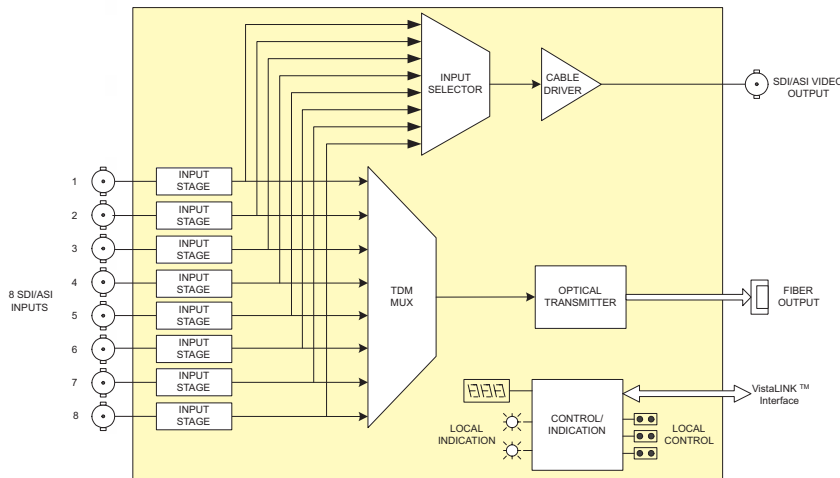
**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



### Features

- Multiplexor for eight synchronous or asynchronous 270Mb/s SDI, DVB-ASI or SDTi video signals
- Signal transport uninterrupted by loss of any SDI, DVB-ASI or SDTi input feed
- Transparently passes embedded AES or any other data in the horizontal or vertical ancillary data space
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Automatic coaxial equalization up to 250m at 270Mb/s (Belden 8281)
- Fully hot swappable from front of frame with no fiber/coax disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths of 1310nm, 1550nm and up to 16 CWDM wavelengths
- DWDM wavelengths also available
- SC/PC, ST/PC, FC/PC fiber connectors available
- Input selection feature allows user to route 1 of the 8 incoming video signals to the SDI output

### 7707VT-8 Block Diagram & Rear Panel



### Specifications

#### Serial Video Input:

**Standard:** SMPTE 259M, SMPTE 305M, DVB-ASI  
**Number of Inputs:** 8 independent SDI, SDTi or DVB-ASI 270Mb/s signals  
**Connector:** 8 BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 250m @ 270 Mb/s with Belden 8281 or equivalent cable  
**Return Loss:** > 15 dB up to 270 Mb/s

#### Serial Video Output:

**Standards:** SMPTE 259M, SMPTE 305M, DVB-ASI  
**Number of Outputs:** 1 Independent SDI, SDTi or DVB-ASI 270Mb/s signal  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV(nominal).  
**DC Offset:** 0V ± 0.5V  
**Rise and Fall Time:** 900ps(nominal).  
**Overshoot:** < 10% of amplitude.  
**Return Loss:** > 15dB to 270Mb/s.  
**Wide Band Jitter:** < 0.2UI

#### Optical Output:

**Number:** 1  
**Connector:** Female SC/PC, ST/PC or FC/PC  
**Return Loss:** > 14 dB  
**Wideband Jitter:** < 0.2 UI  
**Fiber Size:** 9µm core / 125 µm overall  
**Wavelengths:**  
**Standard:** 1310nm, 1550nm (nominal)  
**CWDM:** 1270nm to 1610nm (See Ordering Information)  
**DWDM:** C-Band (ITU-T G.694.1 compliant) (See Ordering Information)

#### Output Power:

**1310nm FP(Standard):** -7dBm ± 1dBm  
**1550nm & CWDM DFB:** 0dBm ± 1dBm  
**DWDM DFB:** 7dBm ± 1dBm

#### Electrical:

**Voltage:** +12VDC  
**Power:** 12 Watts (Non DWDM), 15 Watts (DWDM)

#### Physical:

**Number of slots:** 2

#### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
**Laser Safety:** Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC directive

#### Ordering Information:

**7707VT13-8** Eight SDI/ASI Mux Fiber Transmitter, 1310nm FP, Laser, VistaLINK®  
**7707VT15-8** Eight SDI/ASI Mux Fiber Transmitter, 1550nm DFB Laser, VistaLINK®

**For CWDM, please refer to the end of the fiber section for ordering information**  
**7707VTxx-8** Eight SDI/ASI Mux Fiber Transmitter, CWDM Laser

**For DWDM, please refer to the end of the fiber section for ordering information**  
**7707VTDyyy-8** Eight SDI/ASI Mux Fiber Transmitter, DWDM Laser

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



## 8 Channel SDI/ASI Fiber Receiver

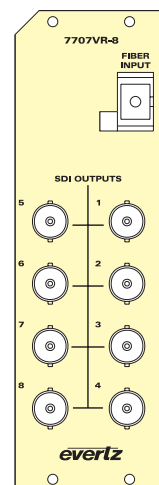
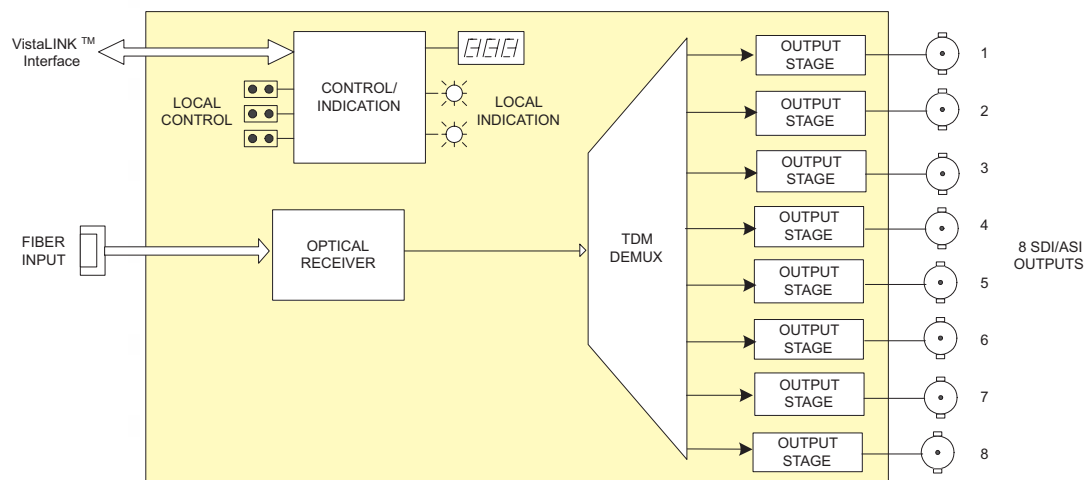
### 7707VR-8



#### Features

- Demultiplexor for eight synchronous or asynchronous 270Mb/s SDI, DVB-ASI or SDTi video signals
- Signal transport over fiber uninterrupted by loss of any input video feed
- Transparently passes embedded AES or any other data in the horizontal or vertical ancillary data space
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Supports single-mode and multi-mode fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range
- SC/PC, ST/PC, FC/PC fiber connectors available

#### 7707VR-8 Block Diagram & Rear Panel



#### Specifications

##### Optical Input:

**Number of Inputs:** 1  
**Connector:** Female SC/PC, ST/PC, FC/PC  
**Return Loss:** >25dB  
**Operating Wavelength:** 1270nm to 1610nm  
**Maximum Input Power:**

**Standard Version:** -1dBm  
**-H Version:** -8dBm

##### Optical Sensitivity

**Standard Version:** -21dBm  
**-H Version:** -28dBm

##### Serial Video Output:

**Standards:** SMPTE 259M, SMPTE 305M, DVB-ASI  
**Number of Outputs:** 8 independent SDI, SDTi or DVB-ASI 270Mb/s signals  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 900ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 15dB up to 270Mb/s  
**Wide Band Jitter:** < 0.2UI

##### Electrical:

**Voltage:** +12VDC  
**Power:** 12 Watts  
**Safety:** CSA Listed to CSA C22.2 No. 60065-03, UL 60065-03

##### EMI/RFI:

IEC 60065-(2001-12) 7th Edition  
 Complies with CE Low voltage Directive 93/68/EEC  
 Complies with FCC regulations for class A devices  
 Complies with EU EMC directive 89/336/EEC

##### Physical:

**Number of slots:** 2

##### Ordering Information:

**7707VR-8** Eight SDI/ASI Demux Fiber Receiver, VistaLINK® Monitoring  
**7707VR-8-H** Eight SDI/ASI Demux Fiber Receiver, High Sensitivity Optical Input, VistaLINK® Monitoring

##### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

##### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

##### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

##### Enclosures:

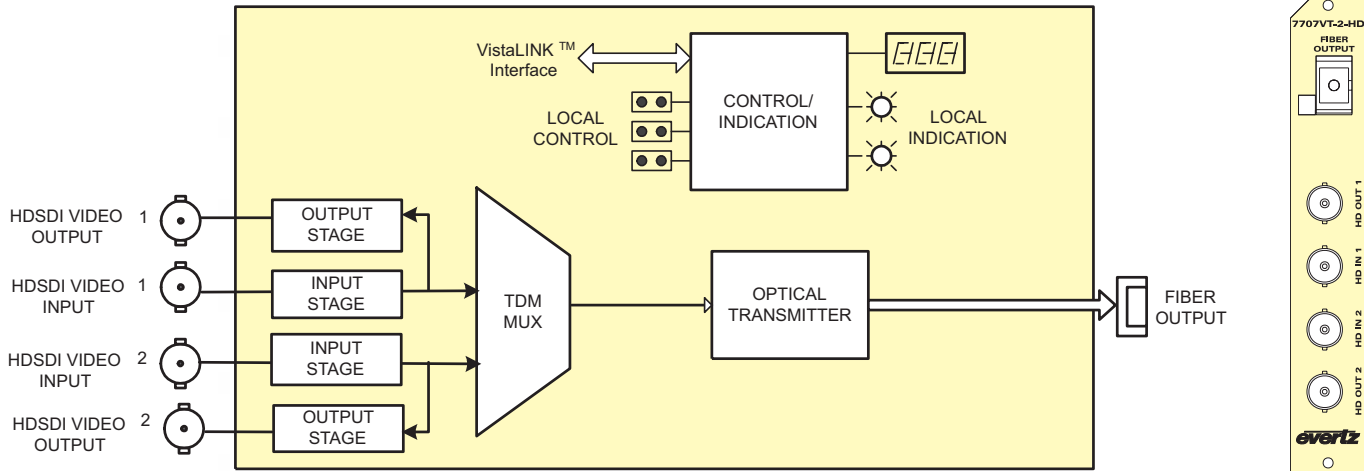
**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



## Features

- Single card multiplexer for two 1.485Gb/s HDSDI video signals
- Signal transport over fiber uninterrupted by loss of any HDSDI, input feed
- Transparently passes embedded AES or any other data in the horizontal or vertical ancillary data space
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Automatic coaxial input equalization up to 100m at 1.485Gb/s
- Fully hot-swappable from front of frame
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- SC/PC, ST/PC, FC/PC connector options
- Occupies one card slot & can be housed in a standalone frame, a 1RU frame holding up to 3 modules or a 3RU frame holding up to 15 modules

## 7707VT-2-HD Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

**Standard:** SMPTE 292M  
**Number of Inputs:** 2 independent HD-SDI signals  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 100m @ 1.485Gb/s with Belden 1694A or equivalent cable  
**Return Loss:** > 15 dB up to 1.485Gb/s

### Serial Video Outputs:

**Standard:** SMPTE 292M  
**Number of Outputs:** 2 independent reclocked HD-SDI outputs  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 270ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** >15dB up to 1.485Gb/s  
**Wide Band Jitter:** < 0.2UI

### Optical Output:

**Number:** 1  
**Connector:** Female SC/PC, ST/PC or FC/PC  
**Return Loss:** > 14 dB  
**Wideband Jitter:** < 0.2 UI  
**Fiber Size:** 9µm core / 125 µm overall  
**Wavelengths:**  
**Standard:** 1310nm, 1550nm  
**CWDM:** 1270nm to 1610nm (See Ordering Information)  
**DWDM:** C-Band (ITU-T G.694.1 compliant) (See Ordering Information)  
**Output Power:**  
**1310nm FP(Standard)** -7dBm ± 1dBm  
**1550nm & CWDM DFB** 0dBm ± 1dBm  
**DWDM DFB** 7dBm ± 1dBm

### Electrical:

**Voltage:** +12VDC  
**Power:** 10 Watts (Non DWDM), 13 Watts (DWDM)

### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
 Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
**Laser Safety:** Complies with FCC Part 15, Class A  
**EMI/RFI:** EU EMC directive

### Ordering Information:

**7707VT13-2-HD** Dual HDSDI Mux Fiber Transmitter, 1310nm FP,  
**7707VT15-2-HD** Dual HDSDI Mux Fiber Transmitter, 1550nm DFB Laser

**For CWDM, please refer to the end of the fiber section for ordering information**  
**7707VTxx-2-HD** Dual HDSDI Mux Fiber Transmitter, CWDM Laser,

**For DWDM, please refer to the end of the fiber section for ordering information**  
**7707VTDyyy-2-HD** Dual HDSDI Mux Fiber Transmitter, DWDM Laser,

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



# Dual HD-SDI Fiber Transmitter

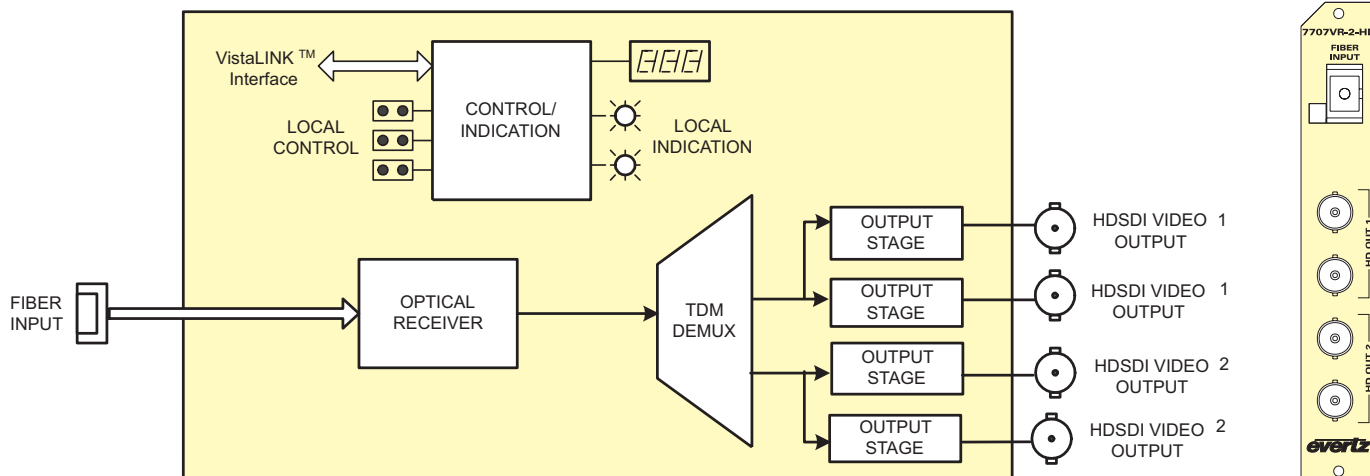
## 7707VR-2-HD



### Features

- Single card demultiplexer for two 1.485Gb/s HDSDI video signals
- Signal transport over fiber uninterrupted by loss of any HDSDI input feed
- Transparently passes embedded AES or any other data in the horizontal or vertical ancillary data space
- Fully hot-swappable from front of frame
- Supports single-mode and multi-mode fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range
- SC/PC, ST/PC, FC/PC connector options
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Occupies one card slot & can be housed in a standalone frame, a 1RU frame holding up to 3 modules or a 3RU frame holding up to 15 modules

### 7707VR-2-HD Block Diagram & Rear Panel



### Specifications

#### Optical Input:

Number of Inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Return Loss:	>25dB
Operating Wavelength:	1270nm to 1610nm
Maximum Input Power:	
Standard Version:	-1dBm
-H Version:	-7dBm
Optical Sensitivity	
Standard Version:	-20dBm
-H Version:	-28dBm

#### Serial Video Outputs:

Standards:	SMPTE 292M
Number of Outputs:	2 sets of 2 independent HD-SDI signals
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	800mV nominal
DC Offset:	0V $\pm$ 0.5V
Rise and Fall Time:	270ps nominal
Overshoot:	<10% of amplitude
Return Loss:	>15dB up to 1.485Gb/s
Wide Band Jitter:	< 0.2UI

#### Electrical:

Voltage:	+12VDC
Power:	10 Watts

#### Physical:

Number of slots:	1
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### Ordering Information:

7707VR-2-HD	Dual HD-SDI Fiber Receiver, VistaLINK® Monitoring
7707VR-2-HD-H	Dual HD-SDI Fiber Receiver, High Sensitivity Optical Input, VistaLINK® Monitoring

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure



The 7707MT Multi-Signal Fiber Transmitter is a VistaLINK® - capable, fiber transmitter for SDI Video, AES Audio, RS422 control and GPI/O. This single card module transports one uni-directional SDI Video, two uni-directional AES Audio, one bi-directional RS422 and two bi-directional GPI's and GPO's. These signals are combined using Time Domain Multiplex (TDM) technology and transmitted over a single fiber. The companion 7707MR Multi-Signal Fiber Receiver demultiplexes the signals and converts them back to their original formats. The 7707MT and companion 7707MR will transparently pass incoming SDI video feeds with embedded AES audio or any other data in the horizontal or vertical ancillary data space. Minimal Audio to Video latency over the transport interface is also achieved.

The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm, CWDM and DWDM transmission schemes.

The 7707MT occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

## Features

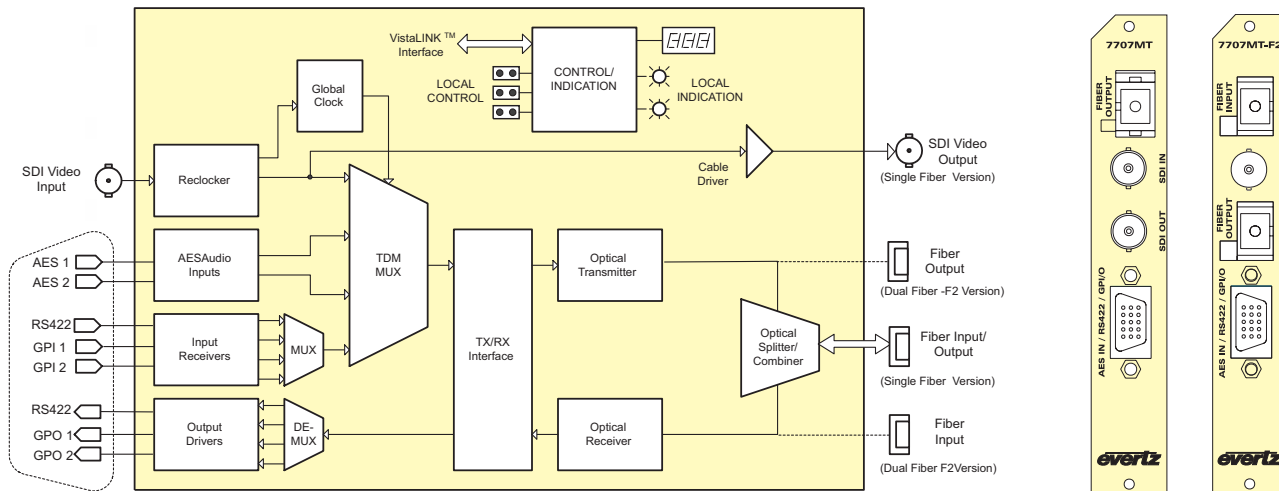
- SDI Video, 2 AES Audio, 1 bi-directional RS-232/422 and 2 GPI/O fiber optic transmitter
- Supports 525 or 625 line 4:2:2 component SDI signals
- Supports SDTi signals
- Supports 32, 44.1, 48 kHz AES audio inputs
- Dolby E compatible
- Supports bi-directional RS422 signals at baud rates up to 3 Mb/s
- AES audio inputs can be synchronous or asynchronous to each other and/or to input video
- Reclocked SDI output for additional signal distribution
- Signal transport over fiber uninterrupted by loss of input SDI, AES, Serial Data or GPI/O feeds
- Low Audio to Video latency over transport interface
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Local display of optical signal strength, video, audio, and data presence, video and AES formats, EDH errors, GPI and GPO status
- Automatic coaxial input equalization to 300m at 270Mb/s (Belden 1694A)
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Bi-directional optical input/output
- Accepts any wavelength in the 1270nm to 1610nm range
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Supports multi-mode and single mode fiber optic cable

## 7707MT Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<3km	7707MT13-F2	-7dBm	7707MR13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	2	21dB/60km	7707MT13-F2	-7dBm	7707MR13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	1(WDM)	25dB/71km	7707MT15-W	-1dBm	7707MR13M-W	-26dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	24dB/96km**	7707MTxx-F2	0dBm	7707MRyy-F2	-28dBm	Different CWDM wavelengths on Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	30dB/120km***	7707MTDxxx-F2	+7dBm	7707MRDyyy-F2	-28dBm	Different DWDM wavelengths on Tx & Rx, with 8 channel DWDM Mux/Demux***
** Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB			Fiber loss= 0.35/0.25dB per km @1310nm/1550nm				
***Assumes 8 Ch DWDM Mux/Demux loss of 5dB							



## 7707MT Block Diagram & Rear Panels



### Specifications

#### Serial Video Input:

Standard:	SMPTE 259M-C, SMPTE 305M
Connector:	1 BNC per IEC 60169-8 Amendment 2
Equalization:	Automatic to 300m @ 270 Mb/s with Belden 1694A or equivalent cable
Return Loss:	> 15 dB up to 270 Mb/s

#### Serial Video Output (Not available on dual fiber -F2' version):

Number of Outputs:	1 Per Card reclocked
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	800mV nominal
DC Offset:	0V $\pm$ 0.5V
Rise and Fall Time:	900ps nominal
Overshoot:	< 10% of amplitude
Return Loss:	> 15 dB at 270 Mb/s
Wide Band Jitter:	< 0.2 UI

#### AES Audio Inputs:

Standard:	SMPTE 276M
Unbalanced:	AES3-1992
Balanced:	Dolby E compatible
Other:	2 Jumper selectable for balanced or unbalanced input)
Number of Inputs:	2
Connector:	4 pins on female high density DB-15
Signal Level:	1V p-p $\pm$ 0.1V
Unbalanced:	2 to 7Vp-p with Level Jumper set to HI, 1 to 2Vp-p with level jumper set to LO
Balanced:	500m @ 48kHz with Belden 1800B or equivalent cable
Equalization:	Up to 24 bits
Resolution:	32, 44.1, 48 kHz
Sampling Rate:	< 20ns
Intrinsic Jitter:	
Impedance:	
Unbalanced:	75 $\Omega$
Balanced:	110 $\Omega$

#### Serial Data Ports:

Number of Ports:	1 RS-422 or 2 RS-232 - Jumper Selectable
Connector:	4 pins (plus ground) on female high density DB-15
Baud Rate:	Up to 3 Mb/s (Determined by incoming data)

#### General Purpose Inputs:

Number of Inputs:	2
Type:	Opto-isolated, active low with internal pull-ups to +5V or +12V (jumper selectable)
Connector:	2 pins (plus ground) on female high density DB-15
Signal Drive Level:	Open or closure to ground

#### General Purpose Outputs:

Number of Outputs:	2
Type:	"Dry Contact" relay closure
Connector:	2 pins per output on female high density DB-15
Signal Level:	Normally Closed or Normally Open (jumper settable)

#### Optical Input/Output:

Number:	1 (Single fiber version) 2 (Dual fiber -F2' version)
Connector:	Female SC/PC, ST/PC or FC/PC
Return Loss:	> 20dB
Rise and Fall Time:	200ps nominal
Maximum Input Power:	0 dBm
Input Wavelengths:	1270nm to 1610nm
Input Optical Sensitivity:	See Application Configurations Chart
Output Wavelengths:	See Ordering Information
Output Power:	See Application Configurations Chart

### System Performance (7707MT + 7707MR):

Video Input To Output Delay:	< 1.5 $\mu$ s
Audio to Video delay:	< 1 $\mu$ s with SoftSwitch™ disabled on 7707MR < 2ms with SoftSwitch™ enabled on 7707MR
Electrical:	
Voltage:	+12VDC
Power:	12 Watts (Non DWDM), 14 Watts (DWDM)

#### Physical:

Number of slots:	1
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#### Compliance:

Electrical Safety:	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive Class 1 laser product Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
Laser Safety:	Complies with FCC Part 15, Class A EU EMC directive
EMI/RFI:	

#### Ordering Information:

7707MT13-F2	SDI, 2 AES, Bi-directional RS232/422, GPI/O Fiber Transmitter dual fiber, 1310nm FP TX & RX, VistaLINK®
7707MT15-W	SDI, 2 AES, Bi-directional RS232/422, GPI/O Fiber Transmitter single fiber, WDM, 1550nm FP TX, RX on 1310nm, VistaLINK®

#### For CWDM, please refer to the end of the fiber section for ordering information

7707MTxx-F2	SDI, 2 AES, Bi-directional RS232/422, GPI/O Fiber Transmitter dual fiber, CWDM TX, VistaLINK®
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#### For DWDM, please refer to the end of the fiber section for ordering information

7707MTDyyy-F2	SDI, 2 AES, Bi-directional RS232/422, GPI/O Fiber Transmitter dual fiber, DWDM Laser, VistaLINK®
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#### Ordering Options

7707MX-BHP-15	Bulkhead Breakout Panel for 15 x 7707MT cards (includes 15 3 ft. cables)
7707MX-BHP-15-B	Bulkhead Breakout Panel for 15 x 7707MT cards (includes 15 3 ft. cables) for balanced audio only
7707MX-BHP-1	Bulkhead Breakout Panel for 1 x 7707MT card (includes 1 3 ft cable)

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

#### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure



The 7707MR Multi-Signal Fiber Receiver is a VistaLINK® - enabled fiber optic receiver for SDI Video, AES Audio, RS422 control, and GPI/O signals. This single card module demultiplexes one uni-directional SDI Video, two uni-directional AES Audio, one bi-directional RS422 and two bi-directional GPI's and GPO's that have been Time Domain Multiplexed (TDM) by the companion 7707MT Multi-Signal Fiber Transmitter module. Evertz patent pending SoftSwitch™ technology is applied to the received signal to ensure virtually glitch free AES Audio output signals when upstream SDI or AES feeds are switched. The 7707MR and companion 7707MT will transparently pass incoming SDI video feeds with embedded AES audio or any other data in the horizontal or vertical ancillary data space. Minimal Audio to Video latency over the transport interface is also achieved.

The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm, CWDM and DWDM transmission schemes.

The 7707MR occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3 RU frame which will hold up to 15 modules and a standalone enclosure which will hold 1 module.

## Features

- SDI Video, 2 AES Audio, 1 bi-directional RS232/422 and 2 GPI/O fiber optic receiver
- Supports 525 or 625 line 4:2:2 component SDI signals
- Supports SDTi signals
- Supports 32, 44.1, 48 kHz AES audio
- Dolby E compatible
- Supports bi-directional RS422 rates up to 3 Mb/s
- Incorporates Evertz SoftSwitch™ (Patent Pending) technology for virtually glitch-free AES Audio outputs when upstream SDI or AES feeds are switched
- User selectable SoftSwitch™ bypass
- Minimal Audio to Video latency
- Output AES "Mute" on loss of fiber optic input signal or AES feed to upstream 7707MT multiplexer
- Output Video "Black" or "Blue" (selectable) on loss of video input signal
- Signal transport over fiber uninterrupted by loss of input SDI, AES, Serial Data or GPIO feeds
- SDI video regeneration for jitter removal
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Local display of optical signal strength, video, audio and data presence, video and AES formats, EDH errors, GPI and GPO status
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Bi-directional optical input/output
- Accepts any wavelength in the 1270nm to 1610nm range
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Supports single-mode and multi mode fiber optic cable

## 7707MR Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<3km	7707MR13-F2	-7dBm	7707MT13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	2	21dB/60km	7707MR13-F2	-7dBm	7707MT13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	1(WDM)	25dB/71km	7707MR13M-W	-1dBm	7707MT15-W	-26dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	24dB/96km**	7707MRyy-F2	0dBm	7707MTxx-F2	-28dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	30dB/120km***	7707MRDyyy-F2	+7dBm	7707MTDxxx-F2	-28dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux***

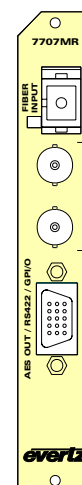
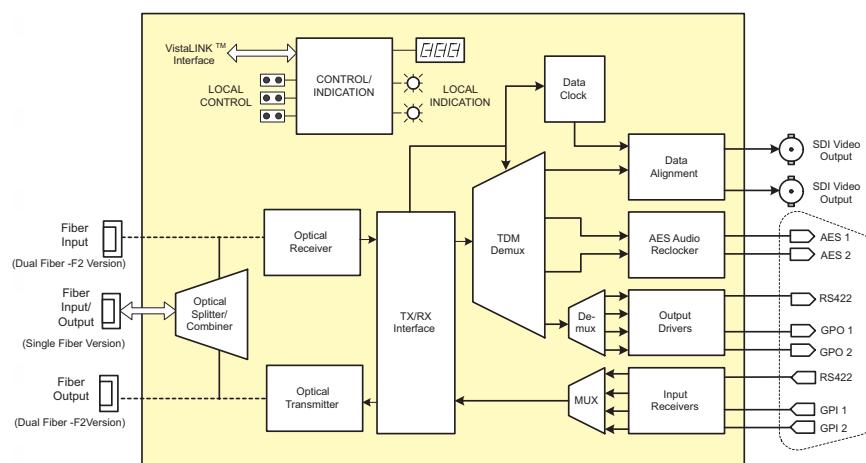
\*\* Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB

\*\*\*Assumes 8 Ch DWDM Mux/Demux loss of 5dB

Fiber loss= 0.35/0.25dB per km @1310nm/1550nm



## 7707MR Block Diagram & Rear Panel



### Specifications

#### Optical Input/Output:

**Number:** 1 (Single fiber version)  
2 (Dual fiber - F2 version)  
**Connector:** Female SC/PC, ST/PC or FC/PC  
**Return Loss:** > 20dB  
**Rise and Fall Time:** 200ps nominal  
**Maximum Input Power:** 0 dBm  
**Input Wavelengths:** 1270nm - 1610nm  
**Input Optical Sensitivity:** See Application Configuration Chart  
**Output Wavelengths:** See Ordering Information  
**Output Power:** See Application Configuration Chart

#### Serial Video Outputs:

**Number of Outputs:** 2 regenerated (1 output on -F2 versions)  
**Standard:** SMPTE 259M-C  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V  $\pm$ 0.5V  
**Rise and Fall Time:** 900ps nominal  
**Overshoot:** < 10% of amplitude  
**Return Loss:** > 15 dB at 270 Mb/s  
**Wide Band Jitter:** < 0.15 UI

#### AES Audio Outputs:

**Standard:** SMPTE 276M  
**Unbalanced AES:** AES3-1992  
**Balanced:** Dolby E compatible  
**Other:** 2 regenerated (Jumper selectable for balanced or unbalanced)  
**Number of Outputs:** 4 pins on female high density DB-15  
**Connector:** Unbalanced - 1 Vp-p, Balanced - 5 Vp-p  
**Signal Level:** Up to 24 bits  
**Resolution:** 32, 44.1, 48 kHz  
**Sampling Rate:** < 20ns  
**Intrinsic Jitter:** Unbalanced - 75 $\Omega$   
**Impedance:** Balanced - 110 $\Omega$

#### Serial Data Ports:

**Number of Ports:** 1 RS-422 or 2 RS-232 - Jumper Selectable  
**Connector:** 4 pins (plus ground) on female high density DB-15  
**Baud Rate:** Up to 3 Mb/s RS-422 (Determined by incoming data)

#### General Purpose Inputs:

**Number of Inputs:** 2  
**Type:** Opto-isolated, active low with internal pull-ups to +5V or +12V (jumper selectable)  
**Connector:** 2 pins (plus ground) on female high density DB-15  
**Signal Drive Level:** Open or closure to ground

#### General Purpose Outputs:

**Number of Outputs:** 2  
**Type:** "Dry Contact" relay closure  
**Connector:** 2 pins per output on female high density DB-15  
**Signal Level:** Normally Closed or Normally Open (jumper settable)

#### System Performance (7707MR + 7707MT):

**Video Input To Output Delay:** <1.5  $\mu$ s  
**Audio to Video delay:** < 1 $\mu$ s with SoftSwitch™ disabled  
< 2ms with SoftSwitch™ enabled

#### Electrical:

**Voltage:** +12VDC  
**Power:** 12 Watts (Non DWDM)  
14 Watts (DWDM)

#### Physical:

**Number of slots:** 1

#### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
Complies with CE Low voltage Directive  
Class 1 laser product  
Complies with 24 CFR 1040.10 and 1040.11  
IEC 60825-1  
**Laser Safety:** Complies with FCC Part 15, Class A  
EU EMC directive

#### EMI/RFI:

**Ordering Information:**  
**7707MR13-F2** SDI, 2 AES, Bi-directional RS232/422, GPI/O Fiber Receiver, dual fiber, 1310nm FP TX & RX, VistaLINK®  
**7707MR13M-W** SDI, 2 AES, Bi-directional RS232/422, GPI/O Fiber Receiver, single fiber, WDM, 1310nm FP TX, RX on 1550nm, VistaLINK®

#### For CWDM, please refer to the end of the fiber section for ordering information

**7707MRxx-F2** SDI, 2 AES, Bi-directional RS232/422, GPI/O Fiber Receiver, dual fiber, CWDM TX, VistaLINK®

#### For DWDM, please refer to the end of the fiber section for ordering information

**7707MRDydy-F2** SDI, 2 AES, Bi-directional RS232/422, GPI/O Fiber Receiver, dual fiber, DWDM Laser, VistaLINK®

#### Ordering Options

**7707MX-BHP-15** Bulkhead Breakout Panel for 15 x 7707MR cards (includes 15 3 ft. cables)  
**7707MX-BHP-15-B** Bulkhead Breakout Panel for 15 x 7707MR cards (includes 15 3 ft. cables) for balanced audio only  
**7707MX-BHP-1** Bulkhead Breakout Panel for 1 x 7707MR card (includes 1 3ft cable)

Rear Plate and Fiber Connector must be specified at time of order

Eg: Model +SC +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



The 7707MB is a VistaLINK® - capable fiber optic transceiver for SDI Video, AES Audio, RS232/422 and GPI/O signals. This single card module transports one bi-directional SDI Video, two bi-directional AES Audio, one bi-directional RS-232/422 and two bi-directional GPI/Os over a single or dual fiber optic cable.

The 7707MB will transparently pass incoming SDI video feeds with embedded AES audio or any other data in the horizontal or vertical ancillary data space. Minimal Audio to Video latency over the transport interface is also achieved.

The fiber output is available in 1310nm, 1550nm, CWDM and DWDM wavelengths.

The 7707MB can be housed in either a 1RU frame which will hold up to 3 modules, or a 3RU frame which will hold up to 15 modules or a stand-alone enclosure which will hold 1 module.

### Features

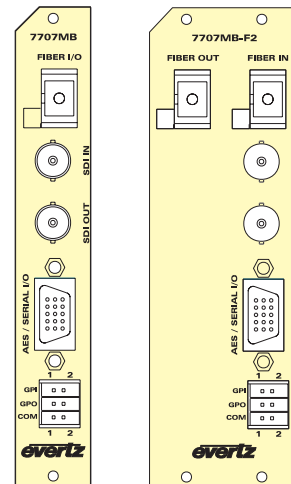
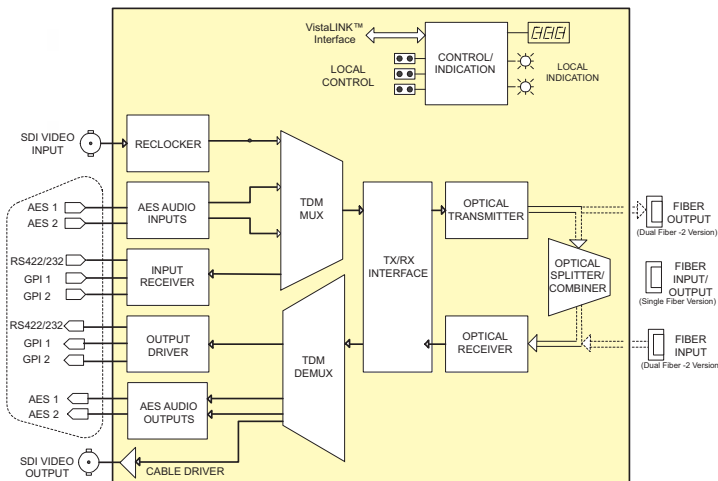
- Bi-directional fiber optic transceiver for 1 SDI Video, 2 AES Audio, 1 RS-232/422 and 2 GPI/O
- Supports 525 or 625 line 4:2:2 component SDI signals
- Supports 32, 44.1, 48 kHz AES audio
- Dolby E compatible
- Supports bi-directional RS422 rates up to 3 Mb/s
- Low Audio to Video latency
- Signal transport over fiber uninterrupted by loss of input SDI, AES or Serial Data feeds
- Built-in jitter attenuation
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Local display of optical signal strength, video, audio, data presence, video and AES formats and EDH errors
- Fully hot-swappable from front of frame with no fiber disconnect/reconnect required
- Bi-directional optical input/output
- Accepts any wavelength in the 1270nm to 1610nm range
- Optical output wavelengths of 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Supports single-mode and multi-mode fiber optic cable

### 7707MB Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<3km	7707MB13-F2	-7dBm	7707MB13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	2	21dB/60km	7707MB13-F2	-7dBm	7707MB13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	1(WDM)	25dB/71km	7707MB13M-W	-1dBm	7707MB15-W	-26dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	24dB/96km**	7707MBxx-F2	0dBm	7707MByy-F2	-28dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	30dB/120km***	7707MBDxxx-F2	7dBm	7707MBDyyy-F2	-28dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux***
** Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB ***Assumes 8 Ch DWDM Mux/Demux loss of 5dB*							Fiber loss= 0.35/0.25dB per km @1310nm/1550nm



### 7707MB Block Diagram & Rear Panels



#### Specifications

##### Serial Video Input:

**Standard:** SMPTE 259M-C, 525 or 625 line component, SMPTE 305M  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 250m @ 270 Mb/s with Belden 8281 or equivalent cable  
**Return Loss:** > 15 dB up to 270 Mb/s

##### Serial Video Output:

**Number of Outputs:** 1  
**Standard:** SMPTE 259M-C, SMPTE 305M  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 900ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** >15 dB at 270 Mb/s  
**Wide Band Jitter:** <0.2 UI

##### Optical Input/Output:

**Number:** 1 (single fiber version)  
 2 (dual fiber -F2 version)  
**Connector:** Female SC/PC, ST/PC or FC/PC  
**Return Loss:** > 14dB  
**Maximum Input Power:** 0 dBm  
**Input Wavelength:** 1270nm to 1610nm  
**Input Optical Sensitivity:** See Application Configurations Chart  
**Output Jitter:** < 0.2 UI  
**Output Wavelengths:** See Ordering Information  
**Output Power:** See Application Configurations Chart

##### AES Audio Inputs:

**Standard:** SMPTE 276M  
**Unbalanced AES:** AES3-1992  
**Balanced:** AES3-1992  
**Other:** Dolby E compatible  
**Number of Inputs:** 2 (Jumper selectable for balanced or unbalanced)  
**Connector:** 4 pins on female high density DB-15  
**Signal Level:** 1Vp-p ±0.1V  
**Unbalanced:** 2 to 7Vp-p with Level Jumper set to HI, 1 to 2Vp-p with level jumper set to LO  
**Balanced:** 300m @ 48kHz with Belden 1800B or equivalent cable  
**Resolution:** Up to 24 bits  
**Sampling Rate:** 32, 44.1, 48 kHz  
**Impedance:** Unbalanced - 75 Ω, Balanced - 110 Ω

##### AES Audio Outputs:

**Standard:** SMPTE 276M  
**Unbalanced:** AES3-1992  
**Balanced:** AES3-1992  
**Other:** Dolby E compatible  
**Number of Outputs:** 2 regenerated (Jumper selectable for balanced or unbalanced)  
**Connector:** 4 pins on female high density DB-15  
**Signal Level:** 1Vp-p  
**Unbalanced:** 5Vp-p  
**Balanced:** Up to 24 bits  
**Resolution:** 32, 44.1, 48 kHz  
**Sampling Rate:** < 20ns  
**Intrinsic Jitter:** Unbalanced - 75Ω, Balanced - 110Ω  
**Impedance:** Unbalanced - 75Ω, Balanced - 110Ω

##### General Purpose Inputs:

**Number of Inputs:** 2  
**Type:** Opto-isolated, active low with internal pull-ups to +5V or +12V (jumper selectable)  
**Connector:** 6 pin removable terminal block  
**Signal Drive Level:** Open or closure to ground

##### General Purpose Outputs:

**Number of Outputs:** 2  
**Type:** "Dry Contact" relay closure  
**Connector:** 6 pin removable terminal block  
**Signal Level:** Normally Closed or Normally Open (jumper settable)

##### Serial Data Port:

**Number of Ports:** 1 RS-422 or 2 RS-232 - Jumper Selectable  
**Connector:** 4 pins (plus ground) on female high density DB-15  
**Baud Rate:** Up to 3 Mb/s RS-422 (Determined by incoming data)

##### System Performance: (7707MB pair)

**Video Input To Output Delay:** <2 μs  
**Audio to Video delay:** < 1μs

##### Electrical:

**Voltage:** +12VDC  
**Power:** 12 Watts (Non-DWDM)  
 14 Watts (DWDM)

##### Physical:

**Number of slots:** 1 (7707MB)  
 2 (7707MB-F2)

##### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
**Laser Safety:** Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC directive

##### Ordering Information:

**7707MB13M-W** Bi-directional SDI, 2 AES, RS232/422, GPI/O Fiber Transceiver, single fiber, WDM, 1310nm FP TX, RX on 1550nm, VistaLINK® use with 7707MB15-W  
**7707MB15-W** Bi-directional SDI, 2 AES, RS232/422, GPI/O Fiber Transceiver, single fiber, WDM, 1550nm DFB TX, RX on 1310nm, VistaLINK® use with 7707MB13M-W  
**7707MB13-F2** Bi-directional SDI, 2 AES, RS232/422, GPI/O Fiber Transceiver, dual fiber, 1310nm FP TX & RX, VistaLINK®

##### For CWDM, please refer to the end of the fiber section for ordering information

**7707MBxx-F2** Bi-directional SDI, 2 AES, RS232/422, GPI/O Fiber Transceiver, dual fiber, CWDM TX, VistaLINK®

##### For DWDM, please refer to the end of the fiber section for ordering information

**7707MBDyyy-F2** Bi-directional SDI, 2 AES, RS232/422, GPI/O Fiber Transceiver, dual fiber, DWDM Laser, VistaLINK®

##### Ordering Options:

**7707MB-BHP-15** Bulkhead Breakout Panel for 15 x 7707MB cards (includes 15 3 ft. cables)  
**7707MB-BHP-15-B** Bulkhead Breakout Panel for 15 x 7707MB cards (includes 15 3 ft. cables) for balanced audio only  
**7707MX-BHP-1** Bulkhead Breakout Panel for 1 x 7707MB card (includes 1 3ft cable)

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

##### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

##### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

##### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure

### Features

- Operation from 19.4Mb/s to 1.5Gb/s
  - Reclocking for SMPTE 292M (1.485Gb/s)
  - Non-reclocking mode for all other rates from 19.4 Mb/s to 1.5Gb/s including SMPTE 259M, SMPTE 305M, SMPTE 310M, M2S, DVB-ASI, etc.
- Supports single-mode and multi-mode fiber optic cable
- Fully hot swappable from front of frame with no fiber or BNC disconnect/reconnect required
- Can be housed in either a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone frame which will hold 1 module
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.

- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

### Input:

- Automatic input cable equalization to 130m (Belden 1694A)

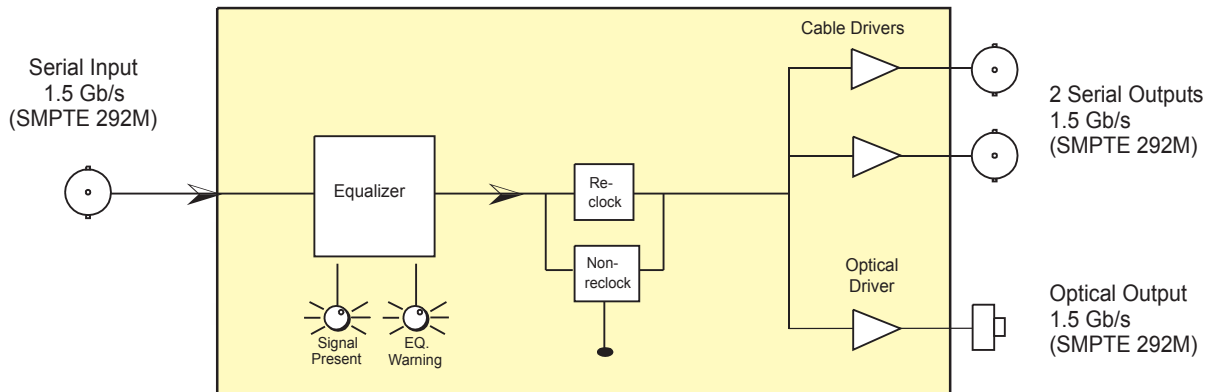
### Outputs:

- Two serial digital BNC outputs for loop-through or monitoring
- One fiber output available in 1310nm or 1550nm
- Wideband Jitter < 0.2 UI (reclocked)
- SC/PC, ST/PC, FC/PC connector options

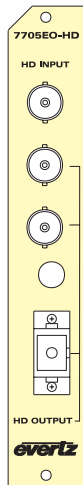
### Status LEDs:

- Signal presence indication
- Maximum equalization warning indication
- Module status indication

### 7705EO-HD Block Diagram & Rear Panel



\*Note: Non-reclock Mode will operate 19.4 Mb/s to 1.5 Gb/s.



### Specifications

#### Standards:

SMPTE 292M, 259M, 297M, 305M, 310M, M2S, DVB-ASI, DVB-SSI, and other bi-level Telecom/Datacom rates from 19.4Mb/s to 1.5Gb/s

#### Serial Video Input:

Connector: 1 BNC per IEC 60169-8 Amendment 2  
 Equalization: Automatic to 130m with Belden 1694A (or equivalent)  
 Return Loss: >15dB to 1GHz, >12dB to 1.5GHz

#### Serial Video Outputs:

Number of Outputs: 2 Reclocked outputs  
 Connector: BNC per IEC 60169-8 Amendment 2  
 Signal Level: 800mV nominal  
 DC Offset: 0V ± 0.5V  
 Rise and Fall Time: 200ps nominal  
 Overshoot: <10% of amplitude  
 Return Loss: >15dB to 1GHz, >12dB to 1.5GHz  
 Jitter: <0.2 UI Reclocked

#### Optical Outputs:

Number of Outputs: 1  
 Connector: SC/PC, ST/PC, FC/PC female housing  
 Return Loss: > 14dB  
 Rise and Fall Time: 270ps nominal  
 Jitter: < 0.2 UI (reclocked)  
 Nominal Wavelength: 1310nm, 1550nm

#### Optical Power:

1310nm FP -7dBm ± 1dBm  
 1310nm/1550nm DFB 0 dBm ± 1dBm

#### Electrical:

Voltage: +12V DC  
 Power: 6 Watts  
 Safety: Complies with EU safety Directive  
 EMI/RFI: Complies with FCC Part 15, Class A  
 EU EMC Directive

#### Physical:

Number of Slots: 1

### Compliance:

#### Electrical Safety:

CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
 Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1

#### Laser Safety:

#### EMI/RFI:

Complies with FCC Part 15, Class A  
 EU EMC directive

### Ordering Information:

7705EO13-HD HDTV Electrical to Optical Converter, 19.4Mb/s to 1.5 Gb/s, 1310nm, FP Laser  
 7705EO13-HD-L HDTV Electrical to Optical Converter, 19.4Mb/s to 1.5 Gb/s, 1310nm, DFB Laser  
 7705EO15-HD HDTV Electrical to Optical Converter, 19.4Mb/s to 1.5 Gb/s, 1550nm, DFB Laser

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

#### Rear Plate Suffix

+3RU 3RU Rear Plate for use with 7700FR-C Multiframe  
 +1RU 1RU Rear Plate for use with 7701FR Multiframe  
 +SA Standalone Enclosure Rear Plate

#### Connector Suffix

+SC SC/PC  
 +ST ST/PC  
 +FC FC/PC

### Fiber Optic Patch Cable:

CB-FP1M-SCPC Single mode fiber cable, 1m, SC/PC male termination  
 CB-FP1M-STPC Single mode fiber cable, 1m, ST/PC male termination  
 CB-FP5M-SCPC Single mode fiber cable, 5m, SC/PC male termination  
 CB-FP5M-STPC Single mode fiber cable, 5m, ST/PC male termination  
 CB-FP10M-SCPC Single mode fiber cable, 10m, SC/PC male termination  
 CB-FP10M-STPC Single mode fiber cable, 10m, ST/PC male termination

### Enclosures:

7700FR-C 3RU Multiframe which holds 15 modules  
 7701FR 1RU Multiframe which holds 3 modules  
 S7701FR Standalone enclosure



### Features

- Operation from 19.4Mb/s to 1.5Gb/s
  - Reclocking for SMPTE 292M (1.485Gb/s)
  - Non-reclocking mode for all other rates from 19.4 Mb/s to 1.5Gb/s including SMPTE 259M, SMPTE 305M, SMPTE 310M, M2S, DVB-ASI, etc.
- Supports single-mode and multi-mode fiber optic cable
- Fully hot swappable from front of frame with no fiber or BNC disconnect/reconnect required
- Can be housed in either a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone frame which will hold 1 module
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.

- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

### Input:

- Optical input range from 1270nm to 1610nm
- Input sensitivity up to -23dBm
- SC/PC, ST/PC, FC/PC connector options

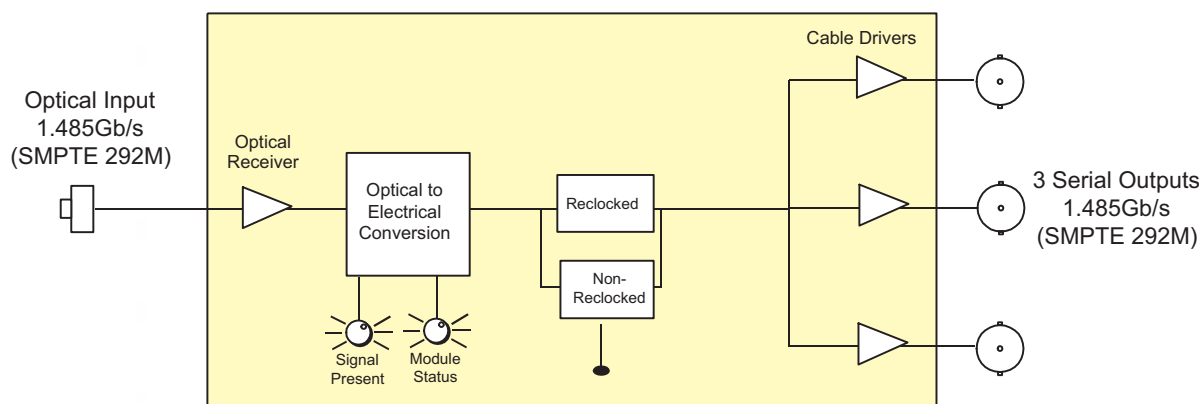
### Outputs:

- Three serial digital BNC outputs for fan-out, loop-through or monitoring
- Wideband Jitter < 0.2 UI (reclocked)

### Status LEDs:

- Signal presence indication
- Module status indication

### 7705OE-HD Block Diagram & Rear Panel



### Specifications

#### Standard:

SMPTE 292M, 259M, 297M, 305M, 310M, M2S, DVB-ASI, and other Telecom/Datacom standards involving data rates from 19.4Mb/s to 1.5Gb/s

#### Optical Input:

Number of Inputs: 1  
 Connector: SC/PC, ST/PC, FC/PC Female housing  
 Operating Wavelength: 1270nm to 1610nm  
 Maximum Input Power: -1dBm  
 Optical Sensitivity: -23dBm

#### Serial Video Outputs:

Number of Outputs: 3 Reclocked outputs  
 Connector: BNC per IEC 60169-8 Amendment 2  
 Signal Level: 800mV nominal  
 DC Offset: 0V ± 0.5V  
 Rise and Fall Time: 270ps nominal  
 Overshoot: <10% of amplitude  
 Return Loss: >15dB to 1GHz, >12dB to 1.5GHz  
 Jitter: <0.2UI Reclocked

#### Electrical:

Voltage: +12V DC  
 Power: 6 Watts  
 EMI/RFI: Complies with FCC Part 15, Class A  
 EU EMC Directive

#### Physical:

Number of Inputs: 1

### Ordering Information:

**7705OE-HD** HDTV Optical to Electrical Converter, 19.4Mb/s to 1.5 Gb/s

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

### Fiber Optic Patch Cable:

**CB-FP1M-SCPC** Single mode fiber cable, 1m, SC/PC male termination  
**CB-FP1M-STPC** Single mode fiber cable, 1m, ST/PC male termination  
**CB-FP5M-SCPC** Single mode fiber cable, 5m, SC/PC male termination  
**CB-FP5M-STPC** Single mode fiber cable, 5m, ST/PC male termination  
**CB-FP10M-SCPC** Single mode fiber cable, 10m, SC/PC male termination  
**CB-FP10M-STPC** Single mode fiber cable, 10m, ST/PC male termination

### Enclosures:

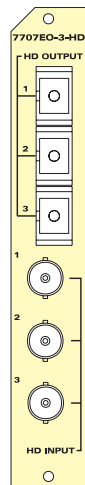
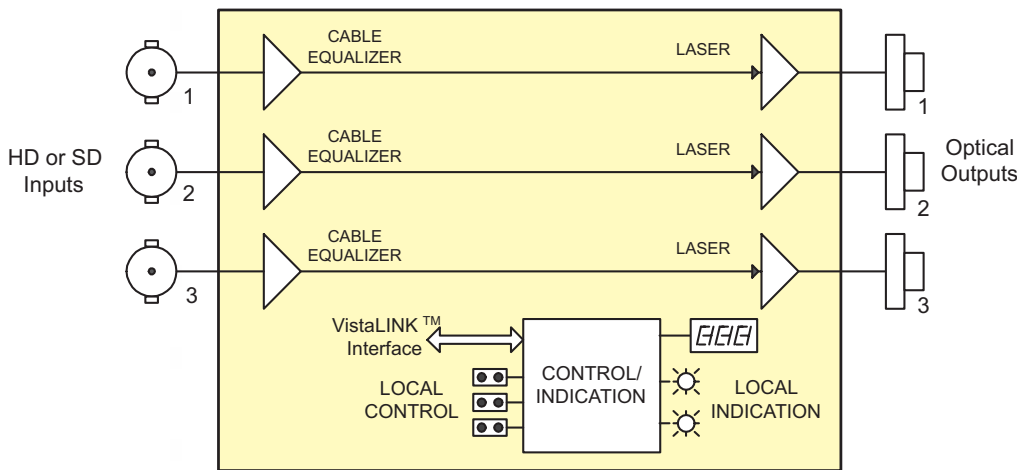
**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



### Features

- Three independent channels of electrical to optical conversion that support all SMPTE 292M standards at 1.485Gb/s.
- Supports all SMPTE 259M standards with operation from 143Mb/s - 360Mb/s.
- Supports additional standards of SMPTE 305M (SDTi), SMPTE 310M (19.4Mb/s), SMPTE 344M (540Mb/s), M2S and DVB-ASI (270Mb/s).
- Automatic cable equalization to 300m @ 270 Mb/s and 75m @ 1.485 Gb/s with Belden 1694A (or equivalent) cable
- Fully hot swappable from front of frame, with no fiber or BNC disconnect /reconnect required.
- High density - accommodates up to 45 independent channels of optical conversion, in a single 3RU frame
- Can be housed in either a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone which will hold 1 module
- Signal and card status monitoring via four-digit card-edge display, or remotely through SNMP and VistaLINK® available
- Detection and display of input cable length
- Supports single-mode and multi-mode fiber optic cable
- SC/PC, ST/PC or FC/PC connector options
- Tally output on Frame Status bus upon loss of input signal
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

### 7707EO-3-HD Block Diagram & Rear Panels



### Specifications

#### Standards:

SMPTE 292M, SMPTE 259M A, B, C, D, SMPTE 297M, SMPTE 305M, SMPTE 310M, SMPTE 344M, M2S, DVB-ASI

#### Serial Video Input:

**Number of Inputs:** 3 (independent channels)  
**Connector:** 3 BNC inputs per IEC 169-8  
**Equalization:** Automatic to 75m@ HD (1.485Gb/s) and 300m@ SD(270Mb/s) with Belden 1694A (or equivalent)  
**Return Loss:** >14dB up to 1.5Gb/s

#### Optical Outputs:

**Number of Outputs:** 3 (independent channels)  
**Connector:** SC/PC, ST/PC, FC/PC female housing  
**Return Loss:** >14dB  
**Rise/Fall Time:** 270ps nominal  
**Jitter:** <0.2UI  
**Nominal Wavelength:** 1310nm, 1550nm  
**Optical Power:** -7dBm ±1dBm @1310nm, 0dBm ±1dBm @1550nm

#### Electrical:

**Voltage:** +12V DC  
**Power:** 6 Watts

#### Physical:

**Number of Slots:** 1

#### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
 Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
**Laser Safety:** Complies with FCC Part 15, Class A  
**EMI/RFI:** EU EMC directive

### Ordering Information:

**7707EO13-3-HD** Triple HD or SD Electrical to Optical Converter, 19.4Mb/s or 143Mb/s -1.485Gb/s, 1310nm FP laser, VistaLINK®  
**7707EO15-3-HD** Triple HD or SD Electrical to Optical Converter, 19.4Mb/s or 143Mb/s -1.485Gb/s, 1550nm FP laser, VistaLINK®

### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
 Eg. Model +3RU +SC

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

### Fiber Optic Patch Cable:

**CB-FP1M-SCPC** Single mode fiber cable, 1m, SC/PC male termination  
**CB-FP1M-STPC** Single mode fiber cable, 1m, ST/PC male termination  
**CB-FP5M-SCPC** Single mode fiber cable, 5m, SC/PC male termination  
**CB-FP5M-STPC** Single mode fiber cable, 5m, ST/PC male termination  
**CB-FP10M-SCPC** Single mode fiber cable, 10m, SC/PC male termination  
**CB-FP10M-STPC** Single mode fiber cable, 10m, ST/PC male termination

### Enclosures:

**7700FR-C** 3RU Multiframe, which holds 15 modules  
**7701FR** 1RU Multiframe, which holds 3 modules  
**S7701FR** Standalone enclosure



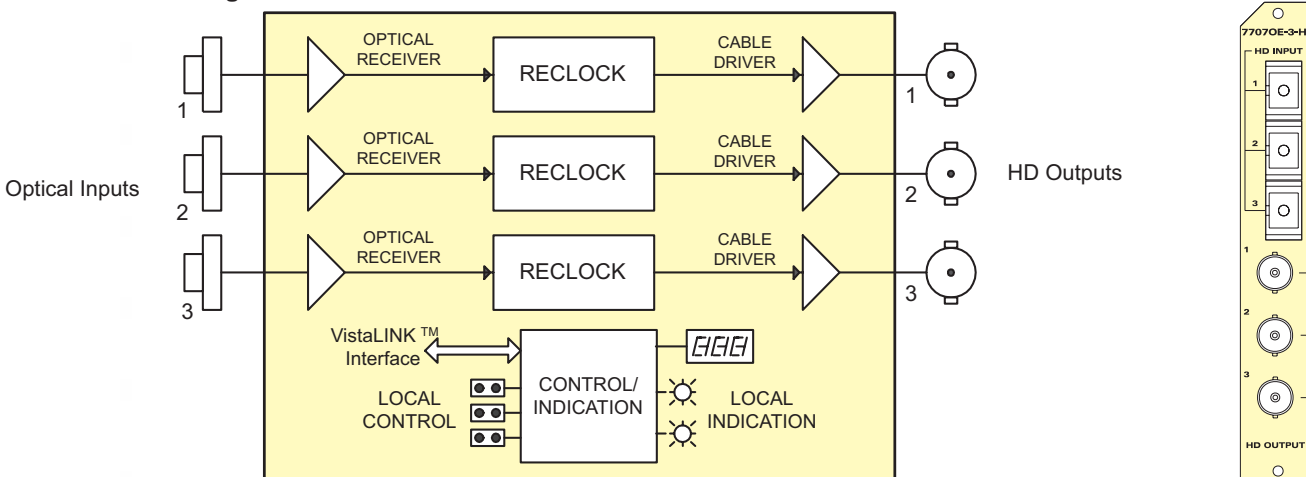
# Triple HDTV Optical to Electrical Converter, 19.4Mb/s to 1.485Gb/s 7707OE-3-HD



## Features

- Three independent channels of optical to electrical conversion that support all SMPTE 292M standards at 1.485Gb/s.
- Supports reclocking of all SMPTE 259M standards with operation from 143Mb/s - 360Mb/s
- Supports reclocking of additional standards of SMPTE 305M (SDTi), SMPTE 344M (540Mb/s), M2S and DVB-ASI (270Mb/s)
- Automatically operates in non-reclocking mode in the presence of rates not supported by reclocking
- Fully hot swappable from front of frame, with no fiber or BNC dis connect /reconnect required
- High density - accommodates up to 45 independent channels of optical conversion, in a single 3RU frame
- Can be housed in either a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone which will hold 1 module
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Detection and display of optical input power, and data rate
- Wide range optical input (1270nm-1610nm)
- Supports single-mode and multi-mode fiber optic cable
- SC/PC, ST/PC or FC/PC connector options
- Tally output on Frame Status bus upon loss of input signal

## 7707OE-3-HD Block Diagram & Rear Panel



## Specifications

**Standards:** SMPTE 292M, SMPTE 259M-A,B,C,D  
SMPTE 305M, SMPTE 310M, SMPTE 344M, M2S,  
DVB-ASI

### Optical Inputs:

**Number of Inputs:** 3 (independent channels)  
**Connector:** SC/PC, ST/PC, FC/PC female housing  
**Operating Wavelength:** 1270nm to 1610nm  
**Maximum Input Power:** -1dBm  
**Optical Sensitivity:** -18dBm

### Serial Video Outputs:

**Number of Outputs:** 3 reclocked (independent channels)  
**Connector:** 3 BNC inputs per IEC 169-8  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V±0.5V  
**Rise/Fall Time**  
SD @270Mb/s: 600ps nominal  
HD @1.485Gb/s: 150ps nominal  
**Overshoot:** < 10% of amplitude  
**Return Loss:** > 15dB up to 1.5Gb/s  
**Jitter:** < 0.2UI

### Electrical:

**Voltage:** +12V DC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC Directive

### Physical:

**Number of Slots:** 1

## Ordering Information:

**7707OE-3-HD** Triple HD or SD Optical to Electrical Converter,  
19.4Mb/s or 143Mb/s - 1.485Gb/s, VistaLINK®

### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg. Model +3RU +SC

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

### Fiber Optic Patch Cable:

**CB-FP1M-SCPC** Single mode fiber cable, 1m, SC/PC male termination  
**CB-FP1M-STPC** Single mode fiber cable, 1m, ST/PC male termination  
**CB-FP5M-SCPC** Single mode fiber cable, 5m, SC/PC male termination  
**CB-FP5M-STPC** Single mode fiber cable, 5m, ST/PC male termination  
**CB-FP10M-SCPC** Single mode fiber cable, 10m, SC/PC male termination  
**CB-FP10M-STPC** Single mode fiber cable, 10m, ST/PC male termination

### Enclosures:

**7700FR-C** 3RU Multiframe, which holds 15 modules  
**7701FR** 1RU Multiframe, which holds 3 modules  
**S7701FR** Standalone enclosure

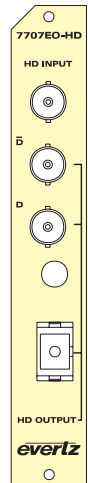
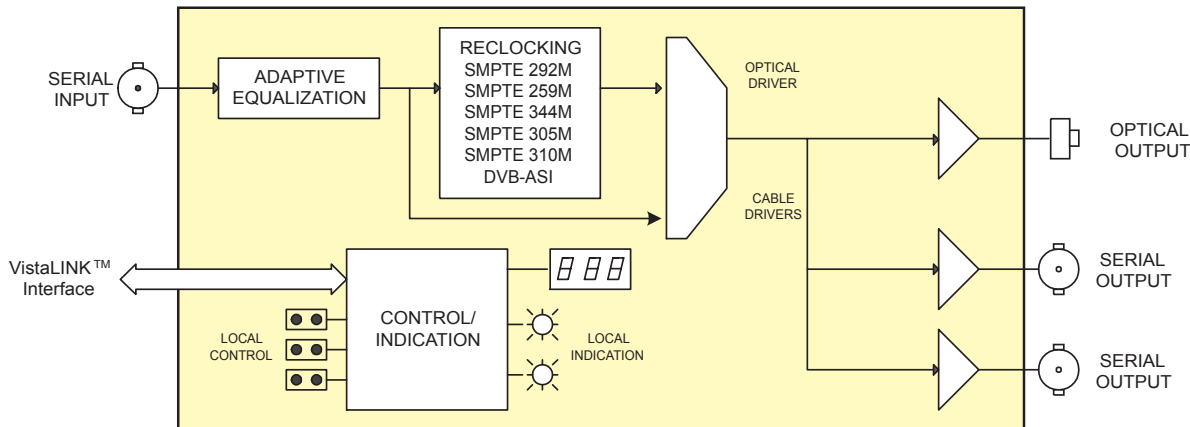


### Features

- Supports all SMPTE 292M standards at 1.485Gb/s
- Supports all SMPTE 259M standards with operation from 143Mb/s - 360Mb/s
- Supports SMPTE 310M (19.4Mb/s), M2S or DVB-ASI (270Mb/s), SMPTE 344M (540Mb/s), and SMPTE 305M (SDTi) rates
- Auto rate selection, indication and relocking for all SDI and HD-SDI data rates from 143Mb/s to 1.485Gb/s
- Selectable non relock mode for other data rates
- Detection and display of equalization strength, video format, and EDH errors (SDI only)
- Automatic coaxial input equalization to 150m for all rates to 1.485Gb/s (Belden 1694A)

- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Supports single-mode and multi-mode fiber optic cable
- Fully hot swappable from front of frame
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Occupies one card slot and can be housed in either a 1RU frame which will hold up to three modules, a 3RU frame which will hold up to 15 modules, or a standalone enclosure which will hold one module

### 7707EO-HD Block Diagram & Rear Panel



### Specifications

#### Serial Video Input:

##### Standards:

- Relocked:** SMPTE 292M, SMPTE 259M A, B, C, D, SMPTE 344M, SMPTE 305M, DVB-ASI, M2S, SMPTE 310M
- Non-Relocked:** Any bi-level signal type at rates of 19.4 Mb/s to 1.485Gb/s
- Connector:** 1 BNC per IEC 60169-8 Amendment 2
- Equalization:** Automatic to 150m @ 1.485Gb/s with Belden 1694A or equivalent cable
- Return Loss:** > 15dB to 1.5GHz

#### Serial Video Outputs:

- Number of Outputs:** 2 Per Card (1 output DVB-ASI/M2S compliant)
- Connector:** BNC per IEC 60169-8 Amendment 2
- Signal Level:** 800mV ±80mV
- DC Offset:** 0V ±0.5V
- Rise and Fall Time:** <270ps
- Overshoot:** <10% of amplitude
- Return Loss:** >12dB to 1.5GHz
- Wide Band Jitter:** < 0.2UI (Relocked).

#### Optical Output:

- Standard:** SMPTE 297M
- Number of Outputs:** 1
- Connector:** Female SC/PC, ST/PC or FC/PC
- Return Loss:** > 14dB
- Rise and Fall Time:** < 270ps
- Wide Band Jitter:** < 0.2 UI (Relocked).
- Wavelengths:** See Ordering Information
- Output Power:**
- 1310nm FP: -7dBm ± 1dBm
  - 1310/1550nm DFB: 0dBm ± 1dBm
  - CWDM: 0dBm ± 1dBm
  - DWDM: 7dBm ± 1dBm

#### Electrical:

- Voltage:** +12VDC
- Power:** 8 Watts (Non DWDM), 11 Watts (DWDM)
- EMI/RFI:** Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

- Number of slots:** 1

#### Compliance:

##### Electrical Safety:

- CSA Listed to UL 60065-03, IEC 60065
- Complies with CE Low voltage Directive
- Class 1 laser product
- Complies with 24 CFR 1040.10 and 1040.11
- IEC 60825-1
- Complies with FCC Part 15, Class A
- EU EMC directive

##### Laser Safety:

##### EMI/RFI:

#### Ordering Information:

- 7707EO13-HD HD Electrical to Optical Converter, 1310nm FP Laser
- 7707EO13-HD-L HD Electrical to Optical Converter, 1310nm DFB Laser
- 7707EO15-HD HD Electrical to Optical Converter, 1550nm

- For CWDM, please refer to the end of the fiber section for ordering information**
- 7707EOxx-HD HD Electrical to Optical Converter, CWDM DFB Laser

- For DWDM, please refer to the end of the fiber section for ordering information**
- 7707EODyyy-HD HD Electrical to Optical Converter, DWDM Laser

#### Ordering Options

- Rear Plate and Fiber Connector must be specified at time of order
- Eg: Model +SC +3RU

#### Rear Plate Suffix

- +3RU 3RU Rear Plate for use with 7700FR-C Multiframe
- +1RU 1RU Rear Plate for use with 7701FR Multiframe
- +SA Standalone Enclosure Rear Plate

#### Connector Suffix

- +SC SC/PC
- +ST ST/PC
- +FC FC/PC

#### Fiber Optic Patch Cable:

- CB-FP1M-SCPC Single mode fiber cable, 1m, SC/PC male termination
- CB-FP1M-STPC Single mode fiber cable, 1m, ST/PC male termination
- CB-FP5M-SCPC Single mode fiber cable, 5m, SC/PC male termination
- CB-FP5M-STPC Single mode fiber cable, 5m, ST/PC male termination
- CB-FP10M-SCPC Single mode fiber cable, 10m, SC/PC male termination
- CB-FP10M-STPC Single mode fiber cable, 10m, ST/PC male termination

#### Enclosures:

- 7700FR-C 3RU Multiframe which holds 15 modules
- 7701FR 1RU Multiframe which holds 3 modules
- S7701FR Standalone enclosure



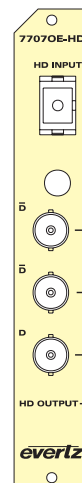
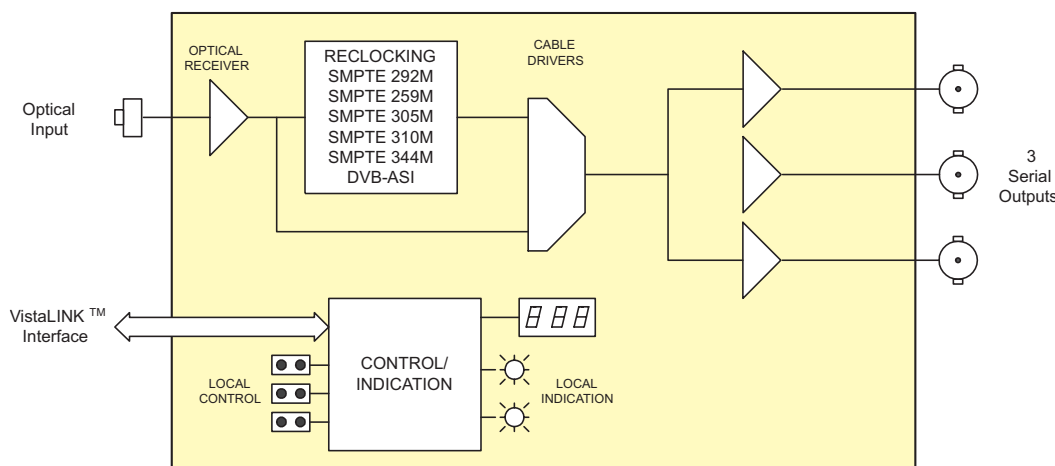


### Features

- Supports all SMPTE 292M standards at 1.485Gb/s
- Supports all SMPTE259M standards with operation from 143Mb/s - 360Mb/s
- Supports SMPTE 310M (19.4Mb/s), M2S or DVB-ASI (270Mb/s), SMPTE 344M (540Mb/s), and SMPTE 305M (SDTi) rates
- Auto rate selection, indication and reclocking for all SDI and HD-SDI data rates from 143Mb/s to 1.485Gb/s
- Selectable non-reclock mode for other rates
- Detection and display of optical input power, video format, and EDH errors (SDI only)
- Display of received optical power for continuous indication of link integrity
- Wide range optical input (1270nm-1610nm)
- Supports single-mode and multi-mode fiber optic cable
- Fully hot swappable from front of frame
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Occupies one card slot and can be housed in either a 1RU frame which will hold up to three modules, a 3RU frame which will hold up to 15 modules, or a standalone enclosure which will hold one module

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### 7707OE-HD Block Diagram & Rear Panel



#### Optical Input:

##### Standards:

SMPTE 297M  
SMPTE 292M, SMPTE 259M A, B, C, D,  
SMPTE 344M, SMPTE 305M,  
SMPTE 310M (19.4 Mb/s), DVB-ASI, M2S

##### Reclocked:

##### Non-Reclocked:

Any bi-level signal type at rates of 19.4Mb/s  
- 1.485Gb/s

##### Connector:

Female SC/PC, ST/PC or FC/PC.

##### Wavelength:

1270nm - 1610nm

##### Optical Sensitivity:

##### Standard:

-23dBm @ 1.485Gb/s

##### High Sensitivity (-H):

-28dBm @ 1.485Gb/s

##### Max. Input Power:

##### Standard:

-1dBm

##### High Sensitivity (-H):

-8dBm

#### Serial Video Outputs:

##### Number of Outputs:

3 Per Card (1 output DVB-ASI/M2S compliant)

##### Connectors:

BNC per IEC 60169-8 Amendment 2

##### Impedance:

75Ω (nominal)

##### Signal Level:

800mV(nominal)

##### DC Offset:

0V ±0.5V

##### Rise and Fall Time:

<270ps

##### Overshoot:

< 10% of amplitude

##### Return Loss:

> 12dB to 1.5GHz

##### Wide Band Jitter:

< 0.20UI (Reclocked)

#### Electrical:

##### Voltage:

+12VDC

##### Power:

8 Watts

##### EMI/RFI:

Complies with FCC Part 15, Class A  
EU EMC Directive

#### Physical:

##### Number of slots:

1

#### Ordering Information:

##### 7707OE-HD

HDTV Optical to Electrical Converter, 19.4Mb/s to 1.5Gb/s

##### 7707OE-HD-H

HDTV Optical to Electrical Converter, 19.4Mb/s to 1.5Gb/s,  
High Sensitivity receiver

#### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg. Model +3RU +SC

#### Rear Plate Suffix

##### +3RU

3RU Rear Plate for use with 7700FR-C Multiframe

##### +1RU

1RU Rear Plate for use with 7701FR Multiframe

##### +SA

Standalone Enclosure Rear Plate

#### Connector Suffix

##### +SC

SC/PC

##### +ST

ST/PC

##### +FC

FC/PC

#### Fiber Optic Patch Cable:

##### CB-FP1M-SCPC

Single mode fiber cable, 1m, SC/PC male termination

##### CB-FP1M-STPC

Single mode fiber cable, 1m, ST/PC male termination

##### CB-FP5M-SCPC

Single mode fiber cable, 5m, SC/PC male termination

##### CB-FP5M-STPC

Single mode fiber cable, 5m, ST/PC male termination

##### CB-FP10M-SCPC

Single mode fiber cable, 10m, SC/PC male termination

##### CB-FP10M-STPC

Single mode fiber cable, 10m, ST/PC male termination

#### Enclosures:

##### 7700FR-C

3RU Multiframe, which holds 15 modules

##### 7701FR

1RU Multiframe, which holds 3 modules

##### S7701FR

Standalone enclosure



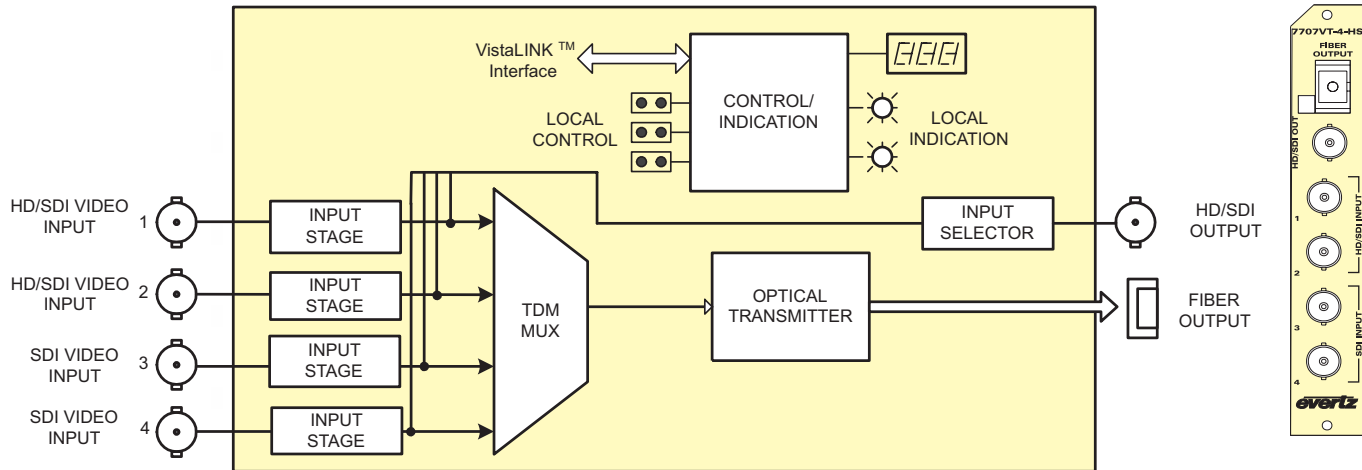


## Features

- Single card TDM multiplexer for two HD-SDI signals, or one HD-SDI signal and three SDI/DVB-ASI signals, or four SDI/DVB-ASI signals
- Two auto-sensing video inputs for HD-SDI or SDI/DVB-ASI video signals
- Two 270Mb/s inputs for SDI or DVB-ASI video signals
- Signal transport over fiber uninterrupted by loss of any HD-SDI, SDI, SDTi or DVB-ASI input feed
- Transparently passes embedded AES or any other data in the horizontal or vertical ancillary data space
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.

- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Automatic coaxial input equalization up to 130m at 1.485Gb/s and 250m at 270Mb/s (Belden 1694A)
- Fully hot-swappable from front of frame
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- SC/PC, ST/PC, FC/PC connector options
- Occupies one card slot & can be housed in a standalone frame, a 1RU frame holding up to 3 modules or a 3RU frame holding up to 15 modules

## 7707VT-4-HS Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

#### Number of Inputs:

2 HD/SDI/DVB-ASI and 2 SDI/DVB-ASI video signals

#### Standard:

##### Inputs 1&2

SMPTE 292M, SMPTE 259M-C, DVB-ASI

##### Inputs 3&4

SMPTE 259M-C, DVB-ASI

#### Connector:

4 BNC per IEC 60169-8 Amendment 2

#### Equalization:

Automatic to 100m @ 1.485Gb/s and 250m @ 270 Mb/s with Belden 1694A or equivalent cable

#### Return Loss:

> 15 dB up to 1.5Gb/s

### Serial Video Output:

#### Number of Outputs:

1, loopback signal user selectable from above 4 inputs

#### Connector:

BNC per IEC 60169-8 Amendment 2

#### Standards:

SMPTE 292M, SMPTE 259-C, SMPTE 305.2M

#### Signal Level:

800mV nominal

#### DC Offset:

0V ±0.5V

#### Rise and Fall Time:

<270ps at 1.485Gb/s and 900ps nominal at 270Mb/s

#### Overshoot:

<10% of amplitude

#### Return Loss:

>12dB to 1.5Gb/s

#### Wideband Jitter:

< 0.2UI

### Optical Output:

#### Number:

1

#### Connector:

Female SC/PC, ST/PC or FC/PC

#### Return Loss:

> 14 dB

#### Rise and Fall Time:

200 ps nominal

#### Wideband Jitter:

< 0.2 UI

#### Fiber Size:

9µm core / 125 µm overall

#### Wavelengths:

##### Standard:

1310nm, 1550nm (nominal)

##### CWDM:

1270nm to 1610nm (See Ordering Information)

##### DWDM:

C-Band (ITU-T G.694.1 compliant) (See Ordering Information)

#### Output Power:

##### 1310nm FP(Standard)

-7dBm ± 1dBm

##### 1550nm & CWDM DFB

0dBm ± 1dBm

##### DWDM DFB

7dBm ± 1dBm

### Electrical:

#### Voltage:

+12VDC

#### Power:

10 Watts (Non DWDM), 13 Watts (DWDM)

### Physical:

#### Number of slots:

1

### Compliance:

#### Electrical Safety:

CSA Listed to CSA C22.2 No. 60065-03, UL 60065-03  
IEC 60065-(2001-12) 7th Edition  
Complies with CE Low voltage directive 93/68/EEC  
Complies with 24 CFR 1040.10 and 1040.11 except for deviations pursuant to LN No. 50, dated July 26, 2001  
Complies with IEC 60825-1, Am. 2  
Complies with FCC regulations for class A devices  
Complies with EU EMC directive 89/336/EEC

#### Laser Safety:

#### EMI/RFI:

### Ordering Information:

#### 7707VT13-4-HS

Quad SD/Dual HD Fiber Transmitter, 1310nm FP, VistaLINK®

#### 7707VT15-4-HS

Quad SD/Dual HD Fiber Transmitter, 1550nm DFB, VistaLINK®

#### For CWDM, please refer to the end of the fiber section for ordering information

#### 7707VTxx-4-HS

Quad SD/Dual HD Fiber Transmitter, CWDM Laser, VistaLINK®

#### For DWDM, please refer to the end of the fiber section for ordering information

#### 7707VTyyyy-4-HS

Quad SD/Dual HD Fiber Transmitter, DWDM Laser, VistaLINK®

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order

Eg: Model +SC +3RU

#### Rear Plate Suffix

##### +3RU

3RU Rear Plate for use with 7700FR-C Multiframe

##### +1RU

1RU Rear Plate for use with 7701FR Multiframe

##### +SA

Standalone Enclosure Rear Plate

#### Connector Suffix

##### +SC

SC/PC

##### +ST

ST/PC

##### +FC

FC/PC

### Enclosures:

#### 7700FR-C

3RU Multiframe which holds 15 modules

#### 7701FR

1RU Multiframe which holds 3 modules

#### S7701FR

Standalone enclosure



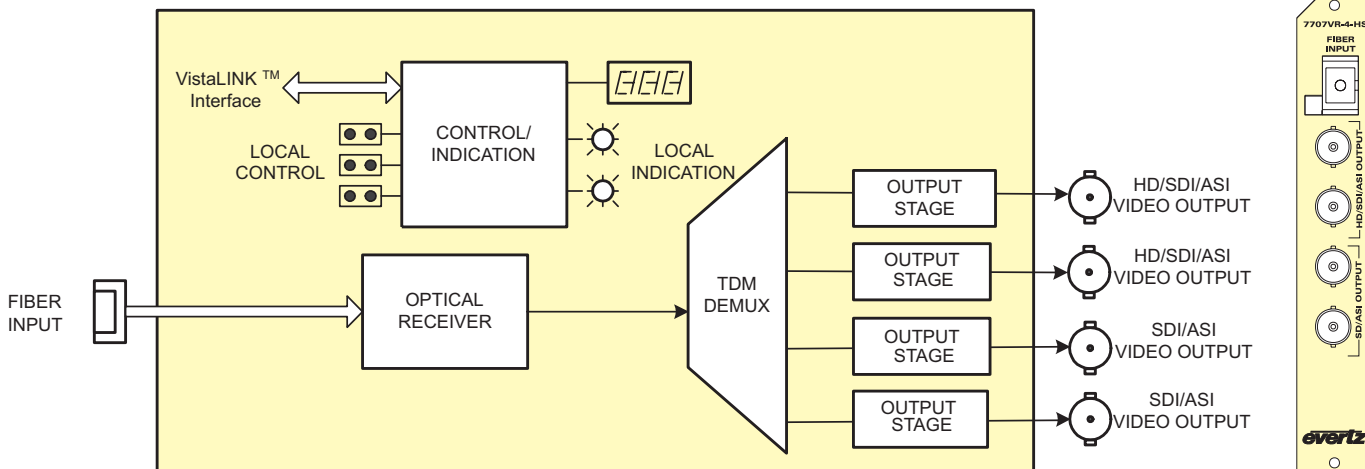
# Quad SD/Dual HD Fiber Receiver 7707VR-4-HS



## Features

- Single card TDM de-multiplexer for two HD-SDI signals, or one HD-SDI signal and three SDI/DVB-ASI signals, or four SDI/DVB-ASI signals
- Low jitter outputs
- Independent signal outputs unaffected by loss of any other HD, SDI or DVB-ASI input feed
- Transparently passes embedded AES or any other data in the horizontal or vertical ancillary data space
- Fully hot-swappable from front of frame
- Supports single-mode and multi-mode fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range
- SC/PC, ST/PC, FC/PC connector options
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Occupies one card slot & can be housed in a standalone frame, a 1RU frame holding up to 3 modules or a 3RU frame holding up to 15 modules

## 7707VR-4-HS Block Diagram & Rear Panel



## Specifications

### Optical Input:

**Number of Inputs:** 1  
**Connector:** Female SC/PC, ST/PC, FC/PC  
**Return Loss:** >25dB  
**Operating Wavelength:** 1270nm to 1610nm  
**Maximum Input Power:**

**Standard Version:** -1dBm  
**-H Version:** -8dBm

### Optical Sensitivity

**Standard Version:** -20dBm  
**-H Version:** -28dBm

### Serial Video Outputs:

**Number of Outputs:** 2 HD/SDI/DVB-ASI and 2 SDI/DVB-ASI video signals

### Standard:

**Outputs 1&2** SMPTE 292M, SMPTE 259M-C, DVB-ASI  
**Outputs 3&4** SMPTE 259M-C, DVB-ASI

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V  $\pm$ 0.5V

**Rise and Fall Time:**

**1.485Gb/s:** <270ps  
**270Mb/s:** 900ps nominal  
**Overshoot:** <10% of amplitude

**Return Loss:** >12dB to 1.5Gb/s

**Wide Band Jitter:** < 0.2UI

### Electrical:

**Voltage:** +12VDC  
**Power:** 10 Watts

### Physical:

**Number of slots:** 1

### Ordering Information:

**7707VR-4-HS** Quad SD/Dual HD Demux Fiber Receiver, VistaLINK®

**7707VR-4-HS-H** Quad SD/Dual HD Demux Fiber Receiver, High sensitivity RX, VistaLINK®

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Connector Suffix

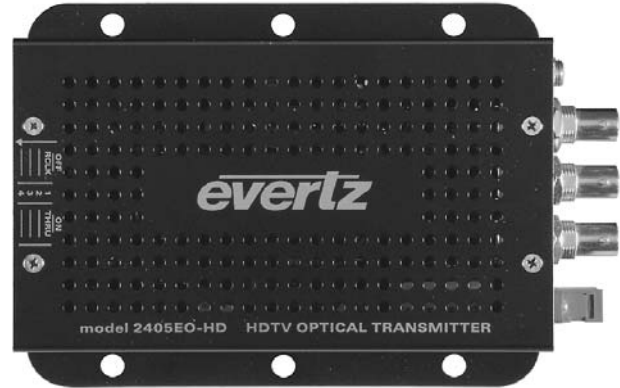
**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

### Enclosures:

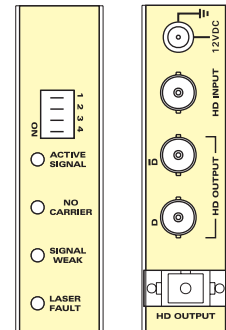
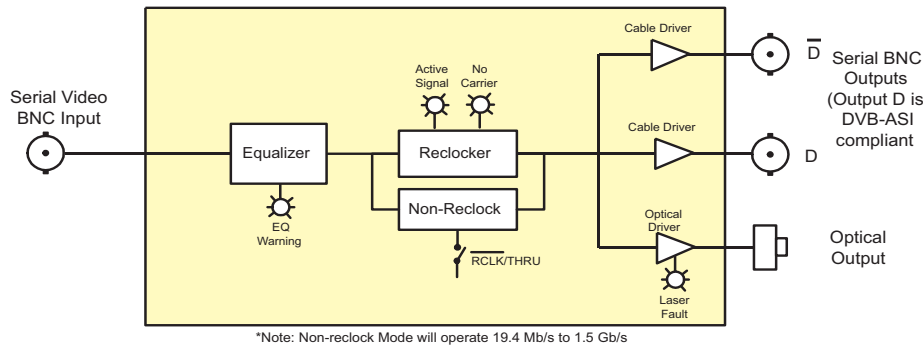
**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure

## Features

- Operation from 19.4Mb/s to 1.5Gb/s
  - Reclocking for SMPTE 292M (1.485Gb/s)
  - Non-reclocking for all other rates from 19.4 Mb/s to 1.5Gb/s including SMPTE 259M, SMPTE 305M, SMPTE 310M, M2S, DVB-ASI
- Available in 1310nm, 1550nm and up to sixteen different CWDM wavelengths (ITU-T G.694.2 compliant)
- Automatic laser shutdown on absence of input signal for extended laser life
- Supports single-mode and multi-mode fiber optic cable
- Immunity to video Pathological signals
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation



## 2405EO-HD Block Diagram & Rear Panels



## Specifications

**Standards:** SMPTE 292M, 259M, 297M, 310M, M2S, DVB-ASI, and any bi-level Telecom/Datacom signal from 19.4Mb/s to 1.5Gb/s

### Serial Video BNC Input:

**Number of Inputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 125m @ 1.485Gb/s with Belden 1694A (or equivalent)  
**Return Loss:** > 15dB up to 1.485GHz

### Serial Video BNC Output:

**Number of Outputs:** 2 (1 output DVB-ASI/M2S compliant)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ± 0.5V  
**Rise, Fall Time:** 270ps nominal  
**Overshoot:** < 10% of amplitude  
**Return Loss:** > 15dB up to 1.485GHz  
**Wideband Jitter:** < 0.2 UI

### Optical Output:

**Number of Outputs:** 1  
**Connector:** SC/PC, ST/PC, FC/PC Female Housing  
**Return Loss:** > 14 dB  
**Rise, Fall Time:** 200ps nominal  
**Jitter:** < 0.2UI reclocked  
**Nominal Wavelength:**  
**Standard:** 1310nm, 1550nm  
**CWDM:** 1270nm - 1610nm (See Ordering Information)

### Optical Power:

**1310nm FP:** -7dBm± 1dBm  
**1310nm/1550nm DFB:** 0 dBm± 1dBm  
**CWDM DFB:** 0 dBm± 1dBm

### Physical:

**Dimensions:** With Flanges: 6"L x 4"W x 1"H  
 (152mm L x 114mm W x 25mm H)  
**Weight:** 0.5 lbs (0.28Kg)

### Electrical:

**Voltage:** +12V DC  
**Power:** 6 Watts

### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
**Laser Safety:** Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC directive

### Ordering Information:

**2405EO3F-HD** HD Miniature Optical Transmitter 1310nm, FP Laser  
**2405EO3D-HD** HD Miniature Optical Transmitter 1310nm, DFB Laser  
**2405EO5D-HD** HD Miniature Optical Transmitter 1550nm, DFB Laser

**For CWDM, please refer to the end of the fiber section for ordering information**  
**2405EOxx-HD** HD Miniature Optical Transmitter CWDM DFB Laser

All 2405 modules include power supply

### Ordering Options

Fiber Connector must be specified at time of order  
 Eg: Model + SC

### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

### Fiber Optic Patch Cable:

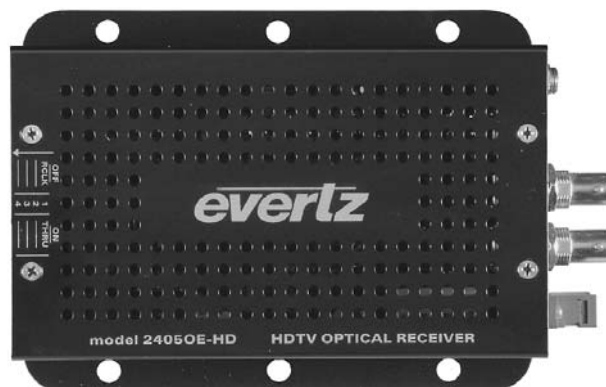
**CB-FP1M-SCPC** Single mode fiber cable, 1m, SC/PC male termination  
**CB-FP1M-STPC** Single mode fiber cable, 1m, ST/PC male termination  
**CB-FP5M-SCPC** Single mode fiber cable, 5m, SC/PC male termination  
**CB-FP5M-STPC** Single mode fiber cable, 5m, ST/PC male termination  
**CB-FP10M-SCPC** Single mode fiber cable, 10m, SC/PC male termination  
**CB-FP10M-STPC** Single mode fiber cable, 10m, ST/PC male termination



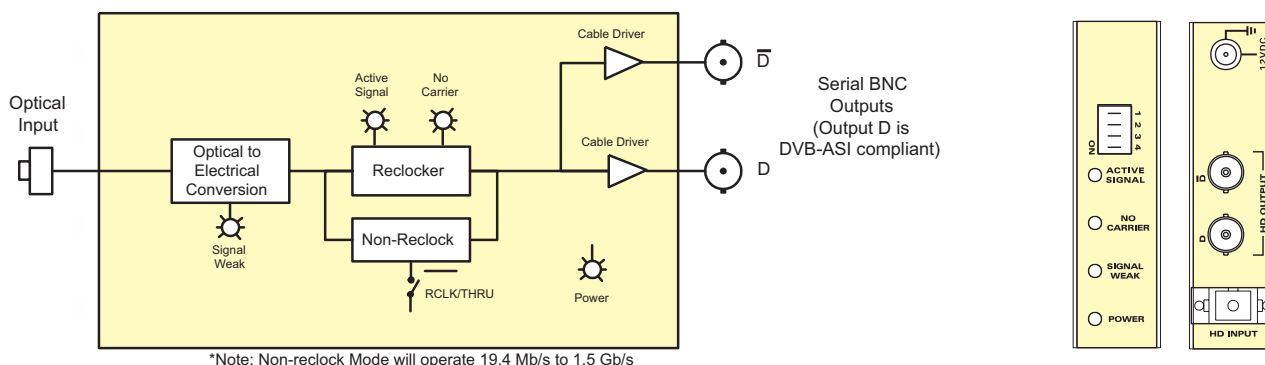
### 2405OE-HD

#### Features

- Operation from 19.4Mb/s to 1.5Gb/s
  - Reclocking for SMPTE 292M (1.485Gb/s)
  - Non-reclocking for all other rates from 19.4Mb/s to 1.5Gb/s including SMPTE 259M, SMPTE 305M, SMPTE 310M, M2S, DVB-ASI
- Immunity to video Pathological signals
- Supports single-mode and multi-mode fiber optic cable
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation



#### 2405OE-HD Block Diagram & Rear Panels



#### Specifications

**Standards:** SMPTE 292M, 259M, 297M, 310M, M2S, DVB-ASI, and any bi-level Telecom/Datacom signal from 19.4Mb/s to 1.5Gb/s

#### Optical Input:

**Number of Inputs:** 1  
**Operating Wavelength:** 1270nm to 1610nm  
**Maximum Input Power:** -1dBm  
**Optical Sensitivity:** -23dBm  
**Connector:** SC/PC, ST/PC, FC/PC Female Housing

#### Serial Video BNC Outputs:

**Number of Outputs:** 2 (1 output DVB-ASI/M2S compliant)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V  $\pm$  0.5V  
**Rise, Fall Time:** 270ps nominal  
**Overshoot:** < 10% of amplitude  
**Return Loss:** > 15dB up to 1.485GHz  
**Wideband Jitter:** < 0.2 UI

#### Physical:

**Dimensions:** With Flanges: 6"L x 4"W x 1"H (152mm L x 114mm W x 25mm H)  
**Weight:** 0.5 lbs (0.28Kg)

#### Electrical:

**Voltage:** +12V DC  
**Power:** 6 Watts  
**Safety:** Complies with EU Safety Directive  
**EMI/RFI:** Complies with FCC Part 15, Class A EU EMC Directive

#### Ordering Information:

**2405OE-HD:** HD Miniature Optical Receiver, 19.4Mb/s to 1.5Gb/s

All 2405 modules include power supply

#### Ordering Options

Fiber Connector must be specified at time of order  
 Eg: Model + SC

#### Connector Suffix

<b>+SC</b>	SC/PC
<b>+ST</b>	ST/PC
<b>+FC</b>	FC/PC

#### Fiber Optic Patch Cable:

<b>CB-FP1M-SCPC</b>	Single mode fiber cable, 1m, SC/PC male termination
<b>CB-FP1M-STPC</b>	Single mode fiber cable, 1m, ST/PC male termination
<b>CB-FP5M-SCPC</b>	Single mode fiber cable, 5m, SC/PC male termination
<b>CB-FP5M-STPC</b>	Single mode fiber cable, 5m, ST/PC male termination
<b>CB-FP10M-SCPC</b>	Single mode fiber cable, 10m, SC/PC male termination
<b>CB-FP10M-STPC</b>	Single mode fiber cable, 10m, ST/PC male termination

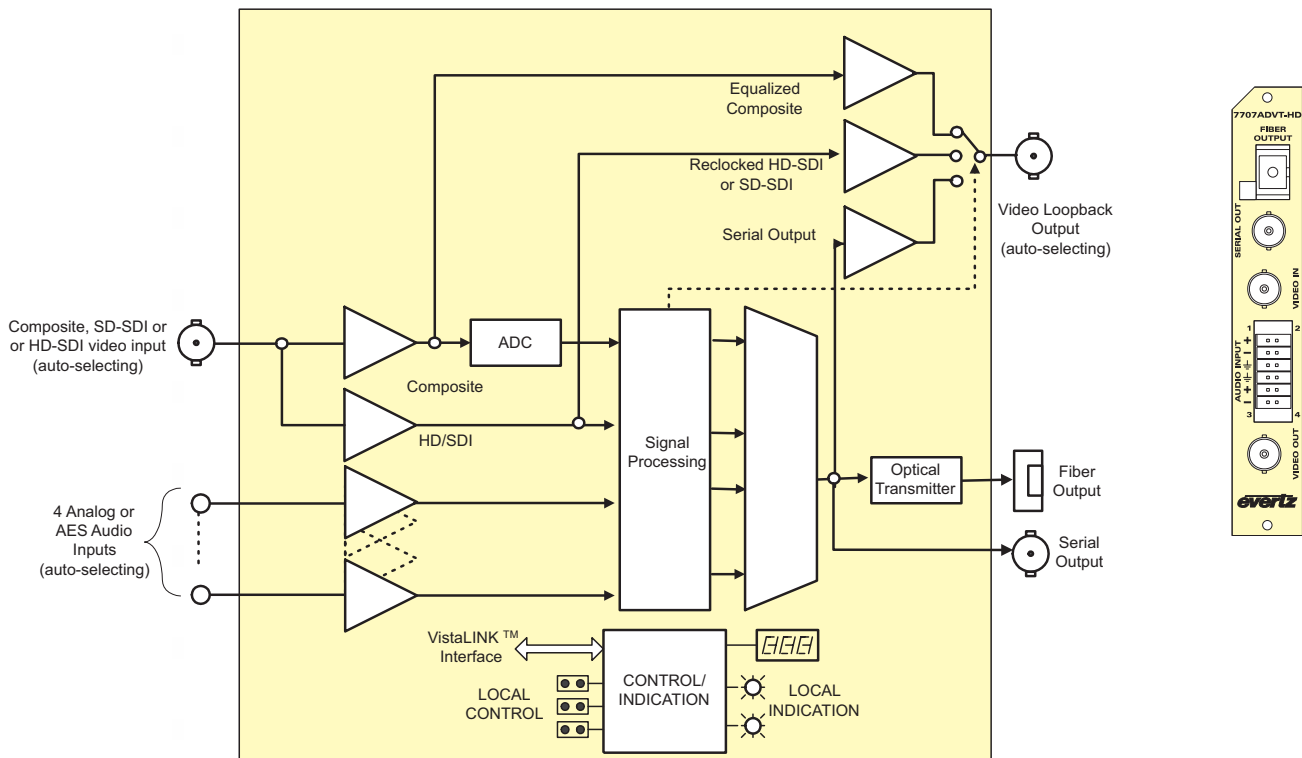


### Features

- Single card fiber optic transmitter for one composite Analog, SDI or HD-SDI video and four analog or AES audio signals
- Auto-sensing (analog or digital) video and audio inputs
- Supports 525/625 line component 4:2:2 SDI @ 270Mb/s
- Supports HD (SMPTE 292M) video @ 1.485Gb/s
- Supports both NTSC and PAL analog video
- Supports Analog to Digital and Digital to Analog audio conversion
- Broadcast quality analog video and audio performance
- Meets or exceeds EIA/TIA RS250-C short haul specifications for analog video and audio transport
- Supports 32, 44.1, 48kHz AES audio inputs
- Dolby E compatible
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.

- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Adjustable gain equalization for analog video for up to 250m of Belden 1694A coaxial cable
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths at 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU G 694.2 compliant)
- DWDM wavelengths also available (ITU G.694.1 compliant)

### 7707ADVT-HD Block Diagram & Rear Panel





## Specifications

### Analog Video Input:

Standards:	SMPTE 170M (NTSC), ITU-R 624-2 (PAL)
Number of Inputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2.
Signal Quantization:	12 bit
System Bandwidth:	>5.5MHz
Input Level:	2 Vp-p (Maximum)
Gain Equalization:	Up to 250m of Belden 1694A or equivalent (adjustable)

Input impedance:	75Ω
Return Loss:	> 30dB to 5.5 MHz
Signal/Noise Ratio:	> 70dB
Differential Gain:	< 1.0%
Differential Phase:	< 0.7°
Passband Ripple:	
NTSC:	< ± 0.1dB to 4.1 MHz < ± 0.2dB to 5.5 MHz

PAL:	< ± 0.1dB to 4.8 MHz < ± 0.2dB to 5.8 MHz
Chroma/Luma Gain:	98% to 103%

### Chroma/Luma Delay:

NTSC:	< 5 ns
PAL:	< 12 ns
Line Time Distortion:	1.2%

### Serial Video Input:

Standard:	SMPTE 259M-C (525 or 625 line component), SMPTE 305M (SDTi), DVB-ASI (without separate audio), SMPTE 292M (HD)
Connector:	1 BNC per IEC 60169-8 Amendment 2
Equalization:	Automatic to 300m @ 270 Mb/s and 100m @ 1.485 Gb/s with Belden 1694A or equivalent cable
Return Loss:	> 15 dB up to 1.485 Gb/s

### Analog Video Output:

Standard:	Same as Analog Video Input
Number of Outputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2.
Output Level:	1V p-p
Output Impedance:	75Ω
Return Loss:	> 30 dB to 5.5 MHz

### Serial Video Output:

Number of Outputs:	2, (1 loopback, 1 serial)
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	800mV nominal
DC Offset:	0V ± 0.5V
Rise and Fall Time:	900ps nominal @ 270 Mb/s < 270ps @ 1.485 Gb/s
Overshoot:	<10% of amplitude
Return Loss:	>15 dB at 270 Mb/s
Wide Band Jitter:	<0.2 UI

### Analog Audio Inputs:

Number of Inputs:	4
Type:	Balanced analog audio
Connector:	12 pin removable terminal block
Input impedance:	High Impedance (>20K Ω)
Freq. Response:	±0.1 dB, 20Hz to 20 kHz
THD 20Hz-20kHz:	< 0.005%
Channel Phase Diff.:	± 1 deg
SNR (weighted):	> 85 dB
Max. Audio Input Level:	+24 dBu
Signal Quantization:	24 Bits

### AES Audio Inputs:

Number of Inputs:	4 (auto-sensing for balanced or unbalanced input)
Standard:	
Unbalanced AES:	SMPTE 276M
Balanced AES:	AES3-1992
Other:	Dolby E compatible
Connector:	12 pin removable terminal block
Input Return Loss:	>15dB (1MHz to 6MHz)
Signal Level:	
Unbalanced:	1.2V p-p ±0.1V
Balanced:	1 to 7 Vp-p

### Equalization:

Unbalanced:	450m of Belden 1800D cable
Balanced:	1500m of Belden 1694A cable
Resolution:	Up to 24 bits
Sampling Rate:	32, 44.1, 48 kHz
Impedance:	
Unbalanced:	75 Ω
Balanced:	110 Ω

### Optical Outputs:

Number of Outputs:	1
Connector:	Female SC/PC, ST/PC or FC/PC
Return Loss:	> 14 dB
Rise and Fall Time:	200ps nominal
Fiber Size:	9 μm core / 125 μm overall
Wavelengths:	
Standard	1310nm, 1550nm (nominal)
CWDM:	See Ordering Information
DWDM:	See Ordering Information
Output Power:	
1310nm FP (Standard)	-7dBm ± 1dBm
1550 & CWDM DFB	0dBm ± 1dBm
DWDM DFB	+7dBm ± 1dBm

### Electrical:

Voltage:	+12VDC
Power:	10 Watts (Non DWDM), 12 Watts (DWDM)

### Physical:

Number of slots:	1
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### Compliance:

Electrical Safety:	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive
Laser Safety:	Class 1 laser product Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC directive

### Ordering Information:

7707ADVT13-HD:	1310nm FP Laser (-7dBm launch power)
7707ADVT15-HD:	1550nm DFB Laser

### For CWDM applications please refer to the end of the fiber section for details

7707ADVTxx-HD	Analog, HD-SDI or SDI Video & 4 Analog or 4 AES audio Fiber Transmitter, CWDM Laser, VistaLINK®
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### For DWDM applications please refer to the end of the fiber section for details

7707ADVTDyyy-HD	Analog, HD-SDI or SDI Video & 4 Analog or 4 AES audio Fiber Transmitter, DWDM Laser, VistaLINK®
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### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
7701FR	Standalone Enclosure

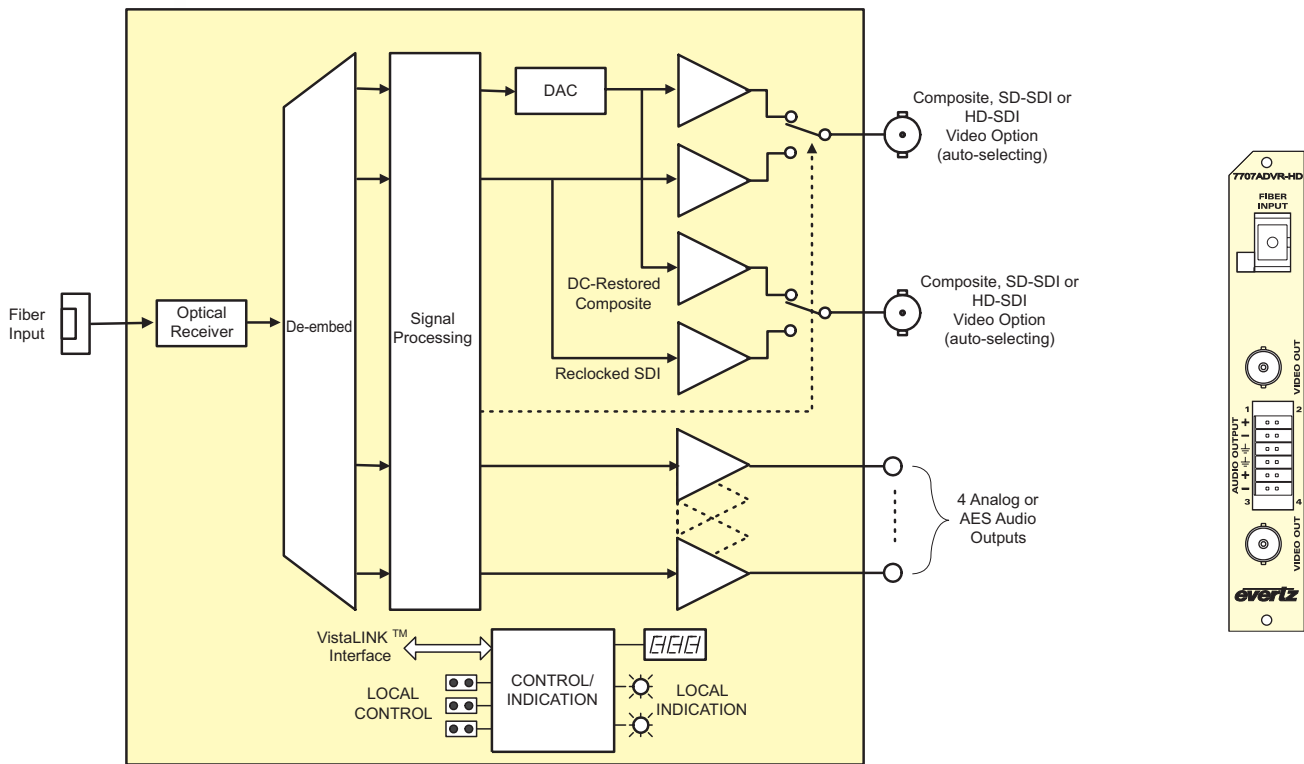


### Features

- Single card fiber optic receiver for one composite Analog, SDI or HD-SDI video and four analog or AES audio signals
- Auto sensing (analog or digital) video and audio outputs
- Supports 525/625 line component 4:2:2 SDI @ 270Mb/s
- Supports HD (SMPTE 292M) video @ 1.485Gb/s
- Supports both NTSC and PAL analog or 4:2:2 component digital video
- Supports Analog to Digital and Digital to Analog audio conversion
- Broadcast quality analog video and audio performance
- Meets or exceeds EIA/TIA RS250-C short haul specifications for analog video and audio transport
- Supports 32, 44.1, 48kHz AES audio

- Dolby E compatible
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Adjustable gain, DC offset and pre-emphasis for analog video for driving up to 250m of Belden 1694A coaxial cable
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Wideband optical input (1270nm-1610nm)

### 7707ADVR-HD Block Diagram & Rear Panel





### Specifications

#### Analog Video Outputs:

<b>Standard:</b>	SMPTE 170M, (NTSC), ITU-R 624-2 (PAL)
<b>Number of Outputs:</b>	2 BNC per IEC 60169-8 Amendment 2.
<b>System bandwidth:</b>	> 5.5 MHz
<b>Output Level:</b>	1 Vp-p (nominal), 2 Vp-p (maximum)
<b>Gain:</b>	Unity gain nominal, adjustable 50% to 150%
<b>Output Impedance:</b>	75Ω
<b>Return Loss:</b>	> 30dB to 5.5MHz
<b>SNR:</b>	> 70dB
<b>Differential Gain:</b>	< 1.0%
<b>Differential Phase:</b>	< 0.7°
<b>Pre-Emphasis:</b>	Adjustable cable loss compensation for up to 250m of Belden 1694A

#### Passband Ripple:

<b>NTSC:</b>	< ±0.1dB to 4.1MHz and < ±0.2dB to 5.5MHz
<b>PAL:</b>	< ±0.1dB to 4.8MHz and < ±0.2dB to 5.8MHz

#### Chroma/Luma Gain:

#### Chroma/Luma Delay:

<b>NTSC:</b>	<5ns
<b>PAL:</b>	<12ns
<b>Line Time Distortion:</b>	1.2%

#### Serial Video Output:

<b>Number of Outputs:</b>	2 regenerated
<b>Standard:</b>	SMPTE 259M-C (525 or 625 line component), SMPTE 305M (SDTi), DVB-ASI (without separate audio), SMPTE 292M (HD)
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V ±0.5V
<b>Rise and Fall Time:</b>	900ps nominal @ 270Mb/s < 270ps @1.485 Gb/s
<b>Overshoot:</b>	<10% of amplitude
<b>Return Loss:</b>	> 15dB up to 1.485 Gb/s
<b>Wide Band Jitter:</b>	< 0.2UI

#### Analog Audio Outputs:

<b>Number of Outputs:</b>	4
<b>Type:</b>	Balanced analog audio
<b>Connector:</b>	12 pin removable terminal block
<b>Output impedance:</b>	66Ω
<b>Freq. Response:</b>	± 0.1dB, 20Hz to 20 kHz
<b>THD 20Hz-20kHz:</b>	< 0.005%
<b>Channel Phase Diff.</b>	± 1 deg
<b>SNR (weighted):</b>	> 85dB
<b>Output Level Adj:</b>	-20dB to +3dB
<b>Max Output Level:</b>	+24 dBu into 10kΩ loads

#### AES Audio Outputs:

<b>Number of Outputs:</b>	4 regenerated (selectable for balanced or unbalanced)
<b>Standard:</b>	
<b>Unbalanced AES:</b>	SMPTE 276M
<b>Balanced AES:</b>	AES3-1992
<b>Other:</b>	Dolby E compatible
<b>Connector:</b>	12 pin removable terminal block
<b>Input Return Loss:</b>	>15dB (1MHz to 6MHz)
<b>Signal Level:</b>	
<b>Unbalanced:</b>	1 Vp-p ±0.1Vp-p
<b>Balanced:</b>	2 Vp-p ±0.1Vp-p

<b>Resolution:</b>	Up to 24-bits
<b>Sampling Rate:</b>	32, 44.1, 48 kHz
<b>Output Jitter:</b>	<0.1UI
<b>Impedance:</b>	
<b>Unbalanced:</b>	75Ω
<b>Balanced:</b>	110Ω

#### Optical Input:

<b>Number of Inputs:</b>	1
<b>Connector:</b>	Female SC/PC, ST/PC, FC/PC
<b>Operating Wavelength:</b>	1270nm to 1610nm
<b>Maximum Input Power:</b>	0dBm
<b>Optical Sensitivity:</b>	-32dBm

#### Electrical:

<b>Voltage:</b>	+12VDC
<b>Power:</b>	12Watts

#### Physical:

<b>Number of slots:</b>	1
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#### Ordering Information:

<b>7707ADVR-HD:</b>	Analog, SDI or HD-SDI video & analog/AES audio fiber optic receiver
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#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Connector Suffix

<b>+SC</b>	SC/PC
<b>+ST</b>	ST/PC
<b>+FC</b>	FC/PC

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone Enclosure



The 7707VAR-HD is a VistaLINK® -capable fiber optic receiver for HDTV or SDTV video and AES audio signals. This single card module outputs one HD-SDI or SD-SDI video plus four AES audio signals that have been transmitted by the companion 7707VAT-HD fiber optic transmitter.

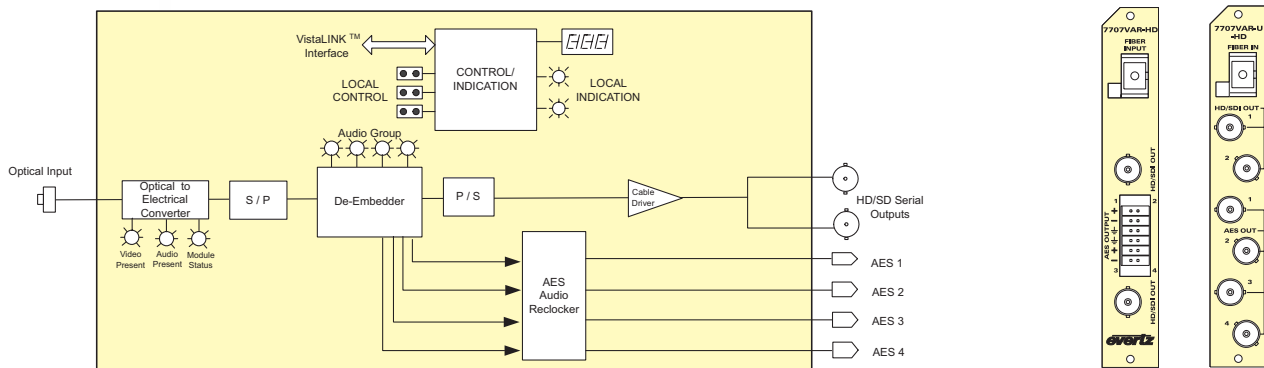
The 7707VAR-HD occupies one card slot and can be housed in a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone enclosure holding 1 module.

### Features

- Supports all HDTV video formats @1.485Gb/s
- Supports 525/625 line component 4:2:2 SDI @270Mb/s
- Provides up to four de-embedded AES audio outputs
- Dolby E compatible
- HD/SDI video regeneration for jitter reduction
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.

- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Local display of optical signal strength, video and audio presence, video and AES formats
- Fully Hot-swappable from front of frame
- Supports single-mode and multi-mode fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range

### 7707VAR-HD Block Diagram & Rear Panels



### Specifications

#### Optical Input:

Number of Inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Return Loss:	>25dB
Operating Wavelength:	1270nm to 1610nm
Maximum Input Power:	
Standard:	-1dBm
High Sensitivity	
-H version:	-7dBm
Optical Sensitivity:	
Standard:	-23dBm
High Sensitivity	
-H version:	-28dBm

#### Serial Video Outputs:

Number of Outputs:	2 regenerated
Standard:	SMPTE 292M, SMPTE 259M-C
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	< 270ps for HDSDI, < 900ps for SDI
Overshoot:	<10% of amplitude
Return Loss:	> 15dB up to 1.485Gb/s
Wide Band Jitter:	< 0.2 UI

#### AES Audio Outputs:

Number of Signals:	4 (user selectable for balanced or unbalanced)
Standards:	AES3-2003 (Balanced AES) SMPTE 276M (Unbalanced AES)
Connector:	
7707VAR-HD	12 pin removable terminal strip
7707VAR-U-HD	BNC per IEC 60169-8 Amendment 2
Sampling Rate:	48kHz
Resolution:	Up to 24 bits
Signal Level:	
Balanced:	1Vp-p ±0.1V
Unbalanced:	2Vp-p ±0.1V Differential
Rise/Fall Times:	
Balanced:	20ns ±5ns
Unbalanced:	35ns ±5ns
Impedance:	
Balanced:	110Ω
Unbalanced:	75Ω
Return Loss:	>15dB, from 1MHz to 6MHz
Wideband Jitter:	<10nsp-p, with conditions of minimum to maximum cable length

### System Performance (7707VAT-HD + 7707VAR-HD):

#### Video Input To Output

Delay:	< 35μs
Audio to Video delay:	< 9ms

#### Electrical:

Voltage:	+12VDC
Power:	11 Watts

#### Physical:

Number of slots:	1
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### Ordering Information:

7707VAR-HD	HDTV with 4 AES Audio Fiber Receiver, VistaLINK® Monitoring
7707VAR-HD-H	HDTV with 4 AES Audio High Sensitivity Fiber Receiver, VistaLINK® Monitoring

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

+U	Unbalanced AES audio
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### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

### Fiber Optic Patch Cable:

CB-FP1M-SCPC	Single mode fiber cable, 1m, SC/PC male termination
CB-FP1M-STPC	Single mode fiber cable, 1m, ST/PC male termination
CB-FP5M-SCPC	Single mode fiber cable, 5m, SC/PC male termination
CB-FP5M-STPC	Single mode fiber cable, 5m, ST/PC male termination
CB-FP10M-SCPC	Single mode fiber cable, 10m, SC/PC male termination
CB-FP10M-STPC	Single mode fiber cable, 10m, ST/PC male termination

### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure



# HD SDI with 4 AES Audio Fiber Receiver 7707VAT-HD



The 7707VAT-HD is a VistaLINK® -capable fiber optic transmitter for HDTV or SDTV video and AES audio signals. This single card module accepts one HD-SDI or SD-SDI video plus four AES audio and transmits them on a single fiber. The companion 7707VAR-HD receiver converts the HD-SDI and AES back to separate video and audio.

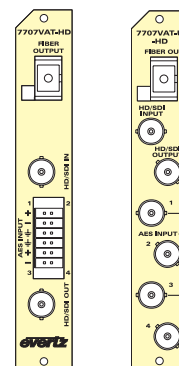
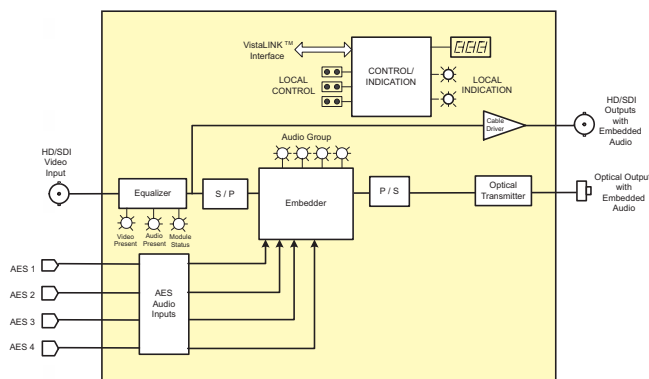
The fiber output is available in an assortment of optical wavelengths accomodating 1310/1550nm, CWDM and DWDM transmission schemes. The 7707VAT-HD occupies one card slot and can be housed in a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone enclosure holding 1 module.

## Features

- Supports all HDTV video formats @1.485Gb/s
- Supports 525/625 line component 4:2:2 SDI @270Mb/s
- Supports 32, 44.1, 48 kHz AES audio inputs
- Dolby E compatible
- AES audio inputs can be synchronous or asynchronous to each other and/or to input video
- Reclocked video output for additional signal distribution or monitoring
- Signal transport over fiber uninterrupted by loss of video or AES audio input feeds
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.

- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Local display of input coaxial cable length equalization
- Automatic coaxial input equalization up to 130m at 1.485Gb/s and 300m at 270Mb/s (Belden 1694A)
- Fully Hot-swappable from front of frame
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available

## 7707VAT-HD Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

Standard: SMPTE 292M, SMPTE 259M-C  
Connector: 1 BNC per IEC 60169-8 Amendment 2  
Equalization: Automatic to 100m @ 1.485 Gb/s and 300m @ 270 Mb/s with Belden 1694A (or equivalent)  
Return Loss: >15 dB up to 1.485Gb/s

### Serial Video Output:

Number of Outputs: 1 Per Card relocked  
Connector: BNC per IEC 60169-8 Amendment 2  
Signal Level: 800mV nominal  
DC Offset: 0V ± 0.5V  
Rise and Fall Time: <270ps for HDI, <900ps for SD  
Overshoot: <10% of amplitude  
Return Loss: >15 dB up to 1.485Gb/s  
Wide Band Jitter: <0.2 UI

### AES Audio Inputs:

Number of Signals: 4 Inputs  
Standards: AES3-2003 (Balanced AES), SMPTE 276M (Unbalanced AES)  
Connector: 12 pin removable terminal strip  
7707VAT-HD: BNC per IEC 60169-8 Amendment 2  
7707VAT-U-HD: Up to 24 bits  
Sampling Rate: 32kHz, 44.1kHz, 48kHz  
Resolution: 200mVp-p  
Minimum Input: Balanced 7Vp-p, Unbalanced 1.2Vp-p  
Maximum Input:  
Equalization:  
Balanced: <600m @ 48KHz, with Belden 1800B, and 2Vp-p source signal  
Unbalanced: <1200m @ 48KHz, with Belden 6281, and 1Vp-p source signal  
Impedance: Balanced 110Ω, Unbalanced 75Ω  
Return Loss: >15dB, from 1MHz to 6MHz  
Wideband Jitter: <10nsp-p, with conditions of minimum to maximum cable length

### Optical Output:

Number: 1  
Connector: Female SC/PC, ST/PC or FC/PC  
Return Loss: >14 dB  
Wavelengths: See Ordering Information  
Output Power:  
1310nm FP(Standard) -7dBm ± 1dBm  
1550nm & CWDM DFB 0dBm ± 1dBm  
DWDM DFB 7dBm ± 1dBm  
Fiber Size: 9µm core / 125 µm overall

### System Performance: (7707VAT-HD +7707VAR-HD)

Video Input To Output Delay: < 35µs  
Audio to Video delay: < 9ms

### Electrical:

Voltage: +12VDC  
Power: 11 Watts (Non-DWDM), 13 Watts (DWDM)

### Compliance:

Electrical Safety: CSA Listed to UL 60065-03, IEC 60065  
Laser Safety: Class 1 laser product  
Complies with 24 CFR 1040.10 and 1040.11, IEC 60825-1  
Complies with FCC Part 15, Class A, EU EMC directive

### EMI/RFI:

### Ordering Information:

7707VAT13-HD 1310nm, FP Laser  
7707VAT15-HD 1550nm, DFB Laser

For CWDM applications please refer to the end of the fiber section for details  
7707VATxx-HD HD-SDI with 4 AES Audio Fiber Transmitter, CWDM Laser

For DWDM application please refer to end of fiber section for details  
7707VATDyyy-HD HD-SDI with 4 AES Audio Fiber Transmitter, DWDM Laser

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

+U Unbalanced AES audio

### Rear Plate Suffix

+3RU 3RU Rear Plate for use with 7700FR-C Multiframe  
+1RU 1RU Rear Plate for use with 7701FR Multiframe  
+SA Standalone Enclosure Rear Plate

### Connector Suffix

+SC SC/PC  
+ST ST/PC  
+FC FC/PC

### Fiber Optic Patch Cable:

CB-FP1M-SCPC Single mode fiber cable, 1m, SC/PC male termination  
CB-FP1M-STPC Single mode fiber cable, 1m, ST/PC male termination  
CB-FP5M-SCPC Single mode fiber cable, 5m, SC/PC male termination  
CB-FP5M-STPC Single mode fiber cable, 5m, ST/PC male termination  
CB-FP10M-SCPC Single mode fiber cable, 10m, SC/PC male termination  
CB-FP10M-STPC Single mode fiber cable, 10m, ST/PC male termination

### Enclosures:

7700FR-C 3RU Multiframe which holds 15 modules  
7701FR 1RU Multiframe which holds 3 modules  
S7701FR Standalone enclosure



### Features

- Supports HD-SDI and SDI video
- Demultiplexes up to 4 AES audio, bi-directional RS-232/422 and 1 GPIO with HD-SDI or SDI
- Supports all SMPTE 292M (1.485Gb/s) rates/standards
- Supports 525/625 line component 4:2:2 SDI @ 270 Mb/s
- Supports 32, 44.1, 48 kHz AES audio
- Dolby E compatible
- Built-in jitter attenuation
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Local display of optical signal strength, video, audio and data presence, video and AES formats, GPI and GPO status
- Accepts any wavelength in the 1270nm to 1610nm range
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Supports single-mode and multi mode fiber optic cable
- Fully hot-swappable from front of frame
- Occupies a single card slot and can be housed in a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone enclosure that will hold 1 module

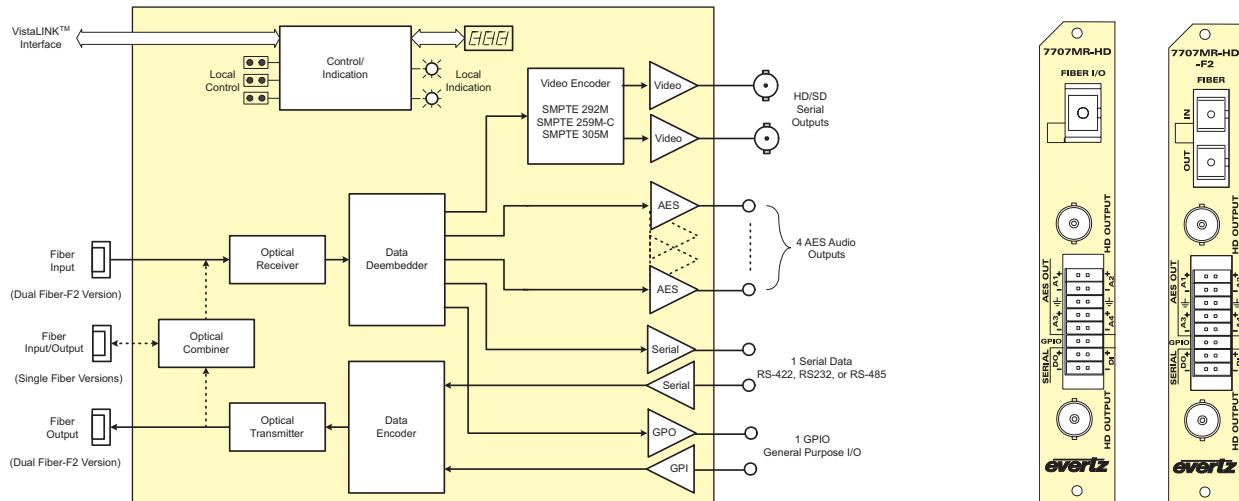
### 7707MR-HD Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	< 1km	7707MT13-HD-F2	-7dBm	7707MR13-HD-F2	-23dBm	1310nm on Tx & Rx fibers
Single-Mode	2	16dB/45km	7707MT13-HD-F2	-7dBm	7707MR13-HD-F2	-23dBm	1310nm on Tx & Rx fibers
Single-Mode	1(WDM)	20dB/57km	7707MT15-HD-W	-1dBm	7707MR13L-HD-W	-21dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	19dB/76km**	7707MTyy-HD-F2	0dBm	7707MRxx-HD-F2	-23dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	25dB/100km**	7707MTDyyy-HD-F2	+7dBm	7707MRDxxx-HD-F2	-23dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux**
Single-Mode	1(DWDM)	30dB/120km***	7707MTDyyy-HD-F2	+7dBm	7707MRDxxx-HD-F2-H	-28dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux***

\*\* Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB  
 \*\*\*Assumes 8 Ch DWDM Mux/Demux loss of 5dB

Fiber loss= 0.35/0.25dB per km @1310nm/1550nm

### 7707MR-HD Block Diagram & Rear Panels





# HD, SDI 4 AES Audio Bi-directional RS232/422, 1 GPI/GPO Fiber Receiver 7707MR-HD

## Specifications

### Optical Input/Output:

**Number of Outputs:** 1 (Single fiber version), 2 (Dual fiber version)  
**Connector:** Female SC/PC, ST/PC or FC/PC  
**Return Loss:** > 14dB  
**Rise and Fall Time:** 200 ps nominal  
**Wide Band Jitter:** < 0.20UI  
**Fiber Size:** 9µm core / 125 µm overall  
**Input Optical Sensitivity:** See Application Configuration Chart  
**Wavelengths:**  
     **Standard:** 1310nm, 1550nm (nominal)  
     **CWDM:** 1270nm to 1610nm (See ordering information)  
     **DWDM:** C-Band/L-Band (ITU-T G.694.1 compliant)  
**Output Power:**  
     **1310nm FP:** -7dBm ± 1dBm  
     **CWDM:** 0dBm ± 1dBm  
     **DWDM:** +7dBm ± 1dBm

### Serial Digital Video Outputs:

**Number of Outputs:** 2 regenerated  
**Standard:** SMPTE 292M (HD-SDI), SMPTE 259M-C (SD-SDI), SMPTE 305.2M (SDTi)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 150ps nominal @ 1.485Gb/s, 600ps nominal @ 270Mb/s  
**Overshoot:** < 10% of amplitude  
**Return Loss:** > 15dB up to 1.5Gb/s  
**Wide Band Jitter:** < 0.2 UI

### AES Audio Outputs:

**Number of Signals:** 4 (user selectable for balanced or unbalanced)  
**Standards:** AES3-2003 (Balanced AES), SMPTE 276M (Unbalanced AES)  
**Connector:** Multi-pin Removable Terminal Block  
**Signal Level:**  
     **Unbalanced:** 2 Vp-p ±0.1V Differential  
     **Balanced:** 1 Vp-p ±0.1V  
**Resolution:** Up to 24-bits  
**Sampling Rate:** 48 kHz  
**Rise/Fall Times:**  
     **Balanced:** 20ns ± 5ns  
     **Unbalanced:** 35ns ± 5ns  
**Return Loss:** > 15dB to 6MHz  
**Wideband Jitter:** < 10nsp-p, with conditions of minimum to maximum cable length  
**Latency:**  
     **SRC enabled:** < 6ms @ 48KHz, < 9ms @ 32KHz  
     **SRC disabled:** < 4ms @ 48KHz, < 6ms @ 32KHz  
**Impedance:**  
     **Unbalanced:** 75Ω  
     **Balanced:** 110Ω

### Serial Data:

**Number of Signals:** 1 input/output  
**Connector at Breakout:** Multi-pin Removable Terminal Block  
**Signal Type:** RS-422, RS-232, or RS-485 (selectable)  
**Input Termination:** High impedance  
**Input Failsafe Bias:** 5KΩ to 5V on DI+ (selectable)  
**Baud Rate:** Up to 153Kb/s (selectable)

### General Purpose Inputs:

**Number of Signals:** 1 input  
**Connector at Breakout:** Multi-pin Removable Terminal Block  
**Type:** Opto-isolated, active low  
**Input Voltage:**  
     **Safe Voltage Range:** -20V to +10V  
     **Off Condition (min):** +3.5V  
     **On condition (max):** +2.5V (active low)  
**Input Current (min):** 1mA  
**Input Current (max):** 10mA (internally limited)

### General Purpose Outputs:

**Number of Outputs:** 1  
**Type:** "Dry Contact" relay closure  
**Connector:** 1 pin on 16 pin removable terminal block  
**Signal Level:** Normally open

### Electrical:

**Voltage:** +12VDC  
**Power:**  
     **Non-DWDM:** 9W  
     **DWDM:** 12W

### Physical:

**7700 or 7701 frame mounting**  
**Number of slots:** 1

### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
**Laser Safety:** Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC directive

### Ordering Information:

**7707MR13-HD-F2** HD-SDI, 4 AES, Bi-directional RS232/422, GPI/O Fiber Receiver, dual fiber, 1310nm FP Tx & Rx, VistaLINK®  
**7707MR13L-HD-W** HD-SDI, 4 AES, Bi-directional RS232/422, GPI/O Fiber Receiver, single fiber, WDM, 1310nm DFB Tx, Rx on 1550nm, VistaLINK®. Use with 7707MT15-HD-W

### For CWDM, please refer to the end of the fiber section for ordering information

**7707MRxx-HD-F2** HD-SDI, 4 AES, Bi-directional RS232/422, GPI/O Fiber Receiver, dual fiber, CWDM TX, VistaLINK®

### For DWDM, please refer to the end of the fiber section for ordering information

**7707MRDyyy-HD-F2** HD-SDI, 4 AES, Bi-directional RS232/422, GPI/O Fiber Receiver, dual fiber, DWDM Tx, VistaLINK®

### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



### Features

- Supports HD-SDI and SDI video
- Multiplexes up to 4 AES audio, bi-directional RS-232/422 and 1 GPIO with HD-SDI or SDI
- Supports all SMPTE 292M (1.485Gb/s) rates/standards
- Supports 525/625 line component 4:2:2 SDI @ 270 Mb/s
- Supports 32, 44.1, 48kHz AES audio inputs
- Reclocked video output for additional signal distribution
- AES audio inputs can be synchronous or asynchronous to each other and/or to input video
- Dolby E compatible
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Local display of optical signal strength, video, audio and data presence, video format, GPI and GPO status
- Automatic coaxial input equalization up to 130m at 1.485Gb/s and 300m at 270Mb/s (Belden 1694A)
- Accepts any wavelength in the 1270nm to 1610nm range
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-G.694.1 compliant) also available
- Supports single-mode and multi-mode fiber optic cable
- Fully hot-swappable from front of frame
- Occupies a single card slot and can be housed in a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone enclosure that will hold 1 module

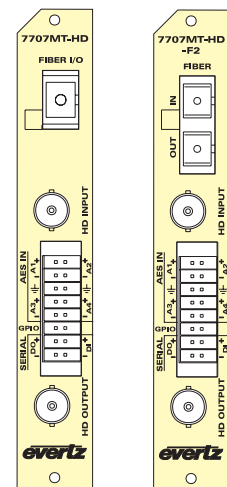
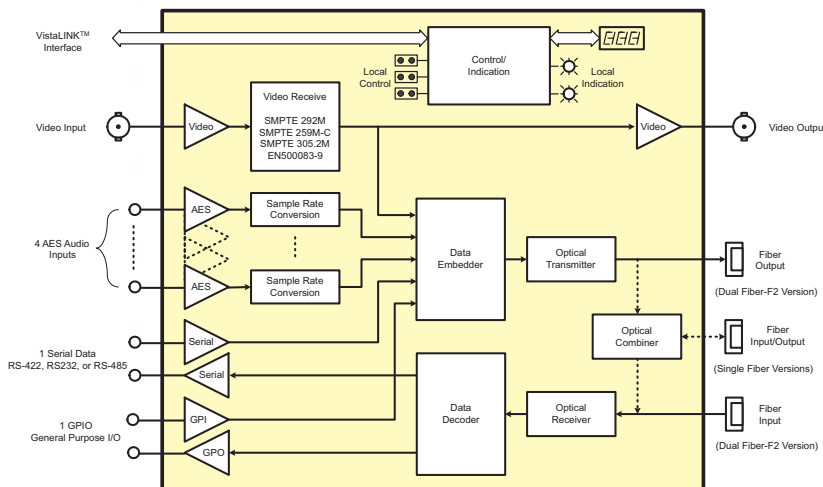
### 7707MT-HD Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	< 1km	7707MT13-HD-F2	-7dBm	7707MR13-HD-F2	-23dBm	1310nm on Tx & Rx fibers
Single-Mode	2	16dB/45km	7707MT13-HD-F2	-7dBm	7707MR13-HD-F2	-23dBm	1310nm on Tx & Rx fibers
Single-Mode	1(WDM)	20dB/57km	7707MT15-HD-W	-1dBm	7707MR13L-HD-W	-21dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	19dB/76km**	7707MTyy-HD-F2	0dBm	7707MRxx-HD-F2	-23dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(CWDM)	24dB/96km**	7707MTyy-HD-F2	0dBm	7707MRxx-HD-F2-H	-28dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	25dB/100km**	7707MTDyyy-HD-F2	+7dBm	7707MRDxxx-HD-F2	-23dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux**

\*\* Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB  
 \*\*\*Assumes 8 Ch DWDM Mux/Demux loss of 5dB

Fiber loss= 0.35/0.25dB per km @1310nm/1550nm

### 7707MT-HD Block Diagram & Rear Panels





# HD, SDI 4 AES Audio Bi-directional RS232/422, 1 GPI/GPO Fiber Transmitter 7707MT-HD

## Specifications

### Serial Digital Video Input:

Number of Signals:	1
Standards:	SMPTE 292M (HD-SDI) SMPTE 259M-C (SD-SDI) SMPTE305.2M (SDTi)
Connector:	BNC per IEC 60169-8 Amendment 2
Equalization:	Automatic to 100m (typ) @ 1.485Gb/s with Belden 1694A or equivalent cable Automatic to 250m (typ) @ 270 Mb/s with Belden 1694A or equivalent cable
Return Loss:	> 15 dB up to 1.5GHz

### Serial Digital Video Output:

Number of Signals:	1
Standards:	SMPTE 292M (HD-SDI), SMPTE 259M-C (SD-SDI), SMPTE305.2M (SDTi), EN500083-9 (DVB-ASI)
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	800mV nominal
DC Offset:	0V $\pm$ 0.5V
Rise and Fall Time:	150ps nominal @1.485Gb/s 600ps nominal @270Mb/s
Overshoot:	<10% of amplitude
Return Loss:	> 15 dB up to 1.5GHz
High Freq. Jitter:	< 0.2 UI

### AES Audio Inputs:

Number of Signals:	4
Standards:	AES3-2003 (Balanced AES) SMPTE 276M (Unbalanced AES)
Connector:	Multi-pin Removable Terminal Block
Sampling Rate:	32KHz, 44.1KHz, 48kHz
Resolution:	up to 24 bits
Minimum Input:	< 200mVp-p
Maximum Input:	
Balanced:	> 7Vp-p
Unbalanced:	> 1.2Vp-p
Equalization:	
Balanced:	< 1500ft @ 48KHz, with Belden 1800B, and 2Vp-p source signal
Unbalanced:	< 1200m @ 48KHz, with Belden 8281, and 1Vp-p source signal
Impedance:	
Balanced:	110 $\Omega$
Unbalanced:	75 $\Omega$
Return Loss:	> 15dB, from 1MHz to 6MHz
Wideband Jitter:	< 10nsp-p, with conditions of minimum to maximum cable length

### Serial Data:

Number of Signals:	1 input/output
Connector at Breakout:	Multi-pin Removable Terminal Block
Signal Type:	RS-422, RS-232, or RS-485 (selectable)
Input Termination:	High impedance
Input Failsafe Bias:	5K $\Omega$ to 5V on DI+ (selectable)
Baud Rate:	Up to 153Kb/s (selectable)

### General Purpose Inputs:

Number of Signals:	1
Connector at Breakout:	Multi-pin Removable Terminal Block
Type:	Opto-isolated, Active low
Input Voltage:	
Safe Voltage Range:	-20V to +10V
Off Condition (min):	+3.5V
On Condition (max):	+2.5V(active low)
Input Current (min):	1mA
Input Current (max):	10mA(internally limited)

### General Purpose Outputs:

Number of Signals:	1 GPO Outputs, 1 Common Reference (GPO COMMON)
Connector at Breakout:	Multi-pin Removable Terminal Block
Output Type:	Dry contact relay closure to GPO COMMON, normally open
Output Current (min):	100mA

### Optical Input/Output:

Number of Connections:	1 (Single fiber version) 2 (Dual fiber version)
Connector:	Female SC/PC, ST/PC or FC/PC
Return Loss:	> 14 dB
Rise and Fall Time:	200 ps nominal
Wide Band Jitter:	< 0.20UI
Fiber Size:	9 mm core / 125 mm overall
Input Optical Sensitivity:	See Applications Configuration Chart
Wavelengths:	
Standard:	1310nm, 1550nm (nominal)
CWDM:	1270nm to 1610nm (See ordering information)
DWDM:	C-Band/L-Band (ITU-T G.694.1 compliant) (See ordering information)
Output Power:	
1310nm FP:	-7dBm $\pm$ 1dBm
CWDM:	0dBm $\pm$ 1dBm
DWDM:	+7dBm $\pm$ 1dBm
Electrical:	
Voltage:	+12VDC
Power:	
Non-DWDM:	9 $\Omega$
DWDM:	12 $\Omega$

### Physical:

7700 or 7701 frame mounting	
Number of slots:	1

### Ordering Information:

7707MT13-HD-F2	HD-SDI, 4 AES, Bi-directional RS232/422, GPI/O Fiber Transmitter, dual fiber, 1310nm FP Tx & Rx, VistaLINK®
7707MT15-HD-W	HD-SDI, 4 AES, Bi-directional RS232/422, GPI/O Fiber Transmitter, single fiber, WDM, 1550nm DFB Tx, Rx on 1310nm, VistaLINK®. (Use with 7707MR13L-HD-W)

### For CWDM, please refer to the end of the fiber section for ordering information

7707MTxx-HD-F2	HD-SDI, 4 AES, Bi-directional RS232/422, GPI/O Fiber Transmitter, dual fiber, CWDM Tx, VistaLINK®
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### For DWDM, please refer to the end of the fiber section for ordering information

7707MTDyyy-HD-F2	HD-SDI, 4 AES, Bi-directional RS232/422, GPI/O Fiber Transmitter, dual fiber, DWDM Tx, VistaLINK®
------------------	---

### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

# 8/16 Channel AES Audio Fiber Transmitter Mux 7707AT-8, 7707AT-8U & 7707AT-16

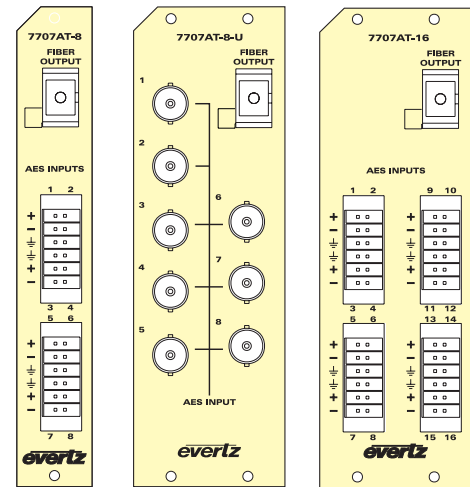
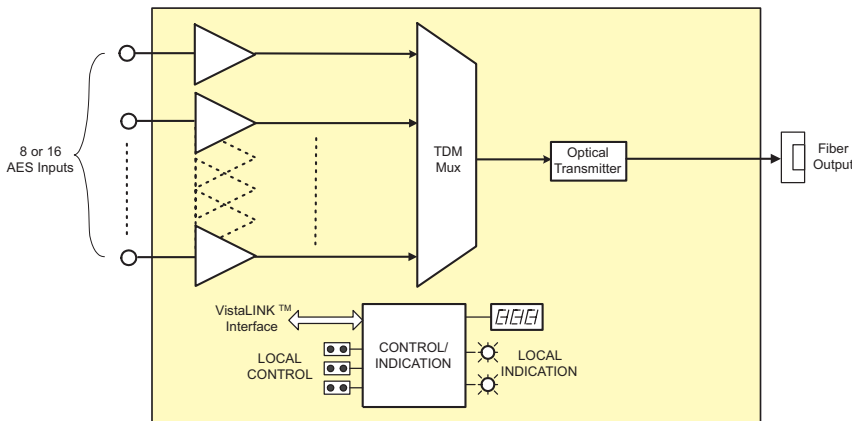


## Features

- Eight or sixteen AES audio fiber optic transmitter
- Dolby E compatible
- 7707AT-8 and 7707AT-16 versions provide interface to balanced or unbalanced signals
- 7707AT-8U version provides interface to unbalanced signals via BNC connections
- AES audio sample rate detection is provided independently for each channel
- Audio monitoring via card-edge headphone jack with adjustable volume
- All configuration settings are controllable through the card-edge user interface, or remotely through SNMP and VistaLINK®

- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths also available (ITU-T G.694.1 compliant)
- Supports single-mode and multi-mode fiber optic cable
- SC/PC, ST/PC, or FC/PC fiber connector options
- Fully hot swappable from front of frame
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

## 7707AT-8 & 7707AT-16 Block Diagram & Rear Panels



## Specifications

### AES Audio Inputs:

Standard:	SMPT E 276M - Unbalanced AES, Dolby E compatible
7707AT-8U:	AES3-1992, Balanced or Unbalanced (selectable), Dolby E compatible
7707AT-8/16:	

### Number of Inputs:

7707AT-8/8U:	8
7707AT-16:	16

### Connectors:

7707AT-8U:	BNC per IEC 60169-8 Amendment 2
7707AT-8/16:	Multi-pin Removable Terminal Blocks

### Input Sample Rate:

7707AT-8/16:	32 to 48kHz
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### Input Impedance:

Unbalanced:	75Ω
Balanced:	110Ω

### Input Return Loss:

Unbalanced:	>15dB
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### Input Amplitude (max):

Unbalanced:	1.2Vp-p
Balanced:	7Vp-p

### Input Amplitude (min):

Unbalanced:	320mVp-p
Balanced:	200mVp-p

### Cable Equalization (max):

Unbalanced:	450m (~1900ft) of Belden 1694A cable
Balanced:	1500m (~4900ft) of Belden 1800B cable

### Optical Output:

Connector:	SC/PC, ST/PC, FC/PC female housing
Output Wavelengths:	See Ordering Information

### Output Power:

1310nm FP (Standard):	-7 dBm ±1dBm
CWDM DFB:	0 dBm ±1dBm
DWDM DFB:	+7 dBm ±1dBm

### Electrical:

Voltage:	12V DC
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### Power

7707AT-8/8U:	6 Watts (Non DWDM) or 9 Watts (DWDM)
7707AT-16:	8 Watts (Non DWDM) or 11 Watts (DWDM)

### Physical:

#### 7700 frame mounting:

#### Number of Slots:

7707AT-8U:	2 slots
7707AT-8:	1 slot
7707AT-16:	2 slots

#### 7701 frame mounting:

Number of Slots:	1 for all versions
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### Compliance:

Electrical Safety:	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive
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### Laser Safety:

Class 1 laser product  
Complies with 24 CFR 1040.10 and 1040.11  
IEC 60825-1

### EMI/RFI:

Complies with FCC Part 15, Class A  
EU EMC Directive

### Ordering Information:

7707AT13-8	Eight channel AES Audio Fiber Transmitter Mux, 1310nm FP, VistaLINK®
7707AT13-8U	Eight channel AES Unbalanced Audio Fiber Transmitter Mux, 1310nm FP, VistaLINK®, AES on BNC's
7707AT13-16	Sixteen channel AES Audio Fiber Transmitter Mux, 1310nm FP, VistaLINK®
7707AT15-8	Eight channel AES Audio Fiber Transmitter Mux, 1550nm DFB, VistaLINK®
7707AT15-8U	Eight channel AES Unbalanced Audio Fiber Transmitter Mux, 1550nm DFB, VistaLINK®
7707AT15-16	Sixteen channel AES Audio Fiber Transmitter Mux, 1550nm DFB, VistaLINK®

### For CWDM, please refer to the end of the fiber section for ordering information

7707ATxx-8	Eight channel AES Audio Fiber Transmitter Mux, CWDM wavelength, VistaLINK®
7707ATxx-8U	Eight channel AES Unbalanced Audio Fiber Transmitter Mux, CWDM wavelength, VistaLINK®
7707ATxx-16	Sixteen channel AES Audio Fiber Transmitter Mux, CWDM wavelength, VistaLINK®

### For DWDM, please refer to the end of the fiber section for ordering information

7707ATDyyy-8	Eight channel AES Audio Fiber Transmitter Mux, DWDM wavelength, VistaLINK®
7707ATDyyy-8U	Eight channel AES Unbalanced Audio Fiber Transmitter Mux, DWDM wavelength, VistaLINK®
7707ATDyyy-16	Sixteen channel AES Audio Fiber Transmitter Mux, DWDM wavelength, VistaLINK®

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure



# 8/16 Channel AES Audio Fiber Receiver Mux 7707AT-A8 & 7707AT-A12

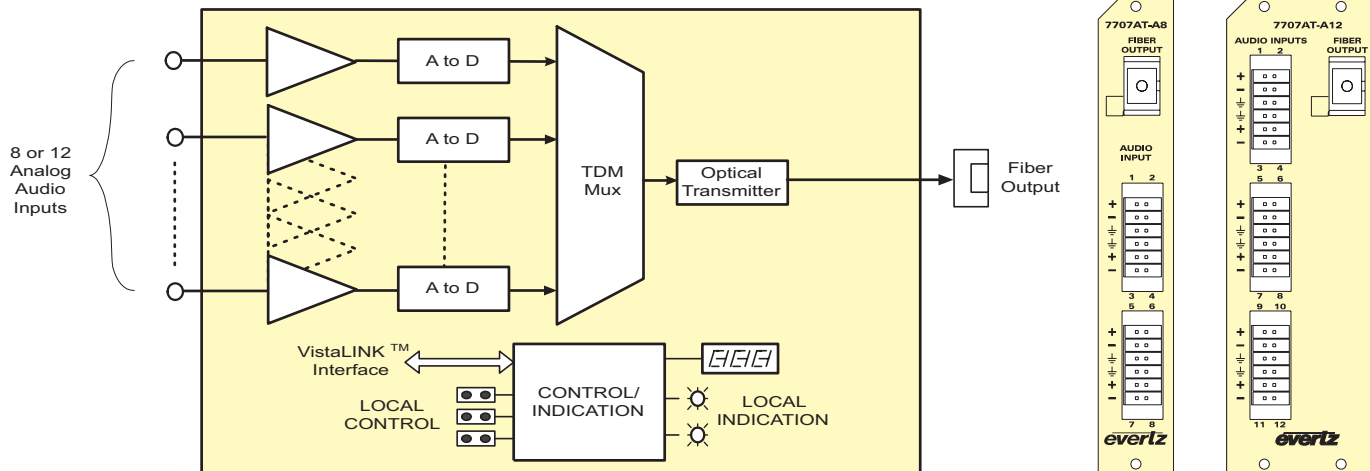


**Dolby E**  
PARTNER

## Features

- Eight or twelve professional quality analog audio fiber optic transmitter
- Adjustable audio detection for each channel
- Audio monitoring via card-edge headphone jack with adjustable volume
- All configuration settings controllable through the card-edge user interface, or remotely through SNMP and VistaLINK®
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths also available (ITU-T G.694.1 compliant)
- Supports single-mode and multi-mode fiber optic cable
- SC/PC, ST/PC, or FC/PC fiber connector options
- Fully hot swappable from front of frame
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

## 7707AT-A8 & 7707AT-A12 Block Diagram & Rear Panels



## Specifications

### Analog Audio Inputs:

#### Number of Inputs:

7707AT-A8:

8

7707AT-A12:

12

#### Connectors:

Multi-pin Removable Terminal Blocks

#### Input Level:

+24dBu (max)

#### Frequency Response:

±0.1dB (max, 20Hz to 20kHz)

#### THD + Noise:

-90dB or 0.003% (max, 20Hz to 20kHz, @0dBFS)

#### Crosstalk:

-100dB (max, 20Hz to 20kHz, measured channel connected at input)

#### S/N Ratio:

100dB (min)

#### Channel Phase:

±0.5° (max, 20Hz to 20kHz)

#### Input Impedance:

10kΩ (min, differential)

#### Resolution:

24 Bits

### Optical Output:

#### Connector:

SC/PC, ST/PC, FC/PC female housing

#### Output Wavelengths:

See Ordering Information

#### Output Power:

-7 dBm (nom) ±1dBm

#### CWDM DFB:

0 dBm (nom) ±1dBm

#### DWDM DFB:

+7 dBm (nom) ±1dBm

### Electrical:

#### Voltage:

12V DC

#### Power:

##### 7707AT-A8:

###### Non DWDM Laser:

8 Watts (max)

###### DWDM Laser:

10 Watts (max)

##### 7707AT-A12:

###### Non DWDM Laser:

10 Watts (max)

###### DWDM Laser:

12 Watts (max)

### Physical:

#### 7700 frame mounting:

##### Number of Slots:

7707AT-A8:

1 slot

7707AT-A12:

2 slots

#### 7701 frame mounting:

##### Number of Slots:

1 slot

### Compliance:

#### Electrical Safety:

CSA Listed to UL 60065-03, IEC 60065

Complies with CE Low voltage Directive

Class 1 laser product

Complies with 24 CFR 1040.10 and 1040.11

IEC 60825-1

#### Laser Safety:

### EMI/RFI:

Complies with FCC Part 15, Class A

EU EMC Directive

### Ordering Information:

#### 7707AT13-A8

Eight channel Analog Audio Fiber Transmitter Mux, 1310nm

FP, VistaLINK®

#### 7707AT15-A8

Eight channel Analog Audio Fiber Transmitter Mux, 1550nm

DFB, VistaLINK®

#### 7707AT13-A12

Twelve channel Analog Audio Fiber Transmitter Mux, 1310nm FP,

VistaLINK®

#### 7707AT15-A12

Twelve channel Analog Audio Fiber Transmitter Mux, 1550nm

DFB, VistaLINK®

### For CWDM, please refer to the end of the fiber section for ordering information

#### 7707ATxx-A8

Eight channel Analog Audio Fiber Transmitter Mux, CWDM

wavelength

#### 7707ATxx-A12

Twelve channel Analog Audio Mux Fiber Transmitter, CWDM

wavelength

### For DWDM, please refer to the end of the fiber section for ordering information

#### 7707ATDyyy-A8

Eight channel Analog Audio Mux Fiber Transmitter, DWDM

wavelength

#### 7707ATDyyy-A12

Twelve channel Analog Audio Mux Fiber Transmitter, DWDM

wavelength

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order

Eg: Model +SC +3RU

### Rear Plate Suffix

+3RU

3RU Rear Plate for use with 7700FR-C Multiframe

+1RU

1RU Rear Plate for use with 7701FR Multiframe

+SA

Standalone Enclosure Rear Plate

### Connector Suffix

+SC

SC/PC

+ST

ST/PC

+FC

FC/PC

### Fiber Optic Patch Cable please refer to the end of the fiber section for details

### Enclosures:

#### 7700FR-C

3RU Multiframe which holds 15 modules

#### 7701FR

1RU Multiframe which holds 3 modules

#### S7701FR

Standalone enclosure

# 8/16 Channel AES Audio Fiber Receiver Mux 7707AR-8, 7707AR-8U & 7707AR-16

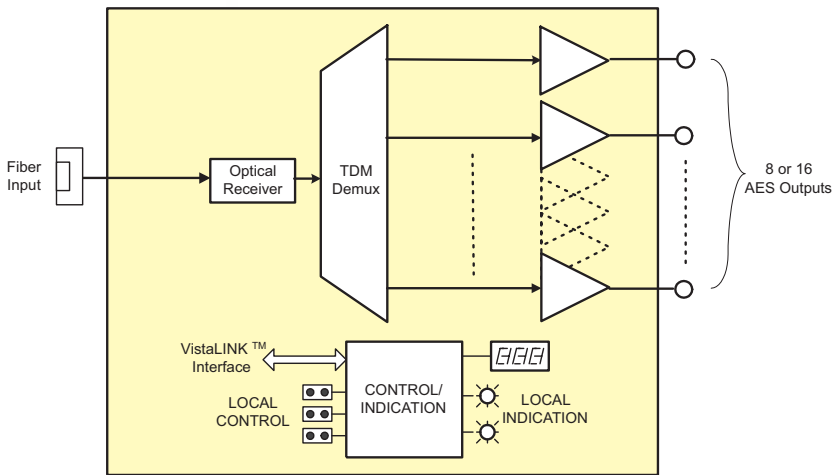


## Features

- Eight or sixteen AES audio fiber optic receiver
- Dolby E compliant
- 7707AR-8 and 7707AR-16 versions provide interface to balanced or unbalanced signals
- 7707AR-8U version provides interface to unbalanced signals via BNC connections
- AES audio sample rate detection provided independently for each channel
- Audio monitoring via card-edge headphone jack with adjustable volume
- All configuration settings controllable through the card-edge user interface, or remotely through SNMP and VistaLINK®

- Wide-band optical input is compatible with 1310nm, 1550nm, CWDM, or DWDM wavelengths
- Supports single-mode and multi-mode fiber optic cable
- SC/PC, ST/PC, or FC/PC fiber connector options
- Fully hot swappable from front of frame
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

## 7707AR-8 & 7707AR-16 Block Diagram & Rear Panels



## Specifications

### AES Audio Outputs:

#### Standard:

7707AR-8U:	SMPTE 276M - Unbalanced AES, Dolby E compliant
7707AR-8/16:	AES3-1992, Balanced or Unbalanced (selectable), Dolby E compliant

#### Number of Outputs:

7707AR-8/8U:	8
7707AR-16:	16

#### Connectors:

7707AR-8U:	BNC per IEC 60169-8 Amendment 2
7707AR-8/16:	Multi-pin Removable Terminal Blocks

#### Output Sample Rate:

32 to 48kHz (same as input signal at 7707AT)

#### Output Impedance:

Unbalanced:	75Ω
Balanced:	110Ω

#### Output Return loss:

>15dB

#### Output Amplitude:

Unbalanced: 1Vp-p to ±0.1Vp-p

Balanced: 2Vp-p to ±0.1Vp-p

#### Output Rise/Fall Times:

Unbalanced: 35ns ±5ns

Balanced: 20ns ±5ns

#### Output Jitter:

< 0.1UI

### Optical Input:

Connector: SC/PC, ST/PC, FC/PC female housing

Input Wavelength: 1270 to 1610nm

Input Power (max): 0dBm

Input Optical Sensitivity: -28dBm

### Electrical:

Voltage: 12V DC

Power (max): 6 Watts

EMI/RFI: Complies with FCC Part 15, Class A

EU EMC Directive

### Physical:

7700 frame mounting:

Number of Slots:

7707AR-8U: 2 slots

7707AR-8: 1 slot

7707AR-16: 2 slots

7701 frame mounting:

Number of Slots: 1 slot all versions

### Ordering Information:

#### 7707AR-8

Eight Channel AES Audio Fiber Receiver Demux, VistaLINK® Monitoring

#### 7707AR-8U

Eight Channel Unbalanced AES Audio Fiber Receiver Demux, VistaLINK® Monitoring

#### 7707AR-16

Sixteen Channel AES Audio Fiber Receiver Demux, VistaLINK® Monitoring

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

### Fiber Optic Patch Cable:

CB-FP1M-SCPC	Single mode fiber cable, 1m, SC/PC male termination
CB-FP1M-STPC	Single mode fiber cable, 1m, ST/PC male termination
CB-FP5M-SCPC	Single mode fiber cable, 5m, SC/PC male termination
CB-FP5M-STPC	Single mode fiber cable, 5m, ST/PC male termination
CB-FP10M-SCPC	Single mode fiber cable, 10m, SC/PC male termination
CB-FP10M-STPC	Single mode fiber cable, 10m, ST/PC male termination

### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

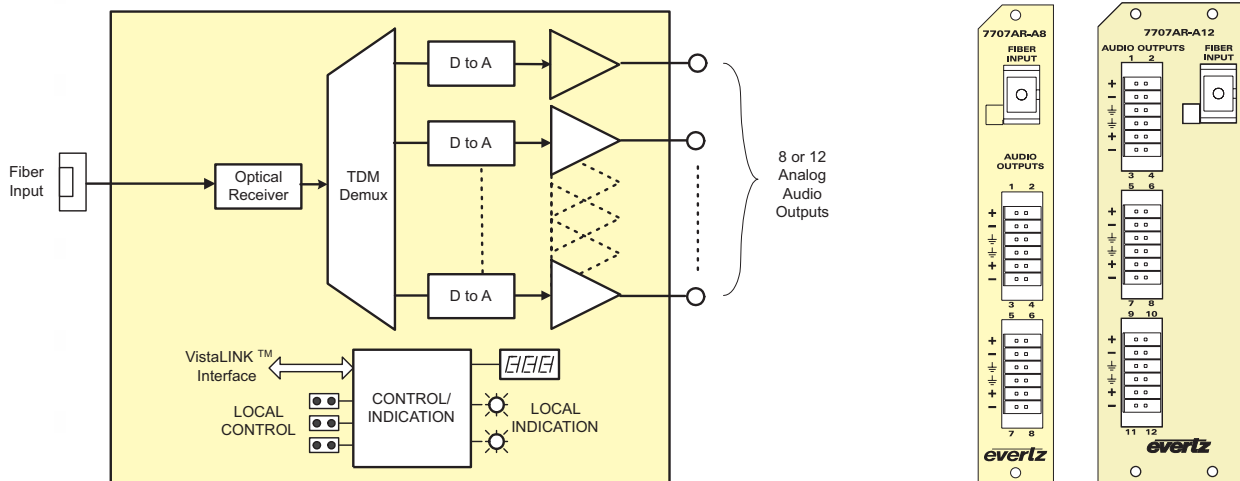


### 7707AR-A8 & 7707AR-A12

#### Features

- Eight or twelve professional quality analog audio fiber optic receiver
- Adjustable audio detection for each channel
- Adjustable audio gain for each channel
- Audio monitoring via card-edge headphone jack
- All configuration settings controllable through the card-edge interface, or remotely through SNMP and VistaLINK®
- Wide-band optical input compatible with 1310nm, 1550nm, CWDM, or DWDM transmission wavelengths
- Supports single-mode and multi-mode fiber optic cable
- SC/PC, ST/PC, or FC/PC fiber connector options
- Fully hot swappable from front of frame
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

#### 7707AR-A8 & 7707AR-A12 Block Diagram & Rear Panels



#### Specifications

##### Analog Audio Outputs:

##### Number of Outputs:

7707AR-A8: 8  
7707AR-A12: 12

Connectors: Multi-pin Removable Terminal Blocks

##### Output Level:

Into High Impedance: +24dBu (max)

Into 600Ω: +23dBu (max)

Frequency Response: ±0.1dB (max, 20Hz to 20kHz)

THD + Noise: -90dB or 0.003% (max, 20Hz to 20kHz, @0dBFS)

Crosstalk: -100dB (max, 20Hz to 20kHz, measured channel connected at input)

S/N Ratio: 100dB (min)

Channel Phase: ±0.5° (max, 20Hz to 20kHz)

Output Impedance: 66Ω (nom, differential)

Adjustable Gain: -10dB to +10dB (0.5dB increments)

##### Optical Input:

Connector: SC/PC, ST/PC, FC/PC female housing

Input Wavelength: 1270 to 1610nm

Input Power (Max): 0dBm

Input Optical Sensitivity: -28dBm

##### Electrical:

Voltage: 12V DC

##### Power:

7707AR-A8: 13.5 Watts (max)

7707AR-A12: 18.5 Watts (max)

EMI/RFI: Complies with FCC Part 15, Class A  
EU EMC Directive

##### Physical:

7700 frame mounting:

Number of Slots:

7707AR-A8: 1 slot

7707AR-A12: 2 slots

7701 frame mounting:

Number of Slots: 1 slot

#### Ordering Information:

##### 7707AR-A8

Eight Channel Analog Audio Fiber Receiver, Demux  
VistaLINK® Monitoring

##### 7707AR-A12

Twelve Channel Analog Audio Fiber Receiver, Demux  
VistaLINK® Monitoring

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order

Eg: Model +SC +3RU

##### Rear Plate Suffix

+3RU 3RU Rear Plate for use with 7700FR-C Multiframe

+1RU 1RU Rear Plate for use with 7701FR Multiframe

+SA Standalone Enclosure Rear Plate

##### Connector Suffix

+SC SC/PC

+ST ST/PC

+FC FC/PC

##### Fiber Optic Patch Cable:

CB-FP1M-SCPC Single mode fiber cable, 1m, SC/PC male termination

CB-FP1M-STPC Single mode fiber cable, 1m, ST/PC male termination

CB-FP5M-SCPC Single mode fiber cable, 5m, SC/PC male termination

CB-FP5M-STPC Single mode fiber cable, 5m, ST/PC male termination

CB-FP10M-SCPC Single mode fiber cable, 10m, SC/PC male termination

CB-FP10M-STPC Single mode fiber cable, 10m, ST/PC male termination

##### Enclosures:

7700FR-C 3RU Multiframe which holds 15 modules

7701FR 1RU Multiframe which holds 3 modules

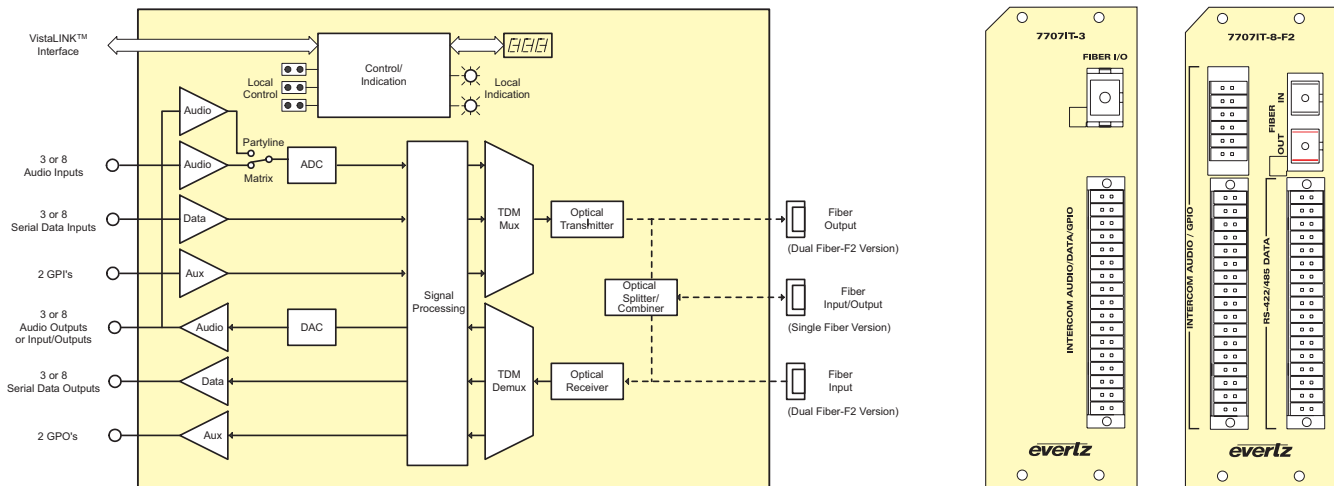
S7701FR Standalone enclosure



### Features

- Extends up to 3 or 8 independent channels of intercom communication over a single fiber optic link
- Configurable interface to:
  - RTS-Telex Matrix: 4-Wire Audio, RS-485 Data, GPIO
  - ClearCom Matrix: 4-Wire Audio, RS-422 Data, GPIO
  - RTS-Telex Party-Line: 2-Wire Audio, GPIO
  - ClearCom Party-line: 2-Wire Audio, GPIO
- Independent channels can simultaneously accommodate different intercom types
- User-friendly selection of intercom interfaces via programmed profiles
- All configurations and adjustments are controllable through the card-edge user interface or remotely via SNMP and VistaLINK®-capable capability
- Selectable termination, and failsafe bias settings for RS422/485 data inputs
- Provides 2 general-purpose inputs (GPI's), and 2 general purpose outputs (GPO's)
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Compatible with single-mode and multi-mode fiber optic cable (dual fiber version)
- Fully hot swappable from front of frame
- Occupies two card slots and can be housed in a 1 RU frame which holds up to 3 modules, a 3RU frame which holds up to 7 dual slot modules or a standalone enclosure which holds 1 module

### 7707IT-3 & 7707IT-8 Block Diagram & Rear Panels



### 7707IT-3/7707IT-8 Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<3km	7707IT13-3-F2 7707IT13-8-F2	-7dBm	7707IT13-3-F2 7707IT13-8-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	2	21dB/60km	7707IT13-3-F2 7707IT13-8-F2	-7dBm	7707IT13-3-F2 7707IT13-8-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	1(WDM)	25dB/71km*	7707IT13M-3-W 7707IT13M-8-W	-1dBm	7707IT15-3-W 7707IT15-8-W	-26dBm	1310nm/1550nm WDM bi-directional on one fiber
Single-Mode	1(CWDM)	24dB/96km**	7707ITxx-3-F2 7707ITxx-8-F2	0dBm	7707ITyy-3-F2 7707ITyy-8-F2	-28dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	30dB/120km***	7707ITDxxx-3-F2 7707ITDxxx-8-F2	+7dBm	7707ITDyyy-3-F2 7707ITDyyy-8-F2	-28dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux***

\*\* Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB

\*\*\*Assumes 8 Ch DWDM Mux/Demux loss of 5dB

Fiber loss= 0.35/0.25dB per km @1310nm/1550nm



# Multi-Channel Intercom Fiber Transceivers

## 7707IT-3 & 7707IT-8

### Specifications

#### Analog Audio:

##### Balanced/Matrix Type Audio

##### Number of Signals

7707IT-3:	3 inputs, 3 outputs
7707IT-8:	8 inputs, 8 outputs
Type:	Analog Audio, Balanced
Industry Standards:	ClearCom, RTS-Telex
Connector:	Multi-pin removable terminal block
Input Impedance:	> 10k $\Omega$
Output Impedance:	66 $\Omega$
Signal Resolution:	24-Bits
Sampling Rate:	52.7kHz
Frequency Response:	20Hz to 20kHz
Gain Flatness:	$\pm$ 2dB
Input Level(max):	+20dBu
Output Level(max):	
Into 10K $\Omega$	+20dBu
Into 600 $\Omega$	+19dBu
Signal/Noise Ratio:	> 90dB
THD:	< 0.01%
Crosstalk:	< -80dB
Controllable Gain:	-10dB to +10dB

##### Unbalanced/Party-Line Type Audio

##### Number of Signals

7707IT-3:	3
7707IT-8:	8
Type:	Analog Audio, Full-duplex, Unbalanced
Industry Standards:	ClearCom, RTS-Telex
Connector:	Multi-pin removable terminal block
Signal Coupling:	AC coupled (accommodates 30V 'wet' inputs)
Bridging Impedance:	>10k $\Omega$
Signal Resolution:	24-Bit
Sampling Rate:	52.7kHz
Sidetone Null:	> 25dB
Sidetone Null Range:	100 $\Omega$ to 300 $\Omega$ load
Frequency Response:	120Hz to 20kHz
Gain Flatness:	$\pm$ 2dB
Input Level(max):	+5dBu
Output Level(max):	+5dBu (into 200 $\Omega$ load)
Signal/Noise Ratio:	> 75dB
THD:	< 0.1%
Crosstalk:	< -60dB
Controllable Gain:	-5dB to +5dB (into 200 $\Omega$ load)
Receive Signaling:	4VDC min (ClearCom), 20kHz $\pm$ 500Hz (RTS)
Send Signaling:	11VDC min (ClearCom), 20kHz $\pm$ 100Hz (RTS)

#### Serial Data:

##### RS-422 /RS-485 Type Data

##### Number of Signals:

7707IT-3:	3
7707IT-8:	8
Connector:	Multi-pin removable terminal block
Signal Type:	RS-485 or RS-422 (selectable)
Input Termination:	120 $\Omega$ or Open (selectable)
Input Failsafe Bias:	200mV (3.3mA into 60 $\Omega$ ) or none (selectable)
Bit Rate:	
RS485:	Compatible with all Telex RS485 rates
RS422:	460Kb/s

#### Optical Input/Output:

Number:	1 (Standard and -W Single Fiber Version) 2 (-F2 Dual Fiber Version)
Connector at Frame:	SC/PC, ST/PC, FC/PC female housing
Input Wavelength:	1270nm to 1610nm
Maximum Input Power:	0dBm
Output Wavelengths:	
Standard:	1310nm, 1550nm (nominal)
CWDM:	1270nm to 1610nm (ITU-T G.694.2 compliant)
DWDM:	C-Band (ITU-T G.694.1 compliant)
Output Power:	See Application Configuration Chart

#### General Purpose Outputs (GPO):

Number of Signals:	2 Outputs
Connector:	Multi-pin removable terminal block
Output Type:	Dry contact relay closure, normally open
Output Current(min):	100mA

#### General Purpose Inputs (GPI):

Number of Signals:	2 Inputs
Connector:	Multi-pin removable terminal block
Type:	Opto-isolated, Active low
GPI Input Voltage:	
Safe Voltage Range:	-20V to +10V
On Condition(max):	<+2.5V(active low)
Off Condition(min):	>+3.5V

GPI Input Current(min):	1mA
GPI Input Current(max):	10mA(internally limited)

#### Electrical:

Voltage(type):	12V DC(nominal frame voltage)
Power(max):	7707IT-3 (Non DWDM) = 7 Watts 7707IT-3 (DWDM) = 9 Watts 7707IT-8 (Non DWDM) = 18 Watts 7707IT-8 (DWDM) = 20 Watts

#### Physical:

7700 frame mounting:	
Number of Slots:	2
7701 frame mounting:	
Number of Slots:	1

#### Compliance:

Electrical Safety:	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive
Laser Safety:	Class 1 laser product Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC directive

#### Ordering Information:

7707IT13M-3-W	3 Channel Intercom Fiber Transceiver, single fiber, WDM, 1310nm FP TX, RX on 1550nm
7707IT15-3-W	3 Channel Intercom Fiber Transceiver, single fiber, WDM, 1550nm DFB TX, RX on 1310nm
7707IT13-3-F2	3 Channel Intercom Fiber Transceiver, dual fiber, 1310nm FP TX & RX
7707IT13M-8-W	8 Channel Intercom Fiber Transceiver, single fiber, WDM, 1310nm FP TX, RX on 1550nm
7707IT15-8-W	8 Channel Intercom Fiber Transceiver, single fiber, WDM, 1550nm DFB TX, RX on 1310nm
7707IT13-8-F2	8 Channel Intercom Fiber Transceiver, dual fiber, 1310nm FP TX & RX

#### For CWDM, please refer to the end of the fiber section for ordering information

7707ITxx-3-F2	3 Channel Intercom Fiber Transceiver, dual fiber, CWDM TX, VistaLINK®
7707ITxx-8-F2	8 Channel Intercom Fiber Transceiver, dual fiber, CWDM TX, VistaLINK®

#### For DWDM, please refer to the end of the fiber section for ordering information

7707ITDyyy-3-F2	3 Channel Intercom Fiber Transceiver, dual fiber, DWDM TX, VistaLINK®
7707ITDyyy-8-F2	8 Channel Intercom Fiber Transceiver, dual fiber, DWDM TX, VistaLINK®

#### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg. Model +3RU +SC

#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone enclosure rear plate

#### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

#### Enclosures:

7700FR-C	3RU Multiframe, which holds 15 modules
7701FR	1RU Multiframe, which holds 3 modules
S7701FR	Standalone enclosure



The 7707DT series Fiber Data Transceivers provide an economical method of transmitting multiple bi-directional RS-232, RS-422, RS-485 data signals as well as Linear Time Code (LTC) over a single fiber optic link. The 7707DT-GPIO version provides additional RS232 and General Purpose Input/Outputs (GPIO). A pair of 7707DT Data Transceivers permits bi-directional data transmission over distances up to 100 km, with minimum possible latency.

Single and dual fiber (-F2) optical interface configurations allow the user to choose the optimal function /price /performance to suit a particular application. The dual fiber configuration is compatible with CWDM /DWDM systems and is designed to transmit and receive over separate fibers. The optical output of the 7707DT is available in 1310nm, 1550nm, CWDM and DWDM wavelengths.

The 7707DT occupies a single card slot and can be housed in either a 1RU Multiframe that will hold up to 3 modules, a 3RU Multiframe that will hold up to 15 modules or a standalone enclosure which will hold 1 module. The 7707DT-GPIO occupies two card slots and can be housed in the same enclosures.

## Features

- 7707DT transports four RS-422 or RS-485, three RS-232, and one LTC
- 7707DT-GPIO version provides five additional RS-232 and eight General Purpose Input/Outputs (GPIO)
- Selectable termination and failsafe bias settings for RS-422/485 data inputs
- Selectable network timeouts for RS-485 accommodates twelve data rates
- All configuration settings are controllable through the card-edge user interface, or VistaLINK®

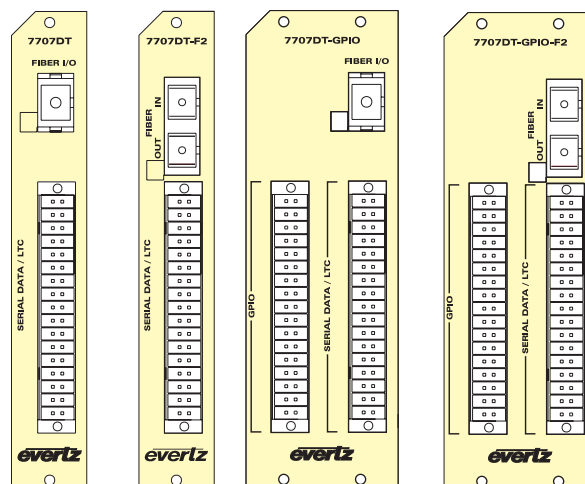
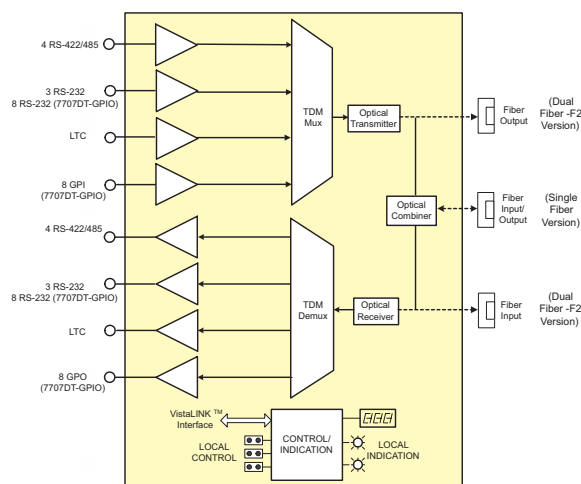
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths also available (ITU-T G.694.1 compliant)
- Supports single-mode and multi-mode fiber optic cable
- SC/PC, ST/PC, or FC/PC\* fiber connector options
- Fully hot swappable from front of frame
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

## 7707DT Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<3km	<b>7707DT13-F2</b>	-7dBm	<b>7707DT13-F2</b>	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	2	21dB/60km	<b>7707DT13-F2</b>	-7dBm	<b>7707DT13-F2</b>	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	1(WDM)	25dB/71km	<b>7707DT13M-W</b>	-1dBm	<b>7707DT15-W</b>	-26dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM )	24dB/96km**	<b>7707DTxx-F2</b>	0dBm	<b>7707DTyy-F2</b>	-28dBm	Different CWDM wavelengths on Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM )	30dB/120km** *	<b>7707DTDxxx-F2</b>	+7dBm	<b>7707DTDyyy-F2</b>	-28dBm	Different DWDM wavelengths on Tx & Rx, with 8 channel DWDM Mux/Demux***
<b>** Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB</b> <b>*** Assumes 8 Ch DWDM Mux/Demux loss of 5dB</b>					<b>Fiber loss= 0.35/0.25dB per km @1310nm/1550nm</b> <b>Tx Power/Rx Sensitivity are nominal values ±1dBm</b>		

# Multi RS-232/422/485/GPIO Fiber Data Transmitter 7707DT & 7707DT-GPIO

## 7707DT/7707DT-GPIO Block Diagram & Rear Panels



### Specifications

#### RS-422/485 Serial Data:

Number of Signals: 4 Inputs/Outputs  
Connector: Multi-pin Removable Terminal Block  
Signal Type: RS-485 or RS-422 (selectable)  
Input Termination: 110Ω or Open (selectable)  
Input Failsafe Bias: 200mV (3.3mA into 60Ω) or None (selectable)  
Bit Rate (max):  
RS-422: 460kb/s  
RS-485: 1.2kb/s, 2.4kb/s, 4.8kb/s, 9.6kb/s, 19.2kb/s, 38.4kb/s, 57.6kb/s, 76.8kb/s, 115kb/s, 153kb/s, 230kb/s, or 460kb/s (selectable)

#### RS-232 Serial Data:

Number of Signals: 3 Input/Outputs  
Standard Version: 8 Inputs/Outputs  
Connector: Multi-pin Removable Terminal Block  
Signal Type: RS-232  
Bit Rate (max): 115kb/s

#### LTC Data:

Number of Signals: 1 Input/Output  
Connector: Multi-pin Removable Terminal Block  
Signal Type: SMPTE 12M Linear Time Code  
Input Level: 0.2 to 4V p-p (balanced or unbalanced)  
Rise/Fall Times: 40μs ± 10μs  
Output Level: 1V p-p nominal (balanced)

#### General Purpose Inputs (7707DT-GPIO ONLY):

Number of Signals: 8 Inputs  
Connector: Multi-pin Removable Terminal Block  
Type: Opto-isolated, Active low  
Input Voltage: -20V to +10V  
Safe Voltage Range: +3.5V  
Off Condition (min): +2.5V (active low)  
On Condition (max): 1mA  
Input Current (min): 10mA (internally limited)  
Input Current (max): 10mA (internally limited)

#### General Purpose Outputs (7707DT-GPIO ONLY):

Number of Signals: 8 Outputs  
Connector: Multi-pin Removable Terminal Block  
Output Type: Dry contact relay closure, normally open  
Output Current (min): 100mA

#### Optical Input/Output:

Connector:  
Single fiber version: 1 Bi-directional optical connector: SC/PC, ST/PC or FC/PC\* female housing  
Dual fiber (F2) version: 2 optical connector: SC/PC or ST/PC female housing  
Maximum Input Power:  
Single fiber versions: 0dBm  
Dual fiber (F2) versions: 0dBm  
Input Optical Sensitivity: See Application Configuration Chart  
Output Wavelengths: See Application Configuration Chart  
Output Power: See Application Configuration Chart

#### Electrical:

Voltage: 12V DC  
Power (max): 6 Watts (Non DWDM), 8 Watts (DWDM)  
EMI/RFI: Complies with FCC Part 15, Class A  
EU EMC Directive

#### Physical:

7700 frame mounting:

Number of Slots:

7707DT: 1  
7707DT-GPIO: 2

7701 frame mounting:

Number of Slots:

7707DT: 1  
7707DT-GPIO: 1

#### Compliance:

Electrical Safety:

CSA Listed to UL 60065-03, IEC 60065  
Complies with CE Low voltage Directive

Laser Safety:

Class 1 laser product  
Complies with 24 CFR 1040.10 and 1040.11  
IEC 60825-1  
Complies with FCC Part 15, Class A  
EU EMC directive

#### Ordering Information:

7707DT13M-W Multi RS232/422 Fiber Data Transceiver, single fiber, WDM, 1310nm FP TX, RX on 1550nm, Vistalink®  
7707DT13M-W-GPIO Multi RS232/422 and GPIO Fiber Data Transceiver, single fiber, WDM, 1310nm FP TX, RX on 1550nm, Vistalink®  
7707DT15-W Multi RS232/422 Fiber Data Transceiver, single fiber, WDM, 1550nm DFB TX, RX on 1310nm, Vistalink®  
7707DT15-W-GPIO Multi RS232/422 and GPIO Fiber Data Transceiver, single fiber, WDM, 1550nm DFB TX, RX on 1310nm, Vistalink®  
7707DT13-F2 Multi RS232/422 Fiber Data Transceiver, dual fiber, 1310nm FP TX & RX, Vistalink®  
7707DT13-F2-GPIO Multi RS232/422 and GPIO Fiber Data Transceiver, dual fiber, 1310nm FP TX & RX, Vistalink®

#### For CWDM, please refer to the end of the fiber section for ordering information

7707DT-xx-F2 Multi RS232/422 Fiber Data Transceiver, dual fiber, CWDM TX  
7707DT-xx-F2-GPIO Multi RS232/422 and GPIO Fiber Data Transceiver, dual fiber, CWDM TX

#### For DWDM, please refer to the end of the fiber section for ordering information

7707DTDyyy-F2 Multi RS232/422 Fiber Data Transceiver, dual fiber, DWDM TX  
7707DTDyyy-F2-GPIO Multi RS232/422 and GPIO Fiber Data Transceiver, dual fiber, DWDM TX

#### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix

+3RU 3RU Rear Plate for use with 7700FR-C Multiframe  
+1RU 1RU Rear Plate for use with 7701FR Multiframe  
+SA Standalone Enclosure Rear Plate

#### Connector Suffix

+SC SC/PC  
+ST ST/PC  
+FC FC/PC\*

Note: FC/PC is only available on single fiber version

#### Enclosures:

7700FR-C 3RU Multiframe which holds 15 modules  
7701FR 1RU Multiframe which holds 3 modules  
S7701FR Standalone enclosure





The 7707ET is a VistaLINK® - capable Ethernet Fiber Transceiver that provides an economical method of transmitting two 10BaseT Ethernet channels or one 100Base-TX Ethernet channel over optical fiber. The transceiver is IEEE 802.3 10BASE-T and IEEE 802.3u 100BASE-TX compliant. It mediates between a 10/100BASE-TX segment and supports both full duplex and half-duplex operation. Monitoring of card status and parameters is provided locally at the card edge and remotely via VistaLINK®. A pair of 7707ET transceivers permits full duplex communication over single or dual optical fibers. Diagnostic LEDs provide indication of power, link status and data reception.

Multiple versions of the 7707ET are available to address single-mode/multi-mode fiber, single/dual fiber and CWDM/DWDM applications (See Applications Configuration Chart)

The 7707ET occupies one card slot and can be housed in either a 1RU Frame that will hold up to 3 modules, a 3RU Frame that will hold up to 15 modules or a standalone enclosure that will hold 1 module.

## Features

- 2 (10 Base T) Ethernet channels or 1 (100 Base TX) Ethernet channel
- Auto negotiation for 10/100 speed and half/full duplex modes
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Local display of optical signal strength, link parameters and link status
- Optical output available in 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Supports single-mode and multi-mode fiber optic cable
- Fully hot-swappable from front of frame with no fiber or Ethernet channel disconnect required
- SC/PC, ST/PC or FC/PC connector options

## Status Indicators:

- Frame Status
- 10/100 speed indication for all copper ports
- Full duplex/Collision Indication for all copper ports
- Link activity for copper port
- Received optical power level
- Fiber link indication

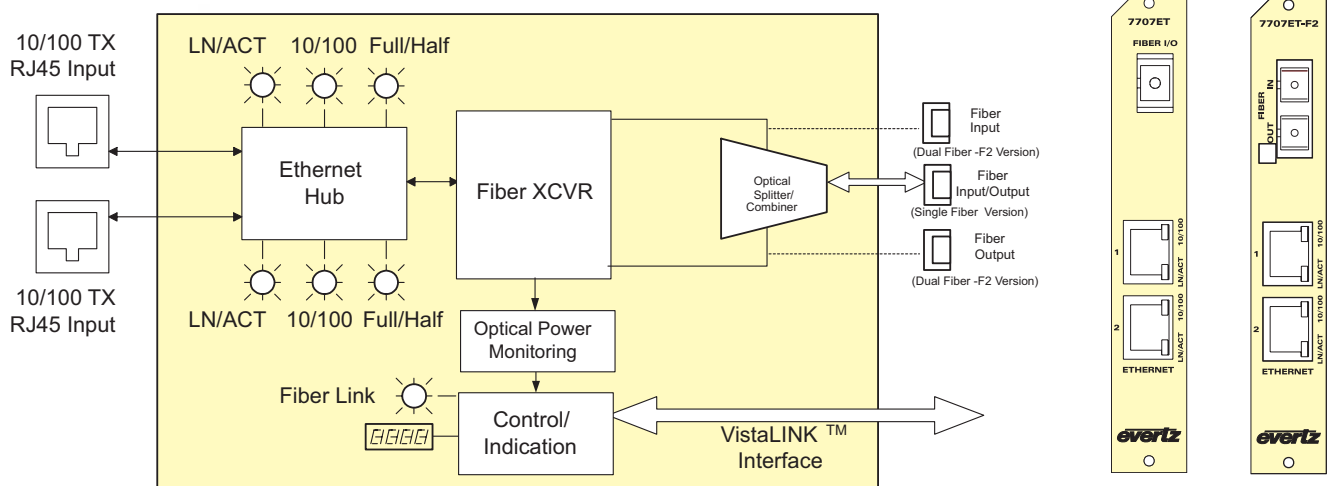
## 7707ET Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<3km	7707ET13-F2	-7dBm	7707ET13-F2	-32dBm	1310nm on Tx & Rx fibers
Single-Mode	2	25dB/71km	7707ET13-F2	-7dBm	7707ET13-F2	-32dBm	1310nm on Tx & Rx fibers
Single-Mode	1(WDM)	25dB/71km	7707ET13M-W	-1dBm	7707ET15-W	-26dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	28dB/112km**	7707ETxx-F2	0dBm	7707ETyy-F2	-32dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	34dB/136km***	7707ETDxxx-F2	+7dBm	7707ETDyyy-F2	-32dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux***

\*\* Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB  
\*\*\*Assumes 8 Ch DWDM Mux/Demux loss of 5dB

Fiber loss= 0.35/0.25dB per km @1310nm/1550nm

## 7707ET Block Diagram & Rear Panels



### Specifications

#### Ethernet Input/Output:

<b>Standard :</b>	IEEE 802.3 (10 BaseT), IEEE 802.3u (100 BaseTX)
<b>Connector:</b>	Two RJ45's
<b>Number of channels:</b>	2 (10Base-T) or 1 (100BaseTX)
<b>Cable Requirements:</b>	
<b>10 BaseT :</b>	UTP category 3,4 or 5 cable up to 328ft/100m (2 pairs)
<b>100 BaseTX :</b>	UTP category 5 cable up to 328 ft/100m (2 pairs)

#### Optical Input/Output:

<b>Connector:</b>	
<b>Single Fiber Versions:</b>	1 Female SC/PC, ST/PC or FC/PC
<b>Dual Fiber (F2) Versions:</b>	2 Female SC/PC, ST/PC or FC/PC
<b>Input wavelengths:</b>	1270nm - 1610nm
<b>Maximum Input Power:</b>	0dBm
<b>Input Optical Sensitivity:</b>	See Application Configuration Chart
<b>Output Wavelengths:</b>	See Ordering Information
<b>Output Power:</b>	See Application Configuration Chart

#### Electrical:

<b>Voltage:</b>	12 volts
<b>Power:</b>	6 Watts (Non DWDM) 8 Watts (DWDM)

#### Physical:

<b>Number of slots:</b>	1
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#### Compliance:

<b>Electrical Safety:</b>	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive
<b>Laser Safety:</b>	Class 1 laser product Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC Directive

#### Ordering Information:

<b>7707ET13M-W</b>	Ethernet Fiber Transceiver - Single Fiber, WDM, 1310nm, FP TX, RX on 1550nm, VistaLINK® Monitoring
<b>7707ET15-W</b>	Ethernet Fiber Transceiver, single fiber, WDM, 1550nm DFB TX, RX on 1310nm, VistaLINK®
<b>7707ET13-F2</b>	Ethernet Fiber Transceiver - Dual Fiber, 1310nm, FP Laser, VistaLINK® Monitoring

#### For CWDM, please refer to the end of the fiber section for ordering information

<b>7707ETxx-F2</b>	Ethernet Fiber Transceiver - Dual Fiber, CWDM, DFB Laser, VistaLINK® Monitoring
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#### For DWDM, please refer to the end of the fiber section for ordering information

<b>7707ETDyyy-F2</b>	Ethernet Fiber Transceiver, dual fiber, DWDM TX, VistaLINK®
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#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Connector Suffix

<b>+SC</b>	SC/PC
<b>+ST</b>	ST/PC
<b>+FC</b>	FC/PC

#### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone enclosure



The 7707ET-TE1 is a VistaLINK® - capable Ethernet and T1/E1/J1 Fiber Transceiver that provides an economical method of transmitting one 10/100BaseT Ethernet signal and one T1/E1/J1 signal over optical fiber. Monitoring control of card status and parameters is provided locally at the card edge and remotely via VistaLINK®. A pair of 7707ET-TE1 transceivers permits full duplex communication of all signals over single or dual optical fibers.

The 7707ET-TE1 provides one RJ45 input connector for the 10/100BaseT Ethernet, one RJ45 input connector for the T1/E1/J1 and one or two fiber optic output connectors. Multiple versions of the 7707ET-TE1 are available to address single-mode/multi-mode fiber, single/dual fiber and CWDM/DWDM applications. (See Applications Configuration Chart below)

The 7707ET-TE1 occupies one card slot and can be housed in either a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone enclosure that will hold 1 module.

### Features

- 10/100BaseT Ethernet and T1/E1/J1 fiber optic transceiver
- Auto negotiation for 10/100 speeds and full/half duplex operation on Ethernet port
- G.703 compliant T1/E1/J1 port
- Ethernet and T1/E1/J1 signals completely independent over transport interface
- Built-in Ethernet switch for isolation of each transmission end
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Local display of optical signal strength, link parameters and link status
- Optical output available in 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Supports single-mode and multi-mode fiber optic cable
- Fully hot-swappable from front of frame
- SC/PC, ST/PC or FC/PC connector options

### Status Indication:

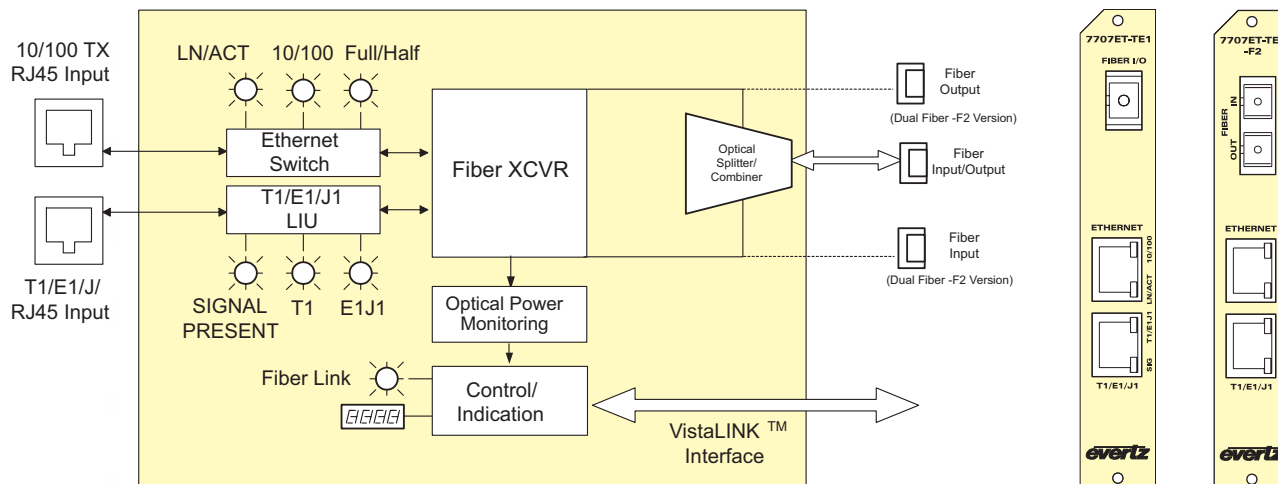
- Frame status
- Fiber link indication
- 10/100 Speed indication
- Ethernet Full Duplex/Collision indication
- Ethernet Link activity
- T1/E1/J1 Signal Presence
- T1/E1/J1 Indication
- Optical Power Level

### 7707ET-TE1 Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<3km	7707ET13-TE1-F2	-7dBm	7707ET13-TE1-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	2	21dB/60km	7707ET13-TE1-F2	-7dBm	7707ET13-TE1-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	1(WDM)	25dB/71km	7707ET13M-TE1-W	-1dBm	7707ET15-TE1-W	-26dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	24dB/96km**	7707ETxx-TE1-F2	0dBm	7707ETyy-TE1-F2	-28dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	30dB/120km***	7707ETDxxx-TE1-F2	+7dBm	7707ETDyyy-TE1-F2	-28dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux***
** Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB				Fiber loss= 0.35/0.25dB per km @1310nm/1550nm			
***Assumes 8 Ch DWDM Mux/Demux loss of 5dB							



## 7707ET-TE1 Block Diagram & Rear Panels



### Specifications

#### Ethernet Input/Output

<b>Standard :</b>	IEEE 802.3 (10 BaseT), IEEE 802.3u (100 BaseTX)
<b>Connector:</b>	1 RJ45
<b>Cable Requirements:</b>	
<b>10 BaseT:</b>	UTP category 3,4 or 5 cable up to 328ft/100m (2 pairs)
<b>100 BaseTX:</b>	UTP category 5 cable up to 328 ft/100m (2 pairs)

#### T1/E1/J1 Input/Output:

<b>Standard:</b>	G.703
<b>Connector:</b>	1 RJ45
<b>Cable Requirements:</b>	0.63 mm (22 AWG) cable up to 1000 meters

#### Optical Input/Output:

<b>Connector:</b>	
<b>Single Fiber versions:</b>	1 Female SC/PC, ST/PC or FC/PC
<b>Dual Fiber (F2) versions:</b>	2 Female SC/PC, ST/PC or FC/PC
<b>Maximum Input Power:</b>	0dBm
<b>Input Wavelength:</b>	1270nm - 1610nm
<b>Input Optical Sensitivity:</b>	See Application Configuration Chart
<b>Output Wavelengths:</b>	See Ordering Information
<b>Output Power:</b>	See Application Configuration Chart

#### Electrical:

<b>Voltage:</b>	12 volts
<b>Power:</b>	6 Watts (Non DWDM) 8 Watts (DWDM)

#### Physical:

<b>Number of slots:</b>	1
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#### Compliance:

<b>Electrical Safety:</b>	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive
<b>Laser Safety:</b>	Class 1 laser product Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC Directive

### Ordering Information:

<b>7707ET13M-TE1-W</b>	Ethernet & T1/E1/J1 Fiber Transceiver, single fiber, WDM, 1310nm FP TX, RX on 1550nm, VistaLINK®
<b>7707ET15-TE1-W</b>	Ethernet & T1/E1/J1 Fiber Transceiver, single fiber, WDM, 1550nm DFB TX, RX on 1310nm, VistaLINK®
<b>7707ET13-TE1-F2</b>	Ethernet and T1/E1/J1 Fiber Transceiver, Dual Fiber, 1310 nm, FP Laser, VistaLINK®

#### For CWDM, please refer to the end of the fiber section for ordering information

<b>7707ETxx-TE1-F2</b>	Ethernet and T1/E1/J1 Fiber Transceiver, Dual Fiber, CWDM, DFB Laser, VistaLINK®
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#### For DWDM, please refer to the end of the fiber section for ordering information

<b>7707ETDyyy-TE1-F2</b>	Ethernet & T1/E1/J1 Fiber Transceiver, dual fiber, DWDM TX, VistaLINK®
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### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix

<b>+3RU</b>	3RU Rear Plate for use with 7700FR-C Multiframe
<b>+1RU</b>	1RU Rear Plate for use with 7701FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

#### Connector Suffix

<b>+SC</b>	SC/PC
<b>+ST</b>	ST/PC
<b>+FC</b>	FC/PC

### Enclosures:

<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>S7701FR</b>	Standalone enclosure



The 7707ET-4 is a VistaLINK® - capable Quad Ethernet Fiber Transceiver that transmits up to four separate 10/100BaseT Ethernet channels over optical fiber. Monitoring of card status and parameters is provided locally at the card edge and remotely via VistaLINK®. A pair of 7707ET-4 transceivers permit full duplex communication of all four channels over a single or dual optical fiber(s).

The 7707ET-4 provides four RJ45 input connectors and either one or two fiber optic output connectors. Multiple versions of the 7707ET-4 are available to address single-mode/multi-mode fiber, single/dual fiber and CWDM/DWDM applications. (See Application Configuration chart below)

The 7707ET-4 occupies one or two card slots and can be housed in a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 7 dual slot modules or 15 single slot modules or a standalone enclosure which will hold 1 module.

### Features

- Four completely independent and isolated Ethernet streams
- Auto negotiation for 10/100 speeds on all ports
- Built-in Ethernet switches for isolation of each transmission end
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Optical output wavelengths at 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)

- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Fully hot swappable from front of frame
- SC/PC, ST/PC, FC/PC Connector options

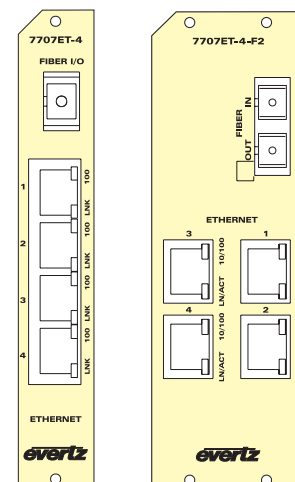
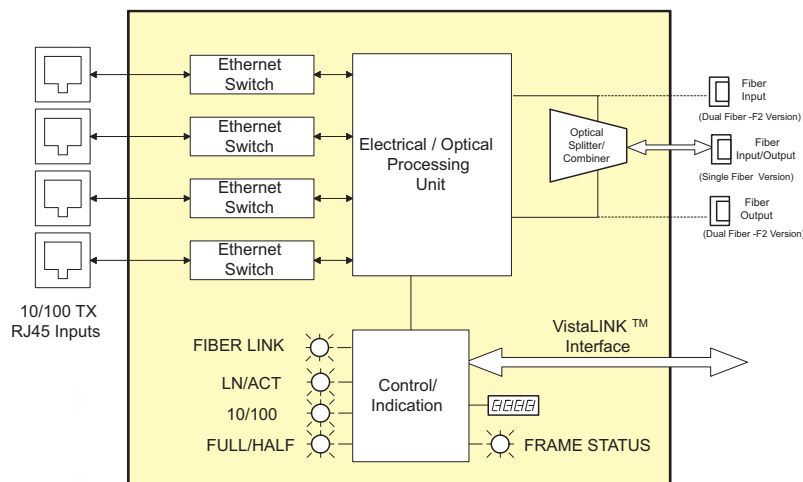
### Status Indication:

- Frame status
- 10/100 Speed indication on copper ports
- Full Duplex/Collision indication on copper ports
- Link activity on copper ports
- Received optical power level

### 7707ET-4 Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<2km	7707ET13-4-F2	-7dBm	7707ET13-4-F2	-23dBm	1310nm on Tx & Rx fibers
Single-Mode	2	16dB/45km	7707ET13-4-F2	-7dBm	7707ET13-4-F2	-23dBm	1310nm on Tx & Rx fibers
Single-Mode	1(WDM)	20dB/57km	7707ET13M-4-W	-1dBm	7707ET15-4-W	-21dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	19dB/76km**	7707ETxx-4-F2	0dBm	7707ETyy-4-F2	-23dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(CWDM)	28dB/112km**	7707ETxx-4-F2-H	0dBm	7707ETyy-4-F2-H	-32dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux with high sensitivity receiver**
Single-Mode	1(DWDM)	25dB/100km***	7707ETDxxx-4-F2	+7dBm	7707ETDyyy-4-F2	-23dBm	Different DWDM wavelengths on Tx & Rx, with 8 channel DWDM Mux/Demux***
Single-Mode	1(DWDM)	34dB/136km***	7707ETDxxx-4-F2-H	+7dBm	7707ETDyyy-4-F2-H	-32dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux with high sensitivity receiver***
** Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB			Fiber loss= 0.35/0.25dB per km @1310nm/1550nm				
***Assumes 8 Ch DWDM Mux/Demux loss of 5dB							

## 7707ET-4-Block Diagram & Rear Panels



### Specifications

#### Ethernet Input/Output:

Standard:	IEEE 802.3 10BASE-T 802.3u 100BASE-TX
Connectors:	4 RJ45 ports
Cable Requirements:	
10Base-T:	UTP category 3, 4, or 5 cable up to 328 ft/100m
100Base-T:	UTP category 5 cable up to 328 ft/100m

#### Optical Input/Output:

##### Connector

Single Fiber Version: 1 Female SC/PC, ST/PC, FC/PC

Dual Fiber Version: 2 Female SC/PC, ST/PC, FC/PC

Input Wavelengths: 1270nm to 1610nm

Rise and Fall Time: 200ps nominal

Wide Band Jitter: < 0.2 UI

##### Maximum Input Power:

Standard: -1dBm

F2-H Versions: -8dBm

##### Input Optical Sensitivity:

See Application Configuration Chart

Output Wavelengths: See Ordering Information

Output Power: See Application Configuration Chart

#### Electrical:

Voltage: + 12VDC

Power: 12 Watts (Non DWDM)

14 Watts (DWDM)

EMI/RFI: Complies with FCC Part 15, Class A  
EU EMC Directive

#### Physical:

##### Number of slots:

Single Fiber: 1

Dual Fiber: 2

#### Compliance:

Electrical Safety: CSA Listed to UL 60065-03, IEC 60065  
Complies with CE Low voltage Directive

Laser Safety: Class 1 laser product  
Complies with 24 CFR 1040.10 and 1040.11  
IEC 60825-1

### Ordering Information:

7707ET13M-4-W	Quad Ethernet Fiber Transceiver, single fiber, WDM, 1310nm FP TX, RX on 1550nm
7707ET15-4-W	Quad Ethernet Fiber Transceiver, single fiber, WDM, 1550nm DFB TX, RX on 1310nm
7707ET13-4-F2	Quad Ethernet Fiber Transceiver, dual fiber, 1310nm FP TX & RX

#### For CWDM, please refer to the end of the fiber section for ordering information

7707ETxx-4-F2	Quad Ethernet Fiber Transceiver, dual fiber, CWDM TX
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#### For Long Distance CWDM, please refer to the end of the fiber section for ordering information

7707ETxx-4-F2-H	Quad Ethernet Fiber Transceiver, dual fiber, CWDM TX, High Sensitivity RX
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#### For DWDM, please refer to the end of the fiber section for ordering information

7707ETDyyy-4-HD-F2	Quad Ethernet Fiber Transceiver, dual fiber, DWDM TX
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#### For Long Distance DWDM, please refer to the end of the fiber section for ordering information

7707ETDyyy-4-HD-F2-H	Quad Ethernet Fiber Transceiver, dual fiber, DWDM TX, High Sensitivity RX
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### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg. Model +3RU +SC

#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

#### Enclosures:

7700FR-C	3RU Multiframe, which holds 15 modules
7701FR	1RU Multiframe, which holds 3 modules
S7701FR	Standalone enclosure





The 7707GT is a VistaLINK® - capable Gigabit Ethernet Fiber Transceiver that provides an economical method of transmitting one 10/100/1000BaseT Ethernet channel over optical fiber. The transceiver is IEEE 802.3 10BASE-T, IEEE 802.3u 100BASE-TX and IEEE 802.3ab 1000BASE-TX compliant and provides auto negotiation between a 10/100/1000BASE-TX segment. Monitoring of card status and parameters is provided locally at the card edge and remotely via VistaLINK®. A pair of 7707GT transceivers permits full duplex communication over single or dual optical fibers. Diagnostic LEDs provide indication of power, linkage and data reception.

Multiple versions of the 7707GT are available to address single-mode/multi-mode fiber, single/dual fiber and CWDM/DWDM applications. (See Application Configuration chart below)

The 7707GT occupies one card slot and can be housed in either a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone enclosure which will hold 1 module.

## Features

- Auto negotiation for 10/100/1000 speeds and half/full duplex modes
- Auto equalization for up to 100m at Gigabit ethernet rates
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Local display of optical signal strength and link status
- Optical output available in 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)

- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Supports single-mode and multi-mode fiber optic cable
- Fully hot swappable from front of frame
- SC/PC, ST/PC or FC/PC connector options

## Status Indication:

- Frame status
- Copper Interface Status
- 10/100/1000 Speed Indication
- Fiber Link Status
- Optical Power Level

## 7707GT Application Configurations

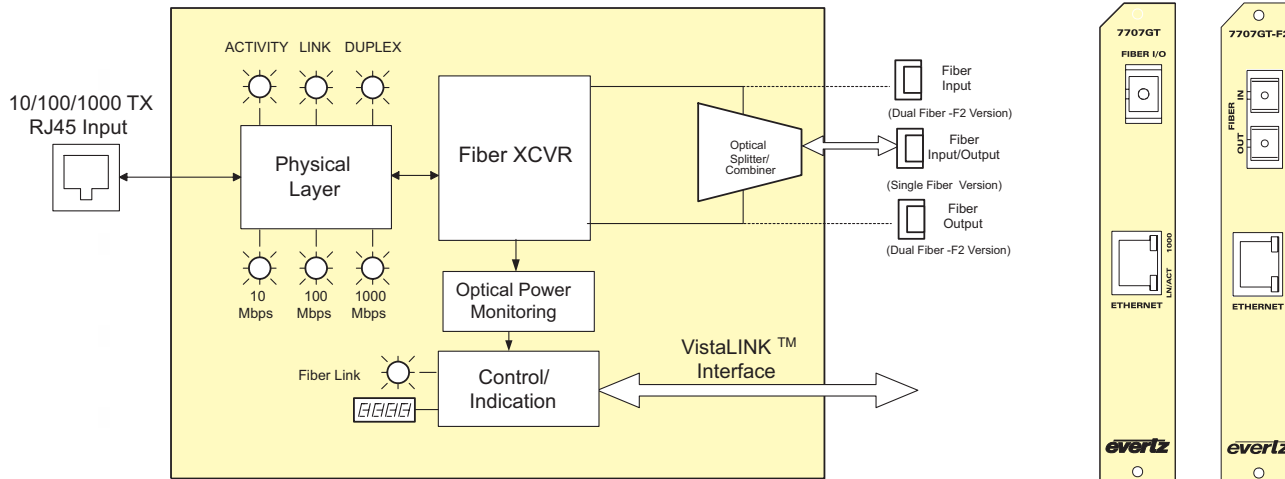
FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<1km	7707GT13-F2	-7dBm	7707GT13-F2	-23dBm	1310nm on Tx & Rx fibers
Single-Mode	2	16dB/45km	7707GT13-F2	-7dBm	7707GT13-F2	-23dBm	1310nm on Tx & Rx fibers
Single-Mode	1(WDM)	20dB/57km	7707GT13M-W	-1dBm	7707GT15-W	-21dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	19dB/76km**	7707GTxx-F2	0dBm	7707GTyy-F2	-23dBm	Different CWDM wavelengths on Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(CWDM)	28dB/112km**	7707GTxx-F2-H	0dBm	7707GTyy-F2-H	-32dBm	Different CWDM wavelengths on Tx & Rx, with 8 channel CWDM Mux/Demux, High Sensitivity Receiver**
Single-Mode	1(DWDM)	25dB/100km***	7707GTDxxx-F2	+7dBm	7707GTDyyy-F2	-21dBm	Different DWDM wavelengths on Tx & Rx, with 8 channel DWDM Mux/Demux***
Single-Mode	1(DWDM)	34dB/136km***	7707GTDxxx-F2-H	+7dBm	7707GTDyyy-F2-H	-32dBm	Different DWDM wavelengths on Tx & Rx, with 8 channel DWDM Mux/Demux, High Sensitivity Receiver***

\*\* Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB  
 \*\*\*Assumes 8 Ch DWDM Mux/Demux loss of 5dB

Fiber loss= 0.35/0.25dB per km @1310nm/1550nm

# Quad Ethernet Fiber Transceiver 7707GT

## 7707GT Block Diagram & Rear Panels



### Specifications

#### Ethernet Input/Output Standard:

IEEE 802.3 (10 BaseT), IEEE 802.3u (100 BaseTX), IEEE 802.3ab(1000baseTX)  
1 RJ45

#### Connector:

##### Cable Requirements:

###### 10 BaseT:

UTP category 3,4 or 5 cable up to 328ft/100m (2 pairs).

###### 100 BaseTX:

UTP category 5 cable up to 328 ft/100m (2 pairs).

###### 1000 BaseTX:

UTP category 5 cable up to 328 ft/100m (4 pairs).

#### Optical Input/Output:

##### Connector:

###### Single Fiber version:

1 female SC/PC, ST/PC or FC/PC

###### Dual Fiber (F2) version:

2 female SC/PC, ST/PC or FC/PC

##### Input Wavelengths:

1270nm - 1610nm

##### Maximum Input Power

###### Standard:

-1dBm

###### -H versions:

-8dBm

##### Input Optical Sensitivity:

See Application Configuration Chart

##### Output Wavelengths:

See Ordering Information

##### Output Power:

See Application Configuration Chart

#### Electrical:

##### Voltage:

12V

##### Power:

8 watts (Non DWDM)

10 watts (DWDM)

#### Physical:

##### Number of slots:

1

#### Compliance:

##### Electrical Safety:

CSA Listed to UL 60065-03, IEC 60065

Complies with CE Low voltage Directive

##### Laser Safety:

Class 1 laser product

Complies with 24 CFR 1040.10 and 1040.11

IEC 60825-1

##### EMI/RFI:

Complies with FCC Part 15, Class A

EU EMC Directive

#### Ordering Information:

##### 7707GT13M-W

Gigabit Ethernet Fiber Transceiver, single fiber, WDM, 1310nm DFB TX, RX on 1550nm, VistaLINK®

##### 7707GT15-W

Gigabit Ethernet Fiber Transceiver, single fiber, WDM, 1550nm DFB TX, RX on 1310nm, VistaLINK®

##### 7707GT13-F2

Gigabit Ethernet Fiber Transceiver, dual fiber, 1310nm FP TX & RX, VistaLINK®

#### For CWDM, please refer to the end of the fiber section for ordering information

##### 7707GTxx-F2

Gigabit Ethernet Fiber Transceiver, dual fiber, CWDM TX, VistaLINK®

#### For Long Distance CWDM, please refer to the end of the fiber section for ordering information

##### 7707GTxx-F2-H

Gigabit Ethernet Fiber Transceiver, dual fiber, CWDM TX, High Sensitivity RX, VistaLINK®

#### For DWDM, please refer to the end of the fiber section for ordering information

##### 7707GTDyyy-F2

Gigabit Ethernet Fiber Transceiver, dual fiber, DWDM TX, VistaLINK®

#### For Long Distance DWDM, please refer to the end of the fiber section for ordering information

##### 7707GTDyyy-F2-H

Gigabit Ethernet Fiber Transceiver, dual fiber, DWDM TX, High Sensitivity RX, VistaLINK®

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

##### Rear Plate Suffix

###### +3RU

3RU Rear Plate for use with 7700FR-C Multiframe

###### +1RU

1RU Rear Plate for use with 7701FR Multiframe

###### +SA

Standalone Enclosure Rear Plate

##### Connector Suffix

###### +SC

SC/PC

###### +ST

ST/PC

###### +FC

FC/PC

#### Enclosures:

##### 7700FR-C

3RU Multiframe which holds 15 modules

##### 7701FR

1RU Multiframe which holds 3 modules

##### S7701FR

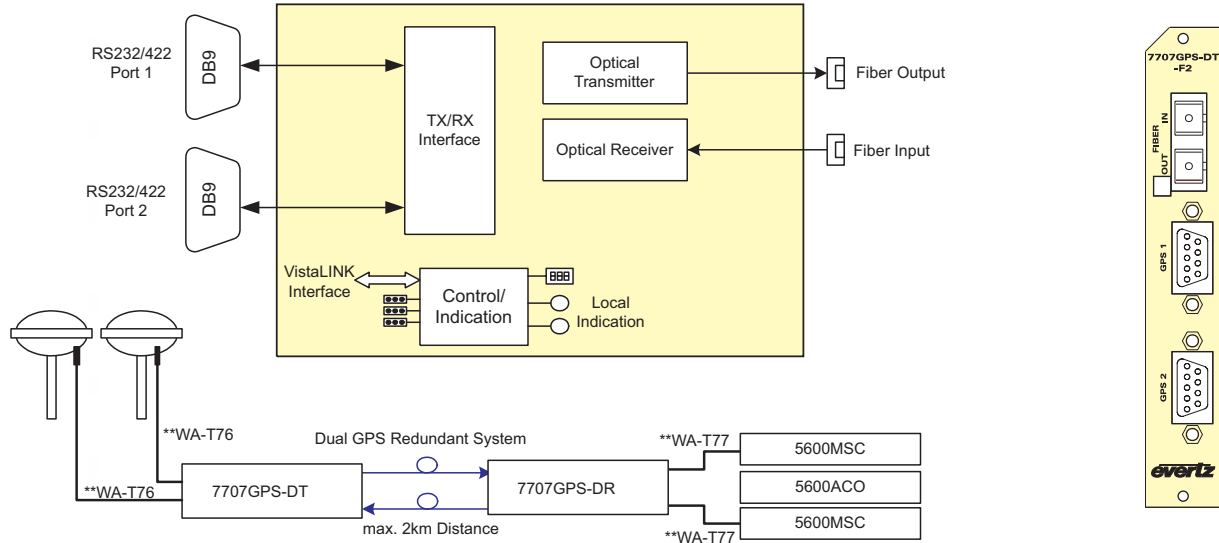
Standalone enclosure



## Features

- Transports GPS data signals from two Trimble Accutime 2000 Smart Antenna's simultaneously
- Allows user to run 1 or 2 Accutime 2000 GPS heads for primary and redundant links
- GPS power at +17V DC with built-in current limiting
- All configuration settings are controllable through the card-edge user interface, or VistaLINK®
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Optical output wavelength of 1310nm or 1550nm provides a 2km transmission distance of GPS data signal
- Low latency
- Compatible with multi-mode and single-mode fiber
- SC/PC, ST/PC, or FC/PC fiber connector options
- Fully hot swappable from front of frame
- VistaLINK® enabled for remote monitoring and control when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

## 7707GPS-DT Block Diagram & Rear Panel



\*\*Evertz recommends that only these cables be used for connecting the specified equipment to the 7707GPS-DT and 7707GPS-DR. See Accessories for ordering details.

## Specifications

### GPS Serial Data:

**Number of Signals:** 2 bi-directional GPS signals  
**Connector:** 2 x DB-9 connectors  
**Type:** RS-232 or RS-422 (selectable)  
**Bit Rate RS-232/RS-422:** 115kb/s,

### Optical Input/Outputs:

**Number of Connections:** 2  
**Connector:** Female SC/PC, ST/PC or FC/PC  
**Maximum Input Power:** 0dBm  
**Input Optical Sensitivity:** -22dBm  
**Fiber Size and Type**  
**Dual Fiber (F2):** 9µm core / single mode on TX, 62.5µm core / multi-mode on RX  
**Output Wavelength** 1310nm, 1550nm (nominal)

### Output Power:

**Dual Fiber (F2)**  
**1310nm FP (Standard):** -7dBm ±1dBm  
**1550nm DFB:** 0dBm ±1dBm

### Electrical:

**Voltage:** +12V DC  
**Power:** 10 Watts

### GPS Power:

**Voltage:** +17V DC  
**Power:** 7 Watts  
**Current:** 200mA

### Connecting Cables\*\* (see Ordering Options):

**Number of cables** 2

### Physical (Number of Slots):

**7700 Frame Mounting:** 1  
**7701 Frame Mounting:** 1

### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive

### Laser Safety:

Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
 Complies with FCC Part 15, Class A  
 EU EMC Directive

### EMI/RFI:

**Ordering Information:**  
**7707GPS-DT13-F2** Dual GPS Data Fiber Transmitter, 1310nm FP Tx and Rx  
**7707GPS-DT15-F2** Dual GPS Data Fiber Transmitter, 1550nm DFB Tx and Rx

### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

### Rear Plate Suffix:

**+3RU** 3RU rear plate for use with 7700FR-C Multiframe  
**+1RU** 1RU rear plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Connector Suffix:

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

### Accessories:

**WA-T76** 100' IF cable for 5600MSC, GPSII and 7707GPS-DT  
**WA-T77** 100' IF cable for 7707GPS-DR to 5600MSC

### Notes\*\*

\*\*Please specify the quantity of WA-T76 and WA-T77 cables required to connect the 7707GPS-DT and 7707GPS-DR to the Accutime Head and 5600MSC or 5010-GPSII respectively. The 7707GPS-DT and 7707GPS-DR are only compatible with the WA-T76 and WA-T77 cables. See diagram and Accessories for more information.

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone Enclosure



# Dual GPS-DR Data Fiber Receiver

## 7707GPS-DR

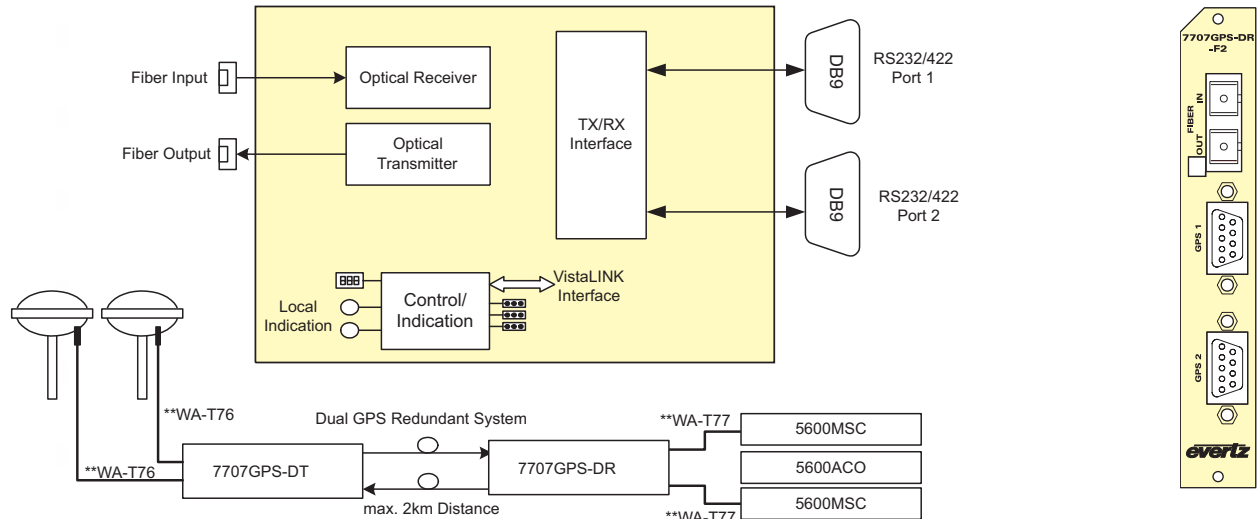


### Features

- Transports GPS data signals from two Trimble Accutime 2000 Smart Antennas simultaneously
- Allows user to run 1 or 2 Accutime 2000 GPS heads for primary and redundant links
- All configuration settings are controllable through the card-edge user interface, or VistaLINK®
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.

- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Optical output wavelength of 1310nm or 1550nm provides a 2km transmission distance of GPS data signal
- Low latency
- Compatible with multi-mode and single-mode fiber
- SC/PC, ST/PC, or FC/PC fiber connector options
- Fully hot swappable from front of frame

### 7707GPS-DR Block Diagram & Rear Panels



\*\*Evertz recommends that only these cables be used for connecting the specified equipment to the 7707GPS-DT and 7707GPS-DR. See Accessories for ordering details.

### Specifications

#### GPS Serial Data:

Number of Signals: 2 bi-directional GPS signals  
Connector: 2 x DB-9 connectors  
Type: RS-232 or RS-422 (selectable)  
Bit Rate RS-232/RS-422: 115kb/s,

#### Optical Input/Outputs:

Number of Connections: 2  
Connector: Female SC/PC, ST/PC or FC/PC  
Maximum Input Power: 0dBm  
Input Optical Sensitivity: -22dBm

#### Fiber Size and Type

Dual Fiber (F2): 9µm core / single mode on TX, 62.5µm core / multi-mode on RX  
Output Wavelength: 1310nm, 1550nm (nominal)

#### Output Power:

Dual Fiber (F2)  
1310nm FP (Standard): -7dBm ±1dBm  
1550nm DFB: 0dBm ±1dBm

#### Electrical:

Voltage: +12V DC  
Power: 6 Watts

#### GPS Power:

Voltage: +17V DC  
Power: 7 Watts  
Current: 200mA

#### Connecting Cables\*\*(see Ordering Options):

Number of cables 2

#### Physical (Number of Slots):

7700 Frame Mounting: 1  
7701 Frame Mounting: 1

#### Compliance:

Electrical Safety: CSA Listed to UL 60065-03, IEC 60065  
Complies with CE Low voltage Directive

#### Laser Safety:

Class 1 laser product  
Complies with 24 CFR 1040.10 and 1040.11  
IEC 60825-1  
Complies with FCC Part 15, Class A  
EU EMC Directive

#### EMI/RFI:

#### Ordering Information:

7707GPS-DR13-F2 Dual GPS Data Fiber Receiver, 1310nm FP Tx and Rx  
7707GPS-DR15-F2 Dual GPS Data Fiber Receiver, 1550nm DFB Tx and Rx

#### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix:

+3RU 3RU rear plate for use with 7700FR-C Multiframe  
+1RU 1RU rear plate for use with 7701FR Multiframe  
+SA Standalone Enclosure Rear Plate

#### Connector Suffix:

+SC SC/PC  
+ST ST/PC  
+FC FC/PC

#### Accessories:

WA-T76 100' IF cable for 5600MSC, GPSII and 7707GPS-DT  
WA-T77 100' IF cable for 7707GPS-DR to 5600MSC

#### Notes\*\*

\*\*Please specify the quantity of WA-T76 and WA-T77 cables required to connect the 7707GPS-DT and 7707GPS-DR to the Accutime Head and 5600MSC or 5010-GPSII respectively. The 7707GPS-DT and 7707GPS-DR are only compatible with the WA-T76 and WA-T77 cables. See diagram and Accessories for more information.

#### Enclosures:

7700FR-C 3RU Multiframe which holds 15 modules  
7701FR 1RU Multiframe which holds 3 modules  
S7701FR Standalone Enclosure

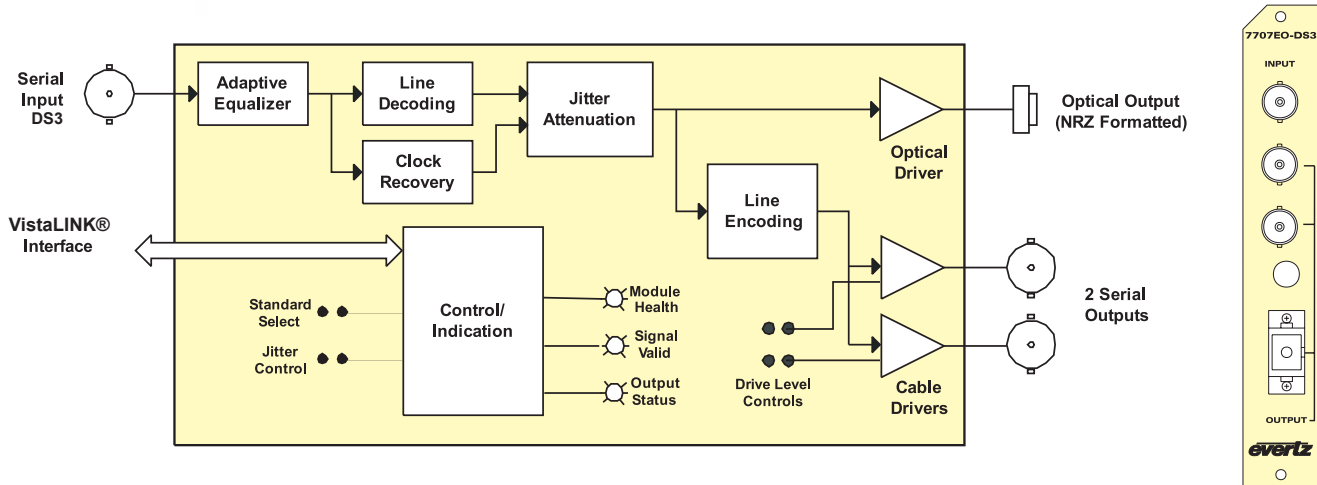


### Features

- Electrical to optical converter for DS3 (44.736Mb/s)
- Automatic cable equalization for up to 300m of high quality 75Ω coaxial cable
- Signal reclocking and jitter attenuation
- Output wave shaping for G.703 standards compliance
- Loss of signal (LOS) detection/indication (ANSI T1.231-1999 and ITU G.775)
- Electrical output drive level control for enhanced distance
- Transformer coupled inputs/outputs
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)

- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Supports single-mode and multi-mode fiber optic cable
- Fully hot swappable from front of frame
- Occupies one card slot and can be housed in either a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone enclosure that will hold 1 module
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

### 7707EO-DS3 Block Diagram & Rear Panels



### Specifications

#### Inputs:

Standard:	G.703 @ 44.736 Mb/s
Connector:	1 Isolated BNC input
Equalization:	Automatic to 300m with Belden 8281 or equivalent cable
Return Loss:	> 20 dB up to 44 Mb/s

#### Outputs:

Standard:	G.703 @ 44.736 Mb/s
Number of Outputs:	2 Per Card-Reclocked.
Connector:	BNC per IEC 60169-8 Amendment 2
Waveform:	Conforms to G.703 compliant masks
Return Loss:	> 15 dB up to 44.736 Mb/s
Drive Level:	
High:	For driving cable lengths > 70m
Low:	For driving cable lengths < 70m

#### Optical Output:

Number of Outputs:	1 Scrambled DS3 @ 44.736Mb/s
Connector:	Female SC/PC, ST/PC or FC/PC
Return Loss:	> 14 dB
Fiber Size:	9 μm core / 125 μm overall
Wavelengths:	(See ordering information)
Output Power:	
1310nm FP:	-7dBm ± 1dB
1550nm/CWDM DFB:	0dBm ± 1dB
DWDM DFB:	7dBm ± 1dBm

#### Electrical:

Voltage:	+ 12VDC
Power:	6 Watts (Non-DWDM), 9 Watts (DWDM)
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC Directive

#### Physical:

Number of slots:	1
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#### Compliance:

Electrical Safety:	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive
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#### Laser Safety:

Class 1 laser product  
Complies with 24 CFR 1040.10 and 1040.11  
IEC 60825-1  
Complies with FCC Part 15, Class A  
EU EMC directive

#### EMI/RFI:

#### Ordering Information:

7707EO13-DS3	DS3 Electrical to Optical Converter, VistaLINK®, 1310nm, FP Laser
7707EO15-DS3	DS3 Electrical to Optical Converter, 1550nm DFB Laser, VistaLINK®,

#### For CWDM, please refer to the end of the fiber section for ordering information

7707EOxx-DS3	DS3 Electrical to Optical Converter, CWDM DFB Laser, VistaLINK®
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#### For DWDM, please refer to the end of the fiber section for ordering information

7707EODyyy-DS3	DS3 (45Mb/s) Electrical to Optical Converter, DWDM Laser, +7dBm, VistaLINK®
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#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

#### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

#### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

#### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

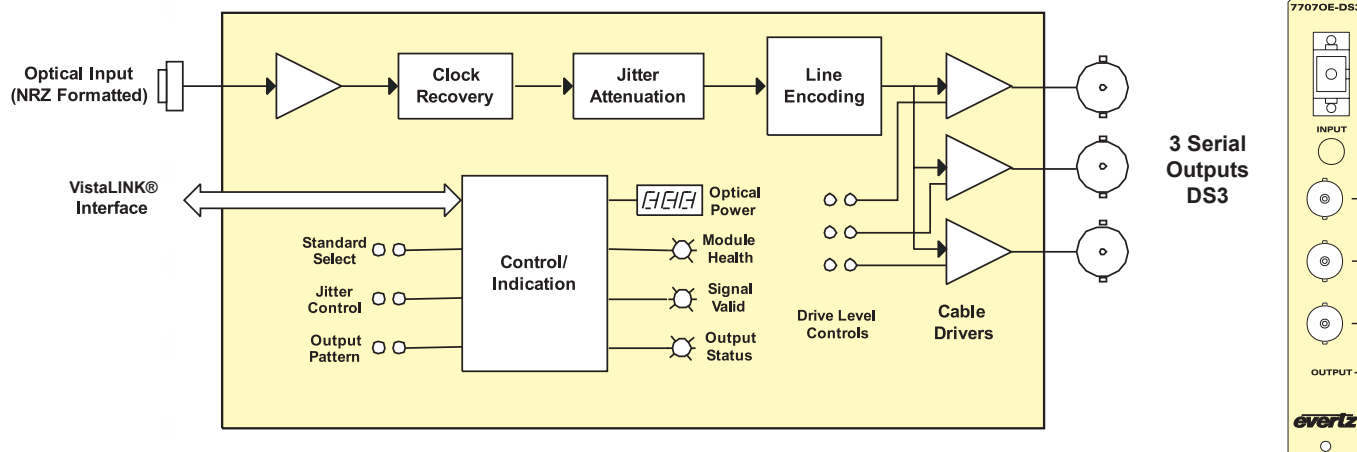


### 7707OE-DS3

#### Features

- Optical to electrical converter for DS3 (44.736Mb/s)
- Signal reclocking and jitter attenuation
- Output wave shaping for G.703 standards compliance
- Output 1010 pattern generation upon loss of lock to an input signal
- Electrical output drive level control for enhanced distance
- Transformer coupled outputs
- Display of received optical power provides a pre-emptive indication of link integrity
- Wide range optical input (1270nm-1610nm)
- Supports single-mode and multi-mode fiber optic cable
- Fully hot swappable from front of frame
- Occupies one card slot and can be housed in either a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone enclosure that will hold 1 module
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

#### 7707OE-DS3 Block Diagram & Rear Panel



#### Specifications

##### Optical Input:

**Number of Inputs:** 1 Scrambled DS3 @ 44.736Mb/s  
**Connector:** Female SC/PC, ST/PC or FC/PC  
**Wavelength:** 1270nm- 1610nm  
**Optical Sensitivity:** -31dBm  
**Max. Input Power:** 0dBm  
**Fiber Size:** 62µm core / 125µm overall

##### Outputs:

**Number of Outputs:** 3 per card-reclocked  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Waveform:** Conforms to G.703 compliant masks  
**Return Loss:** > 15dB up to 44.736Mb/s  
**Drive Level:**  
**High:** For driving cable lengths > 70m  
**Low:** For driving cable lengths < 70m

##### Electrical:

**Voltage:** + 12VDC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

##### Physical:

**Number of slots:** 1

#### Ordering Information:

**7707OE-DS3** DS3 Optical to Electrical Converter, VistaLINK® Monitoring

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

#### Fiber Optic Patch Cable:

**CB-FP1M-SCPC** Single mode fiber cable, 1m, SC/PC male termination  
**CB-FP1M-STPC** Single mode fiber cable, 1m, ST/PC male termination  
**CB-FP5M-SCPC** Single mode fiber cable, 5m, SC/PC male termination  
**CB-FP5M-STPC** Single mode fiber cable, 5m, ST/PC male termination  
**CB-FP10M-SCPC** Single mode fiber cable, 10m, SC/PC male termination  
**CB-FP10M-STPC** Single mode fiber cable, 10m, ST/PC male termination

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



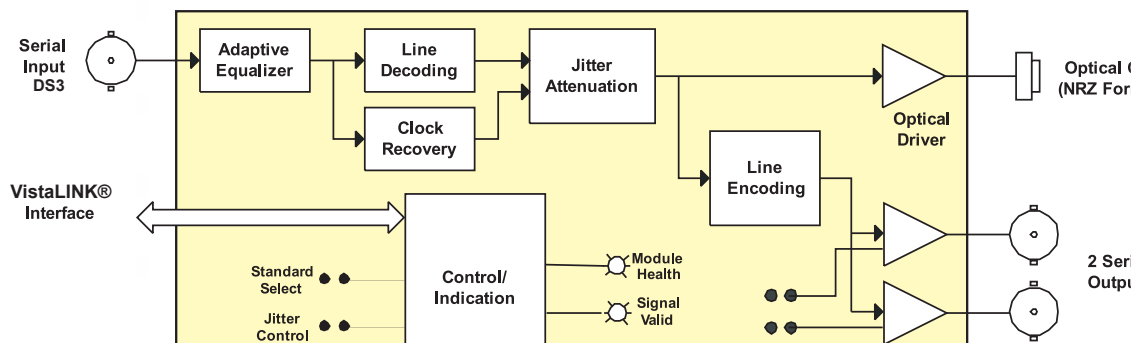


### Features

- Electrical to optical converter for E3 (34.368Mb/s)
- Automatic cable equalization for up to 300m of high quality 75Ω coaxial cable
- Signal reclocking and jitter attenuation
- Output wave shaping for G.703 standards compliance
- Loss of signal (LOS) detection/indication (ANSI T1.231-1999 and ITU G.775)
- Electrical output drive level control for enhanced distance
- Transformer coupled inputs/outputs
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)

- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- Supports single-mode and multi-mode fiber optic cable
- Fully hot swappable from front of frame
- Occupies one card slot and can be housed in either a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone enclosure that will hold 1 module
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

### 7707EO-E3 Block Diagram & Rear Panel



#### Inputs:

**Standard:** G.703 @ 34.368Mb/s  
**Connector:** 1 Isolated BNC input  
**Equalization:** Automatic to 300m with Belden 8281 or equivalent cable  
**Return Loss:** > 20 dB up to 34MHz

#### Outputs:

**Standard:** G.703 @ 34.368Mb/s  
**Number of Outputs:** 2 Per Card-Reclocked.  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Waveform:** Conforms to G.703 compliant masks  
**Return Loss:** > 15 dB up to 34MHz  
**Drive Level:**  
**High:** For driving cable lengths > 70m  
**Low:** For driving cable lengths < 70m

#### Optical Output:

**Number of Outputs:** 1 Scrambled E3 @ 34.368Mb/s  
**Connector:** Female SC/PC, ST/PC or FC/PC  
**Return Loss:** > 14 dB  
**Fiber Size:** 9 μm core / 125 μm overall  
**Wavelengths:** (See ordering information)  
**Output Power:**  
**1310nm FP:** -7dBm ± 1dB  
**1550nm/CWDM DFB:** 0dBm ± 1dB  
**DWDM DFB:** 7dBm ± 1dBm

#### Electrical:

**Voltage:** + 12VDC  
**Power:** 6 Watts (Non-DWDM), 9 Watts (DWDM)  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

#### Physical:

**Number of slots:** 1

#### Compliance:

##### Electrical Safety:

CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
 Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
 Complies with FCC Part 15, Class A  
 EU EMC directive

##### Laser Safety:

##### EMI/RFI:

#### Ordering Information:

**7707EO13-E3** E3 Electrical to Optical Converter, VistaLINK®, 1310nm, FP Laser

#### For CWDM, please refer to the end of the fiber section for ordering information

**7707EOxx-E3** E3 Electrical to Optical Converter, CWDM DFB Laser, VistaLINK®

#### For DWDM, please refer to the end of the fiber section for ordering information

**7707EODyyy-E3** E3 Electrical to Optical Converter, DWDM Laser, +7dBm, VistaLINK®

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure

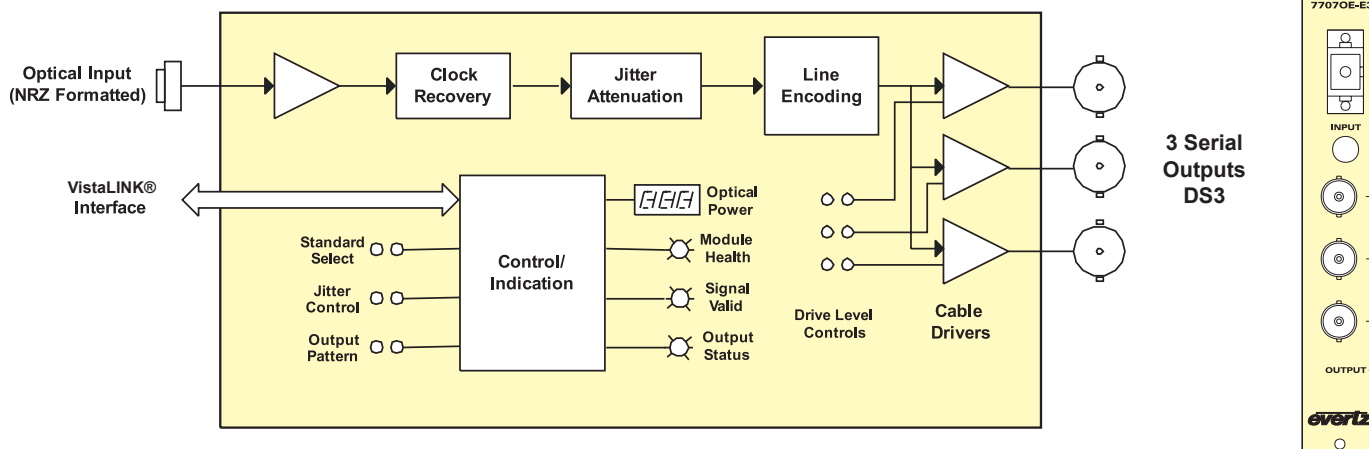


### Features

- Optical to electrical converter for E3 (34.368Mb/s)
- Signal reclocking and jitter attenuation
- Output wave shaping for G.703 standards compliance
- Output 1010 pattern generation upon loss of lock to an input signal
- Electrical output drive level control for enhanced distance
- Transformer coupled outputs
- Display of received optical power provides a pre-emptive indication of link integrity

- Wide range optical input (1270nm-1610nm)
- Supports single-mode and multi-mode fiber optic cable
- Fully hot swappable from front of frame
- Occupies one card slot and can be housed in either a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone enclosure that will hold 1 module
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

### 7707OE-E3 Block Diagram & Rear Panel



### Specifications

#### Optical Input:

**Number of Inputs:** 1 Scrambled E3 @ 34.368Mb/s  
**Connector:** Female SC/PC, ST/PC or FC/PC  
**Wavelength:** 1270nm- 1610nm  
**Optical Sensitivity:** -31dBm  
**Max. Input Power:** 0dBm  
**Fiber Size:** 62µm core / 125µm overall

#### Outputs:

**Number of Outputs:** 3 per card-reclocked  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Waveform:** Conforms to G.703 compliant masks  
**Return Loss:** > 15dB up to 34MHz  
**Drive Level:**  
**High:** For driving cable lengths > 70m  
**Low:** For driving cable lengths < 70m

#### Electrical:

**Voltage:** + 12VDC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

#### Physical:

**Number of slots:** 1

#### Ordering Information:

**7707OE-E3** E3 Optical to Electrical Converter, VistaLINK® Monitoring

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

#### Fiber Optic Patch Cable:

**CB-FP1M-SCPC** Single mode fiber cable, 1m, SC/PC male termination  
**CB-FP1M-STPC** Single mode fiber cable, 1m, ST/PC male termination  
**CB-FP5M-SCPC** Single mode fiber cable, 5m, SC/PC male termination  
**CB-FP5M-STPC** Single mode fiber cable, 5m, ST/PC male termination  
**CB-FP10M-SCPC** Single mode fiber cable, 10m, SC/PC male termination  
**CB-FP10M-STPC** Single mode fiber cable, 10m, ST/PC male termination

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure

### (Replaces the 7705IFT & offers improved performance and wider operating range)

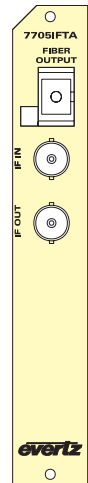
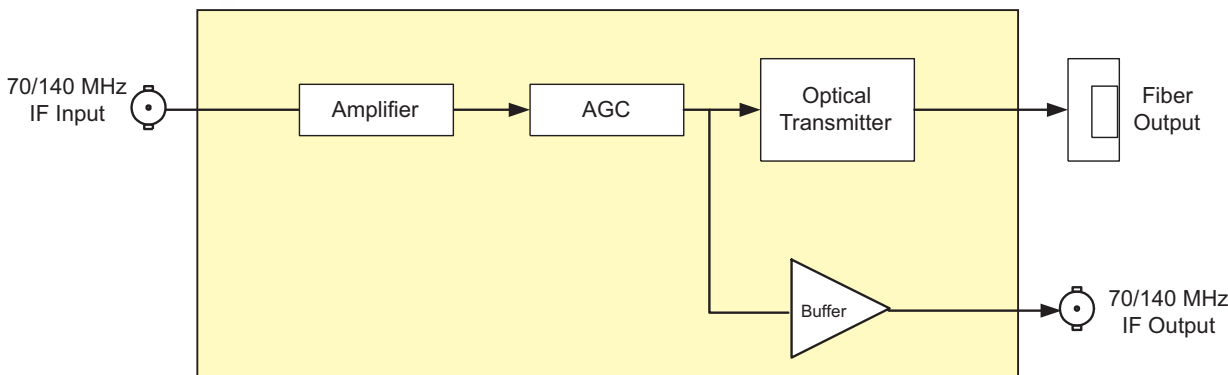
The 7705IFTA is a fiber optic transmitter for 70/140 MHz IF signals. The 7705IFTA accepts one 70/140 MHz coaxial input and provides a fiber optic output signal at 1310nm. An IF BNC output is also provided for monitoring or further signal distribution.

The 7705IFTA occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

### Features

- 30-200MHz bandwidth
- Wide dynamic range RF input (-5 to -65dBm)
- Protocol transparent - transmits all video, audio and data modulation formats
- Supports manual and automatic gain control on IF input
- Wide AGC hold range (45dB) using 7705IFTA +7705IFRA
- Additional IF BNC output for monitoring or distribution
- Available with BNC or F-Type connector options
- Supports single-mode and multi-mode fiber optic cable
- Available in SC/PC, ST/PC, FC/PC and APC connector options
- Fully hot swappable from front of frame

### 7705IFTA Block Diagram & Rear Panel



### Specifications

#### RF Input:

**Connector:** 1 BNC per IEC 60169-8 Amendment 2 (F-type optional)  
**I/O Impedance:** 75Ω (50Ω optional) (See Ordering Information)  
**Return Loss:** 18dB (min)  
**Frequency Range:** 30MHz - 200MHz  
**Input Power Range:** -5 to -65dBm  
**AGC Hold Range:** -10 to -35dBm

#### IF Monitoring Output:

**Connector:** 1 BNC per IEC 60169-8 Amendment 2 (F-type optional)  
**I/O Impedance:** 75Ω (50Ω optional) (See Ordering Information)  
**Return Loss:** 18dB (min)  
**Frequency Range:** 30MHz - 200MHz  
**Flatness:** ± 1dB @ 30 MHz - 200MHz  
 ± .2dB @ 36MHz BW

#### Output Signal Level:

**AGC mode:** -20dBm constant (within AGC range -10 to

-35dBm total RF input power)

(Input signal) + 15dB

**Manual mode:** -50dBc (-10dBm RF in, ACG mode)

**Intermodulation Products:** 37dB @any 36MHz BW

**Carrier to Noise:**

#### Optical Output:

**Number of outputs:** 1  
**Connector:** Female SC/PC, ST/PC, FC/PC, SC/APC, FC/APC  
**Operating Wavelength:** 1310nm  
**Output Power:** 0dBm ± 1dBm

#### Electrical:

**Voltage:** +12VDC  
**Power:** 4 Watts

#### Physical:

**Number of slots:** 1

### Ordering Information: 70/140MHz IF Fiber Transmitter

Note: 75Ω I/O impedance ships standard

**7705IFTA13** 1310nm FP Laser, Medium Haul (<40km)

#### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
 Eg. Model +3RU +SC

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Impedance Suffix

**+50** 50Ω I/O Impedance

#### Connector Suffix

**+SC** SC/PC  
**+AP+SC** SC/APC (Angle polished)  
**+ST** ST/PC  
**+FC** FC/PC  
**+AP+FC** FC/APC (Angle polished)  
**+F75** 75Ω, F-Type rear connector

#### Enclosures:

**7700FR-C** 3RU Multiframe, which holds 15 modules  
**7701FR** 1RU Multiframe, which holds 3modules  
**S7701FR** Standalone enclosure



# 70/140MHz IF Fiber Transmitter

## 7705IFRA

### (Replaces the 7705IFR & offers improved performance and wider operating range)

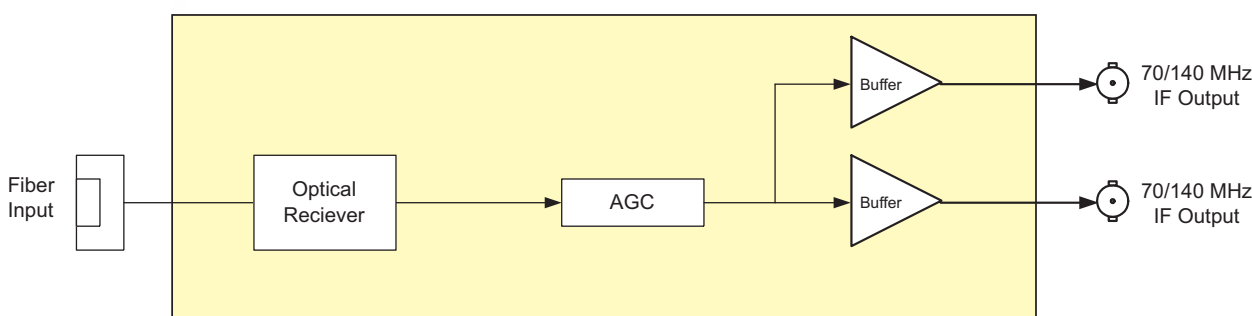
The 7705IFRA is a fiber optic receiver for 70/140 MHz IF signals. The 7705IFRA accepts a fiber optic input from the companion 7705IFTA and provides two 70/140 MHz IF output signals via BNCs.

The 7705IFRA occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

### Features

- 30-200MHz bandwidth
- Protocol transparent - receives all video, audio and data modulation formats
- Supports manual & automatic gain control (AGC)
- Wide AGC hold range (45dB) using 7705IFTA + 7705IFRA
- Two IF outputs for extra signal distribution or monitoring functions
- Available with BNC or F-Type connector options
- Wide range optical input (1270nm to 1610nm)
- IF output power independent of optical loss (within AGC range)
- Supports single-mode and multi-mode fiber optic cable
- Available in SC/PC, ST/PC, FC/PC & APC connector options
- Fully hot swappable from front of frame

### 7705IFRA Block Diagram & Rear Panel



### Specifications

#### RF Output:

Number of Outputs: 2

Connector: BNC per IEC 60169-8 Amendment 2 (F-type optional)

I/O Impedance: 75Ω (50Ω optional) (See Ordering Information)

Return Loss: 18dB (min)

Frequency Range: 30MHz - 200MHz

Flatness: ± 1dB @ 30 MHz - 200MHz

± .2dB @ 36MHz BW

-37dB @ 36MHz BW

Carrier to Noise:

Output Signal Level: -10dBm constant (within AGC range)

AGC: -5 to -65 (depends on RF input level & optical loss)

Manual: -50dBc (-10dBm at IFTA input & 3dB optical loss)

Intermodulation Products: -50dBc (-10dBm at IFTA input & 3dB optical loss)

#### Optical Input:

Number of Inputs: 1

Connector: Female SC/PC, ST/PC, FC/PC, SC/APC, FC/APC

Operating Wavelength: 1270nm - 1610nm

Optical Input Power: +3dBm (max)

Optical Sensitivity: -14dBm @35dB C/N @36MHz BW

Optical Attenuation:

AGC Hold Range: 10dB optical

#### Electrical:

Voltage: +12VDC

Power: 5 Watts

#### Physical:

Number of slots: 1

### Ordering Information:

Note: 75Ω I/O impedance ships standard

**7705IFRA** 70/140 MHz Fiber Receiver

#### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg. Model +3RU +SC

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe

**+1RU** 1RU Rear Plate for use with 7701FR Multiframe

**+SA** Standalone Enclosure Rear Plate

#### Impedance Suffix

**+50** 50Ω I/O Impedance

#### Connector Suffix

**+SC** SC/PC

**+AP+SC** SC/APC (Angle polished)

**+ST** ST/PC

**+FC** FC/PC

**+AP+FC** FC/APC (Angle polished)

**+F75** 75Ω, F-Type rear connector

#### Enclosures:

**7700FR-C** 3RU Multiframe, which holds 15 modules

**7701FR** 1RU Multiframe, which holds 3 modules

**S7701FR** Standalone enclosure

### (Replaces the 7705LT & offers improved performance and wider operating range)

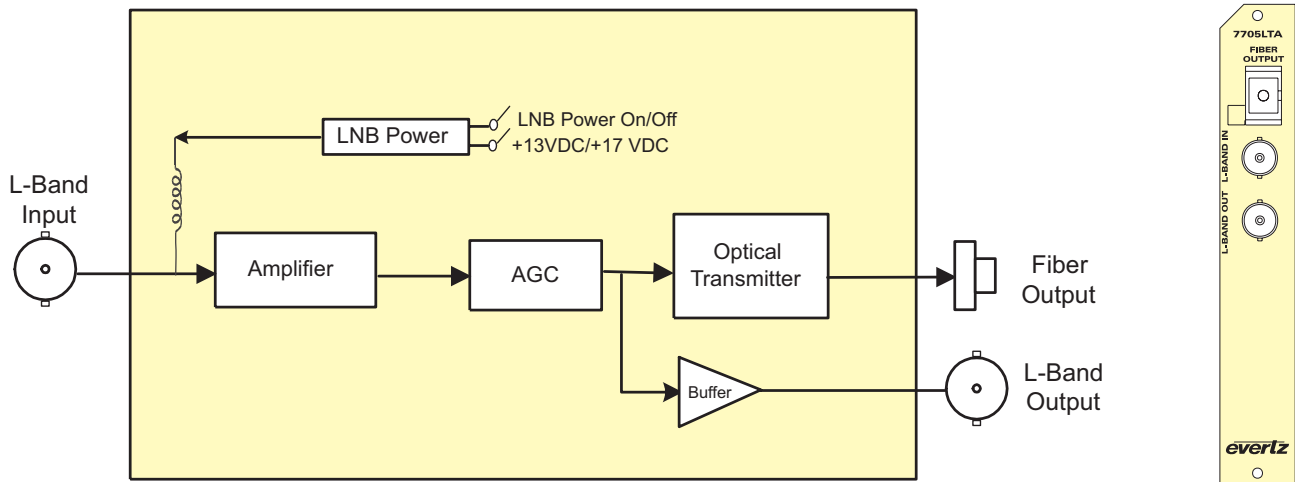
The 7705LTA is a fiber optic transmitter for L-Band satellite signals. The 7705LTA accepts one L-Band coaxial input and provides a fiber optic output signal at 1310nm. An L-Band BNC RF output is also provided for monitoring or further signal distribution.

The 7705LTA occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

### Features

- Broadband operation - 950 to 2250 MHz
- Wide dynamic range RF input (-20 to -65dBm)
- Operation to 40km
- Protocol transparent - transmits all video, audio and data modulation formats
- Supports manual and automatic gain control (AGC)
- Wide AGC hold range (50dB) using 7705LTA + 7705LR
- Additional L-Band BNC output for monitoring or distribution
- LNB power at +13 or +17 VDC with built-in current limiting
- Available with BNC or F-Type connector options
- Supports single-mode and multi-mode fiber optic cable
- Available with SC/PC, ST/PC, FC/PC and APC connector options
- Fully hot swappable from front of frame

### 7705LTA Block Diagram & Rear Panel



### Specifications

<b>RF Input:</b>	
Connector:	1 BNC per IEC 60169-8 Amendment 2 (F-type optional)
I/O Impedance:	75Ω (50Ω optional) (See Ordering Information)
Return Loss:	>10dB
Frequency Range:	950MHz - 2250MHz
Input Power Range:	-20 to -65dBm
AGC Hold Range:	-20 to -50dBm
<b>RF Monitoring Output:</b>	
Number of outputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2 (F-type optional)
I/O Impedance:	75Ω (50Ω optional)
Return Loss:	>10dB
Frequency Range:	950MHz - 2250MHz
Flatness:	± 1.5dB @ 1000MHz - 2250MHz ± 0.25dB @ any 36MHz BW
<b>Output Signal Level</b>	
AGC Mode:	-20dBm constant (within AGC range)
Manual Mode:	(Input Level) +25dB gain (-5dB)
Intermodulation Products:	-55dBc (AGC mode, RF input -20dBm)
Carrier to Noise:	37dB @ any 36MHz BW
<b>Optical Output:</b>	
Number of outputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC, SC/APC, FC/APC
Operating Wavelength:	1310nm
Optical Power:	0 dBm ± 1dBm
<b>Physical:</b>	
Number of slots:	1
<b>Electrical:</b>	
Voltage:	+12VDC
Power:	4 Watts

### Ordering Information:

Note: 75Ω I/O impedance ships standard

**7705LTA13** L-Band Satellite Fiber Transmitter, 1310nm, up to 40km

### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg. Model +3RU +SC

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Impedance Suffix

**+50** 50Ω I/O impedance

### Connector Suffix

**+SC** SC/PC  
**+AP+SC** SC/APC (Angle polished)  
**+ST** ST/PC  
**+FC** FC/PC  
**+AP+FC** FC/APC (Angle polished)  
**+F75** 75Ω, F-Type rear connector

### Enclosures:

**7700FR-C** 3RU Multiframe, which holds 15 modules  
**7701FR** 1RU Multiframe, which holds 3 modules  
**S7701FR** Standalone Enclosure

# L-Band Satellite Fiber Receiver

## 7705LR

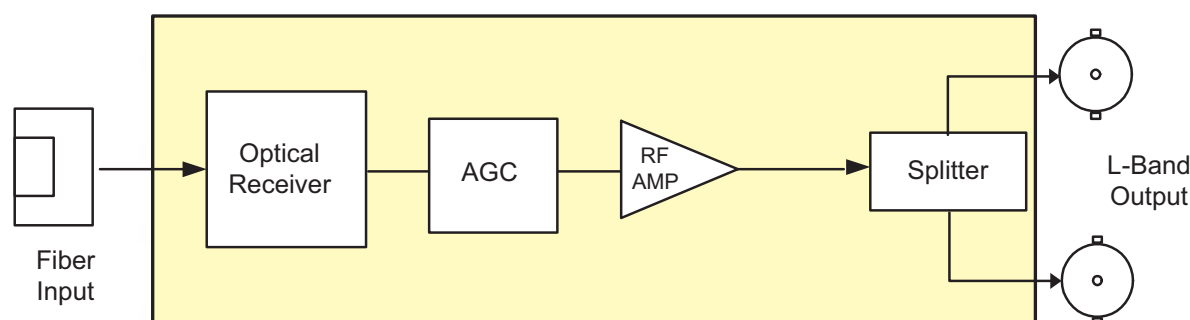
The 7705LR is a fiber optic receiver for L-Band satellite signals. The 7705LR accepts a fiber optic input from the 7705LTA and provides two L-Band RF output signals via BNCs.

The 7705LR occupies one card slot and can be housed in either a 1RU frame, which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

### Features

- Broadband operation - 950 to 2250MHz
- Operation to 40km
- Supports manual and automatic gain control (AGC)
- Wide AGC hold range (50dB) using 7705LTA + 7705LR
- Protocol transparent - receives all video, audio and data modulation formats
- Two L-Band RF outputs for extra signal distribution or monitoring functions
- RF output independent of optical loss (within AGC range)
- Available with BNC or F-Type connector options
- Supports single-mode and multi-mode fiber optic cable
- Available in SC/PC, ST/PC, FC/PC and APC connector options
- Fully hot-swappable from front of frame

### 7705LR Block Diagram & Rear Panel



### Specifications

#### RF Output:

Number of outputs: 2  
Connector: BNC per IEC 60169-8 Amendment 2 (F-type optional)

I/O Impedance: 75Ω (50Ω optional)

Return Loss: >10dB

Frequency Range: 950MHz - 2250MHz

Fatness: ± 1.5dB (max) @950MHz-2250MHz  
± 0.25dB @ any 36MHz BW

#### Output Signal Level

AGC Mode: -20dBm constant (within AGC range)

Manual Mode: -20 to -65dBm (depends on RF level and optical loss)

Intermodulation Products: -55dBc (-20dBm RF input to TX, 1m fiber, AGC mode on TX & RX)

Carrier to Noise: 37dB @ any 36MHz BW

Noise Figure: (AGC mode on 7705LTA and 7705LR)

0dB Optical Loss: 7dB

5dB Optical Loss: 14dB

Signal to Noise: 55dB

#### Optical Input:

Number of inputs: 1

Connector: Female SC/PC, ST/PC, FC/PC, SC/APC, FC/APC

Operating Wavelength: 1270nm - 1610nm

Optical Input Power: +3dBm (max)

Optical Sensitivity: -14dBm @ 35dB S/N

Optical Attenuation:

AGC Hold Range: 10dB optical

#### Electrical:

Voltage: +12VDC

Power: 4 Watts

EMI/RFI: Complies with FCC Part 15, Class A  
EU EMC Directive

#### Physical:

Number of slots: 1

#### Ordering Information:

Note: 75Ω I/O impedance ships standard

7705LR L-Band Satellite Fiber Receiver

#### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg. Model +3RU +SC

#### Rear Plate Suffix

+3RU 3RU Rear Plate for use with 7700FR-C Multiframe

+1RU 1RU Rear Plate for use with 7701FR Multiframe

+SA Standalone Enclosure Rear Plate

#### Impedance Suffix:

+50 50Ω I/O Impedance

#### Connector Suffix

+SC SC/PC

+AP+SC SC/APC (Angle polished)

+ST ST/PC

+FC FC/PC

+AP+FC FC/APC (Angle polished)

+F75 75Ω, F-Type rear connector

#### Enclosures:

7700FR-C 3RU Multiframe, which holds 15 modules

7701FR 1RU Multiframe, which holds 3 modules

S7701FR Standalone Enclosure





**(Replaces the 7707IFT & offers improved performance and wider operating range)**

The 7707IFTA is a VistaLINK® - capable fiber optic transmitter for 70/140 MHz IF signals. The 7707IFTA accepts one 70/140 MHz coaxial input and provides a fiber optic output signal at 1310nm, 1550nm, CWDM or DWDM wavelengths. An IF BNC output is also provided for monitoring or further signal distribution. Monitoring and control of card status is provided locally at the card edge and remotely via VistaLINK®.

The 7707IFTA occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

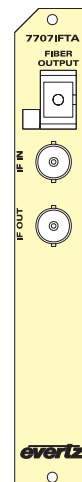
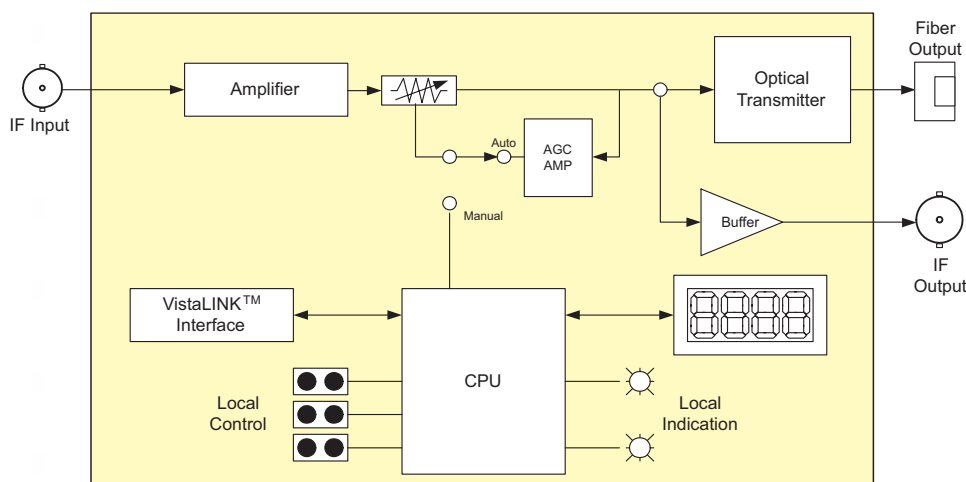
**Features**

- 30-200 MHz bandwidth
- Wide dynamic range RF input (-5 to -65dBm)
- Protocol transparent - transmits all video, audio and data modulation formats
- Supports manual and automatic gain control on IF input
- Wide AGC hold range (45dB) using 7707IFTA + 7707IFRA
- Additional IF BNC output for monitoring or distribution
- Available with BNC or F-Type connector options
- Available with output wavelengths of 1310nm, 1550nm, CWDM (ITU-T G.694.2 compliant) and DWDM (ITU-T G.694.1 compliant)
- Supports single-mode and multi-mode fiber optic cable
- Available in SC/PC, ST/PC, FC/PC and APC connector options
- Fully hot swappable from front of frame
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

**7707IFTA Application Configurations**

APPLICATION	OPTICAL/LINK BUDGET	TRANSMITTER SIDE		RECEIVER SIDE		DESCRIPTION
		ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
ONE SIGNAL PER FIBER						
Short to Medium Haul	14dB/40km	7707IFTA13	0dBm	7707IFRA	-14dBm	1310nm FP laser on Tx
Medium Haul	16dB/45km	7707IFTA13L	+2dBm	7707IFRA	-14dBm	1310nm DFB laser on Tx
Long Haul	16dB/64km	7707IFTA15	+2dBm	7707IFRA	-14dBm	1550nm DFB laser on Tx
Long Haul	25dB/71km	7707IFTA13L	+2dBm	7707IFRA-H	-23dBm	1310nm DFB laser on Tx, High Sensitivity RX
Long Haul	25dB/100km	7707IFTA15	+2dBm	7707IFRA-H	-23dBm	1550nm DFB laser on Tx, High Sensitivity RX
MULTI-SIGNAL PER FIBER (WAVELENGTH MUX/DEMUX)						
Medium Haul	12.5dB/50km*	7707IFTAxx	+2dBm	7707IFRA	-14dBm	1470nm-1610nm CWDM DFB laser on Tx, with 8 Ch CWDM Mux/Demux*
Long Haul	21.5dB/86km*	7707IFTAxx	+2dBm	7707IFRA-H	-23dBm	1470nm-1610nm CWDM DFB laser on Tx, High Sensitivity RX, 8 Ch CWDM Mux/Demux*
Long Haul	16dB/70km**	7707IFTADyyy	+7dBm	7707IFRA	-14dBm	DWDM DFB laser on Tx, with 8 Ch DWDM Mux/Demux**
Long Haul	25dB/100km**	7707IFTADyyy	+7dBm	7707IFRTA-H	-23dBm	DWDM DFB laser on Tx, High Sensitivity RX, 8 Ch DWDM Mux/Demux**
Fiber loss = 0.35/0.25dB per km @1310nm/1550nm						
* Assumes 8 Channel upper band CWDM Mux/Demux loss of 3.5dB						
**Assumes 8 Channel DWDM Mux/Demux loss of 5dB						

# 70/140MHz IF Fiber Transmitter with VistaLINK® Monitoring 7707IFTA



## Specifications

### RF Input:

**Connector:** 1 BNC per IEC 60169-8 Amendment 2 (F-type optional)  
**I/O Impedance:** 75Ω (50Ω optional) (See Ordering Information)  
**Return Loss:** 18dB (min)  
**Frequency Range:** 30MHz - 200MHz  
**Input Power Range:** -5 to -65dBm  
**AGC Hold Range:** -10 to -35dBm

### IF Monitoring Output:

**Connector:** 1 BNC per IEC 60169-8 Amendment 2 (F-type optional)  
**I/O Impedance:** 75Ω (50Ω optional) (See Ordering Information)  
**Return Loss:** 18dB (min)  
**Frequency Range:** 30MHz - 200MHz  
**Flatness:** ± 1dB @ 30 MHz - 200MHz  
 ± .2dB @ 36MHz BW

### Output Signal Level:

**AGC mode:** -20dBm constant (within AGC range -10 to -35dBm total RF input power)  
 (Input signal) + (manual Gain setting)  
**Manual mode:** -50dBc (-10dBm RF in, ACG mode)  
**Intermodulation Products:** 37dB @36MHz BW  
**Carrier to Noise:**

### Optical Output:

**Number of outputs:** 1  
**Connector:** Female SC/PC, ST/PC, FC/PC, SC/APC, FC/APC

### Operating Wavelengths:

**Standard:** 1310nm, 1550nm (nominal)  
**CWDM:** 1270nm to 1610nm  
**DWDM:** C-Band (ITU G.694.1 compliant)

### Output Power:

**1310nm FP:** 0dBm ± 1dBm  
**1310nm, 1550nm & CWDM DFB:** +2dBm ± 1dBm  
**DWDM DFB:** +7dBm ± 1dBm

### Electrical:

**Voltage:** +12VDC  
**Power:** 6 Watts  
 9 Watts (DWDM)  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

### Physical:

**Number of slots:** 1

## Ordering Information:

70/140MHz IF Fiber Transmitter, with VistaLINK®

**Note:** 75Ω I/O impedance ships standard

**7707IFTA13** 1310nm FP Laser, Short to Medium Haul  
**7707IFTA13L** 1310nm DFB Laser, Medium Haul  
**7707IFTA15** 1550nm DFB Laser, Long Haul

## For CWDM, please refer to the end of the fiber section for ordering information

**7707IFTAxx** 70/140 Mhz IF Fiber Transmitter, CWDM wavelength, with VistaLINK®

## For DWDM, please refer to the end of the fiber section for ordering information:

**7707IFTADyyy** 70/140 Mhz IF Fiber Transmitter, DWDM wavelength, with VistaLINK®

## Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
 Eg. Model +3RU +SC

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Impedance Suffix

**+50** 50Ω I/O Impedance

### Connector Suffix

**+SC** SC/PC  
**+AP+SC** SC/APC (Angle polished available with 7707IFTA13 only)  
**+ST** ST/PC  
**+FC** FC/PC  
**+AP+FC** FC/APC (Angle polished available with 7707IFTA13 only)  
**+F75** 75Ω, F-Type rear connector

### Enclosures:

**7700FR-C** 3RU Multiframe, which holds 15 modules  
**7701FR** 1RU Multiframe, which holds 3modules  
**S7701FR** Standalone enclosure



**(Replaces the 7707IFR & offers improved performance and wider operating range)**

The 7707IFRA is a VistaLINK® - capable fiber optic receiver for 70/140 MHz IF signals. The 7707IFRA accepts a fiber optic input from the companion 7707IFTA and provides two 70/140 Mhz IF output signals via BNC's. Monitoring and control of card status and parameters is provided locally at the card edge and remotely via VistaLINK® capability.

The 7707IFRA occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

**Features**

- 30-200 MHz bandwidth
- Protocol transparent - receives all video, audio and data modulation formats
- Supports manual and automatic gain control (AGC)
- Wide AGC hold range (45dB) using 7707IFTA + 7707IFRA
- Two IF outputs for extra signal distribution or monitoring functions
- IF output power independent of optical loss (within AGC range)
- Available with BNC or F-Type connector options
- Wide range optical input (1270nm to 1610nm)
- Supports single-mode and multi-mode fiber optic cable
- Available in SC/PC, ST/PC, FC/PC and APC connector options
- Fully hot swappable from front of frame
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

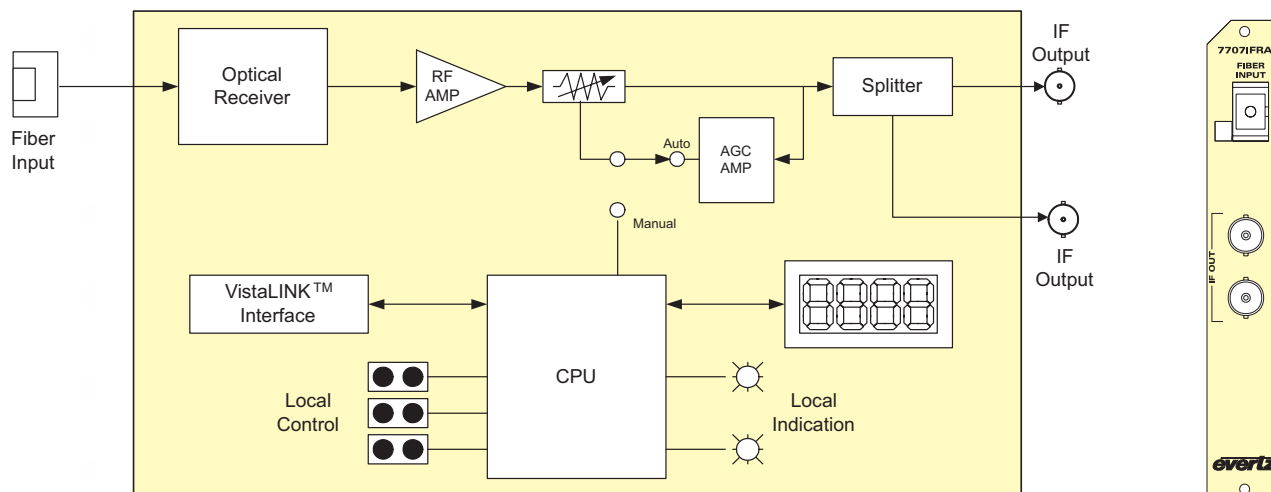
**7707IFRA Application Configurations**

APPLICATION	OPTICAL/LINK BUDGET	TRANSMITTER SIDE		RECEIVER SIDE		DESCRIPTION
		ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
ONE SIGNAL PER FIBER						
Short to Medium Haul	14dB/40km	7707IFTA13	0dBm	7707IFRA	-14dBm	1310nm FP laser on Tx
Medium Haul	16dB/45km	7707IFTA13L	+2dBm	7707IFRA	-14dBm	1310nm DFB laser on Tx
Long Haul	16dB/64km	7707IFTA15	+2dBm	7707IFRA	-14dBm	1550nm DFB laser on Tx
Long Haul	25dB/71km	7707IFTA13L	+2dBm	7707IFRA-H	-23dBm	1310nm DFB laser on Tx, High Sensitivity RX
Long Haul	25dB/100km	7707IFTA15	+2dBm	7707IFRA-H	-23dBm	1550nm DFB laser on Tx, High Sensitivity RX
MULTI-SIGNAL PER FIBER (WAVELENGTH MUX/DEMUX)						
Medium Haul	12.5dB/50km*	7707IFTAxx	+2dBm	7707IFRA	-14dBm	1470nm-1610nm CWDM DFB laser on Tx, with 8 Ch CWDM Mux/Demux*
Long Haul	21.5dB/86km*	7707IFTAxx	+2dBm	7707IFRA-H	-23dBm	1470nm-1610nm CWDM DFB laser on Tx, High Sensitivity RX, 8 Ch CWDM Mux/Demux*
Long Haul	16dB/70km**	7707IFTADyyy	+7dBm	7707IFRA	-14dBm	DWDM DFB laser on Tx, with 8 Ch DWDM Mux/Demux**
Long Haul	25dB/100km**	7707IFTADyyy	+7dBm	7707IFRTA-H	-23dBm	DWDM DFB laser on Tx, High Sensitivity RX, 8 Ch DWDM Mux/Demux**
Fiber loss = 0.35/0.25dB per km @1310nm/1550nm * Assumes 8 Channel upper band CWDM Mux/Demux loss of 3.5dB **Assumes 8 Channel DWDM Mux/Demux loss of 5dB						



# 70/140MHz IF Fiber Receiver with VistaLINK® Monitoring 7707IFRA

**7707IFRA Block Diagram & Rear Panel**



## Specifications

### IF Output:

**Connector:** 2 BNC per IEC 60169-8 Amendment 2  
75 (50Ω optional) (See Ordering Information)

### I/O Impedance:

### Return Loss:

18dB (min)

### Frequency Range:

30MHz - 200MHz

### Flatness:

± 1dB @ 30 MHz - 200MHz

± 0.2dB @ 36MHz BW

37dB @ 36MHz BW

### Carrier to Noise:

### Output Signal Level:

**AGC mode:** -10dBm constant (within AGC range)

**Manual mode:** -5 to -65 (depends on RF input level, optical loss & gain setting)

**Intermodulation Products:** -50dBc (-10dBm at IFTA input & 3dB optical loss)

### Optical Input:

### Number of Inputs:

1  
**Connector:** Female SC/PC, ST/PC, FC/PC, SC/APC, FC/APC

**Operating Wavelength:** 1270nm - 1610nm

### Maximum Input Power:

**Standard Version** +3dBm

**-H Version** -7dBm

### Optical Sensitivity:

**Standard Version** -14dBm @35dB C/N @36MHz BW

**-H Version** -23dBm @35dB C/N @36MHz BW

-29dBm @25dB C/N @36MHz BW

### Optical Attenuation:

**AGC Hold range:** 10dB optical

### Electrical:

**Voltage:** +12VDC

**Power:** 5 Watts

**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC Directive

### Physical:

**Number of slots:** 1

## Ordering Information:

Note: 75Ω I/O impedance ships standard

### 7707IFRA

70/140MHz IF Fiber Receiver, VistaLINK® Monitoring

### 7707IFRA-H

70/140MHz IF High Sensitivity Fiber Receiver, VistaLINK® Monitoring

## Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg. Model +3RU +SC

### Rear Plate Suffix:

#### +3RU

3RU Rear Plate for use with 7700FR-C Multiframe

#### +1RU

1RU Rear Plate for use with 7701FR Multiframe

#### +SA

Standalone Enclosure Rear Plate

### Impedance Suffix:

#### +50

50Ω I/O Impedance

### Connector Suffix:

#### +SC

SC/PC

#### +AP+SC

SC/APC (Angle polished)

#### +ST

ST/PC

#### +FC

FC/PC

#### +AP+FC

FC/APC (Angle polished)

#### +F75

75Ω, F-Type rear connector

## Enclosures:

### 7700FR-C

3RU Multiframe, which holds 15 modules

### 7701FR

1RU Multiframe, which holds 3modules

### S7701FR

Standalone enclosure



The 7707LR and 7707LR-WB are VistaLINK® -capable fiber optic receivers for L-Band Satellite signals. The 7707LR-WB offers extended bandwidth from 250 to 2250MHz vs 950 to 2250MHz for the 7707LR version. Both 7707LR and 7707LR-WB accept a fiber optic input from the companion L-Band transmitters and provide L-Band RF output signals via BNC's. Monitoring and control of card status is provided locally at the card edge and remotely via VistaLINK®.

The 7707LR and 7707LR-WB occupy one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules, or a standalone enclosure which will hold 1 module.

## Features

- Band operation - 950 to 2250MHz (7707LR)  
- 250 to 2250MHz (7707LR-WB)
- Protocol transparent - receives all video, audio and data modulation formats
- Supports manual and automatic gain control (AGC)
- Wide AGC hold range (50dB) using 7707LTA/LTA-WB + 7707LR/LR-WB
- Two L-Band RF outputs (7707LR only) for extra signal distribution or monitoring functions

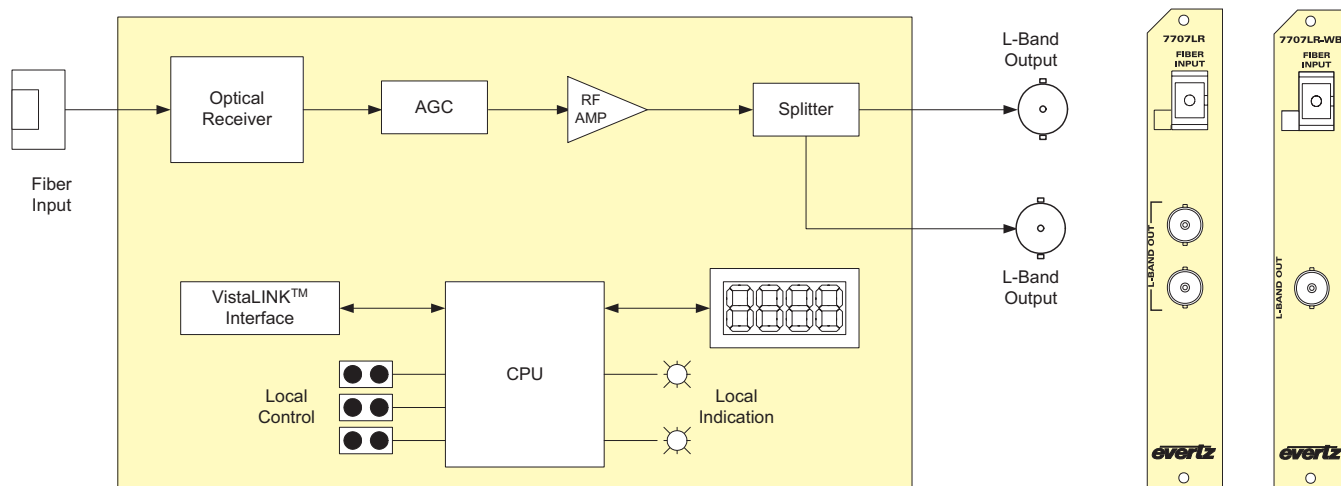
- RF output independent of optical loss (within AGC range)
- Available with BNC or F-Type connector options
- Wide range optical input (1270nm to 1610nm)
- Supports single-mode and multi-mode fiber optic cable
- Available in SC/PC, ST/PC, FC/PC and APC connector options
- Fully hot swappable from front of frame
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

## 7707LR/LR-WB Application Configurations

APPLICATION	OPTICAL/LINK BUDGET	TRANSMITTER SIDE		RECEIVER SIDE		DESCRIPTION
		ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
ONE SIGNAL PER FIBER						
Short to Medium Haul	14dB/40km	7707LTA13-WB	0dBm	7707LR-WB	-14dBm	1310nm FP laser on Tx
Medium Haul	16dB/45km	7707LTA13L-WB	+2dBm	7707LR-WB	-14dBm	1310nm DFB laser on Tx
Long Haul	16dB/64km	7707LTA15-WB	+2dBm	7707LR-WB	-14dBm	1550nm DFB laser on Tx
Long Haul	25dB/71km	7707LTA13L-WB	+2dBm	7707LR-H-WB	-23dBm	1310nm DFB laser on Tx, High Sensitivity RX
Long Haul	25dB/100km	7707LTA15-WB	+2dBm	7707LR-H-WB	-23dBm	1550nm DFB laser on Tx, High Sensitivity RX
MULTI-SIGNAL PER FIBER (WAVELENGTH MUX/DEMUX)						
Medium Haul	12.5dB/50km	7707LTAx-WB	+2dBm	7707LR-WB	-14dBm	1470nm-1610nm CWDM DFB laser on Tx, with 8 Ch CWDM Mux/Demux*
Long Haul	21.5dB/86km*	7707LTAx-WB	+2dBm	7707LR-H-WB	-23dBm	1470nm-1610nm CWDM DFB laser on Tx, High Sensitivity RX, 8 Ch CWDM Mux/Demux*
Long Haul	16dB/64km**	7707LTADyyy-WB	+7dBm	7707LR-WB	-14dBm	DWDM DFB laser on Tx, with 8 Ch DWDM Mux/Demux**
Long Haul	25dB/100km**	7707LTADyyy-WB	+7dBm	7707LR-H-WB	-23dBm	DWDM DFB laser on Tx, High Sensitivity RX, 8 Ch DWDM Mux/Demux**
Fiber loss = 0.35/0.25dB per km @1310nm/1550nm * Assumes 8 Channel upper band CWDM Mux/Demux loss of 3.5dB **Assumes 8 Channel DWDM Mux/Demux loss of 5dB						

# L-Band Fiber Receiver with VistaLINK® Monitoring 7707LR & 7707LR-WB

**7707LR Block Diagram & Rear Panels**



## Specifications

### RF Outputs:

Number of Outputs:	2 (7707LR) 1 (7707LR-WB)
Connector:	2 BNC's (F-type optional)
I/O Impedance:	75Ω (50Ω optional) (See Ordering Information)
Return Loss:	>10dB
Frequency Range:	950MHz - 2250MHz (7707LR) 250MHz - 2250MHz (7707LR-WB)
Flatness:	± 1.5dB @950MHz-2250MHz (7707LR) ± 2dB @250MHz - 2250MHz (7707LR-WB) ± 0.25dB @ any 36MHz BW

### Output Signal Level

AGC Mode:	-20dBm constant (within AGC range)
Manual Mode:	-20 to -65dBm (depends on RF level and optical loss)
OIP3:	+10dBm (-40dBm input level)
Intermodulation Products:	-55dBc (-20dBm RF in on TX, 1m fiber, AGC mode on TX & RX)
Carrier to Noise:	37dB @ any 36MHz BW
Noise Figure:	20dB/32dB (minimum/maximum optical loss)
Signal to Noise:	>55dB

### Optical Input:

Number of inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC, SC/APC, FC/APC
Operating Wavelength:	1270nm - 1610nm
Maximum Input Power:	
Standard Version	+3dBm
-H Version	-7dBm
Optical Sensitivity:	
Standard Version	-14dBm @35dB S/N
-H Version	-23dBm @35dB S/N -29dBm @25dB S/N

### Optical Attenuation

AGC Hold Range:	10dB optical
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### Electrical:

Voltage:	+12VDC
Power:	5 Watts
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC Directive

### Physical:

Number of slots:	1
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### Ordering Information:

	L-Band Satellite Fiber Receiver with VistaLINK®
Note:	75Ω I/O impedance ships standard
7707LR	L-Band Satellite Fiber Receiver
7707LR-H	L-Band High Sensitivity Satellite Fiber Receiver
7707LR-WB	L-Band Satellite Fiber Receiver, Wideband
7707LR-H-WB	L-Band High Sensitivity Satellite Fiber Receiver, Wideband

### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
Eg. Model +3RU +SC

### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

### Impedance Suffix

+50	50Ω I/O impedance
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### Connector Suffix

+SC	SC/PC
+AP+SC	SC/APC (Angle polished)
+ST	ST/PC
+FC	FC/PC
+AP+FC	FC/APC (Angle polished)
+F75	75Ω, F-Type rear connector

### Enclosures:

7700FR-C	3RU Multiframe, which holds 15 modules
7701FR	1RU Multiframe, which holds 3 modules
S7701FR	Standalone enclosure





The 7707LTA and 7707LTA-WB are VistaLINK® - capable fiber optic transmitters for L-Band satellite signals. The 7707LTA-WB offers extended bandwidth from 250 to 2250MHz vs 950 to 2250MHz for the 7707LTA version. The 7707LTA and 7707LTA-WB accept one L-Band coaxial input and provide a fiber optic output signal at 1310nm, 1550nm, CWDM or DWDM wavelengths. An L-Band BNC output is also provided for monitoring or further signal distribution. Monitoring and control of card status is provided locally at the card edge and remotely via VistaLINK®.

The 7707LTA and 7707LTA-WB occupy one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules, or a standalone enclosure which will hold 1 module.

## Features

- Band operation - 950 to 2250MHz (7707LT)  
- 250 to 2250MHz (7707LTA-WB)
- Wide dynamic range RF input (-20 to -65dBm)
- Protocol transparent - transmits all video, audio and data modulation formats
- Supports manual and automatic gain control (AGC)
- Wide AGC hold range (50dB) using 7707LTA/LTA-WB + 7707LR/LR-WB
- Additional L-Band BNC output for monitoring or distribution
- LNB power at +13 or +17 VDC with built-in current limiting
- Available with BNC or F-Type connector options
- Available with wavelengths of 1310nm, 1550nm, CWDM (ITU-T G.694.2 compliant) and DWDM (ITU-T G.694.1 compliant)
- Supports single-mode and multi-mode fiber optic cable
- Available in SC/PC, ST/PC, FC/PC and APC connector options
- Fully hot-swappable from front of frame
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.

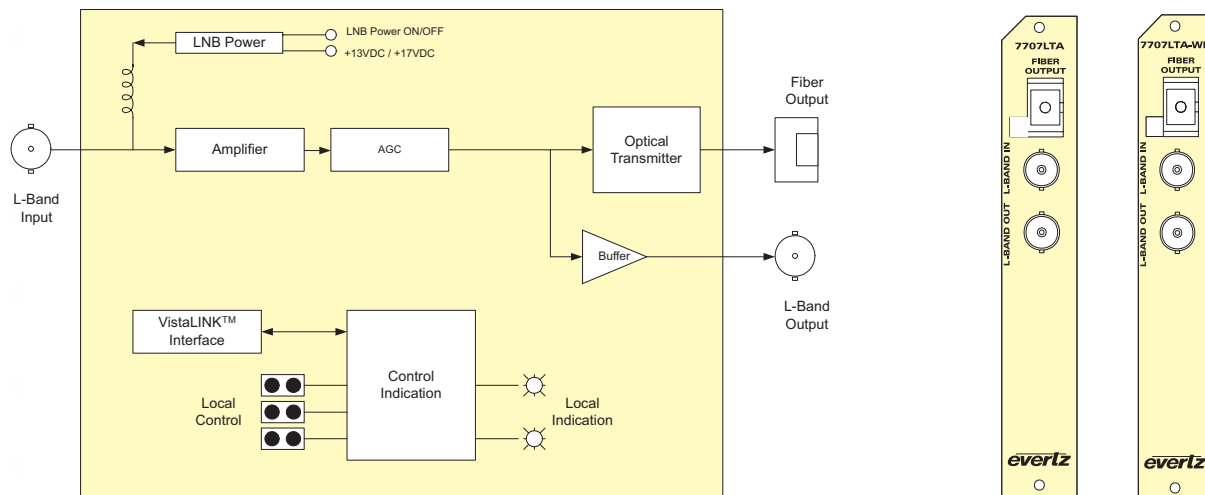
## 7707LTA & LTA-WB Application Configurations

APPLICATION	OPTICAL/LINK BUDGET	TRANSMITTER SIDE		RECEIVER SIDE		DESCRIPTION
		ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
ONE SIGNAL PER FIBER						
Short to Medium Haul	14dB/40km	7707LTA13-WB	0dBm	7707LR-WB	-14dBm	1310nm FP laser on Tx
Medium Haul	16dB/45km	7707LTA13L-WB	+2dBm	7707LR-WB	-14dBm	1310nm DFB laser on Tx
Long Haul	16dB/64km	7707LTA15-WB	+2dBm	7707LR-WB	-14dBm	1550nm DFB laser on Tx
Long Haul	25dB/71km	7707LTA13L-WB	+2dBm	7707LR-H-WB	-23dBm	1310nm DFB laser on Tx, High Sensitivity RX
Long Haul	25dB/100km	7707LTA15-WB	+2dBm	7707LR-H-WB	-23dBm	1550nm DFB laser on Tx, High Sensitivity RX
MULTI-SIGNAL PER FIBER (WAVELENGTH MUX/DEMUX)						
Medium Haul	12.5dB/50km	7707LTAx-WB	+2dBm	7707LR-WB	-14dBm	1470nm-1610nm CWDM DFB laser on Tx, with 8 Ch CWDM Mux/Demux*
Long Haul	21.5dB/86km*	7707LTAx-WB	+2dBm	7707LR-H-WB	-23dBm	1470nm-1610nm CWDM DFB laser on Tx, High Sensitivity RX, 8 Ch CWDM Mux/Demux*
Long Haul	16dB/64km**	7707LTADyyy-WB	+7dBm	7707LR-WB	-14dBm	DWDM DFB laser on Tx, with 8 Ch DWDM Mux/Demux**
Long Haul	25dB/100km**	7707LTADyyy-WB	+7dBm	7707LR-H-WB	-23dBm	DWDM DFB laser on Tx, High Sensitivity RX, 8 Ch DWDM Mux/Demux**
Fiber loss = 0.35/0.25dB per km @1310nm/1550nm * Assumes 8 Channel upper band CWDM Mux/Demux loss of 3.5dB **Assumes 8 Channel DWDM Mux/Demux loss of 5dB						

# L-Band Fiber Transmitter with VistaLINK® Monitoring

## 7707LTA & 7707LTA-WB

### 7707LTA Block Diagram & Rear Panels



#### Specifications

**RF Input:**  
**Number of Inputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2 (F-type optional)  
**I/O Impedance:** 75Ω (50Ω optional) (See Ordering Information)  
**Return Loss:** >10dB  
**Frequency Range:** 950MHz - 2250MHz (7707LTA)  
 250MHz - 2250MHz (7707LTA-WB)  
**Input Power Range:** -20 to -65dBm  
**AGC Hold Range:** -20 to -50dBm

#### RF Monitoring Output:

**Number of Outputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2 (F-type optional)  
**I/O Impedance:** 75Ω (50Ω optional) (See Ordering Information)  
**Return Loss:** >10dB  
**Frequency Range:** 950MHz - 2250MHz (7707LTA)  
 250MHz - 2250MHz (7707LTA-WB)  
**Flatness:** ± 1.5dB @ 950MHz - 2250MHz (7707LTA)  
 ± 2.0dB @ 250MHz - 2250MHz (7707LTA-WB)  
 ± 0.25dB @ any 36MHz BW

#### Output Signal Level

**AGC mode:** -20dBm constant (within AGC range)  
**Manual mode:** (Input signal) + (manual Gain setting) -5dB  
**OIP3:** +10dBm (-40dBm input level)  
**Intermodulation Products:** -55dBc (-20dBm RF in, AGC mode)  
**Carrier to Noise:** 37dB @ any 36MHz BW  
**Noise Figure:** 20dB/32dB (minimum/maximum optical loss)

#### Optical Output:

**Number of outputs:** 1  
**Connector:** Female SC/PC, ST/PC, FC/PC, SC/APC, FC/APC  
**Operating Wavelengths**  
**Standard:** 1310nm, 1550nm (nominal)  
**CWDM:** 1270nm to 1610nm  
**DWDM:** C-Band (ITU G.694.1 compliant)

#### Output Power:

**1310nm FP:** 0dBm ± 1dBm  
**1310nm, 1550nm & CWDM DFB:** +2dBm ± 1dBm  
**DWDM DFB:** +7dBm ± 1dBm

#### Electrical:

**Voltage:** +12VDC  
**Power:** 6 Watts (Non DWDM)  
 9 Watts (DWDM)

#### Physical:

**Number of slots:** 1

#### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
 Class 1 laser product  
 Class 1M laser product (DWDM versions only)  
 Complies with 24 CFR 1040.10 and 1040.11, IEC 60825-1  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC directive

#### Ordering Information:

#### L-Band Satellite Fiber Transmitter with VistaLINK®

Note: 75Ω I/O impedance ships standard

**7707LTA13** 1310nm, FP Laser, Short to Medium Haul  
**7707LTA13L** 1310nm, DFB Laser, Medium Haul  
**7707LTA15** 1550nm, DFB Laser, Long Haul  
**7707LTA13-WB** 1310nm, FP Laser, Short to Medium Haul, Wideband  
**7707LTA13L-WB** 1310nm, DFB Laser, Medium Haul, Wideband  
**7707LTA15-WB** 1550nm, DFB Laser, Long Haul, Wideband

#### For CWDM, please refer to the end of the fiber section for ordering information

**7707LTAXx** L-Band Satellite Fiber Transmitter, CWDM wavelength,  
**7707LTAXx-WB** L-Band Satellite Fiber Transmitter, CWDM wavelength, Wideband

#### For DWDM, please refer to the end of the fiber section for ordering information

**7707LTADyyy** L-Band Satellite Fiber Transmitter, DWDM wavelength,  
**7707LTADyyy-WB** L-Band Satellite Fiber Transmitter, DWDM wavelength, Wideband

#### Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order  
 Eg. Model +3RU +SC

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Impedance Suffix

**+50** 50Ω I/O impedance

#### Connector Suffix

**+SC** SC/PC  
**+AP+SC** SC/APC (Angle polished available with 7707LTA13 only)  
**+ST** ST/PC  
**+FC** FC/PC  
**+AP+FC** FC/APC (Angle polished available with 7707LTA13 only)  
**+F75** 75Ω, F-Type rear connector

#### Enclosures:

**7700FR-C** 3RU Multiframe, which holds 15 modules  
**7701FR** 1RU Multiframe, which holds 3 modules  
**S7701FR** Standalone Enclosure

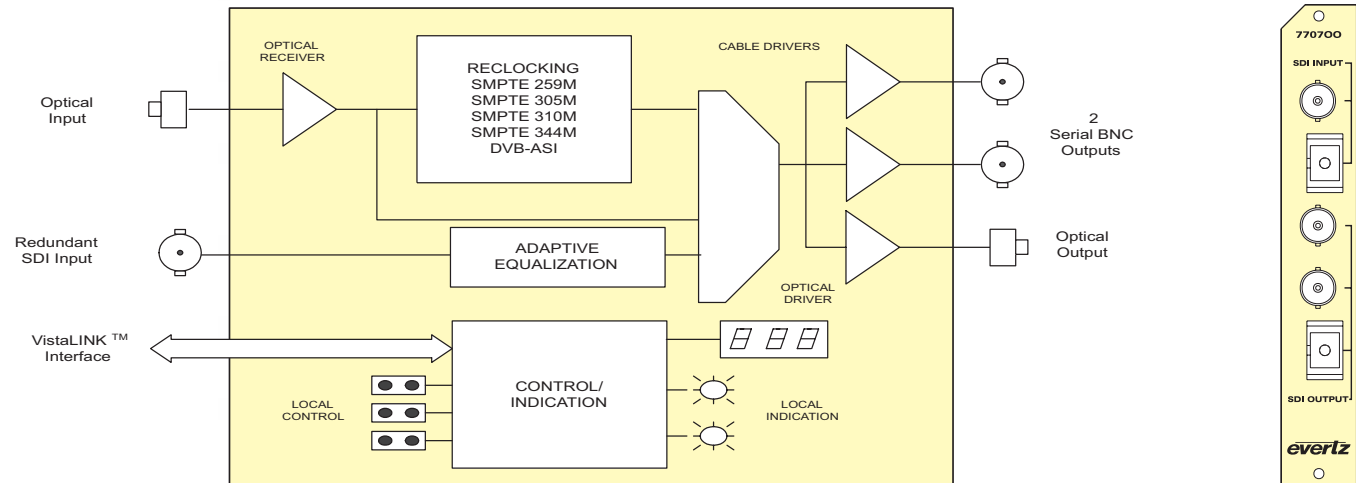


### Features

- Can be used as optical regenerator/repeater, E to O converter, O to E converter, O to O wavelength converter
- Auto-rate selection, reclocking and indication for all SMPTE 259M standards from 143-540Mb/s
- Supports additional standards of SMPTE 305M(SDTi), SMPTE 310M(19.4Mb/s) and M2S or DVB-ASI(270Mb/s)
- Can also support Datacom/Telecom rates up to 540Mb/s
- Coaxial or optical input (jumper selectable)
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths of 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.694.1 compliant) also available

- Independent isolated output drivers to ensure no cross channel loading effects and to maintain polarity from input to output for DVB-ASI applications
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®.
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Detection and display of optical input power, video format and EDH errors
- Fully hot-swappable from front of frame
- Two BNC serial digital outputs

### 770700 Block Diagram & Rear Panel



### Specifications

**Standards:** SMPTE 259M A, B, C, D, SMPTE 297M, SMPTE 305M, SMPTE 310M, DVB-ASI, M2S

#### Optical Input:

**Connector:** Female SC/PC, ST/PC, FC/PC  
**Operating Wavelength:** 1270nm to 1610nm  
**Maximum Input Power:** 0dBm  
**Optical Sensitivity:** -31dBm

#### Electrical Video Input:

**Normal:** SMPTE 259M (143 to 540 Mb/s) or DVB/ASI  
**Jumper Selectable:** SMPTE 310M (19.4 Mb/s)  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 275m @ 270 Mb/s with Belden 8281 (or equivalent)  
**Return Loss:** > 15 db to 540 Mb/s

#### Optical Outputs:

**Connector:** SC/PC, ST/PC, FC/PC female housing  
**Return Loss:** > 14dB  
**Jitter:** < 0.15UI (Reclocked)  
 < 0.20UI (Non-reclocked)

#### Nominal Wavelength:

1310nm, 1550nm  
**CWDM Wavelengths:** See Ordering Information  
**DWDM Wavelengths:** See Ordering Information  
**Output Power:**  
 1310nm FP: -7dBm ± 1dBm  
 1550nm DFB: 0dBm ± 1dBm  
 CWDM DFB: 0dBm ± 1dBm  
 DWDM DFB: +7dBm ± 1dBm

#### Electrical Video Outputs:

**Number of Outputs:** 2 per card - reclocked (both outputs maintain polarity from input to output for DVB-ASI applications)  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Impedance:** 75Ω (nominal)  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 900ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** >15dB up to 540Mb/s  
**Wide Band Jitter:** < 0.15UI (Reclocked)  
 < 0.20UI (Non-reclocked)

#### Electrical:

**Voltage:** +12V DC  
**Power:** 6 Watts (Non DWDM), 9 Watts (DWDM)

#### Physical:

**Number of Slots** 1

#### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
 Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC directive

#### Ordering Information:

**77070013** Optical Regenerator / Wavelength Converter for rates to 540Mb/s, 1270nm to 1610nm input, 1310nm FP output  
**77070015** Optical Regenerator / Wavelength Converter for rates to 540Mb/s, 1270nm to 1610nm input, 1550nm DFB laser output

#### For CWDM, please refer to the end of the fiber section for ordering information

**770700xx** Optical Regenerator / Wavelength Converter for rates to 540Mb/s, 1270nm to 1610nm input, CWDM output

#### For DWDM, please refer to the end of the fiber section for ordering information

**770700Dyyy** Optical Regenerator / Wavelength Converter for rates to 540Mb/s, 1270nm to 1610nm input, DWDM output

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



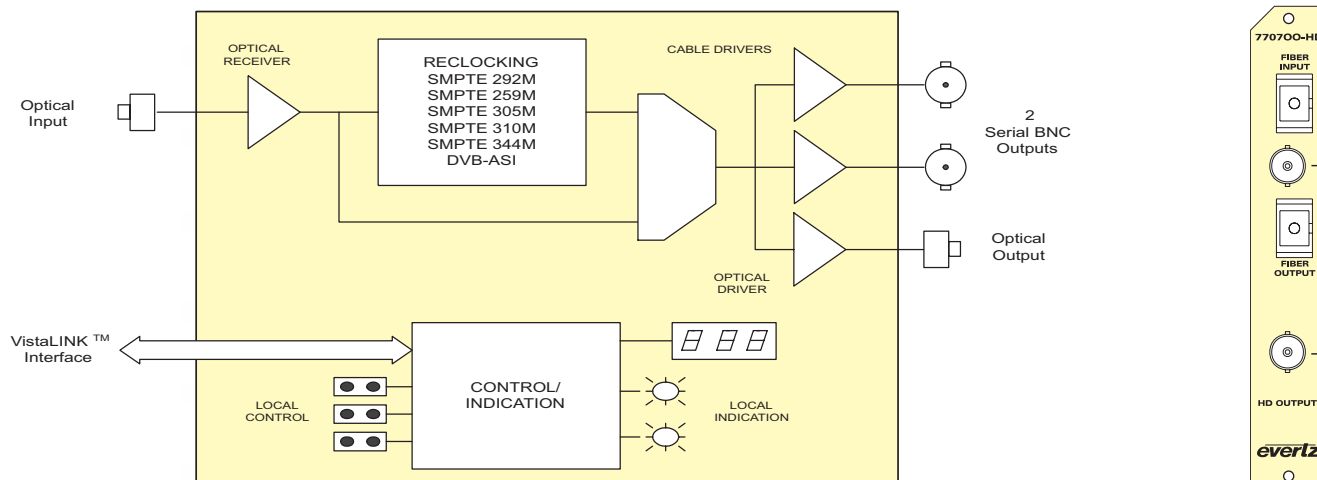


### Features

- Can be used as optical regenerator/repeater, O to E converter or O to O wavelength converter
- Auto rate selection, reclocking and indication for all SDI (SMPTE 259M) and HD-SDI (SMPTE 292M) data rates from 143Mb/s to 1.485Gb/s
- Also supports SMPTE 305M (SDTi), SMPTE 310M (19.4Mb/s) and M2S or DVB-ASI (270Mb/s)
- Supports other Telecom/Datacom rates up to 1.5Gb/s
- Wide range optical input (1270nm-1610nm)
- Optical output wavelengths of 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)

- DWDM wavelengths (ITU-T G.694.1 compliant) also available
- BNC outputs maintain polarity from input to output for DVB-ASI applications
- Supports single-mode and multi-mode fiber optic cable
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK® - capable capability
- Detection and display of optical input power, video format, and EDH errors (SDI only)
- Fully hot swappable from front of frame

### 770700-HD Block Diagram & Rear Panel



### Specifications

**Standards:** SMPTE 297M  
**Reclocked:** SMPTE 292M, SMPTE 259M A, B, C, D, SMPTE 344M, SMPTE 305M, SMPTE 310M (19.4 Mb/s), DVB-ASI, M2S  
**Non-Reclocked:** Any bi-level signal type at rates of 19.4Mb/s - 1.485Gb/s

#### Optical Input:

**Connector:** Female SC/PC, ST/PC or FC/PC  
**Operating Wavelength:** 1270nm - 1610nm  
**Max. Input Power:**  
**Standard:** -1dBm  
**High Sensitivity (-H):** -7dBm  
**Optical Sensitivity**  
**Standard:** -23dBm @ 1.485Gb/s  
**High Sensitivity (-H):** -28dBm @ 1.485Gb/s

#### Optical Output:

**Connector:** SC/PC, ST/PC or FC/PC female housing  
**Return Loss:** < 14dB  
**Wide Band Jitter:** < 0.2UI (reclocked)  
**Nominal Wavelength:** 1310nm, 1550nm  
**CWDM Wavelengths:** See Ordering Information  
**DWDM Wavelengths:** See Ordering Information  
**Output Power:**  
**1310nm FP:** -7dBm ± 1dBm  
**1550nm DFB:** 0dBm ± 1dBm  
**CWDM DFB:** 0dBm ± 1dBm  
**DWDM DFB:** +7dBm ± 1dBm

#### Electrical Video Outputs:

**Number of Outputs:** 2 per card reclocked (both outputs maintain polarity from input to output for DVB-ASI applications)  
**Connectors:** BNC per IEC 60169-8 Amendment 2.  
**Impedance:** 75Ω(nominal).  
**Signal Level:** 800mV(nominal).  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** <270ps  
**Overshoot:** < 10% of amplitude.  
**Return Loss:** > 12dB to 1.5GHz  
**Wide Band Jitter:** < 0.2UI (Reclocked)

#### Electrical:

**Voltage:** +12VDC  
**Power:** 8 Watts (Non-DWDM version)  
 11 Watts (DWDM version)

#### Physical:

**7700 or 7701 frame mounting:**  
**Number of slots:** 1

#### Compliance:

**Electrical Safety:** CSA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive

#### Laser Safety:

Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
 Complies with FCC Part 15, Class A  
 EU EMC directive

#### Ordering Information:

**77070013-HD** Optical Regenerator / Wavelength Converter for rates to 1.5Gb/s, 1270nm to 1610nm input, 1310nm FP output  
**77070013-HD-H** Optical Regenerator / Wavelength Converter for rates to 1.5Gb/s, High Sensitivity (-28dBm) input, 1310nm FP output  
**77070015-HD** Optical Regenerator / Wavelength Converter for rates to 1.5Gb/s, 1270nm to 1610nm input, 1550nm DFB Laser output

#### For CWDM, please refer to the end of the fiber section for ordering information

**770700xx-HD** Optical Regenerator / Wavelength Converter for rates to 1.5Gb/s, 1270nm to 1610nm input, CWDM output

#### For Long Distance CWDM high sensitivity, please refer to the end of the fiber section for ordering information

**770700xx-HD-H** Optical Regenerator / Wavelength Converter for rates to 1.5Gb/s, High Sensitivity (-28 dBm) input, CWDM output

#### For DWDM, please refer to the end of the fiber section for ordering information

**770700Dyyy-HD** Optical Regenerator / Wavelength Converter for rates to 1.5Gb/s, 1270nm to 1610nm input, DWDM output

#### For Long Distance DWDM high sensitivity, please refer to the end of the fiber section for ordering information

**770700Dyyy-HD-H** Optical Regenerator / Wavelength Converter for rates to 1.5Gb/s, High Sensitivity (-28dBm) input, DWDM output

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

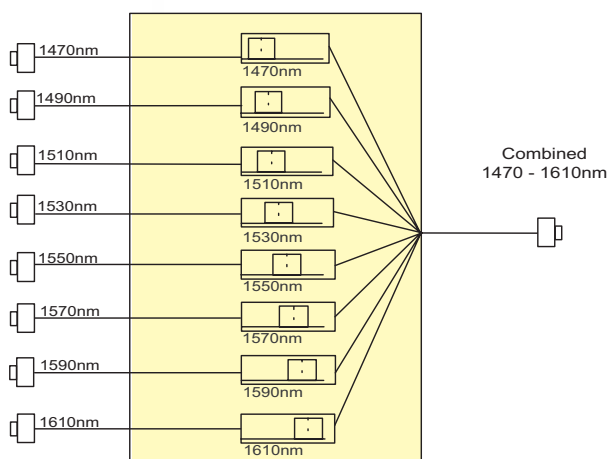
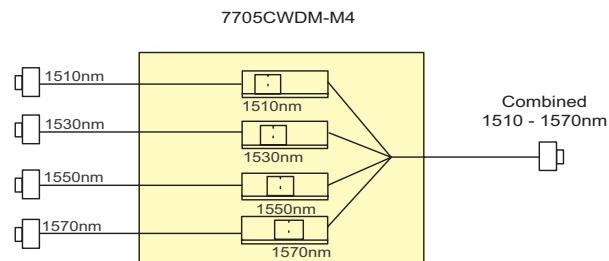
#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure

### Features

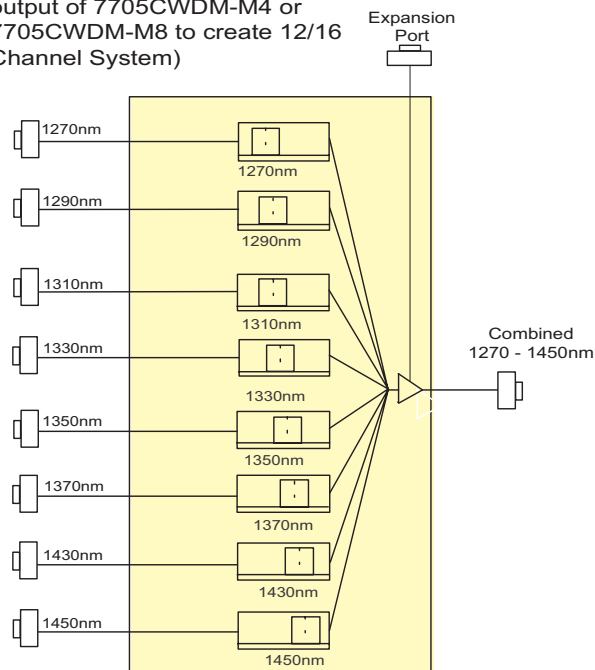
- Bi-directional mux/demux of up to 16 wavelengths in the 1270nm to 1610nm spectrum (ITU-T G.694.2 compliant)
- Expandable from 4 or 8 to 12 or 16 channel systems
- Passive design for any bit rate
- Low insertion loss to conserve system power
- High optical isolation for low crosstalk
- Fully hot swappable from front of frame with no fiber disconnect/reconnect required
- SC/PC, ST/PC, FC/PC\* connector options
- Fiber protector to prevent connector damage
- Housed in Evertz standard 3RU or 1RU Multiframe

### 7705CWDM Block Diagrams



7705CWDM-M8

Expansion port input (Accepts output of 7705CWDM-M4 or 7705CWDM-M8 to create 12/16 Channel System)



7705CWDM-M8LB

### Applications

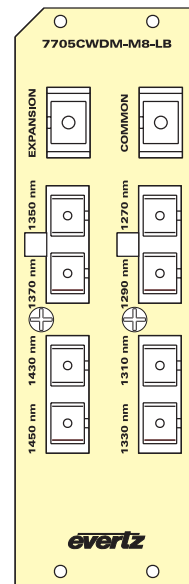
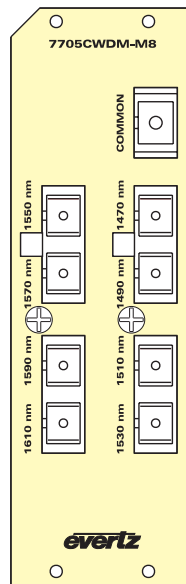
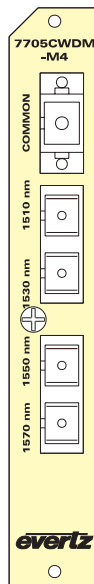
- Multi-channel transport of video, audio, data, control in fiber limited applications
- Cost reduction exercises through fewer leased fibers
- Studio and Facility extension / expansion
- STL and TSL links
- Signal aggregation for outdoor and event coverage
- Signal aggregation for security and monitoring

### Descriptions

Function	Ordering Information	Description	Slots Occupied
4 Channel CWDM Mux	<b>7705CWDM-M4</b>	4 Channel CWDM Mux (1510nm - 1570nm)	1
4 Channel CWDM Demux	<b>7705CWDM-D4</b>	4 Channel CWDM Demux (1510nm - 1570nm)	1
8 Channel CWDM Mux	<b>7705CWDM-M8</b>	8 Channel CWDM Mux (1470nm - 1610nm)	2
8 Channel CWDM Demux	<b>7705CWDM-D8</b>	8 Channel CWDM Demux (1470nm - 1610nm)	2
12 Channel CWDM Mux	<b>7705CWDM-M4 &amp; 7707CWDM-M8LB</b>	12 Channel CWDM Mux (1270nm - 1570nm)	3
12 Channel CWDM Demux	<b>7705CWDM-D4 &amp; 7705CWDM-D8LB</b>	12 Channel CWDM Demux (1270nm - 1570nm)	3
16 Channel CWDM Mux	<b>7705CWDM-M8 &amp; 7707CWDM-M8LB</b>	16 Channel CWDM Mux (1270nm - 1610nm)	4
16 Channel CWDM Demux	<b>7705CWDM-D8 &amp; 7705CWDM-D8LB</b>	16 Channel CWDM Demux (1270nm - 1610nm)	4



## 7705CWDM Rear Panels



### Specifications

#### Optical Input/Output:

**Connector:** SC/PC, ST/PC or FC/PC\* female housing

#### Wavelength:

**7705CWDM-4:** 1510 - 1570nm

**7705CWDM-8:** 1470 - 1610nm

**7705CWDM-8LB:** 1270 - 1450nm

**Channel Spacing:** 20nm

**Passband @ 0.5dB:** > 13nm

**Channel Uniformity:** < 1.5dB

#### Isolation Adjacent

**Channel:** > 30dB

**Directivity:** > 50dB

**Fiber Size:** 9 µm core / 125 µm overall

**Return Loss:** > 45dB

#### Link Loss with Mux and Demux Combination:

**7705CWDM-4:** < 2.5dB Maximum Loss

**7705CWDM-8:** < 3.5dB Maximum Loss

**7705CWDM-8LB:** < 5.5dB Maximum Loss

**Expansion Port:** < 3.5dB Maximum Loss

**7707CWDM-4 +  
7707CWDM-8LB:** < 6.0dB (1270nm - 1570nm)

**7705CWDM-8 +  
7705CWDM-8LB:** < 5.5dB (1270nm - 1450nm)  
< 7.0dB (1470nm - 1610nm)

### Ordering Information

<b>7705CWDM-D4</b>	4 Channel CWDM Demux (1510nm - 1570nm)
<b>7705CWDM-D8</b>	8 Channel CWDM Demux (1470nm - 1610nm)
<b>7705CWDM-D8LB</b>	8 Channel Low Band CWDM Demux (1270nm - 1450nm)
<b>7705CWDM-M4</b>	4 Channel CWDM Mux (1510nm - 1570nm)
<b>7705CWDM-M8</b>	8 Channel CWDM Mux (1470nm - 1610nm)
<b>7705CWDM-M8LB</b>	8 Channel Low Band CWDM Mux (1270nm - 1450nm)

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +3RU +SC

#### Rear Plate Suffix

**+3RU**

3RU Rear Plate for use with 7700FR-C Multiframe

**+1RU**

1RU Rear Plate for use with 7701FR Multiframe

**+SA**

Standalone Enclosure (with power supply)

#### Connector Suffix

**+SC**

SC/PC

**+ST**

ST/PC

**+FC**

FC/PC\*

#### \*Note:

FC/PC connector option is available on 'COMMON' and 'EXPANSION' ports only (SC/PC on remaining fiber I/O ports)

### Fiber Optic Patch Cable:

<b>CB-FP1M-SCPC</b>	Single mode fiber cable, 1m, SC/PC male termination
<b>CB-FP1M-STPC</b>	Single mode fiber cable, 1m, ST/PC male termination
<b>CB-FP5M-SCPC</b>	Single mode fiber cable, 5m, SC/PC male termination
<b>CB-FP5M-STPC</b>	Single mode fiber cable, 5m, ST/PC male termination
<b>CB-FP10M-SCPC</b>	Single mode fiber cable, 10m, SC/PC male termination
<b>CB-FP10M-STPC</b>	Single mode fiber cable, 10m, ST/PC male termination

### Enclosures:

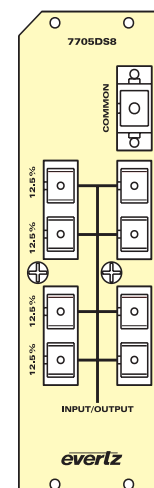
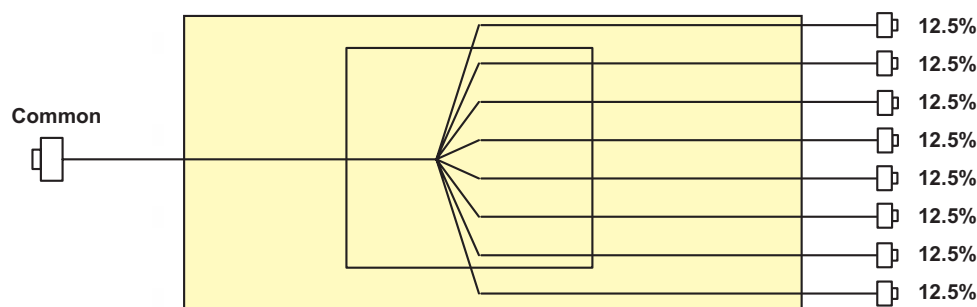
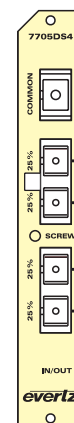
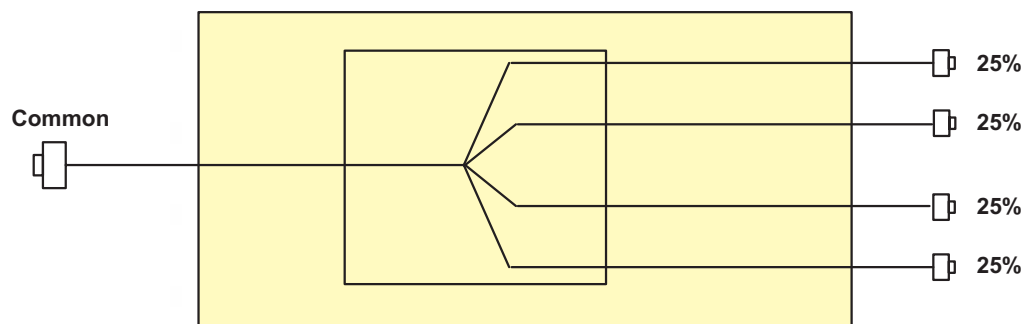
<b>7700FR-C</b>	3RU Multiframe which holds 15 modules
<b>7701FR</b>	1RU Multiframe which holds 3 modules
<b>7701FR</b>	Standalone enclosure

## Four & Eight Channel Optical Splitter 7705DS-4, 7705DS-8

### Features

- Separates one optical input into 4 or 8 optical outputs
- Wideband operation from 1270nm - 1610nm
- Passive splitter design for any bit rate
- Fully hot swappable from front of frame with no fiber disconnect/reconnect required
- Supports single mode fiber
- Available in SC, ST & FC\* connector options
- 7705DS-4 occupies one card slot, 7705DS-8 occupies two card slots and both can be housed in a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 7 dual slot modules or 15 single slot modules or a standalone enclosure which will hold 1 module

### 7705DS-4 & 7705DS-8 Block Diagrams & Rear Panels



### Specifications

#### Optical Input/Output:

Connector: SC/PC, ST/PC & FC/PC\* female housing  
Wavelength: 1270nm to 1610nm

#### Insertion Loss:

7705DS-4: 7dB typical, < 8.5dB maximum  
7705DS-8: 10dB typical, < 11.0dB maximum

#### Uniformity:

7705DS-4: < 2.5dB  
7705DS-8: < 0.9dB

#### Directivity:

7705DS-4: > 50dB  
7705DS-8: > 55dB

#### Fiber Size:

9µm, single mode fiber

#### Physical:

Number of Slots:  
7705DS-4: 1  
7705DS-8: 2

### Ordering Information:

7705DS-4: Four Channel Optical Splitter  
7705DS-8: Eight Channel Optical Splitter

### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

### Rear Plate Suffix

+3RU: 3RU Rear Plate for use with 7700FR-C Multiframe  
+1RU: 1RU Rear Plate for use with 7701FR Multiframe  
+SA: Standalone Enclosure Rear Plate

### Connector Suffix

+SC: SC/PC  
+ST: ST/PC  
+FC: FC/PC\*

### \*Note:

FC/PC connector option is available only on 'COMMON' port (SC/PC on remaining fiber I/O ports)

### Fiber Optic Patch Cable:

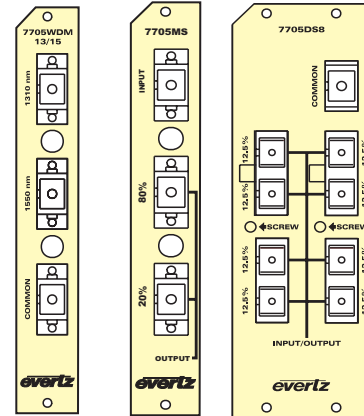
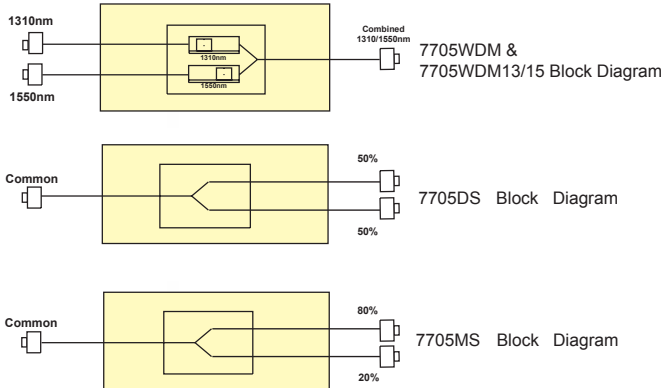
7705FC-SP1MSP: Single-mode fiber, 9µm core/900µm

### Enclosures:

7700FR-C: 3RU Multiframe which holds 15 modules  
7701FR: 1RU Multiframe which holds 3 modules  
S7701FR: Standalone enclosure

## 7705WDM (Wideband Wavelength Division Multiplexor) 7705WDM13/15 (Standard Wavelength Division Multiplexor) 7705DS (Fiber Distribution Splitter) & 7705MS (Fiber Monitoring Splitter)

- Bi-directional operation handles 1310nm and 1550nm bands
- Passive design for any bit rate
- Fully hot swappable from front of frame with no fiber disconnect/reconnect required
- Low insertion loss to conserve system power
- Supports single mode fiber
- Available in SC, ST & FC connector options



## Specifications

### Optical Input/Output:

**Connector:** SC/PC, ST/PC, FC/PC female housing  
**Wavelength:** 1310nm and 1550nm bands  
**Fiber Size:** 9µm core / 125µm overall

### Insertion Loss:

**7705WDM:** 1310nm port, 2dB Maximum Loss  
 1550nm port, 3dB Maximum Loss  
 (1470nm - 1610nm)  
**7705WDM13/15:** 1310nm port, 2dB Maximum Loss  
 1550nm port, 2dB Maximum Loss  
**7705DS:** 50% port, 4 dB Maximum Loss  
**7705MS:** 80% port, 2 dB Maximum Loss  
 20% port, 9 dB Maximum Loss

### Isolation:

**7705WDM:** >50dB between 1310nm/1550nm ports with  
 1470nm - 1610nm on 1550nm port  
**7705WDM13/15:** >25dB between 1310nm/1550nm ports at center  
 wavelength ± 20nm

### Physical:

**Number of Slots:** 1

## Functions:

- **7705WDM** -- Combines/separates 1310nm and 1470nm-1610nm wavelengths on/from a single fiber
- **7705WDM13/15** -- Combines/separates 1310nm and 1550nm wavelengths on/from a single fiber
- **7705DS** -- Splits one signal into two signals of 50% power or combines two signals into one output signal.
- **7705MS** -- Splits input signal into two signals of 80% / 20% power - used for fiber confidence monitoring.

## Ordering Information:

**7705WDM:** Wideband wavelength Division Multiplexor  
**7705WDM13/15:** Standard Wavelength Division Multiplexor  
**7705DS:** Fiber Distribution Splitter  
**7705MS:** Fiber Monitoring Splitter

## Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

## Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

## Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

## Fiber Optic Patch Cable:

**CB-FP1M-SCPC** Single mode fiber cable, 1m, SC/PC male termination  
**CB-FP1M-STPC** Single mode fiber cable, 1m, ST/PC male termination  
**CB-FP5M-SCPC** Single mode fiber cable, 5m, SC/PC male termination  
**CB-FP5M-STPC** Single mode fiber cable, 5m, ST/PC male termination  
**CB-FP10M-SCPC** Single mode fiber cable, 10m, SC/PC male termination  
**CB-FP10M-STPC** Single mode fiber cable, 10m, ST/PC male termination  
**7705FC-SP1MSP** Single-mode fiber, 9µm core/900µm

## Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



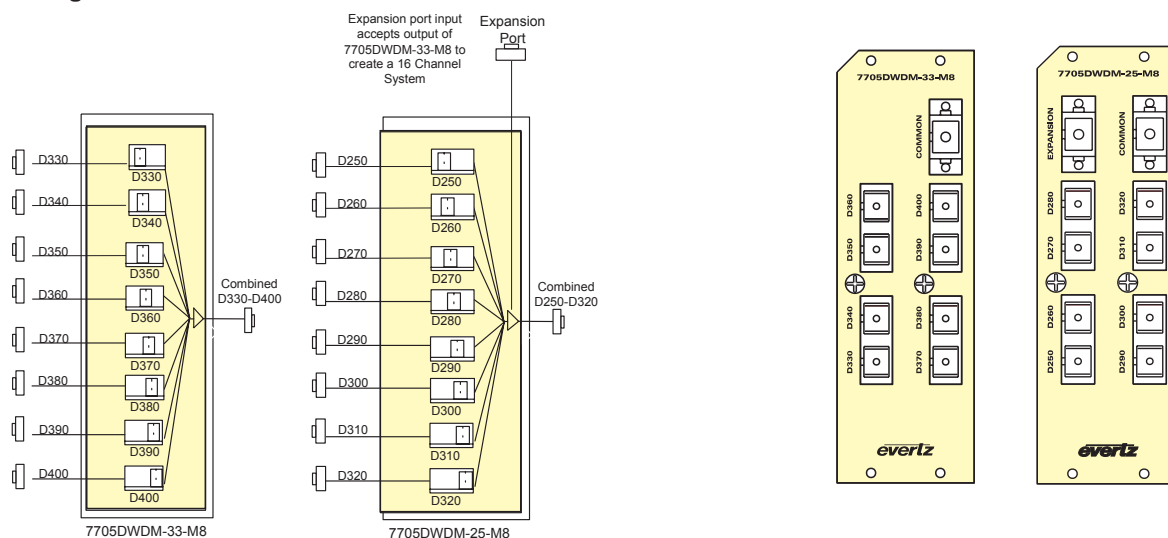
### Features

- Cascadeable, bi-directional eight channel mux/demux modules
- ITU-T G.694.1 compliant 0.8nm (100GHz) channel spacing
- Capable of being inserted into CWDM wavelength slots adding an additional 8 or 16 DWDM wavelengths to existing CWDM systems
- Passive design for any bit rate
- Low insertion loss to conserve system power
- High optical isolation for low crosstalk
- Fully hot swappable from front of frame with no fiber disconnect/reconnect required
- SC/PC, ST/PC, FC/PC\* connector options
- Fiber protector to prevent connector damage

### Applications

- Multi-channel transport of video, audio, data, control in fiber limited applications
- Cost reduction exercises through fewer leased fibers
- Studio and Facility extension / expansion
- L-Band & IF Link transport
- STL and TSL Links
- Signal aggregation for outdoor and event coverage
- Signal aggregation for security and monitoring

### 7705DWDM Block Diagrams & Rear Panels



### Specifications

#### Optical Input/Output:

Connector: SC/PC, ST/PC or FC/PC\* female housing

Wavelength: C-Band (ITU G.694.1 compliant)

7705DWDM-25: ITU C25-C32 (1557.36 - 1551.72nm)

7705DWDM-33: ITU C33-C40 (1550.92 - 1545.32nm)

Channel Spacing: 100GHz (0.8nm nominal)

Passband @ 0.5dB:  $\pm 0.11\text{nm}$

Channel Uniformity:  $< 1.5\text{dB}$

#### Isolation

Adjacent Channel:  $> 25\text{dB}$

Non-Adjacent Channel:  $> 35\text{dB}$

Directivity:  $> 40\text{dB}$

Maximum Optical Power: 300mW or +25dBm

Fiber Size: 9  $\mu\text{m}$  core / 125  $\mu\text{m}$  overall

Return Loss:  $> 45\text{dB}$

Max Input Power: +25dBm

#### Link Loss with Mux and Demux Combination:

7705DWDM-8:  $< 4.5\text{dB}$  maximum loss

(7705DWDM-25/33)

7705DWDM-16:  $< 7.5\text{dB}$  maximum loss

(7705DWDM-33 +

7705DWDM-25)

#### Ordering Information

7705DWDM-25-M8 8 Channel Cascadeable DWDM Mux, 100GHz Spacing, ITU Channel C25-C32

7705DWDM-25-D8 8 Channel Cascadeable DWDM Demux, 100GHz Spacing, ITU Channel C25-C32

7705DWDM-33-M8 8 Channel Cascadeable DWDM Mux, 100GHz Spacing, ITU Channel C33 to C40

7705DWDM-33-D8 8 Channel Cascadeable DWDM Demux, 100GHz Spacing, ITU Channel C33 to C40

#### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order

Ex: Model +3RU + SC

#### Rear Plate Suffix

+3RU 3RU Rear Plate for use with 7700FR-C Multiframe

+1RU 1RU Rear Plate for use with 7701FR Multiframe

+SA Standalone Enclosure (with power supply)

#### Connector Suffix

+SC SC/PC

+ST ST/PC

+FC FC/PC\*

#### \*Note:

FC/PC connector option is available on 'COMMON' and "EXPANSION" ports only (SC/PC on remaining fiber I/O ports)

#### Fiber Optic Patch Cable:

CB-FP1M-SCPC Single mode fiber cable, 1m, SC/PC male termination

CB-FP1M-STPC Single mode fiber cable, 1m, ST/PC male termination

CB-FP5M-SCPC Single mode fiber cable, 5m, SC/PC male termination

CB-FP5M-STPC Single mode fiber cable, 5m, ST/PC male termination

CB-FP10M-SCPC Single mode fiber cable, 10m, SC/PC male termination

CB-FP10M-STPC Single mode fiber cable, 10m, ST/PC male termination

#### Enclosures:

7700FR-C 3RU Multiframe which holds 15 modules

7701FR 1RU Multiframe which holds 3 modules

S7701FR Standalone enclosure

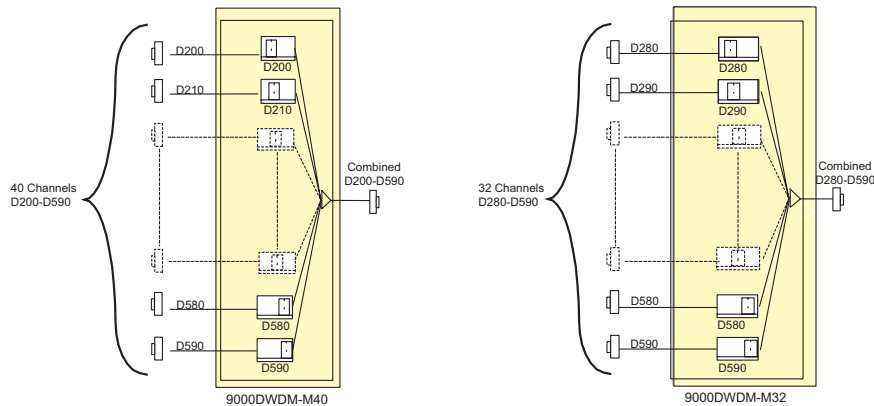
The 9000DWDM are bi-directional Multiplexors/De-multiplexors that combine/separate 32 or 40 DWDM wavelengths over a single fiber. The 9000DWDM are housed in an Evertz 1RU unit.

## Features

- Bi-directional mux/demux of 32 or 40 wavelengths in the C-Band DWDM spectrum (ITU-T G.694.1 compliant)
- 0.8nm (100GHz) channel spacing
- Passive design for any bit rate
- Low insertion loss to conserve system power
- High optical isolation for low crosstalk
- SC/PC, ST/PC, FC/PC connector options

## Applications

- Multi-channel transport of video, audio, data, control in fiber limited applications
- Cost reduction exercises through fewer leased fibers
- Studio and Facility extension / expansion
- L-Band & IF Link Transport
- STL and TSL Links
- Signal aggregation for outdoor and event coverage
- Signal aggregation for security and monitoring



## Specifications

### Optical Input/Output:

**Connector:** SC/PC, ST/PC or FC/PC

**Wavelength:**

**9000DWDM-32:** ITU C28-C59 (1554.94 - 1530.33nm)

**9000DWDM-40:** ITU C20-C59 (1561.42 - 1530.33nm)

**Channel Spacing:** 0.8nm (100GHz)

**Passband @ 0.5dB:**  $\pm 0.11$ nm

**Channel Uniformity:** < 1.5dB

**Isolation Adjacent**

**Channel:** > 25dB

**Isolation Non-Adjacent**

**Channel:** > 40dB

**Directivity:** > 40dB

**Fiber Size:** 9  $\mu$ m core / 125  $\mu$ m overall

**Return Loss:** > 45dB

**Max Optical Power:** < 300mw (+25dBm)

### Link Loss with Mux and Demux Combination:

**9000DWDM-M32 &**

**9000DWDM-D32:** < 8dB Maximum Loss

**9000DWDM-M40 &**

**9000DWDM-D40:** < 10dB Maximum Loss

### Physical:

**Dimensions:** 19" W x 1.75" H x 18.75" D  
(483mm W x 45mm H x 477mm D)

**Weight:** 8 lbs. (3.5Kg)

### Ordering Information

#### Dense Wave Division Multiplexing Optical Modules

**9000DWDM-M32** 32 Ch DWDM Mux, 100Ghz spacing, 1RU enclosure

#### 9000DWDM-M40

40 Ch DWDM Mux, 100Ghz spacing, 1RU enclosure

#### 9000DWDM-D32

32 Ch DWDM Demux, 100Ghz spacing, 1RU enclosure

#### 9000DWDM-D40

40 Ch DWDM Demux, 100Ghz spacing, 1RU enclosure

### Ordering Options:

Fiber Connector must be specified at time of order

Eg: Model +SC

### Connector Suffix

**+SC**

SC/PC

**+ST32**

ST/PC Fiber connectors on all ports for 9000DWDM-X32

**+ST40**

ST/PC Fiber connectors on all ports for 9000DWDM-X40

**+FC32**

FC/PC Fiber connectors on all ports for 9000DWDM-X32

**+FC40**

FC/PC Fiber connectors on all ports for 9000DWDM-X40

### Fiber Optic Patch Cable:

**CB-FP1M-SCPC**

Single mode fiber cable, 1m, SC/PC male termination

**CB-FP1M-STPC**

Single mode fiber cable, 1m, ST/PC male termination

**CB-FP5M-SCPC**

Single mode fiber cable, 5m, SC/PC male termination

**CB-FP5M-STPC**

Single mode fiber cable, 5m, ST/PC male termination

**CB-FP10M-SCPC**

Single mode fiber cable, 10m, SC/PC male termination

**CB-FP10M-STPC**

Single mode fiber cable, 10m, ST/PC male termination

## 2 x 1 Optical Bypass Protection Switch 7707BPX

### 7707BPX



The 7707BPX is a wide band 2 x 1 optical protection switch that provides auto-changeover functionality by detecting changes in the optical input power level.

The 7707BPX has integrated VistaLINK™ technology for remote control and monitoring capability via SNMP. This provides the user with the ability to locally or remotely configure and monitor parameters such as module status, selected input, power level and switching threshold.

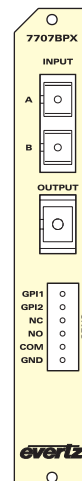
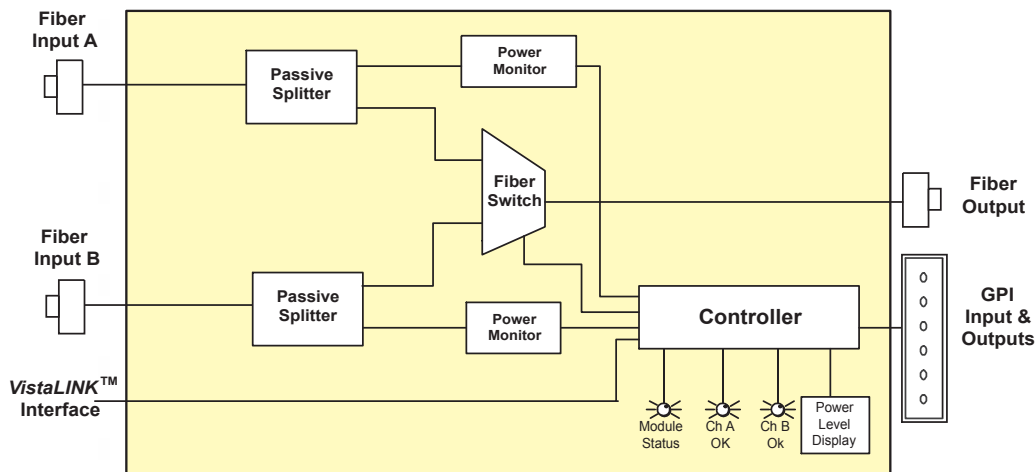
In the application of auto-changeover, the 7707BPX can be configured to have a MAIN input and a STANDBY input. In this configuration, it will automatically switch to the Standby input when the Main input power is weak or lost. It can also be configured to have auto or manual switch back to the Main input when the signal is re-established.

The 7707BPX occupies one card slot and can be housed in a 1RU frame which hold up to 3 modules or a 3RU frame which will hold up to 15 modules.

#### Features

- Intelligent auto-switching with input power detection and user definable thresholds
- Supports automatic or manual control via SNMP or GPI
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Accepts any wavelength in the 1270nm to 1610nm range
- Supports single-mode fiber optic cable
- SC/PC, ST/PC or FC/PC fiber connector options
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK® capability

#### 7707BPX Block Diagram & Rear Panel



#### Specifications

##### Optical Input/Output:

Number:	3 Bi-directional optical signals
Connector:	SC/PC, ST/PC, FC/PC Female Housing
Insertion Loss:	< 3dB
Switch Time:	< 30 ms
Maximum Input Power:	5 dBm
Input Optical Sensitivity:	-40dBm
Operating Wavelength:	1270nm to 1610nm
Fiber Size:	9µm core / 125 µm overall

##### General Purpose Inputs:

Number of Inputs:	2
Type:	Opto-isolated, active low with internal pull-ups to +5V
Connector:	2 pins plus ground on 6 pin terminal strip
Signal Level:	
+5V Pullup:	Low: -5 to +2.5 VDC, High: 3.5 to 10 VDC
+12V Pullup:	Low: -5 to +9.5 VDC, High: 10.5 to 15 VDC (input shorted to ground) 15 mA
Max Sink Current:	
Max Leakage Current for input High:	200 µA

##### General Purpose Outputs:

Number of Outputs:	1
Type:	"Dry Contact" relay contacts - normally open & normally closed contact provided
Connector:	3 pins on 6 pin terminal strip

##### Electrical:

Voltage:	+12V DC
Power:	3 Watts
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC Directive

##### Physical:

Number of Slots:	1
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##### Ordering Information:

7707BPX:	2 x 1 Optical Bypass Protection Switch
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##### Ordering Options

Rear Plate and Fiber Connector must be specified at time of order  
Eg: Model +SC +3RU

##### Rear Plate Suffix

+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

##### Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

##### Enclosures:

7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure



## CWDM Transmitter Ordering Options - 20nm Channel Grid - Based on ITU G.694.2

Laser Ordering Number (xx)	Wavelength (nm)	Transmitter Module (Example)
27	1270	7707EO27
29	1290	7707EO29
31	1310	7707EO31
33	1330	7707EO33
35	1350	7707EO35
37	1370	7707EO37
43	1430	7707EO43
45	1450	7707EO45
47	1470	7707EO47
49	1490	7707EO49
51	1510	7707EO51
53	1530	7707EO53
55	1550	7707EO55
57	1570	7707EO57
59	1590	7707EO59
61	1610	7707EO61

## DWDM Transmitter Ordering Options - 100GHz/0.8nm Channel Grid - Based on ITU G.694.1

Laser Ordering Number (Dyyy)	ITU Channel Number	Frequency (GHz)	Wavelength (nm)	Transmitter Module (Example)
D200	20	192,000	1561.42	Contact Factory
D210	21	192,100	1560.61	Contact Factory
D220	22	192,200	1559.79	Contact Factory
D230	23	192,300	1558.98	Contact Factory
D240	24	192,400	1558.17	Contact Factory
D250	25	192,500	1557.36	7707EOD250
D260	26	192,600	1556.55	7707EOD260
D270	27	192,700	1555.75	7707EOD270
D280	28	192,800	1554.94	7707EOD280
D290	29	192,900	1554.13	7707EOD290
D300	30	193,000	1553.33	7707EOD300
D310	31	193,100	1552.52	7707EOD310
D320	32	193,200	1551.72	7707EOD320
D330	33	193,300	1550.92	7707EOD330
D340	34	193,400	1550.12	7707EOD340
D350	35	193,500	1549.32	7707EOD350
D360	36	193,600	1548.51	7707EOD360
D370	37	193,700	1547.72	7707EOD370
D380	38	193,800	1546.92	7707EOD380
D390	39	193,900	1546.12	7707EOD390
D400	40	194,000	1545.32	7707EOD400
D410	41	194,100	1544.53	Contact Factory
D420	42	194,200	1543.73	Contact Factory
D430	43	194,300	1542.94	Contact Factory
D440	44	194,400	1542.14	Contact Factory
D450	45	194,500	1541.35	Contact Factory
D460	46	194,600	1540.56	Contact Factory
D470	47	194,700	1539.77	Contact Factory
D480	48	194,800	1538.98	Contact Factory
D490	49	194,900	1538.19	Contact Factory
D500	50	195,000	1537.40	Contact Factory
D510	51	195,100	1536.61	Contact Factory
D520	52	195,200	1535.82	Contact Factory
D530	53	195,300	1535.04	Contact Factory
D540	54	195,400	1534.24	Contact Factory
D550	55	195,500	1533.47	Contact Factory
D560	56	195,600	1532.68	Contact Factory
D570	57	195,700	1531.90	Contact Factory
D580	58	195,800	1531.12	Contact Factory
D590	59	195,900	1530.33	Contact Factory
D600	60	196,000	1529.55	Contact Factory

# HD JPEG 2000 Decompression CODEC

## 7772MFD-HD



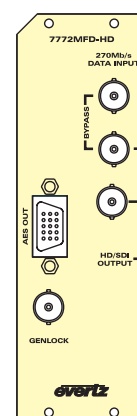
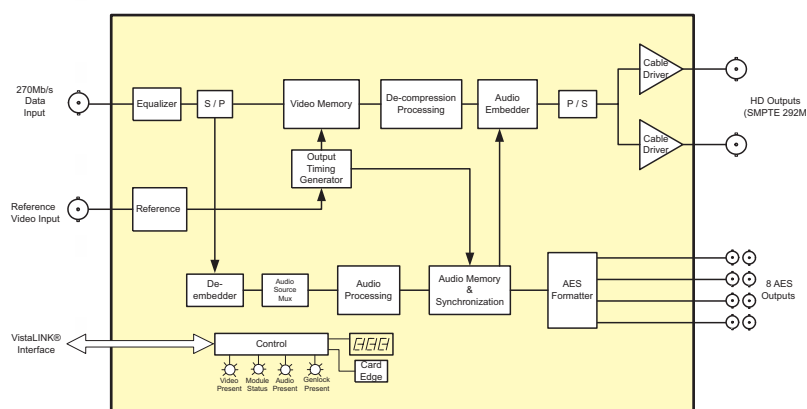
The 7772MFD-HD, HDTV Decompression Codec utilizes JPEG 2000 technology to convert the 270Mb/s data input signal from the 7772MFC-HD into a SMPTE 292M (1.485Gb/s) component serial digital stream with embedded or separate AES audio. The 7772MFD-HD also re-embeds VANC data that existed in the original HD-SDI stream. The 7772MFD-HD supports 1080i/59.94, 1080i/50, 720p/59.94 and 720p/50 field rates. Card functions are controlled from the card edge or through VistaLINK® interface.

The 7772MFD-HD occupies two card slots and can be housed in a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 7 modules or a standalone enclosure which will hold 1 module.

### Features

- Supports 1080i/59.94, 1080i/50, 720p/59.94 and 720p/50 field rates
- Automatic detection of 1080i/720p active lines
- Handles up to four groups of embedded AES audio
- Audio delay processing to match video decompression delay
- Re-embeds original VANC data in outgoing HD-SDI stream
- Eight separate stereo AES unbalanced outputs
- Fully hot swappable from front of frame
- VistaLINK® - capable offering remote monitoring, control and configuration capabilities via SNMP. VistaLINK® is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame

### 7772MFD-HD Block Diagram & Rear Panel



### Specifications

#### 270Mb/s Data Input:

**Standard:** SMPTE 259M-C (270Mb/s)  
**Number of Inputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Return Loss:** >15dB @ 270Mb/s

#### HD Serial Video Output:

**Standard:** SMPTE 292M (1080i/59.94, 1080i/50, 720p/54.94, 720p/50)  
**Number of Outputs:** 2  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** <200ps nominal  
**Overshoot:** <10% of amplitude  
**Wide Band Jitter:** <0.2UI

#### AES Audio Outputs:

**Standard:** SMPTE 276M, single ended AES, Dolby E  
**Number of Outputs:** 8  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Sampling Rate:** 48khz  
**Impedance:** 75Ω  
**Resolution:** 24-bit

#### Reference Input:

**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Type:** HD Tri-level, NTSC/PAL Color Black (1 V p-p) or composite bi-level sync (525i/59.94 or 625i/50) 300mV  
**Termination:** 75Ω jumper selectable

#### 270Mb/s Data Input to HDSDI Output Delay:

**Delay:** ≤ 4 frames interlaced  
 ≤ 8 frames progressive

#### Electrical:

**Voltage:** +12VDC  
**Power:** 15 Watts  
**EMI/RFI** Complies with FCC Part 15, Class A  
 EU EMC Directive

#### Physical:

**7700 frame mounting:** 2 slots  
**7701 frame mounting:** 1 slot

#### Ordering Information:

**7772MFD-HD** HD JPEG 2000 Decompression CODEC

#### Ordering Options:

Rear Plate must be specified at time of order  
 Eg: Model +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



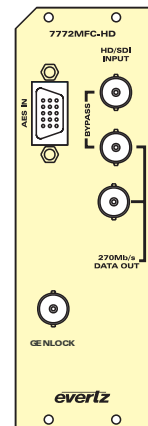
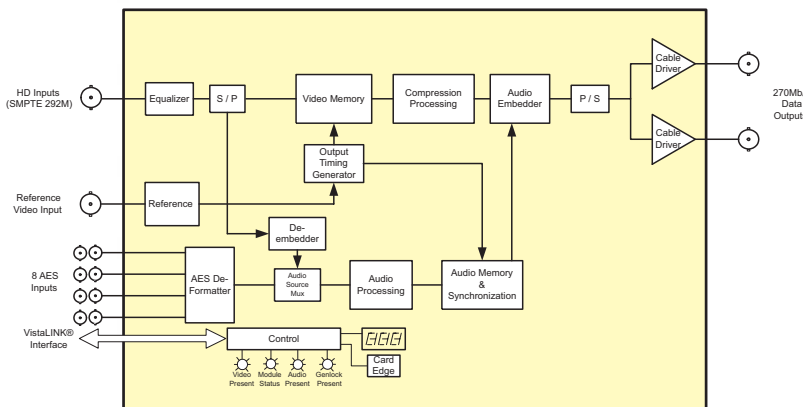
The 7772MFC-HD, HDTV Compression Codec utilizes JPEG 2000 technology to encode one SMPTE 292M (1.485Gb/s) serial digital video signal with up to four AES groups of embedded or separate audio, into one 270Mb/s compliant data output stream. The 7772MFC-HD also preserves VANC data in the incoming HD-SDI stream and transports this across the 270Mb/s interface. Automatic detection and support of 1080i/59.94, 1080i/50, 720p/59.94 and 720p/50 field rates is provided. Card functions are controlled from the card edge or through the VistaLINK® interface.

The 7772MFC-HD occupies two card slots and is housed in a 1RU frame which holds up to 3 modules, a 3RU frame which will hold up to 7 modules or a standalone enclosure which will hold 1 module.

## Features

- Supports 1080i/59.94, 1080i/50, 720p/59.94, 720p/50 field rates
- Automatic detection of 1080i, 720p active lines
- Accepts up to four groups of embedded or separate AES audio
- No compression applied to AES audio streams
- Preserves VANC from input HD-SDI stream
- Fully hot swappable from front of frame
- VistaLINK® - capable offering remote monitoring, control and configuration capabilities via SNMP. VistaLINK® is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame

## 7772MFC-HD Block Diagram & Rear Panel



## Specifications

### HD Serial Video Input:

**Standard:** SMPTE 292M, (1080i/59.94, 1080i/50, 720p/59.94, 720p/50)

**Number of Inputs:** 1

**Connector:** BNC per IEC 60169-8 Amendment 2

**Equalization:** Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent

### 270Mb/s Data Output:

**Standards:** SMPTE 259M-C (270Mb/s)

**Number of Outputs:** 2

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V ±0.5V

**Rise and Fall Time:** 900ps nominal

**Overshoot:** <10% of amplitude

**Return Loss:** >15dB up to 270Mb/s

**Wide Band Jitter:** <0.20 UI

### AES Audio Inputs:

**Standard:** SMPTE 276M, single ended AES

**Number of Inputs:** 8

**Signal Level:** 200mv to 1100mv

**Connector:** BNC per IEC 60169-8 Amendment 2

**Sampling Rate:** 48kHz

**Impedance:** 75Ω balanced

**Return Loss:** > 20dBm

**Resolution:** 24-bit

### Reference Input:

**Connector:** 1 BNC per IEC 60169-8 Amendment 2

**Type:** HD Tri-level, NTSC/PAL Color Black (1 V p-p) or composite bi-level sync (525i/59.94 or 625i/50) 300mV

**Termination:** 75Ω jumper selectable

### HD SDI Input to 270Mb/s Data:

**Delay:** ≤4 frames interlaced  
≤8 frames progressive

### Electrical:

**Voltage:** +12VDC

**Power:** 15 Watts

**EMI/RFI** Complies with FCC Part 15, Class A  
EU EMC Directive

### Physical:

**7700 frame mounting:** 2 slots

**7701 frame mounting:** 1 slot

### Ordering Information:

**7772MFC-HD** HD JPEG 2000 Compression CODEC

### Ordering Options:

Rear Plate must be specified at time of order  
Eg: Model +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



# Dual HD Test Signal Generator with Embedded Audio

## 7751TG2-HD



The 7751TG2-HD Test Signal Generator provides a cost-effective method of generating 1.5 Gb/s HDTV 4:2:2 and 4:4:4 test signals. The 7751TG2-HD is ideal for checking signal path integrity, or to determine system performance over varying cable lengths. The 7751TG2-HD generates test signals in a wide variety of SMPTE 292M video formats. In single link mode, the 7751TG2-HD outputs a 4:2:2 black signal on two outputs and the selected 4:2:2 test signal on the remaining two outputs. In dual link mode, the 7751TG2-HD outputs a 4:4:4 test signal on two dual-link 4:4:4 outputs. The 7751TG2-HD provides an analog genlock input that allows you to synchronize the test signals to your plant horizontal and vertical timing.

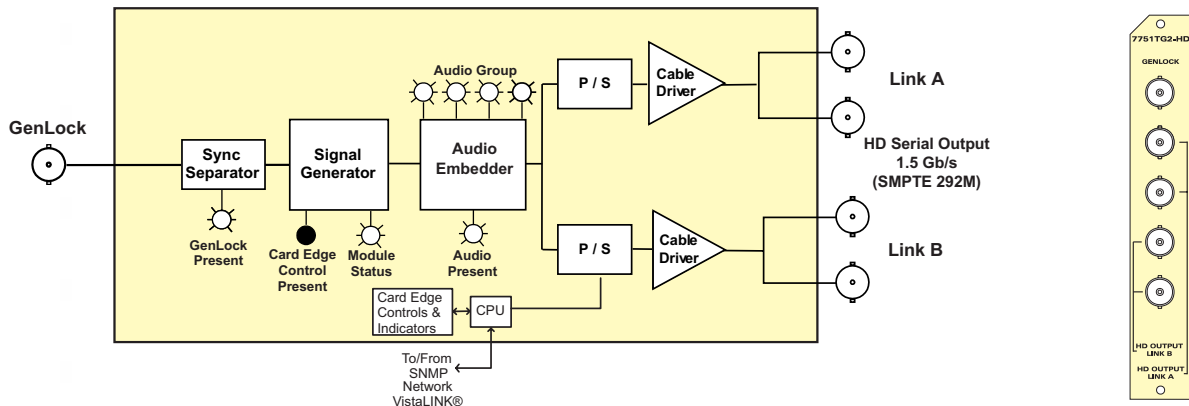
Separate audio tones can be embedded into each channel of two of the four embedded audio groups. The user can select which of the audio groups the tones will be embedded into. In dual link mode, the selected audio groups will be embedded into each link. The Audio level is fixed at -20 dB full scale.

VistaLINK® offers remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP) giving the flexibility to manage operations, including signal monitoring and module configuration from SNMP-capable control systems (Manager or NMS).

### Features

- Wide variety of 1080i, 1035i, 1080p, 480p and 720p output formats
- 8 position DIP switch selects output format, single or dual link and genlock reference
- Card edge toggle switch selects test signal
- Selectable gen lock input format - bi-level or tri-level sync, color black embedded audio tones for 4 groups selectable audio group assignment
- Closed caption test messages
- 2 black outputs, 2 test gen. outputs
- On screen display of test signal names
- On screen setup menu
- Tally output upon loss of gen lock
- Card edge LEDs indicate gen lock presence, module fault and audio signal presence on the output
- SMPTE 334M - EIA 708 advanced captioning test packet
- VistaLINK® - capable offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame

### 7751TG2-HD Block Diagram and Rear Panel



### Specifications

#### Gen Lock Input:

##### Type:

Menu selectable - depends on output video format  
HD Tri-level Sync  
NTSC or PAL Color Black 1 V p-p  
Composite Bi-level sync (525i or 625i) 300 mV  
BNC per IEC 60169-8 Amendment 2  
75Ω (jumper selectable)

##### Connector:

##### Termination:

#### HD Serial Video Outputs:

##### Standard:

SMPTE 292M, 4:2:2 YCBCR (single link)  
SMPTE 372M, 4:4:4 YCBCR or 4:4:4 GBRA (dual link)

##### Number of Outputs:

##### Single Link Mode:

2 outputs of Black video  
2 outputs of selected test signal

##### Dual Link Mode:

##### Embedded Audio:

2 dual link outputs of selected test signal  
Up to 4 groups in one audio group as specified in SMPTE 299M. Selectable tone frequencies (from 60 Hz to 10 kHz) and audio group. Audio can be embedded on either or both links. Audio Level is set to -20 dB Full Scale.

##### Source ID:

User programmable on-screen 15 character source ID message - selectable position. On Screen message can be displayed on either or both links

##### Connectors:

##### Signal Level:

##### V Phasing:

##### H Phasing:

##### DC Offset:

##### Rise and Fall Time:

##### Overshoot:

##### Wide Band Jitter:

4 BNC per IEC 60169-8 Amendment 2  
800mV nominal  
Infinite lines  
Infinite samples  
0V ±0.5V  
200ps nominal  
<10% of amplitude  
< 0.2 UI

#### Electrical:

##### Voltage:

+12VDC

##### Power:

6 Watts

##### EMI/RFI:

Complies with FCC Part 15, Class A  
EU EMC Directive

#### Physical:

##### 7700 or 7701 frame mounting:

##### Number of slots:

1

#### Stand Alone Enclosure:

##### Dimensions:

14 " L x 4.5 " W x 1.9 " H  
(355 mm L x 114 mm W x 48 mm H)  
approx. 1.5 lbs. (0.7 Kg)

##### Weight:

#### Ordering Information:

##### 7751TG2-HD

Dual HD Test Signal Generator with embedded audio

#### Ordering Options

Rear Plate must be specified at time of order

Eg: Model +3RU

##### Rear Plate Suffix

##### +3RU

3RU Rear Plate for use with 7700FR-C Multiframe

##### +1RU

1RU Rear Plate for use with 7701FR Multiframe

##### +SA

Standalone Enclosure Rear Plate

#### Enclosures:

##### 7700FR-C

3RU Multiframe which holds 15 modules

##### 7701FR

1RU Multiframe which holds 3 modules

##### S7701FR

Standalone enclosure

The 7751TG2-CF-HD Test Signal Generator provides a cost-effective method of generating 1.5 Gb/s HDTV 4:2:2 and 4:4:4 test signals. The 7751TG2-CF-HD is ideal for checking signal path integrity, or to determine system performance over varying cable lengths. The 7751TG2-CF-HD generates test signals in a wide variety of SMPTE 292M video formats. In single link mode, the 7751TG2-CF-HD outputs a 4:2:2 black signal on two outputs and the selected 4:2:2 test signal on the remaining two outputs. In dual link mode, the 7751TG2-CF-HD outputs a 4:4:4 test signal on two dual-link 4:4:4 outputs.

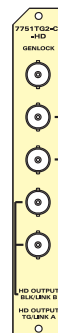
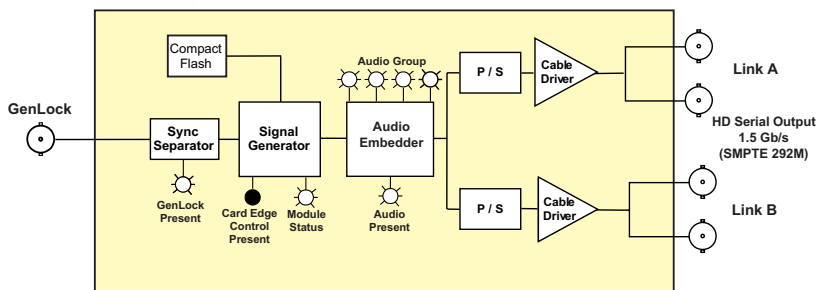
The 7751TG2-CF-HD provides downloadable bitmaps for trouble or test slides. Customers may store their own designed bitmaps (trouble slides, test slides, or test signals) into a directory structure on the compact flash. The module allows users to output one trouble slide on a pair of outputs and another trouble slide on the second pair of outputs. The 7751TG2-CF-HD comes with a 128MB compact flash. The 7751TG2-CF-HD provides an analog genlock input that allows you to synchronize the test signals to your plant horizontal and vertical timing.

Separate audio tones or user created WAV files can be embedded into each channel of two of the four embedded audio groups. The user can select which of the audio groups the tones will be embedded into. In dual link mode, the selected audio groups will be embedded into each link. The Audio level is fixed at -20 dB full scale.

### Features

- Wide variety of 1080i, 1035i, 1080p, 480p and 720p output formats
- Compact flash for user created bitmaps (trouble slides, test slides, or test signals)
- Two user created bitmaps are sent individually on outputs
- User created WAV files can be sent in the embedded audio groups
- 8 position DIP switch selects output format, single or dual link and genlock reference
- Card edge toggle switch selects test signal
- Selectable gen lock input format - bi-level or tri-level sync, color black embedded audio tones for 4 groups selectable audio group assignment
- Closed caption test messages
- 2 black outputs, 2 test gen. outputs
- On screen display of test signal names
- On screen setup menu
- Tally output upon loss of gen lock
- Card edge LEDs indicate gen lock presence, module fault and audio signal presence on the output
- SMPTE 334M - EIA 708 advanced captioning test packet

### 7751TG2-CF-HD Block Diagram & Rear Panel



### Specifications

#### Gen Lock Input:

**Type:** Menu selectable - depends on output video format  
 HD Tri-level Sync  
 NTSC or PAL Color Black 1 V p-p  
 Composite Bi-level sync (525i or 625i) 300 mV  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Termination:** 75Ω (jumper selectable)

#### HD Serial Video Outputs:

**Standard:** SMPTE 292M, 4:2:2 YCBCR (single link)  
 SMPTE 372M, 4:4:4 YCBCR or 4:4:4 GBRA (dual link)

#### Number of Outputs:

**Single Link Mode:** 2 outputs of Black video  
 2 outputs of selected test signal  
**Dual Link Mode:** 2 dual link outputs of selected test signal  
**Embedded Audio:** Up to 4 groups in one audio group as specified in SMPTE 299M. Selectable tone frequencies (from 60 Hz to 10 kHz) and audio group. Audio can be embedded on either or both links. Audio Level is set to -20 dB Full Scale  
**Source ID:** User programmable on-screen 15 character source ID message - selectable position. On Screen message can be displayed on either or both links

**Connectors:** 4 BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**V Phasing:** Infinite lines  
**H Phasing:** Infinite samples  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 200ps nominal  
**Overshoot:** <10% of amplitude  
**Wide Band Jitter:** < 0.2 UI

#### Electrical:

**Voltage:** +12VDC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

#### Physical:

**7700 or 7701 frame mounting:**  
**Number of slots:** 1

#### Stand Alone Enclosure:

**Dimensions:** 14 " L x 4.5 " W x 1.9 " H  
 (355 mm L x 114 mm W x 48 mm H)  
**Weight:** approx. 1.5 lbs. (0.7 Kg)

#### Ordering Information:

**7751TG2-CF-HD** HD Test Signal Generator with Trouble Slide

#### Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure





The 7750SRG-HD generates various analog bi-level & tri-level sync signals for both HD and SD applications. The 7750SRG-HD provides an analog genlock input that allows you to synchronize the sync signals to your plant horizontal and vertical timing.

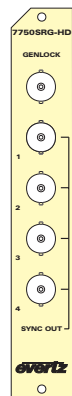
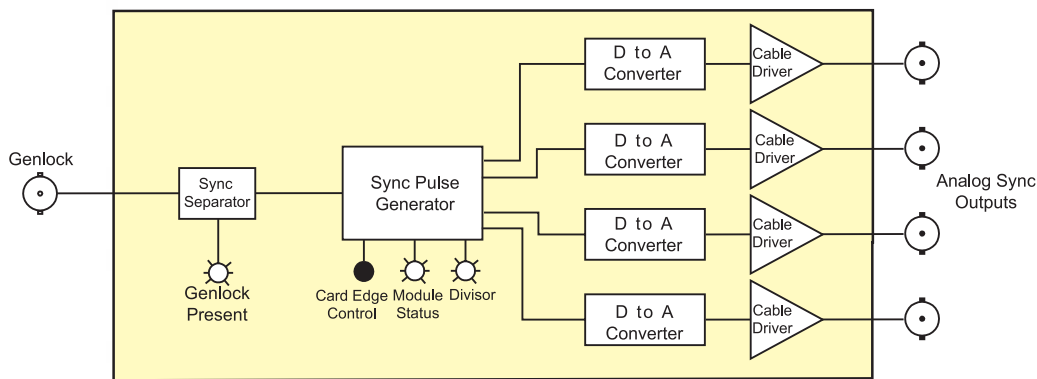
The 7750SRG-HD generates all analog sync signals defined by SMPTE 274M (1080i/p) and SMPTE 296M (720p) as well as those required for NTSC, PAL and slow PAL (625i/48) applications. Sync signals generated for NTSC, PAL and slow PAL applications are sync signals only and do not incorporate color burst signals. The four independent sync outputs can be configured to output different sync signals. The common combinations of HDTV and SD analog sync outputs can be selected via card edge control.

In conjunction with the 7700ADA Analog Distribution Amplifier and the 7751TG2-HD HDTV Test Signal Generator, this module will fulfill all of your slave sync generation requirements. (See the PKG7752RGTS-HD system brochure for details on our HDTV Reference Generator Test Set System applications).

## Features

- NTSC or PAL colour black gen lock or free-runs with no gen lock reference
- Phase adjustment of outputs with respect to gen lock input
- Selectable frame rate divisor of 1 or 1/1.001
- Wide variety of 1080i, 1035i, 1080p, 720p and NTSC/PAL/slow PAL sync output sync signals (excluding burst)
- HSDL tri level sync for 2K data transfers
- 4 separate analog sync signal outputs
- 6 Hz or 1Hz TTL pulse shows relationship between HD & SD Sync outputs
- 8 position DIP switch selects combinations of sync signal available
- Card edge LEDs indicate gen lock presence, module fault

## 7750SRG-HD Block Diagram & Rear Panel



## Selectable Sync Output Options

	Output 1	Output 2	Output 3	Output 4
1	1080i/60	1080p/24sF	625i/48	6Hz Pulse
2	1080i/50	1080p/24sF	625i/48	1Hz Pulse
3	1080p/30	1080p/24sF	625i/48	6Hz Pulse
4	1080p/25	1080p/24sF	625i/48	1Hz Pulse
5	1080p/24	1080p/24sF	625i/48	625i/48
6	1080p/24sF	1080p/24sF	625i/48	625i/48
7	720p/60	1080p/24sF	625i/48	6Hz Pulse
8	1035i/60	1080p/24sF	625i/48	6Hz Pulse
9	1080i/60	720p/60	525i/59.94	525i/59.94
10	1080i/60 V Drive	1080p/24sF	625i/48	6Hz Pulse
1/1.001 Multiple Set Via DIP Switch Where Applicable (See 7750SRG-HD manual for more switch settings)				

## Specifications

### Genlock Input:

Type: NTSC or PAL Color Black 1 V p-p  
Composite Bi-level sync(525i or 625i)300 mV  
Connector: 1 BNC per IEC 60169-8 Amendment 2  
Termination: 75 Ω (jumper selectable)

### Analog Sync Outputs:

Number of Outputs: 4  
Standard: SMPTE 274M, 296M, NTSC, PAL, 6Hz TTL, HSDL (selectable as per above table)  
NTSC/PAL signals are sync signals only (no burst)  
Connectors: 4 BNC per IEC 60169-8 Amendment 2  
Signal Level: HD Sync outputs: 600mV nominal tri-level  
SD Sync outputs: 300mV nominal bi-level  
6 Hz output: TTL

### Electrical:

Power: +12VDC  
Voltage: 6 Watts  
EMI/RFI: Complies with FCC Part 15, Class A,  
EU EMC Directive.

### Physical:

Number of Slots: 1

### Ordering Information:

7750SRG-HD HD Tri-Level Sync Generator

### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model + 3RU

### Rear Plate Suffix

+3RU 3RU Rear Plate for use with 7700FR-C Multiframe  
+1RU 1RU Rear Plate for use with 7701FR Multiframe  
+SA Standalone Enclosure Rear Plate

### Enclosures:

7700FR-C 3RU Multiframe which holds 15 modules  
7701FR 1RU Multiframe which holds 3 modules  
S7701FR Standalone enclosure

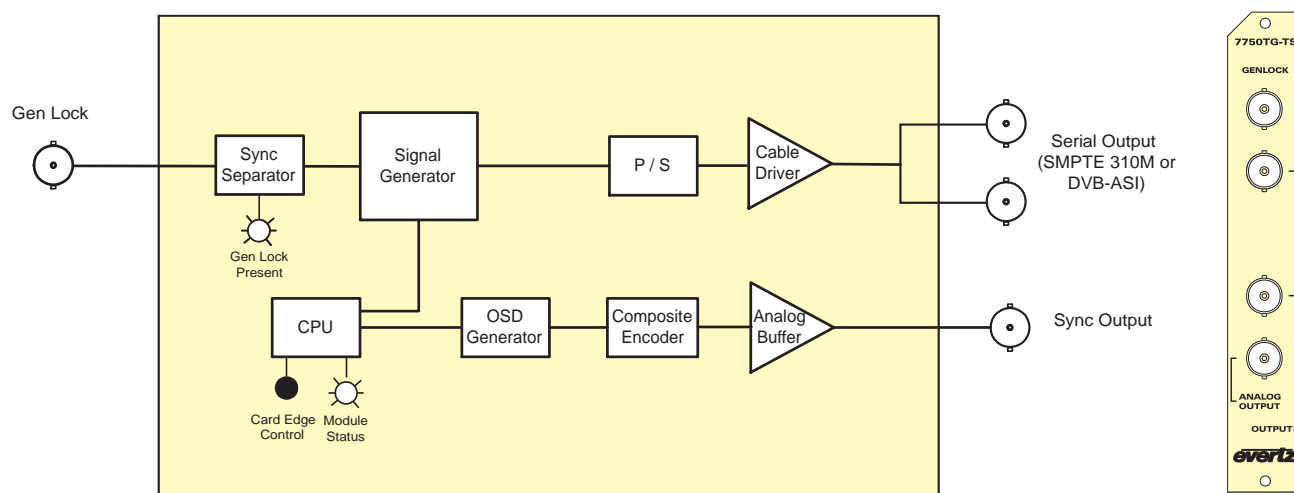
The 7750TG-TS Test Signal Generator provides a cost-effective method of generating SMPTE 310M and ASI test signals. The 7750TG-TS is ideal for checking signal path integrity, or to determine system performance over varying cable lengths. The 7750TG-TS generates test signals in either SMPTE 310M or DVB-ASI transport stream formats.

The 7750TG-TS provides an analog genlock input that allows you to synchronize the test signals to your plant horizontal and vertical timing.

### Features

- SMPTE 310M and ASI outputs
- ATSC and MPEG-2 Main Level Main Profile structures multiple bit rates in ASI output mode
- Multiple video test signals, motion and non-motion, each is a fixed loop of GOPs
- All appropriate tables for ATSC and DVB supported
- Gen locks to bi-level or color black - clock or phase lock possible
- Card edge toggle switch selects test signal
- On screen setup menu
- Composite analog output with On Screen Menu Display on gray
- 8 position DIP switch selects output format
- 2 output drivers
- Tally output upon loss of gen lock
- Card edge LEDs indicate gen lock presence, and module status

### 7750TG-TS Block Diagram and Rear Panel



### Specifications

#### Genlock Input:

**Type:** Menu selectable - depends on output video format NTSC or PAL Color Black 1 V p-p  
Composite Bi-level sync (525i) 300 mV  
1 BNC per IEC 60169-8 Amendment 2  
**Termination:** 75Ω (jumper selectable)

#### Connector:

#### Termination:

#### Serial Transport Stream Outputs:

**Standard:** SMPTE 310M (19.4 Mb/s) or DVB ASI (15 to 50Mb/s) (switch selectable)  
**Number of Outputs:** 2  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 740ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 15 dB up to 270 Mb/s  
**Wide Band Jitter:** < 0.2 UI

#### Analog Video Output:

**Standard:** NTSC (SMPTE 170M)  
**Number of Outputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 1V nominal

#### Electrical:

**Voltage:** +12VDC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC Directive

#### Physical:

**Number of slots:** 1

#### Ordering Information:

**7750TG-TS** SMPTE 310M/DVB-ASI Transport Stream Generator

#### Ordering Options:

Rear Plate must be specified at time of order  
Eg: Model +3RU

#### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

#### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure

The 7750TG Test Signal Generator provides a cost-effective method of generating 270 Mb/s serial digital test signals. The 7750TG is ideal for checking signal path integrity, monitor alignment or to determine system performance over varying cable lengths. The 7750TG generates a wide variety of industry standard test signals in 525 line and 625 line SMPTE 259M-C video formats and offers four 270 Mb/s outputs. Error detection and handling (EDH) codes are embedded on all the outputs to allow you to verify the performance of your digital signal paths.

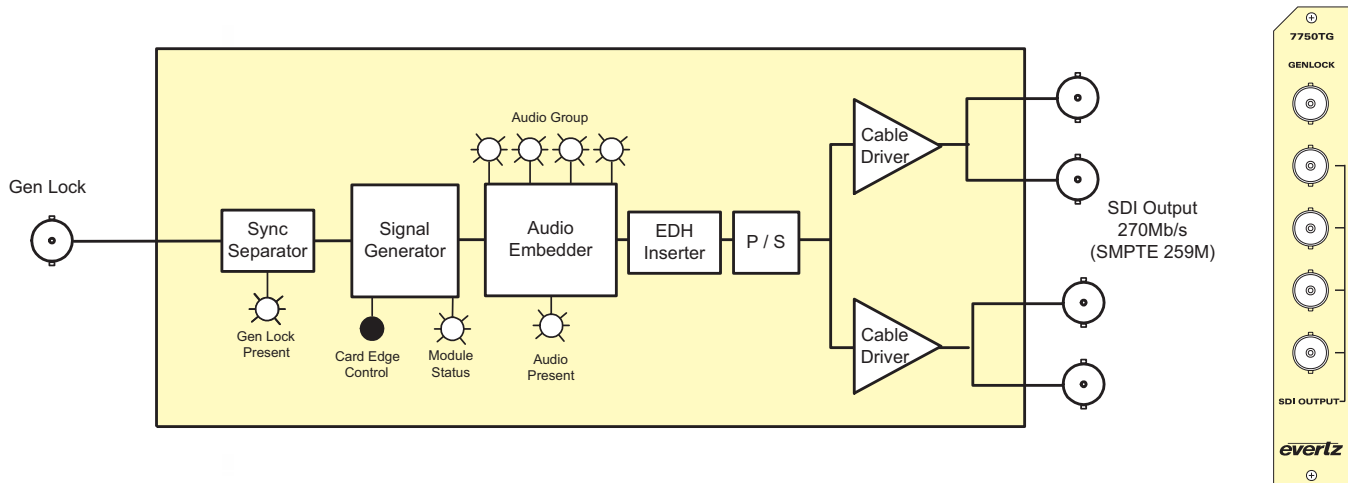
The 7750TG provides an analog genlock input that allows you to synchronize the test signals to your plant horizontal and vertical timing.

Separate audio tones can be embedded into each channel of one of the four embedded audio groups. The user can select which of the audio groups the tones will be embedded into. The audio level is fixed at -20dB full scale.

#### Features

- 525 line and 625 line formats
- Card edge toggle switch selects test signal
- On screen display of test signal names
- 4 embedded audio tones, selectable audio group assignment
- 4 output drivers
- On screen text message can be used for source identification
- On screen setup menu
- Card edge LEDs indicate genlock presence and module health

#### 7750TG Block Diagram and Rear Panel



#### Specifications

##### Genlock Input:

**Type:** NTSC or PAL color black 1 V p-p  
Composite Bi-level sync (525 Line or 625 Line) 300mV  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2.  
**Termination:** 75Ω (jumper selectable)

##### Serial Video Output:

**Standard:** SMPTE 259M-C (270 Mb/s)  
**Embedded Audio:** Up to 4 tones in one audio group as specified in SMPTE 272M. Selectable tone frequencies (from 60Hz to 10kHz) and audio group. Audio level is set to -20dB full scale

**Number of Outputs:** 4  
**Connectors:** 4 BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ± 0.5V  
**Rise and Fall Time:** 740ps nominal  
**Overshoot:** <10% of amplitude  
**Wide Band Jitter:** <0.2 UI

##### Electrical:

**Voltage:** +12 VDC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A, EU EMC Directive

##### Physical:

**Number of Slots:** 1

##### Ordering Information:

**7750TG** SDI Test Signal Generator

##### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

##### Rear Plate Suffix

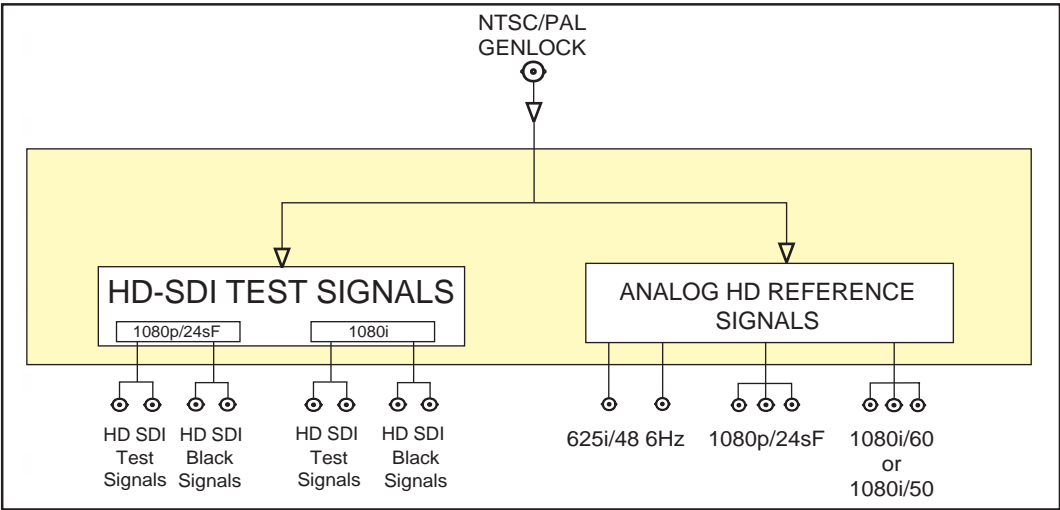
**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

##### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure



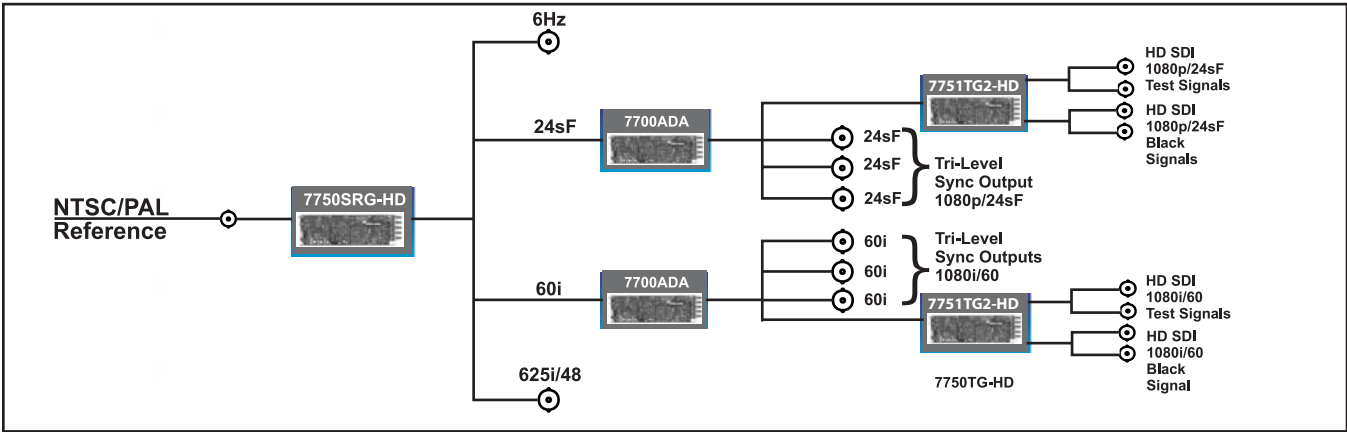
The HDTV Reference Generator Test Set System (PKG7752RGTS-HD) is based on the 7750SRG-HD card. This card locks to either an NTSC or PAL reference signal and generates HD tri-level sync as per SMPTE 274M (1080i, 1080p & 1080p/24sF) or SMPTE 296M (720p). The complete PKG7752RGTS-HD system also generates numerous HDTV test signals.



Features

- Multi-Format tri-level sync generation
- Genlocks to NTSC/59.94, PAL/50 or free-run
- Provides additional reference signals - 6Hz and 'slow PAL' (625i/48)
- LED indicators for NTSC and PAL reference
- Simultaneously generates 1080i and 1080p HD Tri-Level Sync and 'slow PAL' Sync signals (user configurable sync output combinations)
- Two independent selectable HD SDI test signals with embedded audio tones
- Two independent selectable HD SDI black signals

Typical Application Diagram



Ordering Information:

**PKG7752RGTS-HD** HD Reference Generator/Test Set System housed in the 7700FR-C 3RU Multiframe includes the following modules:

7751TG2-HD	Test Signal Generator	Qty. 2
7750SRG-HD	Slave Reference Generator	Qty. 1
7700ADA	Analog Equalizing DA for HD	Qty. 2
7700FR-C	3RU Multiframe with single power supply	Qty. 1

Options:

**7700PS** Redundant power supply

Note:

To obtain more detailed information on each item included in the 7752RGTS-HD system, please refer to the individual spec. sheets for the 7751TG2-HD, 7750SRG-HD, 7700ADA and 7700FR-C.

Please refer to our 5600MSC brochure for master sync and master clock applications



The 7760CCM closed captioning monitoring card extends the signal monitoring capabilities of Evertz AVM product line by focusing on closed captioning and eXtended Data Services (XDS) data packets carried within the Vertical Blanking Interval (VBI). Compliant with the EIA Standard EIA/CEA-608-B, the 7760CCM can be used to monitor VBI content for pre-distribution monitoring or regulatory compliance.

The 7760CCM is capable of decoding VBI Line 21, fields 1 and 2 data and displaying the information on the SD video output. One of four closed captioning channels (CC1-CC4) and one of four text service channels (T1-T4) can be simultaneously displayed on the video output. In addition, the scrolling XDS display supports all data packets including Transmission Signal Identifier (TSID), Copy Generation Management System (CGMS-A), V-Chip rating, Station name, Station ID, Program Name, Program Type, Program Description, time of day, and time in show are decoded to human-readable format. Other (less common) packets are presented as raw data bytes.

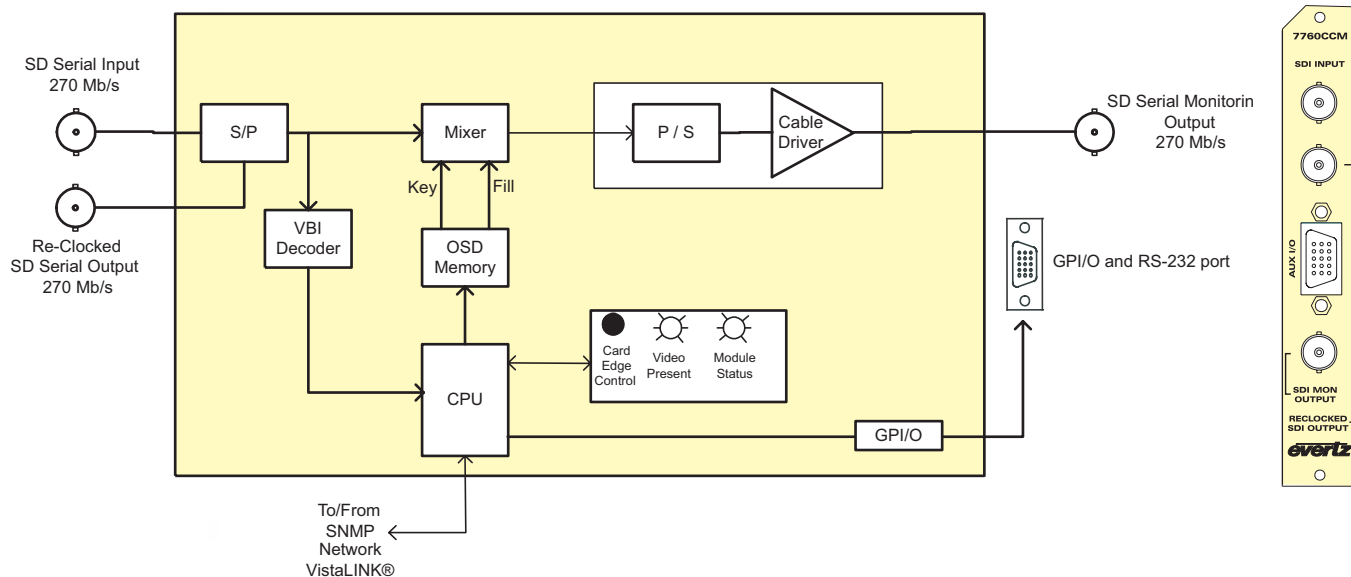
The 7760CCM-T incorporates the fault reporting capabilities inherent in the AVM product line. There are four user-configurable fault alerts that are triggered upon loss of video, loss of CC waveform, parity errors, field inversions, control codes and invalid XDS parameters. The 7760CCM-T is also VistaLINK®-capable, offering remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP).

The single-slot, 7760CCM & 7760CCM-T modules fit conveniently into Evertz 7700FR-C, 7701FR frames or standalone enclosure.

### Features

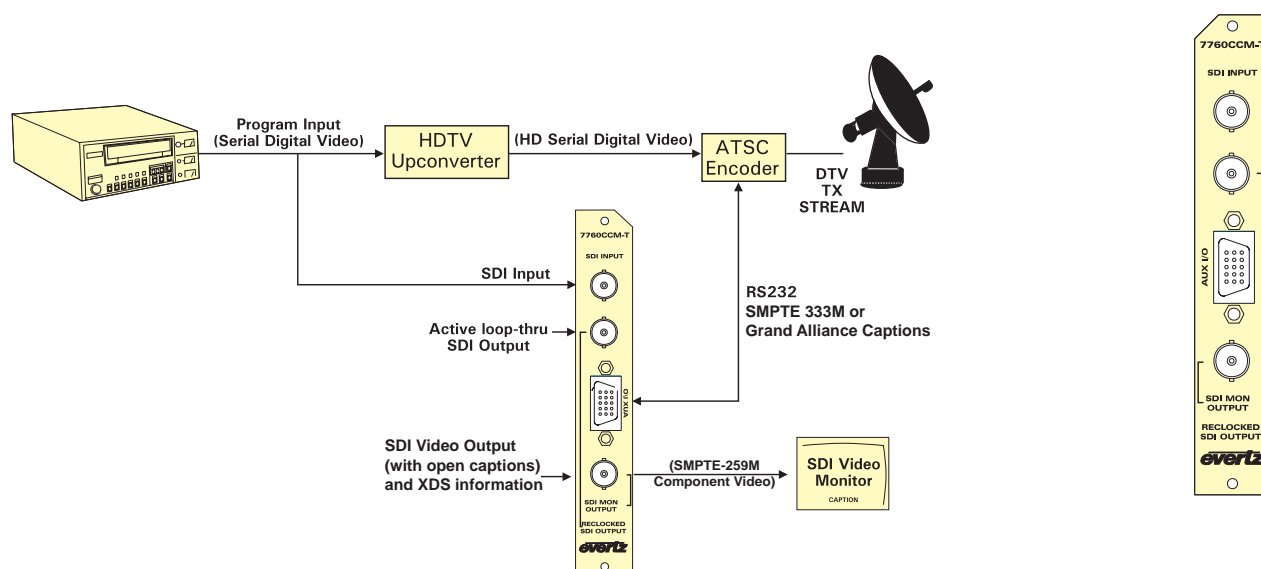
- One SD, 270 Mb/s component digital video input, 525 or 625 lines, auto-detected or manually set
- One re-clocked SD video output
- Decodes and displays closed captioning on fields 1 and 2 as per EIA Standard EIA/CEA-608-B
- User selectable closed captioning channel (1-4), text channel (1-4) and eXtended Data Services (XDS) for video "burn-in"
- Decodes Line 21 XDS packets including Transmission Signal Identifier (TSID), Copy Generation Management System (CGMS-A), Program ID, Time in show, Program name, Program type, V-chip rating, Program description, Network name, Station ID, Time of day and Time zone
- Store and recall up to three module configurations
- Fits conveniently into Evertz 7700FR-C 3RU, 7701FR 1RU frames and stand-alone enclosure
- A comprehensive on screen display menu is available to configure the various features of the module as well as allows flexible configuration of the text window positioning
- An extensive list of closed captioning and XDS error conditions can be enabled and monitored with on-screen fault messages triggered by exceeded timer parameters
- Four user-configurable GPI inputs for on screen display control, closed captioning channel and text channel selection
- Two user-configurable GPI outputs to indicate user definable fault conditions
- RS-232 serial port output used to transmit raw closed captioning data. (Compliments VBI Bridge functionality of Evertz 8084 CC Encoders)
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® PRO) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

### 7760CCM Block Diagram and Rear Panel



# SDI Closed Caption & XDS Decoder & EIA608 & EIA608-708 Analyzer 7760CCM & 7760CCM-T

7760CCM Block Diagram and Rear Panel



## Specifications

### Serial Digital Input:

**Standard:** SMPTE 259M-C - 525 or 625-line component serial digital video, 270Mb/s  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Termination:** 75  $\Omega$   
**Equalization:** Automatic to 225m @ 270 Mb/s with 8281 or equivalent cable  
**Return Loss:** >15dB up to 270MHz

### Serial Video Output:

**Standard:** SMPTE 259M-C - 525 or 625-line component - same as input

### Number of Outputs:

**Reclocked:** 1  
**Monitored:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V  $\pm$ 0.5V  
**Rise and Fall Time:** 470ps nominal  
**Overshoot:** <10% of amplitude

### General Purpose Interface I/O (GPI/GPO):

**Number of Inputs:** 4 (behavior is assigned via. On screen menu items)  
**Number of Outputs:** 2 (behavior is programmable via. On screen menu items)  
**Type:** Opto-isolated, active low with internal pull-ups to +5V  
**Connector:** Female High Density DB-15  
**Signal Level:** +5V nominal

### Serial Port:

**Standard:** RS-232  
**Connector:** Female High Density DB-15  
**Baud Rate:** 9600 (7760CCM)  
 38400 (7760CCM-T)  
**Format:** 8 bits, no parity, 1 stop bits and no flow control

## Electrical:

**Voltage:** +12VDC  
**Power:** 12 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

## Physical:

**Number of slots:** 1

## Ordering Information:

**7760CCM** SDI Closed Caption & XDS Decoder & EIA608 Analyzer with VistaLINK® support  
**7760CCM-T** EIA608-EIA708 Translator (Includes Basic Function of 7760CCM and cable)

## Ordering Options

Rear Plate must be specified at time of order  
 Eg: Model +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

## Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure





The 7760CCM-HD Closed Caption card is a EIA608 / EIA708 translator and extends the signal monitoring capabilities of the Evertz monitoring product line by focusing on closed captioning (EIA-608 & EIA-708) and Extended Data Service (XDS). The 7760CCM-HD has the capability to translate EIA608 captions to EIA708 Captions supporting SMPTE 333M and Grand Alliance format for RS-232 transfer. The 7760CCM-HD also converts SMPTE 334M VANC captions to SMPTE 333M or Grand Alliance Format for RS232 transfer.

The auto detect program input supports both standard definition and high definition formats. The 7760CCM-HD EIA-608 decoder is capable of decoding VBI line 21, field 1 and 2 and displaying the information on the monitoring output. One of four caption channels (CC1-CC4) and one of four text service channels (T1-T4) can be simultaneously displayed on the monitoring output. In addition, the scrolling XDS display supports all data packets including TSID, CGMS-A, V-Chip, Station Name and Station ID. The EIA-708 decoder is capable of decoding all closed caption service channels and displaying the open options on the monitoring output\*\*.

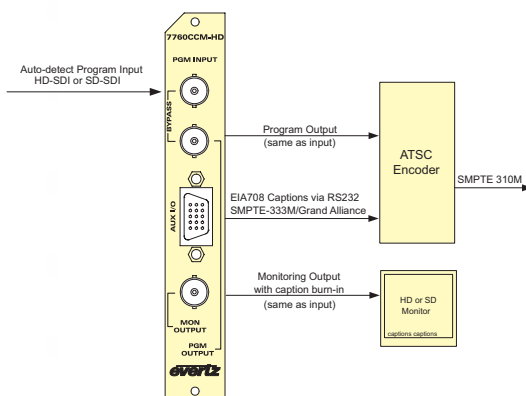
The 7760CCM-HD occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

**\*\*NOTE:** The built in EIA-708 caption decoder does not support the full feature-set of EIA-708 advance captions and is provided for monitoring & verifying captions only.

## Features

- EIA608 / EIA708 translator provides SMPTE 333M or Grand Alliance format output for RS-232 raw caption data transfer
- Supports SMPTE 333M and Grand Alliance Protocol for convenient interface to most ATSC Encoders
- Built in bypass relay on program output video path
- Auto-detect SMPTE 259M (143 to 540 Mb/s), SMPTE 292M (1.5Gb/s) signal input
- Monitoring output decodes and displays upstream EIA608 and EIA708 captions
- Decodes and displays closed captions & XDS information on field 1 and 2 for the EIA-608 standard
- Decodes and displays closed caption information for the EIA-708 standard
- Decodes XDS packets containing TSID, CGMS-A, Program ID, Time in Show, Program Name, Program Type, V-Chip rating, Program Description, Network Name, Station ID, Time of Day and Time of Zone
- Static CGMS-A and TSID encoding via card edge control
- Closed caption line shift (up and/or down) via GPI trigger
- VistaLINK® - capable for remote monitoring and control via SNMP (using VistaLINK® PRO) when installed in 7700FR-C frame with 7700FC VistaLINK® Frame Controller

## 7760CCM-HD Block Diagram & Rear Panel



## Specifications

### Program Input:

**Standard:** SMPTE 259M-C, SMPTE 292M  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Termination:** 75Ω  
**Equalization:** Automatic to 100m @ 1.5Gb/s with Belden 1694A (or equivalent)  
Automatic to 250m @ 270Mb/s with Belden 1694A (or equivalent)  
**Return Loss:** >10dB up to 1.5 Gb/s

### Program Output:

**Standard:** Same as input  
**Number of Outputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 200ps nominal  
**Overshoot:** < 10% of amplitude  
**Return Loss:** > 10dB up to 1.5 Gb/s  
**Wideband Jitter:** < 0.2 UI

### Monitoring Output:

**Standard:** Same as input  
**Reclocked Outputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**Rise and Fall Time:** 200ps nominal @ SMPTE 292M  
740ps nominal @ SMPTE 259M-C  
**Overshoot:** <10% of amplitude  
**Return Loss:** >12dB up to 1.5 Gb/s  
> 15dB up to 270Mb/s  
**Output Impedance:** 75Ω

### General Purpose Interface (GPI) Input/Output:

**Number of Inputs:** 4  
**Number of Outputs:** 2

**Type:** Opto-isolated, active low with internal pull-ups to +5V  
**Connector:** Female High Density DB-15  
**Signal Level:** +5V nominal  
**Serial Port:** RS-232  
**Standard:** Female High Density DB-15  
**Connector:** 19200/38400/57600  
**Baud Rate:** 8-bits, no parity, 1 stop bits and no flow control  
**Format:** 8-bits, no parity, 1 stop bits and no flow control  
**Electrical:** +12V DC  
**Voltage:** 12 Watts  
**Power:** Complies with FCC Part 15, Class A  
**EMI/RFI:** EU EMC Directive  
**Physical:** Number of Slots: 1

### Ordering Information:

**7760CCM-HD:** SD-SDI/HD-SDI Closed Caption EIA608 / EIA708 Translator/Monitor

### Ordering Options

Rear Plate must be specified at time of order  
Eg: Model +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe  
**+1RU** 1RU Rear Plate for use with 7701FR Multiframe  
**+SA** Standalone Enclosure Rear Plate

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules  
**7701FR** 1RU Multiframe which holds 3 modules  
**S7701FR** Standalone enclosure

Compact High Density Balanced Audio Distribution Frame  
400FR



Specifications

Electrical:

AC Mains Input: Auto ranging, 100 to 240 VAC, 50/60 Hz  
Maximum Operating Current: 2.6 A (@ 120 VAC), 1.4 A (@ 240 VAC)  
Maximum Power Consumption: 200 W  
Maximum Module Load: 160 W (10 W per slot)  
Power Supply Configuration: Dual, redundant, separate AC inlets  
Connector: IEC 60320 - 1 per power supply  
Fuses: 4 amp, 250 volt time delay 5 x 20 mm. - 2 per power supply  
Safety: CSA Listed to CSA C22.2 No. 60065-03, UL 60065-03  
IEC 60065-(2001-12) 7th Edition

EMC:

Complies with CE Low voltage Directive 93/68/EEC  
Complies with FCC part 15, class A.  
Complies with EU EMC directive 89/336/EEC

Status Indicators:

PSU status LED  
Local Error/Failure LED

Tally Output Connector:

4 pin terminal, relay N/O, N/C for status/fault alarm, 2 A,  
125 VDC max

Temperature:

0 - 40°C

Physical:

Height: 5.25" (133 mm)  
Width: 19" (483 mm)  
Depth: 9.5" (368 mm)  
Module Capacity: 16 slots  
Weight: Approx 17 lbs (7.7 Kg) with 2 power supplies, no slots  
occupied  
Approx. 32 lbs. (14.5 Kg) with 2 power supplies all slots  
occupied

Certification:

Safety: CSA Listed  
Complies with CE Safety Directive  
Complies with FCC part 15, Class A  
EMC: EU EMC Directive

Signal Connections:

3 Pin removable terminal strips, balanced connection (10  
per slot)

Status Indicators:

PSU status LED,  
Local Error/Failure LED

Tally Output Connector:

4 pin terminal, relay N/O,  
N/C for status/fault alarm

Temperature:

0 - 40° C optimal performance  
0 - 50° C operating

Ordering Information:

400FR Compact High Density Balanced Audio Distribution Frame

Accessories:

+4PS Redundant power supply option for 400FR



The 400ADA-AUD Analog Audio Distribution Amplifier is a general-purpose 1x9 amplifier for distributing balanced analog audio signals.

The 400ADA-AUD can be operated with either differential or single ended inputs and offers a wide range of gain adjustment to handle a wide variety of input signals.

The 400ADA-AUD is housed in the 3RU 400FR frame that will hold up to 16 modules.

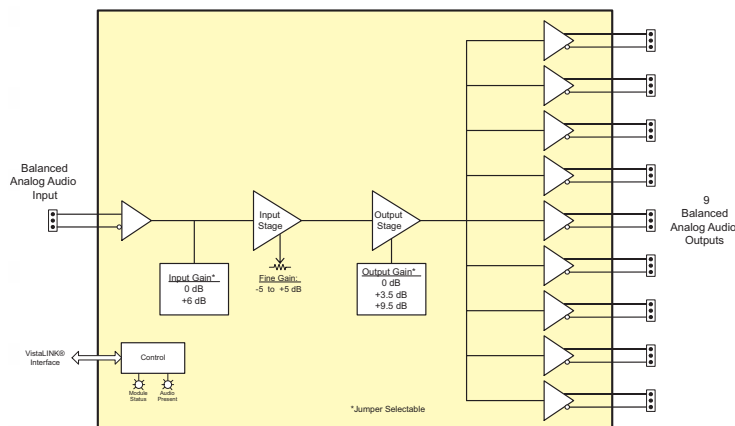
### Features

- Differential and single ended input (automatic single ended to differential conversion)
- High impedance inputs
- Low impedance outputs
- Wide gain adjustment range
- High common mode range and common mode rejection ratio
- Very high SNR
- Very low THD+N
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 400FR frame with 500FC VistaLINK® Frame Controller

### Card Edge LEDs:

- Module status/Local Fault
- Power supply status

### 400ADA-AUD Block Diagram & Rear Panel



### Specifications

#### Analog Audio Input::

<b>Standards:</b>	Any analog audio signal
<b>Number of inputs:</b>	1 (Balanced or Single ended)
<b>Connector:</b>	3 pin removable terminal strips
<b>Input step gain:</b>	0dB or +6dB (configurable with jumpers)
<b>Fine gain control:</b>	-5 to +5dB (card edge pot adjustable)
<b>Maximum input level:</b>	
0dB input gain	+34dBu
+6dB input gain	+28dBu
<b>Common mode rejection:</b>	> 105 dB @ 60Hz
<b>Common mode range:</b>	
0dB input gain:	> ±22 V
+6dB input gain:	> ±7 V
<b>Input impedance:</b>	
0dB input gain:	44k Ω
+6dB input gain:	26k Ω

#### Analog Audio Outputs:

<b>Number of Outputs:</b>	9
<b>Connectors:</b>	3 pin removable terminal strips
<b>Output step gain:</b>	0, 3.5 or 9.5dB (configurable with jumpers)

<b>Max. output level:</b>	+28dBu across hi-impedance load +24dBu into 600Ω load
<b>Output impedance:</b>	66Ω
<b>Freq. Response:</b>	±0.03 dB 20Hz to 20kHz
<b>THD+N:</b>	0.001% 20Hz to 20kHz @ 28dBu, unweighted RMS
<b>Output Isolation:</b>	> 100dB @ 1kHz, 100 dB @ 20kHz

#### Electrical:

<b>Voltage:</b>	+ 12VDC
<b>Power:</b>	TBD

#### Physical:

**Number of slots:** 1

#### Ordering Information:

**400ADA-AUD** Analog Audio Distribution Amplifier (1 x 9)

#### Enclosures:

**400FR** Compact High Density Balanced Audio Distribution Frame



# Balanced AES Audio Distribution Amplifier

## 400DA-AESB



The 400DA-AESB is a nine output reclocking and auto equalizing DA for balanced 110Ω AES signals. The DA automatically equalizes up to 300m of Belden 1800B cable and provides reclocked outputs with sampling frequencies of 32kHz, 44.1kHz, 48kHz and 96kHz.. The 400DA-AESB card edge LED indicators provide quick and accurate assessment of the incoming signal integrity.

The 400DA-AESB is housed in the 3RU 400FR frame that will hold up to 16 modules.

### Features

- Data reclocking provides jitter reduction
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 400FR frame with 500FC VistaLINK® Frame Controller

### Inputs:

- AES3-1992 standard for AES audio on 110Ω twisted pair cable
- EQ and reclock provide extended cable length compensation (>300m)
- Transformer coupled 110Ω balanced input

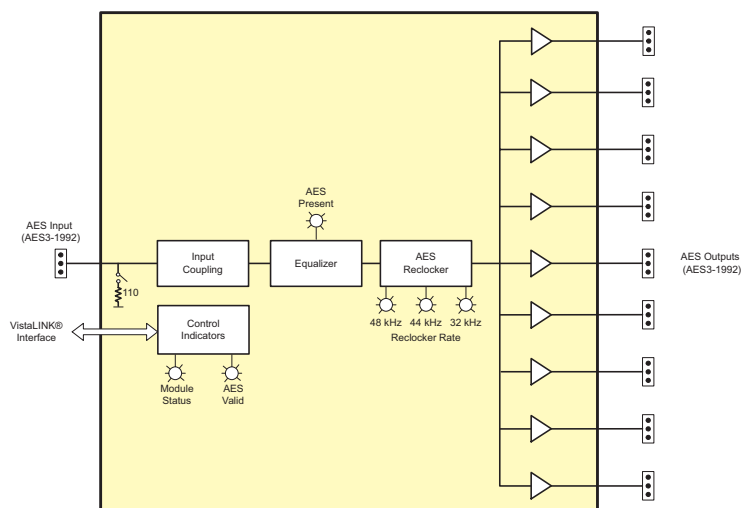
### Outputs:

- Nine 110Ω balanced

### Card Edge LEDs:

- Module Health Status
- Error LED indication for input PLL out of lock, parity error or biphas coding error
- Reclocked locked

### 400DA-AESB Block Diagram & Rear Panel



### Specifications

#### AES Input:

Standard:	AES3-1992
Number of Inputs:	1
Connector:	3 pin removable terminal strip
Input Level:	2 to 7V p-p
Coupling:	Transformer
Input Impedance:	110Ω
Return Loss:	>14dB 100kHz to 6MHz
Equalization:	Automatic to 300m with Belden 1800B (or equivalent) @ 48kHz AES signal
Sampling Frequency:	32kHz, 44.1kHz, 48kHz and 96kHz

#### AES Output:

Number of Outputs:	9 Balanced AES reclocked
Connector:	3 pin removable terminal strip
Output Level:	5V p-p
Output Impedance:	110Ω
Return Loss:	>30dB 100kHz to 6MHz

#### Physical:

Number of Slots:	1
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#### Electrical:

Voltage:	+12VDC
Power:	5 Watts
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

#### Ordering Information:

400DA-AESB	Balanced AES Audio Distribution Amplifier (1x9)
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#### Enclosure:

400FR	Compact High Density Audio Distribution Frame
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## Specifications

<b>Electrical :</b>	
AC Mains Input:	Auto ranging, 100 to 240 VAC, 50/60 Hz
Maximum Operating Current:	2.6 A (@ 120 VAC), 1.4 A (@ 240 VAC)
Maximum Power Consumption:	200 W
Maximum Module Load:	160 W (10 W per slot)
Power Supply Configuration	Dual, redundant, separate AC inlets
Connector:	IEC 60320 - 1 per power supply
Fuses:	4 amp, 250 volt time delay 5 x 20 mm. - 2 per power supply
Safety:	CSA Listed to CSA C22.2 No. 60065-03, UL 60065-03 IEC 60065-(2001-12) 7th Edition Complies with CE Low voltage Directive 93/68/EEC Complies with FCC part 15, class A Complies with EU EMC directive 89/336/EEC
EMC:	
Status Indicators:	PSU status LED Local Error/Failure LED
Tally Output Connector:	4 pin terminal, relay N/O, N/C for status/fault alarm, 2 A, 125 VDC max
Temperature:	0 - 40°C
<b>Physical:</b>	
Height:	5.25" (133 mm)
Width:	19" (483 mm)
Depth:	9.5" (368 mm)
Module Capacity:	16 slots
Weight:	Approx 17 lbs (7.7 Kg) with 2 power supplies, no slots occupied Approx. 32 lbs. (14.5 Kg) with 2 power supplies all slots occupied

## S501FR



S501FR



S501FR-RP

## Specifications

<b>Electrical :</b>	
Voltage:	12VDC Nominal Auto ranging, 100 to 240VAC power adapter
Power:	10Ω
Fuse:	Internal self resetting fuse
Connector:	2.5 mm DC power jack
<b>Certification:</b>	
Safety:	Power adapter CSA listed Complies with EU Safety Directive Complies with FCC part 15, Class A Complies with EU EMC Directives
EMC:	

<b>Physical:</b>	
Dimensions:	4.9"W x 1.2"H x 10.5"D (124mm W x 30mm H x 267mm D)
Module Capacity:	1 single slot
Weight:	1 lb

<b>Ordering Information:</b>	
S501FR	Standalone Compact High Density Distribution Frame
<b>Accessories:</b>	
S501FR-RP	exponent Rackmount panel mounts 3 S501FR enclosures in 1RU rack space (Includes two blank panels for unfilled slots)

<b>Certification:</b>	
Safety:	CSA Listed Complies with CE Safety Directive Complies with FCC part 15, Class A EU EMC Directive
EMC:	
<b>Signal Connections:</b>	BNC per IEC 60169-8 Amendment 2 (10 per slot)
<b>Status Indicators:</b>	PSU status LED, Local Error/Failure LED
<b>Tally Output Connector:</b>	4 pin terminal, relay N/O, N/C for status/fault alarm
<b>Temperature:</b>	0 - 40° C optimal performance 0 - 50° C operating

<b>Ordering Information:</b>	
500FR	Compact High Density Distribution Frame
<b>Accessories:</b>	
+5PS	exponent Redundant power supply option for 500FR

## An Industry Comparison

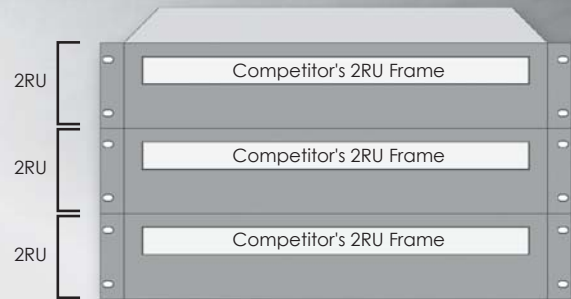
Based on 6RU of Rack Space

Evertz **exponent** DA Frame



Total Number of Output BNCs per 6RU = 288

Competitor's DA Frame



Total Number of Output BNCs per 6RU = 240-270

### NOTES:

- 1) **exponent** achieves the highest density with 288 BNC outputs (per 6RU)
- 2) **exponent** uses less power supplies thus less points of failure (per 6RU)
- 3) **exponent** provides a direct connection to an SNMP network. Some competitive pseudo SNMP solutions require intermediate application servers or protocol translators which add latency, single point of failure issues, cost and complexity



VistaLINK® is Evertz true Simple Network Management Protocol (SNMP) configuration and monitoring platform. Evertz own VistaLINK® PRO application software unites Evertz Fiber, Conversion, NCP, VIP™, MVP™, 500 Series DA and AVM product lines as well as selected third party equipment through a customized, detailed, java-based monitoring and configuration tool that is ready-to-use for signal monitoring and "real-time" equipment configuration. VistaLINK® provides a complete, uncomplicated and cost-effective network monitoring & configuration solution. It is also an effective local and remote monitoring tool for both incoming and departing signals at strategic locations throughout your video network enterprise.



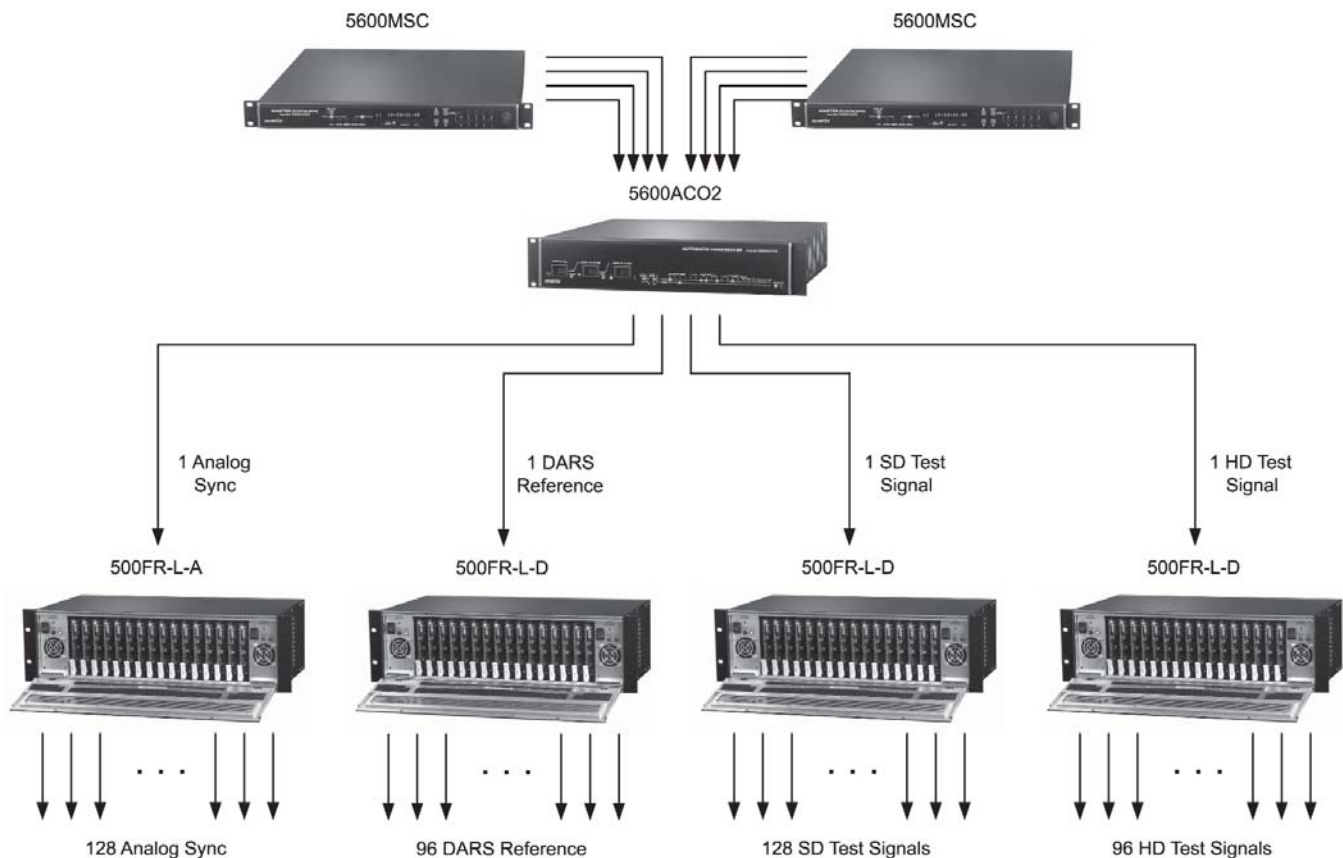


The 500FR-L-A & 500FR-L-D expand on Evertz current exponent family of Compact High Density Distribution Frames. The 500FR-L-A maintains the ability to provide high-density distribution of analog signals while the 500FR-L-D maintains the ability to provide high-density distribution of digital signals. They also provide the ability to loop a single analog or digital input source through multiple slots on the same frame.

The 500FR-L-A allows for the looping of up to 16 (Analog) loop thru modules. The 500FR-L-D allows for the looping of up to 16 (SD SDI) 500DA-L's or up to 12 (HD) 500-DA-HD-L modules. Both frames also allow for the hot swapping of modules from the front without any impact on the input signal to the remaining modules in the frame.

### 500FR-L-A & 500FR-L-D Typical Application

The typical application for the Loop Thru frames are in a broadcast plant or mobile production units, where distribution of reference and test signals from a single timed source is critical. The complete Evertz Master Clock SPG solution allows for minimal impact of potential module failures and provides maximum reliability.



# Compact High Density Analog & Digital Looping Distribution Frames

500FR-L-A, 500FR-L-D

exponent

7

## Specifications

### Electrical:

AC Mains Input: Auto ranging, 100 to 240 VAC, 50/60 Hz

Maximum Operating Current: 2.6 A (@ 120 VAC), 1.4 A (@ 240 VAC)

Maximum Power Consumption: 200 W

Maximum Module Load: 160 W (10 W per slot)

Power Supply Configuration: Dual, redundant, separate AC inlets

Connector: IEC 60320 - 1 per power supply

Fuses: 4 amp, 250 volt time delay 5 x 20 mm.

- 2 per power supply

Safety: CSA Listed to CSA C22.2 No. 60065-03, UL 60065-03

IEC 60065-(2001-12) 7th Edition

Complies with CE Low voltage Directive

93/68/EEC

EMC: Complies with FCC part 15, class A.

Complies with EU EMC directive

89/336/EEC

Status Indicators: PSU status LED

Local Error/Failure LED

Tally Output Connector: 4 pin terminal, relay N/O, N/C for

status/fault alarm, 2 A, 125 VDC max

Temperature: 0 - 40°C

### Physical:

Height: 5.25" (133 mm)

Width: 19" (483 mm)

Depth: 9.5" (368 mm)

Module Capacity: 16 slots

Weight: Approx 17 lbs (7.7 Kg) with 2 power supplies, no slots occupied

Approx. 32 lbs. (14.5 Kg) with 2 power

supplies all slots occupied

### Certification:

Safety: CSA Listed

Complies with CE Safety Directive

EMC: Complies with FCC part 15, Class A

EU EMC Directive

### Signal Connections:

BNC per IEC 60169-8 Amendment 2  
(10 BNC per slot)

### Status Indicators:

PSU status LED  
Local Error/Failure LED

### Tally Output Connector:

4 pin terminal, relay N/O,  
N/C for status/fault alarm

### Temperature:

0 - 40° C optimal performance  
0 - 50° C operating

### Ordering Information:

500FR-L-A

500FR-L-D

### Accessories:

+5PS

## exponent

Compact High Density Distribution  
Frame with Loop Thru (Analog)  
Compact High Density Distribution  
Frame with Loop Thru (Digital)

Redundant power supply option for  
500FR



evertz

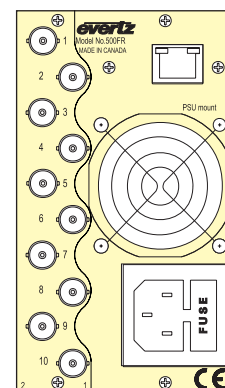
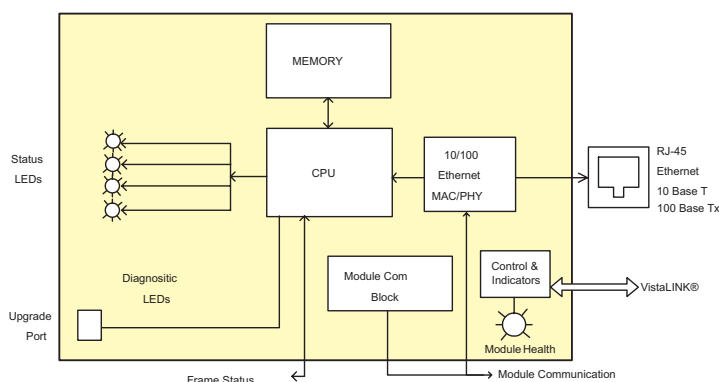


The 500FC VistaLINK® Frame Controller card provides a single point of access to communicate with VistaLINK® - capable 500 and 400 series modules. The 500FC VistaLINK® Frame Controller provides a 10Base-T/100Base-TX Ethernet port and communication is facilitated through the use of Simple Network Management Protocol (SNMP). The 500FC VistaLINK® Frame Controller handles all SNMP communications between the frame (500FR) and the network manager (NMS), and serves as a gateway to individual cards in the frame. The 500FC is a true SNMP agent. No external intermediate translator application servers or PC based protocol translators are required. This means you attach the 500FR or 400FR directly to your Ethernet/SNMP Network.

## Features

- Complies with IEEE 802.3 100Base-TX and 10Base-T Ethernet standards
- 100 Mbps Fast Ethernet or 10 Mbps Ethernet data transfer, selected by auto-negotiation
- Full duplex or half-duplex operation, selected by auto negotiation
- RJ-45 connector for network cable connection
- Front panel LEDs indicate module status
- Rear panel LEDs indicate Ethernet link, activity and speed
- Provides frame/chassis status information through enabled hardware via SNMP (using VistaLINK® PRO) including power supply status, frame status, card insertion/removal counters, 500FC software version number, LED control
- Comprehensive signal and status monitoring through SNMP and VistaLINK®
- Can be used with 400FR, 500FR, 500FR-L-A, 500FR-L-D frames

## 500FC Block Diagram & Rear Panel



## Specifications

### Ethernet:

**Network Type:** Fast Ethernet 100 Base-TX IEEE 802.3u standard for 100 Mbps baseband CSMA/CD local area network  
Ethernet 10 Base-T IEEE 802.3 standard for 10 Mbps baseband CSMA/CD local area network

### Connector:

RJ-45

### Electrical:

**Voltage:** + 12VDC  
**Power:** 7 Watts  
**EMI/RFI:** Complies with FCC Part 15 Class A  
EU EMC directive

### Physical:

**Number of slots:** 1 - occupies slot 1 of the 500FR Frame

### Ordering Information:

**500FC** VistaLINK® Frame Controller

### Enclosure:

**500FR** Compact High Density Distribution Frame  
**400FR** Compact High Density Audio Frame  
**500FR-L-A** Compact High Density Distribution Frame with Loop Thru (Analog)  
**500FR-L-D** Compact High Density Distribution Frame with Loop Thru (Digital)

### exponent



# HD/SD Reclocking DA & Frame Controller with HD/SD Reclocking DA 500DA-HD & 500FC-DA-HD



The Evertz 500DA-HD Reclocking Distribution Amplifier provides reliable distribution of your HD and SD SDI video signal at rates of 1.5 Gb/s and 143Mb/s to 540Mb/s. The DA features an auto-equalized input with eight serial outputs. The 500DA-HD has been designed for use as a SMPTE 292M (1.5 Gb/s), DVB-ASI, SMPTE 259M, or SMPTE 310M distribution product.

The 500FC-DA-HD Frame Controller with Distribution Amplifier card provides a single point of access to communicate with VistaLINK® capable 500 series of cards. The 500FC-DA-HD provides a 10Base-T/100Base-TX Ethernet port and communication is facilitated through the use of Simple Network Management Protocol (SNMP). The 500FC-DA-HD handles all SNMP communications between the frame (500FR) and the network manager (NMS), and serves as a gateway to individual cards in the frame. The 500FC-DA-HD also provides an RS-232 serial port at the card edge to set up the network addresses.

In addition the 500FC-DA-HD provides an on board reclocking distribution amplifier for HD/SD video signal at rates of 1.5 Gb/s and 143 Mb/s to 540 Mb/s. The DA features an auto-equalized input with eight reclocked outputs and has been designed for use as a SMPTE 292M (1.5 Gb/s), DVB-ASI or SMPTE 259M distribution product.

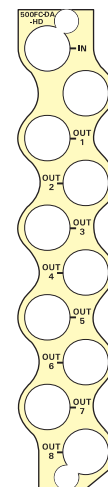
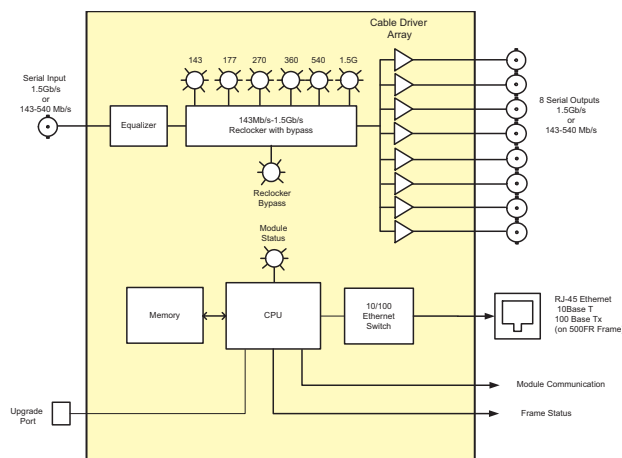
## Frame Controller Features:

- Complies with IEEE 802.3 100Base-TX and 10Base-T Ethernet standards
- 100 Mbps Fast Ethernet or 10 Mbps Ethernet data transfer, selected by auto-negotiation
- Full duplex or half-duplex operation, selected by auto negotiation
- RJ-45 connector for network cable connection
- Card edge RS-232 serial control port for configuration
- Front panel LEDs indicate module fault
- Rear panel LEDs indicate Ethernet link, activity and speed
- Provides frame/chassis status information through enabled hardware via VistaLINK® including frame status, card insertion/removal counters, and 500FC-DA software version number

## DA Features:

- Normal mode for SMPTE 292M (1.5 Gb/s) or SMPTE 259M (143 - 540 Mb/s) signals - autodetects correct bit rate
- Configurable for DVB-ASI and Non-Reclock mode using VistaLINK® control
- Fully hot-swappable from front of frame with no BNC disconnect required
- Independent isolated output drivers to ensure no cross channel loading effects (i.e. no need to terminate unused outputs)
- 8 outputs with optional reclocker
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

## 500FC-DA-HD Block Diagram & Rear Panel



## Specifications

### Serial Video Inputs:

**Standards:** SMPTE 292M, SMPTE 259M-A, B, C, D (143 to 540 Mb/s) or DVB-ASI

**Connector:** 1 BNC per IEC 60169-8 Amendment 2

**Equalization:** Automatic to 350m @ 270Mb/s, 110m @1.5Gb/s with Belden 1694A (or equivalent)(500DA-HD) 140m @1.5Gb/s (500FC-HD-DA)

**Return Loss:** > 15 dB up to 1.0 Gb/s, > 10 dB up to 1.5 Gb/s

### Serial Video Outputs:

**Number of Outputs:** 8 (Optionally reclocked)

**Connector:** BNC per 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V ±0.5V

**Rise and Fall Time:** 200ps nominal

**Overshoot:** < 10% of amplitude

**Return Loss:** > 15 dB up to 1.0 Gb/s

> 10 dB up to 1.5 Gb/s(500DA-HD),

> 12 dB up to 1.5 Gb/s(500FC-DA-HD)

**Wide Band Jitter:** < 0.2 UI

### Ethernet (500FC-DA-HD only):

**Network Type:** Fast Ethernet 100 Base-TX IEEE 802.3u standard for 100 Mbps baseband CSMA/CD local area network  
Ethernet 10 Base-T IEEE 802.3 standard for 10 Mbps baseband CSMA/CD local area network

**Connector:** RJ-45

### Serial Communications (500FC-DA-HD only):

**Standard:** RS-232

**Connector:** 9 Pin Female D connector on upgrade **breakout** cable (provided with 500FR)

**Baud Rate:** 57600

**Format:** 8 bits, no parity, 2 stop bits, no flow control

### Electrical:

**Voltage:** + 12VDC

**Power:** 5 Watts (500DA-HD), 5.5 Watts (500FC-DA-HD)

**EMI/RFI:** Complies with FCC Part 15 Class A and EU EMC directive

### Physical:

**Number of slots:** 1 (must be in slot 1 of 500FR)

### Ordering Information:

**500DA-HD** HD/SD Reclocking Distribution Amplifier (1x8)  
**500FC-DA-HD** Frame Controller with HD/SD Reclocking DA

### Enclosure:

**500FR**

**exponent**

Compact High Density Distribution Frame

# Analog Video Distribution with Cable Equalization for 500FR-L-A Frame

## 500ADA-EQ-L



The Evertz 500ADA-EQ-L is an Analog Distribution Amplifier with cable equalization on 8 outputs. It amplifies composite analog for distributing 75Ω analog video signals.

The 500ADA-EQ-L has a user-selectable Low Pass Filter with an 8 MHz corner frequency to eliminate unwanted out of band high frequencies. This is ideal for the distribution of master black throughout the broadcast plant.

The module features one balanced equalized input with 8 unbalanced outputs. The 500ADA-EQ-L can also monitor signal and hardware integrity.

When inserted into a 500FR-L (Compact High Density Distribution Frame with Loop Thru), the 500ADA-EQ-L allows for passive loop through of an analog video input to the other modules in the frame. The 500ADA-EQ-L is housed in the 3RU **exponent** 500FR frame or 500FR-L-A that will hold up to 16 module.

### Features

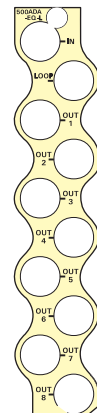
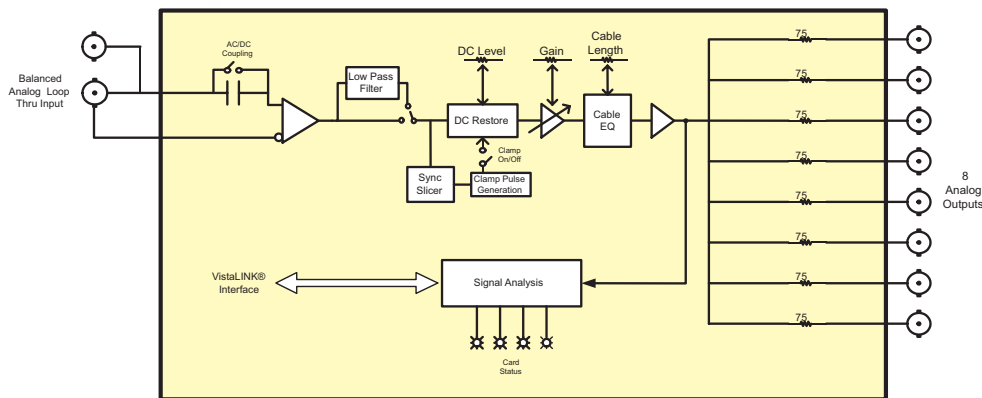
- Passive loop thru
- 75Ω or high impedance input
- High common mode range and common mode rejection ratio (CMRR)
- Jumper selectable low pass input filtering
- Gain control
- Jumper selectable AC or DC coupling
- Jumper selectable fast or slow back porch clamp
- DC level control when clamp is enabled
- Cable post equalizer adjustment on input. Range: 0 to 300m of 8281 or 1694

- Consistent input impedance if card power is lost
- Signal and hardware integrity monitoring
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

### Card Edge LEDs:

- Module status/Local Fault
- Signal Status

### 500ADA-EQ-L Block Diagram & Rear Panel



### Features

#### Analog Video Input:

**Standards:** NTSC or PAL-B  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Common mode range:** >6Vp-p  
**CMRR:** >70dB to 1 kHz  
**Signal amplitude:** 2.5Vp-p max  
**Cable post, pre-equalizer:** 0 to 300m of Belden 8281 or 1694A cable

**Impedance:** Hi-Z (Looping)  
**Coupling:** AC or DC (jumper selectable)  
**Single Card Return Loss:** > 25dB to 5.5MHz  
(De-rate spec. when looping through multiple 500FR-L-A inputs)

**Fast clamp attenuation of 60Hz:** >20dB

#### Analog Video Outputs:

**Number of Outputs:** 8 Per Card  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Output Impedance:** 75Ω  
**Gain control range:** + 5dB  
**DC Level:** < ± 100mV (with DC Coupling active and back porch clamp disabled)  
 < ± 200mV (with back porch clamp enabled)

**DC Level Control Range:** < ± 200mV (with back porch clamp enabled)

**Output isolation:** >42dB to 10MHz, >32dB to 30MHz  
**Output return loss:** >40dB to 30MHz

### Noise Performance

< -70dB RMS 15kHz to 5.5MHz  
 < -78dB RMS NTC7 weighting

### Physical:

**Number of Slots:** 1

### Electrical:

**Voltage:** + 12V DC  
**Power:** 1.2 Watts  
**EMI/RFI:** Complies with FCC Part 15 Class A  
 EU EMC Directive

### Ordering Information:

**500ADA-EQ-L**

Analog Video Distribution Amplifier with Cable Equalization

### Enclosure:

**500FR-L-A**

**exponent**

Compact High Density Distribution

Frame with Loop Thru (Analog)

**500FR-L-D**

Compact High Density Distribution

Frame with Loop Thru (Digital)

# HD/SD SDI Dual Reclocking Distribution Amplifier (32 1x4 DA's in 3RU Rack Space) 500DA2Q-HD

exponent



The Evertz 500DA2Q-HD Dual HD Reclocking Distribution Amplifier provides the highest density DA in the industry allowing up to 32 HD or SDI Distribution amplifiers in a 3RU rack space. It provides inexpensive distribution of your SMPTE 292M (1.5 Gb/s), SMPTE 259M (143 to 360Mb/s), SMPTE 344M (540Mb/s), DVB-ASI or SMPTE 310M (19.4Mb/s) or any other SDI signal within the 143Mb/s to 1.5 Gb/s range. The 500DA2Q-HD features two auto-equalized inputs and can be configured either as a single DA with eight reclocked outputs or as two separate DAs with four outputs each. In the case of dual operation, each DA can be individually set via jumpers for either reclocking or non-reclocking.

The 500DA2Q-HD is housed in the 500FR **exponent** frame that will hold up to 16 modules.

## Features

- Normal mode for SMPTE 292M (1.5 Gb/s) SMPTE 259M (143 -360Mb/s) or SMPTE 344M (540Mb/s) signals - autodetects correct bit rate
- Jumper selectable mode for DVB-ASI
- Jumper selectable non-reclock mode for SMPTE 310M (19.4Mb/s) signals or any other SDI signal within the 143Mb/s to 1.5 Gb/s range
- Configurable as 1 DA with 8 outputs or 2 DAs with 4 outputs each
- Fully hot-swappable from front of frame with no BNC disconnect required
- Independent isolated output drivers to ensure no cross channel loading effects (i.e. no need to terminate unused outputs)
- Module health and 2 x 4 Mode Status LEDs
- Reclocker(s) Locked, Carrier Present and Video Standard LEDs for each DA channel
- Tally output on Frame Status bus upon loss of input signal
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

## Inputs:

- 2 inputs
- SMPTE 292M (1.5 Gb/s), SMPTE 259M (143 to 360Mb/s), SMPTE 344M (540Mb/s), DVB-ASI or SMPTE 310M(19.4Mb/s)
- Auto equalization to 100m Input A, 90m Input B(Belden 1694A) @1.5Gb/s

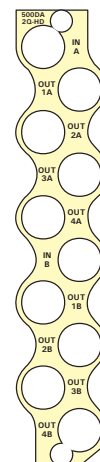
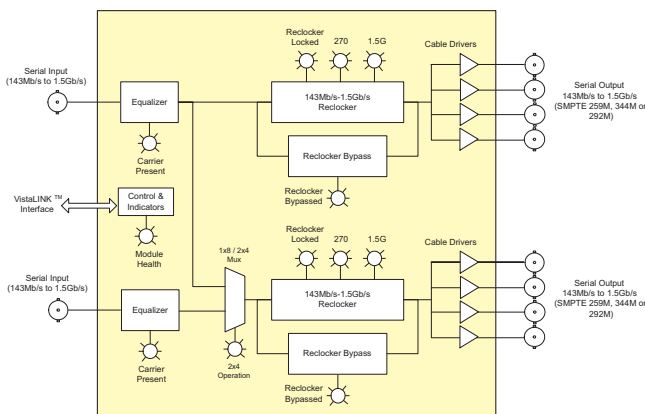
## Outputs:

- 4 reclocked outputs per input
- Jitter < 0.2UI

## Card Edge LEDs:

- Module Health Status
- 2x4 mode operation
- Reclocker rate detection
- Reclocker Locked
- Carrier Present

## 500DA2Q-HD Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

#### Standards

##### Reclocked:

SMPTE 292M (1.5 Gb/s). SMPTE 259M (143 to 360Mb/s), SMPTE 344M (540Mb/s), DVB-ASI

##### Non-reclocked:

SMPTE 310M (19.4Mb/s)  
Any SDI signal in the 143Mb/s to 1.5 Gb/s range  
2 BNC per IEC 60169-8 Amendment 2

### Connectors:

#### Equalization:

##### Input A:

Automatic to 100m @1.5Gb/s with Belden 1694A or equivalent cable

##### Input B:

Automatic to 90m @1.5Gb/s with Belden 1694A or equivalent cable

#### Return Loss:

>10 dB up to 1.5 Gb/s

### Serial Video Outputs:

#### Number of Outputs:

##### 2 x 4 Mode:

(mode set by jumper)  
4 reclocked from each input  
Reclockers can be bypassed separately for each input

##### 1 x 8 Mode:

8 reclocked from Input A (1)  
Reclockers can be bypassed

#### Connector:

BNC per IEC 60169-8 Amendment 2

#### Signal Level:

800mV nominal

### DC Offset:

0V ±0.5V

### Rise and Fall Time:

200ps nominal

### Overshoot:

<10% of amplitude

### Return Loss:

>10 dB up to 1.5 Gb/s

### Jitter:

< 0.2 UI

### Electrical:

#### Voltage:

+ 12VDC

#### Power:

6 Watts

#### EMI/RFI:

Complies with FCC Part 15 Class A  
EU EMC Directive

### Physical:

#### Number of slots:

1

### Ordering Information:

#### 500DA2Q-HD

HD/SD SDI Dual Reclocking Distribution Amplifier (2 - 1 x 4)

#### Enclosure:

##### 500FR

#### **exponent**

Compact High Density Distribution Frame  
Standalone enclosure

##### S501FR





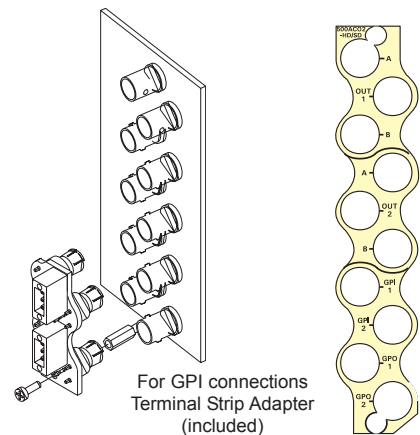
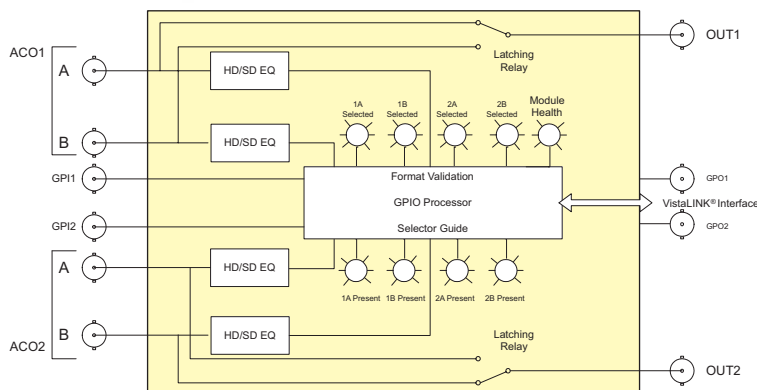
The Evertz 500ACO2-HD/SD dual HD/SD Autochangeover is designed to provide extension to the 5600ACO for HD or SD, or DVB-ASI. The unit can also be operated as a standalone changeover unit with two independent 2X1 switchers. The 500ACO uses latching relays to ensure maximum reliability and minimal disruption in the event of any failure.

The 500ACO2-HD/SD is housed in the 500FR **exponent** frame that will hold up to 16 modules.

### Features

- Auto detection of signal standard
- Four modes of operation
  - Auto changeover - two standalone auto changeovers
  - Manual DIP switch control - two independently controlled 2x1 switchers
  - GPI Control - two independently GPI controlled 2x1 switchers
  - ACO Extension - slave unit of the 5600ACO (requires 5600ACO firmware version 1.2 or higher)
- Fully hot-swappable from front of frame with no BNC disconnect required
- Tally output on Frame Status bus upon loss of input signal for quality monitoring
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

### 500ACO2-HD/SD Block Diagram & Rear Panel



### Specifications

#### Serial Video Input:

**Standards:** SMPTE 292M, SMPTE 259M-A, B, C, D (143 to 540 Mb/s) or DVB-ASI  
**Connector:** 4 BNC per IEC 60169-8 Amendment 2  
**Maximum Cable Length:** 100m of Belden 1694A or equivalent cable combined input and output  
**Return Loss:** 10 dB up to 1.5 Gb/s

#### Serial Video Outputs:

**Number of Outputs:** 2 passive relay outputs  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Maximum Cable Length:** 100m of Belden 1694A or equivalent cable combined input and output  
**DC Offset:** 0V  $\pm$ 0.5V  
**Return Loss:** 10 dB up to 1.5 Gb/s

#### AES Input:

**Standard:** AES-1992  
**Number of Inputs:** 1  
**Connector:** 3 pin removable terminal strip  
**Level:** 2V to 7V p-p  
**Coupling:** Transformer  
**Impedance:** 110 $\Omega$   
**Return Loss:** >14dB 100kHz to 6MHz  
**Equalization:** Automatic to 300m with Belden 1800B (or equivalent) @ 48kHz AES signal  
**Sampling Frequency:** 32kHz, 44.1kHz, 48kHz and 96kHz

#### AES Output

**Type:** Balanced AES reclocked  
**Number of Outputs:** 4  
**Connector:** 3 pin removable terminal strip (screwdown adapter module included)

**Level:** 5V p-p  
**Impedance:** 110 $\Omega$   
**Return Loss:** > 30dB 100kHz to 6MHz

#### General Purpose Inputs and Outputs:

**Type:**  
**Inputs:** Opto-isolated input with internal pull-up to +5Volts  
**Outputs:** Normally 10K internal pull-up to +5Volts  
**Connector:** Two 3 pin terminal blocks with one ground each  
**Signal Level:** +5V nominal

**Physical:**  
**Number of slots:** 1

#### Electrical:

**Voltage:** +12VDC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15 Class A EU EMC Directive

#### Ordering Information:

**500ACO2-HD/SD** Dual HD/SD Digital Auto Signal Changeover

#### Enclosures:

**500FR** **exponent** Compact High Density Distribution Frame  
**S501FR** Standalone enclosure

The 500DCDA-HD is a reclocking high definition serial digital video distribution amplifier and a high quality downconverter for 1.5 Gb/s HDTV signals. It can also function as a monitoring distribution amplifier for standard definition 270Mb/s signals. The 500DCDA-HD provides 5 reclocked DA outputs and 4 downconverted SDI or composite analog NTSC/PAL outputs (selectable). The 500DCDA-HD accepts all the popular international SMPTE 292M video formats. When the 500DCDA-HD down converts 1080p/23.98sF input video to 525i/59.94 with a 3:2 pulldown, the 3:2 pulldown cadence can be free running or locked to embedded RP188 time code.

The 500DCDA-HD has color space conversion from ITU rec. 709 to ITU rec. 601, and will provide various down converted formats such as 16:9 letterbox, 14:9 letterbox, 13:9 letterbox, 4:3 center crop, and 4:3 anamorphic squeeze. The 500DCDA-HD supports Widescreen Signaling (WSS) on the output to handle various aspect ratios of program material. Full 10 bit processing is provided throughout the signal path to achieve excellent downconversion quality. The module allows for selectable horizontal and vertical filters to control picture sharpness. It also de-embeds two groups of audio and re-embeds the audio on the SDI output in time with the video. All parameters may be controlled by use of the on screen display menu.

The 500DCDA-HD has a closed caption monitoring capability that decodes EIA-608 or EIA-708 captions that have been encoded into the VANC data space of an HD video input, or EIA-608 captions from a SD video input.

The 500DCDA-HD provides card edge LEDs to indicate signal present, cable length warning and audio groups present. The 500DCDA-HD is housed in the 3RU 500FR **exponent** frame that will hold up to 16 modules.

#### Features

- Serial digital 1.5 Gb/s HD input per SMPTE 292M
- Supports most international standards including 1080i/60, 1080i/59.94, 1080i/50, 1080i/50sF, 1080p/24, 1080p/23.98, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94, 480p/60, and 480p/59.94
- Will also accept 270Mb/s SD input SDI per SMPTE 259M in a pass through mode - auto senses HD or SD inputs
- 5 Reclocked DA outputs (HD if HD inputs applied, SD if SD inputs applied)
- 4 Selectable SDI or Composite Outputs (downconverted from HD if HD input applied), (from reclocked SD if SD input applied)
- High quality HD -> SD down conversion
- Supports 16:9 letterbox, 14:9 letterbox, 13:9 letterbox, 4:3 center crop, and 4:3 anamorphic squeeze aspect ratio conversions.
- 1080p/23.98sF conversion to 525i/59.94 with 3:2 pulldown sequence
- HD to SD colour space conversion (ITU rec. 709 to ITU rec. 601)
- On screen display used to configure the operating modes
- De-embeds Audio from HD video and embeds into standard definition SDI video (2 groups)
- Decodes and displays EIA-608 or EIA-708 captions from incoming video
- Moves ANC data (e.g. captioning, timecode) from HD video to standard definition SDI video
- Support for Widescreen Signaling (WSS) on output
- On Screen aspect ratio marker
- Card Edge LEDs for signal presence, equalization warning, audio groups present, module status
- VistaLINK® - capable offering remote monitoring, control and configuration capabilities via SNMP. VistaLINK® is available when modules are used with the 3RU 500FR-C frame and a 500FC VistaLINK® Frame Controller module in slot 1 of the frame using the Evertz VistaLINK® PRO or other third party SNMP manager software



## Compact Modular - 500 Exponent & 400 Series



## 287



# SDI Reclocking Distribution Amplifier 500DA

exponent

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The Evertz 500DA Reclocking Distribution Amplifier provides inexpensive distribution of your SMPTE 310M and SMPTE 259M serial digital video signal at rates of 19.4Mb/s and 143Mb/s to 540Mb/s. Ideal in applications where a large quantity of outputs are required, the DA features an auto-equalized input with nine isolated reclocked outputs. The input also features an isolated return that is capacitively coupled to ground.

The 500DA has been designed for use as a SMPTE 310M (19.4Mb/s), DVB-ASI or SMPTE 259M distribution product. SMPTE 310M support is selected by setting a rate select jumper.

The 500DA is housed in the 3RU 500FR **exponent** frame that will hold up to 16 modules.

## Features

- Normal mode for SMPTE 259M (143 to 540Mb/s) or DVB-ASI signals
  - autodetects correct bitrate
- Jumper Selectable mode for SMPTE 310M (19.4Mb/s)
- Fully hot-swappable from front of frame with no BNC disconnect required
- Independent isolated output drivers to ensure no cross channel loading effects (i.e. no need to terminate unused outputs)
- Outputs maintain polarity from input to output for DVB-ASI applications
- Tally output on Frame Status bus upon loss of input signal for quality monitoring
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

## Input:

- SMPTE 259M-A, B, C, D (143Mb/s to 540Mb/s), DVB-ASI, SMPTE 310M (19.4Mb/s) (jumper selectable)
- Return loss > 15dB up to 540Mb/s
- 440m auto eq. at 270Mb/s (Belden 1694A)
- 380m auto eq. at 270Mb/s (Belden 1694A) with HD SDI modules within 500FR

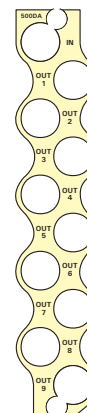
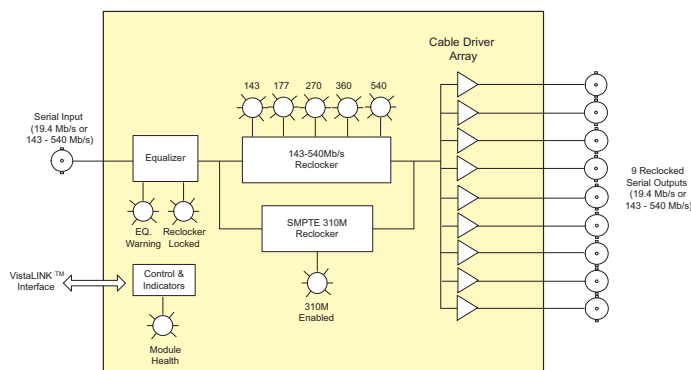
## Outputs:

- 9 reclocked outputs
- Return loss > 15dB up to 540Mb/s
- Wideband jitter <0.2 UI

## Card Edge LEDs:

- Reclocker rate (6 LEDs)
- Reclocker Locked
- Max. Equalization Warning
- 310M Reclocker Enable
- Module Health Status

## 500DA Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

#### Standard:

##### 259 Mode

SMPTE 259M-A, B, C, D (143 to 540Mb/s) or DVB-ASI

##### 310 Mode

SMPTE 310M (19.4Mb/s)

#### Connector:

BNC per IEC 60169-8 Amendment 2

#### Equalization:

Automatic to 440m @ 270Mb/s with Belden 1694A  
Automatic to 380m @ 270Mb/s with Belden 1694A with HD SDI modules within 500FR

#### Return Loss:

> 15dB up to 540Mb/s

### Serial Video Output:

**Number of Outputs:** 9 Reclocked

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V ± 0.5V

**Rise and Fall Time:** 470ps nominal

**Overshoot:** <10% of amplitude

**Return Loss:** >15 dB up to 540Mb/s

**Wideband Jitter:** <0.2 UI

### Physical:

**Number of Slots:** 1

### Electrical:

**Voltage:** +12VDC

**Power:** 6 Watts

**EMI/RFI:** Complies with FCC Part 15 Class A  
EU EMC Directive

### Ordering Information:

**500DA** SDI Reclocking DA - (1 x 9)

### Enclosures:

**500FR**

**exponent**

Compact High Density Distribution Frame

**S501FR**

Standalone enclosure



The Evertz 500DA2Q Reclocking Distribution Amplifier provides the highest density DA in the industry allowing up to 32 SD distribution amplifiers in a 3RU rack space. It provides inexpensive distribution of your SMPTE 259M (143 to 360Mb/s), SMPTE 344M (540Mb/s), or SMPTE 310M (19.4Mb/s) signals. The 500DA2Q features two auto-equalized inputs and can be configured either as a single DA with eight reclocked outputs or as two separate DAs with four outputs each. In the case of dual operation, each DA can be individually set via jumpers for either SMPTE 259M/344M or SMPTE 310M reclocking.

The 500DA2Q is housed in the 3RU 500FR **exponent** frame that will hold up to 16 modules.

### Features

- Normal mode for SMPTE 259M (143-360Mb/s), SMPTE 344M (540Mb/s) or DVB-ASI signals - autodetects correct bit rate
- Jumper selectable mode for SMPTE 310M (19.4Mb/s) signals
- Configurable as 1 DA with 8 outputs or 2 DAs with 4 outputs each
- Fully hot-swappable from front of frame with no BNC disconnect required
- Independent isolated output drivers to ensure no cross channel loading effects (i.e. no need to terminate unused outputs)
- Module health and 2 x 4 Mode status LEDs
- Reclocker(s) Locked, Cable Length Warning and Video Standard LEDs for each DA channel
- Tally output on Frame Status bus upon loss of input signal
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

### Inputs:

- 2 inputs
- SMPTE 259M (143 to 360Mb/s), SMPTE 344M (540Mb/s), DVB-ASI or SMPTE 310M (19.4Mb/s)
- Return loss > 15dB up to 540Mb/s
- 300m auto eq. at 270Mb/s (Belden 8281)
- 210m auto eq. at 540Mb/s (Belden 8281)

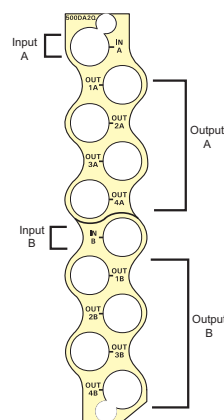
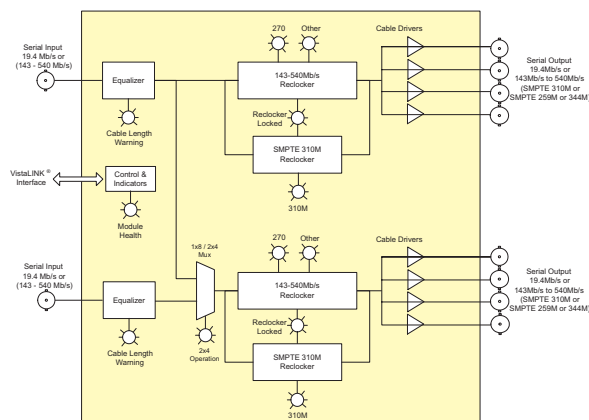
### Outputs:

- 4 reclocked outputs per input
- Return loss > 15dB up to 540Mb/s
- Jitter < 0.2UI

### Card Edge LEDs:

- Module Health Status
- 2x4 mode operation
- Reclocker rate (detection)
- Reclocker Locked
- Max. Equalization Warning

### 500DA2Q Block Diagram & Rear Panel



### Specifications

#### Serial Video Input:

##### Standards

**Reclocked:** SMPTE 259M (143 to 360Mb/s)  
SMPTE 344M (540Mb/s), SMPTE 310M (19.4Mb/s) DVB-ASI

**Non-reclocked:** Any SD signal in the 143Mb/s to 540Mb/s range

**Connectors:** 2 BNC per IEC 60169-8 Amendment 2

**Equalization:** Automatic to 400m @ 270Mb/s with Belden 1694A or equivalent cable (325m in mixed HD/SD frame applications)

**Return Loss:** > 15 dB up to 270Mb/s

**Return Loss:** > 15 dB up to 270Mb/s

**Jitter:** < 0.2 UI

#### Physical:

Number of slots: 1

#### Electrical:

**Voltage:** + 12V DC

**Power:** 6 Watts

**EMI/RFI:** Complies with FCC Part 15 Class A  
EU EMC Directive

#### Serial Video Output:

**Number of Outputs:** (mode set by jumper)

**2 x 4 Mode:** 4 reclocked from each input

**1 x 8 Mode:** 8 reclocked from Input A (1)

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V ±0.5V

**Rise and Fall Time:** 740ps nominal

**Overshoot:** < 10% of amplitude

#### Ordering Information:

**500DA2Q** Dual SD Reclocking Distribution Amplifier (2 - 1 x 4)

#### Enclosure:

**500FR** **exponent** Compact High Density Distribution Frame

**S501FR** Standalone enclosure

# SDI Monitorin Reclocking Distribution Amplifier

## 500VMDA

exponent



The Evertz 500VMDA Reclocking Distribution Amplifier provides inexpensive distribution and monitoring of your SMPTE 259M (270MB/s) serial digital video signal. The DA features an auto-equalized input with nine outputs that can be selected as either SDI or composite analog. The 500VMDA in conjunction with the 500DCDA-HD gives an upgrade path to monitoring future HD SDI signals without having to re-wire your installation.

The 500VMDA is housed in the 3RU 500FR **exponent** frame that will hold up to 16 modules.

### Features

- Fully hot-swappable from front of frame with no BNC disconnect required
- Tally output on Frame Status bus upon loss of input signal
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

### Input:

- Supports SMPTE 259M-C (270Mb/s) video with embedded audio

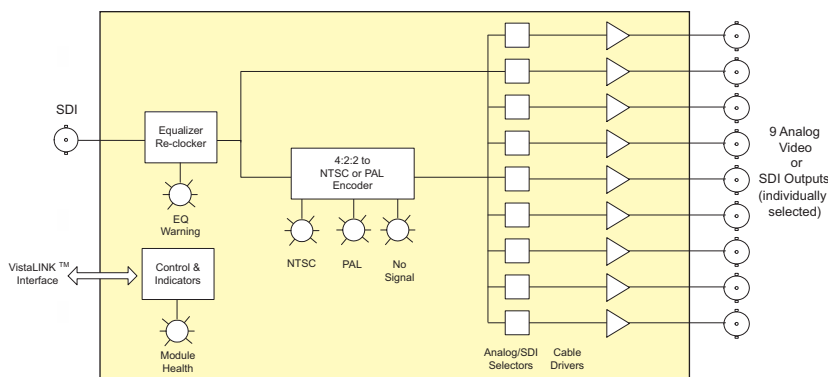
### Output:

- 9 outputs selectable as SDI or composite analog (NTSC/PAL)
- Independent isolated output drivers to ensure no cross channel leading effects (i.e. no need to terminate unused outputs)
- Selectable NTSC pedestal on/off
- Passes embedded audio to SDI output

### Card Edge LEDs:

- Reclocker Locked
- Max. Equalization Warning
- Module Health Status
- Video present, cable length warning and video standard LEDs

### 500VMDA Block Diagram & Rear Panel



### Specifications

#### Serial Video Input:

**Standards:** SMPTE 259M-C (270Mb/s) 525 or 625 line.  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 430m @ 270Mb/s with Belden 1694A or equivalent cable (340m with HD-SDI modules within 500FR frame)  
**Return Loss:** > 15 dB up to 270Mb/s  
**Embedded Audio:** SMPTE 272M-A

#### Electrical:

**Voltage:** +12VDC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15 Class A  
 EU EMC Directive

#### Physical:

**Number of Slots:** 1

#### Serial Video Output:

**Number of Outputs:** Up to 9 reclocked outputs (jumper selectable)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 470ps nominal  
**Overshoot:** < 10% of amplitude  
**Return Loss:** > 15 dB up to 270Mb/s  
**Wide Band Jitter:** < 0.2 UI

#### Ordering Information

**500VMDA** SDI Monitoring Reclocking Distribution Amplifier

#### Enclosure:

**500FR** **exponent**  
**S501FR** Compact High Density Distribution Frame  
 Standalone enclosure

#### Analog Video Output:(User selectable as additional SDI Outputs)

**Number of Outputs:** Up to 9 (jumper selectable)  
**Standards:** NTSC, SMPTE 170M if input is 525i/59.94  
 PAL-B ITY 624-4 if input is 625i/50  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 1 V p-p nominal  
**DC Offset:** 0V ±0.1V  
**Return Loss:** > 35 dB up to 5 MHz







The 500DA-AESB is a four output reclocking and auto equalizing DA for balanced 110Ω AES signals. The DA automatically equalizes up to 300m of Belden 1800B cable and provides reclocked outputs with sampling frequencies of 32kHz, 44.1kHz, 48kHz and 96kHz. The 500DA-AESB card edge LED indicators provide quick and accurate assessment of the incoming signal integrity.

The 500DA-AESB is housed in the 3RU 500FR **exponent** frame that will hold up to 16 modules.

### Features

- Data reclocking provides jitter reduction
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

### Inputs:

- AES3-1992 standard for AES audio on 110Ω twisted pair cable
- EQ and reclock provide extended cable length compensation (>300m)
- Transformer coupled 110Ω balanced input

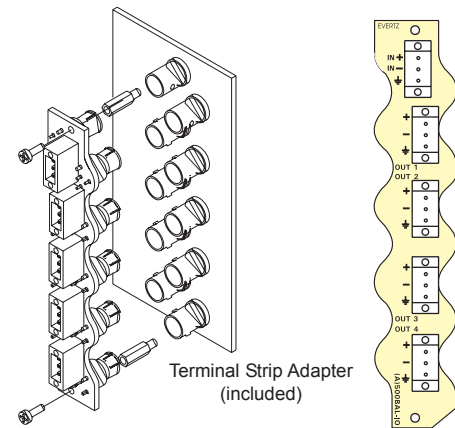
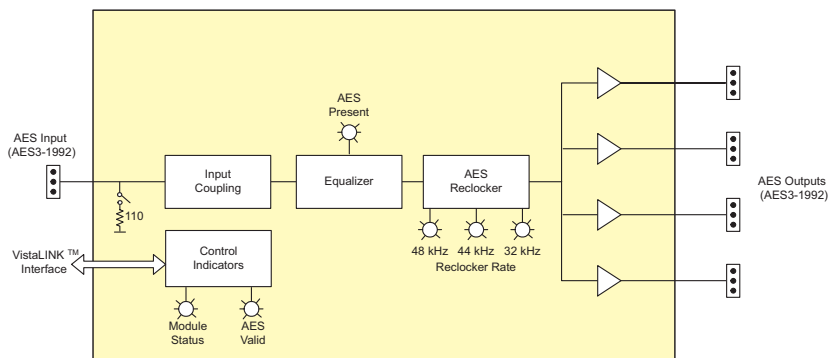
### Outputs:

- Four 110Ω balanced

### Card Edge LEDs:

- Module Health Status
- Error LED indication for input PLL out of lock, parity error or biphas coding error
- Reclocked locked

### 500DA-AESB Block Diagram & Rear Panel



### Specifications

#### AES Input:

**Standard:** AES3-1992  
**Number of Inputs:** 1  
**Connector:** 3 pin removable terminal strip  
**Input Level:** 2 to 7V p-p  
**Coupling:** Transformer  
**Input Impedance:** 110Ω  
**Return Loss:** >14dB 100kHz to 6MHz  
**Equalization:** Automatic to 300m with Belden 1800B (or equivalent) @ 48kHz AES signal  
**Sampling Frequency:** 32kHz, 44.1kHz, 48kHz and 96kHz

#### AES Output:

**Number of Outputs:** 4 Balanced AES reclocked  
**Connector:** 3 pin removable terminal strip (screwdown adapter module included)  
**Output Level:** 5V p-p  
**Output Impedance:** 110Ω  
**Return Loss:** >30dB 100kHz to 6MHz

#### Physical:

**Number of Slots:** 1

#### Electrical:

**Voltage:** +12VDC  
**Power:** 5 Watts  
**EMI/RFI:** Complies with FCC Part 15 Class A  
 EU EMC Directive

#### Ordering Information:

**500DA-AESB** Balanced AES Audio Distribution Amplifier (1x4)

#### Enclosure:

**500FR** **exponent** Compact High Density Distribution Frame  
**S501FR** Standalone enclosure

# Unbalanced AES Audio Distribution Amplifier

## 500DA-AESU

exponent



The 500DA-AESU is a nine output reclocking and auto equalizing DA for unbalanced 75Ω AES signals. The DA automatically equalizes up to 1500m of Belden 1694A coax and provides reclocked outputs with sampling frequencies of 32kHz, 44.1kHz, 48kHz and 96kHz. The 500DA-AESU card edge LED indicators provide quick and accurate assessment of the incoming signal integrity.

The 500DA-AESU is housed in the 3RU 500FR **exponent** frame that will hold up to 16 modules.

### Features

- Data reclocking provides jitter reduction
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

### Inputs:

- SMPTE 276M standard for AES audio on 75Ω coax
- EQ and reclock provide extended cable length compensation (>1500m)
- Transformer coupled 75Ω unbalanced input

### Outputs:

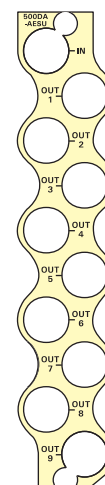
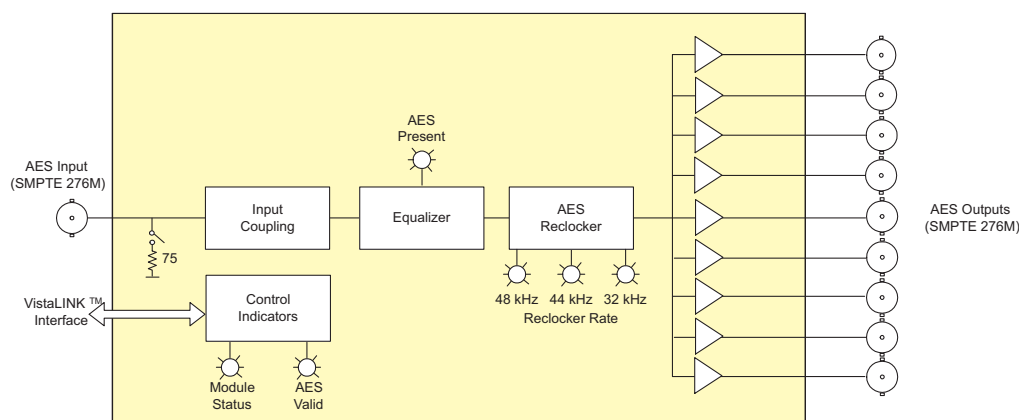
- Nine 75Ω coax outputs

### Card Edge LEDs:

- Module Health Status
- Error LED indication for input PLL out of lock, parity error or biphas coding error
- Reclocker locked

7

### 500DA-AESU Block Diagram & Rear Panel



### Specifications

#### AES Input:

**Standard:** SMPTE 276M  
**Number of Inputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Input Level:** 1V p-p  
**Coupling:** Transformer  
**Input Impedance:** 75Ω  
**Return Loss:** >25dB 100kHz to 6MHz  
**Equalization:** Automatic to 1500m with Belden 1694A (or equivalent) @ 48kHz AES signal  
**Sampling Frequency:** 32kHz, 44.1kHz, 48kHz and 96kHz

#### AES Output:

**Number of Outputs:** 9 Unbalanced AES  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Output Level:** 1V p-p  
**Output Impedance:** 75Ω  
**Return Loss:** >25dB 100kHz to 6MHz

#### Physical:

**Number of Slots:** 1

#### Electrical:

**Voltage:** +12VDC  
**Power:** 5 Watts  
**EMI/RFI:** Complies with FCC Part 15 Class A  
 EU EMC Directive

#### Ordering Information:

**500DA-AESU** Unbalanced AES Audio Distribution Amplifier (1x9)

#### Enclosure:

**500FR** **exponent** Compact High Density Distribution Frame  
**S501FR** Standalone enclosure



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# Dual Unbalanced AES Audio Distribution Amplifier

## 500DA2Q-AESU



The 500DA2Q-AESU provides an economical method of distribution for your AES digital audio signals. The DA's feature two auto-equalized inputs with four re-clocked outputs each. The module can also be configured for one input with eight relocked outputs for applications where a larger number of outputs is required.

The 500DA2Q-AESU is housed in the 500FR **exponent** frame that will hold up to 16 modules.

### Features

- Supports SMPTE 276M standard for AES audio on 75Ω coax
- 2 independent distribution amplifiers with 4 relocked outputs provides jitter reduction
- Can be configured as one 8 output distribution amplifier
- Automatic equalization provides extended cable length capabilities
- Card edge indicators for PLL out of lock, parity error or bi-phase coding errors
- Tally output of input error conditions
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

### Inputs:

- 2 inputs
- SMPTE 276M standard for AES audio on 75Ω coax
- EQ and reclock provide extended cable length compensation (>1500m)
- Transformer coupled 75Ω unbalanced input

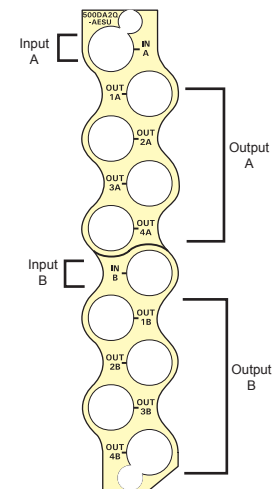
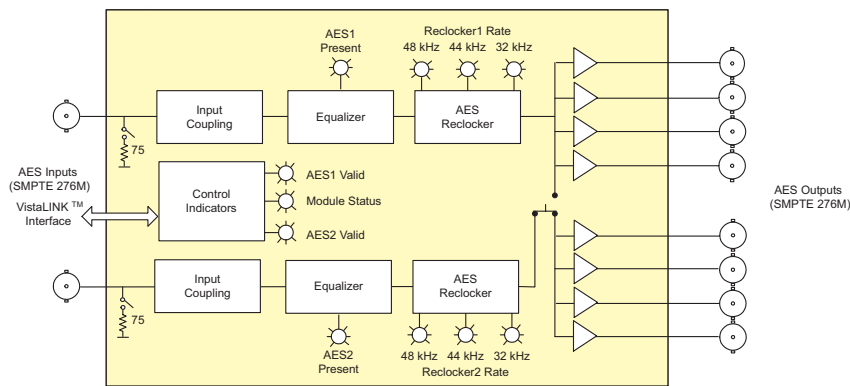
### Outputs:

- 4 relocked outputs per input

### Card Edge LEDs:

- Module Health Status
- Error LED indication for input PLL out of lock, parity error or biphas coding error
- Reclocker locked

### 500DA2Q-AESU Block Diagram & Rear Panel



### Specifications

#### AES Audio Inputs:

**Number of Inputs:** 2  
**Standard:** SMPTE 276M, single ended AES  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Coupling:** Transformer  
**Signal Level:** 1V p-p ±0.1V  
**Equalization:** Automatic 1500m @48kHz with Belden 1694A or equivalent cable

**Impedance:** 75Ω  
**Return Loss:** >25 dB 100 kHz to 6 MHz  
**Sampling Rate:** 32 kHz, 44.1 kHz, 48 kHz and 96 kHz

#### AES Audio Outputs:

**Number of Outputs:** 4 relocked outputs per input (normal)  
 8 outputs from input 1 (jumper selectable)  
**Standard:** SMPTE 276M, single ended AES  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 1V p-p ±0.1V  
**Impedance:** 75Ω unbalanced  
**Return Loss:** >25 dB 100 kHz to 6 MHz

#### Electrical:

**Voltage:** + 12VDC  
**Power:** 1.2 Watts

#### Physical:

**Number of slots:** 1

#### Ordering Information:

**500DA2Q-AESU** SDI Dual Reclocking Distribution Amplifier (2 - 1 x 4)

#### Enclosure:

**500FR** **exponent** Compact High Density Distribution Frame  
**S501FR** Standalone enclosure



# Unbalanced AES Audio DAC & Distribution Amplifier

## 500AMDA-AESU

exponent



The 500AMDA-AESU is a five output reclocking and auto equalizing AES Audio DAC & Distribution Amplifier for unbalanced 75Ω AES signals. It is also a high quality 24-bit audio DAC. The 500AMDA-AESU automatically equalizes up to 1000m of Belden 1694A coax and provides reclocked outputs. The 500AMDA-AESU also converts AES/EBU digital signal to 2 balanced analog audio outputs. The input sample rates supported are 32kHz, 44.1kHz and 48kHz. Analog audio output levels may be set individually from the front panel.

Level control is provided via a card edge toggle. The full scale digital signal can be calibrated to produce analog peak levels ranging from 12dBu to 24.8dBu with 0.1dB resolution. The 500AMDA-AESU card edge LED indicators provide quick and accurate assessment of the incoming signal integrity. Balanced analog audio is provided via a terminal strip adapter.

The 500AMDA-AESU is housed in the 3RU 500FR **exponent** frame that will hold up to 16 modules.

### Features

- 24-bit, high-quality D/A conversion
- 44.1kHz, 32kHz and 48kHz sampling rates supported
- 0dBFS programmable from 12dBu to 24.8dBu
- Support for 2 channels of balanced analog audio (1 AES/EBU)

### Inputs:

- AES3-2003 standard for AES audio on 75Ω coax
- EQ and reclock provide extended cable length compensation (>1000m)

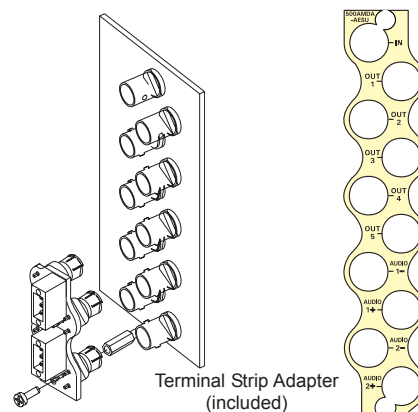
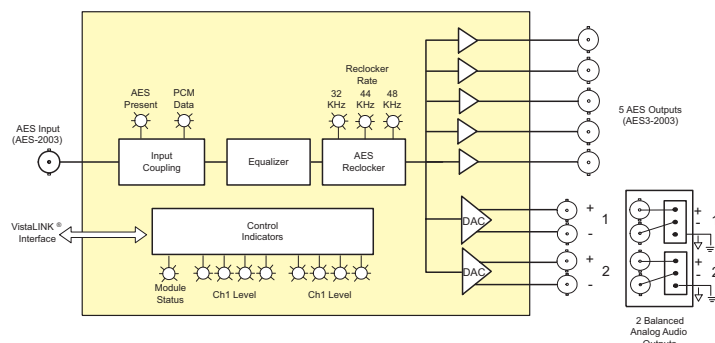
### Outputs:

- Five 75Ω coax outputs
- 2 balanced analog audio outputs

### Card Edge LEDs:

- Module Health Status
- AES signal present
- Detected AES sample rate
- PCM versus non-PCM data
- Audio level bargraph with ballistics
- VistaLINK® - capable for remote monitoring via SNMP(using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

### 500AMDA-AESU Block Diagram & Rear Panel



### Specifications

#### AES Audio Input:

**Number of Inputs:** 1  
**Standard:** AES3-2003, unbalanced AES  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 0.1 to 2.5 Vp-p  
**Equalization:** >1000m @ 48kHz with 1 Vp-p drive and Belden 1694A or equivalent coax cable  
**Resolution:** 24 bits  
**Sample Rate:** 32, 44.1, 48 kHz; ±100 ppm  
**Input Impedance:** 75Ω, AC-coupled  
**Return Loss:** > 25 dB, 100 kHz to 6.0 MHz  
**BNC Grounding:** AC-coupled (for 60 Hz ground loop current protection)

#### AES Audio Outputs:

**Number of Outputs:** 5  
**Standard:** AES3-2003, unbalanced AES  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Sample Rate:** Same as input  
**Impedance:** 75Ω unbalanced  
**Return Loss:** > 25 dB, 100 kHz to 6.0 MHz

#### Analog Audio Outputs:

**Number of Outputs:** 2  
**Type:** Balanced analog audio  
**Connector:** Two 3 pin removable terminal strips on BNC adapter panel  
**Output Impedance:** 66Ω  
**Output Load:** 600Ω or high impedance (10 kΩ)

**Signal Level:** 0dB FS => +12 to +24.8 dBu into 10 kΩ load (user settable)  
**DC Offset:** < ± 30mV  
**Freq. Response:** < ± 0.05dB (20Hz to 20kHz)  
**Dynamic Range:** 24 bits  
**THD+N:** < -100dB RMS @ 1kHz, with 24dBu output  
**SNR:** > 110dB RMS (20Hz to 20kHz), "A" weighted  
**Inter-Channel Phase Error:** < ± 1° (20Hz to 20kHz)  
**Crosstalk Isolation:** > 110dB RMS (20Hz to 20kHz), unweighted  
**Digital to Analog Delay:** 0.95m sec

#### Electrical:

**Voltage:** + 12VDC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15 Class A  
 EU EMC Directive

#### Physical:

**Number of slots:** 1

#### Ordering Information:

**500AMDA-AESU** Unbalanced AES Audio DAC & Distribution Amplifier (5 AES out & 2 balanced analog out)

#### Enclosure:

**500FR** Compact High Density Distribution Frame  
**S501FR** Standalone enclosure

**exponent**

Compact High Density Distribution Frame  
 Standalone enclosure



The 500ADA Analog Distribution Amplifier is a general purpose amplifier for distributing 75Ω analog signals. The 500ADA features one balanced input with nine outputs. The 500ADA has been designed to distribute a wide range of analog video signals. It can also distribute other pulses and signals that do not exceed 2Vp-p.

The 500ADA is housed in the 3RU 500FR **exponent** frame that will hold up to 16 modules.

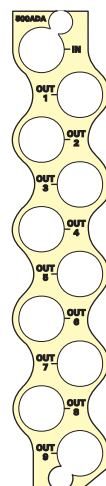
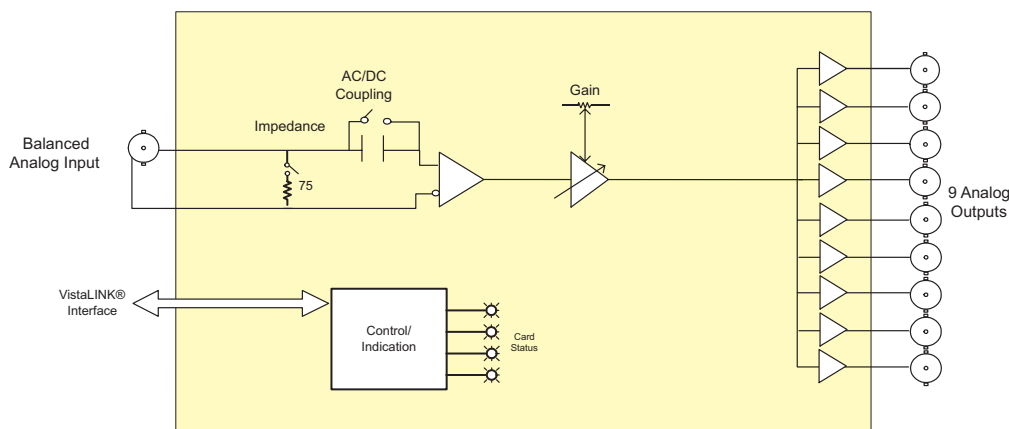
### Features

- 75Ω or high impedance input (jumper selectable)
- High common mode range and common mode rejection ratio (CMRR)
- Gain control
- Jumper selectable AC or DC coupling
- Looping feature with external "T" connector
- Consistent input impedance if card power is lost
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

### Card Edge LEDs:

- Module status/Local Fault
- Power supply status

### 500ADA Block Diagram & Rear Panel



### Specifications

#### Analog Video Input:

<b>Standards:</b>	Any analog video format, up to 2Vp-p and 30MHz bandwidth
<b>Connector:</b>	1 BNC per IEC 60169-8 Amendment 2
<b>Common mode range:</b>	>6Vp-p
<b>CMRR:</b>	>70dB to 1kHz
<b>Signal amplitude:</b>	2.5Vp-p max
<b>Impedance:</b>	75Ω terminated, 35kΩ Hi-Z (jumper selectable)
<b>Coupling:</b>	AC or DC (jumper selectable)
<b>Return loss:</b>	>40dB to 10MHz, >30dB to 30MHz

#### Analog Video Outputs:

<b>Number of Outputs:</b>	9 Per Card
<b>Connector:</b>	BNC per IEC 60169-8 Amendment 2
<b>Output impedance:</b>	75Ω
<b>Gain control range:</b>	± 5dB
<b>Freq. Response:</b>	<±0.05dB (to 5.5MHz)
<b>Differential Gain:</b>	<0.17 %
<b>Differential Phase:</b>	< 0.19°
<b>C/L gain inequality:</b>	<±0.1%
<b>C/L Delay:</b>	<±2ns
<b>Output isolation:</b>	42dB to 10MHz, 32dB to 30MHz
<b>Output return loss:</b>	>40dB to 30MHz
<b>Noise performance:</b>	<-78dB RMS NTC7 weighting <-70dB RMS 15kHz to 5.5MHz

#### Electrical:

<b>Voltage:</b>	+12VDC
<b>Power:</b>	1.2 Watts
<b>EMI/RFI:</b>	Complies with FCC Part 15 Class A, EU EMC Directive

#### Physical:

<b>Number of Slots:</b>	1
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#### Ordering Information:

<b>500ADA</b>	Analog Video Distribution Amplifier (1 x 9)
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#### Enclosures:

<b>500FR</b>	<b>exponent</b> Compact High Density Distribution Frame
<b>S501FR</b>	Standalone enclosure

# Analog Video Distribution Amplifier with Cable Equalization

## 500ADA-EQ

exponent



The 500ADA-EQ Analog Distribution Amplifier is a general purpose amplifier for distributing 75Ω analog video signals.

The 500ADA-EQ features one balanced equalized input with nine unbalanced outputs. The 500ADA-EQ amplifier has been designed to distribute a wide range of analog video signals. It can also distribute other pulses and signals that are less than 2Vp-p.

The 500ADA-EQ is housed in the 3RU 500FR **exponent** frame that will hold up to 16 modules.

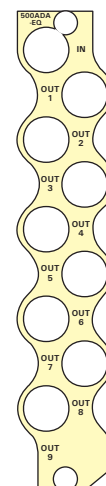
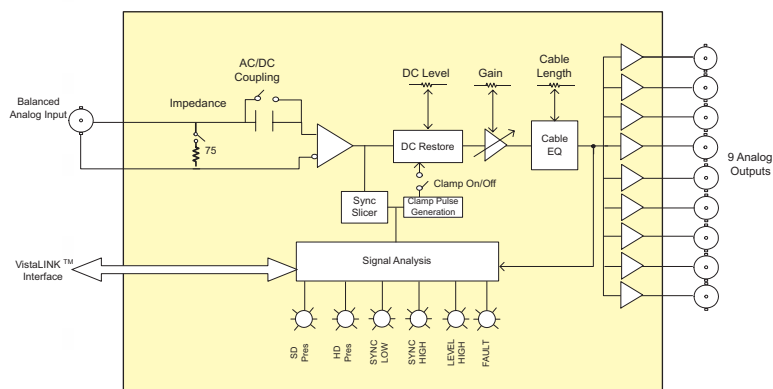
### Specifications

- 75Ω or high impedance input (jumper selectable)
- High common mode range and common mode rejection ratio (CMRR)
- Gain control
- Jumper selectable AC or DC coupling
- Jumper selectable fast or slow back porch clamp
- DC level control when clamp is enabled
- Cable equalizer adjustment range: 0 to 300m of 8281 or 1694
- Looping feature with external "T" connector
- Consistent input impedance if card power is lost
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

### Card Edge LEDs:

- Module status/Local Fault
- Power supply status
- EQ Warning

### 500ADA-EQ Block Diagram & Rear Panel



### Specifications

#### Analog Video Input:

**Standards:** Any analog video format, up to 2Vp-p and 30MHz bandwidth

**Connector:** 1 BNC per IEC 60169-8 Amendment 2

**Common mode range:** >6Vp-p

**CMRR:** >70dB to 1kHz

**Signal amplitude:** 2.5Vp-p max

**Cable equalizer:** 0 to 300m of Belden 8281 or 1694A cable

**Impedance:** 75Ω terminated, 35kΩ Hi-Z (jumper selectable)

**Coupling:** AC or DC (jumper selectable)

**Return loss:** > 40dB to 10MHz, >30dB to 30MHz

**Clamp range:** >± 600mV

**Fast clamp attenuation of 60Hz:** >36dB

#### Analog Video Outputs:

**Number of Outputs:** 9 Per Card

**Connector:** BNC per IEC 60169-8 Amendment 2

**Output impedance:** 75Ω

**Gain control range:** ± 5dB

**DC Level:** < ± 100mV (with DC Coupling active and back porch clamp disabled)

**DC Level Control range:** < ± 200mV (with back porch clamp enabled)

**Freq. Response:** < ±0.05dB no equalization  
< ±0.09dB for 5 to 100m Belden 8281 or 1694A (to 5.5MHz)  
< ±0.15dB for 100 to 300m Belden 8281 or 1694A (to 5.5MHz)

**Differential Gain:** <0.17 % 0 to 300m

**Differential Phase:** < 0.19° 0 to 300m

**C/L gain inequality:** <±0.1% for all cable lengths

**C/L Delay:** <±2ns

**Output isolation:** >42dB to 10MHz, >32 dB to 30MHz

**Output return loss:** >40dB to 30MHz

**Noise performance:** <-78dB RMS NTC7 weighting, <-70dB RMS 15kHz to 5.5MHz

#### Electrical:

**Voltage:** +12VDC

**Power:** 1.2 Watts

**EMI/RFI:** Complies with FCC Part 15 Class A EU EMC Directive

#### Physical:

**Number of Slots:** 1

#### Ordering Information:

**500ADA-EQ** Analog Video Distribution Amplifier with Cable Equalization (1 x 9)

#### Enclosure:

**500FR** **exponent** Compact High Density Distribution Frame

**S501FR** Standalone enclosure



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The 500ADA-AUD Analog Audio Distribution Amplifier is a general purpose 1x4 amplifier for distributing analog audio signals.

The 500ADA-AUD can be operated with either differential or single ended inputs and offers a wide range of gain adjustment to handle a wide variety of input signals.

The 500ADA-AUD is housed in the 500FR **exponent** frame that will hold up to 16 modules.

### Features

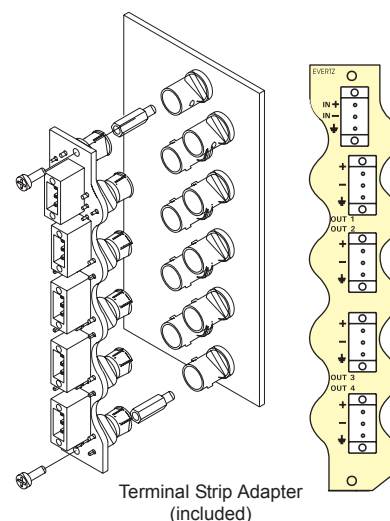
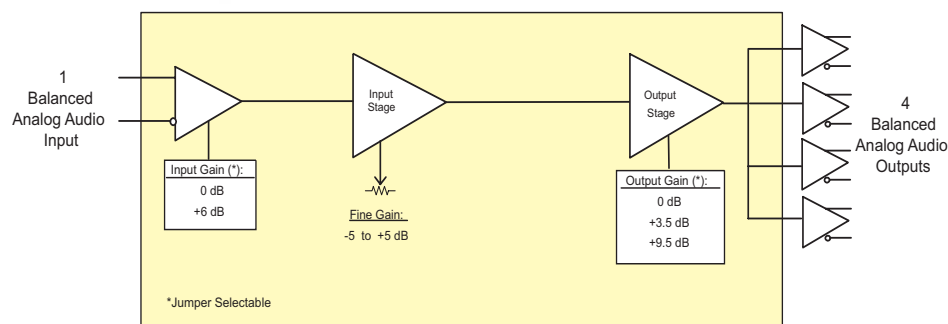
- Differential and single ended input (automatic single ended to differential conversion)
- High impedance inputs
- Low impedance outputs
- Wide gain adjustment range
- High common mode range and common mode rejection ratio
- Very high SNR

- Very low THD+N
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

### Card Edge LEDs:

- Module status/Local Fault
- Power supply status

### 500ADA-AUD Block Diagram & Rear Panel



### Specifications

#### Analog Audio Input:

**Standards:** Any analog audio signal  
**Number of inputs:** 1 (Balanced or Single ended)  
**Connectors:** 3 pin removable terminal strips  
**Input step gain:** 0 dB or +6 dB (configurable with jumpers)  
**Fine gain control:** -5 to +5 dB (card edge pot adjustable)

**Maximum input level:**  
 0 dB input gain: +34 dBu  
 +6 dB input gain: +28 dBu  
**Common mode rejection:** > 105 dB @ 60 Hz  
**Common mode range:**  
 0 dB input gain: >  $\pm 22$  V  
 +6 dB input gain: >  $\pm 7$  V  
**Input impedance:**  
 0 dB input gain: 44k  $\Omega$   
 +6 dB input gain: 26k  $\Omega$

#### Analog Audio Outputs:

**Number of Outputs:** 4  
**Connectors:** 3 pin removable terminal strips  
**Output step gain:** 0, 3.5 or 9.5 dB (configurable with jumpers)  
**Max. output level:**  
 +28 dBu across hi-impedance load  
 +24 dBu into 600 $\Omega$  load  
**Output impedance:** 66 $\Omega$   
**Freq. Response:**  $\pm 0.03$  dB 20 Hz to 20 kHz

#### THD+N:

0.001% 20 Hz to 20 kHz @ 28 dBu, unweighted RMS

#### Output Isolation:

> 100 dB @ 1 kHz, 100 dB @ 20 kHz

#### Electrical:

**Voltage:** + 12VDC  
**Power:** 6 Watts

#### Physical:

**Number of slots:** 1

#### Ordering Information:

**500ADA-AUD** Analog Audio Distribution Amplifier

#### Enclosures:

**500FR** **exponent** Compact High Density Distribution Frame  
**S501FR** Standalone enclosure

# Word Clock Distribution Amplifier (1x9)

500ADA-W

exponent

The 500ADA-W is a SDIF-2 Word Clock distribution amplifier. The input can be configured to be high impedance or terminated to 75Ω. The 500ADA-W provides continuous voltage gain adjust from -6dB to +6dB. The module supports a maximum output signal of 5V.

The 500ADA-W is housed in the 3RU 500FR *exponent* frame that will hold up to 16 modules.

## Features

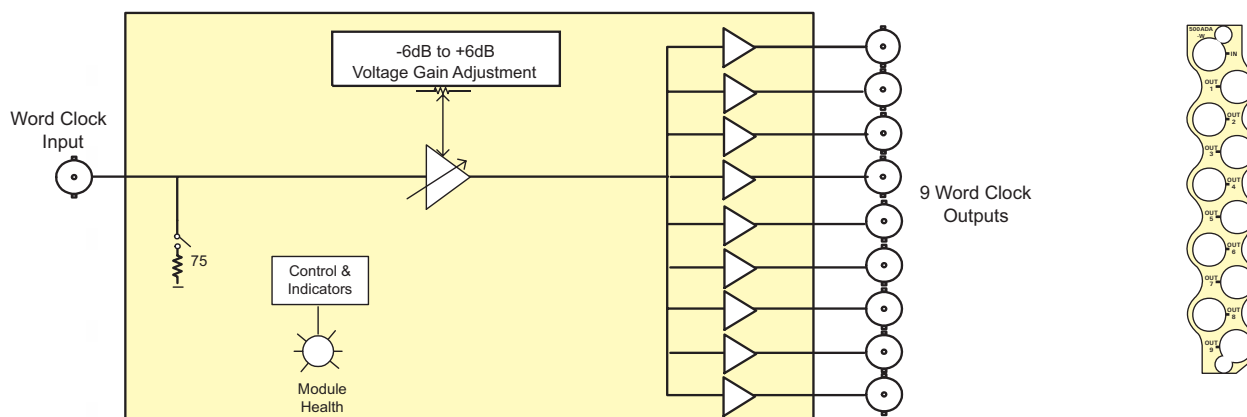
- Jumper selectable 75Ω or high impedance (1kΩ typical) input
- DA has voltage gain adjustment range from -6dB to +6dB
- Outputs can drive into 75Ω loads

## Card Edge LEDs:

- Module status/Local Fault
- Power supply status

7

## 500ADA-W Block Diagram & Rear Panel



## Specifications

### Word Clock Input:

Standard:	SDIF-2 Word Clock
Number of Inputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2
Level:	0 to 5V (terminated or unterminated)
Impedance:	Selectable 75Ω or high impedance (1kΩ typical)

### Word Clock Outputs:

Number of outputs:	9
Connector:	BNC per IEC 60169-8 Amendment 2
Output impedance:	75Ω
Maximum Output levels:	5V into 75Ω load 10V into high impedance load
Minimum Output Level:	0V
Voltage Gain Range:	-6dB to +6dB
Frequency range:	28 kHz - 50kHz

### Electrical:

Voltage:	+12VDC
Power:	1.2 Watts
EMI/RFI:	Complies with FCC Part 15 Class A, EU EMC Directive

### Physical:

Number of Slots:	1
------------------	---

### Ordering Information:

500ADA-W	Word Clock Distribution Amplifier(1x9)
Enclosures:	<i>exponent</i>
500FR	Compact High Density Distribution Frame
S501FR	Standalone enclosure

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# Unbalanced AES Word Clock Extractor Audio Distribution Amplifier

## 520DARS-W



The 520DARS-W provides a compact method of extracting word clock from your AES digital audio reference signals. The 520DARS-W features one auto-equalized input with 4 word clock outputs and 5 reclocked AES audio outputs.

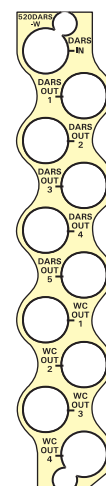
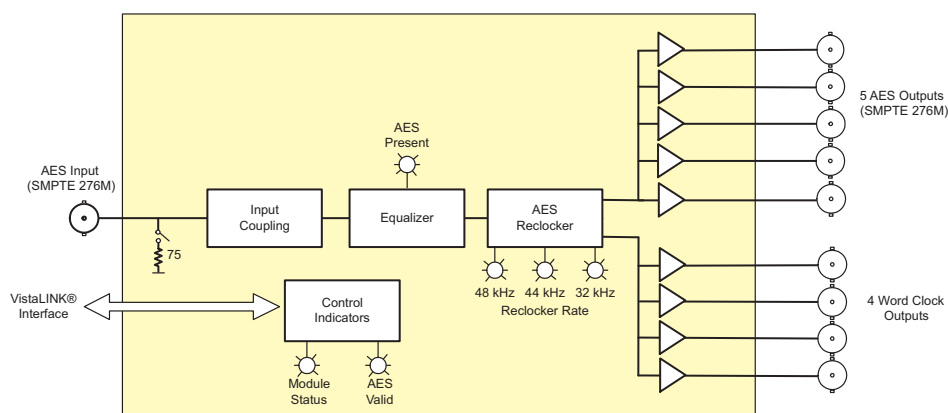
The 520DARS-W can be used in conjunction with the 5600MSC Master Clock/SPG system

The 520DARS-W is housed in the 3RU 500FR **exponent** Frame that will hold up to 16 modules.

### Features

- Supports AES audio over 75Ω coax (SMPTE 276M)
- 4 word clock outputs (AES11-2003)
- 5 reclocked AES outputs provides jitter reduction (SMPTE 276M)
- Automatic equalization provides extended cable length capabilities
- High impedance or 75Ω termination on input (jumper selectable)
- Card edge indicators for AES present, reclocker rate, and AES validity bit
- Tally output of input error conditions
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

### 520DARS-W Block Diagram & Rear Panel



### Specifications

#### AES Input:

**Standard:** SMPTE 276M  
**Number of Inputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Input Level:** 1V p-p  
**Coupling:** Transformer  
**Input Impedance:** 75Ω  
**Return Loss:** >25dB 100kHz to 6MHz  
**Equalization:** Automatic to 1500m with Belden 1694A (or equivalent) @ 48kHz AES signal  
**Sampling Frequency:** 32kHz, 44.1kHz, 48kHz and 96kHz

#### AES Output:

**Number of Outputs:** 5 Unbalanced AES  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Output Level:** 1V p-p  
**Output Impedance:** 75Ω  
**Return Loss:** >25dB 100kHz to 6MHz

#### Word Clock Outputs:

**Standard:** AES11-2003  
**Number of Outputs:** 4  
**Connectors:** BNC per IEC 169-8  
**Signal Level:** 5Vpp square wave (0-5V) ±0.5V

#### Physical:

**Number of Slots:** 1

#### Electrical:

**Voltage:** +12VDC  
**Power:** 5 Watts  
**EMI/RFI:** Complies with FCC Part 15 Class A  
 EU EMC Directive

#### Ordering Information:

**520DARS-W** Unbalanced AES Word Clock Extractor  
 Audio Distribution Amplifier (1x5)

#### Enclosure:

**500FR** **exponent**  
**S501FR** Compact High Density Distribution Frame  
 Standalone enclosure







The 520AE4 Audio Embedder embeds 4 stereo AES channels into 2 specified groups as defined by SMPTE 272M in a 270Mb/s serial SDTV video signal.

Several optional processing steps can be applied to the input audio before it is embedded. If needed, the 4 stereo AES input channels can be processed by 4 on-board sample rate converters (SRC's). The SRC's can be configured to automatically respect Dolby E & Dolby® Digital adding to ease of use & flexibility. The 8 discrete audio channels can be re-arranged in any arbitrary manner with on-board 8 x 8 router. The audio channels may be optionally and independently delayed up to 3 seconds.

This device also handles the Dolby E Metadata. Metadata is optionally embedded in VANC for downstream devices.

The 520AD4 is housed in the 3RU 500FR **exponent** frame that will hold up to 16 modules.

## Features

- Fast locking AES receivers
- Configurable or automatic SRC's on AES inputs
- Headphone jack with monitoring stereo channel
- Card edge display for status & audio channel peak levels bargraphs
- Audio channel router (8 x 8)
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

## Inputs:

- SMPTE 259M (270Mb/s)
- 4 Channel AES (unbalanced)
- 1 BNC for Dolby® metadata (RS422/485)

## Outputs:

- 4 processed outputs
- Program output bypass relay protected

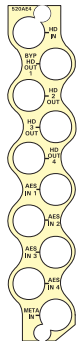
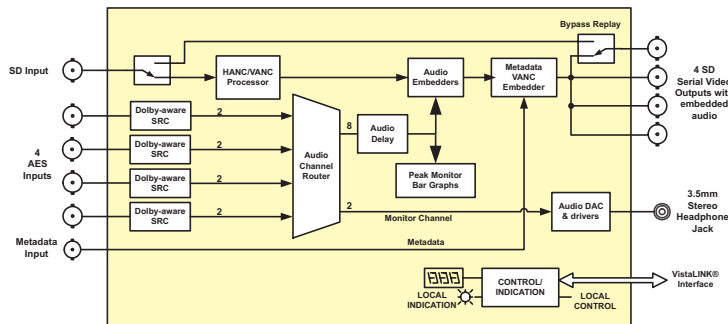
## Controls:

- Audio group selection
- Audio channel selection

## Card Edge LED's:

- Module Status
- Video Signal presence
- AES input presence/errors

## 520AE4 Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

**Standard:** SMPTE 259M-C (270Mb/s) 525 or 625 line component  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic >200m @ 270Mb/s with Belden 8281 (or equivalent), 25m with bypass relay installed

### Processed Serial Video Output:

**Standard:** Same as input or user controlled  
**Number of Outputs:** 4  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** Per standard  
**Overshoot:** <10% of amplitude  
**Wide Band Jitter:** <0.2 UI

### AES Input:

**Standard:** SMPTE 276M  
**Number of Inputs:** 4  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Input Level:** 0.1 to 2.5 Vp-p  
**Input Impedance:** 75Ω  
**Return Loss:** >25dB 100kHz to 6MHz  
**Equalization:** Automatic to 1000m with Belden 1694A (or equivalent) @ 48kHz AES signal  
**Sample Rate:** 48kHz ± 100ppm

### Metadata Input:

**Type:** Dolby E Metadata SMPTE RDD6  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Baud Rate:** 115,200 baud

### System Performance:

**Embedding Latency:** 600μs nominal  
**Audio Delay Range:** 0 to 3 seconds

### Electrical:

**Voltage:** +12V DC  
**Power:** 10 Watts  
**EMI/RFI:** Complies with FCC Part 15 Class A, EU EMC Directive

### Physical:

**Number of Slots:** 1

### Ordering Information:

**520AE4** SD Audio Embedder with 4 unbalanced AES inputs

### Enclosures:

**500FR** **exponent** Compact High Density Distribution Frame  
**S501FR** Standalone enclosure





**Specifications**

**AES Audio Input:**

**Number of Inputs:** 2 (program, backup)  
**Standard:** SMPTE 276M, unbalanced AES  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 0.1 to 2.5 Vp-p  
**Equalization:** Auto >1000m with 1 Vp-p drive and Belden 1694A or equivalent coax cable  
**Resolution:** 24 bits  
**Sample Rate:** 48 kHz;  $\pm 100$  ppm  
**Input Impedance:** 75 $\Omega$   
**Return Loss:** > 25 dB, 100 kHz to 6.0 MHz

**AES Audio Outputs:**

**Number of Outputs:** 6 (2 reclocked & 4 PCM decodes)  
**Standard:** SMPTE 276M, unbalanced AES  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Sample Rate:** 48kHz  
**Impedance:** 75 $\Omega$  unbalanced  
**Return Loss:** > 25 dB, 100 kHz to 6.0 MHz

**Genlock Input:**

**Type:** NTSC or PAL colour black sync (525 line or 625 line) or HD tri-level  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Impedance:** hi-Z or 75 jumper configurable  
**Return Loss:** >40dB to 10MHz

**Metadata Output:**

**Number of Outputs:** 1  
**Type:** Dolby® Metadata SMPTE RDD6  
**Connector:** BNC per IEC 60169-8 Amendment 2 (shared with LTC output as per user selection)  
**Signal Level:** <  $\pm 3V$  @ 4k $\Omega$  load  
**Output Impedance:** 50 $\Omega$ , DC coupled  
**Rise Times:** 200ns

**LTC Output:**

**Number of Outputs:** 1  
**Standard:** SMPTE 12M  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** Adjustable from 0.5 to 4.0Vp-p @1k $\Omega$  load  
**Output Impedance:** 50 $\Omega$   
**Rise Times:** 40 $\mu s \pm 10\mu s$

**Headphone Audio Outputs:**

**Number of Outputs:** 1  
**Type:** Stereo 3.5mm jack  
**Output Load:** 32 $\Omega$ +  
**Signal Level:** 100mW max, soft adjustable over 40dB range  
**THD+N:** 1%  
**SNR:** 90dB RMS, "A" weighted

**Electrical:**

**Voltage:** + 12VDC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15 Class A EU EMC Directive

**Physical:**

**Number of slots:** 1

**Ordering Information:**

**520DD-AESU** Dolby E Decoder

**Enclosures:**

**500FR** **exponent** Compact High Density Distribution Frame  
**S501FR** Standalone enclosure

# HD/SD Audio De-embedder & Dolby E/AC-3 Decoder & Re-embedder

## 520AD4-DD-HD

exponent

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The 520AD4-DD-HD Audio De-embedder and Dolby® Decoder & Re-embedder extracts embedded audio from 2 specified groups as defined by SMPTE 299M from a 1.5 Gb/s serial HD or as defined by SMPTE 272M from a 270Mb/s serial SD video signal.

One selected channel is processed by the on-card Dolby® Decoder. If the channel contains Dolby E or Dolby® Digital (AC3), it will yield up to 8 additional discrete audio channels and the associated Dolby E metadata. Up to 8 selected channels may be optionally delayed up to 3 seconds and re-embedded into the output video and/or directed to 4 AES outputs. Video output may be optionally delayed up to 7 frames to help with lip sync. If PCM audio is embedded, the device acts as a simple 2 group audio de-embedder.

This device also handles the Dolby E Metadata. Metadata is optionally embedded in VANC and can be provided as an output for downstream devices (i.e. Dolby Encoders, Multichannel Audio Tool, etc.). Dolby-E is capable of carrying LTC data embedded within its stream. It can be selected as an output, instead of metadata.

For lip sync cohesion and ease of editing, Dolby-E data is organized in blocks with lengths matching the associated video frame. The decoder will match the beginning of each output block with the start of video, as provided with the genlock input. Additional delay can be dialed up by the user, up to 3 secs. An extra AES input is provided that can be configured as a backup channel, in the event the primary is lost, or as a voice-over source. This input can be re-configured as a metadata input which can be embedded in VANC, instead of the metadata coming from Dolby Decoder.

VistaLINK® enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as Evertz VistaLINK® PRO locally or remotely.

The 520AD4-DD-HD is housed in the 3RU 500FR **exponent** frame that will hold up to 16 modules.

### Features

- Automatic switchover to backup audio source on loss of selected Dolby® stream
- Adjustable video delay to match Dolby® decoder audio delay (up to 7 frames)
- Headphone jack with monitoring stereo down-mix
- Dolby® Metadata is embedded in HD VANC for downstream device decoding (refer to 520AD4-HD brochure)
- Secondary AES input with backup, voice-over or Dolby E/AC3 content
- Card edge display for Dolby ® decoder status & audio channel peak levels bargraphs
- Flexible audio channel router
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

### Inputs:

- Program output bypass relay protected
- SMPTE 292M - (1.5Gb/s serial digital), or SMPTE 259M
- Genlock NTSC-M, PAL-B, any tri-level
- AES input for backup/voice-over source
- Metadata input

### Outputs:

- 2 processed HD outputs (1 protected with bypass relay)
- 4 AES de-embedded and processed outputs
- 1 BNC configurable as LTC or Dolby® metadata (RS422/485)

### Controls:

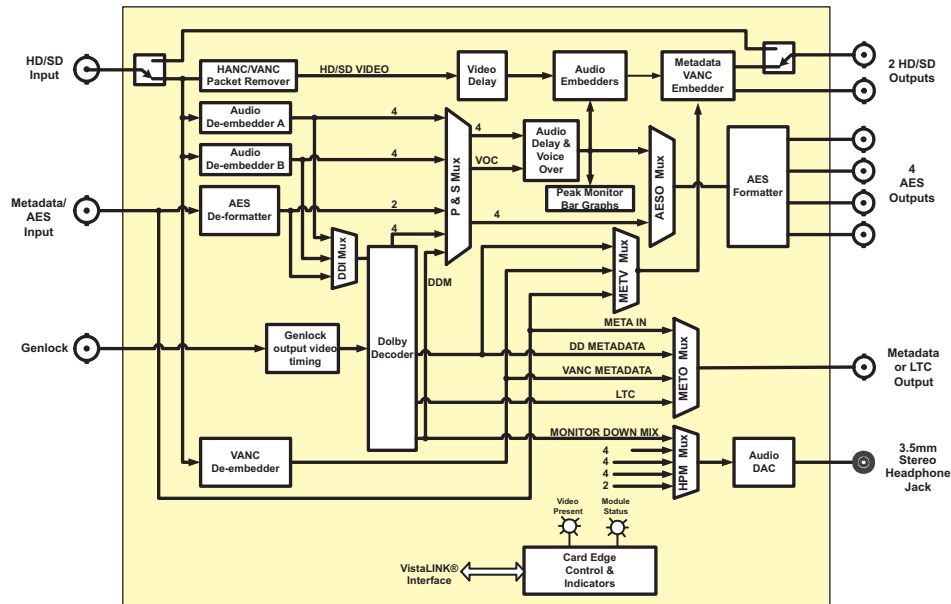
- Audio group selection
- Audio channel selection

### Card Edge LED's:

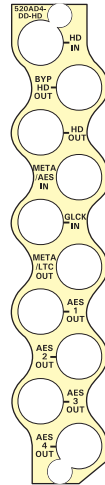
- Module Status
- Video Signal presence
- Selected audio group presence/errors
- Dolby® decoder processing status
- Genlock health/compatibility
- AES signal presence



### 520AD4-DD-HD Block Diagram & Rear Panel



Numbers refer to discrete audio channels



### Specifications

#### Serial Video Input:

**Standard:** SMPTE 292M, (1080i/60, 1080i/59.94, 1080i/50, 1080p/30(sF), 1080p/29.97(sF), 1080p/25(sF), 1080/24(sF), 1080/23.98(sF), 720p/60, 720p/59.94, 1035i/60, 1035i/59.94)  
SMPTE 259M-C (270Mb/s) 525 or 625 line component  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic 100m @ 1.5Gb/s with Belden 1694A (or equivalent), 25m with bypass relay active

#### Processed Serial Video Output:

**Standard:** Same as input  
**Number of Outputs:** 2  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** Per standard  
**Overshoot:** <10% of amplitude  
**Wide Band Jitter:** <0.2 UI

#### Metadata Input/Output:

**Type:** Dolby E Metadata SMPTE RDD6  
**Connector:** \*2 BNC per IEC 60169-8 Amendment 2 (\*BNC to DB9 dongles are provided)  
**Baud Rate:** 115,200 baud

#### AES Audio Input:

**Standard:** SMPTE 276M  
**Number of Inputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Input Level:** 0.1 to 2.5 Vp-p (5Vp-p tolerant)  
**Input Impedance:** 75Ω  
**Return Loss:** >25dB 100kHz to 6MHz  
**Equalization:** Automatic to 1000m with Belden 1694A (or equivalent) @ 48kHz AES signal  
**Sample Rate:** 48kHz ± 100ppm

#### AES Audio Output:

**Standard:** SMPTE 276M, single ended AES  
**Number of Outputs:** 4  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Sample Rate:** 48kHz  
**Impedance:** 75Ω  
**Resolution:** Up to 24-bit

#### Genlock Input:

**Type:** NTSC, PAL, black or any tri-level, all autodetect  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Impedance:** hi-Z or 75Ω (jumper configurable)  
**Return Loss:** >40dB to 10MHz

#### System Performance:

**AC3 Decode Delay:** 32ms nominal  
**Dolby E Decode Delay:** 1 frame nominal  
**De-embedding Latency:** 600μs nominal  
**Additional Audio Delay:** 0 to 3 seconds (user programmable)  
**Additional Video Delay:** 0 to 7 frames (user programmable)

#### Electrical:

**Voltage:** +12V DC  
**Power:** 10 Watts  
**EMI/RFI:** Complies with FCC Part 15 Class A, EU EMC Directive

#### Physical:

**Number of Slots:** 1

#### Ordering Information:

**520AD4-DD-HD** HD/SD Audio De-embedder & Dolby E/AC-3 Decoder & Re-embedder

#### Enclosures:

**500FR** **exponent** Compact High Density Distribution Frame  
**S501FR** Standalone enclosure



# HD/SD Audio De-embedder 520AD4-HD

exponent

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The 520AD4-HD Audio De-embedder extracts embedded audio from 2 specified groups as defined by SMPTE 299M from a 1.5 Gb/s video HD signal or, as defined by SMPTE 272M from a 270Mb/s SD video signal.

Up to 8 selected channels may be delayed up to 3 sec and re-embedded onto the output video and/or directed to 4 unbalanced AES outputs. An extra AES input is provided as a backup channel, in case of the loss of primary, or as the source of voice-over. The video output may also be delayed up to 5 frames to achieve lip sync with the audio.

The 520AD4-HD also embeds Dolby E Metadata in VANC. The module has multiple sources for this metadata including incoming VANC, and externally supplied metadata. The decoded or de-embedded Dolby E Metadata can be provided as an output for downstream devices (i.e. Dolby E Encoders etc.).

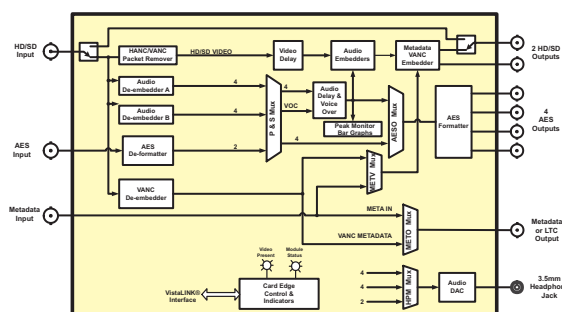
VistaLINK® enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as Evertz VistaLINK® PRO locally or remotely.

The 520AD4-HD is housed in the 3RU 500FR **exponent** frame that will hold up to 16 modules.

## Features

- Supports SMPTE 292M (1.5 Gb/s) or SMPTE 259M (270 Mb/s) serial digital video signals
- Video input relay bypass for power failure bypass protection.
- AES input for backup/voice-over source
- 2 processed video outputs
- 4 AES de-embedded and processed outputs
- 1 Dolby® Metadata output (RS422/485)
- De-embeds and re-embeds 2 audio groups - user selectable
- Selectable audio sources for AES and embedded outputs
- Adjustable video (up to 7 frames) and audio delay (up to 3 seconds) to achieve lip sync at output
- Headphone jack with monitoring stereo down-mix
- Card edge LEDs for module status, Video and Audio present
- Card edge display for card status & audio channel peak levels bar graphs
- Configurable Dolby® Metadata input and output
- VistaLINK® -enabled for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

## 520AD4-HD Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

**Standard:** SMPTE 292M, (1080i/60, 1080i/59.94, 1080i/50, 1080p/30(sF), 1080p/29.97(sF), 1080p/25(sF), 1080/24(sF), 1080/23.98(sF), 720p/50, 720p/60, 720p/59.94, 1035i/60, 1035i/59.94  
SMPTE 259M-C (270Mb/s) 525 or 625 line component

**Number of Inputs:** 1

**Connector:** BNC per IEC 60169-8 Amendment 2

**Equalization:** Automatic >200m @ 270Mb/s with Belden 8281 (or equivalent), 25m with bypass relay installed

### Processed Serial Video Output:

**Standard:** Same as input

**Number of Outputs:** 2

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V ±0.5V

**Rise and Fall Time:** Per standard

**Overshoot:** <10% of amplitude

**Wide Band Jitter:** <0.2 UI

### AES Input:

**Standard:** SMPTE 276M

**Number of Inputs:** 1

**Connector:** BNC per IEC 60169-8 Amendment 2

**Input Level:** 0.1 to 2.5 Vp-p

**Input Impedance:** 75Ω

**Return Loss:** >25dB 100kHz to 6MHz

**Equalization:** Automatic to 1000m with Belden 1694A (or equivalent) @ 48kHz AES signal

**Sample Rate:** 48kHz ± 100ppm

### AES Audio Output:

**Standard:** SMPTE 276M, single ended AES

**Number of Outputs:** 4

**Connector:** BNC per IEC 60169-8 Amendment 2

**Sample Rate:** 48kHz

**Impedance:** 75Ω

**Resolution:** Up to 24-bit

### Metadata Input:

**Type:** Dolby E Metadata SMPTE RDD6

**Connector:** 1 BNC per IEC 60169-8 Amendment 2

**Baud Rate:** 115,200 baud

### System Performance:

**Embedding Latency:** 600μs nominal

**Audio Delay Range:** 0 to 3 seconds

### Electrical:

**Voltage:** +12V DC

**Power:** 10 Watts

**EMI/RFI:** Complies with FCC Part 15 Class A,

EU EMC Directive

### Physical:

**Number of Slots:** 1

### Ordering Information:

**520AD4-HD** HD/SD Audio De-embedder with 4 unbalanced AES inputs

### Enclosures:

**500FR**

**S501FR**

**exponent**

Compact High Density Distribution Frame  
Standalone enclosure





The 520AE4-HD Audio Embedder embeds 4 stereo AES channels into 2 specified groups as defined by SMPTE 299M in a 1.5 Gb/s serial HDTV or as defined by SMPTE 272M in a 270Mb/s serial SDTV video signal.

Several optional processing steps can be applied to the input audio before it is embedded. If needed, the 4 stereo AES input channels can be processed by 4 on-board sample rate converters (SRC's). The SRC's can be configured to automatically respect Dolby E & Dolby® Digital adding to ease of use & flexibility. The 8 discrete audio channels can be re-arranged in any arbitrary manner with on-board 8 x 8 router. The audio channels may be optionally and independently delayed up to 3 seconds.

This device also handles the Dolby E Metadata. Metadata is optionally embedded in VANC for downstream devices.

The 520AD4-HD is housed in the 3RU 500FR **exponent** frame that will hold up to 16 modules.

## Features

- Fast locking AES receivers
- Configurable or automatic SRC's on AES inputs
- Headphone jack with monitoring stereo channel
- Card edge display for status & audio channel peak levels bargraphs
- Audio channel router (8 x 8)
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

## Inputs:

- SMPTE 292M - (1.5Gb/s), or SMPTE 259M - (270Mb/s)
- 4 Channel AES (unbalanced)
- 1 BNC for Dolby® metadata (RS422/485)

## Outputs:

- 4 processed HD outputs
- Program output bypass relay protected

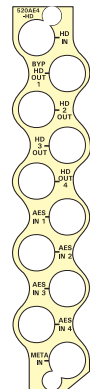
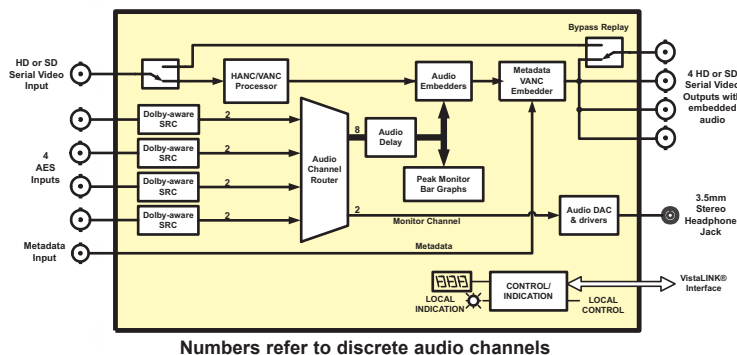
## Controls:

- Audio group selection
- Audio channel selection

## Card Edge LED's:

- Module Status
- Video Signal presence
- AES input presence/errors

## 520AE4-HD Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

**Standard:** SMPTE 292M, (1080i/60, 1080i/59.94, 1080i/50, 1080p/30(sF), 1080p/29.97(sF), 1080p/25(sF), 1080/24(sF), 1080/23.98(sF), 720p/50, 720p/60, 720p/59.94, 1035i/60, 1035i/59.94  
SMPTE 259M-C (270Mb/s) 525 or 625 line component  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic 100m @ 1.5Gb/s with Belden 1694A (or equivalent), 25m with bypass relay installed

### Processed Serial Video Output:

**Standard:** Same as input  
**Number of Outputs:** 4  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** Per standard  
**Overshoot:** <10% of amplitude  
**Wide Band Jitter:** <0.2 UI

### AES Input:

**Standard:** SMPTE 276M  
**Number of Inputs:** 4  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Input Level:** 0.1 to 2.5 Vp-p  
**Input Impedance:** 75Ω

### Return Loss:

>25dB 100kHz to 6MHz  
**Equalization:** Automatic to 1000m with Belden 1694A (or equivalent)  
@ 48kHz AES signal  
48kHz ± 100ppm

### Sample Rate:

### Metadata Input:

**Type:** Dolby E Metadata SMPTE RDD6  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Baud Rate:** 115,200 baud

### System Performance:

**Embedding Latency:** 600µs nominal  
**Audio Delay Range:** 0 to 3 seconds

### Electrical:

**Voltage:** +12V DC  
**Power:** 10 Watts  
**EMI/RFI:** Complies with FCC Part 15 Class A, EU EMC Directive

### Physical:

**Number of Slots:** 1

### Ordering Information:

**520AE4-HD** HD/SD Audio Embedder with 4 unbalanced AES inputs

### Enclosures:

**500FR** **exponent** Compact High Density Distribution Frame  
**S501FR** Standalone enclosure

# HD/SD Audio De-embedder 520AD8-HD

exponent

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The 520AD8-HD Audio De-embedder extracts embedded audio from all 4 groups as defined by SMPTE 299M from a 1.5 Gb/s serial HD or as defined by SMPTE 272M from a 270Mb/s serial SD video signal. Up to 16 selected channels may be de-embedded and directed to 8 AES outputs.

This device also handles the Dolby E Metadata. Metadata is optionally de-embedded from VANC and can be provided as an output for downstream devices (i.e. Dolby E or Dolby® AC3 Encoders etc.).

VistaLINK® enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as Evertz VistaLINK® PRO locally or remotely.

The 520AD8-HD is housed in the 3RU 500FR **exponent** frame that will hold up to 16 modules.

## Features

- Flexible de-embedded audio channels router (16 x 16)
- Headphone jack with monitoring stereo channel
- Card edge display for status & audio channel peak levels bargraphs
- VANC decode and output of Dolby® Metadata
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

## Outputs:

- 1 BNC Dolby® Metadata output (RS422/485)
- 8 AES de-embedded outputs

## Controls:

- Audio channel routing selection

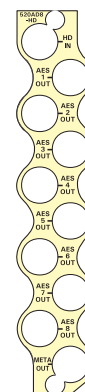
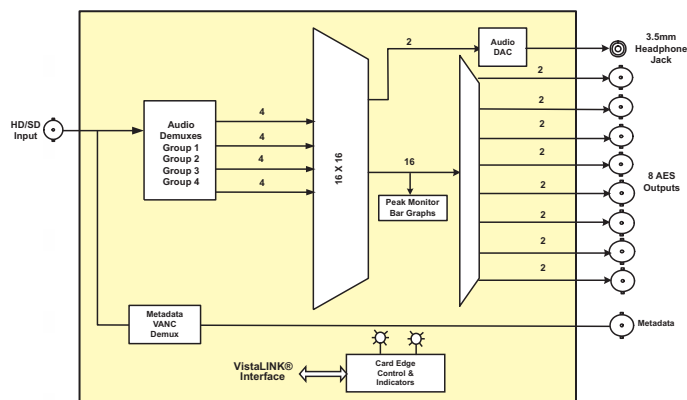
## Card Edge LED's:

- Module Status
- Video Signal presence
- Audio group presence/errors

## Inputs:

- SMPTE 292M (1.5Gb/s serial digital), or SMPTE 259M

## 520AD8-HD Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

**Standard:** SMPTE 292M, (1080i/60, 1080i/59.94, 1080i/50, 1080p/30(sF), 1080p/29.97(sF), 1080p/25(sF), 1080/24(sF), 1080/23.98(sF), 720p/23.98, 720p/24, 720p/50, 720p/60, 720p/59.94, 1035i/60, 1035i/59.94  
SMPTE 259M-C (270Mb/s) 525 or 625 line component

**Connector:** BNC per IEC 60169-8 Amendment 2

**Equalization:** Automatic 100m @ 1.5Gb/s with Belden 1694 (or equivalent)

### Metadata Output:

**Type:** Dolby E Metadata SMPTE RDD6

**Connector:** \*1 BNC per IEC 60169-8 Amendment 2 (\*BNC to DB9 dongles are provided)

**Baud Rate:** 115,200 baud

### AES Audio Output:

**Standard:** SMPTE 276M, single ended AES

**Number of Outputs:** 8

**Connector:** BNC per IEC 60169-8 Amendment 2

**Sample Rate:** 48kHz

**Impedance:** 75Ω

**Resolution:** Up to 24-bit

## System Performance:

### De-embedding

**Latency:** 600μs nominal (SD)  
200μs nominal (HD)

### Electrical:

**Voltage:** +12V DC

**Power:** 10 Watts

**EMI/RFI:** Complies with FCC Part 15 Class A, EU EMC Directive

### Physical:

**Number of Slots:** 1

## Ordering Information:

**520AD8-HD** HD/SD Audio De-embedder with 8 unbalanced AES outputs

### Enclosures:

**500FR** Compact High Density Distribution Frame

**S501FR** Standalone enclosure

**exponent**

Compact High Density Distribution Frame  
Standalone enclosure





The 520AE8-HD Embedder embeds 8 AES input signals (16 channels) as 4 groups into a 1.5Gb/s HD video signal (as specified in SMPTE 299M) or into a 270Mb/s serial SD video signal (as defined by SMPTE 272M).

Several optional processing steps can be applied to the input audio before it is embedded. If needed, the 8 AES input signals can be processed by 8 on board sample-rate converters (SRC's). This processing will automatically detect Dolby E / AC3 inputs and bypass the SRCs to maintain the integrity of the non-PCM audio data. Also, audio channels can be independently rearranged (using on-board 16x16 router) in any desired way before embedding.

The 520AE8-HD module also handles Dolby E Metadata. The module can optionally embed Metadata in the vertical ancillary data space (VANC) of HD/SD signals for downstream devices.

The 520AD8-HD is housed in the 3RU 500FR **exponent** frame that will hold up to 16 modules.

## Features

- Fast locking AES receivers
- Headphone jack with monitoring stereo channel
- Card edge display for status & audio channel peak levels bargraphs
- Dolby®-aware SRC (sample rate converters)
- Flexible audio channel router (16 x 16)
- VistaLINK® - capable for remote monitoring via SNMP (using VistaLINK® PRO) when installed in 500FR frame with 500FC VistaLINK® Frame Controller

## Inputs:

- SMPTE 292M - (1.5Gb/s serial digital), or SMPTE 259M
- 8 Channel AES (unbalanced)
- Dolby® metadata (RS422/485)

## Outputs:

- Program output bypass relay protected
- 1 processed HD output

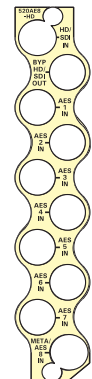
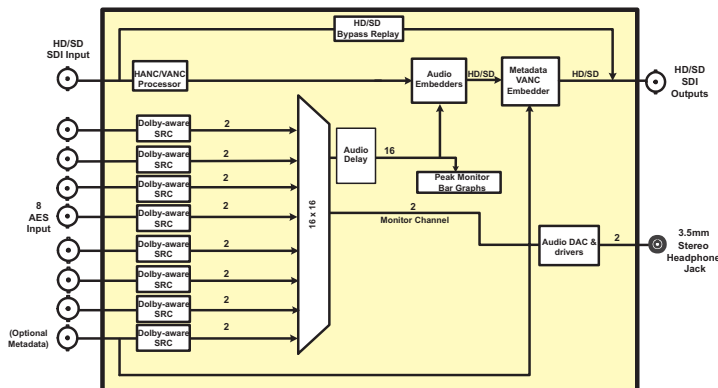
## Controls:

- Audio channel selection
- Embedded group enable/disable

## Card Edge LED's:

- Module Status
- Video Signal presence
- AES input presence/errors

## 520AE8-HD Block Diagram & Rear Panel



## Specifications

### Serial Video Input:

**Standard:** SMPTE 292M, (1080i/60, 1080i/59.94, 1080i/50, 1080p/30(sF), 1080p/29.97(sF), 1080p/25(sF), 1080/24(sF), 1080/23.98(sF), 720p/23.98, 720p/24, 720p/50, 720p/60, 720p/59.94, 1035i/60, 1035i/59.94  
SMPTE 259M-C (270Mb/s) 525 or 625 line component  
BNC per IEC 60169-8 Amendment 2

**Connector:** Automatic 100m @ 1.5Gb/s with Belden 1694A (or equivalent), 25m when bypass relay engaged

### Processed Serial Video Output:

**Standard:** Same as input or user controlled

**Number of Outputs:** 1

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V ±0.5V

**Rise and Fall Time:** Per standard

**Overshoot:** <10% of amplitude

**Wide Band Jitter:** <0.2 UI

### AES Input:

**Standard:** SMPTE 276M

**Number of Inputs:** 8

**Connector:** BNC per IEC 60169-8 Amendment 2

**Input Level:** 0.1 to 2.5 Vp-p

**Input Impedance:** 75Ω

**Return Loss:** >25dB 100kHz to 6MHz

### Equalization:

Automatic to 1000m with Belden 1694A (or equivalent) @ 48kHz AES signal

### Sample Rate:

48kHz ± 100ppm

### Metadata Input:

**Type:** Dolby E Metadata SMPTE RDD6

**Connector:** 1 BNC per IEC 60169-8 Amendment 2 (adapter to DB9 available)

**Baud Rate:** 115,200 baud

### System Performance:

**Embedding Latency:** 600μs nominal  
3ms (with SRC), 0.2ms (SRC off)

### Electrical:

**Voltage:** +12V DC

**Power:** 10 Watts

**EMI/RFI:** Complies with FCC Part 15 Class A, EU EMC Directive

### Physical:

**Number of Slots:** 1

### Ordering Information:

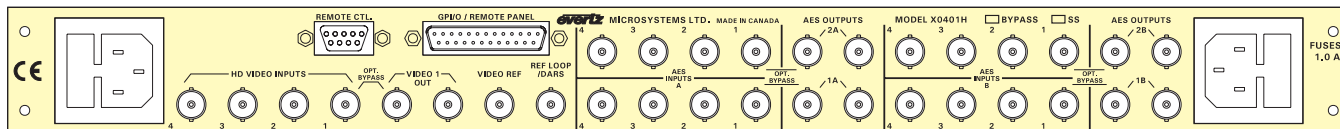
**520AE8-HD** HD/SD Audio Embedder with 8 unbalanced AES inputs

### Enclosures:

**500FR** **exponent** Compact High Density Distribution Frame

**S501FR** Standalone enclosure

## 4x1 HDTV Router with Quad 4x1 AES Audio X-0401H-AES4/HSS



**X-0401H-AES4 Rear Panel**

8

The X-0401H HDTV four input routing switcher provides a convenient, low cost way to route high definition and standard definition serial digital signals. The X-0401H routers are used for 1.5Gb/s, 270Mb/s, 360Mb/s, 540Mb/s and DVB-ASI serial digital signals. The unit can also be used for SMPTE 310M(19.4Mb/s) signals with the reclocker turned off. When the unit is ordered with the Quad 4x1 AES router option the AES output busses can be used in an "audio follow video" mode, or can be broken away from the video buss. The routers features redundancy protection by providing dual power supply and bypass relay options.

The router electronics are housed in a 1RU rackmount frame and is controlled from the built-in front panel controls. Each model can also be purchased with an optional rack mount remote control panel that replaces the built-in control panel or can be used as a second control panel. All units can also be controlled by contact closures on the GPI control port or through the RS-232 or RS-422 serial remote control port using industry standard switcher protocols.

### **SoftSwitch™ Features (X-0401H-AES4-HSS)**

Routers equipped with SoftSwitch™ have the following additional features. The video output has adjustable vertical timing with respect to the genlock input, and line synchronizers on the video inputs can accommodate differences in timing up to approximately  $\pm$  one half line providing clean video switches on the video output. All the AES outputs will have a continuous AES carrier locked to either the video genlock or DARS reference (when the DARS reference is used, Z bit alignment of the AES outputs is also guaranteed). The AES outputs use Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed on synchronous audio sources.

### **Embedded SoftSwitch™ Features (X-0401H-AES4-HES)**

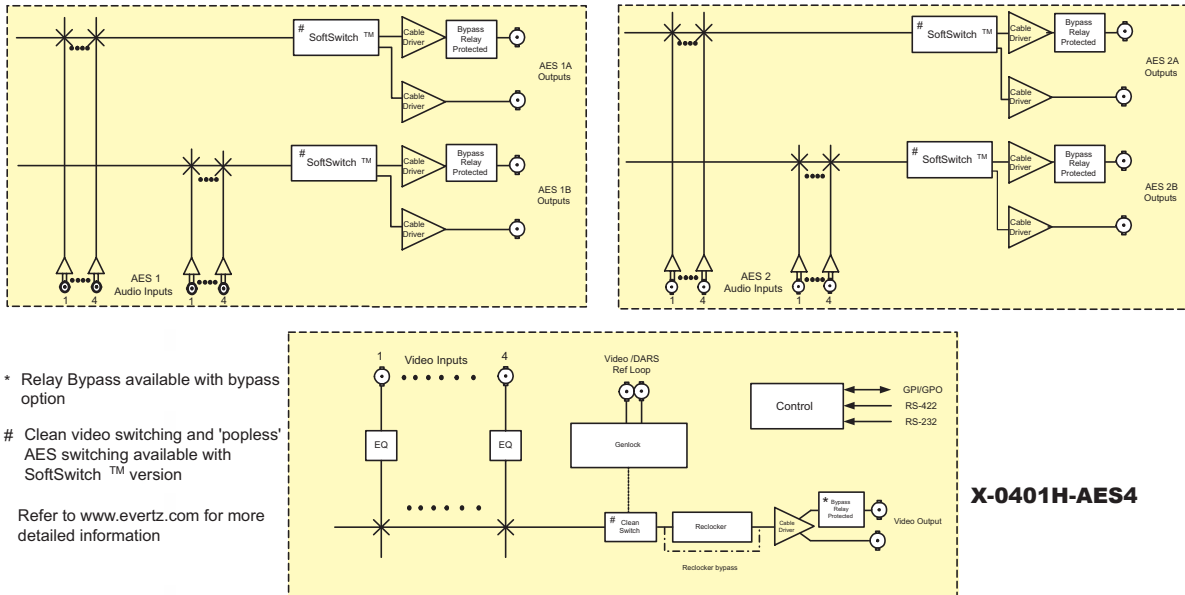
Routers equipped with the Embedded SoftSwitch™ have all the features of the SoftSwitch™ versions as well as the following additional features. The embedded audio on the Video 1 buss uses Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed. Embedded SoftSwitch™ is performed on all 4 audio groups.

### **Features**

- Supports SMPTE 292M (1.5Gb/s), SMPTE 259M (270, 360 or 540Mb/s) and DVB-ASI video signals
- Supports SMPTE 310M (19.4Mb/s) signals with reclocker turned off
- SoftSwitch™ equipped models eliminate hot-switch audio pop on AES outputs
- Auto timing of video inputs to perform a clean video switch on SoftSwitch™ & Embedded SoftSwitch™ versions
- Embedded SoftSwitch™ equipped versions eliminate hot-switch audio pops on embedded audio (all 4 audio groups)
- Switch point is fully controllable from the front panel
- Video input presence detection displayable on the front panel
- Front panel or remote control panel version available. Second control panel can be ordered for any version
- Programmable source input names available on the front panel
- Bypass verification test using main menu
- Field upgradeable firmware as new features become available
- Programmable tally output bus
- RS-422 remote control via GVG TEN-XL protocol
- SoftSwitch™ model provides clean video and popless AES switching
- Optional video and audio input relay bypass for power failure bypass protection
- Optional dual power configuration



## X-0401H Block Diagrams



## Specifications

### Video Inputs:

#### Standard:

SMPTE 292M (1.5Gb/s), SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s) and DVB-ASI  
SMPTE 310M with redlocker turned off

#### Number of Inputs:

4

#### Connector:

BNC per IEC 60169-8 Amendment 2

#### Equalization:

Automatic up to 100m @ 1.485Gb/s with Belden 1694A (or equivalent) cable (50m on input 1 when the +HBP is installed)  
> 15 dB up to 1.5 Gb/s

#### Return Loss:

Input Timing (On X-0401H-AES4-HSS & X-0401H-AES4-HES Routers)

#### Input Range:

Measured with respect to the Genlock reference  
±1/2 line when *Course phase* = 1, *Fine phase* = 0

### Video Outputs:

#### Standard:

Same as Input

#### Number of Outputs:

2 per buss, 1 buss

#### Connector:

Input 1 bypass protected with +HBP option

#### Signal Level:

BNC per IEC 60169-8 Amendment 2

#### DC Offset:

800mV nominal

#### Rise and Fall Time:

0V ±0.5V

#### Overshoot:

200ps for SMPTE 292

#### Return Loss:

950ps for SMPTE 259M

#### Jitter:

<10% of amplitude

#### Output Timing:

> 15 dB up to 1 Gb/s, > 12dB up to 1.5Gb/s

#### Output Phase:

< 0.2 UI  
Measured with respect to the Genlock reference Adjustable 1 line to a full frame of delay - set by *Coarse phase* parameter. The active video content will align to the nearest line

### AES Audio Inputs (AES4 versions only):

#### Standards:

SMPTE 276M single ended AES

#### Number of Inputs:

4 per buss, 4 busses

#### Connector:

BNC per IEC 60169-8 Amendment 2

#### Signal Level:

1V p-p ± 10%

#### Reference:

From Video Reference  
On SoftSwitch™ model, menu selectable to Video or DARS

### Video Reference:

#### Type:

Menu selectable - depends on video format NTSC or PAL Color  
Black 1 V p-p  
Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV  
HD Tri-level Sync

#### Connectors:

2 BNC per IEC 60169-8 Amendment 2

#### Termination:

High impedance loop through  
SoftSwitch™ model: High impedance loop through or non-looping or 75Ω non-looping (jumper selectable)

### DARS Reference (X-0401H-AES4-HSS & X-0401H-AES4-HES Routers):

(DARS reference requires jumper configuration inside the router)

#### Standard:

SMPTE 276M single ended AES

#### Type:

Digital Audio Signal with 48KHz sample rate

#### Connector:

BNC per IEC 60169-8 Amendment 2

#### Termination:

Inactive or High impedance non-looping or 75Ω non

#### Signal Level:

looping (jumper selectable)

#### Freq. Lock Range:

1V p-p  
± 100ppm from nominal

### GPI Control Port:

#### Number of Inputs:

8 opto-isolated, programmable functions

#### Number of Outputs:

4 sets of relay contacts, normally closed, programmable functions

#### Relay Max Current:

1 A at 30 V DC

### Serial Remote Control:

#### Standard:

RS-232 or RS-422, programmable baud rate

#### Connector:

9 pin female "D"

#### Protocol:

GVG Ten XL ASCII, master or slave or Remote Control Panel

### Remote Control Panel Port:

#### Standard:

RS-422, 9600 baud rate

#### Connector:

6 pins on GPIO 25 pin female "D"

#### Protocol:

Remote Control Panel

### Physical:

#### Dimensions:

19" W x 1.75" H x 7.75" D.

#### Weight:

(483mm W x 45mm H x 196mm D)

#### Electrical:

8 lbs. (3.5Kg)

#### Voltage:

Auto ranging 100 - 240 Volts AC, 50/60 Hz 40 Watts

#### Fuse Rating:

250 V, 1 amp time delay

#### Safety:

ETL Listed, complies with EU safety directives

#### EMI/RFI:

Complies with FCC Part 15 Class A regulations

Complies with EU EMC Directive

### Ordering Information:

#### X-0401H

4x1 HDTV video router

#### X-0401H-AES4

4x1 HDTV video router with 4 (4x1) AES busses

#### X-0401H-AES4-HSS

4x1 HDTV video router with 4 (4x1) AES busses and SoftSwitch™

#### X-0401H-AES4-HES

4x1 HDTV video router with 4 (4x1) AES busses and Embedded SoftSwitch™

### Ordering Options:

#### +HBP

Optional bypass relay

#### +2PS

Redundant power supply

#### +RCP

Rackmount remote control panel

(replaces front control panel)

### Accessories:

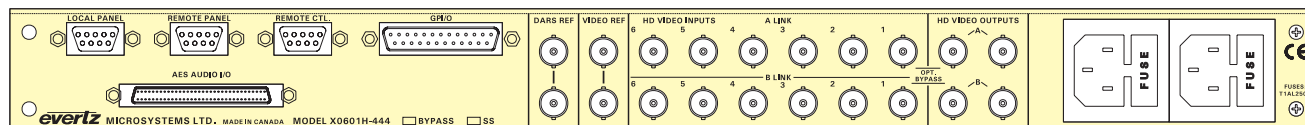
#### X-0401H-PANEL

Additional Remote Control Panel

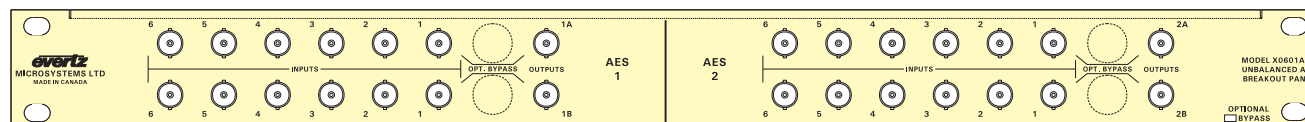
(works in addition to front control panel)



## 6x1 HDTV Dual Link Router with Quad 6x1 AES Audio X-0601H-444



**X-0601H Rear Panel**



**X0601 Audio AES Breakout Panel**

(Qty 1 with AES4 option, Note: the bypass relay is optional)

The X-0601H-444 HDTV six input video router provides a convenient, low cost way to route dual link 1.5Gb/s HDTV serial digital signals. When the unit is ordered with the 6x1 AES router option the AES output busses can be used in an “audio follow video” mode, or can be broken away from the video buss. The routers feature redundancy protection by providing dual power supply and bypass relay options.

The router electronics are housed in a 1RU rackmount frame and is controlled from the built-in front panel controls. Each model can also be purchased with an optional rack mounted remote control panel that replaces the built-in control panel. All units can also be controlled by contact closures on the GPI control port or through the RS-232 serial remote control port using industry standard switcher protocols.

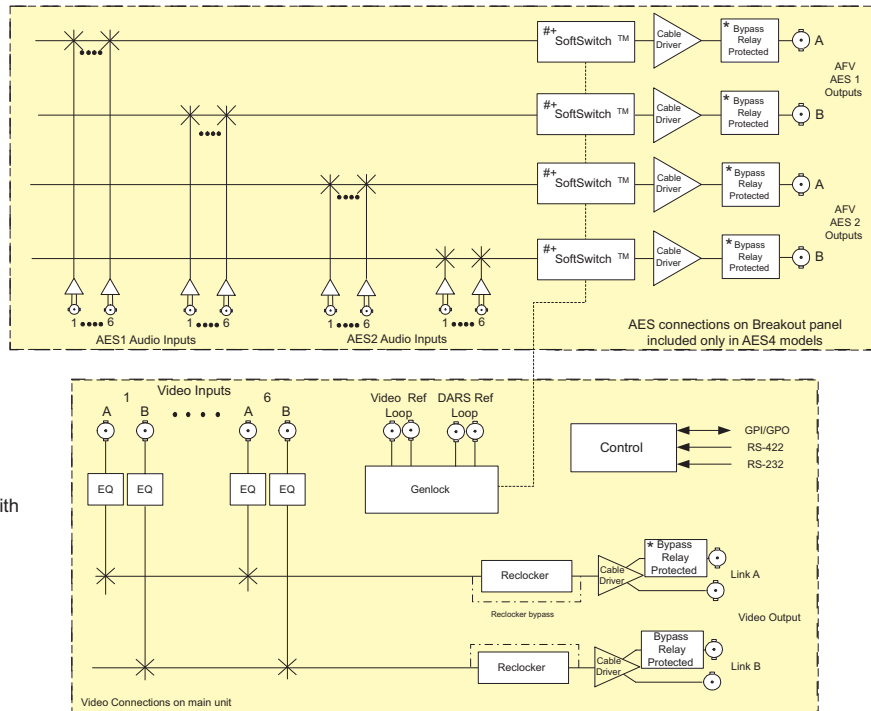
### Optional SoftSwitch™ Feature (+HSS Option)

Routers equipped with the SoftSwitch™ option have the following additional features. All the AES outputs will have a continuous AES carrier locked to either the video genlock or DARS reference (when the DARS reference is used, Z bit alignment of the AES outputs is also guaranteed). The AES outputs use Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed on synchronous audio sources.

### Features

- Supports dual link SMPTE 372M and single link SMPTE 292M (1.5 Gb/s) video signals
- Can be operated in a non-reclock mode to pass SMPTE 259M video signals
- Optional SoftSwitch™ technology eliminates hot-switch audio pops on AES outputs
- Switch line is fully controllable from the front panel
- Video input presence detection displayable on the front panel
- Front panel or remote control panel versions available. Second control panel can be ordered for either version
- Parallel GPI and RS-232 serial control
- Programmable source input names available on the front panel
- Optional video and audio input relay bypass for power failure bypass protection
- Optional dual power supplies
- Field upgradeable firmware as new features become available





\* Relay Bypass available with bypass option

# 'Popless' AES switching available with SoftSwitch™ version

Refer to [www.evertz.com](http://www.evertz.com) for more detailed information

## Specifications

### HD Video Inputs:

**Standard:** SMPTE 372M dual link (1.5 Gb/s) or 292M (1.5 Gb/s)  
SMPTE 259M with reclocker and embedded SoftSwitch™ turned off  
**Number of Inputs:** 6 dual link pairs  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic 100m @ 1.485Gb/s with Belden 1694A (or equivalent) (50m on input 1 with +HBP option)  
**Return Loss:** > 15dBV up to 1.5Gb/s

### HD Video Outputs:

**Standard:** Same as input  
**Number of Outputs:** 2 dual link pairs  
Input 1 bypass protected with +HBP option  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 200ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 15dB up to 1Gb/s, >12dB up to 1.5Gb/s  
**Jitter:** <0.2UI

### AES Audio Inputs (on AES4 versions):

**Standard:** SMPTE 276M single ended AES  
**Number of Inputs:** 6 per buss, 4 busses optional  
**Connector:** BNC per IEC 60169-8 Amendment 2 on breakout panels provided

### AES Audio Outputs (on AES4 versions):

**Standard:** SMPTE 276M single ended AES  
**Number of Outputs:** 2 per buss, 4 busses optional  
Input 1 bypass protected with +HBP option  
**Connector:** BNC per IEC 60169-8 Amendment 2 on breakout panels provided  
**Signal Level:** 1V p-p  
**Reference:** From Video General Reference  
DARS reference available with +HSS option

### Video Reference:

**Type:** Menu selectable - depends on video format  
HD Tri-level Sync  
NTSC or PAL Color Black 1 V p-p  
Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV  
**Connectors:** 2 BNC per IEC 60169-8 Amendment 2  
**Termination:** High impedance loop through

### DARS Reference (On +HSS Optioned Routers):

**Type:** Digital Audio Signal with 48kHz sample rate  
**Standard:** SMPTE 276M single ended AES  
**Connector:** 2 BNC per IEC 60169-8 Amendment 2  
**Termination:** High impedance loop through  
**Signal Level:** 1V p-p  
**Freq. Lock Range:** ± 100ppm from nominal

### GPI Control Port:

**Number of Inputs:** 14 opto-isolated, programmable functions  
**Number of Outputs:** 4 sets of relay contacts, normally closed, programmable functions  
**Relay Max Rating:** 1A at 30VDC

### Serial Remote Control:

**Standard:** RS-232 or RS422, programmable baud rate  
**Connector:** 9 pin female "D"  
**Protocol:** GVG Ten XL ASCII, master or slave or remote control panel

### Physical:

**Dimensions:** 19"W x 1.75"H x 18.75"D  
(483mm W x 45mm H x 477mm D)  
**Weight:** 8 lbs. (3.5Kg)

### Electrical:

**Voltage:** Auto ranging 100-240VAC 50/60 Hz 40 Watts  
**Safety:** ETL Listed  
Complies with EU safety directives  
Complies with FCC Part 15 Class A  
EU EMC Directive

### Ordering Information:

**X-0601H-444** 6x1 Dual Link HDTV Router  
**X-0601H-444-AES4** 6x1 Dual Link HDTV video router with 4(6x1) AES busses (includes 1 AES breakout panel)

### Ordering Options:

**+HSS** SoftSwitch™ Option  
**+HBP** Bypass Relay Protection  
**+2PS** Redundant Power Supply  
**+RCP** Rack Mount Remote Control Panel (replaces front control panel)

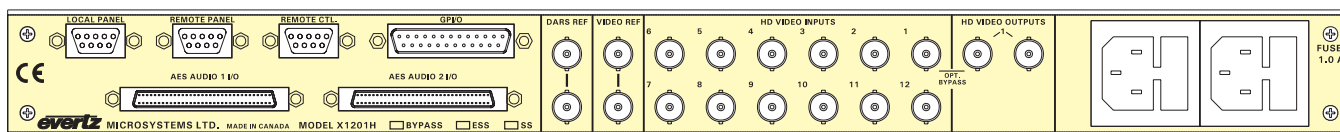
### (Must specify +B or +U version when ordering AES4)

**+B** Balanced AES Audio Breakout Panel  
**+U** Unbalanced AES Audio Breakout Panel

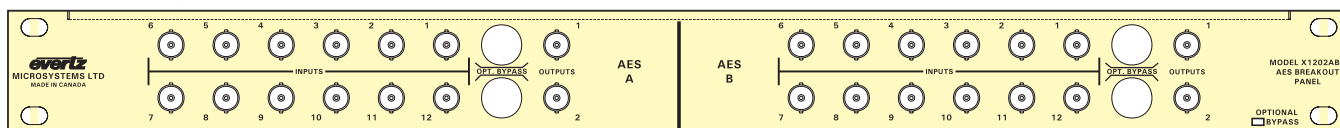
### Accessories:

**X-0601H-444-PANEL** Additional Remote Control Panel (works in addition to front control panel)  
**X-0601ABO** Unbalanced AES Audio Breakout Panel  
**X-0601ABOB** Balanced AES Audio Breakout Panel  
**X-0601ABOB-BP** Balanced AES Audio Breakout Panels (with Bypass Relays)  
**X-0601ABO-BP** Unbalanced AES Audio Breakout Panel (with Bypass Relays)

# 12x1 HDTV Router with Dual or Quad 12x1 AES Audio X-1201H/AES/AES4/HSS



X-1201H Rear Panel



X1201 Audio AES Breakout Panel

(Qty 1 with AES option, Qty 2 with AES4 option, Note: the bypass relay is optional)

The X-1201H HDTV twelve input video router provides a convenient, low cost way to route standard and high definition serial digital signals. The X-1201H routers are used for 1.5Gb/s HDTV serial digital signals. When the unit is ordered with the Dual 12x1 AES router or Quad 12x1 AES router options the AES output busses can be used in an "audio follow video" mode, or can be broken away from the video buss. The routers feature redundancy protection by providing dual power supply and bypass relay options.

The router electronics are housed in a 1RU rackmount frame and is controlled from the built-in front panel controls. Each model can also be purchased with an optional rack mounted remote control panel that replaces the built-in control panel or can be used as a second control panel. All units can also be controlled by contact closures on the GPI control port or through the RS-232 serial remote control port using industry standard switcher protocols.

## Optional SoftSwitch™ Features (+HSS Option)

Routers equipped SoftSwitch™ option have the following additional features. The video output has adjustable vertical timing with respect to the genlock input, and line synchronizers on the video inputs can accommodate differences in timing up to approximately  $\pm$  one half line providing clean video switches on the video output (for HD video only). All the AES outputs will have a continuous AES carrier locked to either the video genlock or DARS reference (when the DARS reference is used, Z bit alignment of the AES outputs is also guaranteed). The AES outputs use Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed on synchronous audio sources.

## Optional Embedded SoftSwitch™ Features (+HES Option)

Routers equipped with the Embedded SoftSwitch™ option have all the features of the SoftSwitch™ versions as well as the following additional features. The embedded audio on the Video 1 buss uses Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed. Embedded SoftSwitch™ is performed on all 4 audio groups.

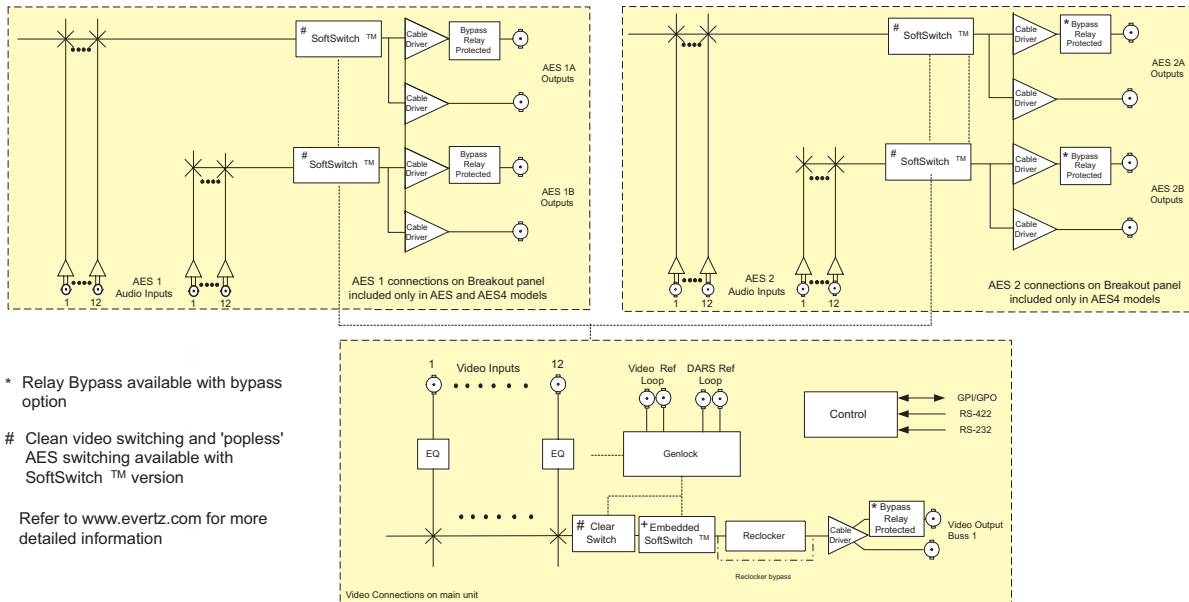
## Features

- Supports SMPTE 292M (1.5 Gb/s) video signals
- Can be operated in a non-reclock mode to pass SMPTE 259M video signals
- Units can be genlocked to an external source so that a "clean switch" can be achieved
- Autotiming of V1 buss inputs to perform a clean video switch when SoftSwitch™ or Embedded SoftSwitch™ option is installed
- Optional SoftSwitch™ technology eliminates hot-switch audio pops on AES outputs following V1 buss
- Optional Embedded SoftSwitch™ technology eliminates hot-switch audio pops on embedded audio on V1 buss
- With embedded SoftSwitch™ option, SoftSwitch™ is performed on all 4 audio groups
- Switch line is fully controllable from the front panel
- Video input presence detection displayable on the front panel
- Front panel or remote control panel versions available. Second control panel can be ordered for either version
- Parallel GPI and RS-232 serial control
- Programmable source input names available on the front panel
- Optional video and audio input relay bypass for power failure bypass protection
- Optional dual power supplies
- Field upgradeable firmware as new features become available



# 12x1 HDTV Router with Dual or Quad 12x1 AES Audio X-1201H/AES/AES4/HSS

## X-1201H Block Diagrams



## Specifications

### HD Video Inputs:

**Standard:** SMPTE 292M (1.5 Gb/s)  
SMPTE 259M with line synchronizer, reclocker and embedded SoftSwitch™ turned off

**Number of Inputs:** 12

**Connector:** BNC per IEC 60169-8 Amendment 2

**Equalization:** Automatic 100m @ 1.485Gb/s with Belden 1694A (or equivalent) (50m on input 1 with +HBP option)

**Return Loss:** > 15dBV up to 1.5Gb/s

**Input Timing (On +HSS and +HES Optional Routers)**

**Input Range:** Measured with respect to the Genlock reference  
±1/2 line when *Course phase* = 1, *Fine phase* = 0  
Auto timer for HD Video only

### HD Video Outputs:

**Standard:** Same as input

**Number of Outputs:** 2 per buss, 1 buss  
Input 1 bypass protected with +HBP option

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V ±0.5V

**Rise and Fall Time:** 200ps nominal

**Overshoot:** <10% of amplitude

**Return Loss:** > 15dB up to 1Gb/s, >12dB up to 1.5Gb/s

**Jitter:** <0.2UI

**Output Timing (On +HSS and +HES Optional Routers)**

**Output Phase:** Measured with respect to the Genlock reference  
Adjustable 1 line to a full frame of delay - set by *Course phase* parameter.  
The active video content will align to the nearest line only. Output phasing for HD Video only

### AES Audio Inputs:

**Standard:** AES3-2003 balanced

**+B option:** SMPTE 276M single ended AES

**+U option:** SMPTE 276M single ended AES

**Number of Inputs:** 12 per buss, 2 or 4 busses optional

**Connector (On breakout panel(s) provided):**

**+B** Removable terminal strips

**+U** BNC per IEC 60169-8 Amendment 2

**Signal Level:**

**+B** 2-7V p-p ± 10%

**+U** 1V p-p ± 10%

### AES Audio Outputs:

**Standard:** Same as input

**Number of Outputs:** Same as input

**Connector:** Same as input

**Signal Level:**

**+B** 2V p-p nominal

**+U** 1V p-p nominal

**Reference:** From Video General Reference  
DARS reference available with +HSS or +HES options

### Video Reference:

**Type:** Menu selectable - depends on video format  
HD Tri-level Sync  
NTSC or PAL Color Black 1 V p-p  
Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV

**Connectors:** 2 BNC per IEC 60169-8 Amendment 2

**Termination:** High impedance loop through

### DARS Reference (On +HSS and +HES Optional Routers):

**Type:** Digital Audio Signal with 48kHz sample rate

**Standard:** SMPTE 276M single ended AES

**Connector:** 2 BNC per IEC 60169-8 Amendment 2

**Termination:** High impedance loop through

**Signal Level:** 1V p-p

**Freq. Lock Range:** ± 100ppm from nominal

### GPI Control Port:

**Number of Inputs:** 14 opto-isolated, programmable functions

**Number of Outputs:** 4 sets of relay contacts, normally closed, programmable functions

**Relay Max Rating:** 1A at 30VDC

### Serial Remote Control:

**Standard:** RS-232 or RS422, programmable baud rate

**Connector:** 9 pin female "D"

**Protocol:** GVG Ten XL ASCII, master or slave or remote control panel

### Physical:

**Dimensions:** 19"W x 1.75"H x 18.75"D  
(483mm W x 45mm H x 477mm D)

**Weight:** 8 lbs. (3.5Kg)

### Electrical:

**Voltage:** Auto ranging 100-240VAC 50/60 Hz 40 Watts

**Fuse Rating:** 250 V, 1 amp time delay

**Safety:** ETL Listed  
Complies with EU safety directives  
Complies with FCC Part 15 Class A  
EU EMC Directive

### Ordering Information:

**X-1201H** 12X1 HDTV video router

**X-1201H-AES** 12x1 HDTV video router with 2(12x1) AES busses (includes 1 AES breakout panel)

**X-1201H-AES4** 12x1 HDTV video router with 4(12x1) AES busses (includes 2 AES breakout panels)

### Ordering Options:

**+HSS** SoftSwitch™ Option

**+HES** Embedded SoftSwitch™ Option

**+HBP** Bypass Relay Protection

**+2PS** Redundant Power Supply

**+RCP** Rack Mount Remote Control Panel (replaces front control panel)

(Must specify +B or +U version when ordering AES or AES4)

**+B** Balanced AES Audio Breakout Panel

**+U** Unbalanced AES Audio Breakout Panel

### Accessories:

**X-1201H-PANEL** Additional Remote Control Panel(works in addition to front control panel)

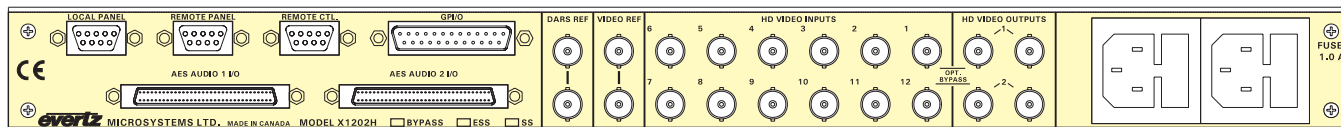
**X-1201ABO** Unbalanced AES Audio Breakout Panel (for all 1201 series routers)

**X-1201ABOB** Balanced AES Audio Breakout Panel (for all 1201 series routers)

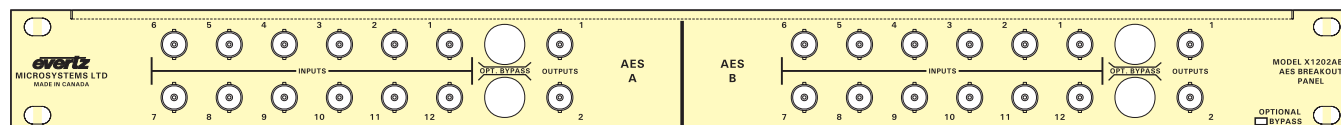
**X-1201ABOB-BP** Balanced AES (with Bypass Relays) Audio Breakout Panels (for all 1201 series routers)

**X-1201ABO-BP** Unbalanced AES (with Bypass Relays) Audio Breakout Panel (For all 1201 series routers)

# 12x2 HDTV Router with Dual or Quad 12x2 AES Audio X-1202H/AES/AES4/HSS



**X-1202H Rear Panel**



**X1202 Audio AES Breakout Panel**

(Qty 1 with AES option, Qty 2 with AES4 option, Note: the bypass relay is optional)

The X-1202H HDTV twelve input video router provides a convenient, low cost way to route standard and high definition serial digital signals. The X-1202H routers are used for 1.5Gb/s HDTV serial digital signals. It features redundancy protection by providing optional dual power supply and relay bypass options. When the unit is ordered with the Dual 12x2 AES router or Quad 12x2 AES router options the AES output busses can be used in an "audio follow video" mode, or can be broken away from the video buss. The routers feature redundancy protection by providing dual power supply and bypass relay options.

The router electronics are housed in a 1RU rackmount frame and is controlled from the built-in front panel controls. Each model can also be purchased with an optional rack mounted remote control panel that replaces the built-in control panel or can be used as a second control panel. All units can also be controlled by contact closures on the GPI control port or through the RS-232 or RS-422 serial remote control port using industry standard switcher protocols.

## Optional SoftSwitch™ Features (+HSS Option)

Routers equipped SoftSwitch™ option have the following additional features. The Video 1 output has adjustable vertical timing with respect to the genlock input, and line synchronizers on the video inputs can accommodate differences in timing up to approximately  $\pm$  one half line providing clean video switches on the V1 output (for HD Video only). All the AES outputs will have a continuous AES carrier locked to either the video genlock or DARS reference (when the DARS reference is used, Z bit alignment of the AES outputs is also guaranteed). The AES outputs that follow the Video 1 buss use Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed on synchronous audio sources.

## Optional Embedded SoftSwitch™ Features (+HES Option)

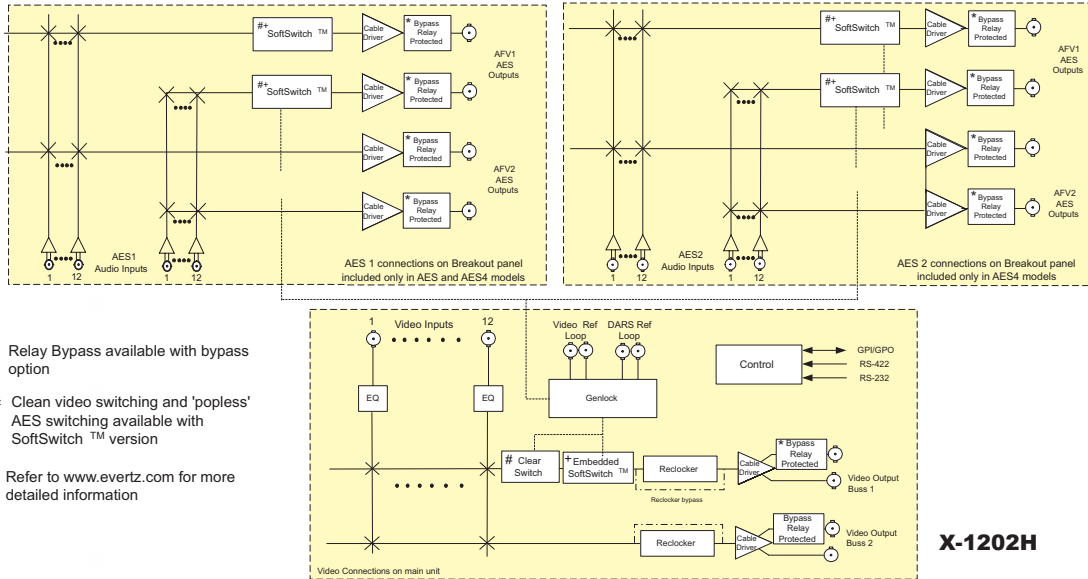
Routers equipped with the Embedded SoftSwitch™ option have all the features of the SoftSwitch™ versions as well as the following additional features. The embedded audio on the Video 1 buss uses Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed. Embedded SoftSwitch™ is performed on all 4 audio groups.

## Features

- Supports SMPTE 292M (1.5 Gb/s) video signals
- Can be operated in a non-reclock mode to pass SMPTE 259M video signals
- Units can be genlocked to an external source so that a "clean switch" can be achieved.
- Autotiming of V1 buss inputs to perform a clean video switch when SoftSwitch™ or Embedded SoftSwitch™ option is installed
- Optional SoftSwitch™ technology eliminates hot-switch audio pops on AES outputs following V1 buss
- Optional Embedded SoftSwitch™ technology eliminates hot-switch audio pops on embedded audio on V1 buss
- With embedded SoftSwitch™ option, SoftSwitch™ is performed on all 4 audio groups
- Switch line is fully controllable from the front panel
- Video input presence detection displayable on the front panel
- Front panel or remote control panel versions available. Second control panel can be ordered for either version
- Parallel GPI and RS-232 serial control
- Programmable source input names available on the front panel
- Optional video and audio input relay bypass for power failure bypass protection
- Optional dual power supplies
- Field upgradeable firmware as new features become available

# 12x2 HDTV Router with Dual or Quad 12x2 AES Audio X-1202H/AES/AES4/HSS

## X-1202H Block Diagrams



\* Relay Bypass available with bypass option

# Clean video switching and 'popless' AES switching available with SoftSwitch™ version

Refer to [www.evertz.com](http://www.evertz.com) for more detailed information

**X-1202H**

## Specifications

### HD Video Inputs:

**Standard:** SMPTE 292M (1.5 Gb/s)  
SMPTE 259M with line synchronizer, reclocker and embedded SoftSwitch™ turned off

**Number of Inputs:** 12

**Connector:** BNC per IEC 60169-8 Amendment 2

**Equalization:** Automatic 100m @ 1.485Gb/s with Belden 1694A (or equivalent) (50m on inputs 1 and 12 with +HPB option)

**Return Loss:** > 15 dB up to 1.5 Gb/s

### Input Timing (On +HSS and +HES Optional Routers)

**Input Range:** Measured with respect to the Genlock reference  
±1/2 line when *Course phase* = 1, *Fine phase* = 0  
Auto timer for HD Video only

### HD Video Outputs:

**Standard:** Same as input

**Number of Outputs:** 2 per buss, 2 busses

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V ±0.5V

**Rise and Fall Time:** 200ps nominal

**Overshoot:** <10% of amplitude

**Return Loss:** > 15dB up to 1Gb/s, >12dB up to 1.5Gb/s

**Jitter:** <0.2UI

**Output Timing (On +HSS and +HES Optional Routers)**

**Output Phase:** Measured with respect to the Genlock reference  
Adjustable 1 line to a full frame of delay - set by *Course phase* parameter. The active video content will align to the nearest line only.  
Output phasing for HD Video only

### AES Audio Inputs:

**Standard:** AES3-2003 balanced

**+B option:** SMPTE 276M single ended AES

**+U option:** SMPTE 276M single ended AES

**Number of Inputs:** 12 per buss, 2 or 4 busses optional

**Connector (On breakout panel(s) provided):**

- +B Removable terminal strips
- +U BNC per IEC 60169-8 Amendment 2

**Signal Level:**

- +B 2-7V p-p ± 10%
- +U 1V p-p ± 10%

### AES Audio Outputs:

**Standard:** Same as input

**Number of Outputs:** Same as input

**Connector:** Same as input

**Signal Level:**

- +B 2V p-p nominal
- +U 1V p-p nominal

**Reference:** From Video General Reference  
DARS reference available with +HSS or +HES options

### Video Reference:

**Type:** Menu selectable - depends on video format  
HD Tri-level Sync  
NTSC or PAL Color Black 1 V p-p  
Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV

**Connectors:** 2 BNC per IEC 60169-8 Amendment 2

**Termination:** High impedance loop through

### DARS Reference (On +HSS and +HES Optional Routers):

**Type:** Digital Audio Signal with 48kHz sample rate

**Standard:** SMPTE 276M single ended AES

**Connector:** 2 BNC per IEC 60169-8 Amendment 2

**Termination:** High impedance loop through

**Signal Level:** 1V p-p

**Freq. Lock Range:** ± 100ppm from nominal

### GPI Control Port:

**Number of Inputs:** 14 opto-isolated, programmable functions

**Number of Outputs:** 4 sets of relay contacts, normally closed, programmable functions

**Relay Max Rating:** 1A at 30VDC

### Serial Remote Control:

**Standard:** RS-232 or RS422, programmable baud rate

**Connector:** 9 pin female "D"

**Protocol:** GVG Ten XL ASCII, master or slave or remote control panel

### Physical:

**Dimensions:** 19"W x 1.75"H x 18.75"D  
(483mm W x 45mm H x 477mm D)

**Weight:** 8 lbs. (3.5Kg)

### Electrical:

**Voltage:** Auto ranging 100-240V AC 50/60 Hz 40 Watts

**Fuse Rating:** 250 V, 1 amp time delay

**Safety:** ETL Listed  
Complies with EU safety directives  
Complies with FCC Part 15 Class A  
EU EMC Directive

### Ordering Information:

**X-1202H** 12X2 HDTV video router

**X-1202H-AES** 12x2 HDTV video router with 2(12x2) AES busses (includes 1 AES breakout panel)

**X-1202H-AES4** 12x2 HDTV video router with 4(12x2) AES busses (includes 2 AES breakout panels)

### Ordering Options:

**+HSS** SoftSwitch™ Option

**+HES** Embedded SoftSwitch™ Option

**+HPB** Bypass Relay Protection

**+2PS** Redundant Power Supply

**+RCP** Rack Mount Remote Control Panel (replaces front control panel)

### (Must specify +B or +U version when ordering AES or AES4)

**+B** Balanced AES Audio Breakout Panel

**+U** Unbalanced AES Audio Breakout Panel

### Accessories:

**X-1202H-PANEL** Additional Remote Control Panel(works in addition to front control panel)

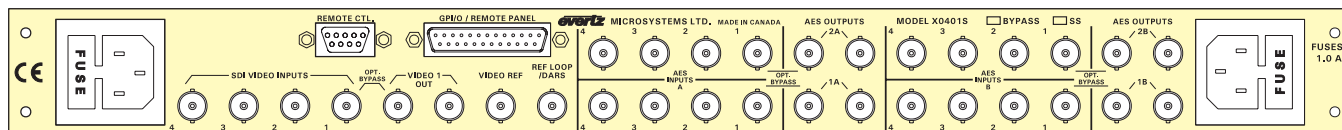
**X-1202ABO** Unbalanced AES Audio Breakout Panel (for all 1202 series routers)

**X-1202ABOB** Balanced AES Audio Breakout Panel (for all 1202 series routers)

**X-1202ABOB-BP** Balanced AES (with Bypass Relays) Audio Breakout Panels (for all 1202 series routers)

**X-1202ABO-BP** Unbalanced AES (with Bypass Relays) Audio Breakout Panel (For all 1202 series routers)





**X-0401S-AES4 Rear Panel**

The X-0401S SDTV four input routing switcher provides a convenient, low cost way to route standard definition serial digital signals. The X-0401S router is used for 270, 360, 540Mb/s and DVB-ASI serial digital signals. The unit can also be used for SMPTE 310M(19.4Mb/s) signals with the reclocker turned off. When the unit is ordered with the Quad 4x1 AES router options the AES output busses can be used in an "audio follow video" mode, or can be broken away from the video buss. The routers feature redundancy protection by providing dual power supply and bypass relay options.

The router electronics are housed in a 1RU rackmount frame and is controlled from the built-in front panel controls. Each model can also be purchased with an optional rack mount remote control panel that replaces the built-in control panel or can be used as a second control panel. All units can also be controlled by contact closures on the GPI control port or through the RS-232 or RS-422 serial remote control port using industry standard switcher protocols.

## SoftSwitch™ Features (X-0401S-AES4-SS)

Routers equipped with SoftSwitch™ have the following additional features. The video output has adjustable vertical timing with respect to the genlock input, and line synchronizers on the video inputs can accommodate differences in timing up to approximately  $\pm$  one half line providing clean video switches on the video output. All the AES outputs will have a continuous AES carrier locked to either the video genlock or DARS reference (when the DARS reference is used, Z bit alignment of the AES outputs is also guaranteed). The AES outputs use Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed on synchronous audio sources.

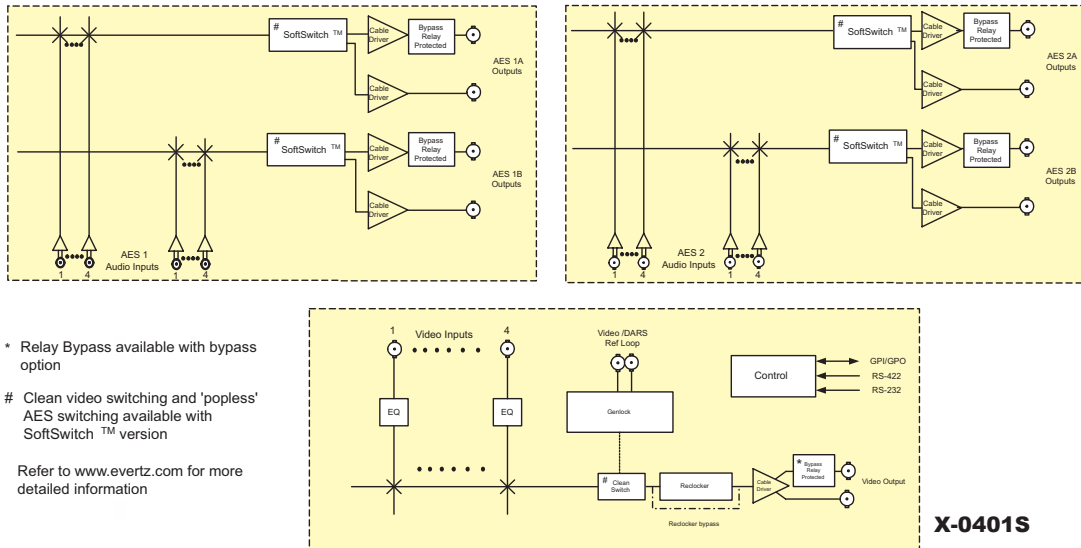
## Embedded SoftSwitch™ Features (X-0401S-AES4-ES)

Routers equipped with the Embedded SoftSwitch™ have all the features of the SoftSwitch™ versions as well as the following additional features. The embedded audio on the Video 1 buss uses Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed. Embedded SoftSwitch™ is performed on all 4 audio groups.

## Features

- Supports SMPTE 259M (270Mb/s,360Mb/s,540Mb/s) or DVB-ASI video signals
- Units support SMPTE 310M (19.4Mb/s) with reclocker turned off
- Units can be genlocked to an external source so that a "clean switch" can be achieved.
- SoftSwitch™ equipped models eliminate hot-switch audio pop on AES outputs
- Auto timing of video inputs to perform a clean video switch on SoftSwitch™ & Embedded SoftSwitch™ versions
- Embedded SoftSwitch™ equipped versions eliminate hot-switch audio pops on embedded audio (all 4 audio groups)
- Switch point is fully controllable from the front panel
- Video input presence detection displayable on the front panel.
- Front panel or Remote control panel versions available. Second control panel can be ordered for either version
- Programmable source input names available on the front panel.
- Programmable parallel GPI control and tallies.
- Serial remote control via GVG TEN-XL protocol (master or slave)
- Field upgradeable firmware as new features become available
- Optional video and audio input relay bypass for power failure bypass protection. (Bypass verification test from front panel menu)
- Optional dual power supplies

## X-0401S Block Diagrams



## Specifications

### SD Video Inputs:

#### Standard:

**SMPT Mode:** SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s) and DVB-ASI

**ATSC Mode:** SMPTE 310M with reclocker turned off

**Number of Inputs:** 4

**Connector:** BNC per IEC 60169-8 Amendment 2

**Equalization:** Automatic up to 250m @ 270Mb/s with Belden 8281

(or equivalent) cable

**Return Loss:** > 15 dB up to 540Mb/s

**Input Timing (On X-0401S-AES4-SS & X-0401S-AES4-ES Routers)**

**Input Range:** Measured with respect to the Genlock reference  
±1/2 line when *Course phase* = 1, *Fine phase* = 0

### SD Video Outputs:

**Standard:** Same as Input

**Number of Outputs:** 2 per buss, 1 buss

Input 1 bypass protected with +BP option

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V ±0.5V

**Rise and Fall Time:** 950ps nominal

**Overshoot:** <10% of amplitude

**Return Loss:** > 15 dB up to 540Mb/s

**Jitter:** < 0.2 UI

**Output Timing (On X-0401S-AES4-SS & X-0401S-AES4-ES Routers)**

**Output Phase:** Measured with respect to the Genlock reference  
Adjustable 1 line to a full frame of delay - set by *Coarse phase* parameter. The active video content will align to the nearest line

### AES Audio Inputs (AES4 versions only):

**Standards:** SMPTE 276M single ended AES

**Number of Inputs:** 4 per buss, 4 busses

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 1V p-p ± 10%

### AES Audio Outputs (AES4 versions only):

**Standards:** SMPTE 276M single ended AES

**Number of Outputs:** 2 per buss, 4 busses

Input 1 bypass protected with +BP option

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 1V p-p

**Reference:** From Video Reference

On SoftSwitch™ model, menu selectable to Video or DARS

### Video Reference:

**Type:** Menu selectable - depends on video format

NTSC or PAL Color Black 1 V p-p

Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV

**Connectors:** 2 BNC per IEC 60169-8 Amendment 2

### Termination

**Standard models:** High impedance loop through

**SoftSwitch™ model:** High impedance loop through or non-looping or 75Ω non-looping (jumper selectable)

### DARS Reference (On X-0401S-AES4-SS & X-0401S-AES4-ES Routers) :

(DARS reference requires jumper configuration inside the router)

**Type:** Digital Audio Signal with 48kHz sample rate.

**Standard:** SMPTE 276M single ended AES

**Connector:** BNC per IEC 60169-8 Amendment 2

**Termination:** Inactive or High impedance non-looping or 75Ω non looping (jumper selectable)

**Signal Level:** 1V p-p

**Freq. Lock Range:** ± 100ppm from nominal

### GPI Control Port:

**Number of Inputs:** 8 opto-isolated, programmable functions

**Number of Outputs:** 4 sets of relay contacts, normally closed, programmable functions

**Relay Max Rating:** 1 A at 30 V DC

### Serial Remote Control:

**Standard:** RS-232 or RS-422, programmable baud rate

**Connector:** 9 pin female "D"

**Protocol:** GVG Ten XL ASCII, master or slave or remote control panel

### Remote Control Panel Port:

**Standard:** RS-422, 9600 baud rate

**Connector:** 6 pins on GPIO 25 pin female "D"

**Protocol:** Remote Control Panel

### Physical:

**Dimensions:** 19" W x 1.75" H x 7.75" D.  
(483mm W x 45mm H x 196mm D)

**Weight:** 8 lbs. (3.5Kg)

### Electrical:

**Voltage:** Auto ranging 100 - 240 Volts AC, 50/60 Hz 40 Watts

**Fuse Rating:** 250 V, 1 amp time delay

**Safety:** ETL Listed, complies with EU safety directives

Complies with FCC Part 15 Class A regulations

Complies with EU EMC Directive

### Ordering Information:

**X-0401S** 4X1 SDI video router

**X-0401S-AES4** 4x1 SDI video router with 4 (4x1) AES busses

**X-0401S-AES4-ES** 4x1 SDI video router with 4 (4x1) AES busses and Embedded SoftSwitch™

**X-0401S-AES4-SS** 4x1 SDI video router with 4 (4x1) AES busses and SoftSwitch™

**X-0401S-ATSC** 4x1 SDI video router with 4 (4x1) AES busses (reclocked)

### Ordering Options:

**+BP** Optional bypass relay

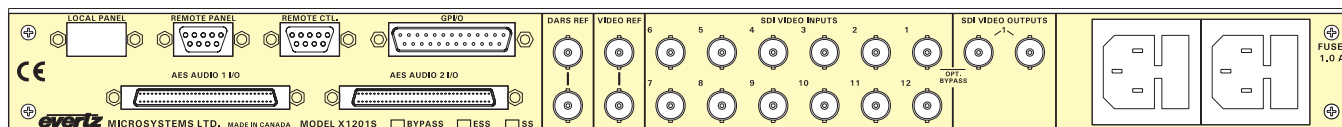
**+2PS** Redundant power supply

**+RCP** Rackmount remote control panel (replaces front control panel)

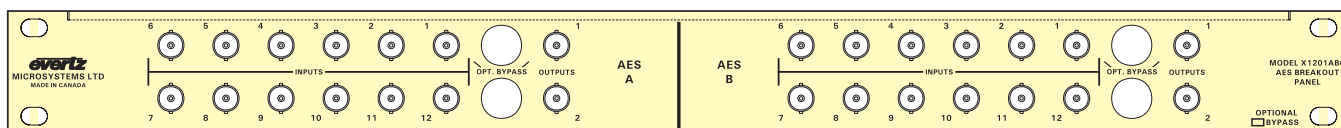
### Accessories:

**X-0401S-PANEL** Additional Remote Control Panel (works in addition to front control panel)

# 12x1 SDI Router with Dual or Quad 12x1 AES Audio X-1201S



**X1201S Rear Panel**



**X1201 Audio AES Breakout Panel**

(Qty 1 with AES option, Qty 2 with AES4 option, Note: the bypass relay is optional)

The X-1201S SDTV twelve input routing switcher provides a convenient, low cost way to route standard definition serial digital signals. The X-1201S routers are used for 270, 360, 540Mb/s and DVB-ASI serial digital signals. When the unit is ordered with the Dual 12x1 AES router or Quad 12x1 AES router options the AES output busses can be used in an "audio follow video" mode, or can be broken away from the video buss. The routers feature redundancy protection by providing dual power supply and bypass relay options.

The router electronics are housed in a 1RU rackmount frame and is controlled from the built-in front panel controls. Each model can also be purchased with an optional rack mount remote control panel that replaces the built-in control panel or can be used as a second control panel. All units can also be controlled by contact closures on the GPI control port or through the RS-232 or RS-422 serial remote control port using industry standard switcher protocols.

## Optional SoftSwitch™ Features (+SS Option)

Routers equipped with the SoftSwitch™ option have the following additional features. The video output has adjustable vertical timing with respect to the genlock input, and line synchronizers on the video inputs can accommodate differences in timing up to approximately  $\pm$  one half line providing clean video switches on the video output. All the AES outputs will have a continuous AES carrier locked to either the video genlock or DARS reference (when the DARS reference is used, Z bit alignment of the AES outputs is also guaranteed). The AES outputs use Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed on synchronous audio sources.

## Optional Embedded SoftSwitch™ Features (+ES Option)

Routers equipped with the Embedded SoftSwitch™ option have all the features of the SoftSwitch™ versions as well as the following additional features. The embedded audio on the Video 1 buss uses Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed. Embedded SoftSwitch™ is performed on all 4 audio groups.

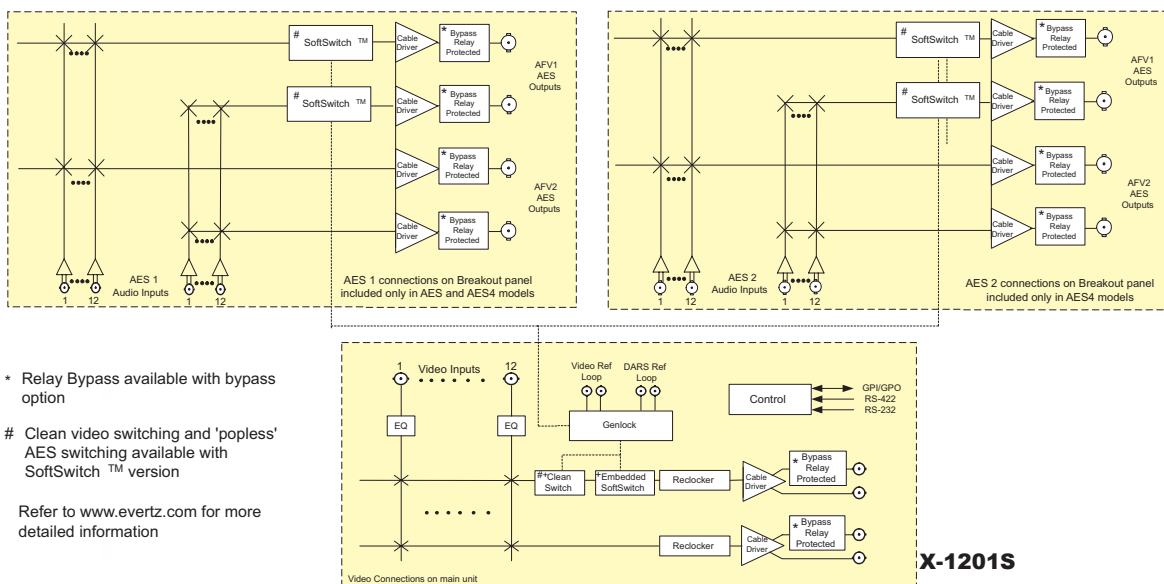
## Features

- Supports SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s) video signals
- Units can be genlocked to an external source so that a "clean switch" can be achieved
- Autotiming of V1 buss inputs to perform a clean video switch when SoftSwitch™ or Embedded SoftSwitch™ option is installed
- Optional SoftSwitch™ technology eliminates hot-switch audio pops on AES outputs following V1 buss
- Optional Embedded SoftSwitch™ technology eliminates hot-switch audio pops on embedded audio on V1 buss
- With embedded SoftSwitch™ option, SoftSwitch™ is performed on all 4 audio groups
- Switch line is fully controllable from the front panel
- Video input presence detection displayable on the front panel
- Front panel or remote control panel versions available. Second control panel can be ordered for either version
- Parallel GPI and RS-232 serial control
- Programmable source input names available on the front panel
- Optional video and audio input relay bypass for power failure bypass protection
- Optional dual power supplies.
- Field upgradeable firmware as new features become available



# 12x1 SDI Router with Dual or Quad 12x1 AES Audio X-1201S

## X-1201S Block Diagrams



## Specifications

### SDI Video Inputs:

**Standard:** SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s) and DVB-ASI  
**Number of Inputs:** 12  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic up to 250m @ 270Mb/s with Belden 8281 (or equivalent) cable  
**Return Loss:** > 15 dB up to 540Mb/s  
**Input Timing (On +SS and +ES Optioned Routers)**  
**Input Range:** Measured with respect to the Genlock reference  
 $\pm 1/2$  line when *Course phase* = 1, *Fine phase* = 0

### SDI Video Outputs:

**Standard:** Same as Input  
**Number of Outputs:** 2 per buss, 1 buss  
 Input 1 bypass protected with +BP option  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V  $\pm 0.5V$   
**Rise and Fall Time:** 200ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 15 dB up to 540Mb/s  
**Jitter:** < 0.2 UI  
**Output Timing (On +SS and +ES Optioned Routers)**  
**Output Phase:** Measured with respect to the Genlock reference  
 Adjustable 1 line to a full frame of delay - set by *Course phase* parameter. The active video content will align to the nearest line only.

### AES Audio Inputs:

**Standard:**  
**+B option:** AES3-2003 balanced  
**+U option:** SMPTE 276M single ended AES  
**Number of Inputs:** 12 per buss, 2 or 4 busses optional  
**Connector (On breakout panel(s) provided):**  
**+B** Removable terminal strips  
**+U** BNC per IEC 60169-8 Amendment 2  
**Signal Level:**  
**+B** 2-7V p-p  $\pm 10\%$   
**+U** 1V p-p  $\pm 10\%$

### AES Audio Outputs:

**Standard:** Same as input  
**Number of Outputs:** Same as input  
**Connector:** Same as input  
**Signal Level:**  
**+B** 2V p-p nominal  
**+U** 1V p-p nominal  
**Reference:** From Video General Reference  
 DARS reference available with +HSS or +HES options

### Video Reference:

**Type:** Menu selectable - depends on video format  
 NTSC or PAL Color Black 1 V p-p  
 Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV  
**Connectors:** 2 BNC per IEC 60169-8 Amendment 2  
**Termination:** High impedance loop through

### DARS Reference (On +SS and +ES Optioned Routers):

**Type:** Digital Audio Signal with 48kHz sample rate  
**Standard:** SMPTE 276M single ended AES  
**Connector:** 2 BNC per IEC 60169-8 Amendment 2  
**Termination:** High impedance loop through  
**Signal Level:** 1V p-p  
**Freq. Lock Range:**  $\pm 100$ ppm from nominal

### GPI Control Port:

**Number of Inputs:** 14 opto-isolated, programmable functions  
**Number of Outputs:** 4 sets of relay contacts, normally closed, programmable functions  
**Relay Max Rating:** 1A at 30VDC

### Serial Remote Control:

**Standard:** RS-232 or RS422, programmable baud rate  
**Connector:** 9 pin female "D"  
**Protocol:** GVG Ten XL ASCII, master or slave or remote control panel

### Physical:

**Dimensions:** 19"W x 1.75"H x 18.75"D  
 (483mm W x 45mm H x 477mm D)  
**Weight:** 8 lbs. (3.5Kg)

### Electrical:

**Voltage:** Auto ranging 100-240VAC 50/60 Hz 40 Watts  
**Fuse Rating:** 250 V, 1 amp time delay  
**Safety:** ETL Listed  
 Complies with EU safety directives  
**EMI/RFI:** Complies with FCC Part 15 Class A  
 EU EMC Directive

### Ordering Information:

**X-1201S** 12x1 SDI video router  
**X-1201S-AES** 12x1 SDI video router with 2(12x1) AES busses (includes 1 AES breakout panel)  
**X-1201S-AES4** 12x1 SDI video router with 4(12x1) AES busses (includes 2 AES breakout panels)

### Ordering Options:

**+SS** SoftSwitch™ Option  
**+ES** Embedded SoftSwitch™ Option  
**+BP** Bypass Relay Protection  
**+2PS** Redundant Power Supply  
**+RCP** Rack Mount Remote Control Panel (replaces front control panel)

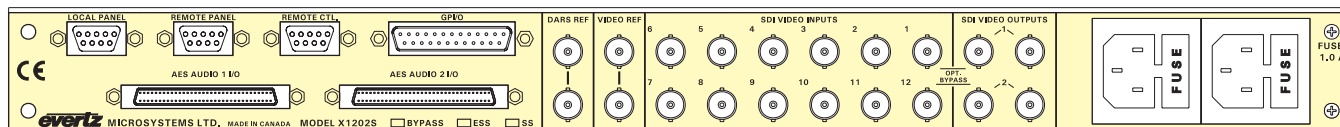
### (Must specify +B or +U version when ordering AES or AES4)

**+B** Balanced AES Audio Breakout Panel  
**+U** Unbalanced AES Audio Breakout Panel

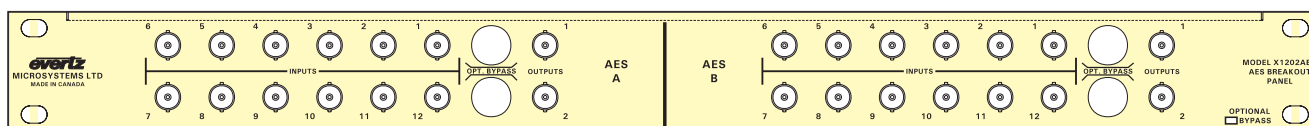
### Accessories:

**X-1201S-PANEL** Additional remote control panel (works in addition to front control panel)  
**X-1201ABO** Unbalanced AES Audio Breakout Panel (for all 1201 series routers)  
**X-1201ABOB** Balanced AES Audio Breakout Panel (for all 1201 series routers)  
**X-1201ABOB-BP** Balanced AES (with Bypass Relays) Audio Breakout Panels (for all 1201 series routers)  
**X-1201ABO-BP** Unbalanced AES (with Bypass Relays) Audio Breakout Panel (For all 1201 series routers)

# 12x2 SDI Router with Dual or Quad 12x2 AES Audio X-1202S



X1202S Rear Panel



X1202 Audio AES Breakout Panel

(Qty 1 with AES option, Qty 2 with AES4 option, Note: the bypass relay is optional)

The X-1202S SDTV twelve input routing switcher provides a convenient, low cost way to route standard definition serial digital signals. The X-1202S routers are used for 270, 360, 540Mb/s and DVB-ASI serial digital signals. When the unit is ordered with the Dual 12x2 AES router or Quad 12x2 AES router options the AES output busses can be used in an "audio follow video" mode, or can be broken away from the video buss. It features redundancy protection by providing dual power supply and bypass relay options.

The router electronics are housed in a 1RU rackmount frame and is controlled from the built-in front panel controls. Each model can also be purchased with an optional rack mount remote control panel that replaces the built-in control panel or can be used as a second control panel. All units can also be controlled by contact closures on the GPI control port or through the RS-232 or RS-422 serial remote control port using industry standard switcher protocols.

## Optional SoftSwitch™ Features (+SS Option)

Routers equipped with the SoftSwitch™ option have the following additional features. The Video 1 output has adjustable vertical timing with respect to the genlock input, and line synchronizers on the video inputs can accommodate differences in timing up to approximately  $\pm$  one half line providing clean video switches on the V1 output. All the AES outputs will have a continuous AES carrier locked to either the video genlock or DARS reference (when the DARS reference is used, Z bit alignment of the AES outputs is also guaranteed). The AES outputs that follow the Video 1 buss use Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed on synchronous audio sources.

## Optional Embedded SoftSwitch™ Features (+ES Option)

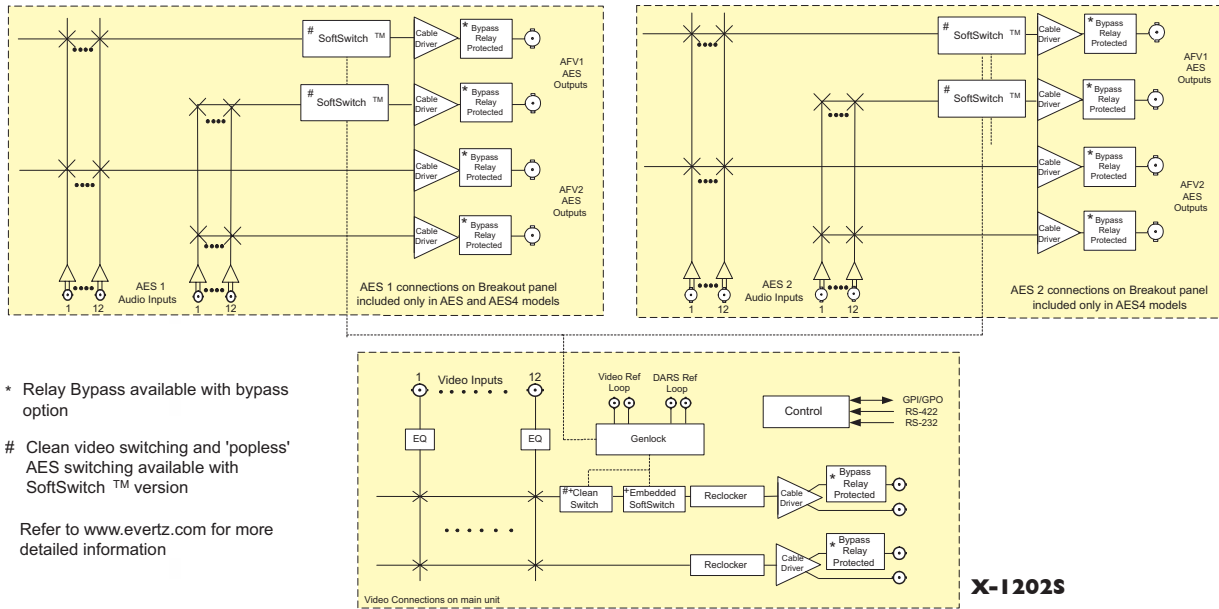
Routers equipped with the Embedded SoftSwitch™ option have all the features of the SoftSwitch™ versions as well as the following additional features. The embedded audio on the Video 1 buss uses Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed. Embedded SoftSwitch™ is performed on all 4 audio groups.

## Features

- Supports SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s) video signals
- Units can be genlocked to an external source so that a "clean switch" can be achieved
- Autotiming of V1 buss inputs to perform a clean video switch when SoftSwitch™ or Embedded SoftSwitch™ option is installed
- Optional SoftSwitch™ technology eliminates hot-switch audio pops on AES outputs following V1 buss
- Optional Embedded SoftSwitch™ technology eliminates hot-switch audio pops on embedded audio on V1 buss
- With embedded SoftSwitch™ option, SoftSwitch™ is performed on all 4 audio groups
- Switch line is fully controllable from the front panel
- Video input presence detection displayable on the front panel.
- Front panel or remote control panel versions available. Second control panel can be ordered for either version
- Parallel GPI and RS-232 serial control
- Programmable source input names available on the front panel.
- Optional video and audio input relay bypass for power failure bypass protection
- Optional dual power supplies
- Field upgradeable firmware as new features become available

# 12x2 SDI Router with Dual or Quad 12x2 AES Audio X-1202S

## X-1202S Block Diagrams



## Specifications

### SDI Video Inputs:

**Standard:** SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s) and DVB-ASI  
**Number of Inputs:** 12  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic up to 250m @ 270Mb/s with Belden 8281 (or equivalent)  
**Return Loss:** > 15 dB up to 540Mb/s  
**Input Timing (On +SS and +ES Optioned Routers)**  
**Input Range:** Measured with respect to the Genlock reference  
 $\pm 1/2$  line when *Course phase* = 1, *Fine phase* = 0

### SDI Video Outputs:

**Standard:** Same as Input  
**Number of Outputs:** 2 per buss, 2 busses  
 Inputs 1 & 12 bypass protected with +BP option  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V  $\pm 0.5V$   
**Rise and Fall Time:** 200ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 15 dB up to 540Mb/s  
**Jitter:** < 0.2 UI

### Output Timing (On +SS and +ES Optioned Routers)

**Output Phase:** Measured with respect to the Genlock reference  
 Adjustable 1 line to a full frame of delay - set by *Course phase* parameter. The active video content will align to the nearest line only

### AES Audio Inputs:

**Standard:**  
**+B option:** AES3-2003 balanced  
**+U option:** SMPTE 276M single ended AES  
**Number of Inputs:** 12 per buss, 2 or 4 busses optional  
**Connector (On breakout panel(s) provided):**  
**+B** Removable terminal strips  
**+U** BNC per IEC 60169-8 Amendment 2  
**Signal Level:**  
**+B** 2-7V p-p  $\pm 10\%$   
**+U** 1V p-p  $\pm 10\%$

### AES Audio Outputs:

**Standard:** Same as input  
**Number of Outputs:** Same as input  
**Connector:** Same as input  
**Signal Level:**  
**+B** 2V p-p nominal  
**+U** 1V p-p nominal  
**Reference:** From Video General Reference  
 DARS reference available with +HSS or +HES options

### Video Reference:

**Type:** Menu selectable - depends on video format  
 NTSC or PAL Color Black 1 V p-p  
 Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV  
**Connectors:** 2 BNC per IEC 60169-8 Amendment 2  
**Termination:** High impedance loop through

### DARS Reference (On +SS and +ES Optioned Routers):

**Type:** Digital Audio Signal with 48kHz sample rate  
**Standard:** SMPTE 276M  
**Termination:** High impedance loop through  
**Connector:** 2 BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 1V p-p  
**Freq. Lock Range:**  $\pm 100$ ppm from nominal

### GPI Control Port:

**Number of Inputs:** 14 opto-isolated, programmable functions  
**Number of Outputs:** 4 sets of relay contacts, normally closed, programmable functions  
**Relay Max Rating:** 1A at 30VDC

### Serial Remote Control:

**Standard:** RS-232 or RS422, programmable baud rate  
**Connector:** 9 pin female "D"  
**Protocol:** GVG Ten XL ASCII, master or slave or remote control panel

### Physical:

**Dimensions:** 19"W x 1.75"H x 18.75"D  
 (483mm W x 45mm H x 477mm D)  
**Weight:** 8 lbs. (3.5Kg)

### Electrical:

**Voltage:** Auto ranging 100-240VAC 50/60 Hz 40 Watts  
**Fuse Rating:** 250 V, 1 amp time delay  
**Safety:** ETL Listed  
 Complies with EU safety directives  
**EMI/RFI:** Complies with FCC Part 15 Class A  
 EU EMC Directive

### Ordering Information:

**X-1202S** 12X2 SDI video router  
**X-1202S-AES** 12x2 SDI video router with 2(12x2) AES busses (includes 1 AES breakout panel)  
**X-1202S-AES4** 12x2 SDI video router with 4(12x2) AES busses (includes 2 AES breakout panels)

### Ordering Options:

**+SS** SoftSwitch™ Option  
**+ES** Embedded SoftSwitch™ Option  
**+BP** Bypass Relay Protection  
**+2PS** Redundant Power Supply  
**+RCP** Rack Mount Remote Control Panel (replaces front control panel)

### (Must specify +B or +U version when ordering AES or AES4)

**+B** Balanced AES Audio Breakout Panel  
**+U** Unbalanced AES Audio Breakout Panel

### Accessories:

**X-1202H-PANEL** Additional Remote Control Panel (works in addition to front control panel)  
**X-1202ABO** Unbalanced AES Audio Breakout Panel (for all 1202 series routers)  
**X-1202ABOB** Balanced AES Audio Breakout Panel (for all 1202 series routers)  
**X-1202ABOB-BP** Balanced AES (with Bypass Relays) Audio Breakout Panels (for all 1202 series routers)  
**X-1202ABO-BP** Unbalanced AES (with Bypass Relays) Audio Breakout Panel (For





Evertz 2RU XNCP2 provides real-time control and configuration of Evertz XRF1 and XRF6 series routers, allowing access to configuration parameters such as gain control, AGC mode, and LNB power generation.

Multiple control panels may reside on a single Ethernet network. The unit includes two 4-line displays, programmable quick-access pushbuttons, a direct-entry 0-9 keypad, and four rotary shaft encoders.

When combined with Evertz VistaLINK®, the XNCP2 can be used to configure and display custom source/destination labels, program and execute quick-access configuration buttons, and set passcode protection on features such as input channel configuration menus and destination or salvo locks.

## Features

- Provides control and configuration of router crosspoint matrices for the entire range of Evertz RF routers
- Two, 4-line, 24 alphanumeric digit per line vacuum fluorescent display (VFD) featuring very high brightness and wide viewing angles
- Panel pushbuttons are illuminated, tactile and full-size
- 26 pushbuttons are programmable for quick-access to channels and features
- VistaLINK® - capable for advanced system features such as custom labels and passcode protections
- Low-powered, rack-mountable, 2RU router control panel

## Specifications

### Ethernet Input/Output:

**Standard:** IEEE 802.3 (10BaseT), IEEE 8002.3u (100BaseTx)  
**Connector:** 1 RJ45

### Serial I/O (COM1):

**Standard:** RS-232/RS-422  
**Connector:** Female DB9  
**Baud Rate:** 57600  
**Format:** 8 bits, no parity, 2 stop bits, no hardware flow (COM2 not available)

### Physical:

19" W x 4 3/8" D x 3 1/2" H  
(483mm x 111mm x 89mm)

### Weight:

3 lbs. (1.36 kg)

### Temperature:

0 to 50 deg. C. (Operating)

### Electrical:

**Voltage:** + 12VDC  
**Power:** 11 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC Directive

### Ordering Information:

**XNCP2** 2RU VistaLINK® Router Control Panel



Xenon brings many advanced new capabilities to the world of routing switchers, building on a new generation design that starts with a solid multi-format router core. In today's broadcast environment a router must be reliable, resilient and cost effective. Xenon excels in all these areas while offering the flexibility of multi-format operation, and the ability to add Signal Processing Technology.

Great care has been taken in the design of Xenon to avoid single points of failure. Active assemblies are all hot swappable from the front of the frame. Power, control, cooling and reference generation are available in redundant configurations.



### Features Configuration

Xenon allows any mix of formats within a frame in independent blocks of 32 inputs or outputs. Any of the supported formats, HD/SD/AES/Analog audio, can be expanded to fill an entire 128x128 frame.

The Xenon is housed in a 4RU frame, switching up to 64 sources to 64 destinations, or in an 8RU frame switching up to 128 sources to 128 destinations. Additional input and output modules can be installed in to the router at anytime.

### Control

The Xenon router includes, as standard, an internal FU-0020 Controller module which supports four Q-Link ports, two F-Link ports, two Ethernet ports and two Serial ports mounted on the rear of the router.

The Xenon has a number of control options, they are:

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the Xenon router connected via Q-Link.

**External third party control:** The Xenon router can be remotely controlled via an external third party control device, such as an automation system, when connected to the router's serial port.

### Expansion

The input and output stages of the Xenon can be expanded in steps of 32 at any time by adding additional I/O modules. The Xenon can not be expanded beyond its frame size.

### Power Supply

The power supplies for the Xenon are internal. The 4RU & 8RU frame can be fitted with an optional redundant power supply with separate AC power inlet & alarm output.

### Video

Xenon supports HD, SD and ASI video routing. It is available as HD/SD or SD only, offering cost savings for those who do not require HD capability. The signal path through Xenon is so clean that reclocking is not normally required. For those applications requiring it, reclocking modules can be added in blocks of 8 outputs.

### Audio

Balanced AES or unbalanced AES on BNCs are supported in any mixture in blocks of 32 inputs or outputs.

### Signal and System Monitoring

Xenon supports full signal monitoring of both inputs and outputs. It also incorporates comprehensive system monitoring, including power supply voltages, interior temperatures and fan speeds. Monitored data is available through SNMP for facility-wide monitoring systems. System status may also be monitored remotely by a network based remote connection over TCP/IP or a direct serial connection to a PC. User configurable closing contacts are also provided for connection to an external alarm system.

### Feature Summary

- Multiple signal formats within a single frame
- Optional output reclocking in blocks of 8 outputs
- All outputs can switch in one TV frame
- Dual reference inputs
- Advanced audio features including Soft Switching
- Dolby® E signal compatible
- Redundant internal controllers
- No controllers needed for slave frames
- Q-Link, F-Link, Ethernet and RS485 control interfaces
- Deterministic switching
- System monitoring with SNMP support
- Powerful and intuitive WinSetup Software

**Specifications****Configuration**

Inputs:	Selectable in blocks of 32
Outputs:	Selectable in blocks of 32

**Standard Definition:****SD Video Inputs:**

Signals supported:	SMPTE 259M 1997, ASI DVB standard
Signal Level:	800mV p-p nominal
Impedance:	75Ω terminating
Return Loss, 5 - 270MHz:	15dB typical
Cable equalization:	Belden 8281
BBC PSF1/2:	250m min
BBC PSF1/3:	150m min
Connectors:	BNC, 75Ω terminating

**SD Video Outputs:**

Signal Level:	800mV p-p ± 10%
Impedance:	75Ω terminating
Return Loss, 5 - 270MHz:	15dB typical
D.C. offset:	0 ± 0.5V
Connectors:	BNC, 75Ω terminating

**Signal Path:**

Rise/fall times:	<0.4ns
Path Length:	12ns, typical
Output jitter:	0.2UI p-p with <250m input cable

**Switching Reference:**

Reference inputs:	2x, BNC, analog 525/625 75Ω terminating
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**High Definition:****HD Video Inputs:**

Signals supported:	SMPTE 292M
Signal Level:	800mV p-p nominal
Impedance:	75Ω terminating
Return Loss, 5 - 1485MHz:	15dB typical
Cable equalization:	Belden 1694A, 90m
Connectors:	BNC, 75Ω terminating

**HD Video Outputs:**

Signal Level:	800mV p-p ± 10%
Impedance:	75Ω terminating
Return Loss, 5 - 1485MHz:	15dB typical
D.C. offset:	0 ± 0.5V
Connectors:	BNC, 75Ω terminating

**Audio Inputs - AES:**

Sample rates:	32kHz, 44.1kHz, 48kHz, and 96kHz
Balanced version (D50)	
Standard:	AES3-1992
Signal level:	0.2-7V p-p
Impedance:	110Ω ±20%
Transformer coupled	
D.C. on input:	±50V
Connectors:	D50 female carrying 16 signals

**Unbalanced version (BNC):**

Standard:	SMPTE 276M
Impedance:	75Ω
Return loss:	25dB, 0.1 - 6.0kHz
Connectors:	BNC per IEC 60169-8-8 Amendment 2

**Audio Outputs - AES:**

Balanced version (D50)	
Signal level:	2-5V p-p
Impedance:	110Ω Transformer coupled
D.C. isolation:	±50V
Rise/fall time:	3.5-10ns
Connectors:	D50 female carrying 16 signals

**Unbalanced version (BNC):**

Signal level:	1.0V p-p ± 50%
Impedance:	75Ω
Return loss:	25dB, 0.1 - 6.0kHz
Jitter:	Conforms to ANSI S4.40 - 1992
Connectors:	BNC per IEC 60169-8-8 Amendment 2

**Signal Path:**

Rise/fall times:	<0.4ns
Path Length:	12ns, typical
Output jitter:	0.2UI p-p with <95m input cable

**Switching Reference:**

Reference inputs (SD):	2x, BNC, analog 525/625
Reference inputs (HD/SD):	Tri level analog 625 or 525
Signal level:	1V p-p ± 3dB
Impedance:	75Ω
Line switching:	Lines 3/319 (625) Lines 10/273 (525)
Connectors:	BNC, 75Ω terminating

**Physical:**

Height:	
4RU:	7" (178mm)
8RU:	14" (355mm)
Width:	19" (483mm)
Depth:	17 3/4" (450mm)
Weight:	
4RU:	16Kg
8RU:	31Kg

**Operating Temperature:**

Spec maintained to 30°C  
Operation to 40°C

**Ventilation:**

Fan cooled from the front to the rear  
of the left hand and right hand side of  
the router

**Power:**

Supply:	Auto ranging 100 to 240 VAC 50/60Hz
Power:	
8RU:	Typical 300VA Max 500VA

**4RU:**

Typical 150VA  
Max 250VA  
Not including the SPT modules  
Optional

**Backup:****Control:**

Q-Link:	4x 75Ω video cable (max length 500m)
F-Link:	2x RJ45
Serial RS422/232:	2x D9 female
Ethernet, 10baseT:	2x RJ45

**Ordering Information:**

<b>XE4 Up To 64x64</b>	
XE4-3232S	Xenon 4RU 32x32 SDI Router
XE4-3232H	Xenon 4RU 32x32 HD/SD Router

**XE4 Up To 64x64**

XE8-3232S	Xenon 8RU 32x32 SDI Router
XE8-3232H	Xenon 8RU 32x32 HD/SD Router

XE4-3232AESB	Xenon 4RU 32x32 Digital Audio Router
XE4-3232AESU	Xenon 4RU 32x32 Digital Audio Router
XE8-3232AESB	Xenon 8RU 32x32 Digital Audio Router
XE8-3232AESU	Xenon 8RU 32x32 Digital Audio Router

**Ordering Options:**

+2PS	Redundant Power Supply (1 required for 4RU Frame), (1 required for 8RU Frame)
+FU	Redundant Controller Module
+REF	Redundant Reference module (Can only be fitted on frames with 64, or more, outputs)
+R8	Reclocking option for 8 HD/SD outputs
+R16	Reclocking option for 16 HD/SD outputs
+R24	Reclocking option for 24 HD/SD outputs
+R32	Reclocking option for 32 HD/SD outputs
XE-IP32S	32 Standard Definition Inputs
XE-IP32H	32 High Definition Inputs
XE-IP32-AESB	AES Balanced input
XE-IP32-AESU	AES Unbalanced input
XE-IP64-AESB	Double density input
XE-IP64-AESU	Double density input
XE-OP32-AESB	AES Balanced output
XE-OP32-AESU	AES Unbalanced output
XE-OP64-AESB	Double density output
XE-OP32-AA	Analog Audio output

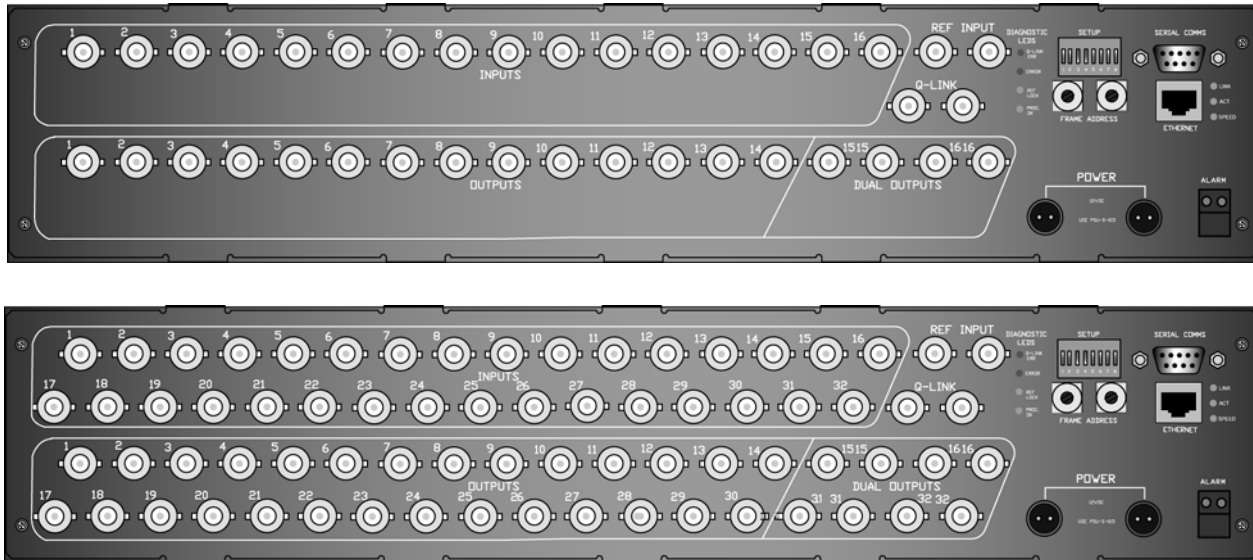


## QT-1616H, QT-3232H - Topaz HD

Designed to meet the needs of both the broadcast and professional video users Topaz is an aggressively low priced routing system combining no-compromise technical specifications with a market leading control system.

With broadcast quality, reliability, and affordability, Topaz is suited to many applications, including professional, corporate/industrial markets, educational uses and the AV and presentation markets.

### QT-HD-1616 - QT-1616-H & QT-HD-3232 - QT-3232-H Rear Panels



#### Features Configuration

The QT-HD-1616's are housed in a 2RU frame and switches 16 sources to 16 destinations. Both the input and output stage of the QT-HD-1616 are fixed at 16.

The QT-HD-3232's are also housed in a 2RU frame and can switch up to 32 sources to 32 destinations. Both the input and output stage of the QT-HD-3232 are fixed at 32.

#### Control

The entire range of Topaz routers are compatible with the existing ranges of Quartz routers, remote control panels and control systems.

The Topaz routers include, as standard, an internal FU-0019 Controller module which supports a single Q-Link and Serial port on the rear of the router.

The Topaz routers have a number of control options, they are:

**Passive Remote Control Panels:** The CP-1601A-P and CP-1604-P passive remote control panels can be fitted to the Topaz routers via a PI-1604 or PI-1608 parallel interface.

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the QT-HD-1616 and QT-HD-3232 router connected via Q-Link.

**External Third Party Control:** The QT-HD-1616 and QT-HD-3232 router can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port.

#### Expansion

The input and output stage of the Topaz routers are fixed at 16 and 32. They can not be expanded beyond their frame size.

#### Power Supply

The power supply for the the Topaz routers is external and connects to the frame via secure bayonet locking connector. The Topaz routers can be fitted with an optional redundant external power supply. An optional mounting tray securely supports both of the power supplies without the need for additional rack space.

#### Feature Summary

- Full broadcast specifications
- Silent operation - convection cooled
- Powerful built-in control systems
- Q-Link and Serial control
- Ethernet control
- Compatible with all Quartz routers and remote control panels
- Frames can be segmented into multiple smaller routers
- Optional power supply tray
- Redundant power supply option
- Bayonet locking power connectors

### Specifications

Topaz-HD offers a full 1.5Gb/s bandwidth to handle uncompressed HD signals. Automatic Sample Rate Detection on the input equalizer allows any mix of HD and SD signals in the same unit. Up to 95m of cable equalization is provided at HD data rates (250m at SD rates)

#### Configuration:

**Inputs/Outputs:** Fixed at 16x16 or 32x32

#### Serial Video Inputs:

**Standard:** SMPTE 292M (1.5Gb/s),  
SMPTE 259M (143, 177, 270, 360)

**Signal Level:** 800mV p-p nominal

**Impedance:** 75Ω terminating

**Return Loss, 5-1485MHz:** 15dB

**Cable equalization at 1485MHz**

**Belden 8281:** 95m min

**Connectors:** BNC per IEC 60169-8-8 Amendment 2

#### HD Video Outputs:

**Standard:** SMPTE 292M (1.5Gb/s),  
SMPTE 259M (143, 177, 270, 360)

**Signal Level:** 800mV p-p ± 10%

**Impedance:** 75Ω terminating (non-reclocking)

**Return Loss, 5-1485MHz:** 15dB

**D.C. offset:** 0 ± 0.5V

**Connectors:** BNC per IEC 60169-8-8 Amendment 2

#### Signal Path:

**Rise/fall times:** 200 to 400ps

**Output jitter:** <200ps

#### Control:

**Q-Link to remote panels:**

**Cable type:** 75Ω video cable

**Max length:** 500m

**Serial RS232/422:**

**Signal:** RS232/422

**Connector:** D9 socket

**Ethernet:** RJ45

#### Switching Reference:

**Reference inputs:** Analog 625 or 525 tri-level

**Signal level:** 1V p-p ± 3dB or 1-4V pulses

**Impedance:** 75Ω

**Switching Line :** Lines 6/319, (625)

Lines 10/273, (525)

#### Power:

**Supply, external:** Auto ranging 100 to 240 VAC  
50/60 Hz

**Power consumption:** 20Watts

**Connections:** Two pin bayonet locking

**Power Fail Alarm Output:** Relay contact rated 250mA, 50v

Connector screw terminals

**Redundant PSU:** Optional

#### Physical:

19" W x 4.75" D x 3.5" H  
(483mm W x 120mm D x 90mm H)

**Weight: Frame:** 1.45Kg

**PSU:** 0.4Kg

**Operating temp.(ambient):** 0-40°C

**Specification maintained (ambient):**

10-30°C

**Humidity:** 10-90% non-condensing

**Ventilation:** Natural convection

### Ordering Information:

**QT-1616H**

HD/SD 16 x 16 High Definition router

**QT-3232H**

HD/SD 32 x 32 High Definition router

### Ordering Options:

**+2PS**

Redundant power supply

**+TL**

Lefthand power supply support  
tray

**+TR**

Righthand power supply support  
tray

**QT-CONFIG**

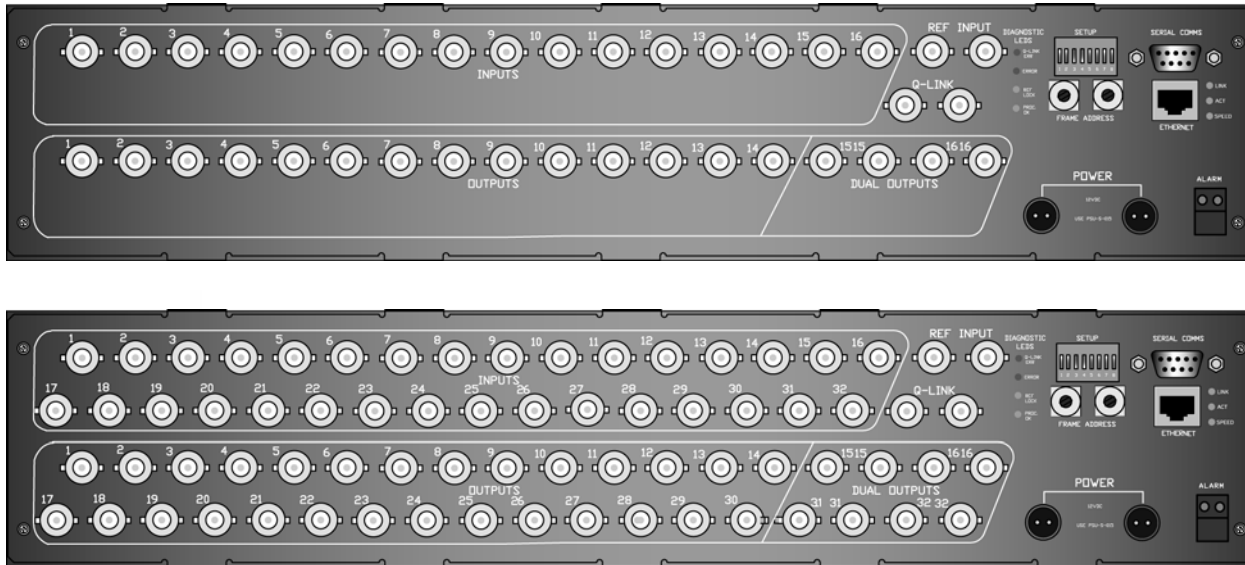
Topaz custom configuration

## QT-1616S, QT-3232S - Topaz SD

Designed to meet the needs of both the broadcast and professional video users Topaz is an aggressively low priced routing system combining no-compromise technical specifications with a market leading control system.

With broadcast quality, reliability, and affordability, Topaz is suited to many applications, including professional, corporate/industrial markets, educational uses and the AV and presentation markets.

### QT-SD-1616 - QT-1616 & QT-SD-3232 Rear Panels



### Features Configuration

The QT-SD-1616 is housed in a 2RU frame and switches 16 sources to 16 destinations. Both the input and output stage of the QT-SD-1616 is fixed at 16.

The QT-SD-3232 is also housed in a 2RU frame and can switch up to 32 sources to 32 destinations. Both the input and output stage of the QT-SD-3232 is fixed at 32.

### Control

The entire range of Topaz routers are compatible with the existing ranges of Quartz routers, remote control panels and control systems.

Both the QT-SD-1616 and the QT-SD-3232 router include, as standard, an internal FU-0019 Controller module which supports a single Q-Link and Serial port on the rear of the router.

The QT-SD-1616 and QT-SD-3232 have a number of control options, they are:

**Passive Remote Control Panels:** The CP-1601A-P and CP-1604-P passive remote control panels can be fitted to the QT-SD-1616 and QT-SD-3232 router via a PI-1604 or PI-1608 parallel interface.

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the QT-SD-1616 and QT-SD-3232 router connected via Q-Link.

**External third party control:** The QT-SD-1616 and QT-SD-3232 router can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port.

### Expansion

The input and output stage of both the QT-SD-1616 and the QT-SD-3232 are fixed at 16 and 32. They can not be expanded beyond their frame size.

### Power Supply

The power supply for the Topaz routers is external and connects to the frame via secure bayonet locking connector. The Topaz routers can be fitted with an optional redundant external power supply. An optional mounting tray securely supports both of the power supplies without the need for additional rack space.

### Feature Summary

- Full broadcast specifications.
- Silent operation - convection cooled.
- Powerful built-in control systems.
- Q-Link and Serial control.
- Ethernet control.
- Compatible with all Quartz routers and remote control panels.
- Frames can be segmented into multiple smaller routers.
- Optional power supply tray.
- Redundant power supply option.
- Bayonet locking power connectors.



### Specifications

Topaz-SD handles a wide range of digital signals up to 360Mb/s. Typically used to carry SDI or ASI signals at 270Mb/s or 360MB/s, Topaz-SD will also handle lower bit rate signals since it does not re-clock inputs or outputs. Embedded Audio Signals carried on the SDI signal are passed through transparently.

#### Configuration:

**Inputs/Outputs:** Fixed at 16x16 or 32x32

#### SD Video Inputs:

**Standard:** SMPTE 259M-C (270Mb/s)

**Signal Level:** 800mV p-p nominal

**Impedance:** 75Ω terminating

**Return Loss, 5-270 MHz:** 15dB

**Cable equalization:**

**Belden 8281**

**BBC PSF1/2:** 250m min

**BBC PSF1/3:** 150m min

**Connectors:** BNC per IEC 60169-8-8 Amendant 2

#### SD Video Outputs:

**Standard:** SMPTE 259M-C (270Mb/s)

**Signal Level:** 800mV p-p ± 10%

**Impedance:** 75Ω terminating

**Return Loss, 5-270 MHz:** 15dB

**D.C. offset:** 0 ± 0.5V

**Connectors:** BNC per IEC 60169-8-8 Amendant 2

#### Signal Path:

**Rise/fall times:** 0.4 to 1.5ns

**Path length:** 12ns, typical

**Output jitter:** 0.2UI p-p with <250m input cable

#### Control:

**Q-Link to remote panels:**

**Cable type:** 75Ω video cable

**Max length:** 500m

**Serial RS232/422:**

**Signal:** RS232/422

**Connector:** D9 female

**Ethernet:** RJ45

#### Switching Reference:

**Reference inputs:** Analog 625 or 525

**Signal level:** 1V p-p ± 3dB

**Impedance:** 75Ω

**Line switching:** Lines 6/319 (625)  
Lines 10/273 (525)

#### Power:

**Supply, external:** Auto ranging 100 to 240 VAC 50/60 Hz

**Power consumption:** 20 Watts

**Connections:** Two pin bayonet locking

**Power Fail Alarm Output:** Relay contact rated 250mA, 50v  
Connector screw terminals

**Redundant PSU:** Optional

#### Physical:

19" W x 4.75" D x 3.5" H  
(483mm W x 120mm D x 90mm H)

**Weight: Frame:** 1.45Kg

**PSU:** 0.4Kg

**Operating temp.(ambient):** 0-40°C

**Specification maintained (ambient):**

10-30°C

**Humidity:** 10-90% non-condensing

**Ventilation:** Natural convection

### Ordering Information:

**QT-1616S** SD 16 x 16 router

**QT-3232S** SD 32 x 32 router

### Ordering Options:

**+2PS** Redundant power supply

**+TL** Lefthand power supply support tray

**+TR** Righthand power supply support tray

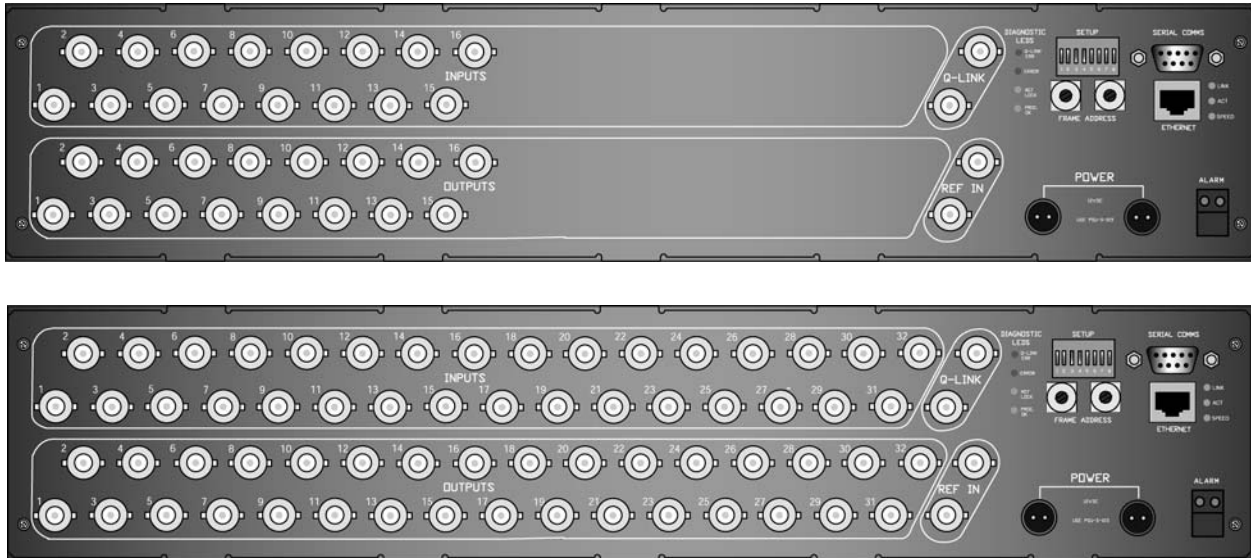
**QT-CONFIG** Topaz custom configuration

## QT-1616N, QT-3232N - Topaz Analog Video

Designed to meet the needs of both the broadcast and professional video users Topaz is an aggressively low priced routing system combining no-compromise technical specifications with a market leading control system.

With broadcast quality, reliability, and affordability, Topaz is suited to many applications, including professional, corporate/industrial markets, educational uses and the AV and presentation markets.

### QT-AV-1616 - QY-1616N & QT-AV-3232 - QT-3232N Rear Panels



#### Features

##### Configuration

The Topaz routers are housed in a 2RU frame and switches 16 sources to 16 destinations. Both the input and output stage of the QT-AV-1616 is fixed at 16.

The Topaz routers are also housed in a 2RU frame and can switch up to 32 sources to 32 destinations. Both the input and output stage of the QT-AV-3232 is fixed at 32.

##### Control

The entire range of Topaz routers are compatible with the existing ranges of Quartz routers, remote control panels and control systems.

The Topaz routers include, as standard, an internal FU-0019 Controller module which supports a single Q-Link and Serial port on the rear of the router.

The Topaz routers have a number of control options, they are:

**Passive Remote Control Panels:** The CP-1601A-P and CP-1604-P passive remote control panels can be fitted to the QT-AV-1616 and QT-AV-3232 router via a PI-1604 or PI-1608 parallel interface.

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the Topaz routers connected via Q-Link.

**External third party control:** The Topaz routers can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port.

#### Expansion

The input and output stage of both the Topaz routers are fixed at 16 and 32. They can not be expanded beyond their frame size.

#### Power Supply

The power supply for the Topaz routers is external and connects to the frame via secure bayonet locking connector. Both the QT-AV-1616 and the QT-AV-3232 can be fitted with an optional redundant external power supply. An optional mounting tray securely supports both of the power supplies without the need for additional rack space.

#### Feature Summary

- Full broadcast specifications
- Silent operation - convection cooled
- Powerful built-in control systems
- Q-Link and Serial control
- Ethernet control
- Compatible with all Quartz routers and remote control panels
- Frames can be segmented into multiple smaller routers
- Optional power supply tray
- Redundant power supply option
- Bayonet locking power connectors

### Specifications

Topaz-AV provides excellent performance and reliability at an exceptional price for any analog video application. Full Broadcast Specifications with 75Ω terminating inputs. DC Restored Inputs and vertical interval switching for disturbance free switches. Component Video signals can be handled by stacking multiple units, or internally splitting the unit into several virtual levels. This allows support of many formats by simple configuration changes.

### Configuration

**Inputs/Outputs:** Fixed at 16x16 or 32x32

### Analog Video Inputs:

#### Nominal signal Level:

Video signal: 1v p-p

Sync pulse (separate H+V): 2v p-p

#### Max signal level:

##### DC restored inputs

Video signal: +6dB

Sync pulse (separate H+V): 2.5v p-p

##### DC coupled inputs

Video: ± 0.7v

Impedance: 75Ω terminating

Return Loss, 5-270 MHz: 40dB

DC on input (DC restored): ± 3v

Connectors: BNC per IEC 60169-8-8 Amendant 2

### Analog Video Outputs:

Impedance: 75Ω

Return Loss to 5.5MHz: 40dB

DC on output: ± 50mV

Connectors: BNC per IEC 60169-8-8 Amendant 2

### Insertion Gain:

Insertion gain: ± 0.1dB

Gain spread between inputs: ± 0.05dB

### Distortion:

#### HF response

15kHz to 5.5MHz: ± 0.1dB

5.5 to 10MHz: ± 0.2dB

10MHz to 100MHz: +0.5, -1.0dB

Above 100MHz: smooth roll off

LF response, tilt at 50Hz: ± 0.5%

Y-C gain inequality: ± 0.5%

Y-C delay inequality: ± 5nsec

Differential Gain (10-90% APL): 0.25%

Differential Phase (10-90% APL): 0.15°

Path length, typical: 13nsec typical

### Unwanted Residual Effects:

Crosstalk, at 5.5MHz worst case: -60dB

Noise to 5.5Mz: -70dBrms

### Control:

Q-Link to remote panels: 75Ω video cable

Max length: 500m

Serial RS232/422:

Connector: D9 socket

Ethernet: RJ45

### Switching Reference:

Reference inputs: Analog 625 or 525

Signal level: 1V p-p +6dB, -3dB

Impedance: 75Ω

Switching Line: Lines 6/319 (625)

Lines 10/273 (525)

### Power:

#### Supply, external:

Auto ranging 100 to 240 VAC

50/60 Hz

20Watts

#### Power consumption:

#### Connections:

Two pin bayonet locking

#### Power Fail Alarm Output:

##### Relay contact:

Rated 250mA, 50v

##### Connector:

Screw terminals

#### Redundant PSU:

Optional

### Physical:

19" W x 10.25" D x 3.5" H

(483mm W x 260mm D x 90mm H)

#### Weight: Frame:

1.45Kg

#### PSU:

0.4Kg

#### Operating temp.(ambient):

0-40°C

#### Specification maintained

#### (ambient):

10-30°C

#### Humidity:

10-90% non-condensing

#### Ventilation:

Natural convection

### Ordering Information

#### QT-1616N

16 x 16 Analog Video router

#### QT-3232N

32 x 32 Analog Video router

### Options

#### +2PS

Redundant power supply

#### +TL

Lefthand power supply support tray

#### +TR

Righthand power supply support tray

#### QT-CONFIG

Topaz custom configuration

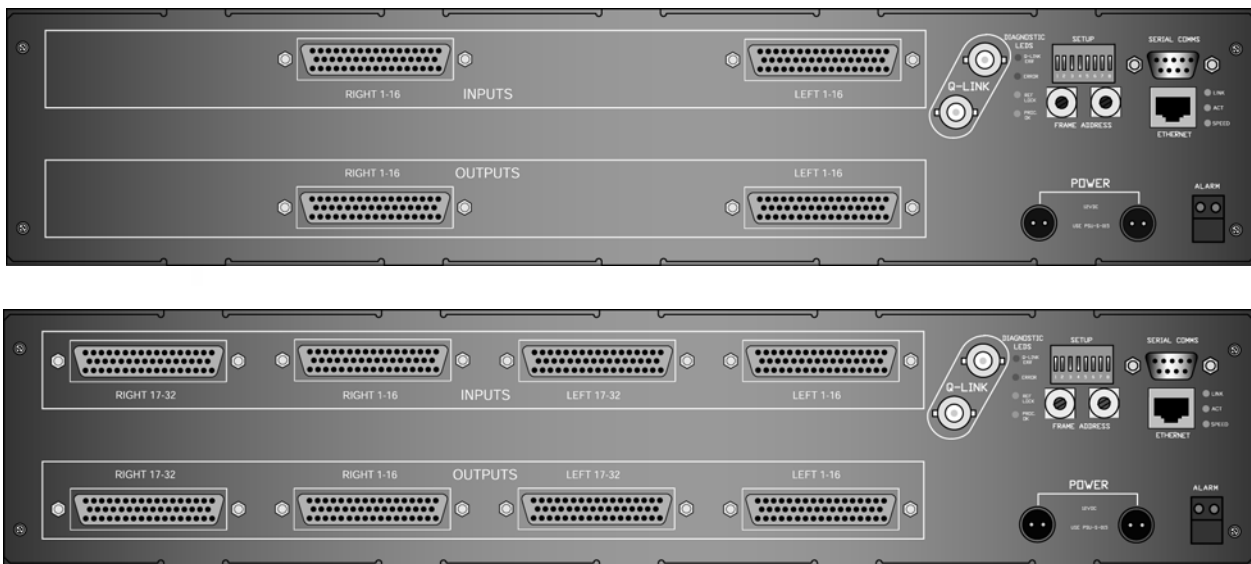


## QT-1616-AA, QT-3232AA - Topaz Analog Audio

Designed to meet the needs of both the broadcast and professional video users Topaz is an aggressively low priced routing system combining no-compromise technical specifications with a market leading control system.

With broadcast quality, reliability, and affordability, Topaz is suited to many applications, including professional, corporate/industrial markets, educational uses and the AV and presentation markets.

### QT-AA-1616 - QY-1616-AA & QT-AA-3232 - QT-3232AA Rear Panels



### Features Configuration

The Topaz routers are housed in a 2RU frame and switches 16 sources to 16 destinations. Both the input and output stage of the QT-AA-1616 is fixed at 16.

The Topaz routers are also housed in a 2RU frame and can switch up to 32 sources to 32 destinations. Both the input and output stage of the QT-AA-3232 is fixed at 32.

### Control

The entire range of Topaz routers are compatible with the existing ranges of Quartz routers, remote control panels and control systems.

The Topaz routers include, as standard, an internal FU-0019 Controller module which supports a single Q-Link and Serial port on the rear of the router.

The Topaz routers have a number of control options, they are:

**Passive Remote Control Panels:** The CP-1601A-P and CP-1604-P passive remote control panels can be fitted to the QT-AA-1616 and QT-AA-3232 router via a PI-1604 or PI-1608 parallel interface.

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the Topaz routers connected via Q-Link.

**External third party control:** The Topaz routers can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port.

### Expansion

The input and output stage of both the Topaz routers are fixed at 16 and 32. They can not be expanded beyond their frame size.

### Power Supply

The power supply for the Topaz routers is external and connects to the frame via secure bayonet locking connector. The Topaz routers can be fitted with an optional redundant external power supply. An optional mounting tray securely supports both of the power supplies without the need for additional rack space.

### Feature Summary

- Full broadcast specifications.
- Silent operation - convection cooled.
- Powerful built-in control systems.
- Q-Link and Serial control.
- Ethernet control.
- Compatible with all Quartz routers and remote control panels.
- Frames can be segmented into multiple smaller routers.
- Optional power supply tray.
- Redundant power supply option.
- Bayonet locking power connectors.

## Topaz Analog Audio Routers

### QT-1616-AA & QT-3232-AA

#### Specifications

Topaz-AA may be used as a companion audio router, working with Topaz video routers, or as a standalone audio router. With its outstanding performance the Topaz-AA even suits the most demanding audio applications. Timecode Signals may be passed through Topaz-AA, even when shuttling tape. Each Topaz-AA Frame carries two channels of audio. Frames may be stacked when additional channels are required or split into sections to add channels in the same frame.

#### Configuration:

**Inputs/Outputs:** Fixed at 16x16 or 32x32 Stereo

#### Analog Audio Inputs:

**Signal Level:** 0dB nominal, +24dBu max  
**Impedance:** 20k $\Omega$   
**Common Mode Rejection:** 40dB  
**Typical at 50/60Hz:** -100dBu  
**Nominal 20Hz to 3KHz:** -80dBu  
**Nominal 3KHz to 20KHz:** -60dBu  
**Common Mode Level:** +27dBu maximum, no signal  
**Connectors:** D50 female

#### Analog Audio Outputs:

**Impedance:** 40 $\Omega$  balanced  
**DC on output:**  $\pm$  50mV  
**Connectors:** D50 female

#### Signal Path:

**Insertion gain:**  $\pm$  0.1dB  
**Frequency response:**  
    **20Hz to 20KHz:**  $\pm$  0.25dB  
    **20KHz to 150KHz:** -3dB  
**Delay between two routes:** 1m sec  
**Total harmonic distortion:**  
    **-10dBu to +20dBu:** 0.02%, 0.01% typical  
**Crosstalk 20Hz to 20KHz:** -80dB  
**Noise (un-weighted)**  
    **20Hz to 20kHz:** -85dB rms

#### Control:

**Q-Link to remote panels:**  
    **Cable type:** 75 $\Omega$  video cable  
    **Max length:** 500m  
**Serial RS232/422:**  
    **Signal:** RS232/422  
    **Connector:** D9 socket  
**Ethernet:** RJ45

#### Power:

**Supply, external:** Auto ranging 100 to 240 VAC  
50/60 Hz  
**Power consumption:** 20 Watts  
**Connections:** Two pin bayonet locking  
**Power Fail Alarm Output:**  
    **Relay contact:** Rated 250mA, 50v  
    **Connector:** Screw terminals  
**Redundant PSU:** Optional

#### Physical:

19" W x 10.25" D x 3.5" H  
(483mm W x 260mm D x 90mm H)  
**Weight: Frame:** 1.45Kg  
**PSU:** 0.4Kg  
**Operating temp.(ambient):** 0-40°C  
**Specification maintained (ambient):** 10-30°C  
**Humidity:** 10-90% non-condensing  
**Ventilation:** Natural convection

#### Ordering Information:

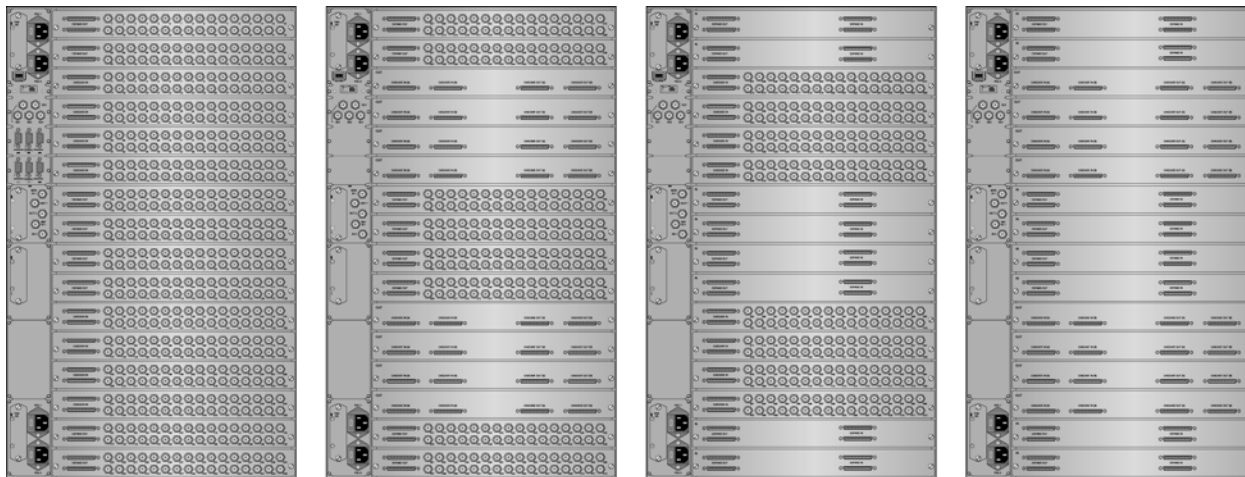
**QT-1616-AA** 16 x 16 Analog Audio router  
**QT-3232-AA** 32 x 32 Analog Audio router

#### Ordering Options:

**+2PS** Redundant power supply  
**+TL** Lefthand power supply support tray  
**+TR** Righthand power supply support tray  
**QT-CONFIG** Topaz custom configuration

While primarily designed as High Definition video router the input, crosspoint and output circuitry of the Q256-H equally supports the routing of Standard Definition digital video. While some routers only allow HD or SD routing within a defined I/O block the Q256-H allows an HD or SD source to be connected to any one of its inputs and to be switched through to any one of its outputs. There are no operational restrictions imposed by the Q256-H router. All outputs are reclocked with automatic sample rate selection.

## Q256-HD Rear Panel (Configurations A, B, C & D)



### Features Configuration

The Q256-H is housed in a 16RU frame, switching up to 256 sources to 256 destinations. The modular design of the Q256-H allows additional input and output modules to be installed in to the router at anytime in blocks of 32.

### Control

The Q256-H requires an external control system that operates alongside its internal controller. The external controller can be either the SC-500 or SC-1000. The SC-500 is a simple non-redundant system controller suitable for non-critical installation while the SC-1000 is a comprehensive fully redundant system controller suitable for all critical on-air installations. The SC-1000 should always be used when 100% redundancy protection is required. The System Controller handles the management of the router as well as optionally providing additional redundancy features. It's an expandable platform that supervises all of the communication and interface requirements of the Q256-H router and its control panels.

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the Q256-H router connected via Q-Link and the System Controller.

**External third party control:** The Q256-H router can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port. Some automation systems have the ability to connect directly to the Q256-H while others connect via the System controller.

### Router Expansion

The Q256-H router can be expanded by installing extra plug-in modules into a part-populated router frame or adding additional frames. The Q256-H router is scaled in steps of 32 from 32x32 through to 256x256 in a single 16RU frame.

### Power Supply

The two power supplies for the Q256-H are internal. The 16RU Q256-H frame can be fitted with an optional redundant power supply configuration with separate AC power inlets and alarm outputs.

### Feature Summary

- Automatic cable equalization on each input.
- Reclocking outputs with fully automatic sample rate selection.
- Can be controlled over an Ethernet network.
- Redundant controller option.
- Module, power supply and fan 'hot-swap' capability.
- Vertical interval switching, reverts to free running if no analog sync is detected.
- Basic signal presence detectors check each input, each output and the reference inputs.
- Transaction logging.
- Remote monitoring and diagnostics are possible via serial or Ethernet ports.
- Power supply voltage and temperature monitoring.
- Temperature inside the router is monitored at several points.
- Fans are monitored for rotation and rotation speed.
- Control ports are monitored for activity.



### Specifications

#### Configuration:

**Inputs:** Selectable in blocks of 32  
**Outputs:** Selectable in blocks of 32

#### Standard Definition Video:

##### Inputs:

**Signals Supported:** SMPTE 259M  
 ASI DVB standard  
**Signal level:** 800mV p-p nominal  
**Impedance:** 75Ω terminating  
**Return Loss at 5-270Mhz:** 18dB typical  
**Cable equalization at 270Mhz:**

##### Belden 8281

**BBC PS1/2:** 300m min, 350m typical

**BBC PS1/3:** 150m min, 175m typical

**Connectors:** BNC per IEC 60169-8-8 Amendament 2

##### Outputs:

**Signal level:** 800mV p-p ± 10%  
**Impedance:** 75Ω  
**Return Loss at 5-270Mhz:** 23dB typical  
**Reclocking Outputs**  
**D.C. offset:** 0 ± 0.5V  
**Connectors:** BNC per IEC 60169-8-8 Amendament 2

##### Signal Path:

**Rise/fall times:** 600 to 900ps  
**Path length:** 45ns, typical  
**Output jitter:** 0.2UI p-p with <300m input cable

#### Switching Reference:

**Reference input:** 2, analog 525 and 625  
**Signal level:** 1V p-p ± 3dB or 1-4V pulses  
**Impedance:** 75Ω terminated  
**Switching Line :** 6/319 (625) 10/273 (525)  
 complies with SMPTE RP-168

#### High Definition Video:

##### Video Inputs:

**Signals Supported:** SMPTE 292M  
**Signal level:** 800mV p-p nominal  
**Impedance:** 75Ω terminating  
**Return Loss at 5-270Mhz:** better than 15dB  
**Cable equalization at 1485Mhz**  
**Belden 8281:** 100 meters  
**Belden 1694A:** 150 meters  
**Connectors:** BNC per IEC 60169-8-8 Amendament 2

##### Video Outputs:

**Signal level:** 800mV p-p ± 10%  
**Impedance:** 75Ω  
**Return Loss at 5-270Mhz:** better than 15dB  
**Reclocking Outputs**  
**D.C. offset:** 0± 0.5V  
**Connectors:** BNC per IEC 60169-8-8 Amendament 2

##### Signal Path:

**Rise/fall times:** <270ps  
**Path length:** 25ns, typical  
**Path Inequality:** <10ns

#### Switching Reference:

**Reference input:** 2, analog 525 and 625  
**Signal level:** 1V p-p ± 3dB or 1-4V pulses  
**Impedance:** 75Ω terminated  
**Line Switching:** SMPTE RP-168

#### Control:

**Q-Link to remote panels:** 4x (75Ω video cable)  
 500m max. length  
**Serial RS232/422:** 3x (D9 female)  
**Ethernet:** 2x (RJ45)

#### Power

**Supply:** Auto ranging 100 to 240 VAC 50/60 Hz  
**Power:** 1600 Watts  
**Backup:** Optional with alarm output

#### Physical

**Height:** 16RU 28" (719mm)  
**Width:** 19" Rack mount (483mm)  
**Depth:** 20.75" (515mm)  
**Weight:** 220lbs (100kg)  
**Operating temperature:** 0-40°C ambient  
**Ventilation:** Fan cooled right to left

#### Ordering Information:

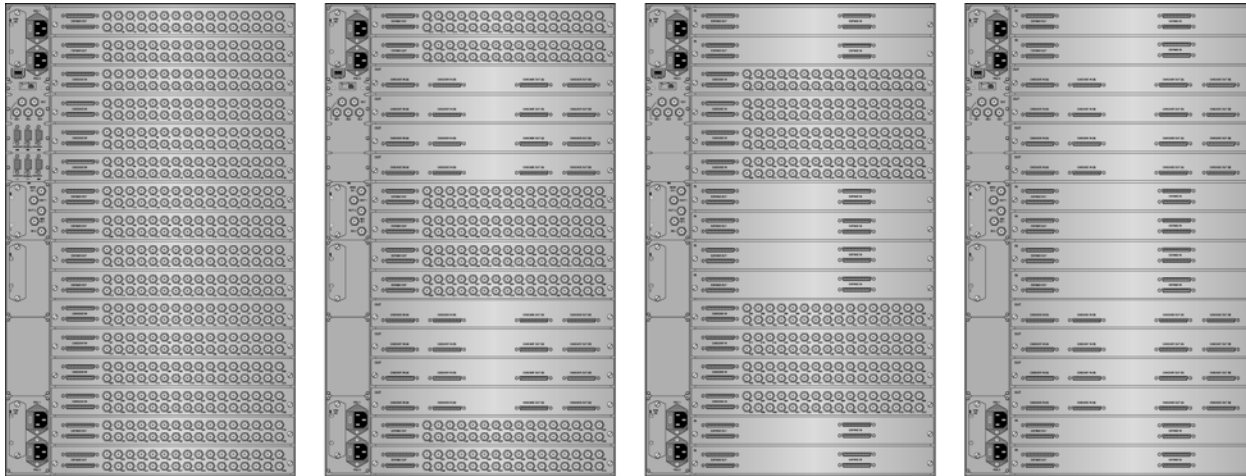
**Q256-032032H+R32** 32x32 HD/SD Video Router with reclocked outputs

#### Ordering Options:

**+2PS** Redundant power supplies (2)  
**Q256-IP32H** 32 HD/SD Inputs  
**Q256-OP32H+R32** 32 HD/SD Reclocking Outputs  
**+FU** Redundant controller module (required for redundant operation)

The Q256-S is an advanced large-scale standard definition digital video router that can be expanded up to a matrix size of 1024x1024. The design of Q256-S includes comprehensive and diagnostic facilities allowing the signal to be monitored at the input as well as the output of the router. The monitoring output is available externally or can be processed internally to yield EDH status information. In addition there is comprehensive monitoring of the power supplies and cooling fans.

#### Q256-SV Rear Panels (Configurations A, B, C, & D)



#### Features Configuration

The Q256-S is housed in a 16RU frame, switching up to 256 sources to 256 destinations. The modular design of the Q256-S allows additional input and output modules to be installed in to the router at anytime in blocks of 32.

#### Control

The Q256-S requires an external control system that operates alongside its internal controller. The external controller can be either the SC-500 or SC-1000. The SC-500 is a simple non-redundant system controller suitable for non-critical installation while the SC-1000 is a comprehensive fully redundant system controller suitable for all critical on-air installations. The SC-1000 should always be used when 100% redundancy protection is required. The System Controller handles the management of the router as well as optionally providing additional redundancy features. It's an expandable platform that supervises all of the communication and interface requirements of the Q256-S router and its control panels.

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the Q256-S router connected via Q-Link and the System Controller.

**External third party control:** The Q256-S router can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port. Some automation systems have the ability to connect directly to the Q256-S while others connect via the System controller.

#### Router Expansion

The Q256-S router can be expanded by installing extra plug-in modules into a part-populated router frame or adding additional frames to provide a very large routing system. Circuitry for expansion is built in to the router as standard so that there is no need for additional distribution or switching hardware.

The Q256-S router can be scaled in steps of 32 from 32x32 through to 256x256 in a single 16RU frame. Expansion beyond 256x256, up to 1024x1024, can be achieved by combining several router frames together.

#### Power Supply

The two power supplies for the Q256-S are internal. The 16RU Q256-S frame can be fitted with an optional redundant power supply configuration with separate AC power inlet and alarm output.

#### Monitoring and Diagnostics

A major feature of the design is the integral monitoring and diagnostic facilities which allows the signal to be monitored at the inputs and at the outputs of the router. The monitoring output is available externally or can be processed internally to yield EDH status information. In addition there is comprehensive monitoring of the power supplies and cooling fans. The monitoring and diagnostics can be controlled and the resulting data accessed through a serial or Ethernet port.

#### Feature Summary

- Automatic cable equalization on each input
- Reclocking outputs with fully automatic sample rate selection
- Comprehensive system & signal monitoring option
- Can be controlled over an Ethernet network
- Redundant controller option
- Module, power supply and fan 'hot-swap' capability
- Vertical interval switching, reverts to free running if no analog sync is detected
- Basic signal presence detectors check each input, each output and the reference inputs
- Signal quality monitoring using EDH checks.
- Transaction logging
- Remote monitoring and diagnostics are possible via serial or Ethernet ports
- Power supply voltage and temperature monitoring
- Temperature inside the router is monitored at several points
- Fans are monitored for rotation and rotation speed
- Control ports are monitored for activity
- Status of signal leaving the input modules (optional)
- Status of signal leaving the output modules (optional)

### Specifications

#### Configuration:

Inputs: Selectable in blocks of 32  
Outputs: Selectable in blocks of 32

#### Standard Definition Video:

##### Video Inputs:

Signals Supported: SMPTE 259M

ASI DVB standard

Signal level: 800mV p-p nominal

Impedance: 75Ω terminating

Return Loss at 5-270Mhz: 18dB typical

Cable equalization at 270Mhz:

Belden 8281

BBC PS1/2: 300m min, 350m typical

BBC PS1/3: 100m min, 175m typical

Connectors: BNC per IEC 60169-8-8 Amendant 2

##### Video Outputs:

Signal level: 800mV p-p ± 10%

Impedance: 75 Ω

Return Loss at 5-270Mhz: 23dB typical

##### Reclocking Outputs

D.C. offset: 0± 0.5V

Connectors: BNC per IEC 60169-8-8 Amendant 2

##### Signal Path:

Rise/fall times: 600 to 900ps

Path length: 45ns, typical

Output jitter: 0.2UI p-p with <300m input cable

##### Switching Reference:

Reference input: 2, analog 525 and 625

Signal level: 1V p-p ± 3dB or 1-4V pulses

Impedance: 75Ω terminated

Switching Line : 6/319 (625) 10/273 (525)  
complies with SMPTE RP-168

##### Control:

Q-Link to remote panels: 4x (75Ω video cable)

500m max. length

Serial RS232/422: 3x (D9 female)

Ethernet: 2x (RJ45)

##### Power:

Supply: Auto ranging 100 to 240 VAC 50/60 Hz

Power: 1600 Watts

Backup: Optional with alarm output

##### Physical:

Height: 16RU 28" (719mm)

Width: 19" Rack mount (483mm)

Depth: 20.75" (515mm)

Weight: 220lbs. (100kg)

Operating temperature: 0-40°C ambient

Ventilation: Fan cooled right to left

##### Ordering Information:

Q256-032032S 16RU 32x32 Serial Video Router with  
reclocking outputs

##### Ordering Options:

+2PS Redundant power supplies (2)

Q256-IP32S 32 Standard Definition Inputs

Q256-OP32S 32 SD Outputs (non-reclocking)

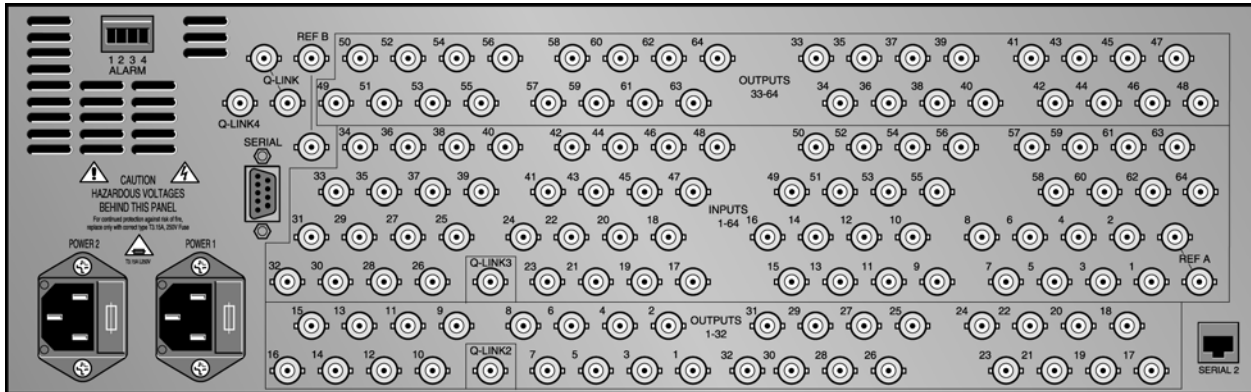
+FU Redundant controller module (required  
for redundant operation)

+SM System Monitor Module



The Q6400-N router is a mid-sized analog video router.

## Q6400-N Rear Panel



### Features Configuration

The Q6400-N is housed in a 3RU frame. The Q6400-N is available in three fixed sizes, 32x32, 64x32 and 64x64. The Q6400-N can be upgraded by returning the router to the local service centre.

### Control

The Q6400-N router includes, as standard, an internal FU-0003 Controller module which supports a single Q-Link and Serial port on the rear of the router. The optional internal CI module can be fitted to the Q6400-N to increase the number of Q-Link and Serial ports.

The Q6400-N has a number of control options, they are:

**Passive Remote Control Panels:** The CP-1601A-P and CP-1604-P passive remote control panels can be fitted to the Q6400-N router via a PI-1604 or PI-1608 parallel interface.

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the Q6400-N router connected via Q-Link.

**External Third Party Control:** The Q6400-N router can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port.

### Expansion

The input or output stage of the Q6400-N can be expanded from 16 to 32. In both cases the router needs to be returned to the local service centre to be upgraded. It can not be expanded beyond its frame size.

### Power Supply

The power supply for the Q6400-N is internal. An optional redundant power supply with separate AC power inlet and alarm output is available.

### Analog Video

- 50Mhz bandwidth and terminated inputs for best possible signal performance.
- D.C. restored inputs for composite signals ensures switching free from the picture disturbances often encountered in D.C. coupled only designs.
- Vertical interval switching for clean switching, reverts to free running if no sync reference (video or pulse) with all levels of the same route switching in the same field.
- Dual 525/625 reference input.

### Operational Features

- Frames can be stacked for parallel component analog video routers, or a single frame can be split to provide separate routers from a single frame.
- Diagnostic monitoring of temperature and PSU status.
- All modules are installed from the front for easy access for upgrades and maintenance, not possible with some alternative designs.
- Built-in control system.

# Analog Video Router

## Q6400-N

### Specifications

#### Configuration:

Inputs Selectable: 32 or 64

Outputs Selectable: 32 or 64

#### Analog Video Inputs:

Signal level: 1V p-p nominal, +3dB max.

Impedance: 75Ω terminating

Return Loss to 5.5MHz: 39dB

Connectors: BNC per IEC 60169-8-8 Amendant 2

#### Analog Video Outputs:

Impedance: 75Ω

Return Loss to 5.5MHz: 38dB

D.C. on output: ±50mV

Connectors: BNC per IEC 60169-8-8 Amendant 2

#### Signal Path:

Insertion gain: ±0.1dB

HF response: 15kHz to 5.5MHz ±0.1dB to 20MHz

±0.2dB -3dB bandwidth > 50MHz

LF response, tilt at 50Hz: 0.5%

2T pulse, pulse/bar, bar slope: 0.25%

Luma/Chroma Inequalities: ±0.5% gain, ±5ns delay

Diff Gain and Phase: 0.15%, 0.15° (10-90% APL)

Luminance non-linearity: 0.2%

Path length, typical: 10ns

Timing spread at 3.58/4.43MHz: ±2° at any output

Crosstalk at 3.58/4.43MHz: -63dB

Noise to 5.5MHz: -68dB rms.

#### Control:

Q-link to remote panels: 1 as standard (additional 3 Q-links with CI-0004 option) 75Ω video cable 500m max. length

Serial RS232/422: 1 as standard (additional port with CI-0001 or CI-0004 option)

#### Switching Reference:

Reference: NTSC/PAL

Signal level: 1V p-p ±3dB or 1-4V pulses

Impedance: 75Ω looping

Switching Line : 6/319 - 11/324

#### Power:

Supply: Auto ranging 100 to 240 VAC  
50/60 Hz

Power Consumption: 34 Watts

#### Physical:

Height: 3RU, 133mm (5.25" nom.)

Width: 19" rack mount

Depth: 485mm (19" nom.)

Weight: 11.25kg (23lb)

Operating Temperature: 0-40°C

Specification maintained: 10-30°C

Ventilation: Fan cooled, air drawn in from the front and exhausted from the side

### Ordering Information:

Up to 64x64 in a 3RU frame with single or redundant power supplies.

**Q6400-3232N**

32x32 Analog Video Router

**Q6400-6432N**

64x32 Analog Video Router

**Q6400-6464N**

64x64 Analog Video Router

### Ordering Options:

**+2PS**

Redundant power supply

**CI-0001**

Sub-module that enables a second RS232/422 serial port.

**CI-0004**

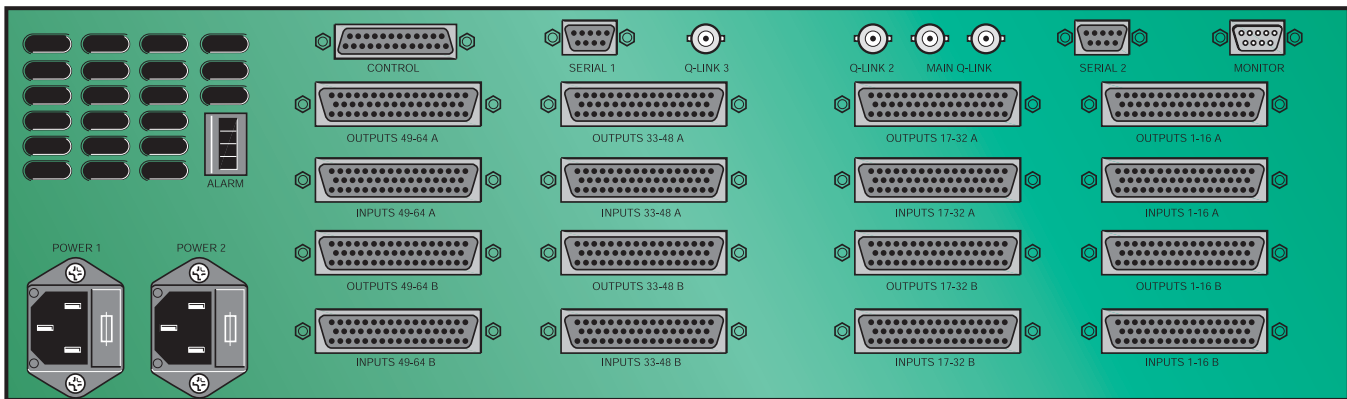
Sub-module that enables three additional Q-Links and one extra RS232/422 serial port.

Contact factory for other configurations and for further options.

## Q6400-AA Analog Audio

The Q6400-AA is a mid-sized analog audio router handling up to 64 inputs and 64 outputs of stereo audio in just 3U of rack space including an integral control system. All modules are installed from the front for easy access for upgrades and maintenance. The Q6400-AA supports an audio reverse feature which allows the left and right channels in a stereo pair to be swapped. This feature can also be used to arrange the router into a 128x64 mono configuration.

### Q6400-AA Rear Panel



### Features Configuration

The design of the Q6400-AA router allows it to be configured in square or non-square sizes. It is housed in a 3RU frame and is available in a redundant power supply configuration. The input and output stage of the router is selectable in blocks of 16 up to a maximum size of 64x64 stereo or 128x64 mono.

### Control

The Q6400-AA includes, as standard, an internal FU-0003 Controller module which supports a single Q-Link and Serial port on the rear of the router. The optional internal CI module can be fitted to the Q6400-AA to increase the number of Q-Link and Serial ports.

The Q6400-AA has a number of control options, they are:

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the Q6400-AA router connected via Q-Link.

**External third party control:** The Q6400-AA router can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port.

### Expansion

The input or output stage of the Q6400-AA can be expanded in blocks of 16 or 32 depending upon the audio format of the router, mono or stereo.

### Power Supply

The power supply for the Q6400-AA is internal and can be fitted with an optional redundant power supply with separate AC power inlet and alarm output.

### Feature Summary

- Frames may be stacked for multi-level systems.
- Many matrix sizes available from 32x32 up to 64x64 mono or stereo, or even 128x64 mono.
- Field upgradeable output modules in blocks of 16.
- Handles time code, even at spooling speeds, as well as genuine audio signals.
- Electronically balanced inputs with excellent common mode rejection.
- Electronically balanced outputs.
- Optional Output Crossover in blocks of 16 outputs provides the following extra features:
  - Left and right channels can be reversed
  - Left (or right) channel can be fed to both left and right outputs
  - Mono mix of left and right channels to both outputs



# Analog Audio Router

## Q6400-AA

### Specifications

#### Configuration:

##### Inputs:

Stereo: 16, up to 64 blocks of 16  
Mono: 32 to 128 blocks of 32

##### Outputs:

Stereo: 16, 32, 48, 64  
Mono: 32 or 64

#### Analog Audio Inputs:

Signal level: 0dBu nominal, +24dBu max.  
Impedance: 20k $\Omega$   
Common Mode Rejection:  
20Hz to 3kHz: -80dB, -100dB typical at 50/60Hz  
3kHz to 20kHz: -60dB, -70dB typical at 20kHz  
Common Mode Level: +27dBu maximum, no signal  
Connectors: D50 female, XLR Breakout panels available

#### Analog Audio Outputs:

Impedance: 40 $\Omega$  balanced  
D.C. on output:  $\pm 50$  mV  
Connectors: D50 female, XLR Breakout panels available

#### Signal Path:

Insertion gain:  $\pm 0.1$  dB  
Frequency Response at 20Hz to 20kHz:  $\pm 0.25$  dB to 150kHz -3dB  
Delay between two routes: 1 $\mu$ sec  
Total Harmonic Distortion: 0.02 %, 0.01 % typical -10dBu to +20dBu and 20Hz to 20kHz

#### Crosstalk:

20Hz to 20kHz: -80dB Noise (unweighted)  
20Hz to 20kHz: -85dB rms.

#### Control:

Q-link: 1 as standard (additional 3 Q-links with CI-0004 option)  
75 $\Omega$  video cable 500m max length  
Serial RS232/422: 1 as standard (additional port with CI-0001 or CI-0004 option) D9 female

#### Power:

Supply: Auto ranging 100 to 240 VAC 50/60 Hz  
Power Consumption: 120 Watts  
Backup: Optional with alarm output

#### Physical:

Height: 3U, 133mm (5.25" nom.)  
Width: 19" rack mount  
Depth: 485mm (19" nom.)  
Weight: 12.7kg (27.9lb) fully loaded  
Audio Connectors: D50 female multi-pin connectors carrying 16

Operating Temperature: 0-40°C  
Specification maintained: 10-30°C  
Ventilation: Fan cooled. Intake at front, exhaust at right-hand side and rear

#### Ordering Information:

Q6400-4816-AAM	48x16 Mono Audio Router
Q6400-4832-AAM	48x32 Mono Audio Router
Q6400-4848-AAM	48x48 Mono Audio Router
Q6400-6416-AAM	64x16 Mono Audio Router
Q6400-6432-AAM	64x32 Mono Audio Router
Q6400-6448-AAM	64x48 Mono Audio Router
Q6400-6464-AAM	64x64 Mono or 32x32 Dual Audio Router
Q6400-4816-AAS	48x16 Dual Audio Router
Q6400-4832-AAS	48x32 Dual Audio Router
Q6400-4848-AAS	48x48 Dual Audio Router
Q6400-6416-AAS	64x16 Dual Audio Router
Q6400-6432-AAS	64x32 Dual Audio Router
Q6400-6448-AAS	64x48 Dual Audio Router
Q6400-6464-AAS	64x64 Dual Audio Router
Q6400-4816-AAX	48x16 Dual Audio Router with Xover
Q6400-4832-AAX	48x32 Dual Audio Router with Xover
Q6400-4848-AAX	48x48 Dual Audio Router with Xover
Q6400-6416-AAX	64x16 Dual Audio Router with Xover
Q6400-6432-AAX	64x32 Dual Audio Router with Xover
Q6400-6448-AAX	64x48 Dual Audio Router with Xover
Q6400-6464-AAX	64x64 Dual Audio Router with Xover
Q6400-9616-AAM	96x16 Mono Audio Router
Q6400-9632-AAM	96x32 Mono Audio Router
Q6400-9648-AAM	96x48 Mono Audio Router
Q6400-128016-AAM	128x16 Mono Audio Router
Q6400-128032-AAM	128x32 Mono Audio Router
Q6400-128048-AAM	128x48 Mono Audio Router
Q6400-128064-AAM	128x64 Mono Audio Router

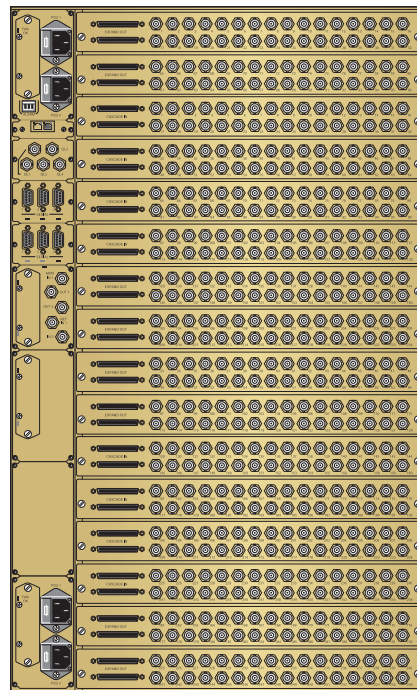
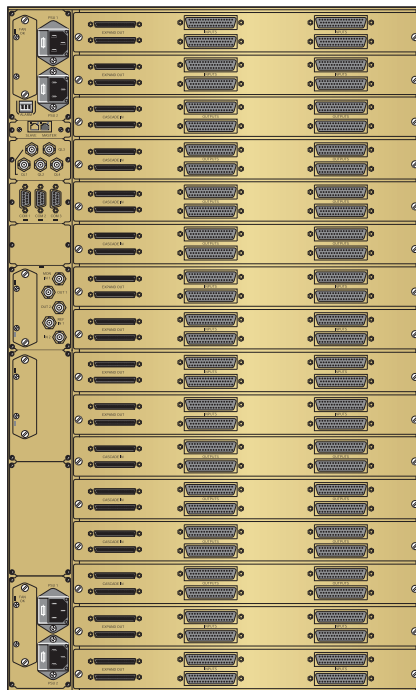
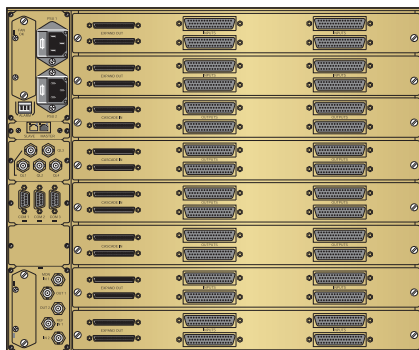
#### Ordering Options:

+2PS	Redundant power supply
CI-0001	RS232/RS422 Serial Card Modification to add second serial port to monitoring routers
CI-0004	Multi Q-Link Card
AK-0002	1RU Rear Frame Support Kit,
AK-0006	Audio Connectors, D50 male (each)
AK-0008	16 way XLR Breakout Panel, Male
AK-0009	16 way XLR Breakout Panel, Female



The Q256 Audio Router is a multi format audio router supporting both digital (balanced and unbalanced) and analog audio I/O's. Its features include Sample Rate Conversion (SRC), "Soft Switching" and "Wild Shuffling" as well as comprehensive monitoring and diagnostic facilities.

### Q256-AA 8RU, Q256-AES-AA (Balanced) 16RU & Q256-AES-AA (Unbalanced) 16RU Rear Panels



### Features

#### Configuration

The Q256-AES and Q256-AA are housed in a 16RU frame, switching up to 256 sources to 256 destinations. The Q256-AA is also available in an 8RU frame, switching up to 128 sources to 128 destinations. The modular design of the Q256-AES/AA allows additional input and output modules to be installed in to the router at anytime in blocks of 32. AES and analog audio modules can be mixed in any combination within the same frame. As the analog-to-digital and digital-to-analog conversion is handled by the input and output modules any input can be routed to any output regardless of its format type.

#### Control

The Q256-AES/AA routers require an external control system that operates alongside its internal controller. The external controller can be either the SC-500 or SC-1000. The SC-500 is a simple non-redundant system controller suitable for non-critical installation while the SC-1000 is a comprehensive fully redundant system controller suitable for all critical on-air installations. The SC-1000 should always be used when 100% redundancy protection is required. The System Controller handles the management of the router as well as optionally providing additional redundancy features. It's an expandable platform that supervises all of the communication and interface requirements of the Q256-AES/AA router and its control panels.

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the Q256-AES/AA router connected via Q-Link and the System Controller.

**External third party control:** The Q256-AES/AA router can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port. Some automation systems have the ability to connect directly to the Q256-AES/AA while others connect via the System controller.

#### Router Expansion

The Q256-AES/AA router can be expanded by installing extra plug-in modules into a part-populated router frame or adding additional frames to provide a routing matrix up to 1024x1024. The Q256-AES/AA router is scaled in steps of 32 from 32x32 through to 256x256 in a single 16RU frame and up to 1024x1024 by using multiple frames.

#### Power Supply

The power supplies for the Q256-AES/AA are internal. Both 8RU and 16RU frame can be fitted with an optional redundant power supply configuration with separate AC power inlets and alarm outputs.

### Feature Summary

#### Sample Rate Conversion

Sample Rate Conversion (SRC) allows the Q256-AES/AA router to accept audio input sample rates of 32kHz, 44.1kHz, 48kHz and 96kHz. On each input these sample rates are then converted to the chosen internal sample rate of 48kHz or 96kHz, before being switched to the required output destination. The use of SRC removes the complexity normally associated with systems routing multiple audio sample rates.

#### Soft Switching

Audio clicks can sometimes be experienced when switching between audio sources with an asynchronous or synchronous audio router. The soft switching technology used in the Q256-AES/AA router is able to predict these occasions and smooth out the audio transition for a guaranteed click-free switch. Soft switching requires a valid reference input to be present at all times.

#### Wild Shuffling

The Q256-AES/AA router also features Wild Shuffling allowing any input audio track to be selected with any other input audio track and routed to the same output destination.

#### Balanced and Unbalanced AES audio

The modular nature of the Q256-AES/AA router enables simultaneous support for a combination of both AES balanced (D50) and unbalanced (BNC) inputs and outputs.

#### Monitoring and Diagnostics

An important feature of the design is the integral monitoring and diagnostic facilities which allows the signal to be monitored at the inputs and at the outputs of the router. The monitoring is available externally or can be processed internally. In addition there is comprehensive monitoring of the power supplies and cooling fans. The monitoring and diagnostics can be controlled and the resulting data accessed through a serial or Ethernet port.

### Specifications

#### Configuration:

**Inputs:** Selectable in blocks of 32  
**Outputs:** Selectable in blocks of 32

#### Audio Inputs - AES:

**Sample rates:** 32kHz, 44.1kHz, 48kHz, and 96kHz

#### Balanced version (D50)

**Standard:** AES3-1992  
**Signal level:** 0.2-7V p-p  
**Impedance:** 110Ω ±20%  
**Transformer coupled**  
**D.C. on input:** ±50V  
**Connectors:** D50 female carrying 16 signals

#### Unbalanced version (BNC):

**Standard:** SMPTE 276M  
**Impedance:** 75Ω  
**Return loss:** 25dB, 0.1 - 6.0kHz  
**Connectors:** BNC per IEC 60169-8-8 Amendment 2

#### Audio Inputs - Analog:

**Signal level:** 0dBu nominal, +24dBu max.  
**Impedance:** 20kΩ  
**Common mode rejection**  
**20 to 22kHz:** -74dB (typical -80 @ 50Hz)  
**Connectors:** D50 female

#### Audio Outputs - AES:

##### Balanced version (D50)

**Signal level:** 2-5V p-p  
**Impedance:** 110Ω Transformer coupled  
**D.C. isolation:** ±50V  
**Rise/fall time:** 3.5-10ns  
**Connectors:** D50 female carrying 16 signals

##### Unbalanced version (BNC)

**Signal level:** 1.0V p-p ± 50%  
**Impedance:** 75Ω  
**Return loss:** 25dB, 0.1 - 6.0kHz  
**Jitter:** Conforms to ANSI S4.40 - 1992  
**Connectors:** BNC per IEC 60169-8-8 Amendment 2

#### Audio Outputs - Analog:

**Impedance:** 40Ω balanced  
**D.C. on output:** ± 50mV  
**Connectors:** D50

#### Control:

**Q-link to remote panels:** 4x 75Ω video capable 500m max. length  
**Serial RS232/422:** 3x D9 female  
**Maintenance RS232:** D9 female  
**Ethernet:** 2x RJ-45, 100BaseT, TCP/IP  
**Monitoring:** Input monitoring  
Output monitoring

#### Power:

**Supply:** Auto ranging 100 to 240 VAC 50/60 Hz  
**Power Consumption:** 8U: 1000 Watts  
16U: 1700 Watts  
**Backup:** Optional with alarm output

#### Physical:

**Height:** 8U: 355mm  
16U: 710mm  
**Width:** 19" rack mount  
**Depth:** 485mm (19" nom.)  
**Weight:** 8U: 50kg  
16U: 100kg  
**Operating temperature:** 0-40°C  
**Specification maintained:** 10-30°C  
**Ventilation:** Fan cooled right to left, as viewed from the front of the unit

#### Ordering Information:

**Q256-032032-AESB** Q256 32x32 Digital Audio Router  
**Q256-032032-AESU** Q256 32x32 Digital Audio Router

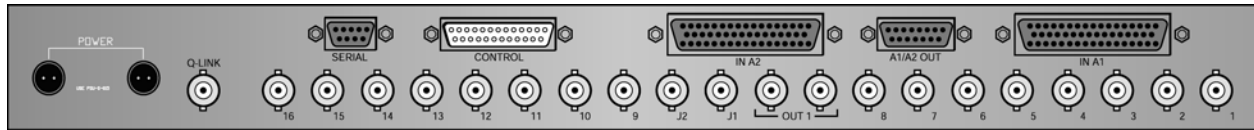
#### Ordering Options:

**+2PS** Redundant power supply  
**+FU** Redundant controller module



The Q1601, Q1602 and Q0802 are compact broadcast quality monitoring routers for high definition, standard definition or analog video applications. The design can also incorporate a digital or analog audio layer within the same frame.

### Q1602 Rear Panel



### Features Configuration

The 1RU frame is available with 8 (HD only) or 16 inputs and 1 or 2 outputs. It can be configured to accommodate single, mixed video or audio formats in the following configurations:

#### Single formats:

- High Definition Video (with embedded audio)
- Standard Definition Video (with embedded audio)
- Analog Video

#### Mixed formats:

- High definition video and four channel digital audio
- High definition video and stereo analog audio
- Standard definition video and four channel digital audio
- Standard definition video and stereo analog audio
- Analog video and four channel digital audio
- Analog video and stereo analog audio

*Note: The analog video module is also suitable for routing unbalanced digital audio signals.*

### Control

There are a number of control options for the monitoring routers:

**Local Control Panels:** The CP-1600A-LP or the CP-1601A-LP local panel can be fitted to the front of the router.

*Note: The CP-1600A-LP is the only local panel that can be fitted to a Monitoring router which has the optional FU-0003 Controller module fitted. The FU-0003 must be removed when any other local or passive remote panels are fitted.*

**Passive Remote Control Panels:** The CP-1601A-P or the CP-1604-P passive remote control panel can be fitted to the Monitoring router. These panels are connected to the router via the Control parallel port. Only one passive remote control panel can be fitted to the Monitoring router.

*Note: Passive remote control panels can not be fitted to a Monitoring router which has the optional FU-0003 Controller module fitted.*

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the Monitoring router. They connect via Q-Link and require the optional FU-0003 Controller module to be fitted.

**External third party control:** The Monitoring router can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port. The optional FU-0003 Controller module must be fitted.

### Expansion

For solutions requiring more than 16 inputs, multiple Monitoring routers can be cascaded together building in to a system with over 256 inputs. Cascading the Q1601 provides a single output while the Q1602 provides two outputs. The optional FU-0003 Controller module must be fitted to the master router in a cascaded system.

### Power Supply

The Monitoring router is available as standard with an external power supply. An optional redundant power supply can also be fitted. A single non-redundant internal power supply can be fitted to the Monitoring router if required.

### Digital Video (HD & SD)

- Terminating inputs with automatic cable equalization on each input.
- Reclocking outputs with fully automatic sample rate selection supporting:
  - HD - 1.485 and 1.485/1.001 Gb/s sample rates (SMPTE 292M).
  - SD - 143, 177, 270 and 360 Mb/s sample rates (SMPTE 259M).
- Vertical interval switching for clean switching. Reverts to free running if the reference is not connected
- Support of Bi-level syncs (PAL/NTSC) for SD and Bi-level and Tri-level syncs for HD
- Tri-level sync circuit auto-detects the HD standard
- Transparent to high definition and standard definition signals carrying embedded audio
- Compatible with ASI transport streams, such as MPEG video
- Automatic standards selection for complete standards independence

### Analog Video

- Terminating D.C. coupled inputs, suitable for composite and component signals
- Vertical interval switching for clean switching. Reverts to free running if a signal is not present on Input 1
- Suitable for unbalanced AES/EBU audio due to its wide analog bandwidth

### Digital Audio (Balanced)

- Electronically balanced inputs and outputs to AES3-1992.
- Two AES/EBU pairs

### Analog Audio

- Stereo analog audio
- Electronically balanced inputs and outputs
- Handles wide speed LTC

### Operational Features

- Deterministic switching
- Joystick override, used for matching the colour balanced of up to eight cameras
- Chop, used for rapidly switching between two sources, often used for calibration purposes

# HD or SD Video & Audio Routers

## Q1601, Q1602 & Q0802

### Specifications

#### Q1601 and Q1602:

**Inputs:** Fixed at 16  
**Outputs:** Selectable, 1 or 2

#### Q0802-HD and Q1602-HD:

**Inputs:** Selectable, 8 or 16  
**Outputs:** Fixed at 2

#### Standard Definition Video:

**Inputs:**  
**Signal level:** 800mV p-p nominal  
**Impedance:** 75Ω terminating  
**Return Loss to 5-270MHz:** 18dB, 20dB typical  
**Cable Equalization at 270MHz**  
**Belden 8281:**  
BBC PSF1/2: 300m min, 350m typical  
BBC PSF1/3: 200m min, 250m typical  
**Connectors:** BNC per IEC 60169-8-8 Amendment 2

#### Outputs:

**Impedance:** 75Ω  
**Return Loss to 5-270MHz:** 18dB, 20dB typical  
**D.C. on output:** 0±0.5V  
**Connectors:** BNC per IEC 60169-8-8 Amendment 2

#### Signal Path:

**Rise/Fall Times:** 0.6-0.9ns  
**Path length:** 9ns, spread 1ns  
**Switching Line :** line 6/319 (625) & line 10/273 (525)  
**Jitter:** 0.2 UI P-P with <300m input cable

#### Analog Video:

**Inputs:**  
**Signal level:** 1V p-p nominal, +6dB max.  
**Impedance:** 75Ω terminating  
**Return Loss to 5.5MHz:** 40dB  
**Connectors:** BNC per IEC 60169-8-8 Amendment 2

#### Outputs:

**Impedance:** 75Ω  
**Return Loss to 5.5 MHz:** 40dB  
**D.C. on output:** ±50mV  
**Connectors:** BNC per IEC 60169-8-8 Amendment 2

#### Signal Path:

**Insertion gain:** ±0.1dB  
**HF response:** ±0.2dB, to 5.5MHz -3dB, to 100MHz  
**Diff Gain and Phase:** 0.15%, 0.15° (10-90% APL)  
**Timing spread at 3.58/4.43MHz:** ±10 at any output  
**Crosstalk to 5.5MHz:** -57dB  
**Noise to 5.5 MHz:** -70dB rms.  
**Vertical Interval Switching:** Input 1

#### High Definition Video:

**Inputs:**  
**Signal level:** 800mV p-p nominal  
**Impedance:** 75Ω terminating  
**Return Loss 5 MHz to 1.485GHz:** better than 15dB  
**Cable equalization at 1.485 GHz:**  
**Belden 1694A:** 100m typical  
**Belden 8281**  
BBC PSF1/2: 70m typical  
**Connectors:** BNC

#### Outputs:

**Impedance:** 75Ω  
**Return Loss 5 MHz to 1.485GHz:** better than 15dB  
**D.C. on output:** 0±0.5V  
**Connectors:** BNC per IEC 60169-8-8 Amendment 2

#### SIGNAL PATH:

**Rise/Fall Times:** 270ps ± 100ps  
**Path length:** 5ns typical  
**Switching Line :** Lines 6/319 (625), lines 10/273 (525) & line 7 (HD Tri-level sync)

#### Digital Audio (Balanced):

**INPUTS:**  
**Sample rates:** 32-96kHz  
**Transformer coupled**  
**D.C. isolation on input:** ±50V  
**Signal level:** 0.2-5V p-p  
**Impedance:** 110Ω ±20%  
**Connectors:** D50 female

#### Outputs:

**Transformer coupled**  
**Signal level:** 2-7V p-p  
**Impedance:** 110Ω  
**D.C. isolation:** ±50 V  
**Rise/fall time:** 3.5-10ns  
**Jitter:** Conforms to ANSI S4.40 - 1992  
**Connectors:** D15 female

#### Analog Audio:

**Inputs:**  
**Signal level:** 0dBu nominal, +20dBu max.  
**Impedance:** 20Ω  
**Connectors:** D50 female

#### Outputs:

**Impedance:** 40Ω balanced  
**D.C. on output:** ±50mV  
**Connectors:** D15 female

#### SIGNAL PATH:

**Insertion gain:** ±0.1dB  
**Freq. Response 20Hz to 20kHz:** ±0.25dB to 150kHz -3dB  
**Total Harmonic Distortion:** 0.02%, 0.01% typical -10dBu to +20dBu and 20Hz to 20kHz  
**Crosstalk:** -85dB 20Hz to 20kHz  
**Noise (un-weighted):** -90dB rms. 20 Hz to 20 kHz

#### Common Features:

**CONTROL:**  
**Remote passive panel:** D25 male, 50m (165 ft) max. cable length  
**With FU-0003 Option**  
**Q-link to remote panels:** 75Ω video cable, 500m max cable length  
**With FU-0003 Option**  
**Serial RS232/422:** D9 female

#### Power:

**External:**  
**Supply:** 90-264V, universal 50/60Hz  
**Power Consumption:** 25 Watts  
**Connections:** Two pin bayonet locking  
**Redundant PSU:** Optional

#### Internal (Optional):

**Supply:**  
**HD/SD:** 90-264V universal, 50/60Hz  
**AV:** 90-132V, 180-264V 50/60Hz  
**Power Consumption:** 25 Watts

#### Physical:

**Height:** 1RU, 44mm (1.75" nom.)  
**Width:** 19" rack mount  
**Depth:** 280mm (11")  
**Weight:** 3.7kg (8.2lb)  
**Operating Temperature:** 0-40°C  
**Ventilation:** Natural convection

#### Ordering Information:

**Q-1601S** 16x1 Serial Video Router  
**Q-1601N** 16x1 Analog Video Router  
**Q-1602S** 16x2 Serial Video Router  
**Q-0802H** 8x2 High Definition Video Router  
**Q-1602H** 16x2 High Definition Video Router  
**Q-1602N** 16x2 Analog Video Router

#### +FU

FU-0003 controller for connection to other Quartz routers, for RS232/422 serial control and for cascading multiple 16x1 routers  
**+AA** Stereo Analog Audio option  
**+AESB** Balanced Digital Audio option  
**+PSX** Redundant External Power Supply

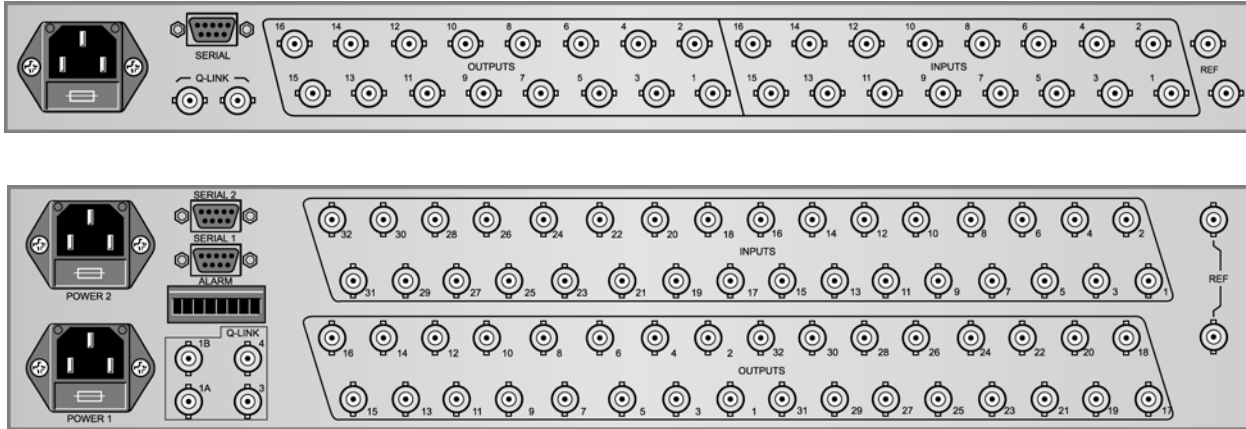
#### CAB-R0017-2

Q1601 & Q1602 Control Interconnect Cable (120mm) for cascading routers  
Please refer to the Control Panel section

#### Control Panels

The Q16-S and Q32-S series are standard definition digital video and embedded audio routers.

### Q16-1616S & Q32-3232S Rear Panels



### Features Configuration

The modular design of the Q16-S and Q32-S routers give them a high degree of flexibility, allowing them to be easily configured in square or non-square sizes.

The Q16-S is housed in a 1RU frame and switches 16 sources to 16 destinations. The input stage of the Q16-S is fixed at 16 while the output stage is fully configurable. Up to 16 individual output SIMMs can be added to the output stage of the router at anytime.

The Q32-S is housed in a 2RU frame and can switch up to 32 sources to 32 destinations. The input stage of the Q32-S is initially fixed at 16 with the ability to add a further 16 input SIMMs to the router at anytime. The output stage is fully configurable with up to 32 individual output SIMMs being added to the output stage of the router at anytime.

### Control

Both the Q16-S and the Q32-S routers include, as standard, an internal FU-0003 Controller module which supports a single Q-Link and Serial port on the rear of the router. The optional internal CI module can be fitted to the Q32-S to increase the number of Q-Link and Serial ports. This option is not available for the Q16-S.

The Q16-S and Q32-S have a number of control options, they are:

**Local Control Panels:** The CP-1600A-LP, can be fitted to the Q16-S (up to a maximum matrix size of 16x8). This option is not available for the Q32-S.

**Passive Remote Control Panels:** The CP-1601A-P and CP-1604-P passive remote control panels can be fitted to the Q16-S and Q32-S router via a PI-1604 or PI-1608 parallel to interface.

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the Q16-S and Q32-S router connected via Q-Link.

**External third party control:** The Q16-S and Q32-S router can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port.

### Expansion

The output stage of the Q16-S and the input and output stage of the Q32-S can expanded at any time by adding additional SIMMs. They can not be expanded beyond their frame size.

### Power Supply

The power supplies for the Q16-S and the Q32-S are internal. The 2RU Q32-S frame can be fitted with an optional redundant power supply with separate AC power inlet and alarm output. This option is not available for the Q16-S.

### Digital Video

- Terminating inputs with automatic cable equalization on each input.
- Reclocking outputs with fully automatic sample rate selection supporting SD - 143, 177, 270 and 360 Mb/s sample rates (SMPTE 259M).
- Non-reclocking outputs for low cost and standards independence.
- Vertical interval switching for clean switching. Reverts to free running if the reference is not connected.
- Support of Bi-level syncs (PAL/NTSC).
- Transparent to standard definition signals carrying embedded audio.
- Compatible with ASI transport streams, such as MPEG video.
- Automatic standards selection for complete standards independence.

### Operational Features

- Deterministic switching.
- The Q16-S and the Q32-S are available with reclocking or non-reclocking outputs.
- Reclocking and non-reclocking SIMMs can be mixed within the same router.
- Diagnostic monitoring of internal temperature and power supply status.
- All modules are accessed from the front of the router.



## SD Video & Embedded Audio Routers

### Q16-SV & Q32-SV Standard Definition

#### Specifications

##### Configuration:

Inputs:	Q16:	Fixed at 16
	Q32:	Selectable, from 16 or 32
Outputs:	Q16:	Selectable 4, 8, 4
	Q32:	Selectable 4, 8, 16, 32

##### Standard Definition Video:

Inputs:	
Signal level:	800mV p-p nominal
Impedance:	75Ω terminating
Return Loss, 5-270 MHz:	15dB, 16dB typical (for reclocking outputs)

##### Cable equalization at 270 MHz:

Belden 8281	
BBC PSF1/2:	250m min, 300m typical
BBC PSF1/3:	150m min, 200m typical (for non-reclocking outputs)

##### Total Input plus Output Cable length supported up to 270MHz:

Belden 8281	
BBC PSF1/2:	100m min, 200m typical
BBC PSF1/3:	60m min, 120m typical
Connectors:	BNC per IEC 60169-8-8 Amendant 2

Outputs:	
Signal level:	800mV p-p ±10%
Impedance:	75Ω
Return Loss 5-270MHz:	15dB
D.C. offset:	0 ±0.5 V
Connectors:	BNC per IEC 60169-8-8 Amendant 2

##### Signal Path:

Rise/fall times:	0.6 to 0.9ns
Path length:	12ns, typical
Output jitter:	0.2UI p-p with <300m input cable

##### Control:

Q-link to remote panels:	1 as standard (additional 3 Q-links optional)
Interconnect:	75Ω video cable, 500 maximum length.
Connector:	BNC per IEC 60169-8-8 Amendant 2
Serial RS232/422:	1 as standard (additional 1 serial port optional)
Connector:	D9 female

##### Switching Reference:

Reference inputs:	Analog 625 or 525 black
Signal level:	1V p-p ±3dB or 1-4V pulses
Impedance:	75Ω (loop through)
Switching Line :	Lines 6/319 (625) & lines 10/273 (525)

##### Power:

Supply:	Auto ranging 100 to 240 VAC 50/60 Hz
Power Consumption:	Q16: 25 Watts Q32: 50 Watts
Redundant PSU:	Optional with alarm output, Q32 only

##### Physical:

Height:	
Q16:	1RU, 1.75" nom (44mm)
Q32:	2RU, 3.5" nom. (88 mm)
Width:	19" (483mm)
Depth:	19" nom (483mm)
Weight:	Q16: 5.2kg (11.3lb) Q32: 6.6kg (14.5lb)
Operating Temperature:	0-40°C
Ventilation:	Fan cooled. Air intake at the front, exhaust at the sides.

#### Ordering Information:

<b>Q16-16nns</b>	16 Input SDI router with non-reclocking outputs (blocks of 4)
Replace "nn" with the number of outputs required. For reclocking outputs order appropriate +R option	

<b>Q32-32xxnnS</b>	16 or 32 Input SDI router with non- reclocking outputs (blocks of 4)
Replace "xx" with the number of inputs required. Note: min of 16. Replace "nn" with the number of outputs required. For reclocking outputs order appropriate +R option	

#### Ordering Options:

<b>AK-0002</b>	Rear frame support kit for Q16, strongly recommended for mobile applications.
<b>+R4</b>	4 outputs
<b>+R8</b>	8 outputs
<b>+R16</b>	16 outputs
<b>+R32</b>	32 outputs

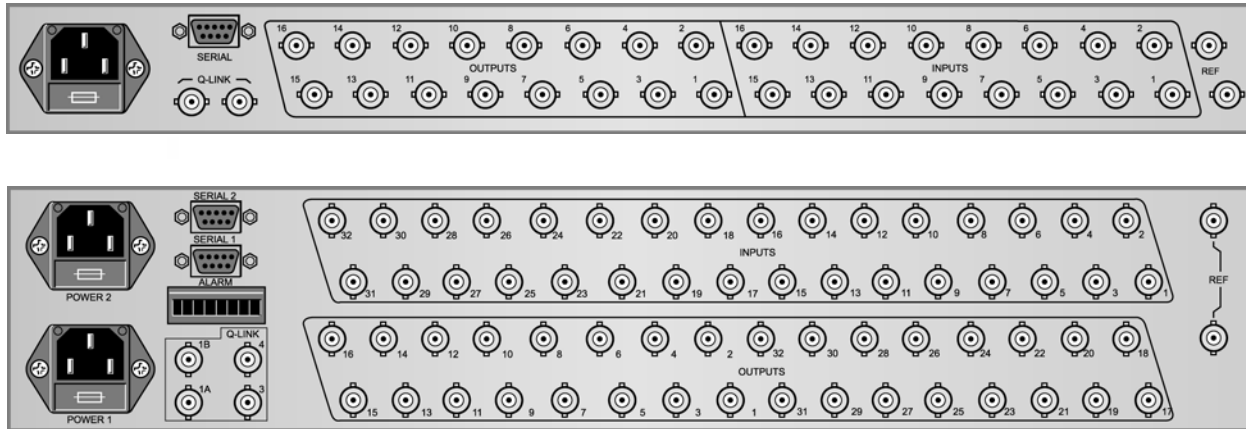
For other configurations contact factory

#### Note: The following options are only available on Q32-SV frames.

<b>+2PS</b>	Redundant power supply
<b>CI-0001</b>	Sub-module that enables a second RS232/422 serial port.
<b>CI-0004</b>	Sub-module that enables three additional Q-Links and one extra RS232/422 serial port.

The Q16-N and Q32-N are analog video routers.

## Q16-1616N & Q32-3232N Rear Panels



### Features

#### Configuration

The modular design of the Q16-N and Q32-N router gives them a high degree of flexibility, allowing them to be easily configured in square or non-square sizes.

The Q16-N is housed in a 1RU frame. The input stage of the Q16-N is fixed at 16 while the output stage can be set to 4, 8 or 16. The Q16-N can be upgraded by returning the router to the local service center.

The Q32-N is housed in a 2RU frame. The Q32-N is available in three fixed sizes, 16x16, 32x16 and 32x32. The Q32-N can be upgraded by returning the router to the local service center.

#### Control

Both the Q16-N and the Q32-N router include, as standard, an internal FU-0003 Controller module which supports a single Q-Link and Serial port on the rear of the router. The optional internal CI module can be fitted to the Q32-N to increase the number of Q-Link and Serial ports. This option is not available for the Q16-N.

The Q16-N and Q32-N have a number of control options, they are:

**Local Control Panels:** The CP-1600A-LP, can be fitted to the Q16-N. This option is not available for the Q32-N.

**Passive Remote Control Panels:** The CP-1601A-P and CP-1604-P passive remote control panels can be fitted to the Q16-N and Q32-N router via a PI-1604 or PI-1608 parallel to interface.

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the Q16-N and Q32-N router connected via Q-Link.

**External third party control:** The Q16-N and Q32-N router can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port.

#### Expansion

The output stage of the Q16-N can be expanded from 4 to 8 or 16. The input or output stage of the Q32-N can be expanded from 16 to 32.

In both cases the router needs to be returned to the local service center for the upgrade. They can not be expanded beyond their frame size.

#### Power Supply

The power supplies for the Q16-N and the Q32-N are internal. The 2RU Q32-N frame can be fitted with an optional redundant power supply with separate AC power inlet and alarm output. This option is not available for the Q16-N.

#### Analog Video

- Terminated inputs for best possible signal performance.
- DC restored inputs for composite signals ensures switching free from the picture disturbances often encountered in DC coupled only designs.
- Vertical interval switching for clean switching, reverts to free running if no sync reference (video or pulse) with all levels of the same route switching in the same field.
- Frames can be stacked for parallel component analog video routers, or a single frame can be split to provide, for example, four separate 8x8 routers from a single 32x32 frame.

#### Operational Features

- Diagnostic monitoring of temperature and PSU status.
- All modules are installed from the front for easy access for upgrades and maintenance, not possible with some alternative designs.
- Built-in control system.

### Specifications

#### Configuration:

**Inputs:** Q16 fixed at 16  
Q32 Selectable, 16 or 32

**Outputs:** Q16 Selectable, 4, 8, 16  
Q32 Selectable 4, 8, 16, or 32

#### Analog Video Inputs:

**Signal level:** 1V p-p nominal, +3dB max.

**Impedance:** 75Ω terminating

**Return Loss to 5.5MHz:** 40dB

**Connectors:** BNC per IEC 60169-8-8 Amendant 2

#### Analog Video Outputs:

**Impedance:** 75Ω

**Return Loss to 5.5MHz:** 40dB

**D.C. on output:** ±50mV

**Connectors:** BNC per IEC 60169-8-8 Amendant 2

#### Signal Path:

**Insertion gain:** ±0.1dB

**HF response:** 15kHz to 5.5MHz ±0.1dB to 30MHz  
+0.2, -0.5dB to 100MHz -3dB

**LF response, tilt at 50Hz:** 0.5%

**2T pulse, pulse/bar, bar slope:** 0.25%K

**Luma/Chroma inequalities:** ±0.5% gain, ±5ns delay

**Diff Gain and Phase:** 0.1%, 0.1° ( 10-90% APL )

**Luminance non-linearity:** 0.2%

**Path length, typical:** 10ns

**Timing spread at 3.58/4.43MHz:** ±1° at any output

**Crosstalk at 3.58/4.43MHz:** -57dB

**Noise to 5.5MHz:** -70dB rms.

#### Control:

**Q-link to remote panels:** 1 as standard (additional 3 Q-links optional) 75Ω video cable 500m max. length

**Serial RS232/422:** 1 as standard (additional serial port optional) D9 female

#### Switching Reference:

**Signal level:** 1V p-p ±3dB or 1-4V pulses 525 or 625 line

**Impedance:** 75Ω (loop through)

**Switching Line :** Lines 6/319 (675)  
Lines 10/273 (525)

#### Power:

**Supply:** Auto ranging 100 to 240 VAC  
50/60 Hz

**Power Consumption:** 12 Watts

**Backup:** Option with alarm output on 2U frame

#### Physical:

**Height:** Q16: 1RU, 44mm (1.75" nom.)  
Q32: 2RU, 88mm (3.5" nom.)

**Width:** 1RU, 1.75" nom (44mm)

**Q32:** 2RU, 3.5" nom. (88 mm)

**Width:** 19" (483mm)

**Depth:** 19" nom (483mm)

**Weight:** Q16: 5.15kg

Q32: 6.6kg

**Operating Temperature:** 0-40°C

**Specification maintained:** 10-30°C

**Ventilation:** Natural convection

#### Ordering Information:

16x4 to 16x16 in 1RU frame with single power supply

<b>Q16-1604N</b>	16 x 4 Analog Video Router
<b>Q16-1608N</b>	16 x 8 Analog Video Router
<b>Q16-1616N</b>	16 x 16 Analog Video Router

16x16 to 32x32 in 2RU frame with option of redundant power supply

<b>Q32-1616N</b>	16 x 16 Analog Video Router
<b>Q32-3216N</b>	32 x 16 Analog Video Router
<b>Q32-3232N</b>	32 x 32 Analog Video Router

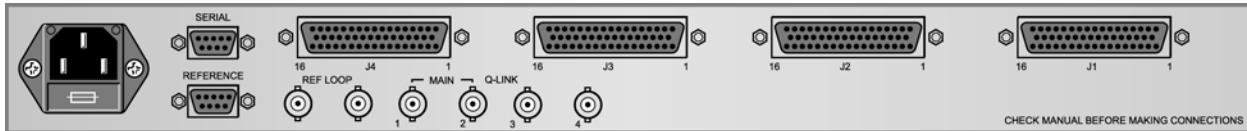
#### Ordering Options:

<b>+2PS</b>	Redundant power supply
<b>AK-0002</b>	Rear frame support kit Recommended for mobile applications
<b>CI-0001</b>	Sub-module that enables a second RS232/422 serial port
<b>CI-0004</b>	Sub-module that enables three additional Q-Links and one extra RS232/422 serial port



The Q16-AES and Q32-AES routers provide asynchronous or synchronous AES/EBU digital audio switching with either balanced or unbalanced inputs and outputs. The synchronous audio switching mode also supports a number of additional features such as Soft Switching, Wild Shuffling, Mono Mixing and Sample Rate Conversion.

### Q16-AESB Rear Panel



### Features

#### Configuration

**Q16-AESB** • The Q16-DA is housed in a 1RU and is only available in a non-single power supply configuration.

*Asynchronous switching, with balanced I/O:*  
Available in two fixed sizes - 16x16 or 32x32.

*Asynchronous switching, with unbalanced I/O:*  
Only available in one fixed size - 16x16.

*Synchronous switching (+SS option):*  
Can be added to any router configuration.

**Q32-AESB** • The Q32-DA is housed in a 2RU and is available in a redundant power supply configuration.

*Asynchronous switching, with balanced or unbalanced I/O:*  
Available in two fixed sizes - 16x16 or 32x32.

*Synchronous switching, with balanced or unbalanced I/O (+SS option):*  
Can be added to any router configuration

#### Control

The AES routers include, as standard, an internal FU-0003 Controller module supporting a single Q-Link and RS 422/232 Serial port. The optional internal CI module can be fitted to the Q32-AES to increase the number of Q-Link and Serial ports. This option is not available for the Q16-AES.

The routers have a number of control options, they are:

**Local Control Panels:** The CP-1600A-LP, can be fitted to the Q16-AES. This option is not available for the Q32-AES.

**Passive Remote Control Panels:** The AES routers passive remote control panels can be fitted to the Q16-DA and Q32-DA router via a PI-1604 or PI-1608 parallel to interface.

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the Q16-DA and Q32-DA router connected via Q-Link.

**External Third Party Control:** The Q16-DA and Q32-DA router can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port.

#### Expansion

The Q16-AES with unbalanced I/O cannot be expanded. The Q16-AES with balanced I/O can be expanded from 16x16 to 32x32. The input and output stage of the Q32-AES can be expanded at any time by adding additional SIMMs. The routers cannot be expanded beyond its frame size.

#### Power Supply

The power supplies for the Q16-AES and the Q32-AES are internal. The 2RU Q32-AES frame can be fitted with an optional redundant power supply with separate AC power inlet and alarm output. This option is not available for the Q16-AES.

### Digital Audio

**Asynchronous:** a simple low cost crash switch router.

**Synchronous (+SS Option):** provides a clean switch between audio sources as long as they are all synchronized to a common studio reference. The synchronous operation will also align locked but misaligned digital audio signals to the routers reference. A number of extra features such as I/P & O/P Gain Control, Mono Mix, Soft Switching, Wild Shuffling and Sample Rate Conversion are included as standard.

**Bypass:** The Soft Switch or SRC circuit can be bypassed in order to allow Dolby E and other AES and non-AES formats to be switched through the router. Dolby E and other non-AES data can be routed through the Asynchronous router without being affected.

### Operational Features (+SS Option) only

**Sample Rate Conversion:** Sample Rate Conversion (SRC) allows the router to accept input sample rates between 32kHz and 96kHz. These sample rates are then converted to the selected sample rate of the router, 48kHz or 96kHz, before being switched to the output. Output sample rates other than 48kHz or 96kHz can be handled by switching selected outputs into a mode that bypasses the Sample Rate Converters.

**Soft Switch:** Synchronization does not eliminate audible switching 'clicks' as the switch may take place when the difference in the source amplitudes is large. To avoid the fast transition caused by this large difference in source amplitudes the router uses a programmable Crossfade to switch between the sources. The duration of the Crossfade can be set between 0 and 20 mSeconds. This guarantees a "click-free" switch every time. Crossfading is preferable to a 'V' fade as it avoids the dip in audio level resulting from a 'V' fade.

**Wild Shuffling:** All synchronized sources can be wild shuffled. Wild shuffling allows any input audio track to be selected and grouped together with any other audio track. This new audio stream can be routed to the required destination. This allows a 32x32 stereo router to become a 64x64 mono router.

**Mono Audio Mix:** Mono audio mix enables the router to mix together two selected mono audio tracks. The router combines the two audio tracks together to give a single mono mixed audio track which is then routed to the chosen destination. Output = ½ (Input A + Input B)

**Gain adjustment:** The gain for each half of the stereo pair on both the input and the output can be individually controlled. The adjustment range +12dB to -34dB in increments of 0.002dB

### Feature Summary

- Sample rate conversion (SRC)
- Guaranteed click-free switching using "Soft Switching" technology.
- Wild Shuffling
- Mono Audio Mix
- Input and output gain adjustment
- Input sample rates of 32kHz, 44.1kHz, 48kHz and 96kHz
- Output sample rates of 48kHz or 96kHz in Soft Switch mode
- Output sample rates of 32kHz, 44.1kHz, 48kHz and 96kHz in Soft Switch bypass mode
- Digital silence on output when input source is lost

### Specifications

#### Configuration:

**Inputs:** Selectable 16 or 32  
**Outputs:** Selectable 16 or 32  
 (depends on version)

#### Audio Inputs:

**Sample rates:** 32kHz, 44.1kHz, 48kHz, 96kHz

#### Transformer coupled

**D.C. on input:**  $\pm 50V$

#### Balanced version (D-type)

**Standard:** AES-2003  
**Signal level:** 0.2-7V p-p  
**Impedance:** 110 $\Omega$   $\pm 20\%$   
**Connectors:** D50 female, XLR Breakout panel available

#### Unbalanced version (BNC)

**Standard:** SMPTE 276M  
**Impedance:** 75 $\Omega$   
**Return loss:** 25dB, 0.1 - 6.0kHz  
**Connectors:** BNC per IEC 60169-8-8 Amendant 2

#### Audio Outputs:

**Transformer coupled**  
**D.C. isolation:**  $\pm 50V$

#### Balanced version (D-type)

**Standard:** AES-2003  
**Signal level:** 2-5V p-p  
**Impedance:** 110 $\Omega$   
**Rise/fall time:** 3.5-10ns  
**Connectors:** D50 female, XLR Breakout panel available

#### Unbalanced version (BNC)

**Standard:** SMPTE 276M  
**Signal level:** 1.0V p-p  $\pm 50\%$   
**Impedance:** 75 $\Omega$   
**Return loss:** 25dB, 0.1 - 6.0kHz  
**Jitter:** Conforms to ANSI S4. 40 - 1992  
**Connectors:** BNC per IEC 60169-8-8 Amendant 2

#### Control:

**Q-link to remote panels:** 1 as standard (additional 3 Q-links optional)  
 75 $\Omega$  video cable 500m max. length  
**Serial RS232/422:** 1 as standard (additional serial port optional) D9 female

#### Power:

**Supply:** Auto ranging 100 to 240 VAC 50/60 Hz

**Power Consumption:** Q16: 15 Watts  
 Q32: 15 Watts

**Backup:** Optional with alarm output (Q32 only)

- Reclocking on each input
- Supports switching of Dolby E and other data streams in Soft Switch bypass mode
- Transformer coupled inputs, with D.C. protection
- Transformer coupled outputs with D.C. protection
- Frames may be stacked for multi-level systems
- Optional dual PSU for redundancy on the Q32.
- Diagnostic monitoring of internal temperature and PSU status
- Built-in control system

#### Physical:

**Height:** Q16: 1RU, 1.75" nom (44mm)  
 Q32: 2RU, 3.5" nom (88mm)  
**Width:** 19" rack mount 483mm)  
**Depth:** 485mm (19" nom.)  
**Weight:** Q16: 5.15kg (11.35lb)  
 Q32: 6.6kg (14.55lb)

**Operating Temperature:** 0-40°C

**Specification maintained:** 10-30°C

**Ventilation:** Natural convection

#### Ordering Information:

Each frame ships with a single power supply as standard. An optional redundant power supply is available on the Q32.

The models listed below handle standard AES/EBU signals with balanced 110 $\Omega$  inputs and outputs via D50 connectors or SMPTE/SPDIF signals with unbalanced 75 $\Omega$  inputs and outputs via BNC connectors.

#### Balanced Asynchronous

**Q16-1616-AESB** 16x16 Digital audio in a 1RU frame & single PSU only  
**Q16-3232-AESB** 32x32 Digital audio in a 1RU frame & single PSU only  
**Q32-1616-AESB** 16x16 Digital audio in a 2RU frame and optional redundant PSU  
**Q32-3232-AESB** 32x32 Digital audio in a 2RU frame and optional redundant PSU

#### Un-Balanced Asynchronous

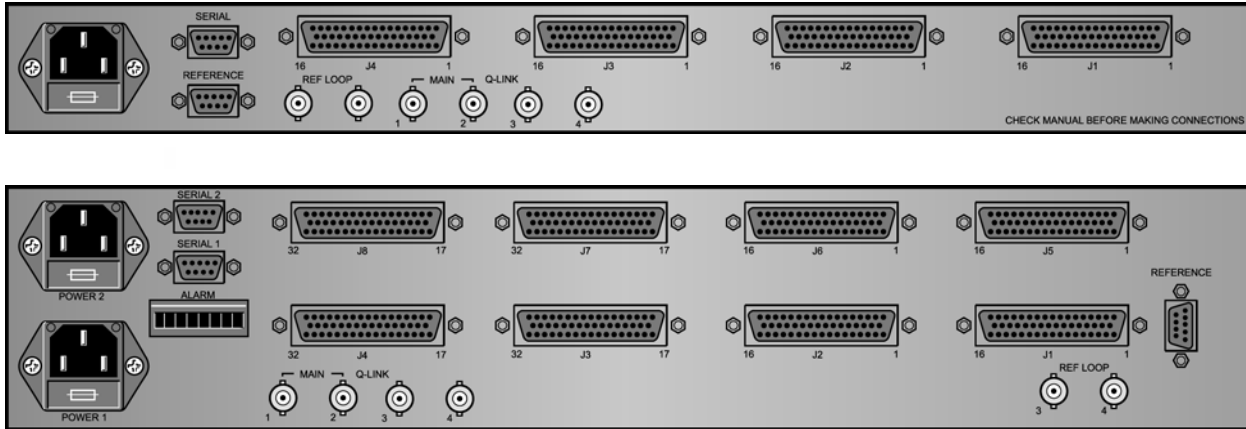
**Q16-1616-AESU** 16x16 in a 1RU frame & single PSU only  
**Q32-1616-AESU** 16x16 in a 2RU frame and optional redundant PSU  
**Q32-3232-AESU** 32x32 in a 2RU frame and optional redundant PSU

#### Ordering Options:

**+2PS** Redundant power supply (Q32 only)  
**+SS** Clean Switch between synchronous sources  
**CI-0001** RS232/RS422 Serial Card Modification to add second serial port to monitoring routers  
**CI-0004** Multi Q-Link Card  
**AK-0002** 1RU Rear Frame Support Kit,  
**AK-0006** Audio Connectors, D50 male (each)  
**AK-0008** 16 way XLR Breakout Panel, Male  
**AK-0009** 16 way XLR Breakout Panel, Female,

The Q16-AA and Q32-AA are small mono and stereo analog audio routers.

### Q16-AA & Q32-AA Rear Panels



### Features

#### Configuration

The design of the Q16-AA and Q32-AA router allows them to be configured in square or non-square sizes.

**Q16-AA** • The Q16-AA is housed in a 1RU frame and is only available in a non-redundant power supply configuration.

**Q16-AA Mono:**

Available in four fixed sizes, 16x16, 32x8, 32x16 and 32x32.

**Q16-AA Stereo:**

Available in three fixed sizes, 16x4, 16x8 and 16x16.

**Q32-AA** • The Q32-AA is housed in a 2RU frame and is available in a redundant power supply configuration.

**Q32-AA Mono:**

Available in seven fixed sizes, 16x16, 32x8, 32x16, 32x32, (64x8, 64x16 and 64x32).

**Q32-AA Stereo:**

Available in six fixed sizes, 16x4, 16x8, 16x16, 32x8, 32x16 and 32x32.

#### Control

Both the Q16-AA and the Q32-AA router include, as standard, an internal FU-0003 Controller module which supports a single Q-Link and Serial port on the rear of the router. The optional internal CI module can be fitted to the Q32-AA to increase the number of Q-Link and Serial ports. This option is not available for the Q16-AA.

The Q16-AA and Q32-AA have a number of control options, they are:

**Local Control Panels:** The CP-1600A-LP, can be fitted to the Q16-AA. This option is not available for the Q32-AA.

**Passive Remote Control Panels:** The CP-1601A-P and CP-1604-P passive remote control panels can be fitted to the Q16-AA and Q32-AA router via a PI-1604 or PI-1608 parallel to interface.

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the Q16-AA and Q32-AA router connected via Q-Link.

**External third party control:** The Q16-AA and Q32-AA router can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port.

#### Expansion

The input or output stage of the Q16-AA and the Q32-AA can be expanded from 16 to 32 depending upon the audio format of the router, mono or stereo. In all cases the router needs to be returned to the local service centre to be upgraded. The ROUTERS can not be expanded beyond THEIR frame size.

#### Power Supply

The power supplies for the Q16-AA and the Q32-AA are internal. The 2RU Q32-AA frame can be fitted with an optional redundant power supply with separate AC power inlet and alarm output. This option is not available for the Q16-AA.

#### Feature Summary

- Output Crossover, which is available on mono routers configured as stereo provides the following extra features:
  - left and right channels can be reversed.
  - left (or right) channel can be fed to both left and right outputs.
- Handles timecode, even at spooling speeds.
- Electronically balanced inputs with excellent common mode rejection.
- Electronically balanced outputs.
- Frames may be stacked for use in multi-level systems.
- XLR Breakout Panels are available to simplify installation.
- Diagnostic monitoring of temperature and PSU status.
- Built-in control system.
- All modules are installed from the front for easy access for upgrades and maintenance.



# Mono & Stereo Analog Audio Routers

## Q16-AA & Q32-AA

### Specifications

#### Configuration:

##### Inputs:

<b>Stereo:</b>	Q16:	Fixed at 16
	Q32:	Selectable, 16 or 32
<b>Mono:</b>	Q16:	Selectable, 16 or 32
	Q32:	Selectable, 16 or 32 or 64

##### Outputs:

<b>Stereo:</b>	Q16:	Selectable, 4, 8 or 16
	Q32:	Selectable, 4, 8, 16 or 32
<b>Mono:</b>	Q16:	Selectable, 8, 16 or 32
	Q32:	Selectable, 8, 16, 32 or 64

#### Audio Inputs:

**Signal level:** 0dBu nominal, +24dBu max.

**Impedance:** 20k  $\Omega$

#### Common Mode Rejection:

**20Hz to 3kHz:** -80dB, -100dB typical at 50/60Hz

**3kHz to 20kHz:** -60dB, -70dB typical at 20kHz

**Common Mode Level:** +27dBu maximum, no signal

**Connectors:** D50 female

#### Audio Outputs:

**Impedance:** 40 $\Omega$  balanced

**D.C. on output:**  $\pm$ 50mV

**Connectors:** D50 female

#### Signal Path:

**Insertion gain:**  $\pm$ 0.1dB

#### Frequency Response at:

**20Hz to 20kHz:**  $\pm$ 0.25dB

**to 150kHz:** -3dB

**Delay between two routes:** 1 $\mu$ sec

**Total Harmonic Distortion:** 0.02%, 0.01% typical -10dBu to +20dBu and 20Hz to 20kHz

**Crosstalk 20Hz to 20kHz:** -80dB

**Noise (un-weighted) 20Hz to 20kHz:** -85dB rms

#### Control:

**Q-link to remote panels:** 1 as standard (additional 3 Q-links optional) 75 $\Omega$  video cable 500m max. length

**Serial RS232/422:** 1 as standard (additional serial port optional) D9 female

#### Power:

**Supply:** 90-264V universal, 50/60Hz

**Power Consumption:** Q16: 20 Watts

Q32: 40 Watts

**Backup:** Optional with alarm output on 2RU frame

#### Physical:

**Height:** Q16: 1RU, 44mm (1.75" nom.)

Q32: 2RU, 88mm (3.5" nom.)

**Width:** 19" rack mount

**Depth:** 485mm (19" nom.)

**Weight:** Q16: 5.2kg

Q32: 6.6kg

**Audio Connectors:** D50 female multi-pin connectors each carrying 16 balanced signals

**Operating Temperature:** 0-40°C

**Specification maintained:** 10-30°C

**Ventilation:** Q16: Natural convection  
Q32: Fan cooled. Intake at front  
Exhaust at side

### Ordering Information:

<b>Q16-1604-AAS</b>	16x4 Dual Audio Router
<b>Q16-1608-AAS</b>	16x8 Dual Audio Router
<b>Q16-1616-AAS</b>	16x16 Dual Audio Router
<b>Q16-1616-AAM</b>	16x16 Mono or 8x8 Dual Audio Router
<b>Q16-3208-AAM</b>	32x8 Mono or 16x4 Dual Audio Router
<b>Q16-3216-AAM</b>	32x16 Mono or 16x8 Dual Audio Router
<b>Q16-3232-AAM</b>	32x32 Mono or 16x16 Dual Audio Router
<b>Q32-1604-AAS</b>	16x4 Dual Audio Router. 2RU frame, Dual channel
<b>Q32-1608-AAS</b>	16x8 Dual Audio Router. 2RU frame, Dual channel
<b>Q32-1616-AAS</b>	16x16 Dual Audio Router. 2RU frame, Dual channel
<b>Q32-1616-AAM</b>	16x16 Mono or 8x8 Dual Audio Router
<b>Q32-3208-AAM</b>	32x8 Mono or 16x4 Dual Audio Router
<b>Q32-3216-AAM</b>	32x16 Mono or 16x8 Dual Audio Router
<b>Q32-3232-AAM</b>	32x32 Mono or 16x16 Dual Audio Router
<b>Q32-3208-AAS</b>	32x8 Dual or 64x8 Mono Audio Router
<b>Q32-3216-AAS</b>	32x16 Dual or 64x16 Mono Audio Router
<b>Q32-3232-AAS</b>	32x32 Dual or 64x32 Mono Audio Router

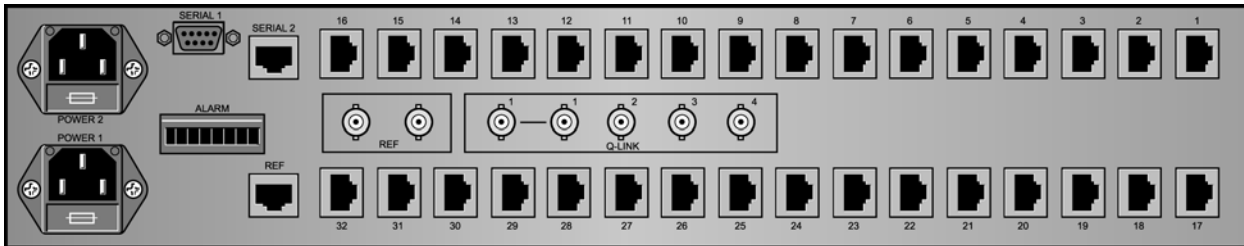
### Ordering Options:

<b>+2PS</b>	Redundant power supply
<b>CI-0001</b>	RS232/RS422 Serial Card Modification to add second serial port to monitoring routers
<b>CI-0004</b>	Multi Q-Link Card
<b>AK-0002</b>	1RU Rear Frame Support Kit,
<b>AK-0006</b>	Audio Connectors, D50 male (each)
<b>AK-0008</b>	16 way XLR Breakout Panel, Male
<b>AK-0009</b>	16 way XLR Breakout Panel, Female

The Q32-PR and Q64-PR data routers provide port-to-port routing. Both models support a mix of RS422 and RS232 ports and are able to convert between the two standards. This means that the router can accept controlling devices in RS422, for example, whose ports are set as RS232 or a mixture of both.

It is designed to route the remote control signals between equipment, for example VTRs (normally controlled devices) and edit controllers (controlling devices) and can equally handle other devices such as PC's. The router can switch four wire signals, a transmitter pair and a receiver pair, through the matrix.

### Q32-PR Rear Panel



### Features Configuration

The modular design of the Q32-PR and Q64-PR routers give them a high degree of flexibility, allowing them to be easily configured.

The Q32-PR is housed in a 2RU frame and provides port-to-port routing for up to 32 devices. The input and output is configurable in steps of 16.

The Q64-PR is housed in a 3RU frame and provides port-to-port routing for up to 64 devices. The input and output stage of the Q32-PR is configurable in steps of 16. Individual I/O SIMMs can be added to the router at anytime.

### Control

Both the Q32-PR and the Q64-PR router include, as standard, an internal FU-0003 Controller module which supports a single Q-Link and Serial port on the rear of the router. The optional internal CI module can be fitted to both of the routers to increase the number of Q-Link and Serial ports.

The Q32-PR and Q64-PR have a number of control options, they are:

**Passive Remote Control Panels:** The CP-1601A-P and CP-1604-P passive remote control panels can be fitted to the Q32-PR and Q64-PR router via a PI-1604 or PI-1608 parallel to interface.

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the Q32-PR and Q64-PR router connected via Q-Link.

**External third party control:** The Q32-PR and Q64-PR router can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port.

### Expansion

The input and output stage of the Q32-PR and Q64-PR can be expanded at any time by adding additional SIMMs. They can not be expanded beyond their frame size.

### Power Supply

The power supplies for the Q32-PR and Q64-PR are internal. Both routers can be fitted with an optional redundant power supply with separate AC power inlet and alarm output.

### Feature Summary

- Port-to-port routing for flexible operation.
- Standard configurations of 16, 32, 48 and 64 ports.
- Manual or automatic sensing of controlling and controlled devices.
- Supports a mix of RS232 or RS422 signals and conversion between the two.
- Supports Sony interface for detecting controlling or controlled devices.
- Optional redundant power supply with separate AC power inlet and alarm output.
- Built-in control system.
- Built-in RS232/422 serial port for control purposes.
- Front access plug-in modules for easy upgrades and maintenance.
- Diagnostic monitoring of temperature and PSU status.

A route can be established between any two of the ports. For example, on a Q64-PR a maximum of 32 pairs of machines can be connected at one time. Unlike traditional matrix based routers there is no limitation on the routing of controlling devices and controlled devices.

During direct dubbing between VTR's, one of the VTR's changes function to become a controlling device and is used to send commands to the other VTR which is still a controlled device. This is a problem for traditional matrix based routers where the ports are organized to support either controlling or controlled devices and are not able to change mode dynamically. By contrast the ports of the Quartz Port Data Router can adapt, manually or automatically, between the two modes, which simplifies the operation.

The router fully integrates with the standard Quartz control system to follow video & audio routers or can operate independently.

### Specifications

#### Configuration:

**RS232 I/O ports:** Selectable in blocks of 2

**RS422 I/O ports:** Selectable in blocks of 2

Note: RS232 and RS422 ports can be mixed in the same router.

#### Signal Inputs:

**Type:** Accepts signals to RS422A

**Signal level:** 0.2-7V p-p

**Connectors:** RJ-45

#### Signal Outputs:

**Type:** Conforms to RS422A (STD)

RS232 optimal

**Signal level:** 2-7V p-p

**Impedance:** 110Ω

**Connectors:** RJ-45

#### Control:

**Q-link to remote panels:** 1 as standard (additional 3 Q-links with CI-0004 option)

**Serial RS232/422:** 1 as standard (additional port with CI-0001 or CI-0004 option) D9 female

#### Power:

**Supply:** Auto ranging 100 to 240 VAC 50/60 Hz

**Power:** 15 Watts

**Backup:** Optional with alarm output

#### Physical:

##### Height:

Q32: 2RU = 88mm (3.5" nom.)

Q64: 3RU = 132mm (5.25" nom.)

**Width:** 19" rack mount

##### Weight:

Q32: 4.4kg

Q64: 6.6kg

**Depth:** 485mm (19" nom.)

**Signal Connectors:** RJ45

**Operating Temperature:** 0-40°C

**Ventilation:** Natural convection

#### Ordering Information:

Up to 32 ports, supporting RS422, in a single 2RU frame with single power supply as standard.

**Q32-16PR** 16 Port Data Router

**Q32-32PR** 32 Port Data Router

Up to 64 ports, supporting RS422, in a single 3RU frame with single power supply as standard.

**Q64-16PR** 16 Port Data Router

**Q64-32PR** 32 Port Data Router

**Q64-48PR** 48 Port Data Router

**Q64-64PR** 64 Port Data Router

#### Ordering Options:

**+2PS** Redundant power supply

**CI-0001** Sub-module that enables a second RS232/422 serial port

**CI-0004** Sub-module that enables three additional Q-Links and one extra RS232/422 serial port

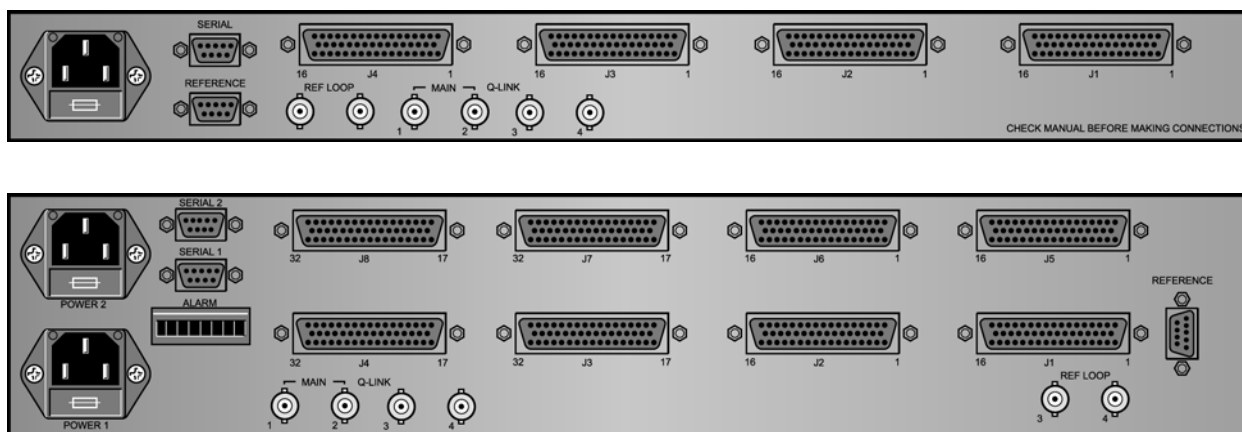
**QPR-RS232** RS232 output (per 2 ports)



The Q16-RR and Q32-RR relay routing switcher has been designed to route signals which cannot be handled by normal video or audio routers, either because the signal is bi-directional, or has incompatible levels.

The 16x8 1RU unit is supplied complete with power supply and the standard Quartz controller. A 2RU frame is available if a 16x16 matrix is required and/or a redundant power supply, Note the inputs must be wired together externally.

## Q16-RR & Q32-RR Rear Panels



## Features Configuration

The Q16-RR is housed in a 1RU frame and switches 16 sources to 8 destinations. The input and output stage of the Q16-RR is fixed.

The Q32-RR is housed in a 2RU frame and can switch up to 16 sources to 16 destinations. The input and output stage of the Q32-RR is fixed.

## Control

Both the Q16-RR and the Q32-RR router include, as standard, an internal FU-0003 Controller module which supports a single Q-Link and Serial port on the rear of the router. The optional internal CI module can be fitted to the Q32-RR to increase the number of Q-Link and Serial ports. This option is not available for the Q16-RR.

The Q16-RR and Q32-RR have a number of control options, they are:

**Local Control Panels:** The CP-1600A-LP, can be fitted to the Q16-RR. This option is not available for the Q32-RR.

**Passive Remote Control Panels:** The CP-1601A-P and CP-1604-P passive remote control panels can be fitted to the Q16-RR and Q32-RR router via a PI-1604 or PI-1608 parallel to interface.

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the Q16-RR and Q32-RR router connected via Q-Link.

**External third party control:** The Q16-RR and Q32-RR router can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port.

## Expansion

Both the Q16-RR and the Q32-RR can not be expanded.

## Power Supply

The power supplies for the Q16-RR and the Q32-RR are internal. The 2RU Q32-RR frame can be fitted with an optional redundant power supply with separate AC power inlet and alarm output. This option is not available for the Q16-RR.

## Feature Summary

- Two pole model used for two wire signals, such as balanced bi-directional audio.
- Four pole model used for four wire signals, such as RS422 control.
- With external wiring, frames may be stacked for larger numbers of inputs and outputs.
- Suitable for telephone signals with ringing.
- Relay contacts default to open condition in the absence of power.
- Front access plug-in modules for easy maintenance and upgrades.
- RS232/422 Serial Interface for remote control.
- D50 multi-pole for signal connectors.
- Diagnostic monitoring of temperature and PSU status.
- Built-in control systems.

## Relay Data Routers

### Q16-RR & Q32-RR

#### Specifications

##### Configuration:

**Inputs:** Fixed at 16  
**Outputs:** Selectable, 8 or 16

##### Relay Contacts:

Gold over silver palladium

**Contact resistance:** 1Ω max.  
**Operate/Release time:** 1Ω max.  
**Contact rating:** 0.5A @ 24V D.C.  
0.15A @ 100V rms. A.C.  
100V A.C./D.C.

**Service Life:** Typically 1.0 x 10<sup>6</sup> at low load  
0.5 x 10<sup>6</sup> at full load

##### Control:

**Q-link to remote panels:** 1 as standard (additional 3 Q-links on Q32 with CI-0004 option) 75Ω video cable 500m max. length  
**Serial RS232/422:** 1 as standard (additional port on Q32 with CI-0001 or CI-0004 option) D9 female

##### Power:

**Supply:** Auto ranging 100 to 240 VAC 50/60 Hz  
**Power:** Consumption 25 Watts  
**Backup:** Optional with alarm output

##### Physical:

**Height:**  
**Q16:** 1RU = 44mm (1.75" nom.)

**Q32:** 2RU = 88mm (3.5" nom.)

##### Weight:

**Q16:** 5.5kg

**Q32:** 6.7kg

**Width:** 19" rack mount

**Depth:** 485mm (19" nom.)

**Signal Connectors:** D50 multi-pole connectors

**Operating Temperature:** 0-40°C

**Ventilation:** Natural convection

#### Ordering Information:

Each frame ships with a single power supply as standard.

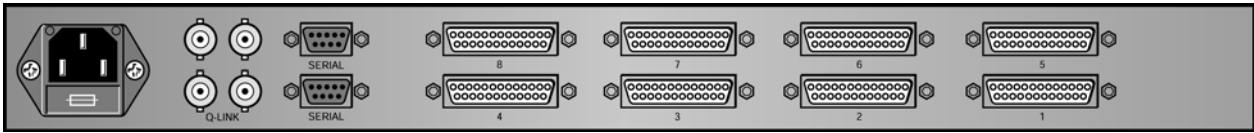
<b>Q16-1608-RR+2P</b>	16x8 Relay Router 2 pole
<b>Q32-1608-RR+2P</b>	16x8 Relay Router 2 pole
<b>Q32-1616-RR+2P</b>	16x16 Relay Router 2 pole

#### Ordering Options:

<b>+4P</b>	4 pole option
<b>+2PS</b>	Redundant power supply
<b>CI-0001</b>	Sub-module that enables a second RS232/422 serial port Note: only available on Q32 frames
<b>CI-0004</b>	Sub-module that enables three additional Q-Links and one extra RS232/422 serial port Note: only available on Q32 frames.
<b>AK-0002</b>	Rear frame support kit for Q16, strongly recommended for mobile applications
<b>AK-0006</b>	D50 mating connectors, all male type, one required for each group of 16 inputs or outputs
<b>AK-0008</b>	16 way XLR breakout panel, Male, 1RU. Includes 3m flying lead with D50 connector pre-wired for connection to Quartz relay routers
<b>AK-0009</b>	16 way XLR breakout panel, Female, 1RU. Includes 3m flying lead with D50 connector pre-wired for connection to Quartz relay routers

The TR-3200A Tally router is used in conjunction with a video or audio router. It routes tally inputs from, for example, a vision mixer and processes them according to the current settings of the main signal router. The Tally router provides up to 32 tally outputs to feed tally or cue lights on cameras, called reverse tally, or Under Monitor Displays (UMDs), called forward tally. The TR-3200A supports serial tallies from a variety of vision mixers.

TR-3200A Rear Panel



Features  
Configuration

The TR-3200A is housed in a 1RU frame.

Four 16 input ports are used to read up to 64 tally inputs. They are processed by software in conjunction with the current matrix settings to provide 32 tally outputs to feed camera tally or cue lights using relay contacts; two wires are provided for each relay to ensure electrical isolation from the outside world and between individual relays.

Control

TR-3200A includes, as standard, an internal FU-0003 Controller module which supports a single Q-Link and Serial port on the rear of the router. The optional internal CI module can be fitted to the TR-3200A to increase the number of Q-Link and Serial ports.

The TR-3200A has a number of control options, they are:

**Local Control Panels:** The CP-1600A-LP, can be fitted to the TR-3200A.

**Passive Remote Control Panels:** The CP-1601A-P and CP-1604-P passive remote control panels can be fitted to the TR-3200A router via a PI-1604 or PI-1608 parallel to interface.

Specifications

Read Ports (Inputs):

**Input:** <0.8V for logic low  
>3.5V or open circuit for logic high  
**Connectors:** D25 female  
Four for inputs, each with 16 lines

Tally Ports (Outputs):

**Normally open contacts:** Gold over silver palladium  
**Contact resistance:** 1Ω max.  
**Operate/Release time:** 10ms max.  
**Contact rating:** 0.5A @ 24V, d.c. resistive load  
0.15A @ 100V rms. a.c.  
**Service Life:** 1.0 x 106 at low load  
0.5 x 106 at full load  
**Connectors:** D25 female  
Four for outputs, each with 8 relays

Control:

**Q-link to remote panels:** 1 as standard (additional 3 Q-links with CI-0004 option) 75Ω video cable 500m max. length  
**Serial RS232/422:** 1 as standard (additional port with CI-0001 or CI-0004 option)

Power:

**Supply:** 100-132V, 180-240V, 50/60Hz  
**Power Consumption:** 15 Watts

**Remote Control Panel:** Any panel(s) from the entire range of Quartz remote control panels can be used with the TR-3200A router connected via Q-Link.

**External third party control:** The TR-3200A router can be remotely controlled via an external third party control device, such as an automation system, when connected to the routers serial port.

Expansion

Two TR-3200A Tally routers can be used together to form a 64x64 tally router by looping the mixer tallies to both units.

Power Supply

The power supplies for the TR-3200A is internal. A redundant power supply can not be fitted to the TR-3200A.

Physical:

**Height:** 1RU, 44mm (1.75" nom.)  
**Width:** 19" rack mount  
**Depth:** 280mm  
**Weight:** 2.5Kg  
**Operating Temperature:** 0-40°C  
**Ventilation Natural:** convection

Ordering Information:

Please refer to Application Note AN-0010 for further information on the operation of the TR-3200A Tally Router.

**TR-3200A** 64 read circuits,  
32 tally output circuits

Ordering Options:  
AK-0005

**CI-0001** Mating D25 Connectors, all male type, one required for each port, eight needed for full system.  
**CI-0004** Sub-module that enables a second RS232/422 serial port.  
Sub-module that enables three additional Q-Links and one extra RS232/422 serial port.



The CP-1000A control panel features assignable and dynamic LCD button technology. Each of the LCD buttons is capable of displaying a multiple character text string, graphics, different language characters or custom characters. The CP-1000A has 16 buttons offering 256 virtual buttons - allowing selection from up to 256 sources with just two key strokes.

The CP-1000A panel is ideal in applications where changes to sources and destinations are needed regularly e.g. OB trucks or other applications where you need to pre-configure panels to suit different or recurring tasks.

Alternatively, it can be configured with a menu structure to allow quick navigation through the system. When a menu button is pressed, some or all of the buttons change their function and legend. Their operation is then defined by the configuration setup for this menu.

Individual panel settings can be saved in WinSetup with the display changing instantly to the new configuration as soon as the download is complete. The panels represent a radical departure in control panel design resulting in the most flexible control panel on the market today.

### CP-1000A Remote Control Panel



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#### Features

- Flexible feature or menu driven configurations providing quick and simple access.
- Easily reconfigured for regularly changing environments.
- Each LCD display features a 32x24 dot matrix capable of supporting three rows of five character text or a graphic.
- Each LCD illumination can be red, green or yellow with a two level programmable intensity providing unprecedented visual indication of the button status.
- Fully programmable button operation - user-definable via WinSetup configuration software.
- Button-per-source selection with Page mode NEXT and LAST buttons to select more sources.
- LOCK or ENABLE button to protect against unauthorized or accidental selection.
- Buttons can be programmed for breakaways or to give a menu structure to the panel.
- Camera joystick override on any eight inputs, with momentary or latching action.

#### Specifications

##### Control

**Q-link to remote panels:** 75Ω video cable 500m max. length

**Serial RS232/422 (Optional):** D9 female

**Parallel (Joystick override):** D9 male, TTL levels

##### Power:

**Supply:** 100-132V, 180-240V, 50/60Hz

**Consumption:** 15 Watts

##### Physical:

**Height:** 1RU, 44mm

**Width:** 19" rack mount

**Depth:** 130mm

**Weight:** 1.85kg

**Operating Temperature:** 0-40°C

#### Ordering Information:

Note: These part numbers refer to the hardware only. Precise operation is determined by the configuration of the control panel.

##### CP-1000A

Intelligent Remote Panel, 1RU 16 buttons

##### CP-1000A-S7

CP-1000A panel with serial port fitted, supporting an open protocol for use with third party controllers.

#### Ordering Options:

##### CI-0003

RS232/422 Interface  
(Enables the serial port and is fitted inside the panel).

The CP-1600A is intended to be a cost effective panel for small systems. As with all Quartz panels, the buttons are individually programmable for functions such as source selection, destination selection, breakaways and locks, etc. The CP-1600A is typically used to control 16 sources and 16 destinations with four levels of breakaway and is neatly packaged in just 1RU of rack space. A version is also available as a local panel which fits onto the front of most standard Quartz 1RU router frames. The CP-1600A supports up to four levels of breakaway.

The CP-1601A is a simple 1RU panel intended as an entry level low cost panel for small systems. As with all Quartz panels the buttons are individually programmable for functions such as source selection, destination selection, breakaways and locks, etc. This ensures maximum flexibility of the system. The most common use is as a single destination 16 button-per-source input panel.

## CP-1600A Remote Control Panel



## CP-1601A Remote Control Panel



### Features

- Fully programmable buttons to operate in a variety of modes, e.g. as 16x16 XY.
- Button-per-source selection of 16 inputs.
- Lock or Enable button to protect against unauthorized or accidental selection.
- Buttons can be programmed for breakaways.
- Push buttons with a quality action and red LED.
- Slide-in designation strip for name legending.
- Camera joystick override on any eight inputs, with momentary or latching action.

### Additional CP-1600A Features

- XY panel, programmable to control from one through 16 destinations with breakaway.
- Single destination mode with breakaways.
- Dual seven segment display shows current destination number.
- Four levels of breakaway available.
- Lock facility protects against accidental or unauthorized selections.
- Chop mode for continuous toggle between any two sources.

### Specifications

#### Control:

Q-link to remote panels: 75Ω video cable, 500m max. length

Serial RS232/422 (Optional): D9 female

Parallel (Joystick override): D9 male, TTL levels

#### Power:

Supply: 100-132V, 180-240V, 50/60Hz

Power: 10 Watts

#### Physical:

Height: 1RU, 44mm (1.75" nom.)

Width: 19" rack mount

Depth: 130mm (5" nom.)

Weight: 1.50kg (3.3lb)

Operating Temperature: 0-40°C

### CP-1600A Ordering Information:

Note: These part numbers refer to the hardware only. Precise operation is determined by the configuration of the control panel.

**CP-1600A**  
**CP-1600A-LP**

Remote Mini XY Panel, BPS.  
Local Mini XY Panel, BPS. Supplied for use as a front panel on most 1RU frames

### Ordering Options:

**CI-0003**

RS232/422 Interface (Enables the serial port and is fitted internal to the panel)

### CP-1601A Ordering Information:

Note: These part numbers refer to the hardware only. Precise operation is determined by the configuration of the control panel.

**CP-1601A**  
**CP-1601A-S7**

Remote Panel, multi-mode 16 BPS and Lock  
CP-1601A Panel with serial port fitted, supporting an open protocol for use with third party controllers

**CP-1601A-LP**

Local Passive Panel, 16 BPS and Lock  
Supplied for use as a front panel on Q1601, Q1602 or with PI-1604/08  
Remote Passive Panel, 16 BPS and Lock (Has integral rack ears for 19" rack mounting, connects via D25 cable. Generally used with the Q1601 and PI-1604/08)

**CP-1601A-P**

### Ordering Options:

**CI-0003**

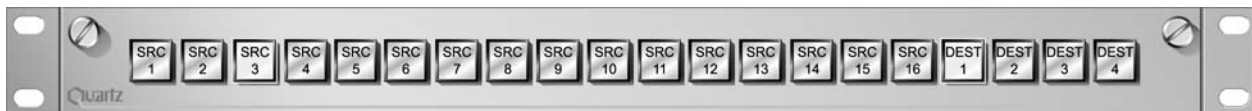
RS232/422 Interface (Enables the serial port and is fitted internal to the panel)

## Remote Control Panel

### CP-1604

The CP-1604 is a versatile programmable panel with 20 illuminated push buttons. A wide range of panel operations including XY and multi-destination may be configured using the WinSetup software. Buttons can be individually configured for any combination of source, destination, breakaway or control function. For instance, this panel can be configured as a 16 button-per-source panel leaving four buttons for breakaways, lock, destinations, etc.

#### CP-1604 Remote Control Panel



#### Features

- 15mm square buttons suitable for film legends with green LED illumination, uniform over whole legend surface
- Buttons with high quality positive action
- All panels are fully programmable to operate in a number of modes
- Buttons can be programmed for breakaways
- Program/Preview/Take mode can be programmed, emulating vision mixer operation, useful in transmission environments
- Optional Lock button protects against accidental or unauthorized selections
- Camera joystick override on any eight inputs, with momentary or latching action

#### Specifications

##### Control:

Q-link to remote panels: 75Ω video cable 500m max. length

Serial RS232/422 (Optional): D9 female

Parallel (Joystick override): D9 male, TTL levels

##### Power:

Supply: 100-132V, 180-240V, 50/60Hz

Power Consumption: 10 Watts

##### Physical:

Height: 1RU, 44mm (1.75" nom.)

Width: 19" rack mount

Depth: 130mm (5" nom.)

Weight: 1.50kg (3.3lb)

Operating Temperature: 0-40°C

#### Ordering Information:

Note: These part numbers refer to the hardware only. Precise operation is determined by the configuration of the control panel.

**CP-1604** Remote Panel, multi-mode, 20 Button-per-source

**CP-1604-S7** CP-1604 panel with serial port fitted, supporting an open protocol for use with third party controllers

#### Ordering Options:

**CI-0003** RS232/422 Interface (Enables the serial port and is fitted inside the panel)



The CP-2032A features assignable and dynamic LCD button technology. Each of the LCD buttons is capable of displaying a multiple character text string, graphics, different language characters or custom characters. The CP-2032A panel has 32 buttons laid out in two 16 button rows.

These panels are ideal in applications where changes to sources and destinations are needed regularly e.g. OB trucks or other applications where you need to pre-configure panels to suit different or recurring tasks.

Alternatively, the panels can be configured with a menu structure to allow quick navigation through the system. When a menu button is pressed some or all of the buttons change their function and legend. Their operation is then defined by the configuration setup for this menu.

Individual panel settings can be saved in WinSetup with the display changing instantly to the new configuration as soon as the download is complete. The panels represent a radical departure in control panels design resulting in the most flexible control panel on the market today.

### CP-2032A Remote Control Panel



#### Features

- Flexible feature or menu driven configurations providing quick and simple access.
- Easily reconfigured for regularly changing environments.
- Each LCD display features a 32x24 dot matrix capable of supporting three rows of five character text or a graphic.
- Each LCD illumination can be red, green or yellow with a two level programmable intensity providing unprecedented visual indication of the button status.
- Fully programmable button operation - user-definable via WinSetup configuration software.
- Button-per-source selection with Page mode NEXT and LAST buttons to select more sources.
- LOCK or ENABLE button to protect against unauthorized or accidental selection.
- Buttons can be programmed for breakaways or to give a menu structure to the panel.
- Camera joystick override on any eight inputs, with momentary or latching action.

#### Specifications

##### Control:

**Q-link to remote panels:** 75Ω video cable 500m max. length

**Serial RS232/422 (Optional):** D9 female

**Parallel (Joystick override):** D9 male, TTL levels

##### Power:

**Supply:** 100-132V, 180-240V, 50/60Hz

**Consumption:** 15 Watts

##### Physical:

**Height:** 2RU, 88mm

**Width:** 19" rack mount

**Depth:** 130mm

**Weight:** 3.70kg

**Operating Temperature:** 0-40°C

#### Ordering Information:

Note: These part numbers refer to the hardware only. Precise operation is determined by the configuration of the control panel.

##### CP-2032A

##### CP-2032A-S7

Intelligent Remote Panel, 2RU 32 buttons  
CP-2032A panel with serial port fitted,  
supporting an open protocol for use  
with third party controllers

#### Ordering Options:

##### CI-0003

RS232/422 Interface  
(Enables the serial port and is fitted  
inside the panel)

The CP-2024A features assignable and dynamic LCD button technology. Each of the LCD buttons is capable of displaying a multiple character text string, graphics, different language characters or custom characters. The CP-2024A panel has 32 buttons laid out with a keypad section in the style of a traditional XY panel.

The CP-2024A is ideal in applications where changes to sources and destinations are needed regularly e.g. OB trucks or other applications where you need to pre-configure panels to suit different or recurring tasks.

Alternatively, the panels can be configured with a menu structure to allow quick navigation through the system. When a menu button is pressed some or all of the buttons change their function and legend. Their operation is then defined by the configuration setup for this menu.

Individual panel settings can be saved in WinSetup with the display changing instantly to the new configuration as soon as the download is complete. The panels represent a radical departure in control panels design resulting in the most flexible control panel on the market today.

### CP-2024A Remote Control Panel



#### Features

- Flexible feature or menu driven configurations providing quick and simple access.
- Easily reconfigured for regularly changing environments.
- Each LCD display features a 32x24 dot matrix capable of supporting three rows of five character text or a graphic.
- Each LCD illumination can be red, green or yellow with a two level programmable intensity providing unprecedented visual indication of the button status.
- Fully programmable button operation - user-definable via WinSetup configuration software.
- Button-per-source selection with Page mode NEXT and LAST buttons to select more sources.
- LOCK or ENABLE button to protect against unauthorized or accidental selection.
- Buttons can be programmed for breakaways or to give a menu structure to the panel.
- Camera joystick override on any eight inputs, with momentary or latching action.

#### Specifications

##### Control:

Q-link to remote panels: 75Ω video cable 500m max. length

Serial RS232/422 (Optional): D9 female

Parallel (Joystick override): D9 male, TTL levels

##### Power:

Supply: 100-132V, 180-240V, 50/60Hz

Consumption: 15 Watts

##### Physical:

Height: 2RU, 88mm

Width: 19" rack mount

Depth: 130mm

Weight: 3.70kg

Operating Temperature: 0-40°C

#### Ordering Information:

Note: These part numbers refer to the hardware only. Precise operation is determined by the configuration of the control panel.

##### CP-2024A

Intelligent Remote Panel, 2RU 24 buttons, keypad style

##### CP-2024A-S7

CP-2024A panel with serial port fitted, supporting an open protocol for use with third party controllers

#### Ordering Options:

##### CI-0003

RS232/422 Interface  
(Enables the serial port and is fitted inside the panel)

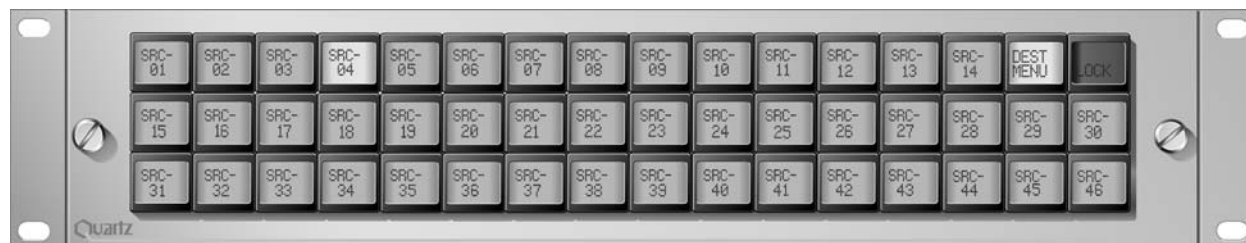
The CP-2048A features assignable and dynamic LCD button technology. Each of the LCD buttons is capable of displaying a multiple character text string, graphics, different language characters or custom characters. The CP-2048A panel has 48 buttons arranged in three rows of 16.

These panels are ideal in applications where changes to sources and destinations are needed regularly e.g. OB trucks or other applications where you need to pre-configure panels to suit different or recurring tasks.

Alternatively, the panels can be configured with a menu structure to allow quick navigation through the system. When a menu button is pressed some or all of the buttons change their function and legend. Their operation is then defined by the configuration setup for this menu.

Individual panel settings can be saved in WinSetup with the display changing instantly to the new configuration as soon as the download is complete. The panels represent a radical departure in control panels design resulting in the most flexible control panel on the market today.

### CP-2048A Remote Control Panel



#### Features

- Flexible feature or menu driven configurations providing quick and simple access.
- Easily reconfigured for regularly changing environments.
- Each LCD display features a 32x24 dot matrix capable of supporting three rows of five character text or a graphic.
- Each LCD illumination can be red, green or yellow with a two level programmable intensity providing unprecedented visual indication of the button status.
- Fully programmable button operation - user-definable via WinSetup configuration software.
- Button-per-source selection with Page mode NEXT and LAST buttons to select more sources.
- LOCK or ENABLE button to protect against unauthorized or accidental selection.
- Buttons can be programmed for breakaways or to give a menu structure to the panel.
- Camera joystick override on any eight inputs, with momentary or latching action.

#### Specifications

##### Control:

**Q-link to remote panels:** 75Ω video cable 500m max. length

**Serial RS232/422 (Optional):** D9 female

**Parallel (Joystick override):** D9 male, TTL levels

##### Power:

**Supply:** 100-132V, 180-240V, 50/60Hz

**Consumption:** 15 Watts

##### Physical:

**Height:** 2RU, 88mm

**Width:** 19" rack mount

**Depth:** 130mm

**Weight:** 3.70kg

**Operating Temperature:** 0-40°C

#### Ordering Information:

Note: These part numbers refer to the hardware only. Precise operation is determined by the configuration of the control panel.

##### CP-2048A

Intelligent Remote Panel, 2RU 48 buttons

##### CP-2048A-S7

CP-2048A panel with serial port fitted, supporting an open protocol for use with third party controllers

#### Ordering Options:

##### CI-0003

RS232/422 Interface  
(Enables the serial port and is fitted inside the panel)



The CP-2404 is the latest panel to be introduced into Quartz's extensive range of remote and local router control panels. The CP-2404 is a versatile programmable panel with 29 illuminated push buttons and two display windows.

The CP-2404 is fully programmable and therefore the operation of the panel is entirely dependent upon its configuration. It can be configured in a number of different ways including XY and multi-destination. The CP-2404 is configured using the WinSetup software. Each button can be individually configured for any combination of source, destination, breakaway or control functions.

The physical button layout of the CP-2404 guides its configuration but does not restrict it. For example the left hand block of 24 buttons can be programmed as sources. A number of these buttons can also be used for other functions such as level selection etc. The two display windows can be used to show the current selected destination and the selected source. The two buttons located next to the display windows can be used to scroll up or down through the source or destination list. The take button confirms the selection.

### CP-2404 Remote Control Panel



#### Features

- 1RU panel with internal power supply. 15mm LED illuminated square buttons suitable for film legends
- Buttons with high quality positive action. Fully programmable to operate in a number of modes
- Buttons can be programmed for breakaways, level selection etc.
- Optional lock button protects against accidental or unauthorized selections
- Camera joystick override on any eight inputs with momentary or latching action

#### Specifications

##### Control:

Q-link  
Serial RS232/422 (Optional)  
Parallel - Joystick override

##### Power:

Supply: 100-132V, 180-240V, 50/60Hz  
Power Consumption: 10 Watts

##### Physical:

Height: 1RU, 44mm  
Width: 19" rack mount  
Depth: 130mm  
Weight: 1.55kg  
Operating Temperature: 0-40°C

##### Ordering Information:

CP-2404 Remote Control Panel

The CP-3200A is a keypad panel normally arranged to operate as an XY panel allowing control of any input or output, with up to four levels of breakaway. The CP-3200A is normally used as a master XY panel in engineering or MCR type applications where access to any input or output is required. The CP-3200A is suitable for any system from 16x4 and above.

Advanced programming control enables the CP-3200A also to be configured to control five destinations without breakaway or a single destination with five levels of breakaway.

### CP-3200A Remote Control Panel



### Features

- XY mode with four levels of breakaway.
- Five destination mode with a TAKE button for each destination but without breakaways.
- Single destination mode with five levels of breakaway.
- 24 + 6 button keypad for source and destination names.
- High brightness vacuum fluorescent alphanumeric display with better viewing angles than LCD types.
- Source names can be up to seven characters long.
- Destination names can be up to eight characters long.
- In use displays for all levels plus preset.
- All buttons fully programmable for different functions such as LOCK.
- TAKE button optionally causes the source in use and preset displays to toggle.
- Optional NEXT and LAST buttons to scroll through the available sources and destinations.
- Optional CHOP button for continuous toggle between sources, for line-up purposes.
- Optional Preview mode causes a destination to switch when a valid source name is entered in the preset display. Available on any or all destinations.
- Camera joystick override on any eight inputs, with momentary or latching action.
- Programmable display brightness with optional sleep mode.

### Specifications

#### Control

**Q-link to remote panels:** 75Ω video cable 500m max. length

**Serial RS232/422 (Optional):** D9 female

**Parallel (Joystick override):** D9 male, TTL levels

#### Power:

**Supply:** 100-132V, 180-240V, 50/60Hz

**Consumption:** 10 Watts

#### Physical:

**Height:** 2RU, 88mm (3.5" nom.)

**Width:** 19" rack mount

**Depth:** 130mm (5" nom.)

**Weight:** CP-3200A: 2.45kg (5.4lb)

**Operating Temperature:** 0-40°C

### Ordering Information:

Note: These part numbers refer to the hardware only. Precise operation is determined by the configuration of the control panel.

#### CP-3200A

#### CP-3200A-S7

Remote Panel with keypad and display.  
CP-3200A panel with serial port fitted, supporting an open protocol for use with third party controllers.

### Ordering Options:

#### CI-0003

RS232/422 Interface. (Enables the serial port and is fitted inside the panel).

The CP-3201 has 40 illuminated push buttons and is ideal for systems with 32 sources leaving eight buttons to select destinations, breakaways and lock, etc. Alternatively, it can be programmed with 16 source buttons and 16 destination buttons to provide an XY panel suitable for small systems using the WinSetup software.

### CP-3201 Remote Control Panel



### Features

- 15mm square buttons suitable for film legends with green LED illumination, uniform over whole legend surface.
- Buttons with high quality positive action.
- All panels are fully programmable to operate in a number of modes.
- Split panels can be programmed in many ways, for instance, permitting two separate destinations to be controlled using two rows of source buttons.
- Buttons can be programmed for breakaways.
- Program/Preview/Take mode can be programmed, emulating vision mixer operation, useful in transmission environments.
- Optional Lock button protects against accidental or unauthorized selections.
- Camera joystick override on any eight inputs, with momentary or latching action.

### Specifications

#### Control:

**Q-link to remote panels:** 75Ω video cable 500m max. length

**Serial RS232/422 (Optional):** D9 female

**Parallel (Joystick override):** D9 male, TTL levels

#### Power:

**Supply:** 100-132V, 180-240V, 50/60Hz

**Power Consumption:** 10 Watts

#### Physical:

**Height:** 1RU, 44mm (1.75" nom.)

**Width:** 19" rack mount

**Depth:** 130mm (5" nom.)

**Weight:** 1.55kg (3.4lb)

**Operating Temperature:** 0-40°C

#### Ordering Information:

Note: These part numbers refer to the hardware only. Precise operation is determined by the configuration of the control panel.

**CP-3201** Remote Panel, multi-mode, 40 Button-per-source.

**CP-3201-S7** CP-3201 panel with serial port fitted, supporting an open protocol for use with third party controllers.

**CP-3201-P** Passive Panel, multi-mode, 40 Button-per-source.

(Has integral rack ears for 19" rack mounting, connects via D25 cable. Generally used with the PI-1604/08A).

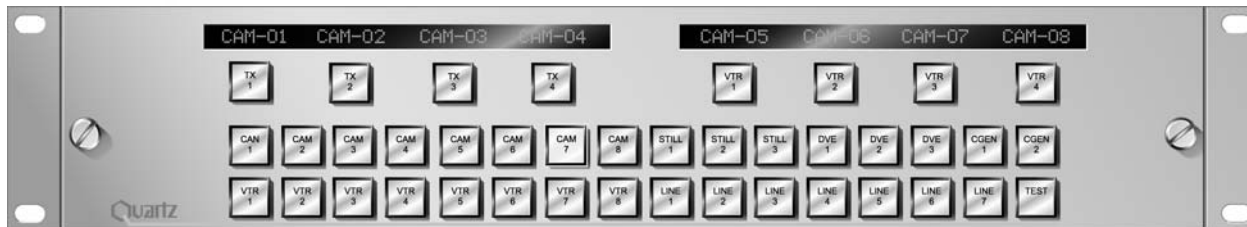
#### Ordering Options:

**CI-0003** RS232/422 Interface (Enables the serial port and is fitted inside the panel).



The CP-3208 is an eight destination control panel that can handle up to 32 sources. It is ideal in applications, such as monitoring or live operational areas, where several destinations are to be controlled rapidly with a single button selection. The status of each destination is visible at all times for increased operational confidence.

### CP-3208 Remote Control Panel



#### Features

- Eight displays show the current source selected to each destination.
- High brightness, green LED displays with up to seven character names.
- 32 buttons for source selection and eight TAKE buttons for the destinations.
- TAKE button can optionally be cleared or retain the last source selection.
- 15mm square buttons suitable for film legends with green LED illumination, uniform over whole legend surface.
- Optional LOCK button protects against accidental or unauthorized selections.
- Optional Preview mode causes a destination to switch when a source button has been selected but before a TAKE has been made. Available on any or all destinations.
- Camera joystick override on any eight inputs, with momentary and latching action.
- Optional VTR control buttons for <<, >>, > and STOP. (Requires CI-0003).

#### Specifications

##### Control:

**Q-link to remote panels:** 75Ω video cable 500m max. length

**Serial RS232/422 (Optional):** D9 female

**Parallel (Joystick override):** D9 male, TTL levels

##### Power:

**Supply:** 100-132V, 180-240V, 50/60Hz

**Consumption:** 10 Watts

##### Physical:

**Height:** 2RU, 88mm (3.5" nom.)

**Width:** 19" rack mount

**Depth:** 130mm (5" nom.)

**Weight:** 2.55kg (5.6lb)

**Operating Temperature:** 0-40°C

#### Ordering Information:

Note: These part numbers refer to the hardware only. Precise operation is determined by the configuration of the control panel.

##### CP-3208

Remote Panel, eight destination, 32 Button-per-source with source display for each destination.

##### CP-3208-S7

CP-3208 panel with serial port fitted, supporting an open protocol for use with third party controllers.

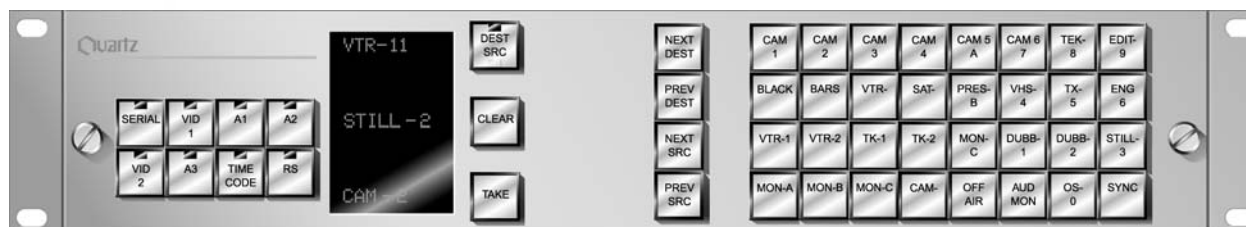
#### Ordering Options:

##### CI-0003

RS232/422 Interface. (Enables the serial port and is fitted inside the panel).

The CP-6400 is an advanced XY panel ideal for larger applications above 64x64 but can be used with any Quartz router. It is typically used as a master panel to control any input or output, with up to eight levels of breakaway. Its extra large keypad and eight character names provide great flexibility to name sources and destinations in larger systems. Flexible architecture permits any key to be programmed to provide any function.

### CP-6400 Remote Control Panel



### Features

- Extra large keypad are of 32 buttons.
- Eight character names on high brightness green LED displays.
- Programmable display brightness.
- Up to eight levels of breakaway supported.
- All buttons are fully programmable for different functions.
- Preset and in use displays to help avoid false selections.
- TAKE button optionally causes the source in use and preset displays to toggle, to reverse false selections.
- Optional LOCK button protects against accidental or unauthorized selections.
- Optional NEXT and LAST buttons to scan the available sources and destinations.
- Optional CHOP button for continuous toggle between sources, for line-up purposes.
- Camera joystick override on any eight inputs, with momentary and latching action.

### Specifications

#### Control:

Q-Link to remote panels: 75Ω video cable 500m max. length

Serial RS232/422 (Optional): D9 female

Parallel (Joystick override): D9 male, TTL levels

#### Power:

Supply: 100-132V, 180-240V, 50/60Hz

Consumption: 10 Watts

#### Physical:

Height: 2RU, 88mm

Width: 19" rack mount

Depth: 130mm

Weight: 2.45kg (5.4lb)

Operating Temperature: 0-40°C

#### Ordering Information:

Note: These part numbers refer to the hardware only. Precise operation is determined by the configuration of the control panel.

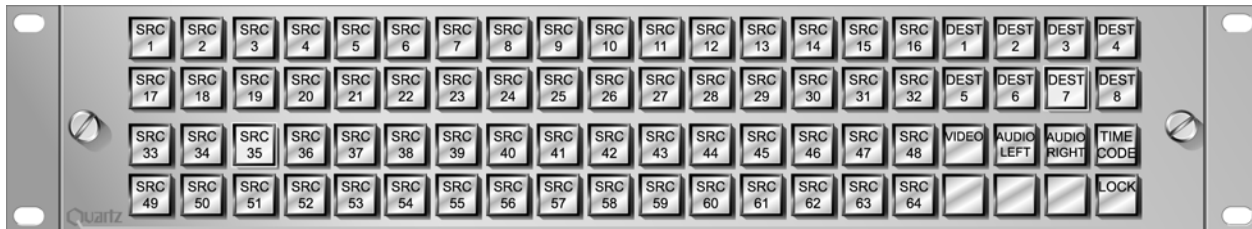
**CP-6400** Remote Display Panel, XY, keypad.  
**CP-6400-S7:** CP-6400 panel with serial port fitted, supporting an open protocol for use with third party controllers.

#### Ordering Options:

**CI-0003:** RS232/422 Interface  
 (Enables the serial port and is fitted internal to the panel).

The CP-6401 has 80 illuminated push buttons and is ideal for 64 input systems, needing selection of the source with a single button press. Alternatively, it can be used as an XY panel for systems up to 32x32 using the WinSetup software.

### CP-6401 Remote Control Panel



### Features

- 15mm square buttons suitable for film legends with green LED illumination, uniform over whole legend surface.
- Buttons with high quality positive action.
- All panels are fully programmable to operate in a number of modes.
- Split panels can be programmed in many ways, for instance, permitting two separate destinations to be controlled using two rows of source buttons.
- Buttons can be programmed for breakaways.
- Program/Preview/Take mode can be programmed, emulating vision mixer operation, useful in transmission environments.
- Optional Lock button protects against accidental or unauthorized selections.
- Camera joystick override on any eight inputs, with momentary or latching action.

### Specifications

#### Control:

**Q-link to remote panels:** 75Ω video cable 500m max. length

**Serial RS232/422 (Optional):** D9 female

**Parallel (Joystick override):** D9 male, TTL levels

#### Power:

**Supply:** 100-132V, 180-240V, 50/60Hz

**Power Consumption:** 10 Watts

#### Physical:

**Height:** 2RU, 88mm (3.5" nom.)

**Width:** 19" rack mount

**Depth:** 130mm (5" nom.)

**Weight:** 2.45kg (5.4lb)

**Operating Temperature:** 0-40°C

#### Ordering Information:

Note: These part numbers refer to the hardware only. Precise operation is determined by the configuration of the control panel.

**CP-6401** Remote Panel, multi-mode, 80 Button-per-source.

**CP-6401-S7** CP-6401 panel with serial port fitted, supporting an open protocol for use with third party controllers.

#### Ordering Options:

**CI-0003** RS232/422 Interface (Enables the serial port and is fitted inside the panel).



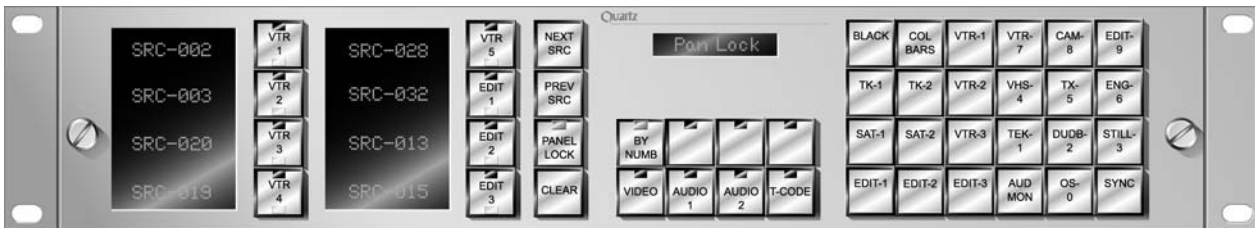
## Remote Control Panel

### CP-6402/6404/6406 & 6408

A selection of multi-destination panels are available for the control of multiple sources to two, four, six or eight destinations. Up to eight levels of break-away are supported. The LED displays give visible readout of the current source status. The large keypad and eight character names provide great flexibility to name sources and destinations in larger systems. Flexible architecture permits any key to be programmed to provide any function.

The CP-6408 also has a display mode where the preset window becomes the current destination and the source control panels windows are then each associated with up to eight levels.

#### CP-6408 Remote Control Panel



8

#### Features

- 24 button keypad.
- Four different models, supporting two, four, six or eight destinations.
- TAKE button for each destination.
- In use display for each destination for easy identification of status.
- Eight character names on high brightness green LED displays.
- Programmable display brightness.
- Up to eight levels of breakaway supported.
- All buttons are fully programmable for different functions.
- Preset and in use displays to help avoid false selections.
- Optional LOCK button protects against accidental or unauthorized selections.
- Optional NEXT and LAST buttons to scan the available sources and destinations.
- Optional CHOP button for continuous toggle between sources, for line-up purposes.
- Camera joystick override on any eight inputs, with momentary and latching action.

#### Specifications

##### Control:

Q-link to remote panels: 75Ω video cable 500m max. length

Serial RS232/422 (Optional): D9 female

Parallel (Joystick override): D9 male, TTL levels

##### Power:

Supply: 100-132V, 180-240V, 50/60Hz

Consumption: 10 Watts

##### Physical:

Height: 2RU, 88mm (3.5" nom.)

Width: 19" rack mount

Depth: 130mm (5" nom.)

Weight: 2.45kg (5.4lb)

Operating Temperature: 0-40°C

#### Ordering Information:

Note: These part numbers refer to the hardware only. Precise operation is determined by the configuration of the control panel.

##### CP-6402

Remote Panel, two destinations, keypad with displays.

##### CP-6404

Remote Panel, four destinations, keypad with displays.

##### CP-6406

Remote Panel, six destinations, keypad with displays.

##### CP-6408

Remote Panel, eight destinations, keypad with displays.

##### CP-6402-S7

CP-6402 panel with serial port fitted, supporting an open protocol for use with third party controllers.

##### CP-6404-S7

CP-6404 panel with serial port fitted, supporting an open protocol for use with third party controllers.

##### CP-6406-S7

CP-6406 panel with serial port fitted, supporting an open protocol for use with third party controllers.

##### CP-6408-S7

CP-6408 panel with serial port fitted, supporting an open protocol for use with third party controllers.

#### Ordering Options:

##### CI-0003

RS232/422 Interface.  
(Enables the serial port and is fitted internal to the panel).

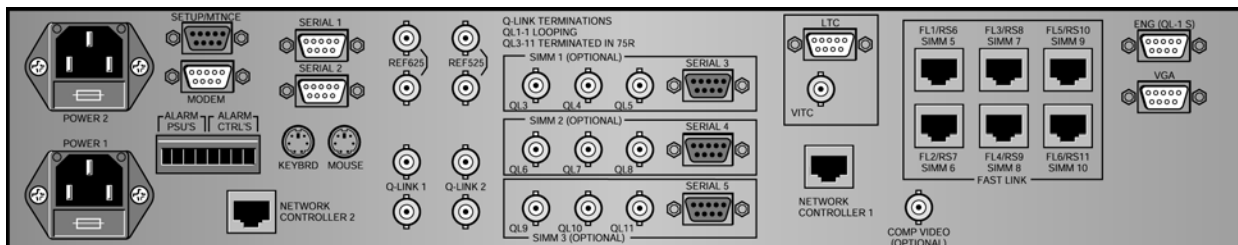


## SC-1000 System Controller

The SC-1000 System Controller handles the management of the routers as well as providing additional redundancy features. With its Ethernet networking and comprehensive interface connections the SC-1000 provides an expandable platform to manage future communication and interface requirements for very large routing systems.

The SC-1000 occupies a 2RU frame and may be equipped with a single controller and power supply, or two of each for redundancy. Each controller and power supply is individually accessible from the front of the frame and supports hot swapping with no disturbance to the controller that is operating. By using a real-time operating system the SC-1000 has been specifically designed to avoid slow operation and slow boot-up time normally associated with PC based solutions.

### SC-1000 Rear Panel



### Features

#### Storage

The basic unit contains non-volatile memory for the storage of crosspoint settings and a 'flash disk' for the storage of configuration data files. A 3 1/2" diskette drive for each controller allows WinSetup configurations to be easily transferred while a networked PC may be connected to the system for virtually unlimited storage.

#### User Interface

Via the front panels users may switch between controllers manually, review system status, or select a configuration file stored internally or on a 3 1/2" diskette.

#### Feature Summary

- Single controller module, or two for redundancy, with automatic and manual changeover. Supports hot swap and changeover with total transparency.
- Single PSU module, or two for redundancy with power sharing for maximum reliability. Supports hot swap.
- Supports up to 16 independent routing levels each of 1024x1024.
- Supports up to 160 control panels.
- Fast boot-up time.
- Panels can be re-configured without disturbing the rest of the system.
- NVRAM for crosspoint status storage.
- Flash disk and 3 1/2" Diskette drive for configuration storage.
- Two Q-Link ports as standard, with the option for up to nine more, allows for small groups of panels on each link providing protection against one link being damaged and maintaining high speed.
- Four serial ports as standard:
  - Maintenance port - RS232/422 used for downloading configurations and for other engineering functions.
  - Modem port - RS232 only, but not restricted to just modem use.
  - 2 ports for general purpose use, RS232/422.
  - Option for up to 3 more ports, RS232/422.
- WinSetup can be used to configure for RS232 or RS422 and choose the protocol type on a port-by-port basis.
- Ethernet port supporting TCP/IP protocol for configuration file downloading and router control. A separate port for each controller connects providing the ultimate in protection if one controller fails.
- Fully supports Quartz WinSetup, WinControl and WinQueue software.
- Support of the SNMP remote monitoring protocol.

#### Timecode

A Timecode input card is available as an option enabling accurate switching according to a real-time schedule. Both LTC and VITC are supported.

#### SNMP

SNMP support allowing remote monitoring of the SC-1000 core features over an Ethernet link by an external device.

### Specifications

#### User Interface:

**Front panel:** 20 characters x 4 lines LCD display with back-light. Used with navigation and enter buttons for control of options and viewing diagnostics.

#### Storage:

**Non-volatile memory:** Used to store route settings, 5 years.  
**Flash Disk:** 8Mbyte as standard, used to store configuration files. Can be upgraded to 144Mbyte or more.

#### Connections:

##### Q-link:

2 as standard, options for 9 more by installing CI-0006 sub-modules, used for connecting to remote panels and Quartz routers. 75Ω video cable 500m max. length

##### Setup/Maintenance:

##### Modem:

RS232/422 selectable, wired to Quartz standard RS232 wired to PC D9 standard (can be used as a serial port)

##### Serial:

##### RS232/422 selectable

##### Network:

##### ENG:

Ethernet 10BaseT, TCP/IP protocol, RJ45  
Special engineering connection for Quartz use, can also be used to interface to a fiber-optic converter for long haul connections  
Relay contact pairs from processors and power supplies  
LTC and VITC supported

##### Alarm:

##### Time code:

##### Power:

##### Supply:

##### Power:

Auto ranging 100 to 240 VAC 50/60 Hz  
Single processor: 30 Watts  
Dual processor: 60 Watts

#### Physical:

##### Height:

2RU, 88mm (3.5" nom.)

##### Width:

19" rack mount

##### Depth:

485mm (19" nom.)

##### Weight:

9kg

##### Operating temperature:

0-40°C

##### Ventilation:

Fan cooled, air drawn from front exhaust at rear and sides

#### Ordering Information:

Each System Controller ships with a single processor and power supply as standard.

##### SC-1000-S

System Controller, single processor and single power supply

##### SC-1000-D

System Controller, redundant processor and single power supply.

#### Ordering Options:

##### PS-0014

##### SC-1000-FU

Redundant power supply  
A-FU-0010-0000 Main Processor module for system controller, used to upgrade a single processor unit to dual processor or to hold as a spare

##### SC-1000-QL

CI-0006 Sub-module that plugs inside the SC-1000 to enable three additional Q-Link and one RS232/422 port. Up to 3 modules may be fitted to provide up to 9 extra Q-Links and up to 3 extra serial ports.

##### SC-1000-TC

Time code sub-module which fits inside the SC-1000

##### AK-0002

Rear frame support kit, strongly recommended in mobile applications

The Quartz Parallel Interface is used to provide interfaces between Quartz routers and equipment requiring parallel rather than serial control e.g. Edit Controllers and custom control panels. The interface is a compact 1RU high 19" rack-mountable unit.

There are two models available supporting four or eight panel ports. The PI-1604A supports four ports and the PI-1608A eight. These units include a serial port as standard and optionally, on the PI-1608A, a second Q-Link and a second serial port.

### PI-1604A & PI-1608A Rear Panels



8

### Features

- Supports custom button-per-source panels.
- Supports XY panel operation.
- Fully programmable to support for example destination 'hold down' mode (sometimes called two finger enable).
- Supports buttons with LED or 24V bulb status illumination.
- Reads GPI signals.
- Interfaces to VTR edit controllers with BCD or binary data format.
- Joystick override function is supported.
- Drives external relays.
- Optional second Q-Link port on PI-1608A.
- Serial port as standard, plus an optional second port on PI-1608A.
- An optional local panel fits to the front of the PI-1604A.
- Power supply provides 24V power for lamps or LEDs.
- External Power Supply may be used to drive lamps, LEDs or relays.

A typical application of the Parallel Interface is to connect to custom control panels. All Quartz systems use serial communications between the matrix frames and the control panels via a single standard video coaxial cable, called the Q-Link. However, there are times when the standard panels will not fit into a desk or the buttons must be integrated into a common panel with the controls of third party equipment. The Quartz Parallel Interface is designed to meet this requirement.

The other main application offers a low cost solution where several panels are needed in the same area. Here, variants of the front panels of standard panels CP-1601A and CP-1604 are used without their normal cases. They are connected to the Parallel Interface by multi-core or ribbon cable. This is especially useful in situations where space behind the panel mounting surface is strictly limited, for instance in horizontal desks where a standard panel limits knee room.

Each port has 16 lines with read/write capability. Each line can read a button push and/or drive a lamp or LED wired to the button in the traditional button-per-source fashion. Each port also carries power for illumination. Alternatively an external source of power may be used.

### Specifications

#### Parallel Ports:

Input:	<0.8V for logic low >3.5V or open circuit for logic high With internal power supply 50mA each output, 500mA total per unit. With external power supply 75mA per output, +24V max
Output Current sink:	1.0V typical
Output low Voltage:	

#### Control:

Q-link:	75Ω video cable 500m max. length
Serial RS232/422:	D9 female

#### Power:

Supply:	100-132V, 180-240V, 50/60Hz
Consumption:	15 Watts

#### Physical:

Height:	1RU, 44mm
Width:	19" rack mount
Depth:	220mm
Weight:	

PI-1604:	2.25kg
PI-1608:	2.5kg

#### Connectors:

	D25 female
	Four on PI-1604A
	Eight on PI-1608A
Operating Temperature:	0-40°C
Ventilation:	Natural convection

#### Ordering Information:

PI-1604A	With four ports supporting 64 buttons/lamps
PI-1608A	With eight ports supporting 128 buttons/lamps

#### Ordering Options:

CI-0004	Sub-module to enable second Q-Link and second serial port CP-1601A-P 17 button passive remote panel similar to CP-1601A, with 19" rack mount flanges, needs one port, depth 40mm.
CP-1604-P	20 button passive remote panel similar to CP-1604, with 19" rack mount flanges, needs three ports, depth 40mm.
CP-1600A-LP	Local panel, functionally identical to CP-1600A
AK-0005	Mating D25 Connectors, all male type, one required for each port



All Quartz routers are equipped with at least one Q-Link port and one RS232/422 serial port as standard, and many have the option for more. Quartz has developed a range of serial interfaces and software protocols to connect to third party equipment such as automation systems, vision mixers, editors, under monitor displays and DVEs.

The serial interfaces fall into two categories:

1. Plug-in Communication Interfaces, called CI-000x, which fit inside routers or control panels and can be supplied with the initial system or installed later.
2. Stand-alone Interfaces, called SI-000x, which are 1RU rack-mount mains-powered units.

### CI-0001 RS232/422 Serial Interface Card

Enables a second serial port on routers equipped with a second D9 connector.

### CI-0003 RS232/422 Serial Interface Card

Drives the serial port on remote control panels, for example to provide point-to-point RS422 interface between Quartz panels and third party equipment.

### CI-0004 Multi Q-Link Card

Adds one more serial port plus three more Q-Link ports, depending on the number of physical ports fitted to the frame.

### SI-0001 Serial Interface Adapter

Adds an extra RS232/422 serial port to a system when there are no spare ports available on the frame(s) or control panel(s). A 1RU rack mounting unit with a Q-Link port and integral power supply. Often used as a platform to handle a third party protocol.



### SI-0004 Q-Link Isolator/Repeater

The SI-0004 provides an opto-isolated connection between two sections of Q-Link which eliminates the induced mains hum or earth loops, etc.



The SI-0004 also buffers the primary (incoming) Q-Link signal and passes it through an optically coupled interface to provide a fully isolated secondary Q-Link feed which can then handle a further 500m length of cable. In addition, an RS232/422 port is available on the secondary side of the interface, but this cannot be used at the same time as the secondary Q-Link.

The unit fits in a 1RU frame with a single feed of ac power to provide D.C. power to both halves of the electrical isolated circuitry.

By connecting the RS232/422 port to standard third party fibre-optic interfaces it is possible to use two SI-0004 Isolator/Repeaters to extend the Q-Link messaging over very long distances.

In outside broadcast applications the internal Q-Link can be vulnerable to damage when taken outside the truck. The SI-0004 can be used to isolate and protect the internal section of the Q-link from faults on the external section.

### Specifications

#### Connectivity:

Main Q-Link:	SI-0001 x1, SI-0003 x1
Main RS232/422:	SI-0001 x1
Extra Q-Links:	SI-0004 x1 isolated
Or extra RS232/422:	SI-0004 x1

#### Physical:

Depth:	SI-0001 - 130mm, SI-0004 - 130mm
Weight:	SI-0001 - 1.25kg, SI-0004 - 1.25kg

#### Common to all:

Operating Temperature:	0-40°C
Height:	1RU, 44mm (1.75" nom.)
Width:	19" rack mount

#### Power:

Common to all:	
Supply:	100-132V, 180-240V, 50/60Hz
Consumption:	10 Watts

#### Ordering Information:

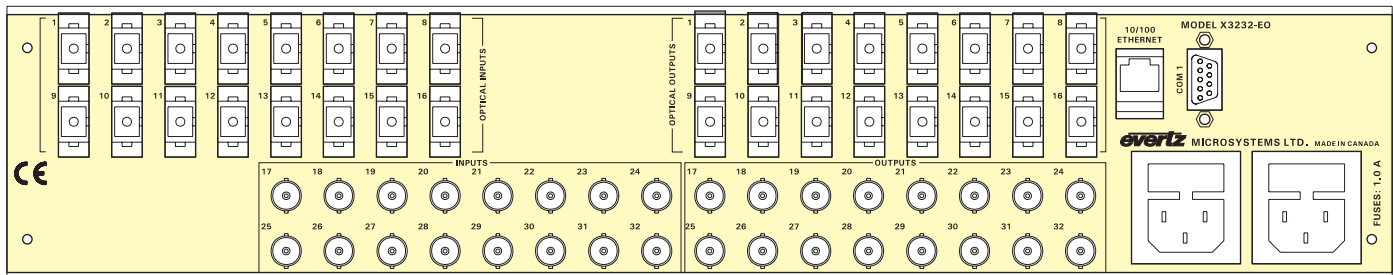
CI-0001	RS232/422 Serial Interface Card
CI-0003	RS232/422 Control Panel Serial Card
CI-0004	Multi Q-Link Card
SI-0001	Serial Interface Adapter
	Please specify the protocol required.
SI-0004	Q-Link Isolator/Repeater

\* Please Note: SI-0002 Multi-mode Serial Interface The SI-0002 Multi-mode Serial Interface has been replaced by the SC-500.



The X-3232-EO is a VistaLINK® - capable electrical/optical router for digital electrical or optical signals with rates up to 3Gb/s. The X-3232-EO can accept signals on any of its 16 optical or 16 electrical inputs and route them to any number of its 16 optical and 16 electrical outputs. The X-3232-EO is ideal for signal regeneration, routing and wavelength management in your optical system.

The optical outputs are available in 1310nm, CWDM or DWDM wavelengths. The X-3232-EO is housed in a 2RU frame.



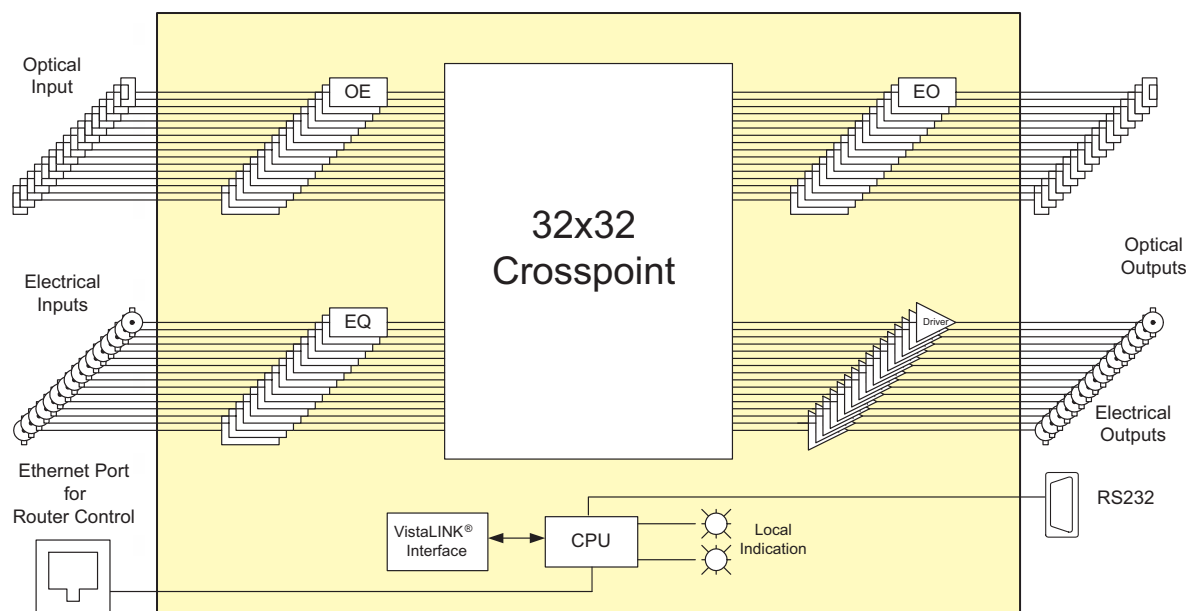
**X-3232 Rear Panel**

### Features

- 16 fiber optic inputs and outputs
- 16 coaxial inputs and outputs
- Provides optical regeneration (amplification, reshaping), routing and wavelength management
- Data rate independent to 3Gb/s
- Handles Video, Audio, Datacom and Telecom signals
- Fully non-blocking architecture
- Broadcast mode capability (any input to any number of outputs)
- Allows EO/OE conversion in one platform
- Provides ADD, DROP and MUX capabilities
- Accepts any input wavelength (1270nm to 1610nm)
- Outputs available with 1310nm, CWDM (ITU G.694.2) or DWDM (ITU G.694.1) wavelengths
- SNMP monitoring and remote router control via model 9000NCP control panel
- Compatible with single-mode or multi-mode fiber optic cable
- Compact 2RU size



**X-3232-EO Block Diagram**



### Specifications

#### Optical Input:

**Number of Inputs:** 16  
**Connector:** SC/PC, ST/PC, FC/PC Female housing  
**Operating Wavelength:** 1270nm - 1610nm  
**Maximum Input Power:** -1dBm  
**Optical Sensitivity:** -21dBm

#### Optical Output:

**Number of Outputs:** 16  
**Connector:** SC/PC, ST/PC, FC/PC Female housing  
**Return Loss:** >14dB  
**Output Wavelength:**  
**X-3232-EO13** 1310nm  
**X-3232-EOCWDM** 1270nm - 1610nm (16 wavelengths, 20nm spacing)  
**X-3232-EODWDM** 1545.32-1557.36nm (ITU C40-C25, 16 wavelengths, 0.8nm spacing)

#### Output Power:

**X-3232-EO13** -7dBm  
**X-3232-EOCWDM** 0dBm  
**X-3232-EODWDM** 7dBm

#### Electrical Input:

**Standard:** Any scrambled, 8b/10b or similarly encoded signal from 155Mb/s to 3.125Gb/s  
**Number of Inputs:** 16  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Return Loss:** >12dB  
**Signal Level:** 800mV nominal

#### Electrical Output:

**Standard:** Any scrambled, 8b/10b or similarly encoded signal from 155Mb/s to 3.125Gb/s  
**Number of Outputs:** 16  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Return Loss:** >12dB  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V  $\pm$ 0.5V

#### Communication and Control:

**Serial:** RS232/422, DB9 Male  
**Ethernet:** IEEE 802.3/U (10/100 BaseTx)  
 RJ45 connector

#### Compliance:

##### Electrical Safety:

ETA Listed to UL 60065-03, IEC 60065  
 Complies with CE Low voltage Directive  
 Class 1 laser product  
 Complies with 24 CFR 1040.10 and 1040.11  
 IEC 60825-1  
 Complies with FCC Part 15, Class A  
 EU EMC directive

##### Laser Safety:

##### EMI/RFI:

#### Physical:

##### Dimensions:

19"W x 3.5"H x 18"D  
 (483mm W x 90mm H x 457mm D)  
 8lbs. (3.5Kg)

##### Weight:

#### Electrical:

##### Voltage:

Auto-ranging 100-240 VAC 50/60Hz 40 Watts  
 250 V, 1 amp time delay

##### Fuse Rating:

#### Ordering Information:

**X-3232-EO13** 32 x 32 Electrical/Optical Router with 16 1310nm optical outputs  
**X-3232-EOCWDM** 32 x 32 Electrical/Optical Router with 16 CWDM (1270nm - 1610nm) optical outputs  
**X-3232-EODWDM** 32 x 32 Electrical/Optical Router with 16 DWDM (ITU C40-C25) optical outputs

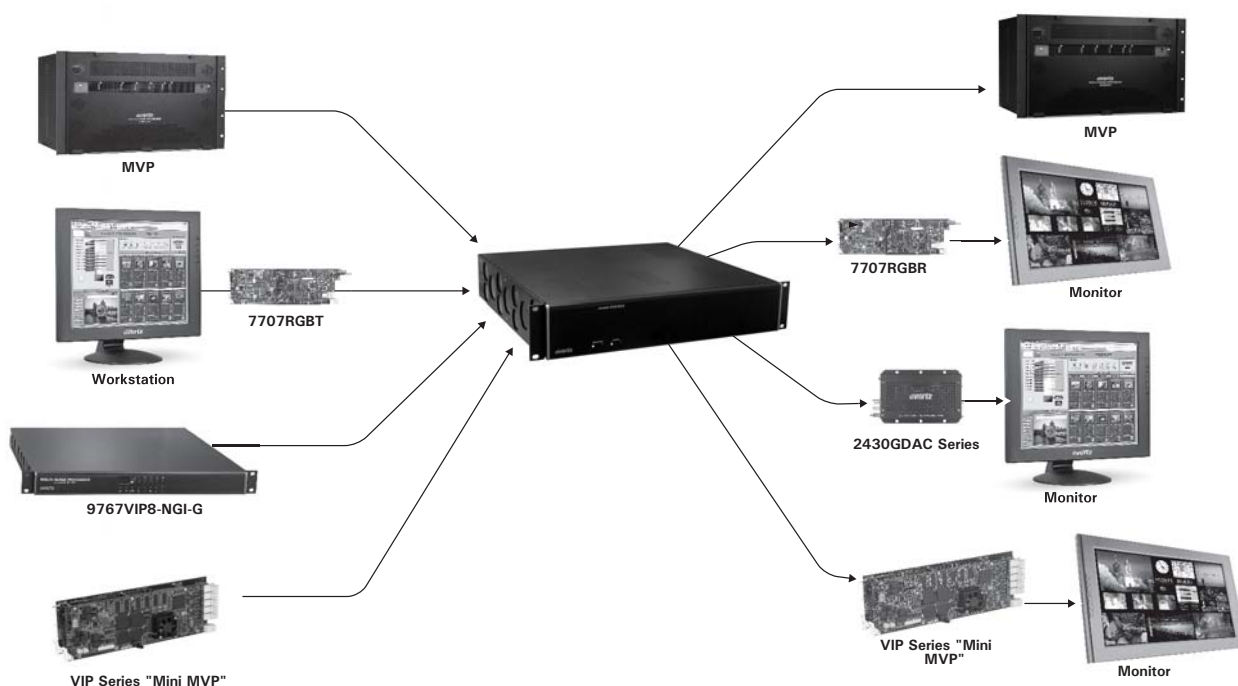
#### Ordering Options

Fiber Connector must be specified at time of order  
 Eg: Model +SC +3RU

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC





The X-3232G Series is a VistaLINK® enabled cross-point matrix for routing DVI/RGBHV digital signals using the Evertz Graphics Link protocol (GLINK). The system is comprised of 3 elements. Input source devices which generate or convert baseband signals to GLINK, Core Cross-point matrix for switching GLINK signals, edge output devices for converting from GLINK to DVI/RGBHV, or injecting GLINK directly.

Input devices include: Evertz MVP Multi-viewers, modular 7767VIP series, 1RU 9767VIP series multi-viewers, and 7707RGT-G DVI/RGBHV to GLINK converter. Output devices include: Evertz MVP™ with GLINK inputs, VIP series with GLINK inputs, 7707RGTR-G modular GLINK to DVI/RGBHV converter, and 2430GDAC small form factor GLINK to DVI/RGBHV converters. The following versions of 2RU GLINK router models are available:

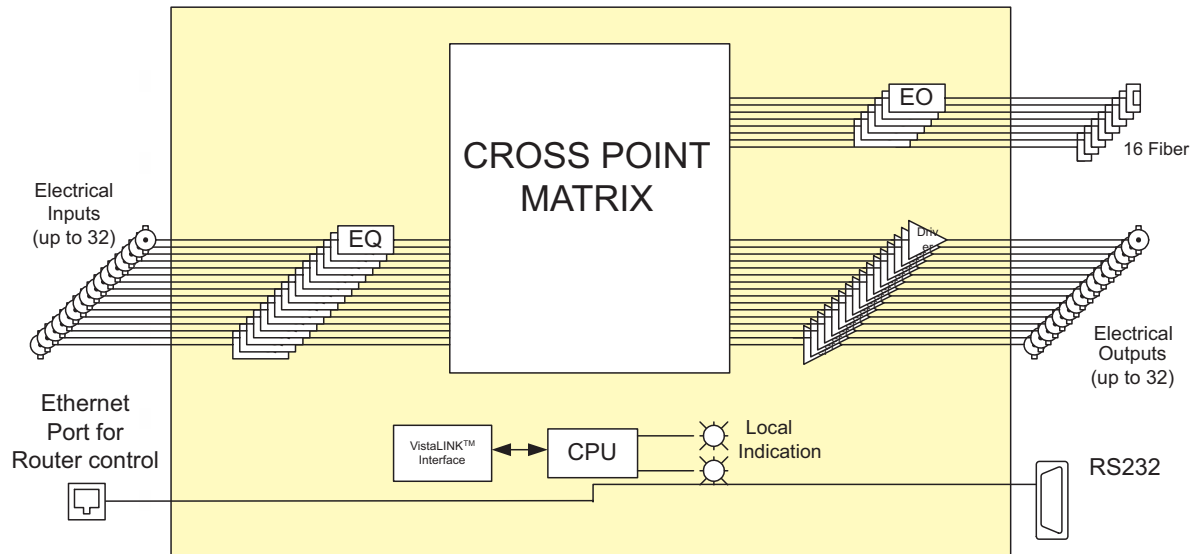
X-1616G	16 x 16 GLINK Router, 16 Electrical Inputs, 16 Electrical Outputs
X-1616G-F	16 x 16 GLINK Router, 16 Electrical Inputs, 16 Fiber Outputs
X-3216G-F	32 x 16 GLINK Router, 32 Electrical Inputs, 16 Fiber Outputs
X-3232G	32 x 32 GLINK Router, 32 Electrical Inputs, 32 Electrical Outputs

The GLINK optical outputs are available at 1310nm. For applications requiring 32x32 optical inputs and outputs the X3232G can be coupled with the 3000MWP-OE-5 and 3000MWP-EO-5 high density optical to electrical and electrical to optical converters house within the 3000FR.

### Features

- Fully non-blocking architecture
- Broadcast mode capability (any input to any number of outputs)
- Allows EO/OE conversion in one platform
- Provides ADD, DROP and MUX capabilities
- SNMP monitoring and remote router control via model 9000NCP control panel
- Compatible with single-mode or multi-mode fiber optic cable
- Compact 2RU size





#### **Specifications:**

##### **Optical Input:**

**Number of Inputs:** Up to 32 using 3000OE-5  
**Connector:** SC/PC, ST/PC, FC/PC Female housing  
**Operating Wavelength:** 1270nm - 1610nm  
**Maximum Input Power:** -1dBm  
**Optical Sensitivity:** -21dBm

##### **Optical Output:**

**Number of Outputs:** Up to 16 native within the device, expandable to 32 using 3000EO-5  
**Connector:** SC/PC, ST/PC, FC/PC Female housing  
**Return Loss:** >14dB  
**Output Wavelength:** 1310nm  
**Output Power:** -7dBm

##### **Electrical Input:**

**Standard:** GLINK 8b/10b or similarly encoded signal  
**Number of Inputs:** upto 32 depending on configuration  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Return Loss:** >12dB  
**Signal Level:** 800mV nominal

##### **Electrical Output:**

**Standard:** GLINK 8b/10b or similarly encoded signal  
**Number of Outputs:** Up to 32 depending on configuration  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Return Loss:** >12dB  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V  $\pm 0.5V$

##### **Communication and Control:**

**Serial:** RS232/422, DB9 Male  
**Ethernet:** IEEE 802.3/U (10/100 BaseTx) RJ45 connector

##### **Physical:**

**Dimensions:** 19"W x 3.5"H x 18"D  
 (483mm W x 90mm H x 457mm D)  
**Weight:** 8lbs. (3.5Kg)

##### **Electrical:**

**Voltage:** Auto ranging 110 + 240 Volts AC, 50/60 Hz 40 Watts  
**Fuse Rating:** 250 V, 1 amp time delay  
**Safety:** ETL Listed, complies with EU safety directives  
**EMI/RFI:** Complies with FCC Part 15 Class A regulations  
 Complies with EU EMC Directive

##### **Ordering Information:**

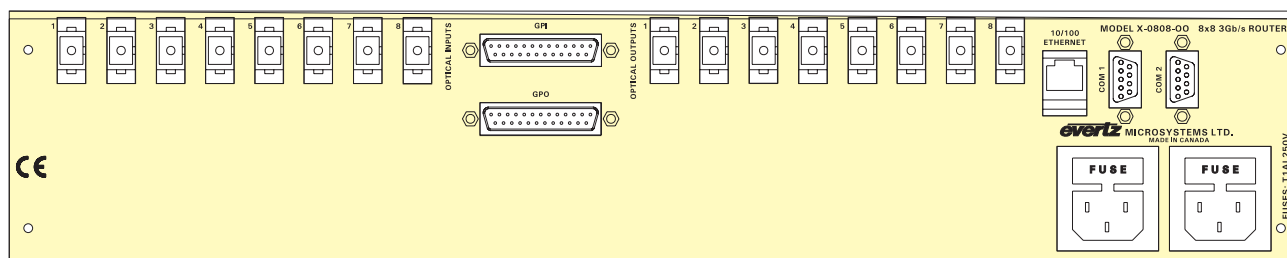
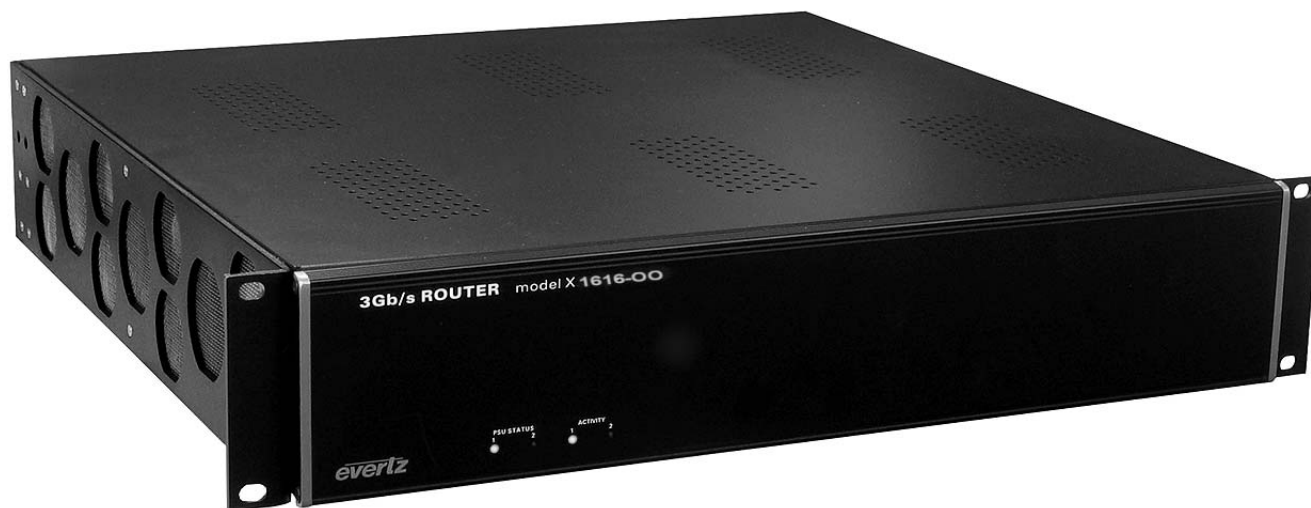
<b>X-1616G</b>	16 x 16 G-LINK Router, 16 Electrical inputs, 16 Electrical outputs
<b>X-1616G-F</b>	16 x 16 G-LINK Router, 16 Electrical inputs, 16 Fiber outputs
<b>X-3232G</b>	32 x 32 G-LINK Router, 32 Electrical inputs, 32 Electrical outputs
<b>X-3216G-F</b>	32 x 16 G-LINK Router, 32 Electrical inputs, 16 Fiber outputs

## 8x8 and 16x16 Optical Routers

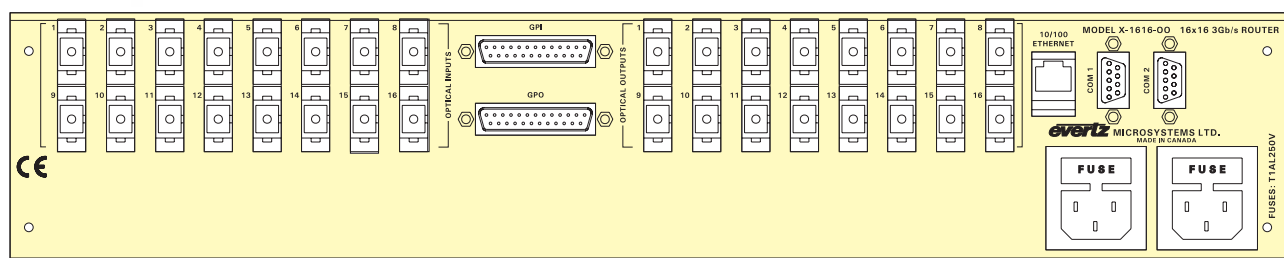
### X-0808-OO & X-1616-OO

The X-0808-OO & X-1616-OO are VistaLINK® - capable optical routers for digital optical signals with rates up to 3Gb/s. The X-0808-OO & X-1616-OO can accept signals on any of the 8 or 16 optical inputs and route them to any number of the 8 or 16 optical outputs. The X-0808-OO & X-1616-OO are ideal for signal regeneration, routing and wavelength management in any optical system.

The optical outputs are available in 1310nm, CWDM or DWDM wavelengths. The X-0808-OO X-1616-OO are housed in a 2RU frame.



**X-0808 Rear Panel**



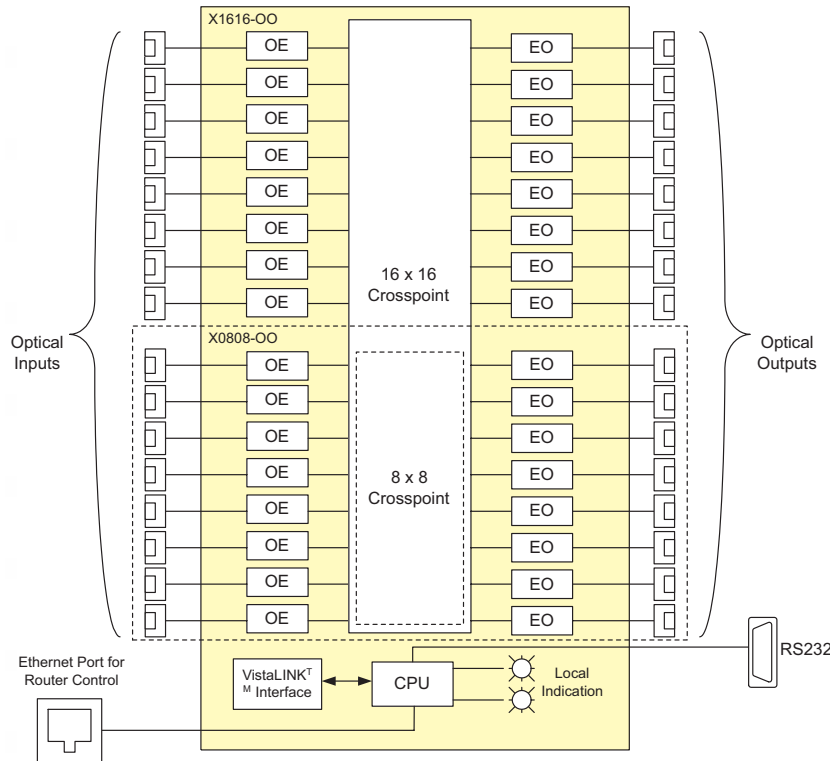
**X-1616 Rear Panel**

#### Features

- 8 or 16 fiber optic inputs and outputs
- Provides optical regeneration (amplification, reshaping), routing and wavelength management
- Data rate independent to 3Gb/s
- Handles Video, Audio, Datacom and Telecom signals
- Fully non-blocking architecture
- Broadcast mode capability (any input to any number of outputs)
- Accepts any input wavelength (1270nm to 1610nm)
- Outputs available with 1310nm, CWDM (ITU G.694.2) or DWDM (ITU G.694.1) wavelengths
- SNMP monitoring and remote router control via Model 9000NCP control panel
- Compatible with single-mode or multi-mode fiber optic cable
- Compact 2RU size



## X-0808-OO & X-1616-OO Block Diagrams:



### Specifications

#### Optical Input:

<b>Number of Inputs:</b>	8 (X-0808-OO), 16 (X-1616-OO)
<b>Connector:</b>	SC/PC, ST/PC, FC/PC Female housing
<b>Operating Wavelength:</b>	1270nm - 1610nm
<b>Maximum Input Power:</b>	-1dBm
<b>Optical Sensitivity:</b>	-21dBm

#### Optical Output:

<b>Number of Outputs:</b>	8 (X-0808-OO), 16 (X-1616-OO)
<b>Connector:</b>	SC/PC, ST/PC, FC/PC Female housing
<b>Return Loss:</b>	>14dB
<b>Output Wavelength:</b>	
<b>Standard</b>	1310nm
<b>CWDM</b>	1270nm - 1610nm (8 or 16 wavelengths, 20nm spacing)
<b>DWDM</b>	1545.32-1557.36nm (ITU C40-C25, 8 or 16 wavelengths, 0.8nm spacing)

#### Output Power:

<b>1310nm</b>	-7dBm
<b>CWDM</b>	0dBm
<b>DWDM</b>	7dBm

#### Communication and Control:

<b>Serial:</b>	RS232/422, DB9 Male
<b>Ethernet:</b>	IEEE 802.3/U (10/100 BaseTx) RJ45 connector

#### Compliance:

<b>Electrical Safety:</b>	ETL Listed Complies with CE Low voltage Directive
<b>Laser Safety:</b>	Class 1 laser product Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC directive

#### Physical:

<b>Dimensions:</b>	19"W x 3.5"H x 18"D (483mm W x 90mm H x 457mm D)
<b>Weight:</b>	8lbs. (3.5Kg)

#### Electrical:

<b>Voltage:</b>	Auto-ranging 100-240 VAC 50/60Hz 40 Watts
<b>Fuse Rating:</b>	250 V, 1 amp time delay

#### Ordering Information:

<b>X-0808-OO13</b>	8 x 8 Optical Router with 8 1310nm optical outputs
<b>X-0808-OOCWDM</b>	8 x 8 Optical Router with 8 CWDM (1470nm - 1610nm) optical outputs
<b>X-0808-ODWDM</b>	8 x 8 Optical Router with 8 DWDM (ITU C40-C33) optical outputs
<b>X-1616-OO13</b>	16 x 16 Optical Router with 16 1310nm optical outputs
<b>X-1616-OOCWDM</b>	16 x 16 Optical Router with 16 CWDM (1270nm - 1610nm) optical outputs
<b>X-1616-ODWDM</b>	16 x 16 Optical Router with 16 DWDM (ITU C40-C25) optical outputs

#### Ordering Options

Fiber Connector must be specified at time of order  
Eg: Model +SC

#### Connector Suffix

<b>+SC</b>	SC/PC
<b>+ST</b>	ST/PC
<b>+FC</b>	FC/PC

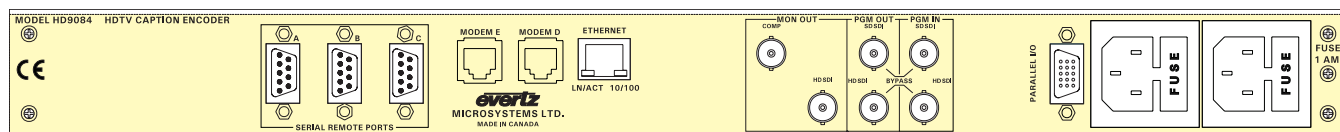
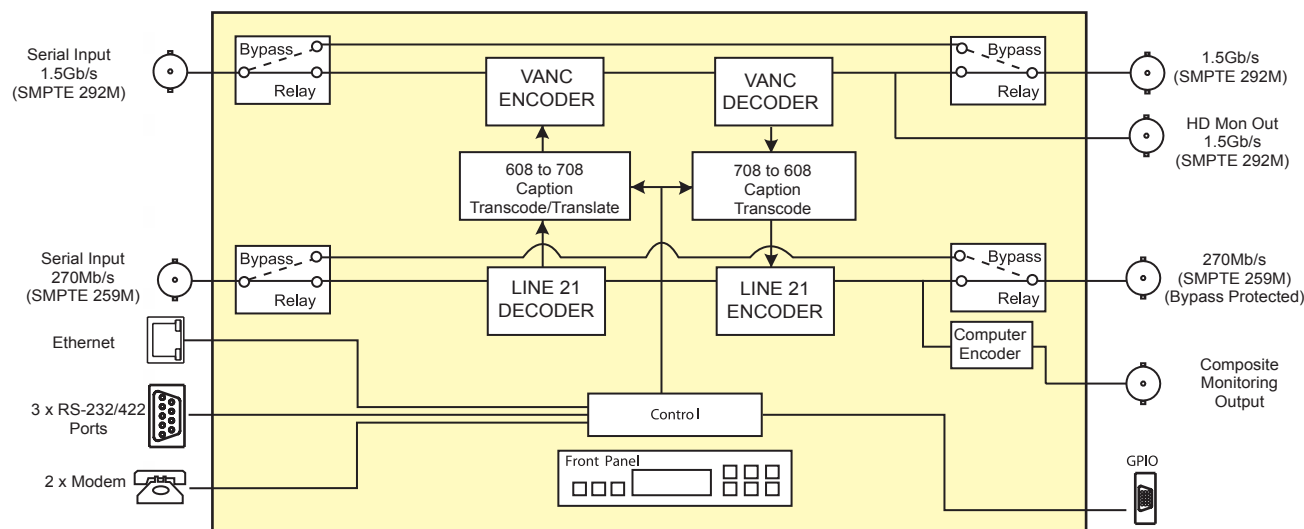
The HD9084 DTV Caption Processor is a comprehensive, compact solution for all HD Advanced Closed Caption, SD Advanced Closed Caption and SD Line 21 Closed Captions. Simultaneous HD-SDI and SD-SDI video I/O paths provide a compact one-box solution.



### Features

- Simultaneous encoding of new EIA608 and EIA708 captions onto SD and HD video
- Dolby® Metadata encode via serial port ingest
- Port Echo capability for closed caption encoder “daisy chain” set-up
- EIA-608 Line 21 VBI bridge functionality
- EIA-708 Advance caption bridge functionality
- One SD-SDI, 270Mb/s digital video input, 525 or 625
- One HD-SDI, 1.5Gb/s digital video input, 1080i/720p/480p
- Support for SMPTE 334M, SMPTE 333M & grand alliance transfer formats for both SD-SDI & HD-SDI
- RS232/422 serial, telephone modem, Ethernet TCP/IP and parallel GPI communication interface
- Support for Line 21 EIA-608 captions on SD-SDI
- Built-in EIA-708 (HD-SDI) and EIA-608 (SD-SDI) closed caption decoder via NTSC monitoring output
- Closed caption shifting for both SD and HD captions
- Easy configuration via front panel or via on-screen display
- Encoding of Extended Data Service Packets into field 2 of the SD-SDI signal including Transmission Signal Identifier (TSID), Copy Generation Management System (CGMS-A) and V-Chip

### HD9084 Block Diagram & Rear Panel



### Specifications

#### HDTV Serial Digital Video Input:

**Standard:** SMPTE 292M 1.485 Gb/s, 1080i, 720p, 480p  
**Number of Inputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic up to 75m @1.5 Gb/s with Belden 1694A (or equivalent). 24m with bypass relay installed  
**Impedance:** 75Ω

#### HDTV Serial Digital Video Output:

**Standard:** Same as HD input  
**Number of Outputs:** 1 program out (bypass relay protected)  
 1 monitoring out  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ± 0.5V  
**Rise and Fall Time:** 200ps nominal  
**Overshoot:** <10% of amplitude  
**Wide Band Jitter:** <0.2 UI  
**Impedance:** 75Ω

#### SDTV Serial Digital Video Input:

**Standard:** SMPTE 259M-C  
**Number of Inputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic 200m @ 270Mb/s Belden 1694A (or equivalent). 24m with bypass relay installed

#### SDTV Serial Digital Video Output:

**Standard:** Same as Input  
**Number of Outputs:** 1 program out (bypass relay protected)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 470ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 15 dB  
**Wide Band Jitter:** < 0.2 UI

#### Composite Monitoring Output with OSD:

**Standard:** NTSC (SMPTE 170M)  
**Number of Outputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 1V nominal  
**Impedance:** 75Ω

#### General Purpose In/Out:

**Number of Inputs:** 7  
**Number of Outputs:** 3  
**Type:** Opto isolated, active low  
**Connector:** Female High Density DB-15  
**Signal level:** +5V nominal

#### Communications and Control:

**Serial:** 3 DB-9 male  
 RS232 /422 selectable  
 1200 baud to 57.6 kbaud  
 7 or 8 data bits  
**Modem:** 2 RJ-11 telephone jacks  
 (2nd modem optional)  
 1200 baud to 14.4 kbaud  
 V.32BIS compatible  
**Ethernet:** IEEE 802.3 (10 BaseT)  
 IEEE 802.3u (100 BaseTX)  
 RJ-45 connector  
**Physical:**  
**Dimensions:** 19"W x 1.75"H x 18.75"  
 (483mm W x 45mm H x 477mm D)  
**Weight:** 8 lbs. (3.5Kg)  
**Electrical:**  
**Power:** 115/230 VAC 50/60 Hz, 30 VA  
**Safety:** ETL Listed  
 Complies with EU safety directive  
**EMI/RFI:** Complies with FCC part 15, class A  
 EU EMC Directive

#### Ordering Information:

**HD9084** HD/SD DTV Caption Encoder

#### Ordering Options:

**+2PS** Optional redundant power supply  
**+MDM2** Second internal modem option



The 8084 is a full broadcast quality Closed Caption Encoder which generates line 21 caption data directly into the digital bitstream. The 8084 allows data to be encoded into all caption and text channels in both field 1 and field 2 of the video. It can also encode Extended Data Service (XDS) packets into field 2 supporting such services as Transmission Signal Identifier (TSID), Copy Generation Management System (CGMS-A), station name, call letter identification, program name, classification, remaining air time and content advisory ratings (compatible with V-Chip decoders).

The 8084 is highly configurable to guarantee maximum compatibility with a wide variety of applications and software packages. The encoder can be configured to individually manipulate each data stream independent of the others. The 8084 is also compatible with various automation and traffic programs such as Enterprise's "BMS Traffic System".

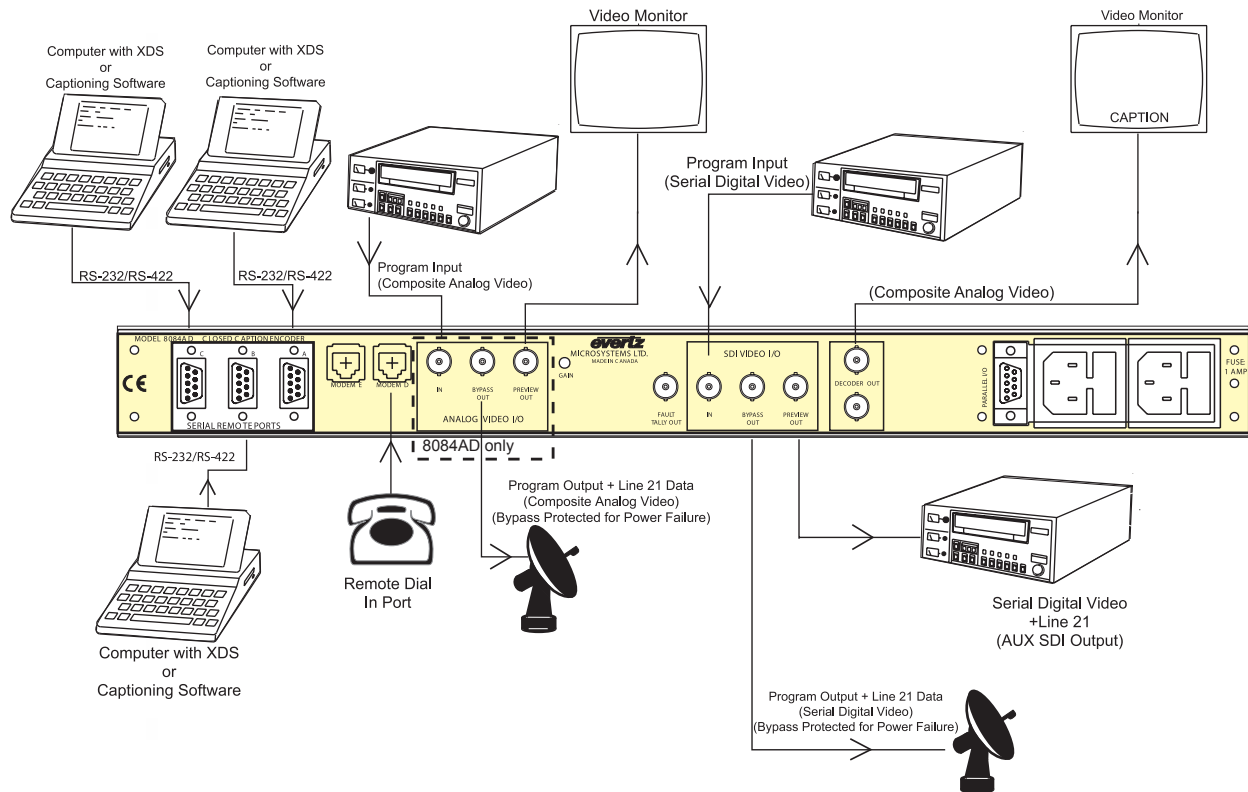
The 8084AD is a full broadcast quality Closed Caption Encoder which generates line 21 caption data directly into both analog and digital video feeds. The 8084AD allows data to be encoded into all caption and text channels in both field 1 and field 2 of the video. It can also encode Extended Data Service (XDS) packets into field 2 supporting such services as Transmission Signal Identifier (TSID), Copy Generation Management System (CGMS-A), station name, call letter identification, program name, classification, remaining air time and content advisory ratings (compatible with V-Chip decoders).

The built-in bypass relay, fault reporting output and optional redundant power supply ensure robust operation. The analog monitor output displays visible captions from any data channel, including many XDS packet types.

#### Features

- Keys directly into a 525 line or 625 line component (4:2:2) digital video bitstream
- Can add captions, text, web links or Extended Data Service information to previously captioned programs
- Individual caption and text data streams can be passed, modified or removed from the incoming video
- Support for text insertion from articles stored in the 8084 by the captioning software
- Support for Extended Data Service (XDS) to encode program information including TSID, CGMS-A and V-Chip content advisory ratings
- V-Chip blocking codes selectable from front panel menus.
- Selectable V-Chip default rating after timeout
- Bypass relay can be activated by GPI, front panel or automatically on power failure to allow the input video to pass through the unit unprocessed
- Three RS-232/RS-422 serial ports allow simultaneous control of the 8084 from three computers, for applications such as in house captioning, XDS insertion and more...
- Built in modem interface for dial-up real time captioning. Support for an optional second internal modem
- Built-in composite analog monitoring decoders provide real-time verification of encoded data. The decoded captions, text or XDS data is inserted as open captions on the monitoring video outputs
- Composite decoder can display these XDS packet types:  
Network Name, Call Letters, Program Name, Program Length, Time in Show, Program Type, Program Description and Program Rating
- Built in test message inserts data into all 9 data channels
- Ability to offset the effect of downstream component to composite encoders which add setup to line 21
- Monitor mode allows caption data to be read directly from line 21 and output on the serial port
- VBI Bridge function allows captions to be copied from one video source to another using two 8084 or 8084AD units
- GPI input to provide caption shift. This input can control the shift of rows 12 to 15 up to rows 1 to 4 when activated. Intended to provide compliance with FCC order prohibiting obstruction of weather warning text which often appears on the bottom of the screen
- Can encode captions on lines other than line 21 for specialized applications
- EDH Packet checksum correction ensures SDI video integrity to downstream equipment
- SMPTE 269M fault reporting output
- Optional LTC input for setting internal clock
- Supports a wide variety of caption software including the following:  
The Captioning Center - CCSQ and CCMS, Captions Inc. - Smart Encoder V 1.0b, Evertz ProCAP, Cheetah Systems - Captivator Offline Edit Version 2.1, Captivator Offline PostCAP 2.1, VITAC PostCAP 2.1, Computer Prompting and Captioning Co. -CPC-700 Version 6.20, National Captioning Institute - Text Encoding and Display System (TED) version 1.7, Autograph Systems - View level XDS controller, Rapid Caption

## 8084 Connection Diagram



### Specifications

#### Serial Digital Video:

**Standard:** SMPTE 259M-C (270Mb/s) Serial Component Video  
**Input:** BNC 75Ω terminated  
**Output:** BNC with bypass relay  
**Preview:** BNC output without bypass  
**Fault Tally:** BNC SMPTE 269M compatible  
**Input Equalization:** Automatic up to 200m with Belden 8281 (or equivalent)

#### Composite Video Monitor:

**Decoder:** 2 BNC 1V p-p composite analog video outputs with open captions

#### Communications and Control:

**Serial:** 3 DB-9 male  
 RS-232/422 selectable  
 1200 baud to 38.4 kbaud  
 7 or 8 data bits  
**Modem:** 2 RJ-11 telephone jacks  
 (2nd modem optional)  
 1200 baud to 14.4 kbaud  
 V.32BIS compatible  
**Parallel GPI:** DB-9 female

#### Composite Analog Video (8084AD only):

**Standard:** SMPTE 170M  
**Input:** BNC 75Ω terminated  
**Output:** BNC with bypass relay  
**Preview:** BNC output with open captions

### Physical:

**Dimensions:** 19"W x 1.75"H x 18.75"  
 (483mm W x 45mm H x 477mm D)  
**Weight:** 8 lbs. (3.5Kg)

### Electrical:

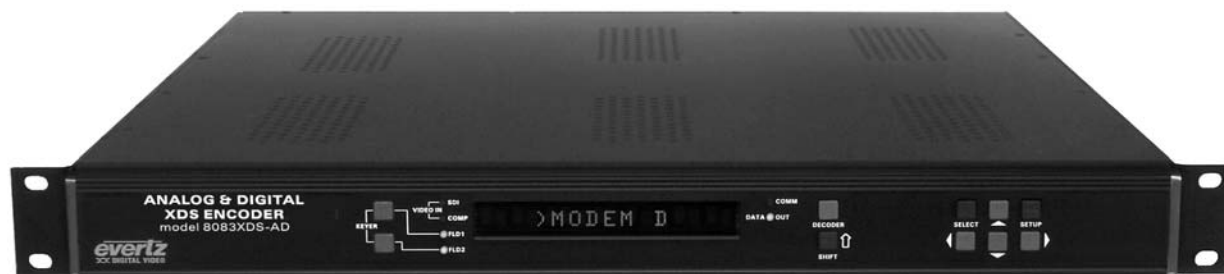
**Power:** 115/230 VAC 50/60 Hz, 40 Watts  
**Safety:** ETL listed  
 Complies with EU safety directive  
 Complies with FCC Part 15, Class A  
 EU EMC Directive

### Ordering Information:

**8084** SDI Caption Encoder  
**8084AD** Analog & SDI Captioning Encoder

### Ordering Options:

**+MDM2** Second internal modem option  
**+2PS** Redundant power supply  
**+LTC** Optional LTC input



The 8083XDS-AD is a full broadcast quality XDS Encoder which generates line 21 XDS data directly into both analog and digital video feeds. The 8084XDS-AD encodes Extended Data Service (XDS) packets into field 2 supporting such services as Transmission Signal Identifier (TSID), Copy Generation Management System (CGMS-A), station name, call letter identification, program name, classification, remaining air time and content advisory ratings (compatible with V-Chip decoders).

The 8083XDS-AD is highly configurable to guarantee maximum compatibility with a wide variety of applications and software packages. The encoder can be configured to individually manipulate each data stream independent of the others. The 8083XDS-AD is also compatible with various automation and traffic programs such as Enterprise's "BMS Traffic System".

Built-in bypass relays on both video paths, a fault reporting output and an optional redundant power supply ensure robust operation. Two separate analog monitor outputs display visible captions from any data channel, including many XDS packet types.

### Features

- Keys directly into a 525 line or 625 line component (4:2:2) digital video bitstream and composite analog video signal
- Support for Extended Data Service (XDS) to encode program information including TSID, CGMS-A and V-Chip content advisory ratings
- V-Chip blocking codes selectable from front panel menus
- Selectable V-Chip default rating after timeout via front panel
- Bypass relays for both video paths can be activated by GPI, front panel or automatically on power failure to allow the input video to pass through the unit unprocessed
- Three RS-232/RS-422 serial ports allow simultaneous control of the 8083XDS from three computers, for applications such as multi-point XDS insertion
- Separate built-in composite analog monitoring decoders for each video path to provide real-time verification of encoded data. The decoded captions, text or XDS data is inserted as open captions on the monitoring video outputs
- Composite decoders can display these XDS packet types: Network Name, Call Letters, Program Name, Program Length, Time in Show, Program Type, Program Description and Program Rating
- Built in test message inserts data into all 9 data channels
- VBI Bridge function allows captions to be copied from one video source to another using two Evertz closed caption or TSID units
- EDH Packet checksum correction ensures SDI video integrity to downstream equipment
- SMPTE 269M fault reporting output
- Optional LTC input for setting internal clock

### Specifications

#### Serial Digital Video:

<b>Standard:</b>	SMPTE 259M-C (270Mb/s) Serial Component Video
<b>Input:</b>	BNC 75Ω terminated
<b>Output:</b>	BNC with bypass relay
<b>Preview:</b>	BNC output without bypass
<b>Fault Tally:</b>	BNC SMPTE 269M compatible
<b>Input Equalization:</b>	Automatic up to 200m with Belden 8281 (or equivalent)
<b>Decoder:</b>	BNC 1V p-p composite analog video outputs with open captions

#### Communications and Control:

<b>Serial:</b>	3 DB-9 male RS-232/422 selectable 1200 baud to 38.4 kbaud 7 or 8 data bits
<b>Parallel GPI:</b>	DB-9 female

#### Composite Analog Video:

<b>Standard:</b>	SMPTE 170M
<b>Input:</b>	BNC 75Ω terminated

<b>Output:</b>	BNC with bypass relay
<b>Preview:</b>	BNC output with open captions

#### Physical:

<b>Dimensions:</b>	19"W x 1.75"H x 18.75" (483mm W x 45mm H x 477mm D)
<b>Weight:</b>	8 lbs. (3.5Kg)

#### Electrical:

<b>Power:</b>	115/230 VAC 50/60 Hz, 40 Watts
<b>Safety:</b>	ETL Listed Complies with EU safety directive
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC Directive

#### Ordering Information:

<b>8083XDS-AD</b>	Analog & SDI XDS Encoder
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#### Ordering Options:

<b>+2PS</b>	Redundant power supply
<b>+LTC</b>	Optional LTC input







## Player

Using Windows™ XP multimedia subsystem for playback, ProCAP adds caption and subtitle preview over video for WYSI-WYG display, timing and positioning. It also supports Avid Quicktime reference clips.

## Editor

Using Microsoft® Word, ProCAP extends the functionality of the universal word processor allowing users to import or create transcripts & author and edit captions, caption styles, format and positioning.

## Timeline

Provides a pictorial view of the caption information. Shot change detection, a film strip and an audio waveform allows for precise alignment of captions.

## 100/1000Mb Hub



## Networking

ProCAP is network ready, supporting 100Base TX and Gigabit Ethernet for quick integration and setup.

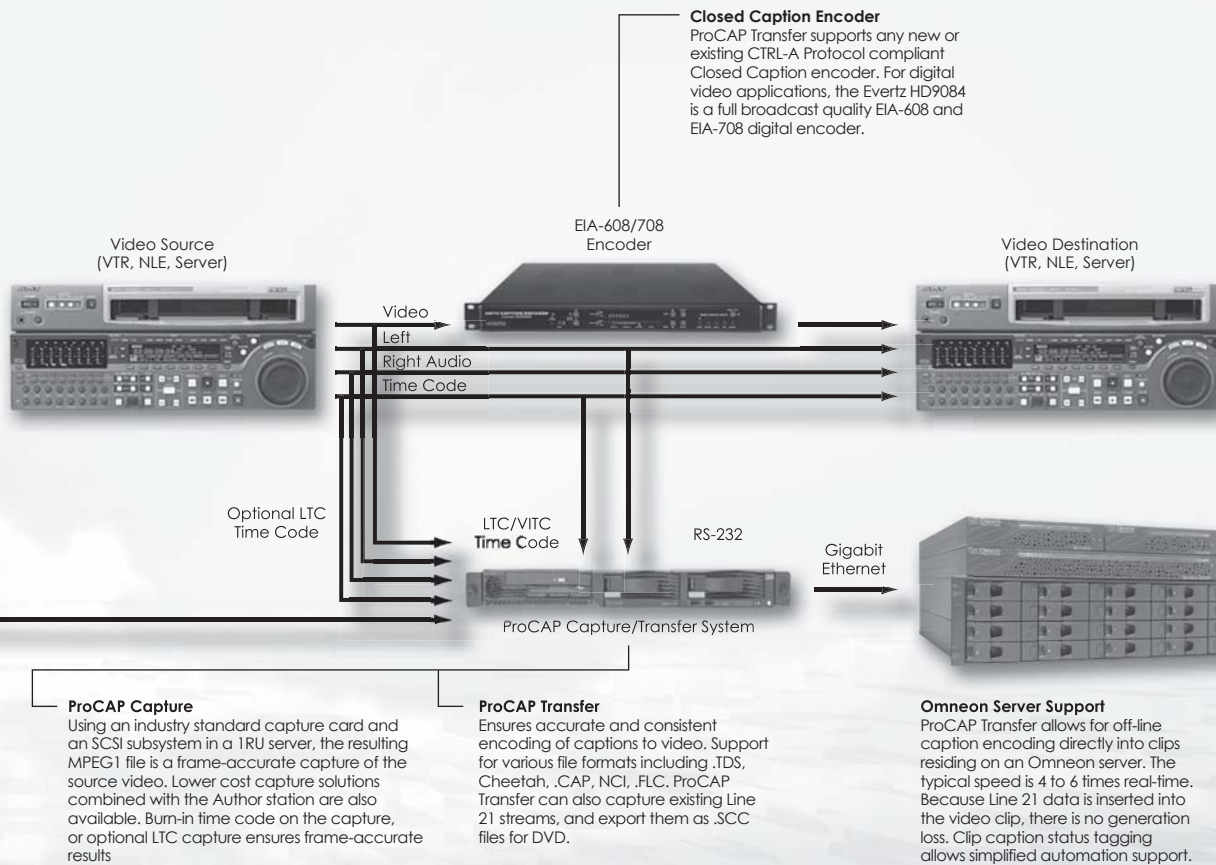


## Avid NLE with MetaSync®

ProCAP Author seamlessly integrates with Avid NLEs. Avid Quicktime reference clips can be used directly. MetaSync® export scripts can be imported for finishing, or any available transcript used as a starting point. Completed work can be output for Transfer or as a Line 21 video clip to be taken back into the Avid project.

## ProCAP Authoring Systems

ProCAP Author saves time by supporting EIA-608 Line 21 captioning, EIA-708 DTV captioning and DVD Subtitling all in the same application - the work done for one standard can be applied to the next. Cheetah, .CAP, TDS, .SCC for DVD Line 21, DVD scripts and Image files are all supported.



## Features

- Full customization of keyboard shortcuts and macros to suit the user
- WYSI/WYG control over caption placement through drag-and-drop and shortcuts
- Resizable player window. Windows™ XP allows for multi-monitor display
- Timeline provides a pictorial view of caption reading rates and any conflicts or errors during authoring, saving revision time and costs
- Shot scene detection with film strip and audio waveform allows for accurate positioning of captions
- Interfaces to Avid and Avid MetaSync® allowing for rapid captioning of material
- Omneon Encode support delivers performance of 4 to 6 times real-time encode. Automation support through clip tagging

### Ordering Information

#### PA-SW-708

ProCAP Author Software Only, 1 Station License, Adds 708 to Base

#### PA-SW-BASE

ProCAP Author Software Only, 1 Station License, Base EIA-608 Standard

#### PA-SW-DVD

ProCAP Author Software Only, 1 Station License, Adds DVD to Base

#### PA-SW-FULL

ProCAP Author Software Only, 1 Station License, All Options

#### PC-HW

ProCAP Capture Hardware and Third Party Software

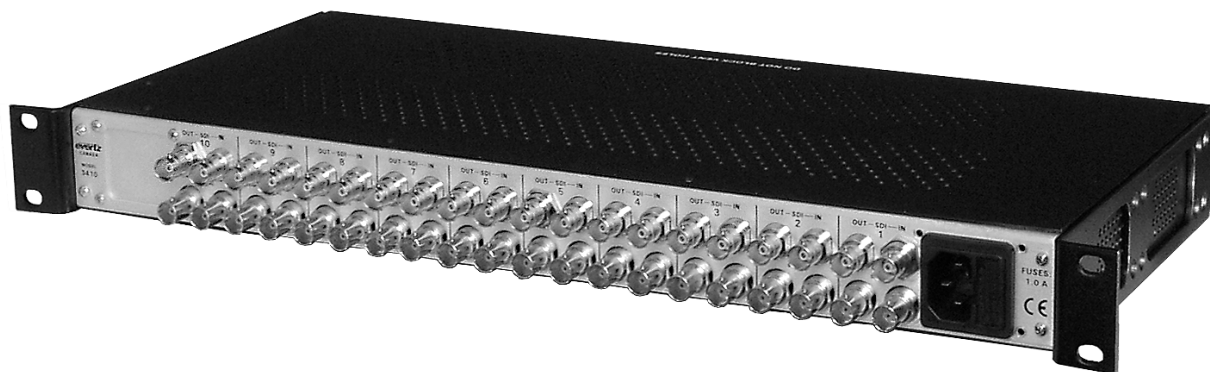
#### PCT-HW-TC

ProCAP Transfer PCI Timecode Reader Board

#### PT-SW

ProCAP Transfer Software Only, 1 Station License, with 1 year support





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The Multivert, a 10 channel composite encoder was designed for monitor wall applications where multiple SDI component video signals need to be converted to composite analog. The Multivert is the most cost effective method of monitoring on a per channel basis as it houses 10 converters as well as a redundant power supply in a 1RU frame. Each of the ten channels has two composite analog video outputs as well as a single regenerated SDI component video output.

The Multivert proves itself to be a better alternative to the use of awkward dongle based converters that use wall mounted or brick based power supplies.

The Multivert is a compact 1RU, 7.75 inches deep, rack mountable frame with both front and rear panel LED status displays for each of its ten channels. Thanks in part to its compact size, the Multivert is capable of being mounted in the rear of the monitoring wall equipment rack (Multivert was designed with capability to reverse the rack mounting brackets). Further, by having status LED's on both the rear panel as well as the front panel, it allows the cables to be installed facing the rear of the rack thus providing for both status monitoring as well as convenient cabling.

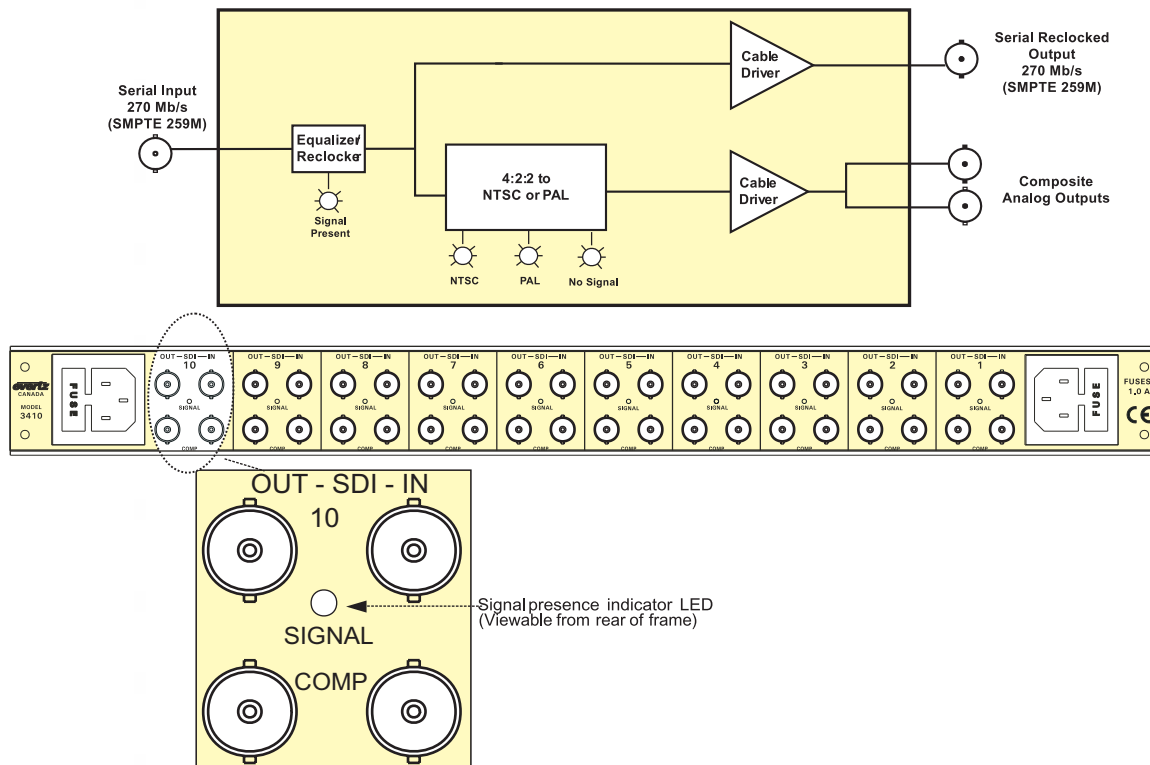
Having the Multivert mounted in the rear of the monitor racks eliminates the need for long analog cable runs from modular converters in the equipment rack room to the monitors, thus eliminating the need for analog equalizing DA's.

#### Features

- 10 independent converters in a 1RU enclosure
- 2 NTSC/PAL analog composite color outputs per converter
- Reclocked SDI output for each channel
- Ideal for monitoring serial component signals with inexpensive composite analog monitors
- Reversible rack ears allow for mounting in the back of a rack and with the shallow chassis measuring only 7.75"
- Can be mounted directly behind other equipment
- Dual power supply (optional)
- Each channel has front panel LED's for PAL, NTSC and signal presence
- Video presence LED for each channel, viewable from the rear of each frame



## 3410 Block Diagram

**Specifications****Serial Digital Video Inputs:**

**Standard:** SMPTE 259M-C 525 line and 625 line component

**Number of Inputs:** 10 (1 per converter)

**Input Equalization:** Automatic up to 250m with Belden 8281 (or equivalent)

**Connector:** BNC per IEC 60169-8 Amendment 2

**Return Loss:** > 15 dB up to 540Mb/s

**Impedance:** 75Ω

**Serial Digital Video Outputs:**

**Standard:** Serial component 270Mb/s (SMPTE 259M-C)

**Number of Outputs:** 10 (1 per converter)

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V ±0.5V

**Rise and Fall Time:** 750ps nominal

**Overshoot:** <10% of amplitude

**Return Loss:** >15 dB

**Wide Band Jitter:** <0.2UI

**Impedance:** 75Ω

**LED's**

**Signal Presence:** 10 Front (NTSC and PAL)  
10 Rear

**Power Supply:** 2 Front

**Composite Analog Outputs:**

**Number of Outputs:** 20 (2 per converter)

**Standard:** Analog composite NTSC if input is 525i/59.94  
Analog composite PAL if input is 625i/50

**Connectors:** 2 BNC per IEC 60169-8 Amendment 2

**Signal Level:** 1 V p-p nominal, internally adjustable

**DC Offset:** 0V ±0.1V

**Return Loss:** > 45 dB up to 6 MHz

**Impedance:** 75Ω

**Physical:**

**Dimensions:** 19"W x 1.75"H x 7.75"D  
(483mm W x 45mm H x 196mm D)

**Weight:** 6.7 lbs (3Kg) with two power supplies

**Electrical:**

**Power:** Auto ranging 100-240VAC 50/60 Hz  
30 Watts

**Safety:** ETL listed  
Complies with EU safety directive

**EMI/RFI:** Complies with FCC part 15 class A  
EU EMC Directive

**Ordering Information:**

**3410** Multivert (10 SDI to Analog Monitoring Converter)

**3400RS** Rear support kit

**Ordering Options:**

**+2PS** Redundant power supply



1200DD



1201DD

The 1200DD Series Digital Data Displays are LED digital clocks with 7-segment-digits display. They may operate as a timecode-reading clock or as a digital SMPTE/EBU serial timecode reader, simply displaying the input timecode. In addition to SMPTE/EBU timecode, the clock can operate on the internal quartz time base, from IRIG-B, a GPS antenna or NTP. This multi-way reference capability allows easy integration into new or existing clock systems.

The model 1200DD clock face has 2.25" tall digits that may display HH:MM:SS AM/PM or HH:MM:SS FF, depending on the control settings. The model 1201DD clock face has 1.00" tall digits that may display HH:MM:SS AM/PM or HH:MM:SS FF, depending on the control settings. The brightness of the digital LEDs is adjustable.

Clock installation is simple when one of the time sources is available. Apply power, connect time and the clock takes care of the rest, instantly setting to the correct time. If the time source fails, the two small character displays flash twice per second to signal its absence. Any time discrepancy on return of timecode is instantly corrected. This also applies to time changes such as Standard Time to Daylight Saving Time.

The 1200DD series displays may be preset to display an offset from local time. This local offset allows the display of any or all time zones at one location. This offset is user-programmable from -12 hours to +12 hours. When no source of timecode is available, the 1200DD series displays may be configured as a timecode generator, using its internal quartz crystal or GPS or IRIG-B or NTP. When used as a generator, the 1200DD series displays can drive multiple high impedance, timecode reading devices.

If AC power is lost, the 1200DD series displays maintain time internally via a crystal oscillator powered by a lithium battery. The display will show this time if no input time source is available on power up. The LTC output time is the same as the input if the input is LTC or IRIG, and it is GMT if the input is GPS or NTP.

The rear panel input connectors for timecode and output are XLR connectors. The IRIG-B input is a BNC and the NTP is a RJ-45 Ethernet connector. The GPS input is a DB9 connector. The GPS feature requires the +GP option to be purchased.

When operating with no time source, the clock time can be easily set by means of three miniature pushbuttons on the front panel, which are also used to control the setup menu.

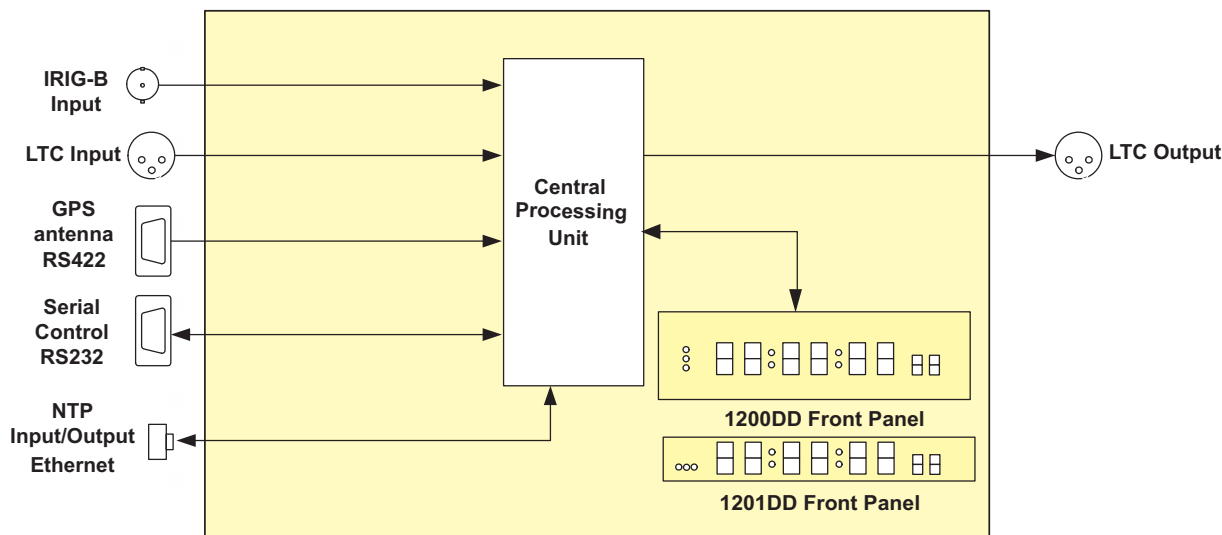
#### Features

- Completely self-setting with SMPTE/EBU timecode input or battery back-up
- Built-in quartz time base oscillator with battery back-up
- May be operated as a timecode reader for use with countdowns
- Digital display is user-selectable between HH:MM:SS, 12/24 hour, HH:MM:SS FF and date
- IRIG reader reads 1 kHz IRIG-B format same wave amplitude modulated code (format B122)
- Optional GPS receiver
- May be configured as a timecode generator to drive other clocks
- LED brightness is adjustable
- Runs on 50/60 Hz, 115/230 VAC power line
- User-programmable time offsets
- Rack mount
- VistaLINK® control for device configuration and status monitoring





# 1200DD & 1201DD Block Diagram



## Specifications

### Linear Time Code Input:

**Standard:** SMPTE 12M linear time code - 24, 25 or 30 Fps nominal  
**Impedance:** > 30k  $\Omega$ , balanced  
**Connector:** 3 pin female XLR  
**Level:** 1 V to 4.5 p-p

### IRIG Reader Input:

**Standard:** IRIG 200-95 FORMAT B122  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Level:** 0.2 to 4Vp-p unbalanced

### Linear Time Code Output:

**Standard:** SMPTE 12M  
**Impedance:** Lo-Z, balanced  
**Level:** 2Vp-p nominal unloaded  
**Connector:** 3 pin male XLR

### Serial Port:

**Connector:** Female DB-9  
**Level:** RS-232  
**Baud Rate:** 57.6 kBaud  
**Format:** 8 data bits, no parity, 2 stop bits

### Time Keeping:

**Accuracy:** < 2 seconds per day with power on, no timecode present  
 < 10 seconds / day with power removed  
**Time Zone Offset:** 0 to 23½ hours in ½ hour increments  
 Set with menu

### GPS Receiver:

**Temperature:** -30°C to +70°C  
**Humidity:** 95% R.H. Condensing at 60°C  
**Dimensions:** 5.8" D x 3.9" H (147mm x 100mm)  
**Max. Cable Length:** 400 feet

### Ethernet:

**Network Type:** Ethernet 100 Base-TX IEEE 802.3u standard for 100 Mb/s baseband  
 CSMA/CD local area network  
 Ethernet 10 Base-T IEEE 802.3 standard for 10 Mb/s baseband  
 CSMA/CD local area network  
**Connector:** RJ-45  
**NTP Standard:** RFC-1305 compliant, client mode support

### Backup Battery:

**Type:** CR-2032 3 volt lithium cell.  
**Life expectancy:** > 5 years

### Electrical:

**Power:** 12 VDC , 15 Watts auto ranging 100 to 240 VAC, 50/60 Hz adapter included  
**Safety:** ETL Listed  
 Complies with EU safety directive  
**EMI/RFI:** Complies with FCC Part 15 Class A  
 EU EMC Directive

### Physical:

**Dimensions**  
**1200DD** 19" W x 3.5" H x 2.75" D  
 (483 mm W x 90 mm H x 70 mm D)  
**1201DD** 19" W x 1.75" H x 2.75" D  
 (483 mm W x 45 mm H x 70 mm D)  
**Controls:**  
**Front:** 3 pushbuttons  
**Rear:** Serial port com.  
**Local Offset:** Any amount, user selectable

### Ordering Information:

**1200DD** 2RU Rack-mount Digital Display  
**1201DD** 1RU Rack-mount Digital Display

### Ordering Options & Accessories:

**+GP** GPS Option (includes GPS receiver and 50' weatherproof cable)  
**WA-T76** 100' weatherproof cable for GPS receiver  
**WA-T11** 400' weatherproof cable for GPS receiver

The models 1212 and 1216 multifunction analog clock displays can act as a slave clock display or as a self contained pre-settable master clock.

#### Features

- SMPTE/EBU timecode input
- Three motors for quiet operation and rapid hand setting
- Addressable slave clocks with programmable time offsets
- Automatic Daylight Saving time adjustment
- Single cable distribution for both power and timecode
- Low voltage (12V) operation
- Master or Slave operation with battery backed up clock
- Sweep or Step second hand movement
- Optional Illumination
- Two sizes 12" or 16"



The introduction of Evertz analog time displays takes master and slave clock technology to new levels of convenience and excellence. The clocks are microprocessor controlled and employ separate direct drive motors for each hand. This means that, as well as being able to set the time almost instantaneously, the new displays are also silent in operation. The hands of the clocks can be programmed to move in sweep mode or in steps.

Each slave clock can be programmed for automatic daylight saving time adjustment, as well as for any time zone offset using a laptop computer. It is then only necessary to supply the clock system with Universal Coordinated Time (UTC) from the master clock. Daylight saving time changes will be automatic, as will adjustments for different time zones.

Each clock can be used as a master or slave clock. When used as a master, it generates timecode for distribution to other slave clocks. In fact, any clock in the chain can generate timecode as soon as it loses timecode input from the master. The system is therefore extremely robust and reliable.

The problems of power distribution have also been considerably simplified. With other clock products, it is necessary to install power outlets wherever clocks are to be located. With the Evertz system slave clocks are powered from a single feed that distributes both power and modulated timecode. The power is introduced at one of the 1212 slave clocks and from there it is distributed to the other downstream clocks. If the system is large, power can be introduced at multiple convenient slave clock locations.

Internal crystal oscillators ensure that the clocks will continue to operate in the absence of input timecode. Internal battery back-up ensures that each clock will continue to keep time in the absence of timecode and power. When power resumes, the hands will immediately reset to the correct time.

Evertz slave clocks are offered in two sizes. Backlighting is available for all models.

### Specifications:

#### Time Code:

**Standard:** SMPTE 12M

**Connectors:** Screw terminal block

**Input Level:** 1 V p-p nominal

**Input Impedance:** 40 k $\Omega$  nominal

#### Output Level

**Powered:** 2 V p-p with 11 VDC nominal offset to drive downstream slave clocks

**Non-Powered:** Looped through from input

#### Serial Control:

**Standard:** RS-232-C

**Baud:** 2400

**Format:** 8-bits, 1 Stop Bit, no flow control

**Connector:** Female 9 pin D

**Function:** Control commands for setting time zone offset, daylight saving time, and operational modes. Commands sent to downstream slave clocks over time code user bits.

#### Time Keeping:

**Accuracy:** 1 second per day free running on internal crystal oscillator.

**Battery:** 3V Lithium

**Time Zone Offset:** Set from DIP switches or serial command  
0 to 23.5 hours in 1/2 hour increments

#### Switches/Controls:

Pushbutton and toggle switch for setting time manually

8 DIP switches:

- set sweep/step motion
- set default time code rate when no incoming time code
- set timecode offset or allow software control of time offset

#### Electrical:

**Power:** Auto ranging 115/230 VAC 50/60 Hz 30 Watts or 12 VDC from upstream powered clocks

**Safety:** ETL Listed

Complies with EU safety directive

**EMI/RFI:** Complies with FCC Part 15 Class A,  
EU EMC Directive

#### Physical

##### Dimensions:

**Model 1212** 13" W x 13" H x 2.5" D  
(330 mm W x 330 mm H x 64 mm D)

**Model 1216** 17" W x 17" H x 2.5" D  
(432 mm W x 432 mm H x 64 mm D)

##### Weight:

**Model 1212** 6.5 lb. (2.9 Kg)

**Model 1216** 10.5 lb. (4.75 Kg)

#### Ordering Information:

**1212** 12" diameter analog clock display

**1216** 16" diameter analog clock display

**1212L** 12" diameter analog clock display with back lighting

**1216L** 16" diameter analog clock display with back lighting



## Digital Clock Display 1275A

The model 1275A is a multifunction time of day display, that can act as a slave to a master clock system or as a self contained, presettable clock.



Sixty bright rectangular LEDs are mounted in a circular arrangement simulating an analog second hand. Twelve individual round LEDs indicate the hour. In addition, the hours, minutes and seconds are displayed in digital format.

As a slave display the unit will read SMPTE/EBU time code. The user can program time zone offsets from the incoming code. The DQS-B6 code format can be ordered as a special order.

As a standalone clock, it can be programmed to operate in either 12 or 24 hour mode. Two unobtrusive front panel push buttons allow presetting and accurate synchronization to a standard time source.

An eight-position DIP switch permits user selection of four different operating and display modes and the time zone offset.

Beautifully finished with black wood trim the 1275A is ideally suited for studio, lobby, board room or office mounting.

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### Specifications

#### Functional:

- Code input:** SMPTE/EBU Time code  
20k $\Omega$  balanced or unbalanced  
DQS-B6 available on special order
- Accuracy:** Approximately 1 second per week on internal crystal oscillator
- Time zone:**  $\pm$  12 hours. Offset from SMPTE/EBU code input (1 hour increments)

#### Electrical:

- Power:**  
**1275A-110:** 115V 60Hz 15 Watts  
**1275A-220:** 220V 50Hz 15 Watts
- Safety:** ETL Listed
- EMI/RFI:** Complies with EU safety directive  
Complies with FCC Part 15 Class A  
EU EMC Directive

#### Physical:

- Dimensions:** 9.6" W x 9.6" H x 2.125" D  
(244mm W x 244mm H x 54mm D)  
1" (25mm) diameter hole in rear panel to accommodate electrical conduit
- Weight:** 4.4lb

#### Ordering Information:

- 1275A-110** Digital Clock Display 115V/60Hz
- 1275A-220** Digital Clock Display 220V/50Hz
- For DQS-B6** Order 1275A-xxx-DQS





### Features

- Generates time code in accordance with SMPTE 12M locked to NTSC or PAL video or free run on internal crystal oscillator
- High resolution Character Inserter, with three Character sizes: 8, 16 and 32 lines, time and user bits separately positionable on raster
- Reads LTC from 1/30th to 70x play speed
- Well proven input circuitry design permits reliable recovery of even severely distorted code
- Momentary or continuous Jam-sync modes
- Time and user bits are presettable from the front panel
- RS-232 serial port permits interfacing to computers
- EBU ↔ SMPTE drop frame time code translator mode
- Parallel control of commonly used functions
- User bit Transfer from Reader Time or User bits
- On-screen programming menu
- Date/Time Zone may be encoded into user bits according to SMPTE 309M
- Generates and reads universal co-ordinated time (UTC) or local time in time/date mode
- Automatic daylight savings time adjustment in time/date mode
- 2 General purpose outputs can be assigned to several output modes

### 5010-VITC

The 5010-VITC is a Time Code Generator/Reader/Character Inserter for both Longitudinal and Vertical Interval Time code. As well as having all the listed 5010 features, the 5010-VITC also has the following additional features.

- Vertical Interval Time code Generator and Reader
- Separate genlock and PGM video inputs
- Set VITC Generator Line numbers from the front panel
- Translates LTC to VITC or VITC to LTC
- Reads VITC over the full shuttle range of most VTR's
- Selectable reader line range
- Optional Bypass relay on VITC Generator

### 5010-24Fps

The 5010-24Fps and 5010-VITC-24Fps are special purpose time code generators designed to work with the 23.98Fps time code commonly in use with the high definition 1080p/24 video format.

- Genlocks to 23.98 'slow PAL' or NTSC
- 24 FPS ↔ 30 FPS time code translator mode
- Momentary or continuous Jam-sync modes
- Locks to 6Hz reference in 24Fps mode

## Time Code Feature Comparison

	5010-GPSII	5010-VITC-GPSII	5950	5010	5010-VITC
LTC Generator	✗	✗		✗	✗
Adjustable Output Level	✗	✗		✗	✗
VITC Generator		✗			✗
LTC Reader	✗	✗	✗	✗	✗
VITC Reader		✗	✗		✗
VITC to LTC Translator		✗	✗		✗
LTC to VITC Translator		✗			✗
LTC Re-shaper			✗		
PAL and NTSC	✗	✗	✗	✗	✗
Colour Framing	✗	✗		✗	✗
Drop Frame	✗	✗	✗	✗	✗
Set User Bits (0-9, A-F)	✗	✗		✗	✗
Transfer RDR. Time or UB to GEN, UB	✗	✗		✗	✗
SMPTE ↔ EBU Time code translator				✗	✗
Date/Time Zone in User Bits	✗	✗		✗	✗
Momentary and continue. Jam-sync	✗	✗		✗	✗
Character Generator	✗	✗	✗	✗	✗
On-screen programming menu	✗	✗	✗	✗	✗
GPS Referenced Time Code	✗	✗			
Serial Remote Control				✗	✗
GPI Remote Control	✗	✗		✗	✗
GP Outputs	✗	✗		✗	✗

### Specifications

#### LTC Generator:

**Standard:** SMPTE 12M  
 NTSC 2/4 field; PAL 4/8 field menu selectable  
 NTSC or 24Fps (5010-24Fps only)  
**Output:** 3 pin male XLR type  
**Level:** Adjustable, 0.5V to 4.5V p-p  
**Rise Time:** 40 ± 10 µs  
**Jitter:** < 2 µs

#### LTC Reader:

**Standard:** SMPTE, 12M Time code  
**Input:** 3 pin female XLR type  
**Level:** 0.2 to 4V p-p, balanced or unbalanced  
**Speed:** 1/30th to 70x play speed, fwd and rev, machine dependent

#### VITC Generator (5010-VITC):

**Input:** Comp. Video 1V p-p, 75Ω terminated  
**Outputs:** 2 Comp. Video + keyed VITC  
 1 Output bypass relay protected when +BP option installed  
**Differential Gain:** <0.5%  
**Differential Phase:** <0.5°

#### VITC Reader (5010-VITC):

**Input:** Comp. video 1V p-p, Hi-Z, BNC Loop  
**Speed:** Still frame to >40x play

#### Character Generator

**Input:** Comp. video 1V p-p, 75Ω terminated  
**Output:** Com. video 1V p-p + keyed high resolution characters, selectable background and sizes

#### Serial Remote Control (5010 & 5010-VITC):

RS-232/422 interface, 9 pin "D" connector  
 Computer control of all functions, selectable baud rate

#### Physical:

**Dimensions:** 19"W x 1.75"H x 7.75"D  
 (483mm W x 45mm H x 196mm D)  
**Weight:** 7 lbs. (3.5Kg)

#### Electrical:

**Power:** Auto ranging 100-230VAC 50/60Hz 30 Watts  
**Safety:** ETL Listed  
 Complies with EU safety directive  
 Complies with FCC Part 15 Class A  
 EU EMC Directive

#### EMI/RFI:

#### Ordering Information:

**5010** Time Code Generator/Reader  
**5010-24Fps** NTSC/24Fps Time Code Generator/Reader  
**5010-VITC** Time Code Generator/Reader with VITC  
**5010-VITC-24Fps** NTSC/24Fps Time Code Generator/Reader with VITC

#### Ordering Options:

**+BP** Optional bypass relay for 5010-VITC, and 5010-VITC-24Fps



### 5010-GPSII

The Evertz 5010-GPSII Time Code Master combines the features of our standard 5010 time code generator with the ability to produce GPS referenced SMPTE/EBU time code anywhere on the face of the globe. The GPS (Global Positioning System) technology provides the 5010-GPSII Time Code Master with an accurate source of time reference. The system is ideally suited for OB or mobile operations and any professional television broadcast applications where accurate time references are a must. The 5010-GPSII system may be programmed to request a time reference from the GPS receiver automatically, daily, or on demand. The 5010-GPSII can be ordered in two configurations. Model 5010-GPSII is an LTC Generator, Reader, Character Inserter with Accutime 2000 antenna. Model 5010-VITC-GPSII comes complete with Vertical Interval Time Code capability.

#### Features

- Generates Time code in accordance with SMPTE 12M locked to NTSC or PAL video
- Can be operated as standard time code generator/reader or as a GPS referred time code master
- Date/Time Zone encoded into user bits according to SMPTE 309M
- Generates and reads universal co-ordinated time (UTC) or local time in time/date mode
- Automatic daylight savings time adjustment in time/date mode
- High resolution Character Inserter, with three Character sizes, 8, 16 and 32 lines, time and user bits separately positionable on raster
- Reads LTC from 1/30th to 70x play speed. Well proven input circuitry design permits reliable recovery of even severely distorted code
- Momentary or continuous Jam-sync modes
- Time and user bits are presettable from the front panel
- Parallel control of commonly used functions
- User bit Transfer from Reader Time or User bits
- On-screen programming menu
- GPS receiver, 50ft of cable (optional 100 & 400 ft. cables for long receiver distances)
- Ideal for OB or Mobile applications
- Easy mounting and installation
- 2 General purpose outputs can be assigned to several output modes
- Tally output on loss of lock to GPS receiver
- Optional bypass relay on 5010-VITC-GPSII

### 5010-VITC-GPSII

As well as having all the listed 5010-GPSII features, the 5010-VITC-GPSII has the following additional features:

#### Features

- Vertical Interval Time Code Generator, and Reader
- Separate genlock and PGM video inputs
- Set VITC Generator Line numbers from the front panel
- Translates LTC to VITC or VITC to LTC
- Reads VITC over the full shuttle range of most VTR's
- Selectable reader line range

#### Specifications:

##### LTC Generator:

**Standard:** SMPTE 12M  
NTSC 2/4 field; PAL 4/8 field menu selectable

**Output:** 3 pin male XLR type

**Level:** Adjustable, 0.5V to 4.5V p-p

**Rise Time:** 40 ± 10 µs

**Jitter:** < 2 µs

##### LTC Reader:

**Standard:** SMPTE, EBU Time code

**Input:** 3 pin female XLR type

**Level:** 0.2 to 4V p-p, balanced or unbalanced

**Speed:** 1/30th to 70x play speed, fwd and rev, machine dependent

##### GPS Receiver:

**Temperature:** -30°C to +70°C

**Humidity:** 95% R.H. Condensing at 60°C

**Dimensions:** 5.8" D x 3.9" H (147mm x 100mm)

**Cable Options:** Standard 50'  
Optional 100' (order WA-T76)  
Optional 400' (order WA-T11)

##### VITC Generator: (5010-VITC-GPSII)

**Input:** Composite Video 1Vp-p, 75Ω terminated

**Outputs:** 2 Composite Video + keyed VITC  
1 Output bypass relay protected when +BP option is installed

**Differential Gain:** <0.5%

**Differential Phase:** <0.5°

##### VITC Reader (5010-VITC-GPSII):

**Input:** Composite video 1V p-p, Hi-Z, BNC Loop

**Speed:** Still frame to >40x play

##### Character Generator

**Input:** Composite video 1V p-p, 75Ω terminated

**Output:** Com. video 1V p-p + keyed high resolution characters, selectable background and sizes

##### Physical:

**Dimensions:** 19"W x 1.75"H x 7.75"D  
(483mm W x 45mm H x 196mm D)

**Weight:** 7 lbs. (3.5Kg)

##### Electrical:

**Power:** Auto ranging 100-240VAC 50/60Hz 30 Watts

**Safety:** ETL listed  
Complies with EU safety directive

**EMI/RFI:** Complies with FCC Part 15 Class A  
EU EMC Directive

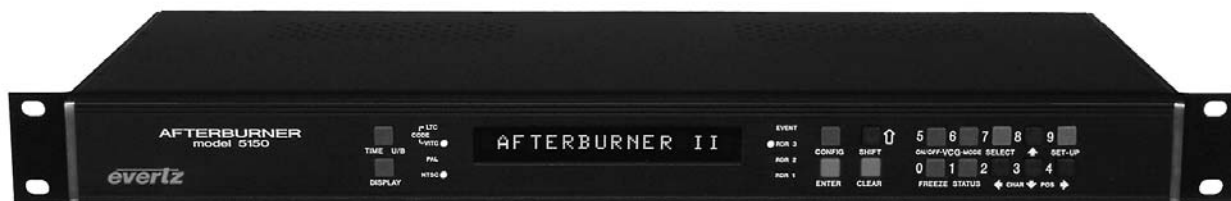
##### Ordering Information:

Comes with standard GPS Receiver and 50 ft. weatherproof cable

<b>5010-GPSII</b>	Time Code Generator with GPSII
<b>5010-VITC-GPSII</b>	VITC Time Code Generator with GPSII

##### Ordering Options:

<b>+BP</b>	Bypass relay for 5010-VITC-GPSII
<b>WA-T76</b>	100 Feet Weatherproof Cable for GPS Receiver
<b>WA-T11</b>	400 Feet Weatherproof Cable for GPS Receiver



The 5150 Afterburner is a full featured Analog VITC and LTC Time Code Reader, VITC to LTC Translator with a full function Character Inserter. The Afterburner reads SMPTE RP201 3-line VITC and displays field accurate video and audio time code as well as KeyCode and 3:2 pulldown on material transferred from film.

The unit can be configured to read LTC or VITC or can operate in an automatic switchover mode. The high speed reader in the 5150 employs sophisticated input conditioning and clock/data separator circuits to reliably recover LTC over the full shuttle spread and wind speed of most VTR's and ATR's.

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## Features

- Reads LTC from 1/30th to 70x play speed
- Full speed VITC Reader with line select
- High resolution Character Inserter, with three character sizes: 8, 16 and 32 lines, time and user bits separately positionable on screen
- Dual Standard (NTSC and PAL)
- On-screen programming menu
- VITC to LTC Translator
- LTC reshaper/regenerator
- 16 digit alpha-numeric display
- Decodes 3:2 pulldown from RP201 3-line VITC
- Displays video and audio time code and keycode encoded by Evertz film footage encoders

## Specifications

### LTC Reader:

**Standard:** SMPTE 12M  
25, 30 Fps Drop & Non Drop Frame

**Connector:** XLR Type 3 Pin female connector

**Signal Level:** 0.2 to 4V p-p, balanced or unbalanced

**Speed:** 1/30th to 70x play speed, forward and rev, machine dependent

### VITC Reader:

**Input:** NTSC or PAL 1V pp,

**Connector:** BNC per IEC 169-8

**Speed:** Still frame to <40x play, VTR dependant

**Impedance:** Hi-Z

### LTC Translator:

**Connector:** XLR Type 3 pin male

**Signal Level:** Adjustable 0.5V to 4.5V p-p

**Rise Time:** 40 ± 10µs

**Jitter:** <2ns

**Gen Lock:** Reader input video 1 V p-p, Hi-Z, BNC loop

### Character Generator:

**Input:** NTSC or PAL 1V p-p + keyed high resolution characters, selectable background and sizes

**Connector:** BNC per IEC 169-8

### Parallel Remote Control:

**Input:** 6 TTL compatible inputs for control of selected functions

**Output:** 2 open collector general purpose outputs

### Physical:

**Dimensions:** 19" W x 1.75" H x 7.75" D  
(483mm W x 454mm H x 196mm D)

**Weight:** 7 lbs (3.5kg)

### Electrical:

**Voltage:** 115/230 VAC, 50/60Hz, 30 Watts

**Safety:** ETL Listed  
Complies with EU safety directive

**EMI/RFI:** Complies with FCC Part 15 Class A  
EU EMC Directive

### Ordering Information:

**5150** Analog Afterburner II LTC/VITC Reader/VCG

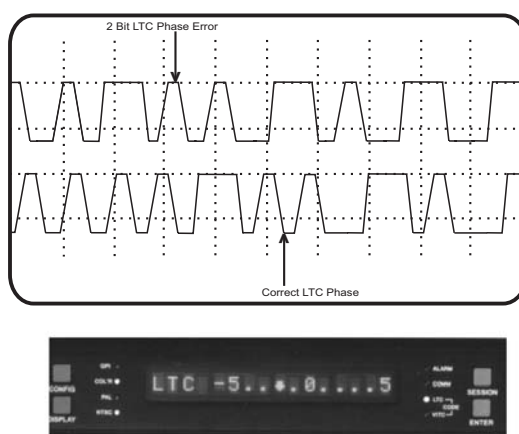


The Model 5300 LTC/VITC Time Code Analyzer combines the latest LSI technology with sophisticated microcontroller firmware to provide a powerful, flexible time code analyzer system. The model 5300, a LTC/VITC reader / analyzer and multi-function character inserter is an invaluable verification and troubleshooting tool for the Video, Audio and Film Post Production industries. Its power and flexibility are unsurpassed in time code analyzer applications. A 16 digit alphanumeric display can be quickly delegated to show the required data. The Time Code Analyzer contains an LTC and VITC reader that can be operated independent of each other, or can be linked to form an auto LTC/VITC reader.

## Features

- Detects time code counting sequence errors
- Detects color framing sequence errors with respect to a reference video input. Detects changes in the status of the color frame input (changing phase, or color/non color changes etc.)
- Detects Time code dropouts and has a user definable dropout length
- Compares LTC and VITC numbers and reports differences between them
- Displays on screen reports of Time code problems
- Audible alarm plus a contact closure to drive an external alarm
- User definable thresholds for most alarm conditions
- Error messages available on RS-232 port for computer logging and time code verification
- On screen programming and front panel menus
- Dual standard PAL and NTSC
- Detects LTC phase problems with respect to video sync
- High resolution character inserter with three character sizes: 8, 16 and 32 lines, time and user bits separately positionable on screen
- VITC to LTC translator
- Regenerates incoming LTC to correct LTC phase problems

## 5300 Time Code Phase



## Specifications

### LTC Reader:

**Standard:** SMPTE 12M  
25, 30Fps Drop & Non Drop Frame  
**Connector:** XLR Type 3 pin female connector  
**Signal Level:** 0.2 to 4V p-p, balanced or unbalanced  
**Speed:** 1/30th to 70x play speed, forward and rev, machine dependent

### VITC Reader:

**Input:** NTSC or PAL 1V pp,  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Speed:** Still frame to <40x play, VTR dependant  
**Connector:** BNC per IEC 60169-8 Amendment 2

### Character Generator:

**Input:** Char. Input from VITC Reader input  
**Output:** NTSC or PAL 1Vp-p + keyed high resolution characters, selectable background and sizes  
**Connector:** BNC per IEC 60169-8 Amendment 2

### LTC Translator:

**Connector:** XLR Type 3 pin male  
**Level:** Adjustable 0.5V to 4.5V p-p  
**Rise Time:** 40 ± 10µs  
**Jitter:** <2 µs  
**Gen Lock:** Reader input video 1 V p-p, Hi-Z, BNC loop

### Parallel Remote Control:

**Input:** 6 TTL compatible inputs for control of selected functions  
**Output:** 2 open collector general purpose outputs

### Physical:

**Dimensions:** 19" W x 1.75" H x 7.75" D  
(483mm W x 45mm H x 196mm D)  
**Weight:** 7 lbs (3.5kg)

### Electrical:

**Voltage:** 115/230 VAC, 50/60Hz, 30 Watts  
**Safety:** ETL Listed  
Complies with EU safety directive  
Complies with FCC Part 15 Class A  
**EMI/RFI:** EU EMC Directive

### Ordering Information:

**5300** Time Code Analyzer



The Model 5950 is a VITC and LTC Time code Reader, VITC to LTC Translator and full function Character Inserter with on-screen programming menu. The unit has a 12 digit alpha-numeric display that can be used for displaying Time code, user bits, or operational messages. The 5950 reads SMPTE Drop or Non-Drop Frame or EBU Time code.

The high speed LTC reader in the 5950 employs sophisticated input conditioning and clock/data separator circuits to reliably recover LTC over the full shuttle and wind speed range of most VTR's and ATR's.

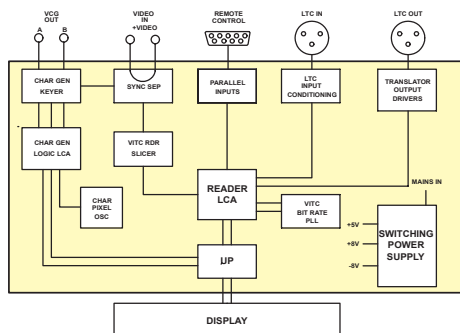
The VITC reader employs advanced video processing and data extraction circuitry in combination with intelligent firmware algorithms to accurately decode multi-generation Time code, even off low end VHS machines. Finely tuned phase locked loop circuits allow the 5950 to recover VITC over the full shuttle range of most VTR's.

The unit can be configured to read either LTC or VITC or can operate in an automatic switchover mode. The 5950 automatically selects valid code from either source and provides accurate Time code reading from still to over 70x play speed. The high resolution Character Inserter can display Time code, User bits, or both. 3 Character sizes: 8, 16, and 32 lines are available. The Characters can be white with or without a black background, or black with or without a white background. The windows are separately positionable on the raster and can be pushed all the way up into the Vertical Interval if desired.

### Features

- Reads LTC from 1/30th to 70x play speed
- Full speed VITC Reader with line select
- Automatic LTC/VITC switchover mode
- High resolution Character Inserter, with three character sizes: 8, 16 and 32 lines, time and user bits separately positionable on screen
- Dual Standard (NTSC and PAL)
- On-screen programming menu
- VITC to LTC Translator
- LTC reshaper/regenerator
- 12 digit alpha-numeric display

### 5950 Block Diagram



### Specifications

#### LTC Reader:

**Standard:** SMPTE 12M  
25, 30 Fps Drop & Non Drop Frame  
**Connector:** XLR Type 3 pin female connector  
**Signal Level:** 0.2 to 4V p-p, balanced or unbalanced  
**Speed:** 1/30th to 70x play speed, forward and reverse machine dependent

#### VITC Reader:

**Input:** NTSC or PAL 1V p-p,  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Speed:** Still frame to <40x play, VTR dependent  
**Impedance:** Hi-Z

#### LTC Translator:

**Connector:** XLR Type 3 pin male  
**Signal Level:** Adjustable 0.5V to 4.5V p-p  
**Rise Time:**  $40 \pm 10 \mu s$   
**Jitter:**  $< 2 \mu s$   
**Gen Lock:** Reader input video 1 V p-p, High, BNC loop

#### Character Generator:

**Input:** Char. Input from VITC Reader input  
**Output:** NTSC or PAL 1V p-p + keyed high resolution characters, selectable background and sizes  
**Connector:** BNC per IEC 60169-8 Amendment 2

#### Parallel Remote Control:

**Input:** 6 TTL compatible inputs for control of selected functions

#### Physical:

**Dimensions:** 19" W x 1.75" H x 7.75" D  
(483mm W x 45mm H x 196mm D)  
**Weight:** 7 lbs (3.5kg)

#### Electrical:

**Voltage:** 115/230 VAC, 50/60Hz, 30 Watts  
**Safety:** ETL listed  
Complies with EU safety directive  
**EMI/RFI:** Complies with FCC Part 15 Class A  
EU EMC Directive

#### Ordering Information:

**5950** VITC/LTC Time Code Reader/Character Inserter



**5600MSC Rear Panel**

The 5600MSC Master Sync and Clock Generator, is both a broadcast quality master sync pulse generator (SPG) and a master clock. It provides all of the synchronizing signals needed in a 21st century TV station or post production facility at the same time as solving the problem of locking the in-house master clock system to the master video sync pulse generator.

A high stability, temperature controlled oscillator, provides the 5600MSC with better than  $0.5 \times 10^{-8}$  (or 0.005ppm) frequency reference. The free running drift of this 10MHz reference will be less than 0.1Hz (which amounts to less than 1 millisecond time drift per day). This guarantees that any frequency drift, with time and temperature, will be within the tolerances expected from the best SPGs or master clocks available in the industry. The 5600MSC may also be referenced to an external 5 MHz or 10 MHz master oscillator if higher stability is required. Both the SPG and the Master Clock sections, may be referenced to high stability time and frequency standards present in the Global Position System (GPS) by adding the GPS option. The 5600MSC provides a high stability 10MHz output reference for use by other devices.

The SPG section provides two banks of three timeable outputs. These six BNC outputs may be configured to provide 6 independently timed color black (black burst) outputs or 6 independently timed HDTV tri-level sync outputs, or 3 of each signal type. Each color black output can optionally carry vertical interval time code (VITC) on a user specified set of lines.

When referenced to the optional GPS receiver, the start of the NTSC four field sequence, or the PAL eight field sequence, will coincide with a specific point in the GPS code. In this way, by referencing all the 5600MSCs in a system to GPS, they will all be automatically locked to each other. This is ideal for applications requiring remote facility frequency, phase and time locked! GPS heads may be remoted from the unit with standard 50 ft. cables included or optional 100 ft. & 400 ft. weatherproof cables. For remote GPS head requirements of greater than 400 ft. or fiber optic isolation, GPS Data Fiber Transmitters & Receivers are also available (7707GPS-DT, 7707GPS-DR).

The unit also has absolute time reference support (ATR). ATR is a set of data currently being proposed by SMPTE and will be inserted onto the SMPTE 318M universal reference signal. This information gives the absolute time of the signal in seconds, and fractions of a second since the SMPTE Epoch (midnight, January 1, 1958 UTC). ATR tells when the signal was created, regardless of current time when the signal is received and provides an additional means of locking two 5600MSCs together. (This feature will be implemented when the signal is standardized by SMPTE.)

The master clock section provides a primary linear time code (LTC) output on an XLR connector and a 9 pin D connector, as well as a secondary LTC output available only on the 9 pin D connector. The time code may be set from the front panel or referenced to a number of different sources. Having two LTC outputs provides the ability to drive 24 and 30 Fps, or drop-frame and non-drop frame timecode simultaneously. Time may be externally referenced to GPS, or via modem to a high-level time source or extracted from VITC on the reference input. Time derived from such sources can be offset from UTC to a specific time zone as required. When referenced to GPS or by modem, the 5600MSC can provide RFC-1305 compliant NTP via Ethernet, and operates in broadcast and server mode. GPS, NTP and Modem access are all options for the 5600MSC. The 5600MSC includes a battery backed-up real time clock to maintain its time while power is not applied to the unit.

An optional word clock output is available for the 5600MSC (+WC) and also audio word clock may be generated from DARS with 520DARS-W module (Refer to 520DARS-W brochure)

There are two test signal generator options available. The STG option provides a composite analog video test signal output, AES and balanced analog audio tone generators and a digital audio reference output (DARS). The STG option also provides two standard definition SDI test signal outputs and two SDI black outputs. The HTG option provides two high definition SDI test signal outputs and two HD SDI black outputs.

All versions of the 5600MSC offer an AUX I/O port and a COM port for software upgrades and/or interconnecting two 5600MSC units (when used with the 5600ACO). An optional redundant power supply is also available.

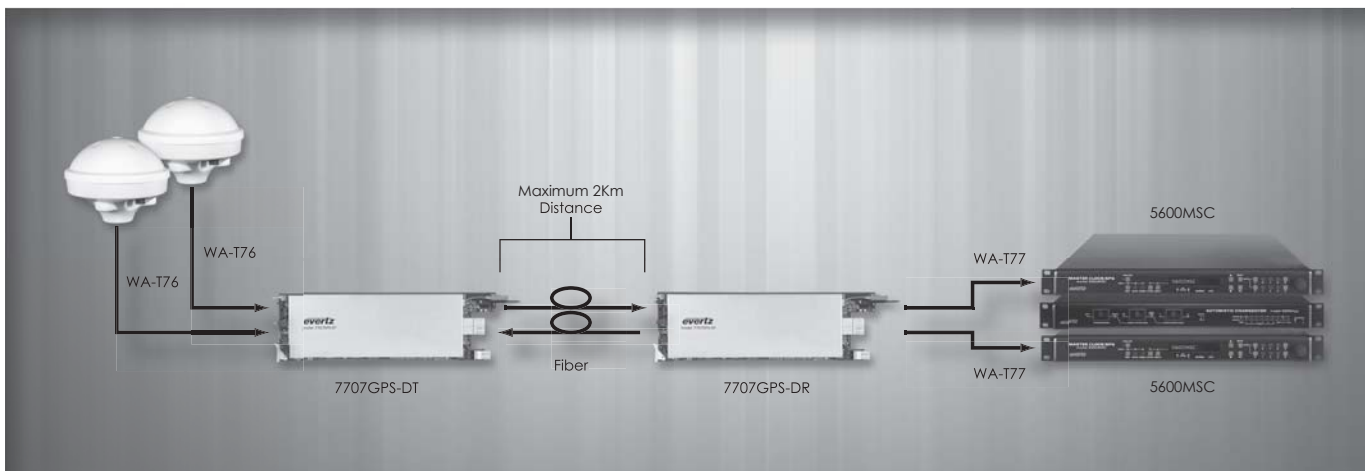
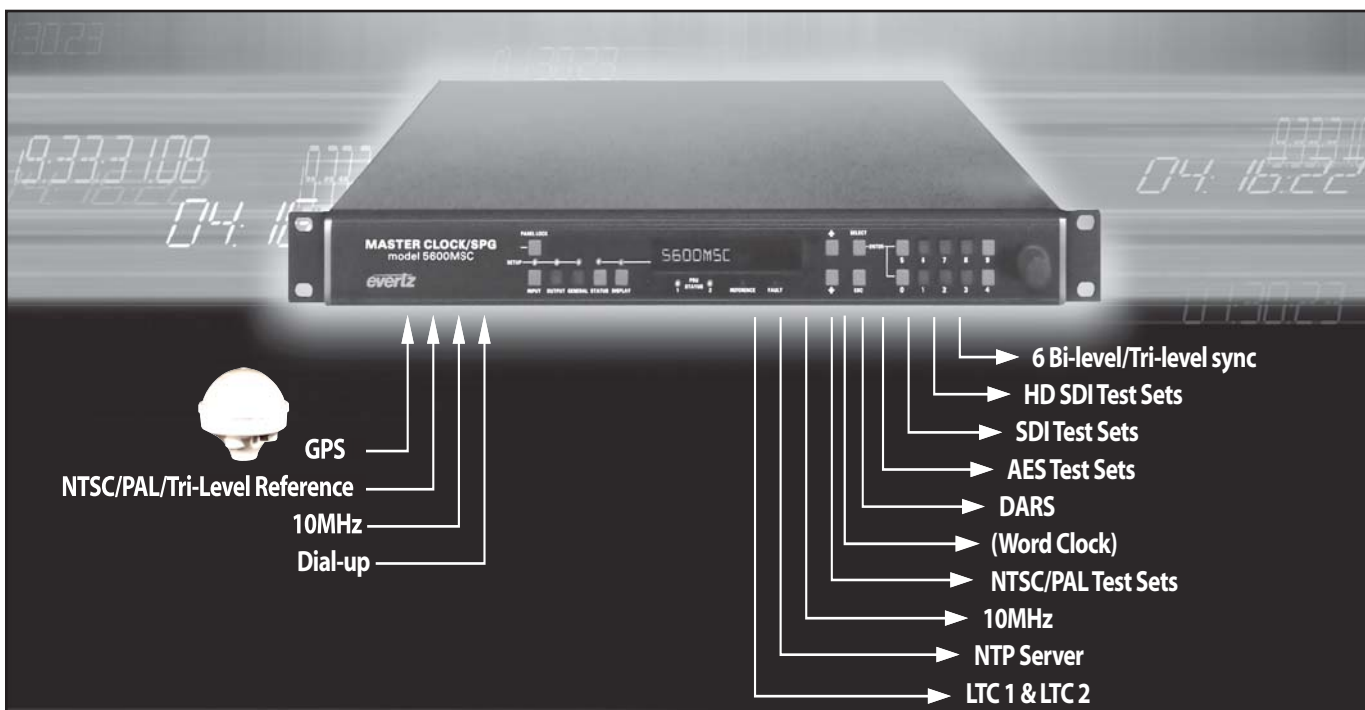
Two 5600MSC units in combination with an Automatic Change Over (model 5600ACO) provide an extra degree of reliability where dual redundant installations are required. The ACO provides relay changeover for the two LTC outputs, the six Sync pulse outputs, the 10 MHz reference output, and the GPI/O interface. A serial cable interconnecting the COM ports of the two 5600MSC units guarantees that the configuration and timing of the units are identical so that changeovers are done with minimal disruption of the plant timing reference. The model 5600ACO2 also provides changeover for the optional test generator signals.

## Features

- 6 independently timeable reference outputs
- Bi-level or Tri-level outputs selectable (can provide 3 tri-level HD sync. outputs and 3 black burst outputs simultaneously)
- 2 Independent LTC Time Code outputs
- 5MHz/10MHz frequency reference input
- GPS option for frequency and time reference
- 10MHz frequency reference output
- Output frequency stability guaranteed better than  $0.5 \times 10^{-8}$  (or 0.005ppm)
- Optional Modem for time reference dial up
- 2 GPS based units will be in time and phase even when remotely separated by miles
- Optional analog TG output, with DARS and analog audio tone outputs
- Optional SD SDI test generator outputs
- Optional HD SDI test generator outputs
- Optional Word Clock output
- Optional Network Time Protocol Server (NTP) server support (GPS option should be ordered with NTP option)
- 16 digit Alpha-numeric display, with 16 pushbuttons
- Rack mountable
- Optional redundant power supply
- Automatic changeover units available for dual redundant systems applications
- Compatible with Dual GPS Data Fiber Receivers & Transmitters
- 2 factory presets and 3 user presets available
- VITC reader on reference input for time reference
- Ten Field Pulse is available on NTSC sync outputs
- Unused menu items can be hidden from user menu using VistaLINK®

## Application Note:

- An optional word clock output is available for the 5600MSC (+WC) and also audio word clock may be generated from DARS with 520DARS-W module (Refer to 520DARS-W brochure)





### Specifications

#### Analog Sync Outputs:

**Standards:** SMPTE 170M (NTSC-M), ITU-R BT 1700-1 (PAL-B), 625i/48Hz/47.95Hz (Slow-PAL), SMPTE 274M (1080i/60, 1080i/50, 1080p/30, 1080p/30sF, 1080p/25, 1080p/25sF, 1080p/24, 1080p/24sF and the 1/1.001 divisor versions where applicable)  
SMPTE 296M (720/60, 720p/59.94, 720p/50) 1 Hz and 6 Hz pulse (and the 1/1.001 divisor versions)

**Connector:** 6 BNC per IEC 60169-8 Amendment 2

**Number of Outputs:** 6 (2 banks of 3) configured as:  
6 color black (black & burst) - selectable with VITC On/Off or  
6 HD tri-level sync or  
3 color black (black & burst) and 3 HD tri-level sync  
All outputs independently timeable

**DC Offset:** 0V  $\pm$  0.1V

**Return Loss:** > 40 dB up to 5MHz

**SNR:** > 75dB

Output	Possible Sync Output Combinations				Example
1	Group A Any combination of PAL and/or NTSC Colour Black 6Hz 1Hz	Group B Any combination of 24/50/60Hz based Tri-Level Syncs	Group C Any combination of 23.98/59.94Hz based Tri-Level Syncs	3 of any signals from groups A or B or C	NTSC
2				3 of any signals from groups A or B or C	NTSC
3				3 of any signals from groups A or B or C	PAL
4				3 of any signals from groups A or B or C	1080i/59.94
5				3 of any signals from groups A or B or C	720p/59.94
6				3 of any signals from groups A or B or C	1080p/23.98

#### 10MHz Input and Output:

**Input:** 0.5 Vp-p min level, 75 $\Omega$  (Relay Bypass Protected)

**Output:** 1Vpp (75 $\Omega$  terminated)

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Type:** Sine wave. Harmonics < 40dB typical

#### Long Term Oscillator Stability

**Free Running:** 0.01ppm

**External Ref:** 5 or 10 MHz external reference autodetect (max locking range  $\pm$  0.1ppm)  
GPS with +G option

#### LTC Outputs:

**Standard:** SMPTE 12M

**Frame Rate:** Nominal 24, 25, and 30 (drop frame and non drop frame)

**Number of outputs:** 2

**Connectors:** 3 pin male XLR type, Female DB9

**Level:**

**Unpowered:** Adjustable, 0.5V to 4.5V p-p

**Powered:** 2V p-p with 11 VDC offset to drive downstream 1200 series slave clocks

**Output Impedance:** 66 $\Omega$  balanced (unpowered)

**Rise Time:** 40  $\pm$  10  $\mu$ s

**Jitter:** < 2  $\mu$ s

#### Communications and Control:

**Serial Port:**

**Connector:** Female DB-9

**Level:** RS232

**Baud Rate:** 57.6 Kbaud

**Format:** 8 data bits, no parity, 2 stop bits

#### Modem: (with "+M" option installed):

**Connector:** RJ-11 telephone jack

**Baud Rate:** 300 baud Bell 103 compatible

#### Ethernet:

**Network Type:** Fast Ethernet 100 Base-TX IEEE 802.3u standard for 100 Mb/s baseband CSMA/CD local area network  
Ethernet 10 Base-T IEEE 802.3 standard for 10 Mb/s baseband CSMA/CD local area network

**Connector:** RJ-45

**NTP Standard:** Hide unused menus via VistaLINK®  
NTP port with +T option installed

#### NTP Port (+T option insallted)

**Standard:** RFC-1305 compliant, broadcast and server mode support

Must be referenced to GPS or have been synchronized via modem within the last 10 days (as per RFC1305)

#### GPS Receiver (with "+GP" option installed)

**Temperature:** -40°C to +70°C

**Humidity:** 95% R.H. Condensing at 60°C

**Dimensions:** 5.8" D x 3.9" H (147mm x 100mm)

**Cable Options:** Standard 50'  
Optional 100' (order WA-T76)  
Optional 100' (for 7707GPS-DR to 5600MSC only) (order WA-T77)  
Optional 400' (order WA-T11)

#### DARS & AES Test Generator Outputs (with "+STG" option installed)

**Standard:**

**Unbalanced:** SMPTE 276M single ended AES (24-bits) (1Vp-p into 75 $\Omega$ )

**Balanced:** AES3-1992 (24-bits) (4Vp-p unterminated)

**Number of Outputs:**

**DARS:** 1 unbalanced, 1 balanced

**AES Test Gen:** 1 unbalanced, 1 balanced

**Connector:**

**Unbalanced:** BNC per IEC 60169-8 Amendment 2

**Balanced:** Removable Terminal Strip

**Sampling Rate:** 48 kHz

**Impedance:**

**Unbalanced:** 75 $\Omega$  unbalanced

**Balanced:** 110 $\Omega$  balanced

**Return Loss:** >25dB to 10MHz (with external 75 $\Omega$  termination)

**AES Tones:** Menu selectable

#### Genlock Input:

**Type:**

Autodetects standard SMPTE 170M (NTSC-M), ITU-R BT.1700-1 (PAL-B), Color Black 1 V p-p with optional VITC  
Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV  
HD Tri-level Sync (same HD standards as sync outputs)

**Number of Inputs:** 1

**Connector:**

BNC per IEC 60169-8 Amendment 2

**Video:**

Max: 2Vp-p video

Min: Sync level 150mV

**Frequency Lock**

**Range:**

$\pm$  50ppm from nominal

**Input Impedance:**

High impedance, isolated, differential - external termination required

**Return Loss:**

> 25dB to 10MHz (with external 75 $\Omega$  termination)

### Analog Composite Video Test Signal Generator (with "+STG" option installed)

**Standard:** SMPTE 170M (NTSC-M)  
ITU-R BT470-6 (PAL-B)

**Number of Outputs:** 1

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 1V p-p nominal

**DC Offset:** 0V  $\pm$  0.1V

**Output Impedance:** 75 $\Omega$

**Return Loss:** >35dB to 10MHz (with external 75 $\Omega$  termination)

**SNR:** > 75dB

### SDI Test Generator Outputs (with "+STG" option installed)

**Standard:** SMPTE 259M-C (270Mb/s)

**Number of Outputs:** 2 outputs of selected test signal  
2 outputs of black video

**Embedded Audio:** Up to 4 groups as specified in SMPTE 292M.

**Connectors:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V  $\pm$  0.5V

**Rise and Fall Time:** 900ps nominal

**Overshoot:** < 10% of amplitude

**Return Loss:** > 15 dB up to 270Mb/s

**Jitter:** < 0.2 UI

**Genlock:** Provided internally by 5600MSC

### Analog Audio Tone Generator (with "+STG" option installed)

**Number of Outputs:** 2

**Type:** Balanced analog audio

**Connector:** 6 pins on 12 pin removable terminal strips

**Output Impedance:** 66 $\Omega$

**Signal Level:** -20 to +8dBu into 10 k $\Omega$  load

### HDTV Test Generator Outputs (with "+HTG" option installed)

**Standards:** SMPTE 292M 4:2:2, YCbCr  
SMPTE 372M dual link 4:4:4 GBRA or YCbCr  
Same standards as HD sync outputs

**Number of Outputs:**

**4:2:2** 2 outputs of selected test signal  
2 outputs of black video

**4:4:4** 2 dual link outputs of selected test signal

**Embedded Audio:** Up to 2 audio groups as specified in SMPTE 299M. Selectable tone frequencies (from 60 Hz to 10 kHz) and audio group. Audio can be embedded on test signal or black or both outputs. Audio Level is set to -20 dB Full Scale

**Connector:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V  $\pm$  0.5V

**Rise and Fall Time:** 200ps nominal

**Overshoot:** < 10% of amplitude

**Jitter:** < 0.2 UI

**Genlock Input:** HD Tri-level Sync or NTSC or PAL Color  
Black 1V p-p, (provided from one of the Sync outputs)

### Word Clock Output (with "+WC" option installed):

**Signal:** 0.0V - 5.0V, 48kHz Word Clock

**Connector:** BNC per IEC 60169-8 Amendment 2

**Number of Outputs:** 1

### General Purpose Inputs and Output

**Number of Inputs:** 2

**Number of Outputs:** 2 (function menu selectable)

**Type:** Opto-isolated, active low with internal pull-ups to + 5 volts

**Connector:** 4 pins plus 2 ground pins on 9 pin female D connector

**Signal Level:** +5V nominal

### Physical:

**Dimensions:** 19" W x 1.75" H x 18.75" D.  
(483mm W x 45mm H x 477mm D)

**Weight:** 8 lbs. (3.5Kg)

### Electrical:

**Voltage:** Auto ranging 100 to 240 Volts AC, 50/60 Hz 40 Watts

**Configuration:** Optional redundant supply available with +2PS option

**Safety:** ETL Listed  
Complies with EU safety directives  
Complies with FCC Part 15 Class A  
Complies with EU EMC Directive

### Ordering Information:

**5600MSC** Master SPG / Master Clock System

**5600ACO** 1RU Automatic Change Over System (see individual brochure)

**5600ACO2** 2RU Automatic Change Over System (see individual brochure)

### Ordering Options (5600MSC):

**+2PS** Redundant power supply

**+M** Modem Option

**+GP** GPS Option (includes GPS receiver and 50' weatherproof cable)

**+T** Network Time Protocol (Most be ordered with +GP or +M option)

**+STG** NTSC/PAL test signal generator  
Audio tone generator (analog)  
DARS generator (balanced & unbalanced)  
AES generator (balanced & unbalanced) PLUS an SD SDI Test Generator with 2 SD SDI test signals and 2 SD SDI black

**+HTG** HD SDI Test Generator with 2 HD SDI test signals & 2 HD SDI black

**+WC** Optional Word Clock output

### Accessories:

**WA-T76:** 100' weatherproof cable for 5600MSC, GPSII & 7707GPS-DT

**WA-T77:** 100' weatherproof cable for 7707GPS-DR to 5600MSC

**WA-T11:** 400' weatherproof cable for GPS receiver

For remote GPS head requirements of greater than 400' cables or fiber optic isolation order:

**7707GPS-DT** Dual GPS Data Fiber Transmitter

**7707GPS-DR** Dual GPS Data Fiber Receiver



**5600ACO**



**5600ACO2**

The 5600ACO/ACO2 Automatic Changeovers are intended for use with two 5600MSC Master Clock / Sync Generators. The 5600ACO/ACO2 system uses latching relays to ensure maximum reliability and minimal disruption in the event of any failure. The complete system provides the highest level of security for television station video and time synchronization systems. The 5600ACO is a 1RU device which is an ACO for a subset of the 5600MSC outputs. The 5600ACO2 is a 2RU ACO for all outputs of the 5600MSC. Two power supplies are included as a standard feature, to alleviate any single point of failure concerns.

The front panel has three switches, recessed into the panel for added security. There is an AUTO / MANUAL switch, a GPI / FRONT PANEL switch and an A / B select switch for manual changeover. In automatic mode, all signals from both 5600MSCs are monitored to detect any abnormal signals. For example if a level, pulse width, phase, time code error or other abnormality is detected, the 5600ACO's circuitry will trigger and the entire bank of signals will be switched to the backup 5600MSC. In manual mode the changeover can be operated from a GPI or from the front panel switch. LEDs provide status information as to the health of the two 5600MSCs, together with indication as to which one is active. In addition two GPO outputs indicate which master is active and when the inputs from both masters are not the same.

The 5600ACO2 features selectable voting for autochangeover feature. Individual inputs may selectively be included or excluded in the voting process to drive autochangeover logic. **(Feature only available on 5600ACO2 model)**

Each 5600MSC is equipped with 2 GPI inputs and 2 GPO outputs. To facilitate installation, these connections are brought through to a 2 x 6 pin terminal block on the 5600ACO. The outputs from the 5600MSCs are passed straight through the 5600ACO's. The inputs to the 5600MSCs are internally split by a 'Y' connector, to ensure that both 5600MSCs receive the same GPI contact closures.

In the event of a changeover occurrence, it is necessary that all outputs on one 5600MSC have the same timing as those on the other. Identical timing for both 5600MSCs is assured by locking both to the same frequency and phase source (e.g. GPS or by genlocking one 5600MSC to the other). Identical phasing of the independent black outputs is assured by implementing the "Syncro" mode in the 5600MSCs. To use this mode, both 5600MSC communication ports are connected together using the link cable supplied with the 5600ACO. With both 5600MSCs operating in Syncro mode, timing adjustments made to one 5600MSC will be automatically applied to both. The link cable is connected permanently, so that any system re-timing will be applied to both 5600MSC units. (See system connection diagram on 5600MSC brochure)

## Features

- Three front panel switches select automatic, front panel or GPI activation of changeover
- Front panel switches are recessed to prevent accidental operation
- Front panel status LEDs show the health of each of the inputs
- Front panel status LEDs show the operational modes of the changeover

- Redundant power supply standard
- GPIO input/outputs
- Automatic changeover is a voting system based on which source has the most valid signals and that the valid signals on the present master are also on the backup

## 5600ACO Protected Outputs

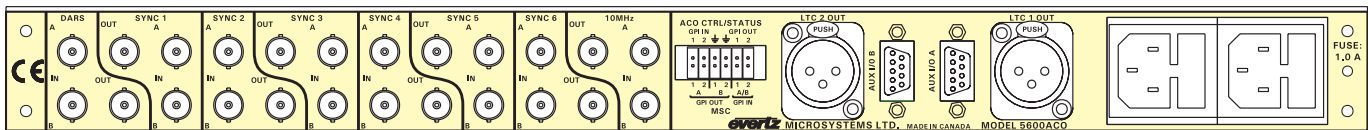
- 6 video/sync or other coaxial signals
- 10MHz frequency reference or word clock
- DARS
- 2 Linear timecode outputs

- 6 video/sync outputs
- 10MHz frequency reference or word clock
- DARS and AES
- 2 Linear timecode outputs

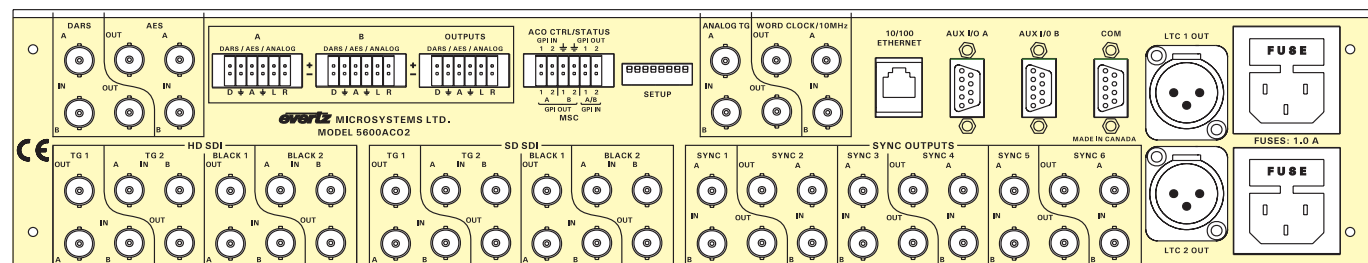
## 5600ACO2 Protected Outputs

- 4 HD SD SDI test signal outputs
- 4 SD SDI test signal outputs
- 1 Analog video test signal output
- Balanced analog audio output

## 5600ACO Rear Panel

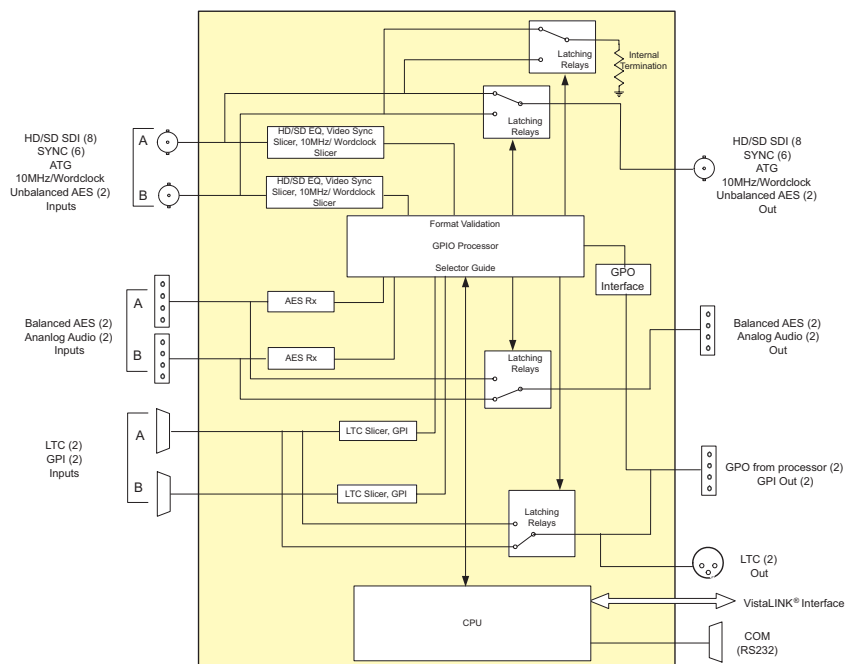


## 5600ACO2 Rear Panel





## 5600ACO2 Block Diagram



### Specifications

#### LTC Inputs and Outputs:

**Standard** SMPTE 12M frame rate set by 5600MSC

**Inputs:** 2 per 5600MSC

**Outputs:** 2

#### Connectors

**Inputs:** Female DB9

**Outputs:** 3 pin male XLR type

**Signal Level:** Set in 5600MSC

#### Coaxial Inputs and Outputs:

**Type:** Depends on signal connected from 5600MSC

DARS, bi-level or tri-level sync, color black, 10 MHz

**Number:** 8 groups each consisting of two inputs and one output

**Connector:** BNC per IEC 60169-8 Amendment 2

#### ACO General Purpose Inputs and Output:

##### Inputs:

**GPI1:** Master select in Manual GPI control mode

Low: Selects Master A

High: Selects Master B

**GPI2:** Future use

##### Outputs:

**GPO1:** Low: Master A is selected

High: Master B is selected

**GPO2:** Low: Master A & Master B differ or PSU failure

High: Master A and B have equivalent signals

##### Type

**Inputs:** Opto-isolated input with internal pull-up to +5 Volts

**Outputs:** Normally closed relay to ground. 10k $\Omega$  internal pull-up to + 5Volts when relay is in active position

**Connector:** 4 pins plus 2 ground pins on 12 pin removable terminal block

**Signal Level:** +5V nominal

#### MSC General Purpose Inputs and Output:

**Inputs:** 2 GPI inputs connected to both Master A and Master B

**Outputs:** 2 GPI outputs connected from Master A through AUX I/O A

2 GPI outputs connected from Master B through AUX I/O B

**Connector:** 6 pins on 12 pin removable terminal block

**Signal Level:** As specified in 5600MSC manual

#### Changeover conditions:

Changeover is a voting system based on which source has the most good signals and that the good signals on the current master are also present on the backup master.

The input signals are considered good according to the following criteria:

**Video:** Level below 70 IRE

**Sync:** H timing detect

**10MHz:** 3dB level below 0.3Vp-p

**DARS:** Sync word error

**LTC:** Level below 0.3Vp-p, Incorrect sync word

#### Electrical:

**Power:** Auto ranging 100 - 240 Volts AC, 50/60 Hz, 30 VA

**Configuration:** Dual redundant supplies

**Fuse Rating:** 250 V, 1 amp, time delay

**Safety:** ETL Listed

Complies with EU safety directives

**EMI/RFI:** Complies with FCC Part 15 Class A

Complies with EU EMC Directive

#### Physical:

##### 5600ACO:

##### Dimensions:

19" W x 1.75" H x 18.75" D.  
(483mm W x 45mm H x 477mm D)

**Weight:** 8 lbs. (3.5Kg)

##### 5600ACO2:

##### Dimensions:

19" W x 3.5" H x 18.75" D.  
(483mm W x 90mm H x 477mm D)

**Weight:** 16 lbs. (3.5Kg)

#### Ordering Information:

**5600ACO** 1RU Automatic Changeover System complete with 2 power supplies, 2 power cords and 3 DB9 cables (BNC cables not included)

**5600ACO2** 2RU Automatic Changeover System complete with 2 power supplies, 2 power cords and 3 DB9 cables (BNC cables not included)



The 8010TM SDI Time Code Master is a full function time code reader/generator system for serial digital video. The 8010TM is a combination generator/reader for Linear Time Code (LTC) and Digital Vertical Interval Time Code (D-VITC), and contains a high resolution character inserter that can burn the generator or reader numbers directly into the digital program output as well as an optional analog monitoring output. A 16 digit alphanumeric display can be quickly delegated to show the required data.

The 8010TM will accept 525 or 625 line component digital video. The 8010TM's time code generator can be preset to lock to the digital program video either by simple frame locking, or where necessary it will colour lock to an analog Color Reference in accordance with the 4 field NTSC or 8 field PAL color sequence.

## Features

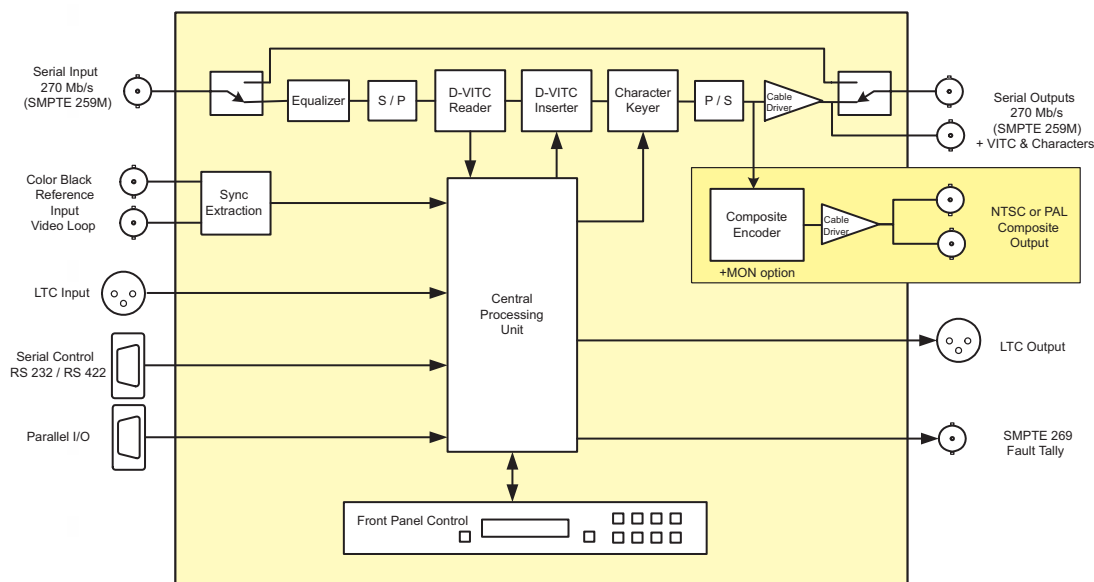
- Accepts 4:2:2 (525 and 625 line) digital video signals
- Serial digital video input provides automatic cable equalization on cable lengths up to 200 meters of low loss coax such as Belden 8281
- Optional bypass relay for program path protection on power loss
- Auxiliary serial digital video output (not bypass protected)
- Passes embedded audio and other ancillary data signals
- LTC and D-VITC Time Code reader with line select
- LTC and D-VITC Time Code generator with line select
- Character Inserter displays reader and generator time and user bits in the picture
- Separate positioning of each character window
- 16 digit Alpha-numeric display, with 16 pushbuttons
- Serial Remote Control of most functions - Broadcasts reader data or sends it on request.
- Rack mountable
- Momentary or continuous jam sync modes
- User bit transfer from reader time or user bits
- EBU/SMPTE Time Code Converter
- Optional composite monitor output converts digital video to analog
- GPI Remote Control mode allows user to pass remote control contact closure information in VITC user bits
- Recalculates EDH after VITC and character insertion

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# SDI Time Code Generator/Reader with Character Inserter

## 8010TM

**8010TM Block Diagram**



10

### Specifications

#### Serial Digital Video Input:

**Standards:** SMPTE 259M-C (270Mb/s)  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic 200m @ 270Mb/s with Belden 8281 or equivalent cable  
 150m @ 270Mb/s when bypass relay is active  
**Return Loss:** > 15 dB up to 540Mb/s

#### Serial Digital Video Outputs:

**Number of Outputs:** 1 with relay bypass, 1 additional output  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800 mV nominal  
**DC Offset:** 0V  $\pm$ 0.5V  
**Rise and Fall Time:** 900 ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 15 dB up to 540Mb/s  
**Wide Band Jitter:** < 0.2 UI

#### Analog Monitor Video Outputs (with +MON option):

**Standards:** Analog composite NTSC if input is 525i/59.94 video  
 Analog composite PAL if input is 625i/50 video  
**Connectors:** 2 BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 1 V p-p nominal, internally adjustable  
**DC Offset:** 0V  $\pm$ 0.1V  
**Return Loss:** >35dB up to 5 MHz  
**Frequency Response:** 0.8dB to 4 MHz  
**Differential Phase:** <0.9° (<0.6° typical)  
**Differential Gain:** <0.9% (<0.5 % typical)  
**SNR:** >56dB to 5 MHz (shallow ramp)  
**Impedance:** 75 $\Omega$

#### Electrical:

**Power:** Auto ranging 100-240VAC 50/60Hz 30 Watts  
**Safety:** ETL listed  
 Complies with EU safety directives  
**EMI/RFI:** Complies with FCC Part 15 Class A  
 EU EMC Directive

#### Physical:

**Dimensions:** 19" W x 1.75" H x 18.75" D  
 (483mm W x 45mm H x 477mm D)  
**Weight:** 8 lbs. (3.5Kg)

#### Ordering Information:

**8010TM** SDI Time Code Generator/Reader with Character Inserter

#### Ordering Options:

**+2PS** Redundant Power Supply  
**+MON** Analog Monitoring Option  
**+BP** Bypass Relay Option





The 8010TM-IRIG SDI Time Code Master is a full function time code reader/generator system for serial digital video. The 8010TM-IRIG is a combination generator for SMPTE Linear Time Code (LTC) and Digital Vertical Interval Time Code (D-VITC), reader for IRIG-B code and D-VITC (standard SMPTE time code and special IRIG encoded VITC), and contains a high resolution character inserter which can be burn the generator or reader numbers directly into the digital program output as well as an optional analog monitoring output.

The 8010TM-IRIG reads IRIG-B code commonly in use within the United States government agencies and supporting private industries and provides a display of days, hours, minutes, seconds and milliseconds in the character inserter. This IRIG information is inserted into a special line of vertical interval time code which is protected by a unique cyclic redundancy checkword (CRC) so that (tape recorders and other devices) do not confuse it with standard SMPTE 12M D-VITC. This special D-VITC can be decoded by the 8010TM-IRIG's D-VITC reader to allow you to encode the IRIG information onto a 'clean' video tape and then display the IRIG information later on playback.

The 8010TM-IRIG SMPTE Time code generator can also be slaved to incoming IRIG code. The millisecond count will be converted to the closest frame number and can also be stored in the generator user bits along with the IRIG day of the year. In the continuous jam sync mode, the generator is slaved to the reader, and will follow code any discontinuities of the reader. The generator may also be momentarily synchronized to the reader, and then it continues to increment normally regardless of the reader code. Momentary jam is the recommended mode when synchronizing to IRIG-B sources so that the resulting SMPTE time code does not contain discontinuities due to the different time bases of 29.97 frame per second video and real time of the IRIG code. In NTSC related video systems, the SMPTE generator should be operated in the Drop Frame counting mode when trying to synchronize the SMPTE generator to IRIG.

The 8010TM-IRIG will accept 525 or 625 line component digital video. The 8010TM-IRIG's SMPTE time code generator can be preset to lock to the digital program video either by simple frame locking, or where necessary it will color lock to an analog Color Reference in accordance with the 4 field NTSC or 8 field PAL color sequence.

In NTSC related color systems operation, with a frame rate of 29.97002618 Hz where the time of day is used for indexing, the generator may be operated in the drop frame mode. Special indicators in the front panel display and in the character inserter indicate that the unit is operating in the drop frame format.

Both the generator and reader are capable of working with the unassigned user bits. Several modes of operation are possible. The generator may be preset to insert hexadecimal values for each group in the generated code, and the reader will read hexadecimal values for each binary group. In addition, the user may select the transfer of either reader time or reader user bits into the generator user bits, thus, allowing pre-edit frame addresses to be preserved when new continuous time code is laid down.

The high-resolution character inserter provides six independently positionable windows to show time and user bits for the generator and readers simultaneously. When the IRIG or VITC readers are operating in the IRIG DAY mode, there are two independently positionable windows for each reader to show the IRIG time to millisecond precision and the IRIG day respectively. Three character sizes and the choice of white or black characters with or without contrasting background mask are selected from the front panel.

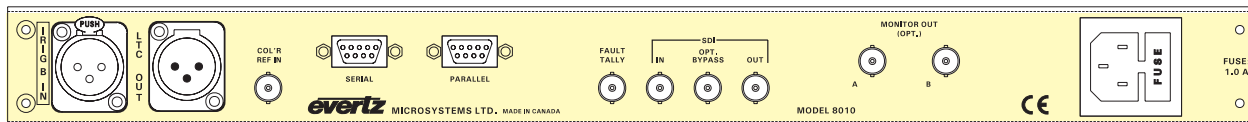
### Features

- Accepts 4:2:2 (525 and 625 line) digital video
- Serial digital video input provides automatic cable equalization on cable lengths up to 200 meters of low loss coax such as Belden 8281
- Optional Bypass relay for Serial digital video program output activates on power loss or from the front panel menu
- Auxiliary serial digital video output (not bypass protected)
- Passes embedded audio and other ancillary data signals
- LTC and D-VITC SMPTE Time Code generator
- IRIG data encoded to second line of VITC generator with special CRC
- SMPTE D-VITC Time Code or IRIG encoded D-VITC reader
- IRIG reader reads 1 kHz IRIG-B format sine wave amplitude modulated and pulse width modulated codes (formats B002 and B122)
- SMPTE Time Code LTC and D-VITC generators can be slaved momentarily or continuously to IRIG reader - converts milliseconds to closest video frame number. Milliseconds and days can be transferred to VITC user bits
- Character Inserter displays IRIG day and time to millisecond resolution in the picture in IRIG modes
- Character Inserter displays time and user bits in the picture in SMPTE modes
- Separate positioning of each character window
- 16 digit Alpha-numeric display, with 16 pushbuttons
- Momentary and Continuous jam sync modes
- User bit transfer from reader time or user bits
- Optional composite monitor output converts digital video to analog
- GPI Remote Control mode allows user to pass remote control contact closure information in VITC user bits
- Recalculates and inserts EDH on the SDI output
- Serial Remote Control of most functions - Broadcasts reader data or sends it on request
- Rack mountable
- IRIG CS-6 compatible serial data output to drive external IRIG displays

# SDI Time Code Master with IRIG Reader

## 8010TM-IRIG

### 8010TM-IRIG Rear Panel



#### Specifications

##### Serial Digital Video Input:

**Standards:** SMPTE 259M (270Mb/s)  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic 200m @ 270Mb/s with Belden 8281 or equivalent cable  
150m @ 270Mb/s when bypass relay is active  
**Return Loss:** >15 dB up to 540Mb/s

##### Serial Digital Video Outputs:

**Number of Outputs:** 1 with relay bypass, 1 additional output.  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800 mV nominal  
**DC Offset:** 0V  $\pm$ 0.5V  
**Rise and Fall Time:** 900 ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** >15 dB up to 540Mb/s  
**Wide Band Jitter:** <0.2 UI

##### Analog Monitor Video Outputs (optional):

**Standards:** Analog composite NTSC if input is 525i/59.94 video  
Analog composite PAL if input is 625i/50 video  
**Connectors:** 2 BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 1 V p-p nominal, internally adjustable  
**DC Offset:** 0V  $\pm$ 0.1V  
**Return Loss:** >35dB up to 5 MHz  
**Frequency Response:** 0.8dB to 4 MHz  
**Differential Phase:** <0.9° (<0.6° typical)  
**Differential Gain:** <0.9% (<0.5 % typical)  
**SNR:** >56dB to 5 MHz (shallow ramp)  
**Impedance:** 75 $\Omega$

##### LTC Generators:

**Standard:** SMPTE 12M  
**Frame Rate:** 25 and 30 Fps nominal  
**Connector:** 3 pin male XLR  
**Level:** Adjustable, 0.5V to 4V p-p

##### IRIG Reader:

**Standard:** IRIG 200-95 Formats B002 and B122  
**Connector:** 3 pin female XLR  
**Level:** 0.2 to 4V p-p, balanced or unbalanced

##### General Purpose Inputs and Outputs:

**Inputs:** 6, programmable control functions  
**Outputs:** 2, programmable tally functions  
**Connector:** 9 pin female "D"  
**Type:** Opto-isolated, active low  
**Signal Level:** Pulled up to +5 volts. 3.3V DC provided

##### Serial Remote Control:

**Standard:** RS-232 or RS-422, programmable baud rate  
**Connector:** 9 pin female "D"  
**Control:** Firmware upgrade, serial remote control of all functions

##### Electrical:

**Voltage:** Autoranging 100 - 240 Volts AC, 50/60 Hz  
**Power:** 30 Watts  
**Fuse Rating:** 250 V, 1 amp, time delay  
**Safety:** ETL Listed, complies with EU safety directives  
**EMI/RFI:** Complies with FCC Part 15 Class A  
EU EMC Directive

##### Physical:

###### Single Power Supply version:

**Dimensions:** 19" W x 1.75" H x 7.75" D.  
(483mm W x 45mm H x 196mm D)  
**Weight:** 7 lbs. (3.2 Kg)

###### Dual Power Supply version:

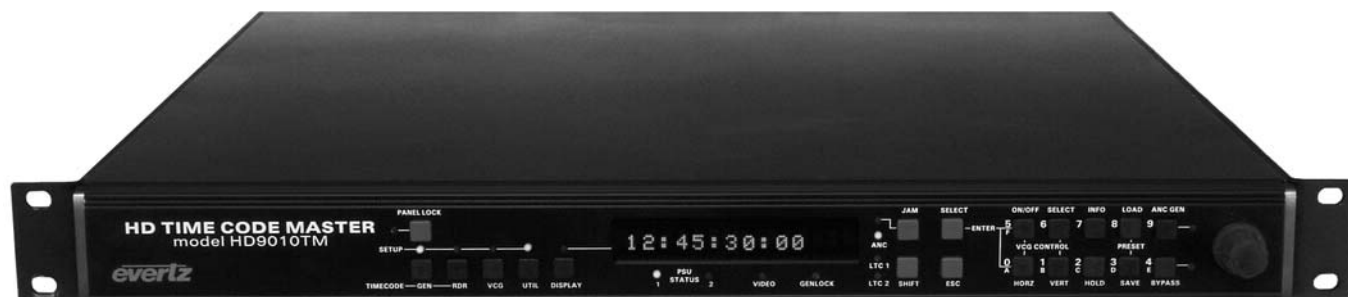
**Dimensions:** 19" W x 1.75" H x 18.75" D.  
(483mm W x 45mm H x 477mm D)  
**Weight:** 8 lbs. (3.5 Kg)

##### Ordering Information:

**8010TM-IRIG** SDI Time Code Master with IRIG Reader

##### Ordering Options:

**+2PS** Redundant Power Supply  
**+MON** Analog Monitoring Option  
**+BP** Bypass Relay Option



The HD9010TM HDTV Time Code Master is a full function time code reader/generator system for high definition serial digital video. The HD9010TM is a combination dual generator/dual reader for Linear Time Code (LTC) and RP188 Ancillary Time Code (ATC), and contains a high resolution character inserter which can burn the generator or reader numbers directly into the serial digital program output.

The HD9010TM will accept SMPTE 292M (1.5 Gb/s) high definition serial digital video. The HD9010TM's time code generators can be referenced to the input video or to an analog color black signal. When generating 24Fps timecode it will also lock to a 6Hz pulse.

The HD9010TM generators can be slaved to incoming LTC or ATC or can be set to free run. The generators may also be momentarily synchronized to one of the readers, and then continue to increment normally regardless of the reader code. The second LTC output normally follows the primary output, however the two generators can be operated at different frame rates to supply both 24Fps and 30Fps time code when used in a 1080p/24 environment. The drop frame conversion mode allows you to generate Drop Frame code on 1080i/59.94 broadcast master tapes when adding 3:2 pulldown to 1080p/23.98sF source material.

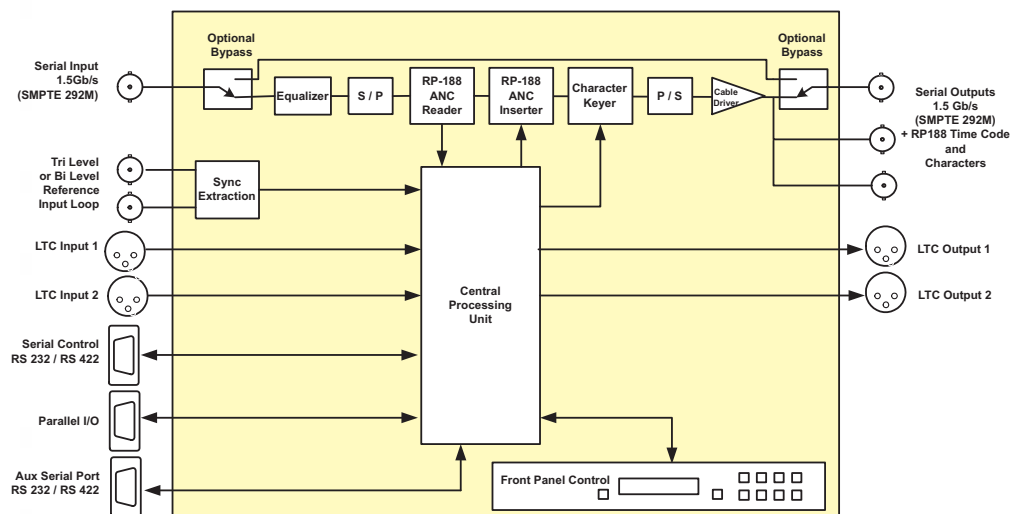
The high-resolution character inserter provides independently positionable windows to show time and user bits for the generator and readers simultaneously. One character size and the choice of white or black characters with or without contrasting background mask are available.

### Features

- Video formats supported: 1080i/60, 1080i/50, 1080p/30sF, 1080p/25sF, 1080p/24sF, 1035i/60, 720p/60, 720p/50 and the 1/1.001 divisor versions where applicable
- Reads RP188 LTC and VITC ancillary time code packets from incoming video.
- Generates RP188 LTC and VITC ancillary time code packets on output video
- RP188 reader line auto detected, generator insertion line programmable
- Two LTC readers and two LTC generators operate at 24, 25 or 30 Fps nominal rate in accordance with SMPTE 12M specification
- Generates 24 Fps and 30 Fps simultaneously
- RP-188 ⇌ LTC translator
- Genlocks to NTSC/PAL color black or HD Tri-level sync
- Locks to 6 Hz pulse when generating 24 FPS nominal rate code
- Drop frame ⇌ Non Drop frame converter
- Genlocks to NTSC/PAL color black
- Generates character burn in windows for the reader and generator time and user bit data. Windows can be positioned and turned off and on independently
- One vertical size of character windows, white or black on contrasting background,
- Front panel display and control using menu system
- Parallel GPIO
- GPI Remote Control mode allows user to pass remote control contact closure information in ATC user bits
- Field upgradeable firmware as new features become available
- Optional dual power supply configuration
- Optional input relay bypass for power failure bypass protection



### HD9010TM Block Diagram



### Specifications

#### Serial Video Input:

**Standard:** SMPTE 292M (1.5 Gb/s), SMPTE 274M, SMPTE 296M, SMPTE 349M, 1080i/60, 1080i/50, 1080p/30sF, 1080p/25sF, 1080p/24sF, 1035i/60, 720p/60, 720p/50, and the 1/1.001 divisor versions where applicable software selectable or autodetect BNC per IEC 60169-8 Amendment 2

**Connector:** BNC per IEC 60169-8 Amendment 2

**Input Equalization:** Automatic to 100m @ 1.5Gb/s with Belden 1694 or equivalent cable (50m with +HBP option)

**Return Loss:** >15 dB up to 1 GHz  
>10 dB up to 1.5 GHz (with +HBP option)

#### Serial Video Output:

**Number of Outputs:** 1 relay bypassed with +HBP option  
2 non bypassed

**Connectors:** BNC per IEC 60169-8 Amendment 2

**Signal Level:** 800mV nominal

**DC Offset:** 0V  $\pm$  0.5V

**Rise and Fall Time:** 200ps nominal

**Overshoot:** <10% of amplitude

**Jitter:** < 0.2 UI

#### LTC Generators:

**Standard:** SMPTE 12M

**Number:** 2

**Frame Rate:** 24, 25 and 30 Fps nominal

**Connectors:** 3 pin male XLR type connector

**Level:** Adjustable, 0.5V to 4.5V p-p

**Rise Time:** 40  $\pm$  10  $\mu$ s

**Jitter:** < 2  $\mu$ s

#### LTC Readers:

**Standard:** SMPTE 12M

**Number:** 2

**Frame Rate:** 24, 25 and 30 Fps nominal

**Connectors:** 3 pin female XLR type connector

**Level:** 0.2 to 4V p-p, balanced or unbalanced

**Speed:** 1/30th to 50 x play speed, VTR dependent

#### Video Reference:

**Type:** Menu selectable - depends on video format NTSC or PAL Color Black 1 V p-p  
Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV

**Connectors:** 2 BNC per IEC 60169-8 Amendment 2

**Termination:** High impedance loop through

#### General Purpose In/Out:

**Number:** 6 programmable input or output functions

**Type:** Active low with internal pull-ups to +5V

**Connector:** Female High Density DB-9

**Signal Level:** +5V nominal

#### Serial Remote Control:

**Standard:** RS-232, 57600 baud

**Number of ports:** 2

**Connector:** 9 pin female "D"

**Control:** Firmware upgrade, timecode data broadcast

#### Physical:

**Dimensions:** 19" W x 1.75" H x 18.75" D  
(483mm W x 45mm H x 477mm D)

**Weight:** 8 lbs. (3.5Kg)

#### Electrical:

**Power:** Auto ranging 100 to 240 VAC 50/60 Hz  
40 Watts

**Safety:** ETL listed  
Complies with EU safety directive  
Complies with FCC Part 15 Class A  
EU EMC Directive

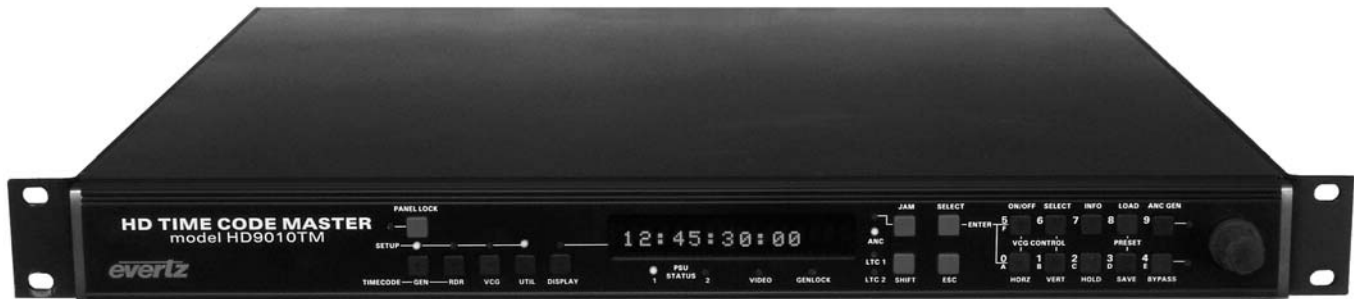
#### Ordering Information:

**HD9010TM** HD Time Code Generator/Reader

#### Ordering Options:

**+HBP** Bypass Relay Protection

**+2PS** Redundant Power Supply



The HD9010TM-IRIG HDTV Time Code Master with IRIG-B Reader is a full function time code reader/generator system for SMPTE 292M (1.5 Gb/s) high definition serial digital video. The HD9010TM-IRIG is a combination generator/reader for SMPTE 12M Linear Time Code (LTC) and SMPTE RP188 Ancillary Time Code (ATC), a reader for IRIG-B code, and a generator/reader of Vertical Ancillary Data (VANC) packets containing the IRIG-B code. The HD9010TM also contains a high resolution character inserter that can burn the generator or reader numbers directly into the serial digital program output.

The HD9010TM-IRIG reads IRIG-B code commonly in use within the United States government agencies and supporting private industries and provides a display of days, hours, minutes, seconds and milliseconds in the character inserter. This IRIG information is inserted into a special ancillary data packet in the vertical ancillary data space (VANC) of the SMPTE 292M serial bitstream. This special VANC packet can be decoded by the HD9010TM-IRIG's VANC reader to allow you to encode the IRIG information onto a 'clean' video tape and then display the IRIG information later on playback.

The HD9010TM-IRIG SMPTE Time code generator is output as LTC and ATC and can also be slaved to incoming IRIG serial time code. The millisecond count will be converted to the closest frame number and can also be stored in the generator user bits along with the IRIG day of the year. In the continuous jam sync mode, the generator is slaved to the IRIG-B reader, and will follow code any discontinuities of the reader. The generator may also be momentarily synchronised to the IRIG-B reader, and then it continues to increment normally regardless of the reader code. Momentary jam is the recommended mode when synchronising to IRIG-B sources so that the resulting SMPTE time code does not contain discontinuities due to the different time bases of 29.97 frame per second video and real time of the IRIG code. In NTSC related video systems, the SMPTE generator should be operated in the Drop Frame counting mode when trying to synchronise the SMPTE generator to IRIG.

The HD9010TM-IRIG SMPTE Time code generator can also be slaved to incoming LTC or ATC, or can be set to free run. The generator may also be momentarily synchronised to one of the readers, and then continue to increment normally regardless of the reader code. The second LTC output normally follows the primary output, however the two generators can be operated at different frame rates to supply both 24Fps and 30Fps time code when used in a 1080p/24 environment.

The high-resolution character inserter provides independently positionable windows to show time and user bits for the SMPTE generator and readers simultaneously. When the IRIG or VANC readers are operating in the IRIG DAY mode, there are two independently positionable windows for each reader to show the IRIG time to millisecond precision and the IRIG day respectively. The choice of white or black characters with or without contrasting background mask is available.

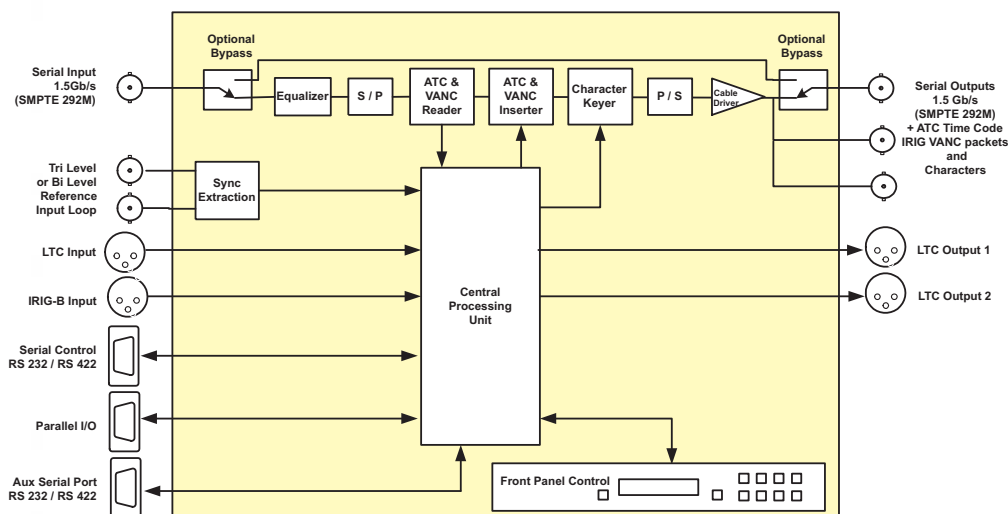
### Features

- Video formats supported: 1080i/60, 1080i/50, 1080p/30sF, 1080p/25sF, 1080p/24sF, 1035i/60, 720p/60, 720p/50 and the 1/1.001 divisor versions where applicable
- IRIG reader reads 1 kHz IRIG-B format sine wave amplitude modulated and pulse width modulated codes (formats B122 and B022)
- Encodes IRIG data and optional metadata in VANC packets on output video.
- Reads IRIG data encoded in VANC packet from incoming video
- Generates RP188 LTC and VITC ancillary timecode packets on output video
- Reads RP188 LTC and VITC ancillary time code (ATC) packets.
- Insertion line for VANC packets programmable, read line auto detected
- One LTC reader and two LTC generators operate at 24, 25 or 30Fps nominal rate in accordance with SMPTE 12M specification
- Generates to 24 Fps and 30 Fps LTC simultaneously
- RP-188 ↔ LTC translator
- Character windows for the reader and generator time and user bit data. Windows can be positioned and turned off and on independently
- White or black characters on contrasting background
- Front panel display and control using menu system
- Optional redundant power supply configuration
- Parallel GPI/O and serial remote control
- Field upgradeable firmware as new features become available
- Optional input relay bypass for power failure bypass protection
- IRIG CS-6 compatible serial data output to drive external IRIG display

# HD Time Code Generator with IRIG Reader

## HD9010TM-IRIG

**HD9010TM-IRIG Block Diagram**



### Specifications

#### HDTV Serial Digital Video Input:

**Standard:** SMPTE 292M (1.5 Gb/s), SMPTE 274M, SMPTE 296M, SMPTE 349M  
1080i/60, 1080i/50, 1080p/30sF, 1080p/25sF, 1080p/24sF, 1035i/60, 720p/60, 720p/50 and the 1/1.001 divisor versions where applicable software selectable or autodetect  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable

#### HDTV Serial Digital Video Outputs:

**Standard:** SMPTE 292M, same as input  
**Outputs:** 2 Program video with RP188 Ancillary time code embedded and optional characters  
**Connectors:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V  $\pm$ 0.5V  
**Rise and Fall Time:** 200ps nominal  
**Overshoot:** <10% of amplitude  
**Wide Band Jitter:** < 0.2 UI

#### Reference Input:

**Type:** NTSC or PAL Color Black 1 V p-p, or Composite bi-level sync (525i/59.94 or 625i/50) 300 mV  
**Connector:** BNC loop per IEC 60169-8 Amendment 2  
**Termination:** High Impedance

#### LTC Generator:

**Standard:** SMPTE 12M  
**Frame Rate:** 24, 25 and 30 Fps nominal  
**Connectors:** 3 pin male XLR type connector  
**Level:** Adjustable, 0.5V to 4.5V p-p

#### LTC Reader:

**Standard:** SMPTE 12M  
**Frame Rate:** 24, 25 and 30 Fps nominal  
**Connector:** 3 pin female XLR type connector  
**Level:** 0.2 to 4V p-p, balanced or unbalanced

#### IRIG Reader:

**Standard:** IRIG 200-95 Formats B002 and B122  
**Connector:** 3 pin female XLR type connector  
**Level:** 0.2 to 4V p-p, balanced or unbalanced

#### Serial Remote Control:

**Standard:** RS-232, 57600 baud  
**Connector:** 9 pin female "D"  
**Control:** Firmware upgrade

#### Physical:

**Dimensions:** 19" W x 1.75" H x 18.75" D.  
(483mm W x 45mm H x 477mm D)  
**Weight:** 8 lbs. (3.5Kg)

#### Electrical:

**Power:** Auto ranging 100-240 VAC 50/60 Hz  
40 Watts  
**Safety:** ETL listed  
Complies with EU safety directive  
**EMI/RFI:** Complies with FCC Part 15 Class A, EU EMC Directive

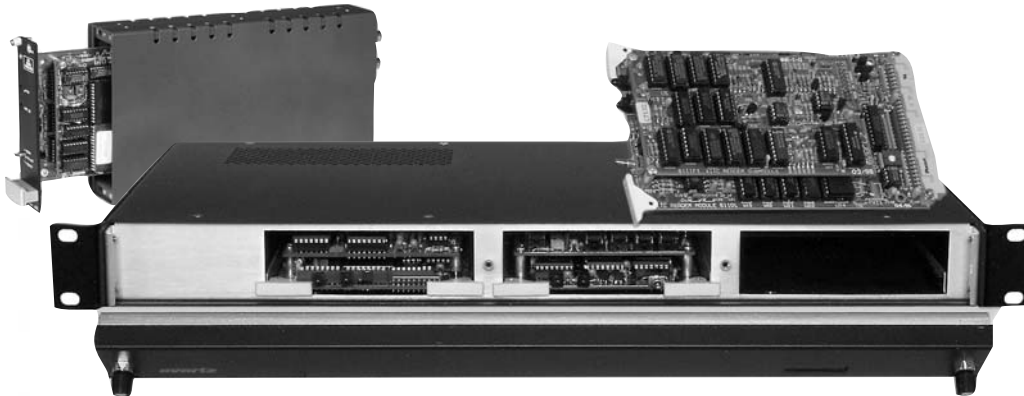
#### Ordering Information:

**HD9010TM-IRIG** HD Time Code Master with IRIG Reader

#### Ordering Options:

**+HBP** Bypass Relay Protection  
**+2PS** Redundant Power Supply





The EV-BLOC 621 module is a full featured vertical interval time code (VITC) generator. Easily accessible DIP switches are used to preset parameters such as VITC line numbers, 2, 4, or 8 field locking, drop frame and source ID code. An optional LTC reader sub-module upgrades the 621 to an LTC to VITC translator. Remote control inputs permit generator reset/start, user bit transfer and tally control (used for ON AIR indication in source ID applications). In addition, 6 uncommitted inputs are available for remote control of downstream equipment via the video path.

### Features

- VITC Generator: 4/8 field color frames, resettable to 00:00:00:00 or jam-synced to longitudinal time code (LTR option)
- Can be synchronized to a common time code generator to accommodate isolated video sources. User bits may be transferred from the common generator or preset locally, using easily accessible DIP switches
- User bits in each module can be encoded to uniquely identify its video source. The time code bits can be set to zero, for cameras etc., or jam-synced to time-coded sources such as VTR's
- Six control inputs can be utilized to control VTR's etc. via the program video path
- Special dual standard LTC to VITC Translator for use with 4025TR (No color framing, Source ID or GPIs)

### Specifications

#### Video:

**Input:** 1V p-p Hi-Z loop  
**Connectors:** 2 BNC per IEC 60169-8 Amendment 2  
**Output:** Composite video 1V p-p  
**Differential Gain:** < 0.5%  
**Differential Phase:** < 0.5°  
**Frequency Response:** ± 0.5dB to 5MHz

#### Longitudinal Code Reader (LTR Option):

**Standard:** SMPTE 12M  
**Input:** -20 dBm to +12dBm, 1/4" stereo phone jack  
**Speed:** 1/30 to 70 times play speed forward and reverse (machine dependent)

#### Physical:

**Dimensions:** 3.94"H x 6.3"L x 1.4"W  
 (100mm H x 160mm L x 33mm W)

#### Ordering Information: VITC Timecode Generator/Translator

**X = N for NTSC or P for PAL (Please specify when ordering)**  
**Standard units generate VITC in vertical interval only:**  
 Lines 6 to 21 for PAL, 10 to 20 for NTSC

#### (Modules for mounting in the 1RU frames)

**EJ621x:** VITC Generator & Source ID Encoder  
**EJ621x-LTR:** LTC to VITC Translator & Source ID Encoder  
**S621x:** Standalone VITC Generator & Source ID Encoder  
**S621x-LTR:** Standalone LTC to VITC Translator & Source ID Encoder

#### Ordering Options:

**+MPEG** MPEG option generates VITC in active picture lines : 10 to 25 for PAL, 14 to 24 for NTSC

#### Enclosure:

**4600T-3P:** 1RU Frame - parallel I/O (3 modules max) with power supply

The EV-BLOC 622 module is a vertical interval time code reader and longitudinal time code generator in one slim euro-card package containing features not found anywhere else. When used as a translator from VITC to LTC, a unique soft locking scheme assures error free play speed code regardless of speed variations of the code being read. If the VTR is bumped in and out of sync by an editor or synchronizer, the translated LTC framing follows gradually without missing a beat. The 622 reader contains all the necessary video processing circuits and therefore requires no external signals other than the video signal containing the VITC.

The EV-BLOC 623 module contains a full speed (1/30 to 70 times play) longitudinal time code (LTC) reader, an LTC translator/phase restorer and an RS-232 serial interface. Installing the optional plug-in VITC sub-module, gives the reader tremendous additional capabilities. It can now read VITC at speeds from still frame to an excess of 20 times play speed.

The front panel mode switch allows the LTC/VITC reader pair to operate in either an LTC or VITC only mode or in an automatic switchover mode. The powerful firmware automatically selects valid code from either source and provides accurate time code reading from still frame to 70 times play speed.

### 622 Features

- Reads vertical interval time code from about 20 times play speed down to still frame, providing time and user data out as LTC and multiplexed parallel BCD. An optional video inserter (VCG) keys the data into the picture
- VITC to LTC translator for use with LTC only editing equipment or readers

### 623 Features

- Reads vertical interval time code from about 20 times play speed down to still frame, providing time and user bits out as LTC
- Reads LTC up to 70x play speed

- User bits encoded with a special code from an EV-BLOC EJ621 module are displayed as unique source identification using the optional VCG
- Six grounding output switches respond to specific user bit codes from a 621 encoder to (remotely) control a variety of devices via the program video path or off tape

- VITC to LTC translator for use with LTC only editing equipment or readers
- RS-232 interface for sending time code to a PC

### Specifications

#### Video:

**Input:** Composite video 1v p-p  
High impedance bridging input loop  
2 BNC per IEC 60169-8 Amendment 2 connectors

**Output:** Composite video 1v p-p  
2 BNC per IEC 60169-8 Amendment 2 connectors

**Differential Gain:** < 0.5%

**Differential Phase:** < 0.5°

**Frequency Response:** ± 0.5dB to 5MHz

#### Vertical Interval Code Reader:

**Input:** Composite video with SMPTE 12M VITC

**Speed:** Still frame to more than 20 times play speed forward and reverse (machine dependent)

#### Longitudinal Code Reader (623 only):

**Standard:** SMPTE 12M

**Input:** -20 dBm to +12dBm, 1/4" stereo phone jack

**Speed:** 1/30 to 70 times play speed forward and reverse (machine dependent)

#### LTC Translator:

**Output:** Play speed regenerated SMPTE 12M LTC phase-locked to video input at play speed level 0dBm, 1/4" stereo phone jack

**Modes:** Individual lines, pair of lines, range of lines, auto (first valid line of code)

**Level:** Level 0dBm, 1/4" stereo phone jack (623 only)

#### Video Character Generator (VCG option)(622 only):

**Input:** Composite video from VITC reader

**Output:** Composite video with high resolution white characters keyed in. Switchable black background or edging, 2 sizes, 15 positions on raster

**Parallel I/O:** Multiplexed digit-wide BCD data out to drive displays or parallel computer interfaces, or 6 open collector switches activated by user bits

#### Physical:

**Dimensions:** 3.94"H x 6.3"L x 1.4"W  
(100mm H x 160mm L x 33mm W)

#### Ordering Information: VITC Timecode Reader/Translator

**X = N for NTSC or P for PAL (Please specify when ordering)**

**Standard units reads VITC in vertical interval only:**

**Lines 6 to 21 for PAL, 10 to 20 for NTSC**

#### (Modules for mounting in the 1RU frames)

**EJ622x:** VITC to LTC Translator

**EJ622x-VCG:** VITC to LTC Translator with VCG & Source ID Decoder

**S622x:** VITC to LTC Translator

**S622x-VCG:** VITC to LTC Translator with VCG & Source ID Decoder

**EJ623x:** LTC/VITC Reader Translator

**EJ623x-VIR:** LTC/VITC Reader Translator with VITC Submodule

**S623x:** Standalone LTC/VITC Reader Translator

**S623x-VIR:** Standalone LTC/VITC Reader with VITC Submodule

#### Ordering Options:

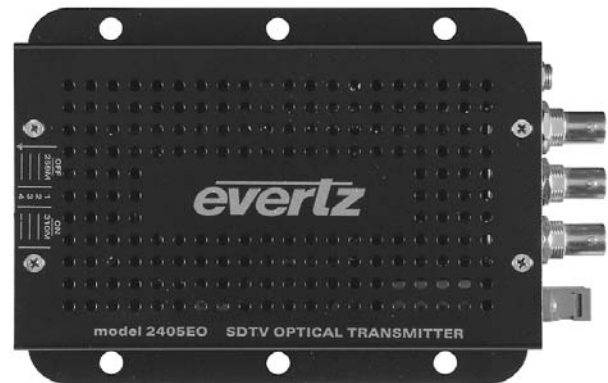
**+MPEG** MPEG option reads VITC in active picture lines : 10 to 25 for PAL, 14 to 24 for NTSC

#### Enclosure:

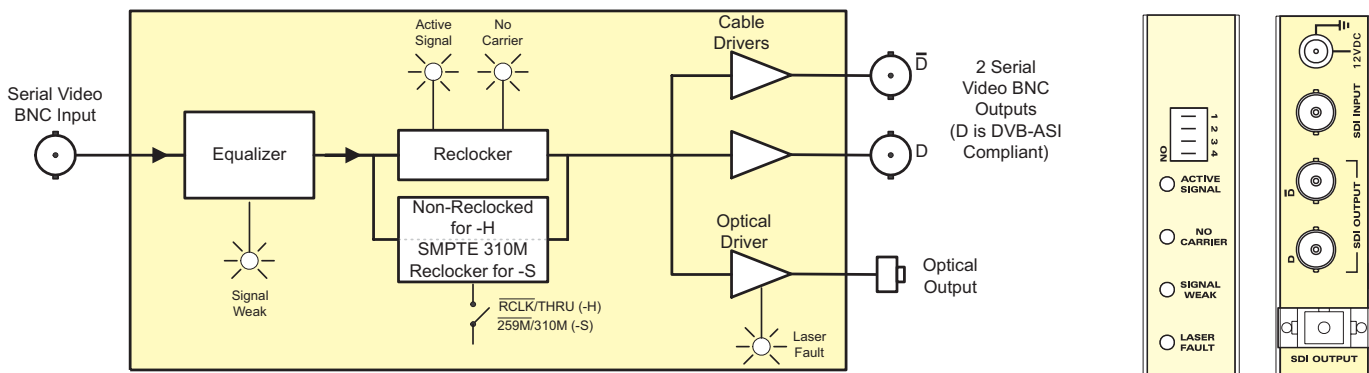
**4600T-3P:** 1RU Frame - parallel I/O (3 modules max) with power supply

### Features

- Reclocking for all for SDTV video rates including SMPTE 259M (143Mb/s-360Mb/s), SMPTE 310M (19.4Mb/s), SMPTE 344M(540Mb/s), M2S and DVB-ASI (270Mb/s)
- Available in 1310nm, 1550nm and up to sixteen different CWDM wave lengths (ITU-T G.694.2 compliant)
- Automatic laser shutdown on absence of input signal for extended laser life
- Supports single-mode and multi-mode fiber optic cable
- Immunity to video Pathological signals
- Long reach transmission capability
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation



### 2405EO Block Diagram & Rear Panels



### Specifications

**Standards:** SMPTE 259M (A, B, C, D), SMPTE 297M, SMPTE 310M, SMPTE 344M, M2S, & DVB-ASI

**Serial Video BNC Input:**  
**Number of Inputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 300m @ 270Mb/s with Belden 8281 (or equivalent)  
**Return Loss:** > 15dB up to 540MHz

**Serial Video BNC Output:**  
**Number of Outputs:** 2 (1 output DVB-ASI/M2S compliant)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ± 0.5V  
**Rise, Fall Time:** 900ps nominal  
**Overshoot:** < 10% of amplitude  
**Return Loss:** > 15dB up to 540MHz  
**Wideband Jitter:** < 0.2 UI

**Optical Output:**  
**Number of Outputs:** 1  
**Connector:** SC/PC, ST/PC, FC/PC Female  
**Return Loss:** > 14 dB  
**Rise, Fall Time:** 400-700ps  
**Jitter:** < 0.2UI  
**Optical Power:**  
 1310nm FP: -7dBm ± 1dBm  
 1550nm DFB: 0 dBm ± 1dBm  
 CWDM DFB: 0 dBm ± 1dBm

**Physical:**  
**Dimensions:** With Flanges: 6"L x 4"W x 1"H (152mm L x 114mm W x 25mm H)  
**Weight:** 0.5 lbs (0.28Kg)

**Electrical:**  
**Voltage:** +12V DC

**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A EU EMC Directive

### Compliance:

**Voltage:** +12V DC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A EU EMC Directive

### Ordering Information:

**2405EO3F** SDI Miniature Optical Transmitter 1310nm FP, Laser  
**2405EO5D** SDI Miniature Optical Transmitter 1550nm DFB Laser

**For CWDM, please refer to the end of the fiber section for ordering information:**  
**2405EOxx** SDI Miniature Optical Transmitter CWDM DFB Laser

All 2405 modules include power supply

### Ordering Options

Fiber Connector must be specified at time of order  
 Eg: Model + SC

**Connector Suffix**  
**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

### Fiber Optic Patch Cable:

**CB-FP1M-SCPC** Single mode fiber cable, 1m, SC/PC male termination  
**CB-FP1M-STPC** Single mode fiber cable, 1m, ST/PC male termination  
**CB-FP5M-SCPC** Single mode fiber cable, 5m, SC/PC male termination  
**CB-FP5M-STPC** Single mode fiber cable, 5m, ST/PC male termination  
**CB-FP10M-SCPC** Single mode fiber cable, 10m, SC/PC male termination  
**CB-FP10M-STPC** Single mode fiber cable, 10m, ST/PC male termination



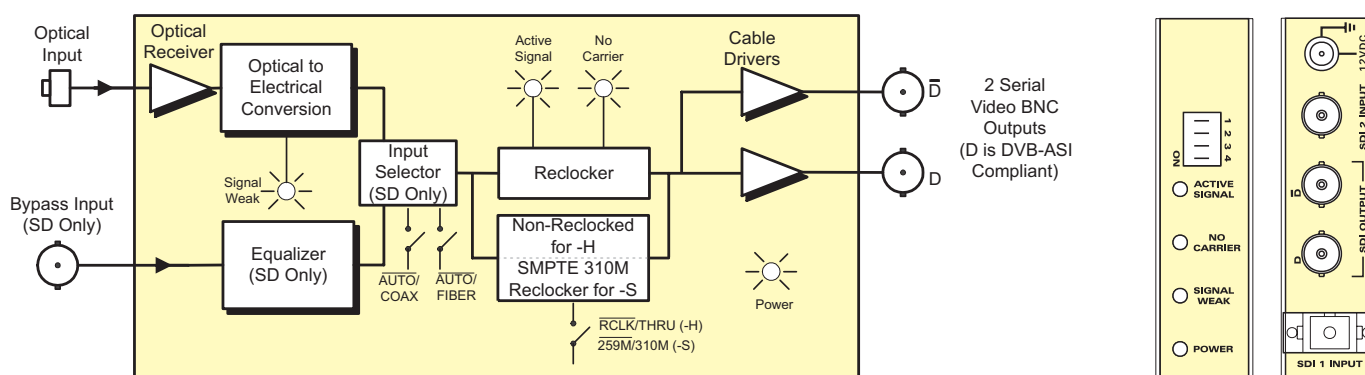
# SDI Miniature Optical Receiver 19.4Mb/s or 143-540Mb/s 2405OE

## Features

- Reclocking for all SDTV video rates including SMPTE 259M (143Mb/s-540Mb/s), SMPTE 310M (19.4Mb/s), SMPTE 344M(540Mb/s), M2S and DVB-ASI (270Mb/s)
- Automatic signal failure switching for optical input
- Immunity to video Pathological signals
- Supports single-mode and multi-mode fiber optic cable
- High optical input sensitivity
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation



## 2405OE Block Diagram & Rear Panels



## Specifications

**Standards:** SMPTE 259M (A, B, C, D), SMPTE 297M, SMPTE 310M, SMPTE 344M, M2S, DVB-ASI

### Serial Video BNC Input:

**Number of Inputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 300m @ 270Mb/s with Belden 8281 (or equivalent)  
**Return Loss:** > 15dB up to 540MHz

### Optical Input:

**Number of Inputs:** 1  
**Operating Wavelength:** 1270nm to 1610nm  
**Maximum Input Power:** 0dBm  
**Optical Sensitivity:** -32 dBm  
**Connector:** SC/PC, ST/PC, FC/PC Female Housing

### Serial Video BNC Output:

**Number of Outputs:** 2 (1 output DVB-ASI/M2S compliant)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ± 0.5V  
**Rise, Fall Time:** 900ps nominal  
**Overshoot:** < 10% of amplitude  
**Return Loss:** > 15dB up to 540MHz  
**Wideband Jitter:** < 0.2 UI

### Physical:

**Dimensions:** With Flanges: 6"L x 4"W x 1"H (152mm L x 114mm W x 25mm H)  
**Weight:** 0.5 lbs (0.28Kg)

### Electrical:

**Voltage:** +12V DC  
**Power:** 6 Watts  
**EMI/RFI:** Complies with FCC Part 15, Class A EU EMC Directive

## Ordering Information:

**2405OE** SDI Miniature Optical Receiver, 19.4Mb/s or 143-540Mb/s

All 2405 modules include power supply

### Ordering Options

Fiber Connector must be specified at time of order  
 Eg: Model + SC

### Connector Suffix

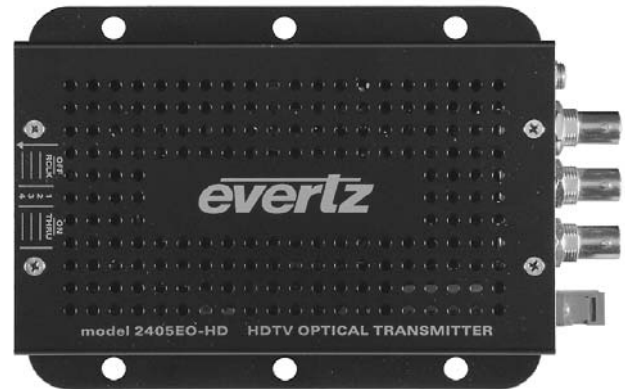
<b>+SC</b>	SC/PC
<b>+ST</b>	ST/PC
<b>+FC</b>	FC/PC

### Fiber Optic Patch Cable:

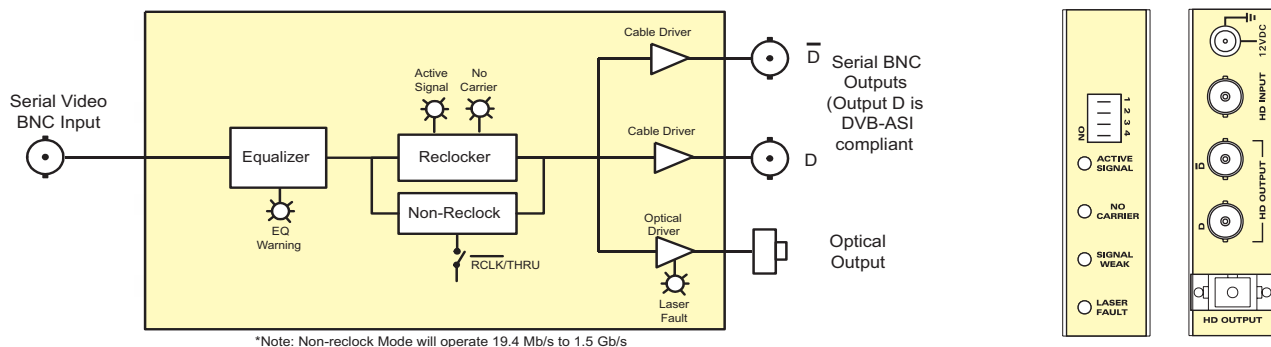
<b>CB-FP1M-SCPC</b>	Single mode fiber cable, 1m, SC/PC male termination
<b>CB-FP1M-STPC</b>	Single mode fiber cable, 1m, ST/PC male termination
<b>CB-FP5M-SCPC</b>	Single mode fiber cable, 5m, SC/PC male termination
<b>CB-FP5M-STPC</b>	Single mode fiber cable, 5m, ST/PC male termination
<b>CB-FP10M-SCPC</b>	Single mode fiber cable, 10m, SC/PC male termination
<b>CB-FP10M-STPC</b>	Single mode fiber cable, 10m, ST/PC male termination

### Features

- Operation from 19.4Mb/s to 1.5Gb/s
  - Reclocking for SMPTE 292M (1.485Gb/s)
  - Non-reclocking for all other rates from 19.4 Mb/s to 1.5Gb/s including SMPTE 259M, SMPTE 305M, SMPTE 310M, M2S, DVB-ASI
- Available in 1310nm, 1550nm and up to sixteen different CWDM wavelengths (ITU-T G.694.2 compliant)
- Automatic laser shutdown on absence of input signal for extended laser life
- Supports single-mode and multi-mode fiber optic cable
- Immunity to video Pathological signals
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation



### 2405EO-HD Block Diagram & Rear Panels



### Specifications

**Standards:** SMPTE 292M, 259M, 297M, 310M, M2S, DVB-ASI, and any bi-level Telecom/Datacom signal from 19.4Mb/s to 1.5Gb/s

#### Serial Video BNC Input:

**Number of Inputs:** 1  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic to 125m @ 1.485Gb/s with Belden 1694A (or equivalent)  
**Return Loss:** > 15dB up to 1.485GHz

#### Serial Video BNC Output:

**Number of Outputs:** 2 (1 output DVB-ASI/M2S compliant)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ± 0.5V  
**Rise, Fall Time:** 270ps nominal  
**Overshoot:** < 10% of amplitude  
**Return Loss:** > 15dB up to 1.485GHz  
**Wideband Jitter:** < 0.2 UI

#### Optical Output:

**Number of Outputs:** 1  
**Connector:** SC/PC, ST/PC, FC/PC Female Housing  
**Return Loss:** > 14 dB  
**Rise, Fall Time:** 200ps nominal  
**Jitter:** < 0.2UI reclocked  
**Nominal Wavelength:**  
 Standard: 1310nm, 1550nm  
 CWDM: 1270nm - 1610nm (See Ordering Information)

#### Optical Power:

**1310nm FP:** -7dBm ± 1dBm  
**1310nm/1550nm DFB:** 0 dBm ± 1dBm  
**CWDM DFB:** 0 dBm ± 1dBm

#### Physical:

**Dimensions:** With Flanges: 6"L x 4"W x 1"H  
 (152mm L x 114mm W x 25mm H)  
**Weight:** 0.5 lbs (0.28Kg)

#### Electrical:

**Voltage:** +12V DC  
**Power:** 6 Watts  
**Safety:** Complies with EU Safety Directive  
**EMI/RFI:** Complies with FCC Part 15, Class A  
 EU EMC Directive

#### Ordering Information:

**2405EO3F-HD** HD Miniature Optical Transmitter 1310nm, FP Laser  
**2405EO3D-HD** HD Miniature Optical Transmitter 1310nm, DFB Laser  
**2405EO5D-HD** HD Miniature Optical Transmitter 1550nm, DFB Laser

#### For CWDM, please refer to the end of the fiber section for ordering information

**2405EOxx-HD** HD Miniature Optical Transmitter CWDM DFB Laser

All 2405 modules include power supply

#### Ordering Options

Fiber Connector must be specified at time of order  
 Eg: Model + SC

#### Connector Suffix

**+SC** SC/PC  
**+ST** ST/PC  
**+FC** FC/PC

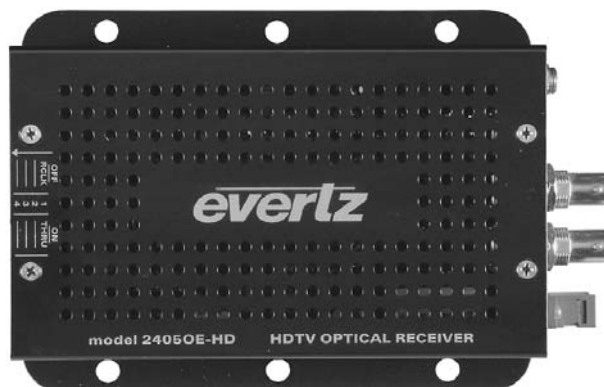
#### Fiber Optic Patch Cable:

**CB-FP1M-SCPC** Single mode fiber cable, 1m, SC/PC male termination  
**CB-FP1M-STPC** Single mode fiber cable, 1m, ST/PC male termination  
**CB-FP5M-SCPC** Single mode fiber cable, 5m, SC/PC male termination  
**CB-FP5M-STPC** Single mode fiber cable, 5m, ST/PC male termination  
**CB-FP10M-SCPC** Single mode fiber cable, 10m, SC/PC male termination  
**CB-FP10M-STPC** Single mode fiber cable, 10m, ST/PC male termination

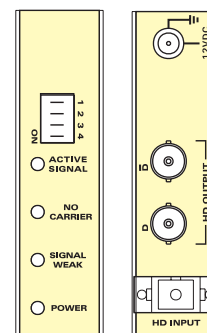
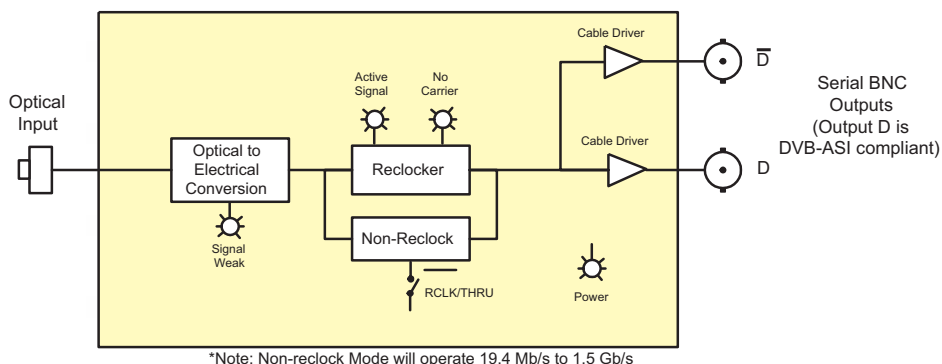
### 2405OE-HD

#### Features

- Operation from 19.4Mb/s to 1.5Gb/s
  - Reclocking for SMPTE 292M (1.485Gb/s)
  - Non-reclocking for all other rates from 19.4Mb/s to 1.5Gb/s including SMPTE 259M, SMPTE 305M, SMPTE 310M, M2S, DVB-ASI
- Immunity to video Pathological signals
- Supports single-mode and multi-mode fiber optic cable
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation



#### 2405OE-HD Block Diagram & Rear Panels



#### Specifications

**Standards:** SMPTE 292M, 259M, 297M, 310M, M2S, DVB-ASI, and any bi-level Telecom/Datacom signal from 19.4Mb/s to 1.5Gb/s

#### Optical Input:

**Number of Inputs:** 1  
**Operating Wavelength:** 1270nm to 1610nm  
**Maximum Input Power:** -1dBm  
**Optical Sensitivity:** -23dBm  
**Connector:** SC/PC, ST/PC, FC/PC Female Housing

#### Serial Video BNC Outputs:

**Number of Outputs:** 2 (1 output DVB-ASI/M2S compliant)  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V  $\pm$  0.5V  
**Rise, Fall Time:** 270ps nominal  
**Overshoot:** < 10% of amplitude  
**Return Loss:** > 15dB up to 1.485GHz  
**Wideband Jitter:** < 0.2 UI

#### Physical:

**Dimensions:** With Flanges: 6"L x 4"W x 1"H (152mm L x 114mm W x 25mm H)  
**Weight:** 0.5 lbs (0.28Kg)

#### Electrical:

**Voltage:** +12V DC  
**Power:** 6 Watts  
**Safety:** Complies with EU Safety Directive  
**EMI/RFI:** Complies with FCC Part 15, Class A EU EMC Directive

#### Ordering Information:

**2405OE-HD:** HD Miniature Optical Receiver, 19.4Mb/s to 1.5Gb/s

All 2405 modules include power supply

#### Ordering Options

Fiber Connector must be specified at time of order  
 Eg: Model + SC

#### Connector Suffix

<b>+SC</b>	SC/PC
<b>+ST</b>	ST/PC
<b>+FC</b>	FC/PC

#### Fiber Optic Patch Cable:

<b>CB-FP1M-SCPC</b>	Single mode fiber cable, 1m, SC/PC male termination
<b>CB-FP1M-STPC</b>	Single mode fiber cable, 1m, ST/PC male termination
<b>CB-FP5M-SCPC</b>	Single mode fiber cable, 5m, SC/PC male termination
<b>CB-FP5M-STPC</b>	Single mode fiber cable, 5m, ST/PC male termination
<b>CB-FP10M-SCPC</b>	Single mode fiber cable, 10m, SC/PC male termination
<b>CB-FP10M-STPC</b>	Single mode fiber cable, 10m, ST/PC male termination



The 2407DVIT is a miniature DVI/KVM fiber transmitter for high resolution/high quality video signals. This self-contained module accepts one DVI video input up to WUXGA resolution and transmits it over a single or dual fiber coax. The 2407DVIT is also available with analog audio, keyboard + mouse and USB options. The companion 2407DVIR DVI/KVM Fiber Receiver demultiplexes the signals and converts them back to digital DVI.

The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm and CWDM transmission schemes.

### Features

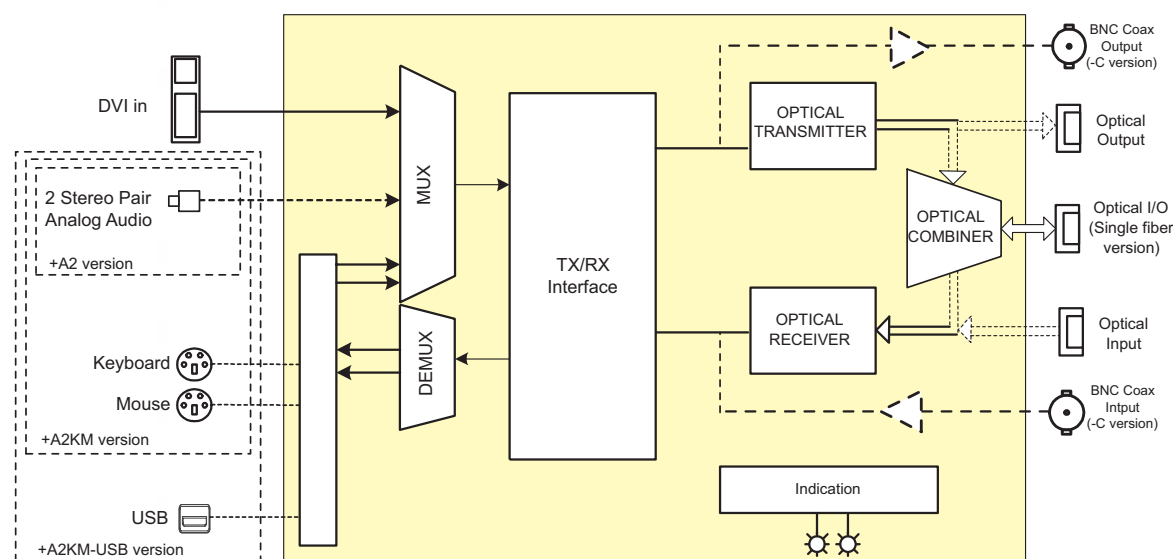
- Supports DVI transport over a single or dual fiber or coax (-C version)
- VESA video resolutions supported up to WUXGA
- Full 24 bits per pixel color resolution
- Ideal for use with high resolution LCD, plasma, and projection screens
- Superior digital data transmission
- Rugged small form factory enclosure
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths at 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- Optional 2 channel stereo analog audio
- Optional keyboard + mouse
- Optional USB interface
- BNC and fiber optic input/output versions available

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<500m	2407DVIT13-A2KM-USB-F2	-7dBm	2407DVIR13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	2	12dB/34km	2407DVIT13-A2KM-USB-F2	-7dBm	2407DVIR13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	1	8dB/20km*	2407DVIT15-A2KM-USB-W	-1dBm	2407DVIR13-A2KM-USB-W	-17dBm	1310nm/1550nm WDM bi-directional, one fiber
Single-Mode	1(CWDM)	15.5dB/60km**	2407DVITxx-A2KM-USB-F2	0dBm	2407DVIRyy-A2KM-USB-F2	-19dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**

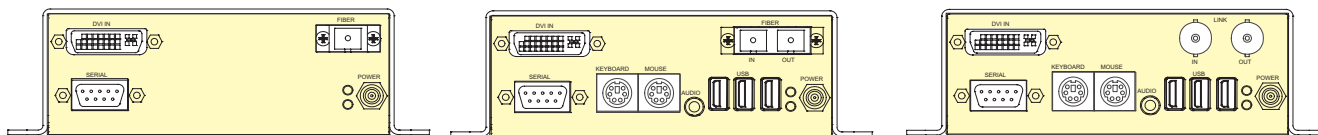
\* With >20dB return loss on fiber interface  
 \*\* Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB

Tx Power/Rx Sensitivity are nominal values  $\pm 1$ dBm  
 Fiber loss = 0.35/0.25dB per km @1310nm/1550nm

**2407DVIT Block Diagram**



### 2407DVIT Side Panels



### Specifications

#### Video Input:

Standards:	DVI 1.0
Number of Inputs:	1
Connectors:	28-pin DVI
Video Resolution:	Up to WUXGA (1920x1200) at 75Hz
Color Resolution:	24 bits

#### Analog Audio Input (A2, A2KM & A2KM-USB-F2 versions):

Number of Inputs:	2
Type:	Balanced analog audio
Connector:	3.5mm female stereo
Impedance:	High Impedance (> 20kΩ)
Frequency Response:	±0.1dB (20Hz to 20kHz)
THD:	< 0.005% (20Hz to 20kHz)
Channel Phase Diff:	< ±1°
SNR:	> 85dB
Maximum Input Level:	+24dBu
Signal Quantization:	24 bits

#### USB, Keyboard/Mouse Input/Output (A2KM & A2KM-USB versions):

Standards:	USB 1.1
Number:	2 (A2KM), 3 (A2KM-USB)
Connector:	1 PS2 for each keyboard & mouse, 1 USB type B (A2KM-USB only)

#### Optical Output:

Number of Outputs:	1
Connector:	Female SC/PC, ST/PC or FC/PC
Wavelengths:	See Ordering Information
Output Power:	See Application Configuration Chart

#### Optical Input (A2KM & A2KM-USB-F2 versions):

Number of Inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Wavelength:	1270 to 1610nm
Maximum Power:	0dBm
Optical Sensitivity:	See Application Configuration Chart

#### Coaxial In/Outputs (-C Versions):

Number of Inputs:	1 (A2KM & A2KM-USB versions only)
Number of Outputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2

#### Electrical:

Voltage:	+12 VDC
Power:	11 Watts

#### Physical:

Diemensions:	
With flanges:	7.81"L x 5.63"W x 1.75"H (199mm L x 143mm W x 45mm H)

#### Compliance:

Electrical Safety:	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive
Laser Safety:	Class 1 laser product Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC directive

### Ordering Information:

<b>2407DVIT13</b>	DVI Fiber Transmitter, 1310nm FP
<b>2407DVIT-C</b>	DVI Transmitter, coaxial connector
<b>2407DVIT13-A2</b>	DVI + 2 Analog Audio Fiber Transmitter, 1310nm FP
<b>2407DVIT-A2-C</b>	DVI +2 Analog Audio Transmitter, coaxial connector
<b>2407DVIT13-A2KM-F2</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Fiber Transmitter, dual fiber, 1310nm TX & RX
<b>2407DVIT13-A2KM-USB-F2</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard Mouse and USB Fiber Transmitter, dual fiber, 1310nm TX & RX
<b>2407DVIT-A2KM-C2</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard & Mouse Transmitter, dual coax, TX & RX
<b>2407DVIT13-A2KM-USB-C2</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard & Mouse and USB coaxial Transmitter, dual coax, TX & RX
<b>2407DVIT15-A2KM-W</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard Mouse Fiber Transmitter, single fiber, 1550nm TX, RX on 1310nm
<b>2407DVIT15-A2KM-USB-W</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse and USB Fiber Transmitter, single fiber, 1550nm TX, RX on 1310nm

### For CWDM, please refer to the end of the fiber section for ordering information

<b>2407DVITxx</b>	DVI Fiber Transmitter, CWDM Laser
<b>2407DVITxx-A2</b>	DVI+ 2 Analog Audio Fiber Transmitter, CWDM Laser
<b>2407DVITxx-A2KM-F2</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Fiber Transmitter, dual fiber, CWDM Laser
<b>2407DVITxx-A2KM-USB-F2</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard Mouse and USB Fiber Transmitter, dual fiber, CWDM Laser

### Ordering Options:

Fiber connector must be specified at time of order  
Eg: Model +SC

### Connector Suffix:

+SC:	SC/PC
+ST:	ST/PC
+FC:	FC/PC

All 2407 models include power supply

The 2407DVIR is a miniature DVI/KVM fiber transmitter for high resolution/high quality video signals. This self-contained module accepts one DVI video input up to WUXGA resolution and transmits it over a single fiber. The 2407DVIR is also available with analog audio, keyboard + mouse and USB options. The companion 2407DVIT DVI/KVM Fiber Receiver demultiplexes the signals and converts them back to digital DVI.

The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm and CWDM transmission schemes.

### Features

- Supports DVI transport over a single or dual fiber or coax (-C version)
- VESA video resolutions supported up to WUXGA
- Full 24 bits per pixel color resolution
- Ideal for use with high resolution LCD, plasma, and projection screens
- Superior digital data transmission
- Rugged small form factor enclosure
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths at 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- Optional 2 channel stereo analog audio
- Optional keyboard + mouse
- Optional USB interface
- BNC and fiber optic input/output versions available

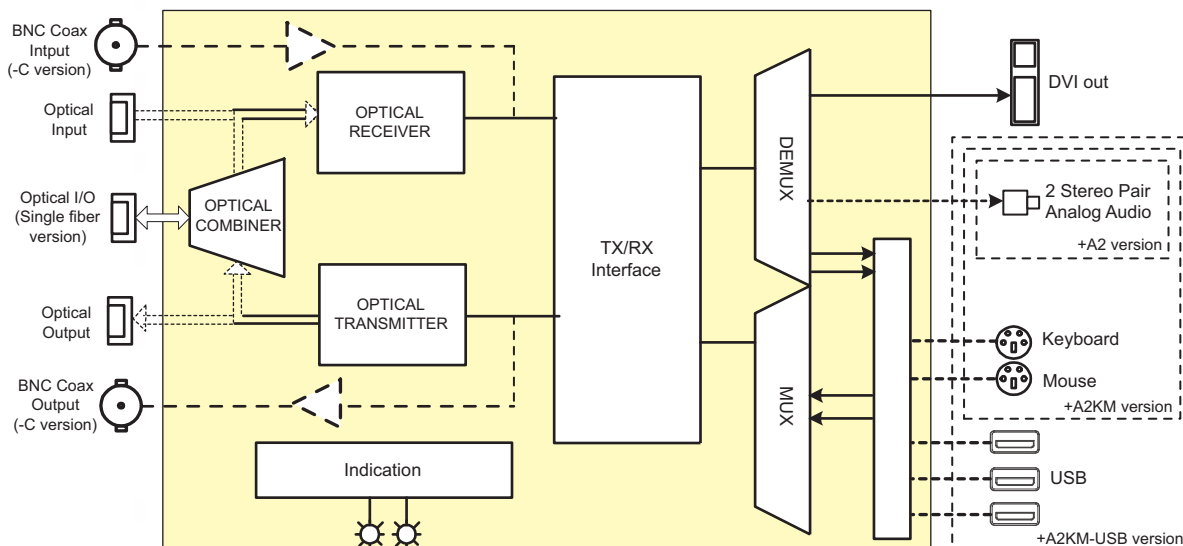
### 2407DVIR Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<500m	2407DVIT13-A2KM-USB-F2	-7dBm	2407DVIR13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	2	12dB/34km	2407DVIT13-A2KM-USB-F2	-7dBm	2407DVIR13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	1	8dB/20km*	2407DVIT15-A2KM-USB-W	-1dBm	2407DVIR13-A2KM-USB-W	-17dBm	1310nm/1550nm WDM bi-directional, one fiber
Single-Mode	1(CWDM)	15.5dB/60km**	2407DVITxx-A2KM-USB-F2	0dBm	2407DVIRyy-A2KM-USB-F2	-19dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**

\* With >20dB return loss on fiber interface  
 \*\* Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB

Tx Power/Rx Sensitivity are nominal values  $\pm 1$ dBm  
 Fiber loss= 0.35/0.25dB per km @1310nm/1550nm

### 2407DVIR Block Diagram

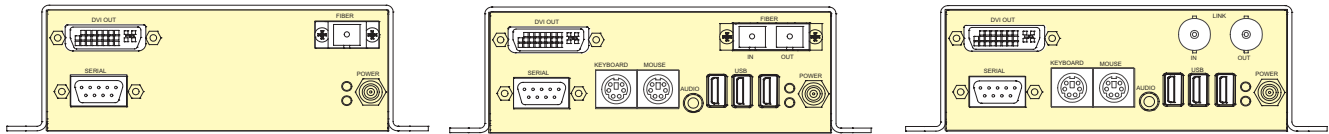




# DVI/KVM Miniature Fiber Receiver

## 2407DVIR

### 2407DVIR Side Panels



#### Specifications

##### Video Input:

Standards:	DVI 1.0
Number of Inputs:	1
Connectors:	28-pin DVI
Video Resolution:	Up to WUXGA (1920x1200) at 75Hz
Color Resolution:	24 bits

##### Analog Audio Input (A2, A2KM & A2KM-USB-F2 versions):

Number of Inputs:	2
Type:	Balanced analog audio
Connector:	3.5mm female stereo
Impedance:	High Impedance (> 20kΩ)
Frequency Response:	±0.1dB (20Hz to 20kHz)
THD:	< 0.005% (20Hz to 20kHz)
Channel Phase Diff:	< ±1°
SNR:	> 85dB
Level:	-20dB to +3dB
Maximum Output Level:	_24dBu into 10kΩ loads

##### USB, Keyboard/Mouse Input/Output (A2KM & A2KM-USB versions):

Standards:	USB 1.1
Number:	2 (A2KM), 5 (A2KM-USB)
Connector:	1 PS2 for each keyboard & mouse, 3 USB type A (A2KM-USB only)

##### Optical Output (A2KM & A2KM-USB-F2 versions):

Number of Outputs:	1
Connector:	Female SC/PC, ST/PC or FC/PC
Wavelengths:	See Ordering Information
Output Power:	See Application Configuration Chart

##### Optical Input (A2KM & A2KM-USB-F2 versions):

Number of Inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Wavelength:	1270 to 1610nm
Maximum Power:	0dBm
Optical Sensitivity:	See Application Configuration Chart

##### Coaxial In/Outputs (-C Versions):

Number of Inputs:	1
Number of Outputs:	1 (A2KM & A2KM-USB versions only)
Connector:	BNC per IEC 60169-8 Amendment 2

##### Electrical:

Voltage:	+12 VDC
Power:	11 Watts

##### Physical:

Diemensions:	
With flanges:	7.81"L x 5.63"W x 1.75"H (199mm L x 143mm W x 45mm H)

##### Compliance:

Electrical Safety:	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive
Laser Safety:	Class 1 laser product Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC directive

#### Ordering Information:

<b>2407DVIR</b>	DVI Fiber Receiver
<b>2407DVIR-C</b>	DVI Receiver, coaxial connector
<b>2407DVIR-A2</b>	DVI + 2 Analog Audio Fiber Receiver
<b>2407DVIR-A2-C</b>	DVI +2 Analog Audio Receiver, coaxial connector
<b>2407DVIR13-A2KM-F2</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Fiber Receiver, dual fiber, 1310nm TX & RX
<b>2407DVIR13-A2KM-USB-F2</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard Mouse and USB Fiber Receiver, dual fiber, 1310nm TX & RX
<b>2407DVIR-A2KM-C2</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard & Mouse Receiver, dual coax, TX & RX
<b>2407DVIR13-A2KM-USB-C2</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard & Mouse and USB coaxial Receiver, dual coax, TX & RX
<b>2407DVIR15-A2KM-W</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard Mouse Fiber Receiver, single fiber, 1550nm TX, RX on 1310nm
<b>2407DVIR15-A2KM-USB-W</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse and USB Fiber Receiver, single fiber, 1550nm TX, RX on 1310nm

#### For CWDM, please refer to the end of the fiber section for ordering information

<b>2407DVIRyy-A2KM-F2</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Fiber Receiver, dual fiber, CWDM Laser
<b>2407DVIRyy-A2KM-USB-F2</b>	DVI/KVM +2 Analog Audio + Bi-di Keyboard Mouse and USB Fiber Receiver, dual fiber, CWDM Laser

#### Ordering Options:

Fiber connector must be specified at time of order  
Eg: Model +SC

#### Connector Suffix:

<b>+SC:</b>	SC/PC
<b>+ST:</b>	ST/PC
<b>+FC:</b>	FC/PC

All 2407 models include power supply

The 2407RGBT is a miniature RGBHV/DVI/KVM fiber transmitter for high resolution/high quality video signals. This self-contained module accepts one analog RGBHV or digital DVI video input up to WUXGA resolution and transmits them over a single or dual fiber or coax. The 2407RGBT is also available with analog audio, keyboard + mouse and USB options. The companion 2407RGBR RGBHV/DVI/KVM Fiber Receiver demultiplexes the signals and converts them back to analog RGBHV and digital DVI.

The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm and CWDM.

### Features

- Supports DVI or RGBHV transport over a single or dual fiber or coax (-C version)
- Both RGBHV and DVI outputs available simultaneously on companion 2407RGBR Receiver
- VESA video resolutions supported up to WUXGA
- Full 24 bits per pixel color resolution
- Ideal for use with high resolution LCD, plasma, and projection screens
- Superior digital data transmission
- Rugged, small form factor enclosure
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths at 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- Optional 2 channel stereo analog audio
- Optional keyboard and mouse
- Optional USB interface
- BNC and fiber optic in/output versions available

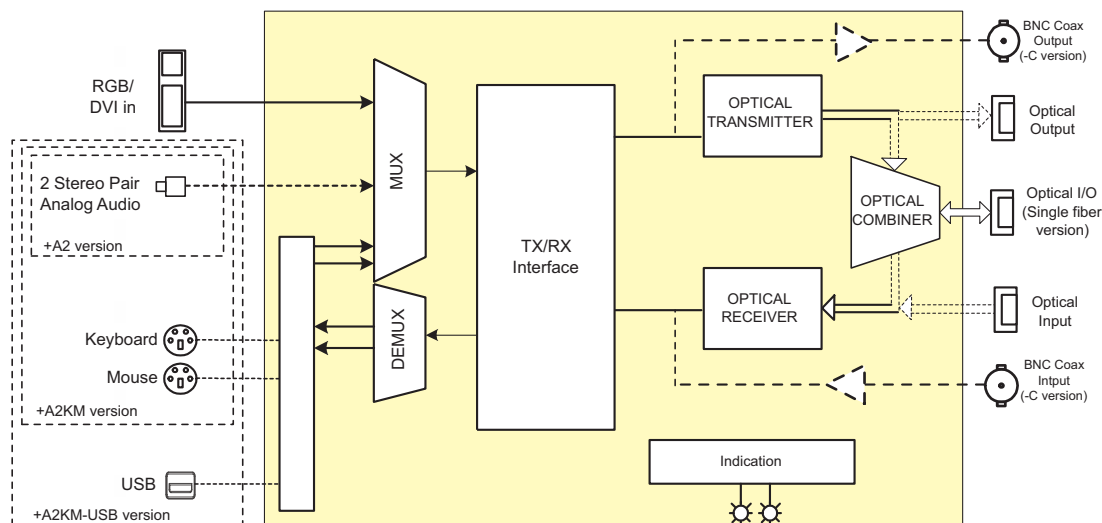
### 7707RGBT Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<500m	2407RGBT13-A2KM-USB-F2	-7dBm	2407RGBR13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	2	12dB/34km	2407RGBT13-A2KM-USB-F2	-7dBm	2407RGBR13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	1	8dB/20km*	2407RGBT15-A2KM-W	-1dBm	2407RGBR13-A2KM-W	-17dBm	1310nm/1550nm WDM bi-directional, one fiber
Single-Mode	1(CWDM)	15.5dB/60km**	2407RGBTxx-A2KM-USB-F2	0dBm	2407RGBRyy-A2KM-USB-F2	-19dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDMux/Demux**

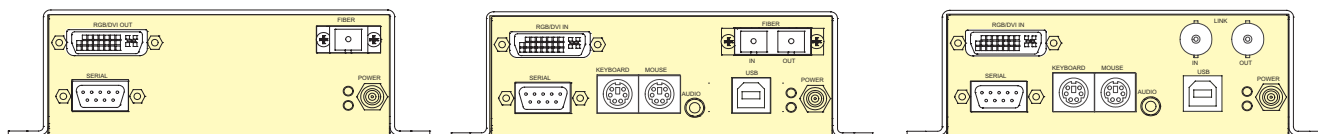
\* With >20dB return loss on fiber interface  
 \*\* Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB

Tx Power/Rx Sensitivity are nominal values  $\pm 1$ dBm  
 Fiber loss= 0.35/0.25dB per km @1310nm/1550nm

### 2407RGBT Block Diagram



### 2407RGBT Side Panels



#### Specifications

##### Video Input:

Standards:	DVI 1.0, VESA
Number of Inputs:	1
Connectors:	28-pin DVI with Analog
Video Resolution:	Up to WUXGA (1920x1200) at 75Hz
Video Bandwidth:	500MHz
Color Resolution:	24 bits
Analog Output Level:	1 Vp-p (maximum)
Analog Output Impedance:	75Ω
Signal/Noise Ratio:	> 55 dB

##### Analog Audio Input (A2, A2KM & A2KM-USB versions):

Number of Inputs:	2
Type:	Balanced analog audio
Connector:	3.5mm female stereo
Impedance:	High Impedance (> 20kΩ)
Frequency Response:	±0.1dB (20Hz to 20kHz)
THD:	< 0.005% (20Hz to 20kHz)
Channel Phase Diff:	< ±1°
SNR:	> 85dB
Maximum Input Level:	+24dBu
Signal Quantization:	24 bits

##### Keyboard/Mouse, USB Input/Output (A2KM & A2KM-USB versions):

Standards:	USB 1.1
Number:	2 (A2KM versions), 3 (USB versions)
Connector:	2 PS2 for keyboard & mouse 1 USB Type B

##### Optical Output:

Number of Outputs:	1
Connector:	Female SC/PC, ST/PC or FC/PC
Wavelengths:	See Ordering Information
Output Power:	See Application Configuration Chart

##### Optical Inputs/Outputs (A2KM & A2KM-USB-F2 versions):

Number of Inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Wavelength:	1270 to 1610nm
Maximum Power:	0dBm
Optical Sensitivity:	See Application Configuration Chart

##### Coaxial Connectors (-C versions):

Number of Inputs:	1 (A2KM & A2KM-USB versions)
Number of Outputs:	1
Connector:	BNC per IEC 60169-8 Amendment 2

##### Electrical:

Voltage:	+12 VDC
Power:	11 Watts

##### Physical:

Diemensions:	
With flanges:	7.81"L x 5.63"W x 1.75"H (199mm L x 143mm W x 45mm H)

##### Compliance:

Electrical Safety:	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive
Laser Safety:	Class 1 laser product Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC directive

#### Ordering Information:

<b>2407RGBT13</b>	RGBHV/DVI Fiber Transmitter, 1310nm FP
<b>2407RGBT-C</b>	RGBHV/DVI Transmitter, coaxial connector
<b>2407RGBT13-A2</b>	RGBHV/DVI + 2 Analog Audio Fiber Transmitter, 1310nm FP laser
<b>2407RGBT-A2-C</b>	RGBHV/DVI + 2 Analog Audio, Transmitter, coax connectors
<b>2407RGBT13-A2KM-F2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Fiber Transmitter, dual fiber, 1310nm TX & RX
<b>2407RGBT13-A2KM-USB-F2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse and USB Fiber Transmitter, dual fiber, 1310nm TX & RX
<b>2407RGBT-A2KM-C2</b>	RGBHV/DVI/KVM + 2 Analog Audio + Bi-di Keyboard and Mouse coaxial Transmitter, dual coax, TX & RX
<b>2407RGBT-A2KM-USB-C2</b>	RGBHV/DVI/KVM + 2 Analog Audio + Bi-di Keyboard and Mouse + USB coaxial Transmitter, dual coax, TX & RX
<b>2407RGBT15-A2KM-W</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Fiber Transmitter, single fiber, 1550nm TX, RX on 1310nm
<b>2407RGBT15-A2KM-USB-W</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse and USB Fiber Transmitter, single fiber, 1550nm TX, RX on 1310nm
<b>For CWDM, please refer to the end of the fiber section for ordering information</b>	
<b>2407RGBTxx</b>	RGBHV/DVI Fiber Transmitter, CWDM DFB laser
<b>2407RGBTxx-A2</b>	RGBHV/DVI+ 2 Analog Audio Fiber Transmitter, CWDM DFB laser
<b>2407RGBTxx-A2KM-F2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Fiber Transmitter, dual fiber, CWDM DFB laser
<b>2407RGBTxx-A2KM-USB-F2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse and USB Fiber Transmitter, dual fiber, CWDM DFB laser

#### Ordering Options:

Fiber Connector must be specified at time of order  
Eg: Model +SC

#### Connector Suffix:

+SC:	SC/PC
+ST:	ST/PC
+FC:	FC/PC

All 2407 models include power supply



The 2407RGR is a miniature RGBHV/DVI/KVM receiver for high resolution/high quality video signals. Available in fiber optic and coaxial versions, this single card module accepts an input from the companion 2407RGT RGBHV/DVI/KVM Transmitter and outputs both analog RGBHV and digital DVI video. The 2407RGR is also available with analog audio, keyboard + mouse and USB options.

The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm and CWDM.

## Features

- Supports DVI or RGBHV transport over a single or dual fiber or coax (-C version)
- Both RGBHV and DVI outputs available simultaneously
- VESA video resolutions supported up to WUXGA
- Full 24 bits per pixel color resolution
- Ideal for use with high resolution LCD, plasma, and projection screens
- Superior digital data transmission
- Rugged, small form factor enclosure
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths at 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- Optional 2 channel stereo analog audio
- Optional keyboard and mouse
- Optional USB interface
- BNC and fiber optic in/output versions available

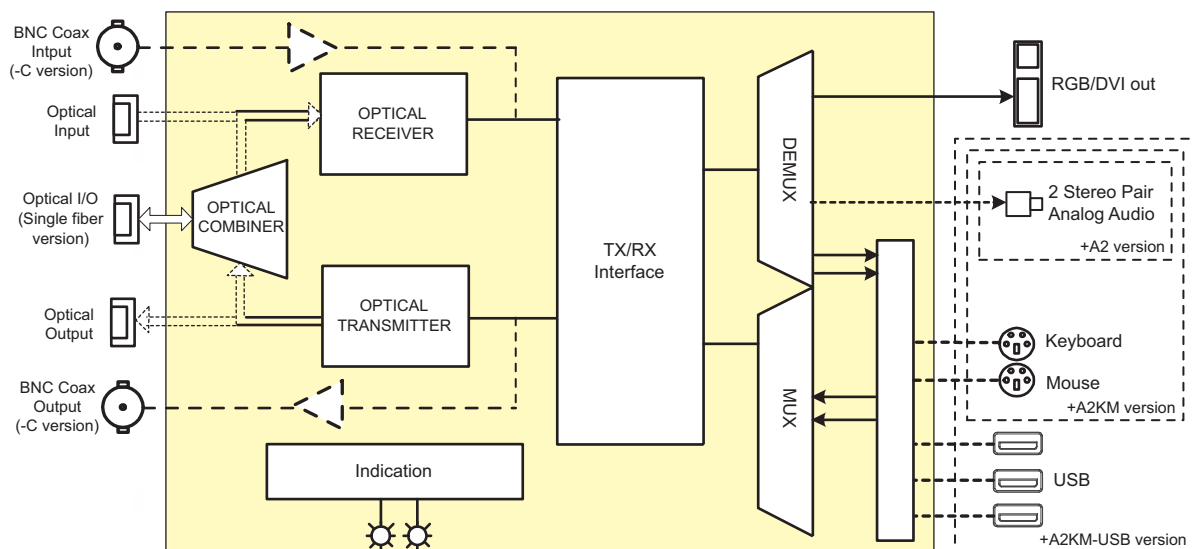
## 7707RGR Application Configurations

FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<500m	2407RGT13-A2KM-USB-F2	-7dBm	2407RGR13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	2	12dB/34km	2407RGT13-A2KM-USB-F2	-7dBm	2407RGR13-A2KM-USB-F2	-19dBm	1310nm on Tx & Rx fibers
Single-Mode	1	8dB/20km*	2407RGT15-A2KM-W	-1dBm	2407RGR13-A2KM-W	-17dBm	1310nm/1550nm WDM bi-directional, one fiber
Single-Mode	1(CWDM)	15.5dB/60km**	2407RGTxx-A2KM-USB-F2	0dBm	2407RGRyy-A2KM-USB-F2	-19dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDMux/Demux**

\* With >20dB return loss on fiber interface  
 \*\* Assumes 8 Ch CWDM Mux/Demux loss of 3.5dB

Tx Power/Rx Sensitivity are nominal values  $\pm 1$ dBm  
 Fiber loss= 0.35/0.25dB per km @1310nm/1550nm

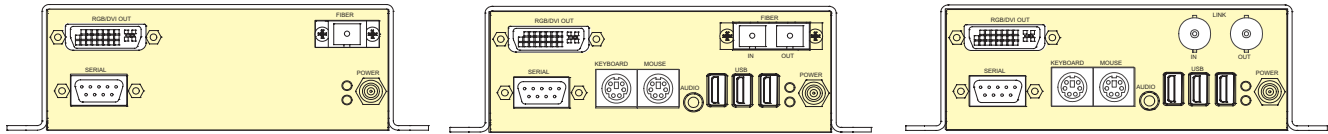
## 2407RGR Block Diagram



# RGBHV/DVI/KVM Miniature Fiber Receiver

## 2407RGBR

### 2407RGBR Side Panels



#### Specifications

##### Video Output:

Standards:	DVI 1.0, VESA
Number of Inputs:	1
Connectors:	28-pin DVI with Analog
Video Resolution:	Up to WUXGA (1920x1200) at 75Hz
Video Bandwidth:	500MHz
Color Resolution:	24 bits
Analog Output Level:	1 Vp-p (maximum)
Analog Output Impedance:	75Ω
Signal/Noise Ratio:	> 55 dB

##### Analog Audio Output (A2, A2KM & A2KM-USB versions):

Number of Inputs:	2
Type:	Balanced analog audio
Connector:	3.5mm female stereo
Impedance:	High Impedance (> 20kΩ)
Frequency Response:	±0.1dB (20Hz to 20kHz)
THD:	< 0.005% (20Hz to 20kHz)
Channel Phase Diff:	< ±1°
SNR:	> 85dB
Level:	+20dBu to +3dB
Maximum Output Level:	+24dBu into 10kΩ loads

##### Keyboard/Mouse, USB Input/Output (A2KM & A2KM-USB versions):

Standards:	USB 1.1
Number:	2 (A2KM versions), 5 (USB versions)
Connector:	2 PS2 for keyboard & mouse 3 USB Type A

##### Optical Input:

Number of Inputs:	1
Connector:	Female SC/PC, ST/PC or FC/PC
Operating Wavelength:	1270nm - 1610nm
Max Input Power:	0dBm
Optical Sensitivity:	See Application Configuration chart

##### Optical Output (A2KM & A2KM-USB-F2 versions):

Number of Outputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Wavelengths:	See Ordering Information
Power:	See Application Configuration Chart

##### Coaxial Connectors (-C versions):

Number of Inputs:	1
Number of Outputs:	1 (A2KM & A2KM-USB versions)
Connector:	BNC per IEC 60169-8 Amendment

##### Electrical:

Voltage:	+12 VDC
Power:	11 Watts

##### Physical:

Dimensions:	
With flanges:	7.81"L x 5.63"W x 1.75"H (199mm L x 143mm W x 45mm H)

##### Compliance:

Electrical Safety:	CSA Listed to UL 60065-03, IEC 60065 Complies with CE Low voltage Directive Class 1 laser product Complies with 24 CFR 1040.10 and 1040.11 IEC 60825-1
Laser Safety:	Complies with FCC Part 15, Class A EU EMC directive
EMI/RFI:	

#### Ordering Information:

<b>2407RGBR</b>	RGBHV/DVI Fiber Receiver
<b>2407RGBR-C</b>	RGBHV/DVI Receiver, coaxial connectors
<b>2407RGBR-A2</b>	RGBHV/DVI +2 Analog Audio Fiber Receiver
<b>2407RGBR-A2-C</b>	RGBHV/DVI +2 Analog Audio Receiver, coaxial connectors
<b>2407RGBR13-A2KM-F2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Fiber Receiver, dual fiber, 1310nm TX & RX
<b>2407RGBR13-A2KM-USB-F2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse + USB, Fiber Receiver, dual fiber, 1310nmTX & RX
<b>2407RGBR-A2KM-C2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Coaxial Receiver, dual coax, TX & RX
<b>2407RGBR-A2KM-USB-C2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse + USB coaxial Receiver, dual coax, TX & RX
<b>2407RGBR13M-A2KM-W</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Fiber Receiver, single fiber, 1310nm RX, TX on 1550nm
<b>2407RGBR13M-A2KM-USB-W</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse + USB Fiber Receiver, single fiber, 1310nm RX, TX on 1550nm
<b>For CWDM, please refer to the end of the fiber section for ordering information</b>	
<b>2407RGBRyy-A2KM-F2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse Fiber Transmitter, dual fiber, CWDM DFB laser
<b>2407RGBRyy-A2KM-USB-F2</b>	RGBHV/DVI/KVM +2 Analog Audio + Bi-di Keyboard and Mouse and USB Fiber Transmitter, dual fiber, CWDM DFB laser

#### Ordering Options:

Fiber Connector must be specified at time of order  
Eg: Model +SC

#### Connector Suffix:

<b>+SC:</b>	SC/PC
<b>+ST:</b>	ST/PC
<b>+FC:</b>	FC/PC

All 2407 models include power supply



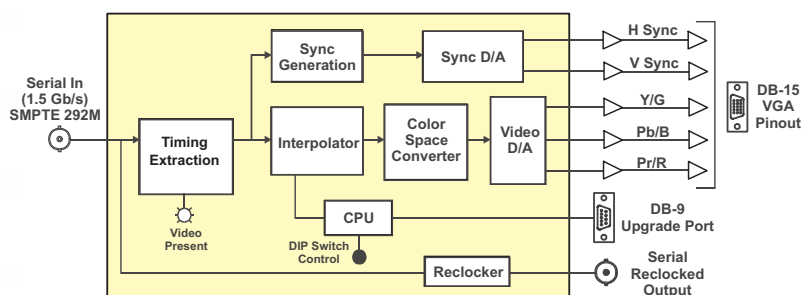
The 2430DAC-HD is a professional quality digital to analog converter for HDTV. The 2430DAC-HD supports all signal standards specified in SMPTE 240M, SMPTE 274M and SMPTE 296M.

DIP switch control allows the user to select between YPrPb, RGB or VGA style analog outputs with a variety of sync output options. User controlled 4:3 alignment markers also allow for convenient framing of the video signal. With the optionally supplied VGA to BNC breakout cable the 2430DAC-HD can easily interface to either standard broadcast monitors or VGA computer monitors.

### Features

- Support for all SMPTE 240M, 274M and 296M video formats
- 4:3 alignment markers
- Full 10 Bit Broadcast quality
- 4:4:4 interpolated component output
- DIP switch selectable YPrPb, RGB or VGA outputs with bi-level or tri-level sync
- 15 pin VGA connector for use with VGA computer monitors
- Front panel LEDs indicate video presence, module faults

### 2430DAC-HD Block Diagram



### Specifications

#### Serial Video Input:

##### Standard:

SMPTE 292M (1.485 Gb/s)  
SMPTE 240M (1035i)  
SMPTE 274M (1080i, 1080psF, 1080p (except 1080p/60 & 1080p/59.94))  
SMPTE 296M (720p)  
1 BNC per IEC 60169-8 Amendment 2  
Automatic 125m @ 1.5Gb/s with Belden 1694A (or equivalent)

#### Connector:

##### Equalization:

#### Serial Video Output Reclocked:

##### Standard:

Same as input

##### Number of Outputs:

1

##### Connector:

BNC per IEC 60169-8 Amendment 2

##### Signal Level:

800mV nominal

##### DC Offset:

0V  $\pm$  0.5V

##### Rise and Fall Time:

200 ps nominal

##### Overshoot:

<10% of amplitude

##### Wide Band Jitter:

<0.2UI

#### Analog Video Outputs:

##### Standard:

SMPTE 240M, 274M or 296M - same as input

##### Connector:

15 pin high density female D type

##### Signal Level:

###### Video:

1Vpp nominal YPrPb/RGB or 0.7Vpp nominal VGA

###### Sync:

300mV or 4V

##### Impedance:

75 $\Omega$

##### DC Offset:

0V  $\pm$  0.1V

##### Return Loss:

> 45 dB up to 30 MHz

#### Upgrade Port:

##### Standard:

RS-232

##### Connector:

Female DB-9

##### Baud Rate:

57600

##### Format:

8-bits, no parity, 1 stop bits

#### Electrical:

##### Voltage:

+12V DC

##### Power:

6 Watts

##### Safety:

Complies with EU safety directive

##### EMI/RFI:

Complies with FCC Part 15 Class A

EU EMC Directive

#### Physical:

##### Dimensions:

6" L x 3.5" W x 1" H  
(152mm L x 89mm W x 25mm H)

##### With Mounting Flanges:

6" L x 4" W x 1" H  
(152mm L x 114mm W x 25mm H)

##### Weight:

0.5 lbs. (0.28 Kg)

#### Ordering Information:

##### 2430DAC-HD

HD Miniature D to A: YPrPb/RGB/VGA via High Density DB-15 (with power supply)

**Note:** Enclosure with side mount flanges ships standard

#### Ordering Options:

##### Case Option Suffix

###### +NF

Enclosure without mounting flanges

#### Accessories:

##### WPVGABNC5

VGA to BNC - 6' Monitor Adapter Cable



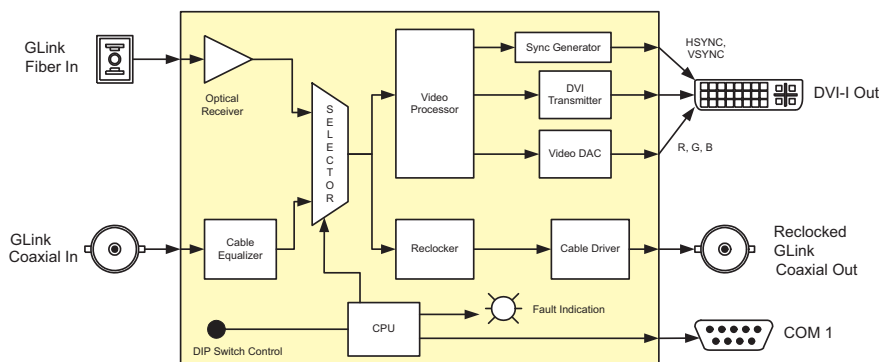
The 2430GDAC GLink D to A Converter provides a simple extension to Evertz multi-display systems by converting a GLink video signal over coaxial or fiber optic cable into a digital DVI signal and analog RGB signal that can be displayed on a computer monitor or flat panel screen, thereby eliminating the 5m distance limit of DVI signals. The converter features one GLink fiber optic input, one GLink coaxial input, one reclocked GLink coaxial output, and one DVI-I video output. The 2430GDAC has been designed for use with any Evertz module featuring a GLink output. (For example, the MVP™ 3000MVP-PPMG output module)

The 2430GDAC-WARP features the same I/O specifications as the standard 2430GDAC but also provides the added capability of “warping” or flipping the output display from landscape mode (16:9) to portrait mode (9:16). The 2430GDAC-WARP rotates the output display 90° counter clockwise. This is ideal for space limited applications.

### Features

- Display resolution capability up to HD (1920 X 1080) at 60Hz or 50Hz refresh rate
- DVI-I digital and analog RGB video output
- Autodetection of display resolution with manual override.
- One reclocked GLink coaxial output for connection to a second 2430GDAC or other GLink-compatible products
- Standard landscape display (2430GDAC) or portrait display support (2430GDAC-WARP)
- Autodetection of GLink signal loss
- Operation with single-mode or multi-mode fiber optic cable
- SC/PC, ST/PC, or FC/PC fiber connector options
- Low power +12VDC operation

### 2430GDAC Block Diagram



### Specifications

#### Coaxial GLink Input:

**Connector:** BNC per IEC 60169-8 Amendment 2  
**Equalization:** Automatic up to 10m

#### Fiber GLink Input:

**Connector:** SC/PC, ST/PC, or FC/PC female housing  
**Maximum Input Power:** -3dBm  
**Wavelength:** 1310 nm to 1610nm  
**Optical Sensitivity:** -25dBm  
**Fiber Size:** 62µm core / 125µm overall

#### Re-clocked Coaxial GLink Output:

**Connector:** BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 750mV minimum

#### Video Output:

**Connector:** DVI-I (digital + analog)  
**Output Resolution:** Up to HD (1920 x 1080) @ 60Hz or 50Hz maximum

#### DVI Digital Video Output:

**Voltage Swing:** 400mV minimum  
**Output Clock Jitter:** 150ps maximum  
**Differential Skew:** 50ps maximum

#### RGB Analog Video Output:

**Signal Level:**  
**Video:** 1Vpp nominal RGB  
**Sync:** 4V  
**Impedance:** 75Ω  
**DC Offset:** 0V ±0.5V

#### Electrical:

**Voltage:** +12VDC nominal  
**Power:** Auto ranging 100-240VAC 10 Watts (power adapter included)

#### Safety:

ETL Listed  
 Complies with EU safety directive  
 Complies with FCC Part 15 Class A  
 EU EMC Directive

#### Physical:

**Dimensions:** 7.2" L x 4.3" W x 1.0" H  
 (166mm L x 110mm W x 26mm H)  
**With mounting flanges:** 7.2" L x 5.3" W x 1.0" H  
 (166mm L x 136mm W x 26mm H)  
**Weight:** 0.85 lbs. (0.38 kg)

#### Ordering Information:

<b>2430GDAC</b>	<b>GLink to DVI converter</b>
<b>2430GDAC-WARP</b>	<b>GLink to DVI converter with WARP (provides landscape to portrait display orientation conversion support)</b>

**Note:** Enclosure with side mount flanges ships standard

Fiber Connector must be specified at time of order  
 Eg: Model +SC

#### Connector Suffix

<b>+SC</b>	SC/PC
<b>+ST</b>	ST/PC
<b>+FC</b>	FC/PC

#### Ordering Options:

<b>Case Option Suffix</b>	
<b>+NF</b>	Enclosure without mounting flanges

The 2410MD-HSN Monitoring Downconverter provides an inexpensive method of confidence monitoring your 1.5 Gb/s HD signals on standard definition monitors. This High Definition Downconverter is ideal to use with your existing standard resolution monitors whether they have Composite Analog or Serial Digital inputs. The 2410MD-HSN accepts 1080i/1080psF and 720p and provides a fixed output frame rate (selectable to 50 or 60Hz) regardless of the input 720/1080 rate. Pedestal is selectable on/off when output is NTSC.

In segmented frame mode, the 2410MD-HSN down converts the 1080p/24sF input video to 525i/60 with a 3:2 pulldown or 625i/50 with a 24:25 pulldown. The 2410MD-HSN repeats fields to create the 3:2 or 24:25 pulldown of the picture content with a random pulldown cadence on the downconverted output.

## Features

### Indicator LED:

- Signal presence
- Module Status

### Down-conversion Format:

- Letter Box
- Side Crop
- 4x3 Squeeze
- On screen markers show 4:3 aspect ratio and safe area

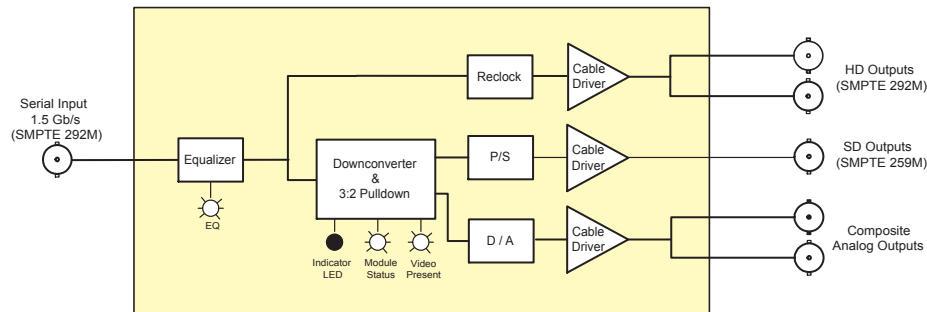
### Input:

- Serial digital 1.5 Gb/s HD
- SMPTE 292M Standards: 1080i/60, 1080i/59.94, 1080i/50, 720p60 & 720p/59.94, 1080p/24sF, 1080i/23.98sF & 1080p/25sF

### Output:

- 2 HD 1.5Gb/s reclocked outputs
- 2 NTSC down converted outputs
- 1 SD down converted output

## 2410MD-HSN Block Diagram



## Specifications

### Serial Video Input:

**Standard:** SMPTE 292M, 1080i/60, 1080i/59.94, 1080i/50, 1080p/24sF, 1080p/23.98sF, 1080/25sF, 720p60 & 720p/59.94,  
**Connector:** 1 BNC per IEC 60169-8 Amendment 2  
**Impedance:** 75Ω  
**Equalization:** Automatic 75m @ 1.5Gb/s with Belden 1694A (or equivalent)

### HD Reclocked Video Output:

**Standard:** Same as input  
**Connectors:** 2 BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 200ps nominal  
**Overshoot:** <10% of amplitude  
**Wide Band Jitter:** < 0.2 UI

### SD Serial Digital Video Output:

**Standard:** Serial component 270Mb/s (SMPTE 259M-C)  
 525i/59.94 or 625i/50 Dip Switch selectable  
**Connectors:** 1 BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 740ps nominal  
**Overshoot:** <10% of amplitude  
**Return Loss:** > 15 dB  
**Wide Band Jitter:** < 0.2 UI

### Analog Video Output:

**Standard:** Analog composite NTSC or Analog composite PAL Dip Switch selectable  
**Connectors:** 2 BNC per IEC 60169-8 Amendment 2  
**Signal Level:** 1 V p-p nominal, internally adjustable  
**DC Offset:** 0V ±0.1V  
**Return Loss:** > 45 dB up to 6 MHz  
**Impedance:** 75Ω

### Electrical:

**Voltage:** +12V DC  
**Power:** 10 Watts  
**Safety:** Complies with EU safety directive  
**EMI/RFI:** Complies with FCC Part 15 Class A EU EMC Directive

### Physical:

**Dimensions:** 6" L x 4" W x 1" H  
 (152mm L x 115mm W x 25mm H)  
**Weight:** 0.5 lbs (0.28Kg)

### Ordering Information:

**2410MD-HSN:** HD Miniature Monitoring Downconverter with 24sF processing (with power supply)

**Note:** Enclosure with side mount flanges ships standard

### Ordering Options:

**Case Option Suffix**  
**+NF** Enclosure without mounting flanges



The PKG7700MFOS Single and Dual Case Systems are portable fiber solutions which transmit various signals point to point via fiber. The single system includes a single Mobile Transit Case, 7700FR-C 3RU Multiframe, single Breakout Cable and a 300 meter fiber Cable Reel. The dual system includes (2) Mobile Transit Cases, (2) 7700FR-C 3RU Multiframes, (2) Breakout Cables and a single 300m Fiber Cable Reel. Both systems support multiple wavelengths over a single fiber and are fully bi-directional. Wavelength operation includes WDM, CWDM and DWDM support.

Key features include remote monitoring & control of all 77xx VistaLINK® enabled cards via SNMP. Evertz VistaLINK® monitoring software offers confidence monitoring for mission critical field applications.

The 7700FR-C frame included in the system utilizes any Evertz 77xx series card. Additional options for the PKG7700MFOS system include redundant power supplies for the 7700FR-C frames, Anton Bauer Quad Battery Holder, and the 7700PCO AC/DC Power Changeover Unit.

### Signal Types Supported:

**NOTE:** All 77xx fiber cards interfacing with the MBL-IRCBP-TAC4-3-ST or MBL-FS3H-TAC4-3-ST must be ordered with ST/PC connectors for PKG7700MFOS system applications.

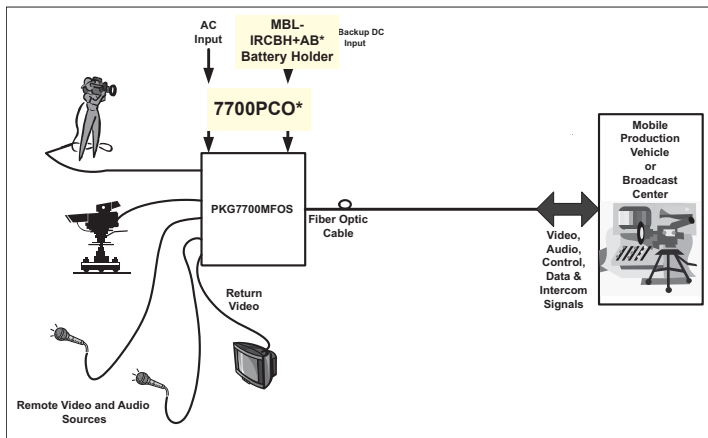
- SD-SDI, HD-SDI, Analog video, DVB-ASI
- AES Audio, Analog Audio, Dolby E Audio
- RS-232/422, GPI, GPO
- 10/100 Mbps, Gigabit Ethernet and Fiber Channel
- L-Band R.F. & 70/140 MHz I.F.
- DS-3/E3, T1/E1, Sonet OC3/12
- RTS & Clear-Com Intercom

### Features

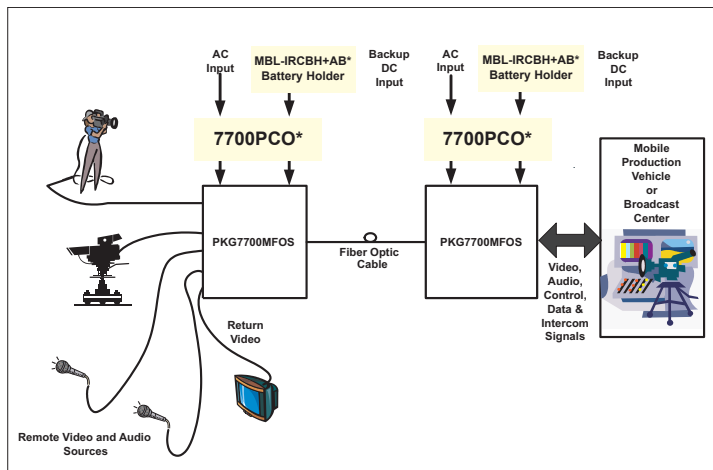
- Ideal for mobile productions
- Capacity for multiple wavelengths over single fiber using WDM, CWDM or DWDM
- Fully bi-directional
- Immune to Interference and electromagnetic hum
- Multiple signal type support
- SNMP monitoring via VistaLINK®
- Easy to set up and use - replaces bulky cable harnesses
- TAC-4 single mode cables with hermaphroditic connectors
- Evertz frames utilize any Evertz 77xx series
- Optional redundant 7700PCO (Power changeover) unit for AC/DC backup
- Optional Anton Bauer quad battery holder for Evertz 7700PCO
- Optional breakout cable Delphi Hermaphroditic TAC4 to ST/PC with mounting plate (only for single case system)



**PKG7700MFOS Typical Application Diagram**



**PKG7700MFOS Typical Application Diagram**



**PKG7700MFOS-2 Typical Application Diagram**

**Ordering Information :**

**PKG7700MFOS:**

**Includes:**

- 1 x 7700FR-C
- 1 x MBL-IRC-420
- 1 x MBL-IRCBP-TAC4-3-ST
- 1 x MBL-FCR-TAC4-300

Mobile Fiber Optic System - Single Case

- 3RU Multiframe with power supply and rear plate
- Mobile Transit Case
- Breakout Cable Delphi Hermaphraditic TAC4 to ST/PC, 1 meter
- Cable Reel with 300 meters of cable

**PKG7700MFOS-2:**

**Includes:**

- 2 x 7700FR-C
- 2 x MBL-IRC-420
- 2 x MBL-IRCBP-TAC4-3-ST
- 1 x MBL-FCR-TAC4-300

Mobile Fiber Optic System - Dual Case

- 3RU Multiframe with power supply and rear plate
- Mobile Transit Case
- Breakout Cable Delphi Hermaphraditic TAC4 to ST/PC, 1 meter
- Cable Reel with 300 meters of cable

**Ordering Options:**

**7700PS**

Redundant power supply

**7700PCO**

AC/DC Power Changeover Unit

**MBL-FCR-TAC4-400**

Cable Reel and 400m TAC4, SMF fiber, Hermaphraditic Connectors

**MBL-FCR-TAC4-450**

Cable Reel and 450m TAC4, SMF fiber, Hermaphraditic Connectors

**MBL-FCR-TAC4-500**

Cable Reel and 500m TAC4, SMF fiber, Hermaphraditic Connectors

**MBL-FCR-TAC4-600**

Cable Reel and 600m TAC4, SMF fiber, Hermaphraditic Connectors

**MBL-IRCBH+AB**

Anton Bauer Quad Battery Holder for Evertz 7700PCO

**MBL-IRC-420**

Impact Resistant Transit Case

**MBL-IRCBP-TAC4-3-ST**

Breakout cable, Hermaphraditic TAC4 to ST/PC, plastic receptacle with mounting plate

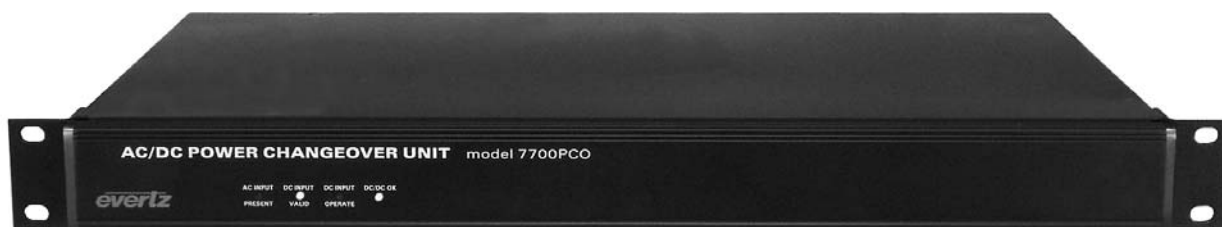
**MBL-FS3H-TAC4-3-ST**

Breakout cable, Hermaphraditic TAC4 to ST/PC, metal receptacle with monitoring plate, SM, 3 foot length

**Options:**

**7700PS**

Redundant power supply



The 7700PCO is a 1 rack-unit high rack frame designed to fit into a standard 19-inch rack. Special care was taken during the design process to ensure that the unit meets the demanding needs of professional video users and applications. It is intended to be used only with Evertz's line of 7700 Multiframe to provide reliable and high quality back-up power switching. This is ideal for remote applications where main power can be intermittent or where a program feed must be guaranteed at all times.

### Features

- Seamless, auto switching to external DC supply in case of AC failure
- Standard AC input cord
- Fused DC input on terminal block
- Direct output connection to 7700 frame power supplies
- Dual power outlets to 7700 frame
- Front panel status LED's
- 30 minutes operation on fully loaded 7700 frame (200 Watt) with dual Anton Bauer Hytron 100 batteries (requires quad battery holder), 60 minutes operation on 100 Watt load (7700 frame about half full dependent on card types)

### NOTE:

Operation times dependent upon type of battery used.  
Operation times will vary

### Specifications

#### Electrical:

#### Power Supply

**Configuration:** Input A: Auto ranging, 95 ⇄ 264 VAC, 47-63 Hz  
Input B: 10 ⇄ 18 VDC

**Output:** 115 ⇄ 370 VDC

#### Maximum Output

**Power Dissipation:** 300 Watts

**Fuse:** DC input fuse - rated for 32V min. at 40 amps

**Status Indicators:** AC Input Present LED (green)  
Valid DC Present LED (green)  
DC Operate LED (green)  
DC/DC OK LED (green)

**Temperature:** 0 ⇄ 55°C ambient

#### Physical

**Height:** 1.75"H x 19"W x 11.2"D  
(44.5 mm x 483mm x 285mm)

**Weight:** Approx. 7 lbs (3.2 Kg)

#### Ordering Information:

**Note:** Enclosure with side mount flanges ships standard

**7700PCO** Power Changeover Unit

#### Ordering Options:

**IRCBH+AB** Anton Bauer Quad Battery Holder



The Evertz Camera Adapter system provides a versatile fiber-optic enabled accessory to Sony HDW/F900, Panasonic Varicam High Definition and Sony Standard definition camcorders. There are three components to the system; each linked via fiber optic cable.

The Camera adapter and Base Stations are available in several models to support a wide variety of cameras as shown below

Camera		Camera Adapter Model	Base Station Model
Manufacturer	Models		
Panasonic	HDC-27	ECAP-HD	ECB-HD
Sony	HDW-750, HDW-F900	ECAS-HD	ECB-HD
Sony	DVW series, DVW series, IMX series	ECAS	ECB

The non-fiber version of the camera-back adapter for the Sony HD cameras, and the fiber enabled high definition versions operating as a stand-alone units, provide HDSDI with embedded audio and time code, NTSC/PAL, SDI and IEEE1394A downconverted video, and 2 analog audio inputs for channels 3 and 4 (on Sony models). The standard definition camera-back adapters provide SDI with embedded audio and time code, NTSC/PAL and IEEE1394A video and 2 analog audio inputs for channels 3 and 4.

When the fiber enabled HD camera adapters are connected to the ECB-HD base station the camera video is transported to the base over fiber and broken out to HDSDI video with embedded audio and time code, analog or AES audio, LTC, NTSC/PAL, SDI and IEEE1394A downconverted video with time code. The base station has inputs for return HDSDI, NTSC/PAL, 4 channels of analog or AES audio, genlock, time code and IFB. The fiber also transports bi-directional RTS intercom, camera remote control (with viewfinder menus), and contact closure tallies. Standard definition models provide similar functionality except for the downconverter.

When the Camera power option is installed in the base station (-CP versions), the base station can send DC power over a hybrid copper/fiber optic cable to the camera adapter. This DC voltage is converted to battery voltage by the ECA-PS power module, which mounts on the camera adapter in place of a battery. When power is sent down the hybrid cable, the camera and accessories can be powered AT a distance up to 2km.

### Features

#### Camera-Back Adapter - Standalone and Non-Fiber Features:

- Sony models - connect directly to camera multi-pin connector, serial digital video output with embedded camera time code and audio
- Panasonic models connect to serial digital output from camera - extra serial digital outputs
- Serial digital video input for connecting to "pool feeds"
- NTSC/PAL camera video out (On HD models, downconverted and aspect ratio converted - supports 4:3 center crop, anamorphic squeeze or 16:9 letter box)
- Auxiliary serial digital output switchable as second output from camera, (or downconverter on HD models)
- Sony models embed camera time code and audio on serial digital outputs
- IEEE 1394 port for output and control of DV devices
- Sony models have inputs for audio 3 & 4 selectable as Line, Microphone (with phantom power) or AES
- Draws power from camera supply (battery connector or 4 pin XLR)
- Sony models available with Sony/IDX, PAG or Anton-Bauer battery connectors
- Panasonic models available with Sony/IDX or Anton-Bauer battery connectors
- 12 VDC accessory power outlet
- On Screen Display menu system

#### Additional Features when connected to Base Station:

- Serial digital return video available on Aux SDI output
- 4 channels of AES or Analog Return Audio
- NTSC/PAL Return Video
- Tri-level or bi-level genlock return to camera
- LTC to and from camera
- Camera control from control panel connected to base station (camera menu video input on Sony models)
- 2 channel Intercom - 5-pin XLR headset connector at camera adapter, RTS belpack connection at base station
- IFB return channel to camera adapter
- Piezo electric speaker with volume control for intercom monitoring
- RS-422/232 channel to base station
- 4 GPI/O channels simple control or tally between camera and base station - 2 each direction
- Status LEDs for SDI and NTSC/PAL return video, Intercom Talk and Fiber Link OK
- Available with LEMO 3K or Fischer 1053 HDTV series fiber-optic connector - contact factory for other connector options



### Features..cont'd

#### Base Station Features:

- Camera serial digital video output
- Return serial digital video input
- NTSC/PAL camera video out (On HD models, downconverted and aspect ratio converted - supports 4:3 center crop, anamorphic squeeze or 16:9 letter box modes)
- HD models have serial digital output from downconverter
- 4 channels of analog audio and AES out (de-embedded from camera serial digital video)
- IEEE 1394 port for output and control of DV devices
- Remote control to camera (camera luminance video output with menus on Sony models)
- NTSC/PAL Return Video In
- Genlock In (Analog black burst or Tri-level)
- 4 channels of analog audio or AES in (return audio to camera adapter - selectable)
- Support for RTS intercom - belt pack 3 pin XLR interface
- IFB return input to camera adapter
- RS-422/232 channel to camera adapter
- 4 GPI/O channels simple control or tally between camera and base station - 2 each direction
- LTC In to camera from external Time code generator
- LTC Out from camera Time code generator
- Front panel control via pushbuttons and LED display
- Status LEDs for Camera Video, Audio and Time code present, Return video, audio and time code, genlock, intercom, IFB present, and fiber links OK
- Status LEDs for camera power ON and Ground Fault on CP versions
- 1 rack unit main frame with 1 rack unit audio breakout panel
- Auto-ranging 90-250VAC 50/60 Hz power supply
- Optional high voltage DC supply to send camera power to ECA-PS power converter (-CP version)
- Front panel power switches for Base power and Camera power (-CP versions)
- Available with LEMO 3K or Fischer 1053HDTV series fiber-optic connector - contact factory for other connector options
- Ethernet port for network upgrade + configuration

### Ordering Information:

#### CAMERA ADAPTER (Must specify Battery Bracket option)

For Sony HD Cameras with 50 pin connector (HDW-750, HDW-F900, etc.):

ECAS-HD	Camera Adapter for high definition Sony cameras
ECAS-1394-HD	Camera Adapter with 1394A I/O for high definition Sony cameras
ECAS-1394-LEMO-HD	Camera Adapter with 1394A I/O and fibre optic I/O for high definition Sony cameras - LEMO fiber connector

For Sony SD Cameras with 40 pin connector (DNW7, DVW700, MSW900, etc.):

ECAS	Camera Adapter for standard definition Sony cameras
ECAS-1394	Camera Adapter with 1394A I/O for standard definition Sony cameras
ECAS-1394-LEMO	Camera Adapter with 1394A I/O and fiber optic I/O for standard definition Sony cameras

For Panasonic HD Cameras with HDSDI output (AJ-HDC20A, AJ-HDC27 Varicam, etc.):

ECAP-HD	Camera Adapter for high definition Panasonic cameras
ECAP-1394-HD	Camera Adapter with 1394A I/O for HD Panasonic cameras
ECAP-1394-LEMO-HD	Camera Adapter with 1394A I/O and fibre optic I/O for HD Panasonic cameras - LEMO fiber connector

Power Converter (Must specify same Battery Bracket option as Camera Adapter):

ECA-PS	Camera Adapter DC-DC Power Converter - or use with camera adapters with fiber optic I/O and Base Stations with Camera Power output (CP version) 160 Watts.
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#### Base Station:

(Must Specify same Fiber Optic connector as Camera Adapter)

ECB-LEMO	Base Station for SD camera adapters - LEMO fiber connector
ECB-CP-LEMO	Base Station for SD camera adapters - with DC camera power (requires ECA-PS Power Converter) - LEMO fiber connector
ECB-LEMO-HD	Base Station for HD camera adapters - LEMO fiber connector
ECB-CP-LEMO-HD	Base Station for HD camera adapters - with DC camera power (requires ECA-PS Power Converter) - LEMO fiber connector

#### Ordering Options:

##### Battery Bracket Options:

(Must specify for Camera adapters and ECA-PS power converter)

+AB	Bracket for Anton Bauer batteries
+IDX	Bracket for IDX V-mount batteries
+PAG	Bracket for PAGlok batteries

##### Fiber Optic Connector Options:

Camera adapters and base stations are also available with the following fiber connectors:

Fischer 1053 HDTV series

(Contact factory for ordering information and availability)

#### Accessories:

ECAS-ACC-MNT	Accessory mounting bracket for wireless microphone, studio viewfinder, etc
ECAS-PAN-MNT-KIT	Mounting kit to use Sony HD camera adapter with Panasonic camera
WPECA-PS-PWR-RA	ECAS-PS power input cable
WPECA-REM-SONY8P	ECAS to Sony 8 pin remote cable
WPECA-REM-PAN6P	ECAP to Panasonic 6 pin remote cable
WPECB-ECB-PAN6P	ECB to Panasonic EC3 adapter cable

"Specifications subject to change without notice"

For further detailed information contact factory



The Evertz HD9690 & HD9690-444 Graticule Generators are multi format High Definition video graticule generators that key various alignment markers and mattes over a source video picture in a wide variety of applications. The HD9690-444 can be operated in a dual link mode for emerging 4:4:4 high definition applications, or a 4:2:2 mode for traditional high definition (1125 and 750 line) digital video. The model HD9690 can only be operated in a 4:2:2 mode.

Commonly used configurations, stored as factory presets simplify routine operation to just a few pushbuttons. The ability to customize these factory presets to your application and store them as USER PRESETS, gives the Graticule Generator tremendous flexibility while maintaining simple operation for day to day use.

Both units are a 1 RU chassis with integrated control panel. The HD9690 & HD9690-444 are also available in a remote control version, which has a blank front panel and either a rack mountable, or a desktop remote control panel.

### Features

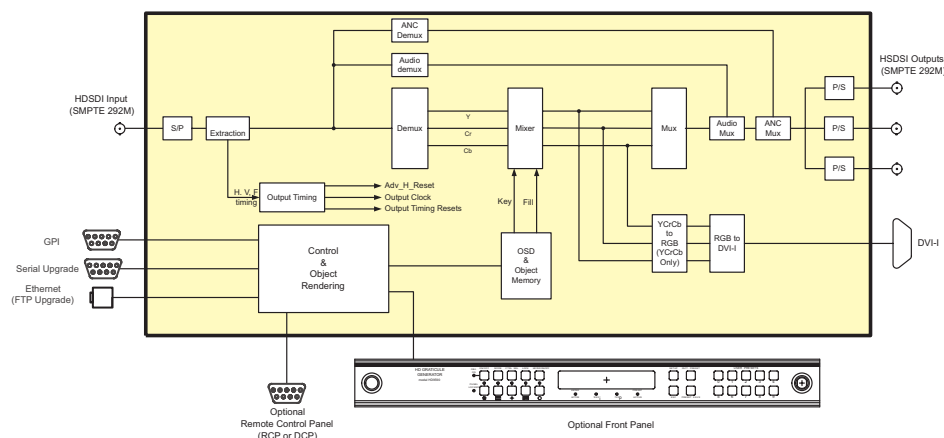
- Automatically senses between 1080i/60, 1080i/50, 1080p/24, 1080p/24sF, 720p/60 and 720p/50 video formats and the 1/1.001 divisor versions where applicable
- Model HD9690 keys Graticule markers directly into 4:2:2 SMPTE 292M High Definition Serial digital video
- DVI-I Output for display on flat screen or computer monitors
- Two rectangular boxes that can be independently resized reshaped and moved anywhere on raster
- A grid consisting of horizontal and vertical line pairs that can be positioned independently or in pairs anywhere on the raster
- Programmable horizontal and vertical hard matte
- Two User programmable cross markers, positionable anywhere on the raster (one on DCP version)
- Ellipse creation for aspect ratio
- Automatic creation of aspect ratios for mask, box and ellipse objects
- On screen display shows object size, position and aspect ratio
- Automatic centring of all objects or individual object by object control of centring
- Single button keyer on/off control
- Adjustable object brightness and color
- Front panel lock-out control
- Easy to operate front panel menu system gives access to advanced object control features for the most demanding application, while limiting normal day to day use to just a few preset buttons
- Factory Presets allow quick setup to common object placements on the raster
- Ten User-definable presets with user definable labels and individual

- write protect allow unlimited customization for any requirement
- Optional Rack mount or Desktop remote control chassis

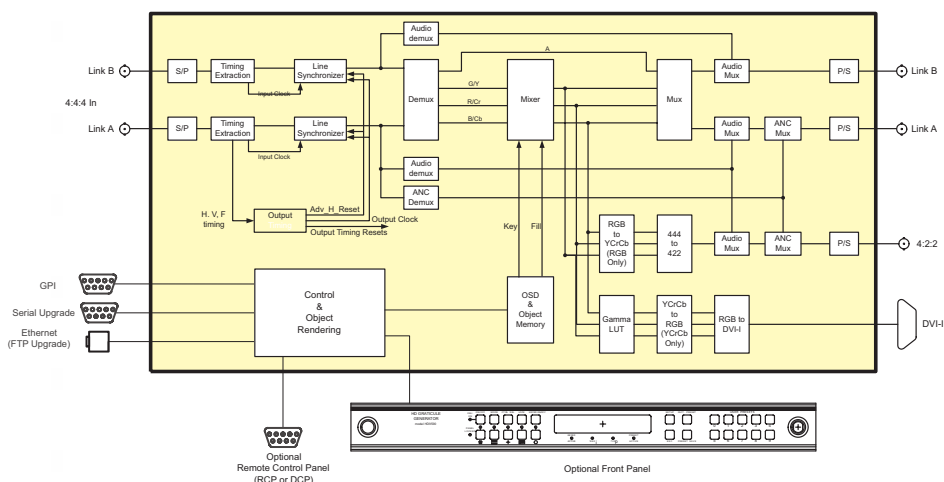
### Additional Features for the HD9690-444

- Keys Graticule markers directly into SMPTE 372M and SMPTE 292M High Definition Serial digital video
- Can be operated in 4:4:4 RGB or YCbCr dual link mode with 4:2:2 output or 4:2:2 single link mode - manual select or autodetect
- Handles extended range (full scale) 4:4:4 RGB with conversion to full scale or legal ITU-R BT.709 YCbCr on the 4:2:2 single link output

### HD9690 Block Diagram



### HD9690-444 Block Diagram



### Specifications

#### Serial Digital Video Input:

Standard:	HD9690 SMPTE 292M 1.5Gb/s HD9690-444 SMPTE 372M Dual link 1.5Gb/s or SMPTE 292M 1.5Gb/s
Number of Inputs:	HD9690 1 HD9690-444 1 dual link
Connector:	BNC per IEC 60169-8 Amendment 2
Equalization:	Automatic up to 50m with Belden 1694A or equivalent cable
Return Loss:	>15dB up to 1.0Gb/s, >10dB up to 1.5Gb/s

#### Serial Video Output:

Standard:	Same as input
Number of Outputs:	HD9690 3 HD9690-444 1 dual link, 1 single link
Connector:	BNC per IEC 60169-8 Amendment 2
Signal Level:	800mV nominal
DC Offset:	0V $\pm$ 0.5V
Rise and Fall Time:	200ps nominal
Overshoot:	<10% of amplitude
Wideband Jitter:	<0.2UI
Output Return Loss:	>10dB up to 1.5Gb/s

#### Digital (DVI) Video Output:

Standards:	VESA (DVI-I, for DVI-D and RGBHV outputs)
Type:	DVI-I (female connector)
Resolution:	1920x1080 or 720x1280 - same as video input
Signal Level:	1V nominal

#### GPI Control Port:

Number of Inputs:	8 opto-isolated, active high or active low, programmable functions
Connector:	Female DB-9

#### Upgrade Control Port:

Standard:	RS 232
Connector:	Female DB-9
Baud Rate:	115200
Format:	8 bits, no parity, and 2 stop bits

#### Ethernet:

Network Type:	Fast Ethernet 100 Base-TX IEEE 802.3u standard for 100 Mb/s base band CSMA/CD local area network Ethernet 10 Base-T IEEE 802.3 standard for 10 Mb/s baseband CSMA/CD local area network
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#### Connector:

RJ-45

#### Remote Control Port:

Standard:	RS-422, 9600 baud rate
Connector:	Female DB-9
Protocol:	Remote Control Panel

#### Physical:

Main Unit:	19" W x 1.75" H x 18.75" D. (483mm W x 45mm H x 477mm D)
Rack Mount Control Panel:	19" W x 1.75" H x 4.25" D. (483mm W x 45mm H x 110mm D)
Desktop Control Panel:	7.75" W x 2.0" H x 6.5" D. (197mm W x 50mm H x 160mm D)
Weight:	8 lbs. (3.5kg)

#### Electrical:

Main Unit:	Voltage: Auto ranging 100 to 240 Volts AC, 50/60 Hz 40 Watts
Desktop + Rack Mount Control Panel:	Voltage: 12 VDC, Auto ranging 100 to 240 Volts AC, 50/60 Hz adapter provided, 10 Watts

#### Safety:

EMI/RFI:	ETL Listed, complies with EU safety directives Complies with FCC Part 15 Class A regulations Complies with EU EMC directive
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#### Ordering Information:

HD9690	HD Graticule Generator
HD9690-444	4:4:4 Graticule Generator

#### Ordering Options:

+RCP	Rackmount remote control
+DCP	Desktop remote control unit



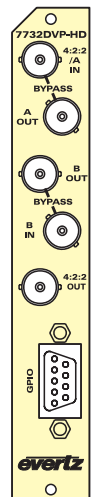
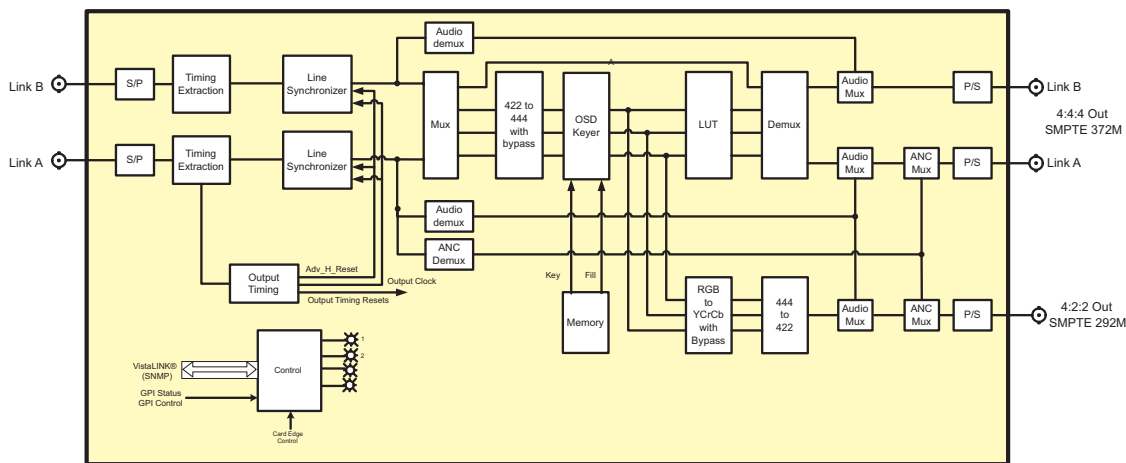


The Evertz 7732DVP-HD Dual Link Video Processor module is a multi-purpose module designed to convert between 4:2:2 and 4:4:4 HDTV video signals in a wide variety of applications. The model 7732DVP-HD can be operated in a dual link to single link mode for emerging 4:4:4 high definition applications, or a 4:2:2 to 4:4:4 mode to convert traditional high definition content to 4:4:4.

## Features

- Automatically senses between 1080i/60, 1080i/50, 1080p/24, 1080p/24sF, 720p/60 and 720p/50 video formats and the 1/1.001 divisor versions where applicable
- 4:4:4 Dual Link HDSDI to 4:2:2 HDSDI converter
- 4:2:2 HDSDI to 4:4:4 Dual Link HDSDI converter
- 4:4:4 Dual Link HDSDI to 4:4:4 HDSDI with LUTs
- 3:2 pulldown inserter - locked to RP188 time code or 6 Hz pulse
- Retimed 4:4:4 dual link outputs
- 6 Hz input
- Programmable LUTs for 4:4:4 and 4:2:2 HDSDI to accommodate different colorimetry between monitoring devices
- Connects logarithmic 'filmstream' inputs from VIPER camera - to linear or 4:4:4 or 4:2:2
- Store/recall user presets of common configurations - up to 5 presets
- GPIO for presets
- On Screen menu on 4:2:2 HDSDI output accessible using push button/toggle switch
- VistaLINK® provides a software GUI interface for control and monitoring of the device. VistaLINK® can be used to manual control the switch or be configured to trigger a change based on specific errors and thresholds

## 7732DVP-HD Block Diagram & Rear Panel



## Specifications

### Serial Digital Video Inputs:

**Standards:** SMPTE 372M (dual Link 1.5 Gb/s) or SMPTE 292M (1.5 Gb/s) 1080i/60, 1080i/50, 1080p/24, 1080p/24sF, 720P/60 and 720p/50 video formats and the 1/1.001 divisor versions where applicable

**Number of Inputs:** 1 dual link input or 1 single link input

**Connector:** BNC per IEC 60169-8 Amendment 2.

**Equalization:** Automatic up to 50m with Belden 1694A or equivalent cable

**Return Loss:** > 15 dB up to 1.0 Gb/s, >10dB at 1.5 Gb/s

### Serial Digital Video Outputs:

**Standard:** Same as Input

**Number of Outputs:** 1 dual link output and 1 single link output

**Connector:** BNC per IEC 60169-8 Amendment 2.

**Signal Level:** 800mV nominal

**DC Offset:** 0V ±0.5V

**Rise and Fall Time:** 200ps nominal

**Overshoot:** <10% of amplitude

**Wide Band Jitter:** < 0.2 UI

**Output Return Loss:** > 10 dB up to 1.5 Gb/s

### GPI Control Port:

**Number of Inputs:** 8 opto-isolated, active high or active low, programmable functions

**Connector:** Female DB-9

### Electrical:

**Voltage:** +12VDC

**Power:** 14 Watts

**EMI/RFI:** Complies with FCC regulations for class A devices  
Complies with EU EMC directive

### Physical:

**Number of slots:** 1

### Ordering Information:

**7732DVP-HD** HD Dual Link Video Processor

### Ordering Options

Rear Plate must be specified at time of order

Eg: Model +3RU

### Rear Plate Suffix

**+3RU** 3RU Rear Plate for use with 7700FR-C Multiframe

**+1RU** 1RU Rear Plate for use with 7701FR Multiframe

**+SA** Standalone Enclosure Rear Plate

### Enclosures:

**7700FR-C** 3RU Multiframe which holds 15 modules

**7701FR** 1RU Multiframe which holds 3 modules

**S7701FR** Standalone enclosure



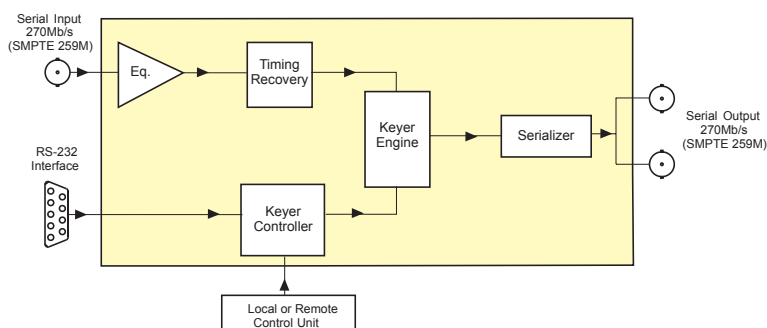
The 9590 is an easy to use, one rack unit, dual standard digital video graticule generator that keys various alignment markers over a standard definition video picture. These alignment markers facilitate film transfer, post production and quality control measurements relating to picture location for various film aspect ratios, safe action and safe title areas as well as picture center.

All of the functions of the 9590 are available from the control panel or one of two remote control panels. Choose from the many factory programmed presets or define your own. The 9590 allows for multiple user defined presets that can be re-called and re-defined at any time.

## Features

- Keys graticule markers directly into SMPTE 259M-C serial digital video
- Auto detects between 525i/59.94 and 625i/50 video formats
- Two rectangular boxes that can be independently resized, reshaped and moved anywhere on the raster
- A grid consisting of horizontal and vertical line pairs that can be positioned independently or in pairs anywhere on the raster
- Programmable horizontal and vertical hard matte
- Adjustable mask starting line in vertical blanking interval to pass VITC or VITS
- Two user programmable cross markers positionable anywhere on the raster
- Circle creation for aspect ratio
- Automatic creation of aspect ratios for matte, box and circle objects
- On screen aspect ratio display
- Automatic centering control for all objects
- Switchable 16:9 or 4:3 pixel aspect ratios to allow easy alignment where anamorphic compression has taken place
- Single button keyer On/Off control
- Adjustable object brightness (white level)
- Front panel lock-out control
- Easy to operate control panel menu system gives access to advanced object control features for the most demanding application, while limiting normal day to day use to just a few preset buttons
- Factory presets allow quick setup to common object placements on the raster
- Ten user-definable presets with individual write protection
- Optional rack mount or desktop remote control unit

## 9590 Block Diagram



## Specifications

### Serial Video Input:

**Standard:** Serial component SMPTE 259M-C  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Impedance:** 75Ω  
**Signal Level:** 800mV ±10%  
**Equalization:** Automatic to 200m @270Mb/s with Belden 8281 (or equivalent)  
**Return Loss:** > 15dB up to 270Mb/s

### Serial Video Output:

**Standard:** Serial component SMPTE 259M-C  
**Number of Outputs:** 2 per frame.  
**Connector:** BNC per IEC 60169-8 Amendment 2  
**Impedance:** 75Ω  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V ±0.5V  
**Rise and Fall Time:** 900ps nominal  
**Overshoot:** <10% of amplitude (All outputs terminated)  
**Wide Band Jitter:** <0.2UI

**Serial Remote Ctl:** RS-232/422 interface, 9 pin "D" connector for software upgrades

### Physical:

**Dimensions:** 19"W x 1.75"H x 18.75"D.  
 (483mm W x 45mm H x 477mm D)  
**Weight:** 8 lbs. (3.5kg)

### Electrical:

**Power:** Auto ranging 100-240VAC 50/60Hz 40 Watts  
**Safety:** ETL listed  
 Complies with EU safety directive  
 Complies with FCC Part 15 Class A  
 EU EMC Directive

### Ordering Information:

**9590** SDI Digital Graticule Generator

### Ordering Options:

**+RCP** Rackmount remote control  
**+DCP** Desktop remote control unit



The HDSD9155Q Afterburner is a powerful device designed to facilitate the creation of off-line videotapes from telecine or field acquired HDTV masters. The Afterburner downconverts the HDTV input video to SDI and analog standard definition video. When the input video is in the 1080p/24sF format the Afterburner also creates a 2:3 pulldown on the output video to create a 30 Fps output. The Afterburner can operate in a 'film mode' working with telecine masters or a 'video mode' working with field acquired HDTV.

In 'film mode' the Afterburner reads the RP215 Film ANC transfer data, that was recorded in the VANC data area by the Evertz HD Film Footage Encoder during the telecine transfer, and makes burn-in windows. When operating as a downconverter, the essential timecode and KeyCode data is also converted into RP201 3-line VITC inserted on the outputs by the Afterburner. The 2:3 cadence can be controlled from the VANC data or from the LTC. The 2:3 cadence can also be locked to an external 6 Hz reference in telecine applications where the Afterburner is directly reading the HD Film Footage Encoder output.

In 'video mode' the Afterburner reads the LTC or RP188 ancillary timecode and makes burn-in windows and new timecode that is in sync with the downconverted video. The original 24 Fps timecode numbers can be placed in the user bits of the VITC and displayed as a burned-in window. The 2:3 cadence can be controlled from the ancillary timecode or from the LTC. When operating as a downconverter, the Afterburner automatically generates video timecode for the standard definition VTR that is converted from 24 to 30 Fps, and delayed to match the complete A frame cycle of delay through the Afterburner.

The HDSD9155Q can be easily configured from the local front panel or using the multi-resolution version of Evertz popular KeyLog TRACKER™ software. The Keylog Tracker™ graphical software interfaces allow the user to store multiple configurations for the Afterburner.

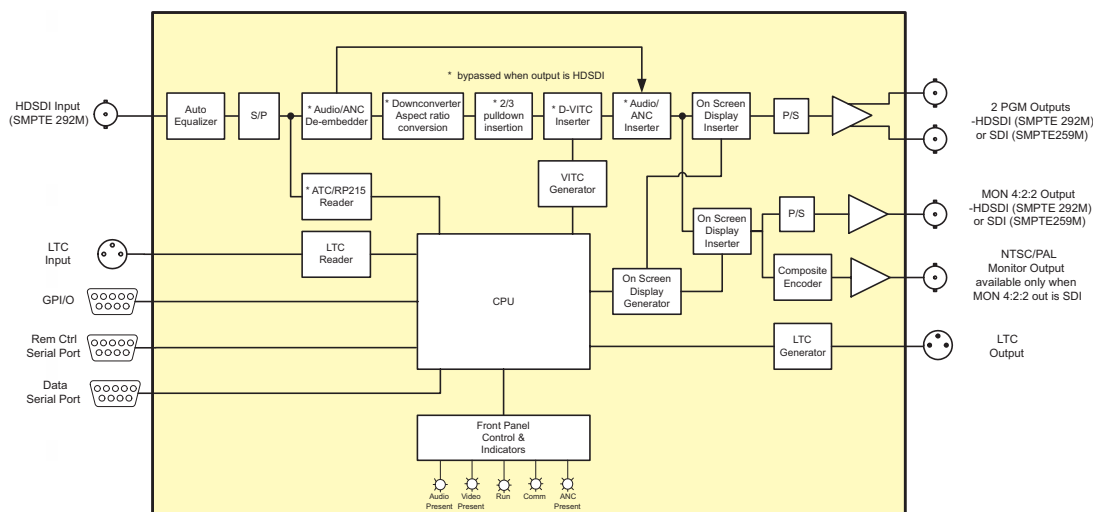
The HDSD9155Q can be operated as a high quality downconverter or as a character inserter on the native HDTV signal. As a high quality downconverter the Afterburner provides two clean SDI downconverted outputs with VITC suitable for creation of high quality viewing copies, and one SDI and one analog monitoring output with VITC and Characters suitable for monitoring or creation of tapes for non-linear editing systems. When outputting the native HDTV input, the Afterburner provides two HDSDI program outputs with optional characters and one HDSDI monitor output with characters burned in. Embedded audio present on the input video is transferred to the outputs in time with the picture.

## Features

- Accepts SMPTE 292M 1080i/59.94, 1080i/50, 1080p/29.97sF, 1080p/25sF, 1080p/23.98sF and 720p/59.94 serial digital video
- Downconverts HDTV inputs to SDTV and creates VITC and window burns on SDI and analog outputs
- Creates window burns on HDSDI inputs
- Reads RP215 VANC film transfer information in 'Film mode'
- Reads RP188 ancillary timecode in 'Video mode'
- Creates 2:3 pulldown when downconverting 1080p/23.98sF video to 525i/59.94.
- 2:3 cadence is determined from a 6Hz pulse input, RP215, RP188 timecode or LTC
- High quality downconverter converts aspect ratio from 16:9 to 4:3 in anamorphic, letterbox or centre crop mode
- LTC timecode reader and generator converts 24 Fps to 30 Fps and re-times the timecode to the output video
- Control from Evertz KeyLog TRACKER™ or integrated front panel allows use of user presets for a variety of applications
- Configurable virtual slate uses double height character windows to enhance visibility of important information
- Embedded audio from input delayed and reinserted on outputs in time with picture



### HDSD9155Q Block Diagram



### Specifications

#### HDTV Serial Digital Video Input:

**Standard:** 1.485 Gb/s HDTV Serial component digital (SMPTE 292M)  
1080i/59.94, 1080i/50, 1080p/29.97sF, 1080p/25sF, 1080p/23.98sF and 720p/59.94 - selectable or autodetect

**Connector:** 1 BNC per IEC 60169-8 Amendment 2

**Equalization:** Automatic to 130m @ 1.5Gb/s with Belden 1694A or equivalent cable

**Embedded Audio:** SMPTE 299M - supports up to 4 groups

#### Serial Digital Video Output:

**Standards:** Same as HDTV input or Serial component 270 Mb/s (SMPTE 259M-C)  
525i/59.94 if input is 720p/59.94, 1080i/59.94 or 1080p/23.98sF  
625i/50 if input is 1080i/50

**Connectors:** BNC per IEC 60169-8 Amendment 2

**Number of outputs:** 2 program, 1 monitor

**Embedded Audio:** SMPTE 272M or SMPTE299M -up to 4 groups transferred from HDS/SD input

**Signal Level:** 800mV nominal

**DC Offset:** 0V  $\pm$ 0.5V

**Rise and Fall Time:** 200ps (HD) or 470ps (SD) nominal

**Overshoot:** <10% of amplitude

**Return Loss:** > 15 dB

**Wide Band Jitter:** < 0.2 UI

#### Analog Monitor Video Output:

**Standards:** Analog composite NTSC if MON 4:2:2 output is 525i/59.94  
Analog composite PAL if MON 4:2:2 output is 625i/50.94  
Inactive if MON 4:2:2 output is HD video rate

**Connectors:** BNC per IEC 60169-8 Amendment 2

**Number of outputs:** 1 monitor

**Signal Level:** 1 V p-p nominal, internally adjustable

**DC Offset:** 0V  $\pm$ 0.1V

**Return Loss:** >35dB up to 5 MHz

**Frequency Response:** 0.8dB to 4 MHz

**Differential Phase:** <0.9° (<0.6° typical)

**Differential Gain:** <0.9% (<0.5 % typical)

**SNR:** >56dB to 5 MHz (shallow ramp)

**Impedance:** 75 $\Omega$

#### LTC Generator:

**Standard:** SMPTE 12M

**Frame Rate:** 25 and 30 Fps nominal

**Connector:** 3 pin male XLR type connector.

**Level:** Adjustable, 0.5V to 4.5V p-p

#### LTC Reader:

**Standard:** SMPTE 12M

**Frame Rate:** 24, 25 and 30 Fps nominal

**Connector:** 3 pin female XLR type connector

**Level:** 0.2 to 4V p-p, balanced or unbalanced

#### Ancillary Timecode/Data Reader:

**Standard:** SMPTE RP188 or RP215

**Line Select:** Autodetect valid lines in vertical interval

**Frame Rate:** 24, 25 and 30 Fps nominal

#### Serial Communications:

**Standard:** RS-232, selectable baud rate

**Connectors:** 2 - 9 pin female "D"

#### Physical:

**Dimensions:** 19" W x 1.75" H x 18.75" D.  
(483mm W x 45mm H x 477mm D)

**Weight:** 8 lbs. (3.5kg)

#### Electrical:

**Power:** Auto ranging 100-240VAC 50/60 Hz 40 Watts

**Safety:** ETL listed  
Complies with EU safety directive

**EMI/RFI:** Complies with FCC Part 15 Class A  
EU EMC Directive

#### Ordering Information:

**HDSD9155Q** HDSD Afterburner with High quality down converter



The Evertz Universal Film Reader/Decoder system provides multi-format reader head and decoder unit that will handle all the major film formats and all the various codes presently in use. All in one easy to install head and a separate 1RU decoder unit. This new break through technology vastly simplifies the telecine bay operation by having a complete solution in one system while providing scalable purchase options.

Evertz KeyCode reader heads can be mounted on a telecine or other film transport, to recover KeyCode and Film Time code numbers from 16, super 16, 35 or 65mm film. Operationally the design is absolute simplicity. When switching between 16 or 35mm film, there are no levers, adjustments or realignments involved on most telecines. With the Evertz combination KeyCode reader system, varying film densities, negative and positive material are handled with ease. The Evertz universal decoder unit (model 5550) features a simple to use automatic light and sensor control.

### Features

- Can be mounted on a variety of film transports including Cintel, Thomson/GVG and Sony Telecines and Flat beds etc. The universal mounting bracket offers easy to use rotational positioning for hassle free installation
- The KeyCode/Film Time code heads can be ordered in different configurations depending on your application
- The head "floats" laterally on precision guides to assure perfect KeyCode tracking at play and shuttle speeds. The Floating design also handles film weave due to oversized rollers (common on many Telecines)
- We now offer a completely Touchless option, the film does not come in contact with the Reader Head assembly ever
- The new optical design improves the depth of field, gaining sharpness over the entire film gap
- Highly polished hard anodized surfaces and smooth round edges help protect your valuable film
- The rollers are made from finely machined highly polished stainless steel
- Simple to use diagnostics for monitoring performance and trouble shooting marginal quality code
- Ideal for non-real-time data mode transfers with Thomson/GVG Spirit, Cintel C-Reality and Millennium
- Decoder can be located up to 50ft. from the film data reader
- Incorporates FLASH technology for easy software upgrading in the field, ensuring support of new film stocks as quickly as possible
- Ability to read KeyCode and Film Time code at speeds other than play speed in forward and reverse
- Front panel display of KeyCode or Film Time code.
- Automatic sensor intensity control is especially useful when tracking various film densities on a single roll
- Separate intensity controls for KeyCode and Film Time code
- 16 digit alpha-numeric front panel display
- 19" rackmountable hardware

# Universal Data Reader & Decoder 5550

The Evertz Universal Film Data reader system can be used with any of the Evertz Film Footage Encoders to encode KeyCode & Film time code into VITC or VANC data. It can be ordered separately or as a part of a Film Footage Encoder system.

The Evertz Film Reader system can be purchased in a variety of configurations. Because these reader heads cannot be retrofitted in the field, it is important to specify the exact model number at the time of order. See the ordering information chart for a list of model numbers and corresponding options.

Our new Touchless Reader Head recovers KeyCode and Film Time code without coming into contact with the film stock. Please specify the Touchless version when ordering.



Please specify manufacturer and model number of Telecine when ordering.

	16mm	35mm	65mm	KeyCode	ARRI I and ARRI II	AATON	Touchless
KR-65			☑	☑			
KR-16/35	☑	☑		☑			
UV-3	☑	☑		☑	☑	☑	
UVT-3	☑	☑		☑	☑	☑	☑
UVS-3*	☑	☑		☑	☑	☑	☑

\*Special Version for Sony Telecine

## Specifications

### (UV series) Multi-Function Reader Head :

**Connector:** 15 pin High Density female "D"  
**Max. Cable Length:** 50 feet  
**Codes Read:** KeyCode, Aaton, Aaton Code II, Arri

### KeyCode Reader Head Interface (KR series heads):

**Connector:** 8 pin miniature female DIN  
**Max. Cable Length:** 50 feet  
**Codes Read:** KeyCode

### LTC Output:

**Standard:** SMPTE 12M compliant  
**Frame Rate:** 24, 25 and 30 Fps nominal from film time code  
**Connector:** 3 pin male XLR type connector.  
**Level:** Adjustable, 0.5V to 4.5V p-p

### Parallel I/O:

**Connector:** 9 pin female D  
**Biphase Tach:** 1, 2, 5 or 10 pulses per frame TTL level  
biphase quadrature  
**GPI:** Film Type (negative/print)  
Film Gauge (16/35 mm)

### Serial Ports:

**Number of Ports:** 2  
**Standard:** RS-232  
**Baud Rate:** 9600 or 38400 independently settable  
**Format:** 7 bits, even parity  
**Connectors:** 9 pin female D

### Physical:

**Dimensions:** 19"W x 1.75"H x 7.75"D  
(483mm W x 45mm H x 196mm D)  
**Weight:** 6.7 lbs (3 Kg)

### Electrical:

**Power:** 115/230 V AC 50/60 Hz, 30 Watts  
**Safety:** ETL Listed  
Complies with EU safety directive  
Complies with FCC Part 15 Class A,  
EU EMC Directive

### EMI/RFI:

### Ordering Information:

Decoder can be ordered separately or as a system which includes the Decoder, Head, Bracket & Cable. Systems may also be ordered with Film Footage Encoders (See Film Footage Encoder data sheets for information)

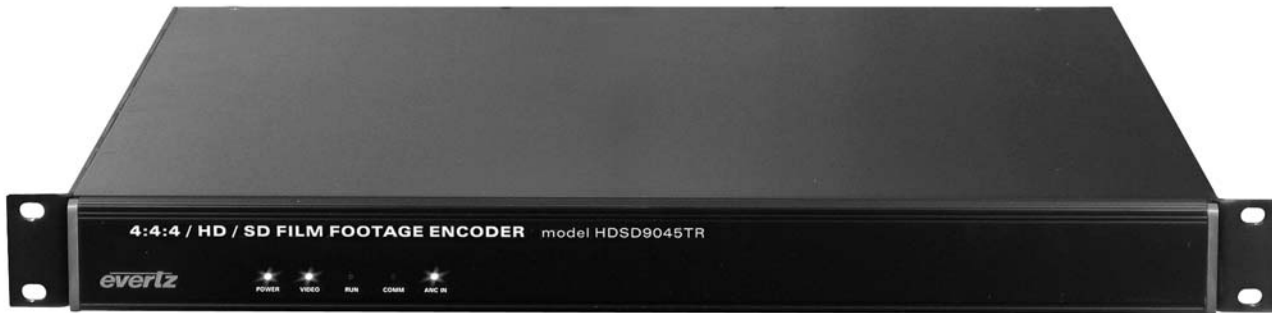
<b>5550</b>	Universal Decoder
<b>5550/KR-16/35</b>	5550 Decoder with KR16/35 Head & 10 ft.cable
<b>5550/UV-3</b>	5550 Decoder with UV-3 Head & 20 ft. cable
<b>5550/UVT-3</b>	5550 Decoder with UVT-3 (Touchless) Head & 20 ft. cable
<b>5550/UVS-3</b>	5550 Decoder with UVS-3 Head & 20 ft. cable for Sony Vialta

**Reader Heads may be ordered separately. (Does not include mounting bracket or cable) (See model selection chart above)**

### Accessories:

<b>EV-BRKT</b>	Universal Reader Mounting Bracket
<b>FDL-SHIMS</b>	Shim kit for BTS, FDL 60/90, Quadra
<b>CINTEL-SHIM</b>	Shim kit for Cintel C-Reality 16/35 heads
<b>WA-S19</b>	C-Reality Cable Harness
<b>WA-F49</b>	50ft extender cable for KR series heads
<b>WA-P57</b>	50ft extender cable for UV series heads
<b>KKFILM16MM</b>	16mm Kodak Keycode Verification Film
<b>KKFILM35MM</b>	35mm Kodak Keycode Verification Film





The Evertz new HDSD9045TR multi-resolution Film post production system is designed to simplify the management of your film to tape transfers for both 4:4:4 RGB and 4:2:2 YCrCb high definition and 4:2:2 standard definition video. At the heart of the system is the HDSD9045TR Film Footage Encoder. Under control of the powerful KeyLog TRACKER™ software, the HDSD9045TR Film Footage encoder permits the seamless integration of video and audio timecodes, film KeyCode and production information whether you are transferring to 24, 25 or 30Fps high definition video. During the transfer, KeyLog TRACKER™, Evertz telecine logging and configuration management tool logs the relationships between these important parameters and outputs many industry standard interchange file formats for use by off-line editing systems.

In dual link high definition mode the HDSD9045TR encodes the timecodes, KeyCode and production information into industry standard SMPTE RP215 vertical ancillary (VANC) data packets on the dual link RGB output. In addition the HDSD9045TR converts the 4:4:4 RGB to a 4:2:2 YCrCb serial output with the VANC data and optional burned in characters for monitoring. In 4:2:2 high definition mode the HDSD9045TR uses the A Link program path for VANC insertion and provides a second 4:2:2 output with VANC and character for offline editioning. The user can also apply one of 5 user programmable look up tables to either output. In standard definition mode the HDSD9045TR encodes time code and KeyCode into SMPTE RP201 3-line VITC on one SDI output and provides a separate SDI output with burned in characters for offline edition copies. Separate LTC inputs and outputs for the audio and video timecodes, allows handling of mixed rate timecodes. The programmable telecine interface allows the encoder to interface to a wide variety of telecine configurations.

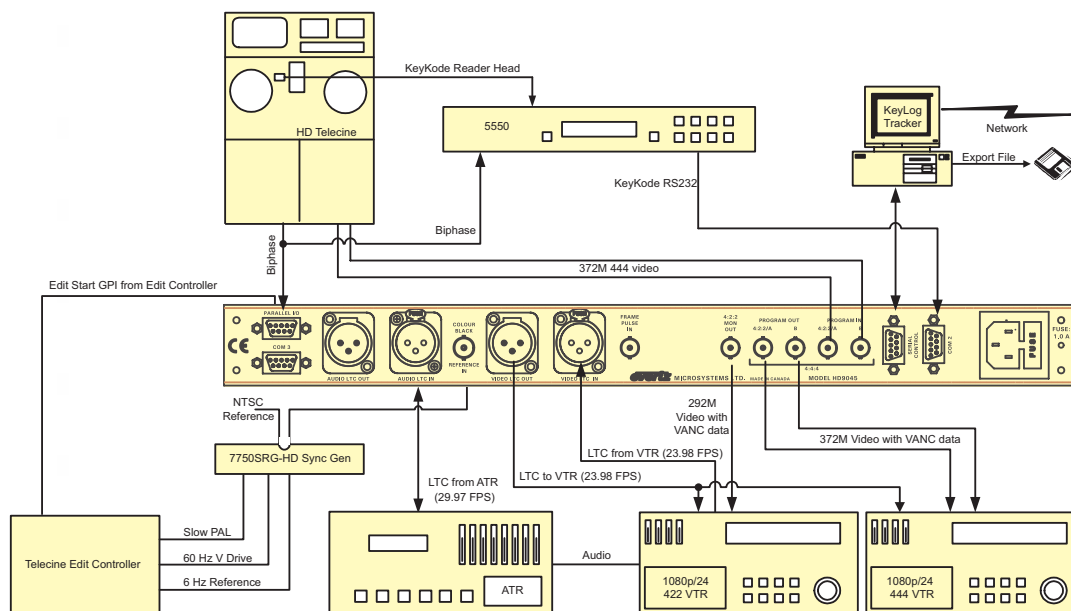
The new HDSD9155Q Afterburner is a powerful device designed to facilitate the creation of off-line tapes from the 4:2:2 high definition telecine master tapes. The Afterburner downconverts the HDTV input video to SID and analog standard definition video. When the input video is in the 1080p/24sK format the Afterburner also creates a 2:3 pulldown on the output video to create a 30Fps output. The Afterburner reads the RP215 film transfer data that was encoded by the HDSD9045TR during the telecine transfer and makes burn-in windows. The essential timecode and KeyCode data are also converted into RP201 3-line VITC and output by the Afterburner. The Afterburner automatically generates video timecode for the standard definition VTR that is converted from 24 to 30Fps, and delayed to match the complete 'A' frame cycle of delay through the Afterburner. The HDSD9155Q can also be used to make burn in copies on the native HD or SD video input.

The multi-resolution version of Evertz popular KeyLog Tracker software allows the user to store multiple configurations for both the Film Footage Encoders and the Afterburners. A simple on screen control in the Tracker software performs switching between 4:4:4 and 4:2:2 HD and SD modes in the HDSD9045TR. Toolbar buttons allow the user to quickly choose which device is being addressed.

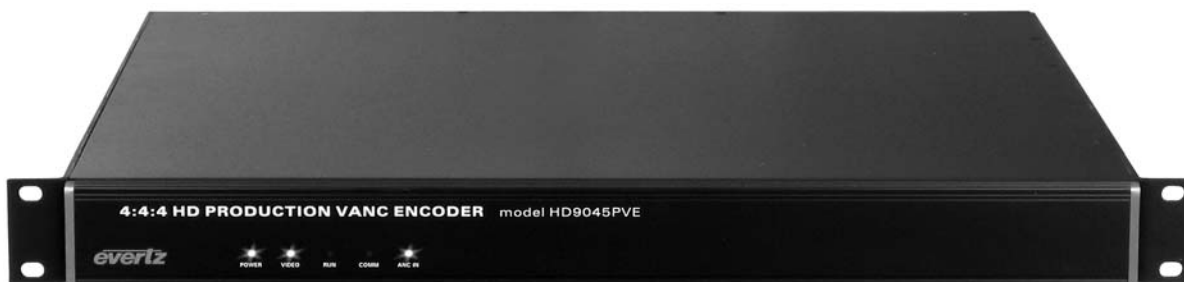
## Features

- Accepts dual link 4:4:4 RGB SMPTE 372M (1.485 Gb/s) 1080i/59.94, 1080i/50 1080p/29.97sF, 1080p/25sF and 1080p/23.98sF digital video
- Dual link 4:4:4 RGB SMPTE 372M outputs with RP215 VANC and characters keyed in
- Converts dual link 4:4:4 RGB SMPTE 372M to 4:2:2 YCbCr SMPTE 292M with user programmable color look up tables
- Can be operated in single link 4:2:2 SMPTE 292M or SMPTE 259M mode
- Compatible with REC 709 or Full Scale RGB 4:4:4 color space
- Interfaces to Evertz 5550 or 5500 KeyCode Reader
- Separate LTC reader and generator for video and audio time codes operating at 30, 25 and 24 Fps
- Control from Evertz KeyLog TRACKER™ software
- Encodes film transfer information in SMPTE RP215 VANC for HD or SMPTE RP201 3-line VITC for SD
- Character burns and VANC available (VITC on SD video) on program and monitor and 4:2:2 outputs can be independently turned on and off

**everlz®**



3 4:4:4 HD/SD Film Footage Encoder system including KeyLog Tracker™, KeyCode Decoder & UV-3 Head



The Evertz Production VANC Encoder is designed to simplify the management of your high definition video acquired production material for both 4:4:4 RGB and 4:2:2 YCrCb high definition video. Under control of the powerful KeyLog TRACKER™ software, the HD9045PVE Production VANC Encoder permits the seamless integration of video and audio timecodes, and production metadata such as camera, lens and dolly information, scene, take and roll numbers. During acquisition or after during an editorial dubbing process, KeyLog TRACKER™, Evertz logging and configuration management tool logs the essential metadata along with the relationships between the source and record timecodes, and outputs many industry standard interchange file formats for use by off-line editing systems.

The HD9045PVE encodes the timecodes and production metadata into industry standard vertical ancillary (VANC) data packets on the dual link RGB output. In addition the HD9045PVE converts the 4:4:4 RGB to a 4:2:2 YCrCb serial output with the VANC data and optional burned in characters for monitoring. The user can also apply one of 5 user programmable look up tables to either output. Separate LTC inputs and outputs for the audio and video timecodes, allows handling of mixed rate timecodes.

The HDSD9155Q Afterburner is a powerful device designed to facilitate the creation of off-line tapes from high definition telecine master tapes. The Afterburner downconverts the HDTV input video to SDI and analog standard definition video. When the input video is in the 1080p/24sF format the Afterburner also creates a 2:3 pulldown on the output video to create a 30Fps output. The Afterburner reads the ancillary data that was encoded by the HD9045PVE and makes burn-in windows. The essential timecodes are also converted into RP201 3-line VITC and output by the Afterburner. The Afterburner automatically generates video timecode for the standard definition VTR that is converted from 24 to 30Fps, and delayed to match the complete 'A' frame cycle of delay through the Afterburner. The HDSD9155Q can also be used to make burn-in copies on the native HD video input.

The new multi-resolution version of Evertz popular KeyLog Tracker software allows the user to store multiple configurations for the HD9045PVE. A simple on screen control in the Tracker software performs switching between 4:4:4 and 4:2:2 modes in the HD9045PVE. Toolbar buttons allow the user to quickly choose which device is being addressed.

#### Features

- Accepts dual link 4:4:4 RGB SMPTE 372M (1.485 Gb/s) 1080i/59.94, 1080i/50 1080p/29.97sF, 1080p/25sF and 1080p/23.98sF digital video
- Dual link 4:4:4 RGB SMPTE 372M outputs with VANC and characters keyed in
- Converts dual link 4:4:4 RGB SMPTE 372M to 4:2:2 SMPTE 292M with user programmable color look up tables
- Can be operated in single link 4:2:2 SMPTE 292M mode
- Separate LTC reader and generator for video and audio time codes operating at 30, 25 and 24 Fps
- Control from Evertz KeyLog TRACKER™ software
- Encodes production timecodes and metadata information in modified SMPTE RP215 VANC
- Character burns available on 4:4:4 and 4:2:2 outputs - can be independently turned on and off
- 3 serial ports to collect production metadata from lens and camera dolly



**evertz®**



## **The Evertz Film Post Production System helps you keep track of all aspects of your Film to Tape transfer session**

KEYLOG TRACKER™ is an intuitive graphical user interface that provides more flexibility to the Evertz Film Post Production System than ever before. KeyLog TRACKER™ runs on standard Window capable computer hardware and gives you access to a host of new capabilities for the system including more character windows, simultaneous KeyCode and Ink number handling and several new Time code modes to mention a few.

The Evertz HDSD9045TR HD/SD System uses function specific hardware units such as the Film Footage Encoder, the 5550 KeyCode Reader and the new HDSD9155Q Afterburner/Inserter to perform the bulk of the real time processing. This dedicated hardware reads and generates Video Time code, reads KeyCode and Film Time code, inserts ancillary data or Vertical Interval Time code and character burn-ins into HDSDI or SDI program video, and keeps track of the 3:2 pulldown.

KEYLOG TRACKER™ centralizes the control of your Film Footage Encoder, and Afterburner and performs frame accurate logging of Video and Audio Time code, KeyCode, Ink numbers, 3:2 pulldown and related production data and provides extensive data base management capabilities for the resulting project data.

### **Character Windows**

KEYLOG TRACKER gives you access to 21 separate character windows to display Video Time code, Audio Time code, KeyCode, Ink numbers (feet & frames), Scene, Take, Slate, Lab roll, Camera roll, Sound roll, Date of Production, and a 32 character user definable text window.



### **Flexible Hardware Control**

KeyLog TRACKER works with Evertz complete line of film footage encoders and HD Afterburners. With KEYLOG TRACKER's graphical configuration editor you choose the overall operating mode that fits your project. Within each mode you can adjust various hardware settings to achieve precisely the result your clients demand. An unlimited number of configurations can be saved and recalled, minimizing set up times for repeat clients and virtually eliminating operator error. A project's configuration is automatically recalled when the project is opened.

An electronic virtual slate shows all the vital information at the start of each take, for master transfers where you cannot display the normal burn-ins throughout the take.

The status bar at the bottom of the screen allows you to see at a glance how your hardware is configured. In addition, the Encoder Status window constantly monitors KeyCode reading performance, incoming Time codes and other real time status information.

### **Data Logging**

KEYLOG TRACKER allows you to choose the optimal method of logging transfer elements to the database. You let the project determine whether you will log only the head and tail of each roll for one light transfers, grab KeyCode or time code breaks for select take rolls, grab events on the fly from the keyboard, or interface to external edit controllers with the GPI interface. Pre-determined tag points can be entered into Daily Roll files to automate data capture on Synced Print transfers. Production data such as Scene and Take, Camera roll, Sound roll can be pre-entered before the telecine session to streamline the transfer process, or can be entered in real time during the transfer.

## **Data Management Functions**

KEYLOG TRACKER's extensive data management capabilities are second to none. Projects can be organized by client, or production, or by operator - you decide. The spreadsheet style preview and editing of logged events allows you to quickly scan the transfer session and edit the database. Project wide viewing and sorting of events facilitates management of data on long form productions such as feature films. Reports can be sorted by VT roll, Camera roll, Scene/Take, KeyCode or Ink numbers to name a few.

The Event Tracker allows you to trim time codes, KeyCode and Ink numbers of in and out points together. Event cleanup functions remove unwanted events and overlaps from the list. KEYLOG TRACKER generates Film Transfer list files compatible with most non linear editors.

- KEYLOG FTL, AVID ALE, TLC FLEx and Lightworks ODB formats are supported.

### **Desktop Configurability**

The KEYLOG TRACKER desktop groups relevant information into separate windows, which can be positioned and sized to suit the colorist's preferences. A spreadsheet style display of logged events is fully configurable to view only the information that is needed for a client. Each user can save their favorite layout of the desktop when the system is shared by multiple colorists.

### **System Requirements**

- CPU: Pentium II - 233 MHz or faster
- Operating System: Win 2000, Win XP Pro
- RAM: 256 MB or more recommended
- mouse
- Video: 2 MB, 800 x 600 minimum
- CD-ROM
- Hard Disk: 20 MB Free
- Serial Ports: 2 available
- local or network printer for printing reports (recommended)
- sound card with speakers used to generate system sounds when logging (recommended)

### **Ordering Information:**

Included with 9025TR & 9045TR Series Film Footage Encoders. Upgrades available for older systems. Contact factory.

### 5150

The 5150 Afterburner is a full featured Analog VITC and LTC Time Code Reader, VITC to LTC Translator with a full function Character Insertter. The Afterburner reads SMPTE RP201 3-line VITC and displays field accurate video and audio time code as well as KeyCode and 3:2 pulldown on material transferred from film.

The unit can be configured to read LTC or VITC or can operate in an automatic switchover mode. The high speed reader in the 5150 employs sophisticated input conditioning and clock/data separator circuits to reliably recover LTC over the full shuttle speed and wind speed of most VTR's and ATR's.

#### Features

- Reads LTC from 1/30th to 70x play speed
- Full speed VITC Reader with line select
- High resolution Character Insertter, with three character sizes: 8, 16 and 32 lines, time and user bits separately positionable on screen
- Dual Standard (NTSC and PAL)
- On-screen programming menu

#### Specifications

##### LTC Reader:

**Standard:** SMPTE 12M  
25, 30 Fps Drop & Non Drop Frame

**Connector:** XLR Type 3 Pin female connector

**Signal Level:** 0.2 to 4V p-p, balanced or unbalanced

**Speed:** 1/30th to 70x play speed, forward and rev, machine dependent

##### VITC Reader:

**Input:** NTSC or PAL 1V p-p,

**Connector:** BNC per IEC 60169-8 Amendment 2

**Speed:** Still frame to <40x play, VTR dependant

**Impedance:** Hi-Z

##### LTC Translator:

**Connector:** XLR Type 3 pin male

**Signal Level:** Adjustable 0.5V to 4.5V p-p

**Rise Time:**  $40 \pm 10\mu\text{s}$

**Jitter:** <2 $\mu\text{s}$

**Gen Lock:** Reader input video 1 V p-p, Hi-Z, BNC loop

##### Character Generator:

**Input:** NTSC or PAL 1V p-p + keyed high resolution characters, selectable background and sizes

**Connector:** BNC per IEC 60169-8 Amendment 2

- VITC to LTC Translator
- LTC reshaper/regenerator
- 16 digit alpha-numeric display
- Decodes 3:2 pulldown from RP201 3-line VITC
- Displays video and audio timecode and keycode encoded by Evertz film footage encoders

##### Parallel Remote Control:

**Input:** 6 TTL compatible inputs for control of selected functions

**Output:** 2 open collector general purpose outputs

##### Physical:

**Dimensions:** 19" W x 1.75" H x 7.75" D  
(483mm W x 454mm H x 196mm D)

**Weight:** 7 lbs (3.5kg)

##### Electrical:

**Voltage:** 115/230 VAC, 50/60Hz, 30 Watts

**Safety:** ETL listed  
Complies with EU safety directive  
Complies with FCC Part 15 Class A  
EU EMC Directive

**EMI/RFI:**

##### Ordering Information:

**5150** Analog Afterburner II LTC/VITC Reader/VCG

### 8150

The 8150 Afterburner is a full featured SDI DVITC Time Code Reader, with a full function Character Insertter. The Afterburner reads SMPTE RP201 3-line VITC and keys field accurate video and audio time code as well as KeyCode and 3:2 pulldown on material transferred from film, directly into the serial digital bitstream.

#### Features

- SMPTE 259M-C
- Full speed VITC Reader with line select
- High resolution Character Insertter, with three character sizes: 8, 16 and 32 lines, time and user bits separately positionable on screen
- On-screen programming menu
- 16 digit alpha-numeric display
- Decodes 3:2 pulldown from RP201 3-line VITC
- Displays video and audio timecode and keycode encoded by Evertz film footage encoders

#### Specifications

##### Serial Digital Video Input:

**Type:** SMPTE 259M-C Serial component (270Mb/s)

**Input Equalization:** Automatic up to 200m with Belden 8281 (or equivalent)

**Connector:** 1 BNC per IEC 60169-8 Amendment 2

##### Serial Digital Outputs:

**Connector:** 2 BNC per IEC 60169-8 Amendment 2, (270Mb/s) SMPTE 259M compliant.

**Analog Monitor:** (Optional) 1 BNC per IEC 60169-8 Amendment 2, V p-p composite analog video with characters inserted

##### Parallel Remote Ctl:

**Input:** 5 TTL compatible inputs for control of selected functions

##### Physical:

**Dimensions:** 19"W x 1.75"H x 7.75"D  
(483mm W x 45mm H x 196mm D)

**Weight:** 7 lbs. (3.5Kg)

##### Electrical:

**Power:** 115/230 V AC 50/60 Hz, 30 Watts

**Safety:** ETL Listed  
Complies with EU safety directive  
Complies with FCC Part 15 Class A  
EU EMC Directive

**EMI/RFI:**

##### Ordering Information:

**8150** SDI Afterburner

##### Ordering Option:

**+MON** Analog Monitoring Option



1200DD	2 RU Rack-mount Digital Display	392-393
1201DD	1 RU Rack-mount Digital Display	392-393
1212	12" Diameter Analog Clock Display	394-395
1216	16" Diameter Analog Clock Display	394-395
1212L	12" Diameter Analog Clock Display With Back Lighting	394-395
1216L	16" Diameter Analog Clock Display With Back Lighting	394-395
1275A-110	9" Digital Clock 115V/60Hz	396
1275A-220	9" Digital Clock 220V/50Hz	396
2405EO27 TO 61HD	HD Miniature Optical Transmitter CWDM DFB Laser	421
2405EO3D-HD	HD Miniature Optical Transmitter 1310nm, DFB Laser	421
2405EO3F-HD	HD Miniature Optical Transmitter 1310nm, FP Laser	421
2405EO5D-HD	HD Miniature Optical Transmitter 1550nm, DFB Laser	421
2405EOxx	SDI Miniature Optical Transmitter CWDM DFB Laser	419
2405EO3F	SDI Miniature Optical Transmitter 1310nm FP, Laser	419
2405EO5D	SDI Miniature Optical Transmitter 1550nm DFB Laser	419
2405OE-HD	HD Miniature Optical Receiver, 19.4Mb/s to 1.5Gb/s	422
2405OE	SDI Miniature Optical Receiver, 19.4Mb/s or 143-540Mb/s	420
2407DVIT	DVI/KVM Miniature Fiber Receiver	423-424
2407DVIR	DVI/KVM Miniature Fiber Transmitter	425-426
2407RGBT	RGBHV/DVI/KVM Miniature Fiber Transmitter	427-428
2407RGBR	RGBHV/DVI/KVM Miniature Fiber Receiver	429-430
2410MD-HSN	HD Miniature Monitoring Downconverter with 24sF processing (with power supply)	433
2430DAC-HD	HDTV Miniature D to A: YPrPb/RGB/VGA via High Density DB-15 (with power supply)	431
2430GDAC	G-LINK to DVI converter. Required for every G-LINK output of PPMG and PPMV+G output processor card	432
2430GDAC-WARP	G-LINK to DVI converter with WARP	432
3000MVP-GI	Dual (2) or Quad (4) computer video inputs per input module	23-27
3000BHP-AI	Monitor up to 4 analog pairs or 4 AES/EBU audio channels per video input	23-27
3000BHP-U	1RU Breakout bulkhead panel to support unbalanced AES/EBU digital audio	23-27
3000BHP-BAL	2 RU Breakout bulkhead panel to support either balanced stereo analog inputs or balanced AES/EBU audio	23-27
3000BHP-AUX	Breakout bulkhead panel for GPI/O, LTC input, and serial communications	23-27
3000MKT-AUX	Dual AUX BHP Rack Mounting Kit	23-27
3410	Multivert (10 SDI to Analog Monitoring Converter)	390-391
3400RS	Rear support kit	390-391
400FR	Compact High Density Balanced Audio Distribution Frame	274
400ADA-AUD	Analog Audio Distribution Amplifier (1x9)	275
400DA-AESB	Balanced AES Audio Distribution Amplifier (1x9)	276
4600T-3P	1 RU Frame - parallel I/O (3 modules max), c/w power supply	417-418
4600T-3S	1 RU Frame - serial I/O (3 modules max), c/w power supply	417-418
500AC02-HD/SD	Dual HD & SD Digital Video Signal 2 x 1 Change Over	285
500ADA	Analog Video Distribution Amplifier (1 x 9)	295
500ADA-AUD	Analog Audio Distribution Amplifier (1 x 4)	297
500ADA-EQ	Analog Video Distribution Amplifier with Cable Equalization (1 x 9)	296
500ADA-EQ-L	Analog Video Distribution Amplifier with Cable Equalization for Looping Analog Frame	283
500ADA-W	Word Clock Distribution Amplifier (1x9)	298
500AMDA-AESU	Unbalanced AES Audio DAC & Distribution Amplifier	294
500DA	SDI Reclocking Distribution Amplifier - (1 x 9)	288
500DA2Q	SDI Dual Reclocking Distribution Amplifier (2 - 1 x 4)	289
500DA2Q-AESU	Unbalanced Dual AES Audio Distribution Amplifier (2- 1x4)	293
500DA2Q-HD	Combo HD/SD SDI Dual Reclocking Distribution Amplifier (2 - 1 x 4)	284
500DA-AESB	Balanced AES Audio Distribution Amplifier (1 x 4)	291
500DA-AESU	Unbalanced AES Audio Distribution Amplifier (1 x 9)	292
500FC-DA-HD	Combo HD/SD SDI Reclocking Distribution Amplifier (1 x 8)	282
500DCCA-HD	HD Downconverter & Distribution Amplifier with closed caption monitoring	286-287
500FC	VistaLINK® Frame Controller	281
500FR	Compact High Density Distribution Frame	277-278
500LR-L-A	Compact High Density Analog Looping Distribution Frame	279-280
500VMDA	SDI Monitoring Reclocking Distribution Amplifier	290
520AD4	SD Audio De-embedder with 4 unbalanced AES inputs (2 audio groups)	300
520AD4-HD	HD/SD Audio De-embedder with 4 unbalanced AES outputs (2 audio groups)	306
520AD4-DD-HD	HD/SD Audio De-embedder & Dolby E/AC-3 Decoder & Re-embedder	304-305
520AD8-HD	HD/SD Audio De-embedder with 8 unbalanced AES outputs (4 audio groups)	308
520AE4	SD Audio Embedder with 4 unbalanced AES inputs (2 audio groups)	301
520AE4-HD	HD/SD Audio Embedder with 4 unbalanced AES inputs (2 audio groups)	307
520AE8-HD	HD/SD Audio Embedder with 8 unbalanced AES inputs (4 audio groups)	309
520DD-AESU	Dolby E Decoder	302-303
520DARS-W	Unbalanced AES Word Clock Extractor Audio Distribution Amplifier	299
5010	Time Code Generator/Reader	397-398
5010-24Fps	NTSC/24Fps Time Code Generator/Reader	397-398
5010-GPSII	Time Code Generator with GPSII	399
5010-VITC	Time Code Generator/Reader with VITC	397-398
5010-VITC-24Fps	NTSC/24Fps Time Code Generator/Reader with VITC	397-398
5010-VITC-GPSII	VITC Time Code Generator with GPSII	399
5150	Analog Afterburner II LTC/VITC Reader/VCG	400
5300	Time Code Analyzer	401
5550	KeyCode Universal Decoder	445-446
5550/KR-16/35	5550 Decoder with KR16/35 Head & 10 ft.cable	445-446
5550/UV-3	5550 Decoder with UV-3 Head & 20 ft. cable	445-446
5550/UV-3/4025TR	Analog Film Footage Encoder System including KeyLog Tracker, KeyCode Decoder and UV-3 Head	445-446
5550/UVS-3	5550 Decoder with UVS-3 Head & 20 ft. cable (for Sony telecine)	445-446

5550/UVT-3	5550 Decoder with UVT-3 (Touchless) Head & 20 ft. cable	-445-446
16MM	16mm Kodak Keycode Verification Film	-445-446
35MM	35mm Kodak Keycode Verification Film	-445-446
CINTEL-SHIM	Shim kit for Cintel C-Reality 16/35 heads	-445-446
EV-BRKT	Universal Reader Mounting Bracket for 16MM & 35MM head & UV head	-445-446
FDL-SHIMS	Shim kit for BTS, FDL 60/90, Quadra	-445-446
5600ACO	Automatic Changeover system complete with 2 power supplies, 2 power cords and 3 DB9 cables	-407-408
5600ACO-2	Dual Automatic Changeover system complete with 2 power supplies, 2 power cords and 3 DB9 cables (BNC cables not included)	-407-408
5600MSC	Combo Master Sync. Pulse Generator/Master Clock (includes 6 Black Burst/Tri-level Sync outputs)	-403-406
5950	VITC/LTC Timecode Reader/Character Inserter	-402
7700ACO-HD	HD/SD SDI 8 Channel AES & RS232/RS422 Auto Changeover	-65
7700ADA	Analog Video Distribution Amplifier	-72
7700ADA7	Analog Video Equalizing Distribution Amplifier (1X4)	-73
7700ADA7-EQ	Analog Video Equalizing Distribution Amplifier (1X7)	-75
7700ADA-AUD	Dual Analog Audio Distribution Amplifier	-76
7700ADA-EQ	Analog Video Equalizing Distribution Amplifier	-74
7700DA	143-540Mb/s, DVB-ASI, SMPTE 310M Reclocking Distribution Amplifier	-68
7700DA7	HD/SD SDI reclocking DA, 7 output	-69
7700DA7-HD	HD SDI reclocking DA, 4 outputs	-63
7700DA8-HD	HD SDI reclocking Distribution Amplifier, 8 outputs	-64
7700DA-AESB	Autoequalizing Balanced AES/EBU Distribution Amplifier	-71
7700DA-AESU	Autoequalizing unbalanced AES/EBU Distribution Amplifier	-70
7700DA-DS3	DS3 Distribution Amplifier	-67
7700DA-HD	HD SDI Reclocking Distribution Amplifier, 4 outputs	-64
7700FC	VistaLINK® Frame Controller (includes VLPRO-C, VistaLINK® PRO S/W configuration Tool)	-56
7700FR-C	3RU Multiframe which holds up to 15 single slot modules with power supply	-54-55
7700PS	Additional power supply for 7700FR-C	-54-55
7700FR-C-48VDC	3RU Multiframe which holds up to 15 single slot modules with 48DC power supply	-54-55
7700PS-48VDC	Additional power supply for 7700FR-C-48VDC	-54-55
7700FR-CR	3RU Multiframe which holds up to 15 single slot modules without power supply	-52-53
7700GPI	VistaLINK® General Purpose Interface Module	-57
7700PCO	AC/DC Power Changeover Unit	-436
7700PTX-MVP	PTX which drives UMDs	-58
7700PTX-SX	PTX which interfaces with Miranda Press Station	-58
7700PTX-XY	PTX which interfaces with Leitch-XY integrator	-58
7700PTX-CTP	PTX which interfaces with Ross switcher	-58
7700PTX-10XL	PTX which controls 10XL-based routers	-58
7700PTX-D28	PTX which controls Datatek D-2800 based router	-58
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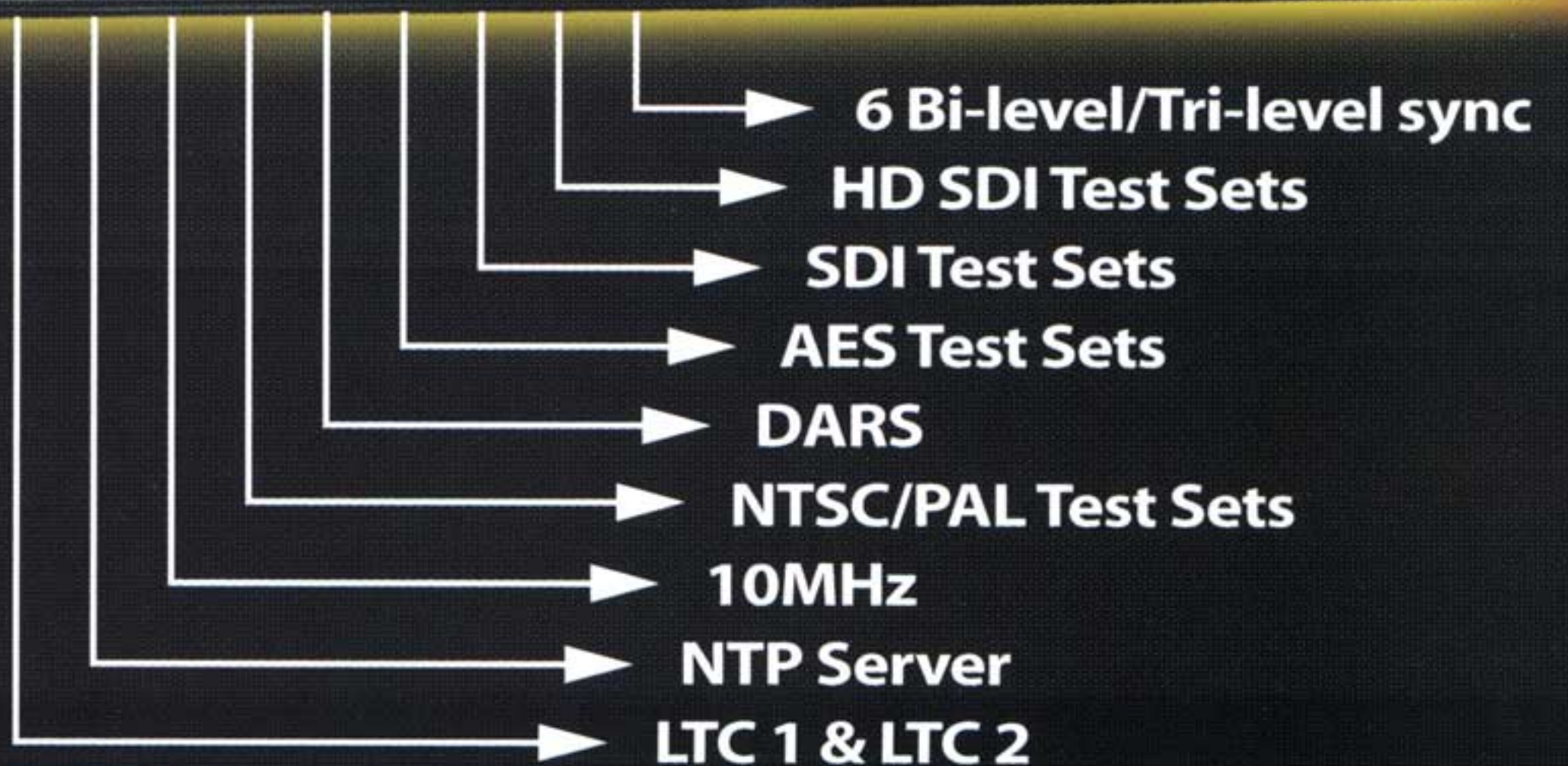
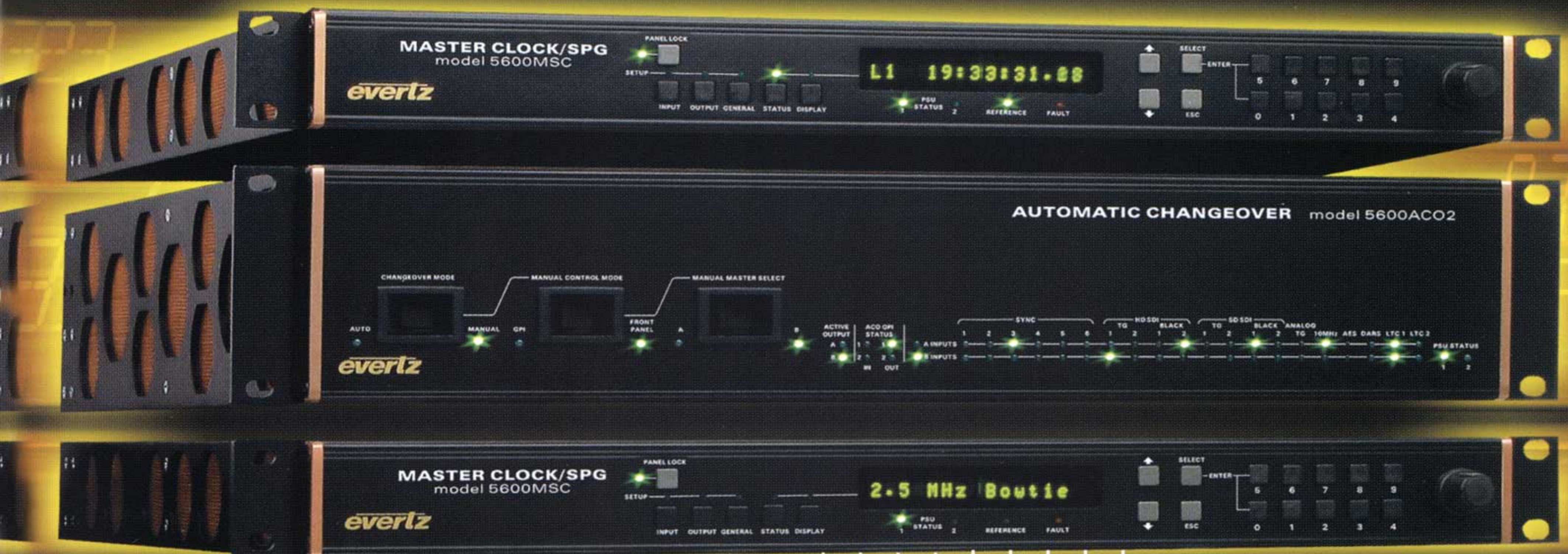




## IT'S ABOUT TIME...

### The Evertz 5600 Series:

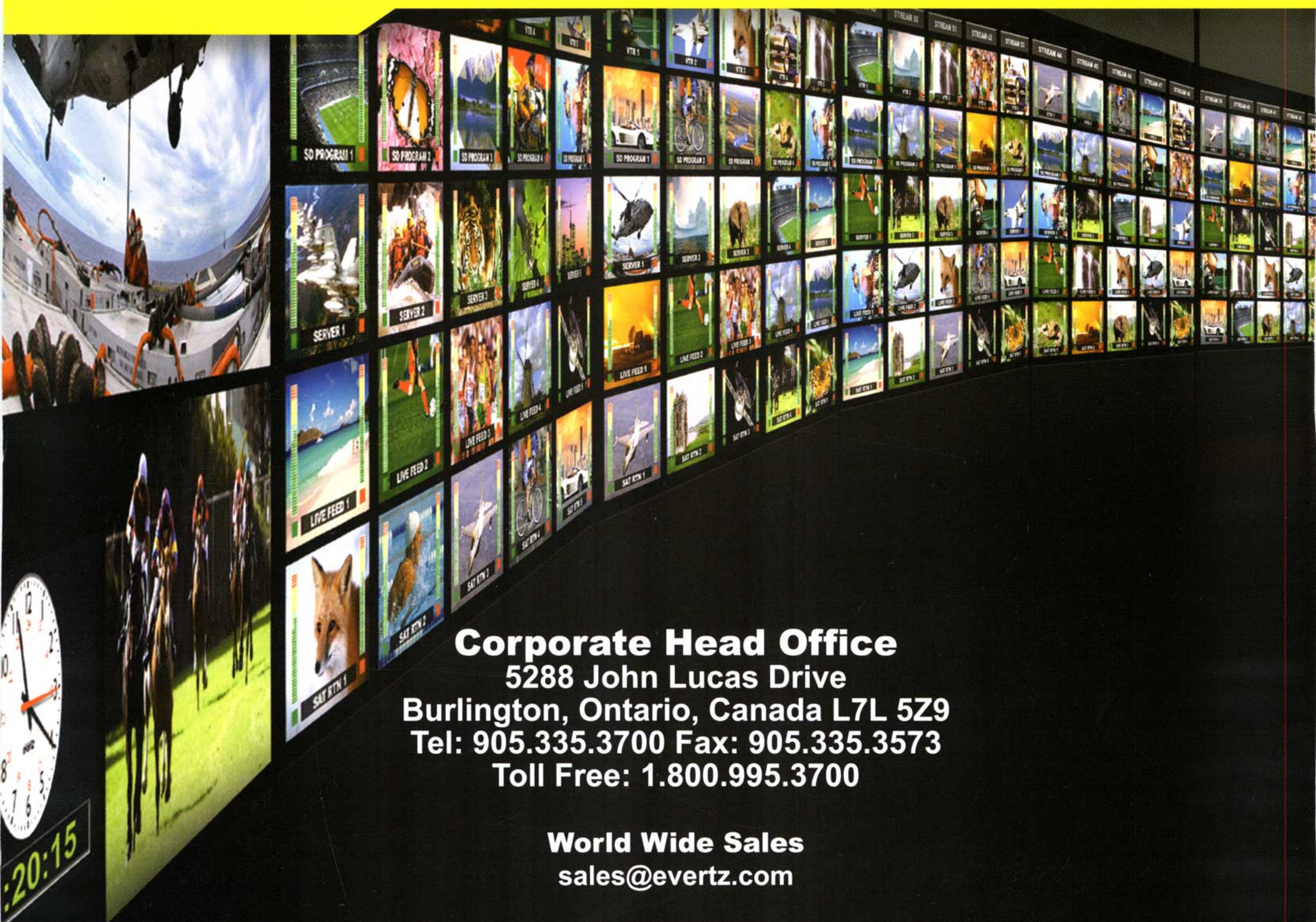
The **5600MSC** is a Master SPG, Master Clock and Master Time Code Generator all in one box. The separate **5600ACO** or **5600ACO2** Automatic Changeover Units complete the package.



Evertz also offers a wide variety of both Digital and Analog Time Displays for all of your time-keeping needs, including the **1200DD**, **1201DD** & **1275A** digital clock displays, and the **1212** & **1216** analog clock displays.



# 2006/2007 Broadcast Pages



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