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Offering You The Most...

Multi-Image Display & Monitoring

HDTV

Fiber Optics

Video & Audio Conversion

SDTV

Closed Captioning

Production & Post-Production

Time Code

Most Advanced
Most Comprehensive
Most Flexible
...Solutions

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2004

Conversion, Synchronization, Monitoring & Control Via VistaLINK™



VistaLINK™ PRO
Server

9000 NCP



VistaLINK™ PRO
Client



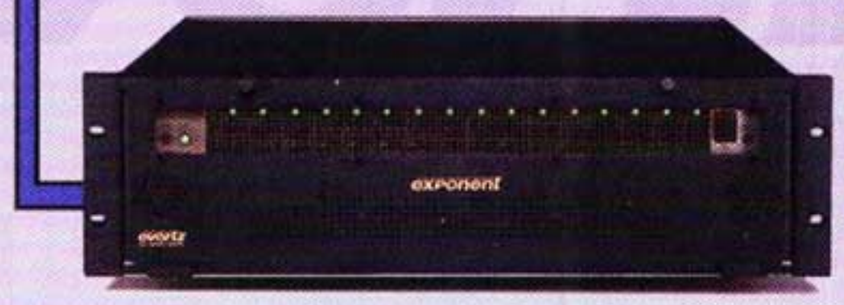
9000 NCP

ETHERNET (SNMP)

ETHERNET (SNMP)



MultiFrame
7700FR



exponent
500 Series



3000 Series

Signal conversion, synchronization, monitoring and configuration control are now united through VistaLINK™ - Evertz's true Simple Network Management Protocol (SNMP)-based network management tool. By way of VistaLINK™ PRO Server/Client NMS software on a networked PC, or by using a convenient, 1RU rack mounted 9000NCP Network Control Panel, video and audio signals are synchronized, level adjusted, converted and monitored through SNMP. In addition, automated configuration and alarm scheduling, fault reporting and logging and even trend analysis through the SNMP network is also available. As a result, Evertz's modular and VistaLINK™-enabled cards provide a "simply complete and completely simple" solution for your signal conversion and monitoring needs.

Many Frames, Many Functions, Many Control Nodes, One Open Protocol

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In The Beginning...



... Evertz introduced the universal, modular 7700 series Multiframe and the 500FR "Exponent" Highest Density DA frame, both with VistaLINK™, offering networked monitoring and configuration control through Simple Network Management Protocol (SNMP)...



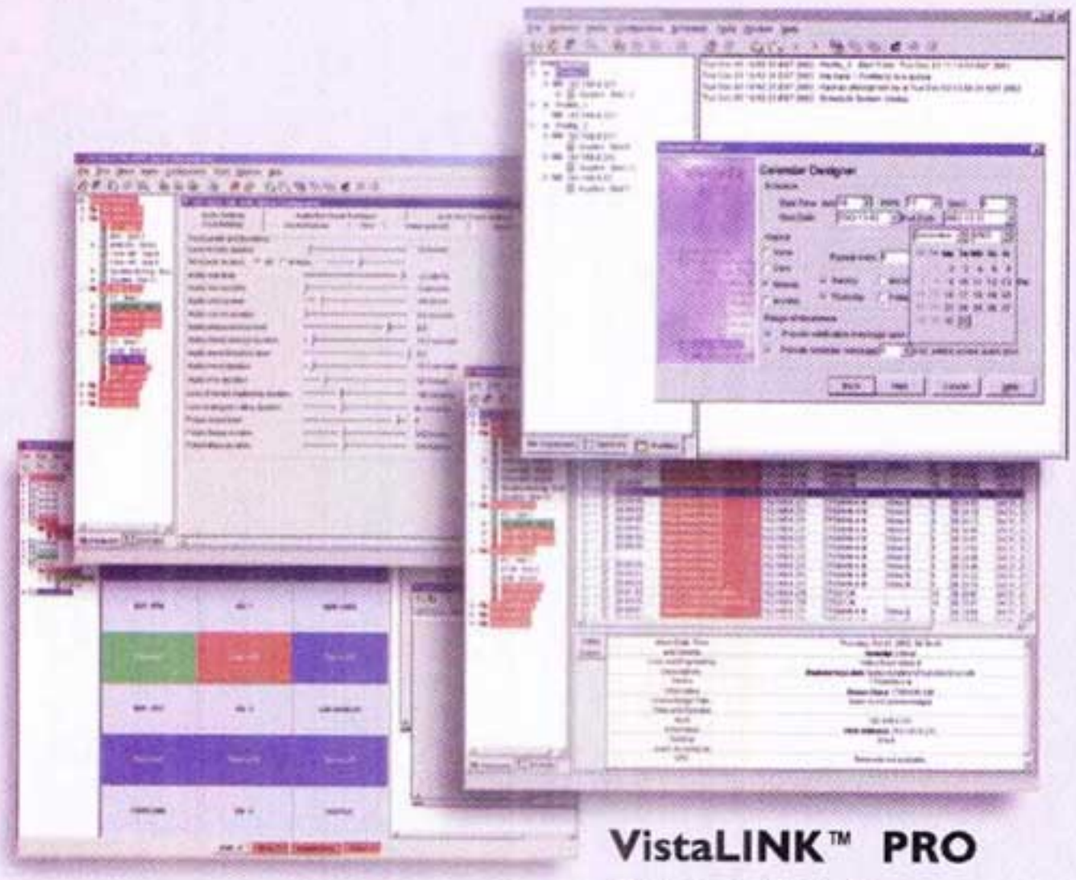
...now, Evertz proudly introduces the

9000NCP Network Control Panel

simple, rack-mountable network configuration control through VistaLINK™

Many Frames, Many Cards... One Open Control Protocol!

Conversion & Synchronization



VistaLINK™ PRO
Screen Shots



VistaLINK™ PRO
Server

9000NCP



Ethernet (SNMP)

Ethernet (SNMP)

HD Frame Synchronizer

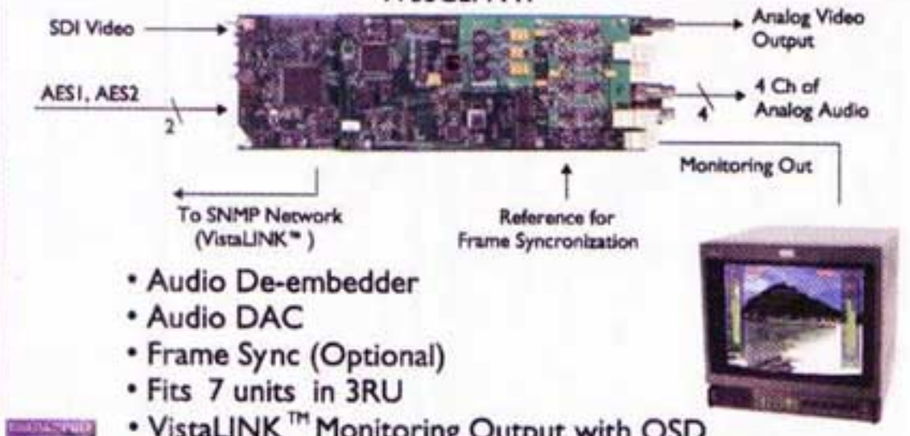
7745FS-EAES4-HD+P



- 2 Group embedded support (4ch AES)
- Proc. controls-luma, chroma, black gain
- Audio level audjust
- Up to 7Fr. additional video delay
- Fits 7 units in 3RU
- Re-embedds 2 groups of audio

Video and Audio D to A

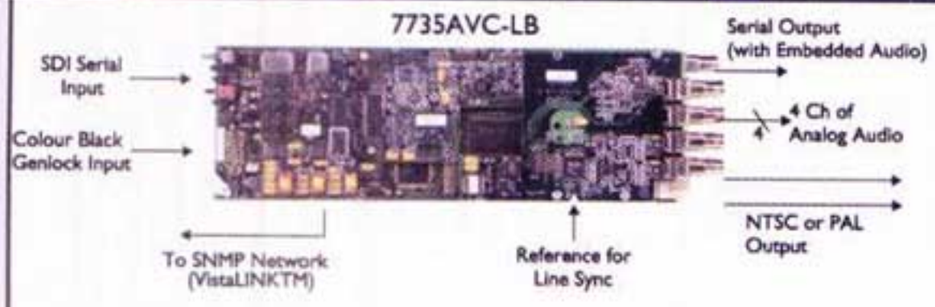
7735CEM-A4



- Audio De-embedder
- Audio DAC
- Frame Sync (Optional)
- Fits 7 units in 3RU
- VistaLINK™ Monitoring Output with OSD
- Softswitch™ - Mitigates audio pops on switch

Video and Audio D to A - Line Buffer

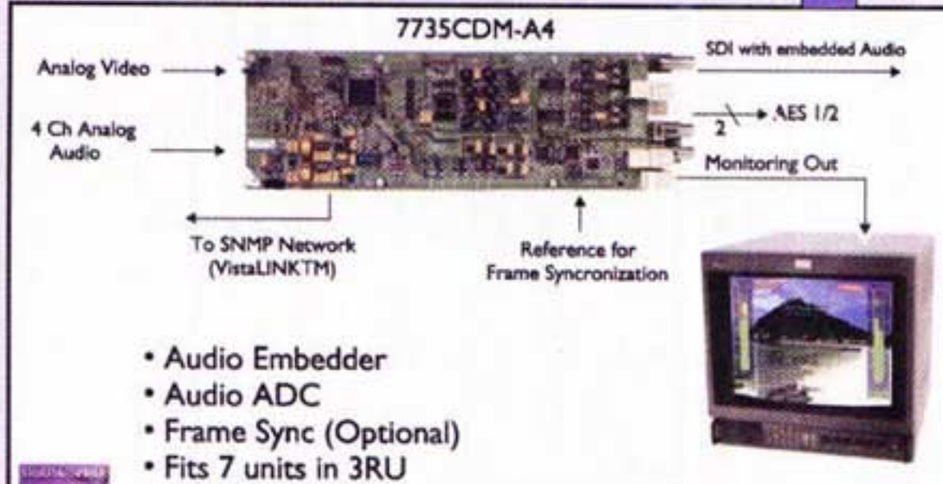
7735AVC-LB



- SDI Line Syncronizer-Autotimer
- Softswitch ™ - Mitigates audio pops on switch
- Audio De-embedder & Audio DAC
- Fits 7 units in 3RU
- VistaLINK ™ Reporting & Control

Video and Audio A to D

7735CDM-A4



- Audio Embedder
- Audio ADC
- Frame Sync (Optional)
- Fits 7 units in 3RU
- VistaLINK ™ Monitoring Output with OSD



Model 7700FR

The most advanced solution to interface and remotely adjust your HD, SD, Analog Video and Audio Signals to your modern plant!

Many Frames,
Many Functions,
Many Control Nodes,
One Open Control Protocol



VistaLINK™ PRO Client

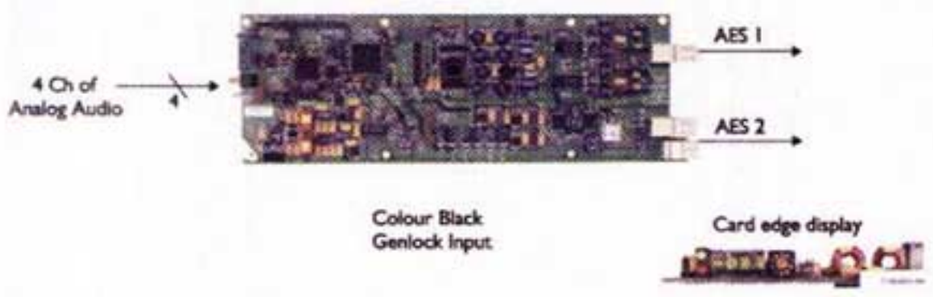
9000NCP



Ethernet (SNMP) **Ethernet (SNMP)**

Audio A to D

7720ADC-A4



- 24 bit ADC
- Card edge level adjust
- Card edge confidence bargraph
- DARS or video reference

SDI Frame Synchronizer

7745FS-EAES+P



- Embedded Audio & 2 AES supported
- Proc. controls-luma, chroma, black gain
- Audio level audjust
- Fits 7 units in 3RU
- VistaLINK™ Monitoring Output with OSD

Audio D to A

7720DAC-A4



- 24 bit DAC
- Card edge level adjust
- Card edge confidence bargraph
- Fits 15 in 3RU

HD Broadcast Quality Down Converter

7711HDC



- 10 bit HD to SD down conversion
- Aspect ratio conversion
- Automatic input standard & frame rate detection
- 4 AES outputs
- VistaLINK™ monitoring

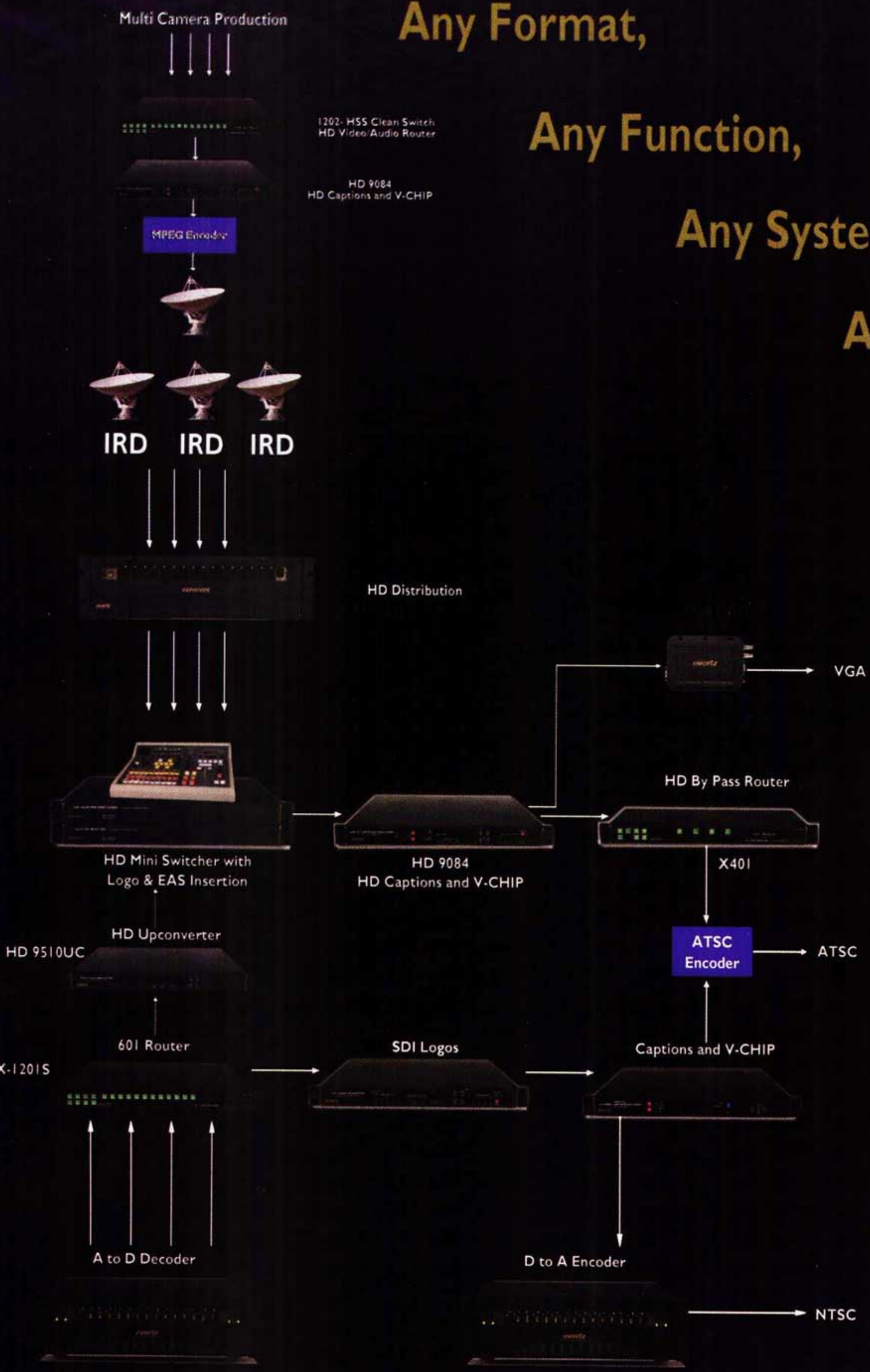
The Most Complete

Any Format,

Any Function,

Any System,

Any Time.



Line of HD Gear...

7700 Series Multiframe

7750SRG-HD	HD Tri-Level Sync Generator
7750TG-HD	HD Test Generator
7750TG2-HD	Dual HD Test Generator
7732PFT-HD	24Fps Progressive Format Translator
7745FS-EAES4-HD	HD Frame Sync with 8 Audio and EAES Crawl
7700DA-HD	HD Distribution Amplifiers
7720AE4-HD	8 Channel Audio Embedder
7720AD4-HD	8 Channel Audio De-embedder
7711HDC	High Quality Down Converter
7711HDC-SN	High Quality Down Converter with Audio
7710MD-HD	HD Monitoring Down Converters
7730DAC-HD	HD D to A Converter
7700DA-HD	HD SDI Relocking Distribution Amplifier
7707EO13-HD	HD Fiber E to O Module
7720AE-HD	HD Audio Embedder
7720AD-HD	HD Audio De-embedder
7720AE-EO-HD	HD Audio Embedder & Fiber Transmitter
7720AD-OE-HD	HD Audio De-embedder & Fiber Receiver
7760CCM-T	EIA608-EIA708 Decoder/Translator
7770CS-HD	HD over SDTI HDCAM Compressor
7770DS-HD	HD over SDTI HDCAM Decompressor

Routers

X-1201H	12x1 HDTV Router with optional dual or quad AES routing layers
X-1202H	12x2 HDTV Router with optional dual or quad AES routing layers
X-0401H	4x1 Series Routers
5600MSC	HD/SD Master SPG/Timecode

500 Series Frame

500DA-HD	1x8 HDSDI Re-clocking
500DCDA-HD	HD Downconverter & Distribution Amplifier
500DA2Q-HD	HD SDI Dual Reclocking Distribution Amplifier 2(1 x 4)

9000 Series

HD9510UC	Upconverter
HD9625LG	HDTV Logo Inserter
HD9625LG+EAS	HDTV Logo Inserter and Emergency Alert System
HD9625DSK	HD Down Stream Keyer
HD9084	HD Closed Caption Inserter
HD9010	HD Time Code Converter
HD9590	HD Graticule Generator

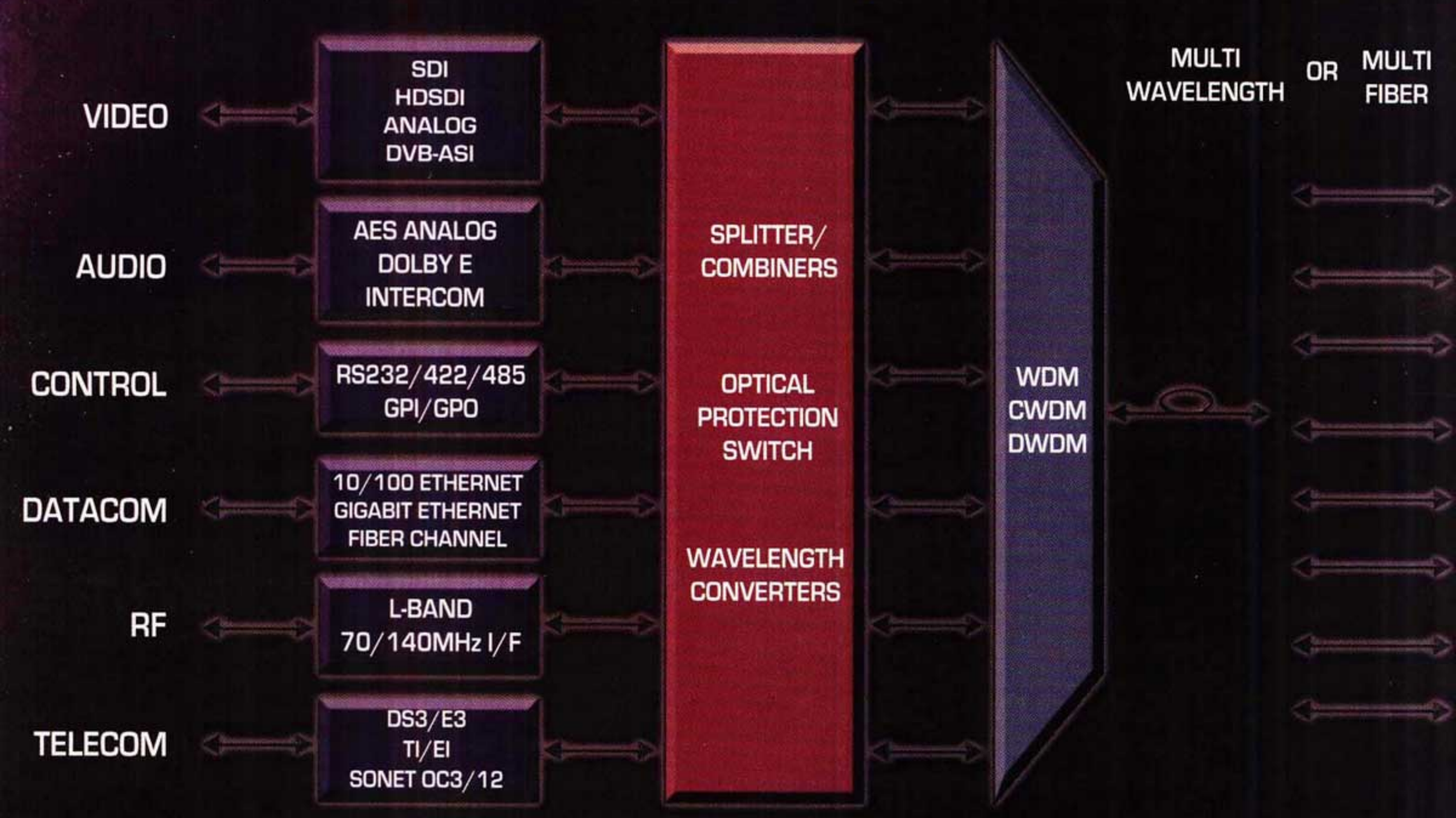
Miniature/Production

F9-2410MD	SONY HDCAM HDSDI Monitoring Downconverter Adapter
A-2410MD	PANASONIC DVCPRO HDSDI Monitoring Downconverter Adapter
2430DAC-HD	Miniature HD D to A Converter w/ VGA Output
HD9155 HD	Production Afterburner with High Quality Downconverter
HD9150QPS-AUD	HD Post Slate Afterburner with High Quality Downconverter, AES and Analog Audio



The Most Complete Fiber Optic Solutions...

Any Signal, Any fiber, Any system, Any where



Evertz FacilityLINK™ Fiber Optic Platform

- Video, Audio, Control, Data, Telecom, RF in one platform
- VistaLINK™ SNMP Remote Monitoring and Control
- Up to 160 video signals on one fiber
- Inter and Intra Facility solutions
- Supports Mulit-mode or Single-mode fiber
- Industry proven



Comprehensive
Monitoring
via VistaLINK™

Evertz Fiber Optic Overview

Evertz's fiber optic product line consists of a comprehensive set of fiber optic conversion and transport products for video, audio, control, datacom, telecom, L-Band and I/F signals. The 7700 FacilityLINK™ Fiber Optic Platform has been designed to handle the complex requirements of current and future fiber optic transport for professional video applications.

Features

- **Flexible & Expandable transport platform**
- **Video + Audio + Control + Tally + LTC + Datacom + Telecom + RF in one platform**
- **Single Fiber (CWDM / DWDM) or Multiple Fibers**
- **Economical expansion (TDM + CWDM / DWDM)**
- **100% hot swappable, supply redundancy**

Applications

- **Facility / Studio Linking**
- **Metro Video + Audio + Control + Data links**
- **Studio to Transmitter links**
- **Outdoor Events & Remote Broadcasts**
- **Low cost, signal aggregation**
- **Wavelength conversion & aggregation**

Multi-format

Support for numerous signal formats and data types in one common platform make this one of the most flexible offerings available. Video formats supported include both analog video (NTSC and PAL) and digital video (SDTV, HDTV, DVB-ASI, SDTi, SMPTE 310M). Audio formats include analog audio, AES/EBU audio and Dolby E. RTS/Telex and ClearCom, 2 and 4 wire intercom systems are also supported. Control formats include bi-directional RS-232, RS-422, RS-485 and GPI/GPO. Datacom formats include single and multiple, bi-directional Ethernet (10/100 BaseT), Gigabit Ethernet, Fiber Channel and other network and server transport protocols. Telecom formats include SONET/SDH, DS3, T1/E1/J1. RF formats include L-Band & 70/140MHz IF signals.

Flexible

Multiple signal combination, wavelength, power and distance options ensure maximum flexibility for varying transport requirements. Multiple audios, control and contact closures can be sent separately from video on different fibers or combined with video onto the same fiber. Single direction or bi-directional signal transport over the same fiber or multiple fibers can also be chosen. Both single-mode and multi-mode fiber is supported for legacy installations. Wavelengths available include 1310nm, 1550nm and up to sixteen Coarse WDM (CWDM) wavelengths in the 1270nm to 1610nm spectrum. DWDM wavelengths at 100GHz/0.8nm spacing covering the C-Band (1530nm to 1565nm) have also been added. High power laser transmitters and high input sensitivity receivers are also available to optimize transport distances.

Expandable

With the use of CWDM up to 16 wavelengths can be economically combined onto a single fiber. The addition of DWDM increases this wavelength count to 40 channels. Evertz DWDM has been designed to operate with existing CWDM systems providing one of the most economical upgrade paths available. In either type of WDM system, each wavelength is completely independent and can carry any data type including bi-directional traffic. With the addition of Evertz Time Domain Multiplexing (TDM) technology, multiple video, audio, data and control signals can be combined to further increase total capacity without the addition of extra fiber runs. The high density 7700 frame with 15 card slots also ensures optimal expandability at minimal cost.

Economical

Evertz's CWDM technology is setting a new standard for economical wavelength multiplexing over single fibers and offers superior value in many system implementations. Evertz DWDM solutions are ideal for applications where wavelength count above 16 is needed or where specific ITU grid wavelengths are requested. For applications where multiple fibers are available and CWDM or DWDM is not needed, Evertz offers lower cost optical transmitter options.

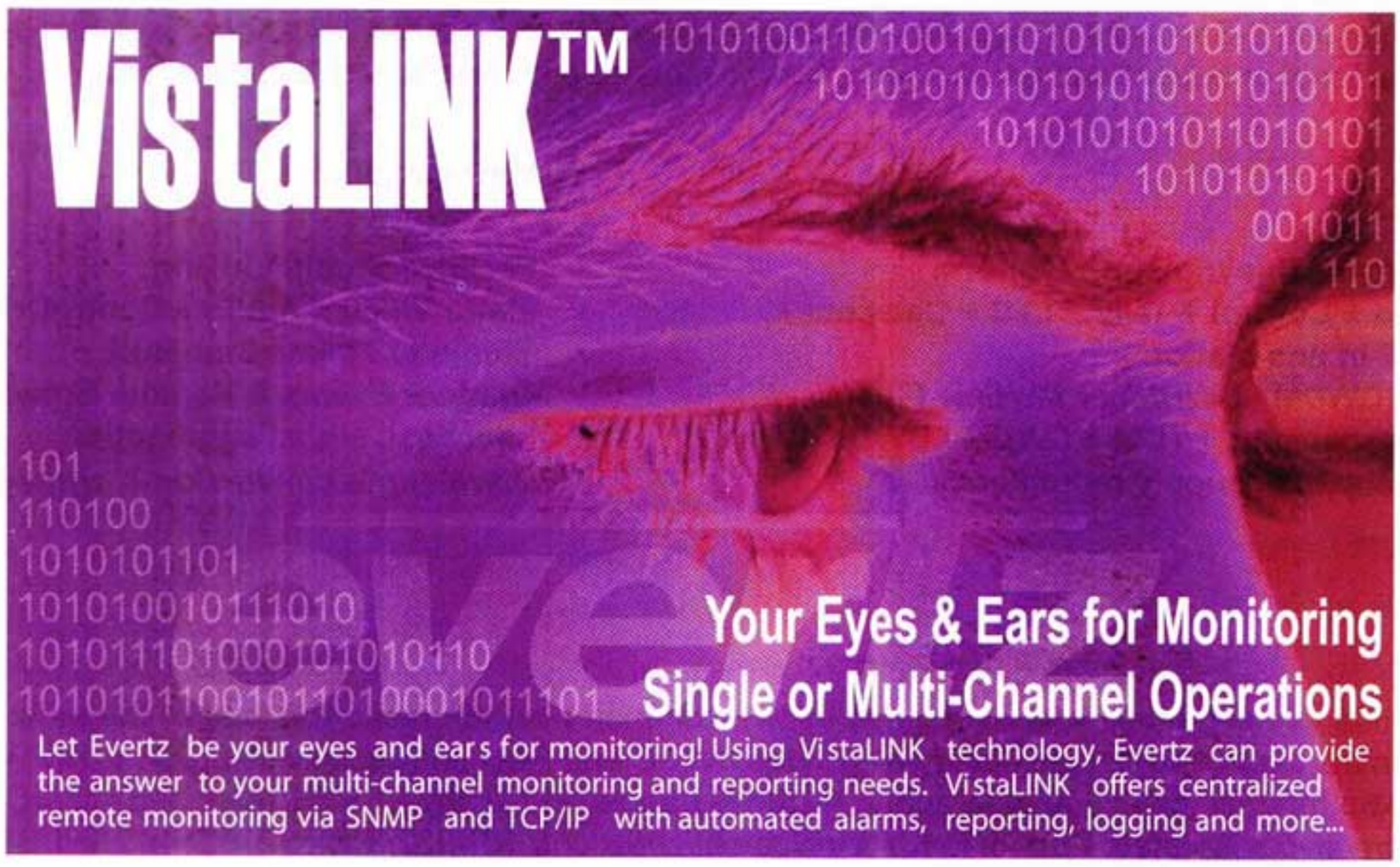
VistaLINK™ Monitoring and Control

With the addition of VistaLINK™ enabled capability, Evertz fiber optic conversion cards can be monitored and controlled locally or remotely by SNMP compliant managers or by third party automation packages.

Redundancy

Built on Evertz's proven 7700 chassis, the Facility Link platform features redundant power supplies, excellent cooling characteristics and fully hot swappable cards. Optical fail over switching for fiber bypass applications is also available.

What is VistaLINK™?



VistaLINK™, by Evertz, is an extensive network monitoring and management solution based on the Simple Network Management Protocol (SNMP). The ultimate goal of VistaLINK™ is to develop a complete end-to-end, networked monitoring solution.

Aspects of VistaLINK™ include:

- Signal Integrity and Facility Link Product Development
- VistaLINK™ PRO Network Management System (NMS) Application Software
- VistaLINK™ Partnership Program

"Signal Integrity" product development involves Evertz audio/video monitoring products (commonly identified as AVM) and spans the single, discreet input signal "sniffers" to the multiple input and multiple display signal solutions. This includes such products as the 7760AVM, 7761AVM-DC, 7765AVM-4/-4A Quattro™ and the MultiViewer Monitoring (MVM) packages. Meanwhile, "Facility Link" products are primarily identified as fiber products (7707x line) with pre-emptive fault warnings. Products such as the 7707EO Electrical to Optical Converter and 7707OE Optical to Electrical Converter, as well as other similar signal transporting terminal gear used to link two or more points are categorized as "Facility Link". Both "Signal Integrity" and "Facility Link" development efforts are unified through the third aspect – VistaLINK™ PRO.

VistaLINK™ PRO Network Management System (NMS) application software is a customized, Java-based monitoring and configuration tool for Evertz's VistaLINK™-enabled products (identified by the VistaLINK™ graphic). VistaLINK™ PRO provides a complete, user-friendly and cost-effective network monitoring solution for network monitoring applications using the open-standard, Simple Network Management Protocol (SNMP) interface, and can also be used as a customized configuration tool with existing, system-wide, third party SNMP-ready Network Control Systems, through the VistaLINK™ Partnership Program.

The VistaLINK™ Partnership Program, originated in 2001, continues to grow with the addition of new partners. The objective of this partnership is to show potential NMS customers that Evertz has established a working relationship with the key software (control system) developers/partners and will work with these partners to support Evertz interface development.

By employing true SNMP through VistaLINK™, network-enabled products may be monitored from anywhere in the world. VistaLINK™ is an effective monitoring tool for both incoming and departing signals at strategic locations (demarcation points) throughout the video enterprise network. When a problem exists, an alert is sent through the network - in effect acting as "your eyes and ears" for monitoring!

Introduction to Evertz Hardware Platforms

7700 Series - MultiFrame



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

5000 & 9000 Series - Fixed Function Frames



The Evertz 5000 & 9000 series frames are compact 1RU frames with front panel control. All 9000 frames offer dual power supplies.

500FR- *exponent* - High Density DA Frames



The Evertz 500FR *exponent* Compact Distribution Frame is an ideal solution to today's vast digital video distribution requirements. It provides flexibility to handle the high-speed requirements of HDTV as well as Analog and SDTV. The Compact Distribution Frame allows extraction of the modules from the front without compromising performance even at 1.5Gb/s. Hot extraction is supported on various types of interfaces.

The 500FR *exponent* Compact Distribution Frame is a 3RU frame designed to house up to 16 single slot modules. Each module can have up to 9 outputs, the 5501FR is a single frame designed to house 1 single module.

2400 Series - Miniature Series



The 2400 series are ideal for use in portable where the small size, rugged enclosure and high performance operation meet the stringent requirements of these applications.

evertz - OFFERING YOU THE MOST...

The Most Advanced Multi-Image Display & Monitoring Systems

MVP

Any input,

Any output,

Any size,

Any time...

MVP - Multi-image Display and Monitoring System
Complete Confidence AVM & MVM's

Model 3000MVP

The MVP - the most advanced multi-image display and comprehensive signal monitoring system, featuring "any input, any output, any size and any time..." capabilties, is ideally suited for displaying and monitoring video signals in new and existing television broadcast facilities (master control and production applications), control rooms, mobile productions, traffic and surveillance facilities, and video conferencing applications.

Any Input...

Within transitioning DTV facilities, it is common to have a mix of video signals including composite analog, SDI and HD-SDI, along with associated analog and digital audio as well as computer inputs. Realizing this, the MVP broadcast video "octal" input module is designed to auto-detect broadcast video input standards per BNC connector. Audio and computer video inputs are inputted separately and mapped as required. Therefore, as the DTV transition continues, there is no need to substitute existing BNC inputs due to signal handling limitations. However, for facilities standardizing on only one type of broadcast video input, optional S-video, SDI or HD-SDI input modules are also available as part of the MVP system, offering the same high performance standards to meet specific application needs. General Purpose Interface (GPI/O), Linear Time Code (LTC), serial communications (RS-232/422) as well as other standard display features tools are also included with the MVP, providing UMD, tally, border and time display control.

Any Output...

Mapping video and audio inputs, then configuring a graphics overlay and effectively displaying the input sources on a virtual monitor wall is the key objective of the MVP. The system will handle up to 48 video inputs per frame and will decode and display 2 audio groups per video input. Multiple frames can be linked to increase the number of inputs, and with the addition of the industry's most comprehensive signal monitoring, the MVP is truly the most versatile multi-image display and monitoring system.

Output resolution is set up to UXGA (1600 x 1200), making it useable with most display products available in the market today. Configurable monitoring audio outputs and GPO round off the standard output features.

From a signal monitoring perspective, the outputs are also configurable to provide signal status displays including audio bar graphs, closed captioning, program rating and fault alert messages. These user-configurable graphic overlays offer a convenient solution for ensuring signal confidence and alerting operators to potential problems as they arise. The MVP is also VistaLINK™ - enabled offering remote monitoring and configuration control via Simple Network Management Protocol (SNMP).

Any Size...

In addition to factory-defined display layout presets, the MVP offers the option to generate and store customized screen layouts. These layout configurations are convenient especially in "static" operation monitoring applications as once the layout is chosen it does not need to be changed. However, for "dynamic" production-type display applications, the ability to resize, rescale and reposition the active pictures through the MVP's simple, drag-and-drop control is paramount.

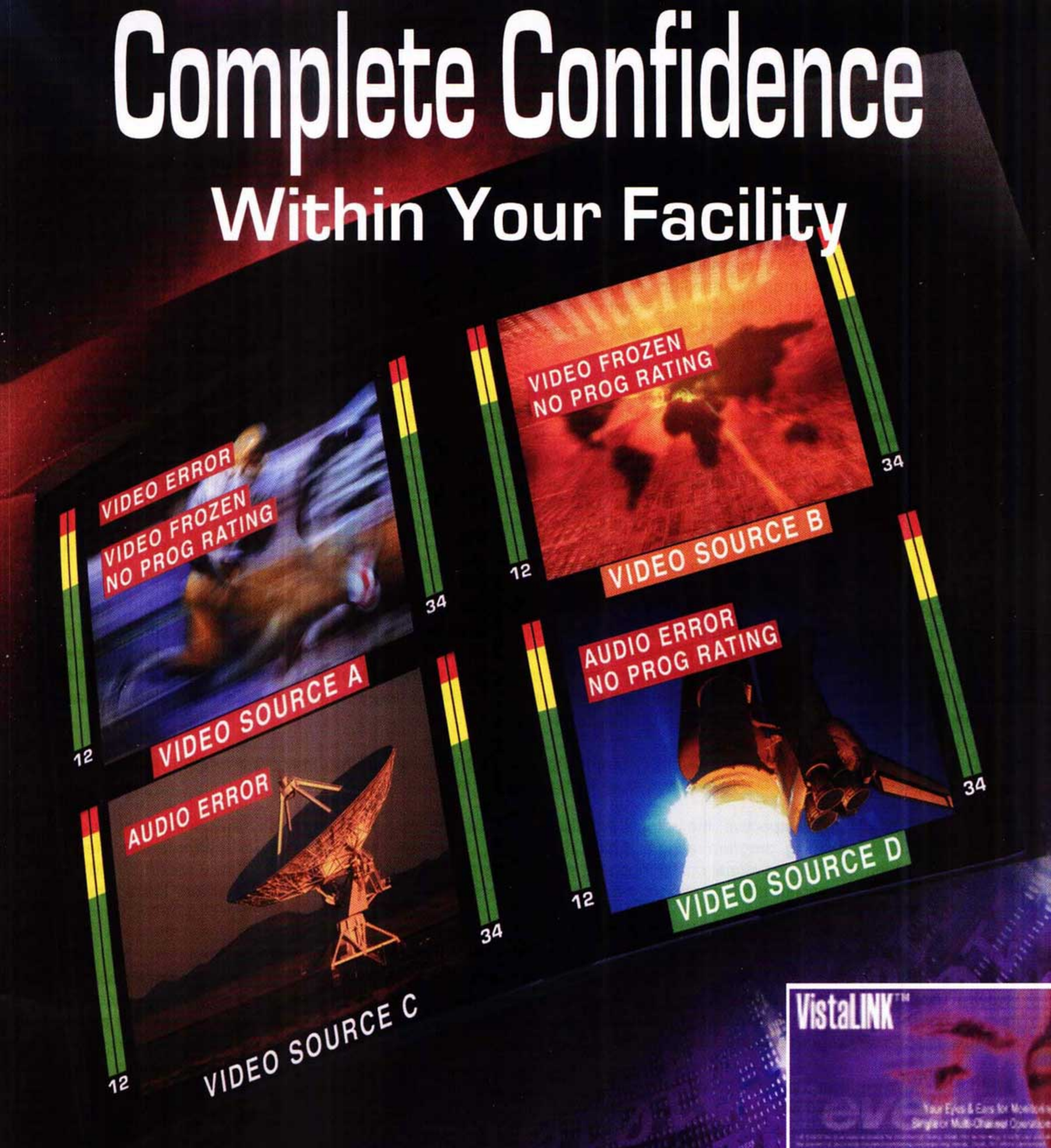
Graphic overlays are also a part of the "any size" criteria. Specifically, some applications will not require any graphic overlays, while others will need big, bold messages displayed on-screen to attract operators' attention. As a result, the MVP is designed to handle many display size and graphic requirements.

Any Time...

The MVP is equipped with a number of configurable digital and analog clocks, offsets, count-up and countdown timers, offering a complete display solution.

Complete Confidence

Within Your Facility



AVM & MVM

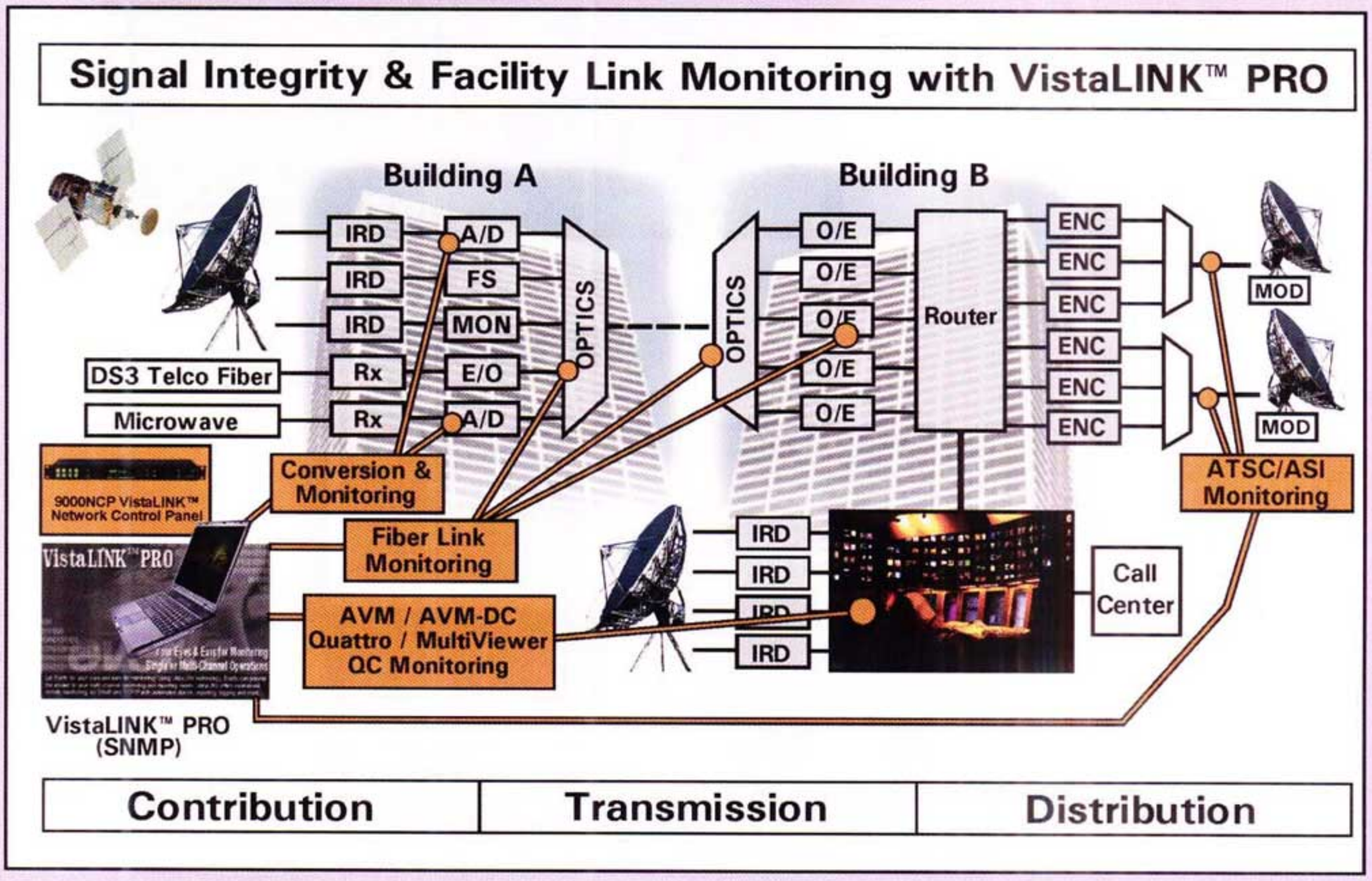
Audio, Video and Data Status Monitoring Solutions with VistaLINK™

Monitoring with VistaLINK™

Whether utilizing a single input, signal status monitoring card of a quad-input Quattro™, Evertz's hot-swappable, modular "AVM" products boost your signal monitoring capacity and confidence through local on-screen displays as well as remote monitoring via VistaLINK™ - Evertz's extensive, end-to-end networked monitoring and management solution using Simple Network Management Protocol (SNMP). Evertz's audio, video and data monitoring (AVM) products offer many signal display and monitoring features. Single, dual and quad-input channel AVM products that increase signal-monitoring density per frame while improving signal monitoring cost-effectiveness. With on-screen, menu-driven displays, signal status information and fault alerts keyed over the active picture, AVM's provide the right solution for signal monitoring needs. In addition, by increasing the number of monitored and the in-depth signal fault monitoring, the MultiViewer Monitoring (MVM) products offer even more value!



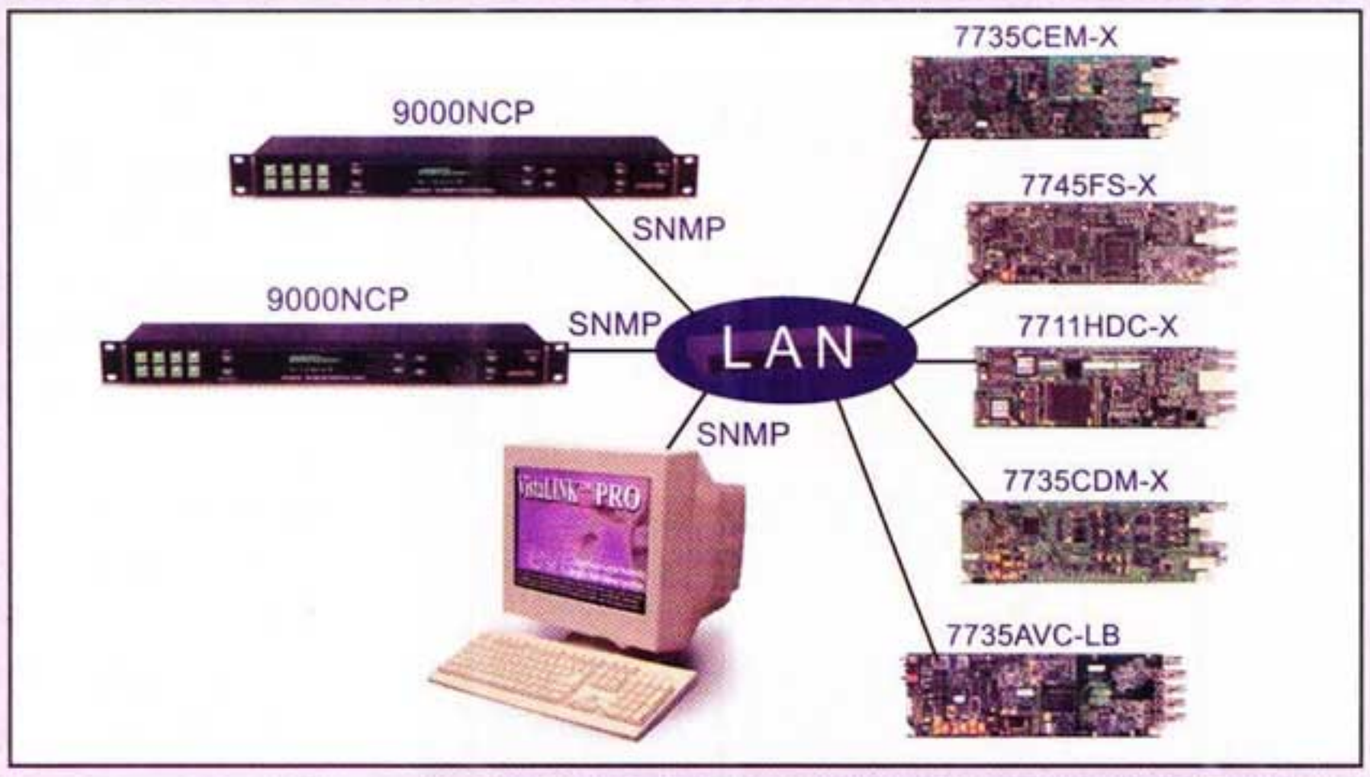
Evertz's multidisplay and monitoring products are VistaLINK™ - enabled and may be monitored from anywhere in the world through VistaLINK™ PRO - customized, complete, uncomplicated and cost-effective monitoring and configuration application software, uniting Evertz's VistaLINK™- enabled AVM, Fiber and Conversion product lines. If faults occur on monitored incoming or outgoing signals throughout the video enterprise network, an alert is sent through the network - in effect acting as "your eyes and ears" for monitoring!



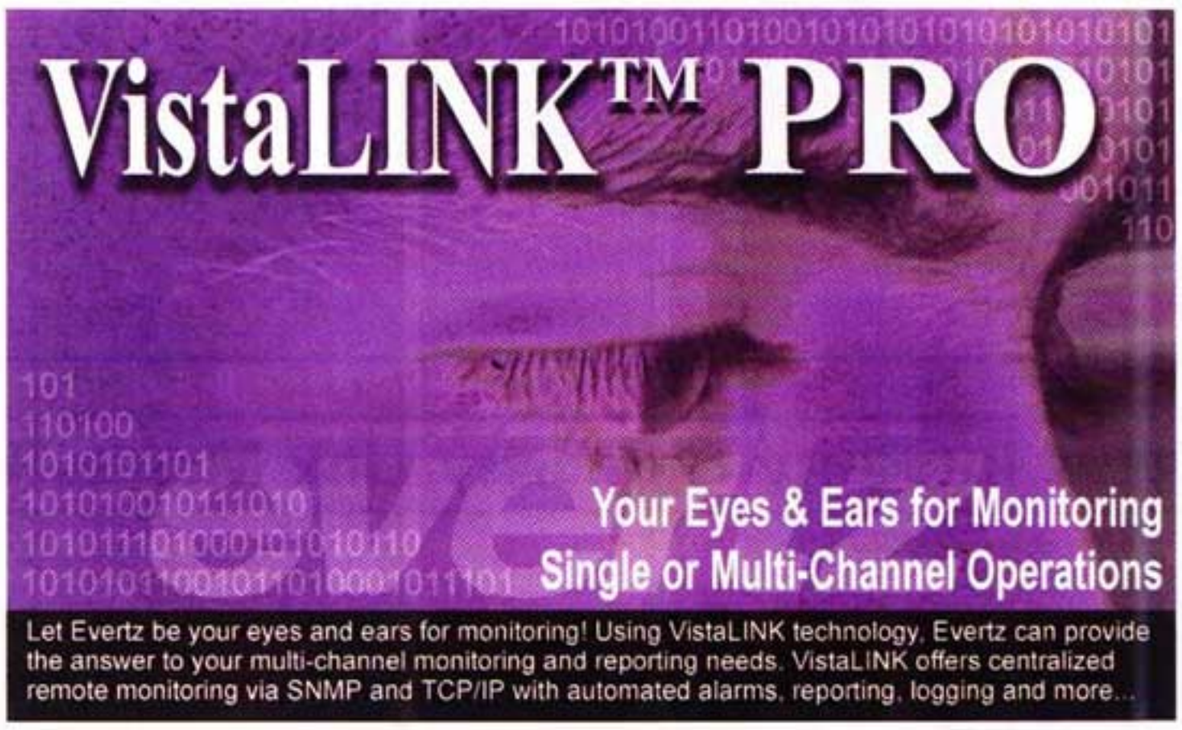
Complete Confidence AVM & MVM's

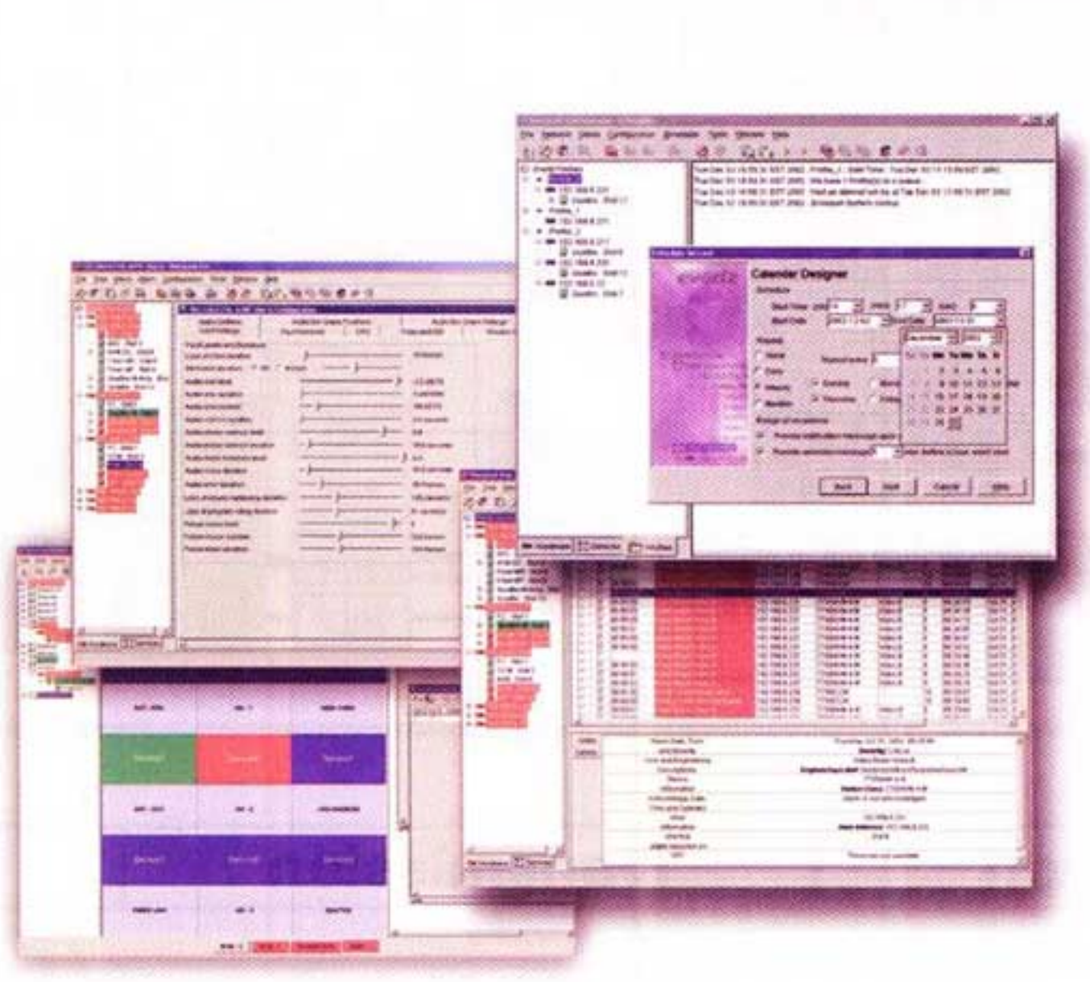
9000NCP VistaLINK™ Network Control Panel





VistaLINK™ PRO





Features:

- Rack-mountable, 1RU control panel
- Primary communication through Ethernet using Simple Network Management Protocol (SNMP)
- Four line, 24 alphanumeric digit per line vacuum fluorescent display (VFD) featuring very high brightness and widest viewing angles
- Additional reserved column (25th digit) for NCP network connection status reporting and other notification
- Operational configuration control of key VistaLINK™ -enabled product parameters
- Illuminated, tactile pushbuttons and positional rotary control

Ordering Information:

9000NCP VistaLINK™ Network Control Panel



Features:

- Remote, networked monitoring and configuration of Evertz's SNMP-enabled equipment
- Customized parameter configuration and alarm displays
- Alarm/Event management through centralized alarm management and event acknowledgement
- Alarm severity configuration with customizable alarm/event user notes and definitions
- Audible alarms (if PC enabled with sound card) with reset buttons for playback "Repeat "and "Volume" settings
- Alarm/event logging with human-readable file formats for record-keeping and trend analysis
- Administrative control through password-protected access and privileges
- External Notification Module option - web-enabled cell phones, pagers, etc.
- Automation Scheduler option - set monitoring and card configuration options automatically, dependent upon program material
- Java-based application software for O/S platform independency and will run on Windows™ Platforms, UNIX, Linux, MAC
- Full installation vs. Upgrade installation option providing a convenient option to install only the new features without deleting existing databases
- Network Tree View Management allows expansion, contraction, refresh and clean-up of network elements
- Disable visual and database alarm reporting and recording through alarm inhibit option
- Features the use of a Frame MIB that specifies frame-related or "environmental" parameters such as product location, hardware status and insertion/remove fault alarms, which can be monitored similar to standard AVM or Fiber modules
- Monitoring/Grid View provides with a "quick reference" software virtual monitor wall replicating existing monitor walls with configurable "grid" and grid labels (including size and color) for fast alarm viewing

Ordering Information:

VLPRO: VistaLINK™ PRO Monitoring and Configuration Application Software (1-year license included for 1 client workstation)

VLPRO-C: VistaLINK™ PRO Configuration-only Software (Included free of charge with every 7700FC VistaLINK™ Frame Controller)

+EN VistaLINK™ PRO with External Notification Module

+SCH VistaLINK™ PRO with Scheduler Module

VLPRO-Ser/Sup/Lic. 1yr: Additional 1 year VistaLINK™ PRO license, service, support and upgrades per client

VLPRO-Ser/Sup/Lic. 2yr: Additional 2 year VistaLINK™ PRO license, service, support and upgrades per client

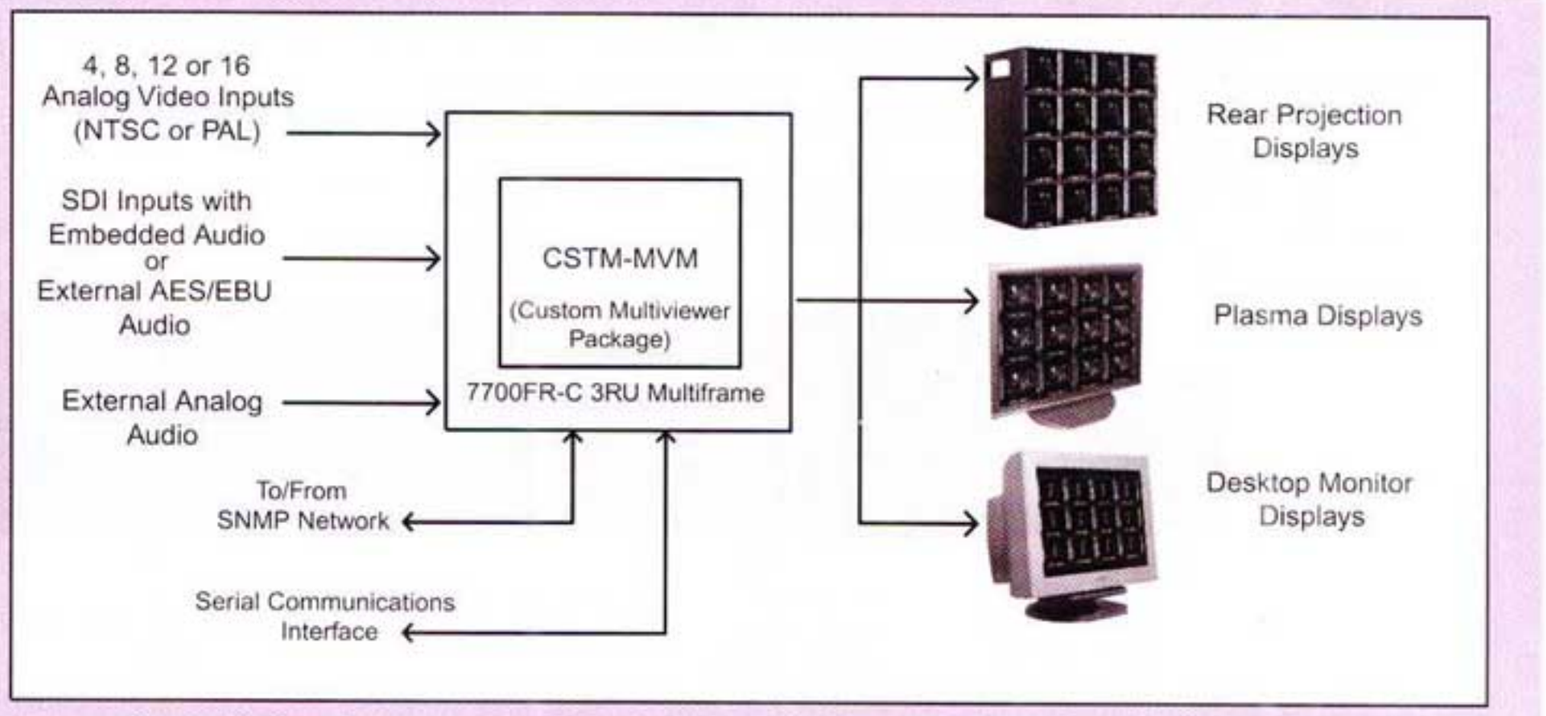
VLPRO-Ser/Sup/Lic. 3yr: Additional 3 year VistaLINK™ PRO license, service, support and upgrades per client

VLPRO Training: VistaLINK™ PRO Configuration and Training session (Contact Evertz for details)

Complete Confidence AVM & MVM's

MultiViewer Monitoring (MVM) Solutions

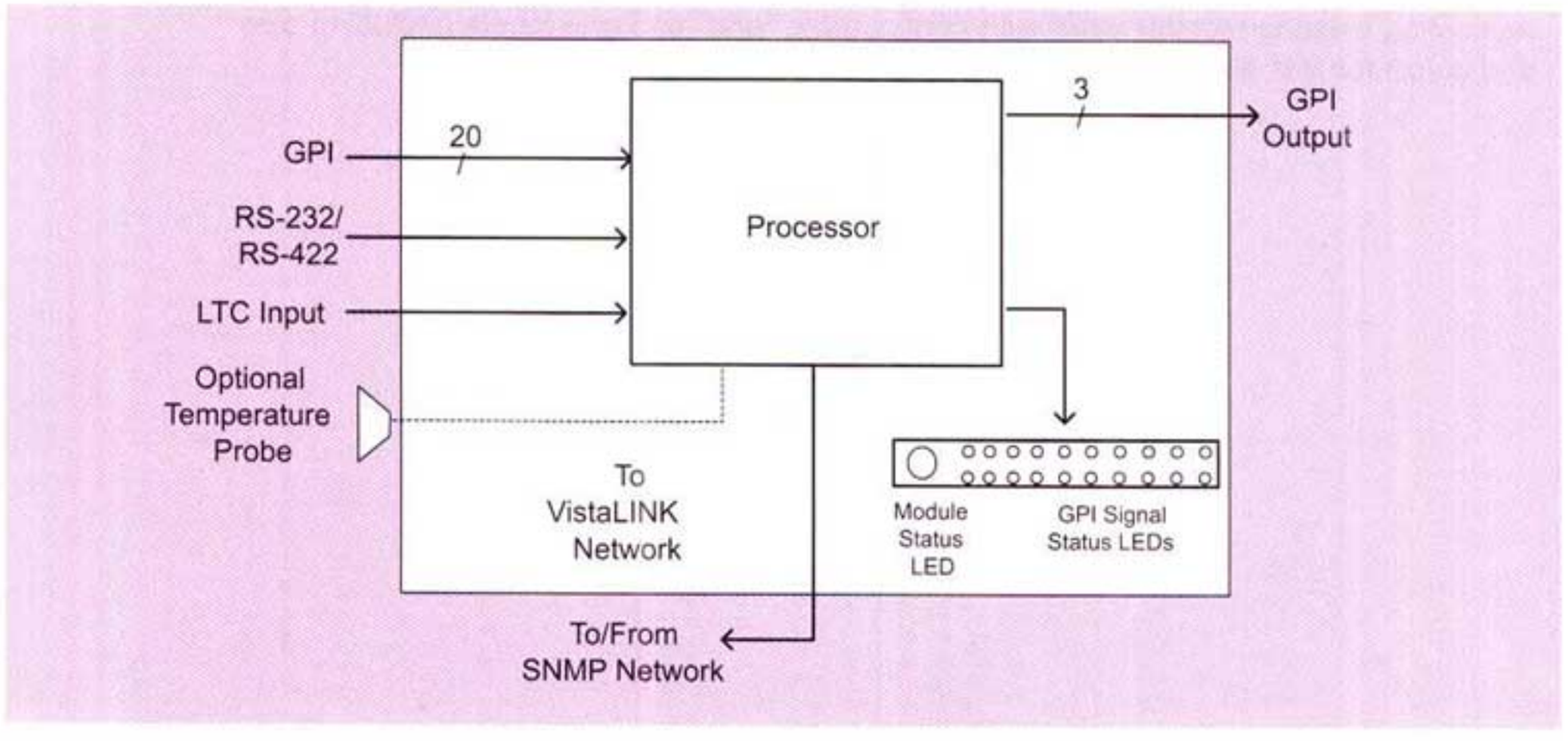




7700FC VistaLINK™ Frame Controller

7700GPI VistaLINK™ General Purpose Interface (GPI I/O)





Complete Confidence AVM & MVM's

Features:

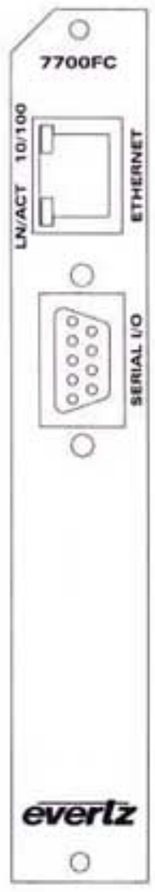
- Eight, twelve and sixteen SDI/601 525 or 625 line, 270 Mb/s component digital video inputs with embedded-only (7765MVM-8, -12, -16) or embedded and external AES/EBU audio (7765MVM-8A, -12A, -16A) monitoring and status display
- Eight, twelve and sixteen composite analog (NTSC or PAL) video inputs with external analog audio (7766MVM-8A, -12A, -16A) monitoring and status display
- Eight, twelve and sixteen S-video inputs with external analog audio (7766MVM-S8A, -S12A, -S16A) monitoring and status display
- Mix and match a combination of SDI, Composite analog and S-Video input modules for customized MVM systems
- On-screen audio level and phase bar graphs, decoded XDS, Source ID (UMD) and fault alerts
- H/V delay and expanded view display
- User-configurable error conditions monitored with four fault condition alert messages per video input
- Standard analog RGB (VGA-type) output, optimized for 4:3 rear-projection type displays and 16:9 plasma displays
- Up to 60 user-configurable GPI inputs (MVM-16) available for display modifications, tally indicators, display borders, display modes and UMDs (up to 20 user-configurable GPIs on MVM-16A)
- External AES audio and GPI I/Os are available on DB-25 connectors on "7765" modules with optional Bulkhead Breakout Panels
- External analog audio, serial communication ports and GPI I/Os are available on 68-pin SCSI connectors on "7766" modules with optional Bulkhead Breakout Panels

Ordering Information:

See individual MVM section 2 for ordering information

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
- Front panel 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 ugrades (product specific)
- Provides frame/chassis status information through enabled hardware via VistaLINK™ including power supply status, frame status, card insertion/removal counters, 7700FC software version number, LED control



Ordering Information:

7700FC +3RU: VistaLINK™ Frame Controller

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 fitting into 7700FR-C 3RU frame
- Module status LED and 20 GPI LEDs for simple GPI input diagnositics
- Frame status trigger
- Jumper-configurable RS-232/RS-422 input serial COM port
- Optional air temperature probe for reporting frame temperature status

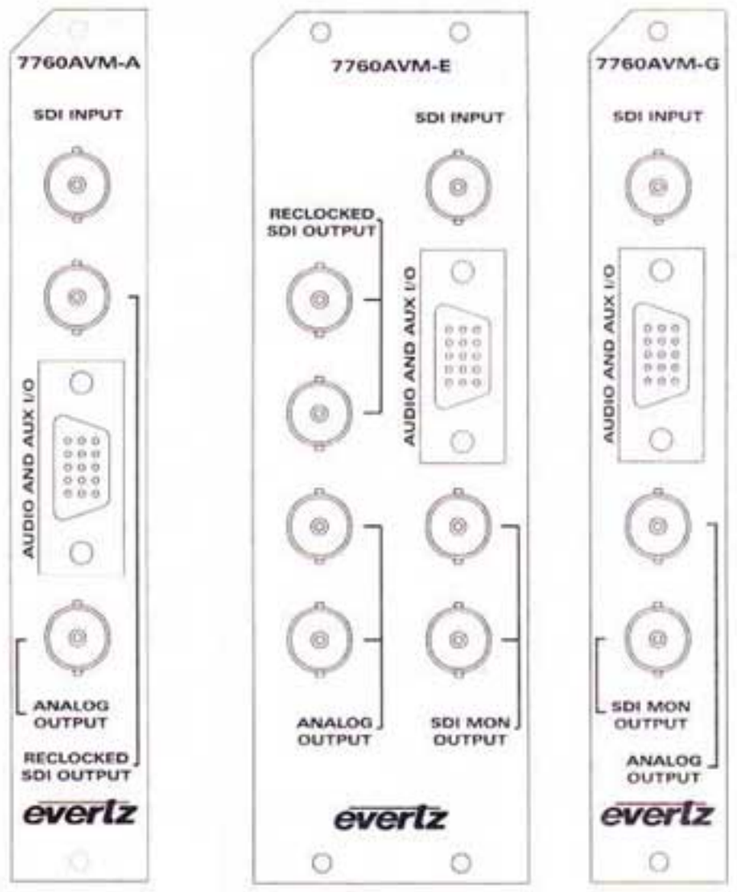
Ordering Information:

7700GPI VistaLINK™ General Purpose Interface

Complete Confidence AVM & MVM's

Features:

- One SDI 525 or 625, 270 Mb/s component digital video input
- One group (4 channels of audio) is demul-plexed from the incoming digital video and VU/PPM level Bargraphs are keyed into the output video
- 4 analog audio outputs available for content monitoring
- Analog audio output levels are adjustable
- Analog audio outputs can be set so both are a mono mix of the selected channel pair
- Decodes vertical interval time code (VITC) and "burns" the time code into the picture
- Large font display of VITC, SID, Program rating and fault messages
- A comprehensive on screen display is available to configure the various features of the module
- AVM configware software allows you to quickly copy configurations to multiple modules



Ordering Information:

7760AVM-X: SDI Video and Audio Monitoring/Conversion (See Chart on individual brochure for product designations)

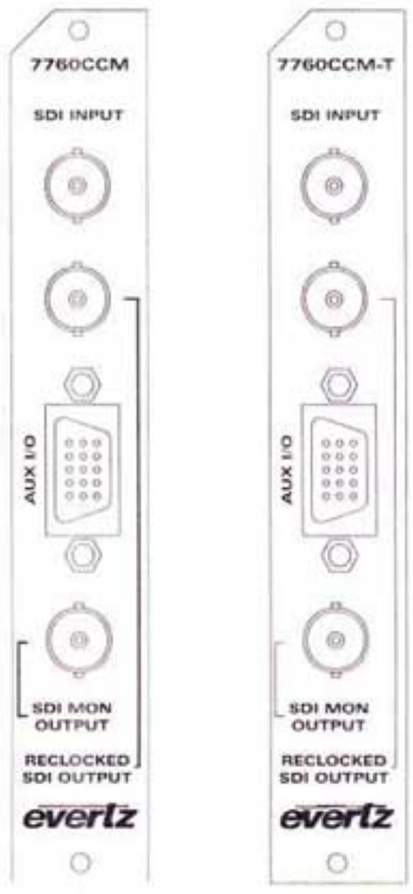
Rack Mount Bulkhead Breakout Panels (BHP):

7760AVM-BHP-10
Bulkhead Breakout panel for 10 AVMs includes 10 WPAVMIO-1-0-3F - 3' cables

7760AVM-BHP-5
Bulkhead Breakout panel for 5 AVMs includes 5 WPAVMIO-1-0-3F - 3' cables

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 containing 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's 7700FR-C 3RU, 7701FR 1RU frames and stand-alone enclosure



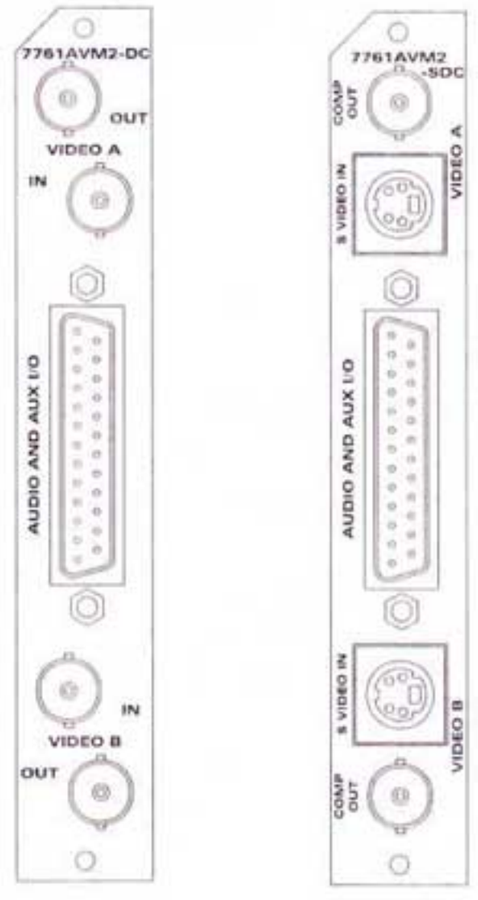
Ordering Information:

7760CCM SDI Closed Caption & XDS Decoder & EIA608 Analyzer

7760CCM-T EIA608-EIA708 Translator (Includes Basic Function of 7760CCM and cable)

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



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 (Coming Soon)

Breakout Panels and Cables:

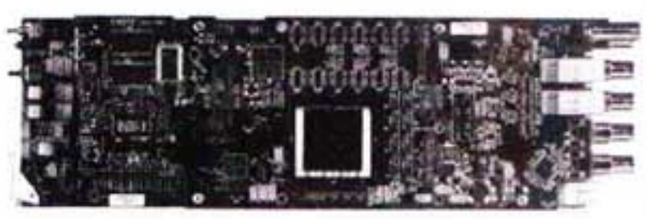
7761AVM-BHP-15 Bulkhead Breakout Panel for 15 x 7761AVM-DC cards (includes 15-3ft cables)

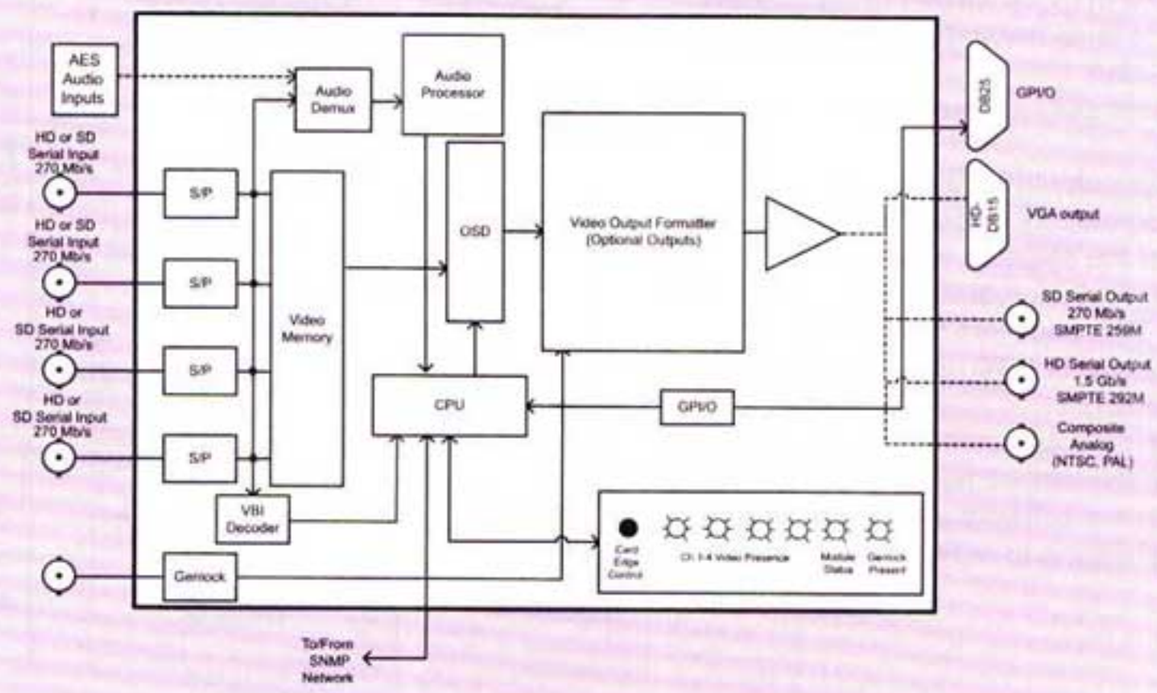
WA7761AVMBHP3F
Breakout cable (3ft) for 7761AVM-DC models

Complete Confidence AVM & MVM's

Quattro™ 7765AVM-4 and 7765AVM-4A Four SDI Video Quad-split Display with Digital Audio Monitoring

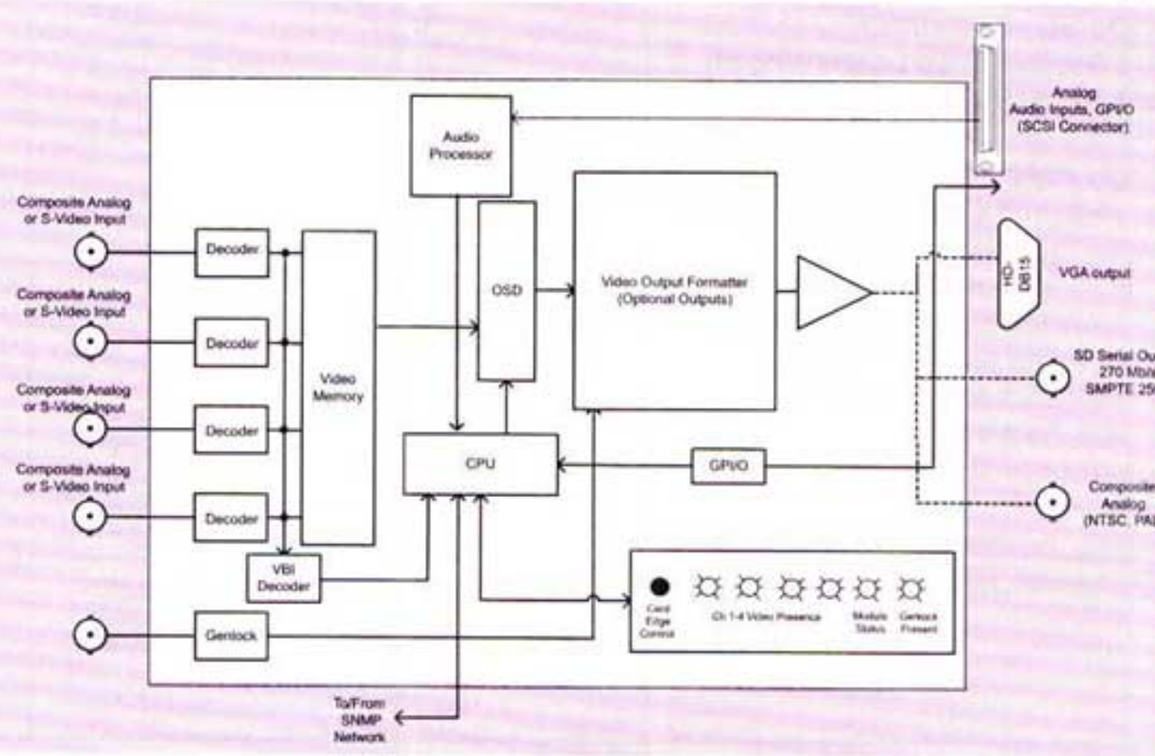




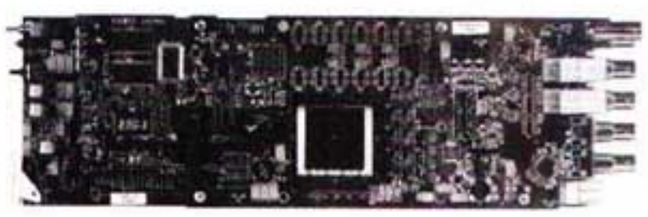


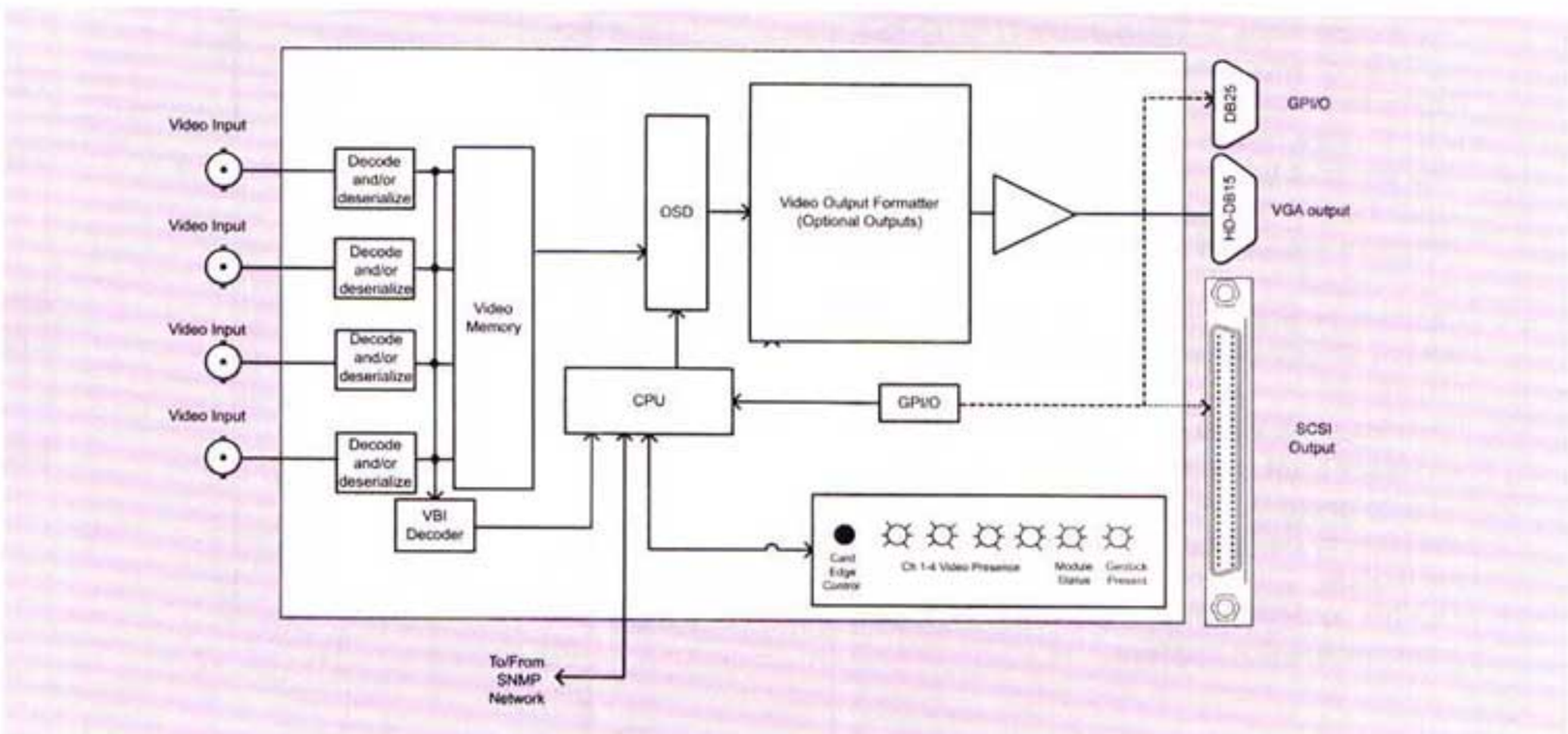
Analog Quattro™ 7766AVM-4A & 7766AVM-S4A Four Analog Video & Audio Monitoring





7765AVM-4V, 7766AVM-4V, 7766AVM-S4V Video-only Quattro™ Quad Split Displays

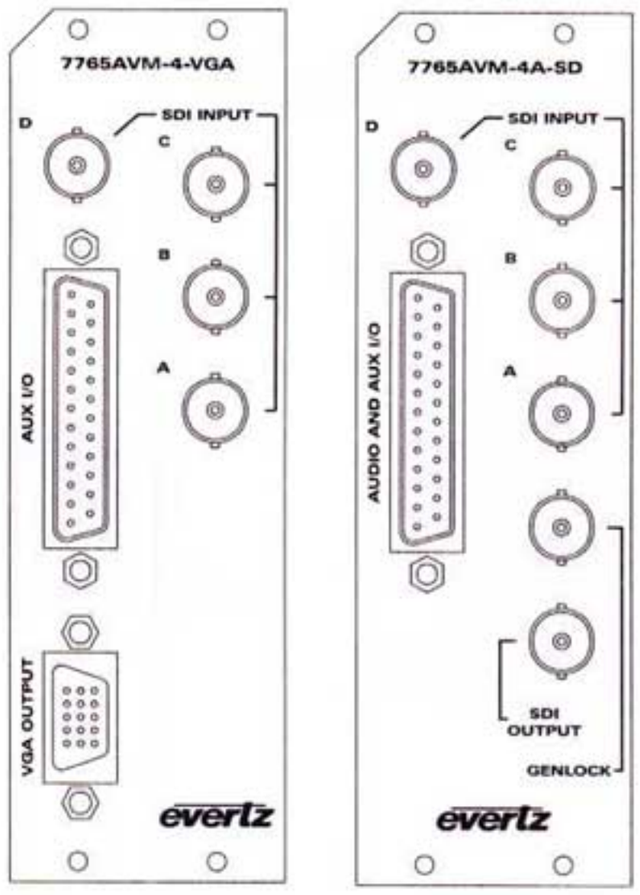




Complete Confidence AVM & MVM's

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 loop input for proper timing (not available 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



Ordering Information:

7765AVM-4-HD
7765AVM-4-VGA
7765AVM-4-SD
7765AVM-4-CA
} Quattro™, Four SDI Video Quad Split Display with Digital Audio Monitoring (Embedded Audio)

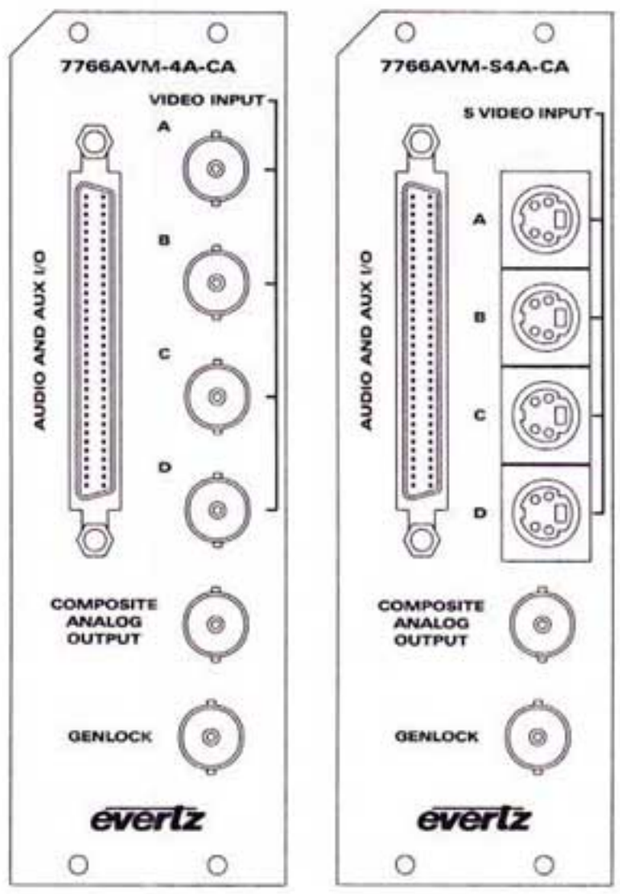
7765AVM-4A-HD
7765AVM-4A-VGA
7765AVM-4A-CA
7765AVM-4A-SD
} Quattro™, Four SDI Video Quad Split Display with Digital Audio Monitoring (Embedded and/or External AES/EBU)

Breakout Panel:

7765AVM-4A-BHP-7 Bulkhead Breakout Panel for 7x 7765AVM-4A (includes 7-3ft cables)

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



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

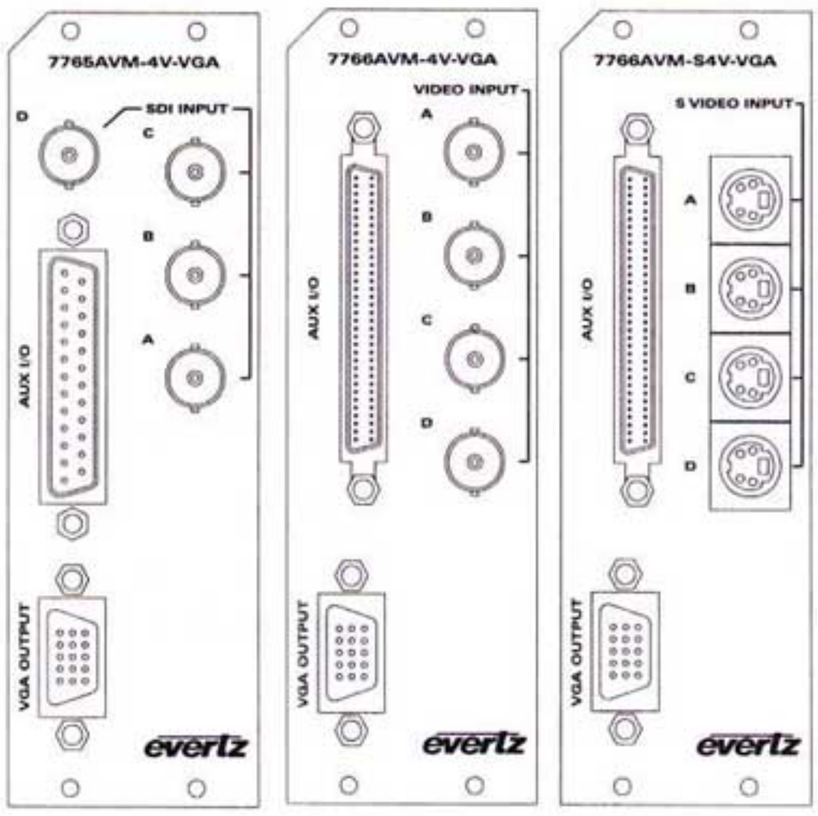
7766AVM-S4A-VGA Analog Quattro™ Four S-Video and Analog Audio Monitoring with analog RGB output

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

Features:

- Four SDI/601 525 line or 625 line, 270 Mb/s component digital video inputs (7765AVM-4V-VGA)
- Four composite analog (NTSC or PAL) video inputs (7766AVM-4V-VGA)
- Optional four S-video inputs (7766AVM-S4V-VGA)
- Decodes vertical interval time code (VITC) and VBI Source ID packets, and burns the ID into the picture
- A comprehensive on screen display is available to configure the various features of the module
- Detects frozen (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
- Quadrant, expanded and H/V delay viewing modes
- Single analog RGB type output



Ordering Information:

7765AVM-4V-VGA Four SDI video-only Quattro™ quad-split display with analog RGB output and rear plate for 3RU frame

7766AVM-4V-VGA Four composite analog video-only Quattro™ quad-split display with analog RGB output and rear plate for 3RU frame (includes 1x 7766AVM-4A-BHP-1 & 1 breakout cable for AUX I/O)

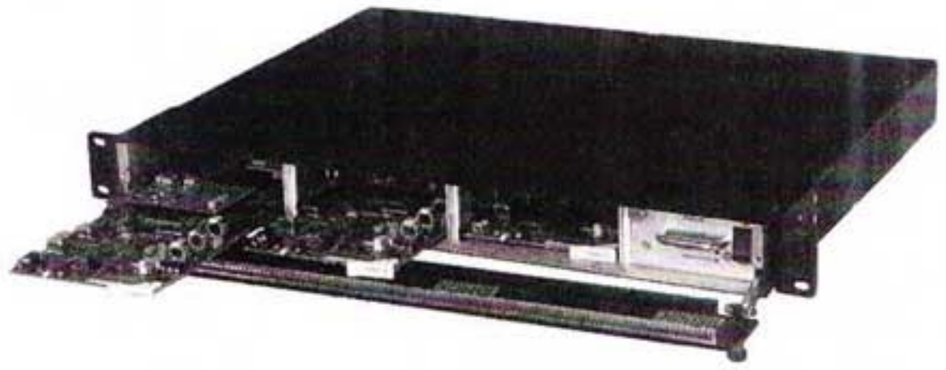
7766AVM-S4V-VGA Four S-video, video-only Quattro™ quad-split display with analog RGB output and rear plate for 3RU frame (includes 1x 7766AVM-4A-BHP-1 & 1 breakout cable for AUX I/O)

1a

Model 7700FR-C, 7701FR or S7701FR



7700FR-C



7701FR



S7701FR

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

Specifications

Electrical :

Power Supply Configuration:

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

Voltage:

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

Maximum Power Dissipation:

7700FR-C:	200 W
7700FR-C-48VDC:	200 W
7701FR:	75 W
S7701FR:	25 W

Fuses:

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

Connectors:

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

Certification:

Safety:	ETL Listed Complies with EU Safety Directive
EMC:	Complies with FCC part 15, Class A Complies with EU EMC Directives

Front Panel Indicators:

PSU status LED, Local Error/Failure

Tally Output:	4 pin terminal, relay N/O, N/C for status/fault alarm

Physical:

Dimensions:

7700FR-C:	19"W x 5.25"H x 14.5"D (483mm W x 133mm H x 368mm D)
7700FR-C-48VDC:	19"W x 5.25"H x 14.5"D (483mm W x 133mm H x 368mm D)
7701FR:	19"W x 1.75"H x 14.5"D (483mm W x 45mm H x 368mm D)
S7701FR:	4.5"W x 1.9"H x 13"D (114mm W x 48mm H x 330mm D)

Temperature: 0-40°C optimal performance
0-50°C operating

Module Capacity:

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

Weight:

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

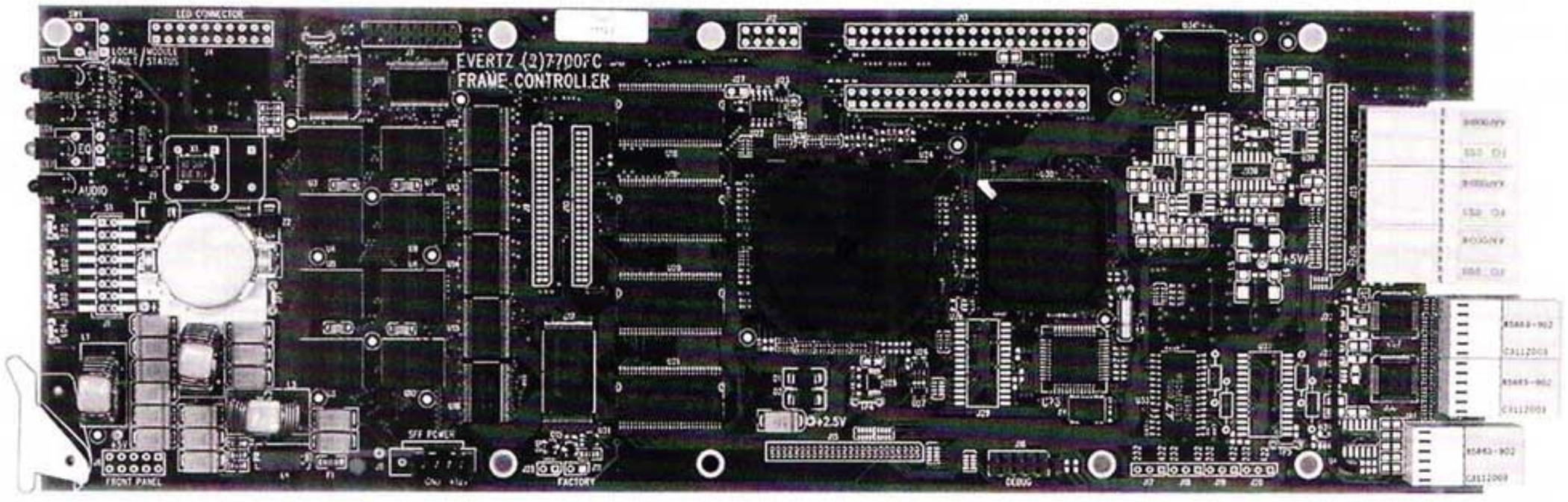
Ordering Information:

7700FR-C	3RU Multiframe which holds up to 15 single slot modules with AC power supply
7700FR-CR	3RU Multiframe which holds up to 15 single slot modules without power supply
7700FR-C-48VDC	3RU Multiframe which holds up to 15 single slot modules with 48DC power supply
7700PS	Redundant power supply for 7700FR-C
7700PS-48VDC	Redundant power supply for 7700FR-C-48VDC
7701FR	1RU Multiframe which holds up to 3 single or dual slot modules
7701PSX	External redundant power supply for 7701FR
7701PS	Internal power supply for 7701FR (replacement or spare orders only)
S7701FR	Standlone frame which holds 1 single slot or 1 dual slot module with power supply (Must order +SA for rear plate separately)

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

1b

Model 7700FC VistaLINK™ Frame Controller

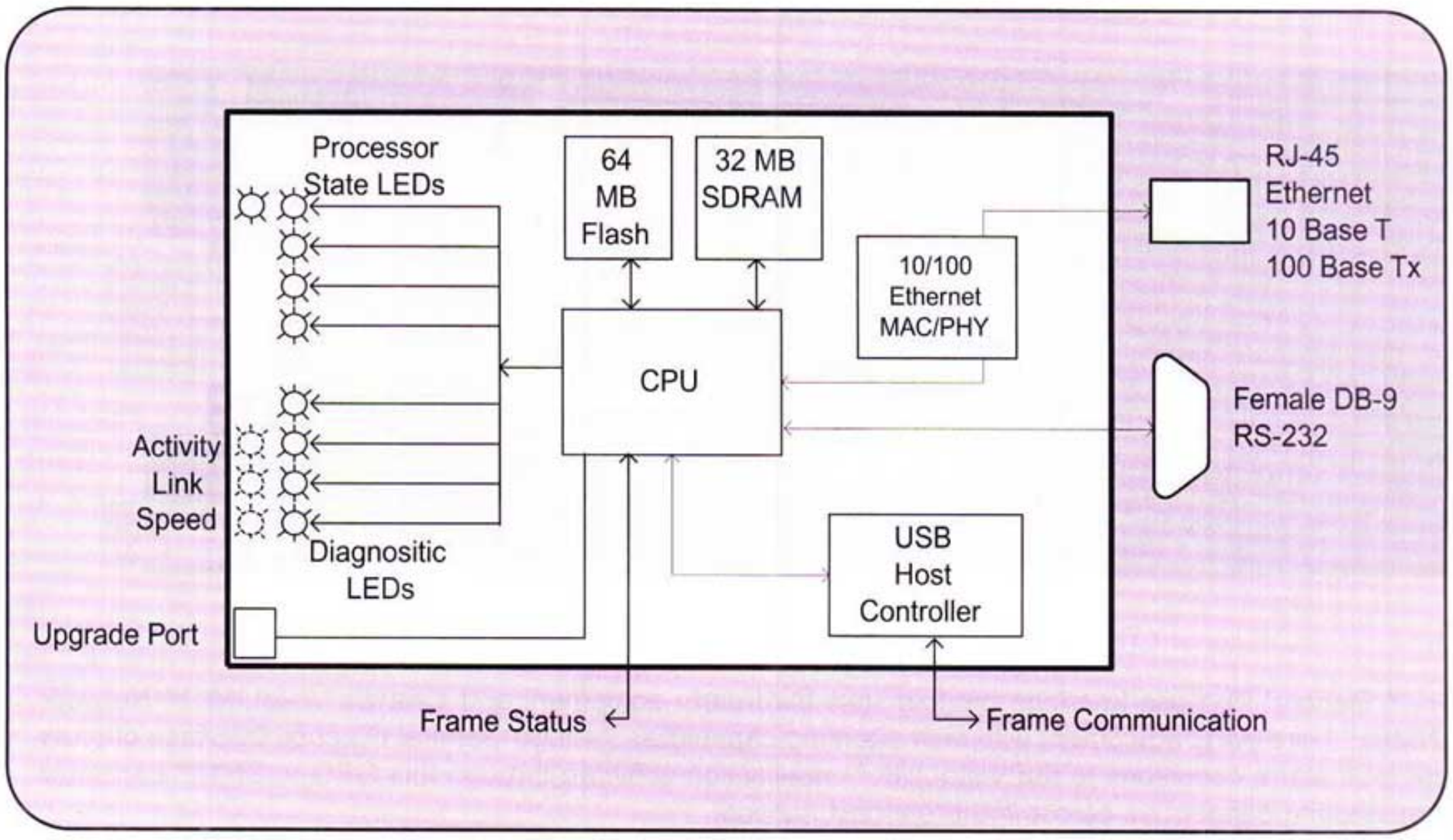


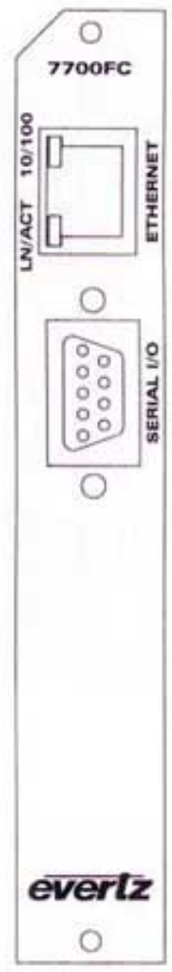
The 7700FC VistaLINK™ Frame Controller card provides a single point of access to communicate with VistaLINK™-enabled modules. The 7700FC VistaLINK™ Frame Controller provides a 10Base-T/100Base-TX Ethernet port and communication is facilitated through the use of Simple Network Management Protocol (SNMP). 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
- Front panel 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)
- Provides frame/chassis status information through enabled hardware via VistaLINK™ including power supply status, frame status, card insertion/removal counters, 7700FC software version number, LED control

Model 7700FC VistaLINK™ Frame Controller Block Diagram





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

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 (must be in slot 1 of 7700FR-C)
Dimensions:	14 " L x 4.5 " W x 1.9 " H (355 mm L x 114 mm W x 48 mm H)
Weight:	approx. 0.5 lbs. (~0.2 kg)

Ordering Information:

7700FC +3RU:	VistaLINK™ Frame Controller

Enclosure:

7700FR-C	3RU Multiframe only

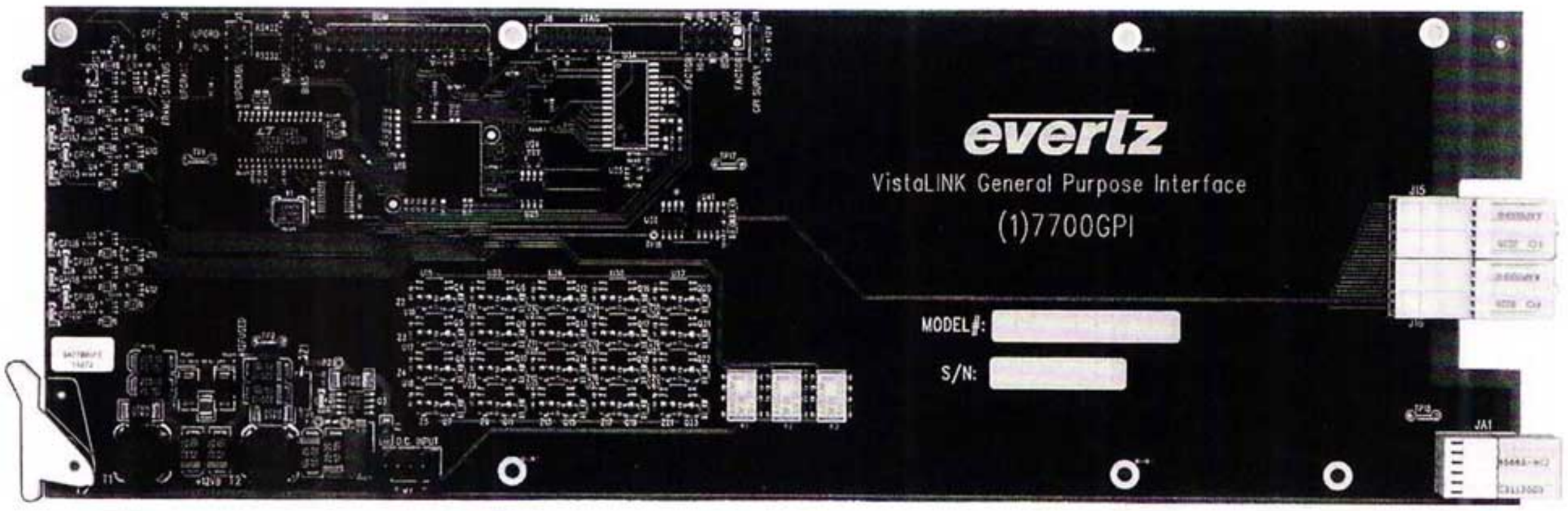
Rear Plate Suffix +3RU	3RU Rear Plate for use with 7700FR-C Multiframe

VistaLINK™ General Purpose (GPI I/O) Interface Module

1b

Model 7700GPI





The 7700GPI VistaLINK™ General Purpose Interface module links third-party equipment and Evertz's 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.

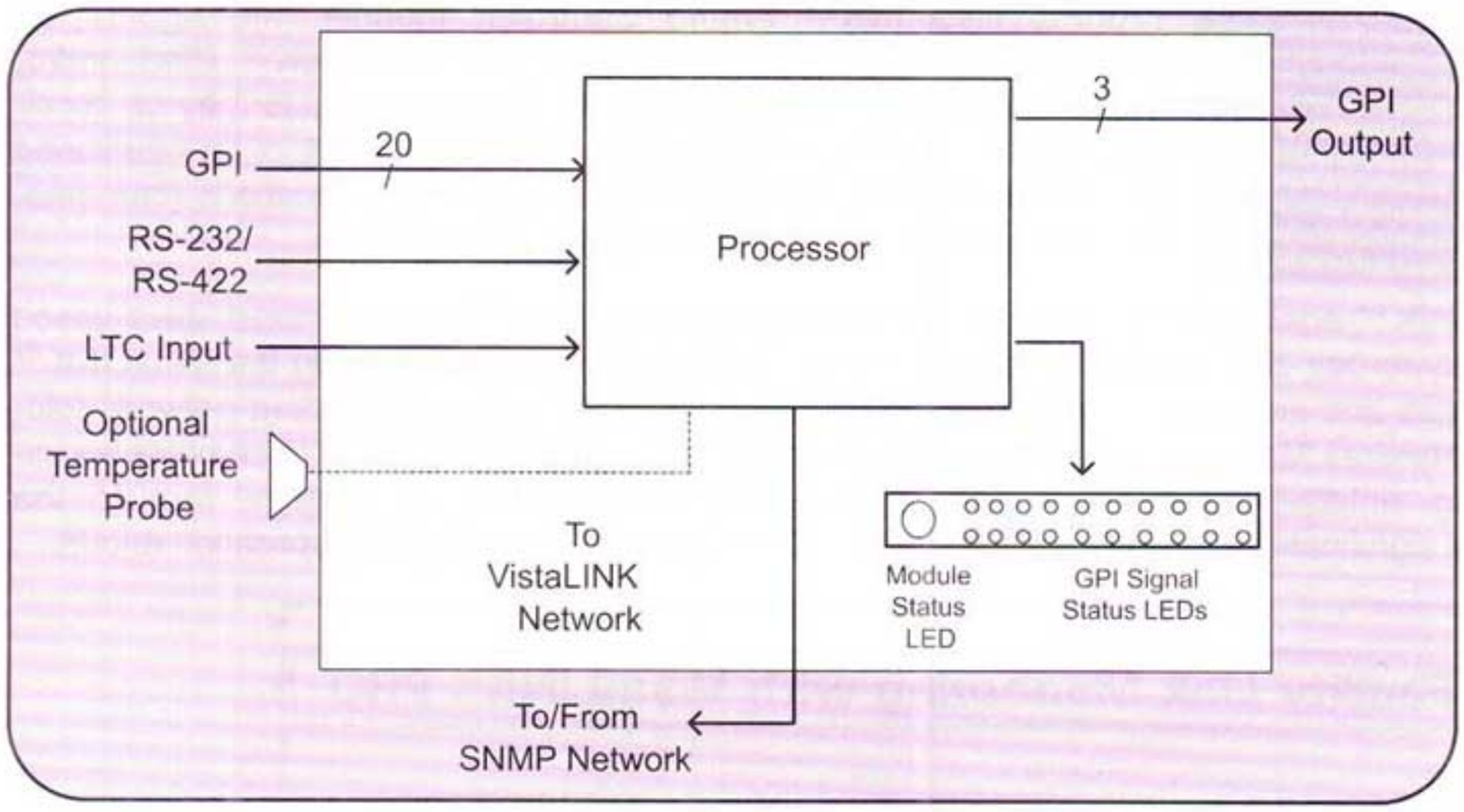
Equipped with a Linear Time Code (LTC) input, the 7700GPI module can synchronize logged fault alarms within the VistaLINK™ application software with the facility clock for accurate alarm acknowledgement and record-keeping.

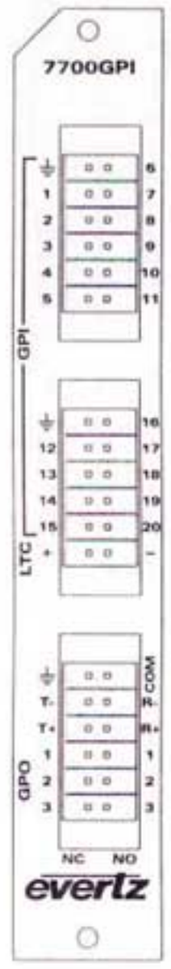
VistaLINK™ offers remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP) giving the flexibility to manage operations, including signal monitoring and module configuration from SNMP-enabled control systems (Manager or NMS).

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 fitting into 7700FR-C 3RU frame
- Module status LED and 20 GPI LEDs for simple GPI input diagnositics
- Frame status trigger
- Jumper-configurable RS-232/RS-422 input serial COM port
- Optional air temperature probe for reporting frame temperature status
- VistaLINK™-enabled 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

7700GPI Block Diagram





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:	<6W
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

+TP	Optional Air Temperature Probe

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

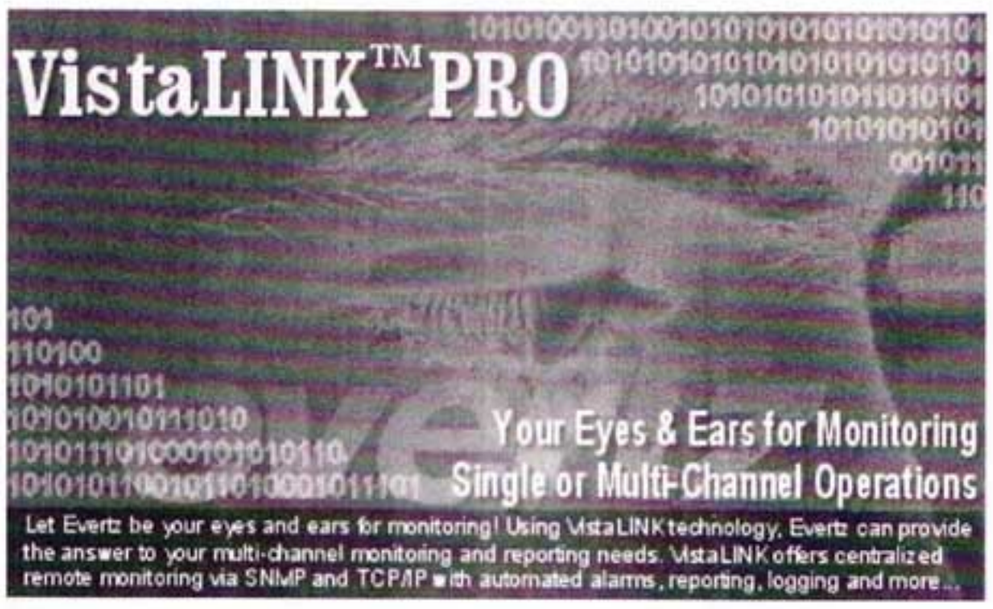
Rear Plate Suffix

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

Enclosures:

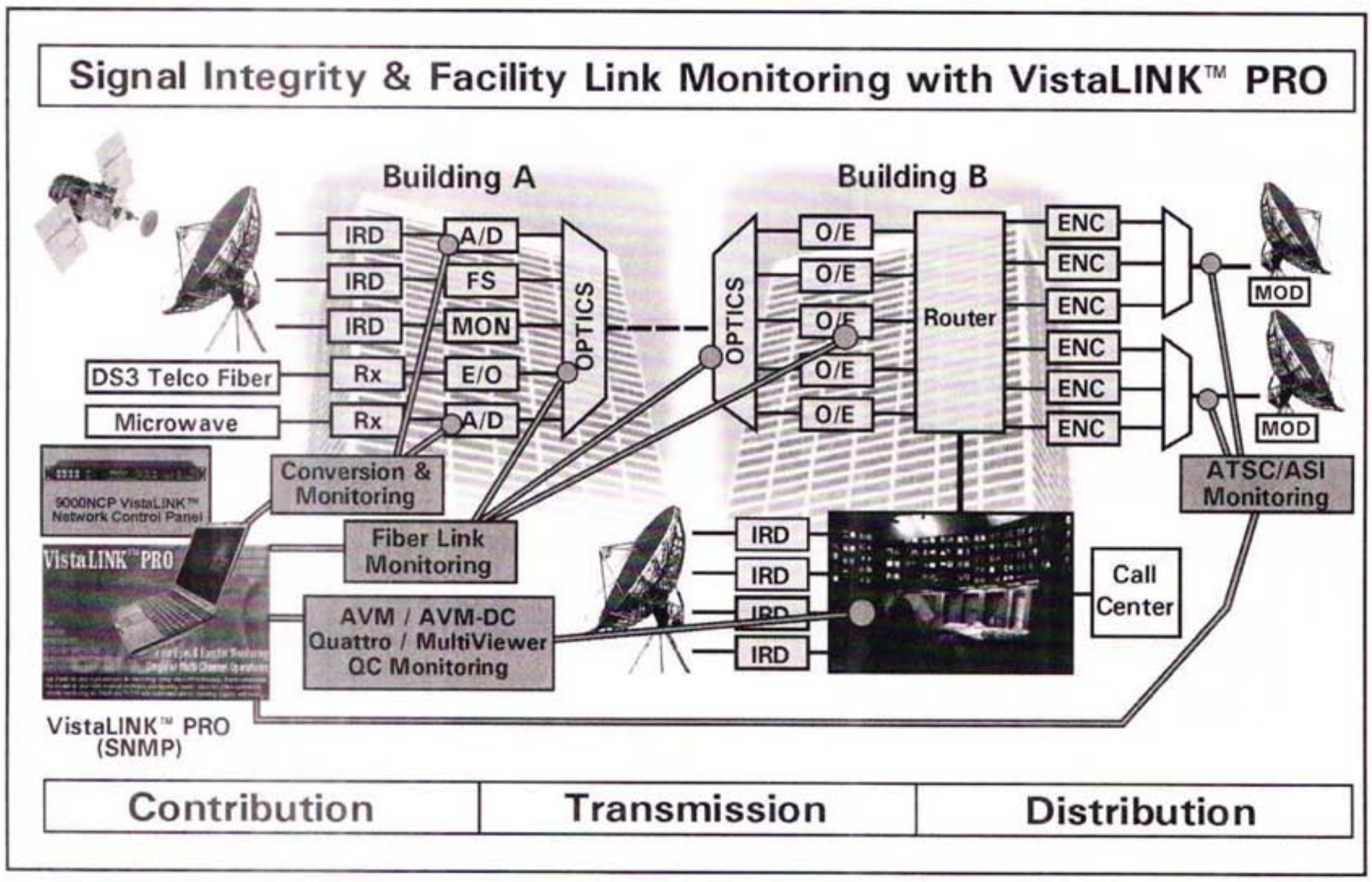
7700FR-C	3RU Multiframe which holds 15 modules

VistaLINK™ PRO
Control & Monitoring Application Software



VistaLINK™ is Evertz's networked monitoring and configuration solution. The protocol for VistaLINK™ is SNMP. As this is an open protocol, third party or custom manager software may be used to monitor and control Evertz's VistaLINK™-enabled products. In Evertz's 3RU modular platform, VistaLINK™-enabled products reside in a 7700FR-C MultiFrame and communicate with a Manager (NMS) via the 7700FC VistaLINK™ Frame Controller module (the Agent). By employing VistaLINK™-enabled products, VistaLINK™ PRO and/or third-party NMS application software, Evertz products may be monitored from anywhere in the world. It is an effective tool for monitoring both incoming and departing signals at strategic locations (demarcation points) throughout the video enterprise network.

VistaLINK™ PRO unites Evertz's VistaLINK™-enabled Fiber, Conversion and AVM product lines. This customized, Java-based monitoring and configuration tool is ready-to-use with Evertz's VistaLINK™-enabled products (identified using the VistaLINK™ graphic) within network monitoring facilities and provides not only a complete, uncomplicated and cost-effective network solution through the open-standard, Simple Network Management Protocol (SNMP) interface, but also the ability to combine a customized configuration tool with existing, enterprise-wide, third party SNMP-ready Network Control Systems through the VistaLINK Partnership Program, thereby significantly decreasing development costs incurred through GUI duplication efforts.



Features

Remote, networked monitoring and configuration of Evertz's SNMP-enabled equipment
- Intuitive, user-friendly, true SNMP monitoring and configuration environment

Customized parameter configuration and alarm displays
- Network tree display
- Individual or multi-card parameter changes
- Delayed or dynamic parameter changes
- Audit trails for parameter changes

Alarm/Event management
- Centralized alarm management and event acknowledgement
- Alarm severity configuration
- Customizable alarm/event user notes and definitions
- Alarm/event logging with human-readable file formats for record-keeping and trend analysis

Administrative control
- Operator-level privileges
- Password-protected access to parameter changes
- Secure access to Alarm/Event database

Interoperability
- Integrates with other third-party SNMP System-wide Managers (NMS)
- Eliminates development time and cost incurred through software duplication
- External Notification Modules – web-enabled cell phones, pagers, etc.

Java-based application software for O/S platform independency
- Runs on Windows™ Platforms, UNIX, Linux, MAC

Installation
- Full Installation vs. Upgrade Installation options
- If already using a previous version of VistaLINK PRO, simply select the "Upgrade" option to install only the new features without deleting existing databases
- Support for 800x600 resolution displays added

Network Tree View Management
- Expand All network elements – show all cards in a VistaLINK™ -enabled frame with one click
- Collapse All network elements – hid all cards in a VistaLINK™ -enabled frame with one click
- Refresh Tree View – through a Quick-link icon, refresh the Tree View immediately after inserting or removing elements. – no need to wait until the next product discovery cycle
- Clean-up Tree View – through a Quick-link icon, remove any cards/frames that are no longer connected to the monitored network

Alarm View Management
- Inhibit Alarms from Monitored Cards
- Disable visual and database alarm reporting and recording
- Select alarm disabling by service/input, module or entire frame
- Alarm Filtering
- Sort the alarms per data field using specific test conditions and criteria
- Save and load alarm filters
- Custom Alarm Note Entry

Configuration View Management
- Right-click Mouse Control
- To access configuration or alarm views through the Network Tree, it is no longer necessary to left-click to highlight, and then right click to see the pop-up menu. All is possible through a single right-click operation

Administrative Management
- "Server Down" message
  - If the server goes down during regular operation, an Alert message will be posted informing all connected clients
  - Upon Client Start-up, indicator that Client is "Searching" for Evertz's VistaLINK™-enabled components and alarm tool-tip showing alarm statistics for a mouse-selected product
- Audit Logs
  - Audit/Non-Event Message Logging
  - Add non-fault related user notes directly to the data base, then save and print audit logs
  - If a VistaLINK™ enabled product is not traced, an alert message is posted to the alarm log for the FC of the specific frame with a "critical" severity.
- Messaging
  - Send notification of new messages to selected user list and view audit log through menu option

Service View via Service Wizard
- Groups hardware/products from different frames into one or more service portfolios
- Complementary display of service chain in addition to "Hardware" view
- Service Wizard Tool:
- A built-in VistaLINK™ PRO utility to allow end-users to create, edit and delete Service View

Monitoring/Grid View
- Allows users to set-up a "quick reference" software monitor wall replicating existing monitor wall set-up with configurable "grid" and grid labels (including size and color) for fast alarm viewing
- VistaLINK™ PRO's Monitoring/Grid view replicates an existing monitoring wall to enable quick and simple-to-understand alarm status viewing. VistaLINK™ PRO Monitoring/Grid view features:
  - Configurable and expandable grid (matrix) to display monitored channels/services
  - Customizable grid attributes including grid color, font size and service captions
  - Automatic grid-resizing to fit given display window size (Dynamic Grid enabled)
  - Customizable alarming attributes (flashing text/backgrounds) to catch operators' attentions
  - Configurable alarm view data log for a comprehensive fault display
  - Simple viewing of multiple "rooms" or "monitor walls" on one display

Frame/Environment Monitoring
- Features the use of a Frame MIB that specifies frame-related or "environmental" parameters, which can be monitored similar to standard AVM or Fiber modules
- "Product Location" depicts product locations or slots in which VistaLINK™-enabled modules are located. With VistaLINK™ PRO's auto-refresh option enabled, any module removal or insertion will be dynamically updated on this tab
- The "Hardware Status" tab enables the user to monitor frame parameters such as frame status, power supply status and 7700FC temperature. As well, Frame Controller card-edge LEDs can be enabled or disabled as required
- "Software Status" identifies the firmware software (also known as "image") currently residing in the 7700FC VistaLINK™ Frame Controller. This is a convenient tool for identifying the latest version on the frame controller to determine if an upgrade is required or for troubleshooting
- "Faults" tab allows the user to enabled/disable TRAPS (network fault messages) relating to the Frame MIB. Specifically, Module insertion/removal, frame status line and temperature traps can be enabled through this screen. In addition, a Trap Status screen identifies if any traps currently exist for the identified frame

Ordering Information:

VLPRO: VistaLINK™ PRO Monitoring and Configuration Application Software (1-year license included for 1 client workstation)

VLPRO-C: VistaLINK™ PRO Configuration-only Software (Included free of charge with every 7700FC VistaLINK™ Frame Controller)

VLPRO-Ser/Sup/Lic. 1yr:
Additional 1 year VistaLINK™ PRO license, service, support and upgrades per client

VLPRO-Ser/Sup/Lic. 2yr:
Additional 2 year VistaLINK™ PRO license, service, support and upgrades per client

VLPRO-Ser/Sup/Lic. 3yr:
Additional 3 year VistaLINK™ PRO license, service, support and upgrades per client

VLPRO Training:
VistaLINK™ PRO Configuration and Training session (Contact Evertz for details)

Ordering Options:

+EN VistaLINK™ PRO with External Notification Module (E-mail and Web enabled Pager Applications; 1-year VLPRO license included for 1 client workstation)

+SCH VistaLINK™ PRO with Scheduler Module (1-year VLPRO license included for 1 client workstation)

VistaLINK™ Network Control Panel

1b

Model 9000NCP



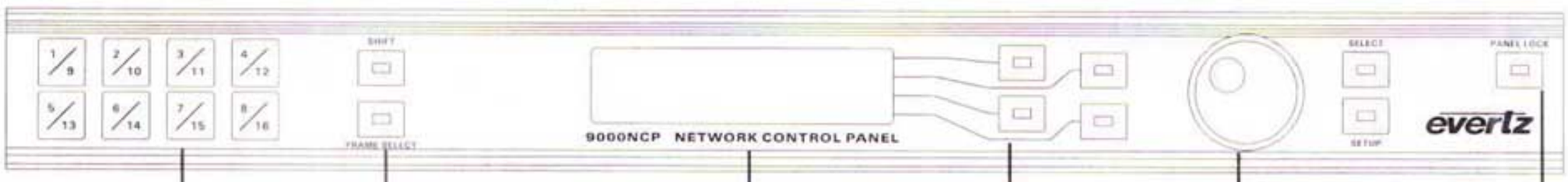


The 9000NCP VistaLINK™ Network Control Panel is a low power rack mounted, 1RU control panel interface to VistaLINK™ -enabled frames and modules.

The 9000NCP connects to the network via Ethernet and comunicates 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.

Features

- Rack-mountable, 1RU control panel
- Primary communication through Ethernet using Simple Network Management Protocol (SNMP)
- Four line, 24 alphanumeric digit per line vacuum fluorescent display (VFD) featuring very high brightness and widest viewing angles
- Additional reserved column (25th digit) for NCP network connection status reporting and other notification
- Operational configuration control of key VistaLINK™ -enabled product parameters
- Illuminated, tactile pushbuttons and positional rotary control



Specifications

Serial I/O (Com 1):
Standard: RS-232
Connector: Female DB-9
Baud Rate: 57600
Format: 8 bits, no parity, 2 stop bit

Ethernet Input/Output:
Standard: IEEE 802.3 (10 BaseT), IEEE 802.3u (100 Base TX)
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
Power: 9 Watts
EMI/RFI: Complies with FCC Part 15 Class A
Complies with EU EMC Directive

Physical:
Number of RU: 1

Ordering Information:
9000NCP VistaLINK™ Network Control Panel

Model 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 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 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

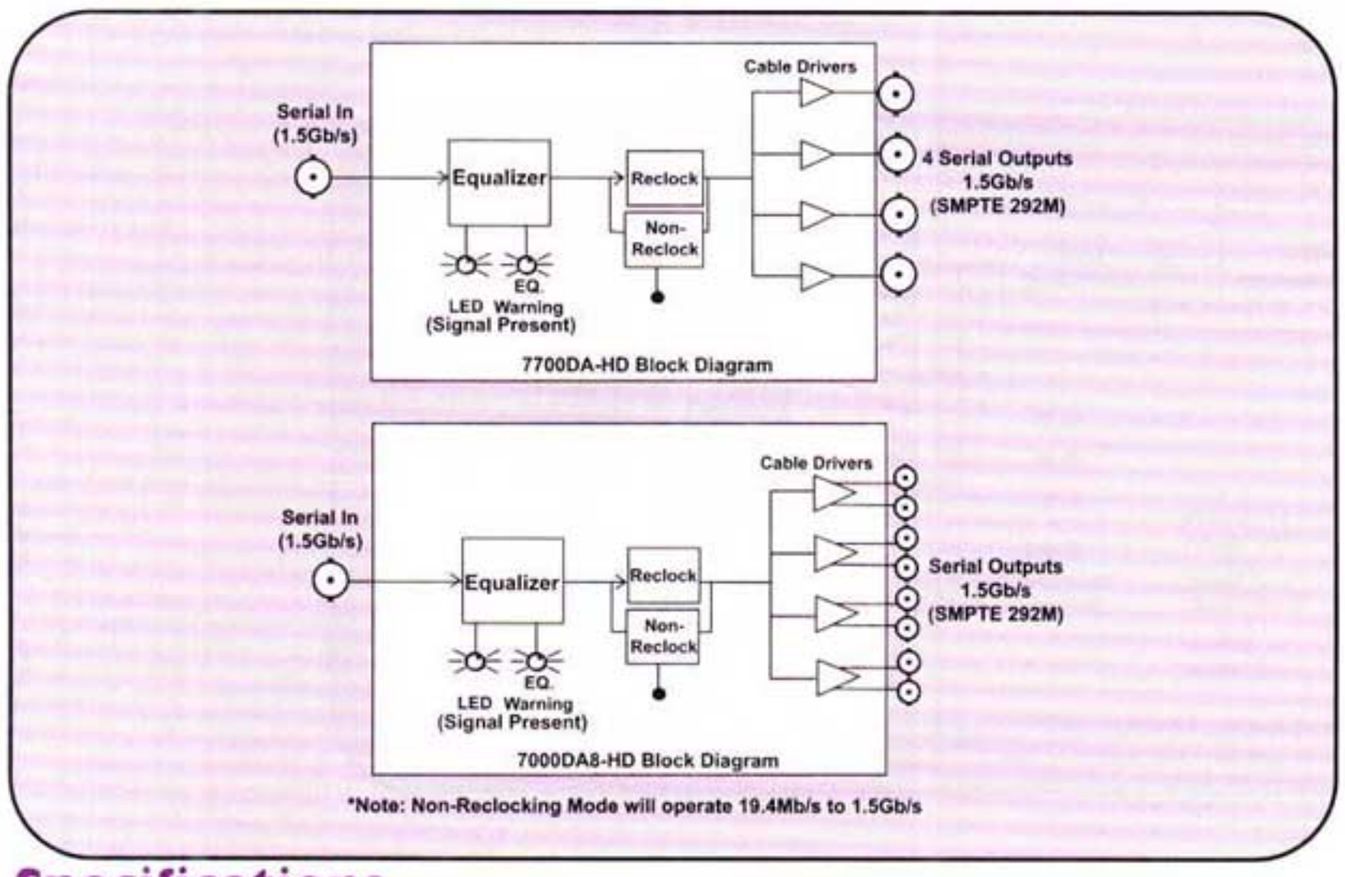
Input:

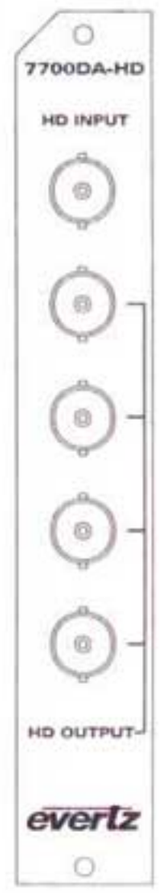
- SMPTE 292M (1.5 Gb/s) - Reclocking mode
- SMPTE 310M/259M, M2S or DVB-ASI - Non-reclocking mode
- Auto equalization to 130m (Belden 1694)

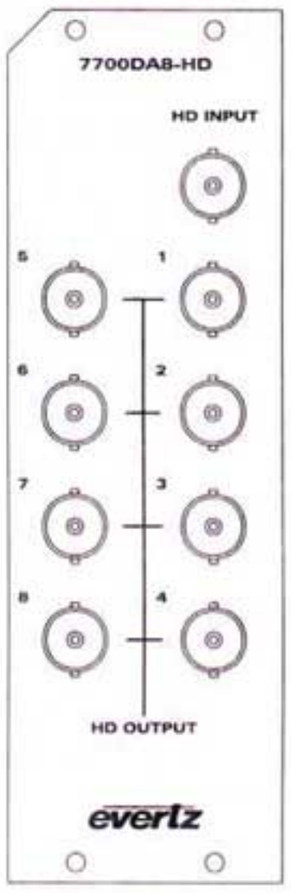
Output:

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

7700DA-HD / 7700DA8-HD Block Diagram







Specifications

Serial Video Input:

Standard:	SMPTE 292M
In Non-Reclock Mode:	SMPTE 310M, SMPTE 259M-A, B, C, D, DVB-ASI or M2S
Connector:	1 BNC input per IEC 169-8
Equalization:	Automatic to 130m @ 1.5Gb/s with Belden 1694 (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 310M, SMPTE 259M-A, B, C, D M2S, DVB-ASI
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

DS3 Distribution Amplifier

7700DA-DS3

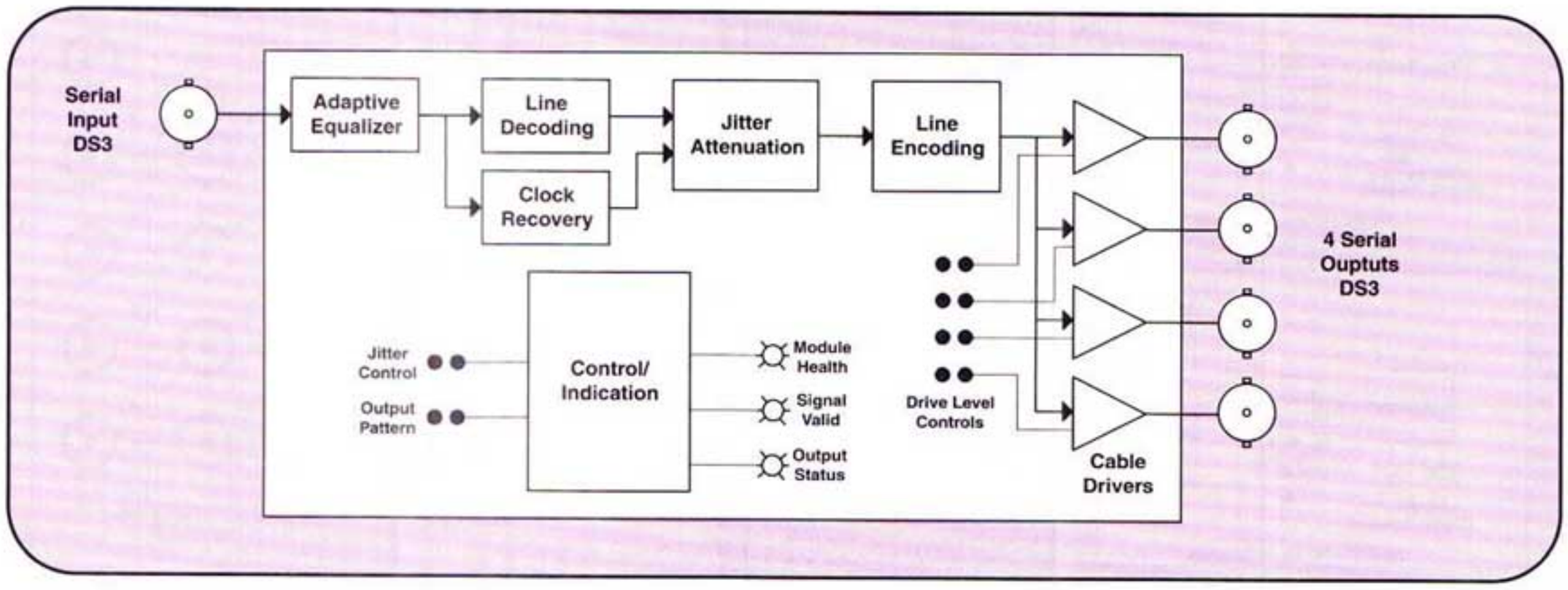
The 7700DA-DS3 Distribution Amplifer provides automatic coaxial cable equalization, reclocking and signal distribution of DS3 (44.736 Mb/s), signals. The 7700DA-DS3 accepts a B3ZS-encoded Alternate Market Inversion (AMI) input signal and provides four reclocked outputs.

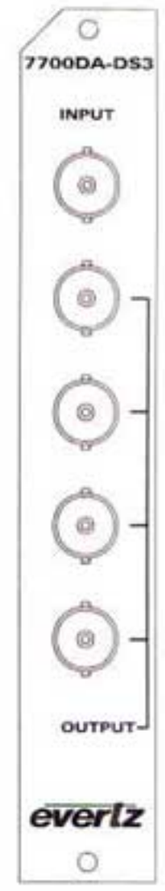
The 7700DA-DS3 occupies one card slot and can be housed in either a 1RU frame that will hold up to three modules or a 3RU frame that will hold up to 15 modules

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





Specifications

Inputs:

Standard:	DS3 (44.7346 Mb/s)
Number of Inputs:	1
Connector:	Isolated BNC input per IEC 169-8r
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 169-8
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

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

Model 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

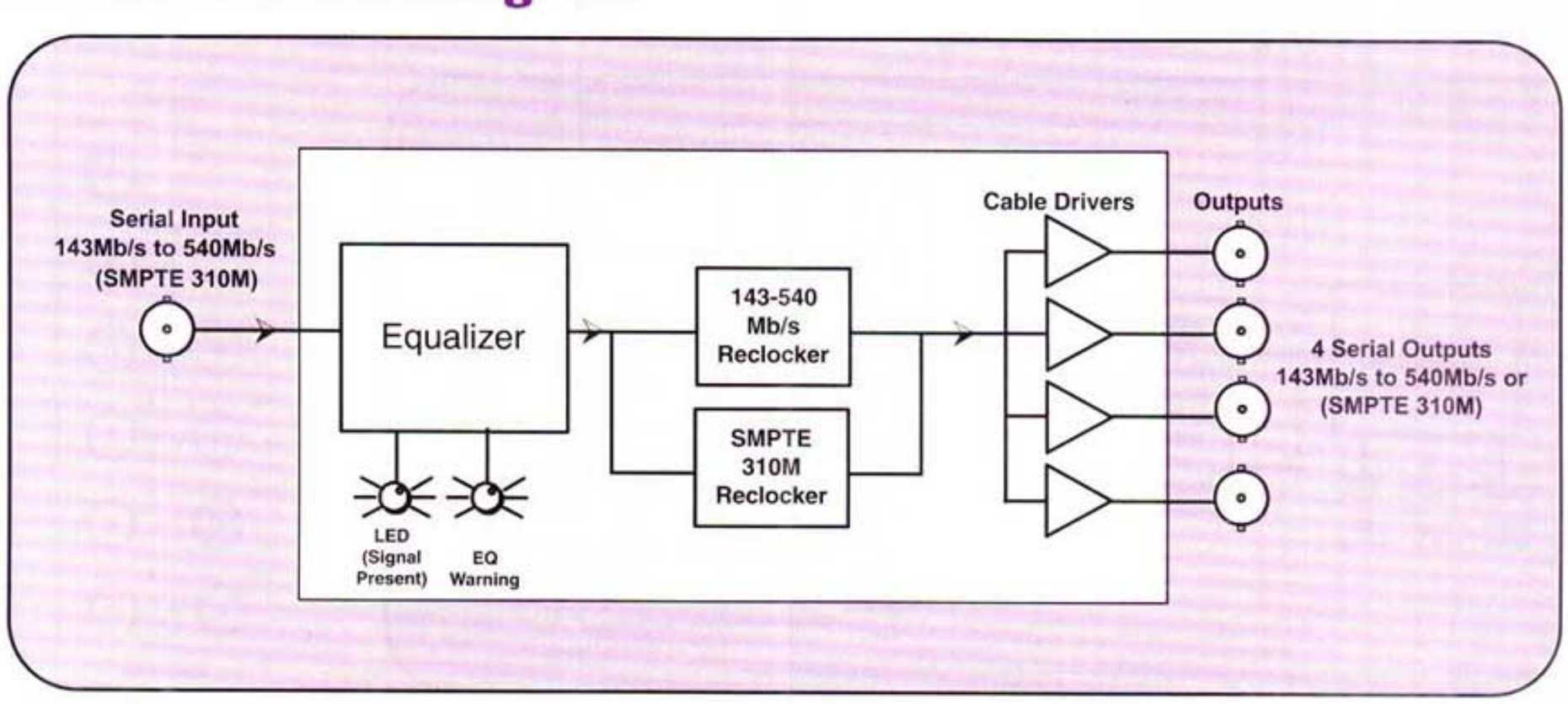
- Mode to run SMPTE 310M DA (nominal 19.4 Mb/s with reclocking)
- Supports up to 540Mb/s operation
- DVB-ASI compatible
- Tally output upon loss of signal for quality monitoring
- Features independent isolated output drivers to ensure no cross channel loading effects (i.e. no need to terminate unused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

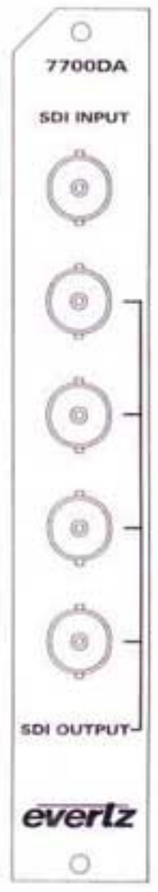
Card Edge LEDs:
- Signal presence
- Max. Equalization Warning
- Module Health Status

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

7700DA Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M A, B, C, D, DVB-ASI, M2S, SMPTE 310M (19.4Mb/s-jumper selected)
Connector:	BNC input per IEC 169-8
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 169-8
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 Complies with 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

143-540 Mb/s, SMPTE 310M Reclocking Distribution Amplifier

Model 7700DA10

The Evertz 7700DA10 Distribution Amplifier provides inexpensive distribution of your serial digital signal at rates of 19.4Mb/s and 143Mb/s to 540Mb/s. The DA features an auto-equalized input with ten reclocked outputs.

Although the 7700DA10DA has been designed for use as a reclocking SMPTE 259M distribution product, it also supports SMPTE310M (19.4Mb/s), DVB-ASI (270Mb/s) and M2S. SMPTE 310M support is selected by setting a rate select jumper.

Features

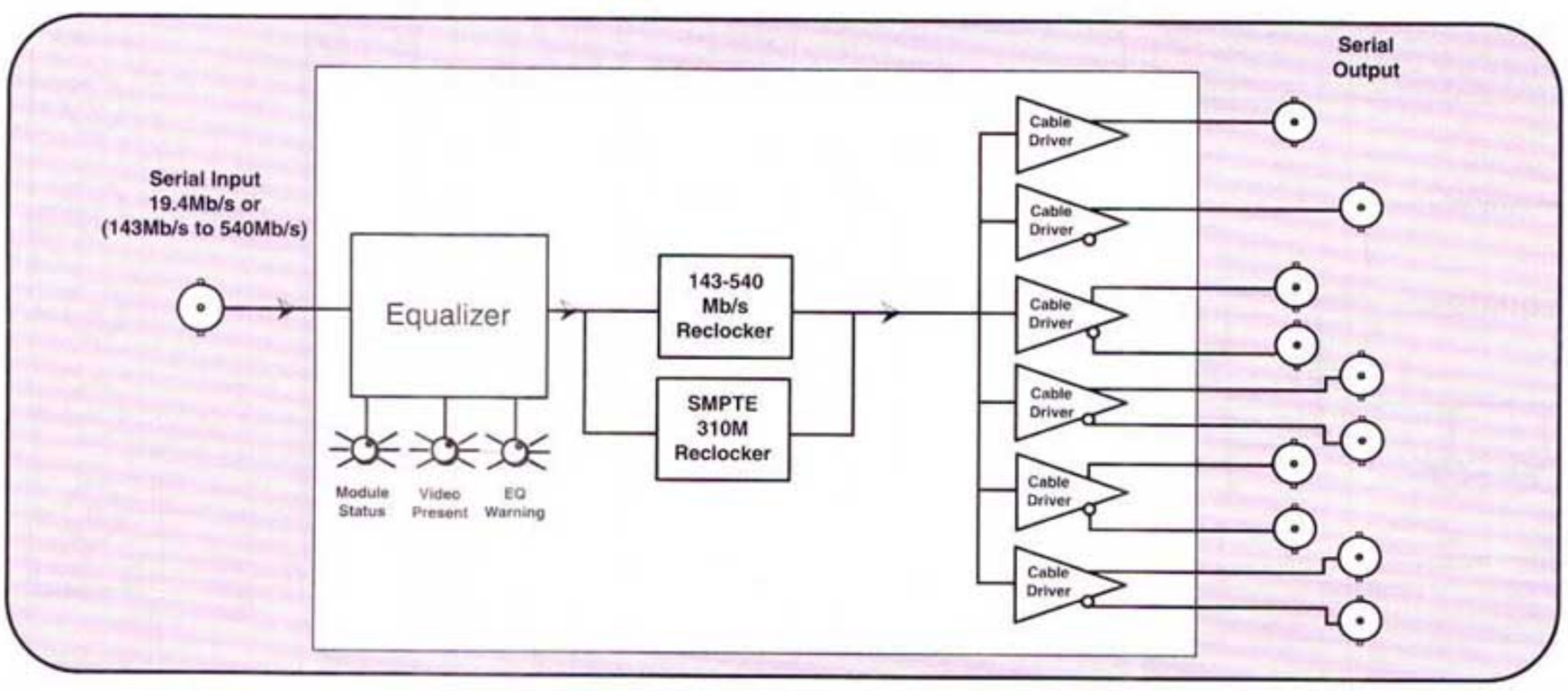
- Mode to run SMPTE 310M (nominal 19.4Mb/s with reclocking)
- Six of ten outputs are DVB-ASI compliant
- Supports up to 540Mb/s operation
- Tally output upon loss of input signal for quality monitoring

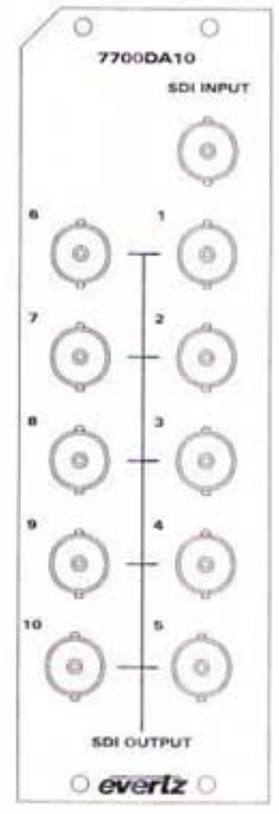
Card Edge LEDs:
- Signal presence
- Max. equalization warning
- Module health status

Input:
- SMPTE 259M (143Mb/s to 540Mb/s), SMPTE 310M (19.4Mb/s), DVB-ASI (270Mb/s) and M2S compliant
- Return loss >15dB up to 540Mb/s
- 300m auto eq. at 270Mb/s (Belden 8281)
- 200m auto eq. at 540Mb/s (Belden 8281)

Outputs:
- 10 reclocked outputs
- 6 DVB-ASI/M2S complient outputs
- Return loss > 15dB up to 540Mb/s
- Widband jitter <0.2UI

7700DA10 Block Diagram





Specifications

Serial Video Input:
Standard:
259 Mode: SMPTE 259M A, B, C, D (143-540Mb/s), DVB-ASI (270Mb/s) or M2s
310 Mode: SMPTE 310M (19.4Mb/s)

Serial Video Output:
Number of Outputs: 10
Number of DVB-ASI Compliant Outputs: 6
Connector: BNC per IEC 169-8
Signal Level: 800mV nominal
DC Offset: 0V ± 0.5V
Rise and Fall Time: 470ps nominal
Overshoot: <10% of amplitude
Return Loss: >15 dB to 540Mb/s
Wideband Jitter: <0.2 UI

Physical:
Number of Slots: 2

Electrical:
Voltage: +12V DC
Power: 6 Watts
EMI/RFI: Complies with FCC Part 15 Class A
EU EMC Directive

Ordering Information:
7700DA10 143-540 Mb/s, SMPTE 310M, DVB-ASI, M2S Reclocking Distribution Amplifier (with 10 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

Model 7700DA-AESU

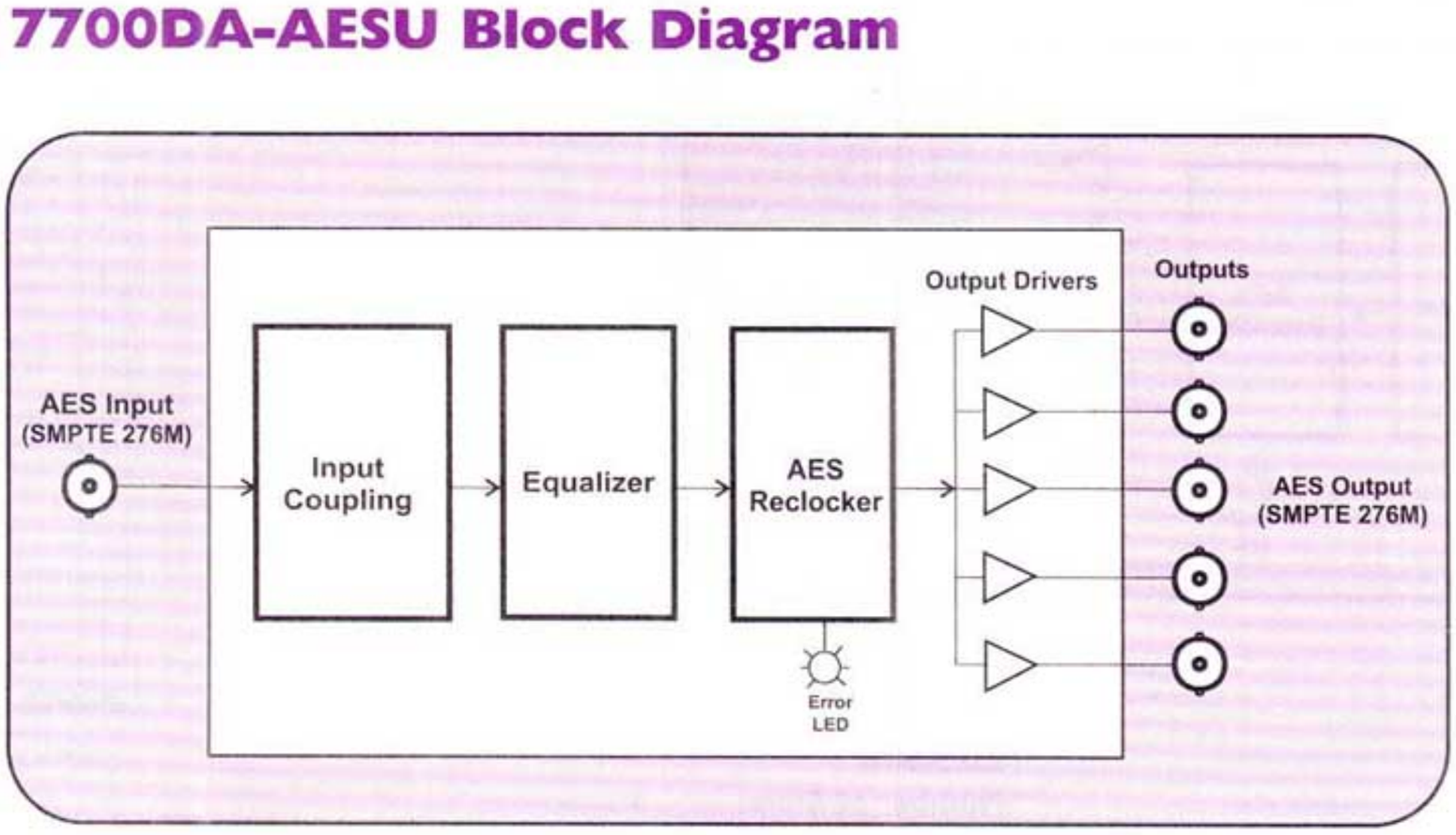
The 7700DA-AESU is a five output reclocking and auto equalizing DA for 75Ω unbalanced AES signals. The DA will automatically equalize AES signals on Belden 1694A coax to 1500m. The DA will reclock data with sampling frequencies of 32kHz, 44.1kHz, 48kHz and 96kHz.

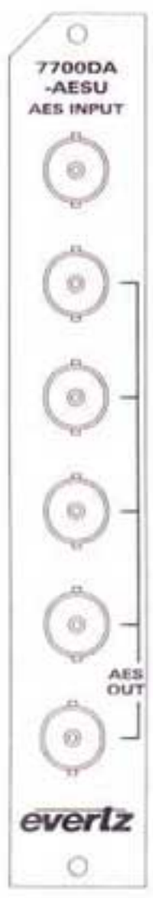
The 7700DA-AESU card edge LED indicators provide quick and accurate assessment of the incoming signal integrity. The 7700DA-AESU also provides a contact closure output that can be configured using on-board jumpers to assert when an input error condition exists.

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 biphase coding error
- External indication of input error condition using contact closure output

7700DA-AESU Block Diagram





Specifications

AES Input:

Standard:	SMPTE 276M (jumper selectable)
Number of Inputs:	1
Connector:	BNC input per IEC 169-8
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 1694A (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 169-8
Output Level:	1V p-p
Output Impedance:	75Ω
Return Loss:	30 dB

Physical:

Number of Slots:	1

Electrical:

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

Ordering Information:

7700DA-AESU	Auto Equalizing Unbalanced 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

Model 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.

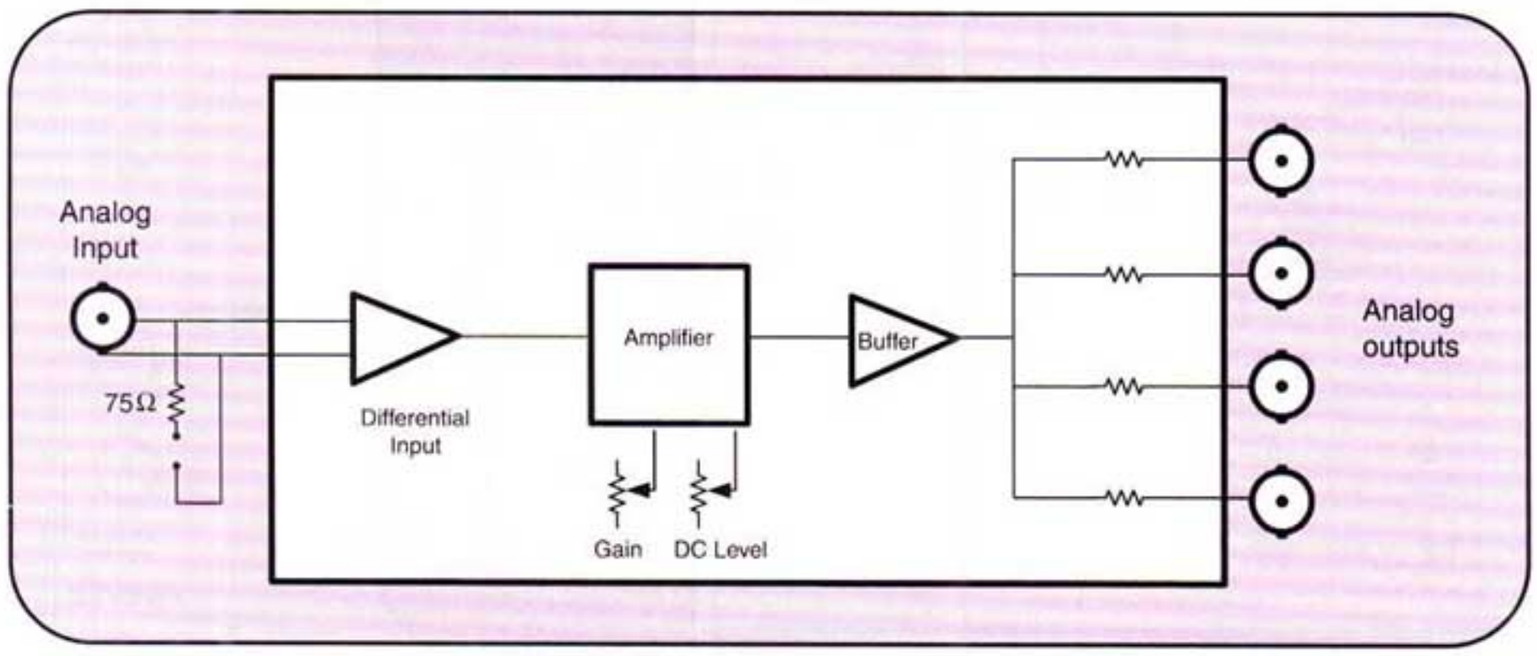
Features

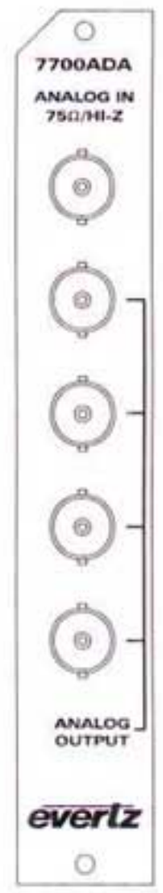
- 75 Ω or high impedance input (jumper selectable)
- Looping feature with external "T" connector
- Consistent input impedance if card power is lost
- High common mode range and common mode rejection ratio (CMRR)

Card Edge LEDs:

- Module status/Local Fault
- Power supply status

7700ADA Block Diagram





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 169-8
Equalization:	None
Return Loss:	>25dB up to 30MHz
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 169-8
Gain Level:	1x +3.5dB, -2.5dB
DC Offset:	OV ± 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:

7700ADA	Analog Video 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 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.

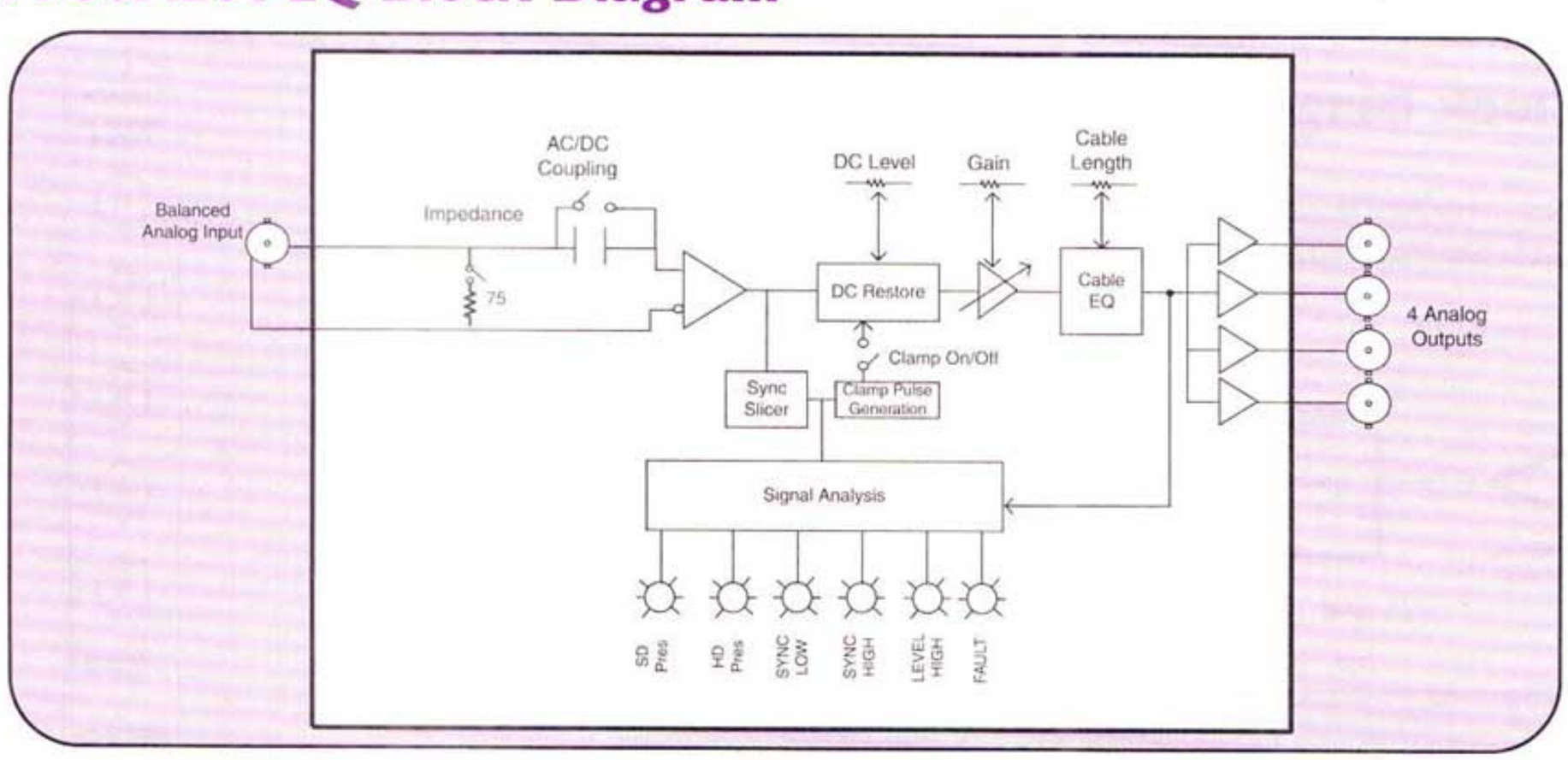
Features

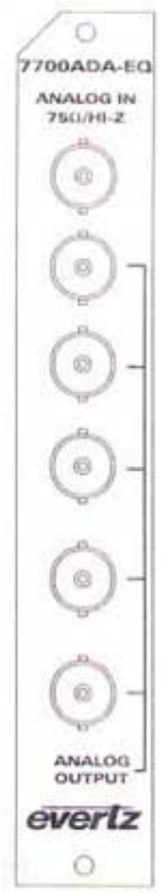
- 75Ω or high impedance input (jumper selectable)
- High common mode range and common mode rejection ratio (CMMR)
- Gain control
- Jumper selectable AC or DC coupling
- Jumper selectable fast or slow back porch clamp
- DC level control when clamp is enabled
- Cable equalizer adjustment range: 0 to 300m of 8281 or 1694
- 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





Specifications

Analog Video Input:

Standards:	Any analog video format, up to 2Vp-p and 30MHz bandwidth
Connector:	1 BNC input per IEC 169-8
Common mode range:	>6Vp-p
CMRR:	>70dB to 1kHz
Signal amplitude:	2.5Vp-p max
Cable equalizer:	0 to 300m of Belden 8281 or 1694 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:	4 Per Card
Connector:	BNC per IEC 169-8
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 1694 (to 5.5Mhz) < ±0.15dB for 100 to 300m Belden 8281 or 1694 (to 5.5MHz)
Differential Gain:	<0.17 % 0 to 300m
Differential Phase:	< 0.19 deg 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:

7700ADA-EQ	Analog Video Equalizing 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

Dual Analog Audio Distribution Amplifier

Model 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.

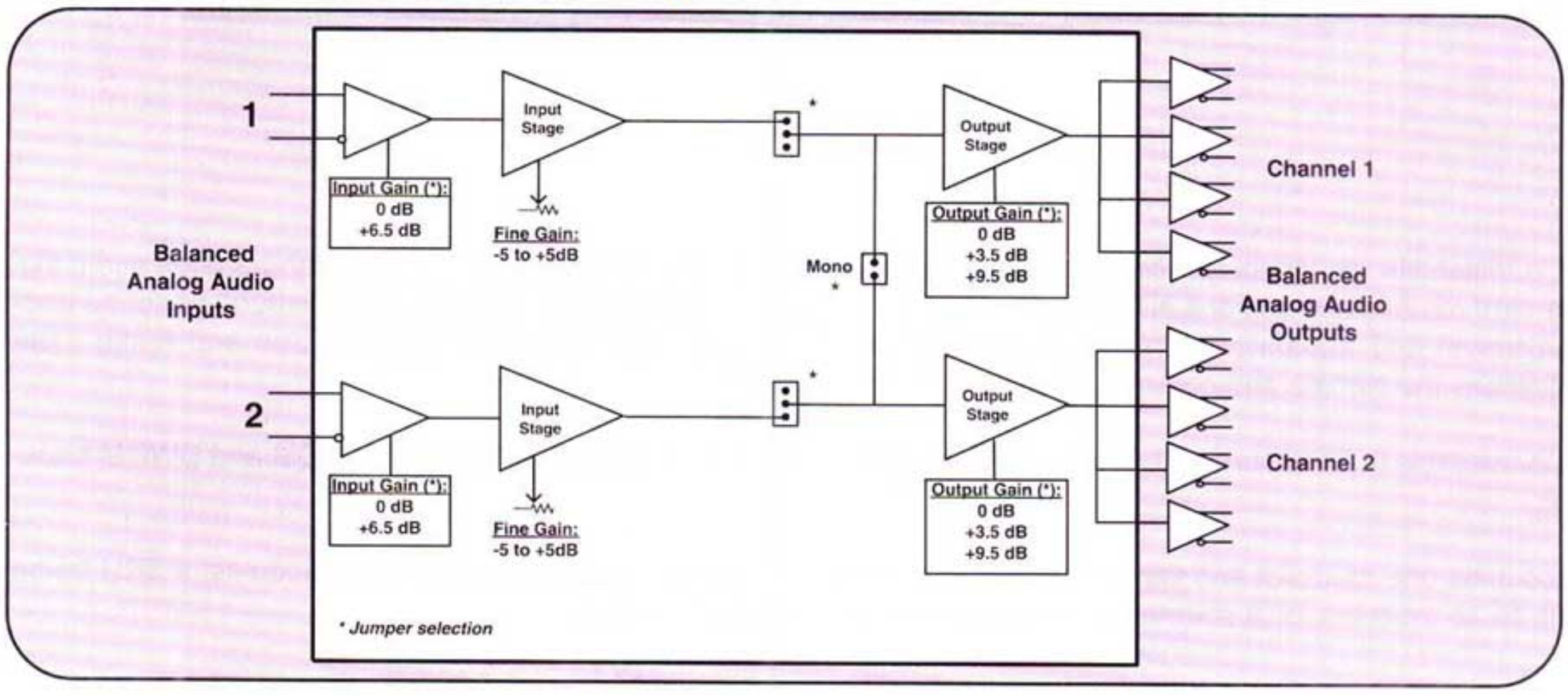
Features

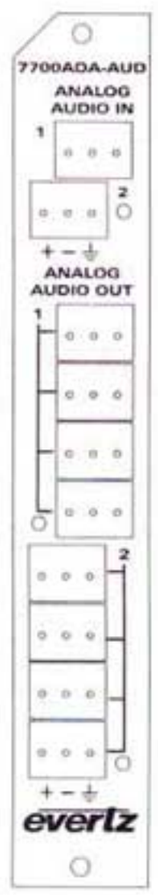
- Differential and single ended input (automatic single ended to differential conversion)
- Configurable for stereo or mono
- High impedance input
- Low impedance outputs
- Wide gain adjustment range
- High common mode range and common mode rejection ratio (CMRR)
- Very high SNR
- Very low THD+N

Card Edge LEDs

- Module status/Local fault

7700ADA-AUD Block Diagram





Specifications

Analog Audio Input:

Standards:	Any analog audio signal
Number of inputs:	2 (Balanced or Single ended)
Connectors:	3 pin removable terminal strips
Input step gain:	0 dB or +6.5 dB (configurable with jumpers)
Fine gain control:	-5 to +5dB (card edge pot adjustable)
Maximum input level:	
0 dB input gain	+33 dBu
+6.5 dB input gain	+26.5 dBu
Noise floor:	-87 dBu (0 dB input gain), -91 dBu (+6.5 dB input gain jumper setup)
Common mode rejection:	> 115 dB @ 60 Hz, 90 dB @ 20 kHz (tested with +28 dBu CM input)
Common mode range:	
0 dB input gain	> ±22 V
+6.5 dB input gain	> ±7 V
Input impedance:	
0 dB input gain	33 kΩ
+6.5 dB input gain	15 kΩ

Analog Audio Outputs:

Number of Outputs:	
Stereo Mode:	4 outputs each on left and right channels
Mono Mode:	8 Outputs
Connectors:	3 pin removable terminal strips
Output step gain:	0, 3.5 or 9.5 dB (configurable with jumpers)
Maximum output level:	+28 dBu across hi-impedance load +24 dBm into 600Ω load
Output impedance:	66Ω
Frequency Response:	+/-0.02 dB 20 Hz to 20 kHz
Stereo phase mismatch:	< 1° @ 20 kHz
SNR:	
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:

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

Physical:

Number of Slots:	1

Ordering Information:

7700ADA-AUD	Dual Analog Audio 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

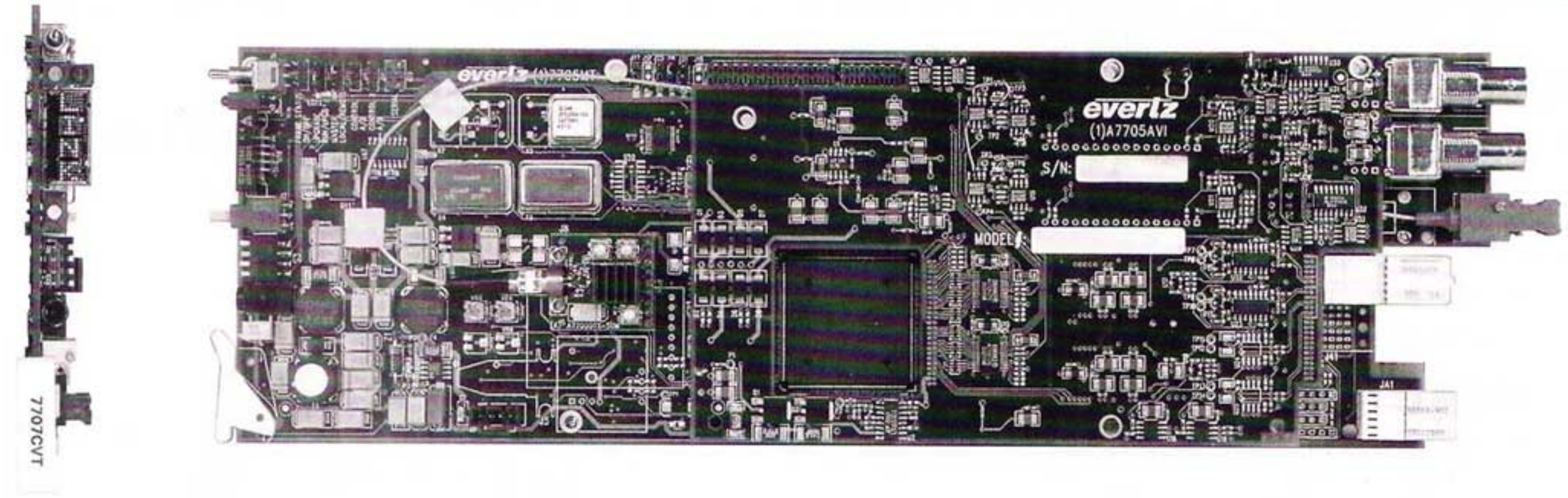
Enclosures:

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

Analog Video with 4-Channel Analog Audio Fiber Transmitter

Model 7707CVT

1d



The 7707CVT is a VistaLINK ™ - enabled, fiber transmitter for broadcast quality composite analog video and analog 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 7707CVR Analog Video and Audio Fiber Receiver demultiplexes the signals and converts them back to analog form.

The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm, CWDM and DWDM transmission schemes.

The 7707CVT 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

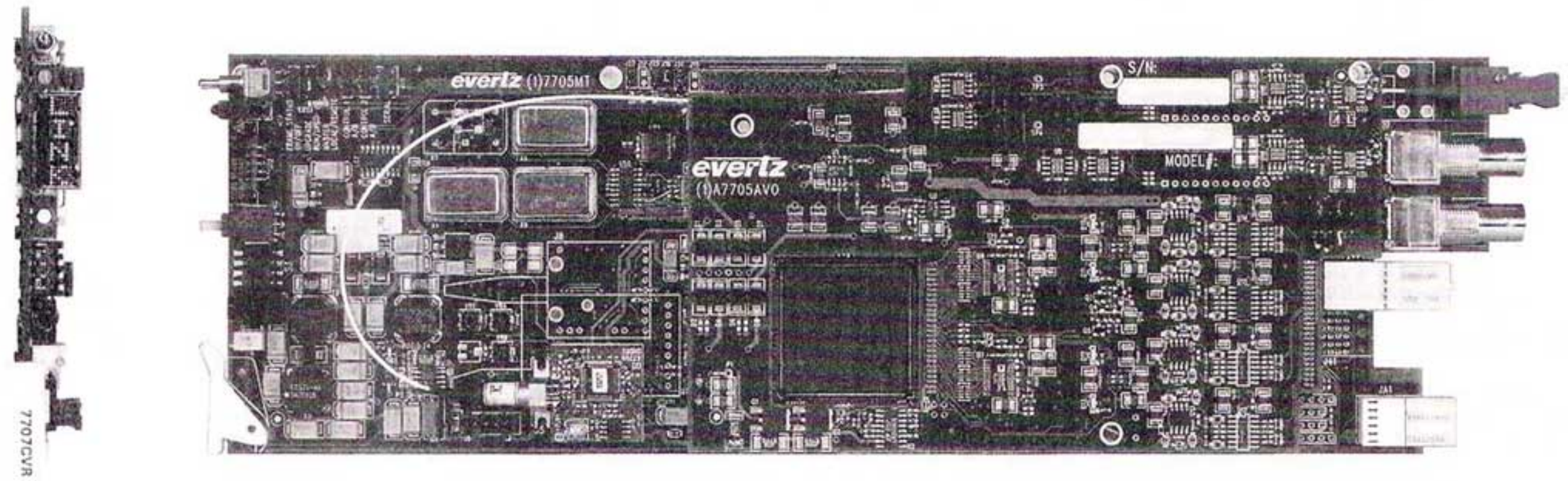
- Single card fiber multiplexor for one analog video and four analog audio signals
- Single card slot including fiber optic converter
- Supports both NTSC and PAL
- Broadcast quality analog video and audio performance
- Superior digital data transmission
- Video loop-through for additional signal distribution or monitoring
- Signal transport over fiber uninterrupted by loss of input video or audio feeds
- Low Audio to Video latency
- Signal and status monitoring via four-digit card-edge display, or remotely through SNMP and VistaLINK™ enabled capability
- Adjustable gain equalization for up to 300m of Belden 1694 coaxial cable
- Fully hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single mode (8-10µm) and multi-mode (50/62.5µm) 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.692 compliant) also available

Analog Video with 4-Channel Analog Audio Fiber Receiver

1d

Model 7707CVR





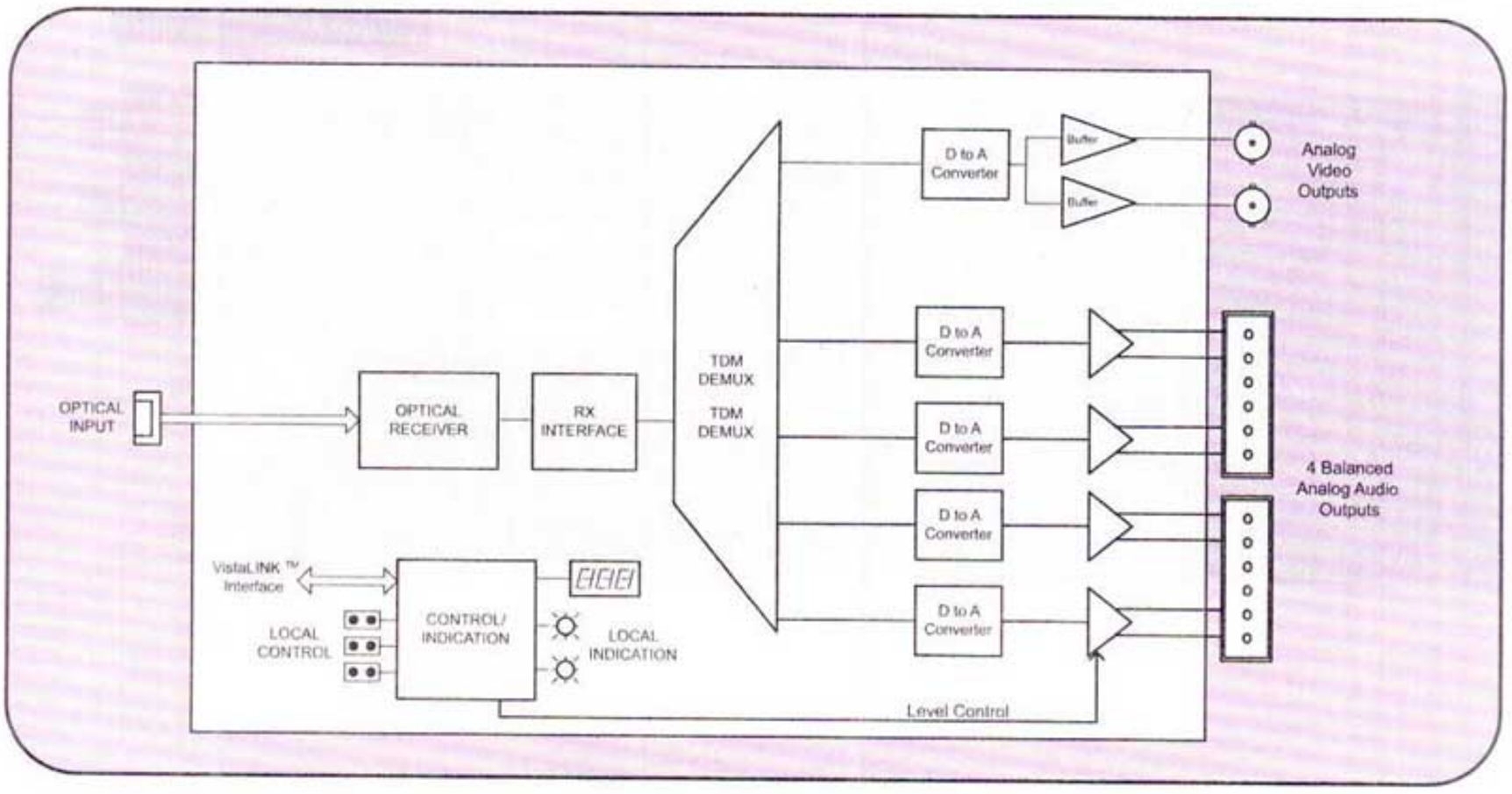
The 7707CVR is a VistaLINK ™ - enabled, fiber receiver for broadcast quality composite analog video and analog audio signals. This single card module accepts a fiber optic input, demultiplexes the signals, performs D to A conversion and outputs NTSC or PAL analog video and up to four balanced analog audio signals. The companion 7707CVT composite video and analog audio fiber transmitter digitizes and multiplexes the analog video and up to four analog audio signals and converts them to an optical signal for transmission.

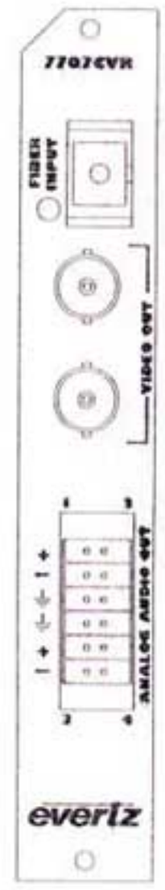
The 7707CVR occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules, or a standalone enclosure which will hold 1 module.

Features

- Single card fiber demultiplexor for one analog video and four analog audio signals
- Supports both NTSC and PAL video signals
- Broadcast quality analog video and audio performance
- Adjustable gain, DC offset and pre-emphasis for driving up to 300m of Belden 1694 coaxial cable
- Minimal Audio to Video latency
- Comprehensive signal and status monitoring via four-digit card-edge display, or through SNMP and VistaLINK™ enabled capability
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports Single mode (8-10 mm) and Multi-mode (50/62.5 mm) fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range

7707CVR Block Diagram





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 BNC per IEC 169-8
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:	>67dB
Differential Gain:	< 1.0%
Differential Phase:	< 1.0°
Passband Ripple:	< +/- 0.1 dB to 4.7 MHz (Equalization set to 0 m) < +/- 0.2 dB to 4.7 MHz (Equalization set to max) < +/- 0.2 dB to 5.5 MHz
Pre-Emphasis:	Cable loss compensation for up to 300m of Belden 1694 (each output adjustable separately)
Chrome/Luma Delay:	< 11 ns
Line Time Distortion:	< 1% (.5% typical)

Analog Audio Outputs:

Number of Outputs:	4
Type:	Balanced analog audio
Connector:	12 pin removal terminal block
Output impedance:	66Ω
Freq. Response:	+/- 0.1dB, 20Hz to 20 kHz
THD 20Hz-20kHz:	< 0.005%
Channel Phase Diff.	+/- 1 deg
SNR (weighted):	> 85dB
Output Level Adj:	-20dB to +3dB
Max Output Level:	+24 dBu into 10kΩ loads

System Performance (7707CVT + 7707CVR)

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:

7707CVR	Analog Video with 4-Channel Analog Audio Fiber Receiver, VistaLINK™ Monitoring

Ordering Options

Rear Plate and Fiber Connector must be specified at time of order
Eg: Model +SC +3RU

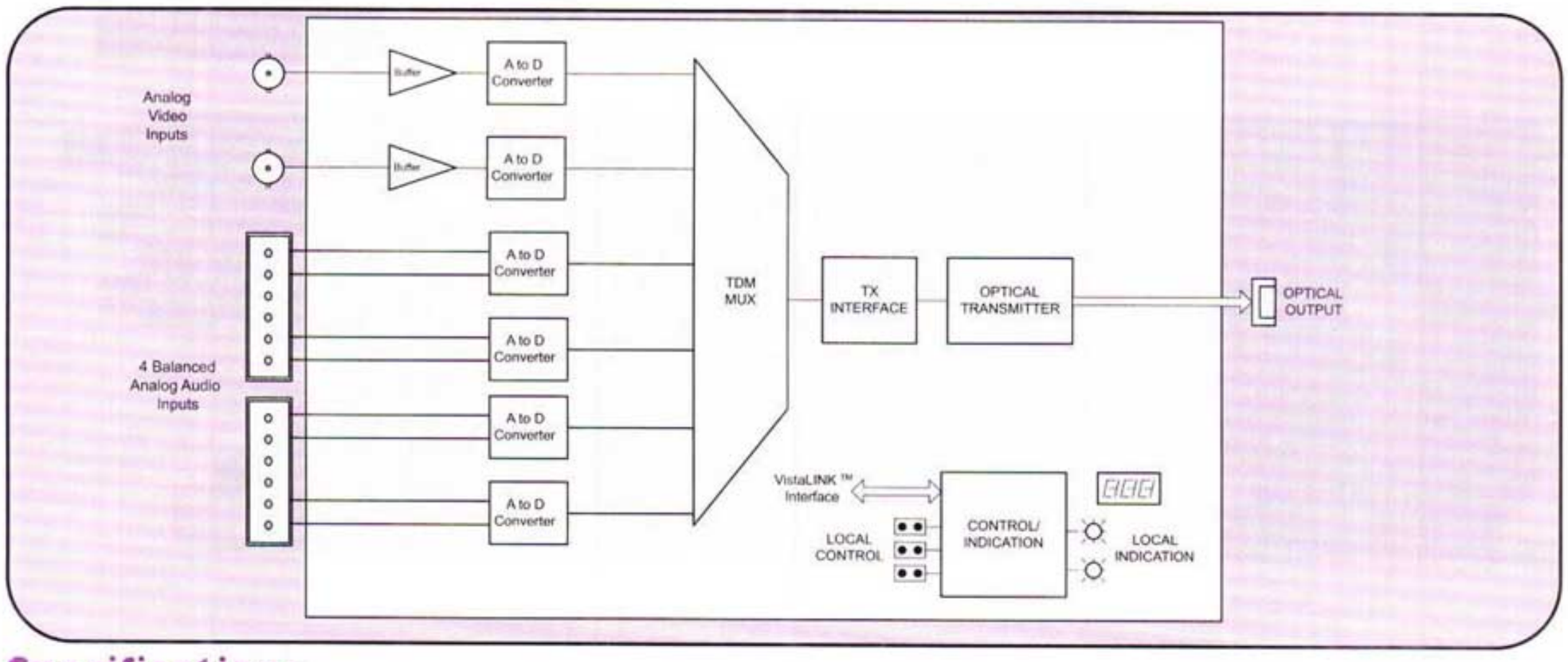
Rear Plate Suffix	
+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate
Connector Suffix	
+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

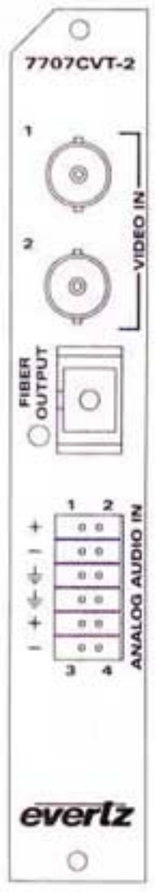
Enclosures:

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

Dual Analog Video with 4-Channel Analog Audio Fiber Transmitter

7707CVT-2 Block Diagram





Specifications

Analog Video Input:

Standards:	NTSC, SMPTE 170M, PAL, ITU-R 624-4
Number of Inputs:	2
Connector:	BNC per IEC 169-8
Signal Quantization:	12 bits
System Bandwidth:	5.5MHz
Input Level:	2 Vp-p (Maximum)
Gain Equalization: (adjustable)	Up to 300m of Belden 1694 or equivalent
Input impedance:	75Ω
Return Loss:	> 30 dB to 5.5 MHz
Signal/Noise Ratio:	> 67 dB
Differential Gain:	< 1.0%
Differential Phase:	< 1.0°
Passband Ripple:	< +/- 0.1dB to 4.7 MHz (equalization set to 0 m) < +/- 0.2dB to 4.7 MHz (equalization set to max) < +/- 0.2dB to 5.5 MHz
Chroma/Luma Delay:	< 11 ns

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 deg
SNR (weighted):	> 85 dB
Max. Audio Input Level:	+24 dBu
Signal Quantization:	24 Bits

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 mm core / 125 mm overall
Wavelengths:	See Ordering Informstion
Output Power:	
1310nm FP (Standard)	-7.5dBm ± 1dBm
1310nm FP (M Version)	0dBm ± 1dBm
1550 & CWDM DFB	0dBm ± 1dBm
DWDM DFB	7dBm ± 1dBm

System Performance: (7707CVT-2 + 7707CVR-2)

Video Input to Output Delay:	< 10µs
Audio Input to Output Delay:	< 1.9ms

Electrical:

Voltage:	+12VDC
Power:	12Watts (Non-DWDM) 15Watts (DWDM)

Ordering Information: *Dual Analog Video with 4-Channel Analog Audio Fiber Transmitter, VistaLINK™ Monitoring*

7707CVT13-2	1310nm FP Laser (-7.5dBm launch power)
7707CVT13M-2	1310nm FP Laser (0dBm launch power)
7707CVT15-2	1550nm DFB Laser

For CWDM Applications:

7707CVT27-2	1270nm, CWDM DFB Laser
7707CVT29-2	1290nm, CWDM DFB Laser
7707CVT31-2	1310nm, CWDM DFB Laser
7707CVT33-2	1330nm, CWDM DFB Laser
7707CVT35-2	1350nm, CWDM DFB Laser
7707CVT37-2	1370nm, CWDM DFB Laser
7707CVT43-2	1430nm, CWDM DFB Laser
7707CVT45-2	1450nm, CWDM DFB Laser
7707CVT47-2	1470nm, CWDM DFB Laser
7707CVT49-2	1490nm, CWDM DFB Laser
7707CVT51-2	1510nm, CWDM DFB Laser
7707CVT53-2	1530nm, CWDM DFB Laser
7707CVT55-2	1550nm, CWDM DFB Laser
7707CVT57-2	1570nm, CWDM DFB Laser
7707CVT59-2	1590nm, CWDM DFB Laser
7707CVT61-2	1610nm, CWDM DFB Laser

For DWDM Applications: Contact Factory

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

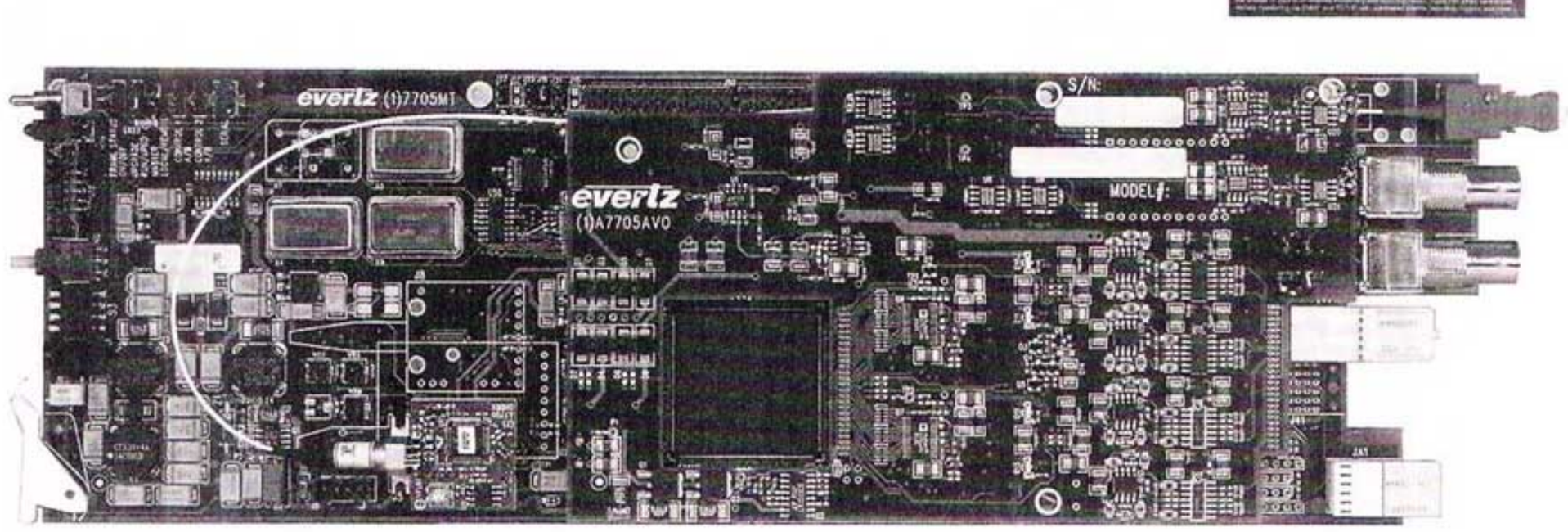
Enclosures:

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

Dual Analog Video with 4-Channel Analog Audio Fiber Receiver

Model 7707CVR-2

1d



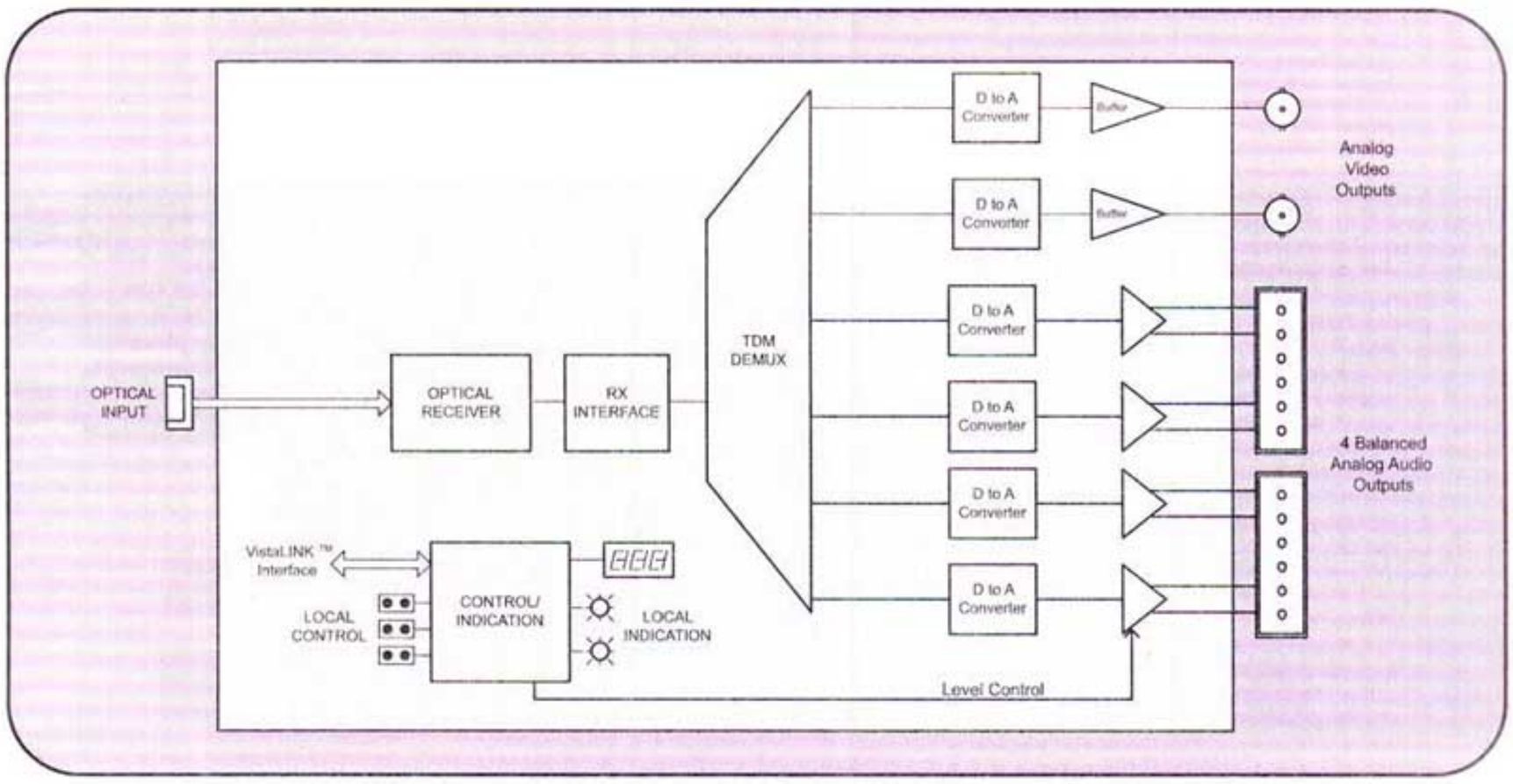
The 7707CVR-2 is a VistaLINK™ - enabled, fiber receiver for broadcast quality composite analog video and analog audio signals. This single card module accepts a fiber optic input, demultiplexes the signals, performs D to A conversion and outputs 2 NTSC or PAL analog video signals and up to four balanced analog audio signals. The companion 7707CVT-2 Dual Composite Video and Analog Audio fiber transmitter digitizes and multiplexes 2 analog video and up to four analog audio signals and converts them to an optical signal for transmission.

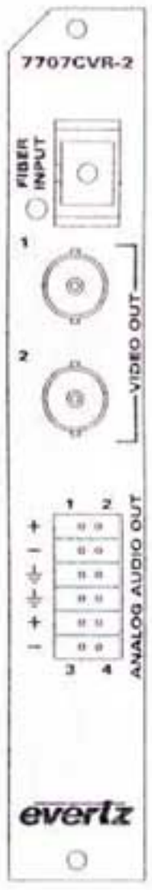
The 7707CVR-2 occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules, or a standalone enclosure which will hold 1 module.

Features

- Single card fiber demultiplexor for two analog video and four analog audio signals
- Supports both NTSC and PAL video signals
- Broadcast quality analog video and audio performance
- Adjustable gain, DC offset and pre-emphasis for driving up to 300m of Belden 1694 coaxial cable
- Minimal Audio to Video latency
- Comprehensive signal and status monitoring via four-digit card-edge display, or through SNMP and VistaLINK™ enabled capability
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports Single mode (8-10 mm) and Multi-mode (50/62.5 mm) fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range

7707CVR-2 Block Diagram





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 BNC per IEC 169-8
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:	> 20 dB
Signal/Noise:	> 67dB
Differential Gain:	< 1.0%
Differential Phase:	< 1.0°
Passband Ripple:	<+/- 0.1dB to 4.7MHz (Equalization set to 0 m) <+/- 0.2dB to 4.7MHz (Equalization set to max) <+/- 0.2dB to 5.5MHz
Pre-Emphasis:	Cable loss compensation for up to 300m of Belden 1694 (each output adjustable separately)
Chroma/Luma Delay:	<11 ns
Line time distortion:	<1% (.5% typical)

Analog Audio Outputs:

Number of Outputs:	4
Type:	Balanced analog audio
Connector:	12 pin removal terminal block
Output impedance:	< 66Ω
Freq. Response:	+/- 0.1dB, 20Hz to 20 kHz
THD 20Hz-20khz:	< 0.005%
Channel Phase Diff.	<+/- 1 deg
SNR (weighted):	> 85 dB
Output Level:	-20dB to +3dB
Max Output Level:	+24dBu into 10kΩ loads

System Performance: (7707CVT-2 + 7707CVR-2)

Video Input to Output Delay:	<10 µs
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:

7707CVR-2	Dual Analog Video with 4-Channel 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

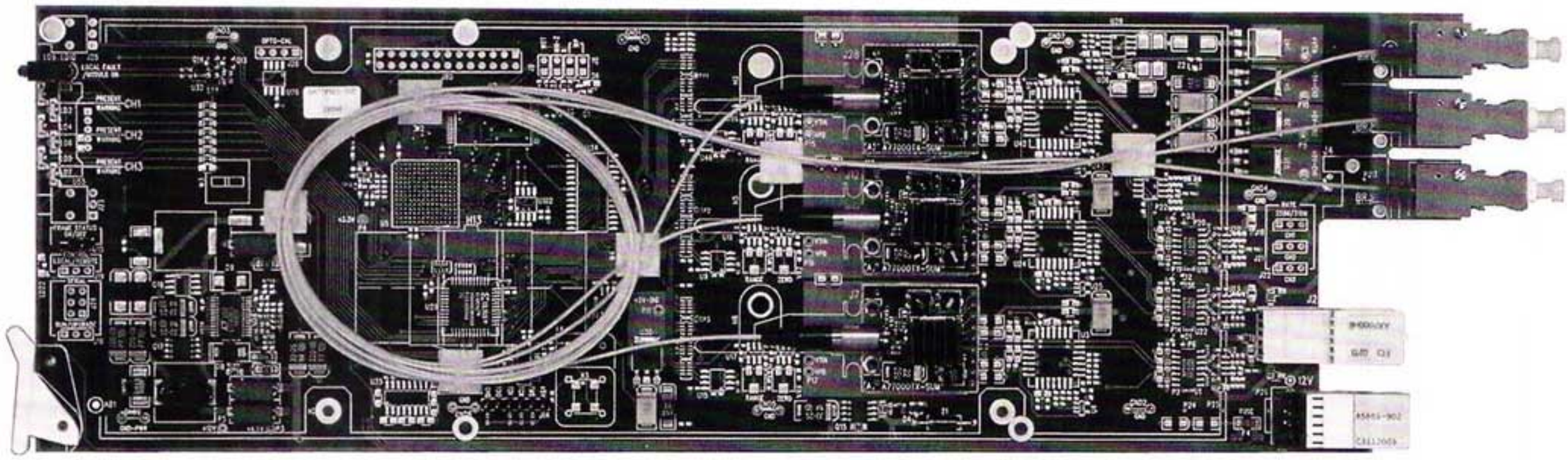
Enclosures:

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

Triple SDI Electrical to Optical Converter 19.4Mb/s or 143-540Mb/s

1d

Model 7705EO-3



The 7705EO-3 Triple SDI Electrical to Optical converter provides low cost electrical to optical conversion for three independent channels of 19.4Mb/s to 540Mb/s SMPTE signals, in a single module. Each independent channel accepts one serial video input, complying with SMPTE259M (143-360Mb/s), SMPTE310M (19.4Mb/s), SMPTE344M (540Mb/s), M2S or DVB-ASI (270Mb/s), and provides one fiber output, at 1310nm.

The 7705EO-3 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

- 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
- 1RU, 3RU frame options

Inputs:

- Three independent serial digital BNC inputs, each providing cable equalization to >300m @270Mb/s (Belden 8281)

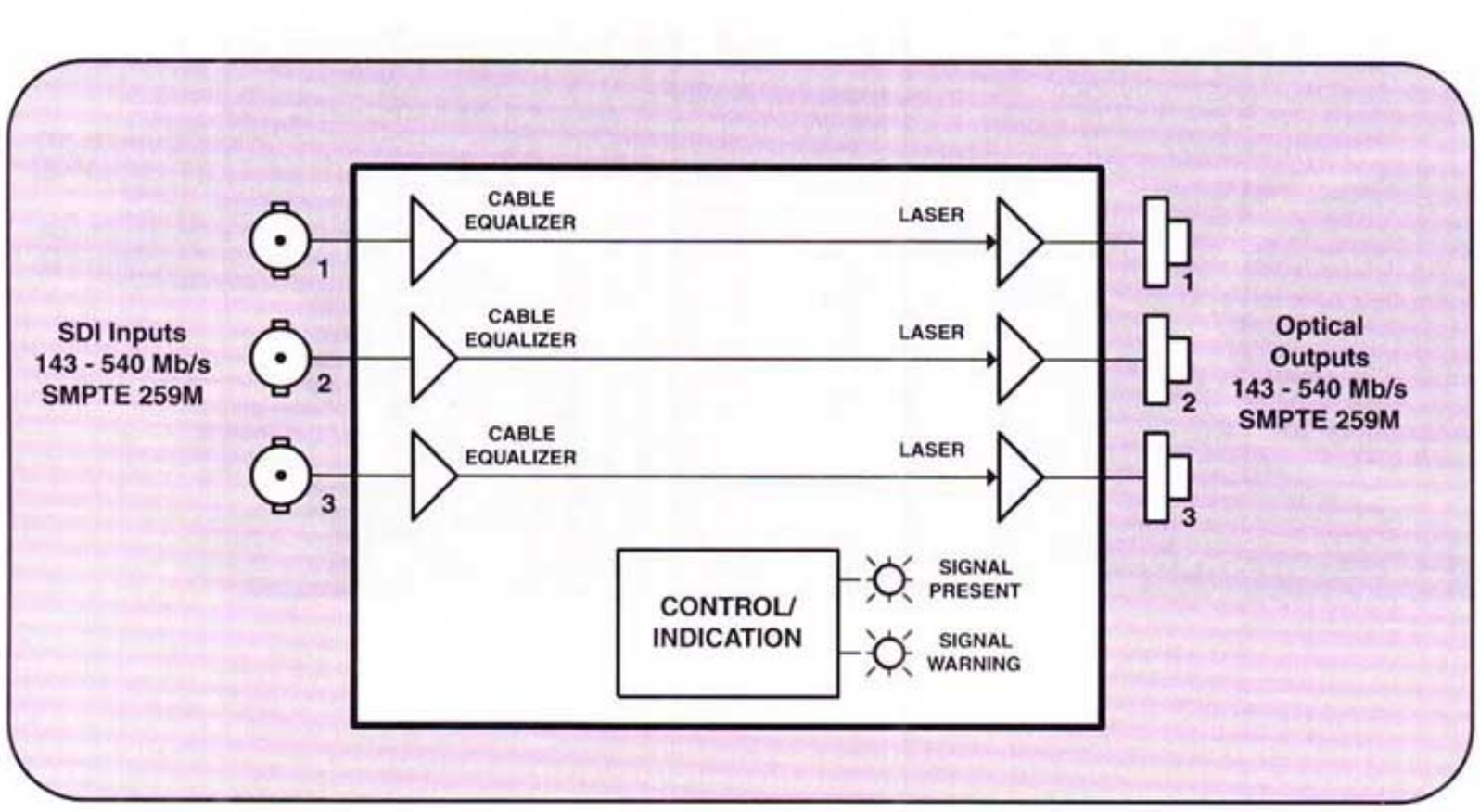
Outputs:

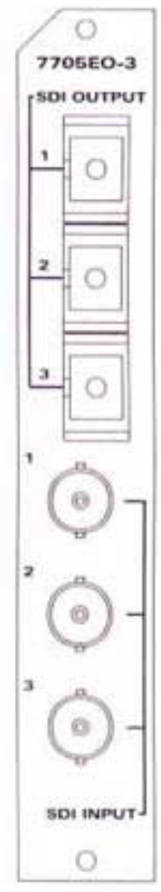
- Three independent fiber outputs
- Optical output wavelength of 1310nm
- SC/PC, ST/PC, FC/PC connector options

Status LEDs:

- Signal presence indication for each channel
- Laser status indication for each channel
- Module status indication

7705EO-3 Block Diagram





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:	-7.5dBm ±1dBm

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:

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

Enclosures:

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

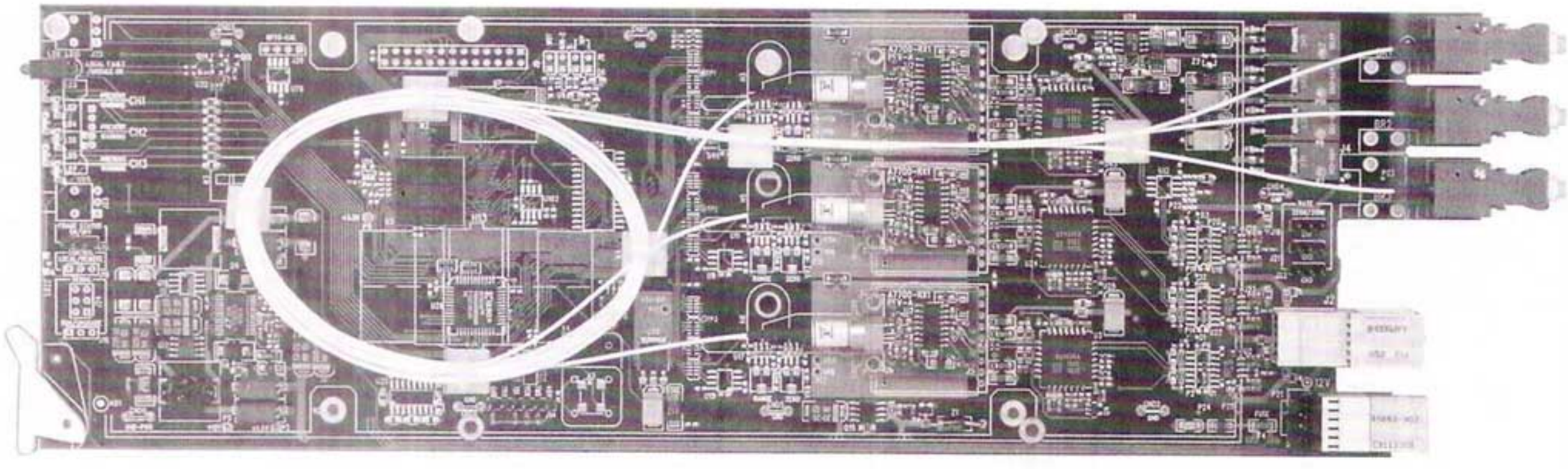
Fiber Optic Patch Cable:

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

Triple SDI Optical to Electrical Converter 19.4Mb/s or 143-540Mb/s

1d

Model 7705OE-3



The 7705OE-3 Triple SDI Optical to Electrical Converter provides low cost optical to electrical conversion for three independent channels of 19.4Mb/s to 540Mb/s SMPTE signals, in a single module. Each independent channel accepts one optical input, complying with SMPTE259M (143-360Mb/s), SMPTE310M (19.4Mb/s), SMPTE344M (540Mb/s), M2S or DVB-ASI (270Mb/s) data rates, and provides one reclocked BNC output. The module provides a jumper select feature to operate in SMPTE310M (19.4Mb/s) mode.

The 7705OE-3 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

- 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
- 1RU, 3RU frame options

Inputs:

- Three independent fiber inputs
- 1270nm to 1610nm input wavelength range
- Input sensitivity to -30dBm
- SC/PC, ST/PC, FC/PC connector options.

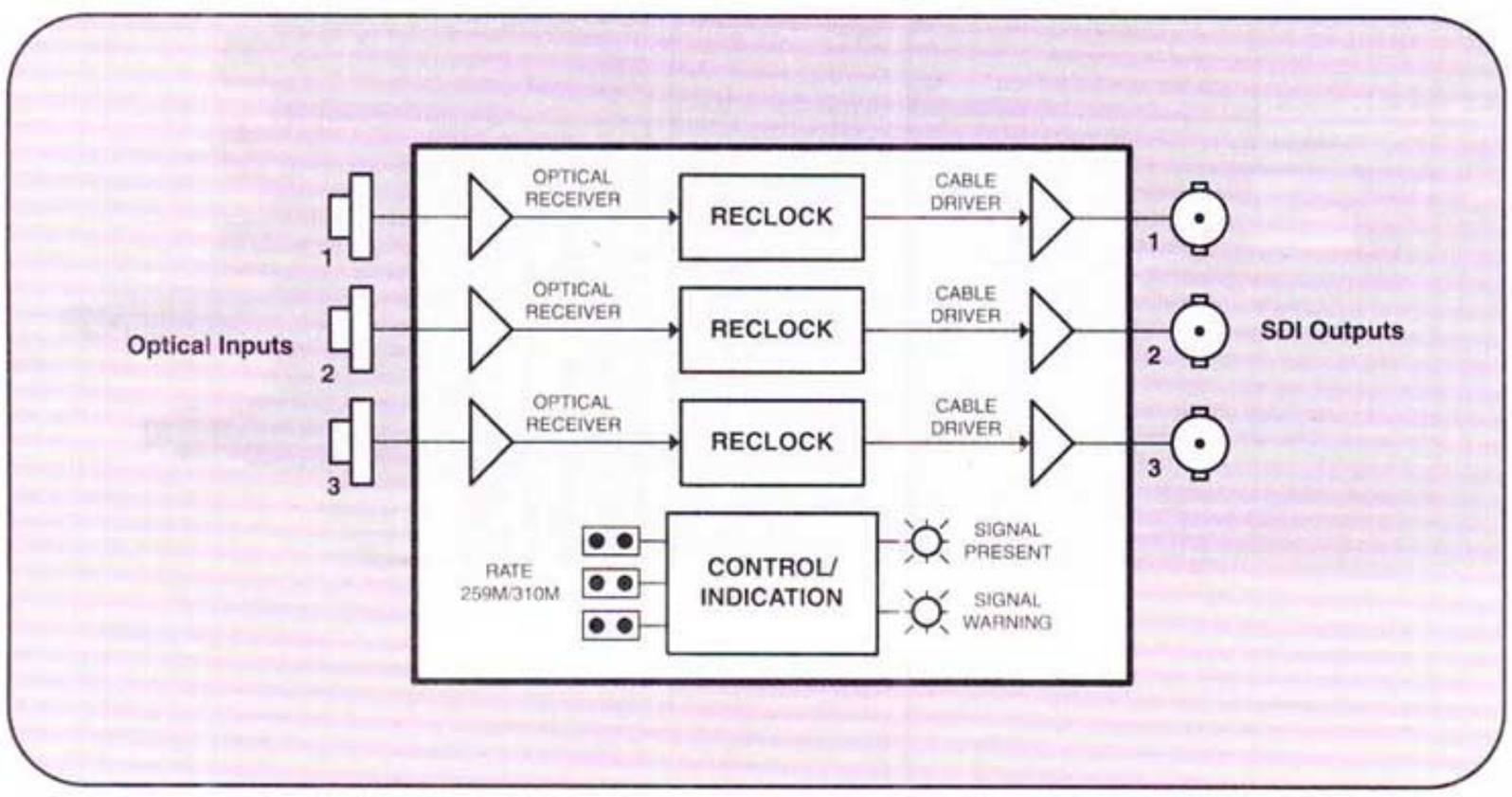
Outputs:

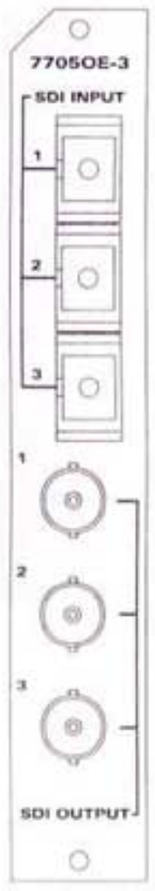
- Three independent, reclocked, serial digital BNC outputs.
- Wideband jitter < 0.2UI

Status LEDs:

- Signal presence indication for each channel
- Input carrier weak indication for each channel
- Module status indication

7705OE-3 Block Diagram





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:	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

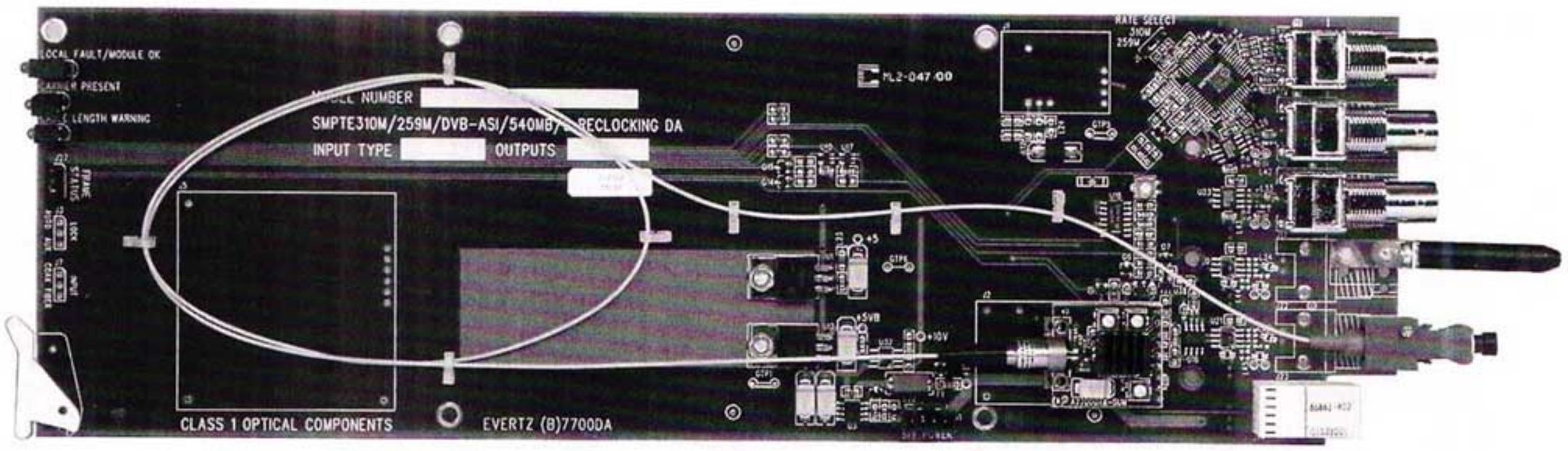
Fiber Optic Patch Cable:

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

SDI Electrical to Optical Converter 19.4Mb/s or 143-540Mb/s

1d

Model 7705EO



The 7705EO accepts one serial digital video input complying with SMPTE 259M(143 - 360Mb/s), SMPTE 310M(19.4Mb/s), SMPTE 344M(540Mb/s), M2S or DVB-ASI(270Mb/s) and provides two serial digital BNC reclocked outputs and one fiber reclocked output. The fiber output is available in 1310nm, 1550nm and up to sixteen coarse wave division multiplexing (CWDM) wavelengths in the 1270nm to 1610nm range. A jumper select feature is provided to operate in SMPTE 310M (19.4Mb/s) mode.

The 7705EO can be housed in either a 1RU frame that will hold up to 3 modules or a 3RU frame that will hold up to 15 modules. A 2405 series standalone miniature module version is also available.

Features

- 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)
- Supports multi-mode or single-mode fiber
- Fully hot swappable from front of frame with no fiber or BNC disconnect/reconnect required
- 1RU, 3RU, single standalone frame options

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, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- Wideband Jitter < 0.2 UI
- SC/PC, ST/PC, FC/PC connector options

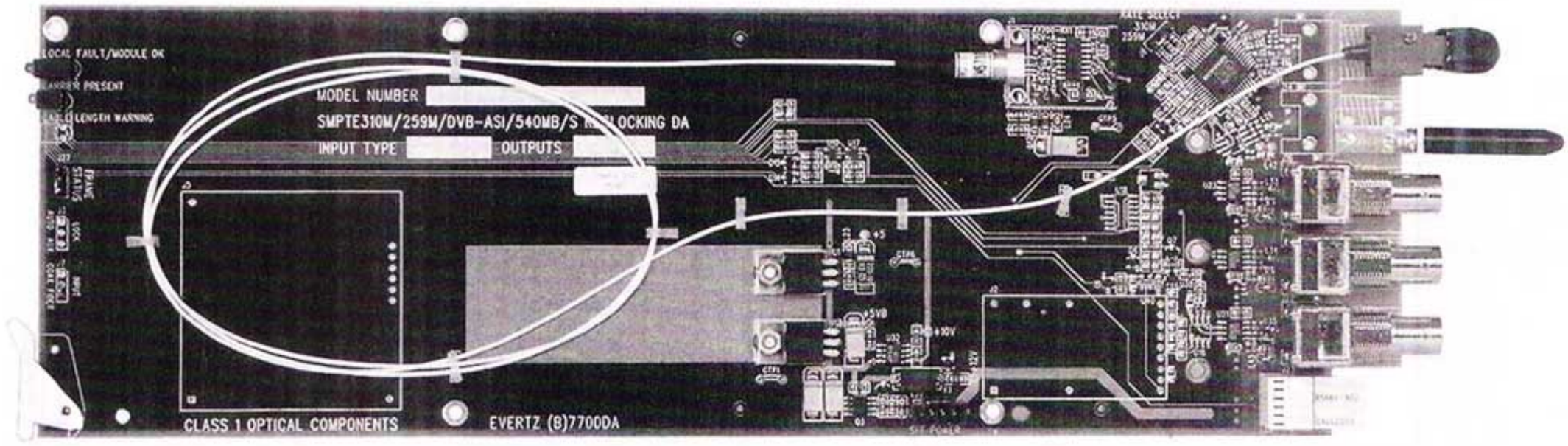
Status LEDs:

- Signal presence indication
- Maximum equalization warning indication
- Module status indication

SDI Optical to Electrical Converter
19.4Mb/s or 143-540Mb/s

1d

Model 7705OE



The 7705OE accepts a SMPTE 259M(143-360Mb/s), SMPTE 310M(19.4Mb/s), SMPTE 344M(540Mb/s), M2S or DVB-ASI (270Mb/s) optical input and provides three reclocked BNC outputs for further signal distribution. The module provides a jumper select feature to operate in SMPTE 310M (19.4Mb/s) mode.

The 7705OE can be housed in either a 1RU frame that will hold up to 3 modules or a 3RU frame that will hold up to 15 modules. A 2405 series standalone miniature module version is also available.

Features

- 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)
- Supports multi-mode or single-mode fiber
- Fully hot swappable from front of frame with no fiber or BNC disconnect/reconnect required
- 1RU, 3RU, single standalone frame options

Input:

- Optical input range from 1270nm to 1610nm
- Input sensitivity to -31dBm
- SC/PC, ST/PC, FC/PC connector options

Outputs:

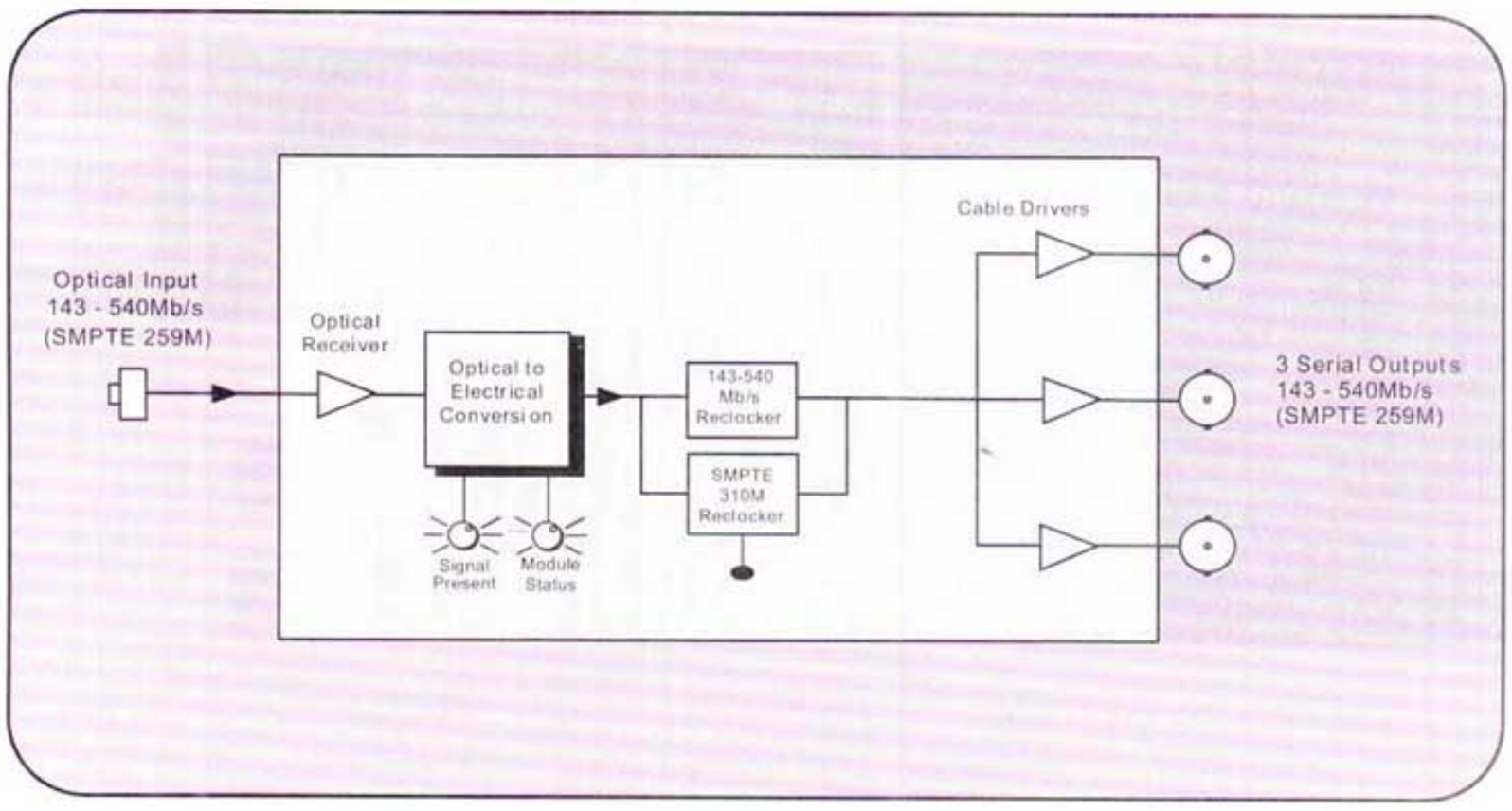
- Three serial digital BNC outputs for loop-through or monitoring
- Wideband Jitter < 0.2 UI

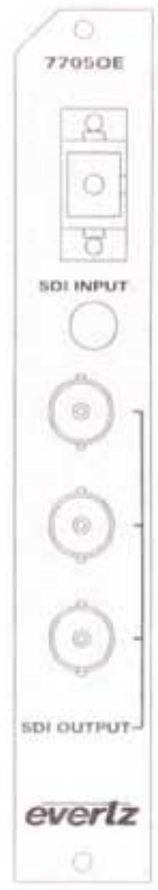
Status LEDs:

- Signal presence indication
- Module status indication

SDI Optical to Electrical Converter 19.4Mb/s or 143-540Mb/s

7705OE Block Diagram





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:	-31dBm
Maximum Input Power:	0dBm

Serial Video Outputs:

Number of Outputs:	3 per card reclocked
Connector:	BNC per IEC 169-8
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

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

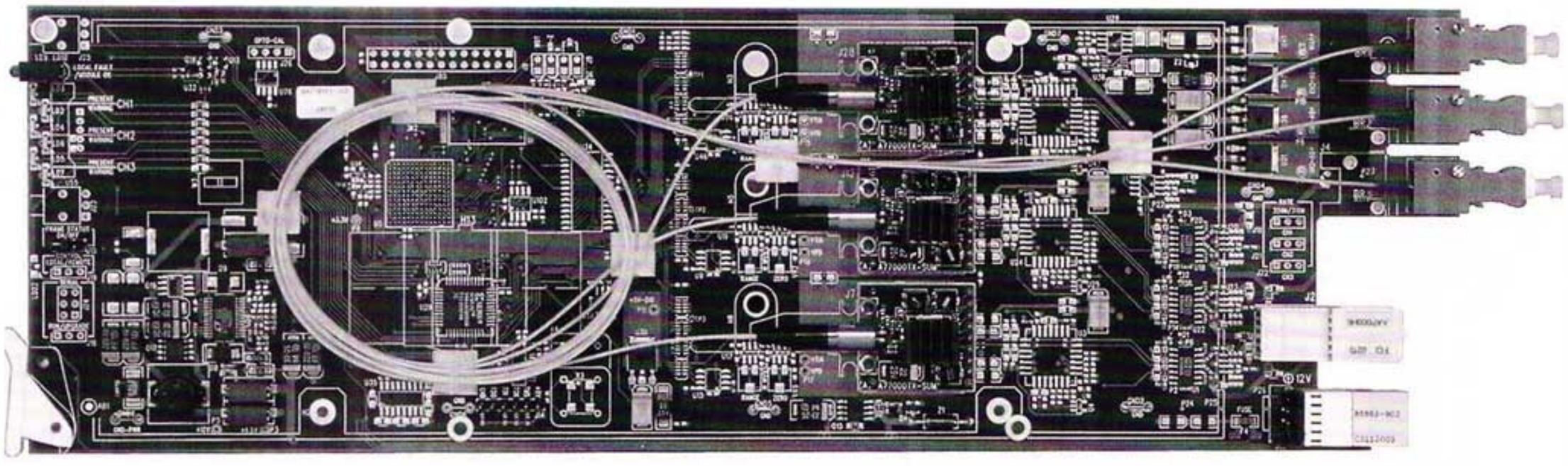
For standalone applications see 2400 series fiber modules

Triple SDI Electrical to Optical Converter 19.4Mb/s or 143-540Mb/s

1d



Model 7707EO-3



The 7707EO-3 is a VistaLINK™ - enabled, Triple SDI Electrical to Optical converter that provides low cost electrical to optical conversion for three independent channels of 19.4Mb/s to 540Mb/s SMPTE signals, in a single module. Each independent channel accepts one serial video input, complying with SMPTE259M (143-360Mb/s), SMPTE310M (19.4Mb/s), SMPTE344M (540Mb/s), M2S or DVB-ASI (270Mb/s), and provides one fiber output, at 1310nm. Monitoring of card status is provided locally at the card edge and remotely via VistaLINK™.

The 7707EO-3 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

- 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
- 1RU, 3RU frame options
- VistaLINK™ -enabled for remote monitoring and control when installed in 7700FR-C with 7700FC VistaLINK™ Frame Controller

Inputs:

- Three independent serial digital BNC inputs, each providing cable equalization to >300m @270Mb/s (Belden 8281)

Outputs:

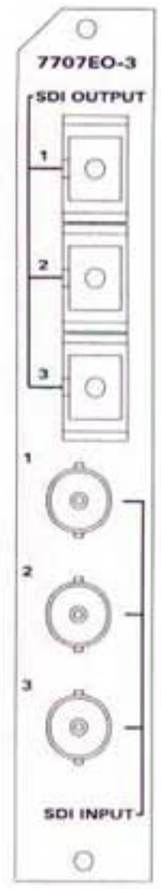
- Three independent fiber outputs
- Optical output wavelength of 1310nm
- SC/PC, ST/PC, FC/PC connector options

Status LEDs:

- Signal presence indication for each channel
- Laser status indication for each channel
- Module status indication

Triple SDI Electrical to Optical Converter, 19.4Mb/s or 143-540Mb/s

7707EO-3 Block Diagram



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:	-7.5dBm ±1dBm

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:

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:

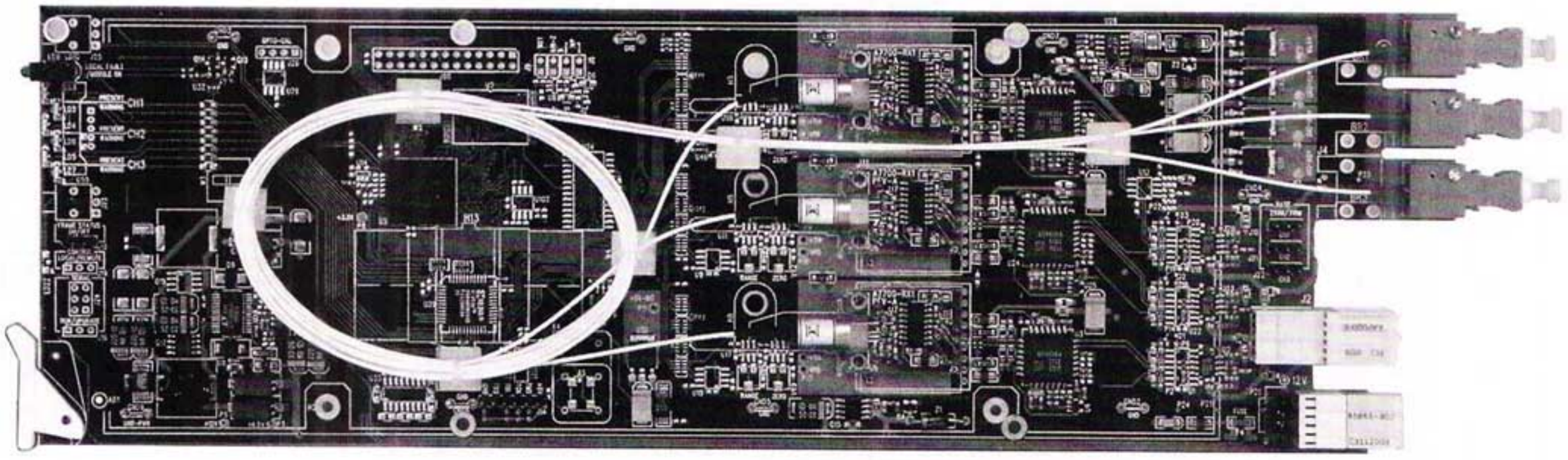
7700FR-C	3RU Multiframe, which holds 15 modules
7701FR	1RU Multiframe, which holds 3 modules
S7701FR	Standalone enclosure

Triple SDI Optical to Electrical Converter 19.4Mb/s or 143-540Mb/s

1d

Model 7707OE-3





The 7707OE-3 is a VistaLINK™ - enabled Triple SDI Optical to Electrical Converter that provides low cost optical to electrical conversion for three independent channels of 19.4Mb/s to 540Mb/s SMPTE signals, in a single module. Each independent channel accepts one optical input, complying with SMPTE259M (143-360Mb/s), SMPTE310M (19.4Mb/s), SMPTE344M (540Mb/s), M2S or DVB-ASI (270Mb/s) data rates, and provides one reclocked BNC output. The module provides a jumper select feature to operate in SMPTE310M (19.4Mb/s) mode. Monitoring and control of card status and parameters is provided locally at the card edge and remotely via VistaLINK™.

The 7707OE-3 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

- 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
- 1RU, 3RU frame options
- VistaLINK™ -enabled for remote monitoring and control when installed in 7700FR-C with 7700FC VistaLINK™ Frame Controller

Inputs:

- Three independent fiber inputs
- 1270nm to 1610nm input wavelength range
- Input sensitivity to -30dBm
- SC/PC, ST/PC, FC/PC connector options.

Outputs:

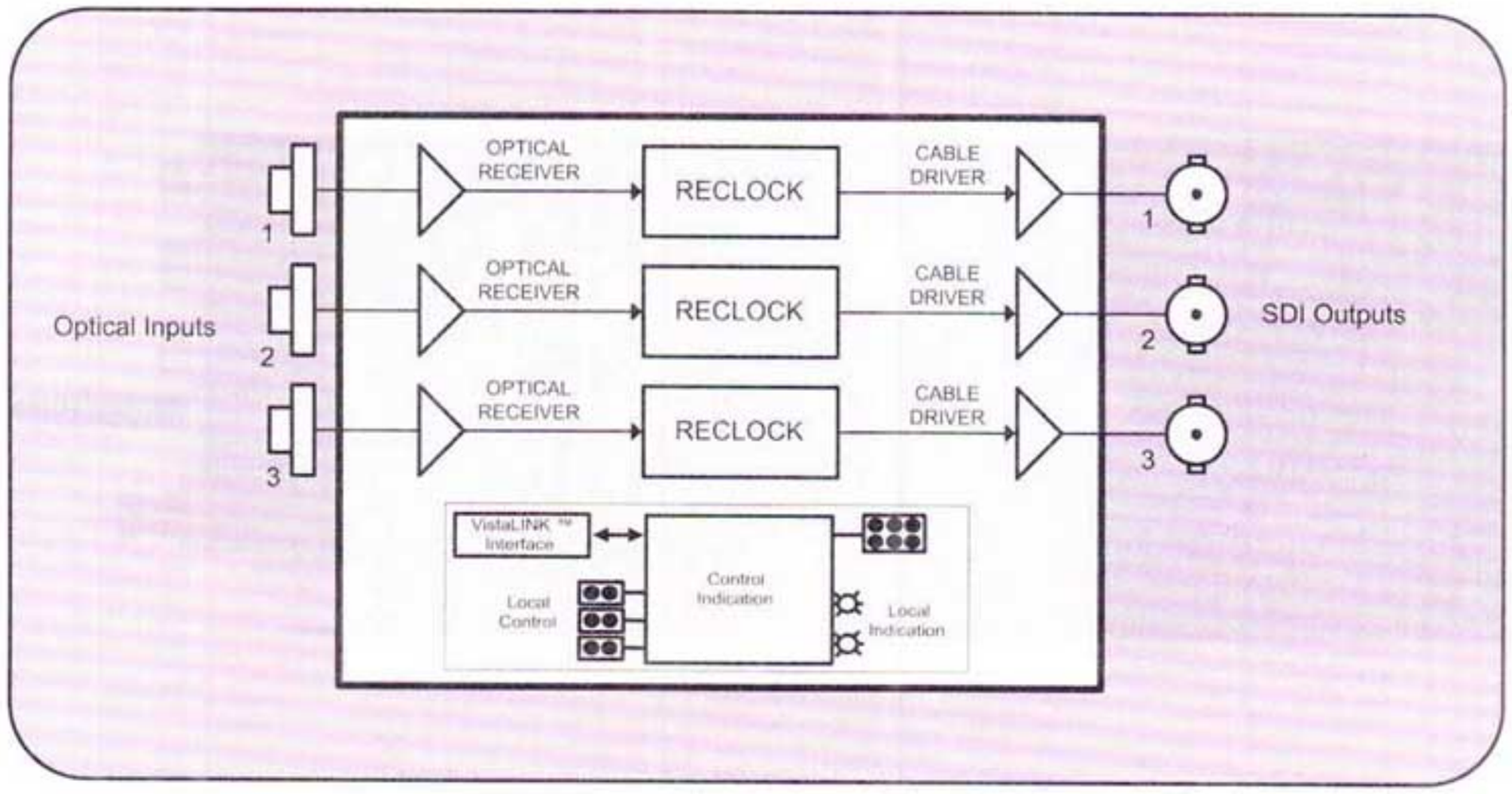
- Three independent, reclocked, serial digital BNC outputs.
- Wideband jitter < 0.2UI

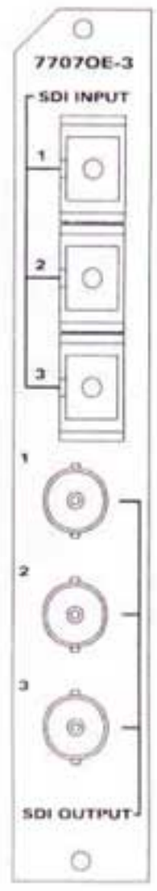
Status LEDs:

- Signal presence indication for each channel
- Input carrier weak indication for each channel
- Module status indication

Triple SDI Optical to Electrical Converter 19.4Mb/s or 143-540Mb/s

7707OE-3 Block Diagram





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, VistLink™ 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

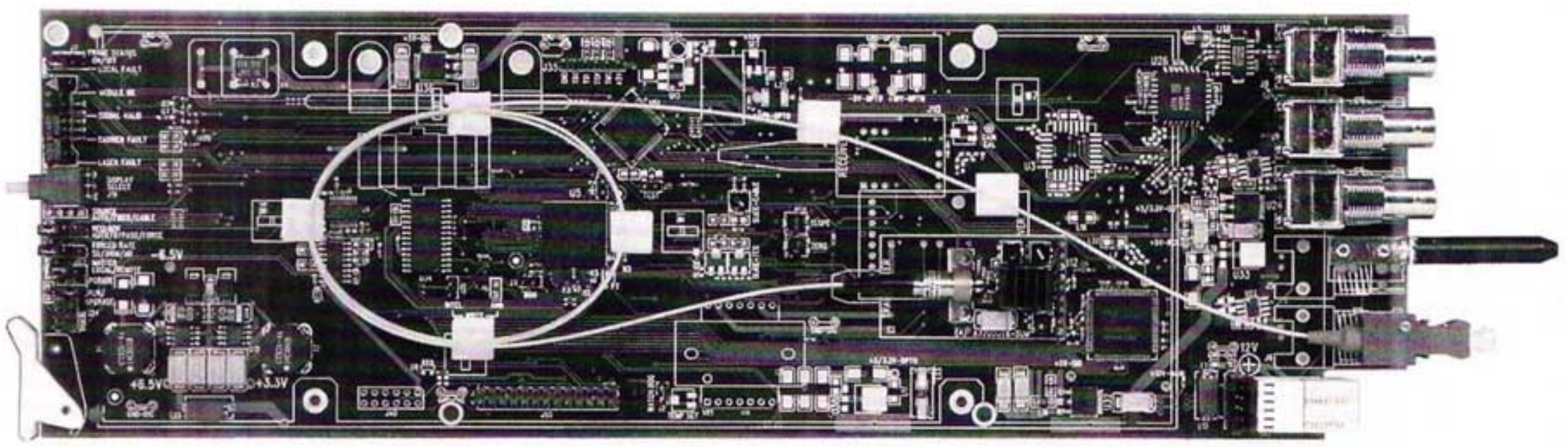
SDI Electrical to Optical Converter, 19.4Mb/s or 143-540Mb/s, VistaLINK™ Monitoring

1d

Model 7707EO







The 7707EO is a VistaLINK™ - enabled, electrical to optical converter for SMPTE 259M (143-360Mb/s), SMPTE 344M (540Mb/s), M2S, DVB-ASI (270Mb/s) and SMPTE 310M (19.4Mb/s) signals. Monitoring and control of card status and parameters is provided locally at the card edge and remotely via VistaLINK™ capability. The 7707EO accepts one coaxial SDI input and provides one reclocked fiber output and two reclocked coaxial SDI outputs. The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm, CWDM and DWDM transmission schemes.

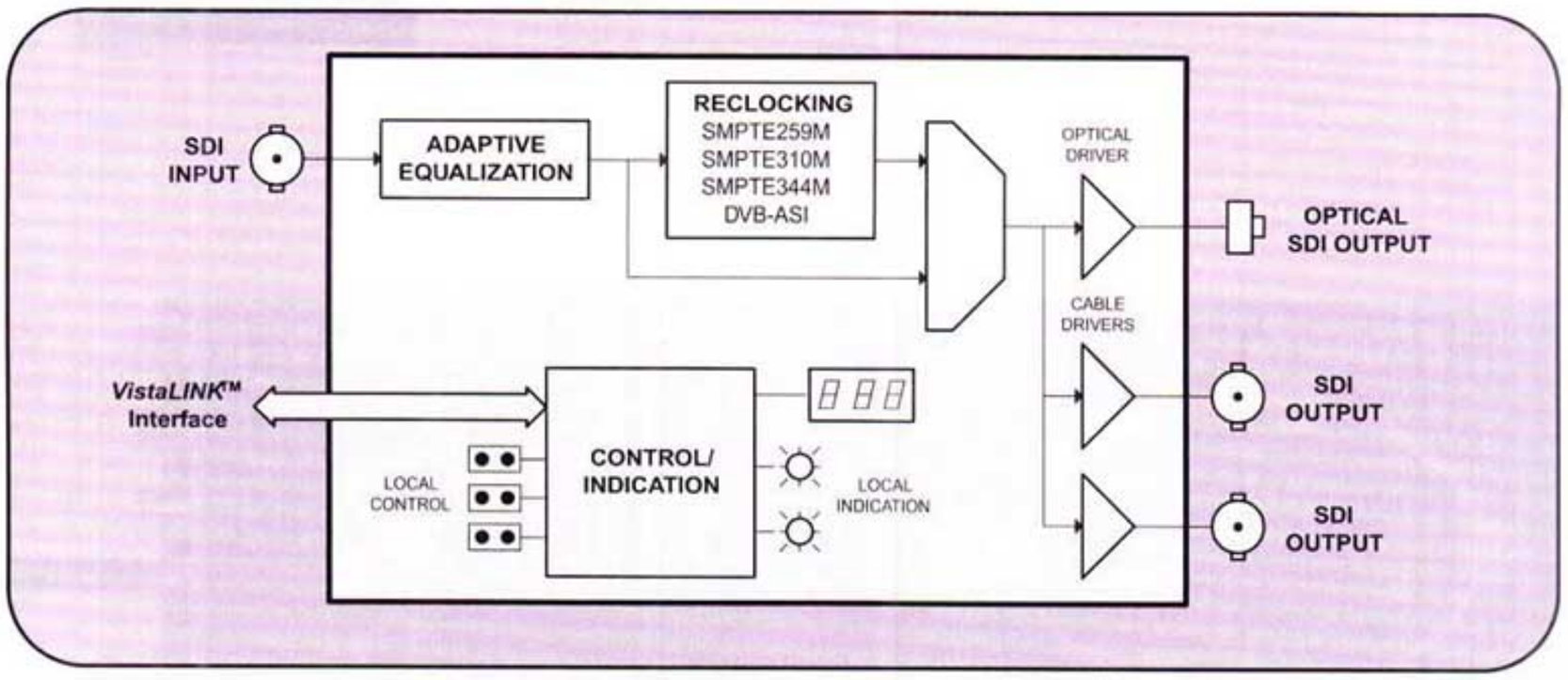
The 7707EO occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure whch will hold 1 module.

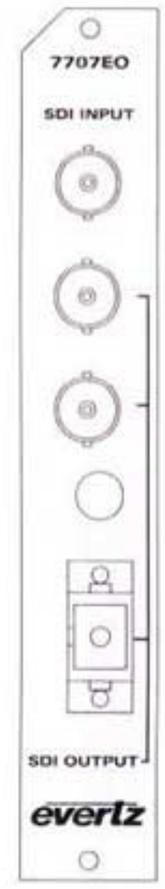
Features

- Supports 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
- Comprehensive signal and status monitoring via four-digit card-edge display or remotely through SNMP and VistaLINK™ capablity
- Detection and display of input equalization, video format and EDH errors
- Automatic coaxial input equalization to up 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.692 compliant) also available
- Supports multi-mode and single-mode fiber
- Fully hot swappable from front of frame

SDI Electrical to Optical Converter, 19.4Mb/s or 143-540Mb/s, VistaLINK™ Monitoring

7707EO Block Diagram





Specifications

Standards:

Reclocked:	SMPTE 259M A, B, C, D, SMPTE 297M, SMPTE 344M, SMPTE 310M, SMPTE 305M, M2S or DVB-ASI
Non-Reclocked:	Any bi-level signal type at rates of 19.4 - 540Mb/s

Serial Video Input:

Connector:	1 BNC input per IEC 169-8
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 169-8
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:	-7.5dBm ± 1dBm
1550nm & CWDM:	0dBm ± 1dBm
DWDM DFB:	7dBm ± 1dBm

Electrical:

Voltage:	+12V DC
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

Ordering Information: *SDI Electrical to Optical Converter 19.4Mb/s or 143-540Mb/s, VistaLINK™ Monitoring*

7707EO13:	1310nm, FP Laser
7707EO15:	1550nm, DFB Laser

For CWDM Applications:

7707EO27	1270nm, CWDM DFB Laser
7707EO29	1290nm, CWDM DFB Laser
7707EO31	1310nm, CWDM DFB Laser
7707EO33	1330nm, CWDM DFB Laser
7707EO35	1350nm, CWDM DFB Laser
7707EO37	1370nm, CWDM DFB Laser
7707EO43	1430nm, CWDM DFB Laser
7707EO45	1450nm, CWDM DFB Laser
7707EO47	1470nm, CWDM DFB Laser
7707EO49	1490nm, CWDM DFB Laser
7707EO51	1510nm, CWDM DFB Laser
7707EO53	1530nm, CWDM DFB Laser
7707EO55	1550nm, CWDM DFB Laser
7707EO57	1570nm, CWDM DFB Laser
7707EO59	1590nm, CWDM DFB Laser
7707EO61	1610nm, CWDM DFB Laser

For DWDM Applications: Contact Factory

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

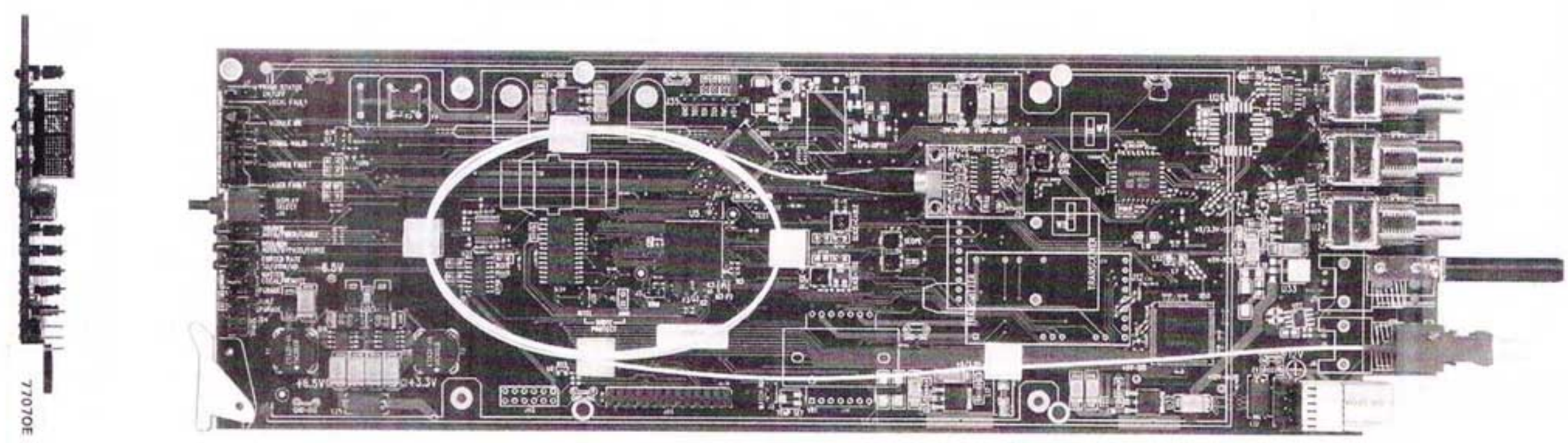
For standalone applications also see 2400 series fiber modules

SDI Optical to Electrical Converter, 19.4Mb/s or 143-540Mb/s, VistaLINK™ Monitoring

1d

Model 7707OE





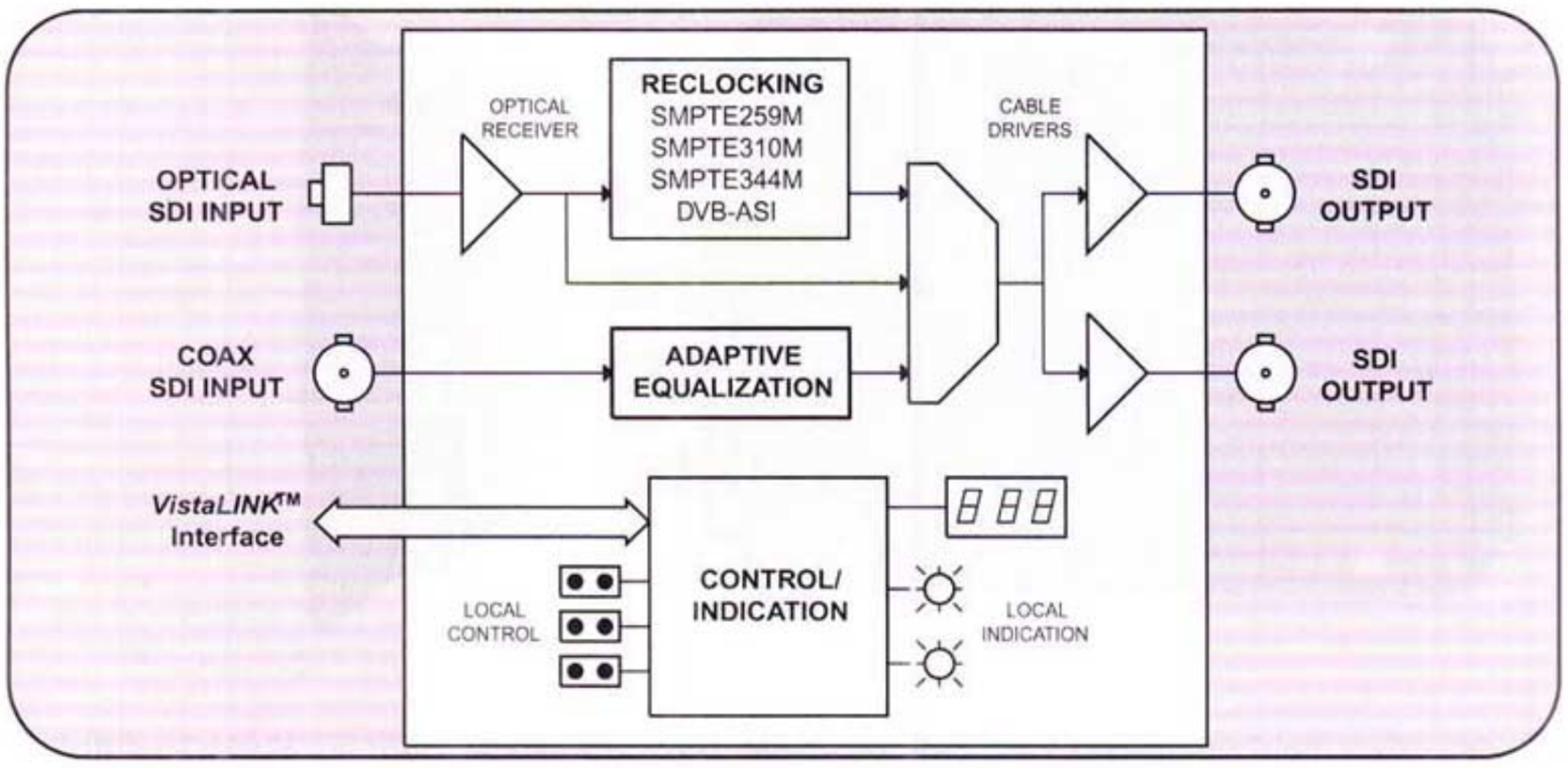
The 7707OE is a VistaLINK™ - enabled, optical to electrical converter for SMPTE 259M (143-360Mb/s), SMPTE 344M (540Mb/s), M2S, DVB-ASI (270Mb/s) and SMPTE 310M (19.4Mb/s) signals. Monitoring and control of card status and parameters is provided locally at the card edge and remotely via VistaLINK™ capability. The 7707OE accepts one fiber input and provides two reclocked coaxial SDI outputs. An additional coaxial SDI input can be used as a fallback source in case of optical link failure or can be selected as the primary input.

The 7707OE 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 whch will hold 1 module.

Features

- Supports 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
- Comprehensive signal and status monitoring via four-digit card-edge display or remotely through SNMP and VistaLINK™ capability
- 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

7707OE Block Diagram





Specifications

Standards:

Reclocked:	SMPTE 259M A, B, C, D, SMPTE 297M, SMPTE 305M, SMPTE 310M, SMPTE 344M, M2S or DVB-ASI
Non-Reclocked:	Any bi-level signal type at rates of 19.4Mb/s to 540Mb/s

Optical Input:

Connector:	1 Female SC/PC, ST/PC or FC/PC
Wavelength:	1270nm to 1610nm
Optical Sensitivity	-31dBm @ 270Mb/s
Max. Input Power:	0dBm

Coaxial Input:

Connector:	1 BNC per IEC 169-8
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 169-8
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:

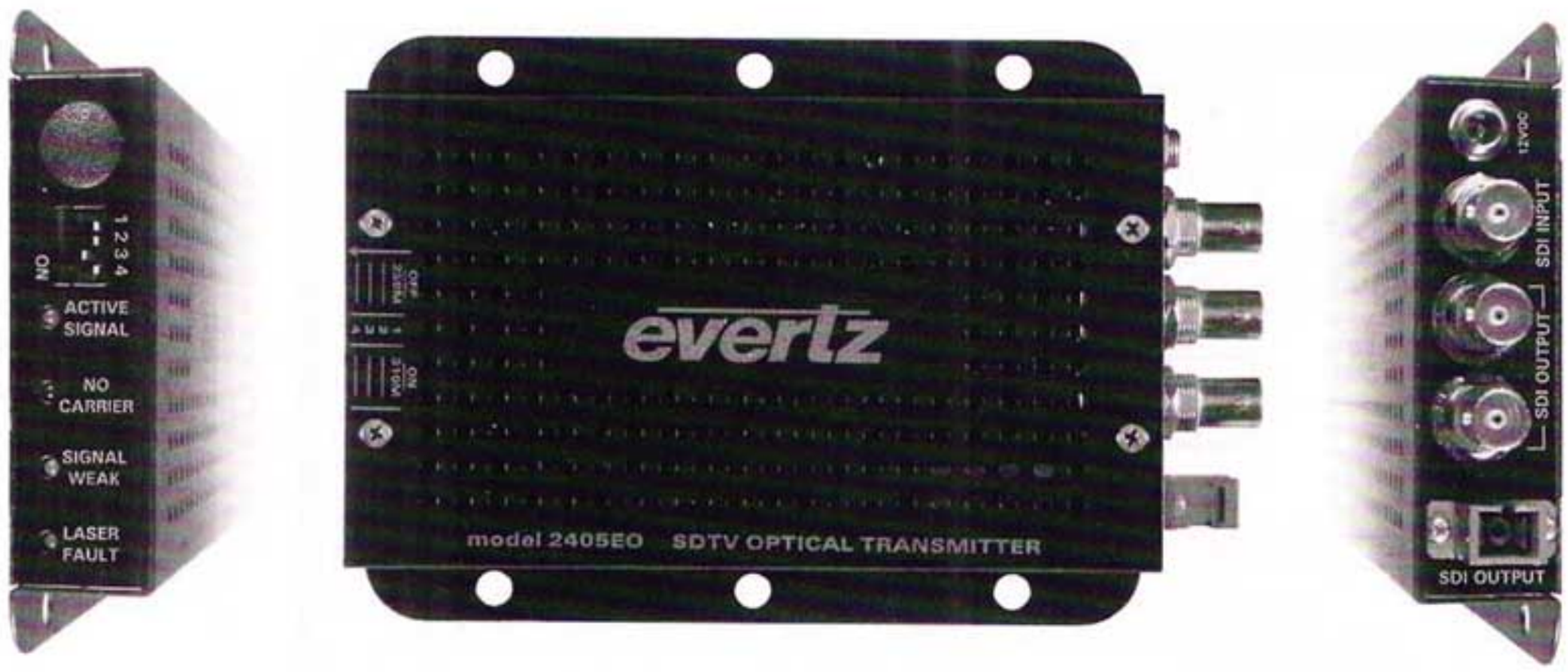
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone Enclosure

For standalone applications see 2400 series fiber modules

SDI Miniature Optical Transmitter

1d

Model 2405EO



The 2405EO accepts one serial digital video input complying with SMPTE 259M(143 - 360Mb/s), SMPTE 310M(19.4Mb/s), SMPTE 344M(540Mb/s), M2S or DVB-ASI(270Mb/s) and provides two serial digital BNC reclocked outputs and one fiber reclocked output. The fiber output is available in 1310nm, 1550nm and up to sixteen coarse wave division multiplexing (CWDM) wavelengths in the 1270nm to 1610nm range. A dip switch select feature is provided to operate in SMPTE 310M (19.4Mb/s) mode.

The 2405EO is ideal for use in portable, remote and link extension applications where the small size, rugged enclosure and high performance operation meet the stringent requirements of these applications.

With the availability of up to 16 different CWDM wavelengths, optical signal aggregation for indoor/outdoor events and remote applications is now possible. When combined with the Evertz 7705CWDM Coarse Wave Division Multiplexor/Demultiplexor products, up to sixteen independent signal types on separate wavelengths can be combined on a single fiber.

The 2405EO is available with SC, ST and FC connector options.

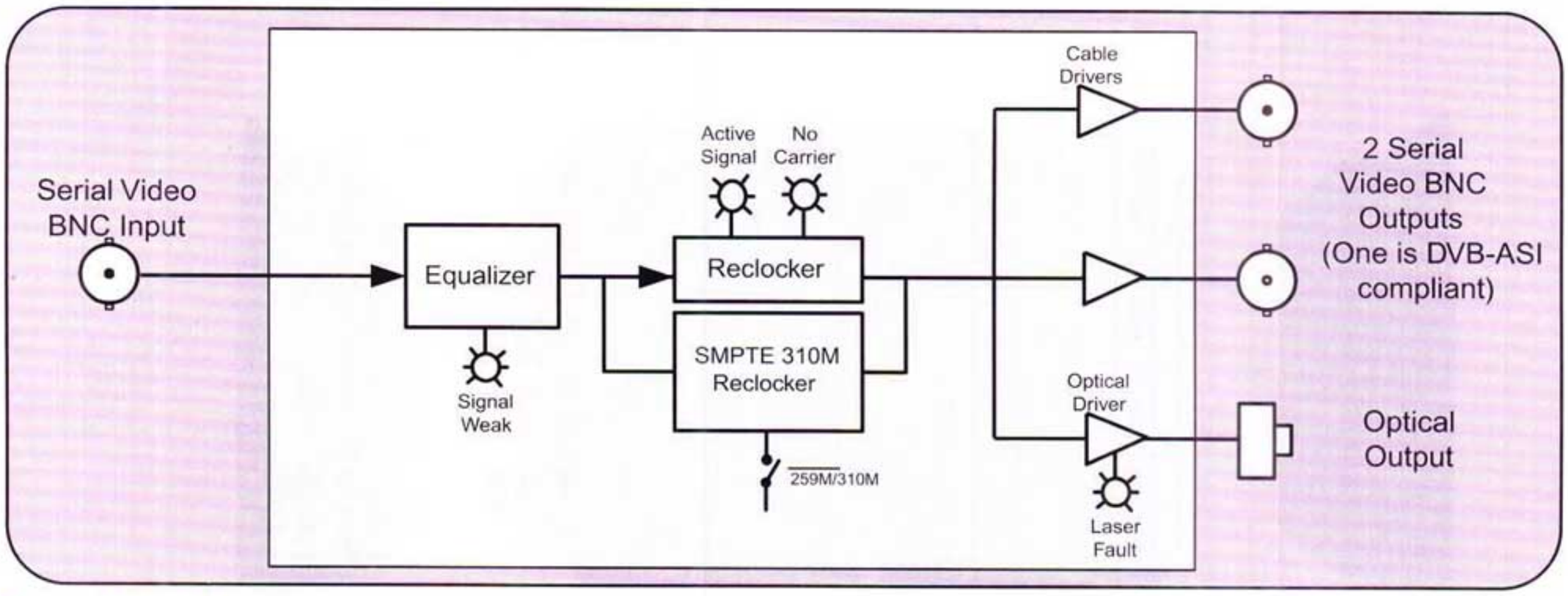
Features

- Reclocking for all for SDTV video rates including SMPTE 259M (143Mb/s-360Mb/s), SMPTE 310M (19.4Mb/s), SMPTE344M(540Mb/s), M2S and DVB-ASI (270Mb/s)
- Available in 1310nm, 1550nm and sixteen different CWDM wavelengths (ITU-T G.694.2 compliant)
- Automatic laser shutdown on absence of input signal for extended laser life
- Supports multi-mode and single mode fiber
- Immunity to video Pathological signals
- Long reach transmission capability
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation

Card Edge LED's:

- Signal presence
- Maximum equalization warning
- Laser fault

2405EO Block Diagram



Specifications

Standards: SMPTE 259M (A, B, C, D), SMPTE 297M, SMPTE310M, SMPTE344M, M2S, & DVB-ASI

Serial Video BNC Input:

Number of Inputs:	1
Connector:	BNC input per IEC 169-8
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 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 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:	-7.5 dBm± 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) No Flanges: 6"L x 3.5"W x 1"H (152mm L x 89mm 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: *SDI Miniature Optical Transmitter*

2405EO3F	1310nm FP, Laser
2405EO5D	1550nm DFB Laser

CWDM Applications:

2405EO27	1270nm, CWDM DFB Laser
2405EO29	1290nm, CWDM DFB Laser
2405EO31	1310nm, CWDM DFB Laser
2405EO33	1330nm, CWDM DFB Laser
2405EO35	1350nm, CWDM DFB Laser
2405EO37	1370nm, CWDM DFB Laser
2405EO43	1430nm, CWDM DFB Laser
2405EO45	1445nm, CWDM DFB Laser
2405EO47	1470nm, CWDM DFB Laser
2405EO49	1490nm, CWDM DFB Laser
2405EO51	1510nm, CWDM DFB Laser
2405EO53	1530nm, CWDM DFB Laser
2405EO55	1550nm, CWDM DFB Laser
2405EO57	1570nm, CWDM DFB Laser
2405EO59	1590nm, CWDM DFB Laser
2405EO61	1610nm, CWDM DFB Laser

All 2405 modules include power supply
Note: *Enclosure with side mount flanges ships standard*

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

Case Option Suffix

+NF	Enclosure without mounting flanges

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

1d

Model 2405OE



The 2405OE accepts a SMPTE 259M(143-360Mb/s), SMPTE 310M(19.4Mb/s), SMPTE 344M(540Mb/s), M2S or DVB-ASI(270Mb/s) optical input signal and provides two reclocked electrical outputs for further signal distribution. On loss of optical signal the unit can switch over to an SDI electrical input. A dip switch select feature provides reclocking for SMPTE 310M (19.4Mb/s) signals.

The 2405OE is ideal for use in portable, remote and link extension applications where the small size, rugged enclosure and high performance operation meet the stringent requirements of these applications.

The 2405OE is available with SC, ST and FC connector options.

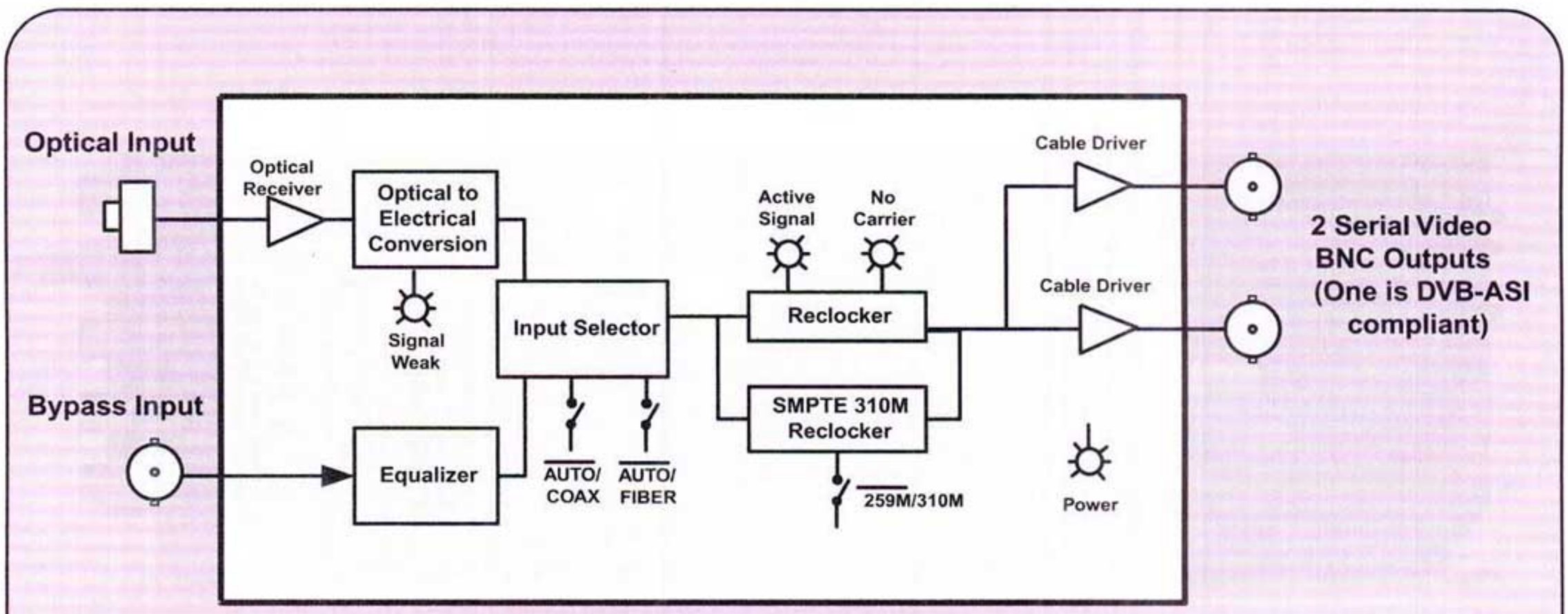
Features

- 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 multi-mode and single-mode fiber
- High optical input sensitivity
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation

Card Edge LED's:

- Signal presence
- Weak optical signal warning

2405OE Block Diagram



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 input per IEC 169-8
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:	-29 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 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 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) No Flanges: 6"L x 3.5"W x 1"H (152mm L x 89mm 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

Note: *Enclosure with side mount flanges ships standard*

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

Case Option Suffix

+NF	Enclosure without mounting flanges

Fiber Optic Patch Cable:

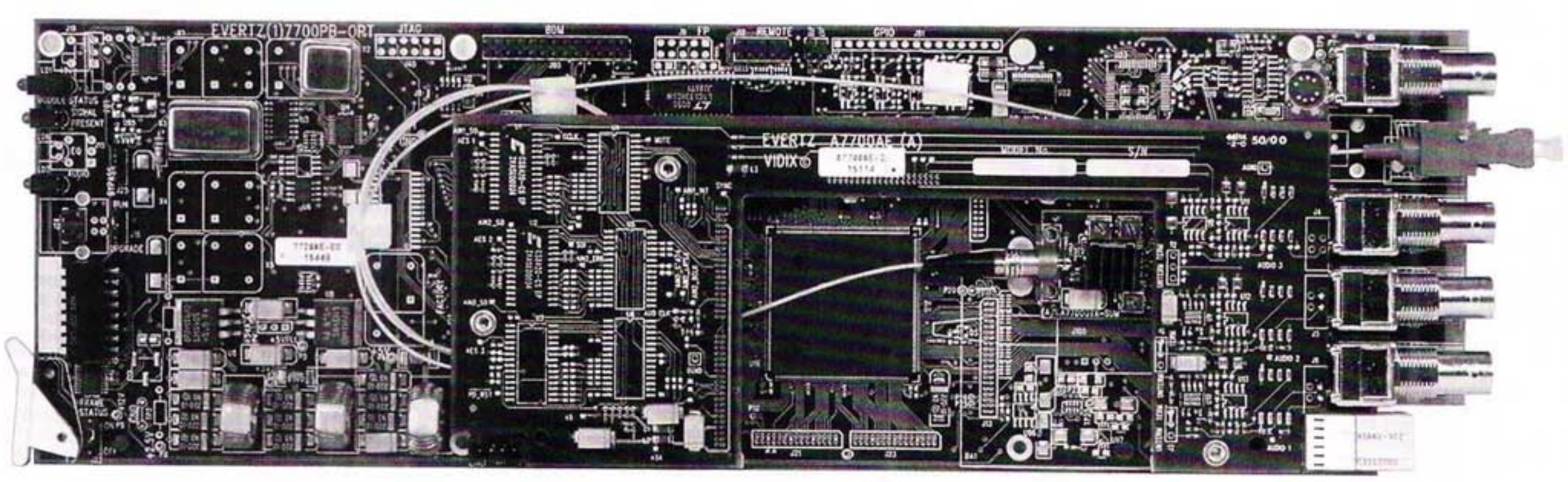
CB-FP1M-SCPC	Single mode fiber cable, 1m, SC/PC male termination
CB-FP1M-STPC	Single mode fiber cable, 1m, ST/PC male termination
CB-FP5M-SCPC	Single mode fiber cable, 5m, SC/PC male termination
CB-FP5M-STPC	Single mode fiber cable, 5m, ST/PC male termination
CB-FP10M-SCPC	Single mode fiber cable, 10m, SC/PC male termination
CB-FP10M-STPC	Single mode fiber cable, 10m, ST/PC male termination

SDI AES Audio Embedder & Fiber Transmitter

1d

Model 7720AE-EO

Dolby E PARTNER



The 7720AE-EO Audio Embedder inserts AES audio channels into a 270 Mb/s SDI video signal as specified in SMPTE 272M. The 7720AE-EO will embed up to four audio channels (2 AES) into the audio group selected by the DIP switches. The 7720AE series Embedders will do a seamless audio embed when the input video is switched properly in the vertical interval.

SMPTE 272M allocates four groups of four audio channels that can be embedded into the SMPTE 259M bitstream. The 7720AE-EO has the ability to select the Audio channel group where the audio will be inserted. The 7720AE series Embedders are Dolby E compliant.

In addition to an SDI output, the 7720AE-EO also provides a fiber optic output with embedded audio.

Features

Card Edge LEDs:

- Video Signal Presence
- Module Status
- Audio Presence - Audio Group Indicator

Controls:

- Audio group selection via card edge DIP switches
- Audio channel swapping selection via card edge DIP switches
- Sample rate conversion disable to permit Dolby E embedding

Inputs:

Video

- SMPTE 259M-C (270Mb/s) SDI video
- Auto equalization to 300m (Belden 8281)

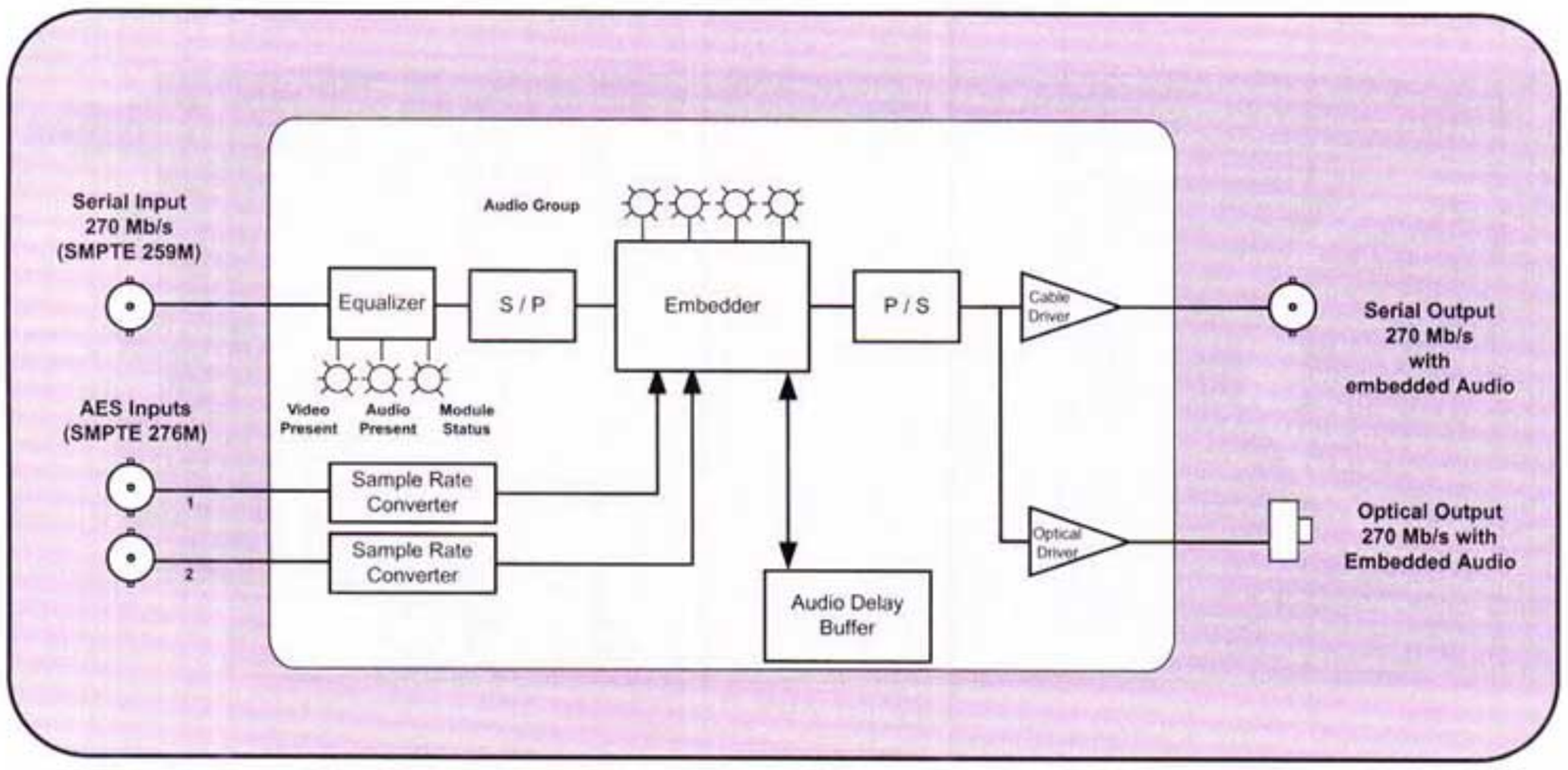
Audio

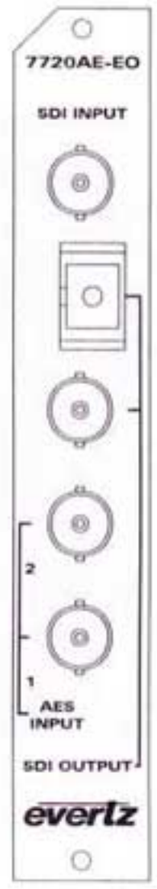
- 2 SMPTE 276M single ended AES

Outputs:

- 1 SMPTE 259M SDI reclocked output with SMPTE 272M embedded audio
- 1 reclocked fiber output with SMPTE 272M embedded audio at 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)

7720AE-EO Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M-C 525 and 625 component
Connector:	BNC, IEC 169-8
Equalization:	Automatic to 300m @ 270 Mb/s Belden 8281 (or equivalent)
Return Loss:	> 15 dB up to 270 Mb/s

Serial Video Output With Embedded Audio

Number of Outputs:	1
Standard:	Same as input
Connector:	BNC per IEC 169-8
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
Standard:	SMPTE 276M, single ended AES
Signal Level:	1V p-p ±0.1V
Connector:	BNC per IEC 169-8
Sampling Rate:	48kHz
Impedance:	75Ω unbalanced
Resolution:	20-bits

Optical Output:

Number of Outputs:	1
Connector:	SC/PC, ST/PC, FC/PC female housing
Return Loss:	> 14dB
Rise and Fall Time:	400-700ps
Jitter:	< 0.2 UI
Nominal Wavelength:	1310nm, 1550nm
CWDM Wavelengths:	1270nm to 1610nm (See Ordering Info)
Output Power:	
1310nm FP:	-7.5 dBm ± 1 dBm
1550Dnm FB:	0 dBm ± 1 dBm
CWDM DFB:	0 dBm ± 1dBm

System Performance:

Embedding Latency:	1.3 to 3 msec

Physical:

Number of Slots:	1

Electrical:

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

Ordering Information: *SDI AES Audio Embedder & Fiber Transmitter*

7720AE-EO13	1310nm, FP, Laser
7720AE-EO15	1550nm, DFB, Laser

For CWDM Applications:

7720AE-EO27	1270nm, CWDM Laser
7720AE-EO29	1290nm, CWDM Laser
7720AE-EO31	1310nm, CWDM Laser
7720AE-EO33	1330nm, CWDM Laser
7720AE-EO35	1350nm, CWDM Laser
7720AE-EO37	1370nm, CWDM Laser
7720AE-EO43	1430nm, CWDM Laser
7720AE-EO45	1450nm, CWDM Laser
7720AE-EO47	1470nm, CWDM Laser
7720AE-EO49	1490nm, CWDM Laser
7720AE-EO51	1510nm, CWDM Laser
7720AE-EO53	1530nm, CWDM Laser
7720AE-EO55	1550nm, CWDM Laser
7720AE-EO57	1570nm, CWDM Laser
7720AE-EO59	1590nm, CWDM Laser
7720AE-EO61	1610nm, CWDM 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:

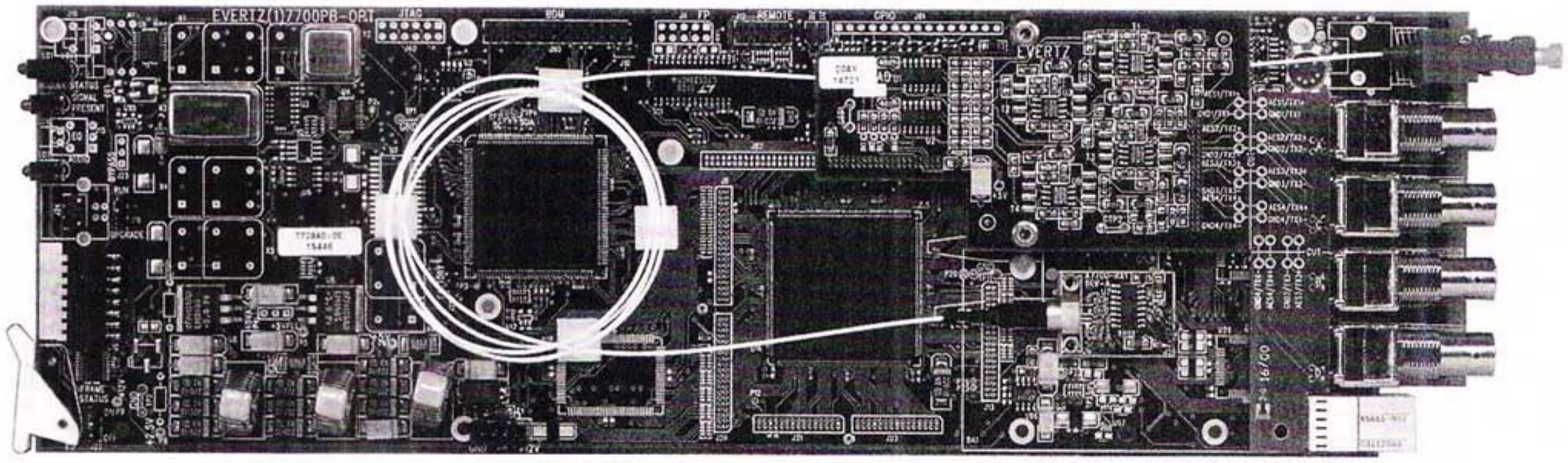
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

SDI AES Audio De-embedder & Fiber Receiver

1d

Model 7720AD-OE

Dolby E PARTNER



The 7720AD-OE Audio De-Embedder extracts embedded audio as specified by SMPTE 272M from a 270Mb/s fiber optic input signal.

SMPTE 272M allows for up to four groups (4 channels/group) to be embedded within a serial digital signal. The 7720AD-OE can de-embed one audio group onto two single ended AES outputs. The 7720AD-OE is Dolby E compliant.

Features

Front Panel LED's:

- Video signal presence
- Module Status
- Audio Presence - Audio Group Indicator

Controls:

- Audio group selection via card edge DIP switches
- Audio channel swapping selection via card edge DIP switches

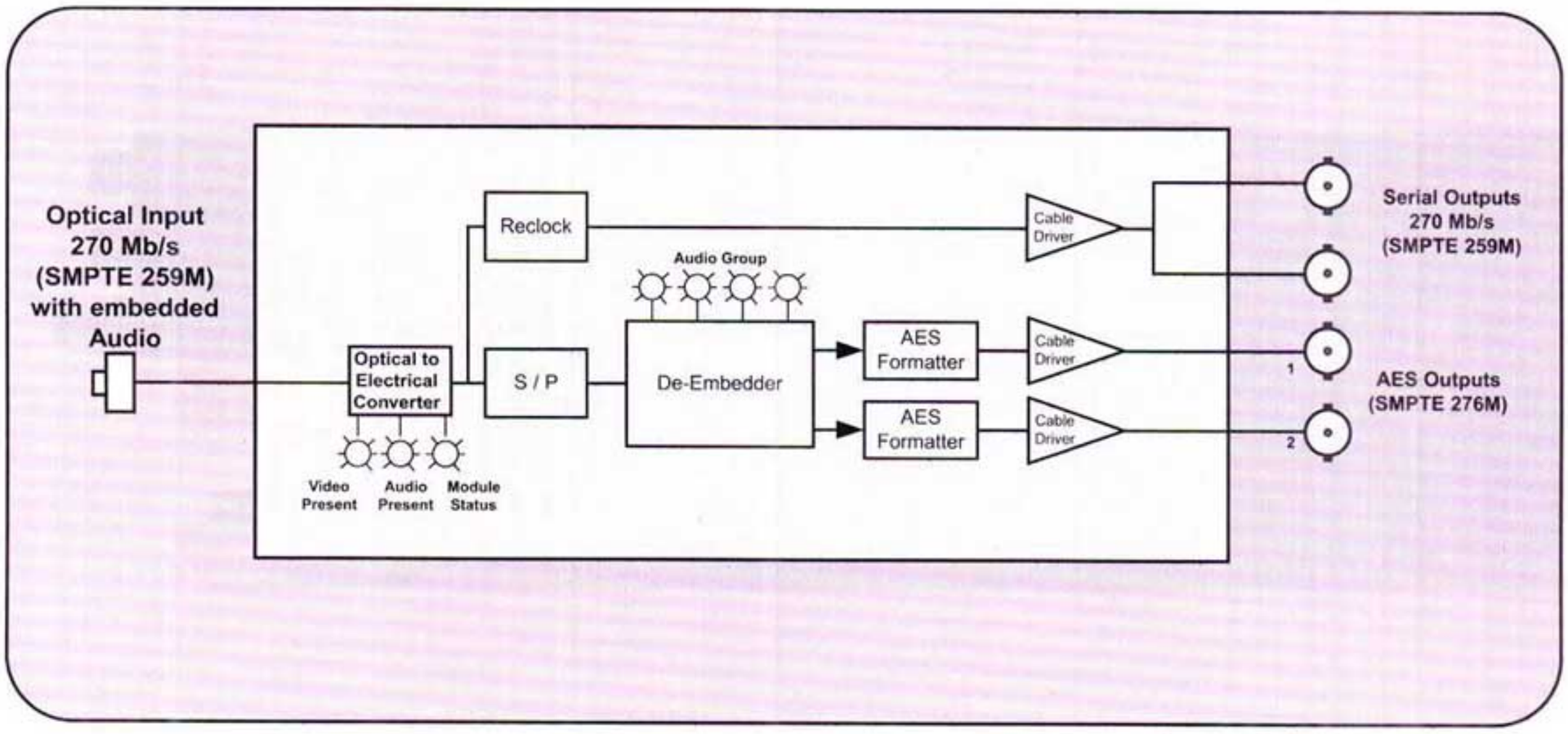
Input:

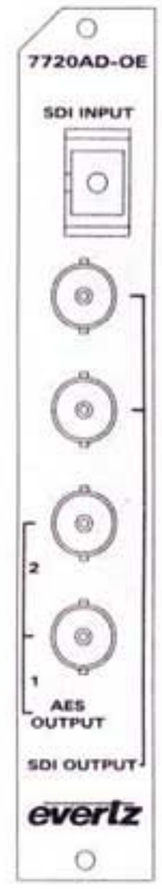
- SMPTE 259M-C (270 Mb/s) SDI Video on fiber optic input

Output:

- 2 Serial SDI reclocked outputs
- 2 Single ended AES outputs

7720AD-OE Block Diagram





Specifications

Optical Input:

Number of Inputs:	1
Connector:	SC/PC, ST/PC, FC/PC Female Housing
Operating Wavelength:	1270nm to 1610nm
Maximum Input Power:	0dBm
Optical Sensitivity:	-30dBm

Reclocked Serial Video Output:

Number of Outputs:	2
Standard:	SMPTE 259M-C
Connector:	BNC per IEC 169-8
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

AES Audio Output:

Number of Outputs:	2
Standard:	SMPTE 276M, single ended AES
Connector:	BNC per IEC 169-8
Sampling Rate:	48kHz
Impedance:	75Ω unbalanced
Resolution:	20-bit

Input to Output Processing Delay:

Optical Input to AES:	600 µSec

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:

7720AD-OE:	SDI AES Audio De-embedder & 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

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

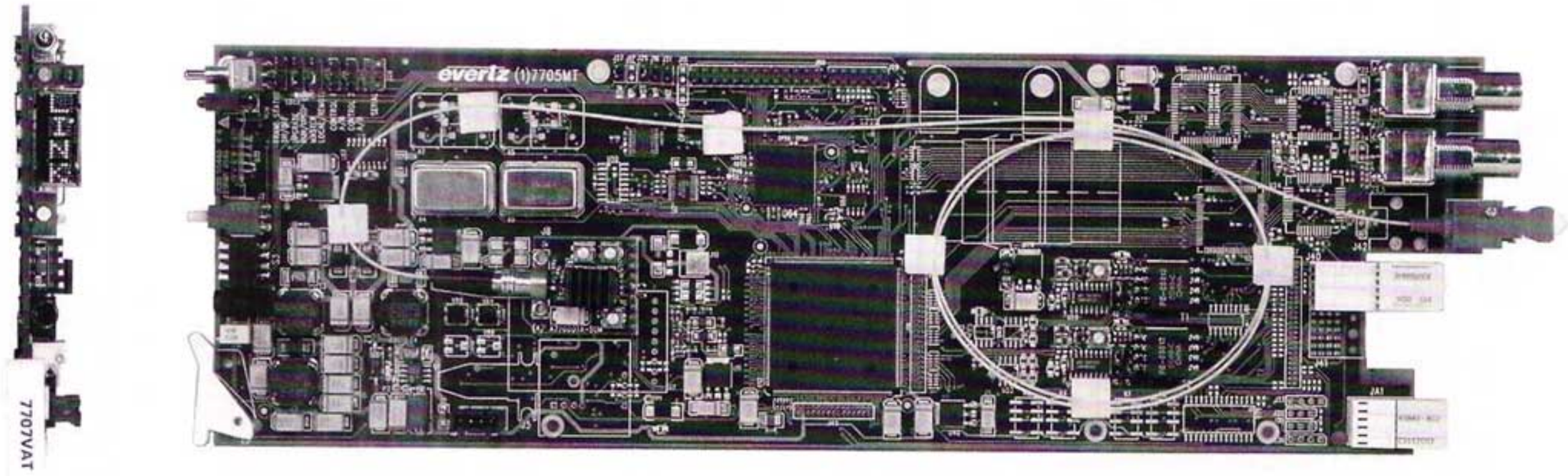
SDI with 2 AES Audio Fiber Transmitter

1d

Models 7707VAT

Dolby E PARTNER





The 7707VAT is a VistaLINK™ - enabled, fiber transmitter for SDI video and AES audio. This single card module accepts one SDI video plus two AES audio signals, combines them using Time Domain Multiplex (TDM) technology and transmits them over a single fiber. The companion 7707VAR SDI Video and AES Audio Fiber Receiver demultiplexes the signals and converts them back to separate SDI video and AES audio feeds.

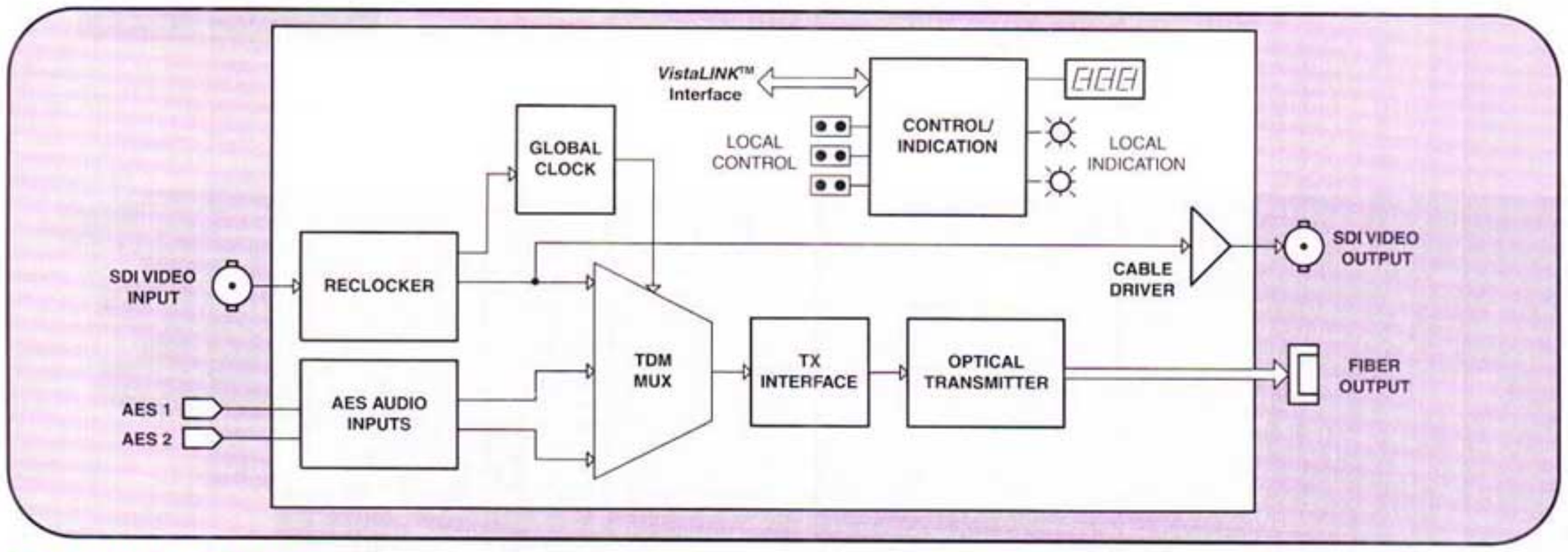
The 7707VAT and companion 7707VAR will transparently pass incoming SDI video feeds with embedded AES audio or any other data in the horizontal or vertical ancillary data space. Minimal audio to video latency over the transport interface is also provided.

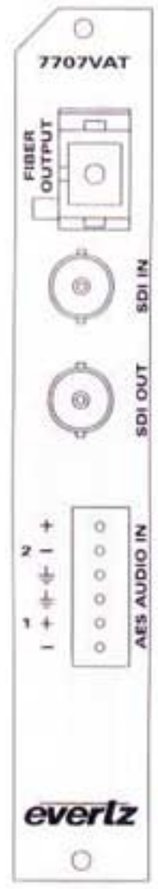
The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm, CWDM and DWDM transmission schemes. The 7707VAT occupies one card slot and can be housed in the 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

Features

- Single card multiplexer for SDI video and 2 AES audio
- 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
- AES audio inputs can be synchronous or asynchronous to each other and/or to input video
- Dolby E compatible
- 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
- Comprehensive signal and status monitoring via four-digit card-edge display, or remotely through SNMP and VistaLINK™ - enabled capability
- Local display of input SDI signal strength, video format, and EDH errors
- Automatic coaxial input equalization up to 300m at 270Mb/s (Belden 1694)
- 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.692 compliant) also available

7707VAT Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M-C, 525 or 625 line component, SMPTE 305M, (SDTi)
Connector:	1 BNC input per IEC 169-8
Equalization:	Automatic to 300m @ 270 Mb/s with Belden 1694 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 169-8
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:

Number of Inputs:	2 (Jumper selectable for balanced or unbalanced input)
Standard:	
Unbalanced AES:	SMPTE 276M
Balanced AES:	AES3-1992
Connector:	6 pin removable terminal block
Signal Level:	
Unbalanced:	1V p-p ±0.1V
Balanced:	2 to 7Vp-p with level jumper set to HI, 1 to 2Vp-p with level jumper set to LO
Equalization:	500m @ 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

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

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)	-7.5dBm ± 1dBm
1310nm FP(M version)	0dBm ± 1dBm
1550nm & CWDM DFB	0dBm ± 1dBm
DWDM DFB	7dBm ± 1dBm
Fiber Size:	9 µm core / 125 µm overall

Electrical:

Voltage:	+12VDC
Power:	10 Watts (Non-DWDM) 13 Watts (DWDM)
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Ordering Information:

SDI with 2 AES Audio Fiber Transmitter, VistaLINK™ Monitoring

7707VAT13	1310nm, FP Laser (-7.5 dBm launch power)
7707VAT13M	1310nm, FP Laser (0 dBm launch power)
7707VAT15	1550nm, DFB Laser

For CWDM Applications:

7707VAT27	1270nm, CWDM DFB Laser
7707VAT29	1290nm, CWDM DFB Laser
7707VAT31	1310nm, CWDM DFB Laser
7707VAT33	1330nm, CWDM DFB Laser
7707VAT35	1350nm, CWDM DFB Laser
7707VAT37	1370nm, CWDM DFB Laser
7707VAT43	1430nm, CWDM DFB Laser
7707VAT45	1450nm, CWDM DFB Laser
7707VAT47	1470nm, CWDM DFB Laser
7707VAT49	1490nm, CWDM DFB Laser
7707VAT51	1510nm, CWDM DFB Laser
7707VAT53	1530nm, CWDM DFB Laser
7707VAT55	1550nm, CWDM DFB Laser
7707VAT57	1570nm, CWDM DFB Laser
7707VAT59	1590nm, CWDM DFB Laser
7707VAT61	1610nm, CWDM DFB Laser

For DWDM Application: Contact Factory

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

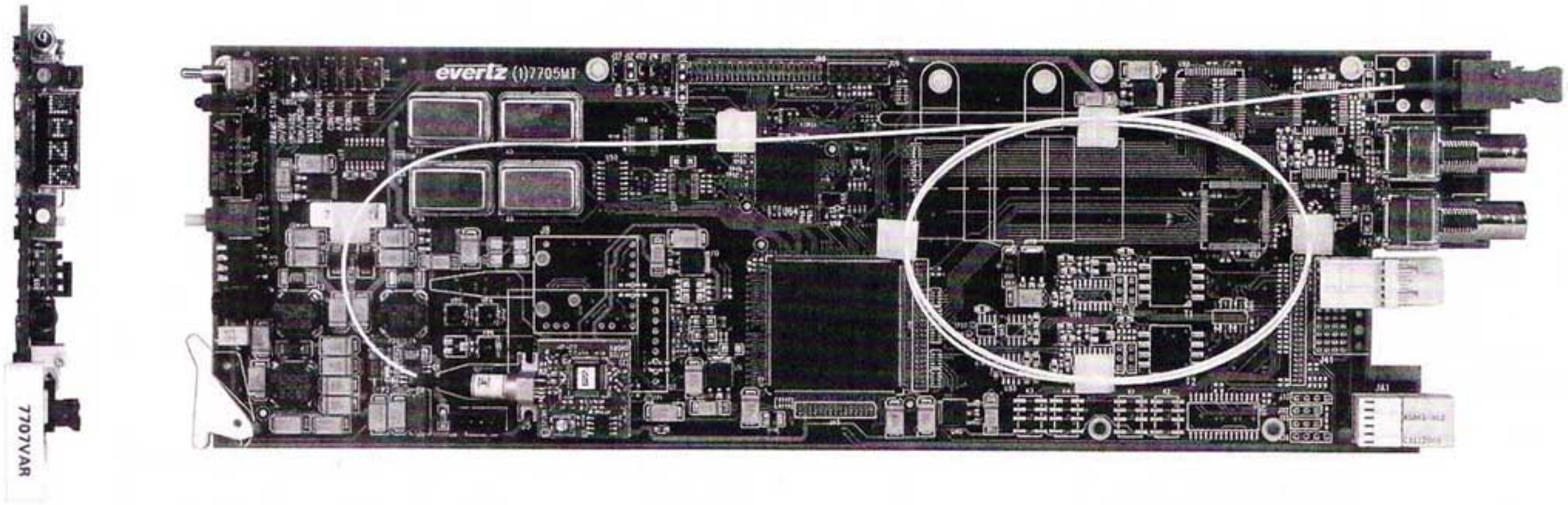
SDI with 2 AES Audio Fiber Receiver

1d

Models 7707VAR

Dolby E PARTNER





The 7707VAR is a VistaLINK™ - enabled fiber optic receiver for SDI Video and AES Audio. This single card module demultiplexes one SDI Video plus two AES Audio signals that have been Time Domain Multiplexed (TDM) by the companion 7707VAT SDI Video and AES Audio Fiber Transmitter module. Evertz's 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.

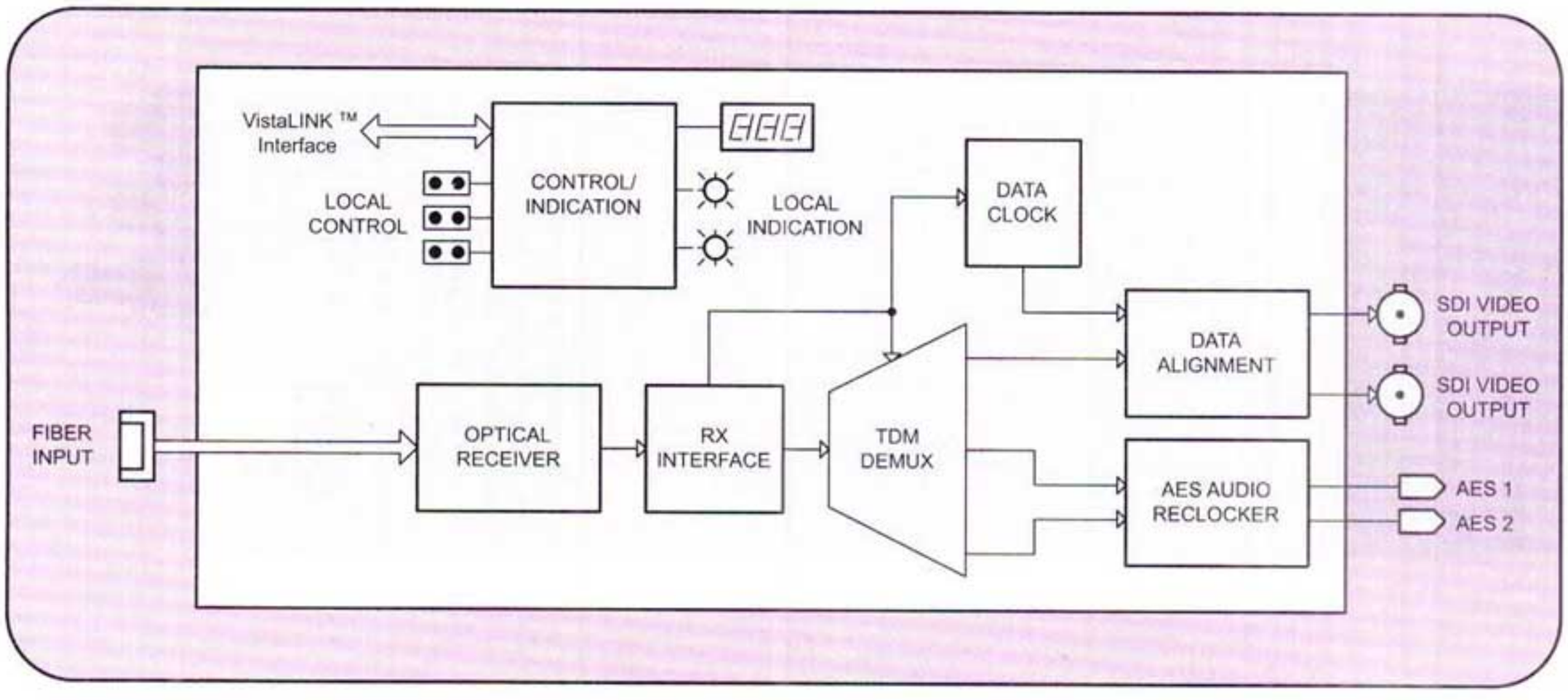
The 7707VAR and companion 7707VAT will transparently pass incoming SDI video feeds with embedded AES audio or any other data in the horizontal or vertical ancillary data space. Minimal Audio to Video latency over the transport interface is also achieved.

The 7707VAR 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

- Single card demultiplexer for SDI Video and two AES audio signals
- Supports 270Mbs 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
- 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 fiber optic input signal or AES feed to upstream 7707VAT multiplexer
- SDI Video regeneration for jitter reduction
- Output Video "Black" or "Blue" (selectable) on loss of video or fiber optic input signals
- Dolby E compatible with SoftSwitch™ Disabled
- Comprehensive signal and status monitoring via four-digit card-edge display, or remotely through SNMP and VistaLINK™ enabled capability
- 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

7707VAR Block Diagram





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
Connector:	BNC per IEC 169-8
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 (jumper selectable for balanced or unbalanced)
Standard:	
Unbalanced AES:	SMPTE 276M
Balanced AES:	AES3-1992
Connector:	6 pin terminal strip
Signal Level:	
Unbalanced:	1 Vp-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: (7707VAT + 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

Ordering Information:

7707VAR	SDI with 2 AES 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

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

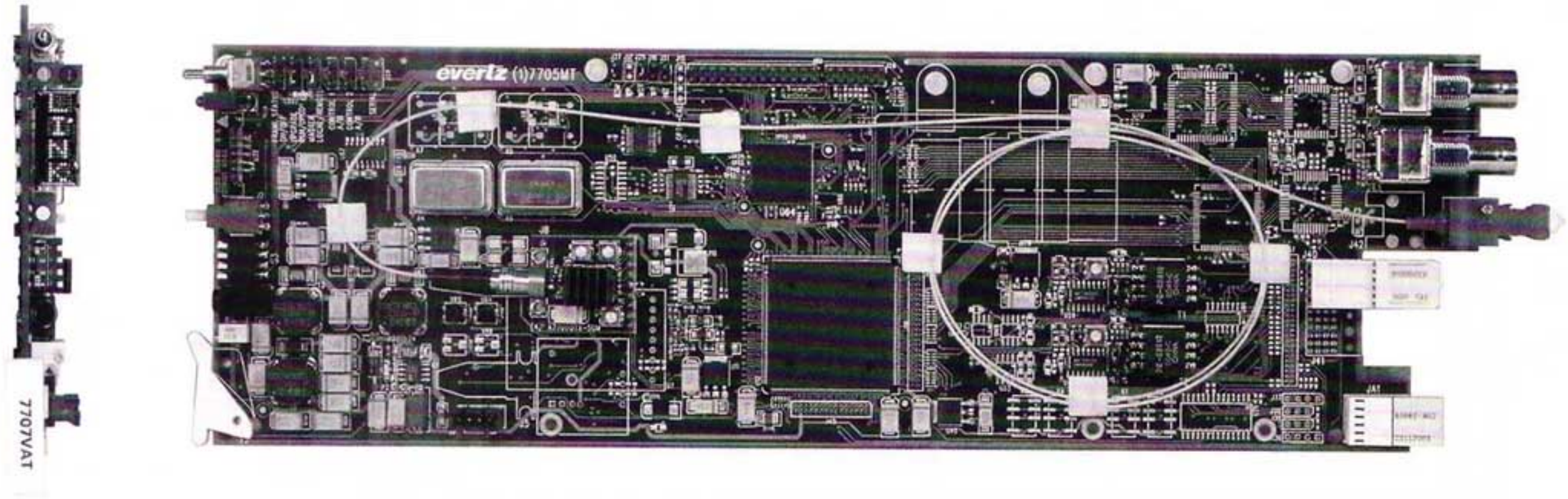
Dual SDI with 2 AES Audio Fiber Transmitter

1d

Models 7707VAT-2

Dolby E PARTNER





The 7707VAT-2 is a VistaLINK™ - enabled, fiber transmitter for SDI video and AES audio. This single card module accepts two SDI video plus two AES audio signals, combines them using Time Domain Multiplex (TDM) technology and transmits them over a single fiber. The companion 7707VAR-2 Dual SDI with 2 AES Audio Fiber Receiver demultiplexes the signals and converts them back to separate SDI video and AES audio feeds.

The 7707VAT-2 and companion 7707VAR-2 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 provided.

The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm, CWDM and DWDM transmission schemes. The 7707VAT-2 occupies one card slot and can be housed in the 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

- Single card multiplexer for 2 SDI video and 2 AES audio
- Supports 525 or 625 line 4:2:2 component SDI (270Mb/s) and SDTi (SMPTE 305M) video signals
- Supports 32, 44.1, 48 kHz AES audio inputs
- AES audio inputs can be synchronous or asynchronous to each other and/or to input video
- Dolby E compatible
- Signal transport over fiber uninterrupted by loss of SDI or AES audio input feeds
- Low audio to video latency over transport interface
- Comprehensive signal and status monitoring via four-digit card-edge display, or remotely through SNMP and VistaLINK™ - enabled capability
- Local display of input SDI signal strength, video format, and EDH errors
- Automatic coaxial input equalization up to 300m at 270Mb/s (Belden 1694)
- 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.692 compliant) also available

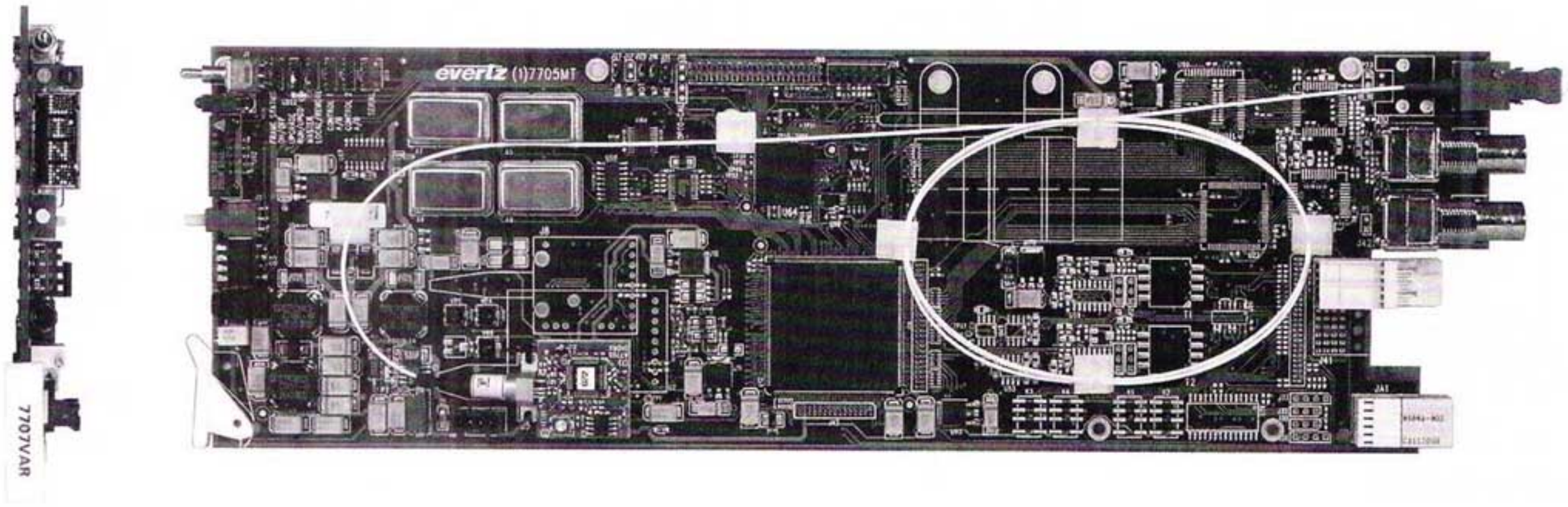
Dual SDI with 2 AES Audio Fiber Receiver

1d

Models 7707VAR-2

Dolby E PARTNER





The 7707VAR-2 is a VistaLINK™ - enabled fiber optic receiver for SDI Video and AES Audio. This single card module demultiplexes two SDI video plus two AES audio signals that have been Time Domain Multiplexed (TDM) by the companion 7707VAT-2 Dual SDI with 2 AES Audio Fiber Transmitter module.

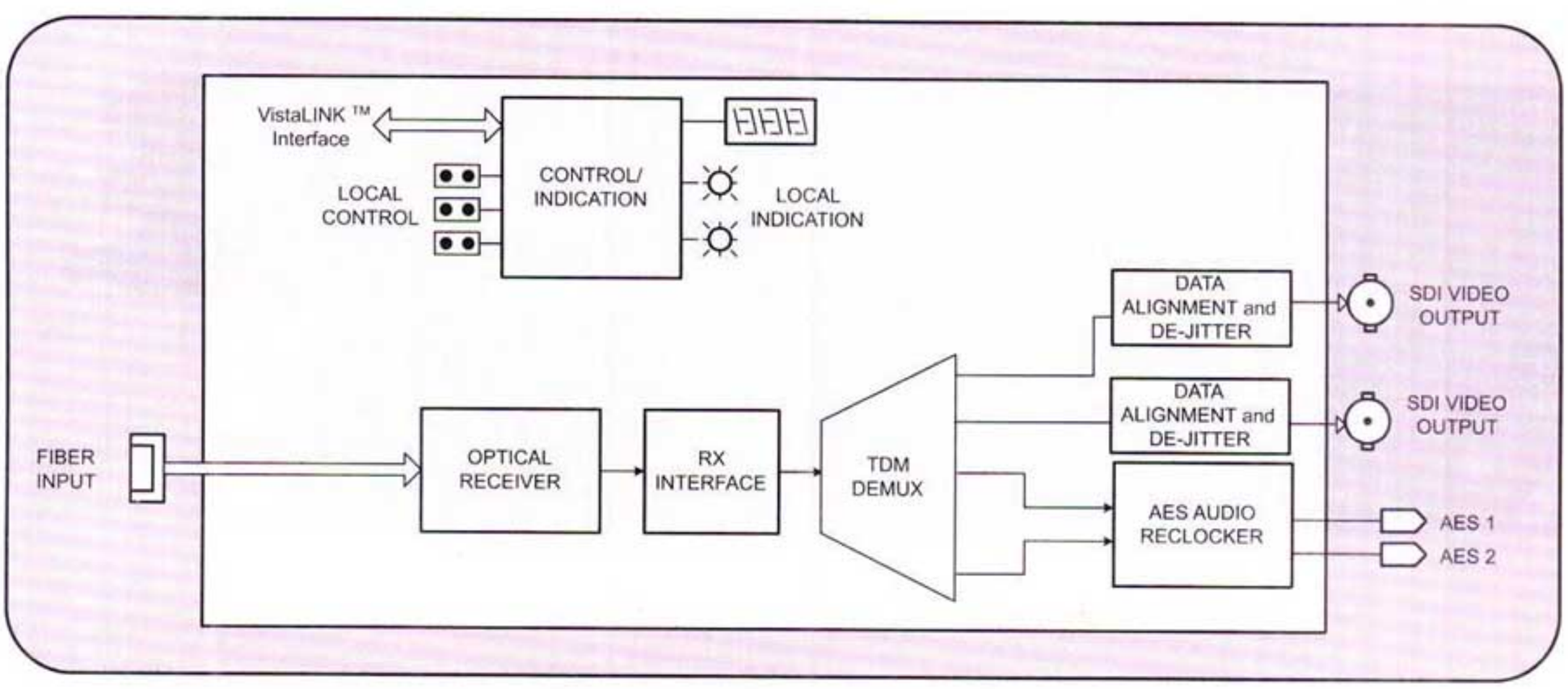
The 7707VAR-2 and companion 7707VAT-2 will transparently pass incoming SDI video feeds with embedded AES audio or any other data in the horizontal or vertical ancillary data space. Minimal Audio to Video latency over the transport interface is also achieved.

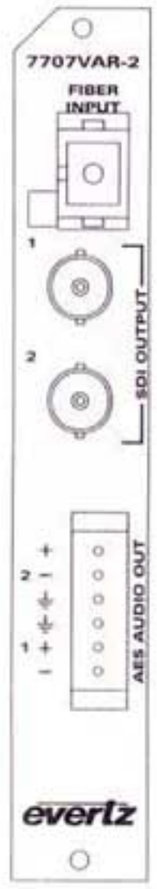
The 7707VAR-2 occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame, which will hold up to 15 modules, or a standalone enclosure which will hold 1 module.

Features

- Single card demultiplexer for two SDI video and two AES audio signals
- Supports 525 or 625 line 4:2:2 component SDI (270Mb/s) and SDTi (SMPTE 305M) video signals
- Supports 32, 44.1, 48 kHz AES audio inputs
- Low Audio to Video latency
- Output AES "Mute" on loss of fiber optic input signal or AES feed to upstream 7707VAT multiplexer
- SDI Video regeneration for jitter reduction
- Output Video "Black" or "Blue" (selectable) on loss of video or fiber optic input signals
- Dolby E compatible
- Comprehensive signal and status monitoring via four-digit card-edge display, or remotely through SNMP and VistaLINK™ enabled capability
- Local display of optical signal strength, video and audio presence, video and AES formats and 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

7707VAR-2 Block Diagram





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
Connector:	BNC per IEC 169-8
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:	< 0.2UI

AES Audio Outputs:

Number of Outputs:	2 regenerated (Jumper selectable for balanced or unbalanced)
Standard:	
Unbalanced AES:	SMPTE 276M
Balanced AES:	AES3-1992
Connector:	6 pin terminal strip
Signal Level:	
Unbalanced:	1 Vp-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: (7707VAT-2 + 7707VAR-2)

Video Input To Output Delay:	< 1.5 µs
Audio to Video delay:	< 1µs

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-2	Dual SDI with 2 AES 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:

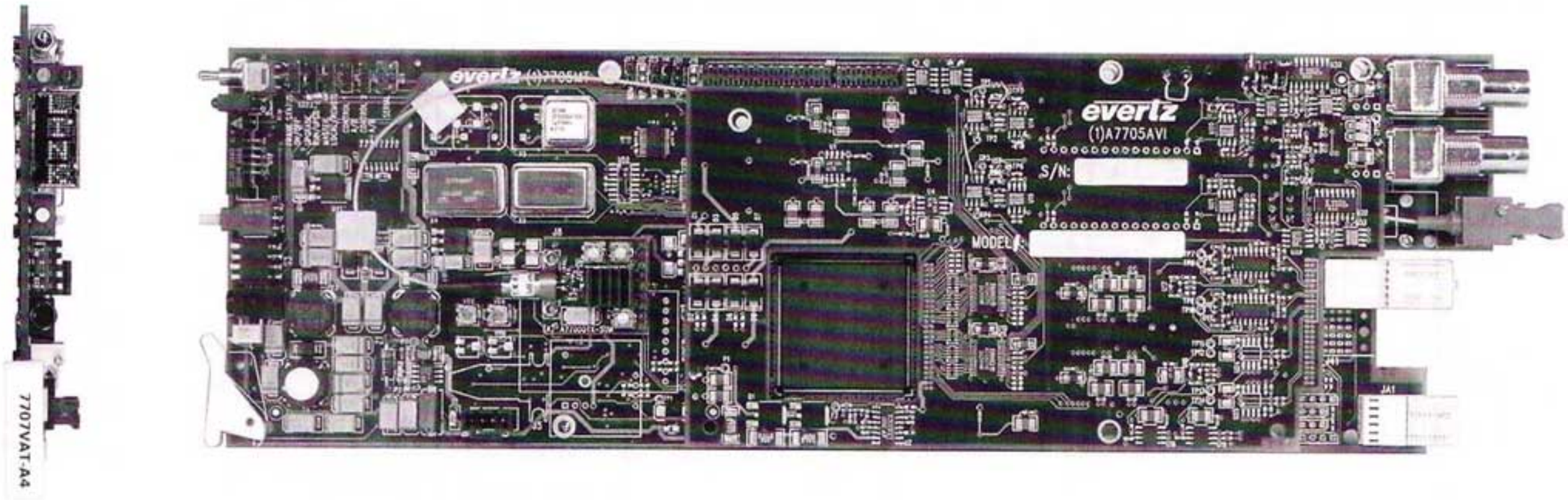
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

SDI with 4 Analog Audio Fiber Transmitter

1d

Models 7707VAT-A4





The 7707VAT-A4 is a VistaLINK™ - enabled, fiber transmitter for SDI video and analog audio. This single card module accepts one SDI video plus four analog audio signals, combines them using Time Domain Multiplexing (TDM) technology and transmits them over a single fiber. The companion 7707VAR-A4 SDI and Analog Audio Fiber Receiver demultiplexes the signals and converts them back to separate SDI video and Analog audio feeds.

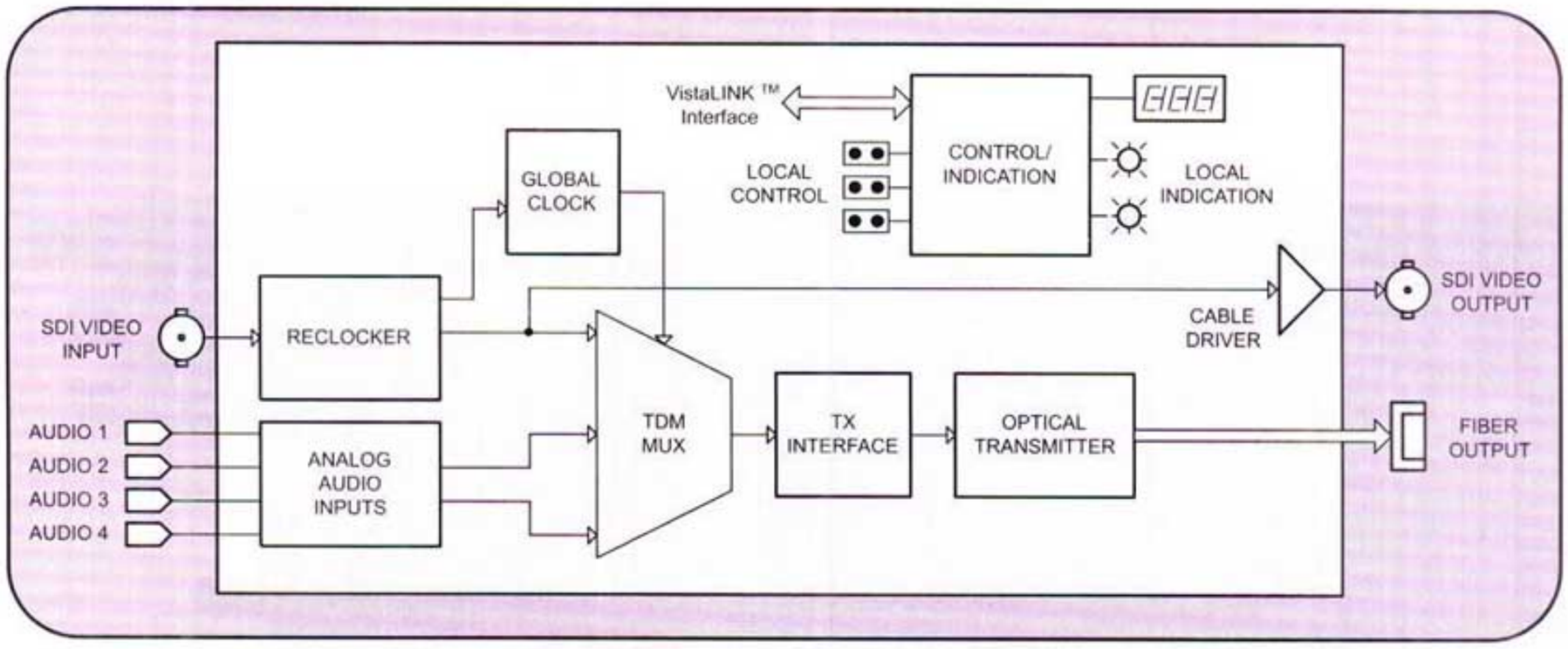
The 7707VAT-A4 and companion 7707VAR-A4 will transparently pass incoming SDI video feeds with embedded AES audio or any other data in the horizontal or vertical ancillary data space. Minimal audio to video latency over the transport interface is also provided.

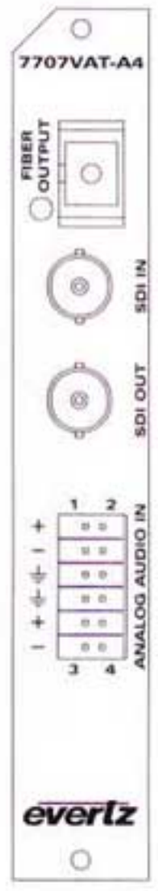
The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm, CWDM or DWDM transmission schemes. The 7707VAT-A4 occupies one card slot and can be housed in a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules, or a standalone enclosure which will hold 1 module.

Features

- Single card TDM Multiplexer for SDI Video and 4 Analog audio signals
- Supports 525 or 625 line 4:2:2 component SDI signals
- Broadcast quality analog audio performance
- 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
- Comprehensive signal and status monitoring via four-digit card-edge display, or remotely through SNMP and VistaLINK™ enabled capability
- Local display of input SDI signal strength, video format, and EDH errors
- Automatic coaxial input equalization to 300m 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.692 compliant) also available

7707VAT-A4 Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M-C
Connector:	1 BNC input per IEC 169-8
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 reclocked
Standard:	SMPTE 259M-C
Connector:	BNC per IEC 169-8
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 (>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

System Performance: (7707VAT-A4 + 7707VAR-A4)

Video Input To Output Delay:	< 2µs
Audio Input to Output delay:	<1.9ms

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)	-7.5dBm ± 1dBm
1310nm FP(M version)	0dBm ± 1dBm
1550nm and CWDM DFB	0dBm ± 1dBm
DWDM DFB	7dBm ± 1dBm

Electrical:

Voltage:	+12VDC
Power:	11 Watts(Non-DWDM) 13 Watts(DWDM)
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Ordering Information:	**SDI with 4 Analog Audio Fiber Transmitter, VistaLink™ Monitoring**
7707VAT13-A4	1310nm, FP Laser (-7.5 dBm launch power)
7707VAT13M-A4	1310nm, FP Laser (0 dBm launch power)
7707VAT15-A4	1550nm, DFB Laser

For CWDM Applications:

7707VAT27-A4	1270nm, CWDM DFB Laser
7707VAT29-A4	1290nm, CWDM DFB Laser
7707VAT31-A4	1310nm, CWDM DFB Laser
7707VAT33-A4	1330nm, CWDM DFB Laser
7707VAT35-A4	1350nm, CWDM DFB Laser
7707VAT37-A4	1370nm, CWDM DFB Laser
7707VAT43-A4	1430nm, CWDM DFB Laser
7707VAT45-A4	1450nm, CWDM DFB Laser
7707VAT47-A4	1470nm, CWDM DFB Laser
7707VAT49-A4	1490nm, CWDM DFB Laser
7707VAT51-A4	1510nm, CWDM DFB Laser
7707VAT53-A4	1530nm, CWDM DFB Laser
7707VAT55-A4	1550nm, CWDM DFB Laser
7707VAT57-A4	1570nm, CWDM DFB Laser
7707VAT59-A4	1590nm, CWDM DFB Laser
7707VAT61-A4	1610nm, CWDM DFB Laser

For DWDM Applications: Contact Factory

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

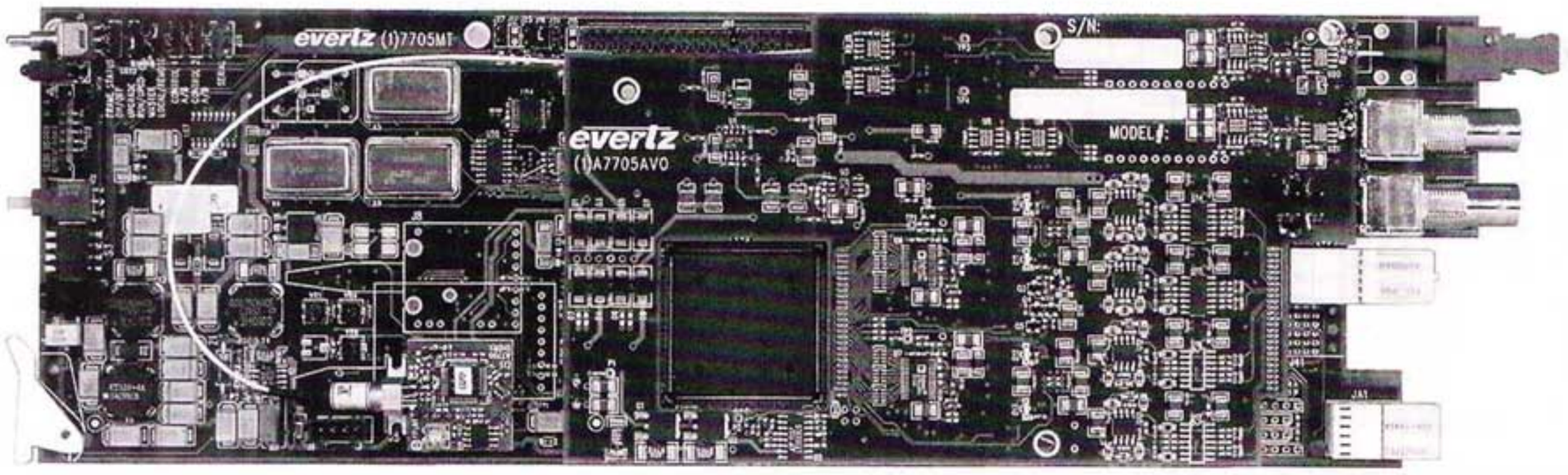
SDI with 4 Analog Audio Fiber Receiver

1d

Model 7707VAR-A4







The 7707VAR-A4 is a VistaLINK™ - enabled fiber optic receiver for SDI video and analog audio. This single card module receives one SDI video plus four analog audio signals that have been Time Domain Multiplexed (TDM) by the companion 7707VAT-A4 SDI and Analog Audio Fiber Transmitter module.

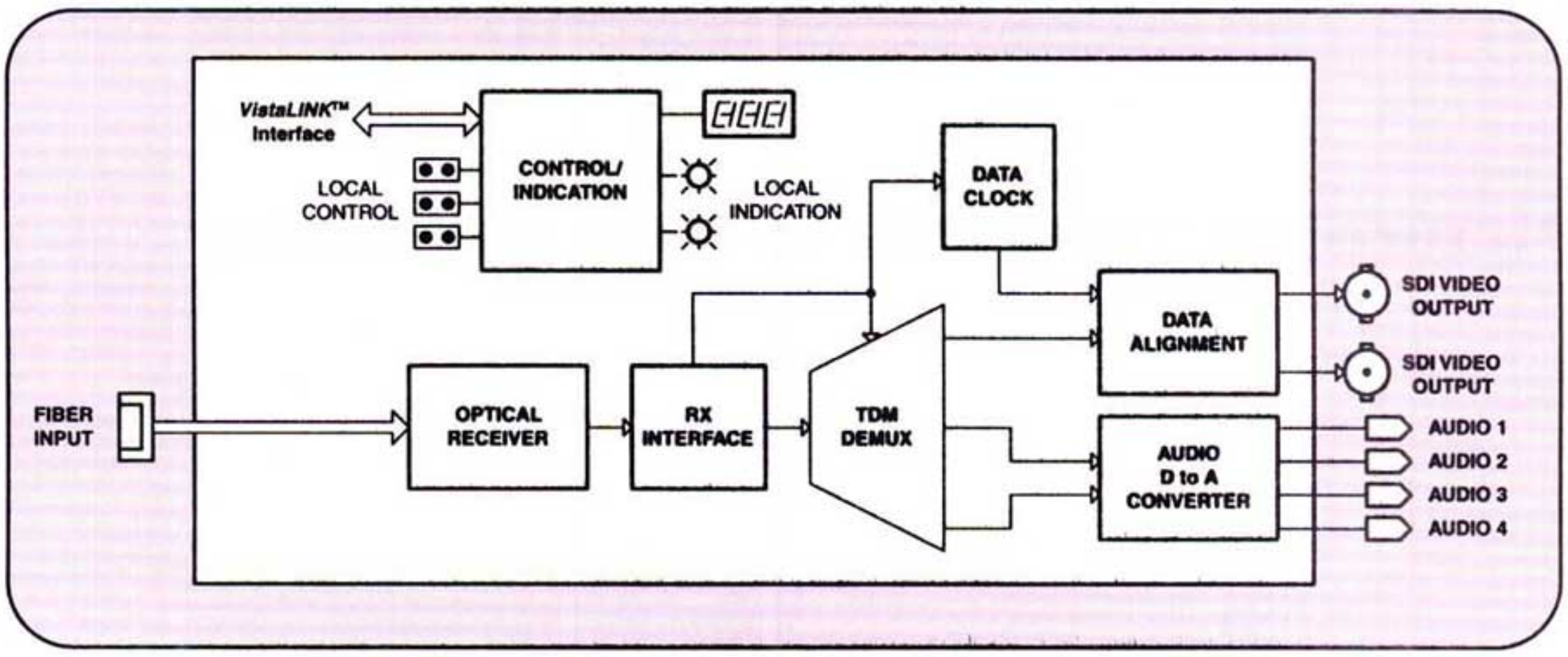
The 7707VAR-A4 and companion 7707VAT-A4 will transparently pass incoming SDI video feeds with embedded AES audio or any other data in the horizontal or vertical ancillary data space. Minimal Audio to Video latency over the transport interface is also achieved.

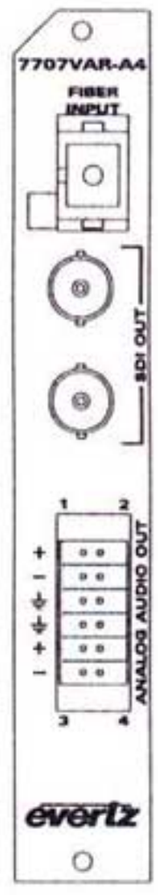
The 7707VAR-A4 occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules, or a standalone enclosure which will hold 1 module.

Features

- Single card demultiplexer for SDI Video and four Analog audio signals
- Supports 525 or 625 line 4:2:2 component SDI signals
- Broadcast quality analog audio performance
- Low Audio to Video latency
- Output Video "Black" or "Blue" (selectable) on loss of video or fiber optic input signals
- Built-in jitter attenuation
- Comprehensive signal and status monitoring via four-digit card-edge display, or through SNMP and VistaLINK™ - enabled capability
- 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
- Supports single mode and multi mode fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range

7707VAR-A4 Block Diagram





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 169-8
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 Outputs:

Number of Outputs:	4
Type:	Balanced analog audio
Connector:	12 pin removal terminal block
Output impedance:	< 100 Ω
Freq. Response:	+/- 0.1dB, 20Hz to 20 kHz
THD 20Hz-20Khz:	< 0.005%
Channel Phase Diff.	+/- 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:	< 2µs
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

Quad SDI Fiber Transmitter

1d

Models 7707VT-4



Picture not available at time of printing

The 7707VT-4 is a VistaLINK™ - enabled, fiber transmitter for four SDI or DVB-ASI video signals. This single card module combines up to four SDI or DVB-ASI signals using Time Domain Multiplex (TDM) technology and transmits them over a single fiber. The companion 7707VR-4 Quad SDI Fiber Receiver demultiplexes the signals and converts them back to separate SDI video feeds.

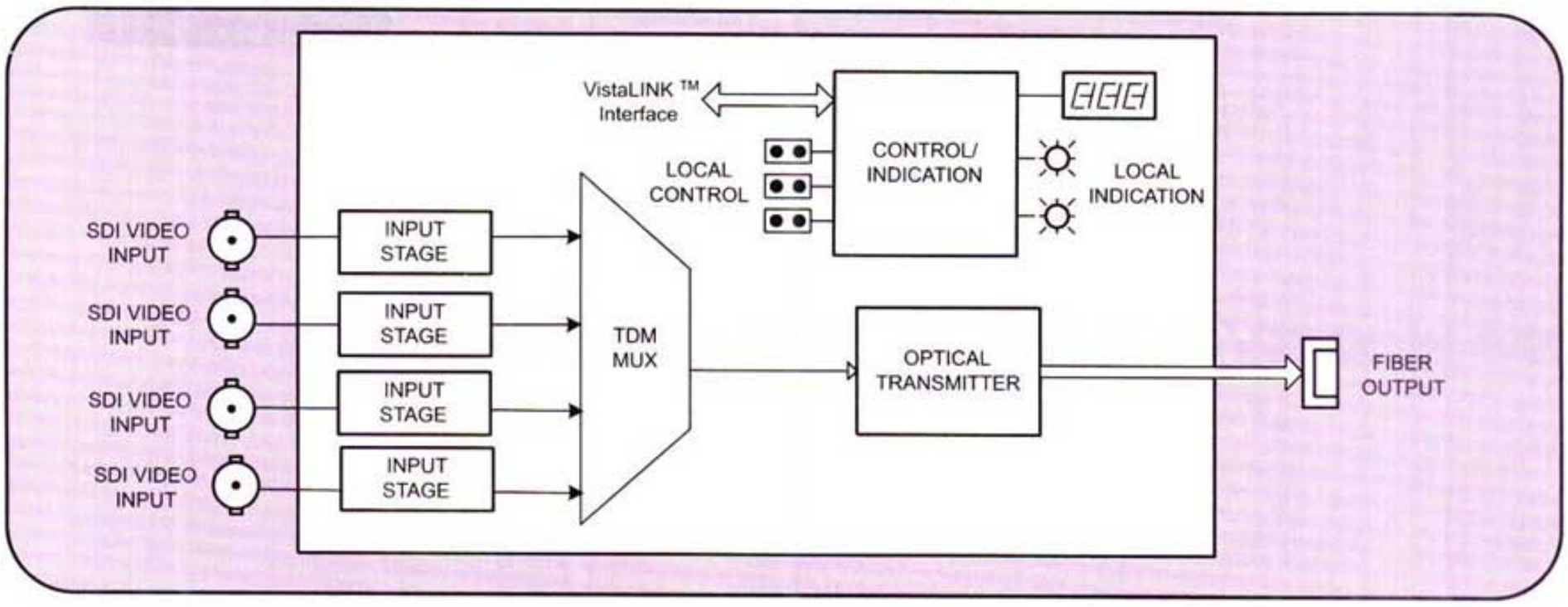
The 7707VT-4 and companion 7707VR-4 will transparently pass incoming SDI video feeds with embedded AES audio or any other data in the horizontal or vertical ancillary data space. Monitoring and control of card status and parameters is provided locally at the card edge or remotely via VistaLINK™.

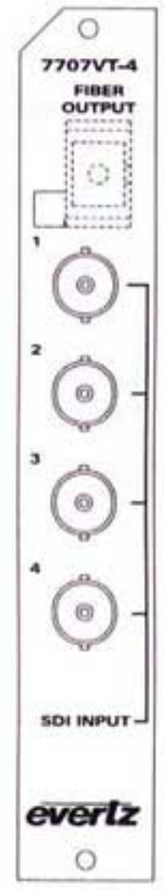
The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm, CWDM and DWDM transmission schemes. The 7707VT-4 occupies one card slot and can be housed in the 1RU frame which will hold up to 3 modules or a 3RU frame which will hold up to 15 modules.

Features

- Single card multiplexer for four synchronous or asynchronous 270Mb/s SDI or DVB-ASI video signals
- Signal transport over fiber uninterrupted by loss of any SDI or DVB-ASI input feed
- Transparently passes embedded AES or any other data in the horizontal or vertical ancillary data space
- Comprehensive signal and status monitoring via four-digit card-edge display
- VistaLINK™ - enabled for remote monitoring and control when installed in a 7700FR-C frame with 7700FC VistaLINK™ Frame Controller
- 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.692 compliant) also available
- SC/PC, ST/PC, FC/PC connector options

7707VT-4 Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M-C, DVB-ASI
Number of Inputs:	4 independent SDI or DVB-ASI 270Mb/s signals
Connector:	4 BNC input per IEC 169-8
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

Wavelengths:

Standard:	1310nm, 1550nm (nominal)
CWDM:	1270nm to 1610nm (See Ordering Information)
DWDM:	C-Band/L-Band (ITU-T G.692 compliant)
Output Power:	
1310nm FP(Standard)	-7.5dBm ± 1dBm
1550nm & CWDM DFB	0dBm ± 1dBm
DWDM DFB	7dBm ± 1dBm

Electrical:

Voltage:	+12VDC
Power:	10 Watts (Non DWDM) 13 Watts (DWDM)
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Ordering Information: *Quad SDI Fiber Transmitter*

7707VT13-4	1310nm, FP Laser
7707VT15-4	1550nm, DFB Laser

For CWDM Applications:

7707VT27-4	1270nm, CWDM DFB Laser
7707VT29-4	1290nm, CWDM DFB Laser
7707VT31-4	1310nm, CWDM DFB Laser
7707VT33-4	1330nm, CWDM DFB Laser
7707VT35-4	1350nm, CWDM DFB Laser
7707VT37-4	1370nm, CWDM DFB Laser
7707VT43-4	1430nm, CWDM DFB Laser
7707VT45-4	1450nm, CWDM DFB Laser
7707VT47-4	1470nm, CWDM DFB Laser
7707VT49-4	1490nm, CWDM DFB Laser
7707VT51-4	1510nm, CWDM DFB Laser
7707VT53-4	1530nm, CWDM DFB Laser
7707VT55-4	1550nm, CWDM DFB Laser
7707VT57-4	1570nm, CWDM DFB Laser
7707VT59-4	1590nm, CWDM DFB Laser
7707VT61-4	1610nm, CWDM DFB Laser

For DWDM Application: Contact Factory

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 SDI Fiber Receiver

1d

Models 7707VR-4



Picture not available at time of printing

The 7707VR-4 is a VistaLINK™ -enabled **fiber optic receiver for four SDI or DVB-ASI video signals.** This single card module demultiplexes up to four SDI or DVB-ASI **video signals that have been Time Domain Multiplexed (TDM) by the companion** 7707VT-4 Quad SDI Fiber Transmitter **module.**

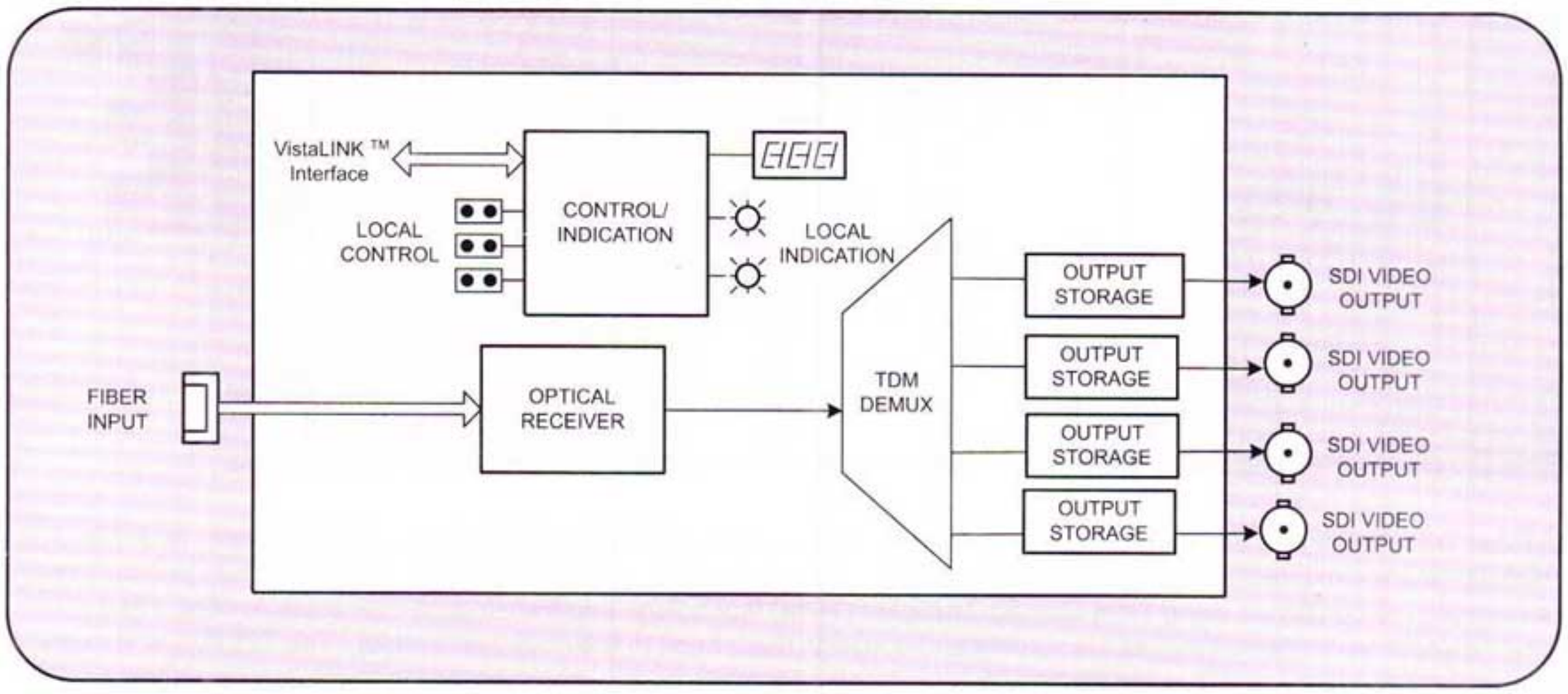
The 7707VR-4 and companion 7707VT-4 **will transparently pass embedded AES audio or any other data in the horizontal or** vertical ancillary data space. **Monitoring and control of card status and parameters is provided locally at the card edge or** remotely via VistaLINK™.

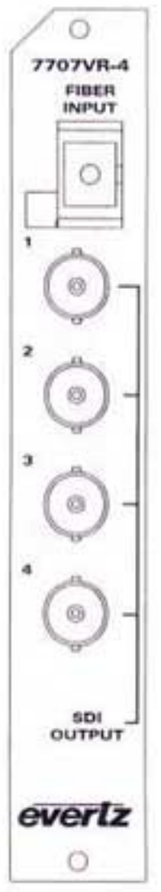
The 7707VR-4 occupies one card slot **and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame,** which will hold up to 15 modules or a **standalone enclosure which will hold up to 1 module.**

Features

- Single card demultiplexer for four synchronous **or asynchronous 270Mb/s SDI or DVB-ASI video signals**
- SDI Video regeneration on outputs
- Signal transport over fiber uninterrupted by **loss of any SDI or DVB-ASI input feed**
- Transparently passes embedded AES **or any other data in the horizontal or vertical ancillary data space**
- Comprehensive signal and status monitoring **via four-digit card-edge display**
- VistaLINK™ - enabled for remote monitoring **and control when installed in a 7700FR-C frame with 7700FC VistaLINK™ Frame Controller**
- 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

7707VR-4 Block Diagram





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	
Standard Version:	-18dBm
-H Version:	-28dBm

Serial Video Outputs:

Standards:	SMPTE 259M-C, DVB-ASI
Number of Outputs:	4 independent SDI or DVB-ASI 270Mb/s signals
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	600ps nominal
Overshoot:	<10% of amplitude
Return Loss:	> 15dB at 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 Fiber Receiver, VistaLINK™ Monitoring
7707VR-4-H	Quad 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

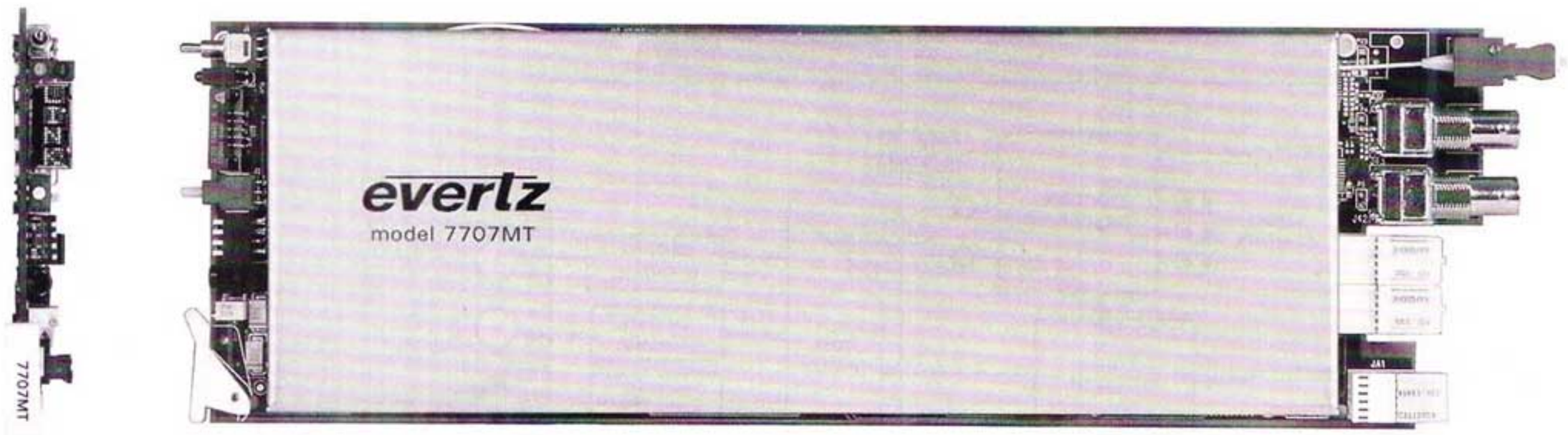
Enclosures:

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

SDI, 2 AES Audio, Bi-Directional RS-232/422, 2 GPI and 2 GPO, Fiber Transmitter

Models 7707MT





The 7707MT Multi-Signal Fiber Transmitter is a VistaLINK™ - enabled, 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

- Single card fiber TDM Multiplexor for SDI Video, 2 AES Audio, 1 bi-directional RS-232/422 and 2 GPI/O
- Reclocked SDI output for additional signal distribution
- Supports 525 or 625 line 4:2:2 component SDI signals
- Supports 32, 44.1, 48 KHz AES audio inputs
- AES audio inputs can be synchronous or asynchronous to each other and/or to input video
- Dolby E compatible
- 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
- Supports bi-directional RS422 signals at baud rates up to 3 Mb/s
- Comprehensive signal and status monitoring via four-digit card-edge display, or remotely through SNMP and VistaLINK™ enabled capability
- 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 1694)
- Supports SDTi signals
- 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.692 compliant) also available
- Supports single mode and multi-mode (-F2 version) fiber optic cable

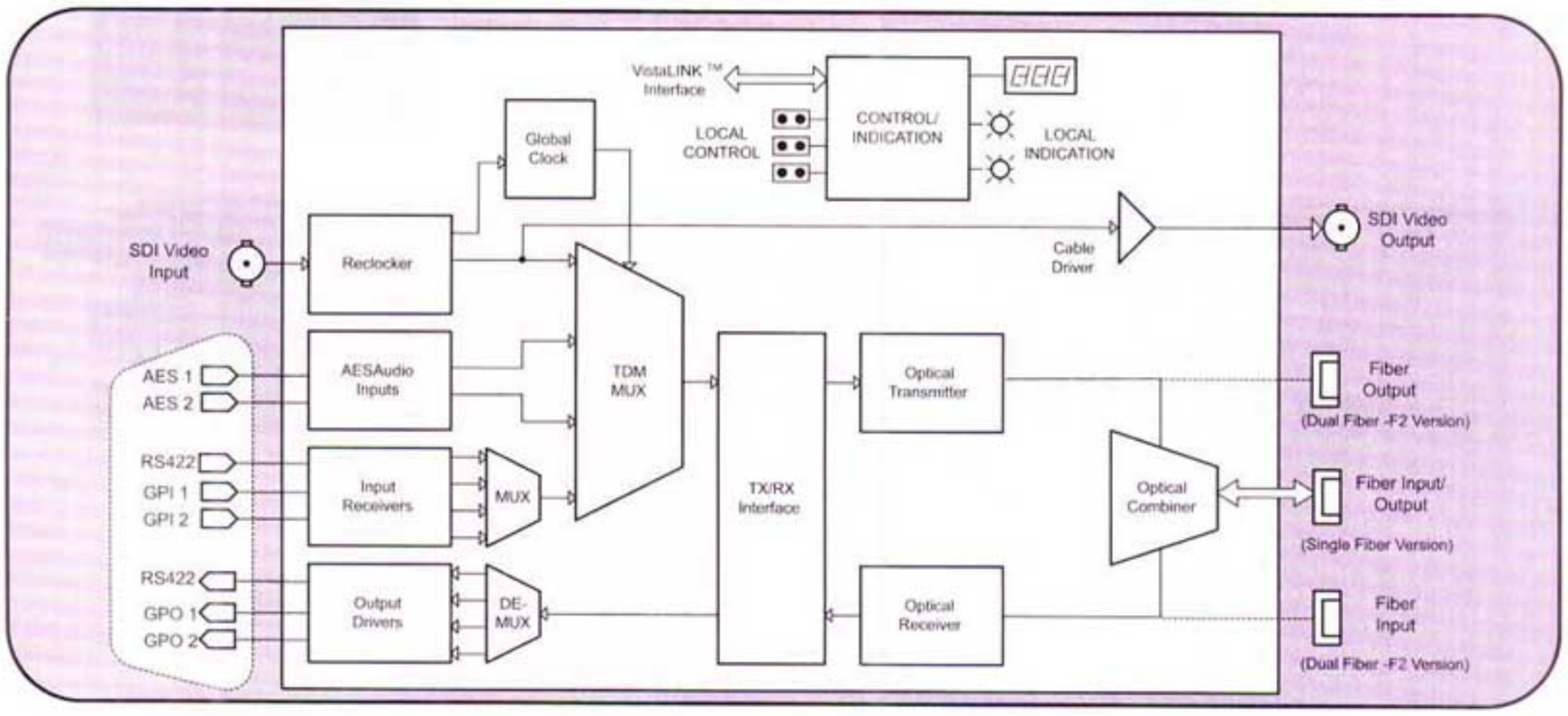
7707MT Application Configurations

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/50km	7707MT13-F2	-7dBm	7707MR13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	1	14dB/30km*	7707MT13	-10dBm	7707MR13	-24dBm	1310nm, bi-directional, one fiber
Single-Mode	1(WDM)	25dB/60km	7707MT15M-W	-1dBm	7707MR13M-W	-26dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	24dB/80km**	7707MTxx-F2	0dBm	7707MRyy-F2	-28dBm	Different CWDM wavelengths on Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	31dB/105km**	7707MTxxxx-F2	+7dBm	7707MRyyyy-F2	-28dBm	Different DWDM wavelengths on Tx & Rx, with 8 channel DWDM Mux/Demux**

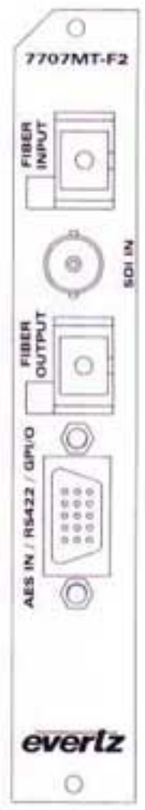
*** With >20dB return loss on fiber interface**
****Assumes 8 Ch Mux/Demux loss of 3.5dB**
Tx Power/Rx Sensitivity are nominal values ±1dBm
Fiber loss= 0.4/0.3dB per km @1310nm/1550nm

SDI, 2 AES Audio, Bi-Directional RS-232/422, 2 GPI and 2 GPO, Fiber Transmitter

7707MT Block Diagram







Specifications

Serial Video Input:

Standard:	SMPTE 259M-C, SMPTE 305M
Connector:	1 BNC input per IEC 169-8
Equalization:	Automatic to 300m @ 270 Mb/s with Belden 1694 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 169-8
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:

Number of Inputs:	2 (Jumper selectable for balanced or unbalanced input)
Standard:	Unbalanced - SMPTE 276M, Balanced - AES3-1992
Connector:	4 pins on female high density DB-15
Signal Level:	
Unbalanced:	1V p-p ± 0.1V
Balanced:	2 to 7Vp-p with Level Jumper set to HI, 1 to 2Vp-p with level jumper set to LO
Equalization:	500m @ 48kHz with Belden 1800B or equivalent cable
Resolution:	Up to 24 bits
Sampling Rate:	32, 44.1, 48 kHz
Intrinsic Jitter:	< 20ns
Impedance:	Unbalanced - 75 Ω, Balanced - 110 Ω

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:	< 1.5µs
Audio to Video delay:	< 1µs with SoftSwitch™ disabled on 7707MR < 2ms with SoftSwitch™ enabled on 7707MR

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:	1

Ordering Information: *SDI, 2 AES Audio, Bi-Directional RS-232/422, 2 GPI and 2 GPO, Fiber Transmitter*

7707MT13	Single fiber, 1310nm FP Laser on Tx and Rx
7707MT15-W	Single fiber, WDM, 1550nm DFB Tx, Rx on 1310nm
7707MT13-F2	Dual fiber, 1310nm FP Tx and Rx
7707MTxx-F2	Dual Fiber, CWDM wavelength on Tx where xx = 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

For DWDM Applications: Contact Factory

Ordering Options

7707MX-BHP-15	Bulkhead Break out Panel for 15 x 7707MT cards (includes 15 3 ft. cables)
7707MX-BHP-15-B	Bulkhead Break out Panel for 15 x 7707MT cards (includes 15 3 ft. cables) for balanced audio only

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

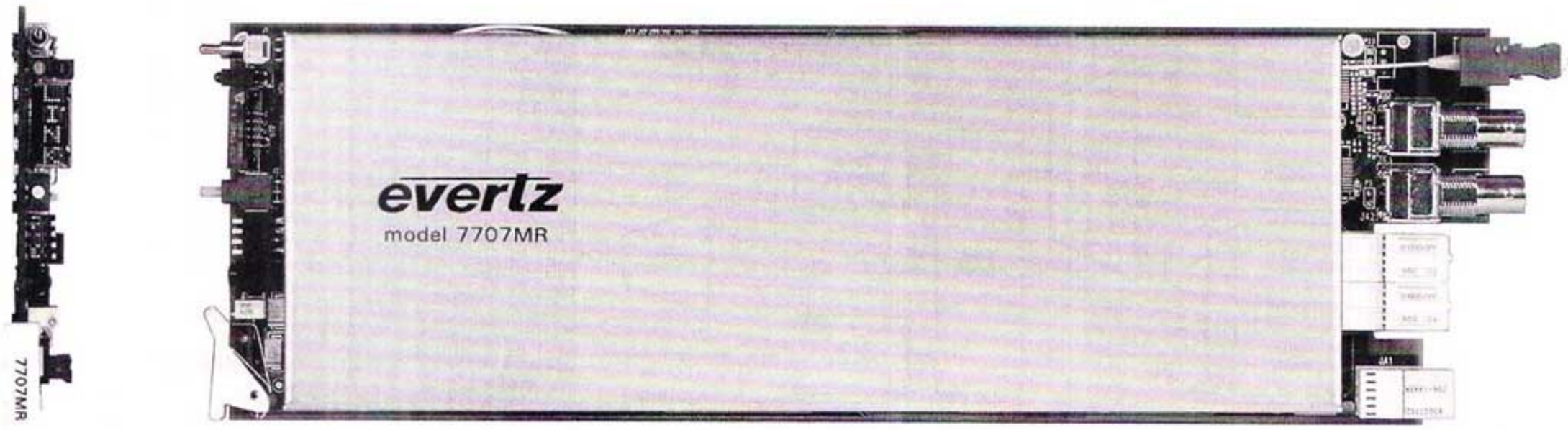
Enclosures:

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

SDI, 2 AES Audio, Bi-Directional RS-232/422, 2 GPI and 2 GPO, Fiber Receiver

Models 7707MR





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's 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

- Single card fiber TDM demultiplexer for SDI Video, 2 AES Audio, 1 bi-directional RS232/422 and 2 GPI/O
- Supports 525 or 625 line 4:2:2 component SDI signals
- Supports 32, 44.1, 48 kHz AES audio
- 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
- Dolby E compatible with SoftSwitch™ Disabled
- Signal transport over fiber uninterrupted by loss of input SDI, AES, Serial Data or GPIO feeds
- SDI video regeneration for jitter removal
- Supports bi-directional RS422 rates up to 3 Mb/s
- Supports 2 GPI's and 2 GPO's
- Comprehensive signal and status monitoring via four-digit card-edge display, or remotely through SNMP and VistaLINK™ - enabled capability
- Local display of optical signal strength, video, audio and data presence, video and AES formats, EDH errors, GPI and GPO status
- Supports SDTi signals
- 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.692 compliant) also available
- Supports single mode and multi-mode (-F2 version) fiber optic cable

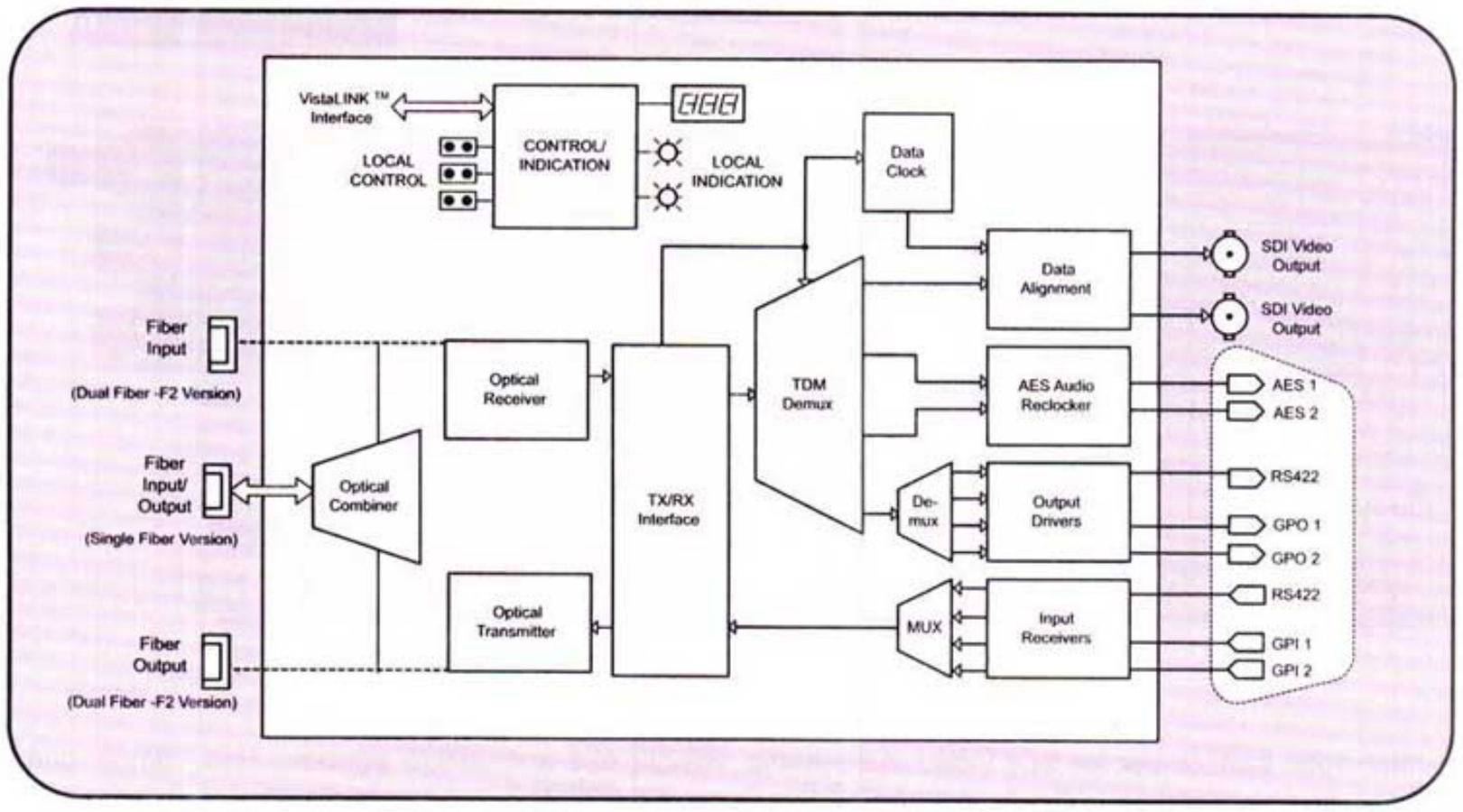
7707MR Application Configurations

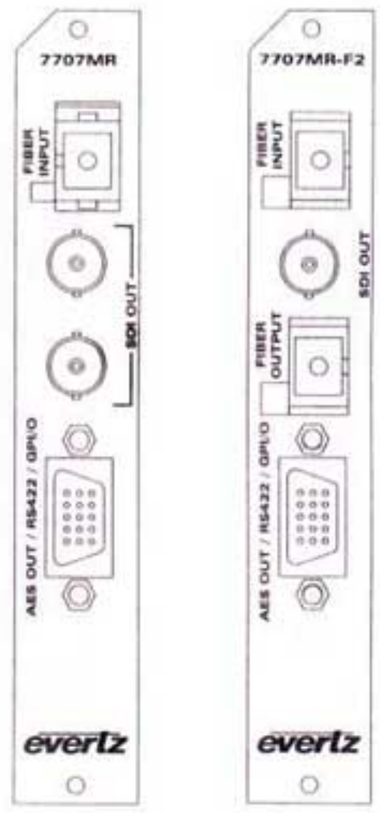
FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<3km	7707MR13-F2	-7dBm	7707MT13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	2	21dB/50km	7707MR13-F2	-7dBm	7707MT13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	1	14dB/30km*	7707MR13	-10dBm	7707MT13	-24dBm	1310nm, bi-directional, one fiber
Single-Mode	1(WDM)	25dB/60km	7707MR13M-W	-1dBm	7707MT15-W	-26dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	24dB/80km**	7707MRyy-F2	0dBm	7707MTxx-F2	-28dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	31dB/105km**	7707MRyyyy-F2	+7dBm	7707MTxxxx-F2	-28dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux**

*** With >20dB return loss on fiber interface**
****Assumes 8 Ch Mux/Demux loss of 3.5dB**
Tx Power/Rx Sensitivity are nominal values ±1dBm
Fiber loss= 0.4/0.3dB per km @1310nm/1550nm

SDI, 2 AES Audio, Bi-Directional RS-232/422, 2 GPI and 2 GPO, Fiber Receiver

7707MR Block Diagram





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 169-8
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:	< 0.15 UI

AES Audio Outputs:

Standard	
Unbalanced AES:	SMPTE 276M
Balanced:	AES3-1992
Number of Outputs:	2 regenerated (Jumper selectable for balanced or unbalanced)
Connector:	4 pins on female high density DB-15
Signal Level:	Unbalanced - 1 Vp-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

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 µs
Audio to Video delay:	< 1µs with SoftSwitch™ disabled < 2ms with SoftSwitch™ enabled

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:	1

Ordering Information: *SDI, 2 AES Audio, Bi-Directional RS-232/422, 2 GPI and 2 GPO, Fiber Receiver*

7707MR13	Single Fiber, 1310nm FP on Tx and Rx
7707MR13M-W	Single Fiber, WDM, 1310nm FP Tx, Rx on 1550nm
7707MR13-F2	Dual Fiber, 1310nm FP on Tx and Rx
7707MRxx-F2	Dual Fiber, CWDM wavelength on Tx where xx = 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

For DWDM Applications: Contact Factory

Ordering Options

7707MX-BHP-15	Bulkhead Break out Panel for 15 x 7707MR cards (includes 15 3 ft. cables)
7707MX-BHP-15-B	Bulkhead Break out Panel for 15 x 7707MR cards (includes 15 3 ft. cables) for balanced audio only

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

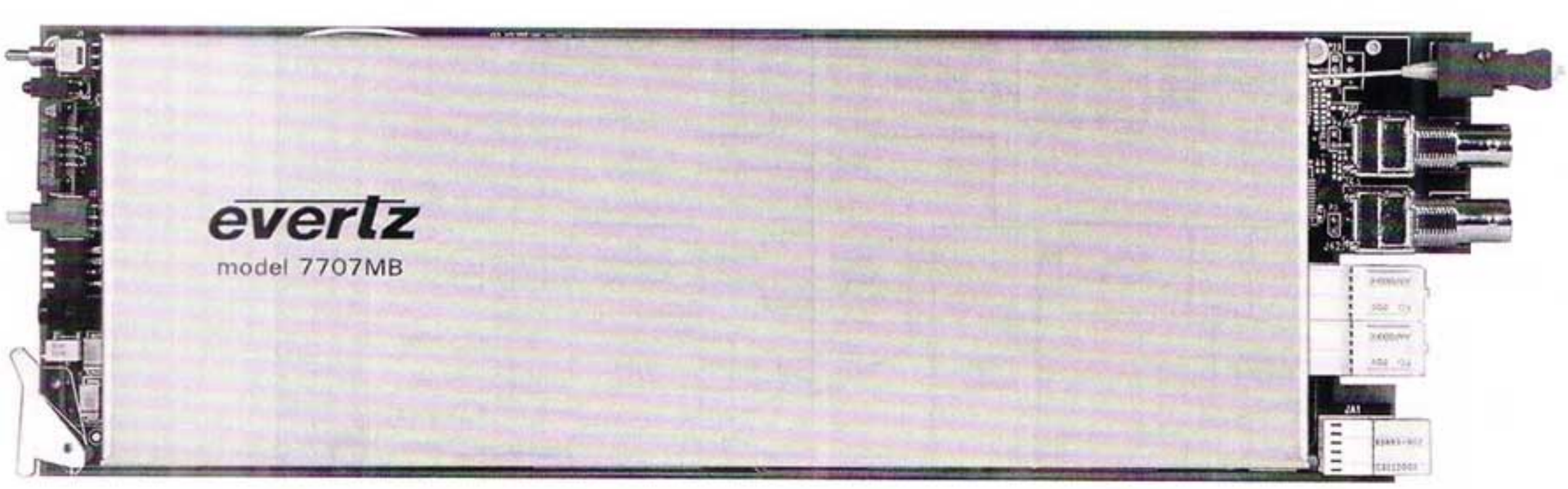
Enclosures:

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

Bi-Directional Transceiver for 1 SDI, 2 AES, RS232/422, 2 GPI/O

1d

Models 7707MB



The 7707MB is a VistaLINK™ - enabled 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 fiber or dual fibers/wavelengths for CWDM/DWDM applications.

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

- Single card bi-directional transceiver for 1 SDI Video, 2 AES Audio, 1 RS-232/422 and 2 GPI/0
- Supports 525 or 625 line 4:2:2 component SDI signals
- Supports 32, 44.1, 48 kHz AES audio
- Supports bi-directional RS422 rates up to 3 Mb/s
- Low Audio to Video latency
- Dolby E compatible
- Signal transport over fiber uninterrupted by loss of input SDI, AES or Serial Data feeds
- Built-in jitter attenuation
- Comprehensive signal and status monitoring via four-digit card-edge display, or remotely through SNMP and VistaLINK™ enabled capability
- 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.692 compliant) also available
- Supports single-mode and multi-mode (-F2 version) fiber optic cable

7707MB Application Configurations

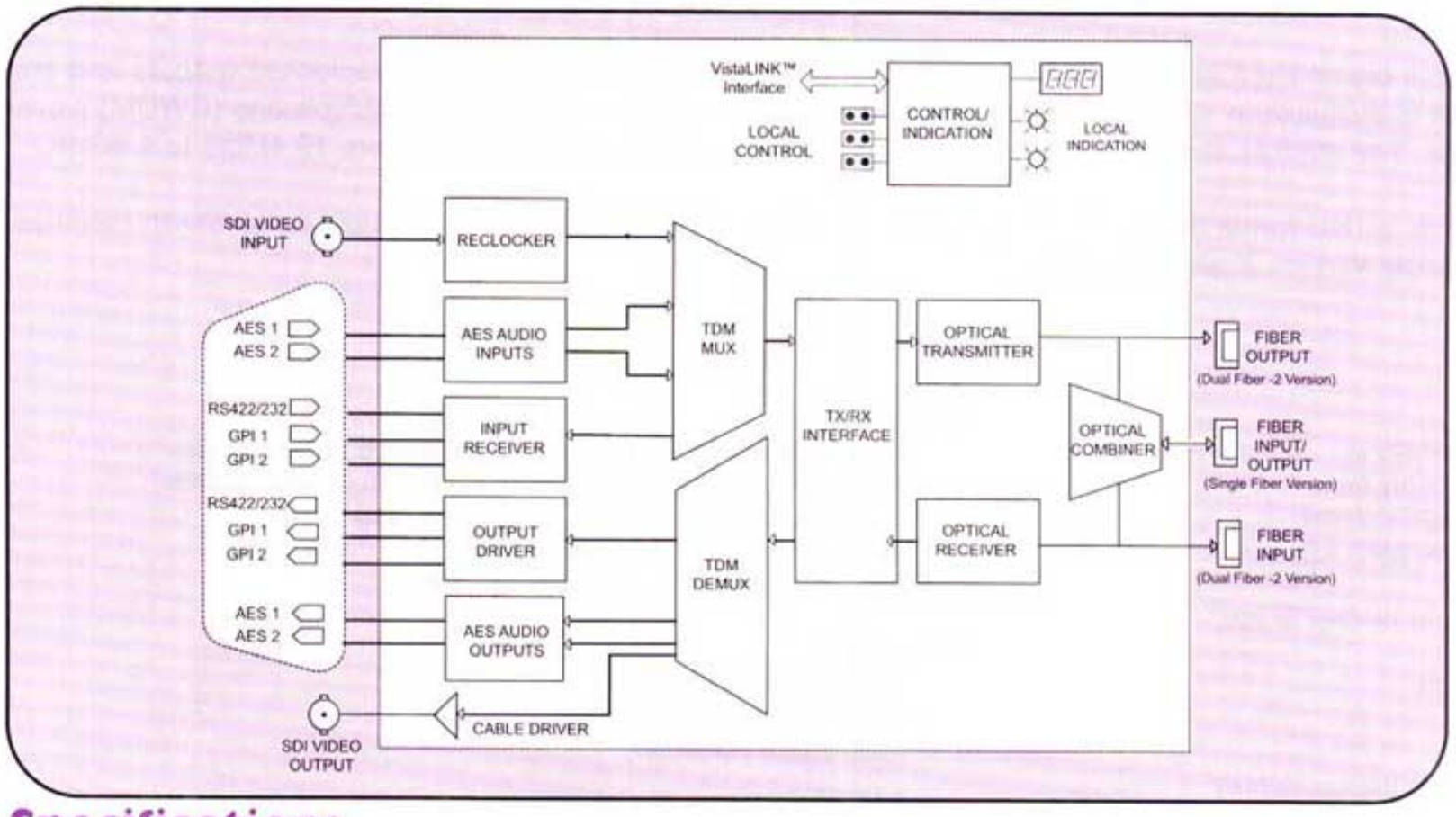
FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<3km	7707MB13-F2	-7dBm	7707MB13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	2	21dB/50km	7707MB13-F2	-7dBm	7707MB13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	1	14dB/30km*	7707MB13	-10dBm	7707MB13	-24dBm	1310nm, bi-directional, one fiber
Single-Mode	1(WDM)	25dB/60km	7707MB13M-W	-1dBm	7707MB15-W	-26dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	24dB/80km**	7707MBxx-F2	0dBm	7707MByy-F2	-28dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	31dB/105km**	7707MBxxxx-F2	7dBm	7707MByyyy-F2	-28dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux**

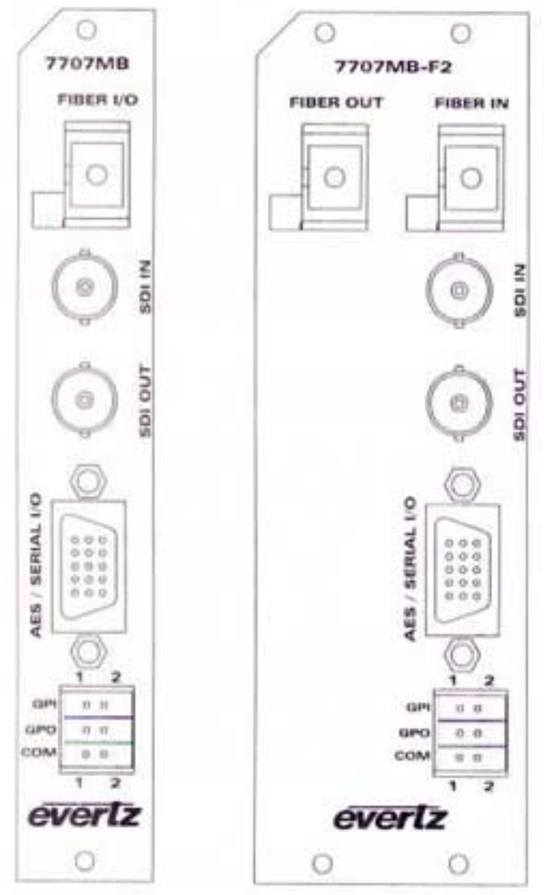
*** With >20dB return loss on fiber interface**
****Assumes 8 Ch Mux/Demux loss of 3.5dB**

Tx Power/Rx Sensitivity are nominal values ±1dBm
Fiber loss= 0.4/0.3dB per km @1310nm/1550nm

Bi-Directional Transceiver for 1 SDI, 2 AES, RS232/422, 2 GPI/O

7707MB Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M-C, 525 or 625 line component, SMPTE 305M
Connector:	1 BNC input per IEC 169-8
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 169-8
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 or 1610nm
Input Optical Sensitivity:	See Application Configurations Chart
Output:Rise and Fall Time:	200ps nominal
Output Jitter:	< 0.2 UI
Output Wavelengths:	See Ordering Information
Output Power:	See Application Configurations Chart

AES Audio Inputs:

Standard:	Unbalanced - SMPTE 276M, Balanced - AES3-1992
Number of Inputs:	2 (Jumper selectable for balanced or unbalanced)
Connector:	4 pins on female high density DB-15
Signal Level:	
Unbalanced:	1Vp-p ±0.1V
Balanced:	4 to 7Vp-p with Level Jumper set to HI, 1 to 4Vp-p with level jumper set to LO
Equalization:	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	Unbalanced - SMPTE 276M, Balanced - AES3-1992
Number of Outputs:	2 regenerated (Jumper selectable for balanced or unbalanced)
Connector:	4 pins on female high density DB-15
Signal Level:	5 Vp-p
Resolution:	Up to 24 bits
Sampling Rate:	32, 44.1, 48 kHz
Intrinsic Jitter:	< 20ns
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:	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)

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

Physical:

Number of slots:	1

Ordering Information: *Bi-Directional Transceiver for 1 SDI, 2 AES, RS232/422, 2 GPI and 2 GPO*

7707MB13	Single fiber, 1310nm FP Laser TX and RX
7707MB13M-W	Single fiber, WDM, 1310nm FP TX, RX on 1550nm
7707MB15-W	Single fiber, WDM, 1550nm DFB TX, RX on 1310nm
7707MB13-F2	Dual fiber, 1310nm FP TX and RX
7707MBxx-F2	Dual Fiber, CWDM wavelength on Tx where xx 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

For DWDM Applications: Contact Factory

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

HDTV Electrical to Optical Converter, 19.4Mb/s to 1.5Gb/s

Model 7705EO-HD

The 7705EO-HD accepts one BNC serial digital input at rates up to 1.5Gb/s and provides two serial digital BNC reclocked outputs and one fiber reclocked output. The fiber output is available in 1310nm, 1550nm and up to sixteen coarse wave division multiplexing (CWDM) wavelengths in the 1270nm to 1610nm range. The module also provides a non-reclock mode to operate at data rates from 19.4Mb/s to 1.5Gb/s.

The 7705EO-HD can be housed in either a 1RU frame that will hold up to three modules or a 3RU frame that will hold up to fifteen modules. A 2405 series standalone miniature module version is also available.

Features

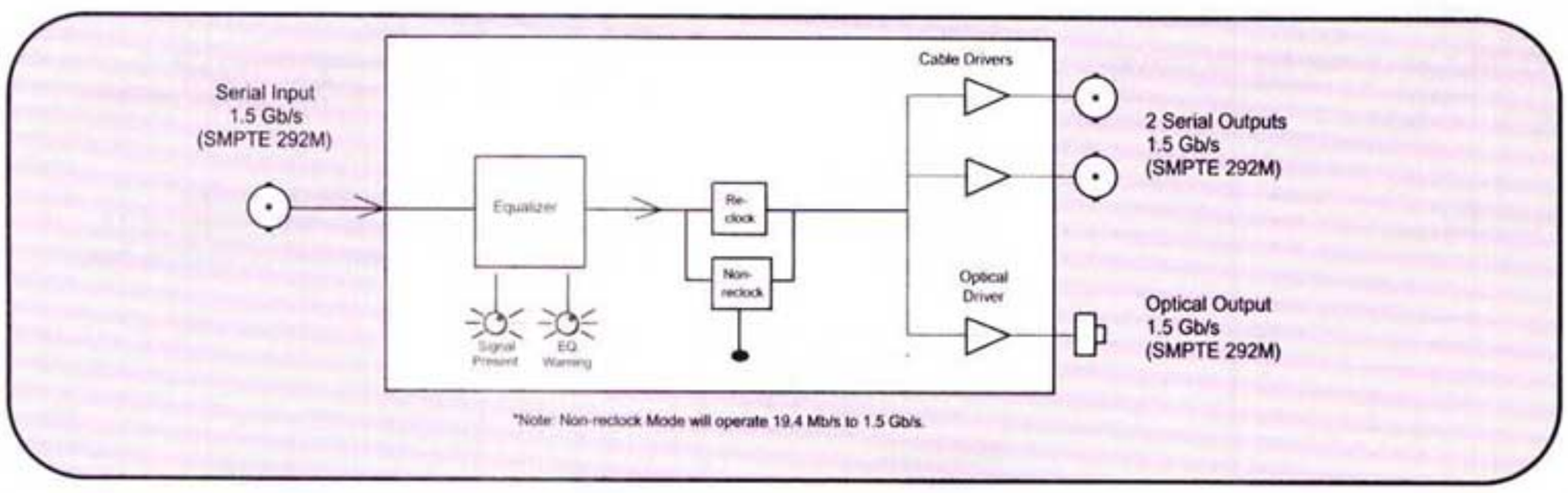
- Operation from 19.4Mb/s to 1.5Gb/s
  - Reclocking for SMPTE 292M (1.485Gb/s)
  - Non-reclocking mode for all other rates from 19.4 Mb/s to 1.5Gb/s including SMPTE 259M, SMPTE 305M, SMPTE 310M, M2S, DVB-ASI, etc.
- Supports multi-mode or single-mode fiber
- Fully hot swappable from front of frame with no fiber or BNC disconnect/reconnect required
- 1RU, 3RU, single standalone frame options

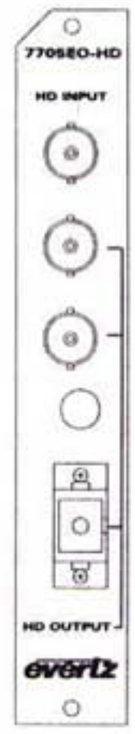
Input:
- Automatic input cable equalization to 130m (Belden 1694A)

Outputs:
- Two serial digital BNC outputs for loop-through or monitoring
- One fiber output available in 1310nm, 1550nm or up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- 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





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 input per IEC 169-8
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 169-8
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
CWDM Wavelength:	1270nm to 1610nm (See Ordering Information)

Optical Power:

1310nm FP	-7.5 dBm ± 1dBm
1310nm/1550nm DFB	0 dBm ± 1dBm
CWDM DFB	0 dBm ± 1dB

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

Ordering Information:

to 1.5 Gb/s	***HDTV Electrical to Optical Converter, 19.4Mb/s***
7705EO13-HD	1310nm, FP Laser
7705EO13-HD-L	1310nm, DFB Laser
7705EO15-HD	1550nm, DFB Laser
7705EOxx-HD	CWDM wavelength where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

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
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

For standalone applications see 2400 series fiber modules

HDTV Optical to Electrical Converter, 19.4Mb/s to 1.5Gb/s

Model 7705OE-HD

The 7705OE-HD accepts one optical input at 1.5Gb/s and provides three reclocked BNC outputs for further signal distribution. The module also provides a bypass feature to operate at data rates from 19.4Mb/s to 1.5Gb/s in a non-reclocking mode.

The 7705OE-HD can be housed either in a 1 RU frame that will hold up to three modules or a 3RU frame that will hold up to fifteen modules. A 2405 series standalone miniature module version is also available.

Features

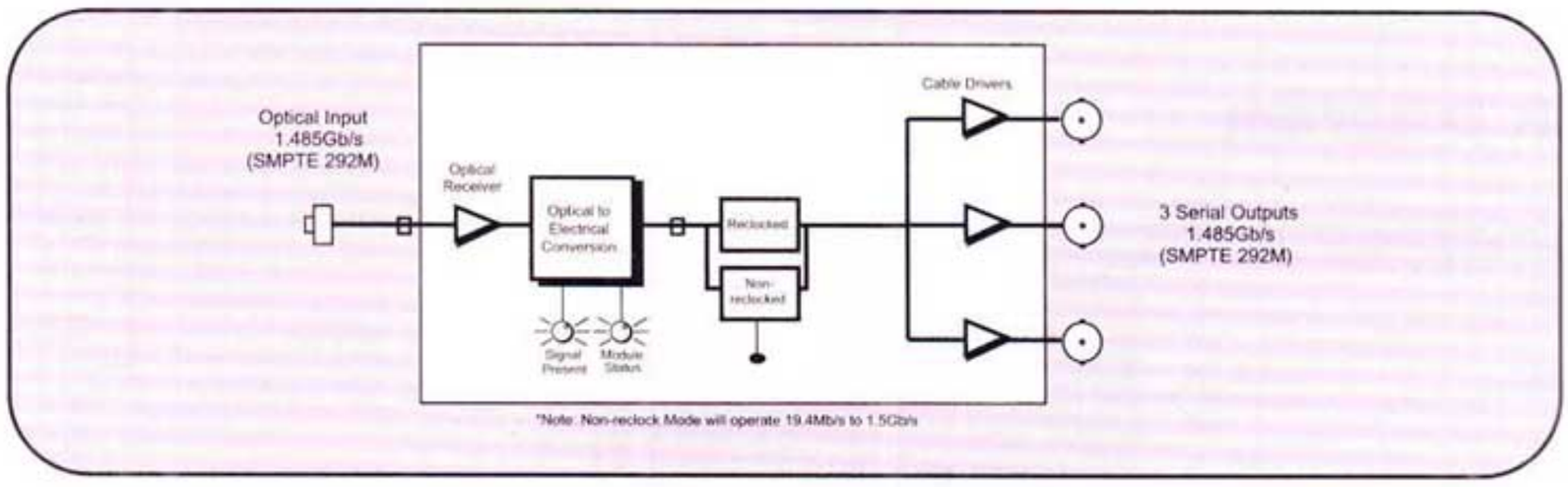
- Operation from 19.4Mb/s to 1.5Gb/s
  - Reclocking for SMPTE 292M (1.485Gb/s)
  - Non-reclocking mode for all other rates from 19.4 Mb/s to 1.5Gb/s including SMPTE 259M, SMPE 305M, SMPTE 310M, M2S, DVB-ASI, etc.
- Supports multi-mode or single-mode fiber
- Fully hot swappable from front of frame with no fiber or BNC disconnect/reconnect required
- 1RU, 3RU, single standalone frame options

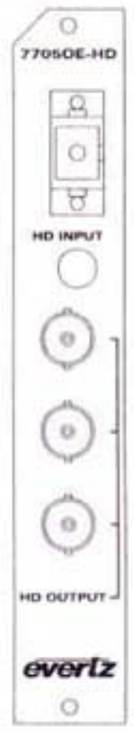
Input:
- Optical input range from 1270nm to 1610nm
- Input sensitivity up to -18dBm
- SC/PC, ST/PC, FC/PC connector options

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





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:	0dBm
Optical Sensitivity:	-18dBm

Serial Video Outputs:

Number of Outputs:	3 Reclocked outputs
Connector:	BNC per IEC 169-8
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:

HDTV Optical to Electrical Converter, 19.4Mb/s to 1.5 Gb/s

7705OE-HD -18dBm Sensitivity, accepts 1270nm to 1610nm

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

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

For standalone applications see 2400 series fiber modules

Triple HDTV Electrical to Optical Converter 19.4Mb/s to 1.485Gb/s

1d

Model 7707EO-3-HD



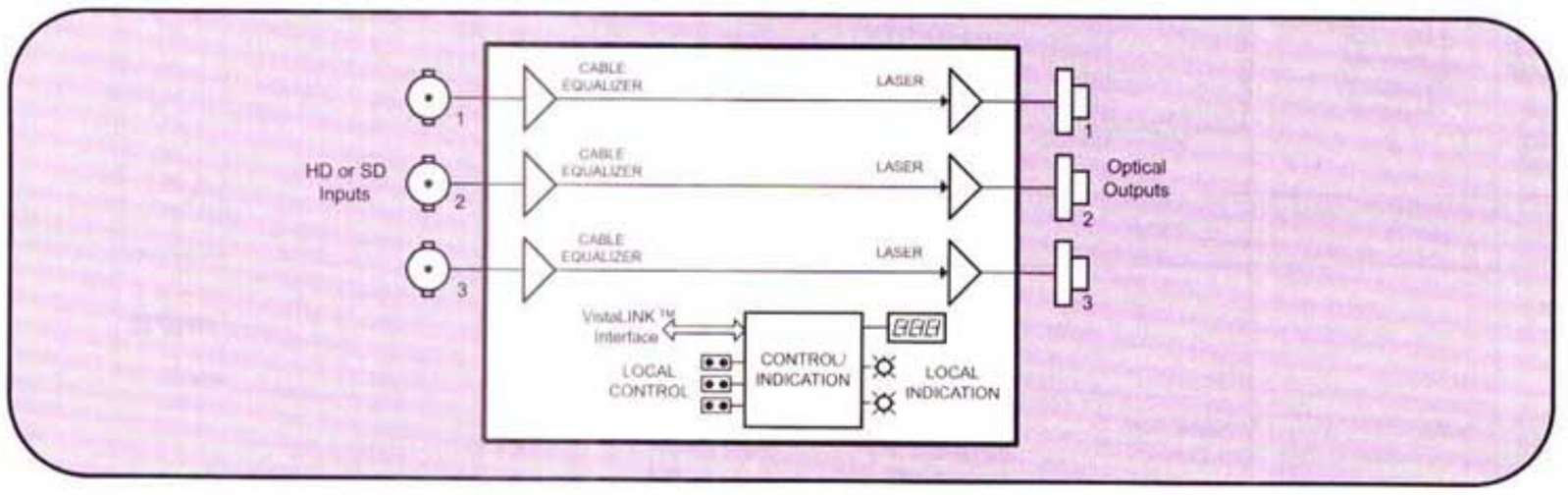
The 7707EO-3-HD is a VistaLINK™ - enabled Triple HDTV Electrical to Optical converter for SMPTE 292M(1.458Gb/s), SMPTE 259M(143-360Mb/s), SMPTE 344M(540Mb/s), DVB-ASI or M2S (270Mb/s) and SMPTE 310M(19.4Mb/s) signals. Each independent channel accepts one serial video input and provides one fiber output with an optical wavelength of 1310nm. Monitoring and control of card status and parameters is provided locally at the card edge and remotely via VistaLINK™.

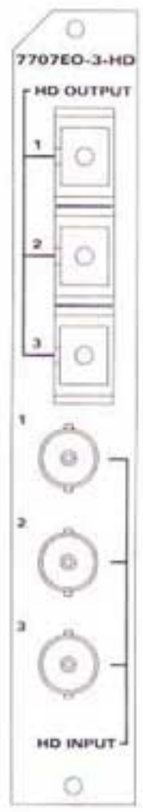
The 7707EO-3-HD can be housed in either a 1RU frame that will hold up to three modules, a 3RU frame that will hold up to fifteen modules or a standalone enclosure that will hold one module.

Features

- Provides 45 independent channels of optical conversion, in a single 3RU frame
- 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), DVB-ASI or M2S (270Mb/s), SMPTE 344M (540Mb/s), and SMPTE 305M (SDTi) rates
- Comprehensive signal and status monitoring via four-digit card-edge display
- VistaLINK™ - enabled for remote monitoring and control when installed in a 7700FR-C frame with 7700FC VistaLINK™ Frame Controller
- Detection and display of equalization strength
- Automatic coaxial input equalization to 100m at HD (1.485Gb/s) and 275m at SD (270Mb/s) rates (Belden 1694A)
- Supports multi-mode and single-mode fiber
- Fully hot swappable from front of frame

7707EO-3-HD Block Diagram





Specifications

Standards: SMPTE 292M, 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 100m @ HD (1.485Gb/s) and 275M @ 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
Optical Power: -7.5dBm ±1dBm

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:
7707EO13-3-HD Triple HDTV Electrical to Optical Converter 19.4Mb/s to 1.485Gb/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 maletermination
CB-FP1M-STPC	Single mode fiber cable, 1m, ST/PC maletermination
CB-FP5M-SCPC	Single mode fiber cable, 5m, SC/PC maletermination
CB-FP5M-STPC	Single mode fiber cable, 5m, ST/PC maletermination
CB-FP10M-SCPC	Single mode fiber cable, 10m, SC/PC maletermination
CB-FP10M-STPC	Single mode fiber cable, 10m, ST/PC maletermination

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

Model 7707OE-3-HD



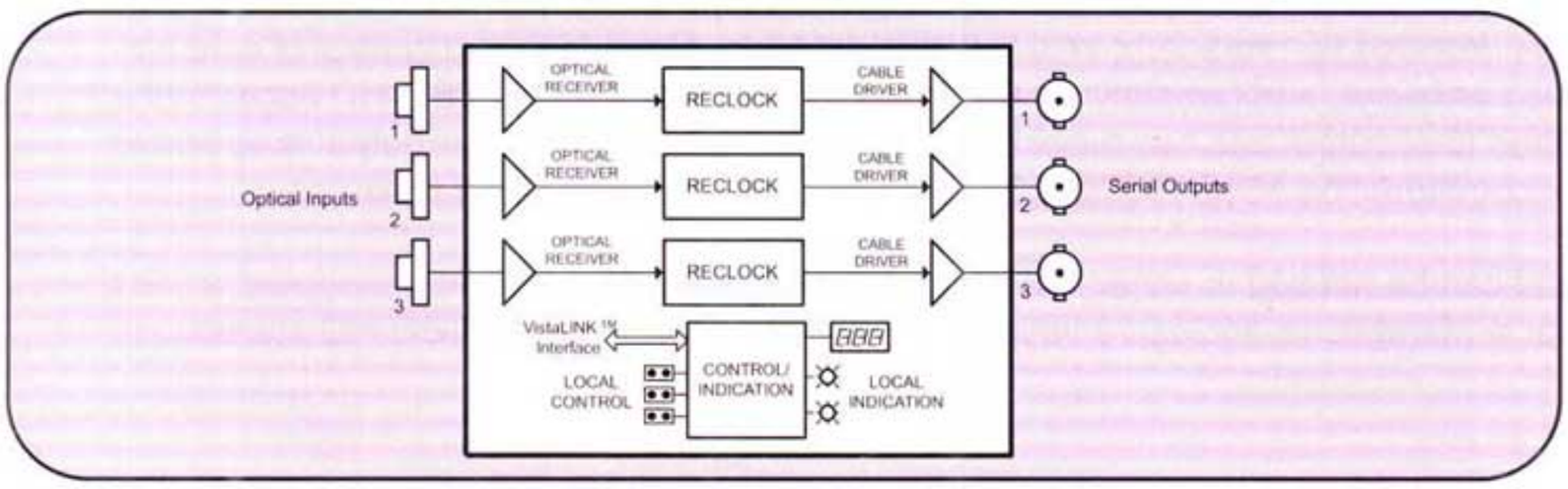
The 7707OE-3-HD is a VistaLINK™ - enabled Triple HDTV Optical to Electrical Converter for SMPTE 292M(1.485Gb/s), SMPTE259M (143-360Mb/s), SMPTE344M (540Mb/s), DVB-ASI or M2S (270Mb/s) and SMPTE 310M (19.4Mb/s) signals. Each independent channel accepts one optical input and provides one reclocked BNC output. Monitoring and control of card status and parameters is provided locally at the card edge and remotely via VistaLINK™.

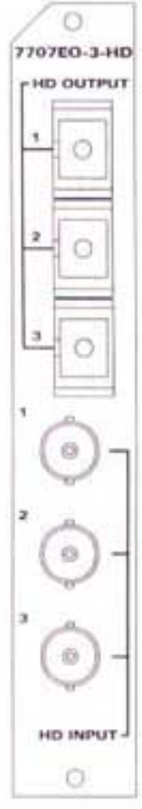
The 7707OE-3-HD can be housed in either a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone enclosure that will hold 1 module.

Features

- Provides 45 independent channels of optical conversion, in a single 3RU frame
- Supports all SMPTE 292M standards at 1.485Gb/s
- Supports all SMPTE259M standards with operation from 143Mb/s - 360Mb/s
- Supports SMPTE310M (19.4Mb/s), DVB-ASI or M2S (270Mb/s), SMPTE 344M (540Mb/s), and SMPTE 305M (SDTi) rates
- Auto rate selection and indication for all SDI and HD-SDI data rates from 143Mb/s to 1.485Gb/s
- Selectable non-reclock mode for other data rates
- Comprehensive signal and status monitoring via local four-digit card-edge display
- VistaLINK™ - enabled for remote monitoring and control when installed in a 7700FR-C frame with 7700FC VistaLINK™ Frame Controller
- Detection and display of optical input power and video format
- Wide range optical input (1270nm-1610nm)
- Supports multi-mode and single-mode fiber
- Fully hot swappable from front of frame

7707OE-3-HD Block Diagram





Specifications

Standards: SMPTE 292M, SMPTE 259M-A,B,C,D, 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:	-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 HDTV Optical to Electrical Converter 19.4Mb/s to 1.485Gb/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:

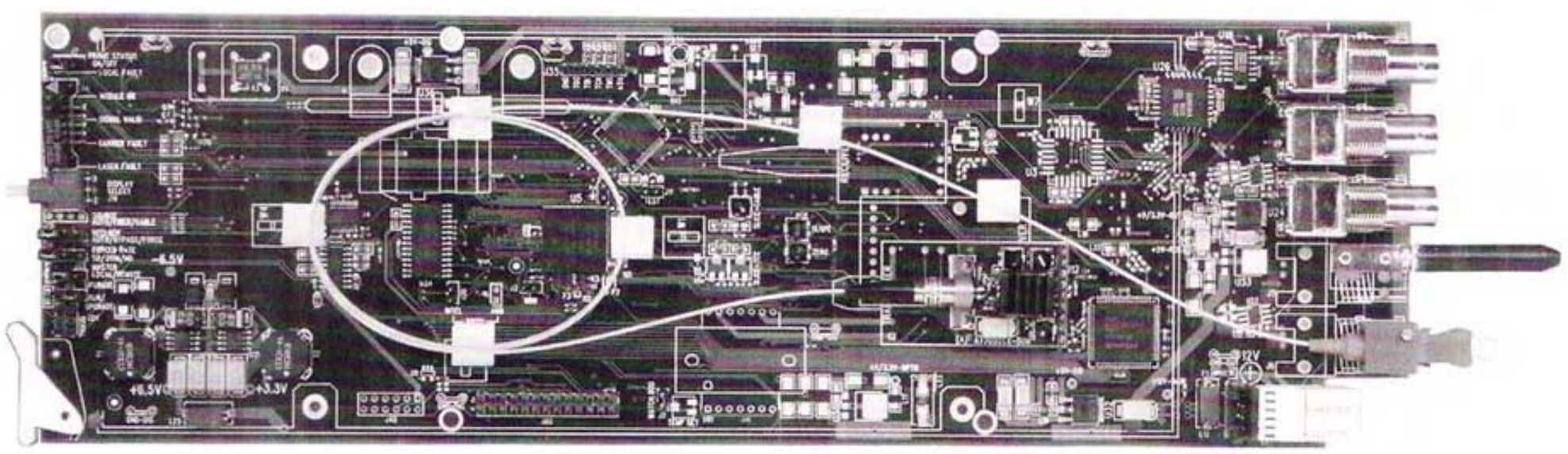
7700FR-C	3RU Multiframe, which holds 15 modules
7701FR	1RU Multiframe, which holds 3 modules
S7701FR	Standalone enclosure

HDTV Electrical to Optical Converter
19.4Mb/s to 1.5Gb/s

1d Model 7707EO-HD







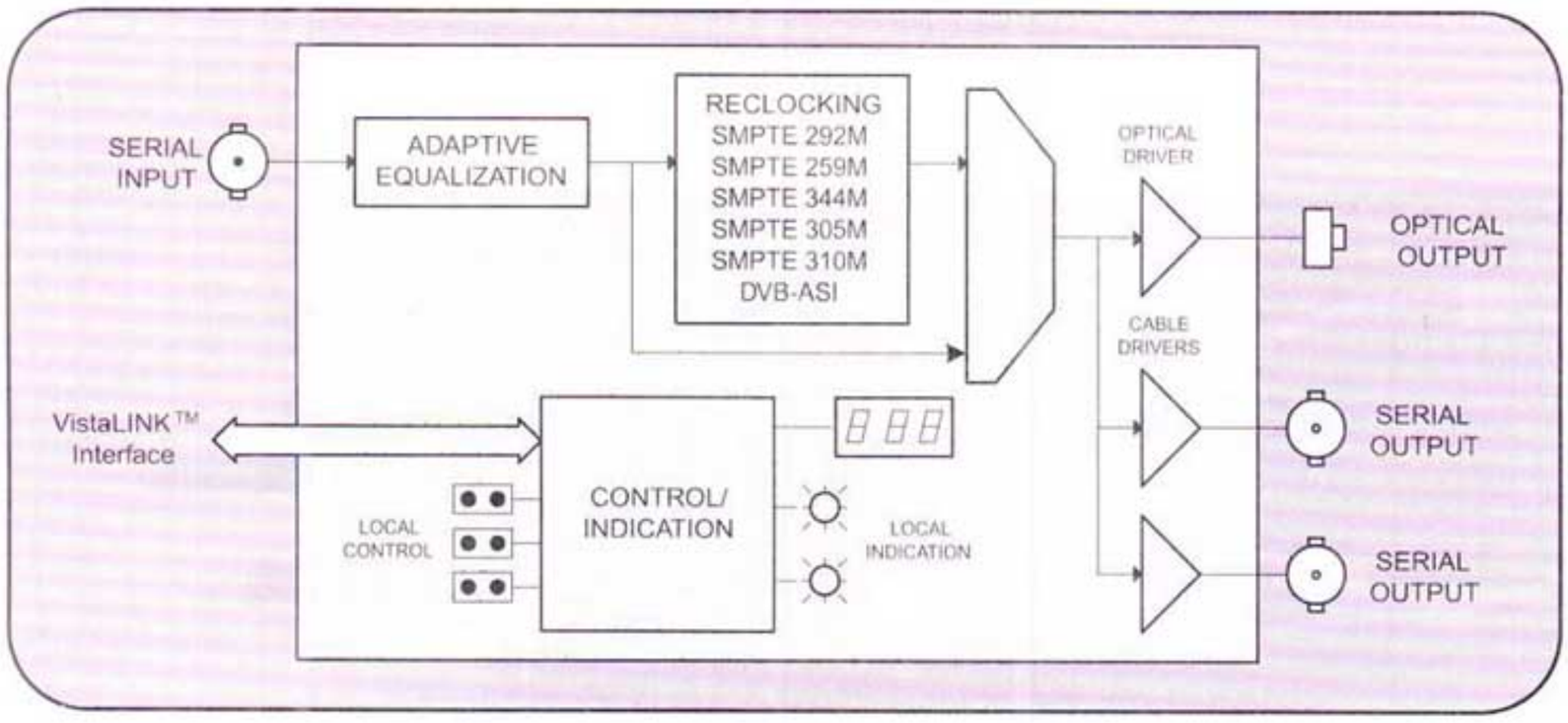
The 7707EO-HD is a VistaLINK™ - enabled, electrical to optical converter for SMPTE 292M (1.485Gb/s), SMPTE 259M (143-360Mb/s), SMPTE 344M (540Mb/s), M2S or DVB-ASI (270Mb/s) and SMPTE 310M (19.4Mb/s) signals. Automatic reclocking, data rate selection and data rate indication is provided for rates from 143Mb/s to 1.485Gb/s. Monitoring and control of card status and parameters is provided locally at the card edge, and remotely via VistaLINK™ capability. The 7707EO-HD accepts one coaxial SDI input, and provides one reclocked fiber output and two reclocked coaxial SDI outputs. The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm, CWDM and DWDM transmission schemes.

The 7707EO-HD 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. A 2405EO-HD standalone miniature module is also available.

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 reclocking for all SDI and HD-SDI data rates from 143Mb/s to 1.485Gb/s
- Selectable non reclock 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.692 compliant) also available
- Supports multi-mode and single-mode fiber
- 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

7707EO-HD Block Diagram





Specifications

Serial Video Input:

Standards:	
Reclocked:	SMPTE 292M, SMPTE 259M A, B, C, D, SMPTE 344M, SMPTE 305M, DVB-ASI, M2S SMPTE 310M
Non-Reclocked:	Any bi-level signal type at rates of 19.4 Mb/s1.485Gb/s
Connector:	1 BNC input per IEC 169-8
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 169-8
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 (Reclocked).

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 (Reclocked).
Wavelengths:	See Ordering Information
Output Power:	
1310nm FP:	-7.5dBm ± 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

Ordering Information: HD Electrical to Optical Converter, VistaLINK™ Monitoring

7707EO13-HD	1310nm FP Laser
7707EO13-HD-L	1310nm DFB Laser
7707EO15-HD	1550nm DFB Laser

For CWDM Applications:

7707EO27-HD	1270nm, CWDM DFB Laser
7707EO29-HD	1290nm, CWDM DFB Laser
7707EO31-HD	1310nm, CWDM DFB Laser
7707EO33-HD	1330nm, CWDM DFB Laser
7707EO35-HD	1350nm, CWDM DFB Laser
7707EO37-HD	1370nm, CWDM DFB Laser
7707EO43-HD	1430nm, CWDM DFB Laser
7707EO45-HD	1450nm, CWDM DFB Laser
7707EO47-HD	1470nm, CWDM DFB Laser
7707EO49-HD	1490nm, CWDM DFB Laser
7707EO51-HD	1510nm, CWDM DFB Laser
7707EO53-HD	1530nm, CWDM DFB Laser
7707EO55-HD	1550nm, CWDM DFB Laser
7707EO57-HD	1570nm, CWDM DFB Laser
7707EO59-HD	1590nm, CWDM DFB Laser
7707EO61-HD	1610nm, CWDM DFB Laser

For DWDM Applicatons: Contact Factory

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

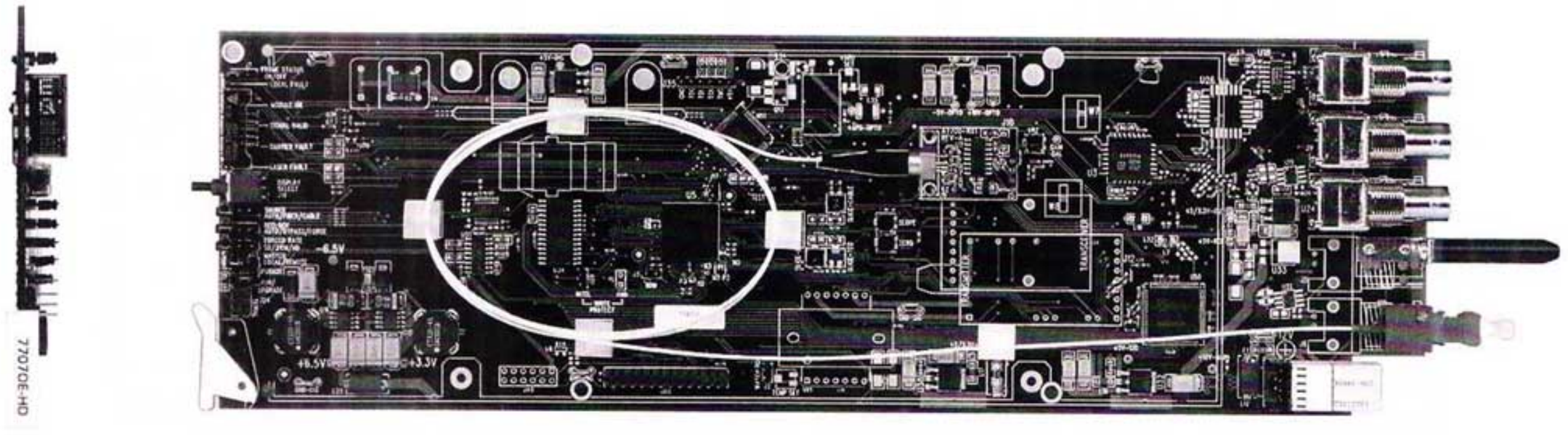
For standalone applications also see 2400 series fiber module

HDTV Optical to Electrical Converter
19.4Mb/s to 1.5Gb/s

1d

Model 7707OE-HD





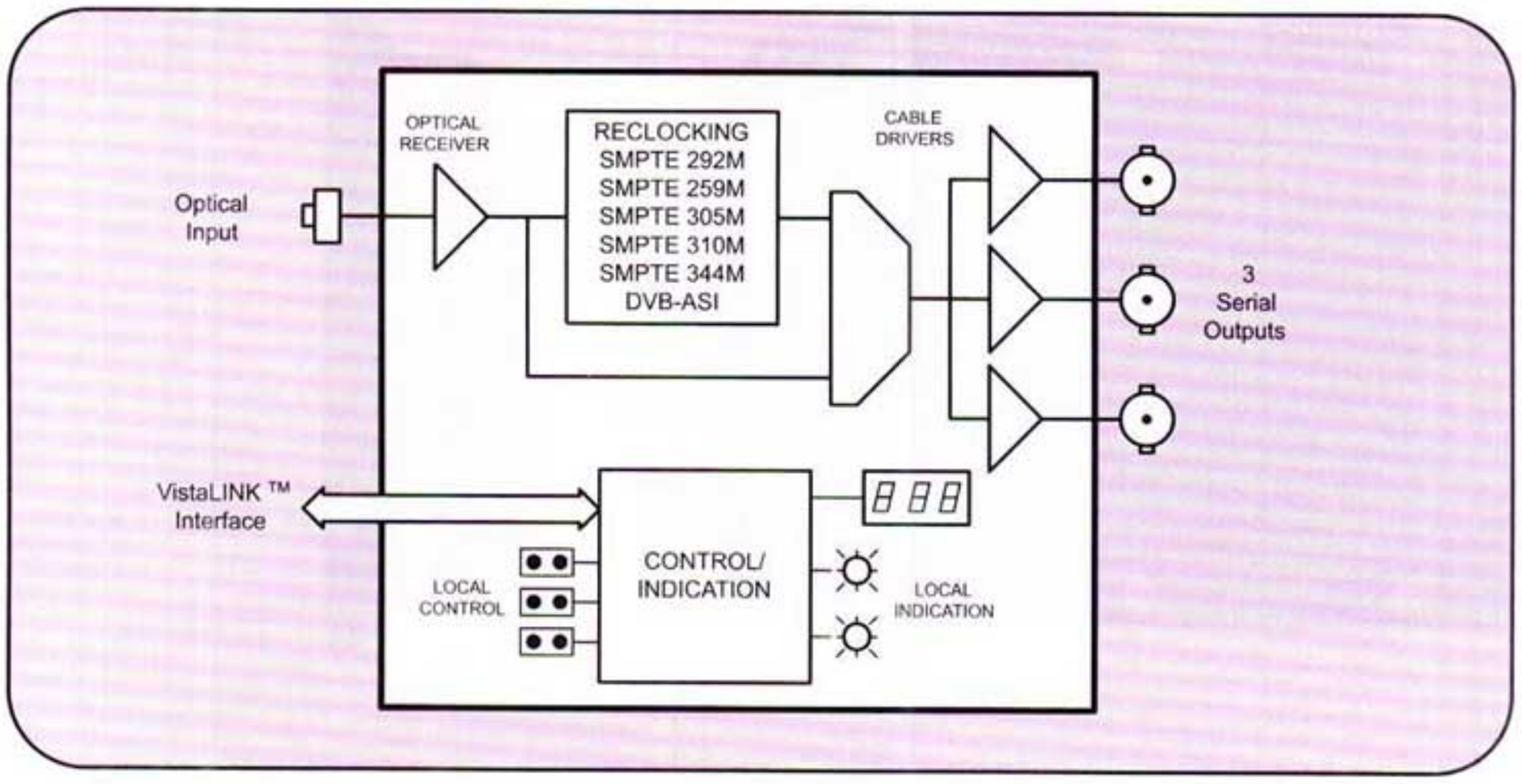
The 7707OE-HD is a VistaLINK™ - enabled, optical to electrical converter for SMPTE 292M (1.485Gb/s), SMPTE 259M (143-360Mb/s), SMPTE 344M (540Mb/s), M2S or DVB-ASI (270Mb/s) and SMPTE 310M (19.4Mb/s) signals. Automatic reclocking, data rate selection and data rate indication is provided for rates from 143Mb/s to 1.485Gb/s. Monitoring and control of card status and parameters is provided locally at the card edge, and remotely via VistaLINK™. The 7707OE-HD accepts one fiber input and provides three reclocked coaxial outputs.

The 7707OE-HD 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. A 2405OE-HD standalone miniature module is also available.

Features

- Supports all SMPTE 292M standards at 1.485Gb/s
- Supports all SMPTE259M standards with operation from 143Mb/s - 360Mb/s
- Supports SMPTE310M (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
- Reclocked optical input, with selectable non-reclock mode
- 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 multi-mode and single-mode fiber
- 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

7707OE-HD Block Diagram





Specifications

Optical Input:

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
Connector:	Female SC/PC, ST/PC or FC/PC.
Wavelength:	1270nm -1610nm
Optical Sensitivity:	
Standard:	-18dBm @ 1.485Gb/s
High Sensitivity (-H):	-28dBm @ 1.485Gb/s
Max. Input Power:	
Standard:	0dBm
High Sensitivity (-H):	-7dBm

Serial Video Outputs:

Number of Outputs:	3 Per Card (2 outputs DVB-ASI/M2S compliant)
Connectors:	BNC per IEC 169-8
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, VistaLINK ™ Monitoring
7707OE-HD-H	High Sensitivity HDTV Optional to Electrical Converter, 19.4Mb/s to 1.5Gb/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

For standalone applications also see 2400 series fiber modules

HDTV Miniature Optical Transmitter, 19.4Mb to 1.5Gb/s

1d

Model 2405EO-HD



The 2405EO-HD accepts one serial digital video input complying with SMPTE 292M (1.485Gb/s) and provides two serial digital BNC reclocked outputs and one reclocked fiber output. The fiber output is available in 1310nm, 1550nm and up to sixteen Coarse Wave Division Multiplexing (CWDM) wavelengths in the 1270nm to 1610nm range. The module provides a non-reclock feature to operate at data rates from 19.4Mb/s to 1.5Gb/s.

The 2405EO-HD is ideal for use in portable, remote and link extension applications where the small size, rugged enclosure and high performance operation meet the stringent requirements of these applications.

With the availability of up to 16 different CWDM wavelengths, optical signal aggregation for indoor/outdoor events and remote applications is now possible. When combined with the Evertz 7705CWDM Coarse Wave Division Multiplexor/Demultiplexor products, up to sixteen independent signal types on separate wavelengths can be combined on a single fiber.

The 2405EO-HD is available with SC, ST and FC connector options.

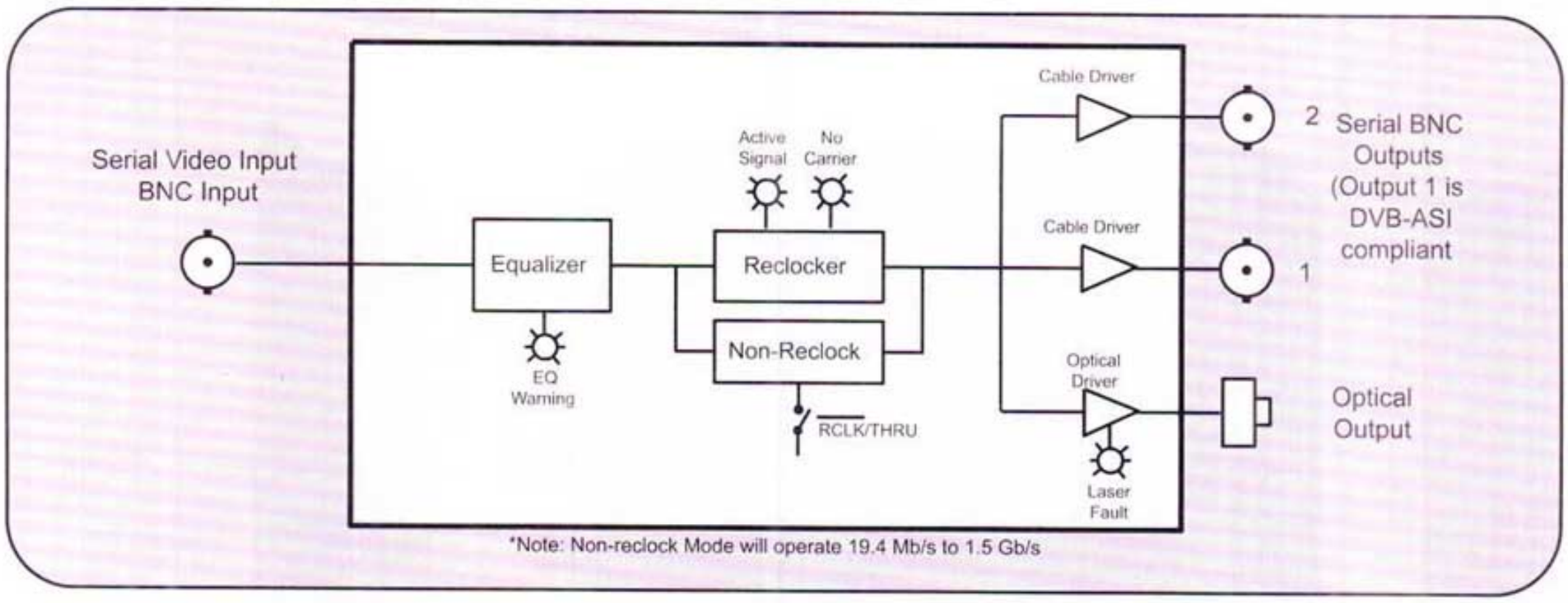
Features

- 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 sixteen different CWDM wave lengths (ITU-T G.694.2 compliant)
- Automatic laser shutdown on absence of input signal for extended laser life
- Supports multi-mode and single-mode fiber
- Immunity to video Pathological signals
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation

Card Edge LED's:

- Signal presence
- Maximum equalization warning
- Laser fault

2405EO-HD Block Diagram



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 input per IEC 169-8
Equalization:	Automatic to 125m @ 1.485Gb/s with Belden 1694 (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 169-8
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:	-7.5 dBm± 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) No Flanges: 6"L x 3.5"W x 1"H (152mm L x 89mm 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: *HDTV Miniature Optical Transmitter, 19.4Mb/s to 1.5Gb/s*

2405EO3F-HD	1310nm, FP Laser
2405EO3D-HD	1310nm, DFB Laser
2405EO5D-HD	1550nm, DFB Laser

CWDM Applications:

2405EO27-HD	1270nm, CWDM DFB Laser
2405EO29-HD	1290nm, CWDM DFB Laser
2405EO31-HD	1310nm, CWDM DFB Laser
2405EO33-HD	1330nm, CWDM DFB Laser
2405EO35-HD	1350nm, CWDM DFB Laser
2405EO37-HD	1370nm, CWDM DFB Laser
2405EO43-HD	1430nm, CWDM DFB Laser
2405EO45-HD	1445nm, CWDM DFB Laser
2405EO47-HD	1470nm, CWDM DFB Laser
2405EO49-HD	1490nm, CWDM DFB Laser
2405EO51-HD	1510nm, CWDM DFB Laser
2405EO53-HD	1530nm, CWDM DFB Laser
2405EO55-HD	1550nm, CWDM DFB Laser
2405EO57-HD	1570nm, CWDM DFB Laser
2405EO59-HD	1590nm, CWDM DFB Laser
2405EO61-HD	1610nm, CWDM DFB Laser

All 2405 modules include power supply
Note: *Enclosure with side mount flanges ships standard*

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

Case Option Suffix

+NF	Enclosure without mounting flanges

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

HDTV Miniature Optical Receiver, 19.4Mb/s to 1.5Gb/s

1d

Model 2405OE-HD



The 2405OE-HD accepts a SMPTE 292M (1.485 Gb/s) optical input and provides two reclocked electrical outputs for further signal distribution. The module also provides a non-reclock mode to operate at data rates from 19.4Mb/s to 1.5Gb/s.

The 2405OE-HD is ideal for use in portable, remote and link extension applications where the small size, rugged enclosure and high performance operation meet the stringent requirements of these applications.

The 2405OE-HD is available with SC, ST and FC connector options.

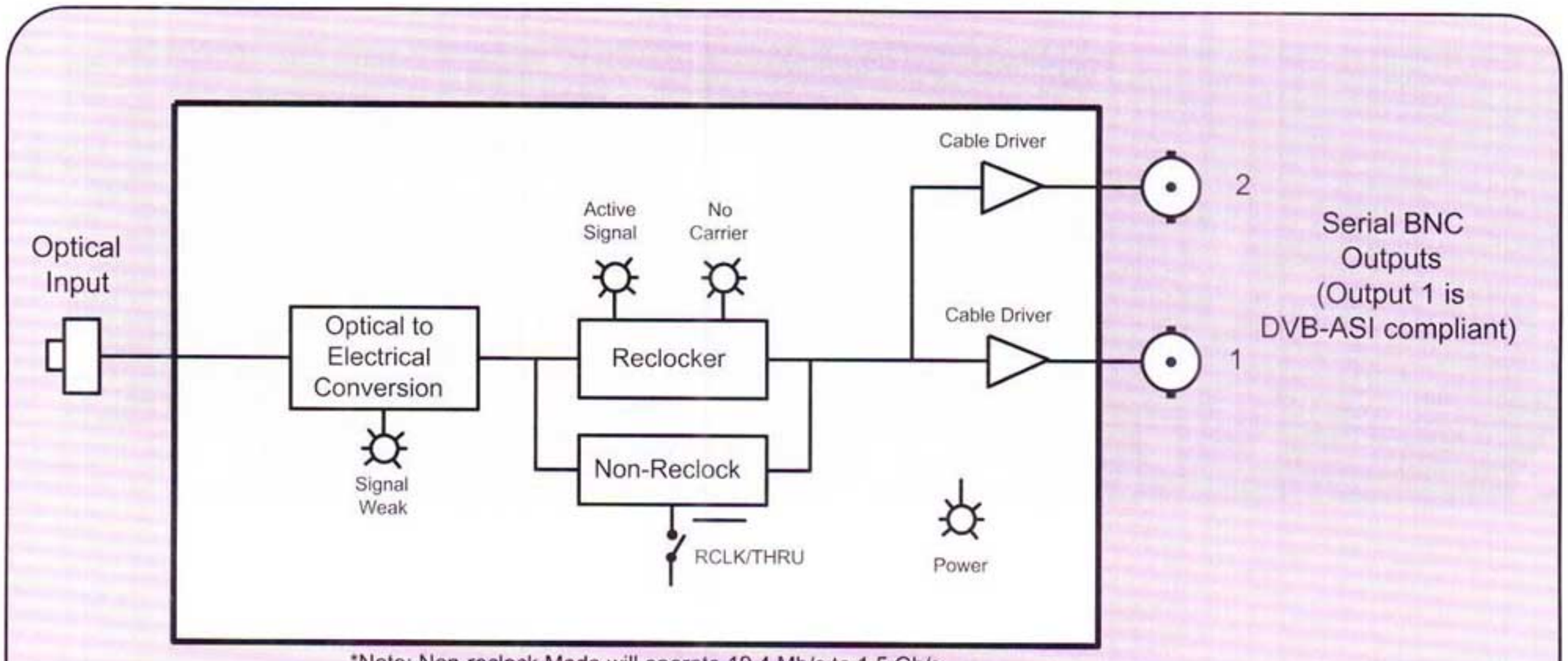
Features

- 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 multi-mode and single-mode fiber
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation,on threaded connector

Card Edge LED's:

- Signal presence
- Weak optical signal warning

2405OE-HD Block Diagram



*Note: Non-reclock Mode will operate 19.4 Mb/s to 1.5 Gb/s

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:	0dBm
Optical Sensitivity:	-18dBm
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 169-8
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

Physical:

Dimensions:	With Flanges: 6"L x 4"W x 1"H (152mm L x 114mm W x 25mm H) No Flanges: 6"L x 3.5"W x 1"H (152mm L x 89mm 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:
All 2405 modules include power supply

Note: *Enclosure with side mount flanges ships standard*

2405OE-HD:	HDTV Miniature Optical Receiver, 19.4Mb/s to 1.5Gb/s

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

Case Option Suffix:

+NF	Enclosure without mounting flanges

Fiber Optic Patch Cable:

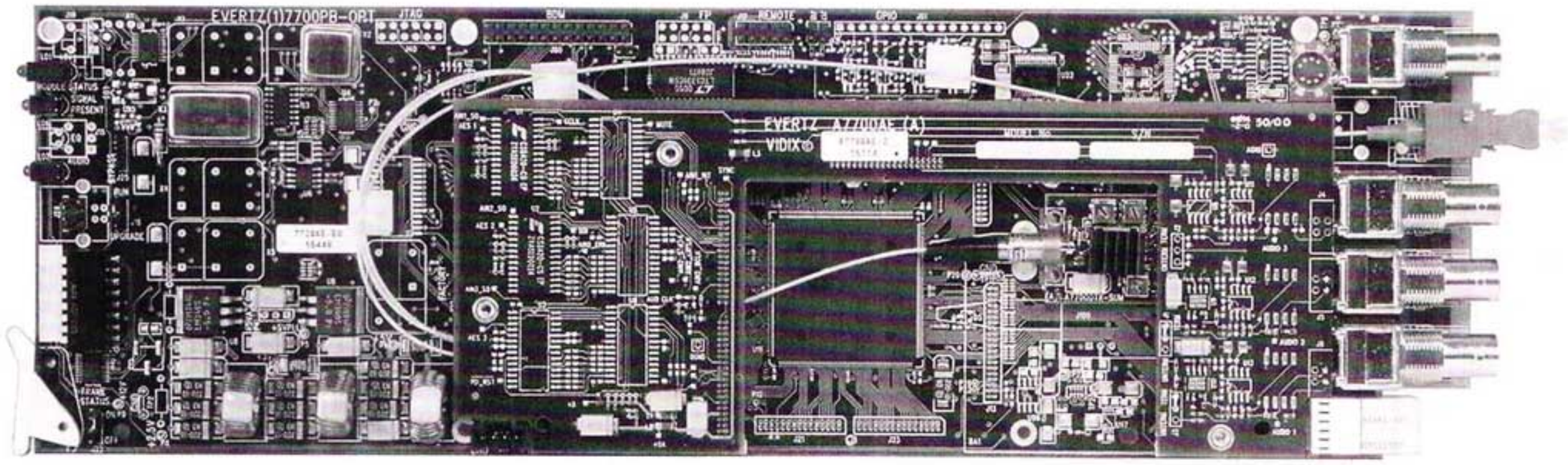
CB-FP1M-SCPC	Single mode fiber cable, 1m, SC/PC male termination
CB-FP1M-STPC	Single mode fiber cable, 1m, ST/PC male termination
CB-FP5M-SCPC	Single mode fiber cable, 5m, SC/PC male termination
CB-FP5M-STPC	Single mode fiber cable, 5m, ST/PC male termination
CB-FP10M-SCPC	Single mode fiber cable, 10m, SC/PC male termination
CB-FP10M-STPC	Single mode fiber cable, 10m, ST/PC male termination

HD AES Audio Embedder & Fiber Transmitter

1d

Model 7720AE-EO-HD

Dolby E PARTNER



The 7720AE-EO-HD Audio Embedder inserts two AES audio signals into a 1.5 Gb/s HDTV video signal as specified in SMPTE 299M. In addition to an HDSDI output the 7720AE-EO-HD provides a fiber optic output with embedded audio. The 7720AE-EO-HD will do a seamless audio embed when the input video is switched properly in the vertical interval.

SMPTE 299M allocates four groups of four audio channels that can be embedded into the SMPTE 292M bitstream. The 7720AE-EO-HD has the ability to select the Audio channel group where the audio will be inserted. The 7720AE-EO-HD is Dolby E compliant.

Features

Card Edge LEDs:

- Video Signal Presence
- Module Status
- Audio Presence - Upstream Audio Group Indicators

Controls:

- Audio group selection via card edge DIP switches
- Selectable clean or pass through embedding mechanism
- Sample rate conversion disable to permit Dolby E embedding

Inputs:

Video

- SMPTE 292M - 1.5Gb/s serial digital
- Auto equalization to 125m

Audio

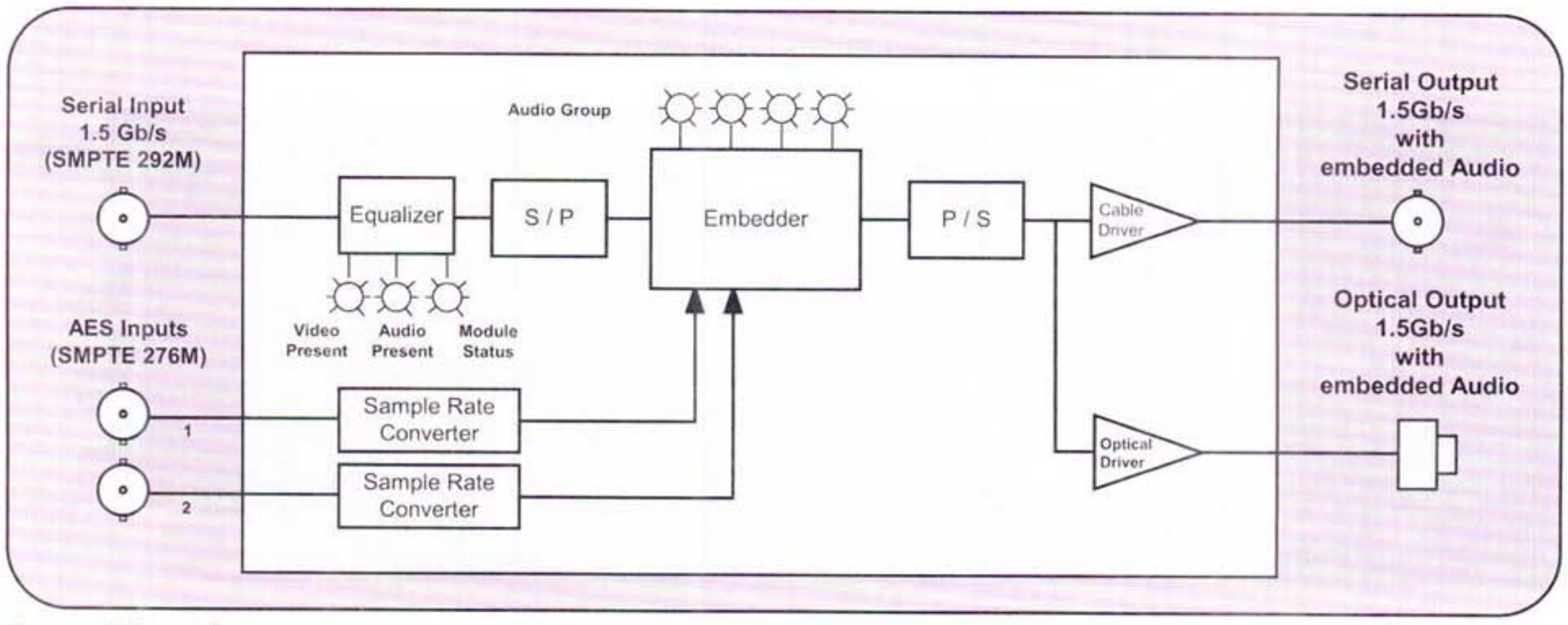
- 2 SMPTE 276M single ended AES

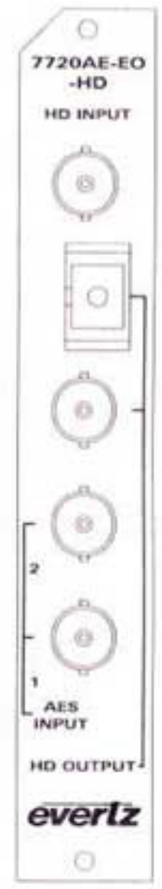
Outputs:

- 1 serial HD SDI reclocked outputs with SMPTE 299M embedded audio
- 1 reclocked fiber output with SMPTE 299M embedded audio at 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.6942. compliant)

HD AES Audio Embedder & Fiber Transmitter

7720AE-EO-HD Block Diagram





Specifications

Serial Video Input:
Standard: SMPTE 292M, (1080i/50, 1080i/60, 1080i/59.94, 1080p23.98sF, 1080p24sF, 1080p25sF, 720p/60, 720p/59.94)
Connector: BNC per IEC 169-8
Equalization: Automatic 125m @ 1.5Gb/s with Belden 1694 (or equivalent)

AES Audio Inputs:
Number of Inputs: 2
Standard: SMPTE 276M, single ended AES
Connector: BNC per IEC 169-8
Signal Level: 1V p-p ± 0.1V
Resolution: 24-bit
Sampling Rate: 48 kHz
Impedance: 75Ω unbalanced

Serial Video Output With Embedded Audio:
Number of Outputs: 1
Standard: SMPTE 292M Video, SMPTE 299M Audio
Connector: BNC per IEC 169-8
Signal Level: 800mV nominal
DC Offset: 0V ± 0.5V
Rise and Fall Time: 270ps nominal
Overshoot: <10% of amplitude
Wide Band Jitter: <0.2 UI

Optical Output:
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
Nominal Wavelength: 1310nm, 1550nm
CWDM Wavelengths: 1270nm to 1610nm (see ordering information)
Output Power:
1310nm FP: -7.5 dBm ± 1 dBm
1310nm/1550nm DFB: 0 dBm ± 1 dBm
CWDM DFB: 0 dBm ± 1dBm

System Performance:
Embedding Latency: 1.3 to 3 mSec

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: *HD AES Audio Embedder & Fiber Transmitter*

7720AE-EO13-HD	1310nm, FP, Laser
7720AE-EO13-HD-L	1310nm, DFB, Laser
7720AE-EO15-HD	1550nm, DFB, Laser

For CWDM Applications:

7720AE-EO27-HD	1270nm, CWDM DFB, Laser
7720AE-EO29-HD	1290nm, CWDM DFB, Laser
7720AE-EO31-HD	1310nm, CWDM DFB, Laser
7720AE-EO33-HD	1330nm, CWDM DFB, Laser
7720AE-EO35-HD	1350nm, CWDM DFB, Laser
7720AE-EO37-HD	1370nm, CWDM DFB, Laser
7720AE-EO43-HD	1430nm, CWDM DFB, Laser
7720AE-EO45-HD	1450nm, CWDM DFB, Laser
7720AE-EO47-HD	1470nm, CWDM DFB, Laser
7720AE-EO49-HD	1490nm, CWDM DFB, Laser
7720AE-EO51-HD	1510nm, CWDM DFB, Laser
7720AE-EO53-HD	1530nm, CWDM DFB, Laser
7720AE-EO55-HD	1550nm, CWDM DFB, Laser
7720AE-EO57-HD	1570nm, CWDM DFB, Laser
7720AE-EO59-HD	1590nm, CWDM DFB, Laser
7720AE-EO61-HD	1610nm, CWDM DFB, 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:

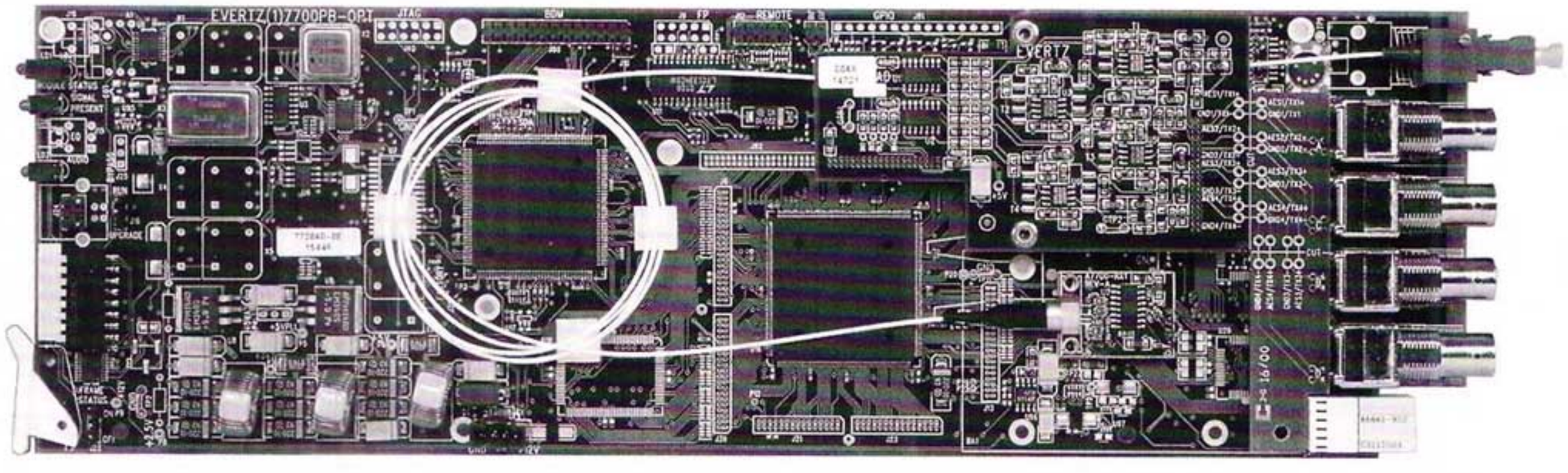
7700FR-C	3RU Multiframe, which holds 15 modules
7701FR	1RU Multiframe, which holds 3 modules
S7701FR	Standalone enclosure

HD AES Audio De-embedder & Fiber Receiver

1d

Model 7720AD-OE-HD

Dolby E PARTNER



The 7720AD-OE-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 7720AE-EO-HD facilitates multiplexing and conversion at the source.

SMPTE 299M allows for up to four groups (4 channels/group) to be embedded within a serial HDTV signal. The 7720AD-OE-HD can de-embed one audio group onto two single ended AES outputs. The de-embedded audio can be delayed up to 3 seconds to retime audio to match video processing delays. The 7720AD-OE-HD is Dolby E compliant.

Features

Card Edge LED's:

- Video Signal presence
- Module Status
- Audio Presence - Audio Group Indicator

Controls:

- Audio group selection via card edge DIP switches
- Audio channel swapping selection via card edge DIP switches

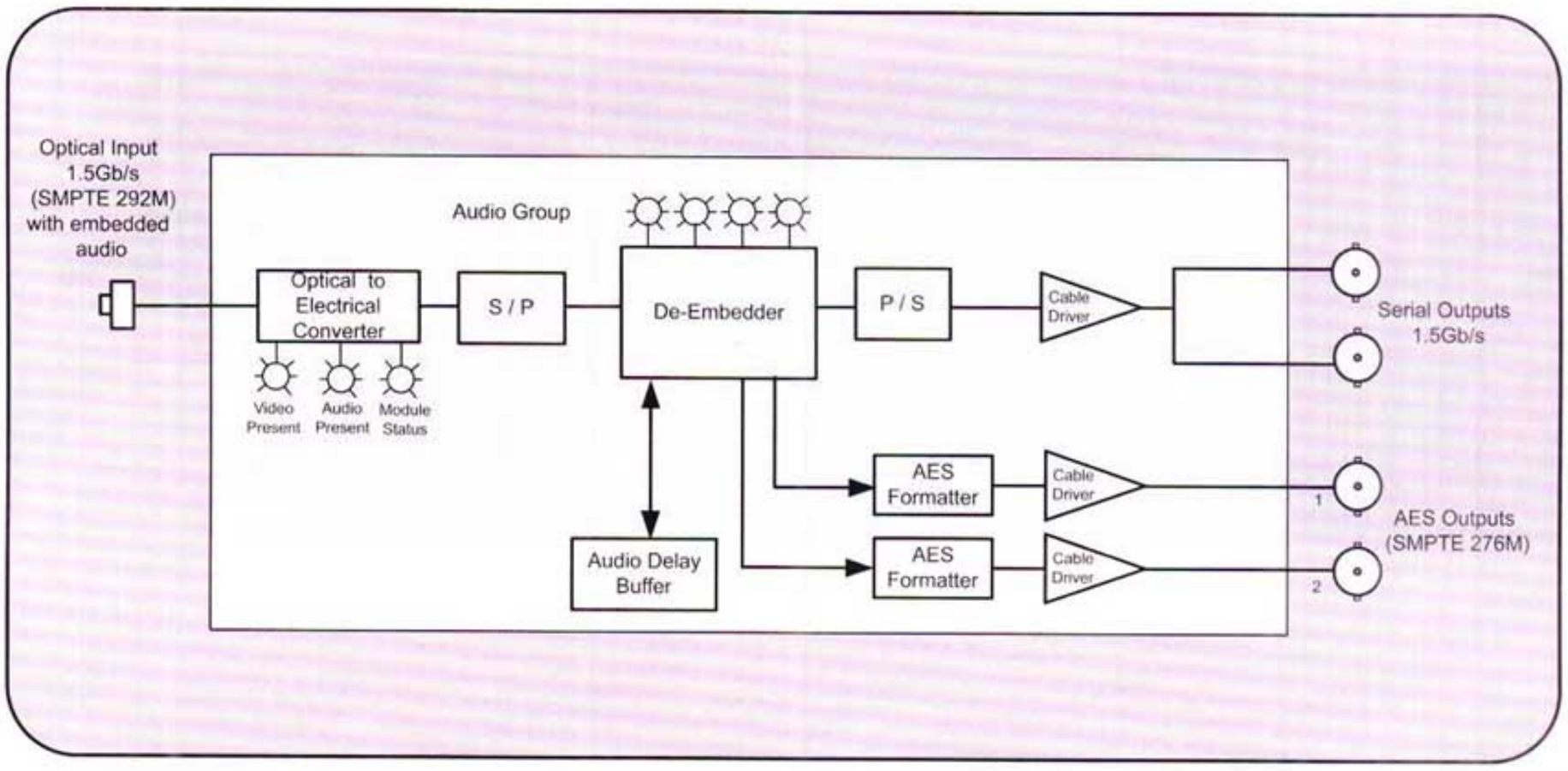
Inputs:

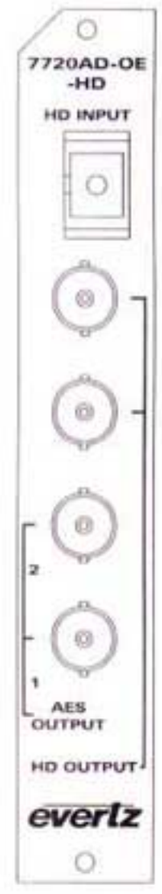
- SMPTE 292M - 1.5Gb/s serial digital on fiber optic input

Outputs:

- 2 serial HD-SDI outputs
- 2 single ended AES outputs

7720AD-OE-HD Block Diagram





Specifications

Optical Input:

Number of Inputs:	1
Connector:	SC/PC, ST/PC, FC/PC Female housing
Operating Wavelength:	1270nm to 1610nm
Maximum Input Power:	0dBm
Optical Sensitivity:	-17dBm

Reclocked Serial Video Output:

Standard:	SMPTE 292M
Number of Outputs:	2
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	270ps nominal
Overshoot:	<10% of amplitude
Wide Band Jitter:	<0.2 UI

AES Audio Output:

Standard:	SMPTE 276M, single ended AES
Number of Outputs:	2
Connector:	BNC per IEC 169-8
Sampling Rate:	48kHz
Impedance:	75Ω
Delay:	9 samples to approx. 3 seconds (user adjustable)
Resolution:	24-bit

System Performance:

Deembedding Latency:	
HD SDI to AES:	1.35 mSec (7720AD-A4-HD) 600 mSec all other versions
HD SDI to Analog:	2.25 mSec

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:

7720AD-OE-HD	HD AES Audio De-embedder & 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

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

Note: This module not available in a standalone enclosure

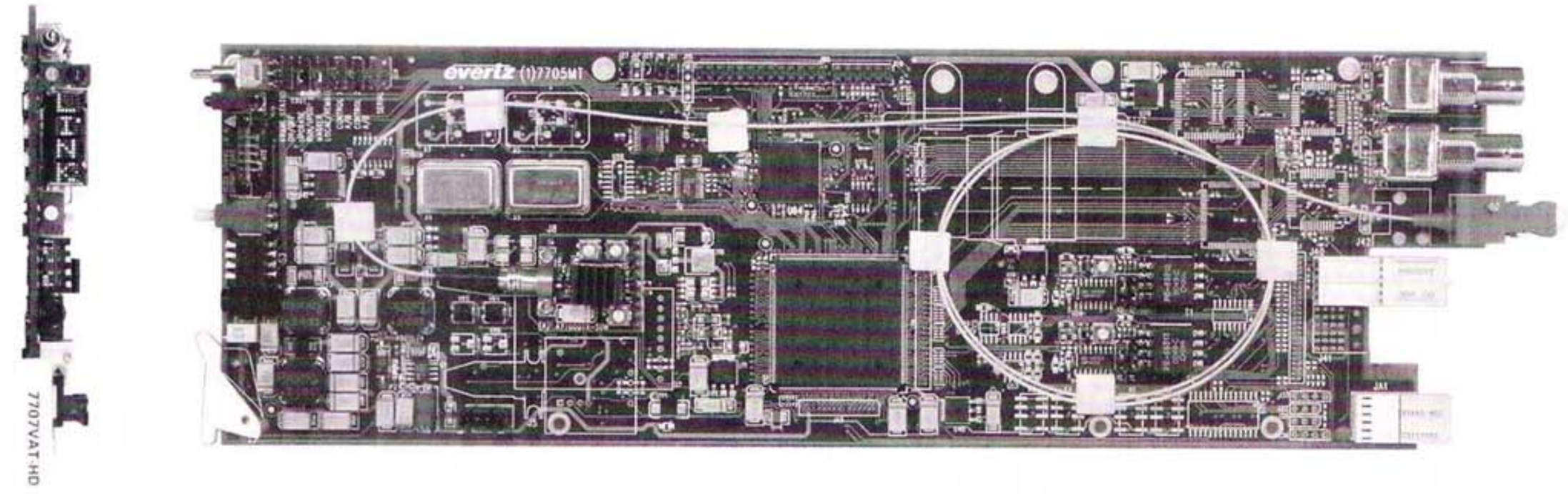
HD-SDI with 4 AES Audio Fiber Transmitter

1d

Model 7707VAT-HD

Dolby E PARTNER

VistaLINK™



The 7707VAT-HD is a VistaLINK™ - enabled, fiber transmitter for HDTV or SDTV video and AES audio. This single card module accepts one HD-SDI, SDI or DVB-ASI video plus four AES audio signals, combines them using Time Domain Multiplexing (TDM) technology and transmits them over a single fiber. The companion 7707VAR-HD HD-SDI and AES Audio Fiber Receiver demultiplexes the signals and converts them back to separate HDTV or SDTV video and AES audio feeds.

The 7707VAT-HD and companion 7707VAR-HD will transparently pass incoming HDTV or SDTV 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 provided.

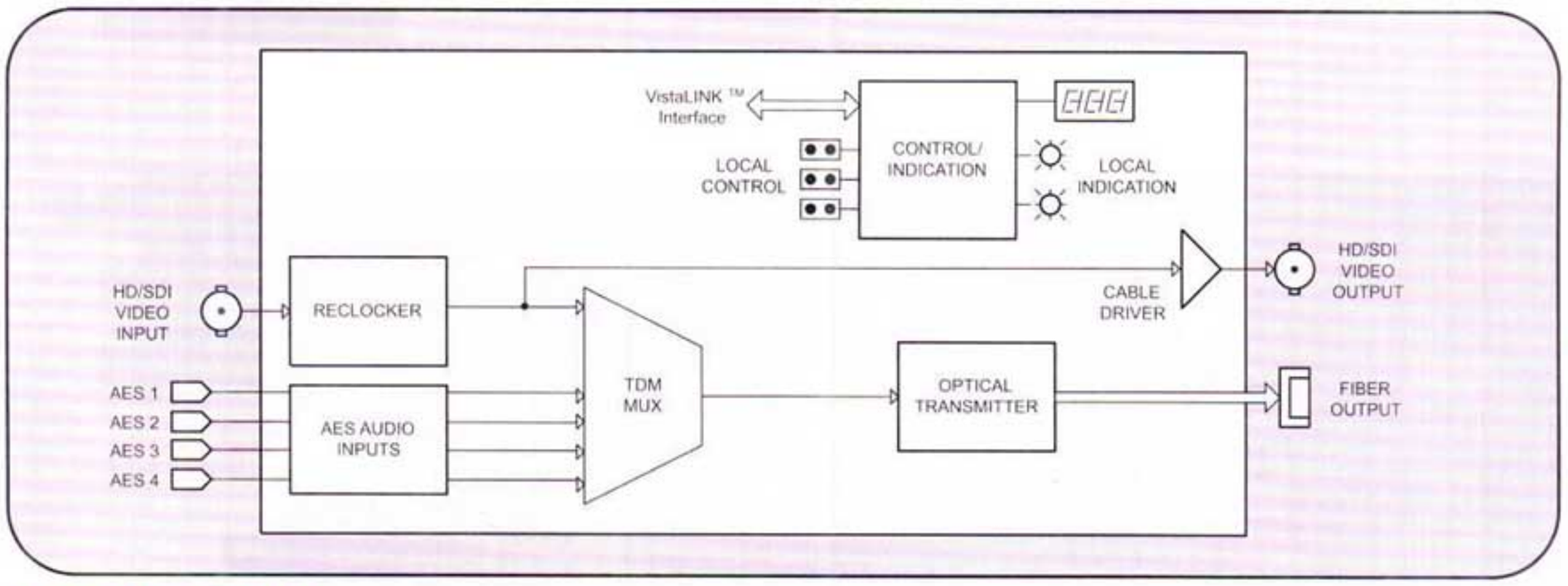
The fiber output is available in an assortment of optical wavelengths, accommodating 1310/1550nm, CWDM and DWDM transmission schemes. The 7707VAT-HD occupies one card slot and can be housed in the 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

Features

- Single card multiplexor for HDTV or SDTV video and four AES audio
- Supports all HDTV video formats @1.485Gb/s
- Supports 525/625 line component 4:2:2 @270Mb/s
- Supports 32, 44.1, 48 kHz AES audio inputs
- AES audio inputs can be synchronous or asynchronous to each other and/or to input video
- Dolby E compatible
- Reclocked HD-SDI/SDI output for additional signal distribution or monitoring
- Signal transport over fiber uninterrupted by loss of video or AES audio input feeds
- Low audio to video latency over transport interface
- Comprehensive signal and status monitoring via four-digit card-edge display, or remotely through SNMP and VistaLINK™ - enabled capability
- Local display of input coaxial cable length equalization
- Automatic coaxial input equalization to 130m at 1.485Gb/s and 300m at 270Mb/s (Belden 1694)
- 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.692 compliant) also available

HD-SDI with 4 AES Audio Fiber Transmitter

7707VAT-HD Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 292M, SMPTE 259M-C, DVB-ASI
Connector:	1 BNC input per IEC 169-8
Equalization:	Automatic to 130m @ 1.485 Gb/s and 300m @ 270 Mb/s with Belden 1694 (or equivalent)
Return Loss:	> 15 dB up to 1.485Gb/s

Serial Video Output:

Number of Outputs:	1 Per Card reclocked
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ± 0.5V
Rise and Fall Time:	< 270ps for HD, < 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 Inputs:	4 (Jumper selectable for balanced or unbalanced)
Standard:	
Unbalanced AES:	SMPTE 276M
Balanced AES:	AES3-1992
Connector:	12 pin removable terminal block
Signal Level:	
Unbalanced:	1V p-p ±0.1V
Balanced:	0.2 to 7Vp-p
Equalization:	Up to 500m @ 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

System Performance: (7707VAT-HD +7707VAR-HD)

Video Input To Output Delay:	< 1.5 µs
Audio to Video delay:	< 1µs

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)	-7.5dBm ± 1dBm
1550nm & CWDM DFB	0dBm ± 1dBm
DWDM DFB	7dBm ± 1dBm
Fiber Size:	9 µm core / 125 µm overall

Electrical:

Voltage:	+12VDC
Power:	11 Watts (Non-DWDM) 13 Watts (DWDM)
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Ordering Information:

HD-SDI with 4 AES Audio Fiber Transmitter, VistaLINK™ Monitoring

7707VAT13-HD	1310nm, FP Laser
7707VAT15-HD	1550nm, DFB Laser

For CWDM Applications:

7707VAT27-HD	1270nm, CWDM DFB Laser
7707VAT29-HD	1290nm, CWDM DFB Laser
7707VAT31-HD	1310nm, CWDM DFB Laser
7707VAT33-HD	1330nm, CWDM DFB Laser
7707VAT35-HD	1350nm, CWDM DFB Laser
7707VAT37-HD	1370nm, CWDM DFB Laser
7707VAT43-HD	1430nm, CWDM DFB Laser
7707VAT45-HD	1450nm, CWDM DFB Laser
7707VAT47-HD	1470nm, CWDM DFB Laser
7707VAT49-HD	1490nm, CWDM DFB Laser
7707VAT51-HD	1510nm, CWDM DFB Laser
7707VAT53-HD	1530nm, CWDM DFB Laser
7707VAT55-HD	1550nm, CWDM DFB Laser
7707VAT57-HD	1570nm, CWDM DFB Laser
7707VAT59-HD	1590nm, CWDM DFB Laser
7707VAT61-HD	1610nm, CWDM DFB Laser

For DWDM Application: Contact Factory

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

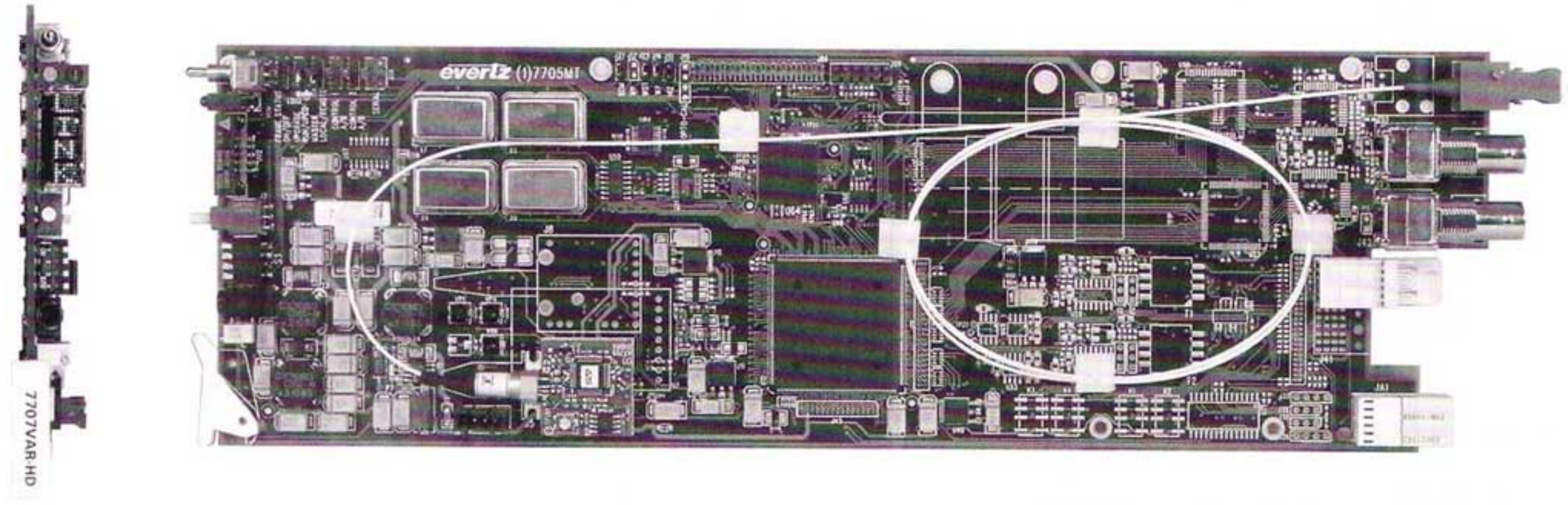
HD-SDI with 4 AES Audio Fiber Receiver

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Model 7707VAR-HD

Dolby E PARTNER





The 7707VAR-HD is a VistaLINK™ - enabled fiber optic receiver for HDTV or SDTV Video and AES Audio. This single card module demultiplexes one HD-SDI, SDI or DVB-ASI video plus four AES Audio signals that have been Time Domain Multiplexed (TDM) by the companion 7707VAT-HD HD-SDI and AES Audio Fiber Transmitter module. Evertz SoftSwitch™ technolog is also applied top demultiplexed AES audio signals to mitigate audio pops and maintain properly formatted AES output sequences when upstream AES feeds are hot-switched.

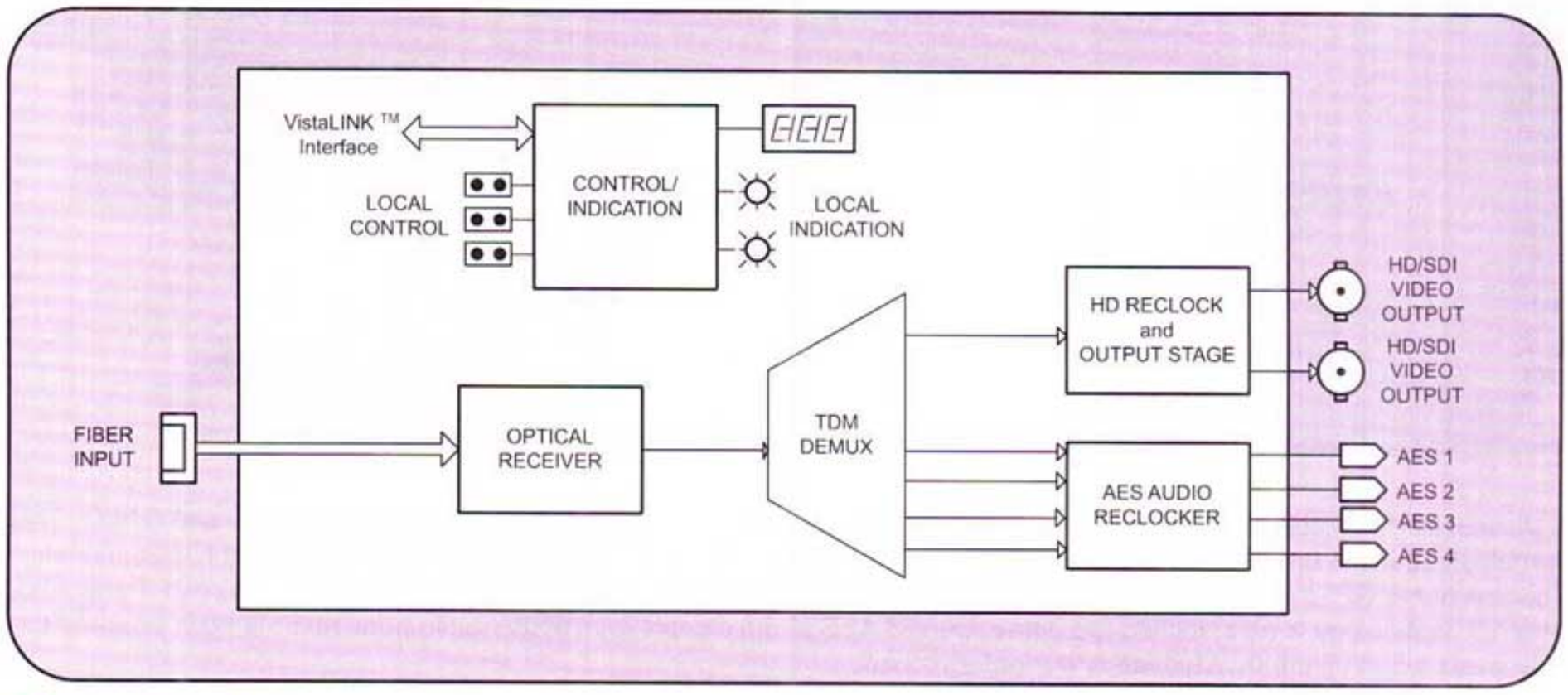
The 7707VAR-HD and companion 7707VAT-HD will transparently pass incoming HDTV or SDTV video feeds with embedded AES audio or any other data in the horizontal or vertical ancillary data space. Minimal Audio to Video latency over the transport interface is also achieved.

The 7707VAR-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.

Features

- Single card demultiplexer for HDTV or SDTV Video and four AES audio
- Supports all HDTV video formats @1.485Gb/s
- Supports 525/625 line component 4:2:2 @270Mb/s
- Supports 32, 44.1, 48 kHz AES audio
- Incorporates Evertz SotftSwitch™ technology (patent pending) for protection again AES discontinuities when upstream AES feeds are switched
- Low Audio to Video latency
- HD/SDI Video regeneration for jitter reduction
- Dolby E compatible
- Comprehensive signal and status monitoring via four-digit card-edge display, or remotely through SNMP and VistaLINK™ enabled capability
- Local display of optical signal strength, video and audio presence, video and AES formats
- 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

7707VAR-HD Block Diagram





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:	0dBm
High Sensitivity -H version:	-7dBm
Optical Sensitivity:	
Standard:	-18dBm
High Sensitivity -H version:	-28dBm

Serial Video Outputs:

Number of Outputs:	2 regenerated
Standard:	SMPTE 292M, SMPTE 259M-C, DVB-ASI
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	< 270ps for HD, < 900ps for SD
Overshoot:	<10% of amplitude
Return Loss:	> 15dB up to 1.485Gb/s
Wide Band Jitter:	< 0.2 UI

AES Audio Outputs:

Standards	
Unbalanced AES:	SMPTE 276M
Balanced AES:	AES3-1992
Number of Outputs:	4 regenerated (Jumper selectable for balanced or unbalanced output)
Connector:	12 pin removable terminal block
Signal Level:	
Unbalanced:	1 Vp-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 (7707VAT-HD + 7707VAR-HD):

Video Input To Output Delay:	< 1.5 µs
Audio to Video delay:	< 1µs

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-HD	HDTV with 4 video AES 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

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

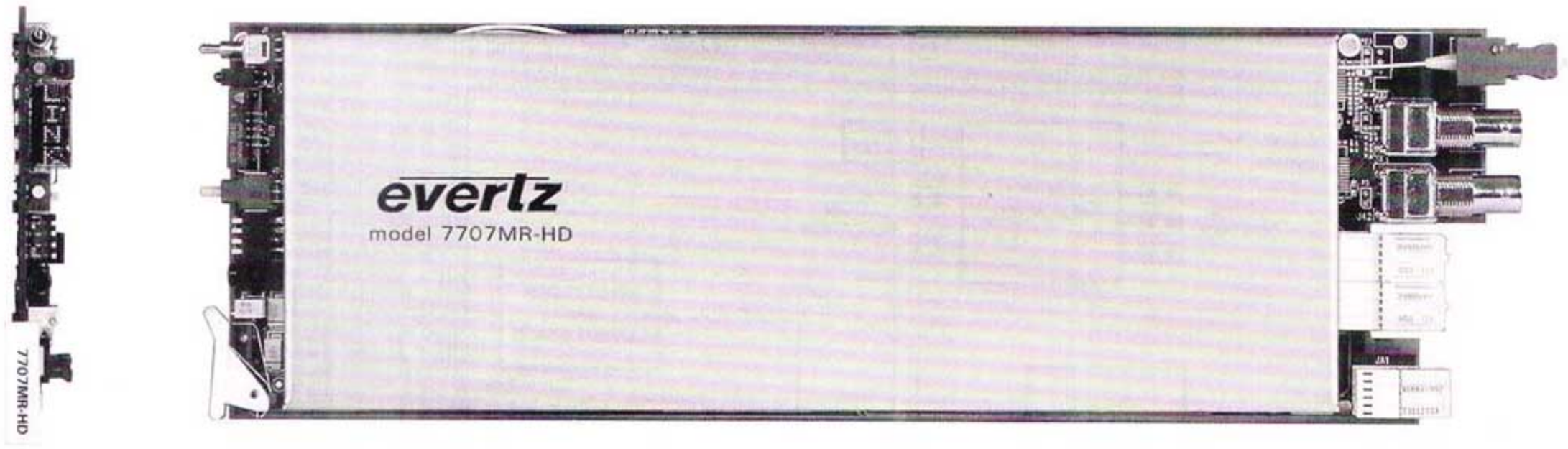
Enclosures:

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

HD-SDI, 4 AES Audio Bi-Directional RS232/422, 1 GPI/GPO, Fiber Receiver

Model 7707MR-HD





The 7707MR-HD is a VistaLINK™ - enabled fiber optic receiver for HDTV or SDTV Video, AES Audio, RS-232/422 control, and GPI/O. This single card module demultiplexes one uni-directional HDTV, SDTV or DVB-ASI Video, four uni-directional AES Audio, one bi-directional RS-232/422 and one bi-directional GPI and GPO that have been time domain multiplexed (TDM) by the companion 7707MT-HD Transmitter module. Evertz SoftSwitch™ technology is also applied top demultiplexed AES audio signals to mitigate audio pops and maintain properly formatted AES output sequences when upstream AES feeds are hot-switched.

The 7707MR-HD and companion 7707MT-HD will transparently pass incoming 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 1310nm/1550nm, CWDM and DWDM transmission schemes.

The 7707MR-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.

Features

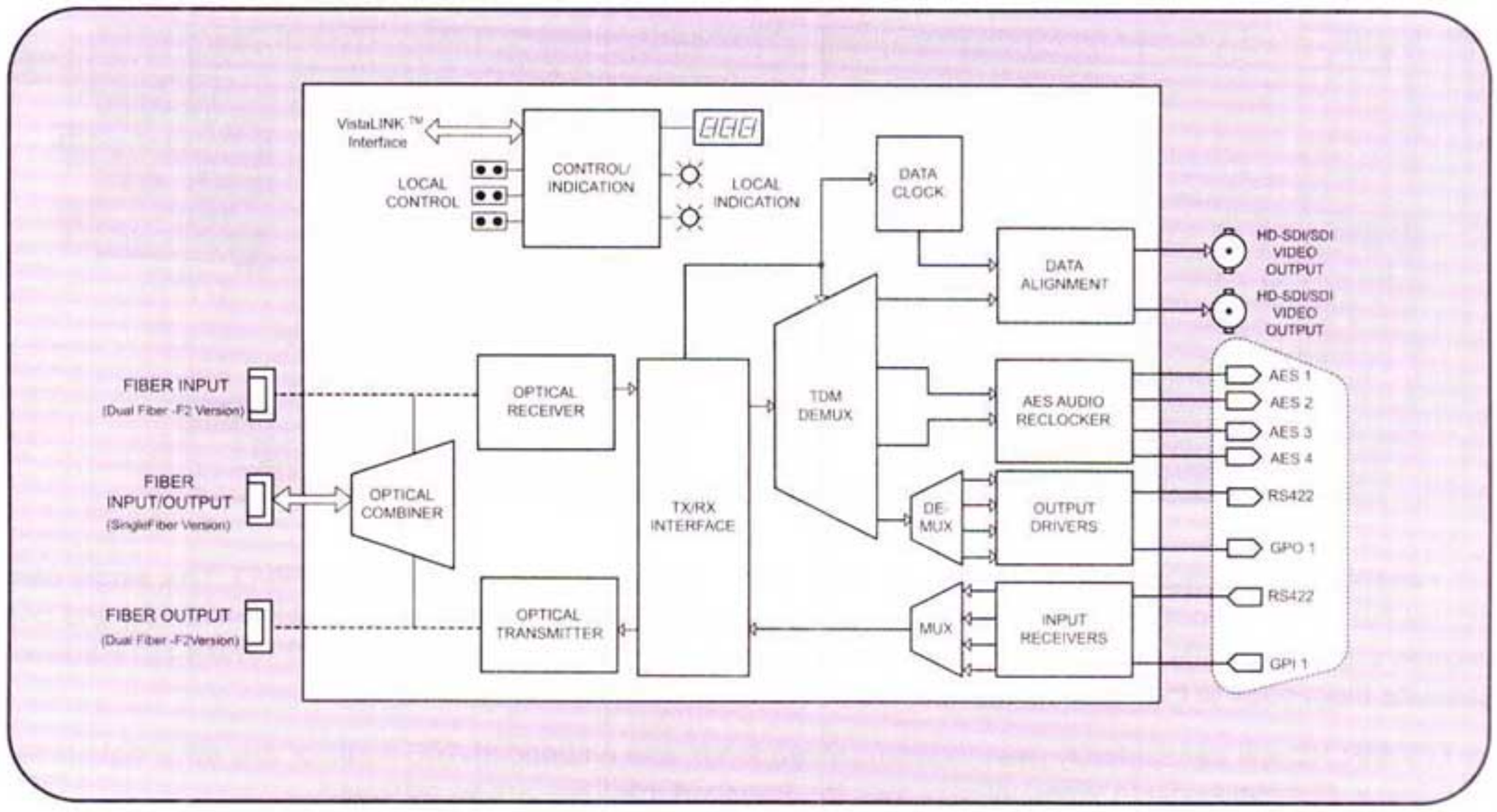
- Single card demultiplexer for HDTV, SDTV or DVB-ASI Video, 4 AES Audio, 1 bi-directional RS232/422 and 1 GPI/O
- Bi-directional optical input/output
- Supports all SMPTE 292M (1.485Gb/s) rates and standards
- Supports 525 or 625 line 4:2:2 component SDI (270Mbs) signals
- Supports 32, 44.1, 48 kHz AES audio
- Supports bi-directional RS-422 rates up to 3 Mb/s
- Supports 1 GPI and 1 GPI/O
- Incorporates Evertz SotftSwitch™ technology for protection again AES discontinuities when upstream AES feeds are switched
- Low Audio to Video latency
- Dolby E compatible
- Signal transport over fiber uninterrupted by loss of input Video, AES, Serial Data or GPIO feeds
- Built-in jitter attenuation
- Comprehensive signal and status monitoring via four-digit card-edge display, or remotely through SNMP and VistaLINK™ enabled capability
- Local display of optical signal strength, video, audio, and data presence, video and AES formats, GPI and GPO status
- Fully hot-swappable from front of frame with no fiber disconnect/reconnect required
- 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.692 compliant) also available
- Supports single mode and multi-mode (-F2 version) fiber optic cable

7707MR-HD Application Configurations

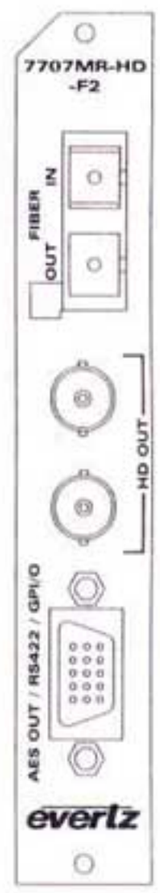
FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<1km	7707MR13-HD-F2	-7dBm	7707MT13-HD-F2	-18dBm	1310nm on Tx & Rx fibers
Single-Mode	2	11dB/20km	7707MR13-HD-F2	-7dBm	7707MT13-HD-F2	-18dBm	1310nm on Tx & Rx fibers
Single-Mode	1	5dB/10km*	7707MR13-HD	-9dBm	7707MT13-HD	-14dBm	1310nm, bi-directional, one fiber
Single-Mode	1(WDM)	15dB/35km	7707MR13L-HD-W	-1dBm	7707MT15-HD-W	-16dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	14dB/45km**	7707MRyy-HD-F2	0dBm	7707MTxx-HD-F2	-18dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(CWDM)	23dB/75km**	7707MRyy-HD-F2-H	0dBm	7707MTxx-HD-F2-H	-27dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**, high sensitivity receiver
Single-Mode	1(DWDM)	30dB/100km**	7707MRyyyy-HD-F2	+7dBm	7707MTxxxx-HD-F2-H	-27dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux**, high sensitivity receiver

*** With >20dB return loss on fiber interface**
****Assumes 8 Ch Mux/Demux loss of 3.5dB**
Tx Power/Rx Sensitivity are nominal values ±1dBm
Fiber loss= 0.4/0.3dB per km @1310nm/1550nm

7707MR-HD Block Diagram







Specifications

Optical Input/Output:
Connector:
Single Fiber: 1 Female SC/PC, ST/PC or FC/PC
Dual Fiber (F2): 2 Female SC/PC, ST/PC or FC/PC
Return Loss: > 14dB
Input Wavelengths: 1270nm to 1610nm
Maximum Input Power: 0 dBm(standard), -7dBm (-F2-H versions)
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
Standard: SMPTE 292M, SMPTE 259M-C, DVB-ASI
Connector: BNC per IEC 169-8
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: < 270ps for HD, < 900ps for SD
Overshoot: < 10% of amplitude
Return Loss: > 15dB up to 1.485Gb/s
Wide Band Jitter: < 0.2 UI

AES Audio Outputs:
Number of Outputs: 2 regenerated (Jumper selectable for balanced or unbalanced)
Standard:
Unbalanced AES: SMPTE 276M
Balanced AES: AES3-1992
Connector: 8 pins on female high density DB-15
Signal Level:
Unbalanced: 1 Vp-p
Balanced: 5 Vp-p
Resolution: Up to 24-bits
Sampling Rate: 32, 44.1, 48 kHz
Intrinsic Jitter: < 20ns
Impedance: 75Ω (unbalanced), 110Ω (balanced)

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: 1
Type: Opto-isolated, active low with internal pull-ups to +5V
Connector: 1 pin on female high density DB-15
Signal Drive Level: Open or closure to ground

General Purpose Outputs:
Number of Outputs: 1
Type: "Dry Contact" relay closure
Connector: 1 pin on female high density DB-15
Signal Level: Normally closed or normally open (jumper settable)

System Performance (7707MT-HD & 7707MR-HD):
Video Input To Output Delay: <2 µs
Audio to Video delay: < 1µs

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: 1

Ordering Information: *HD-SDI, 4 AES Audio, Bi-Directional RS232/422, 1 GPI/GPO, Fiber Receiver, VistaLINK™ Monitoring*

7707MR13-HD	Single fiber, 1310nm, FP Laser on Tx and Rx
7707MR13L-HD-W	Single fiber, WDM, 1310nm, DFB TX, RX on 1550nm
7707MR13-HD-F2	Dual fiber, 1310nm, FP on TX and RX
7707MRxx-HD-F2	Dual fiber, CWDM wavelength on TX where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

For Long Distance CWDM Applications:

7707MRxx-HD-F2-H	Dual fiber, CWDM wavelength on TX where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

For DWDM Applications: Contact Factory

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

HD-SDI, 4 AES Audio, Bi-Directional RS-232/422, 1 GPI/GPO, Fiber Transmitter Transmitter

Model 7707MT-HD



The 7707MT-HD is a VistaLINK™ - enabled, fiber transmitter for HDTV or SDTV Video, AES Audio, RS-232/422 and GPI/O. This single card module transports one uni-directional HDTV, SDTV or DVB-ASI Video, four uni-directional AES Audio, one bi-directional RS-422/232 and one bi-directional GPI and GPO. All signals are time domain multiplexed and transmitted over optical fiber(s). The companion 7707MR-HD Receiver demultiplexes the signals and converts them back to their original formats.

The 7707MT-HD and companion 7707MR-HD will transparently pass incoming 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 1310nm/1550nm, CWDM and DWDM transmission schemes.

The 7707MT-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.

Features

- Single card TDM Mux for HDTV, SDTV or DVB-ASI Video, 4 AES Audio, bi-directional RS-232/422 and 1 GPI/O
- Bi-directional optical input/output
- Supports all SMPTE 292M (1.485Gb/s) rates/standards
- Supports 525 or 625 line 4:2:2 component SDI, (270 Mb/s) signals
- Supports 32, 44.1, 48 kHz AES audio inputs
- Supports bi-directional RS422 rates up to 3Mb/s
- Supports 1 GPI and 1 GPO
- Reclocked HD or SD output for additional signal distribution
- AES audio inputs can be synchronous or asynchronous to each other and/or to input video
- Dolby E compatible
- Signal transport over fiber uninterrupted by loss of Video, AES, Serial Data or GPI/O input feeds
- Low audio to video latency over transport interface
- Comprehensive signal and status monitoring via four-digit card-edge display, or remotely through SNMP and VistaLINK™ - enabled capability
- 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 1694)
- Fully hot-swappable from front of frame with no fiber disconnect/reconnect required
- 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.692 compliant) also available
- Supports single-mode and multi-mode (-F2 version) fiber optic cable

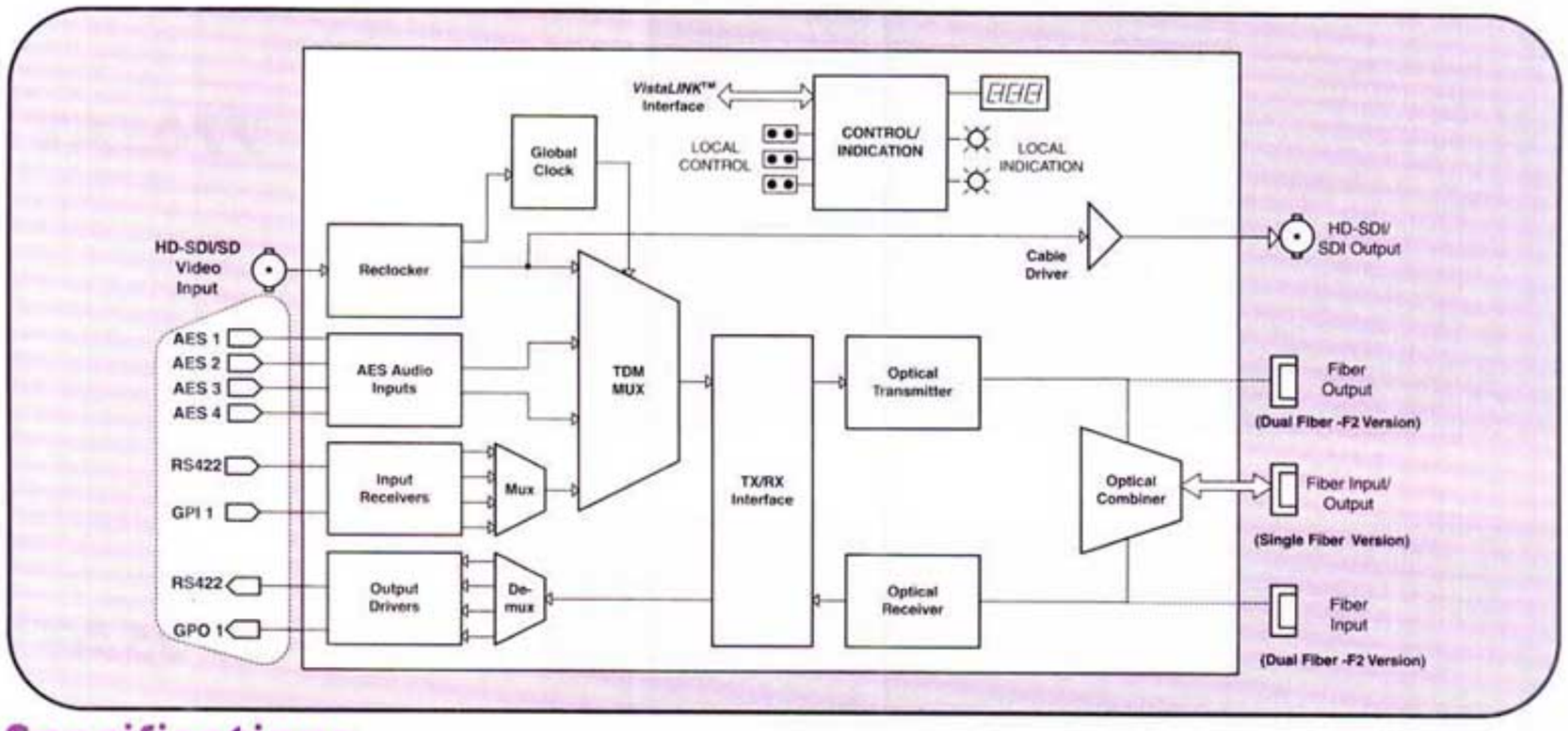
7707MT-HD Application Configurations

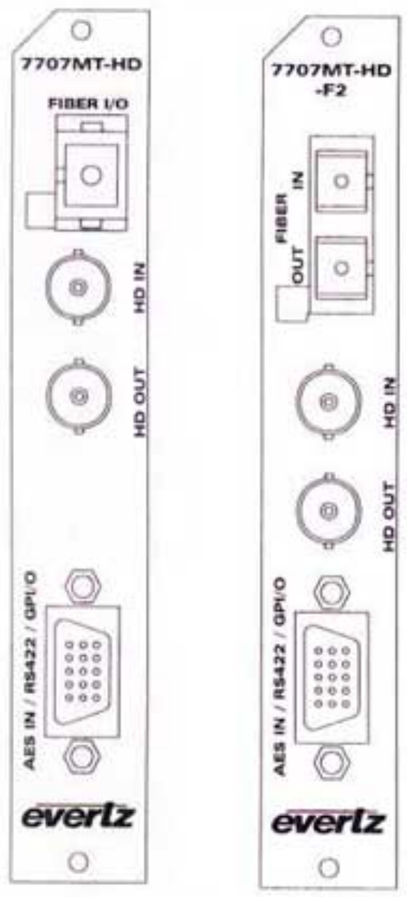
FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	< 1km	7707MT13-HD-F2	-7dBm	7707MR13-HD-F2	-18dBm	1310nm on Tx & Rx fibers
Single-Mode	2	11dB/20km	7707MT13-HD-F2	-7dBm	7707MR13-HD-F2	-18dBm	1310nm on Tx & Rx fibers
Single-Mode	1	5dB/10km*	7707MT13-HD	-9dBm	7707MR13-HD	-14dBm	1310nm, bi-directional, one fiber
Single-Mode	1(WDM)	15dB/35km	7707MT15-HD-W	-1dBm	7707MR13L-HD-W	-16dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	14dB/45km**	7707MTyy-HD-F2	0dBm	7707MRxx-HD-F2	-18dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(CWDM)	23dB/75km**	7707MTyy-HD-F2-H	0dBm	7707MRxx-HD-F2-H	-27dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**, high sensitivity receiver
Single-Mode	1(DWDM)	30dB/100km**	7707MTyyyy-HD-F2-H	+7dBm	7707MRxxxx-HD-F2-H	-27dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux**, high sensitivity receiver

*** With >20dB return loss on fiber interface**
****Assumes 8 Ch Mux/Demux loss of 3.5dB**
Tx Power/Rx Sensitivity are nominal values ±1dBm
Fiber loss= 0.4/0.3dB per km @1310nm/1550nm

HD-SDI, 4 AES Audio Bi-Directional RS-232/422, 1 GPI/GPO, Fiber Transmitter

7707MT-HD Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 292M, SMPTE 259M-C, DVB-ASI
Connector:	1 BNC input per IEC 169-8
Equalization:	Automatic to 130m @ 1.485 Gb/s and 300m @ 270 Mb/s with Belden 1694A or equivalent cable
Return Loss:	> 15 dB up to 1.485 Gb/s

Serial Video Output:

Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	< 270ps for HD, < 900ps for SD
Overshoot:	< 10% of amplitude
Return Loss:	> 15dB up to 1.485 Gb/s
Wide Band Jitter:	< 0.2 UI

AES Audio Inputs:

Number of Inputs:	4 (Jumper selectable for balanced or unbalanced input)
Standard:	
Unbalanced AES:	SMPTE 276M
Balanced AES:	AES3-1992
Connector:	8 pins on female high density DB-15
Signal Level:	
Unbalanced:	1V p-p ±0.1V
Balanced:	0.2 to 7Vp-p
Equalization:	Up to 500m @ 48kHz with Belden 1800B or equivalent cable
Resolution:	Up to 24 bits
Sampling Rate:	32, 44.1, 48 kHz
Impedance:	75Ω (unbalanced), 110Ω (balanced)

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 for RS-422 (Determined by incoming data)

General Purpose Inputs:

Number of Inputs:	1
Type:	Opto-isolated, active low with internal pull-ups to +5V or +12V (jumper selectable)
Connector:	1 pin on female high density DB-15
Signal Drive Level:	Open or closure to ground

General Purpose Outputs:

Number of Outputs:	1
Type:	"Dry Contact" relay closure to ground
Connector:	1 pin on female high density DB-15
Signal Level:	Normally closed or normally open (jumper settable)

Optical Input/Output:

Connector:	
Single Fiber:	1 Female SC/PC, ST/PC or FC/PC
Dual Fiber (F2):	2 Female SC/PC, ST/PC or FC/PC
Return Loss:	> 14dB
Input Wavelengths:	1270nm to 1610nm
Maximum Input Power:	0dBm(standard), -7dBm (-F2-H)
Input Optical Sensitivity:	See Application Configurations Chart
Output Wavelengths:	See Ordering Information
Output Power:	See Application Configurations Chart

System Performance (7707MT-HD + 7707MR-HD):

Video Input To Output Delay:	< 2 µs
Audio to Video delay:	< 1µs

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:	1

Ordering Information: *HD-SDI , 4 AES Audio, Bi-Directional RS-232/422, 1 GPI/ GPO, Fiber Transmitter, VistaLINK™ Monitoring*

7707MT13-HD	Single fiber, 1310nm, FP on Tx and Rx
7707MT15-HD-W	Single fiber, WDM, 1550nm DFB Tx, Rx on 1310nm
7707MT13-HD-F2	Dual Fiber, 1310nm FP Tx and Rx
7707MTxx-HD-F2	Dual Fiber, CWDM wavelength on Tx where xx = 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

For Long Distance CWDM Applications

7707MTxx-HD-F2-H	Dual Fiber, CWDM wavelength on Tx where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

For DWDM Applications: Contact Factory

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:

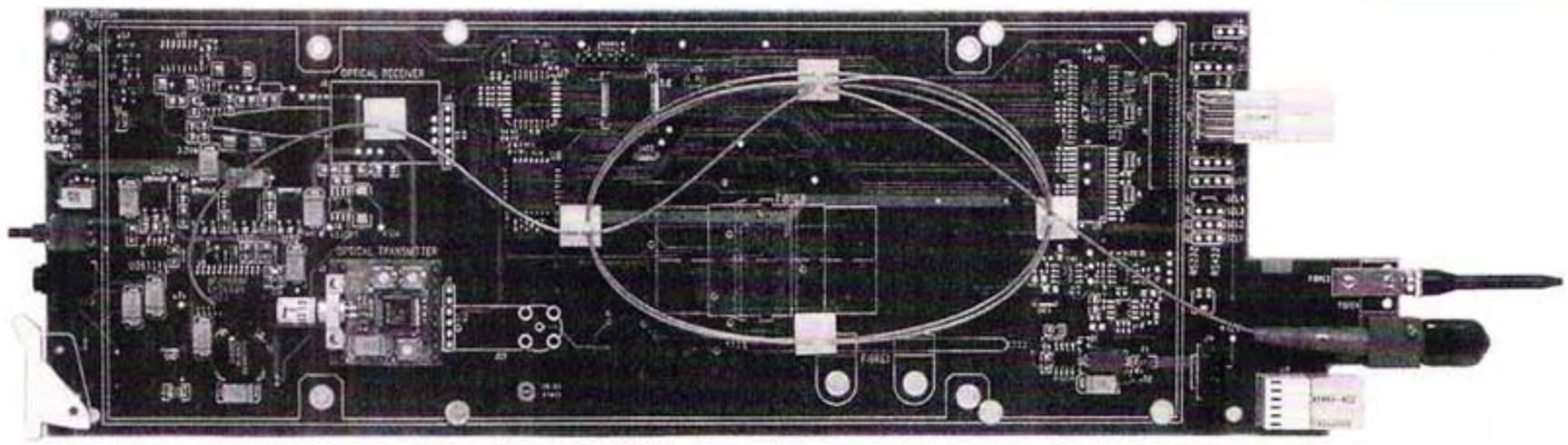
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

Multi-Channel AES Audio Fiber Transmitter Mux

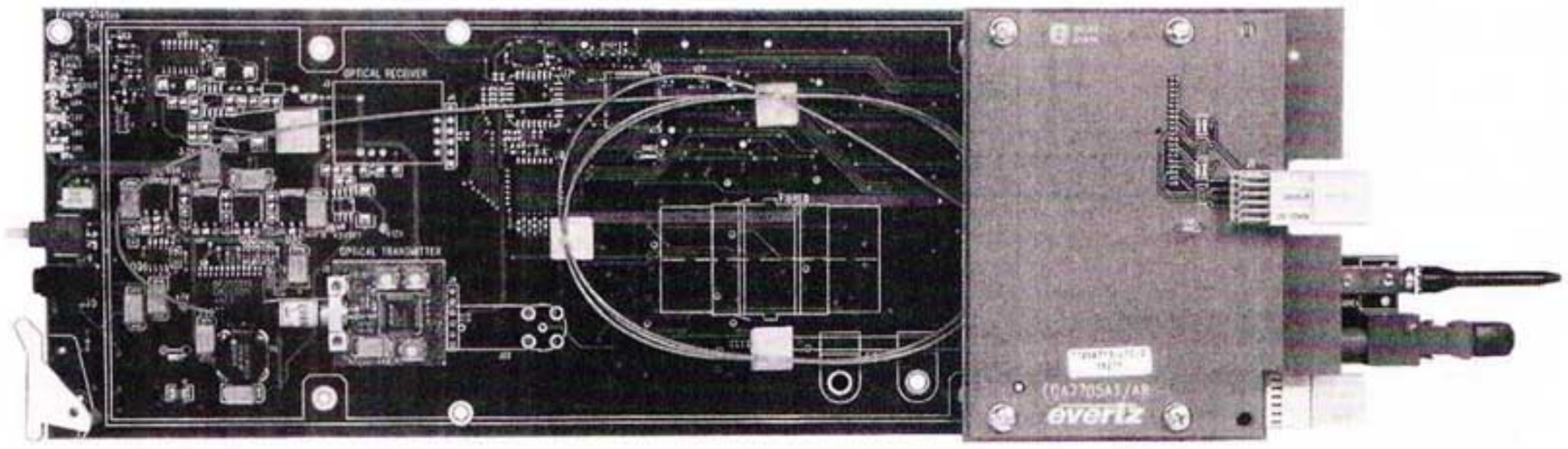
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Models 7705AT/7705AT-2

Dolby E PARTNER



7705AT



7705AT2

The 7705AT AES Audio Fiber Transmitter Mux provides an economical method of transmitting up to six AES audio signals (twelve mono), one uni-directional RS-232/422 control signal and one LTC signal over a single wavelength or fiber optic cable, with minimum latency. AES audio reclocking is provided on the companion 7705AR for jitter reduction.

The fiber optic output of the 7705AT is available in 1310nm, 1550nm or any one of up to sixteen coarse wave division multiplexing (CWDM) wavelengths in the 1270nm to 1610nm range.

The 7705AT is available in a single slot version with AES, RS-232/422 and LTC signals on a DB-25 connector or in a dual slot version with RS-232/422 and LTC on the DB25 connector and the six AES signals on six BNC connectors.

The 7705AT can be housed in either a 1 RU 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 that will hold 1 module.

Features

- Supports SMPTE compliant AES audio signals with 48kHz or 96kHz sampling rate
- Low channel latency (< 1µs) for 7705AT/AR pair
- Monitoring of AES channels via stereo head phone jack and pushbutton channel selector at card edge
- Supports multi-mode or single-mode fiber
- Fully hot swappable from front of frame with no fiber or cabling disconnect/reconnect required
- 1RU, 3RU, single standalone frame options

Inputs:

- Six single-ended AES audio, one RS-232/422 and one balanced LTC

Outputs:

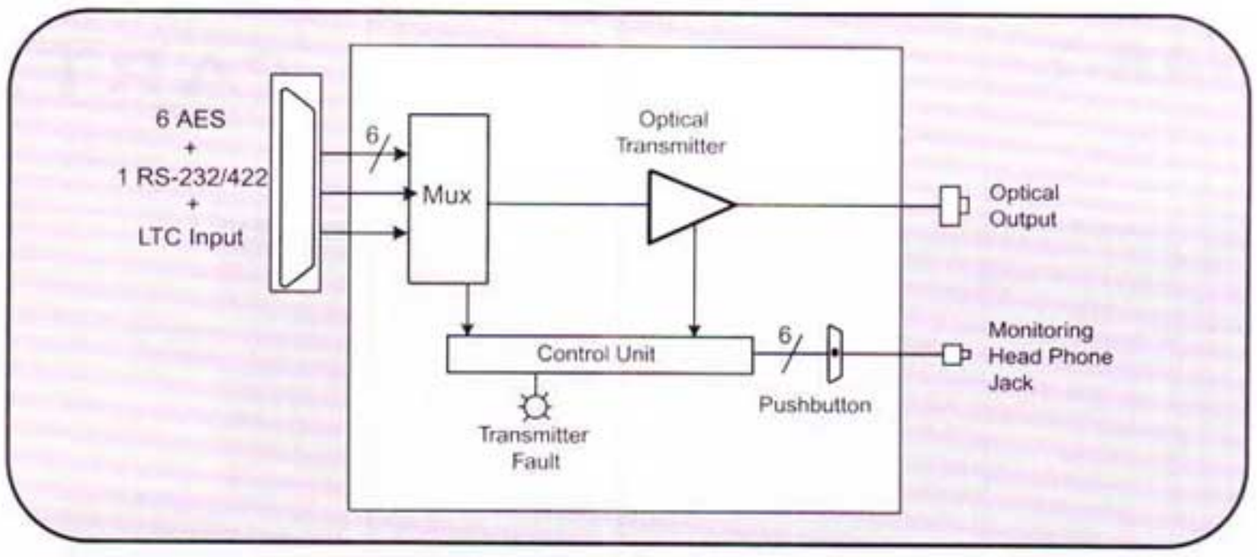
- One fiber output available in 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant) with SC/PC, ST/PC, FC/PC connector option

Card Edge LEDs:

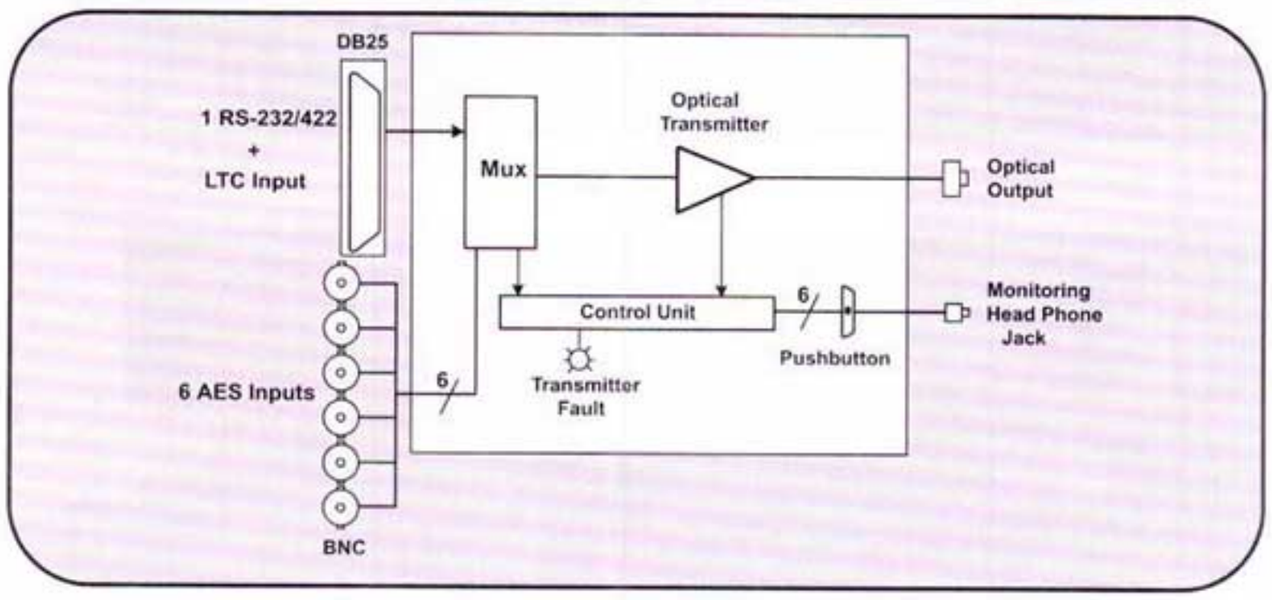
- Local fault
- Module Ok
- Optical transmitter fault
- Audio channel monitor status

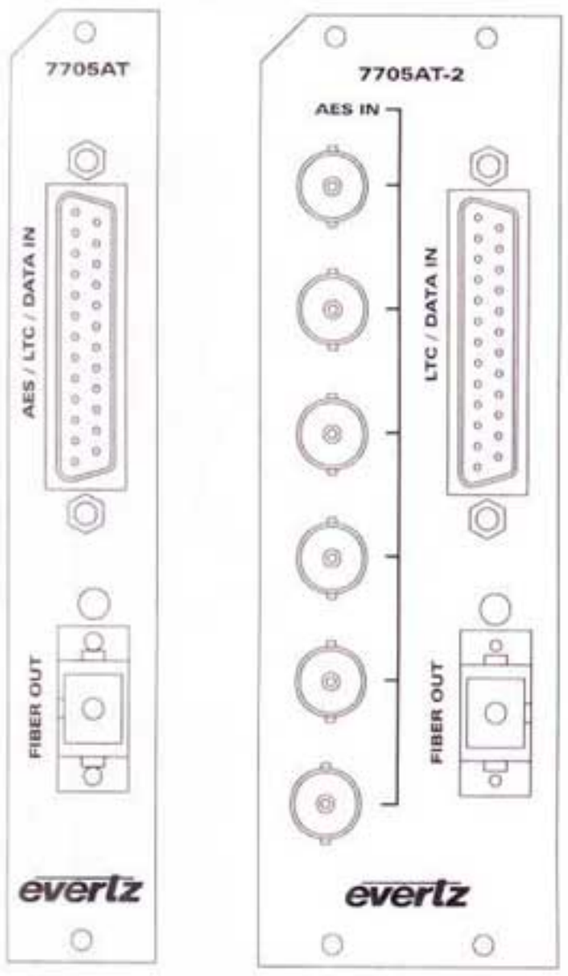
7705AT/7705AT-2 Block Diagrams

7705AT



7705AT-2





Specifications

AES Audio Input:

Number of Inputs:	6
Connectors:	
Single Slot:	Female DB25
Dual Slot:	6 BNC's per IEC 169-8
Resolution:	Up to 24 bits
Sampling Rate:	48kHz or 96kHz
Latency:	< 1µs
Signal Level:	0.2V - 2V
Impedance:	75Ω unbalanced

Data Inputs:

Number of Inputs:	1 RS-232/RS-422(uni-directional)
Connector:	Female DB25
Baud Rate:	Up to 3M baud
Latency:	< 1µs

Audio Monitoring Output:

Number of Ports:	1
Connector:	3.5mm female audio jack

LTC Input:

Standard:	SMPTE 12M
Number of Inputs:	1 Balanced
Connector:	Female DB25
Rise/Fall Time:	40 µs ± 10 µs
Signal Level:	0.2 to 4V p-p
Impedance:	110 Ω balanced

Optical Output:

Number of Outputs:	1
Connector:	SC/PC, ST/PC, FC/PC female housing
Return Loss:	> 14dB
Rise and Fall Time:	400-700ps
Jitter:	< 0.2 UI
Fiber Type:	Single mode or multi mode
Nominal Wavelength:	1310nm, 1550nm
CWDM Wavelengths:	1270nm to 1610nm (see ordering information)

Optical Power:

1310nm FP:	-5dBm ± 1dBm
1550nm DFB:	0dBm ± 1dBm
CWDM DFB:	0dBm ± 1dBm

Electrical:

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

Physical:

Number of Slots:	
7705AT	1
7705AT-2	2

Ordering Information: *Multi-Channel AES Audio Fiber Transmitter Mux*

7705AT13	1310nm FP laser
7705AT15	1550nm DFB laser
7705ATxx	CWDM wavelength where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)
7705AT13-2	1310nm FP Laser, Dual Slot
7705AT15-2	1550nm DFB Laser, Dual Slot
7705ATxx-2	CWDM wavelength where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

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:

7705AT-BC1F	1 meter Break-out Cable, 25 Pin D to 6 Female BNC, Female XLR, 4 pin terminal strip

Enclosures:

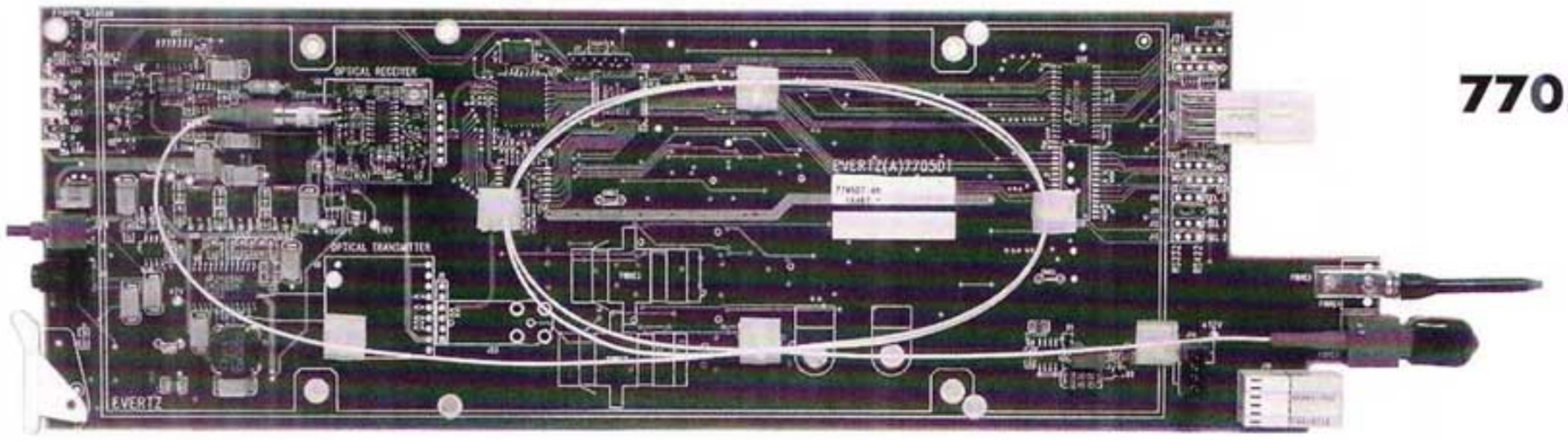
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

Multi-Channel AES Audio Fiber Receiver Demux

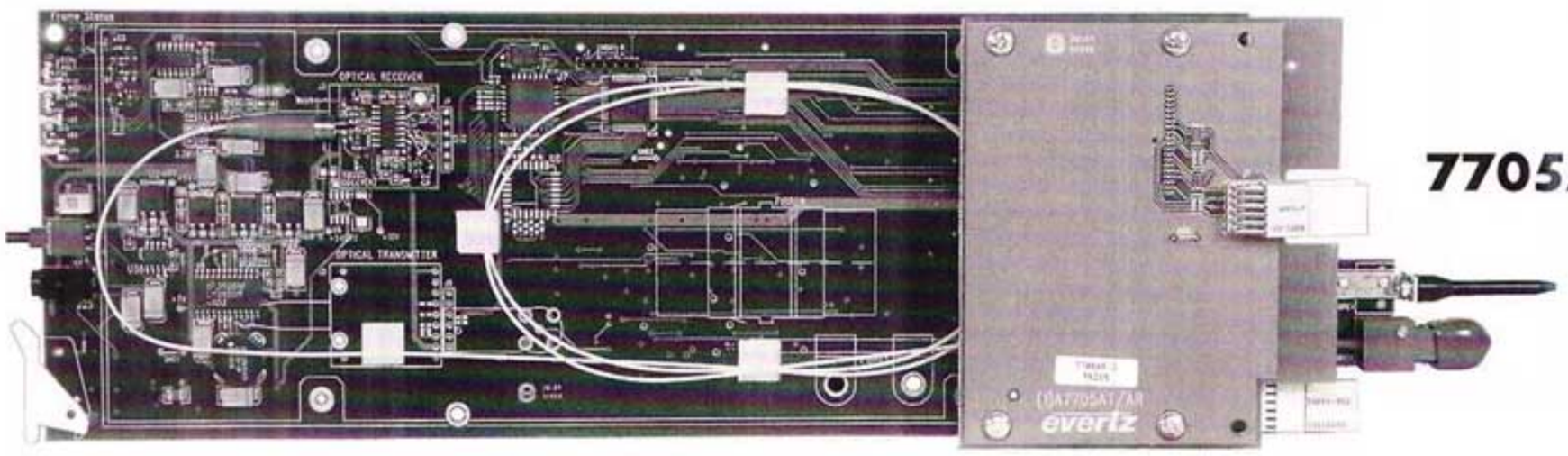
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Models 7705AR/7705AR-2

Dolby E PARTNER



7705AR



7705AR-2

The 7705AR AES Audio Fiber Receiver Demux, provides an economical method of receiving up to six AES audio signals (twelve mono) one uni-directional RS-232/422 control signal and one LTC signal over a single wavelength or fiber optic cable, with minimum latency. AES audio reclocking is provided for jitter reduction.

The 7705AR is available in a single slot version with AES, RS-232/422 and LTC signals on a DB25 connector or in a dual slot version with RS232/422 and LTC signals on the DB25 connector and the six AES signals on six BNC connectors.

The 7705AR 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

- Supports SMPTE compliant AES audio signals with 48kHz or 96kHz sampling rate
- Provides reclocking on AES outputs
- Low channel latency (<1µs) for 7705AT/AR pair
- Monitoring of AES channels via stereo head phone jack and pushbutton channel selector at card edge
- Supports multi-mode or single-mode fiber
- Fully hot swappable from front of frame with no fiber or cabling disconnect/reconnect required
- 1RU, 3RU, single standalone frame options

Inputs:

- One fiber input with SC/PC, ST/PC, FC/PC connector options

Outputs:

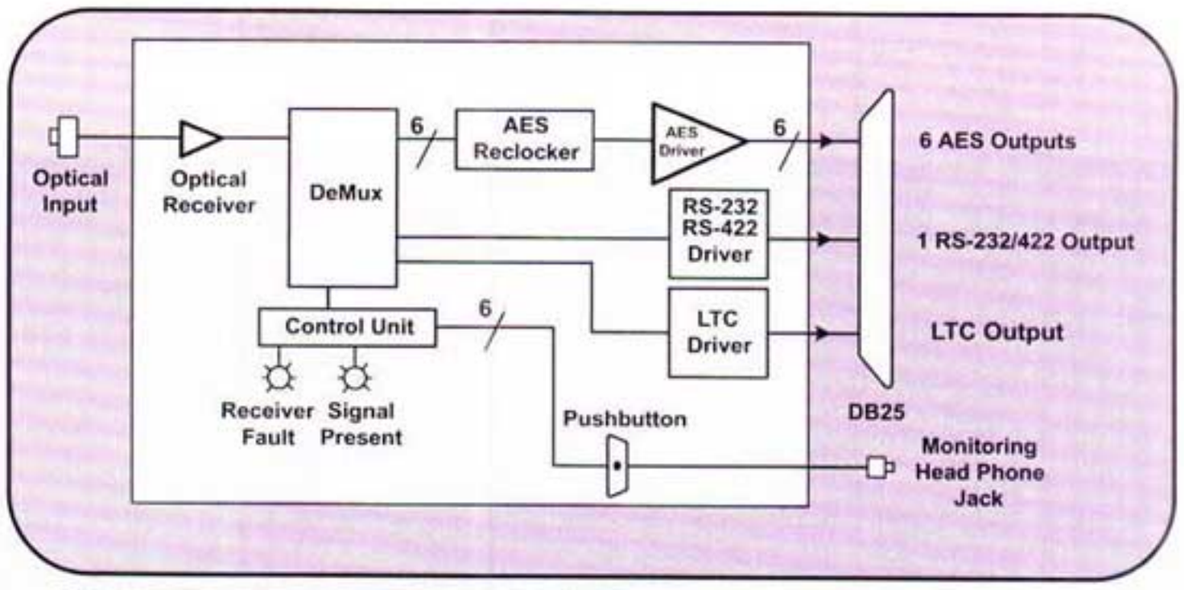
- Six single ended AES, one RS-232/422 and one balanced LTC

Card Edge LEDs:

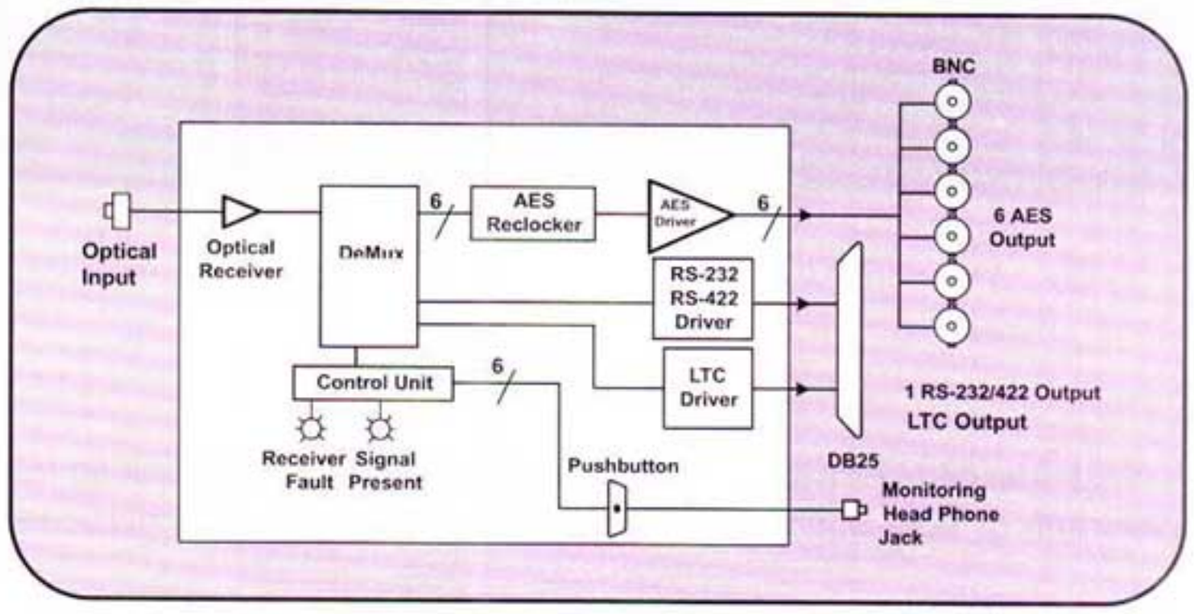
- Local fault
- Module ok
- Optical link valid
- Audio channel monitor status

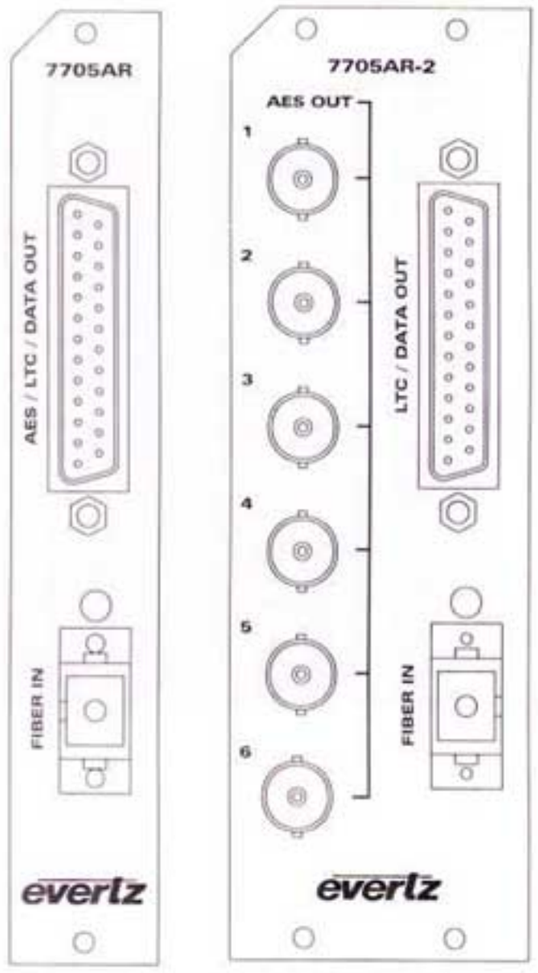
7705AR/7705AR-2 Block Diagrams

7705AR



7705AR-2





Specifications

AES Audio Outputs:

Number of Outputs:	6
Connector:	Female DB25
Resolution:	Up to 24 bits
Sampling Rate:	48kHz or 96kHz
Latency:	< 1µs
Signal Level:	1V p-p ± 0.1V
Impedance:	75Ω unbalanced

Data Outputs:

Number of Ports:	1 RS-232/RS-422(uni-directional)
Connector:	Female DB25
Baud Rate:	Up to 3M baud
Latency:	< 1µs

LTC Output:

Standard:	SMPTE 12M
Number of Outputs:	1 Balanced
Connector:	Female DB25
Signal Levels:	1V p-p nominal
Rise/Fall Times:	40µ s ± 10µs
Impedance:	110 Ω balanced

Audio Monitoring Output:

Number of Ports:	1
Connector:	3.5mm female audio jack

Optical Input:

Number of Inputs:	1
Connector:	SC/PC, ST/PC, FC/PC female housing
Operating Wavelength:	1270nm - 1610nm
Maximum Input Power:	0dBm
Optical Sensitivity:	-28dBm

Electrical:

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

Physical:

Number of Slots:	
7705AR	1
7705AR-2	2

Ordering Information:

Multi-Channel AES Audio Fiber Transmitter Demux

7705AR	Audio receiver in single slot
7705AR-2	Audio receiver in dual slot

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:

7705AR-BC1F	1 meter Break-out Cable, 25 Pin D to 6 Female BNC, Male XLR, 4 pin terminal strip

Enclosures:

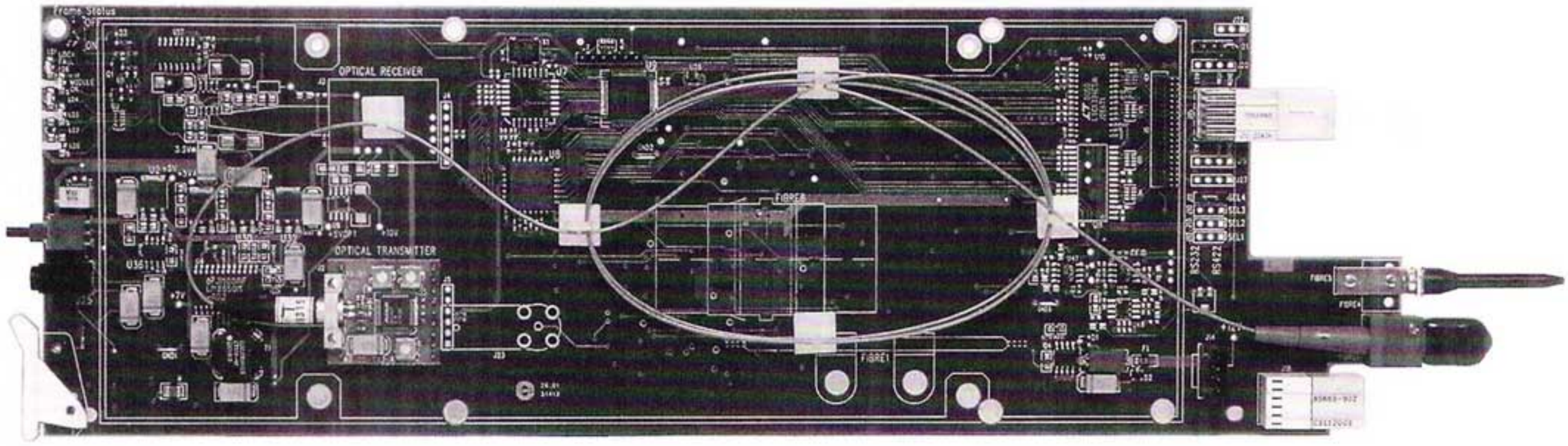
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

Eight Channel AES Audio Fiber Transmitter Mux

1d

Models 7705AT-8

Dolby E PARTNER



The 7705AT-8 AES Audio Fiber Transmitter Mux provides an economical method of transmitting up to eight AES audio signals (sixteen mono) over a single wavelength or fiber optic cable with minimum latency. AES audio reclocking is provided on the 7705AR-8 for jitter reduction.

The fiber optic output of the 7705AT-8 is available in 1310nm, 1550nm or any one of the sixteen coarse wave division multiplexing (CWDM) wavelengths between 1270nm and 1610nm.

The 7705AT-8 occupies a single 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

- Supports SMPTE compliant AES audio signals with a sampling rate of either 48kHz or 96kHz
- Low channel latency < 1µs for 7705AT-8/AR-8 pair
- Monitoring of AES channels via stereo head phone jack and push button channel selector at card edge
- Supports multi-mode or single-mode fiber
- Fully hot swappable from front of frame with no fiber or cabling disconnect/reconnect required
- 1RU, 3RU, single standalone frame options

Inputs:

- Eight single-ended AES audio inputs on a DB-25 connector

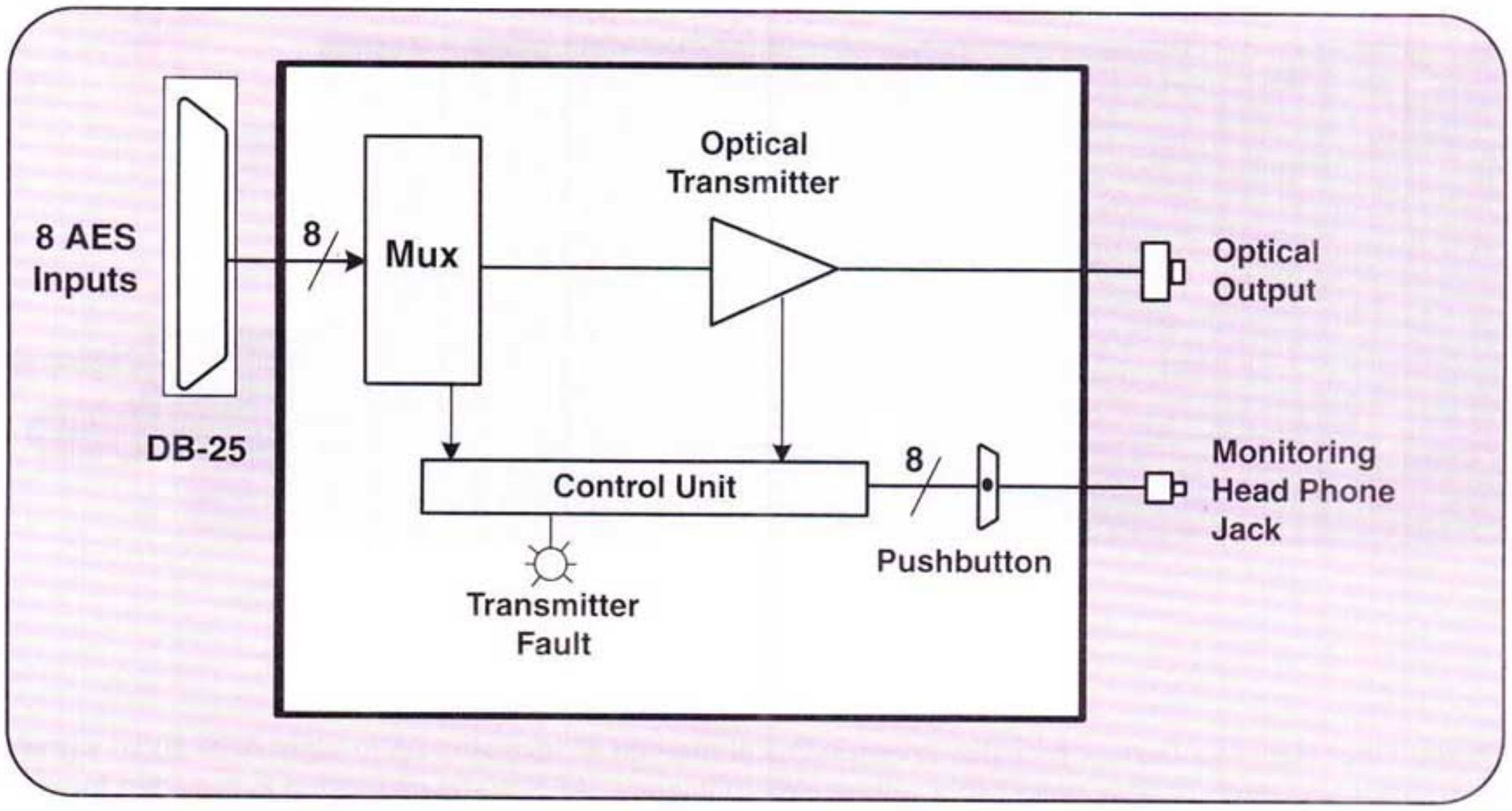
Outputs:

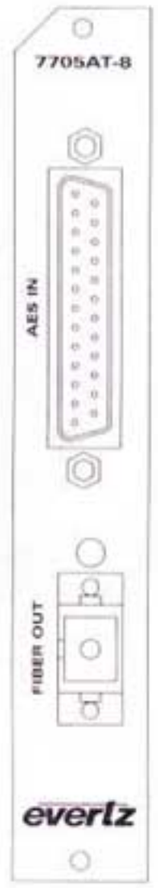
- One fiber output, available in 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2) compliant
- SC/PC, ST/PC, FC/PC connector options

Card Edge LEDs:

- Optical Signal Presence
- Transmitter Fault
- AES Signal Presence

7705AT-8 Block Diagram





Specifications

AES Audio Inputs:

Number of Inputs:	8
Connector:	Female DB25
Resolution:	Up to 24-bits
Sampling Rate:	48kHz or 96kHz
Latency:	< 1µs
Signal Level:	0.2V - 2V
Impedance:	75Ω unbalanced

Audio Monitoring Output:

Number of Ports:	1
Connector:	3.5mm female audio jack

Optical Output:

Number of Outputs:	1
Connector:	SC/PC, ST/PC, FC/PC female housing
Return Loss:	> 14 dB
Rise and Fall Time:	400-700ps
Jitter:	< 0.2 UI
Nominal Wavelength:	1310nm, 1550nm
CWDM Wavelength:	1270nm to 1610nm

Optical Power:

1310nm FP:	-5dBm ± 1dBm
1550nm DFB:	0dBm ± 1dBm
CWDM DFB:	0dBm ± 1dBm

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:

Eight Channel AES Audio Fiber Transmitter Mux

7705AT13-8	1310nm FP laser
7705AT15-8	1550nm DFB laser
7705ATxx-8	CWDM wavelength where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

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/FC

Accessories:

7705AT-8-BC1M	1 meter Break-out Cable, 25 Pin D to 8 Male BNC
7705AT-BCIF	Optional breakout cable

Enclosures:

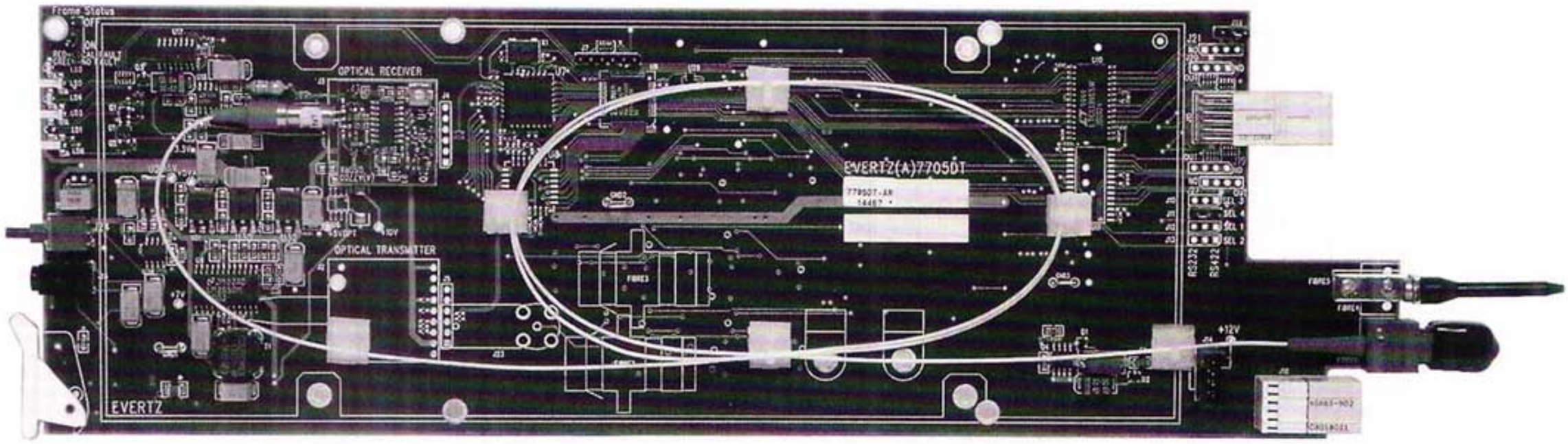
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

Eight Channel AES Audio Fiber Receiver Demux

1d

Models 7705AR-8

Dolby E PARTNER



The 7705AR-8 AES Audio Fiber Receiver Demux provides an economical method of receiving up to eight AES audio signals (sixteen mono) over a single wavelength or fiber optic cable with minimum latency. AES audio reclocking is provided for jitter reduction.

The 7705AR-8 occupies a single 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

- Supports SMPTE compliant AES audio signals with a sampling rate of either 48kHz or 96kHz
- Provides reclocking on AES outputs
- Low channel latency (<1µ s) for 7705AT-8/AR-8 pair
- Monitoring of AES channels via stereo head phone jack and push button channel selector at card edge
- Supports multi-mode or single-mode fiber
- Fully hot swappable from front of frame with no fiber or cabling disconnect/reconnect required
- 1RU, 3RU, single standalone frame options

Inputs:

- One fiber input with SC/PC, ST/PC, FC/PC connector options

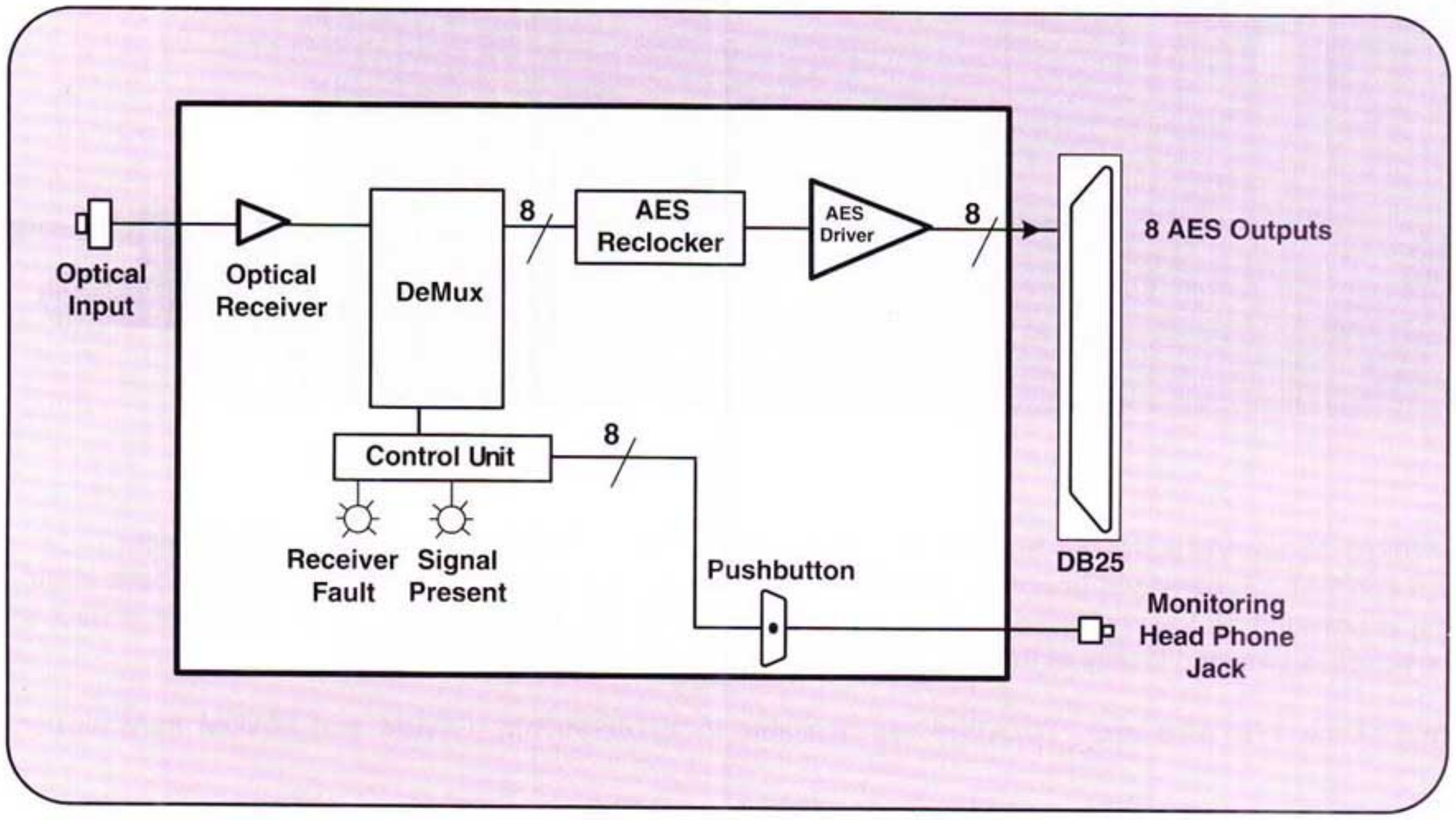
Outputs:

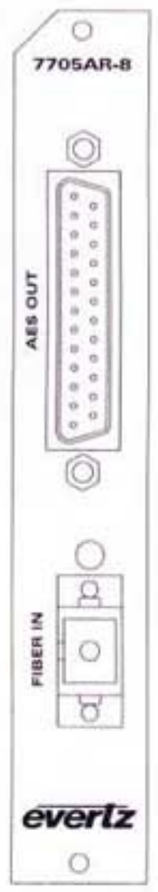
- Eight single ended AES outputs

Card Edge LEDs:

- Receiver Fault
- Module OK
- Optical Link Valid
- Audio channel monitor status

7705AR-8 Block Diagram





Specifications

AES Audio Outputs:

Number of Outputs:	8
Connector:	Female DB25
Resolution:	Up to 24-bits
Sampling Rate:	48kHz or 96kHz
Latency:	< 1µs
Signal Level:	1V p-p ± 0.1V
Impedance:	75Ω unbalanced

Audio Monitoring Output:

Number of Ports:	1
Connector:	3.5mm female audio jack

Optical Input:

Number of Inputs:	1
Connector:	SC/PC, ST/PC, FC/PC female housing
Operating Wavelength:	1270nm - 1610nm
Maximum Input Power:	0dBm
Optical Sensitivity:	-28dBm

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:

Audio Receiver Demux for up to 8 AES Channels

7705AR-8	8 Channel AES Audio Fiber Receiver Demux

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:

7705AR-8-BC1M	1 meter Break-out Cable, 25 Pin D to 8 Male BNC

Enclosures:

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

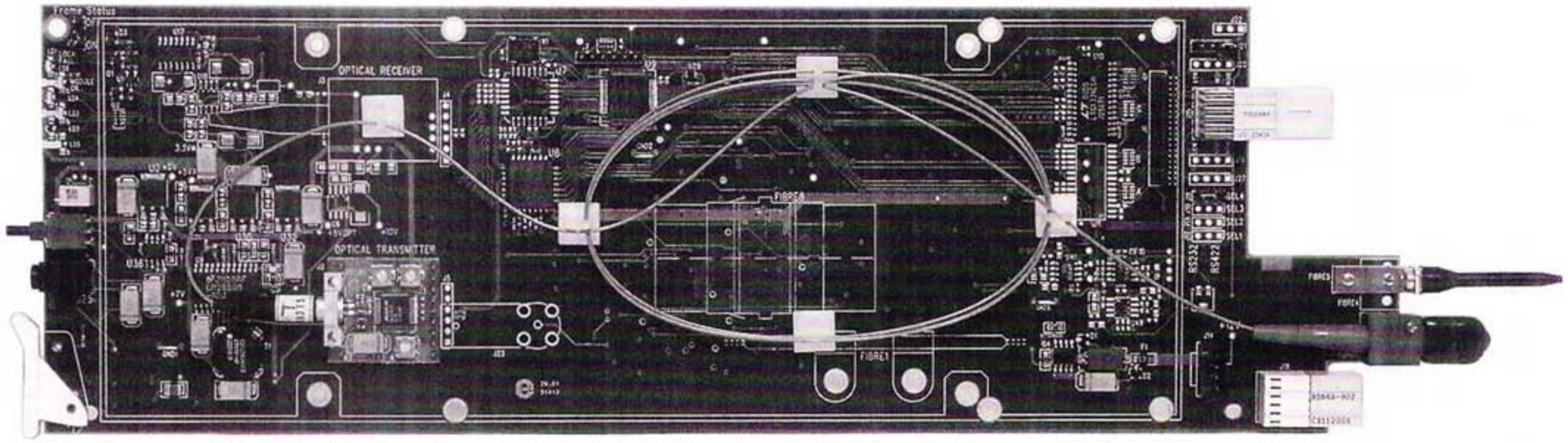
Eight/Sixteen Channel AES Audio Fiber Transmitter Mux

1d

Models 7707AT-8/7707AT-16

Dolby E PARTNER





The 7707AT-8 and 7707AT-16 are VistaLINK™ - enabled, AES Audio Fiber Transmitter Mux's that transmit up to eight (7707AT-8) or sixteen (7707AT-16) balanced or unbalanced AES audio signals over a single wavelength or fiber optic cable. AES audio reclocking is provided on the companion 7707AR-8 and 7707AT-16 for jitter reduction. Monitoring and control of card status and parameters is provided locally at the card edge or remotely via VistaLINK™ capability.

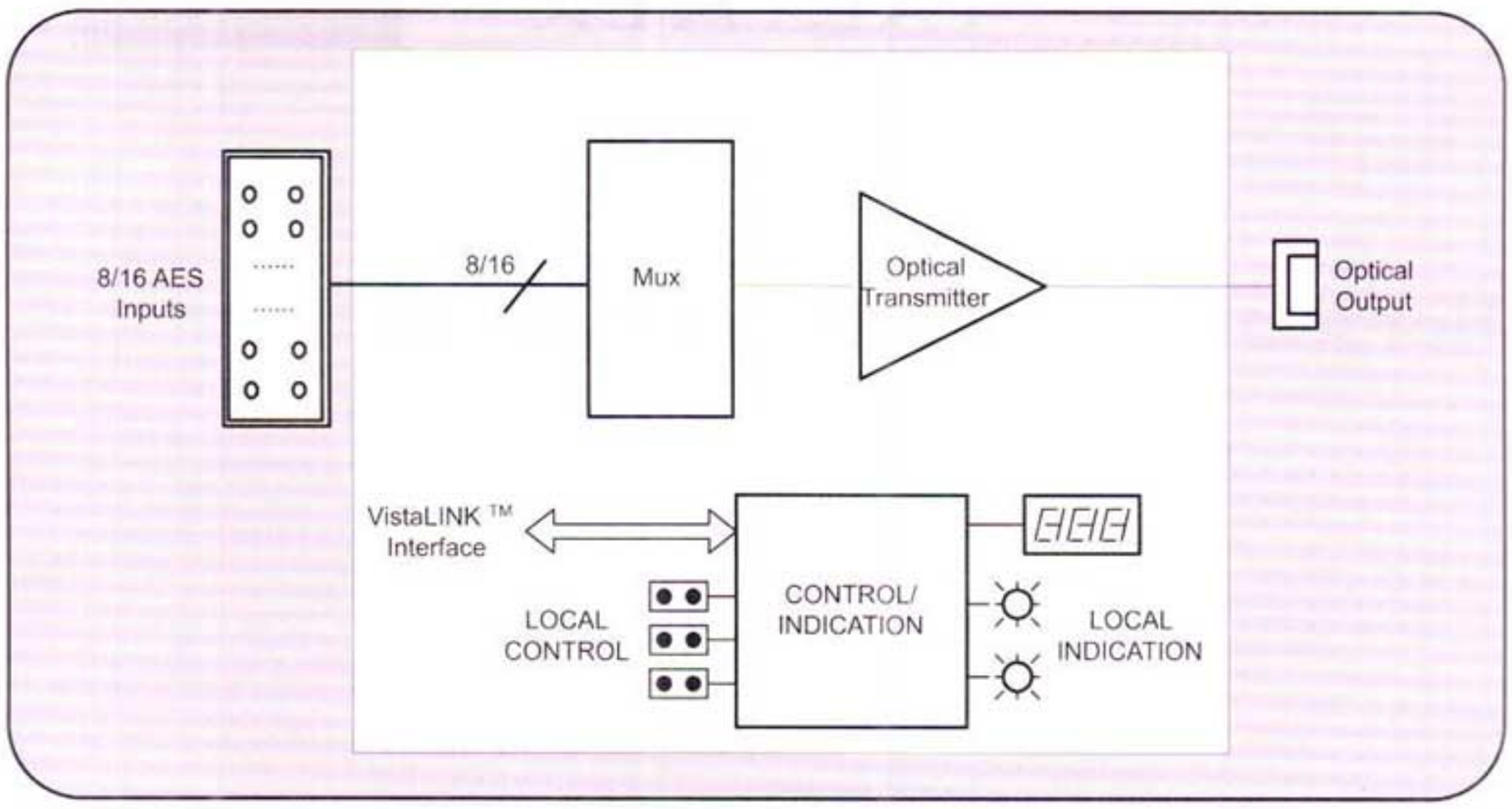
The fiber optic output of the 7707AT-8 and 7707AT-16 are available in 1310/1550nm, CWDM and DWDM transmission schemes.

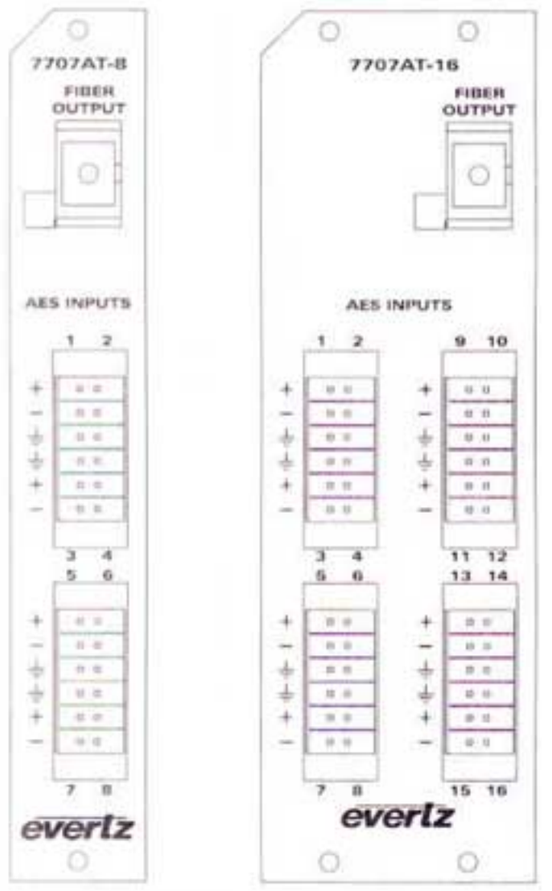
The 7707AT-8 can be housed in either a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules, or a standalone enclosure that will hold 1 module.

Features

- Combines up to eight or sixteen AES signals on a single fiber or wavelength
- Supports balanced or unbalanced AES inputs
- Supports SMPTE compliant AES audio signals at 32kHz, 44.1kHz and 48kHz sampling rates
- Low channel latency
- Comprehensive signal and status monitoring via four-digit card-edge display
- VistaLINK™ - enabled for remote monitoring and control when installed in a 7700FR-C frame with 7700FC VistaLINK™ Frame Controller
- Optical output wavelengths of 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.692 compliant) also available
- Supports multi-mode or single-mode fiber
- Fully hot swappable from front of frame with no fiber or cabling disconnect/reconnect required
- 1RU, 3RU, single standalone frame options

7707AT-8/7707AT-16 Block Diagram





Specifications

AES Audio Input:

Standards	
Unbalanced AES:	SMPTE 276M
Balanced AES:	AES3-1992
Number of Inputs:	8 or 16 (configurable for balanced or unbalanced)
Connectors:	Multi-pin removable terminal block
Signal Level	
Unbalanced:	0.2V to 2V
Balanced:	0.2V to 7V
Equalization:	300m @48kHz with Belden 1800B or equivalent
Resolution:	Up to 24 bits
Sampling Rate:	32, 44.1, 48kHz
Latency:	< 1µs
Impedance	
Unbalanced:	75Ω
Balanced:	110Ω

Optical Output:

Number of Outputs:	1
Connector:	SC/PC, ST/PC, FC/PC female housing
Return Loss:	> 14dB
Rise and Fall Time:	400-700ps
Jitter:	< 0.2 UI
Fiber Type:	Single mode or multi mode
Wavelength:	See Ordering Information
Optical Power:	
1310nm FP:	-7dBm ± 1dBm
1550nm DFB:	0dBm ± 1dBm
CWDM DFB:	0dBm ± 1dBm
DWDM DFB:	7dBm ± 1dBm

Electrical:

Voltage:	+12V DC
Power	
7707AT-8:	6 Watts (Non DWDM) 9 Watts (DWDM)
7707AT-16:	8 Watts (Non DWDM) 11 Watts (DWDM)
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Physical:

Number of Slots	
7707AT-8:	1
7707AT-16:	2

Ordering Information:

Eight Channel AES Audio Fiber Transmitter Mux, VistaLINK™ Monitoring

7707AT13-8	1310nm FP laser
7707AT15-8	1550nm DFB laser
7707ATxx-8	CWDM wavelength where xx= 27(1270nm), 29(1290nm) 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm) 43(1430nm), 45(1450), 47(1470nm), 49(1490nm) 51(1510nm), 53(1530nm), 55(1550nm)57(1570nm), 59(1590nm), 61(1610nm)

Sixteen Channel AES Audio Fiber Transmitter Mux, VistaLINK™ Monitoring

7707AT13-16	1310nm FP laser
7707AT15-16	1550nm DFB laser
7707ATxx-16	CWDM wavelength where xx= 27(1270nm), 29(1290nm) 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm) 43(1430nm), 45(1450), 47(1470nm), 49(1490nm) 51(1510nm), 53(1530nm), 55(1550nm)57(1570nm), 59(1590nm), 61(1610nm)

For DWDM Applications: Contact Factory

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

Eight/Twelve Channel Analog Audio Fiber Transmitter Mux

1d

Models 7707AT-A8/7707AT-A12

Dolby E PARTNER



Picture Not Available At Time of Printing

The 7707AT-A8 and 7707AT-A12 are VistaLINK™ - enabled Analog Audio Fiber Transmitter Mux's that transmit up to eight (7707AT-A8) or twelve (7707AT-A12) professional quality analog audio signals over a single fiber optic link. Monitoring and control of card status and parameters is provided locally at the card edge or remotely via VistaLINK™ capability.

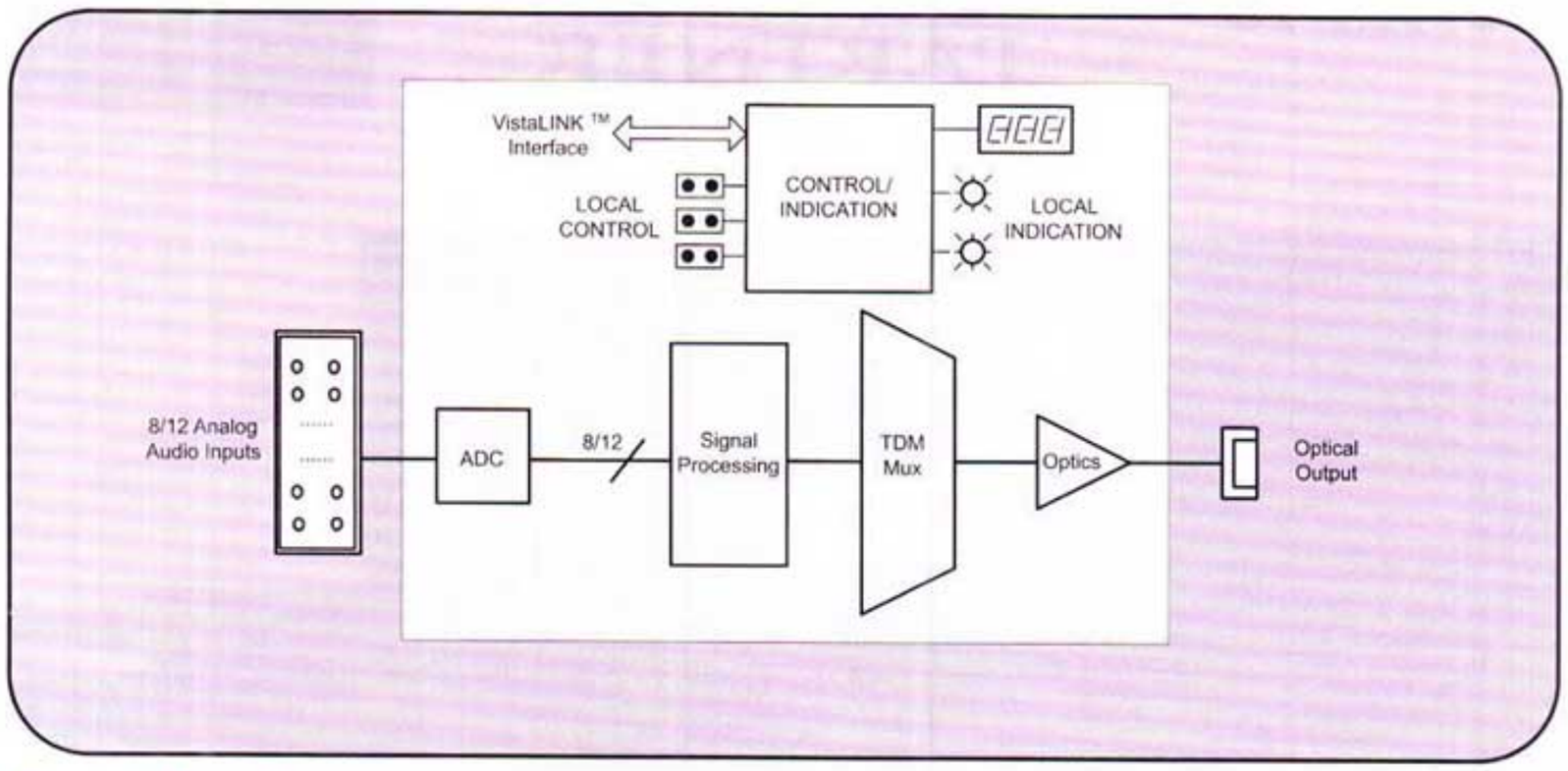
The optical output of the 7707AT-A8 and 7707AT-A12 are available in an assortment of wavelengths accommodating 1310/1550nm, CWDM and DWDM transmission schemes.

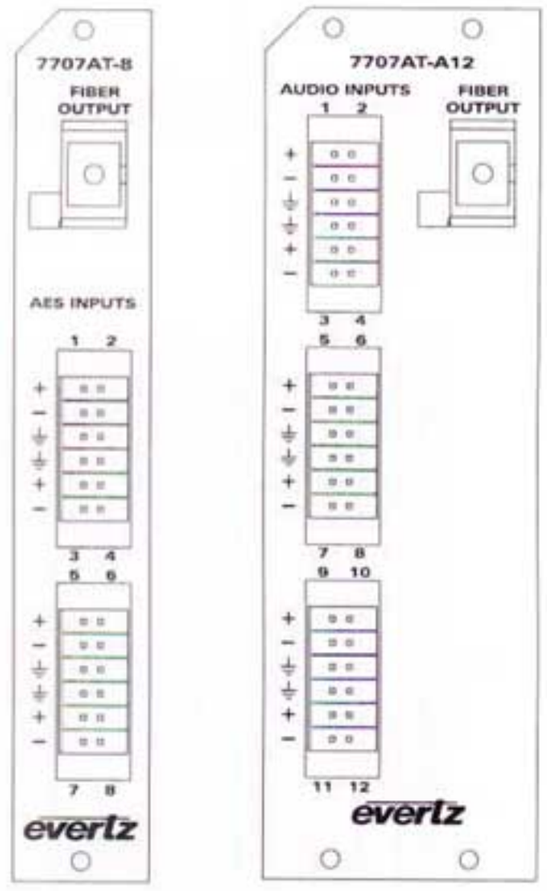
The 7707AT-A8 and 7707AT-A12 can be housed in either a 1 RU frame that will hold up to 3 modules, 3RU frame that will hold up to 15 single slot modules or a standalone enclosure which hold 1 module.

Features

- Combines up to 8 or 12 professional quality analog audio signals on a single fiber or wavelength
- Adjustable audio gain (12dB)
- Comprehensive signal and status monitoring via four-digit card-edge display
- VistaLINK™ - enabled for remote monitoring and control when installed in 7700FR-C frame with 7700FC VistaLINK™ Frame Controller
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.692 compliant) also available
- Supports multi-mode and single-mode fiber
- Fully hot swappable from front of frame

7707AT-A8/7707AT-A12 Block Diagram





Specifications

Analog Audio Input:

Number of Inputs:	8 or 12 balanced audio (See Ordering Information)
Connector:	Removable Terminal Blocks
Input Impedance:	> 10kΩ
Signal Resolution:	24-Bits
Sampling Rate:	48KHz
Frequency Response:	20Hz to 20kHz
Gain Flatness:	± 0.2dB
Input Level(max):	+24dBu
Signal/Noise Ratio:	> 90dB
THD:	< 0.005%
Crosstalk:	< -80dB
CMRR:	>50dB from 0-20kHz
Controllable Gain:	-6dB to +6dB

Optical Output:

Number of Signals:	1
Connector at Frame:	SC/PC, ST/PC, FC/PC female housing
Output Wavelengths:	See Ordering Information
Output Optical Power:	
1310nm FP:	-7dBm ± 1dBm
1550nm DFB:	0dBm ± 1dBm
CWDM DFB:	0dBm ± 1dBm
DWDM DFB:	7dBm ± 1dBm

Electrical:

Voltage(type):	12V DC(nominal frame voltage)
Power	
7707AT-A8:	8 Watts (Non-DWDM) 11 Watts (DWDM)
7707AT-A12:	10 Watts (Non-DWDM) 15 Watts (DWDM)
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Physical:

7700 or 7701 frame mounting:

Number of Slots	
7707AT-A8	1
7707AT-A12	2

Ordering Information:

8 Channel Analog Audio Fiber Transmitter Mux, VistaLINK™ Monitoring

7707AT13-A8	1310nm, FP Laser
7707AT15-A8	1550 DFB Laser
7705ATxx-A8	CWDM wavelength where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

12 Channel Analog Audio Fiber Transmitter Mux, VistaLINK™ Monitoring

7707AT13-A12	1310nm, FP Laser
7707AT15-A12	1550 DFB Laser
7705ATxx-A12	CWDM wavelength where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

For DWDM Applications:

Contact Factory

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

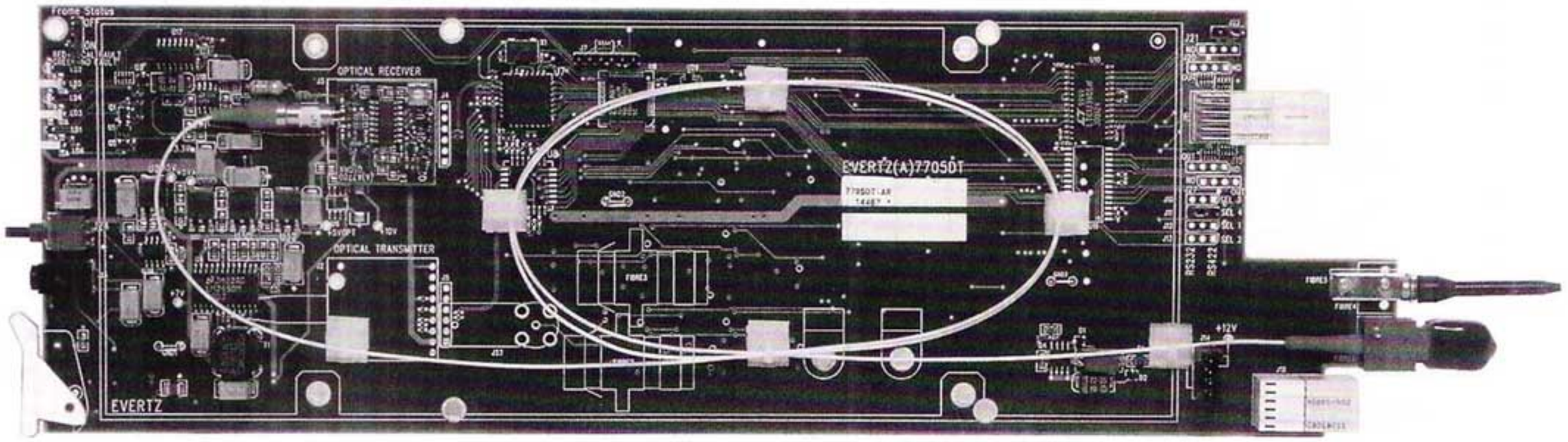
Eight/Sixteen Channel AES Audio Fiber Receiver Demux

1d

Models 7707AR-8/7707AR-16

Dolby E PARTNER





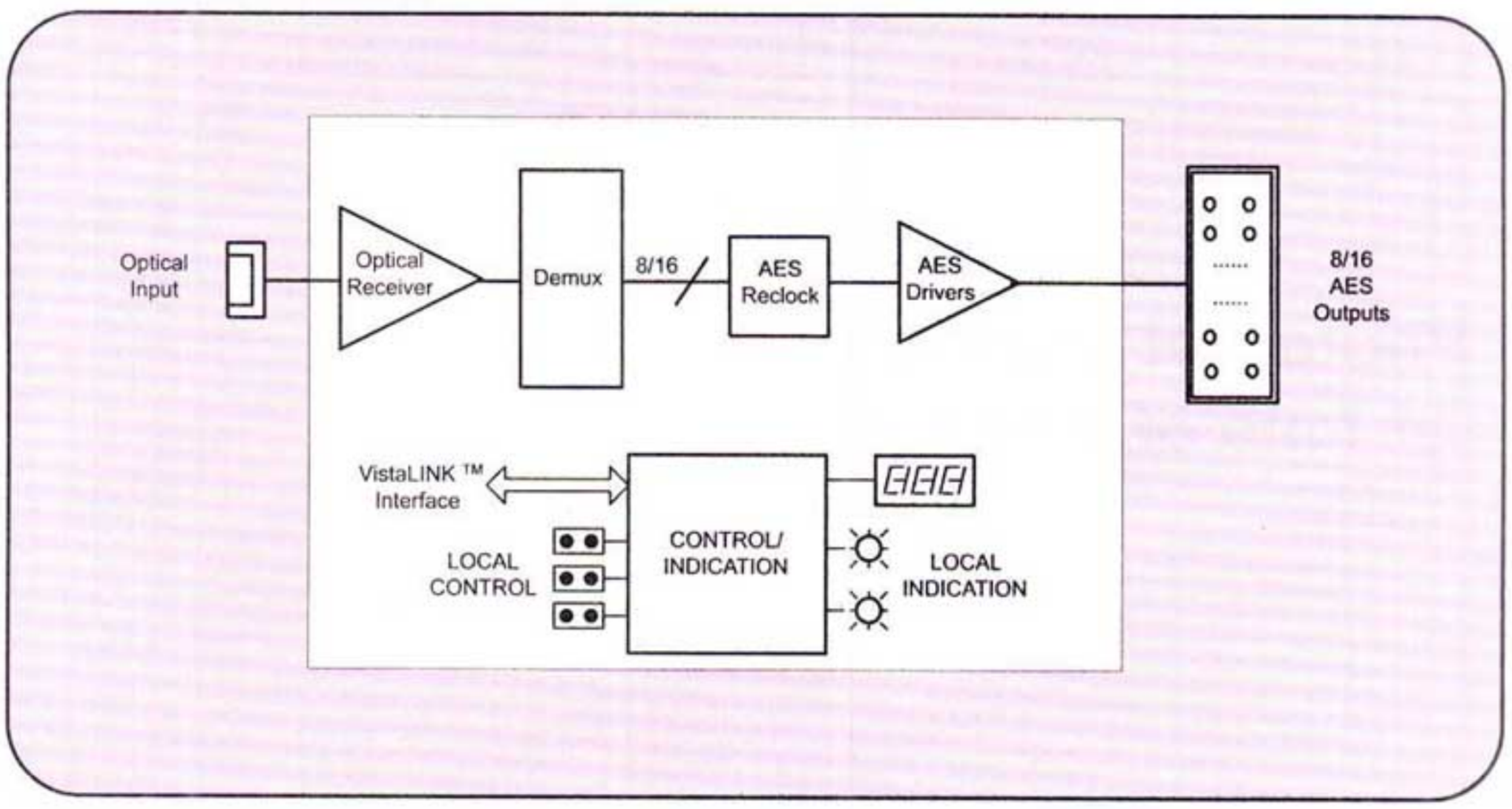
The 7707AR-8 and 7707AR-16 are VistaLINK™ - enabled, AES Audio Fiber Receiver Demux's, that receive up to eight (7707AR-8) or sixteen (7707AR-16) balanced or unbalanced AES audio signals over a single wavelength or fiber optic cable. AES audio reclocking is also provided for jitter reduction. Monitoring and control of card status and parameters is provided locally at the card edge or remotely via VistaLINK™ capability.

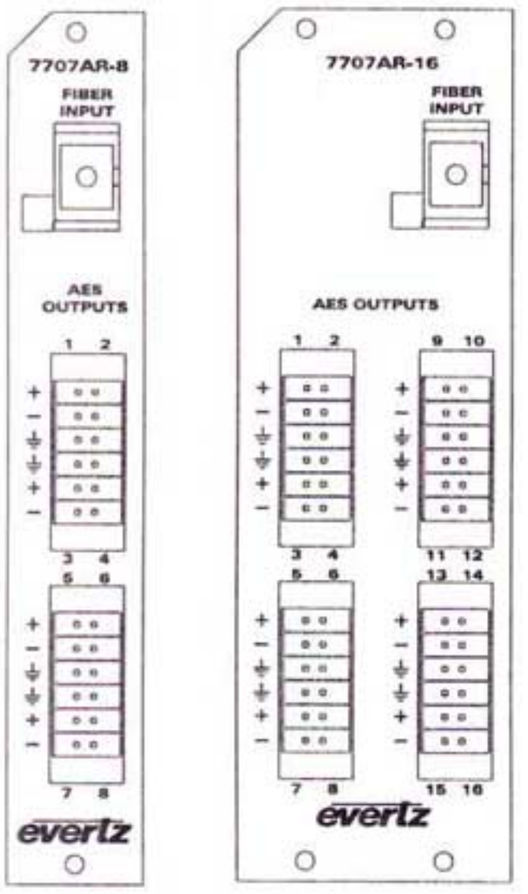
The 7707AR-8 and 7707AR-16 can be housed in either a 1 RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 single slot modules, or a standalone enclosure which will hold 1 module.

Features

- Handles up to eight or sixteen AES signals on a single fiber or wavelength
- Supports balanced or unbalanced AES inputs
- Supports SMPTE compliant AES audio signals at 32kHz, 44.1kHz and 48kHz sampling rates
- Provides reclocking on AES outputs
- Low channel latency
- Comprehensive signal and status monitoring via four-digit card-edge display, or through SNMP and VistaLINK™ enabled capability
- VistaLINK™ - enabled for remote monitoring and control when installed in a 7700FR-C frame with 7700FC VistaLINK™ Frame Controller
- Supports multi-mode or single-mode fiber
- Fully hot swappable from front of frame with no fiber or cabling disconnect/reconnect required
- Accepts any wavelength in the 1270nm to 1610nm range

7707AR-8/7707AR-16 Block Diagram





Specifications

AES Audio Outputs:

Standards	
Unbalanced AES:	SMPTE 276M
Balanced AES:	AES3-1992
Number of Outputs:	8 or 16 (configurable for balanced or unbalanced)
Connector:	Multi-pin removable terminal block
Signal Level	
Unbalanced:	1vp-p
Balanced:	5vp-p
Resolution:	Up to 24 bits
Sampling Rate:	32, 44.1, 48kHz
Latency:	< 1µs
Impedance:	
Unbalanced:	75Ω
Balanced:	110Ω

Optical Input:

Number of Inputs:	1
Connector:	SC/PC, ST/PC, FC/PC female housing
Operating Wavelength:	1270nm - 1610nm
Maximum Input Power:	0dBm
Optical Sensitivity:	-28dBm

Electrical:

Voltage:	+12V DC
Power	
7707AR-8:	6 Watts
7707AR-16:	8 Watts
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Physical:

Number of Slots	
7707AR-8:	1
7707AR-16:	2

Ordering Information:

7707AR-8	Eight Channel 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

Eight/Twelve Channel Analog Audio Fiber Receiver Demux

1d

Models 7707AR-A8/7707AR-A12

Dolby E PARTNER

VistaLINK™ Your Eyes & Ears for Monitoring Single or Multi-Channel Operations

Photo not available at time of printing

The 7707AR-A8 and 7707AR-A12 are VistaLINK™ - enabled Analog Audio Fiber Receiver Demux's for reception of up to eight (7707AR-A8) or twelve (7707AR-A12) channels of professional quality analog audio from a single fiber optic input. The combination of an Audio Transmitter Mux and Audio Receiver Demux permits transmission over distances up to 50km, with minimal latency. Monitoring and control of card status and parameters is provided locally at the card edge or remotely via VistaLINK™ capability.

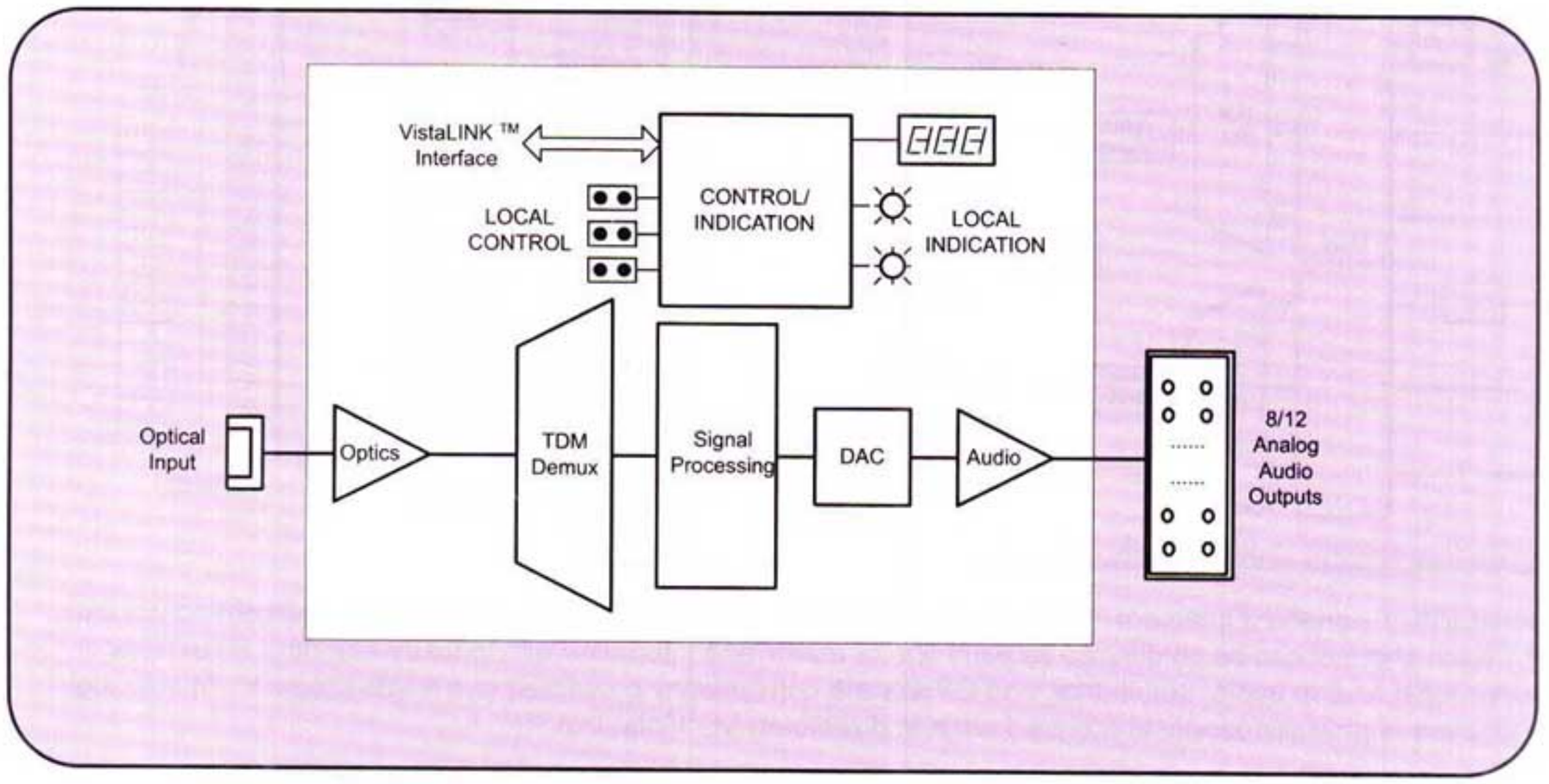
The optical input of the 7707AR-A8 and 7707AR-A12 can receive any wavelength in the 1270nm to 1610nm range.

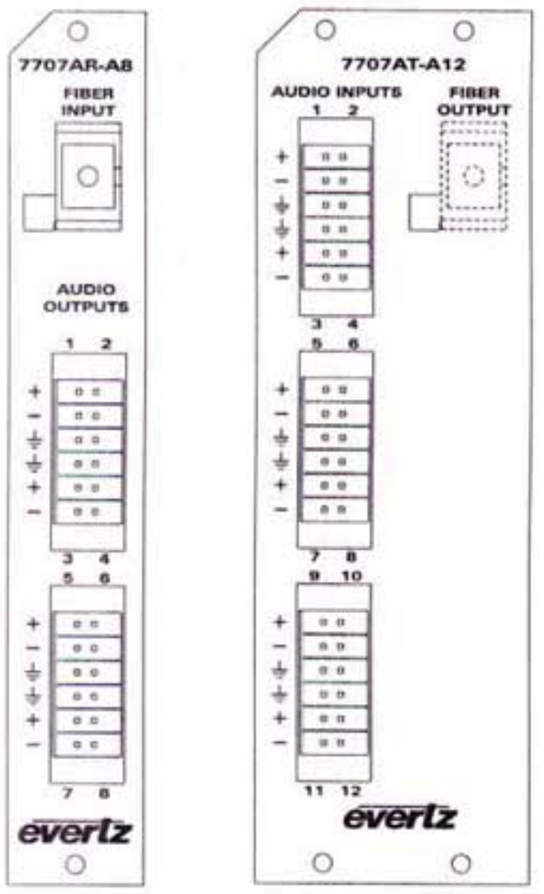
The 7707AR-A8 and 7707AR-A12 can be housed in either a 1 RU frame that will hold up to three modules, a 3RU frame that will hold up to fifteen single slot modules or a standalone enclosure that will hold one module.

Features

- Handles up to 8 or 12 professional quality analog audio signals on a single fiber or wavelength
- Adjustable audio gain (12dB)
- Comprehensive signal and status monitoring via four-digit card-edge display
- VistaLINK™ enabled for remote monitoring and control when installed in 7700FR-C frame with 7700FC VistaLINK™ Frame Controller
- Low latency
- Supports multi-mode and single-mode fiber
- Fully hot swappable from front of frame
- Accepts any wavelength in the 1270nm to 1610nm range

7707AR-A8/7707AR-A12 Block Diagram





Specifications

Analog Audio Output:

Number of Outputs:	8 or 12 balanced audio (See Ordering Information)
Connector:	Multi-pin removable terminal block
Output Impedance:	66Ω
Signal Resolution:	24-Bits
Sampling Rate:	48kHz
Frequency Response:	20Hz to 20kHz
Gain Flatness:	± 0.2dB
Output Level(max):	+24dBu
Signal/Noise Ratio:	> 90dB
THD:	< 0.005%
Crosstalk:	< -80dB
Controllable Gain:	-6dB to +6dB

Optical Input:

Number of Signals:	1
Connector at Frame:	SC/PC, ST/PC, FC/PC female housing
Input Wavelength:	1270 to 1610nm
Input Power(max):	0dBm
Input Optical Sensitivity:	-28dBm

Electrical:

Voltage(typ):	12V DC(nominal frame voltage)
Power	
7707AR-8:	8 Watts
7707AR-12:	12 Watts
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Physical:

7700 or 7701 frame mounting:

Number of Slots

7707AR-A8:	1
7707AR-A12:	2

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:

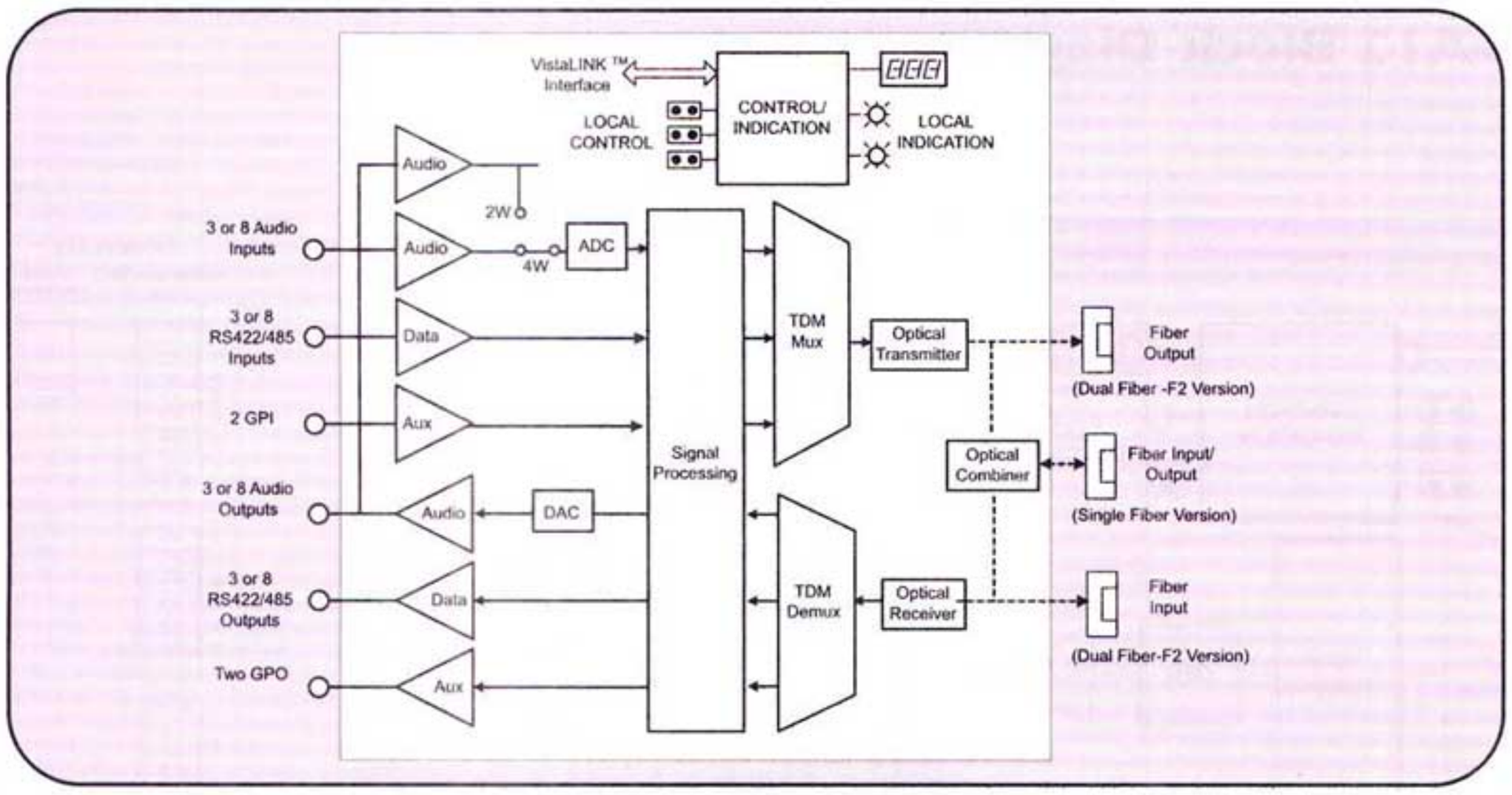
CB-FP1M-SCPC	Single mode fiber cable, 1m, SC/PC male termination
CB-FP1M-STPC	Single mode fiber cable, 1m, ST/PC male termination
CB-FP5M-SCPC	Single mode fiber cable, 5m, SC/PC male termination
CB-FP5M-STPC	Single mode fiber cable, 5m, ST/PC male termination
CB-FP10M-SCPC	Single mode fiber cable, 10m, SC/PC male termination
CB-FP10M-STPC	Single mode fiber cable, 10m, ST/PC male termination

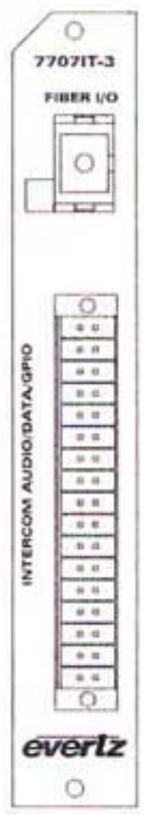
Enclosures:

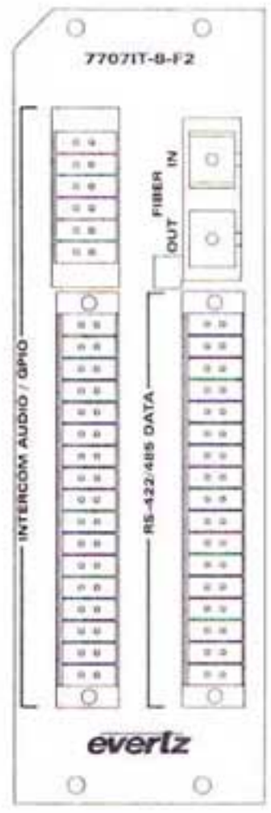
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure



Models 7707IT-3/7707IT-8







The 7707IT-3 and 7707IT-8 are VistaLINK™ - enabled Intercom Transceivers that extend up to three or eight channels of intercom communication over a single fiber optic link. Each channel can be configured as party-line or matrix and interfaces with industry-standard RTS-Telex or ClearCom intercom systems. Bi-directional analog audio, serial data, and GPIO's are conveniently presented in a single product. Monitoring and control of card status and parameters is provided locally at the card edge and remotely via VistaLINK™.

The 7707IT-3 and 7707IT-8 occupy two card slots and can be housed in a 1 RU frame which holds up to 3 modules or a 3RU frame which will hold up to 7 dual slot modules.

Features

- 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: 1-Wire Audio, GPIO
  - ClearCom Party-line: 1-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
- Unique self-calibration of party-line audio null levels
- Selectable termination, and failsafe bias settings for RS422/485data inputs
- Provides 2 general-purpose inputs (GPI's), and 2 general purpose outputs (GPO's)
- Comprehensive signal and status monitoring via four-digit card-edge display, or VistaLINK™
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.692 compliant) also available
- Compatible with multi-mode and single-mode fiber (dual fiber version)
- Fully hot swappable from front of frame

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/50km	7707IT13-3-F2 7707IT13-8-F2	-7dBm	7707IT13-3-F2 7707IT13-8-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	1	14dB/30km*	7707IT13-3 7707IT13-8	-10dBm	7707IT15-3 7707IT15-8	-24dBm	1310nm bi-directional, one fiber
Single-Mode	1(WDM)	25dB/60km	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/80km**	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)	31dB/105km**	7707ITxxxx-3-F2 7707ITxxxx-8-F2	+7dBm	7707ITyyyy-3-F2 7707ITyyyy-8-F2	-28dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux**

*** With >20dB return loss on fiber interface**
****Assumes 8 Ch Mux/Demux loss of 3.5dB**
Tx Power/Rx Sensitivity are nominal values ±1dBm
Fiber loss= 0.4/0.3dB per km @1310nm/1550nm

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: > 10kΩ
Output Impedance: 66Ω
Signal Resolution: 24-Bits
Sampling Rate: 48kHz
Frequency Response: 100Hz to 20kHz
Gain Flatness: ± 1dB
Input Level(max): +20dBu
Output Level(max): +20dBu
Signal/Noise Ratio: > 90dB
THD: < 0.01%
Crosstalk: < -80dB
Controllable Gain: -6dB to +6dB

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: >10kΩ
Signal Resolution: 24-Bit
Sampling Rate: 48kHz
Sidetone Null: > 30dB
Frequency Response: 100Hz to 20kHz
Gain Flatness: ± 3dB
Input Level(max): +5dBu
Output Level(max): +5dBu (into 200Ω load)
Signal/Noise Ratio: > 75dB
THD: < 0.2%
Crosstalk: < -60dB
Controllable Gain: -6dB to +6dB (into 200Ω load)
Receive Signaling: 4VDCmin (ClearCom), 20KHz ±500Hz (RTS)
Send Signaling: 11VDCmin (ClearCom), 20KHz ±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: 120Ω or Open (selectable)
RS-485 Failsafe Bias: 200mV or None (selectable, into 60Ω)
Bit Rate(max): 150kb/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: 1270 to 1610nm (See Ordering Information)
Input Power(max): 0dBm
Input Optical Sensitivity: See Application Configuration Chart
Output Wavelengths: See Ordering Information
Output Optical 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): 1A

General Purpose Inputs (GPI):
Number of Signals: 2 Inputs
Connector: Multi-pin removable terminal block
Type: Opto-isolated, Active low with respect to reference voltage
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(typ): 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
EMI/RFI: Complies with FCC Part 15 Class A
EU EMC Directive

Physical:
7700 or 7701 frame mounting:
Number of Slots: 1 for 7707IT-3, 2 FOR 7707IT-8

Ordering Information:
Three Channel Intercom Transceiver, VistaLINK™ Monitoring

7707IT13-3	Single Fiber, 1310nm FP Tx and Rx
7707IT13M-3-W	Single Fiber, WDM, 1310nm FP Tx, Rx on 1550nm
7707IT15-3-W	Single Fiber WDM, 1550nm DFB Tx, Rx on 1310nm
7707IT13-3-F2	Dual Fibr, 1310nm FP Tx and Rx
7707ITxx-3-F2	Dual Fiber, CWDM, specify Tx wavelength where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450nm), 47(1470nm), 49(1490nm) , 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

Eight Channel Intercom Transceiver, VistaLINK™ Monitoring

7707IT13-8	Single Fiber, 1310nm FP Tx and Rx
7707IT13M-8-W	Single Fiber, WDM, 1310nm FP Tx, Rx on 1550nm
7707IT15-8-W	Single Fiber WDM, 1550nm DFB Tx, Rx on 1310nm
7707IT13-8-F2	Dual Fibr, 1310nm FP Tx and Rx
7707ITxx-8-F2	Dual Fiber, CWDM, specify Tx wavelength where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450nm), 47(1470nm), 49(1490nm) , 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

For DWDM Applications: Contact Factory

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

Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

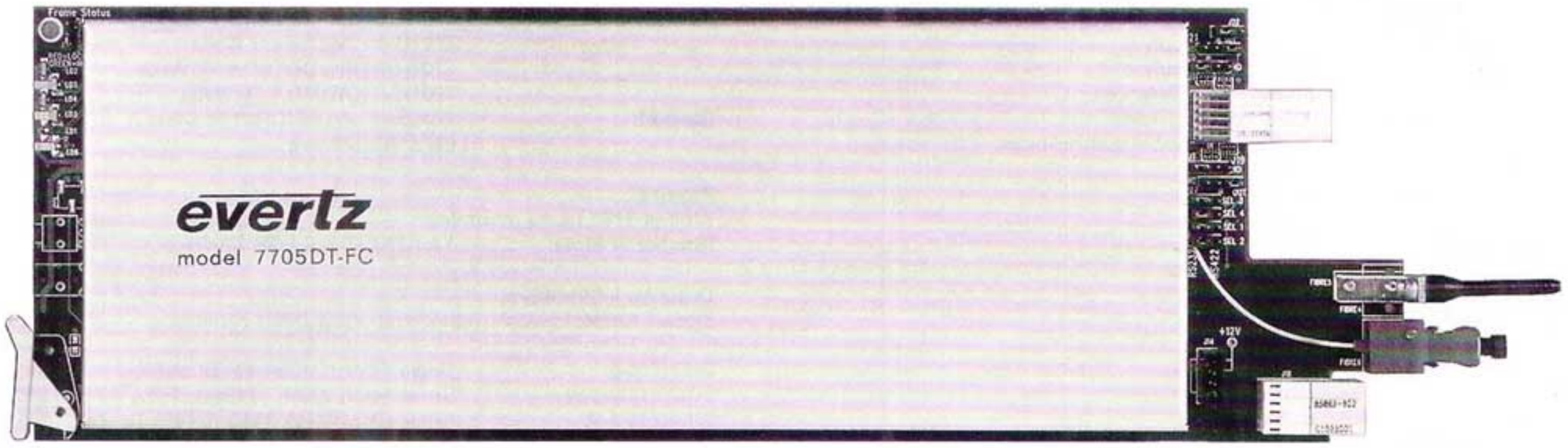
Enclosures:

7700FR-C	3RU Multiframe, which holds 15 modules
7701FR	1RU Multiframe, which holds 3 modules

These modules not available in a standalone enclosure

1d

Model 7705DT/7705DT-LTC



The 7705DT and 7705DT-LTC Fiber Data Transceivers provide an economical method of transmitting RS-232, RS-422 and LTC signals over fiber optic cable. The 7705DT transmits up to eight RS-232 or four RS-422 signals, while the 7705DT-LTC transmits up to seven RS-232 or four RS-422 and one LTC signal.

The fiber optic output of the 7705DT/7705DT-LTC is available in 1310nm, 1550nm or any one of up to sixteen coarse wave division multiplexing (CWDM) wavelengths in the 1270nm to 1610nm range.

The 7705DT/7705DT-LTC occupies a single card slot and can be housed in either a 1RU Multiframe that will hold up to 3 modules or a 3RU Multiframe that will hold up to 15 modules. A single module standalone enclosure is also available.

Features

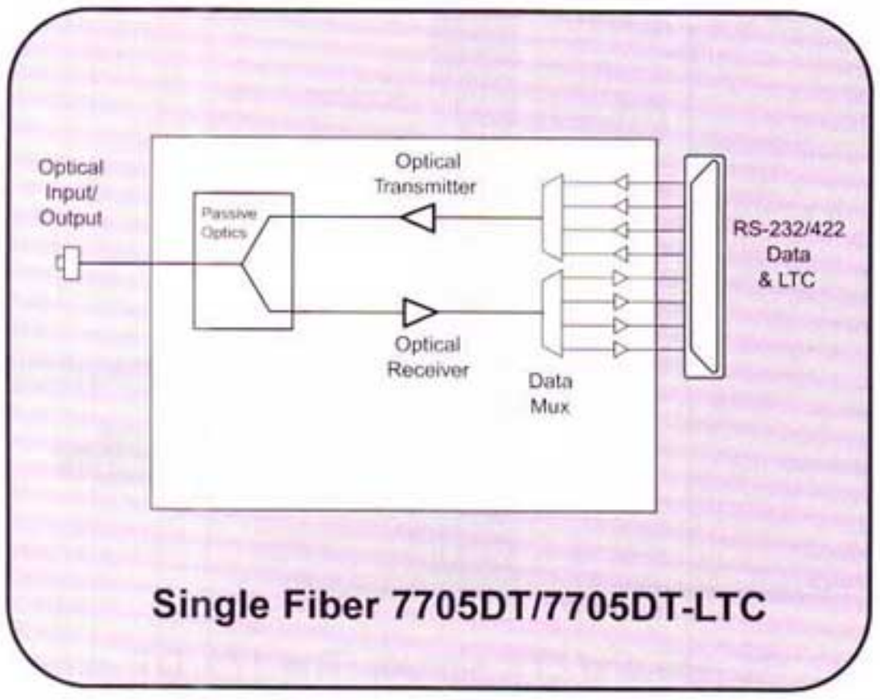
- Up to eight RS-232 or four RS-422 data channels with each pair of inputs and outputs set individually
- Optional LTC available with 7705DT-LTC
- Protocol independent, handles any baud rate (up to 3M Baud) or word length
- Fully hot-swappable from front of frame with no fiber or data disconnect/reconnect required
- SC/PC, ST/PC or FC/PC connector options
- Card edge LEDs indicate module health, receiver and transmitter failure, fiber link bit errors and fiber break
- Can be monitored for fault conditions using the 7700 Multiframe's contact closure

7705DT/7705DT-LTC Application Configurations

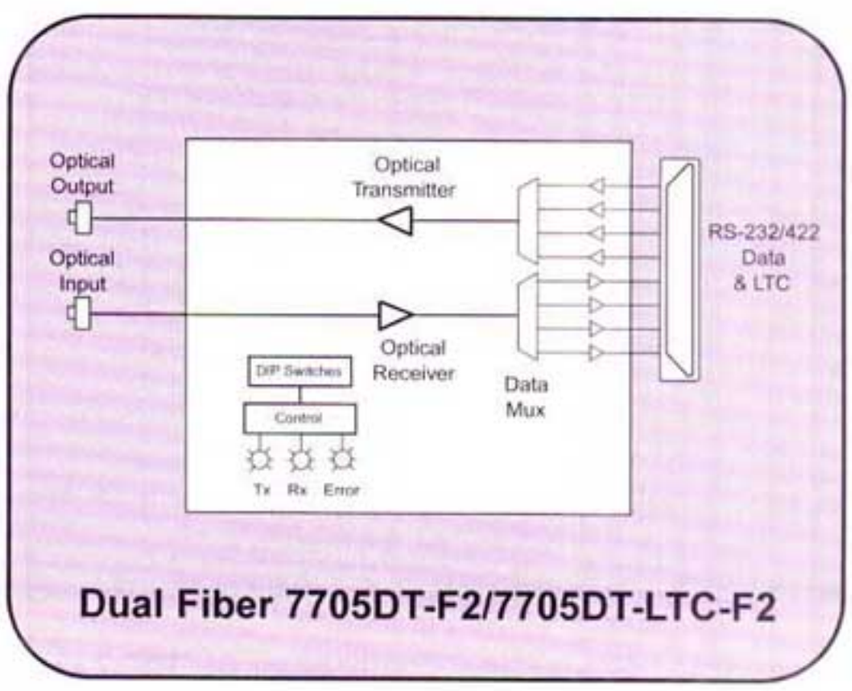
FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<3km	7705DT13-F2	-7dBm	7705DT13-F2	-31dBm	1310nm on Tx & Rx fibers
Single-Mode	2	24dB/60km	7705DT13-F2	-7dBm	7705DT13-F2	-31dBm	1310nm on Tx & Rx fibers
Single-Mode	1	17dB/40km*	7705DT13	-10dBm	7705DT13	-27dBm	1310nm, bi-directional, one fiber
Single-Mode	1(WDM)	28dB/70km	7705DT13M-W	-1dBm	7705DT15-W	-29dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	27dB/90km**	7705DTxx-F2	0dBm	7705DTyy-F2	-31dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**

*** With >20dB return loss on fiber interface**
****Assumes 8 Ch Mux/Demux loss of 3.5dB**
Tx Power/Rx Sensitivity are nominal values ±1dBm
Fiber loss= 0.4/0.3dB per km @1310nm/1550nm

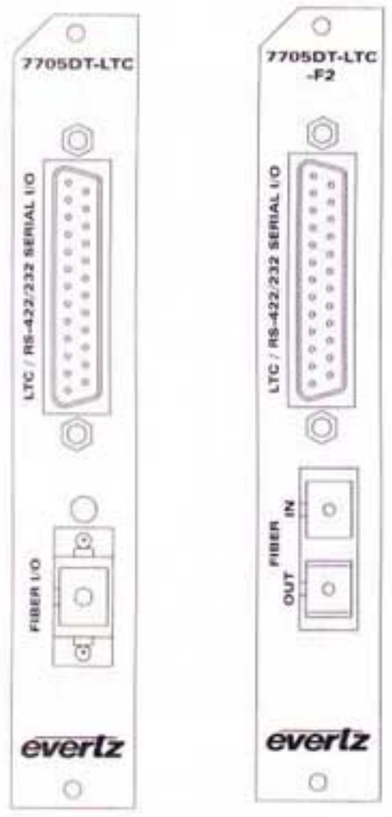
7705DT/7705DT-LTC Block Diagrams



Single Fiber 7705DT/7705DT-LTC



Dual Fiber 7705DT-F2/7705DT-LTC-F2



Specifications

Data Input/Output:

Number of Ports:	8/7(DT/DT-LTC) RS-232 or 4 RS-422 - Jumper selectable (each pair is individually configurable)
Connector:	Female DB-25
Baud Rate:	Up to 3 MBaud
Latency:	Maximum single direction latency with 1m of fiber is 500ns for RS-422 and 10ms for RS-232. Additional latency due to fiber is 5µs/km

LTC Input (-LTC Option):

Standard:	SMPTE 12M
Number of Inputs:	1 Balanced
Connector:	2 Pins on Female DB25
Rise/Fall Time:	40µs ± 10 µs
Signal Level:	0.2 to 4V p-p
Impedance:	110 Ω balanced

LTC Output (-LTC Option):

Standard:	SMPTE 12M
Number of Outputs:	1 Balanced
Connector:	2 Pins on Female DB25
Signal Levels:	1V p-p nominal
Rise/Fall Times:	40µ s ± 10µs
Impedance:	110 Ω balanced

Optical Input/Output:

Number:	1 (Single Fiber Versions) 2 (F2 Versions)
Connector:	Female SC/PC, ST/PC or FC/PC
Input Wavelengths:	1270nm to 1610nm
Output Jitter:	< 0.2 UI
Maximum Input Power:	0dBm
Input Optical Sensitivity:	See Application Configurations Chart
Output Wavelengths:	See Ordering Information
Output Power:	See Application Configurations Chart

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: *Multi RS-232/422 Fiber Data Transceiver*

7705DT13	Single Fiber, 1310nm FP Tx and Rx
7705DT13-LTC	Single Fiber, 1310nm FP Tx and Rx, LTC
7705DT13M-W	Single Fiber, WDM, 1310nm FP TX, RX 1550nm
7705DT15-W	Single Fiber, WDM, 1550nm DFB TX, RX on 1310nm
7705DT13M-LTC-W	Single Fiber, WDM, 1310nm FP TX, RX on 1550nm, LTC
7705DT15-LTC-W	Single Fiber, WDM, 1550nm DFB TX, RX on 1310nm, LTC
7705DT13-F2	Dual Fiber, 1310nm FP TX and RX
7705DT13-LTC-F2	Dual Fiber, 1310nm FP TX and RX, LTC
7705DTxx-F2	Dual Fiber, CWDM wavelength (see xx options below)
7705DTxx-LTC-F2	Dual Fiber and CWDM wavelength with LTC where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

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

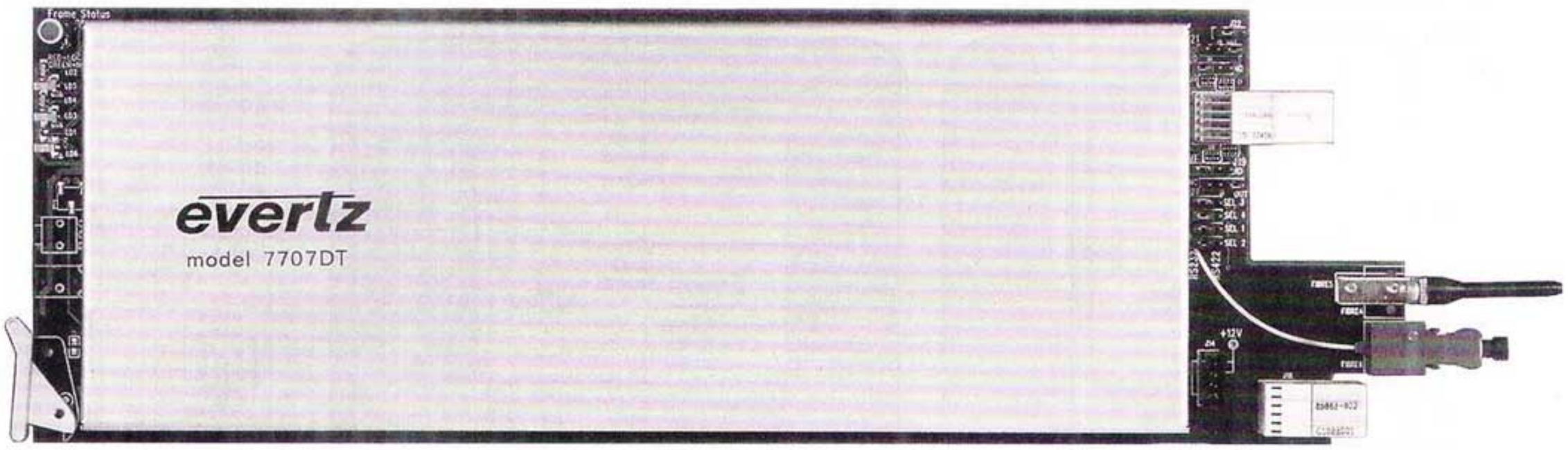
Enclosures:

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

Multi RS-232/422/485 Fiber Data Transceiver,

1d

Model 7707DT



The 7707DT is a VistaLINK™ - enabled Fiber Data Transceiver for RS-232, RS-422, RS-485 and LTC signals. The 7707DT provides bi-directional transmission of four RS-422/485, three RS-232 and one LTC signal over optical fiber. Monitoring and control of card status and parameters is provided locally at the card edge and remotely via VistaLINK™.

The fiber optic output of the 7707DT is available in an assortment of wavelengths accommodating 1310/1550nm, CWDM and DWDM transmission schemes.

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.

Features

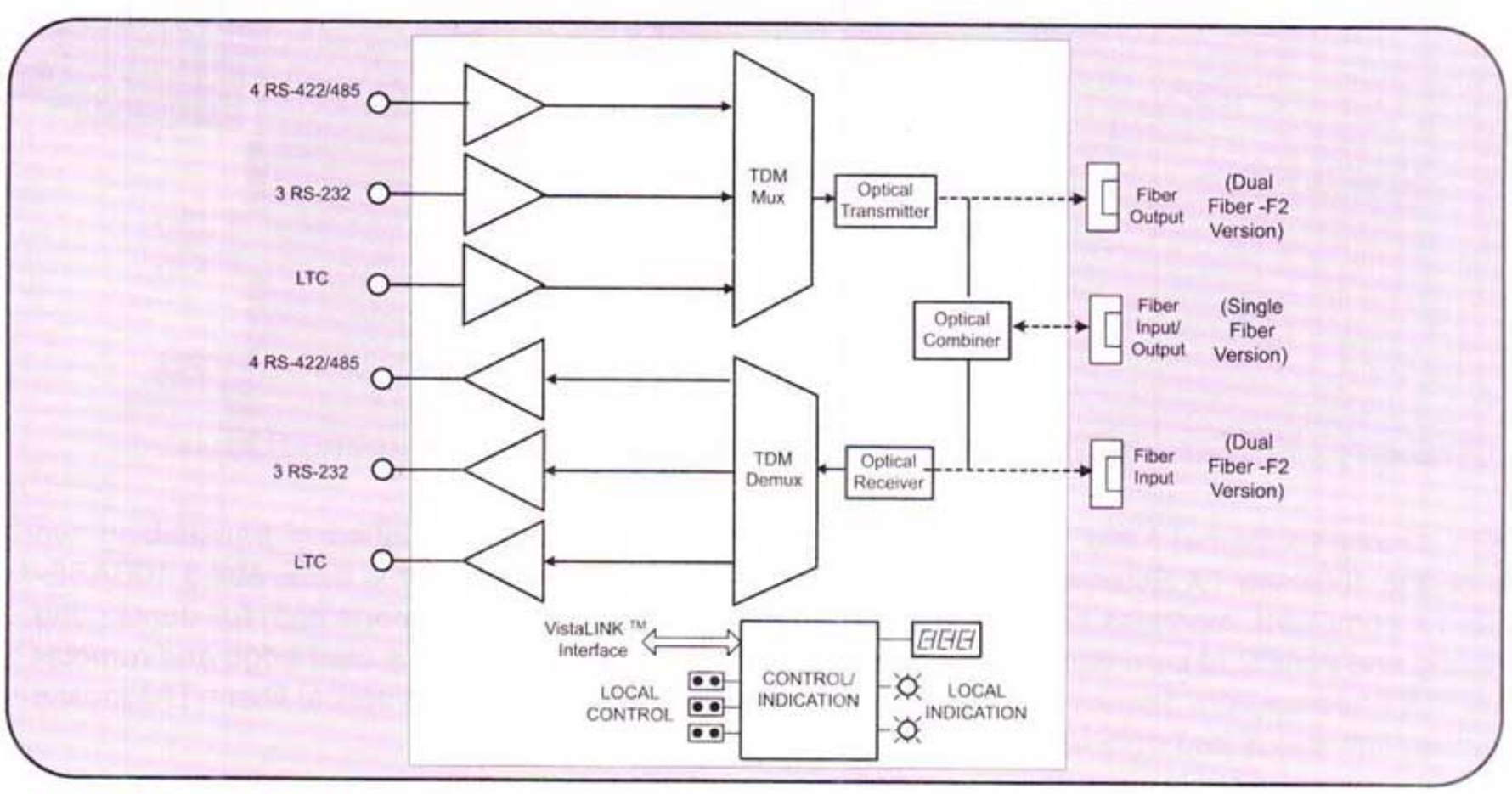
- Four RS-422/485, three RS-232 and one LTC signal on a single card
- Protocol independent, handling any baud rate up to 3M Baud
- Fully hot-swappable from front of frame with no fiber or data disconnect/reconnect required
- SC/PC, ST/PC or FC/PC connector options
- VistaLINK™ - enabled for remote monitoring and control when installed in 7700FR-C frame with 7700FC VistaLINK™ Frame Controller
- Can be monitored for fault conditions using the 7700 Multiframe's contact closure
- Optical output wavelengths at 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.692 compliant) also available

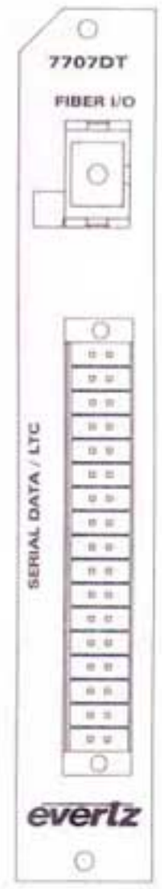
7707DT Application Configurations

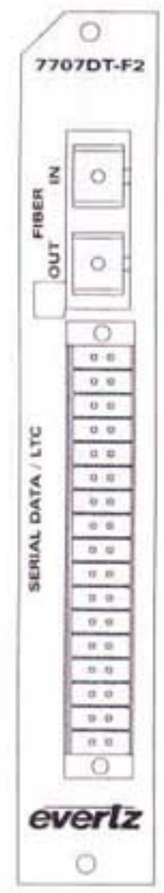
FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<3km	7707DT13-F2	-7dBm	7707DT13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	2	21dB/50km	7707DT13-F2	-7dBm	7707DT13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	1	14dB/30km*	7707DT13	-10dBm	7707DT13	-24dBm	1310nm, bi-directional, one fiber
Single-Mode	1(WDM)	25dB/60km	7707DT13M-W	-1dBm	7707DT15-W	-26dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	24dB/80km**	7707DTxx-F2	0dBm	7707DTyy-F2	-28dBm	Different CWDM wavelengths on Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	31dB/105km**	7707DTxxxx-F2	+7dBm	7707DTyyyy-F2	-28dBm	Different DWDM wavelengths on Tx & Rx, with 8 channel DWDM Mux/Demux**

*** With >20dB return loss on fiber interface**
****Assumes 8 Ch Mux/Demux loss of 3.5dB**
Tx Power/Rx Sensitivity are nominal values ±1dBm
Fiber loss= 0.4/0.3dB per km @1310nm/1550nm

7707DT Block Diagram







Specifications

Data Input/Output:

Number of Ports:	3 RS-232, 4 RS-422/485
Connector:	Multi-pin removable terminal block
Baud Rate:	Up to 3 MBaud
Latency:	Maximum single direction latency with 1m of fiber is 500ns for RS-422 and 10ms for RS-232. Additional latency due to fiber is 5µs/km

Optical Input/Output:

Number:	1 (Single Fiber Versions) 2 (Dual Fiber -F2 Versions)
Connector:	Female SC/PC, ST/PC or FC/PC
Input Wavelengths:	1270nm to 1610nm
Maximum Input Power:	0dBm
Input Optical Sensitivity:	See Application Configuration Chart
Output Jitter:	< 0.2 UI
Output Wavelengths:	See Ordering Information
Output Power:	See Application Configuration Chart

LTC Input:

Standard:	SMPTE 12M
Number of Inputs:	1 Balanced
Connector:	2 Pins on multi-pin removable terminal block
Rise/Fall Time:	40µs ± 10 µs
Signal Level:	0.2 to 4V p-p
Impedance:	110 Ω balanced

LTC Output:

Standard:	SMPTE 12M
Number of Outputs:	1 Balanced
Connector:	2 Pins on multi-pin removable terminal block
Signal Levels:	1V p-p nominal
Rise/Fall Times:	40µs ± 10µs
Impedance:	110 Ω balanced

Electrical:

Voltage:	+12V DC
Power:	6 Watts (Non DWDM) 8 Watts (DWDM)
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Physical:

Number of Slots:	1

Ordering Information:

Multi RS-232/422 Fiber Data Transceiver, VistaLink™ Monitoring

7707DT13	Single Fiber, 1310nm FP TX and Rx
7707DT13M-W	Single Fiber, WDM, 1310nm FP Tx, Rx on 1550nm
7707DT15-W	Single Fiber, WDM, 1550nm DFB Tx, Rx on 1310nm
7707DT13-F2	Dual Fiber, 1310nm FP Tx and Rx
7707DTxx-F2	Dual Fiber, CWDM wavelength, where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

For DWDM Applications: Contact Factory

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

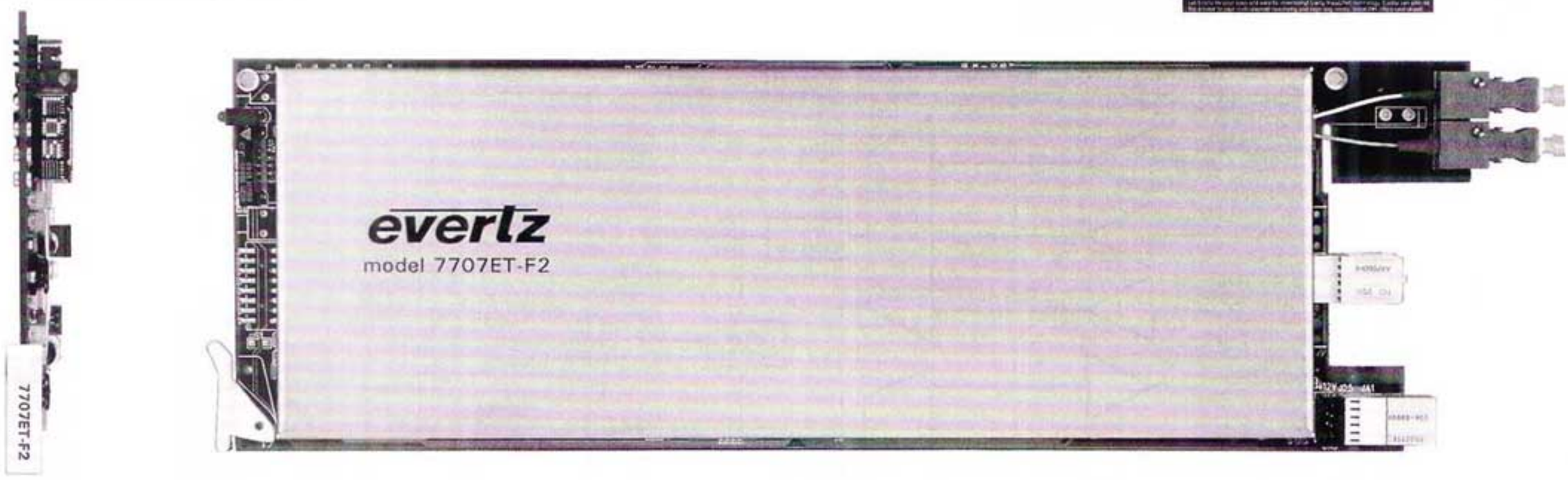
Fiber Optic Patch Cable:

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

Model 7707ET



The 7707ET is a VistaLINK™ -enabled 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, mediates between a 10/100BASE-TX segment and supports both full duplex and half-duplex operation. Monitoring and control of card status and parameters are 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

- Auto negotiation for 10/100 speed and half/full duplex modes
- Built in Ethernet switch for complete isolation of each transmission end
- Comprehensive signal and status monitoring via four digit card edge display or remotely through SNMP and VistaLINK™ enabled capability
- 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.692 compliant) also available
- Supports multi-mode and single-mode fiber (-F2 versions)
- 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:

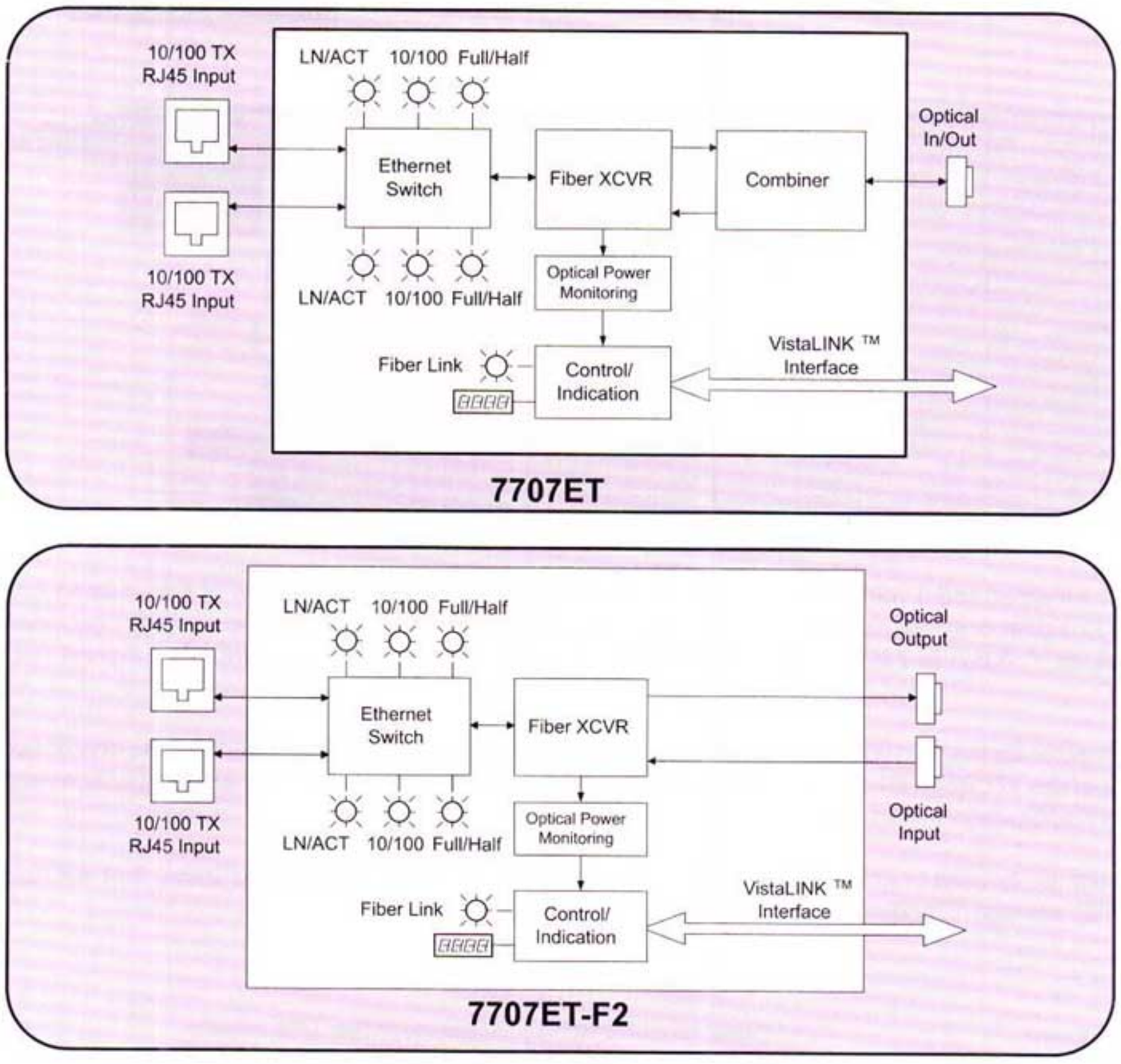
- Frame Status
- 10/100 speed indication for all copper ports
- Full duplex/Collision Indication for all copper ports
- Link activity for copper port
- Received optical power level
- Fiber link indication

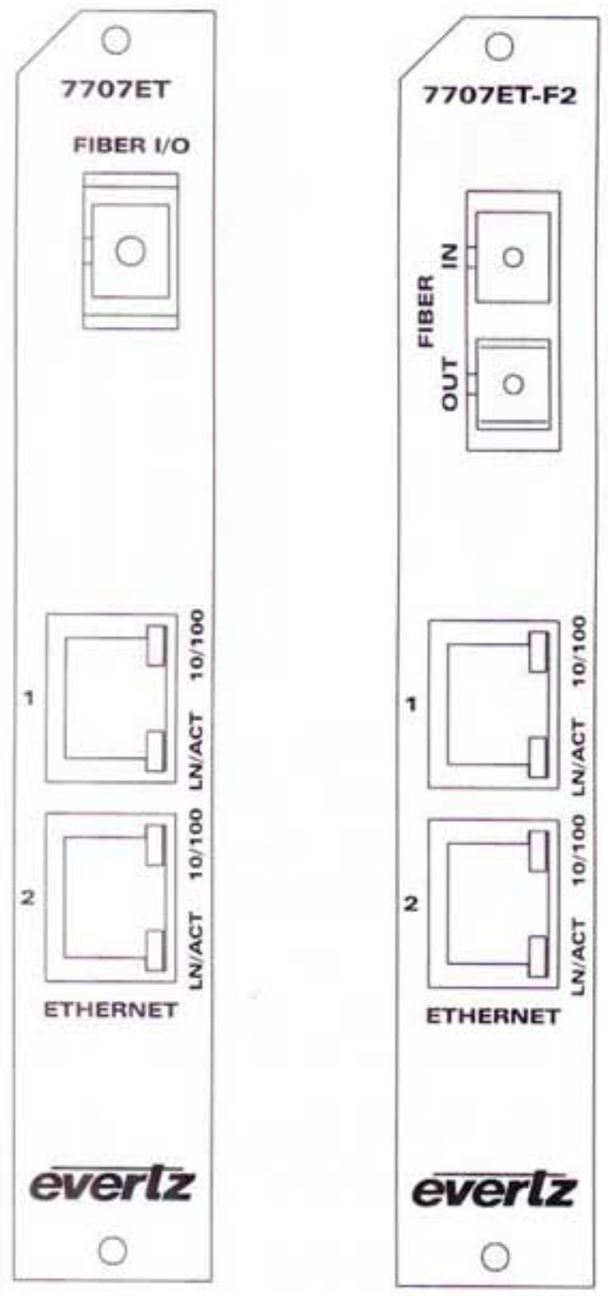
7707ET Application Configurations

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/60km	7707ET13-F2	-7dBm	7707ET13-F2	-32dBm	1310nm on Tx & Rx fibers
Single-Mode	1	14dB/30km*	7707ET13	-10dBm	7707ET13	-24dBm	1310nm, bi-directional, one fiber
Single-Mode	1(WDM)	25dB/50km	7707ET13M-W	-1dBm	7707ET15-W	-26dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	28dB/95km**	7707ETxx-F2	0dBm	7707ETyy-F2	-32dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	35dB/115km**	7707ETxxxx-F2	+7dBm	7707ETyyyy-F2	-32dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux**

*** With >20dB return loss on fiber interface**
****Assumes 8 Ch Mux/Demux loss of 3.5dB**
Tx Power/Rx Sensitivity are nominal values ±1dBm
Fiber loss= 0.4/0.3dB per km @1310nm/1550nm

Model 7707ET Block Diagram





Specifications

Ethernet Input/Output:

Standard :	IEEE 802.3 (10 BaseT), IEEE 802.3u (100 BaseTX)
Connector:	Two RJ45's
Number of channels:	Two 10Base-T or one 100BaseTX
Cable Requirements:	
10 BaseT :	UTP category 3,4 or 5 cable up to 328 ft/100m (2 pairs)
100 BaseTX :	UTP category 5 cable up to 328 ft/100m (2 pairs)

Optical Input/Output:

Connector:	
Single Fiber Versions:	1 Female SC/PC, ST/PC or FC/PC
Dual Fiber (F2) Versions :	2 Female SC/PC, ST/PC or FC/PC
Input wavelengths:	1270nm - 1610nm
Maximum Input Power:	0dBm
Input Optical Sensitivity:	See Application Configurations
Output Wavelengths:	See Ordering Information
Output Power:	See Application Configurations

Electrical:

Voltage:	12 volts
Power:	6 Watts (Non DWDM) 8 Watts (DWDM)
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Physical:

Number of slots:	1

Ordering Information: *Ethernet Fiber Transceiver - VistaLINK™ Monitoring*

7707ET13	Single fiber, 1310nm FP Tx and Rx
7707ET13M-W	Single fiber, WDM, 1310nm FP Tx, Rx on 1550nm
7707ET15-W	Single fiber, WDM, 1550nm DFB Tx, Rx on 1310nm
7707ET13-F2	Dual fiber, 1310nm FP, Tx and Rx
7707ETxx-F2	Dual fiber, CWDM wavelength where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

For DWDM Applications: Contact Factory

Ordering Options

Rear Plate and Fiber Connector must be specified at time of order
Eg: Model +SC +3RU

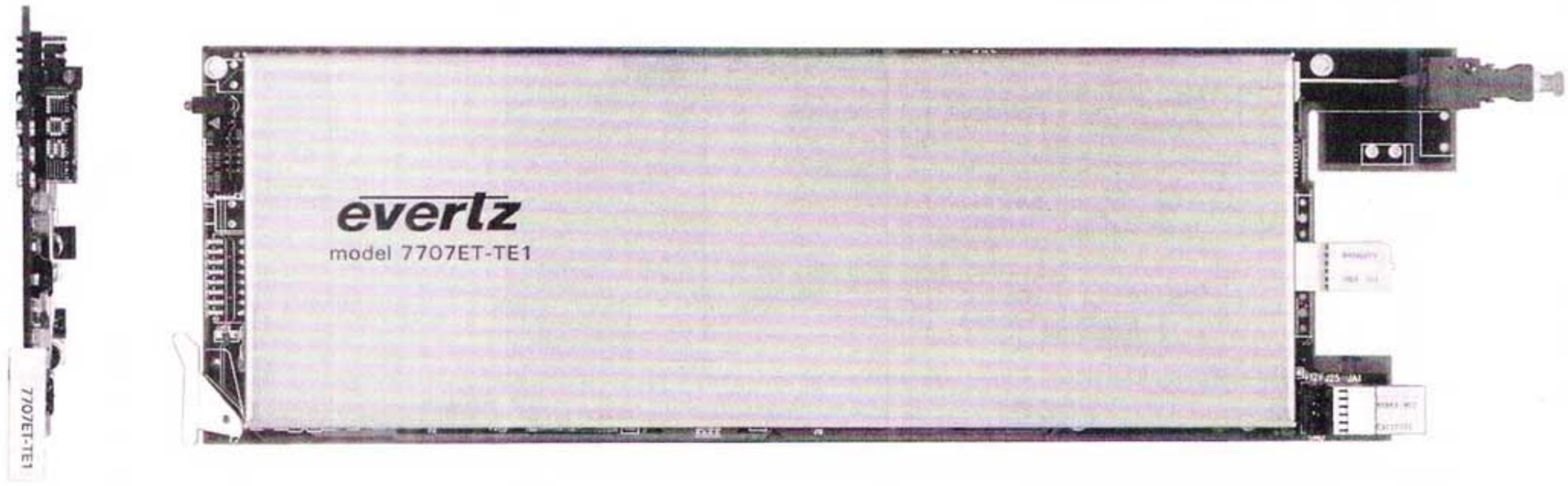
Rear Plate Suffix	
+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate
Connector Suffix	
+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

Enclosures:

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



Model 7707ET-TE1



The 7707ET-TE1 is a VistaLINK™ - enabled Ethernet and T1/E1/J1 Transceiver that provides an economical method of transmitting one 10/100BaseT Ethernet signal and one T1/E1/J1 signal over optical fiber. Monitoring and control of card status and parameters are 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 in a single slot card
- 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 independant over transport interface
- Built-in Ethernet switch for isolation of each transmission end
- Signal and status monitoring via four digit card-edge display or remotely through SNMP and VistaLINK™ capability
- Local display of optical signal strength, link paramaters 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.692 compliant) also available
- Supports multi-mode and single-mode fiber (-F2 version)
- Fully hot swappable from front of frame
- SC/PC, ST/PC or FC/PC connector options

Status Indication:

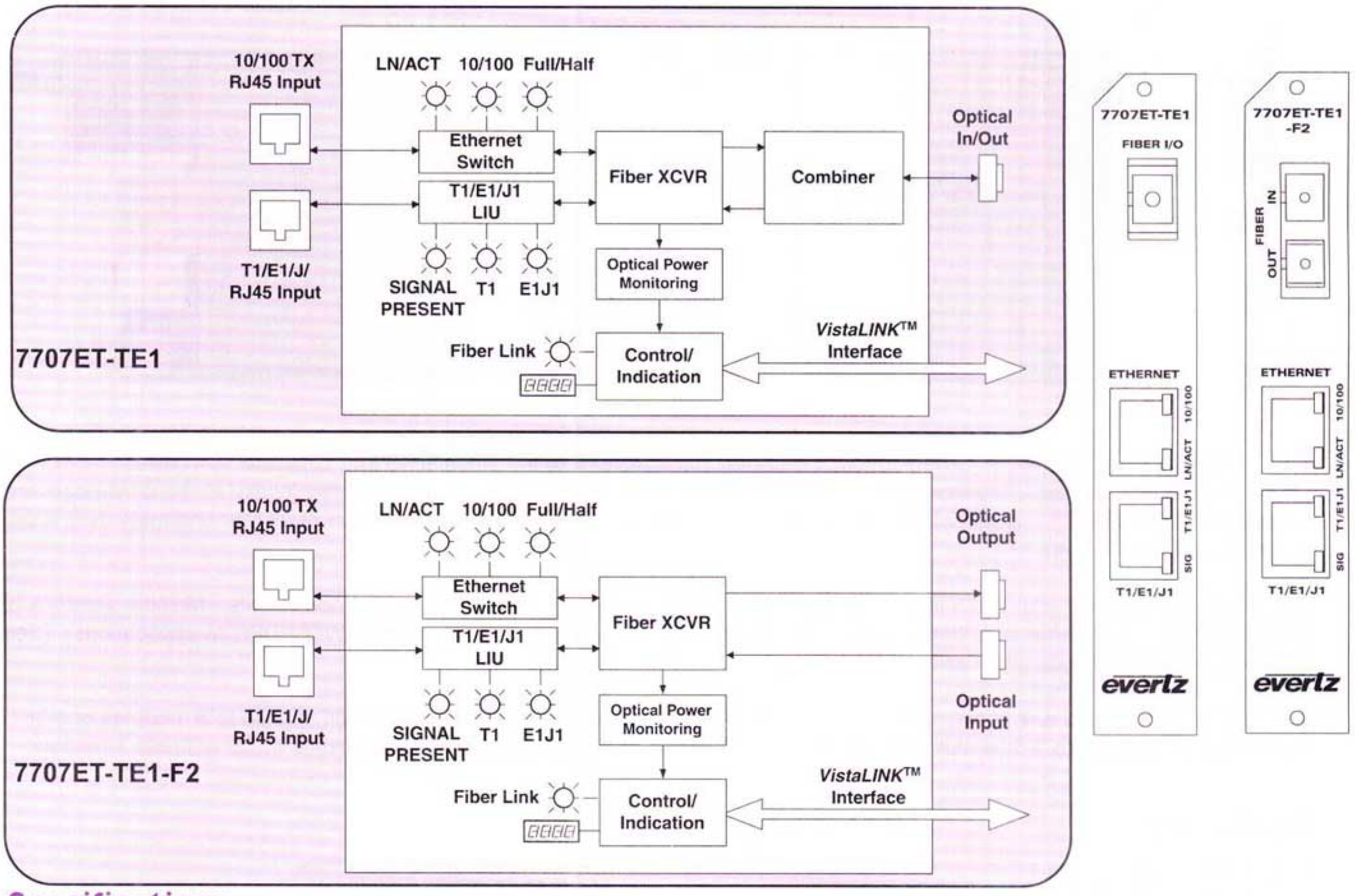
- Frame status
- Fiber link indication
- 10/100 Speed indication
- Ethernet Full Duplex/Collision indication
- Ethernet Link activity
- T1/E1/J1 Signal Presence
- T1/E1/J1 Indication
- Optical Power Level

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/50km	7707ET13-TE1-F2	-7dBm	7707ET13-TE1-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	1	14dB/30km*	7707ET13-TE1	-10dBm	7707ET13-TE1	-24dBm	1310nm, bi-directional, one fiber
Single-Mode	1(WDM)	25dB/60km	7707ET13M-TE1-W	-1dBm	7707ET15-TE1-W	-26dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	24dB/80km**	7707ETxx-TE1-F2	0dBm	7707ETyy-TE1-F2	-28dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	31dB/105km**	7707ETxxxx-TE1-F2	+7dBm	7707ETyyyy-TE1-F2	-28dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux**

*** With >20dB return loss on fiber interface**
****Assumes 8 Ch Mux/Demux loss of 3.5dB**
Tx Power/Rx Sensitivity are nominal values ±1dBm
Fiber loss= 0.4/0.3dB per km @1310nm/1550nm

Model 7707ET-TE1-Block Diagram



Specifications

Ethernet Input/Output

Standard :	IEEE 802.3 (10 BaseT), IEEE 802.3u (100 BaseTX)
Connector:	1 RJ45
Cable Requirements:	
10 BaseT:	UTP category 3,4 or 5 cable up to 328 ft/100m (2 pairs)
100 BaseTX:	UTP category 5 cable up to 328 ft/100m (2 pairs)

T1/E1/J1 Input/Output:

Standard:	G.703
Connector:	1 RJ45
Cable Requirements:	0.63 mm (22 AWG) cable up to 1000 meters

Optical Input/Output:

Connector:	
Single Fiber versions:	1 Female SC/PC, ST/PC or FC/PC
Dual Fiber (F2) versions:	2 Female SC/PC, ST/PC or FC/PC
Maximum Input Power:	0dBm
Input Wavelength:	1270nm - 1610nm
Input Optical Sensitivity:	See Application Configurations Chart
Output Wavelengths:	See Ordering Information
Output Power:	See Application Configurations Chart

Electrical:

Voltage:	12 volts
Power:	6 Watts (Non DWDM) 8 Watts (DWDM)
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Physical:

Number of slots:	1

Ordering Information:

Ethernet and T1/E1/J1 Fiber Transceiver - VistLINK™ Monitoring

7707ET13-TE1	Single Fiber 1310nm FP, TX and RX
7707ET13M-TE1-W	Single Fiber, WDM 1310nm FP TX, RX on 1550nm
7707ET15-TE1-W	Single Fiber, WDM 1550nm DFB TX, RX on 1310nm
7707ET13-TE1-F2	Dual Fiber 1310 nm FP, TX, RX
7707ETxx-TE1-F2	Dual Fiber CWDM wavelength where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)
For DWDM Applications:	Contact Factory

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

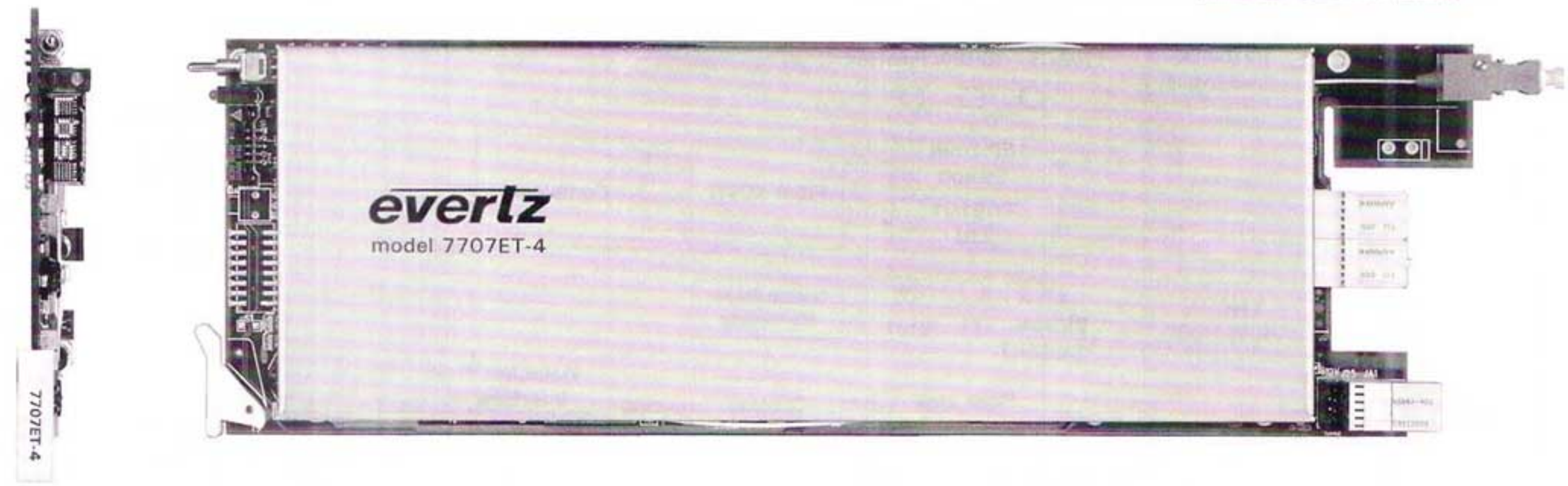
Enclosures:

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

Quad Ethernet Fiber Transceiver

1d

Model 7707ET-4



The 7707ET-4 is a VistaLINK™ – enabled Quad Ethernet Transceiver that transmits up to four separate 10/100BaseT Ethernet channels over optical fiber. Monitoring and control of card status and parameters are provided locally at the card edge and remotely via VistaLINK™. A pair of 7707ET-4 transceivers permits 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 Configurations chart below)

The 7707ET-4 occupies one or two card slots and can be housed in either a 1RU frame that will hold up to 3 modules or 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 status monitoring via four digit card-edge display or remotely through SNMP and VistaLINK™ -enabled capability
- Optical output wavelengths at 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- DWDM wavelengths (ITU-T G.692 compliant) also available
- Fully hot swappable from front of frame
- SC/PC, ST/PC, FC/PC Connector options

Status Indication:

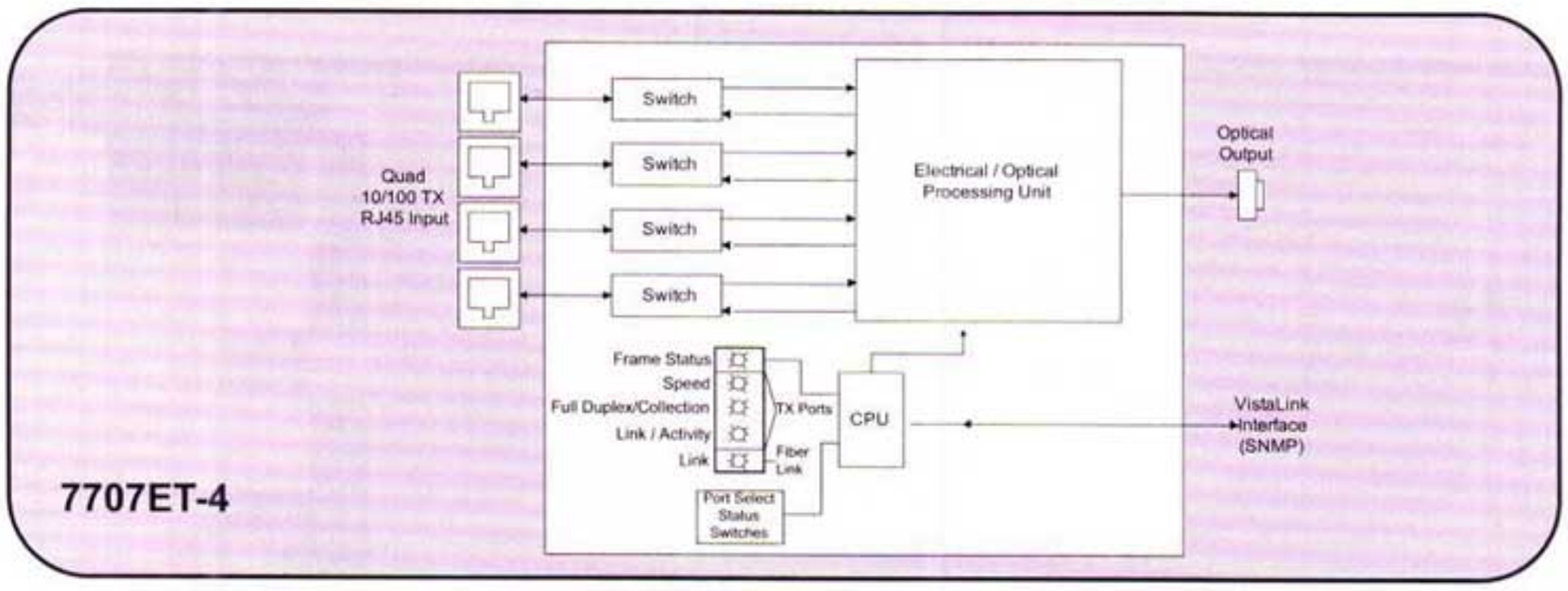
- Frame status
- 10/100 Speed indication on copper ports
- Full Duplex/Collision indication on copper ports
- Link activity on copper ports
- Received optical power level

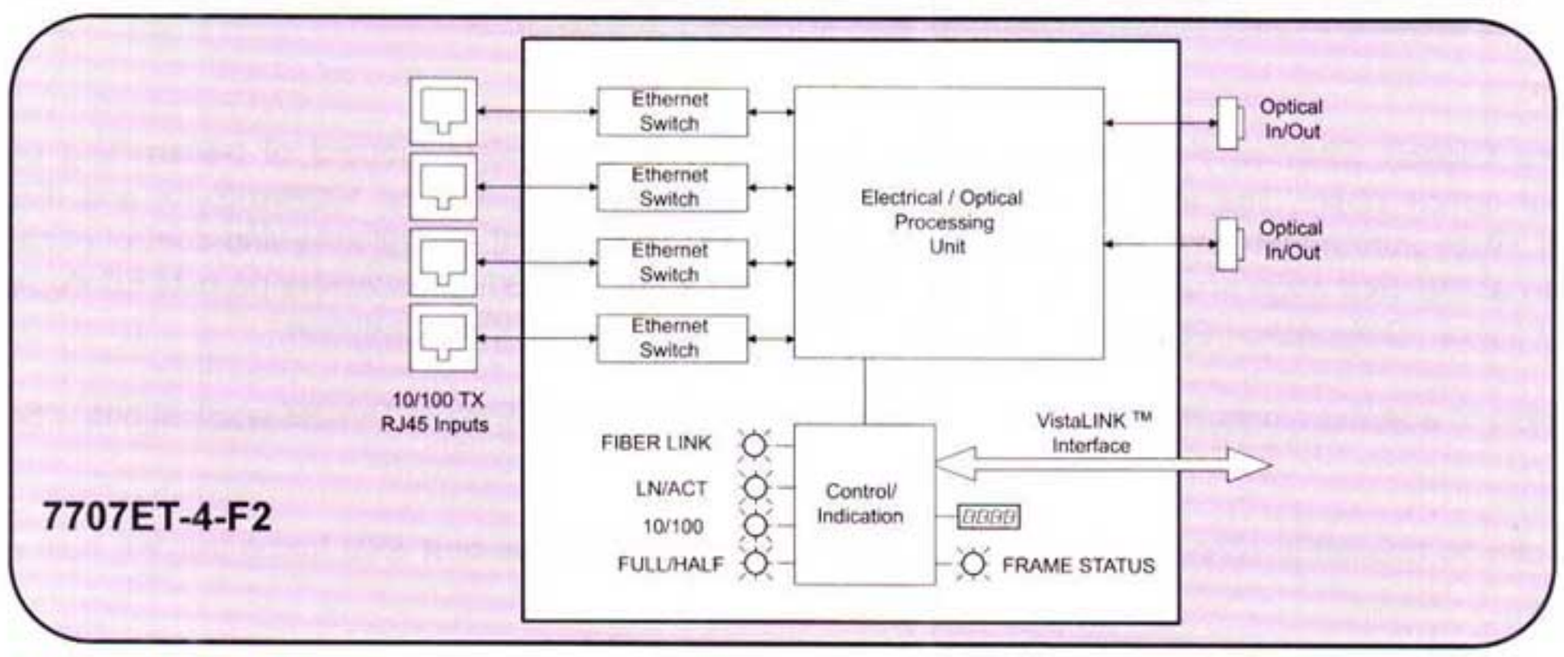
7707ET-4 Application Configurations

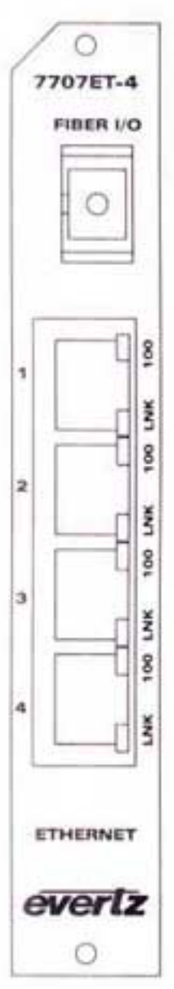
FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<2km	7707ET13-4-F2	-7dBm	7707ET13-4-F2	-23dBm	1310nm on Tx & Rx fibers
Single-Mode	2	16dB/40km	7707ET13-4-F2	-7dBm	7707ET13-4-F2	-23dBm	1310nm on Tx & Rx fibers
Single-Mode	1	10dB/25km*	7707ET13-4	-9dBm	7707ET13-4	-19dBm	1310nm, bi-directional, one fiber
Single-Mode	1(WDM)	20dB/50km	7707ET13M-4-W	-1dBm	7707ET15-4-W	-21dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	19dB/60km**	7707ETxx-4-F2	0dBm	7707ETyy-4-F2	-23dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(CWDM)	24dB/80km**	7707ETxx-4-F2-H	0dBm	7707ETyy-4-F2-H	-28dBm	Different CWDM wavelengths for Tx & Rx, with 8 channel CWDM Mux/Demux with high sensitivity receiver**
Single-Mode	1(DWDM)	31dB/105km**	7707ETxxxx-4-F2-H	+7dBm	7707ETyyyy-4-F2-H	-28dBm	Different DWDM wavelengths for Tx & Rx, with 8 channel DWDM Mux/Demux with high sensitivity receiver**

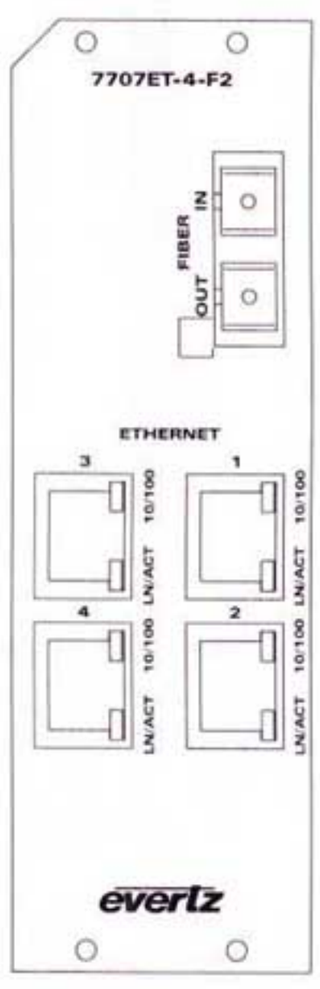
*** With >20dB return loss on fiber interface**
****Assumes 8 Ch Mux/Demux loss of 3.5dB**
Tx Power/Rx Sensitivity are nominal values ±1dBm
Fiber loss= 0.4/0.3dB per km @1310nm/1550nm

Model 7707ET-4-Block Diagram









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:	0 dBm
F2-H Versions:	-7dBm
Input Optical Sensitivity	See Application Configurations
Output Wavelengths:	See Ordering Information
Output Power:	See Application Configurations

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

Ordering Information: *Quad Ethernet Fiber Transceiver*

7707ET13-4	Single fiber, 1310nm FP Tx and Rx
7707ET13M-4-W	Single fiber, WDM, 1310nm FP Tx, Rx on 1550nm
7707ET15-4-W	Single fiber WDM, 1550nm DFB Tx, Rx on 1310nm
7707ET13-4-F2	Dual fiber, 1310nm FP on Tx and Rx
7707ETxx-4-F2	Dual fiber CWDM wavelength where xx= 27(1270nm), 29(1290nm), 31(1310nm),33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

For Long Distance CWDM Applications:

7707ETxx-4-F2-H	Dual fiber CWDM wavelength where xx = 27(1270nm), 29(1290nm), 31(1310nm),33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

DWDM Application: Contact Factory

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

Gigabit Ethernet Fiber Transceiver

1d

Model 7707GT



The 7707GT is a VistaLINK™ - enabled 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 and control of card status and parameters are 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 Configurations chart below)

The 7707GT occupies one card slot and can be housed in either a 1RU frame that will hold up to 3 modules or a 3RU frame that will hold up to 15 modules.

Features

- Auto negotiation for 10/100/1000 speeds and half/full duplex modes
- Auto equalization for up to 100m at Gigabit ethernet rates
- Signal and status monitoring via four digit card edge display or remotely through SNMP and VistaLINK™ enabled capability
- 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.692 compliant) also available
- Supports multi-mode and single-mode fiber(-F2 versions)
- 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

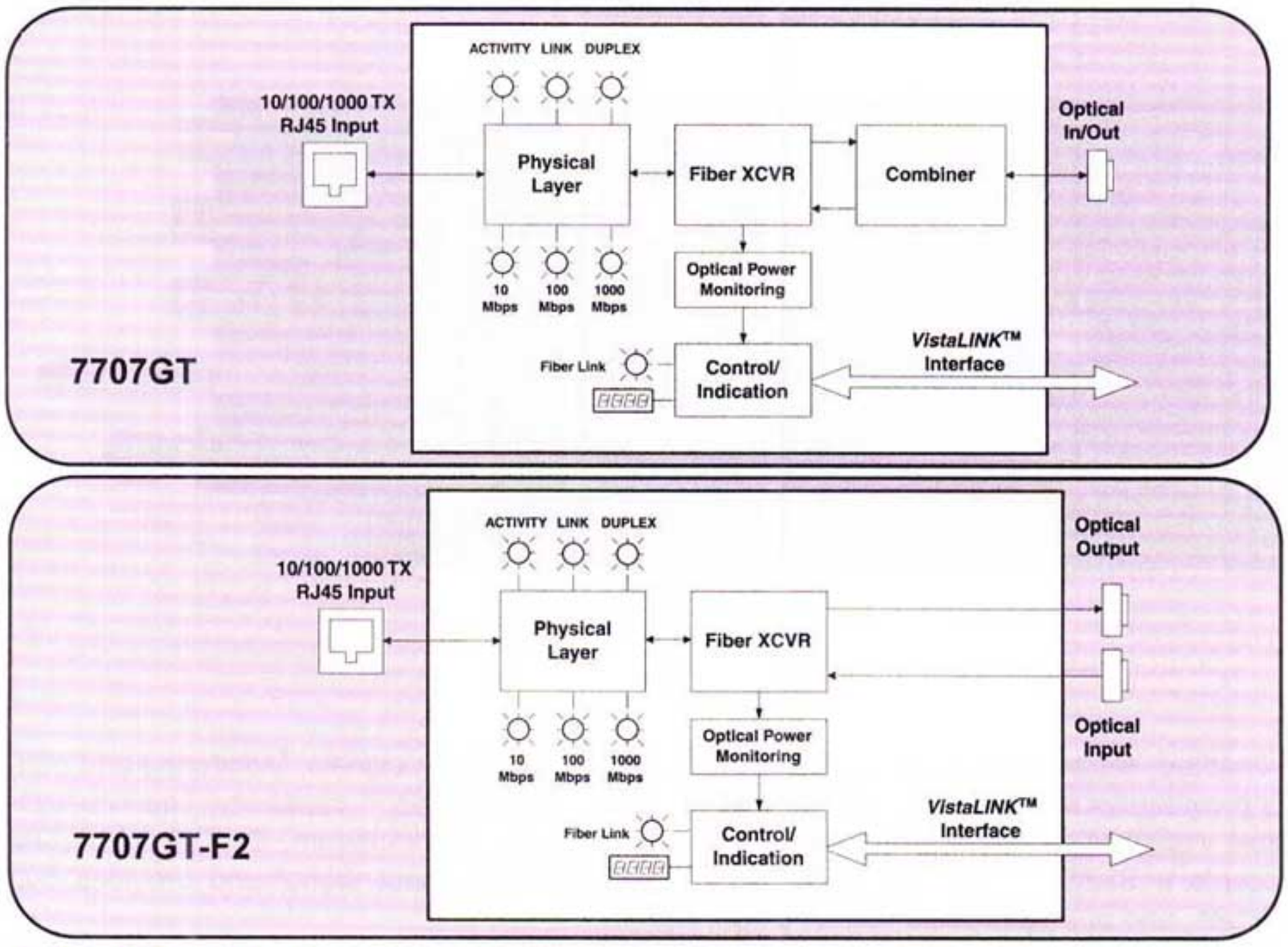
7707GT Application Configurations

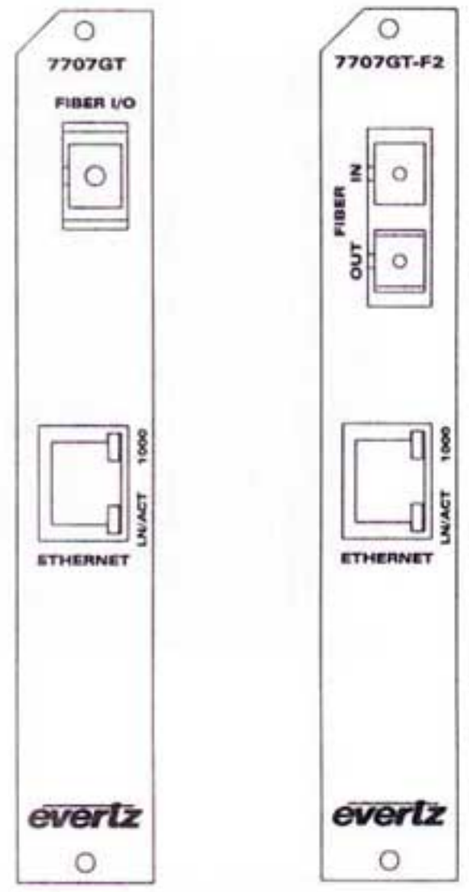
FIBER TYPE	FIBERS	OPTICAL/LINK BUDGET	TRANSMIT SIDE		RECEIVE SIDE		DESCRIPTION
			ORDERING PRODUCT INFO	TX POWER	ORDERING PRODUCT INFO	RX SENSITIVITY	
Multi-Mode	2	<1km	7707GT13-F2	-7dBm	7707GT13-F2	-23dBm	1310nm on Tx & Rx fibers
Single-Mode	2	16dB/40km	7707GT13-F2	-7dBm	7707GT13-F2	-23dBm	1310nm on Tx & Rx fibers
Single-Mode	1	10dB/25km*	7707GT13	-9dBm	7707GT13	-19dBm	1310nm, bi-directional, one fiber
Single-Mode	1(WDM)	20dB/50km	7707GT13L-W	-1dBm	7707GT15-W	-21dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	19dB/60km**	7707GTxx-F2	0dBm	7707GTyy-F2	-23dBm	Different CWDM wavelengths on Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(CWDM)	24dB/80km**	7707GTxx-F2-H	0dBm	7707GTyy-F2-H	-28dBm	Different CWDM wavelengths on Tx & Rx, with 8 channel CWDM Mux/Demux, High Sensitivity Receiver**
Single-Mode	1(DWDM)	31dB/105km**	7707GTxxxx-F2-H	+7dBm	7707GTyyyy-F2-H	-28dBm	Different DWDM wavelengths on Tx & Rx, with 8 channel DWDM Mux/Demux, High Sensitivity Receiver**

*** With >20dB return loss on fiber interface**
****Assumes 8 Ch Mux/Demux loss of 3.5dB**

Tx Power/Rx Sensitivity are nominal values ±1dBm
Fiber loss= 0.4/0.3dB per km @1310nm/1550nm

Model 7707GT Block Diagram





Specifications

Ethernet Input/Output

Standard:	IEEE 802.3 (10 BaseT), IEEE 802.3u (100 BaseTX), IEEE 802.3ab(1000baseTX)
Connector:	1 RJ45
Cable Requirements:	
10 BaseT:	UTP category 3,4 or 5 cable up to 328 ft/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:	0dBm
-H versions:	-7dBm
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)
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Physical:

Number of slots:	1

Ordering Information: *Gigabit Ethernet Fiber Tranceiver, VistaLink™ Monitoring*

7707GT13	Single fiber, 1310nm, FP Tx and Rx
7707GT13L-W	Single fiber WDM, 1310nm DFB Tx, Rx on 1550nm
7707GT15-W	single fiber WDM, 1550nm DFB Tx, Rx 1310nm
7707GT13-F2	Dual fiber, 1310nm FP on Tx and Rx
7707GTxx-F2	Dual fiber CWDM wavelength where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450nm), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

For Long Distance CWDM Applications:

7707GTxx-F2-H	Dual fiber CWDM wavelength with high sensitivity where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm), 35(1350nm), 37(1370nm), 43(1430nm), 45(1450nm), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

For DWDM Applications: Contact Factory

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:

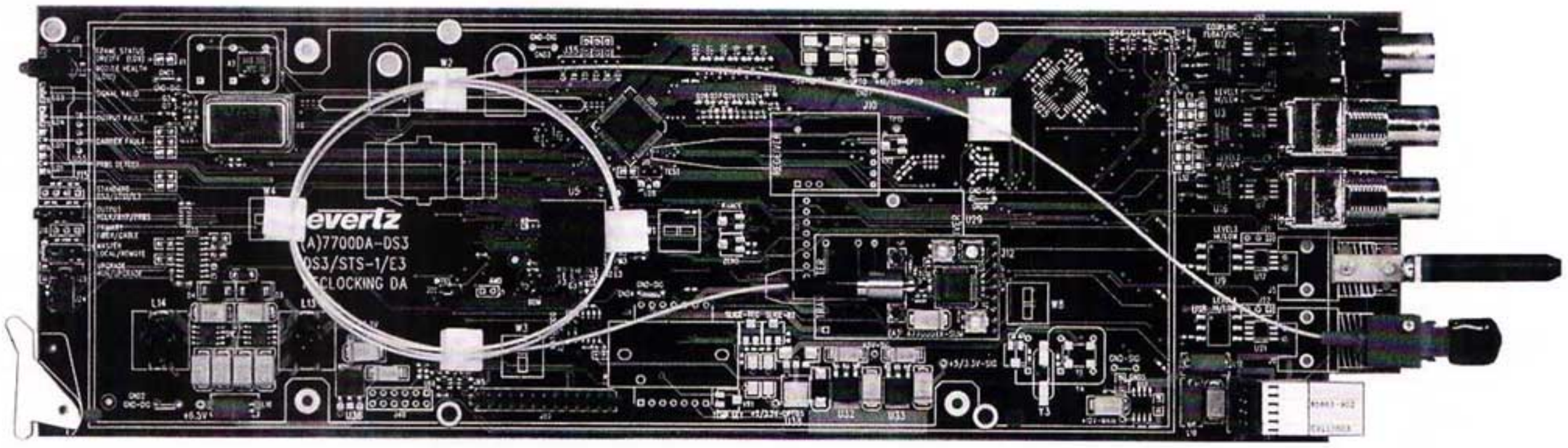
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

DS3 Electrical to Optical Converter

1d

Model 7707EO-DS3





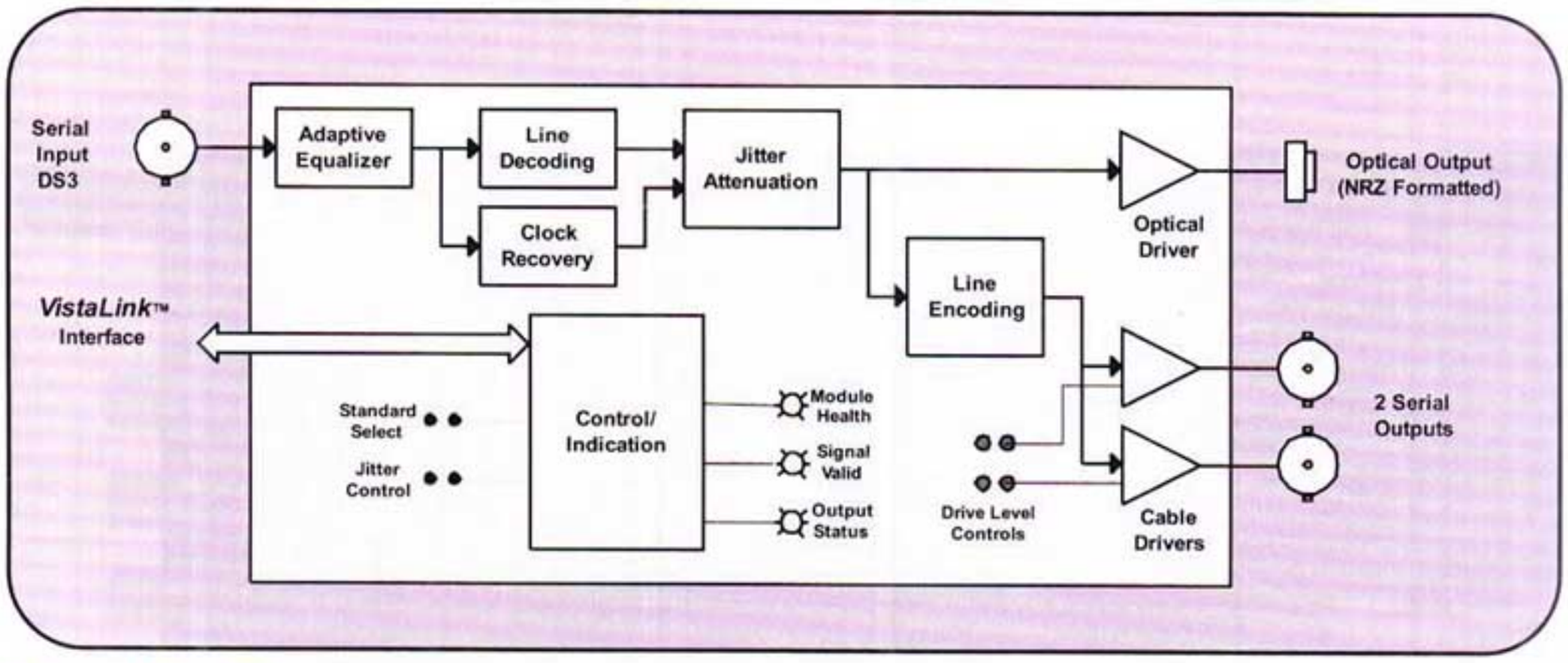
The 7707EO-DS3 is a VistaLINK™-enabled, electrical to optical converter for DS3 (44.736 Mb/s) signals. Monitoring and control of card status and parameters is provided locally at the card edge, and remotely via VistaLINK™ capability. The 7707EO-DS3 provides automatic coaxial cable equalization, reclocking and optical conversion to 1310/1550nm, CWDM or DWDM wavelengths. The 7707EO-DS3 accepts a B3ZS-encoded Alternate Mark Inversion (AMI) input signal and provides two reclocked G.703 compliant output signals, and one scrambled optical output signal.

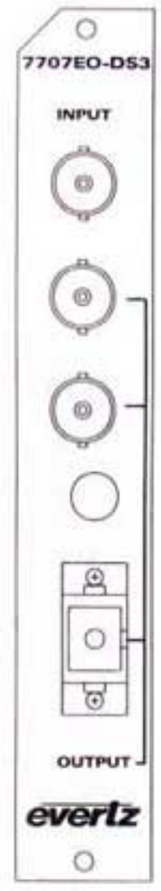
The 7707EO-DS3 occupies one card slot and can be housed in either a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone enclosure that will hold 1 module.

Features

- 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.692 compliant) also available
- Supports multi-mode and single-mode fiber
- 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

Model 7707EO-DS3 Block Diagram





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 169-8
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:	-7.5dBm ± 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

Ordering Information: *DS3 Electrical to Optical Converter, VistaLink™ Monitoring*

7707EO13-DS3	1310nm, FP Laser
7707EO15-DS3	1550nm, DFB Laser

For CWDM Applications:

7707EO27-DS3	1270nm, CWDM DFB Laser
7707EO29-DS3	1290nm, CWDM DFB Laser
7707EO31-DS3	1310nm, CWDM DFB Laser
7707EO33-DS3	1330nm, CWDM DFB Laser
7707EO35-DS3	1350nm, CWDM DFB Laser
7707EO37-DS3	1370nm, CWDM DFB Laser
7707EO43-DS3	1430nm, CWDM DFB Laser
7707EO45-DS3	1450nm, CWDM DFB Laser
7707EO47-DS3	1470nm, CWDM DFB Laser
7707EO49-DS3	1490nm, CWDM DFB Laser
7707EO51-DS3	1510nm, CWDM DFB Laser
7707EO53-DS3	1530nm, CWDM DFB Laser
7707EO55-DS3	1550nm, CWDM DFB Laser
7707EO57-DS3	1570nm, CWDM DFB Laser
7707EO59-DS3	1590nm, CWDM DFB Laser
7707EO61-DS3	1610nm, CWDM DFB Laser

For DWDM Applications:

Contact Factory

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:

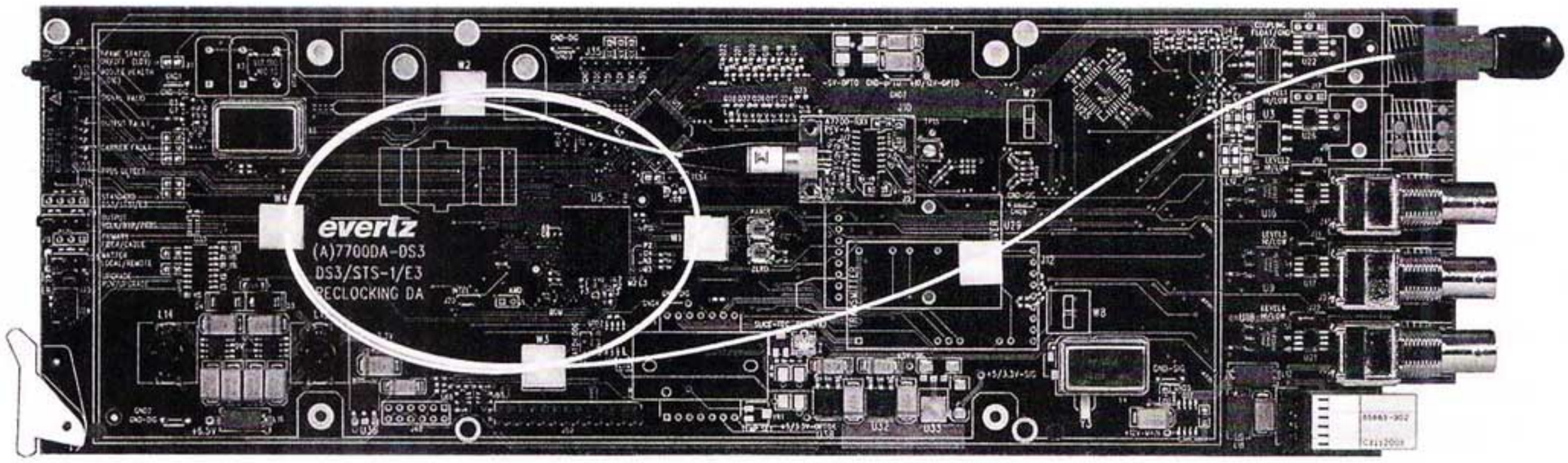
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

DS3 Optical to Electrical Converter

1d

Model 7707OE-DS3





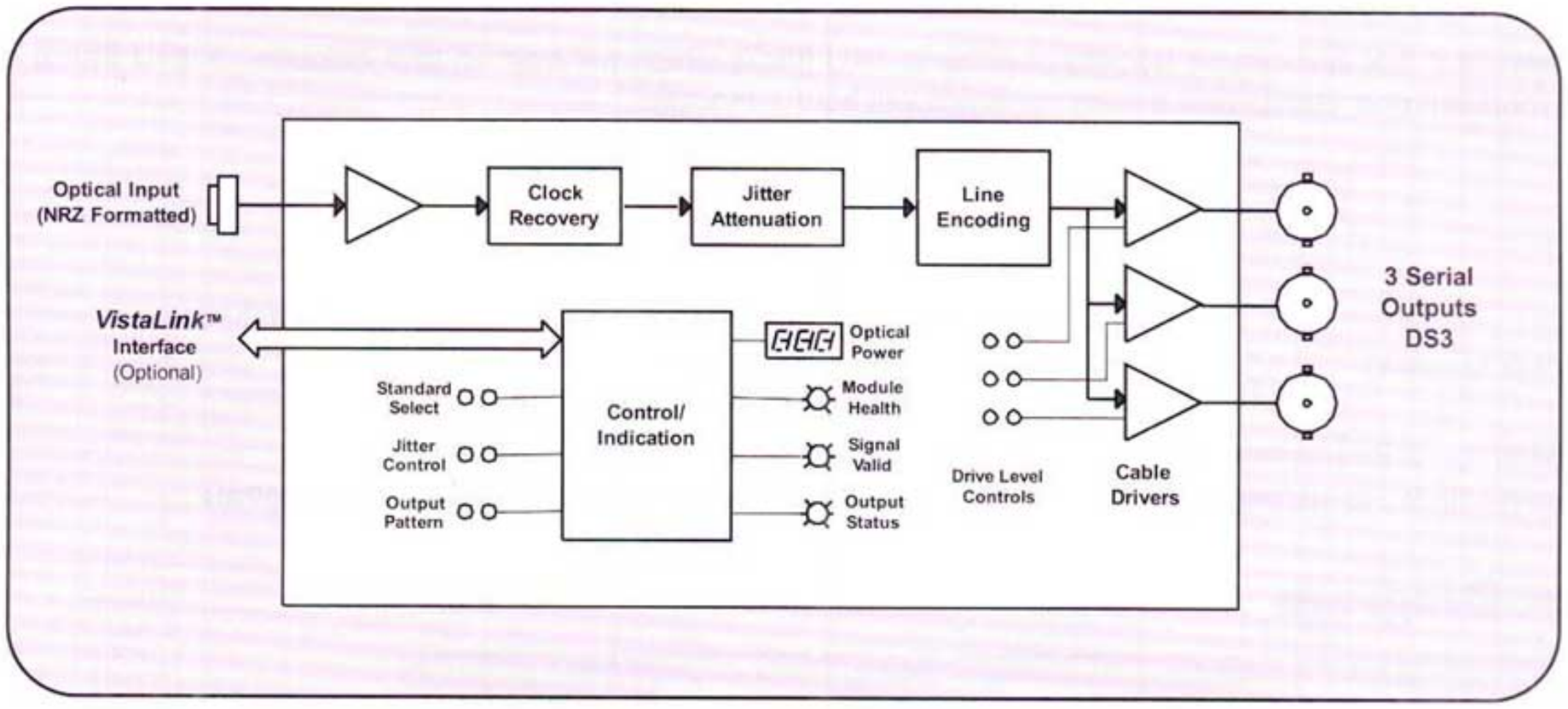
The 7707OE-DS3 is a VistaLINK™ - enabled optical to electrical converter for DS3 (44.736 Mb/s) signals. Monitoring and control of card status and parameters is provided locally at the card edge, and remotely via VistaLINK™ capability. The 7707OE-DS3 accepts one fiber input, and provides jitter attenuation to three reclocked G.703 compliant output signals.

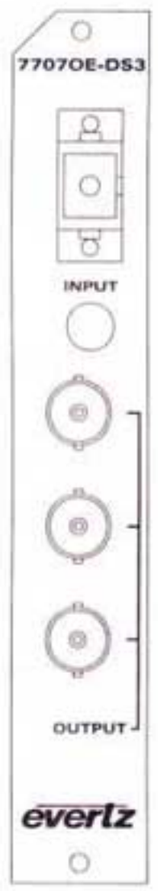
The 7707OE-DS3 occupies one card slot and can be housed in either a 1RU frame that will hold up to 3 modules, a 3RU frame that will hold up to 15 modules or a standalone enclosure that will hold 1 module.

Features

- 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 inputs/outputs
- Display of received optical power provides a pre-emptive indication of link integrity
- Wide range optical input (1270nm-1610nm)
- Supports multi-mode and single-mode fiber
- 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

Model 7707OE-DS3 Block Digram





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 169-8
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

70/140Mhz IF Fiber Transmitter/Receiver

Model 7705IFB

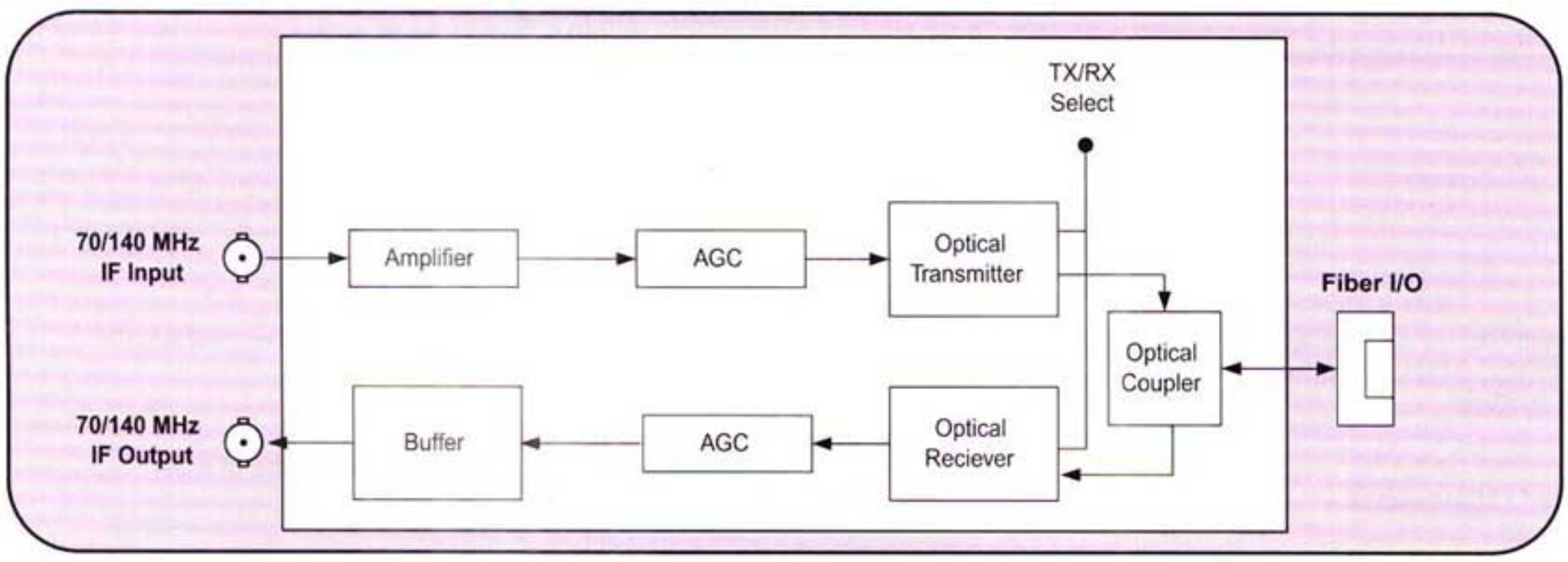
The 7705IFB is a fiber optic transmitter/receiver for 70/140 Mhz I/F signals. The 7705IFB can be configured as either a IF Transmitter or IF Receiver with a dip switch. As an IF Transmitter the 7705IFB accepts one 70/140 MHz BNC input and provides one fiber optic output at 1310nm. As an IF Receiver the 7705IFB accepts one fiber optic input and provides one 70/140 MHz BNC output.

The 7705IFB 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

- Operation up to 10km
- 70/140 MHz transmission or reception
- 10-200 MHz bandwidth
- Wide IF input range (-20dBm to +5dBm) on transmitter
- Adjustable RF output power (-20dBm to +6dBm) on receiver
- Protocol transparent - receives all video, audio and data modulation formats
- Fully hot swappable from front of frame
- Optical output wavelength at 1310nm
- Available in SC/PC, ST/PC, FC/PC connector options

7705IFB Block Diagram





Specifications

RF Input:

Connector:	1 BNC
I/O Impedance:	75Ω or 50Ω (See Ordering Information)
Return Loss:	12dB (min)
Input Signal Range:	-20 to -5dBm

RF Output:

Connector:	1 BNC
I/O Impedance:	75 or 50Ω (See Ordering Information)
Return Loss:	12dB (min)
Flatness:	±1.5db 10-200MHz ±0.25db @ any 36MHz
Carrier to Noise:	40dB @ 1MHz BW
Output Signal Range:	-20 to +6dBm
Intermodulation:	-40dBc (max)

Optical Input/Output:

Number of inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Operating Wavelength:	1310nm
Output power (when selected as TX):	-3.5dBm ±1dBm
Maximum Input Power:	0dBm
Maximum Optical Link Attenuation:	5dB

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:

Note: 75Ω I/O impedance ships standard

7705IFB13	70/140 MHz IF Fiber Transmitter/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
+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

70/140Mhz IF Fiber Transmitter/Receiver

Model 7705IFT

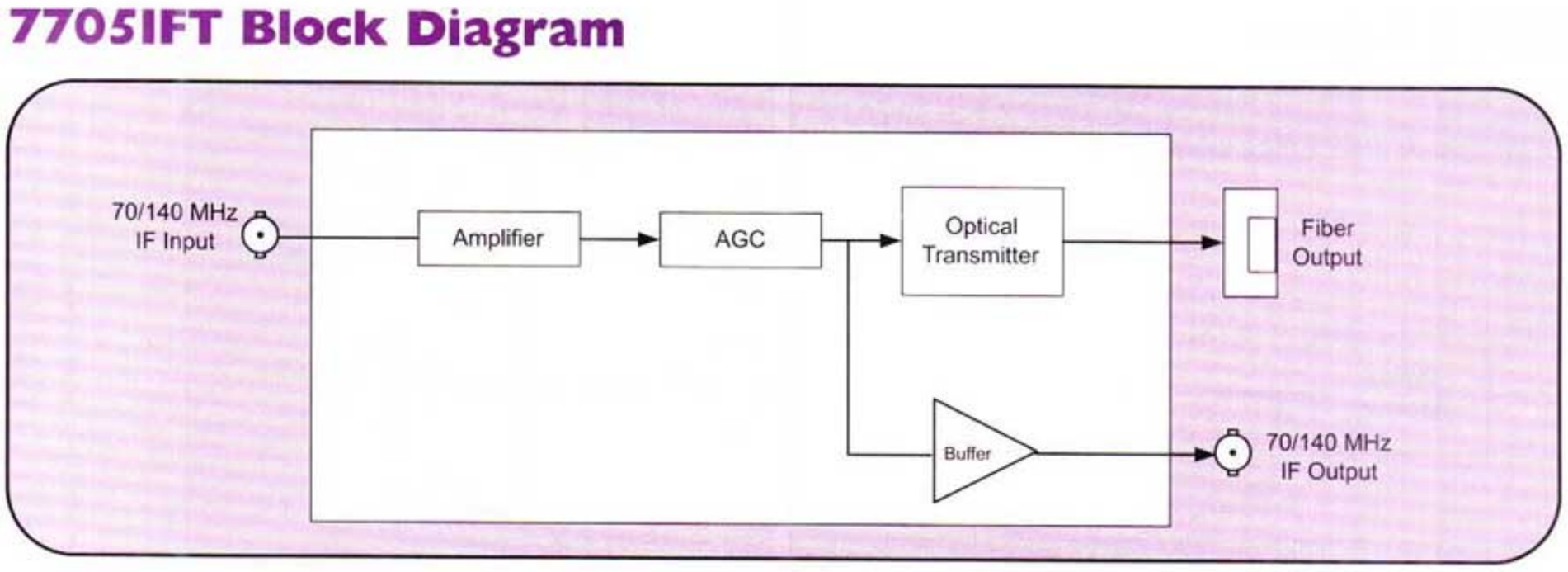
The 7705IFT is a fiber optic transmitter for 70/140 MHz IF signals. The 7705IFT accepts one 70/140 MHz coaxial input and provides a fiber optic output signal at 1310nm. An IF BNC output is also available for monitoring or further signal distribution.

The 7705IFT 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

- Operation up to 25km
- 10-200 MHz bandwidth
- Protocol transparent - transmits all video, audio and data modulation formats
- Automatic gain control on IF input
- Additional IF BNC output
- Supports multi-mode and single-mode fiber
- Available in SC/PC, ST/PC, FC/PC connector options
- Fully hot swappable from front of frame

7705IFT Block Diagram





Specifications

IF Input:

Connector:	1 BNC
I/O Impedance:	75 or 50Ω (See Ordering Information)
Return Loss:	15dB
Input Signal Range:	-20 to -5dBm

IF Output:

Connector:	1 BNC
I/O Impedance:	75 or 50Ω (See Ordering Information)
Return Loss:	15dB
Output Level:	-25dBm

Optical Output:

Number of outputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Operating Wavelength:	1310nm
Optical Power:	
1310nm FP:	0dBm ± 1dBm

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

7705IFT13	70/140MHz IF Fiber Transmitter, 1310nm

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
+ST	ST/PC
+FC	FC/PC

Enclosures:

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

70/140Mhz IF Fiber Receiver

Model 7705IFR

1d

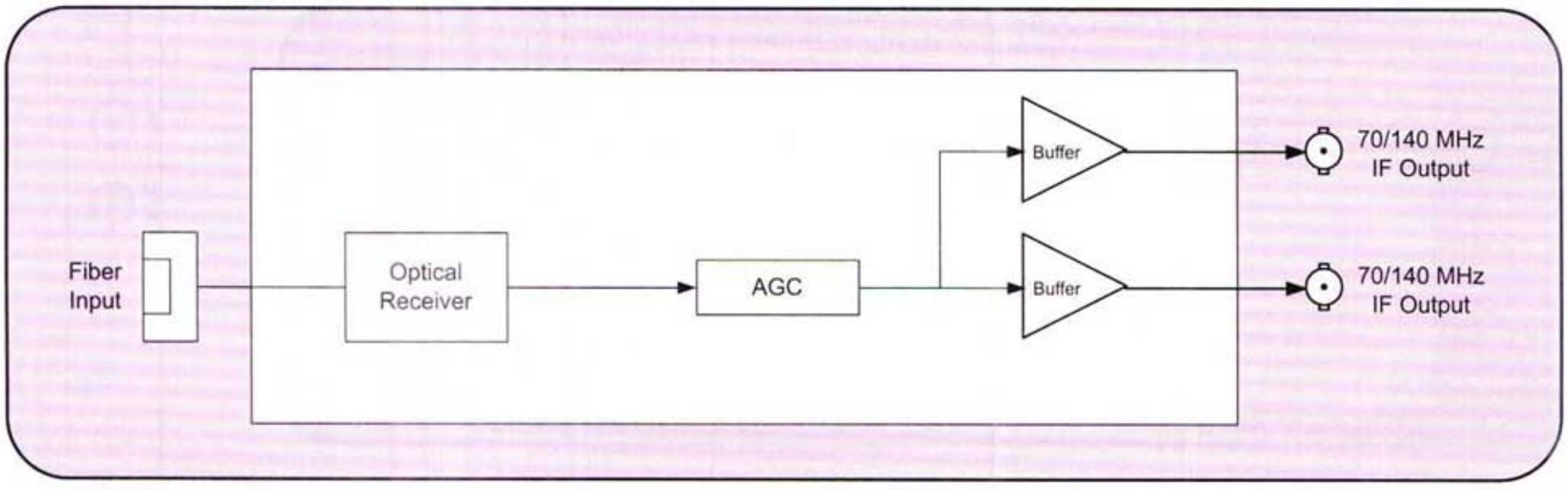
The 7705IFR is a fiber optic receiver for 70/140 MHz IF signals. The 7705IFR accepts a fiber optic input from the companion 7705IFT and provides two 70/140 MHz IF output signals via BNCs.

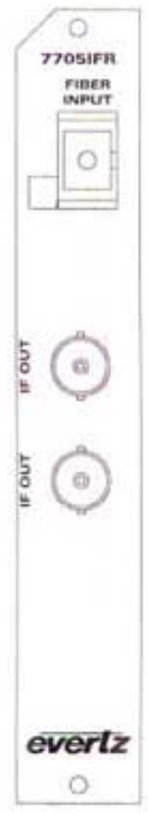
The 7705IFR occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

Features

- 10-200MHz bandwidth
- Protocol transparent - receives all video, audio and data modulation formats
- Two IF outputs for extra signal distribution or monitoring functions
- User selectable IF output power
- IF output power independent of optical loss (within AGC range)
- Supports multi-mode and single-mode fiber
- Available in SC/PC, ST/PC, FC/PC connector options
- Fully hot swappable from front of frame

7705IFR Block Diagram





Specifications

IF Outputs:

Connector:	2 BNC's
I/O Impedance:	75 or 50Ω (See Ordering Information)
Return Loss:	15dB (min)
Flatness:	±1.5db 10-200MHz
	±0.25db @ any 36MHz
Carrier to Noise:	40dB @ 1 MHz BW
Output Signal Range:	-15 to -0dBm
Intermodulation:	
Products:	-40dBc (max)

Optical Input:

Number of inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Operating Wavelength:	1270nm - 1610nm
Maximum Input Power:	0dBm
Maximum Optical Link Attenuation:	13dB

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

7705IFR	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
+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

Model 7705LT

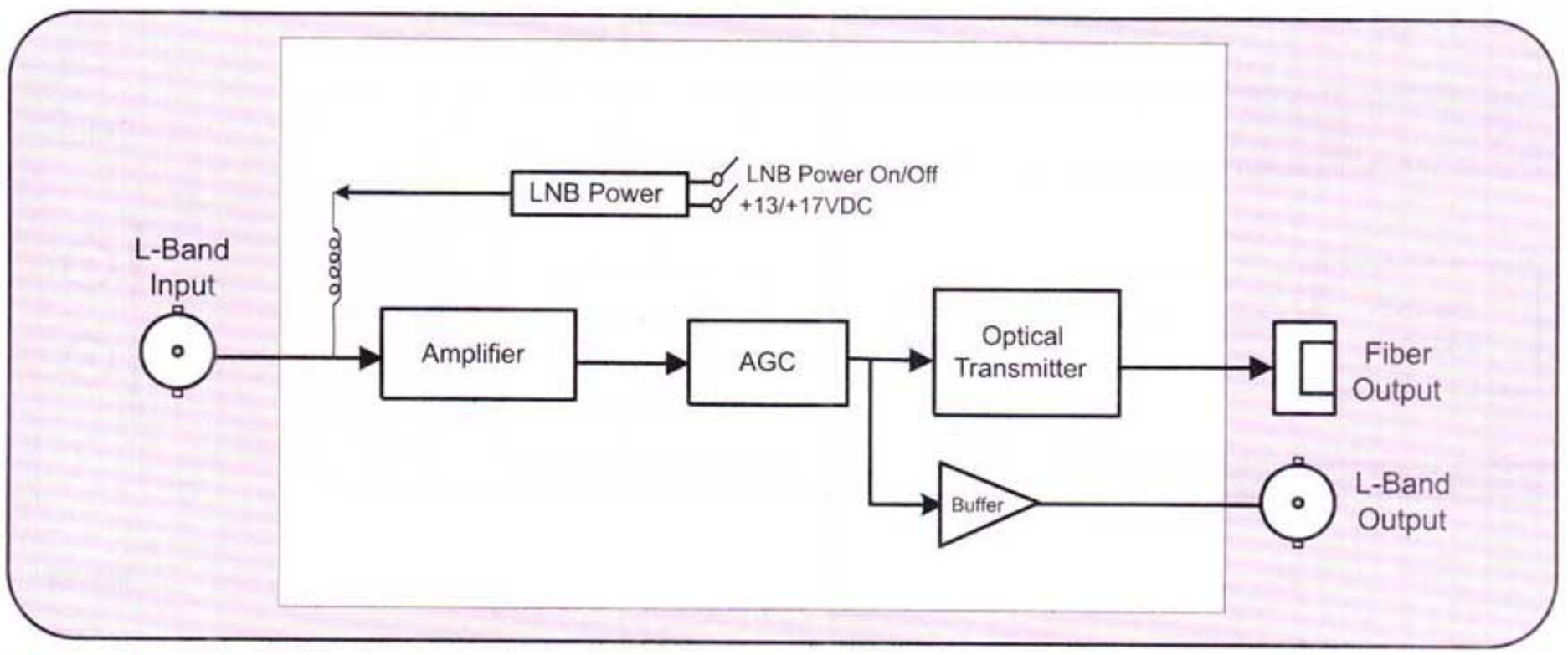
The 7705LT is a fiber optic transmitter for L-Band satellite signals. The 7705LT accepts one L-Band coaxial input and provides a fiber optic output signal at 1310nm. An L-Band BNC RF output is also available for monitoring or further signal distribution.

The 7705LT 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

- Operation to 10km
- Broadband operation - 950 to 2150 MHz
- Protocol independent - transmits all video, audio and data modulation formats
- Automatic gain control on RF input
- Additional L-Band BNC output
- LNB power at +13 or +17 VDC with built-in current limiting
- Supports multi-mode and single-mode fiber
- Available in SC/PC, ST/PC or FC/PC connector options
- Fully hot swappable from front of frame

7705LT Block Diagram





Specifications

RF Input:

Connector:	1 BNC
I/O Impedance:	75 or 50Ω (See Ordering Information)
Return Loss:	12dB
Input Signal Range:	-40 to -20dBm

RF Output:

Connector:	1 BNC
I/O Impedance:	75 or 50Ω (See Ordering Information)
Return Loss:	12dB
Output Level:	-25 to -35dBm

Optical Output:

Number of outputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Operating Wavelength:	1310nm
Output Power:	
1310nm FP:	-5dBm ± 1dBm

Physical:

Number of slots:	1

Electrical:

Voltage:	+12VDC
Power:	4 Watts
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

Note: 75Ω I/O impedance ships standard

7705LT13	L-Band Satellite Fiber Transmitter, 1310nm

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
+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

1d

Model 7705LR

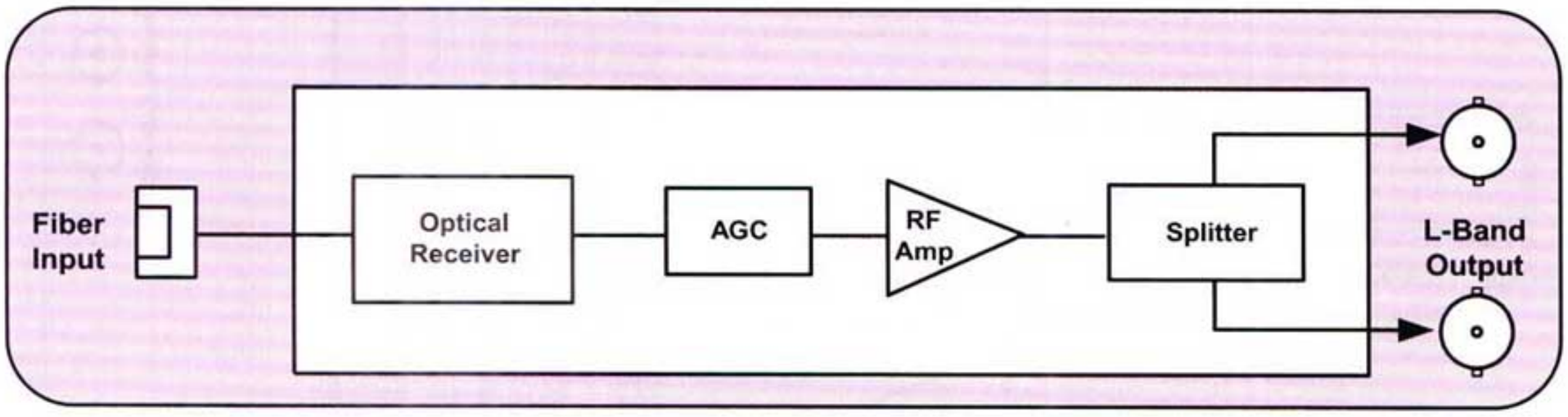
The 7705LR is a fiber optic receiver for L-Band satellite signals. The 7705LR accepts a fiber optic input from the 7705LT and provides two L-Band RF output signals via BNCs.

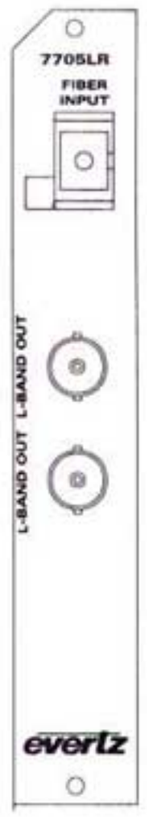
The 7705LR occupies one card slot and can be housed in either a 1RU frame, which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

Features

- Broadband operation - 950 to 2150MHz
- Supports manual and automatic gain control
- Protocol transparent - receives all video, audio and data modulation formats
- Two L-Band RF outputs for extra signal distribution or monitoring functions
- User selectable RF output power
- RF output independent of optical loss (within AGC range)
- Supports multi-mode and single-mode fiber
- Available in SC/PC, ST/PC and FC/PC connector options
- Fully hot-swappable from front of frame

7705LR Block Diagram





Specifications

RF Outputs:

Connector:	2 BNC's
I/O Impedance:	75 or 50Ω (see ordering information)
Return Loss:	12dB
Flatness:	± 1.5dB @950MHz-2150MHz ± 0.25dB @ any 36MHz
Carrier to Noise:	35dB @ 36MHz BW
Output Signal Range:	-40 to -20dBm
Intermodulation Products:	-40dBc

Optical Input:

Number of inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Operating Wavelength:	1270nm - 1610nm
Max Input Power:	0dBm
Max Optical Link Attenuation:	6dBm

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
Impedence Suffix:	
+50	50Ω I/O impedence
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

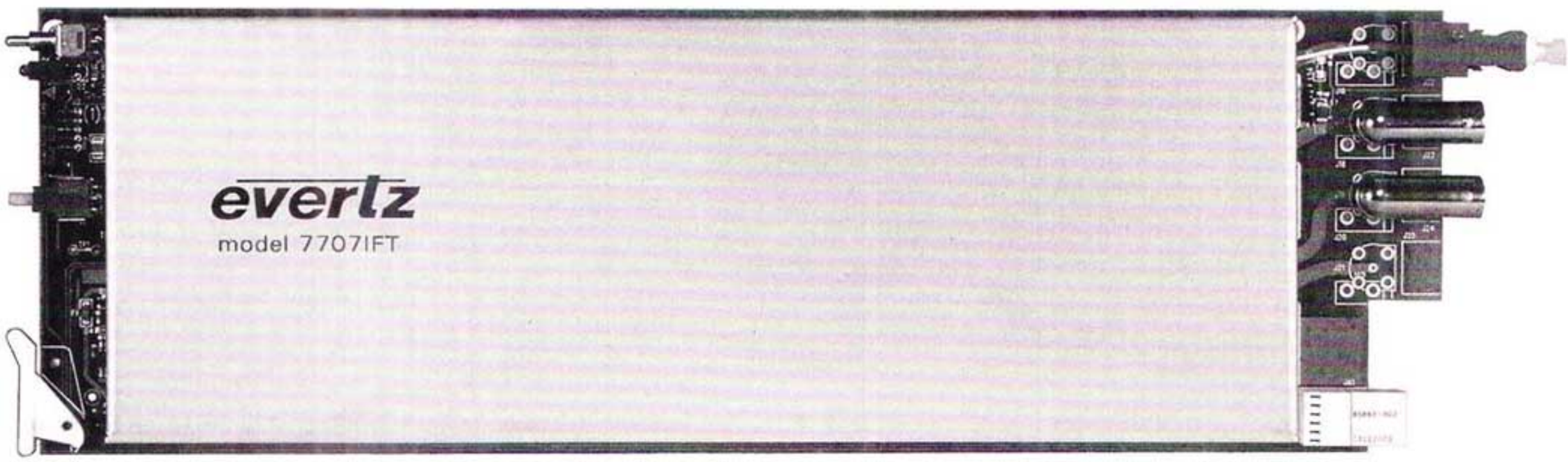
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70/140MHz IF Fiber Transmitter

1d

Model 7707IFT





The 7707IFT is a VistaLINK™ - enabled fiber optic transmitter for 70/140 MHz IF signals. The 7707IFT accepts one 70/140 MHz coaxial input and provides a fiber optic output signal at 1310nm, 1550nm or up to sixteen CWDM wavelengths. An IF BNC output is also provided for monitoring or further signal distribution. Monitoring and control of card status and parameters is provided locally at the card edge and remotely via VistaLINK™ capability.

The 7707IFT 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.

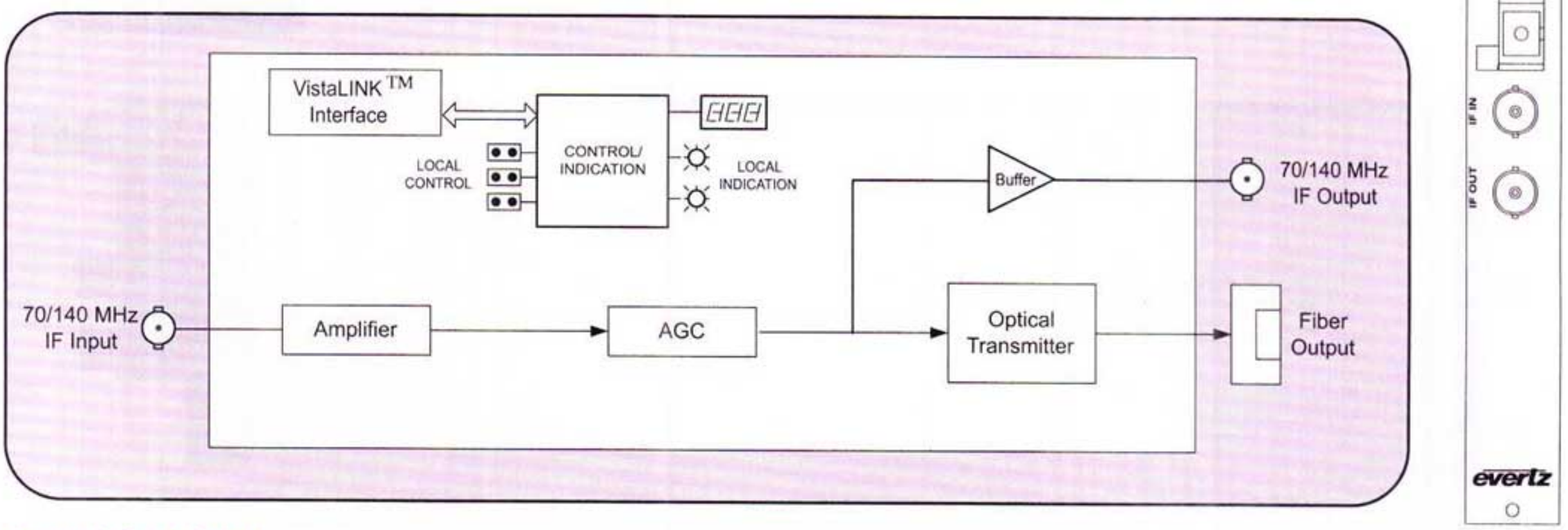
Features

- 10-200 MHz bandwidth
- Protocol transparent - transmits all video, audio and data modulation formats
- Automatic gain control on IF input
- Additional IF BNC output
- Comprehensive signal and status monitoring via four digit card edge display or remotely through SNMP and VistaLINK™ capability
- Optical output wavelengths of 1310nm, 1550nm and up to sixteen WDM wavelengths (ITU-T G.694.2 compliant)
- Supports multi-mode and single-mode fiber
- Available in SC/PC, ST/PC, FC/PC connector options
- Fully hot swappable from front of frame

Application Guide

APPLICATION	OPTICAL/LINK BUDGET	FREQUENCY	PRODUCT	DESCRIPTION
Medium Haul	13dB / 25km	10-200MHz	7707IFT13M	1310nm FP, 0dBm
Long Haul @ 1310nm	16dB / 40km	10-200MHz	7707IFT13L	1310nm DFB, +1dBm
Long Haul @ 1550nm	16dB / 55km	10-200MHz	7707IFT15	1550nm DFB, +1dBm
Long Haul (Multi-carrier CWDM)*	13dB / 45km*	10-200MHz	7707IFTxx	CWDM DFB, +1dBm*
Fiber Loss: 0.4/0.3dB per km @1310nm/1550nm			*** Assumes 8 Ch CWDM @ 3.5db Loss for Mux+Demux**	

7707IFT Block Diagram



Specifications

IF Input:
Connector: 1 BNC
I/O Impedance: 75 or 50Ω (See Ordering Information)
Return Loss: 15dB
Input Signal Range: -20 to -5dBm

IF Output:
Connector: 1 BNC
I/O Impedance: 75 or 50Ω (See Ordering Information)
Return Loss: 15dB
Output Level: -25dBm

Optical Output:
Number of outputs: 1
Connector: Female SC/PC, ST/PC, FC/PC
Operating Wavelength:
Standard: 1310nm, 1550nm (nominal)
CWDM: 1270nm to 1610nm (See Ordering Information)
Optical Power:
1310nm FP: 0dBm ±1dBm
1310nm, 1550nm & CWDM DFB: +1dBm ±1dBm

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: 70/140MHz IF Fiber Transmitter

7707IFT13M	1310nm, FP Laser, Medium Haul (<25km)
7707IFT13L	1310nm, DFB Laser, Long Haul (40Km)
7707IFT15	1550nm, DFB Laser, Long Haul (55Km)

For CWDM Applications:

7707IFT27	1270nm, CWDM DFB Laser
7707IFT29	1290nm, CWDM DFB Laser
7707IFT31	1310nm, CWDM DFB Laser
7707IFT33	1330nm, CWDM DFB Laser
7707IFT35	1350nm, CWDM DFB Laser
7707IFT37	1370nm, CWDM DFB Laser
7707IFT43	1430nm, CWDM DFB Laser
7707IFT45	1450nm, CWDM DFB Laser
7707IFT47	1470nm, CWDM DFB Laser
7707IFT49	1490nm, CWDM DFB Laser
7707IFT51	1510nm, CWDM DFB Laser
7707IFT53	1530nm, CWDM DFB Laser
7707IFT55	1550nm, CWDM DFB Laser
7707IFT57	1570nm, CWDM DFB Laser
7707IFT59	1590nm, CWDM DFB Laser
7707IFT61	1610nm, CWDM DFB Laser

Note: 75Ω I/O impedance ships standard

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
+ST	ST/PC
+FC	FC/PC

Enclosures:

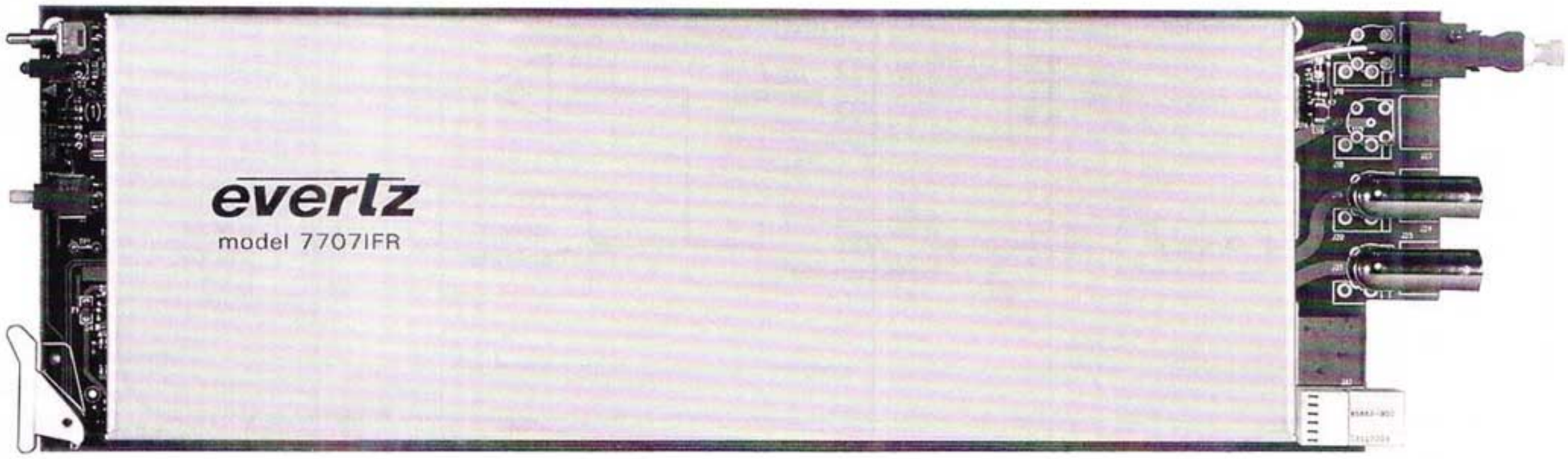
7700FR-C	3RU Multiframe, which holds 15 modules
7701FR	1RU Multiframe, which holds 3modules
S7701FR	Standalone enclosure

70/140 Mhz IF Fiber Receiver

1d

Model 7707IFR





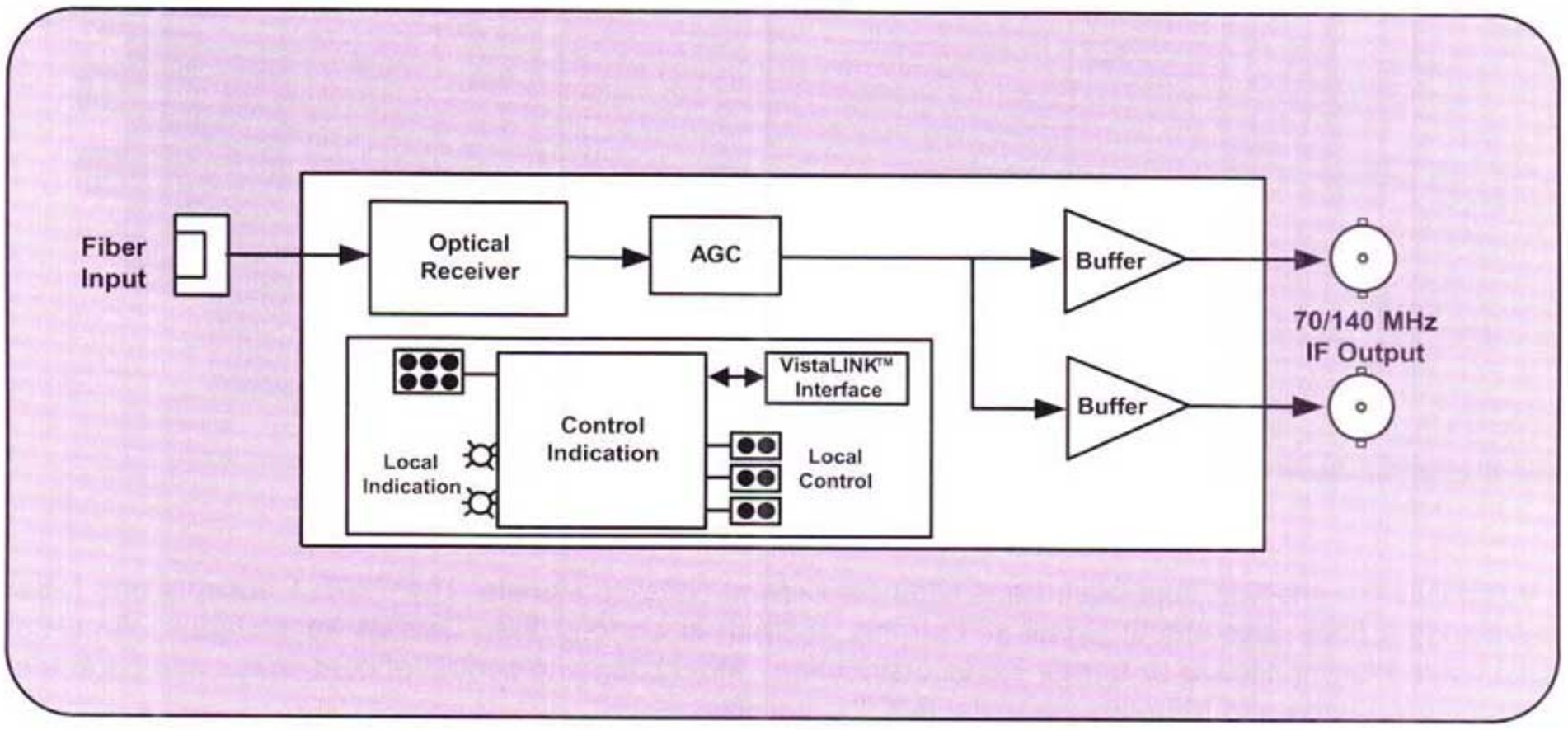
The 7707IFR is a VistaLINK™ -enabled fiber optic receiver for 70/140 MHz IF signals. The 7707IFR accepts a fiber optic input from the companion 7707IFT and provides two 70/140 Mhz IF output signals via BNC's. Monitoring and control of card status and parameters is provided locally at the card edge and remotely via VistaLINK™ capability.

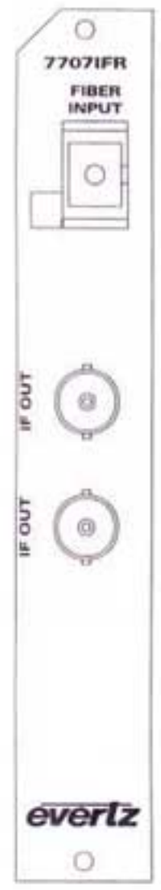
The 7707IFR occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

Features

- 10-200 MHz bandwidth
- Protocol transparent - receives all video, audio and data modulation formats
- Two IF outputs for extra signal distribution or monitoring functions
- User selectable IF output power
- IF output power independent of optical loss (within AGC range)
- Comprehensive signal and status monitoring via four digit card edge display or remotely through SNMP and VistaLINK™ capability
- Supports multi-mode and single-mode fiber
- Wide input range optical input (1270nm to 1610nm)
- Fully hot swappable from front of frame

7707IFR Block Diagram





Specifications

RF Output:

Connector:	1 BNC
I/O Impedance:	75 or 50Ω (See Ordering Information)
Return Loss:	15dB (min)
Carrier to Noise:	-40dB @ 1 MHz
Flatness:	± 1.5dB 10-200MHz ± 0.25dB @ any 36MHz
Output Signal Range:	-15dBm to 0dBm
Intermodulation Products:	-40dBc (max)

Optical Input:

Number of Inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Operating Wavelength:	1270nm - 1610nm
Maximum Input Power:	0dBm
Maximum Optical Link Attenuation:	20dB

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:

7707IFR	70/140MHz IF Fiber Receiver, VistaLINK™ Monitoring

Note: 75Ω I/O impedance ships standard

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
Impedence Suffix:	
+50	50Ω I/O impedence
Connector Suffix:	
+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

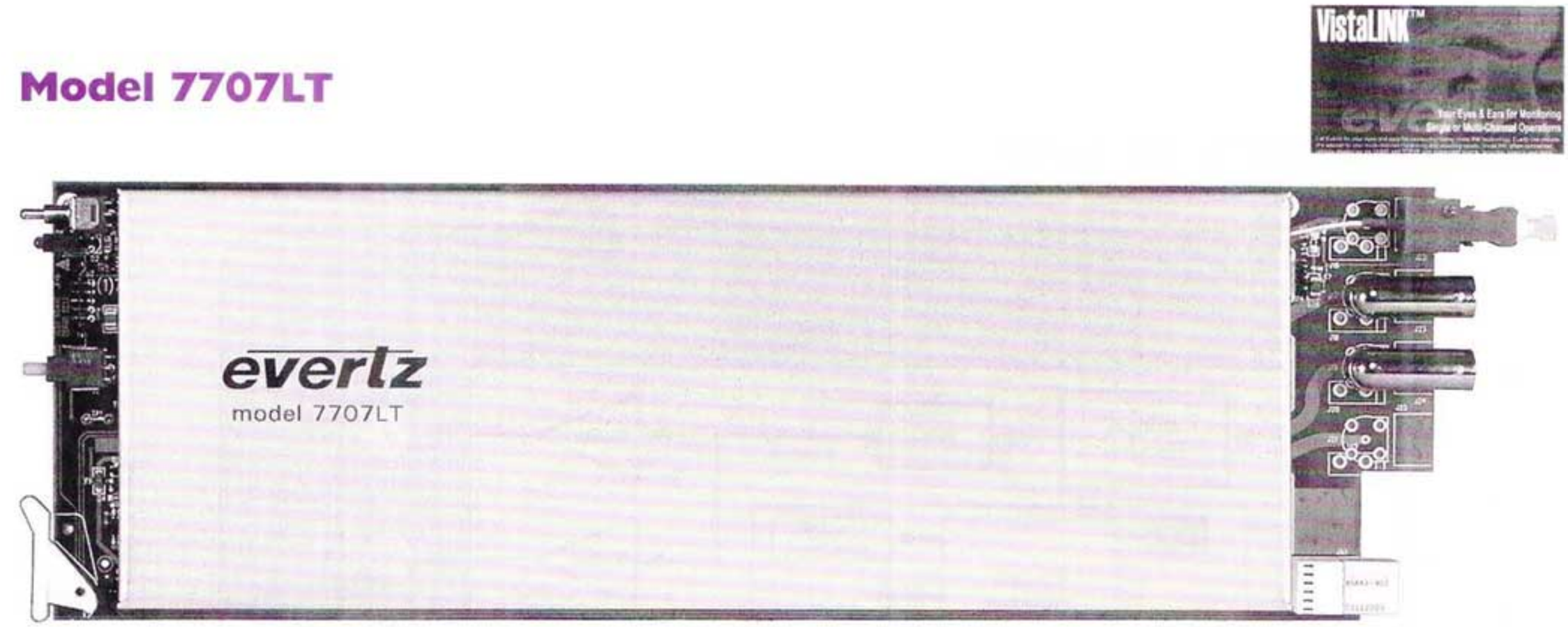
Enclosures:

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

L-Band Satellite Fiber Transmitter with

1d

Model 7707LT



The 7707LT is a VistaLINK™ - enabled fiber optic transmitter for L-Band Satellite signals. The 7707LT accepts one L-Band coaxial input and provides a fiber optic output signal at 1310nm, 1550nm or up to sixteen CWDM wavelengths. An L-Band BNC output is also provided for monitoring or further signal distribution. Monitoring and control of card status and parameters is provided locally at the card edge and remotely via VistaLINK™ capability.

The 7707LT 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.

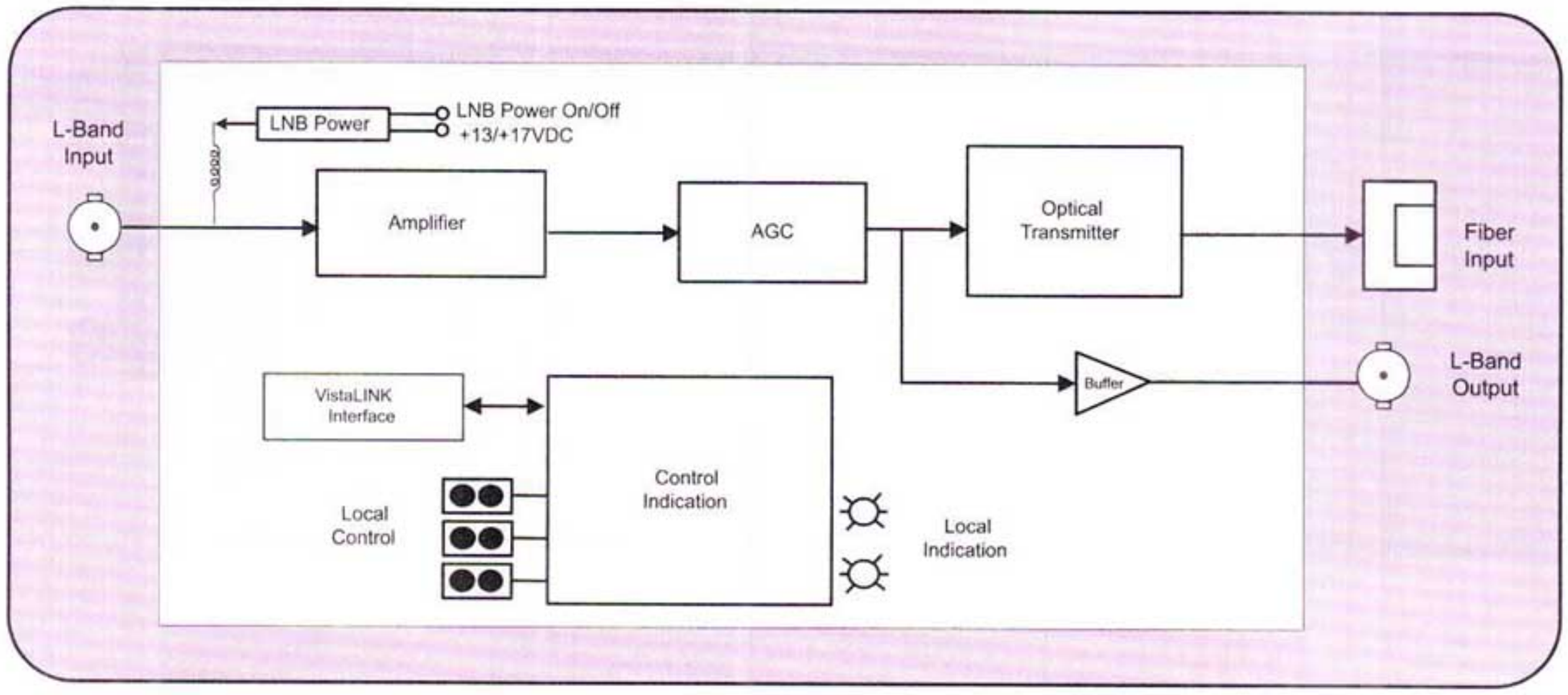
Features

- Broadband operation - 950 to 2150 MHz
- Protocol independent - transmits all video, audio and data modulation formats
- Automatic gain control on RF input
- Additional L-Band BNC out
- Comprehensive signal and status monitoring via four-digit card-edge display, or remotely through SNMP and VistaLINK™ enabled capability
- LNB power at +13 or +17 VDC with built-in current limiting
- Optical output wavelengths of 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- Supports multi-mode and single-mode fiber
- Available in SC/PC, ST/PC, FC/PC connector options
- Fully hot-swappable from front of frame

Application Guide

APPLICATION	OPTICAL/LINK BUDGET	FREQUENCY	PRODUCT	DESCRIPTION
Short Haul	5dB / 10km	950-2150MHz	7707LT13	1310nm FP, -5dBm
Long Haul @ 1310nm	16dB / 40km	950-2150MHz	7707LT13L	1310nm DFB, +1dBm
Long Haul @ 1550nm	16dB / 55km	950-2150MHz	7707LT15	1550nm DFB, +1dBm
Long Haul (Multi-carrier CWDM)*	13dB / 45km*	950-2150MHz	7707LTxx	CWDM DFB, +1dBm*
Fiber Loss: 0.4/0.3dB per km @1310nm/1550nm				*** Assumes 8 Ch CWDM @3.5db Loss for Mux+Demux**

7707LT Block Diagram





Specifications

RF Input:

Connector:	1 BNC
I/O Impedance:	75 or 50Ω (See Ordering Information)
Return Loss:	12dB
Input Signal Range:	-40 to -20dBm

RF Output:

Connector:	1 BNC
I/O Impdedence:	75 or 50Ω (See Ordering Information)
Return Loss:	12dB
Signal Level:	-25dBm to -35dBm

Optical Output:

Number of outputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Operating Wavelengths	
Standard:	1310nm, 1550nm (nominal)
CWDM:	1270nm to 1610nm (See ordering information)
Output Power:	
1310nm FP:	-5dBm ± 1dBm
1310nm, 1550nm & CWDM DFB:	+1dBm ± 1dBm

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:

	L-Band Satellite Fiber Transmitter with VistaLINK™ Monitoring
7707LT13	1310nm, FP Laser, Short Haul (<10 km)
7707LT13L	1310nm, DFB Laser, Long Haul (40km)
7707LT15	1550nm , DFB Laser, Long Haul (55km)

For CWDM Applications:

7707LT27	1270nm, CWDM DFB Laser
7707LT29	1290nm, CWDM DFB Laser
7707LT31	1310nm, CWDM DFB Laser
7707LT33	1330nm, CWDM DFB Laser
7707LT35	1350nm, CWDM DFB Laser
7707LT37	1370nm, CWDM DFB Laser
7707LT43	1430nm, CWDM DFB Laser
7707LT45	1450nm, CWDM DFB Laser
7707LT47	1470nm, CWDM DFB Laser
7707LT49	1490nm, CWDM DFB Laser
7707LT51	1510nm, CWDM DFB Laser
7707LT53	1530nm, CWDM DFB Laser
7707LT55	1550nm, CWDM DFB Laser
7707LT57	1570nm, CWDM DFB Laser
7707LT59	1590nm, CWDM DFB Laser
7707LT61	1610nm, CWDM DFB Laser

Note: 75Ω I/O impedance ships standard

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
+ST	ST/PC
+FC	FC/PC

Enclosures:

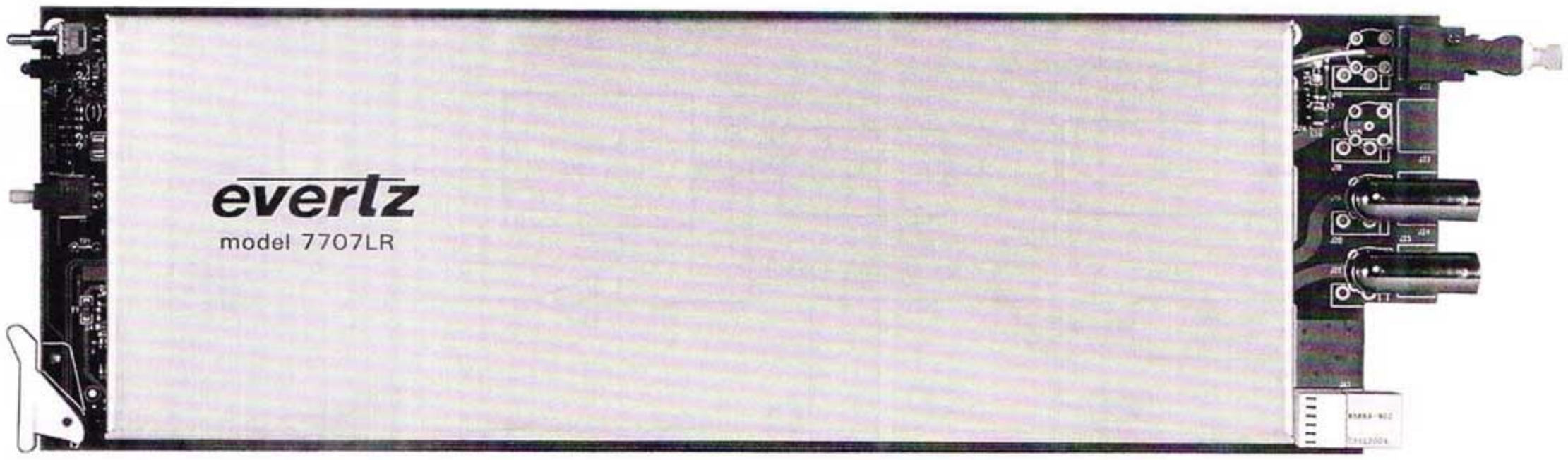
7700FR-C	3RU Multiframe, which holds 15 modules
7701FR	1RU Multiframe, which holds 3 modules
S7701FR	Standalone Enclosure

L-Band Satellite Fiber Receiver with

1d

Model 7707LR





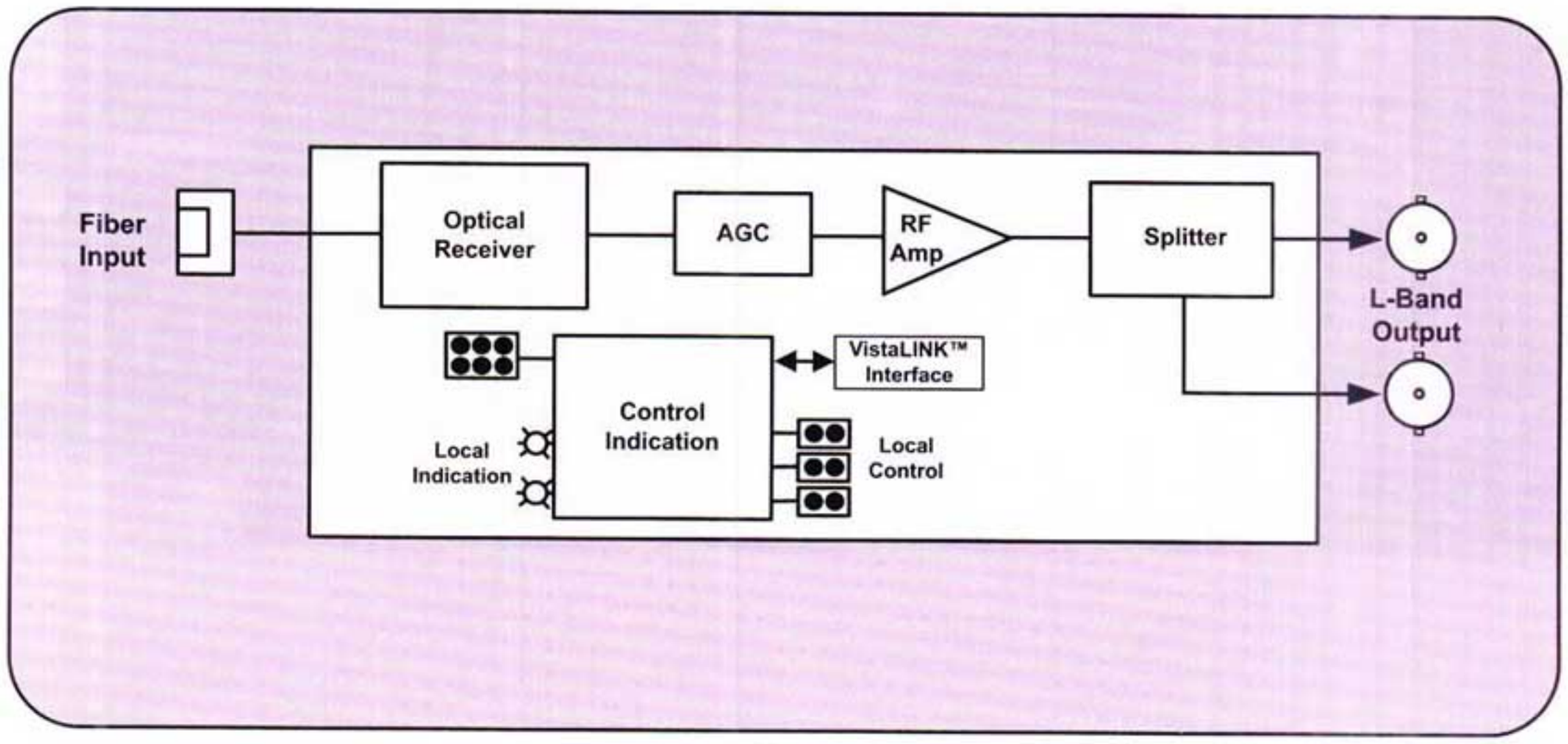
The 7707LR is a VistaLINK™ - enabled fiber optic receiver for L-Band satellite signals. The 7707LR accepts a fiber optic input from the companion 7707LT and provides two L-Band RF output signals via BNC's. Monitoring and control of card status and parameters is provided locally at the card edge and remotely via VistaLINK™ capability.

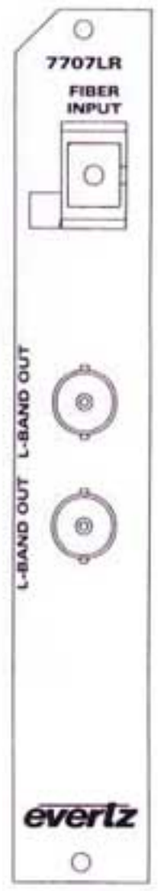
The 7707LR occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules or a standalone enclosure which will hold 1 module.

Features

- Broadband operation - 950 to 2150MHz
- Protocol independent - receives all video, audio and data modulation formats
- Two L-Band RF outputs for extra signal distribution or monitoring functions
- User selectable RF output power
- RF output independent of optical loss (within AGC range)
- Comprehensive signal and status monitoring via four digit card-edge display or remotely through SNMP and VistaLINK™ capability
- Wide range optical input (1270nm to 1610nm)
- Supports multi-mode and single-mode fiber
- Available in SC/PC, ST/PC, FC/PC connector options
- Fully hot swappable from front of frame

7707LR Block Diagram





Specifications

RF Outputs:

Connector:	2 BNC's
I/O Impedance:	75 or 50Ω (See Ordering Information)
Return Loss:	12dB
Flatness:	± 1.5dB @950MHz-2150MHz ± 0.25dB @ any 36MHz
Carrier to Noise:	35dB @ 36MHz BW
Output Signal Range:	-40 to -20dBm
Intermodulation Products:	-40dBc

Optical Input:

Number of inputs:	1
Connector:	Female SC/PC, ST/PC, FC/PC
Operating Wavelength:	1270nm - 1610nm
Maximum Input Power:	0dBm
Max Optical Link Attenuation:	20dB

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:

7707LR	L-Band Satellite Fiber Receiver, VistaLINK™ Monitoring

Note: 75Ω I/O impedance ships standard

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
+ST	ST/PC
+FC	FC/PC

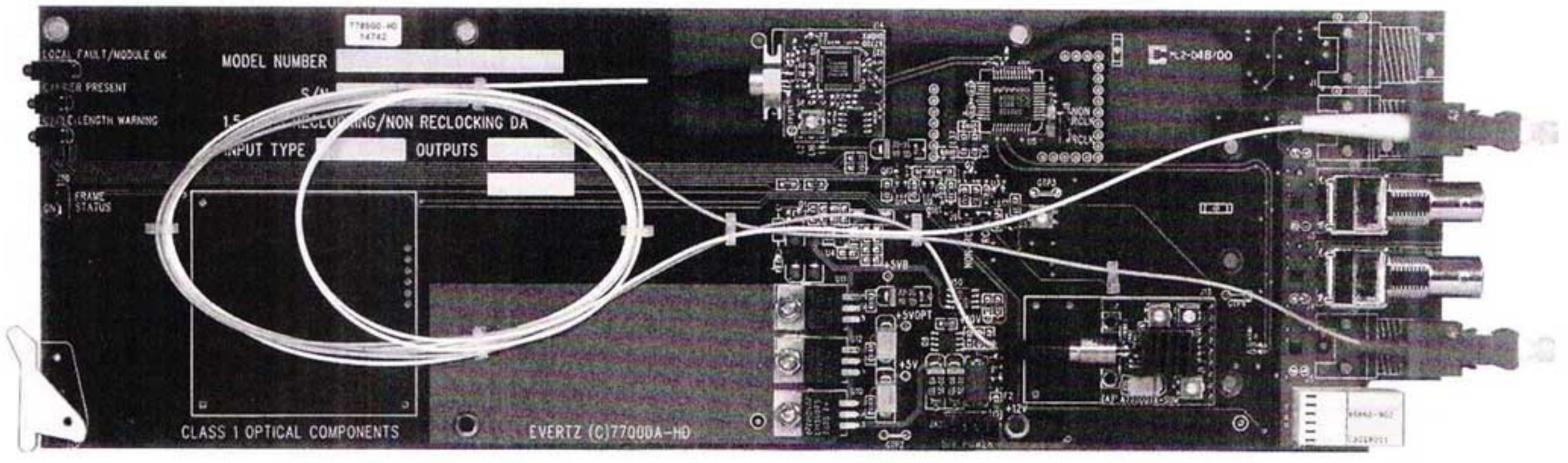
Enclosures:

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

Optical to Optical Wavelength Converter for HDTV, SDTV, Telecom/Datacom Signals to 1.5Gbs

1d

Model 7705OO-HD



The 7705OO-HD Optical Wavelength Converter provides an economical method of converting wavelengths for optical transmission of SMPTE 292M (1.5 Gb/s) HDTV serial digital signals. The module can also operate as an optical repeater providing reclocking and optical signal regeneration. The 7705OO-HD converter features one optical input with two reclocked coaxial outputs and one reclocked fiber output. The 7705OO-HD has been designed for reclocking of 1.5Gb/s however, it can also be used for non-reclocking SMPTE 310M (19.4 Mb/s), DVB-ASI, M2S, SMPTE 259M (143 to 540 Mb/s) or Datacom/Telecom signals up to 1.5 Gb/s.

The 7705OO-HD is available in different wavelength versions to meet a variety of applications. All versions accept 1270nm to 1610nm optical input signals on multi-mode or single-mode fiber and translate the signal to another specified wavelength.

Features

- Reclocking mode for SMPTE 292M (1.5 Gb/s) signals
- Non-reclock mode for SMPTE 310M (nominal 19.4 Mb/s), SMPTE 259M (143 to 540 Mb/s), DVB-ASI, M2S or most other bit rates less than 1.5 Gb/s
- Fully hot-swappable from front of frame with no fiber or BNC disconnect required
- Independent isolated output drivers to ensure no cross channel loading effects and to maintain polarity from input to output for DVB-ASI applications
- Operation with multi-mode or single-mode fiber
- SC/PC, ST/PC or FC/PC connector options
- Tally output on Frame Status bus upon loss of input signal

Input:

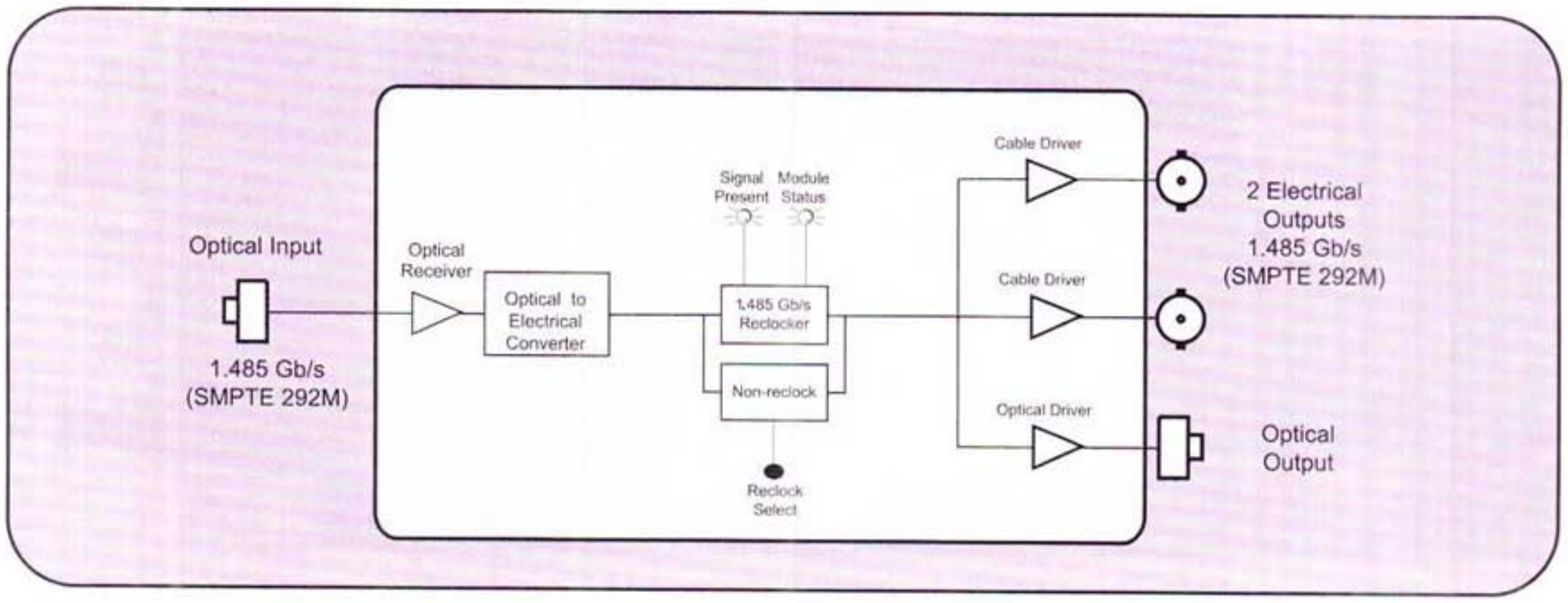
- Optical input accepts 1270nm to 1610nm

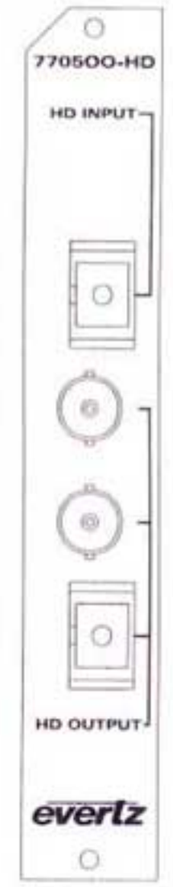
Output:

- Two BNC serial digital outputs
- One fiber reclocked output at 1310nm, 1550nm or any one of sixteen CWDM wavelengths (ITU-T G.694.2 compliant)

Optical to Optical Wavelength Converter for HDTV, SDTV, Telecom/Datacom Signals to 1.5Gbs

770500-HD Block Diagram





Specifications

Standards:
Reclock Mode: SMPTE 292M
Non-Reclock Mode: SMPTE 310M (19.4Mb/s) or SMPTE 259M A, B, C, D or DVB-ASI or any other bit rate less than 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: 0dBm
Optical Sensitivity:
Standard: -18dBm
High Sensitivity(-H): -27dBm

Optical Outputs:
Number of Outputs: 1 reclocked
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
CWDM Wavelengths: 1270nm to 1610nm (See Ordering Information)

Optical Power:
1310nm FP -7.5 dBm ± 1dBm
1310nm DFB 0 dBm ± 1dBm
CWDM DFB 0 dBm ± 1dBm

Electrical Video Outputs:
Number of Outputs: 2 per card - reclocked
Standard: same as input
Connectors: BNC per IEC 169-8
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 270ps nominal
Overshoot: <10% of amplitude
Return Loss: >15dB up to 1Gb/s, >12dB up to 1.5Gb/s
Wide Band Jitter: <0.2 UI (reclocked)

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:
Optical to Optical Wavelength Converter for HDTV, SDTV, Telecom/Datacom Signals to 1.5Gb/s

All version accept 1270nm - 1610nm optical inputs

7705OO13-HD 1310nm FP Laser output
7705OO13-HD-H High sensitivity input 1310nm FB Laser

For CWDM Applications:
7705OOxx-HD CWDM wavelength output where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm),35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

7705OOxx-HD-H High sensitivity input, CWDM wavelength output where xx= 27(1270nm), 29(1290nm), 31(1310nm), 33(1330nm),35(1350nm), 37(1370nm), 43(1430nm), 45(1450), 47(1470nm), 49(1490nm), 51(1510nm), 53(1530nm), 55(1550nm), 57(1570nm), 59(1590nm), 61(1610nm)

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

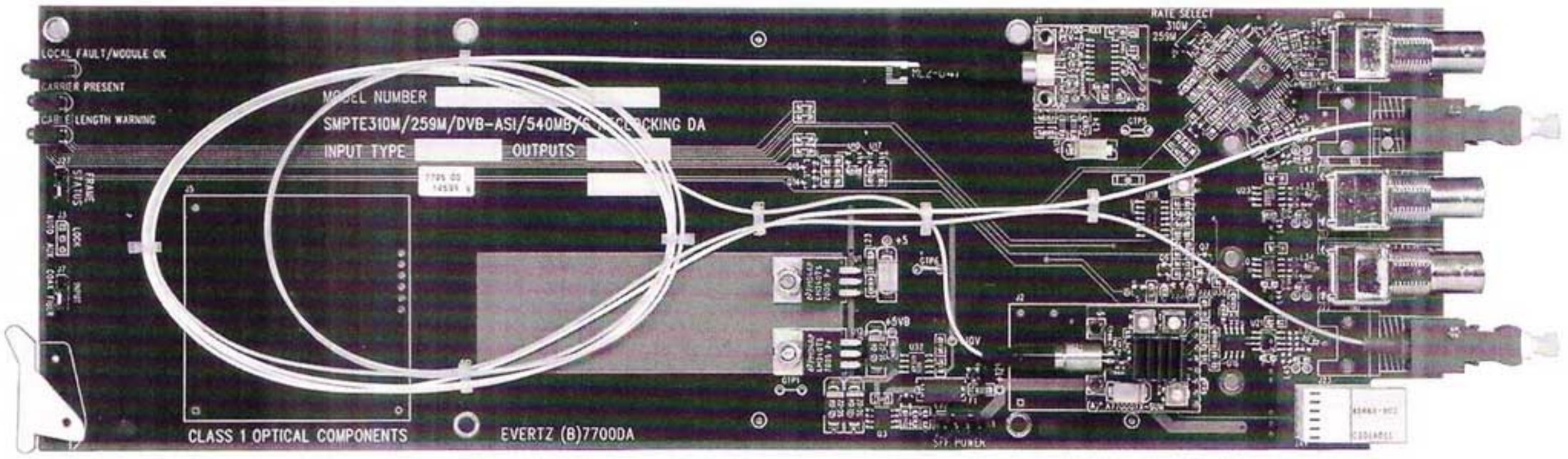
Connector Suffix
+SC SC/PC
+ST ST/PC
+FC FC/PC

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

Optical to Optical Wavelength Converter for SMPTE 259M, 310M, DVB-ASI, Datacom/Telecom

1d

Model 770500



The 7705OO Optical Wavelength Converter provides an economical method of converting wavelengths for optical transmission of SMPTE 259M (143-540Mb/s), SMPTE 310M, M2S or DVB-ASI signals. The module can also operate as an optical repeater providing reclocking and optical signal regeneration. The 7705OO converter features one auto-equalized coaxial input and one optical input (jumper selectable) with two reclocked coaxial outputs and one reclocked fiber output. The 7705OO also supports reclocking for SMPTE 310M (19.4Mb/s) signals with a jumper selection. Other Datacom/Telecom rates up to 540Mb/s can also be supported (Contact Factory).

The 7705OO is available in different wavelength versions to meet a variety of applications. All versions accept 1270nm to 1610nm optical input signals on multi-mode or single-mode fiber and translate the signal to another wavelength.

Features

- Supports all SMPTE 259M standards with operation 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
- Operation with multi-mode or single-mode fiber
- Coaxial or optical input jumper selectable
- Fully hot-swappable from front of frame with no fiber or BNC disconnect required
- Independent isolated output drivers to ensure no cross channel loading effects and to maintain polarity from input to output for DVB-ASI applications
- SC/PC, ST/PC or FC/PC connector options
- Tally output on Frame Status bus upon loss of input signal

Input:

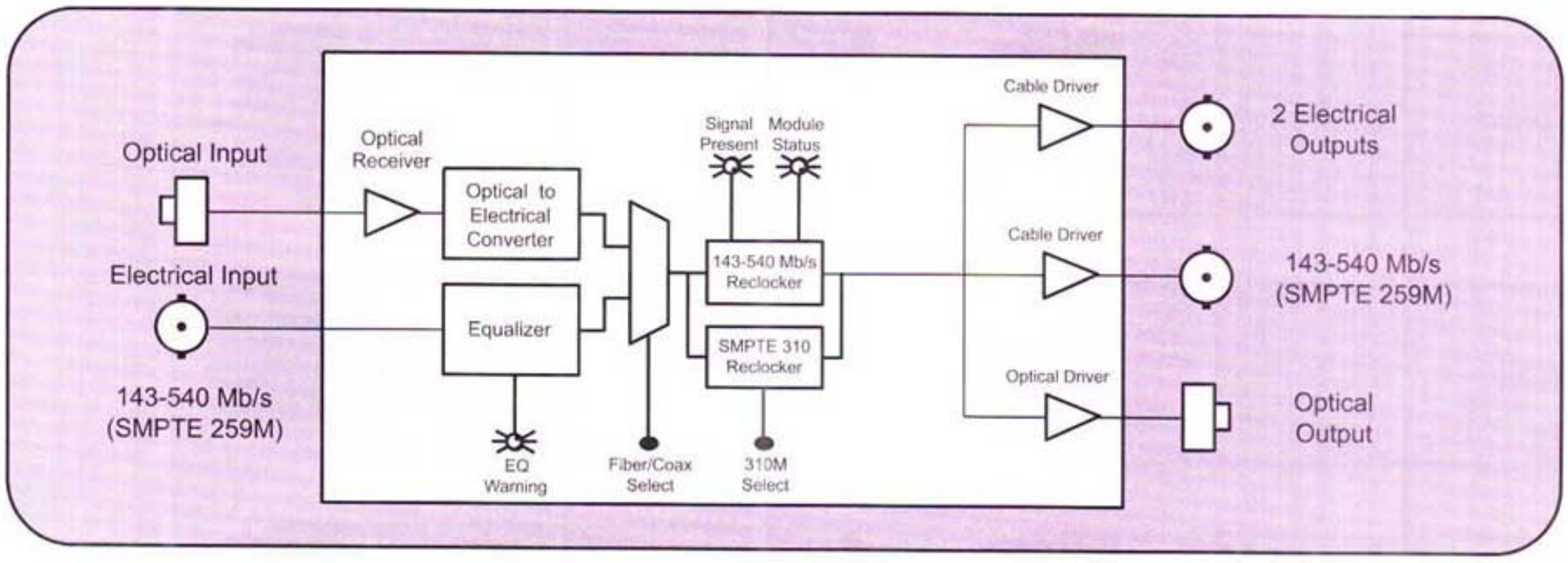
- Optical input accepts 1270nm to 1610nm
- Automatic cable equalization for coaxial input to 300m @ 270Mb/s with Belden 8281 (or equivalent)

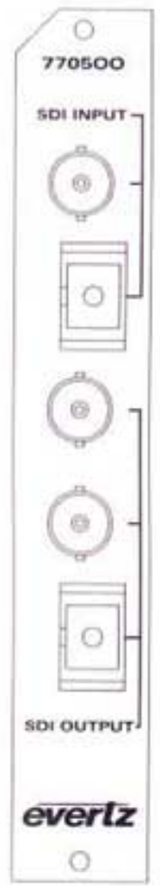
Output:

- One fiber reclocked output at 1310nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- Two BNC serial digital outputs

Optical to Optical Wavelength Converter for SMPTE 259M, 310M, DVB-ASI, Datacom/Telecom

770500 Block Diagram





Specifications

Standards: SMPTE 259M A, B, C, D, SMPTE 297M, SMPTE 305M, SMPTE 310M, DVB-ASI, M2S

Optical Input:
Number of Inputs: 1
Connector: SC/PC, ST/PC, FC/PC Female Housing
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 input per IEC 169-8
Equalization: Automatic to 300m @ 270 Mb/s with Belden 8281 (or equivalent)
Return Loss: > 15 db to 540 Mb/s

Optical Outputs:
Number of Outputs: 1
Connector: SC/PC, ST/PC, FC/PC female housing
Return Loss: > 14dB
Rise and Fall Time: 400-700ps
Jitter: < 0.2 UI
Nominal Wavelength: 1310nm
CWDM Wavelengths: 1270nm to 1610nm (see ordering information)

Optical Power:
1310nm FP -7.5dBm ± 1dBm
CWDM DFB 0dBm ± 1dBm

Electrical Video Outputs:
Number of Outputs: 2 per card - reclocked
Connectors: BNC per IEC 169-8
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: <0.2 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

Ordering Information:
Optical to Optical Wavelength Converter for SMPTE 259M, 310M, DVB-ASI, Datacom/Telecom

All versions support 1270nm - 1610nm optical inputs

770500O13	1310nm FP laser output

For CWDM Applications:

770500O27	1270nm, CWDM DFB Laser
770500O29	1290nm, CWDM DFB Laser
770500O31	1310nm, CWDM DFB Laser
770500O33	1330nm, CWDM DFB Laser
770500O35	1350nm, CWDM DFB Laser
770500O37	1370nm, CWDM DFB Laser
770500O43	1430nm, CWDM DFB Laser
770500O45	1450nm, CWDM DFB Laser
770500O47	1470nm, CWDM DFB Laser
770500O49	1490nm, CWDM DFB Laser
770500O51	1510nm, CWDM DFB Laser
770500O53	1530nm, CWDM DFB Laser
770500O55	1550nm, CWDM DFB Laser
770500O57	1570nm, CWDM DFB Laser
770500O59	1590nm, CWDM DFB Laser
770500O61	1610nm, CWDM 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:

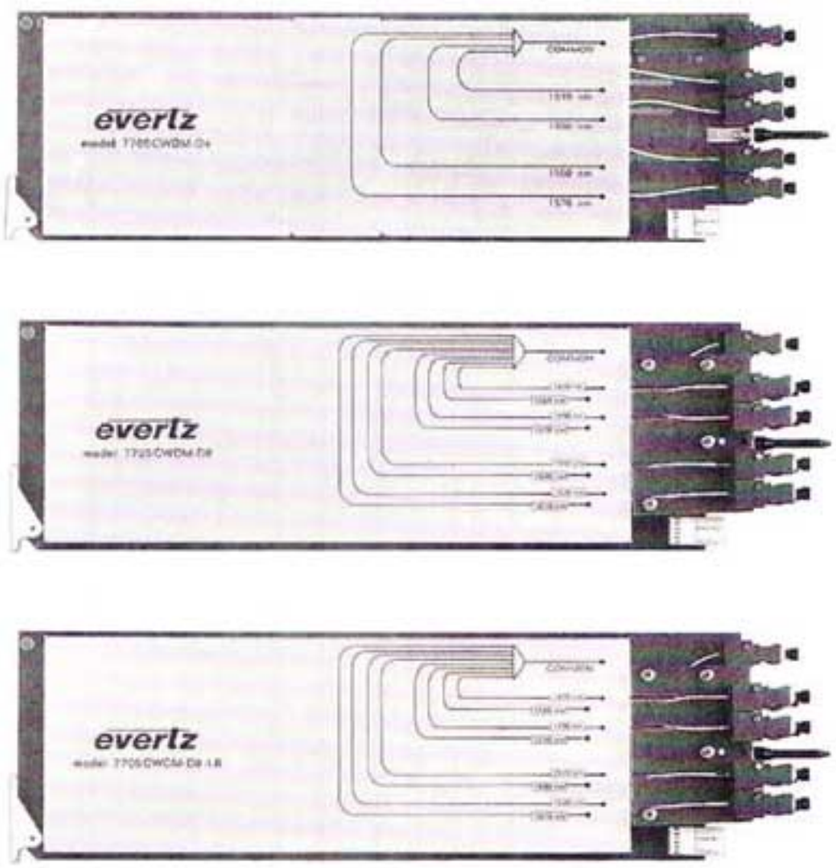
CB-FP1M-SCPC	Single mode fiber cable, 1m, SC/PC male termination
CB-FP1M-STPC	Single mode fiber cable, 1m, ST/PC male termination
CB-FP5M-SCPC	Single mode fiber cable, 5m, SC/PC male termination
CB-FP5M-STPC	Single mode fiber cable, 5m, ST/PC male termination
CB-FP10M-SCPC	Single mode fiber cable, 10m, SC/PC male termination
CB-FP10M-STPC	Single mode fiber cable, 10m, ST/PC male termination

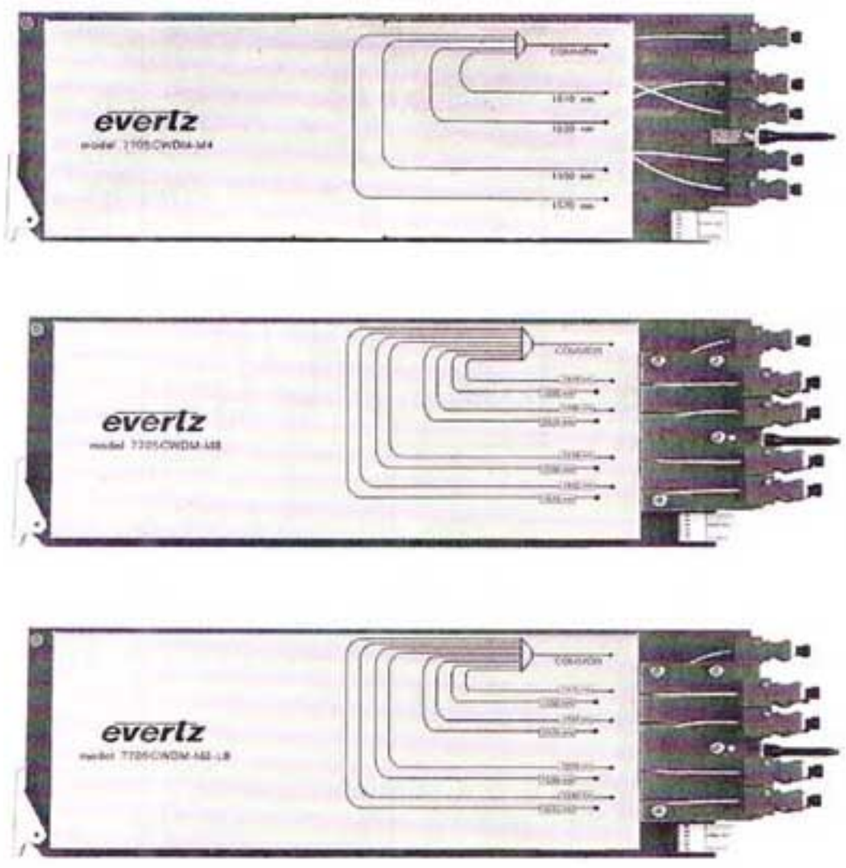
Enclosures:

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

1d

Model 7705CWDM





The 7705CWDM's are bi-directional Multiplexors/De-multiplexors that combine/separate up to 16 different wavelengths over a single fiber. The 7705CWDM-M4/D4 and 7705CWDM-M8/D8 are designed to mux/demux 4 and 8 wavelengths respectively while the 7705CWDM-M8LB/D8LB are designed to expand the 4 and 8 wavelengths systems to 12 and 16 wavelengths over a single fiber.

The 7705CWDM's are housed in Evertz's standard 3RU or 1RU Multiframe.

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

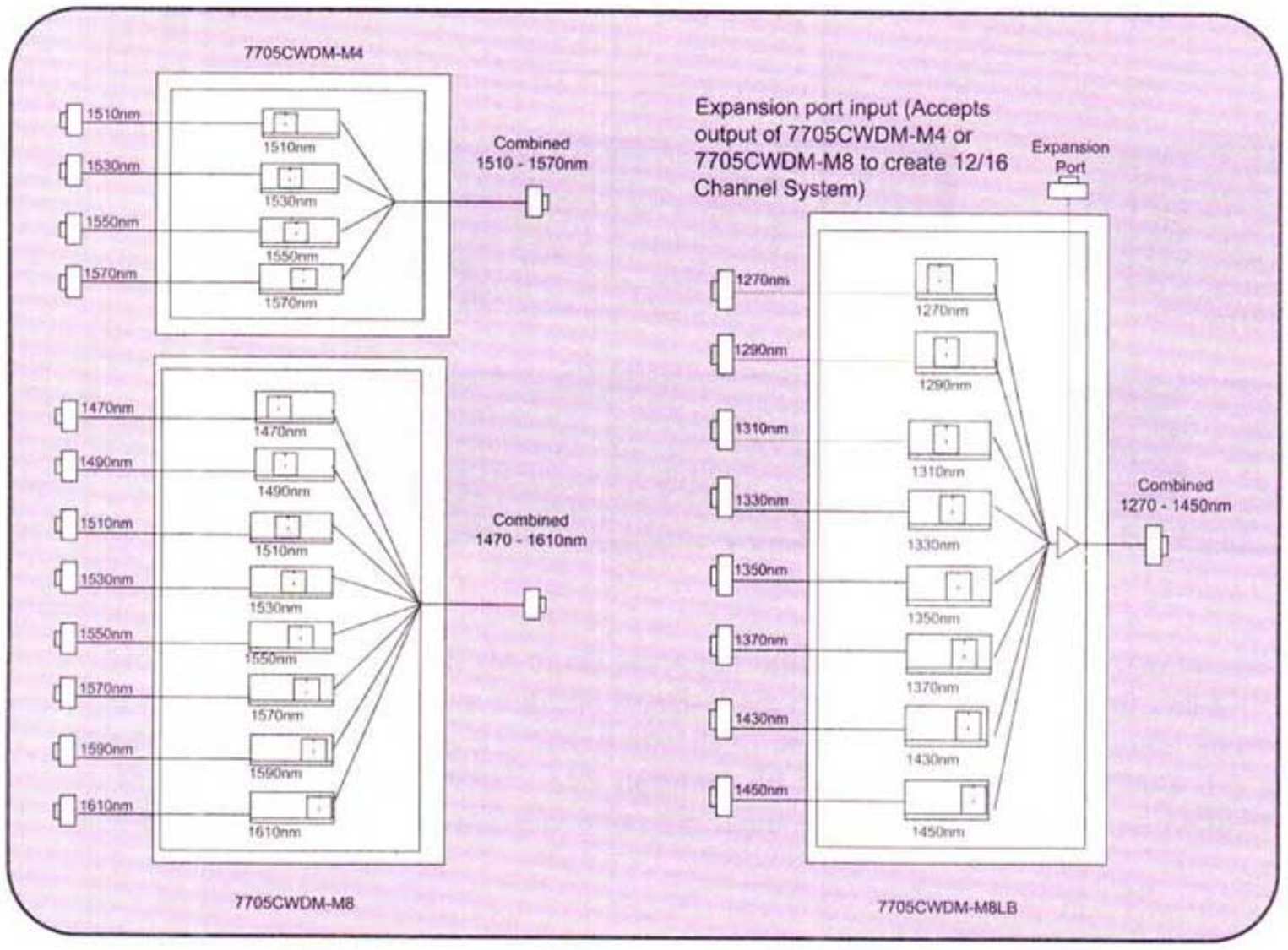
Applications

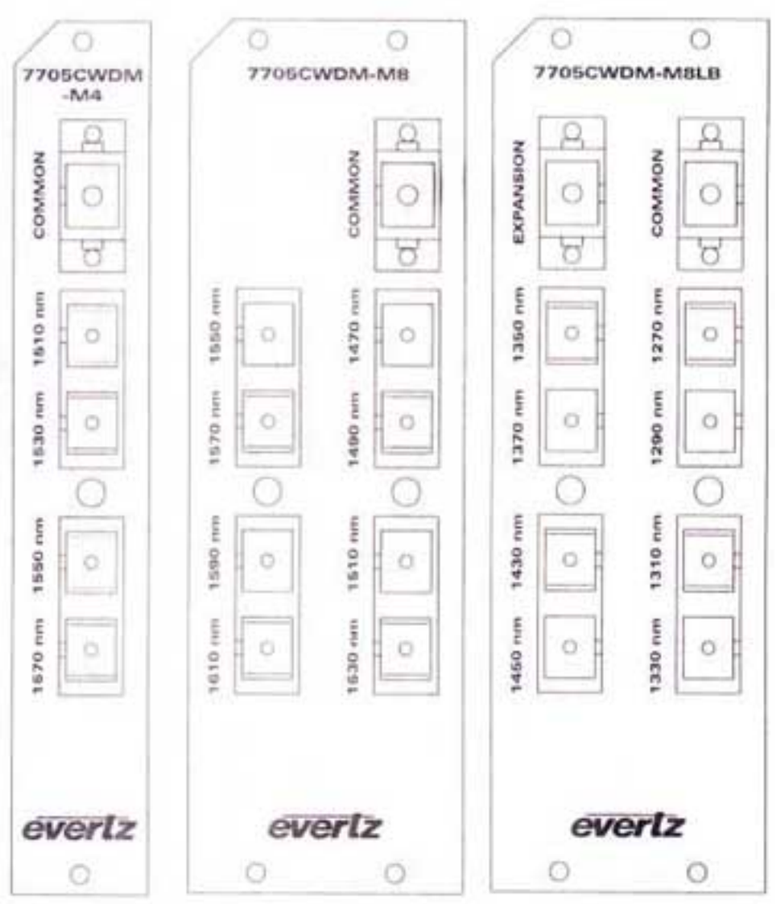
- Multi-channel transport of video, audio, data, control in fiber limited applications
- Cost reduction exercises through fewer leased fibers
- Studio and Facility extension / expansion
- STL and TSL links
- Signal aggregation for outdoor and event coverage
- Signal aggregation for security and monitoring

Descriptions

Function	Ordering Information	Description	Slots Occupied
4 Channel CWDM Mux	7705CWDM-M4	4 Channel CWDM Mux (1510nm -1570nm)	1
4 Channel CWDM Demux	7705CWDM-D4	4 Channel CWDM Demux (1510nm - 1570nm)	1
8 Channel CWDM Mux	7705CWDM-M8	8 Channel CWDM Mux (1470nm - 1610nm)	2
8 Channel CWDM Demux	7705CWDM-D8	8 Channel CWDM Demux (1470nm - 1610nm)	2
12 Channel CWDM Mux	7705CWDM-M4 & 7707CWDM-M8LB	12 Channel CWDM Mux (1270nm -1570nm)	3
12 Channel CWDM Demux	7705CWDM-D4 & 7705CWDM-D8LB	12 Channel CWDM Demux (1270nm -1570nm)	3
16 Channel CWDM Mux	7705CWDM-M8 & 7707CWDM-M8LB	16 Channel CWDM Mux (1270nm -1610nm)	4
16 Channel CWDM Demux	7705CWDM-D8 & 7705CWDM-D8LB	16 Channel CWDM Demux (1270nm -1610nm)	4

7705CWDM Block Diagrams





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

7705CWDM-M4	4 Channel CWDM Mux
7705CWDM-D4	4 Channel CWDM Demux
7705CWDM-M8	8 Channel CWDM Mux
7705CWDM-D8	8 Channel CWDM Demux
7705CWDM-M8LB	8 Channel CWDM Low Band Mux with expansion port
7705CWDM-D8LB	8 Channel CWDM Low Band Demux with expansion port

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:

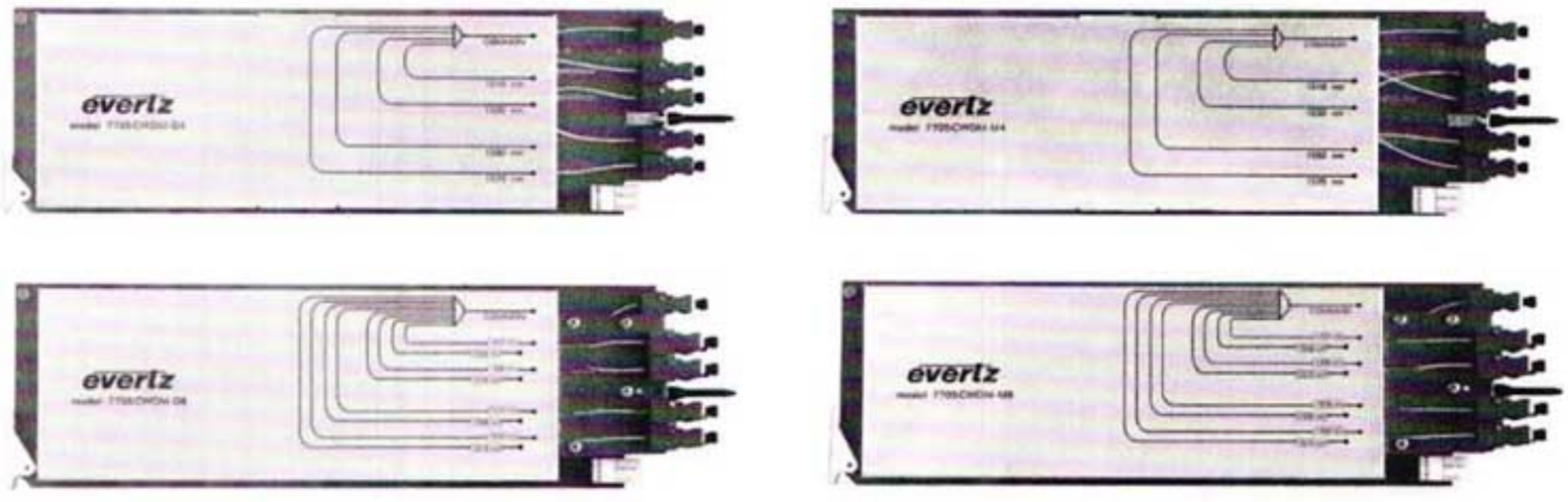
CB-FP1M-SCPC	Single mode fiber cable, 1m, SC/PC male termination
CB-FP1M-STPC	Single mode fiber cable, 1m, ST/PC male termination
CB-FP5M-SCPC	Single mode fiber cable, 5m, SC/PC male termination
CB-FP5M-STPC	Single mode fiber cable, 5m, ST/PC male termination
CB-FP10M-SCPC	Single mode fiber cable, 10m, 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

1d

Model 7705DWDM



The 7705DWDM's are bi-directional Multiplexors/De-multiplexors that combine/separate up to 40 DWDM wavelengths over a single optical fiber. These modules utilize 100GHz/0.8nm channel spacing in the C-Band and are available in cascadable eight wavelength mux/demux versons. These modules have also been designed to work with existing Evertz 7705CWDM modules. Two cascaded, eight channel 7705DWDM's (16 DWDM wavelengths) can be inserted into specific wavelength slots of the 7705CWDM's, combining both CWDM and DWDM technologies to offer the most cost effective wavelength multiplexing solution available.

These 7705DWDM's are housed in Evertz's standard 3RU or 1RU Multiframe.

Features

- Cascadable eight channel mux/demux modules
- ITU-T G.692 compliant 100GHz/0.8nm channel spacing
- Capable of being inserted into CWDM wavelength slots adding an additional 8, 16 or 24 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

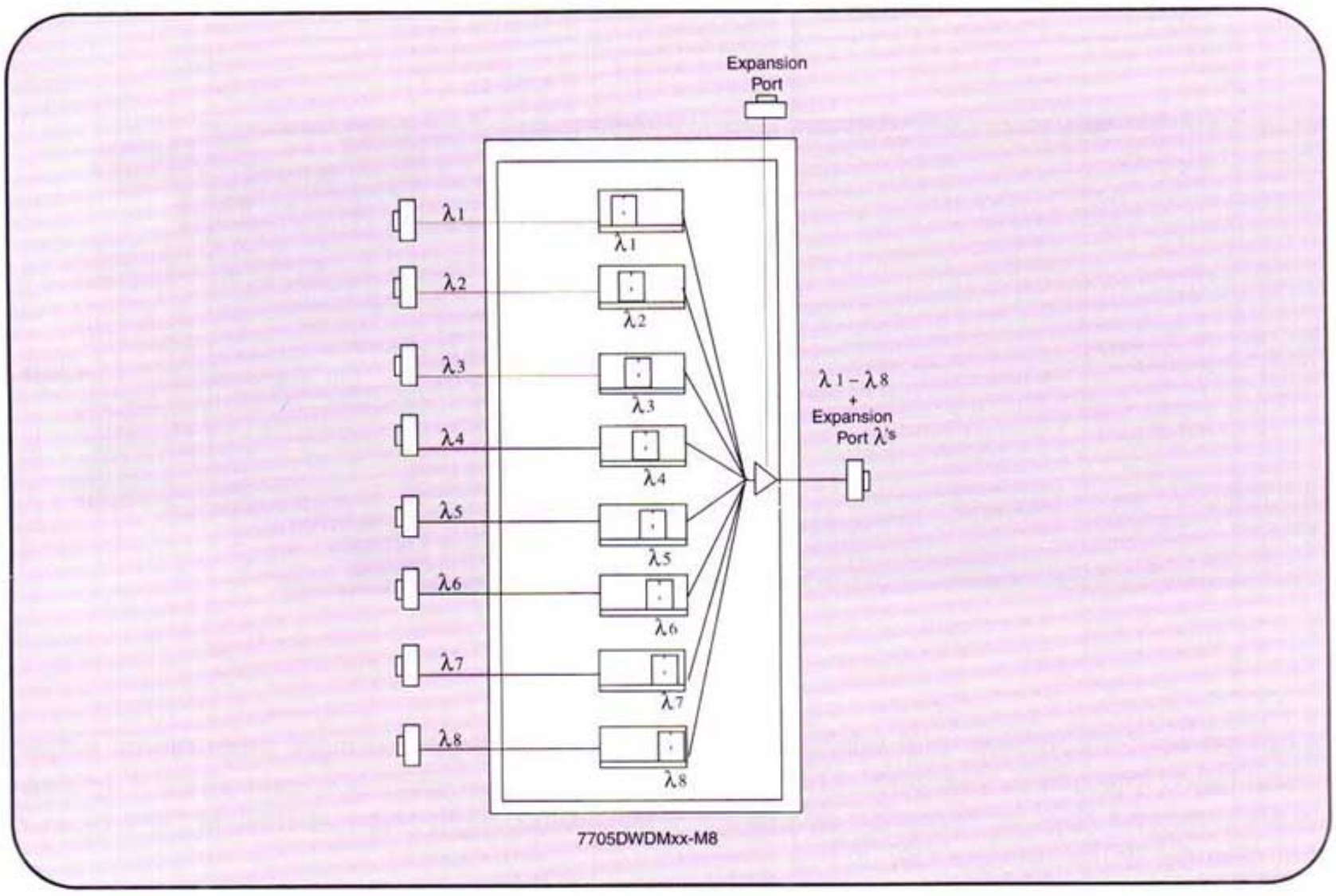
Applications

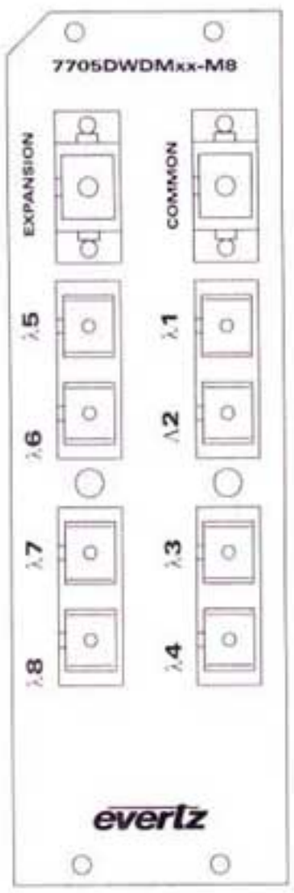
- Multi-channel transport of video, audio, data, control in fiber limited applications
- Cost reduction exercises through fewer leased fibers
- Studio and Facility extension / expansion
- STL and TSL links
- Signal aggregation for outdoor and event coverage
- Signal aggregation for security and monitoring

Descriptions

Ordering Information	Description	Slots Occupied
7705DWDM-33-M8	8 Channel Cascadeable DWDM Mux, 100GHz Spacing, ITU Channels C33 to C40	2
7705DWDM-33-D8	8 Channel Cascadeable DWDM Demux, 100GHz Spacing, ITU Channels C33 to C40	2
7705DWDM-xx-M8*	8 Channel Cascadeable DWDM Mux, 100GHz Spacing, Starting at ITU Channel xx	2
7705DWDM-xx-D8*	8 Channel Cascadeable DWDM Demux, 100GHz Spacing, Starting at ITU Channels xx	2
*** Contact factory for specific wavelength ordering information**		

7705DWDM Block Diagram





Specifications

Optical Input/Output:

Connector:	SC/PC, ST/PC or FC/PC* female housing
Wavelength:	C-Band (ITU G.692 compliant)
Channel Spacing:	0.8nm
Passband @ 0.5dB:	0.3nm
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:

7705DWDM-8	< 3.5dB maximum loss

Ordering Information

7705DWDM-33-M8	8 Channel Cascadeable DWDM Mux, 100Ghz Spacing, ITU Channels C33 to C40
7705DWDM-33-D8	8 Channel Cascadeable DWDM Demux, 100Ghz Spacing, ITU Channels C33 to C40
7705DWDM-xx-M8*	8 Channel Cascadeable DWDM Mux, 100Ghz Spacing, Starting at ITU Channel xx
7705DWDM-xx-D8*	8 Channel Cascadeable DWDM Demux, 100Ghz Spacing, Starting at ITU Channels xx

*** Contact factory for specific wavelength ordering information**

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:

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

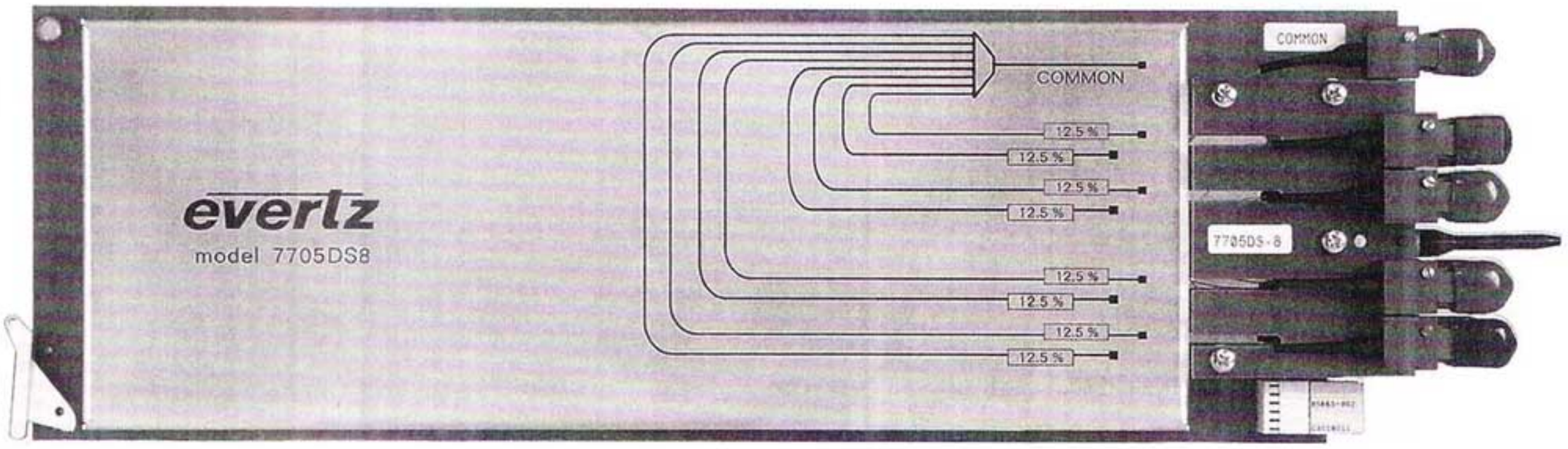
Enclosures:

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

Eight Channel Optical Splitter/Combiner

1d

Model 7705DS-8



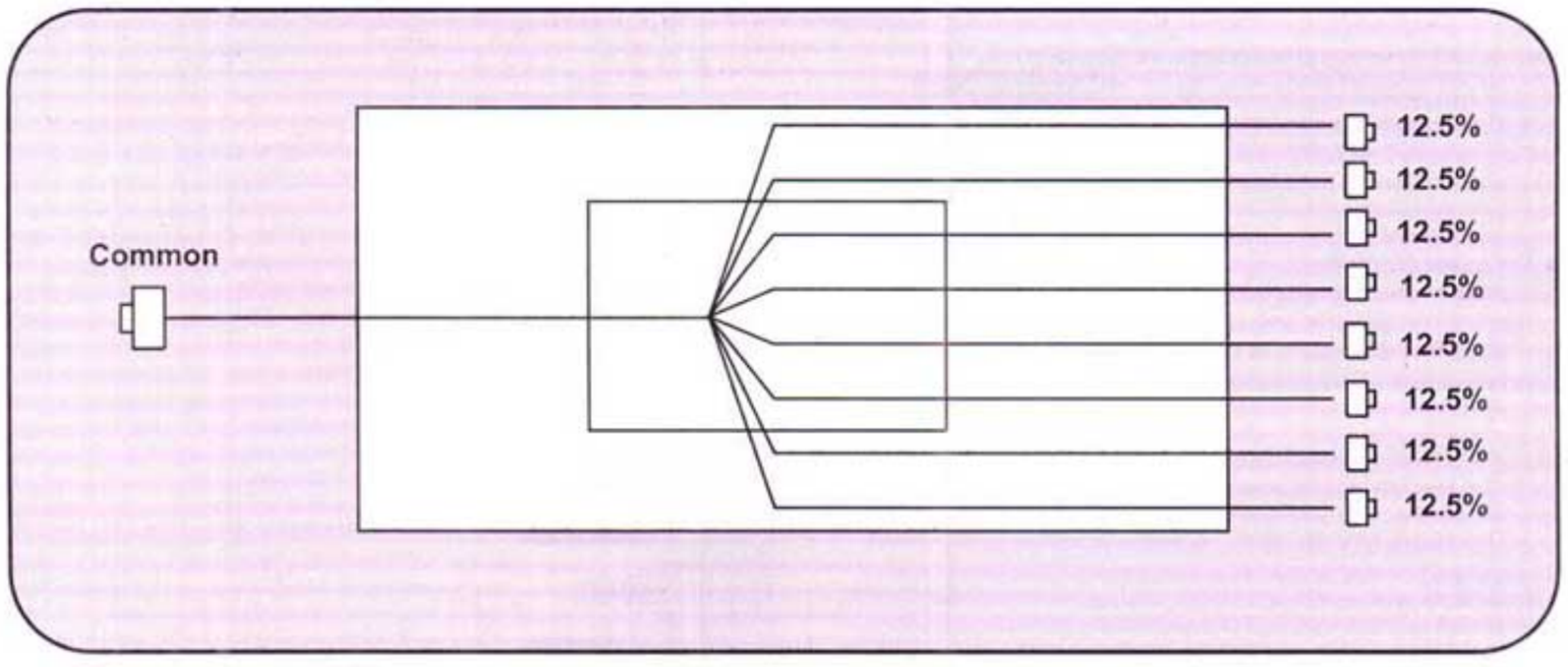
The 7705DS-8 is a bi-directional optical splitter/combiner that separates one optical input feed into eight proportional output feeds, or combines eight optical input feeds into one output feed. This product can be used in unidirectional transport applications to combine eight optical signals onto one fiber for reception by the 7705CWDM-D8, eight channel CWDM Demux or in distribution applications as an eight channel optical fan-out DA.

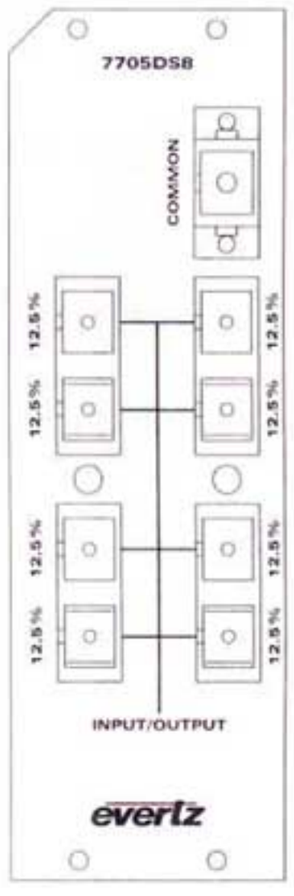
The 7705DS-8 is housed in Evertz's standard 3RU or 1RU Multiframe.

Features

- Wideband operation from 1260nm - 1610nm
- Passive splitter/combiner 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-8 Block Diagram





Specifications

Optical Input/Output:

Connector:	SC/PC, ST/PC & FC/PC female housing
Wavelength:	1260nm to 1610nm
Insertion Loss:	10dB typical, < 11.0dB maximum
Uniformity:	< 0.9dB
Directivity:	> 55dB
Fiber Size:	9µm, single mode fiber

Physical:

Number of Slots:	2

Ordering Information:

7705DS-8: Eight Channel Optical Splitter/Combiner

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*

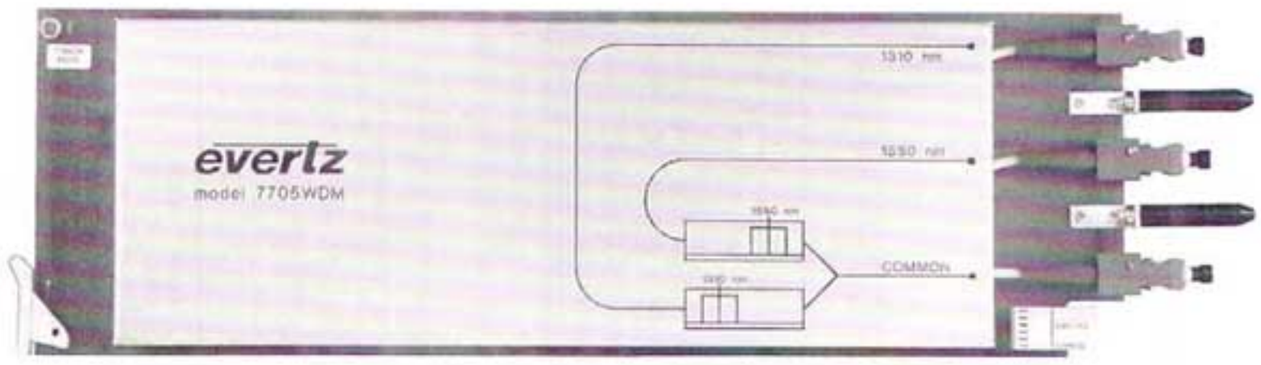
*Note: FC/PC connector option is available only on 'COMMON' port (SC/PC on remaining fibe I/O ports)

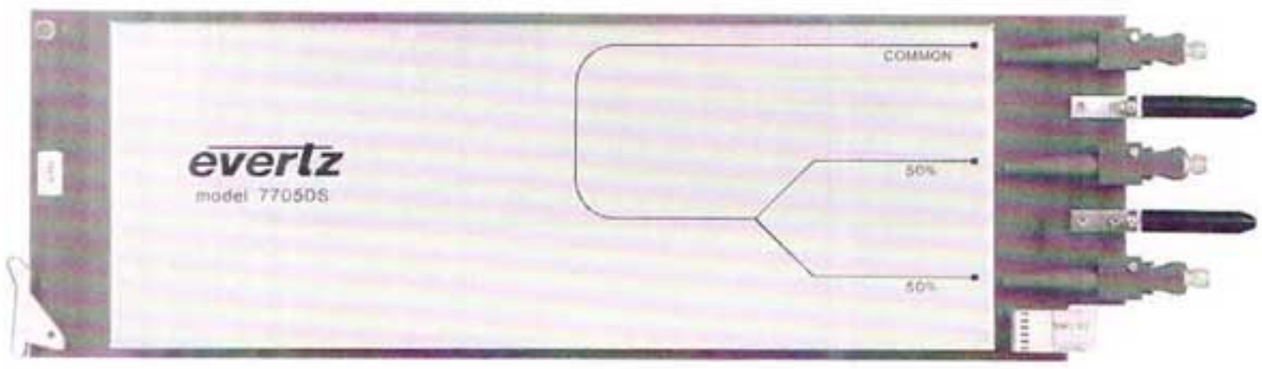
Enclosures:

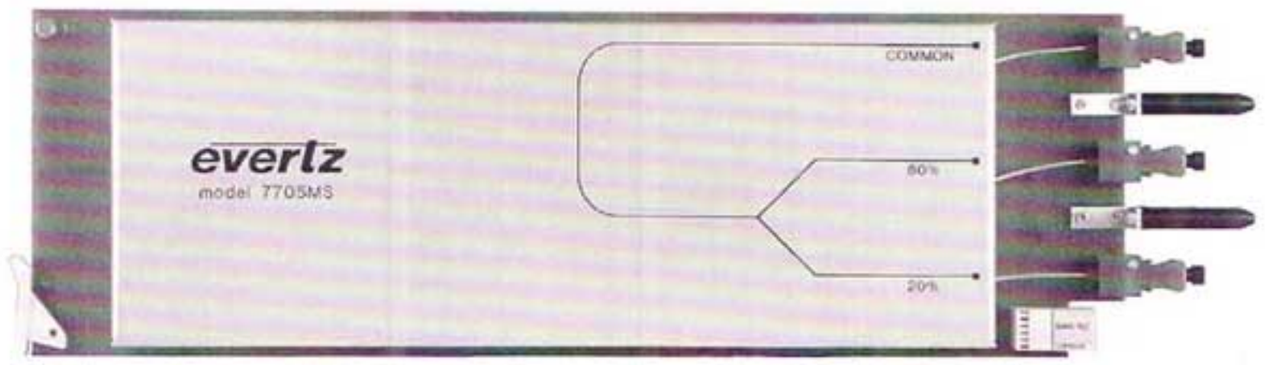
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

1d

Model 7705WDM, 7705WDM13/15, 7705DS & 7705MS







The 7705WDM and 7705WDM13/15 are bi-directional wavelength multiplexors/demultiplexors that combine 1310nm and 1550nm wavelengths onto a single fiber for simultaneous transmission. At the receiving end, the 7705WDM and 7705WDM13/15 can act as a de-multiplexor to separate the combined wavelengths from a single fiber onto individual fibers. The 7705WDM is a wideband WDM that can accept a 1470nm to 1610nm CWDM spectrum into the 1550nm port for multiplexing with 1310nm. The 7705WDM13/15 is a standard fused fiber type WDM that can accept a 1550nm ± 30nm signal into its 1550nm port for multiplexing with 1310nm.

The 7705DS and 7705MS are bi-directional optical splitters/combiners that take a single fiber feed and split it proportionately into two separate fiber feeds or combine two seperate fiber feeds into one output feed. The 7705DS can be used in optical signal distribution applications to split the signal so that each output fiber carries 50% of the input optical power. The 7705MS is used in active fiber monitoring applications to split the signal so that the transmit fiber carries 80% of the input optical power and the monitoring fiber carries 20% of the input power.

Features

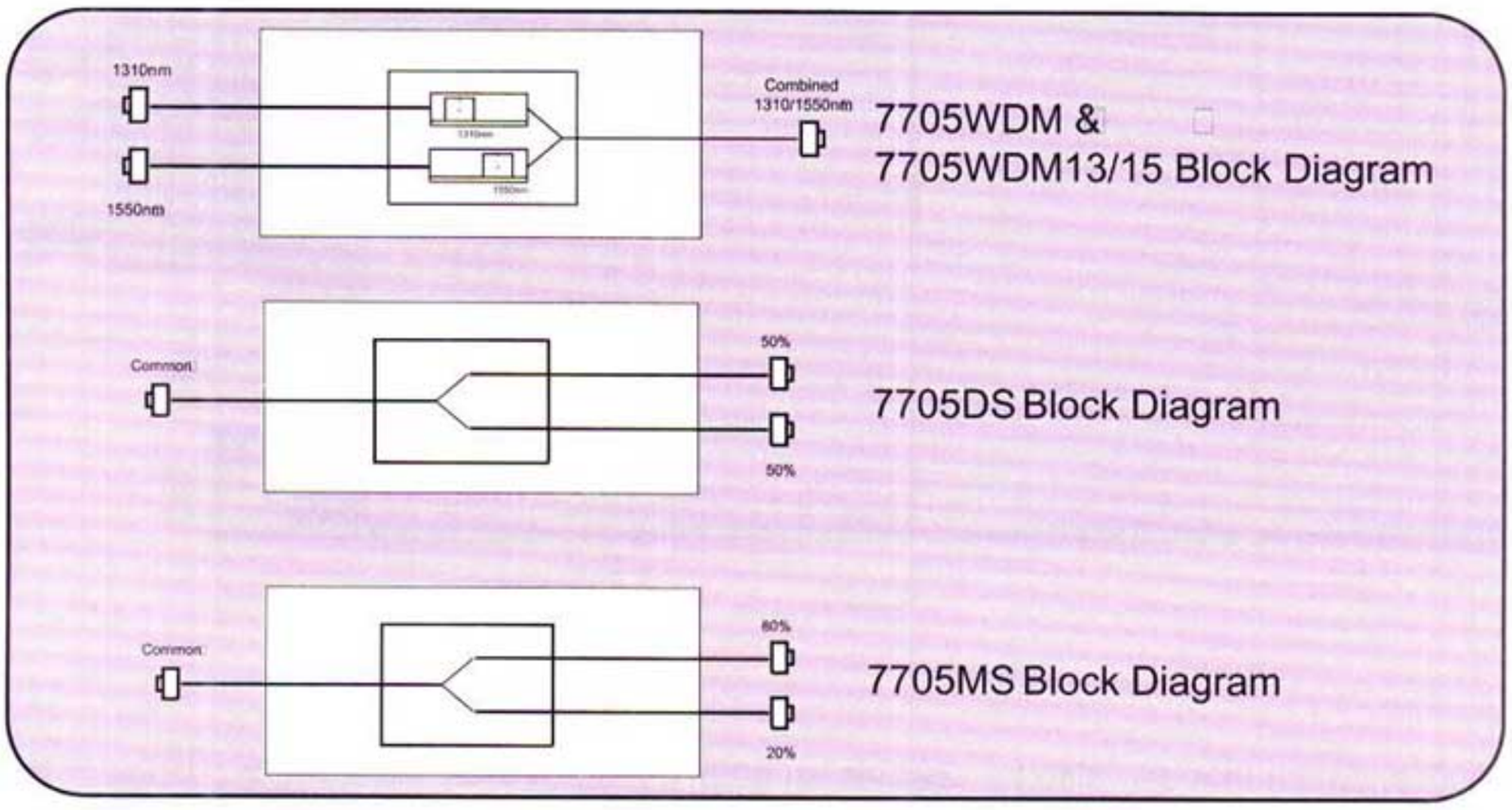
7705WDM (Wideband Wavelength Division Multiplexor)
7705WDM13/15 (Standard Wavelength Division Multiplexor)
7705DS (Fiber Distribution Splitter) &
7705MS (Fiber Monitoring Splitter)

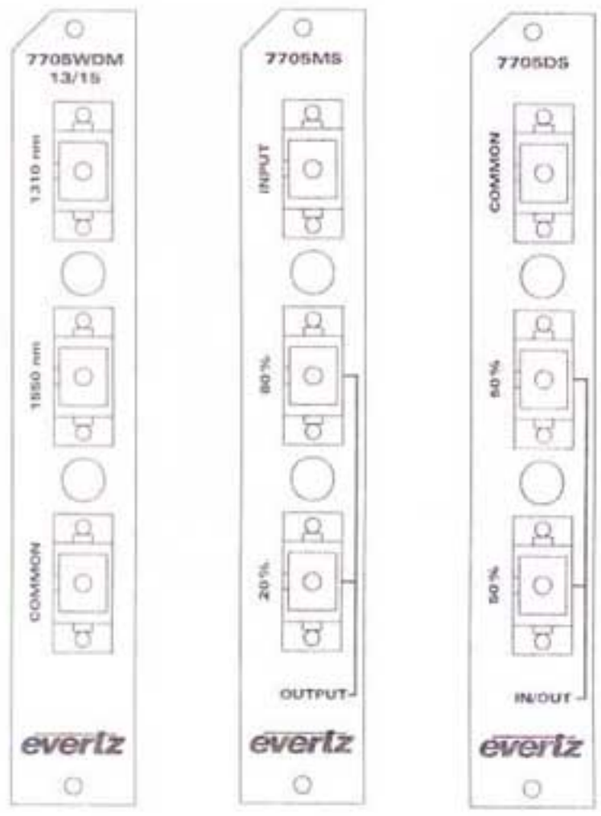
- Bi-directional operation handles 1310nm and 1550nm bands
- Passive design for any bit rate
- Fully hot swappable from front of frame with no fiber disconnect/reconnect required
- Low insertion loss to conserve system power
- Supports single mode fiber
- Available in SC, ST & FC connecter options

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.

7705WDM, 7705WDM13/15, 7705DS & 7705MS Block Diagram





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

Ordering Information:

7705WDM:	Wideband wavelength Division Multiplexor
7705WDM13/15:	Standard Wavelength Division Multiplexor
7705DS:	Fiber Distribution Splitter
7705MS:	Active Fiber Monitoring Splitter

Ordering Options

Rear Plate and Fiber Connector must be specified at time of orde
Eg: Model +SC +3RU

Rear Plate Suffix	
+3RU	3RU Rear Plate for use with 7700FR-C ame
+1RU	1RU Rear Plate for use with 7701FR M me
+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/FC male terminat
CB-FP1M-STPC	Single mode fiber cable, 1m, ST/PC male terminat
CB-FP5M-SCPC	Single mode fiber cable, 5m, SC/PC male terminat
CB-FP5M-STPC	Single mode fiber cable, 5m, ST/PC male terminat
CB-FP10M-SCPC	Single mode fiber cable, 10m, SC/PC male termination
CB-FP10M-STPC	Single mode fiber cable, 10m, ST/PC male termination

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

2 x 1 Optical Bypass Protection Switch

1d

Model 7707BPX





The 7707BPX is a wide band 2 x 1 optical switch that can also be used as an auto-changeover by detecting a change in the input power level. Manual control or automation control via the GPI port is also provided.

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.

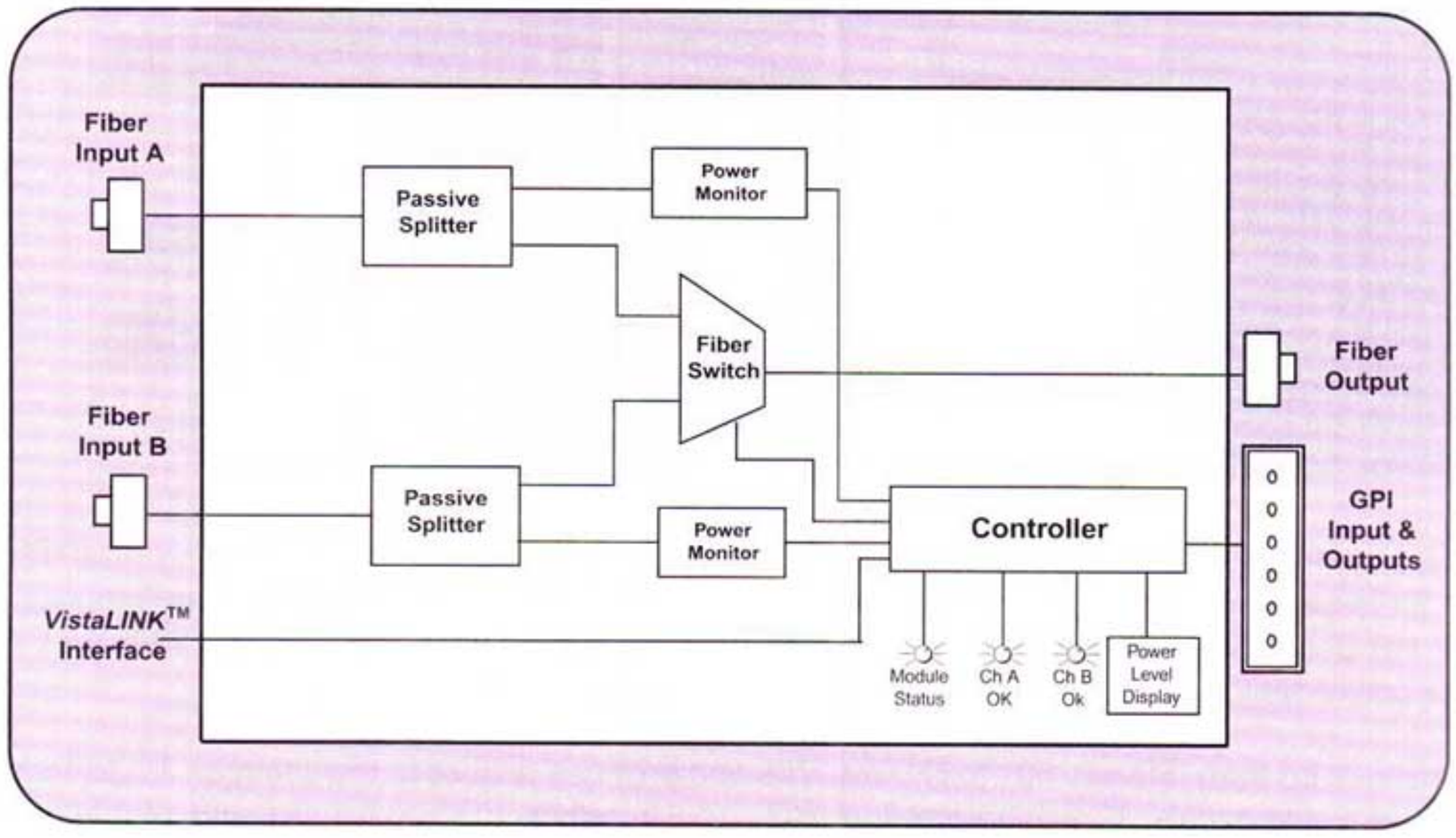
In the application of auto-changeover, the 7707BPX can be configured to have a MAIN input and a STANDBY input. In this configuration, it will automatically switch to the Standby input when the Main input power is weak or lost. It can also be set to auto-switch back to the Main input when this signal is re-established.

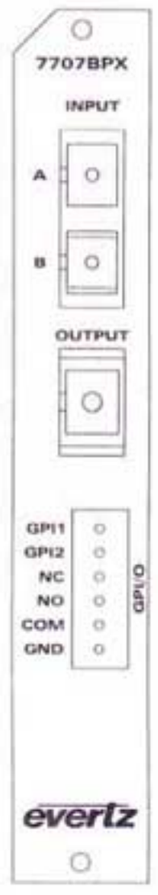
The 7707BPX occupies one card slot and can be housed in either a 1RU frame which hold up to 3 modules or a 3RU frame which will hold up to 15 modules.

Features

- Intelligent auto-switching with input power detection and user definable threshold
- Supports manual or automation control via GPI interface
- Comprehensive signal and status monitoring via four-digit card-edge display, or through SNMP and VistaLINK™ enabled capability
- 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 (8-10 mm) fiber optic cable
- SC/PC, ST/PC or FC/PC fiber connector options

Model 7707BPX Block Diagram





Specifications

Optical Input/Output:

Number:	3 Bi-directional optical signal
Connector:	SC/PC, ST/PC, FC/PC Female Housing
Insertion Loss:	< 3dB
Switch Time:	< 30 msec
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
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
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Physical:

Number of Slots:	1

Ordering Information:

7707BPX:	2 x 1 Optical Bypass Protection Switch

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

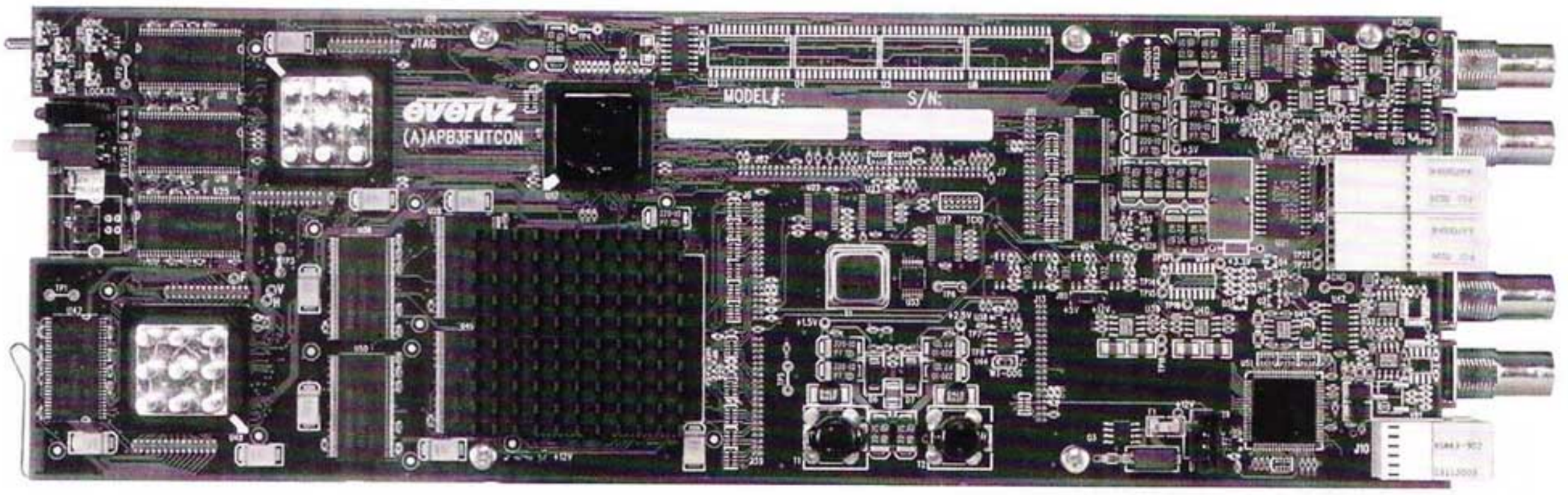
Enclosures:

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

1e

Model 7710UC-HD





The 7710UC-HD High Definition Upconverter provides high quality conversion of your 270 Mb/s standard definition (SMPTE 259M-C) signals to the common 1.5 Gb/s high definition (SMPTE 292M) video formats. The 7710UC-HD has 10-bit processing, 2 reclocked SDI outputs and 2 HD Serial Digital outputs. The 7710UC-HD outputs 1080i/59.94, 1080i/50 and 720p/59.94 HD video formats and also handles conversion to 480p/59.94 in a SMPTE 292M bitstream. (SMPTE 349M)

The 7710UC-HD has color space conversion from ITU rec. 601 to ITU rec. 709 and provides access to the common 4:3 to 16:9 aspect ratio conversion choices; 4:3 with side panels, 16:9 anamorphic stretch, 16:9 letterbox zoom to full size and 14:9 letterbox zoom to full size 14:9 with side panels.

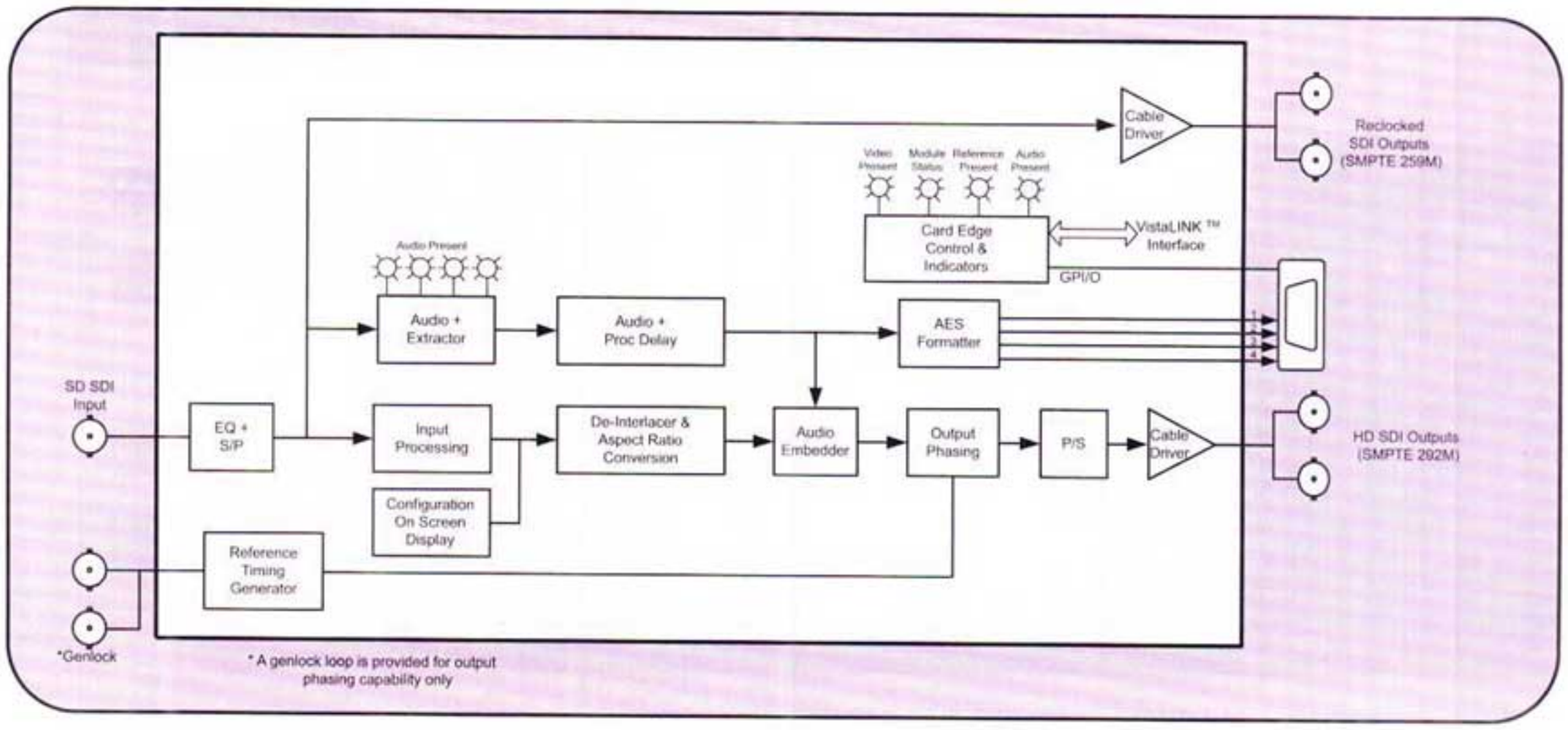
The Upconverter accepts 2 groups of SMPTE 272M embedded audio on the input and re-embeds them into the HD SMPTE 292M 1.5Gbs output. The re-embedded audio is compliant to SMPTE 299M and will have appropriate delay added to compensate for video delay incurred by the upconversion process, thus avoiding the need for external de-embedding and re-embedding of audio. The audio is also available as 4 unbalanced AES outputs.

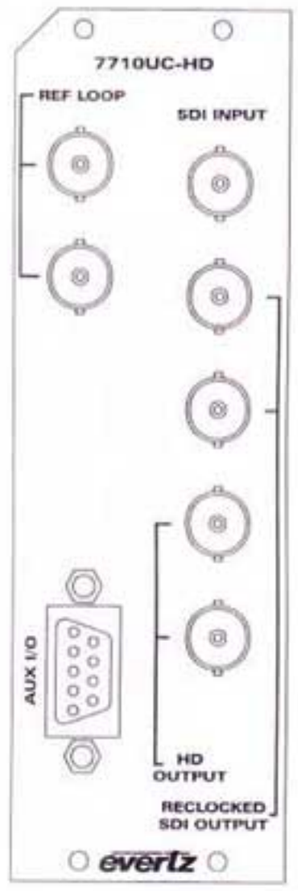
The 7710UC-HD occupies two card slots in the 3 RU frame, which will hold up to 15 modules or one slot modules in the 1RU frame, which will hold up to three modules. The 7710UC-HD provides card edge LEDs to indicate signal present, genlock present and audio groups present.

Features

- Broadcast quality SD -> HD up conversion
- Supports 4:3 Side Panel, 16:9 Crop, 16:9 Stretch and 14:9 Crop aspect ratio conversions.
- SD to HD colour space conversion (ITU rec. 601 to ITU rec. 709)
- 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
- Analog monitor output on screen display used to configure the operating modes
- VistaLINK™ - enabled offering remote control and configuration capabilities via SNMP (using VistaLINK™ PRO or 9000NCP 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

7710UC-HD Block Diagram





Specifications

SDI Video Inputs:

Standards:	525 or 625 line SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of Inputs:	1
Connector:	BNC per IEC 169-8
Input Equalization:	Automatic to 300m @ 270Mb/s with Belden 1694 or equivalent cable
Return Loss:	>15 dB up to 270MHz

Reclocked SDI Video Outputs:

Standard:	same as input
Number of Outputs:	2 Per Card reclocked
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	740ps nominal
Overshoot:	<10% of amplitude
Return Loss:	> 15 dB to 270MHz

HD Serial Video Output:

Standard: 1.5 Gb/s SMPTE 292M - DIP switch selectable.

Input Format	Output Format	SMPTE Standard
525i/59.94	1080i/59.94	274M
625i/50	1080i/50	274M
525i/59.94	720p/59.94	296M
525i/59.94	480-/59.94	293M, 349M

Number of Outputs:	2 Per Card reclocked
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	200ps nominal
Overshoot:	<10% of amplitude
Return Loss:	> 10 dB at 1.5 GHz

Genlock Input:

Type:	NTSC or PAL Colour Black 1 V p-p
Connector:	BNC Loop per IEC 169-8
Termination:	75 ohm (jumper selectable)

AES Audio Outputs:

Number of Outputs:	4
Standard:	SMPTE 276M, single ended AES
Connectors:	Female 9 pin D
Resolution:	24 bits
Sampling Rate:	48 kHz
Impedance:	75 Ω
Signal Level:	1 V p-p nominal

General Purpose Inputs:

Number of Inputs:	3
Type:	Opto-isolated, active low with internal pull-ups to +5 or +12V (jumper settable)
Connector:	3 pins (plus ground) on female 9 pin D
Signal Level:	closure to ground
Function:	User Preset select

Electrical:

Voltage:	+12VDC
Power:	26 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-HD	HD Upconverter

Accessories:

9000NCP	VistaLINK™ General Purpose Network Control Panel

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

Enclosures:

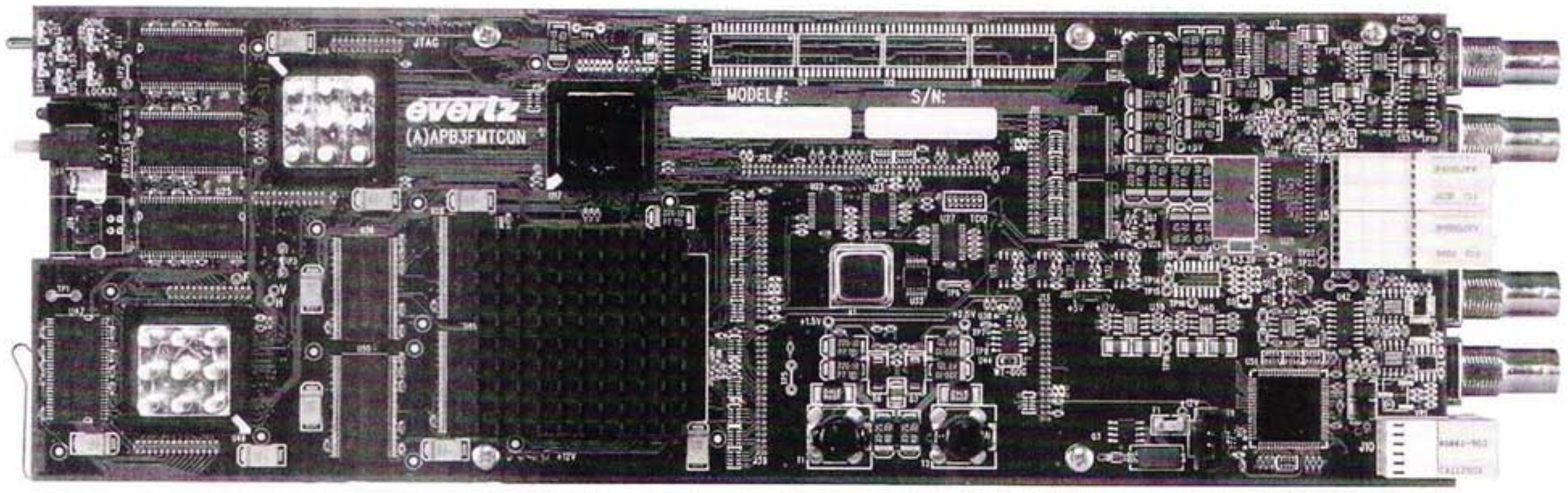
7700FR-C	3RU Multiframe, which holds 15 modules
7701FR	1RU Multiframe, which holds 3 modules
S7701FR	Standalone Enclosure

HD Broadcast Quality Down Converter

1e

Model 7711HDC





The 7711HDC is a high quality down converter for your 1.5 Gb/s HDTV signals. The 7711HDC supports all major HD formats, provides extensive control over the down-conversion process, and seamlessly transfers 2 groups of HANC embedded audio and VANC based metadata to the down-converted outputs. With both SDI 601 digital and Broadcast quality composite outputs, the 7711HDC fits easily into a plant that is fully digital, analog, or mixed. Configuration menus and Status Windows can be activated on an additional pair of composite monitoring outputs making the 7711HDC easy to configure and trouble shoot during installation.

Features

Formats:

- 1080i/59.94, 720p/59.94, 480p/59.94, 1080i/50, 1080p/23.98sF, 1080p/25sF, 1080p/29.97sF, 1035i/59.94

Video Processing:

- High quality 10 bit HD to SD down conversion
- Advanced De-interlacing featuring controls for:
  - Field and Frame Mode
  - Noise Reduction
  - Motion Compensation
  - Horizontal, Vertical Detail Edge Enhancement
- Aspect Ratio Conversion:
  - 16:9/14:9/13:9 Letter Box, 4:3 Side Cut, 4:3 Squeeze
  - Selectable Horizontal/Vertical Filters for control of Picture Sharpness
- HD ITU rec. 709 to SDI ITU rec. 601 color space conversion
- RP188/6Hz Pulse 3:2 Pull-down conversion of 1080p/23.98sF to 525i/59.94
- Automatic input standard and frame rate detection
- Adjustable output timing with respect to reference input

Audio (N-EAES4 only):

- De-embeds, delays and re-embeds 2 groups of audio on SDI 601 outputs
- 4 AES outputs
- Transparent support of embedded PCM, AC3, Dolby E audio

VANC (N-EAES4 only):

- Extraction of RP188 Timecode and conversion to VITC on SDI/Analog outputs
- Extraction of HD Captions and insertion into SDI/Analog outputs

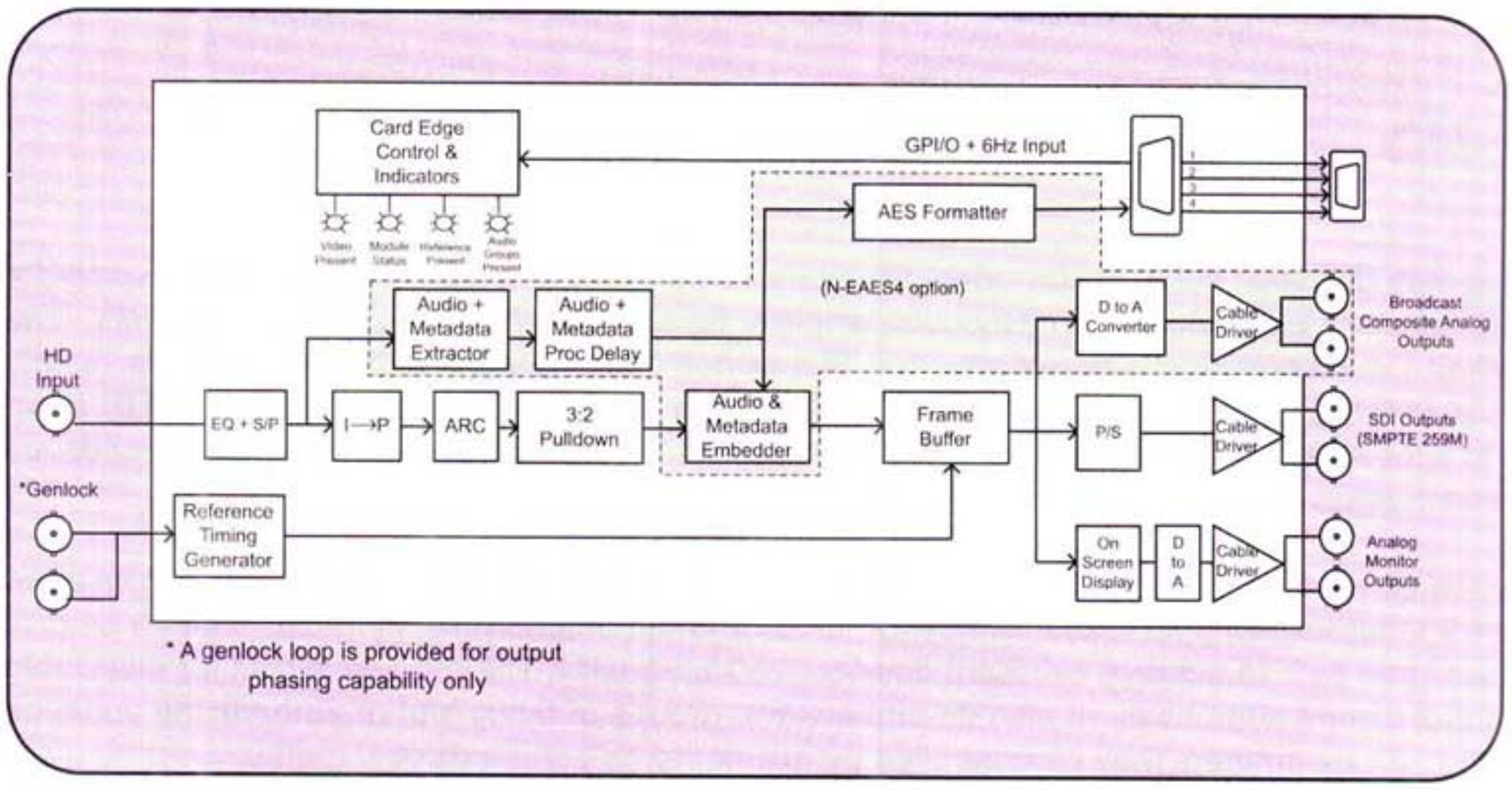
Outputs:

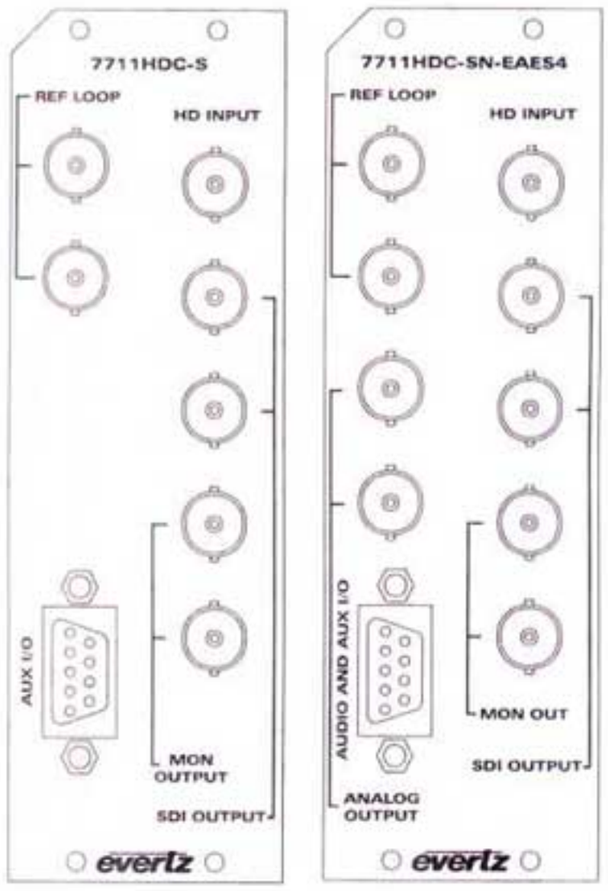
- 2 601 SDI outputs
- 2 High Quality Composite outputs (N-EAES4 option)
- 2 Monitoring Composite outputs with On Screen Display for easy user configuration

Control and Indication:

- Config and control via card edge push-button and toggle switch
- 10 User Presets for storing module configurations
- GPIs for selecting user presets
- LEDs indicating: Module Status/Fault, Video Presence, Reference Presence, Embedded Audio Presence
- VistaLINK™ - enabled offering remote control and capabilities via SNMP 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 VistaLINK™ PRO or 9000NCP Network Control Panel.

7711HDC Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 292M 1.5Gb/s Input
Formats:	1080i/59.94, 720p/59.94, 480p/59.94, 1080i/50, 1080p/23.98sF, 1080p/25sF,1 080p/29.97sF, 1035i/59.94
Connector:	1 BNC input per IEC 169-8
Impedance:	75Ω
Equalization:	Automatic 100m @1.5Gb/s with (Belden1694)
Return Loss:	>10dB to 1.5Gb/s

Serial Video Output:

Standard:	Serial component SMPTE 259M-C
Number of Outputs:	2
Connector:	BNC per IEC 169-8
Impedance:	75Ω
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
Return Loss:	>15dB to 270Mb/s

Genlock Input:

Type:	NTSC or PAL Colour Black 1 Vp-p
Connector:	BNC Loop per IEC 169-8
Termination:	High impedance loop or internal 75Ω termination (jumper selectable)

Analog Video Output (N-EAES4 only):

Standard:	NTSC, SMPTE 170M, PAL, ITU624-4
Number of Outputs:	2
Connector:	BNC per IEC 169-8
Signal Level:	1V nominal (user adjustable from menu)
DC Offset:	0V ±0.02V
Return Loss:	> 35dB up to 5MHz
Frequency Response:	0.1dB to 4MHz, 0.15dB to 5.5 MHz
Differential Phase:	< 0.5 (<0.3 typical)
Differential Gain:	< 0.5% (<0.3 % typical)
SNR:	> 78dB to 5MHz

Analog Monitor Video Output:

Standard:	NTSC, SMPTE 170M, PAL, ITU624-4
Number of Outputs:	2
Connector:	BNC per IEC 169-8
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)

AES Audio Outputs (N-EAES4 only):

Number of Outputs:	4
Standard:	SMPTE 276M, single ended AES
Connector:	Female high density DB-15
Sampling Rate:	Synchronous 48kHz
Impedance:	75Ω unbalanced

General Purpose Inputs:

Number of Inputs:	3
Type:	Opto-isolated, active low with internal pull-ups to +5 or +12V (jumper settable)
Connector:	3 pins (plus ground) on female 9 pin D
Signal Level:	Closure to ground
Function:	6Hz reference and user Prest 1 & 2 select

Input to Output Processing Delay:

Minimum Delay Mode:	2 to 4 frames depending on input video format and processing mode (see manual)
Output Phasing:	Up to 1 additional frame dependent on output phasing to genlock reference
Audio and VANC:	Audio, captions and VITC are delayed and re-embedded in time with the output picture (7711HC-SN-EAES4 only)

Electrical:

Voltage:	+12V DC
Power:	26 Watts
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Physical:

Number of Slots:	2 for the 7700FR-C frame 1 for the 7701FR frame

Ordering Information:

7711HDC-S	HD Broadcast Quality Downconverter with SDI outputs
7711HDC-SN-EAES4	HD Broadcast Quality Downconverter with SDI and Broadcast Analog Outputs with VANC support & AES/Embedded Audio Support

Accessories:

9000NCP	VistaLINK™ General Purpose Network Control Panel

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

Enclosures:

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

HD Down Converter & Distribution Amplifier

1e

Model 7710MD has been superceded by Model 7710DCDA-HD

Model 7710DCDA-HD

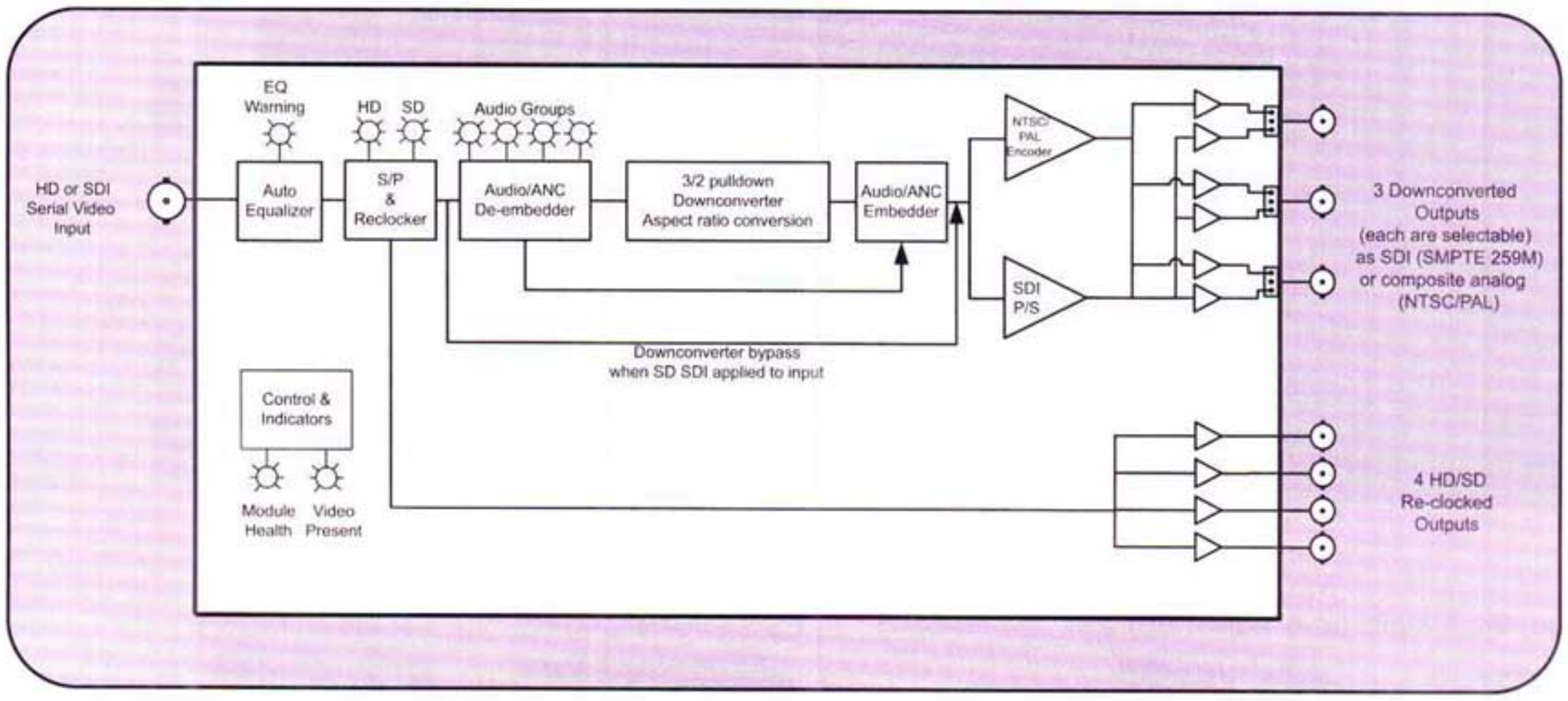
The 7710DCDA-HD is a reclocking high definition serial digital video distribution amplifier and a high quality downconverter for 1.5 Gb/s HDTV signals. It can also function as a monitoring distribution amplifier for standard definition 270 Mb/s signals. The 7710DCDA-HD provides 4 reclocked DA outputs 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/24sF input video to 525i/60 with a 3:2 pulldown, it inserts extra fields to create a random 3:2 pulldown cadence of the picture content on the downconverted output.

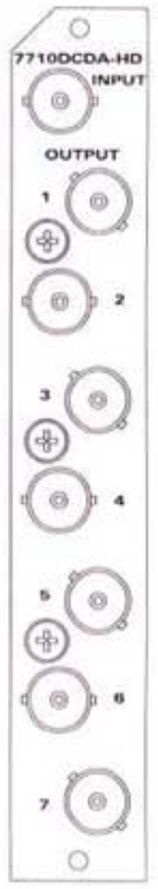
The 7710DCDA-HD has color space conversion from ITU rec. 709 to ITU rec. 601, and will provide various down converted formats such as 16:9 letterbox, 14:9 letterbox, 13:9 letterbox, 4:3 center crop, and 4:3 anamorphic squeeze. Full 10 bit processing is provided throughout the signal path to achieve excellent 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.

Features

- Serial digital 1.5 Gb/s HD input per SMPTE 292M
- Supports most international standards including 1080i/60, 1080i/59.94, 1080i/50, 480p/59.94, 480p/60, 720p/60 & 720p/59.94, 1080p/24sF and 1080i/23.98sF
- Will also accept 270 Mb/s SD input SDI per SMPTE 259M in a pass through mode - auto senses HD or SD inputs (feature not implement at the time of writing)
- 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 (random cadence)
- 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)
- Card Edge LEDs for signal presence, equalization warning, audio groups present, module status
- Tally output on Frame Status bus upon loss of input signal
- Full 10 bit processing for high quality downconversions

7710DCDA-HD Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M 270 Mb/s - pass through mode SMPTE 292M - auto-detects standard, SMPTE 274M, SMPTE 296M, (1080i/60, 1080i/59.94, 1080i/50, 480p/59.94, 480p/60, 720p/60 & 720p/59.94, 1080p/24sF and 1080i/23.98sF)
Connector:	BNC per IEC 169-8
Input Equalization:	Automatic to 100m @ 1.5Gb/s with Belden 1694 or equivalent cable.
Return Loss:	>15 dB up to 1.5GHz

Reclocked Serial Video DA Outputs:

Standard:	Same as input (SMPTE 259M or SMPTE 292M)
Number of Outputs:	4 Per Card reclocked
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	200ps nominal for HD 750ps nominal for SD
Overshoot:	<10% of amplitude
Return Loss:	> 15 dB at 1.5 Gb/s
Jitter:	< 0.2 UI

Downconverted Serial Video Outputs:

Standard:	SMPTE 259M-C (270 Mb/s)
Number of Outputs:	up to 3 Per Card (jumper selectable)
Connector:	BNC per IEC 169-8
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

Downconverted Composite Analog Video Outputs:

Standards:	Analog composite NTSC (SMPTE 170M) if input is 59.94Hz or Analog composite PAL (ITU-R BT.470) if input is 50Hz
Number of Outputs:	up to 3 Per Card (jumper selectable)
Connectors:	BNC per IEC 169-8
Signal Level:	1 V p-p nominal
DC Offset:	0V ±0.1V
Return Loss:	>35dB up to 5 MHz
Frequency Response:	0.1dB to 4 MHz, 01.5dB to 5.5 MHz
Differential Phase:	<0.5°(<0.3° typical)
Differential Gain:	<0.5% (<0.3 % typical)
SNR:	>78dB to 5 MHz (shallow ramp)
Impedance:	75 Ω

Input to Output Processing Delay:

Video Delay:	2 to 4 frames depending on input video format and processing mode.
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:

7710DCDA-HD	HD Down Converter and Distribution Amplifier (4 HD reclocked 1.5Gb/s, selectable 3 SD SDI outputs or 3 composite analog 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

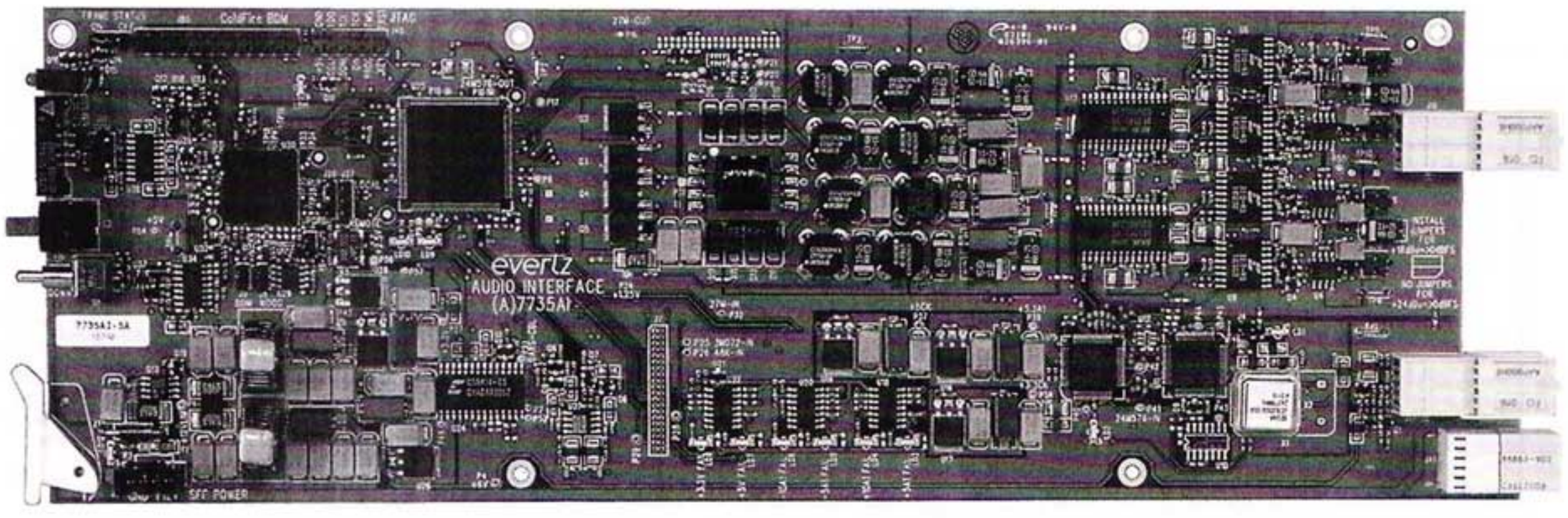
Enclosures:

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

Quad Analog Audio to Dual AES Converter

Model 7720ADC-A4

1f

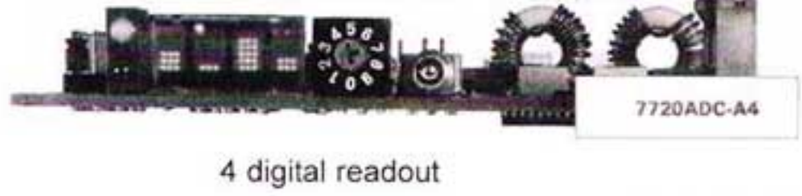


Card Edge Audio Level Adjust Display



4 digital readout toggle switch

Card Edge 4 Channel "VU" Baragraph Meters



4 digital readout

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.

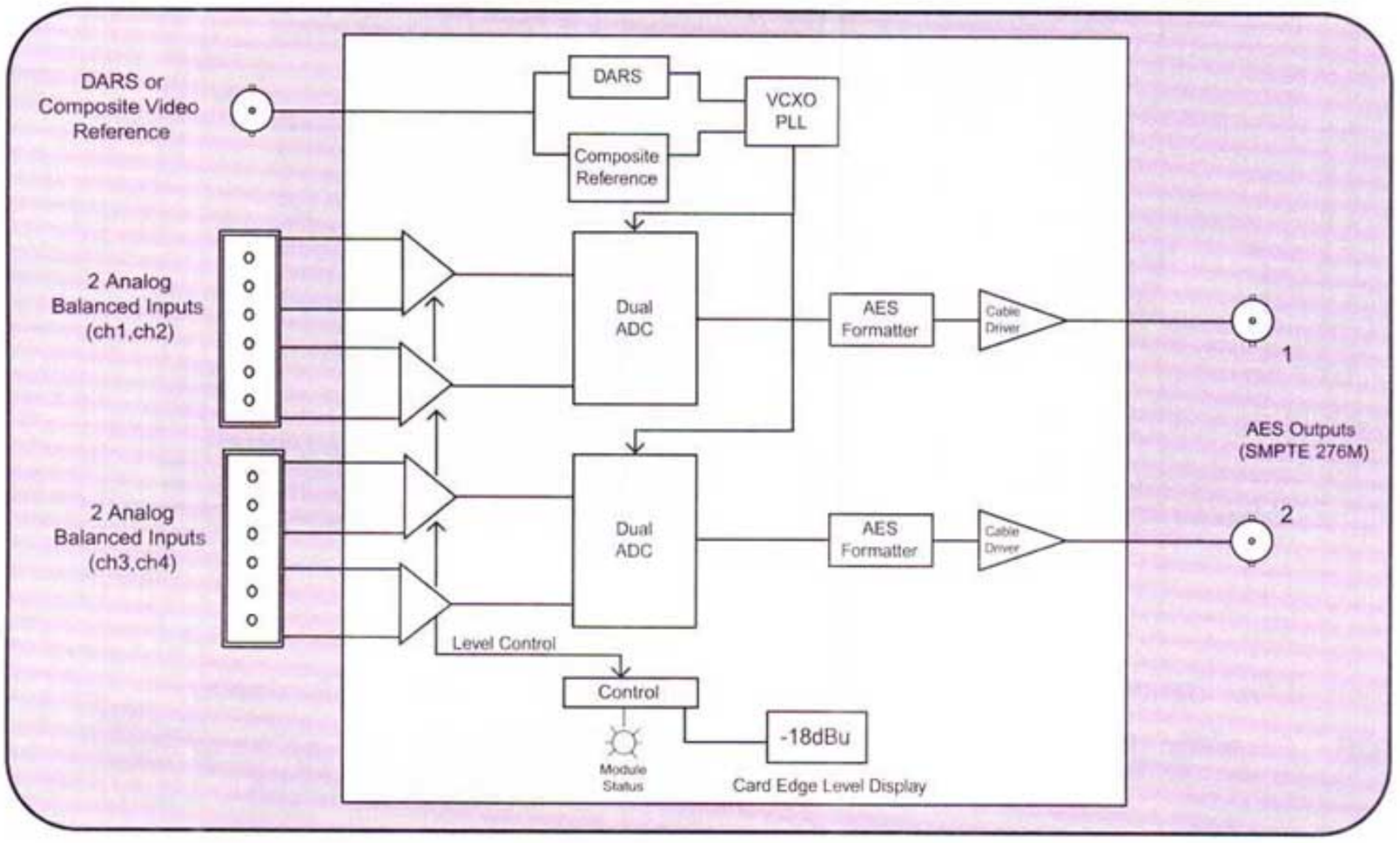
The sampling clock may free run at 48kHz or may be locked to either a DARS (Digital Audio Reference Signal) reference or composite video reference. Level control is provided via a card edge toggle switch. The input gain level can be read out from a card edge display for convenience. The full scale digital signal can be calibrated to accommodate peak levels ranging from 8dBu to 27dBu with 0.5 dB resolution.

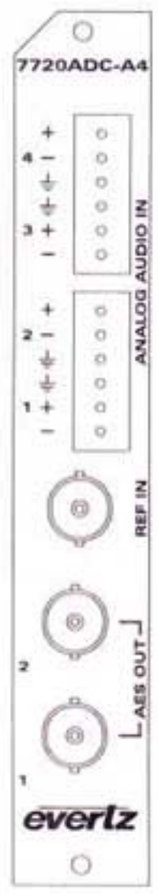
The audio ADC features a card edge VU meter for quick confidence monitoring. Four separate level indicators are provided via bargraphs for quick validation of audio program material.

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

7720ADC-A4 Block Diagram





Specifications

Analog Audio Input:

Number of Inputs:	4
Type:	Balanced analog audio
Connector:	Removable terminal strip
Input Impedance:	10k Ω minimum (differential)
Sampling Frequency:	48kHz (freerun or locked to the reference)
Signal Level:	0dB FS = 8dBu to 27dBu(programmable)
Frequency Response:	+/- 0.1dB (20Hz to 20kHz)
SNR:	100dB with input at -0.5dBFS
THD+N:	<0.001% (>100dB) @ 20Hz to 20kHz, -0.5 dB FS
CMRR:	>100dB @ 1kHz
Crosstalk:	< -100dB @ 20Hz-20kHz
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 169-8
Signal Level:	
Video:	Max: 2Vp-p video (composite only) Min: Sync level150m (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 169-8
Resolution:	24-bits
Sampling Rate:	48 kHz
Impedance:	75 Ω unbalanced
I/O Delay:	0.87m Sec

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

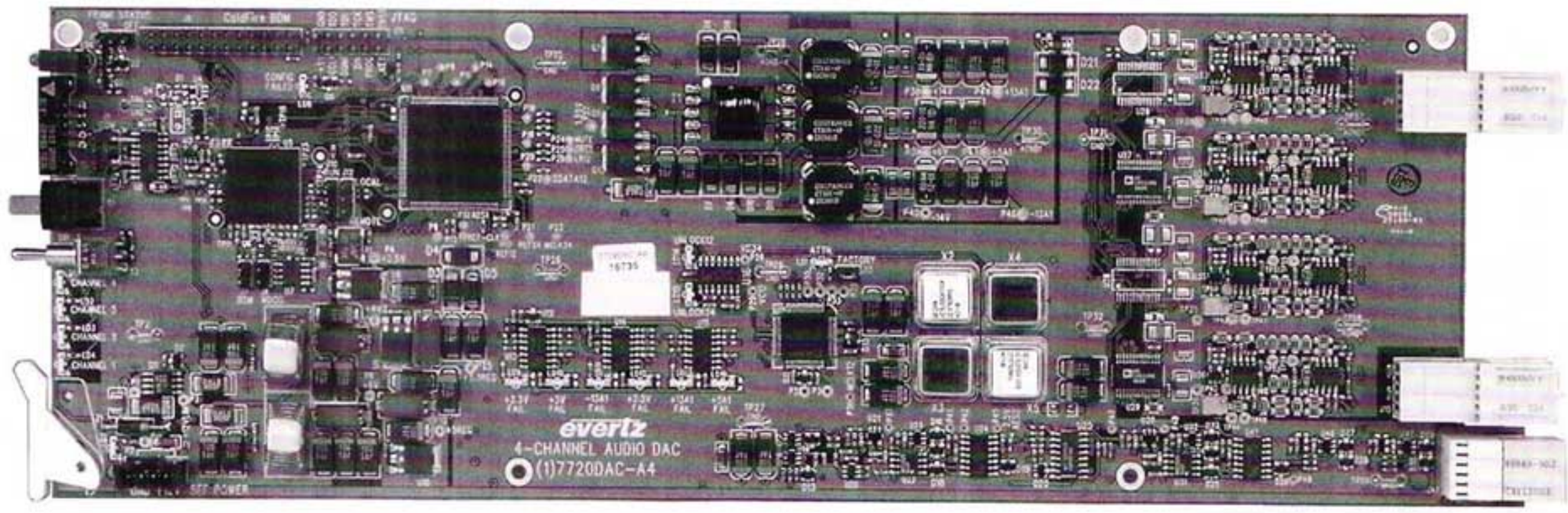
+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

Enclosures:

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

Dual AES to Quad Analog Audio Converter

Model 7720DAC-A4



Card Edge 4 Channel "VU" Baragraph Meters



4 digital readout

Card Edge Audio Level Adjust Display



4 digital readout toggle switch

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.

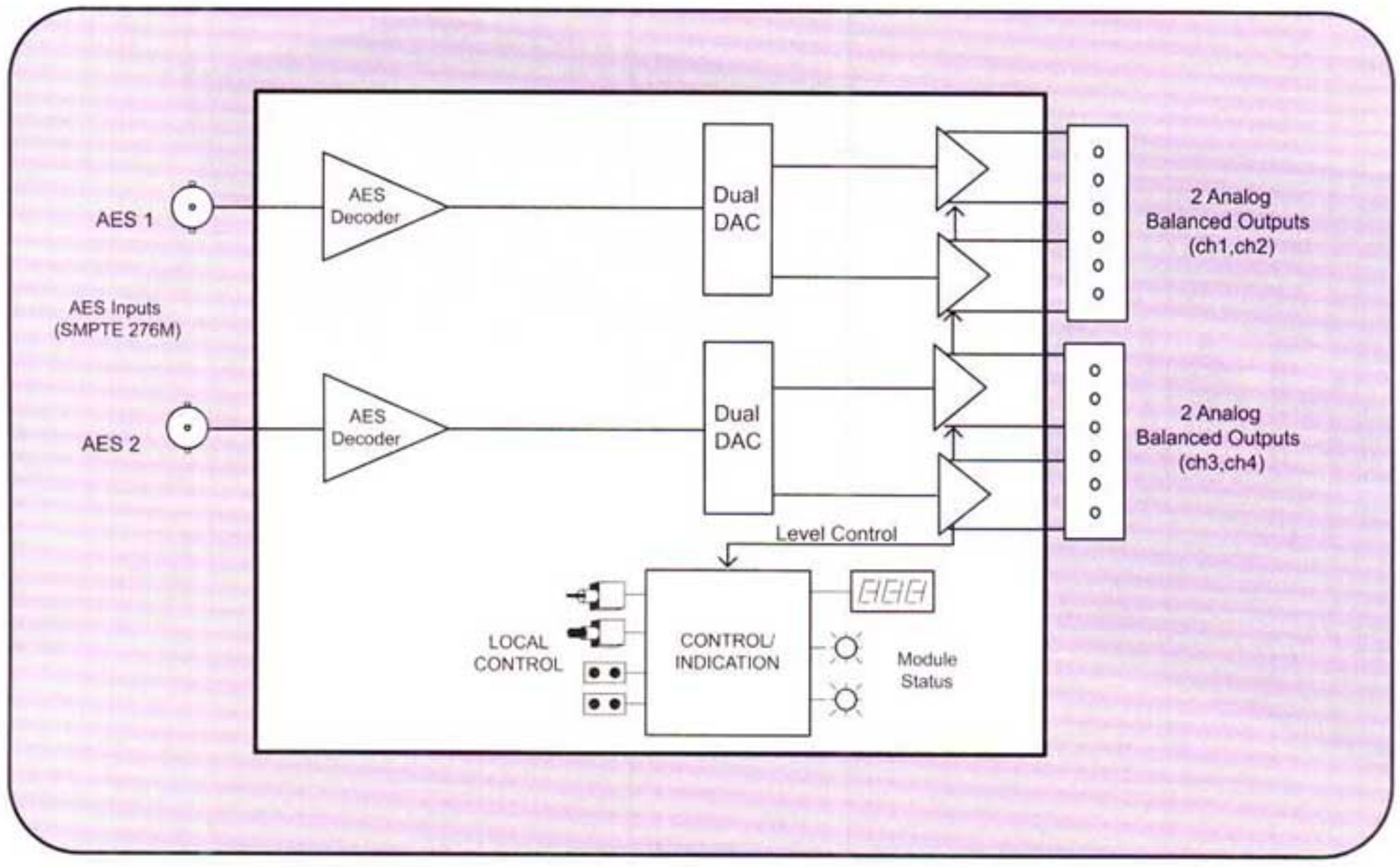
Level control is provided via a card edge toggle and the set gain level can be read out from a card edge display for convenience. The full scale digital signal can be calibrated to product analog peak levels ranging from 12dBu to 25dBu with 0.1 dB resolution.

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.

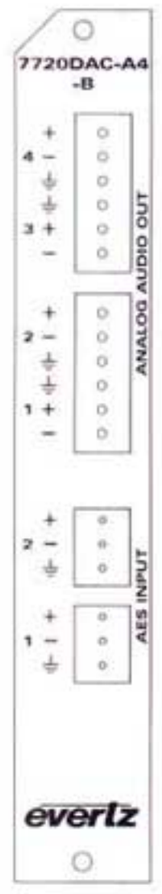
Features

- AES3/IEC-958 or AES-3id/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

7720DAC-A4 Block Diagram







Specifications

AES Audio Inputs (7720 DAC-A4):

Number of inputs:	2
Standard:	SMPTE 276M, AES-3id-2001
Connector:	BNC per IEC 169-8
Input type:	Un-balanced, 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 (7720 DAC-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
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)
I/O Delay:	0.92m Sec

Electrical:

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

Physical:

Number of Slots:	1

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 2 balanced AES inputs

Ordering Options

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

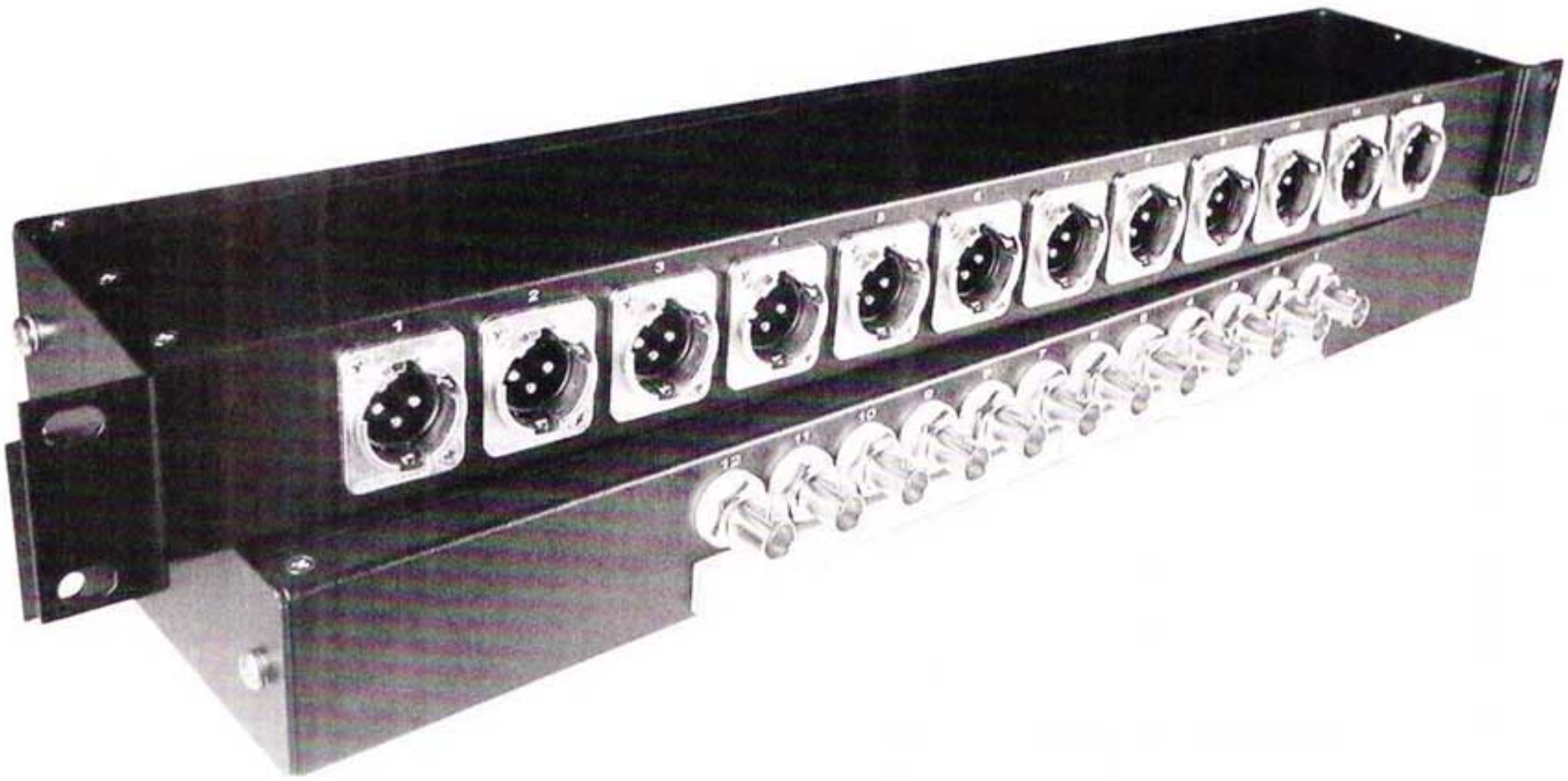
Rear Plate Suffix

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

Enclosures:

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

Model AESIMP-12M (XLR Male to BNC) & AESIMP-12F (XLR Female to BNC)



The AESIMP-12 series translators converts a balanced 110Ω (twisted pair) based digital audio signals to/from an unbalanced 75Ω (coax) based digital audio signal. The conversion is bi-directional regardless of XLR gender. The 1RU units support AES/EBU digital audio signals, with sampling rates ranging from 22kHz to 96kHz.

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. There are two version of the AESIMP-12 available.

PART NUMBER	110Ω CONNECTOR	75Ω CONNECTOR
AESIMP-12F	3 PIN XLR FEMALE	BNC
AESIMP-12M	3 PIN XLR MALE	BNC

The rack mounting ears may be reversed to orient the panel for the greatest ease of installtion. An identification strip holder is provided over the BNC connectors to assist in labelling sources and/or destinations.

Specifications

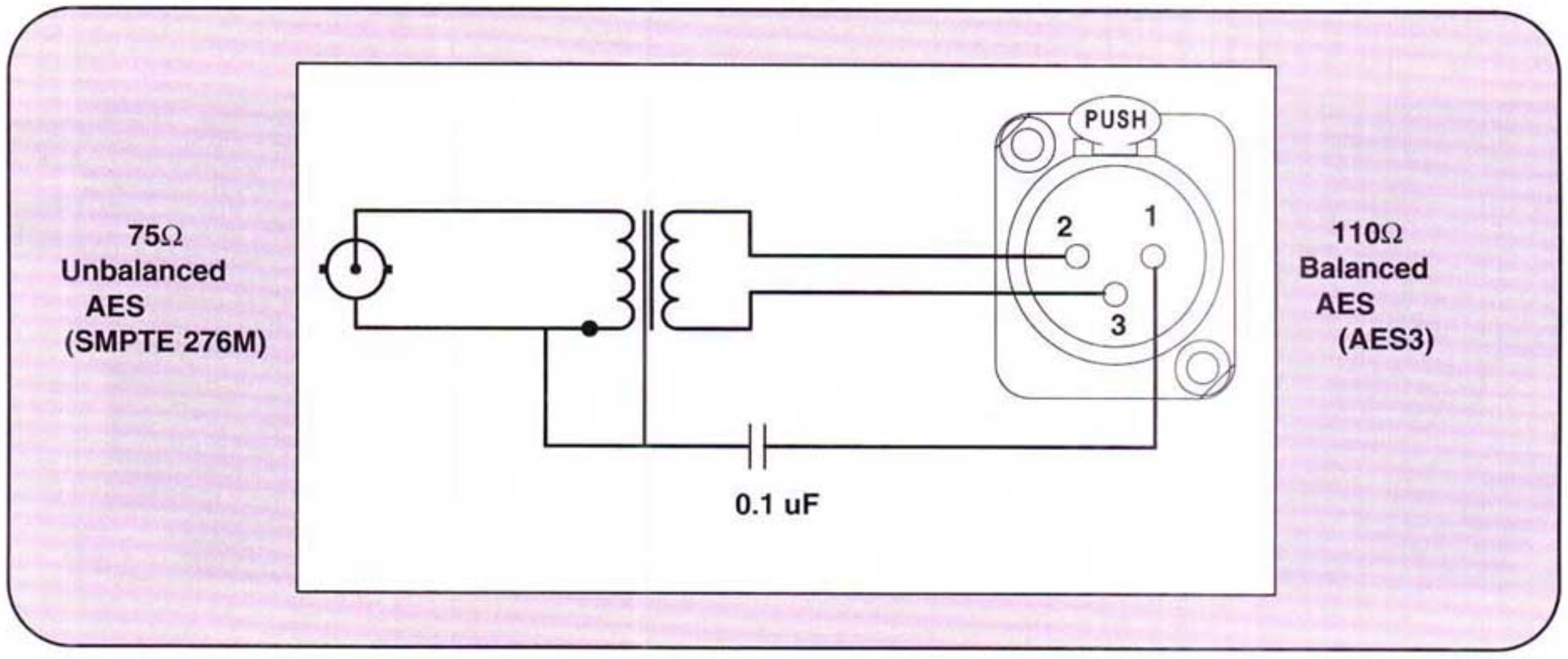
Number of Channels: 12
Coupling: Transformer
Turns Ratio: 1.22:1

Unbalanced AES:
Standard: SMPTE 276M, single ended AES
Connectors: BNC per IEC 169-8
Signal Level: Approx. balanced level x 0.8, 5 V p-p max
Impedance: 75Ω unbalanced

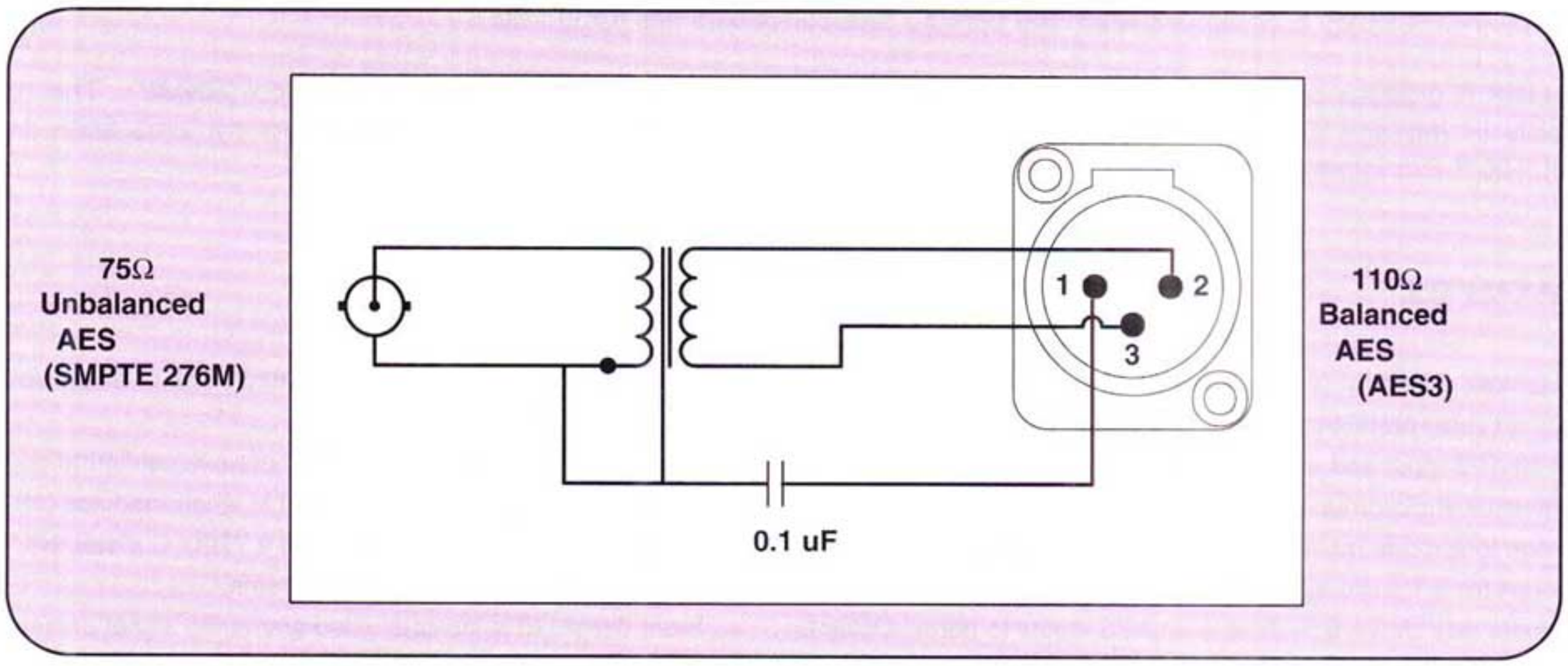
Balanced AES:
Standard: AES3-1992 balanced AES
Connectors: 3 pin Male XLR (AESIMP-12M) or 3 pin Female XLR (AESIMP12F)
Signal Level: Approx. unbalanced level x 1.22, 5 V p-p max
Impedance: 110Ω balanced

Ordering Informaton:
AESIMP-12F 12 Channel female XLR to BNC AES Impedance Matching Panel
AESIMP-12M 12 Channel male XLR to BNC Impedance Matchine Panel

Model AESIMP Block Diagrams



Model AESIMP-12F



Model AESIMP-12M

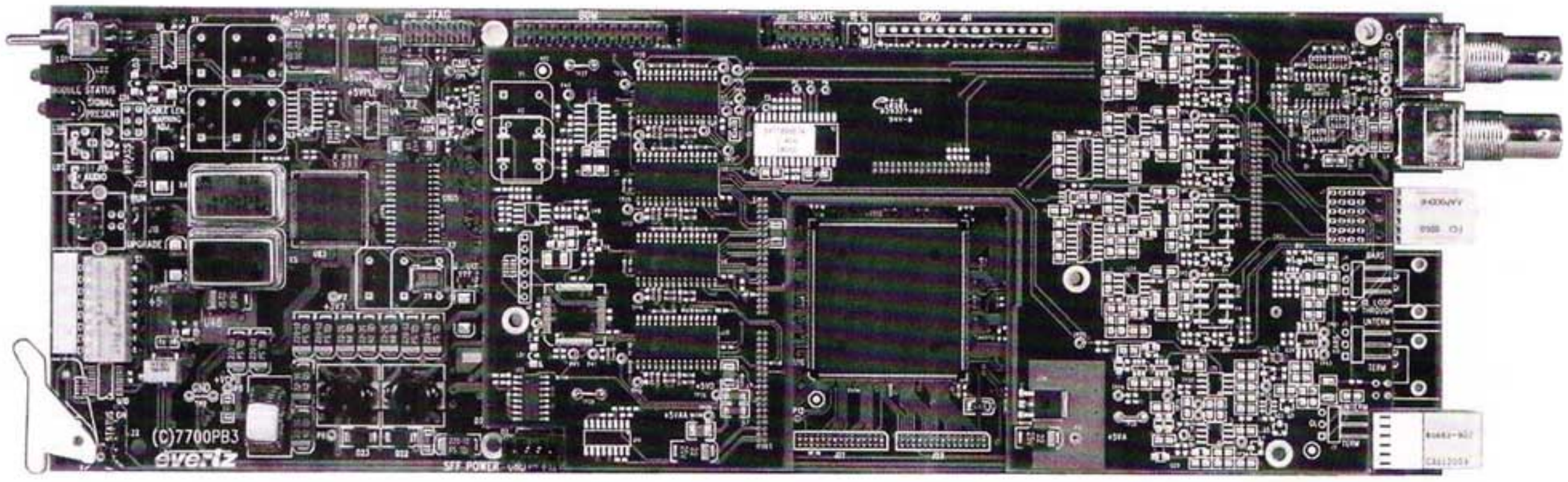
HD 4 AES Channel Embedder

1g

Model 7720AE4-HD



Dolby E PARTNER



The 7720AE4-HD Audio Embedder inserts AES audio signals into a 1.5Gb/s HD video signal as specified in SMPTE 299M. The companion 7720AD4-HD Audio Deembedder facilitates audio demultiplexing at the destination.

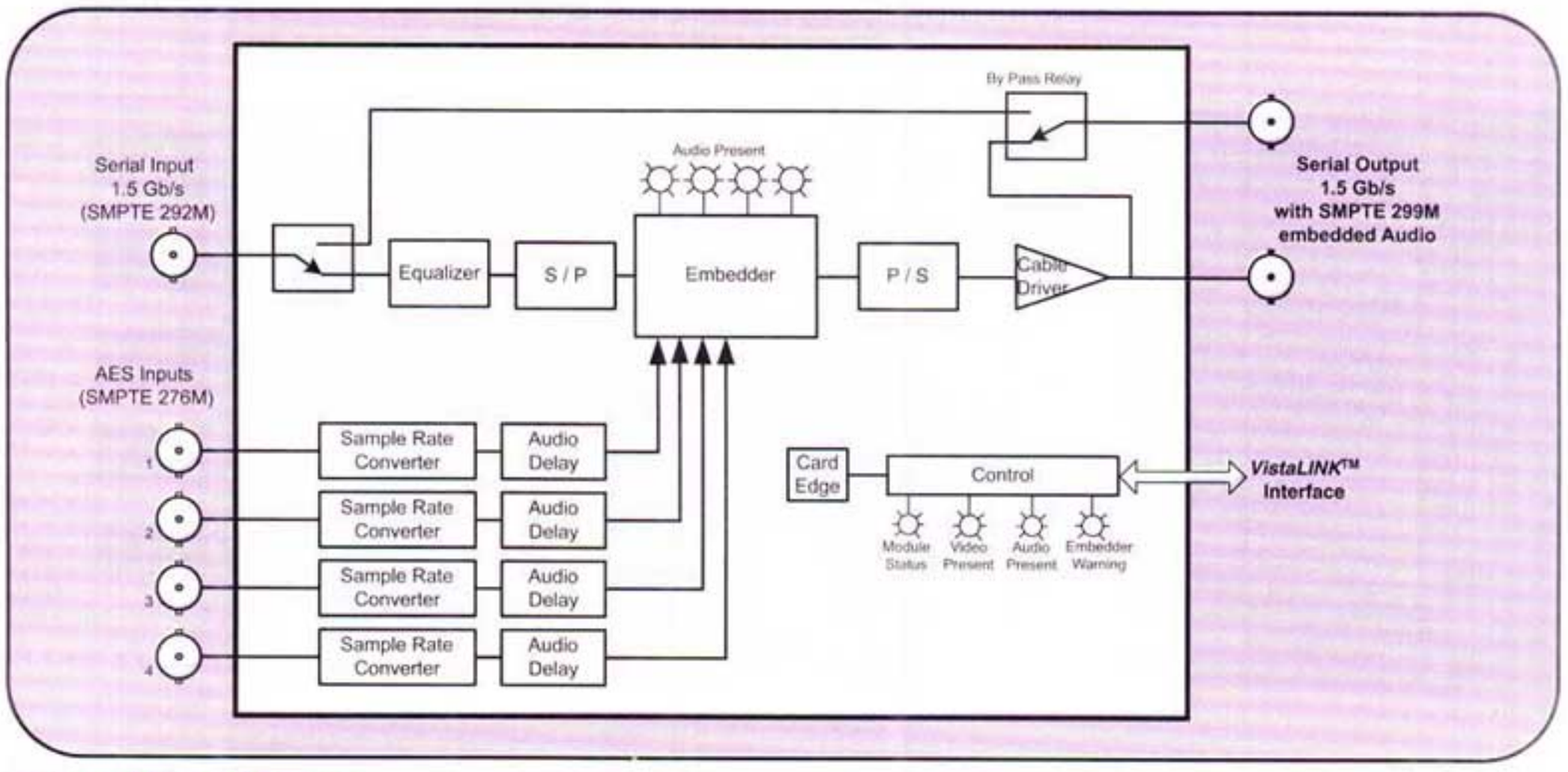
SMPTE 299M allocates four groups of four audio channels that can be embedded into the SMPTE 292M bitstream. The 7720AE4-HD embeds up to 4 AES audio signals into two groups on the SDI outputs for discrete 5.1 audio applications. The 7720AE4-HD is Dolby E compliant when the sample rate converters are turned off.

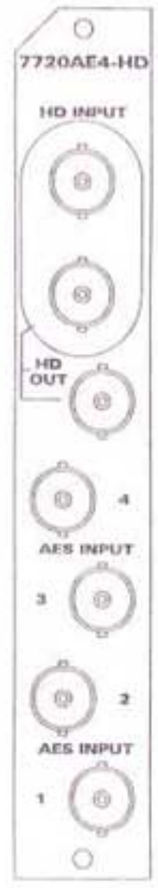
VistaLINK™ enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as Evertz VistaLINK™ Pro locally or remotely.

Features

- Automatic detection of video standard
- Bypass relay protection on one SDI output for power failures
- 24-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 VistaLNK™ 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
- VistaLINK™ control capabilities for module configuration VistaLINK™ capabilities are available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK™ Frame Controller module in slot 1 of the frame.
- Front panel LEDs indicate video and audio signal presence, and module fault

7720AE4-HD Block Diagram





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 169-8
Equalization:	Automatic 100m @ 1.5Gb/s with Belden 1684 or equivalent cable
Return Loss:	> 15 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 169-8
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 1.5Gb/s
Wide Band Jitter:	< 0.2 UI

AES Audio Inputs:

Number of Inputs:	4
Standard:	SMPTE 276M, single ended AES
Connector:	BNC per IEC 169-8
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 mSec
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-HD	HD 4 AES 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

Enclosures:

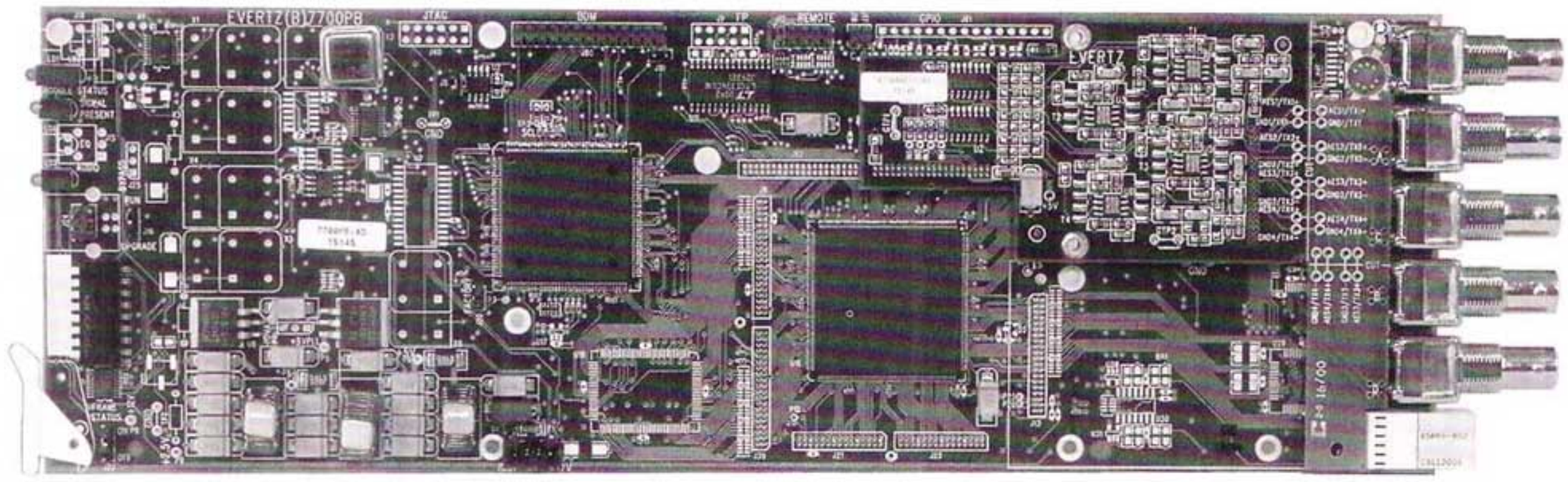
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

HD SDI AES Audio De-embedder

1g

Dolby E PARTNER

Model 7720AD-HD, 7720AD-A4-HD & 7720AD4-HD



The 7720AD-HD series Audio De-embedders extract embedded audio as specified by SMPTE 299M from a 1.5 Gb/s serial HDTV video signal.

SMPTE 299M allows for up to four groups (4 channels/group) to be embedded within a serial HDTV signal. The 7720AD-HD can de-embed one audio group onto two single ended AES outputs. The 7720AD-HD-A4 de-embeds one group onto four analog audio channels. The 7720AD4-HD can de-embed two audio groups onto four single ended AES outputs. The de-embedded audio can be delayed up to 3 seconds to retime audio to match video processing delays. The 7720AD-HD series are Dolby E compliant.

	Audio Outputs		Video 1.5Gb/s Reclocked Ouptuts
Model	AES	Analog	
7720AD-HD	2	--	2
7720AD-A4	--	4	--
7720AD4	4	--	--

Features

Card Edge LED's:

- Video Signal presence
- Module Status
- Audio Presence - Audio Group Indicator

Controls:

- Audio group selection via card edge DIP switches
- Audio channel swapping selection via card edge DIP switches
- Lock De-embedder groups to maintain phase of outputs on 7720AD4-HD

Inputs:

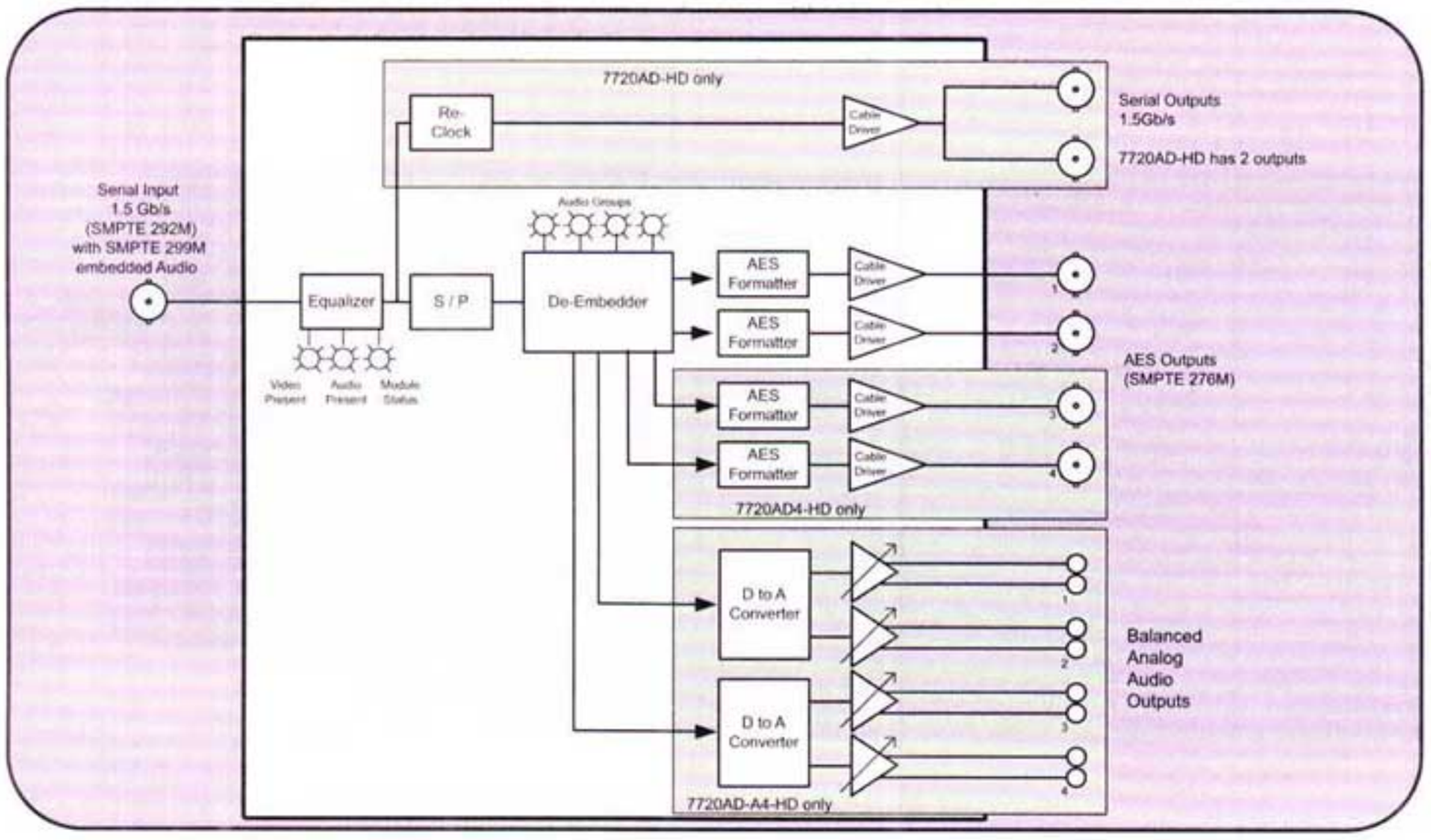
- SMPTE 292M - 1.5Gb/s serial digital
- Auto equalization to 125m

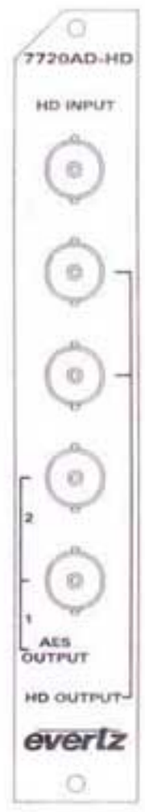
Outputs:

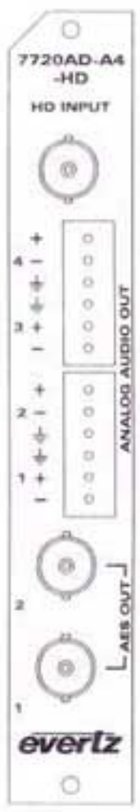
- Variety of outputs (depending on configuration)

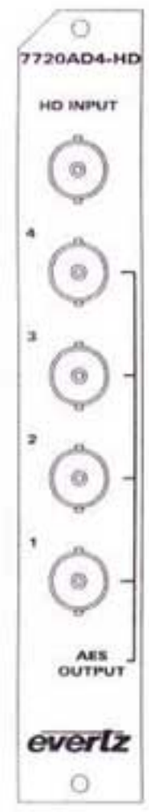
HD SDI AES Audio De-embedder

7720AD-HD Block Diagram









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
Connector:	BNC per IEC 169-8
Equalization:	Automatic 125m @ 1.5Gb/s with Belden 1694 (or equivalent)

Reclocked Serial Video Output:

Standard:	Sames as input
Number of Outputs:	2 on 7720AD-HD 0 on 7720AD-A4-HD, 7720AD4-HD
Connector:	BNC per IEC 169-8
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

AES Audio Output:

Standard:	SMPTE 276M, single ended AES
Number of Outputs:	2 on 7720AD-HD & 7720AD-A4-HD 4 on 7720AD4-HD
Connector:	BNC per IEC 169-8
Sampling Rate:	48kHz
Impedance:	75Ω
Delay:	9 samples to approx. 3 seconds (user adjustable)
Resolution:	24-bit

Analog Audio Output (7720AD-A4-HD Only):

Number of Outputs:	4
Type:	Balanced analog audio
Connector:	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:

Deembedding Latency:

HD SDI to AES:	1.35mSec (7720AD-A4-HD) 600µSec all other verions
HD SDI to Analog:	2.25mSec

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:

7720AD-HD	HD SDI AES Audio De-embedder with 2 unbalanced AES outputs
7720AD-A4-HD	HD SDI Audio De-embedded with 2 unbalanced AES and 4 analog audio outputs
7720AD4-HD	HD SDI Audio De-embedded 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:

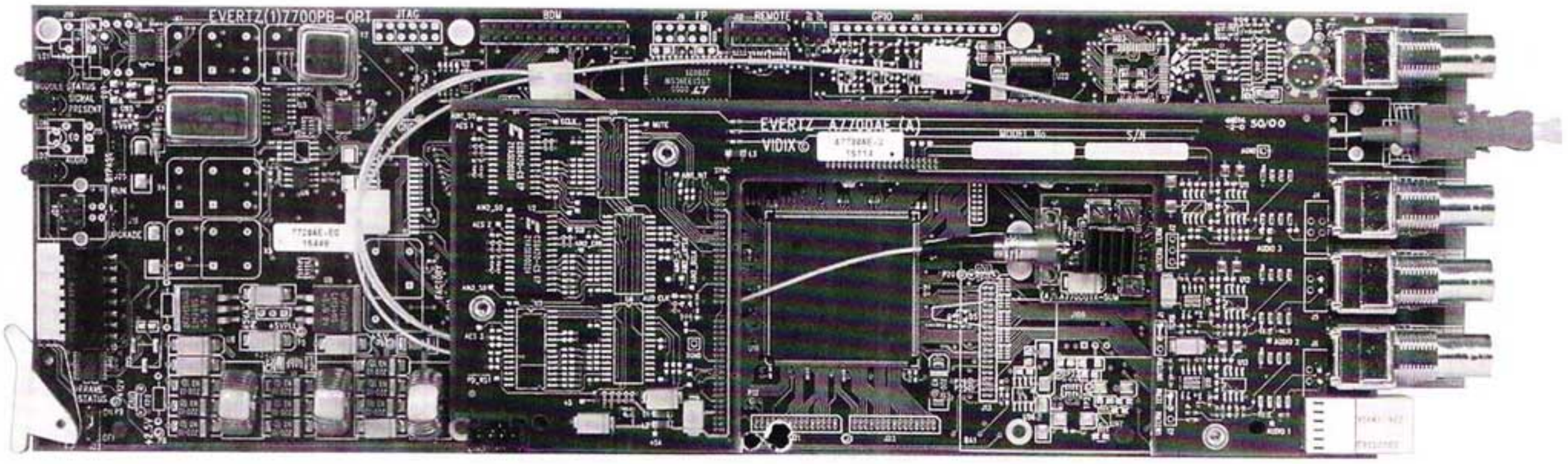
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

HD AES Audio Embedder & Fiber Transmitter

1g

Model 7720AE-EO-HD

Dolby E PARTNER



The 7720AE-EO-HD Audio Embedder inserts two AES audio signals into a 1.5 Gb/s HDTV video signal as specified in SMPTE 299M. In addition to an HD SDI output the 7720AE-EO-HD provides a fiber optic output with embedded audio. The 7720AE-EO-HD will do a seamless audio embed when the input video is switched properly in the vertical interval.

SMPTE 299M allocates four groups of four audio channels that can be embedded into the SMPTE 292M bitstream. The 7720AE-EO-HD has the ability to select the Audio channel group where the audio will be inserted. The 7720AE-EO-HD is Dolby E compliant.

Features

Card Edge LEDs:

- Video Signal Presence
- Module Status
- Audio Presence - Upstream Audio Group Indicators

Controls:

- Audio group selection via card edge DIP switches
- Selectable clean or pass through embedding mechanism
- Sample rate conversion disable to permit Dolby E embedding

Inputs:

Video

- SMPTE 292M - 1.5Gb/s serial digital
- Auto equalization to 125m

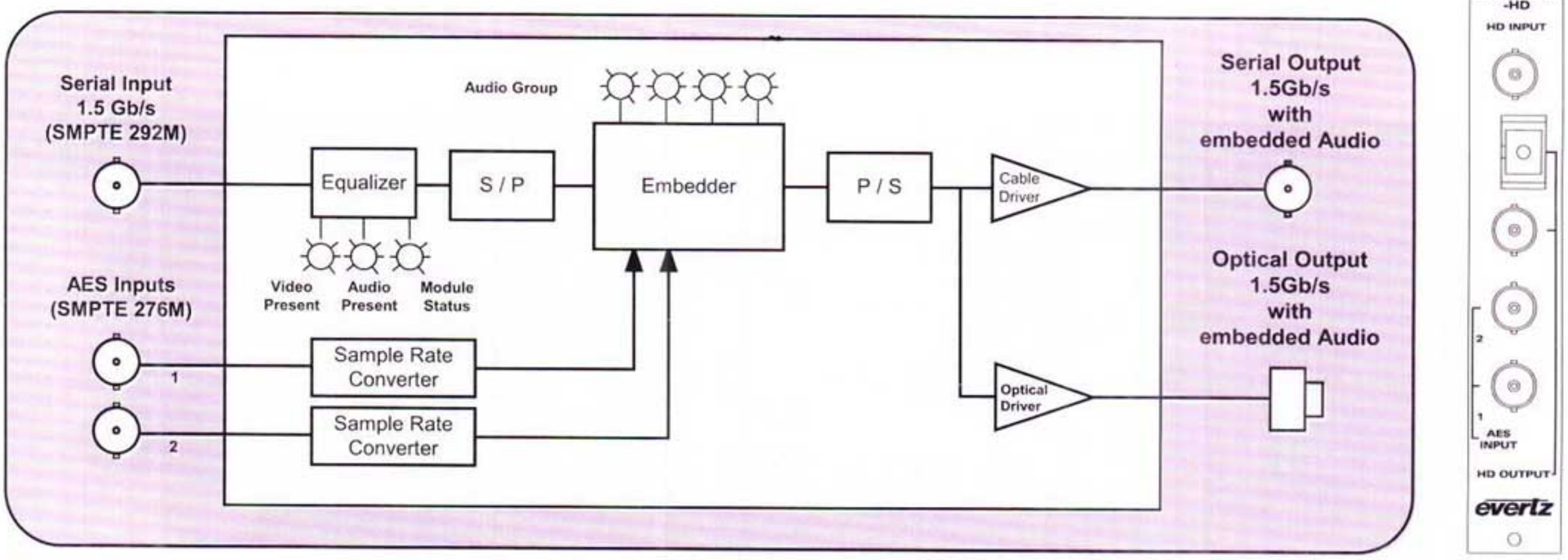
Audio

- 2 SMPTE 276M single ended AES

Outputs:

- 1 serial HD SDI reclocked outputs with SMPTE 299M embedded audio
- 1 reclocked fiber output with SMPTE 299M embedded audio at 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.6942 compliant)

7720AE-EO-HD Block Diagram



Specifications

Serial Video Input:

Standard:	SMPTE 292M, (1080i/50, 1080i/60, 1080i/59.94, 1080p23.98sF, 1080p24sF, 1080p25sF, 720p/60, 720p/59.94)
Connector:	BNC per IEC 169-8
Equalization:	Automatic 125m @ 1.5Gb/s with Belden 1694 (or equivalent)

AES Audio Inputs:

Number of Inputs:	2
Standard:	SMPTE 276M, single ended AES
Connector:	BNC per IEC 169-8
Signal Level:	1V p-p ± 0.1V
Resolution:	24-bit
Sampling Rate:	48 kHz
Impedance:	75Ω unbalanced

Serial Video Output With Embedded Audio:

Number of Outputs:	1
Standard:	SMPTE 292M Video, SMPTE 299M Audio
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ± 0.5V
Rise and Fall Time:	270ps nominal
Overshoot:	<10% of amplitude
Wide Band Jitter:	<0.2 UI

Optical Output:

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
Output Wavelengths:	
Standard:	1310nm, 1550nm
CWDM :	1270nm to 1610nm (See Ordering Info)
Output Power:	
1310nm FP:	-7.5 dBm ± 1 dBm
1310nm/1550nm DFB:	0dBm ± 1 dBm
CWDM DFB:	0dBm ± 1dBm

System Performance:

Embedding Latency:	1.3 to 3 mSec

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: *HD AES Audio Embedder & Fiber Transmitter*

7720AE-EO13-HD	1310nm, FP, Laser
7720AE-EO13-HD-L	1310nm, DFB, Laser
7720AE-EO15-HD	1550nm, DFB, Laser

For CWDM Applications:

7720AE-EO27-HD	1270nm, CWDM DFB, Laser
7720AE-EO29-HD	1290nm, CWDM DFB, Laser
7720AE-EO31-HD	1310nm, CWDM DFB, Laser
7720AE-EO33-HD	1330nm, CWDM DFB, Laser
7720AE-EO35-HD	1350nm, CWDM DFB, Laser
7720AE-EO37-HD	1370nm, CWDM DFB, Laser
7720AE-EO43-HD	1430nm, CWDM DFB, Laser
7720AE-EO45-HD	1450nm, CWDM DFB, Laser
7720AE-EO47-HD	1470nm, CWDM DFB, Laser
7720AE-EO49-HD	1490nm, CWDM DFB, Laser
7720AE-EO51-HD	1510nm, CWDM DFB, Laser
7720AE-EO53-HD	1530nm, CWDM DFB, Laser
7720AE-EO55-HD	1550nm, CWDM DFB, Laser
7720AE-EO57-HD	1570nm, CWDM DFB, Laser
7720AE-EO59-HD	1590nm, CWDM DFB, Laser
7720AE-EO61-HD	1610nm, CWDM DFB, 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:

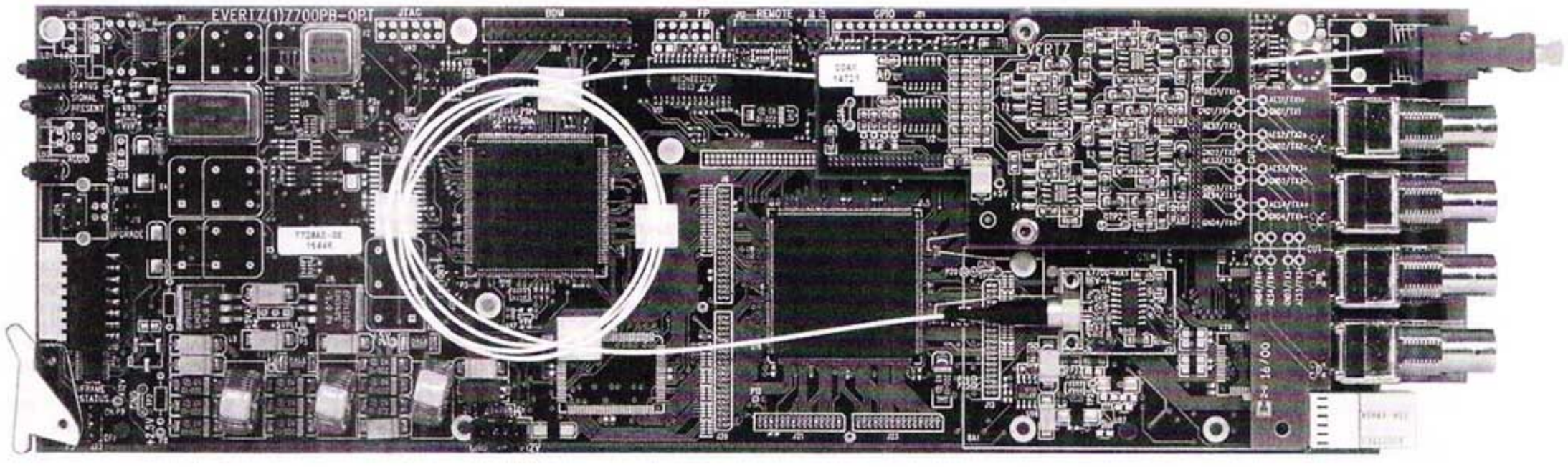
7700FR-C	3RU Multiframe, which holds 15 modules
7701FR	1RU Multiframe, which holds 3 modules
S7701FR	Standalone enclosure

HD AES Audio De-embedder & Fiber Receiver

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Model 7720AD-OE-HD

Dolby E PARTNER



The 7720AD-OE-HD Audio De-embedder extracts embedded audio as specified by SMPTE 299M from a 1.5 Gb/s fiber optic HDTV video signal. The companion 7720AE-EO-HD facilitates multiplexing and fiber conversion at the source.

SMPTE 299M allows for up to four groups (4 channels/group) to be embedded within a serial HDTV signal. The 7720AD-OE-HD can de-embed one audio group onto two single ended AES outputs. The de-embedded audio can be delayed up to 3 seconds to retime audio to match video processing delays. The 7720AD-OE-HD is Dolby E compliant.

Features

Card Edge LED's:

- Video Signal presence
- Module Status
- Audio Presence - Audio Group Indicator

Controls:

- Audio group selection via card edge DIP switches
- Audio channel swapping selection via card edge DIP switches

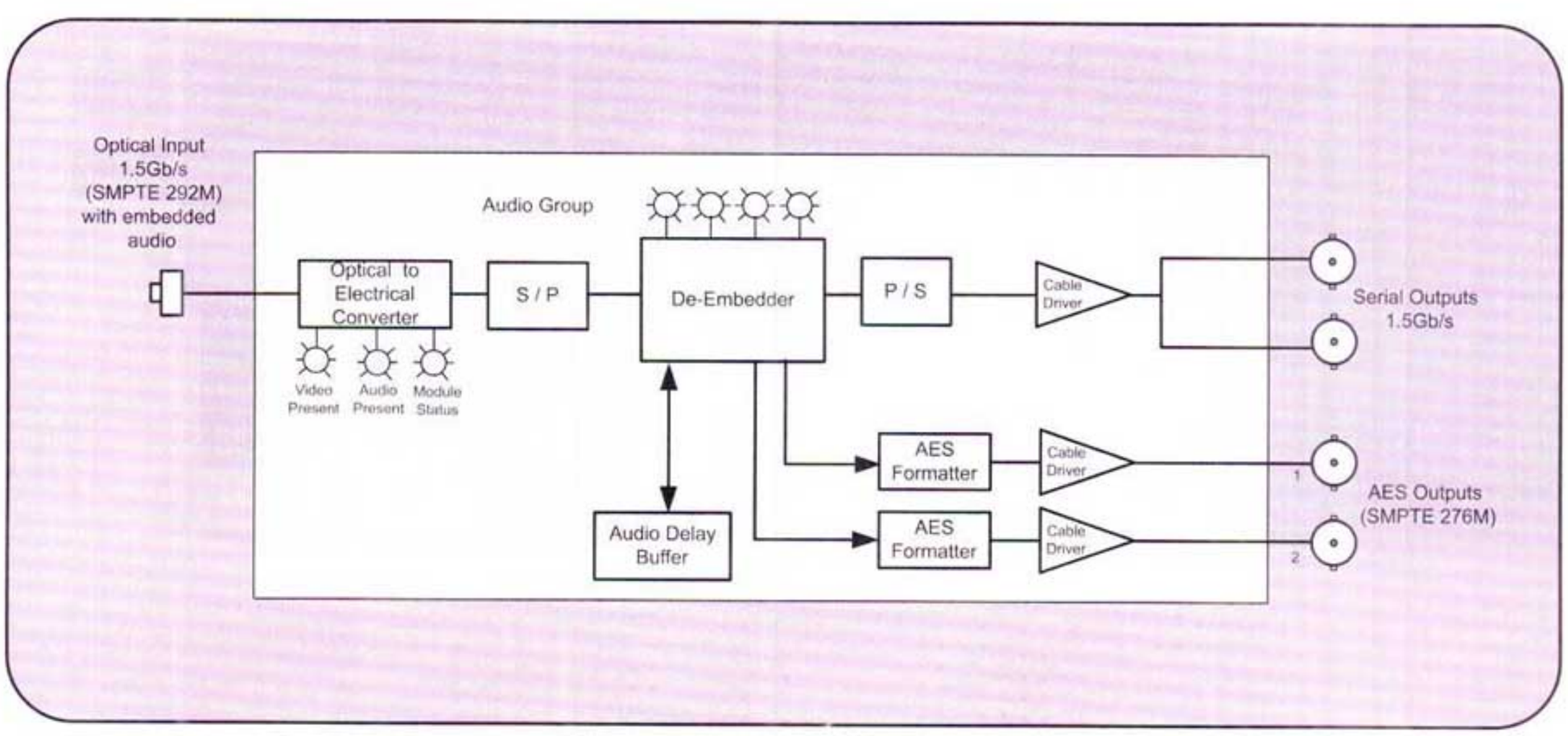
Inputs:

- SMPTE 292M - 1.5Gb/s serial digital on fiber optic input

Outputs:

- 2 serial HD-SDI outputs
- 2 single ended AES outputs

7720AD-OE-HD Block Diagram



Specifications

Optical Input:

Number of Inputs:	1
Connector:	SC/PC, ST/PC, FC/PC Female housing
Operating Wavelength:	1270nm to 1610nm
Maximum Input Power:	0dBm
Optical Sensitivity:	-17dBm

Reclocked Serial Video Output:

Standard:	SMPTE 292M
Number of Outputs:	2
Connector:	BNC per IEC 169-8
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

AES Audio Output:

Standard:	SMPTE 276M, single ended AES
Number of Outputs:	2
Connector:	BNC per IEC 169-8
Sampling Rate:	48kHz
Impedance:	75Ω
Delay:	9 samples to approx. 3 seconds (user adjustable)
Resolution:	24-bit

System Performance: 600µSec

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:

7720AD-OE-HD	HD AES Audio De-embedder & 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

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

Note: This module not available in a standalone enclosure

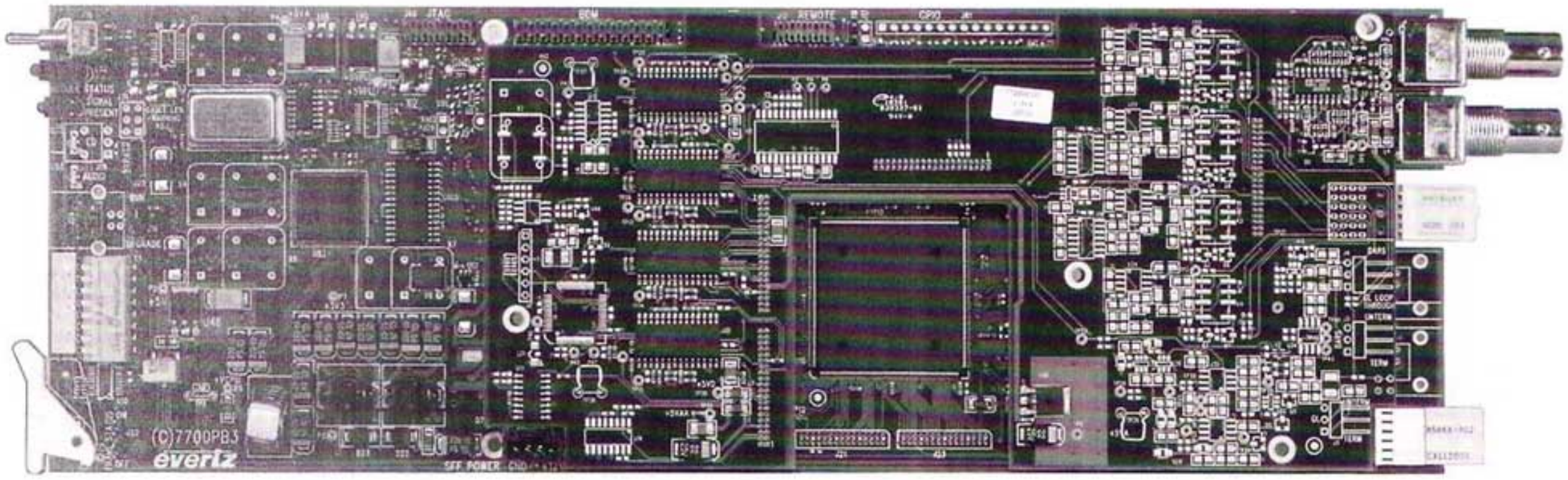
SDI 4 AES Channel Embedder

1g

Model 7720AE4



Dolby E PARTNER



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 Deembedder facilitates audio demultiplexing at the destination.

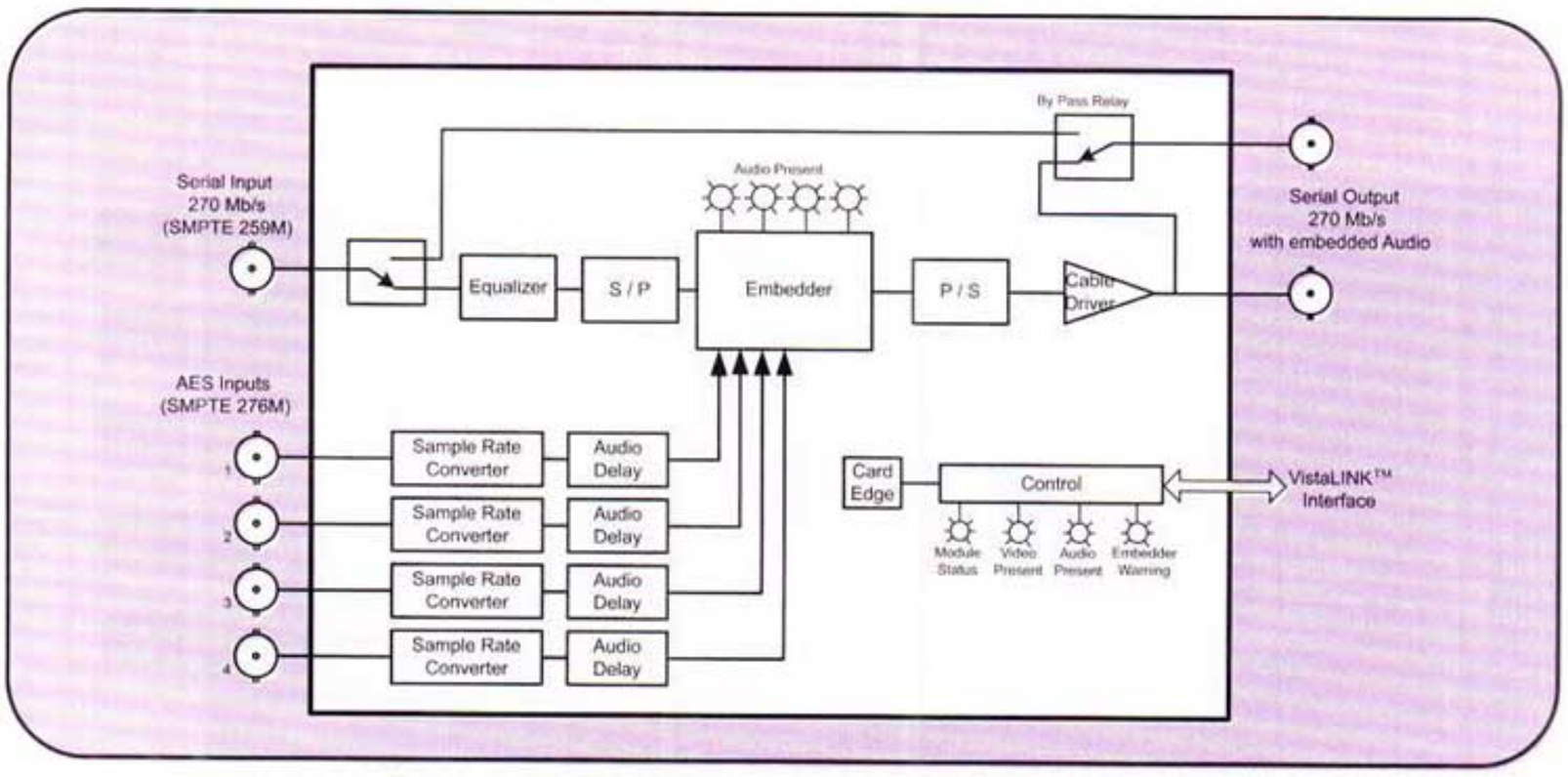
SMPTE 272M allocates four groups of four audio channels that can be embedded into the SMPTE 259M bitstream. The 7720AE4 embeds up to 4 AES audio signals into two groups on the SDI outputs for discrete 5.1 audio applications. The 7720AE4 is Dolby E compliant when the sample rate converters are turned 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 VistaLNK™ 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
- VistaLINK™ control capabilities for module configuration VistaLINK™ capabilities are available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK™ Frame Controller module in slot 1 of the frame.
- Front panel LEDs indicate video and audio signal presence, and module fault

7720AE4 Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M-C (270 Mb/s) 525 or 625 line component.
Connector:	1 BNC per IEC 169-8
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 169-8
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 169-8
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 mSec
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 Channel AES 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:

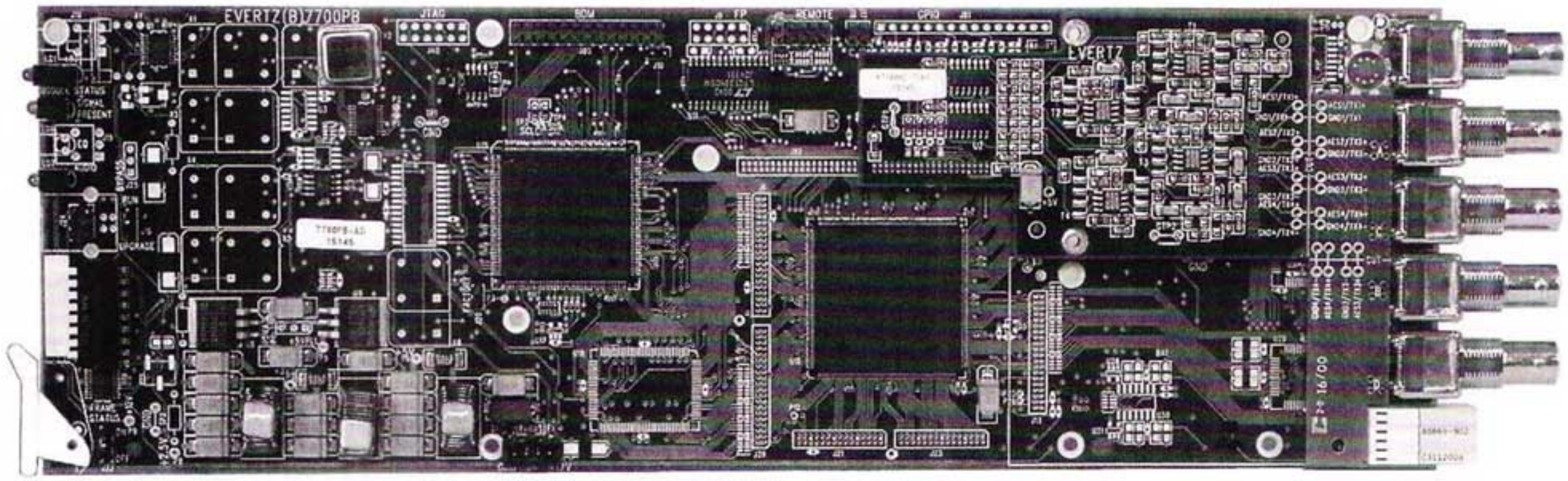
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

SDI AES Audio De-embedder

Dolby E PARTNER

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Model 7720AD, 7720AD-A4, 7720AD4, 7720AD4-B



The 7720AD series Audio De-embedders extract embedded audio as specified by SMPTE 272M from a 270 Mb/s serial digital video signal. The companion 7720AE Audio Embedder facilitates audio multiplexing at the source. The 7720AD is available in 5 different versions.

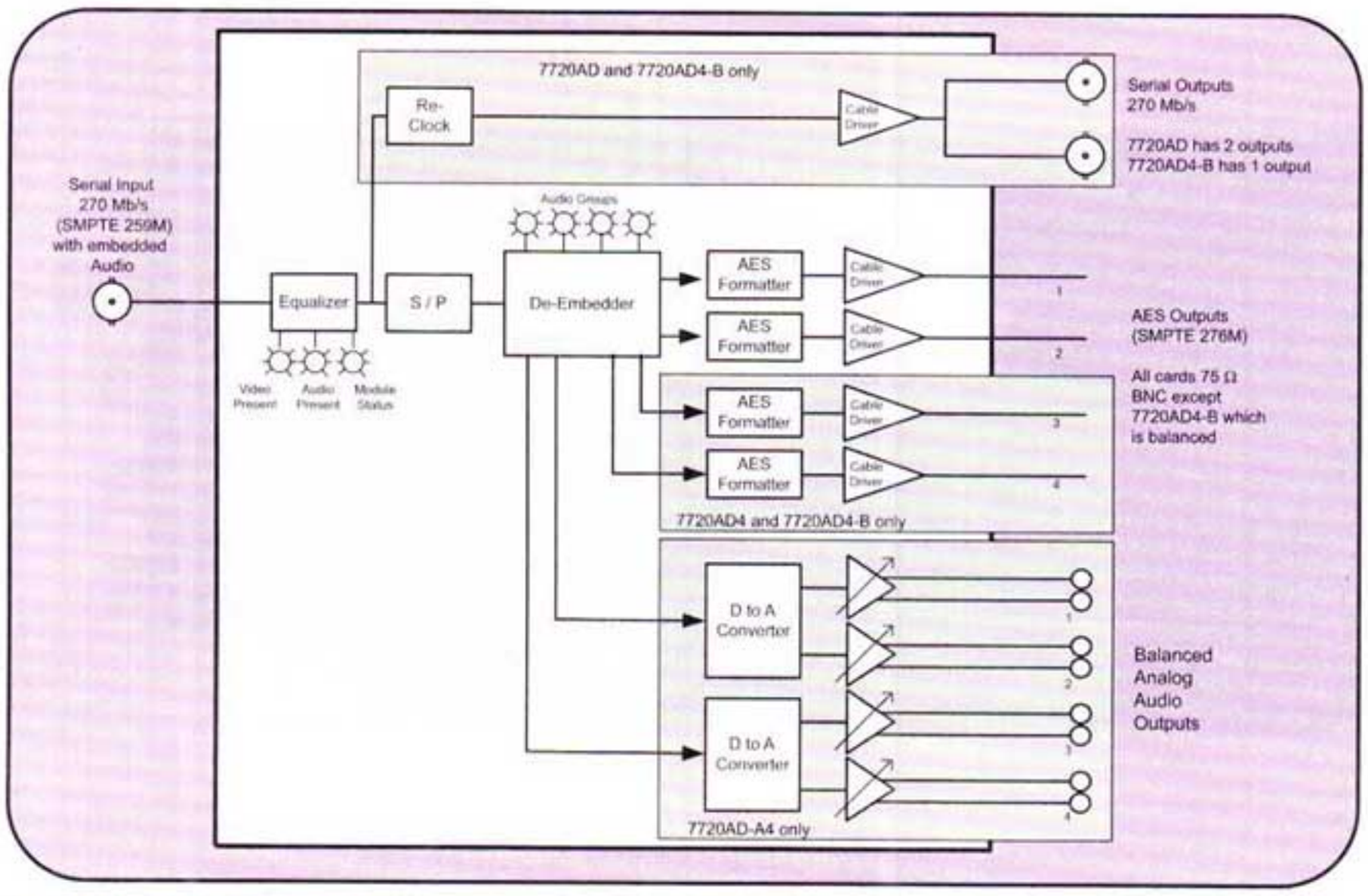
SMPTE 272M allows for up to four groups (4 channels/group) to be embedded within a serial digital signal. The 7720AD can de-embed one audio group onto two unbalanced AES outputs. The 7720AD4 can de-embed two audio groups onto four unbalanced AES outputs. The 7720AD4-B can de-embed two audio groups onto four balanced AES outputs. The 7720AD-A4 can de-embed one audio group onto two unbalanced AES outputs and 4 balanced analog audio outputs. The 7720AD-B-A4-LTC can de-embed one audio group onto two balanced AES outputs and 4 balanced analog audio outputs and can also be used as a VITC to LTC translator.

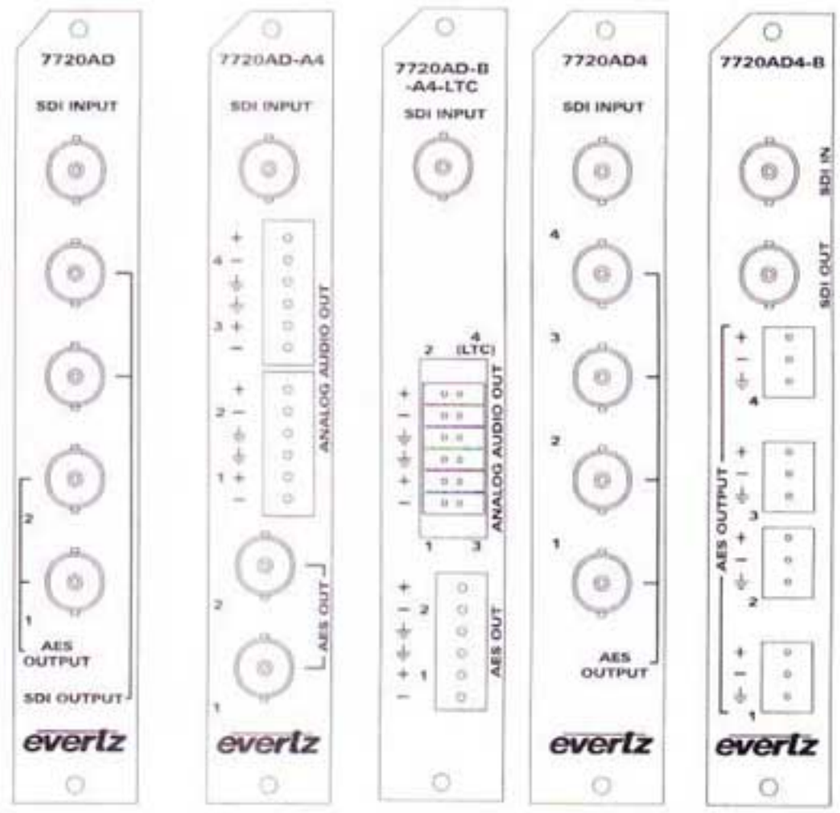
	Audio Outputs		Video 270Mb/s SDI Re-clocked Ouptuts
Model	AES	Analog	
7720AD	2 Unbalanced	--	2
7720AD-A4	2 Unbalanced	4	--
7720AD-B-A4-LTC	2 Balanced	4	--
7720AD4	4 Unbalanced	--	--
7720AD4-B	4 Balanced	--	1

Features

- Front panel 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
- Audio channel swapping selection via card edge DIP switches (not on 7720AD-A4)
- Analog audio output models have independent volume controls for each of the audio channel outputs
- 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

7720AD Series Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M C - 525 and 625 component
Connector:	1 BNC per IEC 169-8
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:	2 on 7720AD, 1 on 7720AD4-B 0 on 7720AD4, 7720AD-A4 & 7720AD-B-A4-LTC
Connectors:	BNC per IEC 169-8
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 540 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, 7720AD-A4 4 on 7720AD4
Connectors:	BNC per IEC 169-8
Sampling Rate:	48 kHz
Impedance:	75 Ω 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:	75Ω balanced
Dynamic Range:	20-bit

Input to Output Processing Delay:

SDI to AES:	1.35 mSec (A4 versions) 600 mSec all other versions
SDI to Analog:	2.25 mSec (A4 versions)

Analog Audio Outputs (A4 Versions Only):

Number of Outputs:	4
Type:	Balanced analog audio
Connector:	Terminal strip
Output Impedance:	66 Ω balanced
Sampling Frequency:	48kHz
Signal Level:	0dB FS =>8 to 24dBu into 10 kΩ loads (user settable) 0dB FS =>8 to 22dBu into 600 Ω loads (user settable)
Frequency Response:	< ± 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	SDI AES Audio De-embedder with 2 unbalanced AES outputs
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:

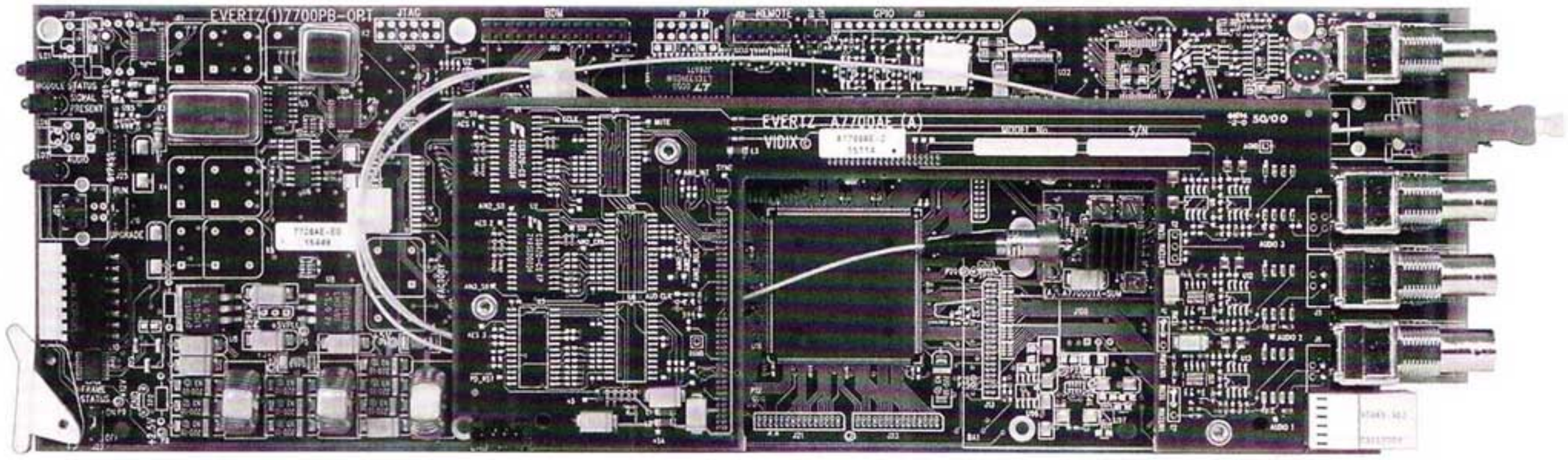
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

SDI AES Audio Embedder & Fiber Transmitter

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Model 7720AE-EO

Dolby E PARTNER



The 7720AE-EO Audio Embedder inserts AES audio channels into a 270 Mb/s SDI video signal as specified in SMPTE 272M. The 7720AE-EO will embed up to four audio channels (2 AES) into the audio group selected by the DIP switches. The 7720AE series Embedders will do a seamless audio embed when the input video is switched properly in the vertical interval.

SMPTE 272M allocates four groups of four audio channels that can be embedded into the SMPTE 259M bitstream. The 7720AE-EO has the ability to select the Audio channel group where the audio will be inserted. The 7720AE series Embedders are Dolby E compliant.

In addition to an SDI output, the 7720AE-EO also provides a fiber optic output with embedded audio.

Features

Card Edge LEDs:

- Video Signal Presence
- Module Status
- Audio Presence - Audio Group Indicator

Controls:

- Audio group selection via card edge DIP switches
- Audio channel swapping selection via card edge DIP switches
- Sample rate conversion disable to permit Dolby E embedding

Inputs:

Video

- SMPTE 259M-C (270Mb/s) SDI video
- Auto equalization to 300m (Belden 8281)

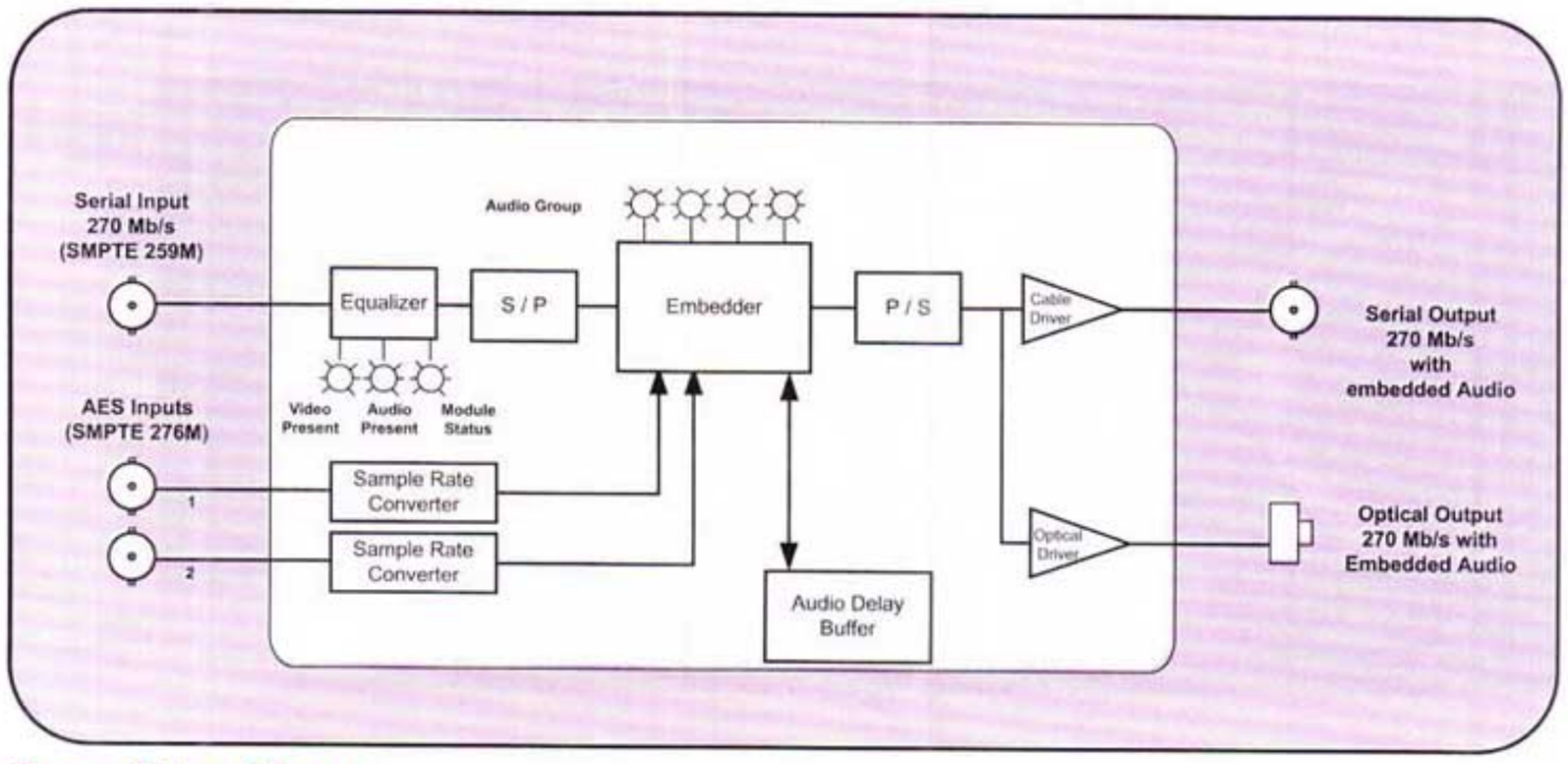
Audio

- 2 SMPTE 276M single ended AES

Outputs:

- 1 SMPTE 259M SDI reclocked output with SMPTE 272M embedded audio
- 1 reclocked fiber output with SMPTE 272M embedded audio at 1310nm, 1550nm and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)

7720AE-EO Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M-C 525 and 625 component
Connector:	BNC, IEC 169-8
Equalization:	Automatic to 300m @ 270 Mb/s Belden 8281 (or equivalent)
Return Loss:	> 15 dB up to 270 Mb/s

Serial Video Output With Embedded Audio

Number of Outputs:	1
Standard:	Same as input
Connector:	BNC per IEC 169-8
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
Standard:	SMPTE 276M, single ended AES
Signal Level:	1V p-p ±0.1V
Connector:	BNC per IEC 169-8
Sampling Rate:	48kHz
Impedance:	75Ω unbalanced
Resolution:	20-bits

Optical Output:

Number of Outputs:	1
Connector:	SC/PC, ST/PC, FC/PC female housing
Return Loss:	> 14dB
Rise and Fall Time:	400-700ps
Jitter:	< 0.2 UI
Nominal Wavelength:	1310nm, 1550nm
CWDM Wavelengths:	1270nm to 1610nm (See Ordering Info)
Output Power:	
1310nm FP:	-7.5 dBm ± 1 dBm
1550Dnm FB:	0 dBm ± 1 dBm
CWDM DFB:	0 dBm ± 1dBm

System Performance:

Embedding Latency:	1.3 to 3 mSec

Physical:

Number of Slots:	1

Electrical:

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

Ordering Information: *SDI AES Audio Embedder & Fiber Transmitter*

7720AE-EO13	1310nm, FP, Laser
7720AE-EO15	1550nm, DFB, Laser

For CWDM Applications:

7720AE-EO27	1270nm, CWDM Laser
7720AE-EO29	1290nm, CWDM Laser
7720AE-EO31	1310nm, CWDM Laser
7720AE-EO33	1330nm, CWDM Laser
7720AE-EO35	1350nm, CWDM Laser
7720AE-EO37	1370nm, CWDM Laser
7720AE-EO43	1430nm, CWDM Laser
7720AE-EO45	1450nm, CWDM Laser
7720AE-EO47	1470nm, CWDM Laser
7720AE-EO49	1490nm, CWDM Laser
7720AE-EO51	1510nm, CWDM Laser
7720AE-EO53	1530nm, CWDM Laser
7720AE-EO55	1550nm, CWDM Laser
7720AE-EO57	1570nm, CWDM Laser
7720AE-EO59	1590nm, CWDM Laser
7720AE-EO61	1610nm, CWDM 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

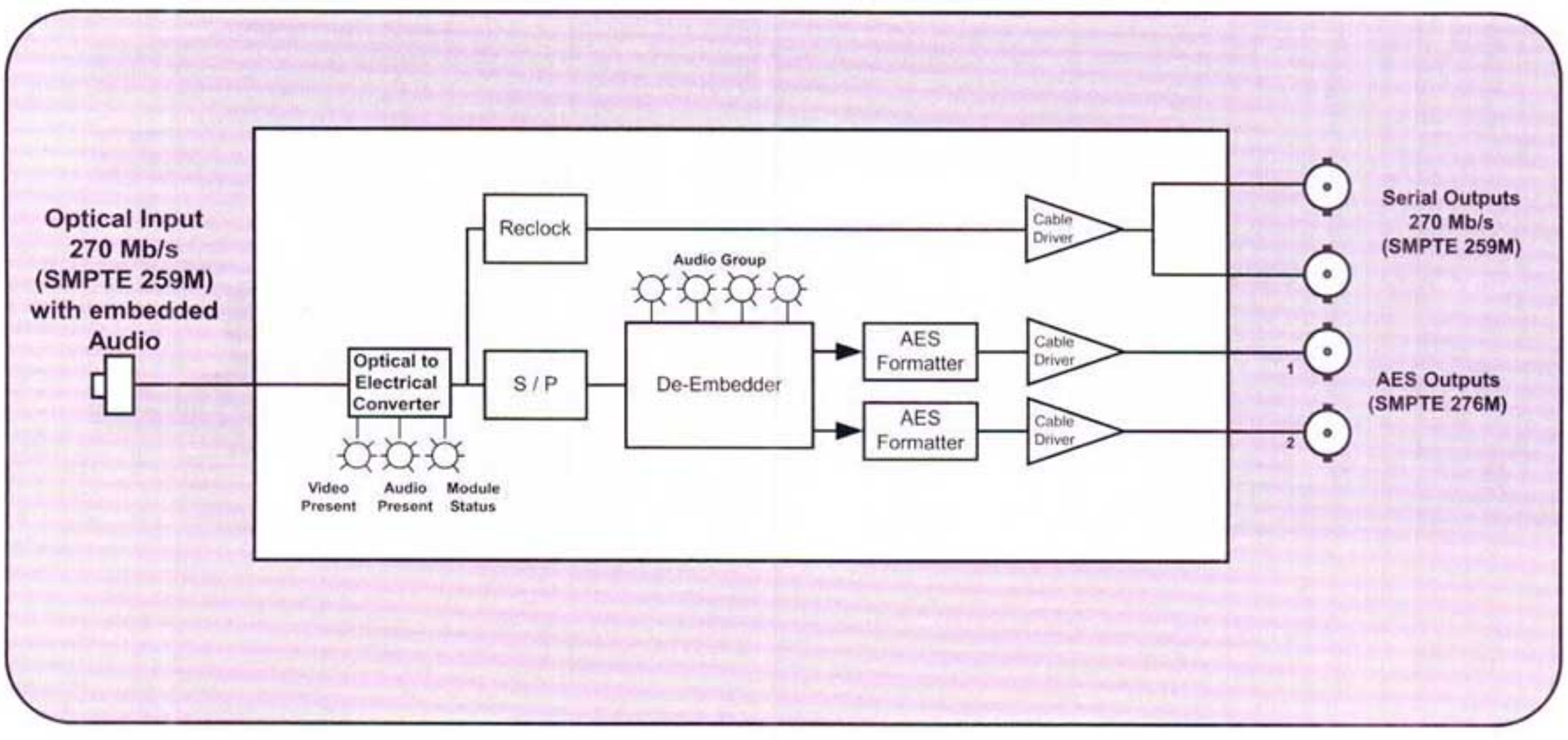
Fiber Optic Patch Cable:

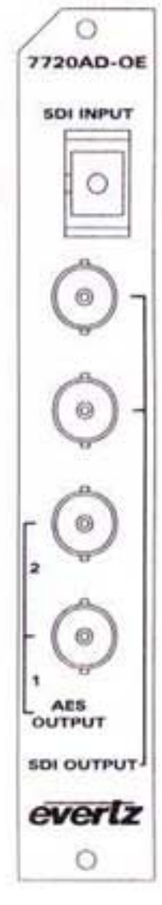
CB-FP1M-SCPC	Single mode fiber cable, 1m, SC/PC male termination
CB-FP1M-STPC	Single mode fiber cable, 1m, ST/PC male termination
CB-FP5M-SCPC	Single mode fiber cable, 5m, SC/PC male termination
CB-FP5M-STPC	Single mode fiber cable, 5m, ST/PC male termination
CB-FP10M-SCPC	Single mode fiber cable, 10m, 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

7720AD-OE Block Diagram





Specifications

Optical Input:
Number of Inputs: 1
Connector: SC/PC, ST/PC, FC/PC Female Housing
Operating Wavelength: 1270nm to 1610nm
Maximum Input Power: 0dBm
Optical Sensitivity: -30dBm

Reclocked Serial Video Output:
Number of Outputs: 2
Standard: SMPTE 259M-C
Connector: BNC per IEC 169-8
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

AES Audio Output:
Number of Outputs: 2
Standard: SMPTE 276M, single ended AES
Connector: BNC per IEC 169-8
Sampling Rate: 48kHz
Impedance: 75Ω unbalanced
Resolution: 20-bit

Input to Output Processing Delay:
Optical Input to AES: 600 nSec

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:
7720AD-OE: SDI AES Audio De-embedder & 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

Connector Suffix
+SC SC/PC
+ST ST/PC
+FC FC/PC

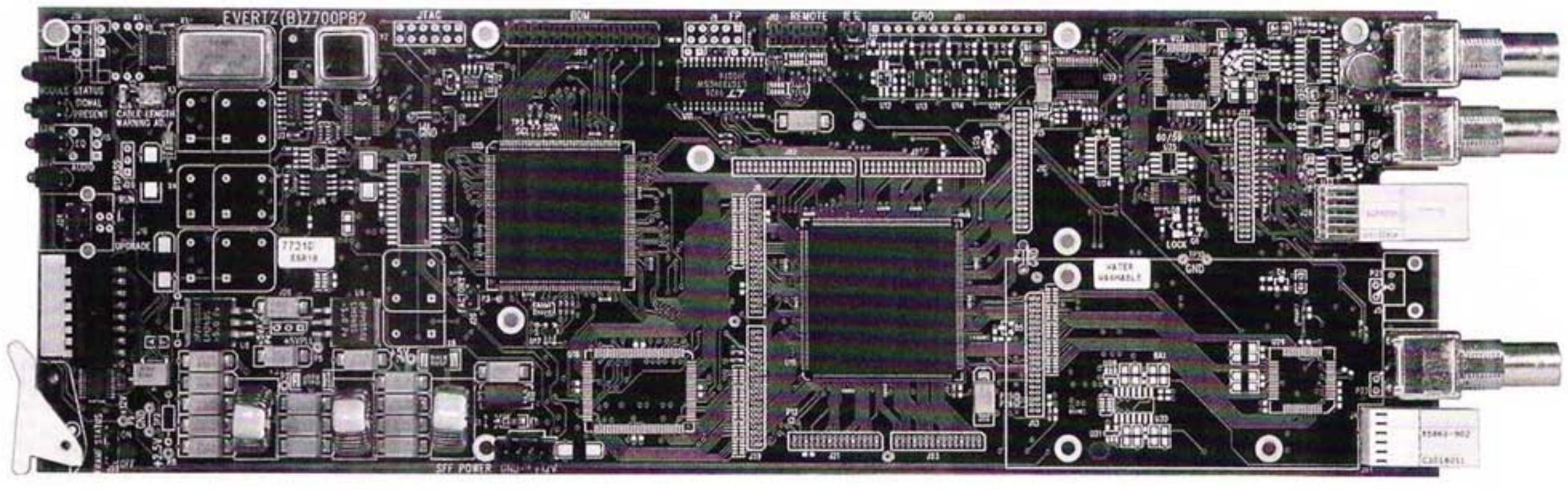
Fiber Optic Patch Cable:
CB-FP1M-SCPC Single mode fiber cable, 1m, SC/PC male termination
CB-FP1M-STPC Single mode fiber cable, 1m, ST/PC male termination
CB-FP5M-SCPC Single mode fiber cable, 5m, SC/PC male termination
CB-FP5M-STPC Single mode fiber cable, 5m, ST/PC male termination
CB-FP10M-SCPC Single 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 Data Embedder

1g

Model 7721DE



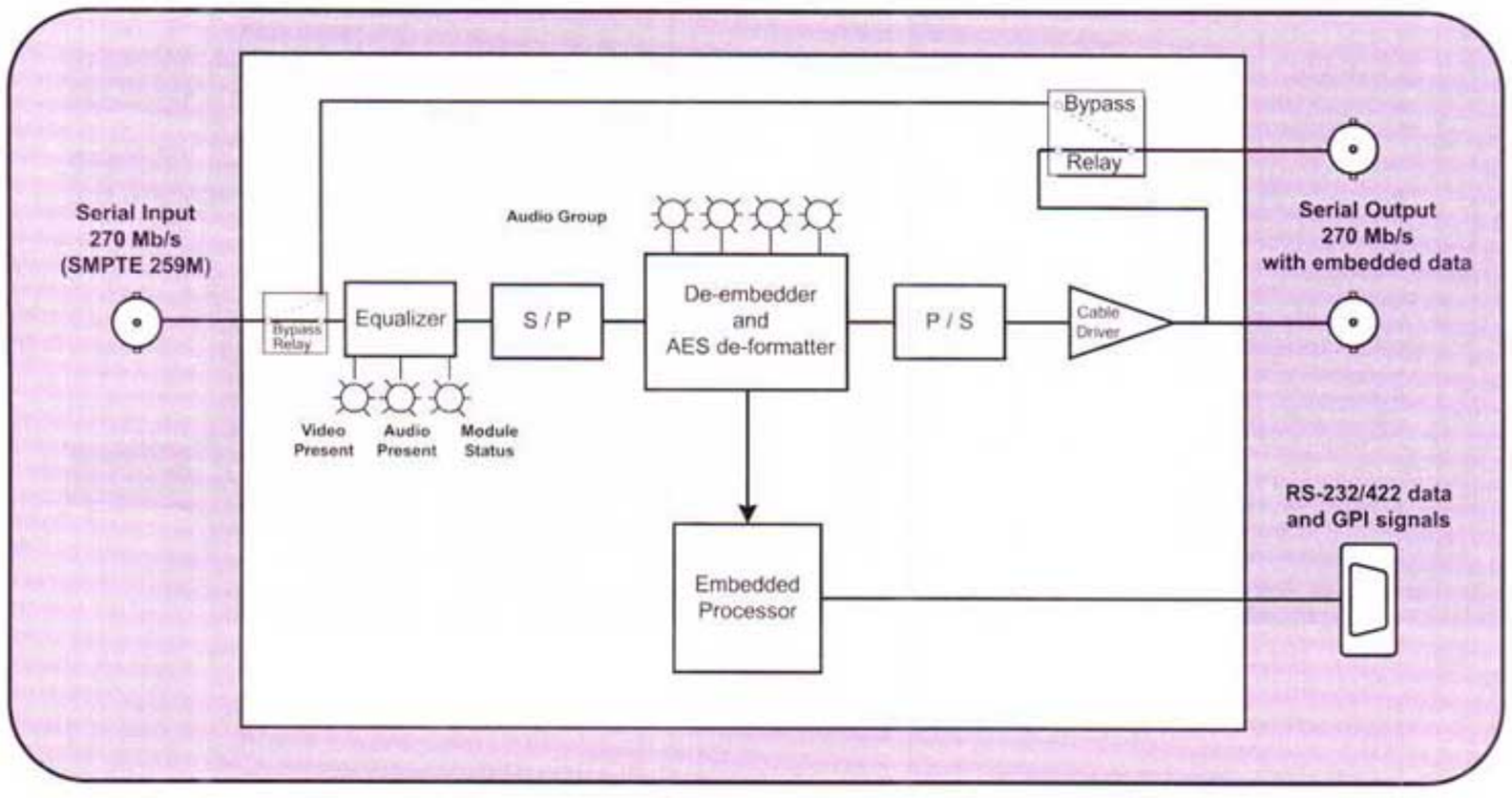
The 7721DE SDI Data Embedder inserts an RS-232/422 serial data stream and GPI contact closure information into a SMPTE 259M-C (270 Mb/s) SDI video signal. The input data is first formatted into an AES audio signal, according to SMPTE 337M, then embedded into the video stream according to SMPTE 272M-A specification.

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.

Features

- Automatic detection of 525 and 625 line SDI video input
- Automatic activation of an internal black video signal on the loss of video input
- One RS-232/422 serial input with selectable baud rate at 9600, 14400, 19200, 38400, 57600
- Packetize data into sub-frame AES format according to SMPTE 337M
- Embedding mechanism based on SMPTE 272M-A
- Share the same group DIDs as embedded audio, selectable from group 1 to 4
- Channel selection for data mapping into one of four channels within a data group
- Redundant data transmission to allow data error detection and correction at the receiver end
- Clean or pass-through data embedding
- Automatically removes the existing embedded packets when a conflict of group DID occurs
- Six TTL level GPI inputs to embed simple control information into the video input. Will activate corresponding GPO outputs on 7721DD
- EDH generation on video output
- Card edge LEDs indicate video signal presence, data presence, cable equalization and module fault
- Program output bypass relay protected

7721DE Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M-C - 525 or 625 line component
Connector:	BNC per IEC 169-8
Equalization:	Automatic 300m @ 270Mb/s with Belden 8281 (or equivalent)
Return Loss:	> 15 dB up to 270 Mb/s

Serial Video Outputs with Embedded Data:

Number of Outputs:	2 (1 output bypass relay protected)
Standard:	Same as input
Connector:	BNC per IEC 169-8
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

Serial Data Input:

Standard:	RS-232 or RS-422 - Jumper Selectable
Connector:	Female High Density DB-15
Baud Rate:	9600, 14400, 19200, 38400 or 57600 switch selectable
Format:	8 bits, parity (none, even, odd), 1 stop bit
Embedding Delay:	Approx. 5ms at 9600 baud
Note:	Guaranteed to embed serial input into the same video field when its arrival time is 1.55ms before the end of each field

General Purpose Inputs:

Number of Inputs:	6
Type	Opto-isolated, active low with internal pull-ups to user supplied voltage (provides +5V which may be used for this purpose)
Connector:	Female High Density DB-15
Signal Level:	+5V nominal
Sample Rate:	Eight times SDI video frame rate

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:

7721DE	SDI Data 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

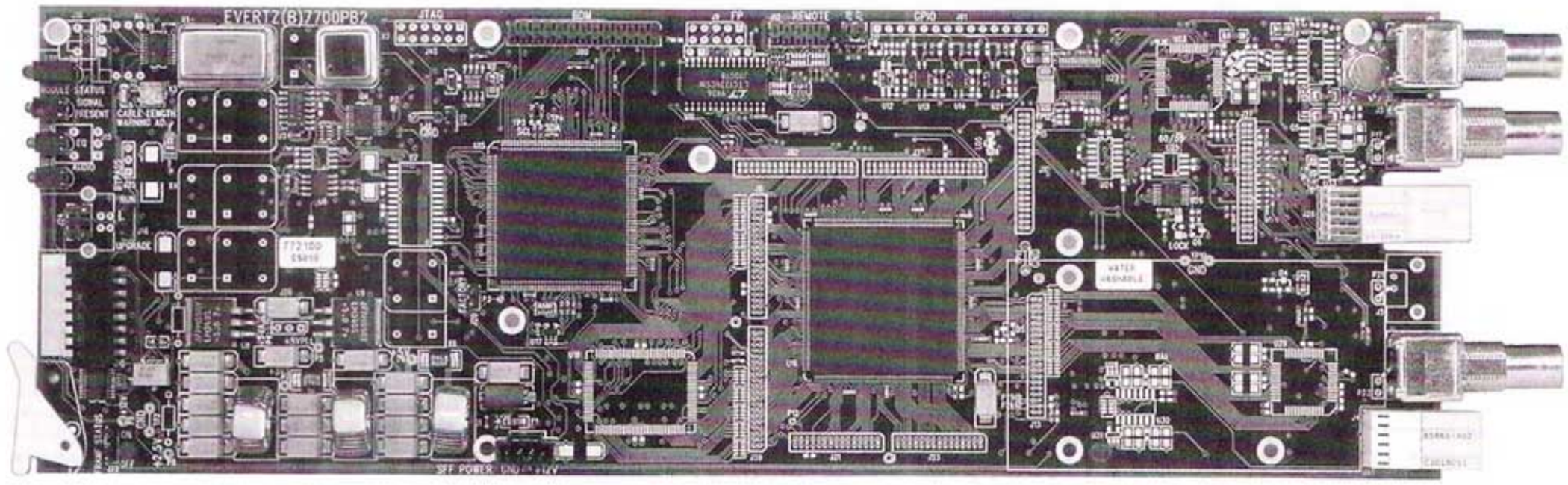
Enclosures:

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

SDI Data De-embedder

1g

Model 7721DD



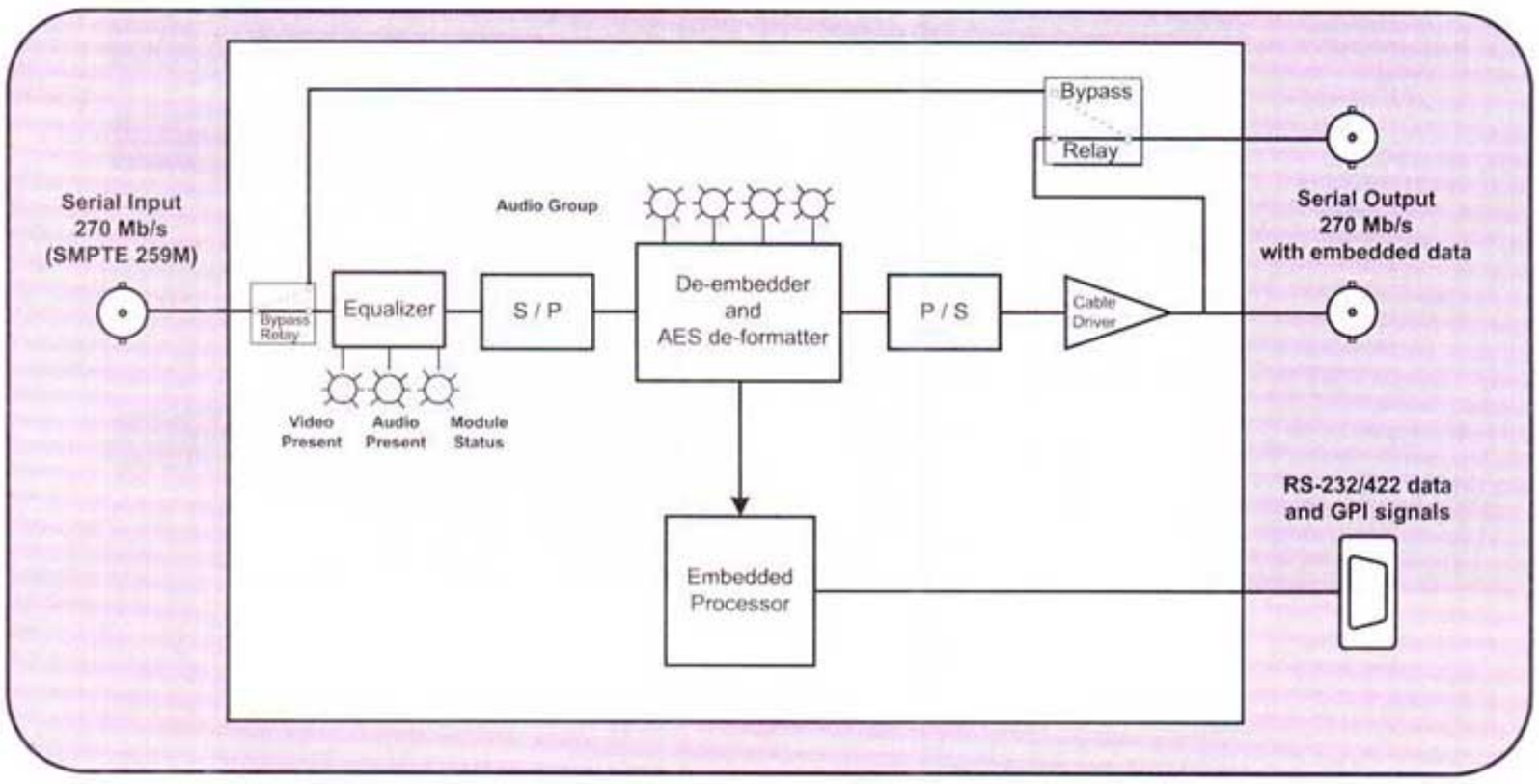
The 7721DD SDI data de-embedder extracts data that has been embedded into a 270 Mb/s SDI video signal by the 7721DE data embedder and outputs these as a RS-232 or RS-422 data stream and GPO contact closure information. The data packets are first de-embedded from the input video then de-formatted from AES audio packets into the original data format stream.

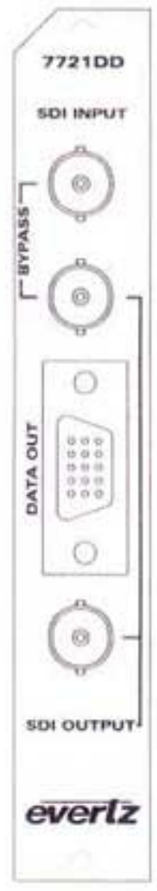
A data error detection and correction scheme is also applied to maintain data integrity. At the embedded packet layer, data packets resemble and have the same group DIDs as embedded audio packets.

Features

- Automatic detection of 525 and 625 line SDI video input
- Supports even, odd or no parity serial input data channel
- Auto insertion of black video on loss of input video
- De-embedding mechanism based on SMPTE 272M-A
- De-formats AES audio (sub-frame mode) to generic data content according to SMPTE 337M
- Share the same group DIDs as embedded audio, selectable from group 1 to 4
- Channel selection for extracting packetized data from one of four channels within a data group
- Supports data error detection and correction, or minimum delay mode without correction
- One RS-232/422 serial output with automatic output baud rate at 9600, 14400, 19200, 38400 or 57600
- Six TTL level GPO signals activated when corresponding GPI inputs on 7721DE are activated
- Removes all data/audio packets with selected group ID
- EDH generation on video output
- Card edge LEDs indicate video signal presence and data presence, cable equalization and module fault
- Program output bypass relay protected

7721DD Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M-C - 525 or 625 line component
Connector:	BNC per IEC 169-8
Equalization:	Automatic 200m @ 270Mb/s with Belden 8281 (or equivalent)
Return Loss:	> 15 dB up to 270 Mb/s

Serial Video Outputs with Embedded Data:

Number of Outputs:	2 (1 output bypass relay protected)
Standard:	Same as input
Connector:	BNC per IEC 169-8
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

Serial Data Output:

Standard:	RS-232 or RS-422 - Jumper Selectable
Connector:	Female High Density DB-15
Baud Rate:	9600, 14400, 19200, 38400 or 57600 automatic
Format:	8 bits, parity (one, even, odd), 1 stop bit
De-embedding Delay:	Approx. 2ms at 9600 baud

General Purpose Outputs:

Number of Outputs:	6
Type:	Opto-isolated, active low with internal pull-ups to user supplied voltage (provides +5V which may be used for this purpose)
Connector:	Female High Density DB-15
Signal Level:	+5V 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:

7721DD	SDI Data De-embedder

Ordering Options

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

Rear Plate Suffix

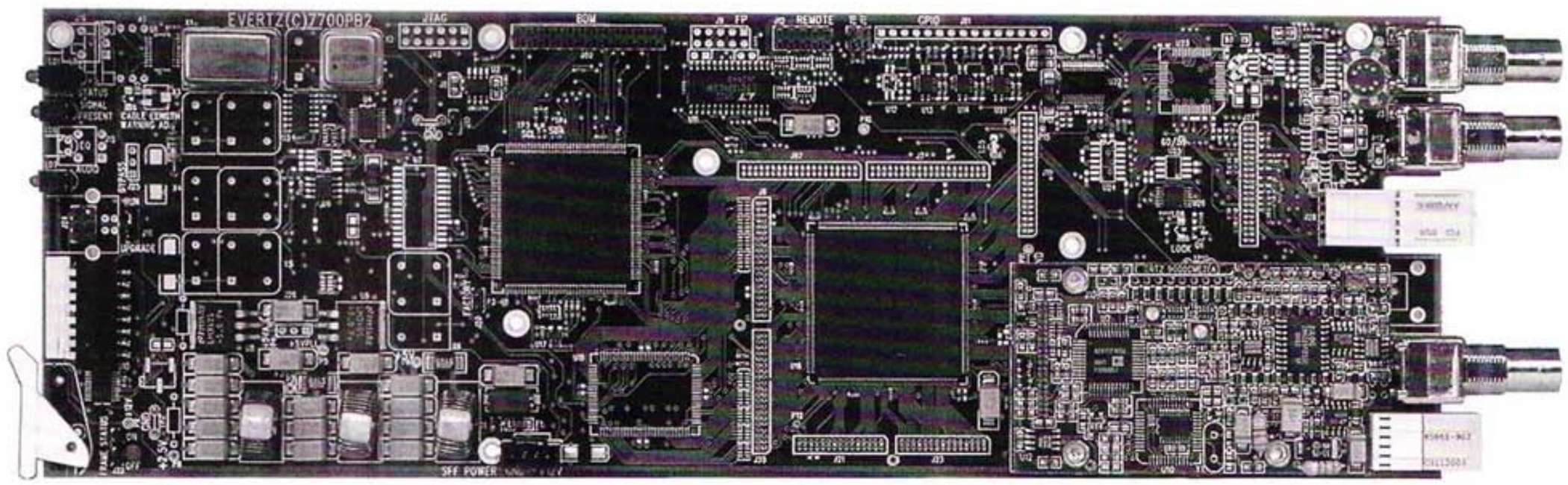
+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

Enclosures:

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

1g

Model 7721GPI-D



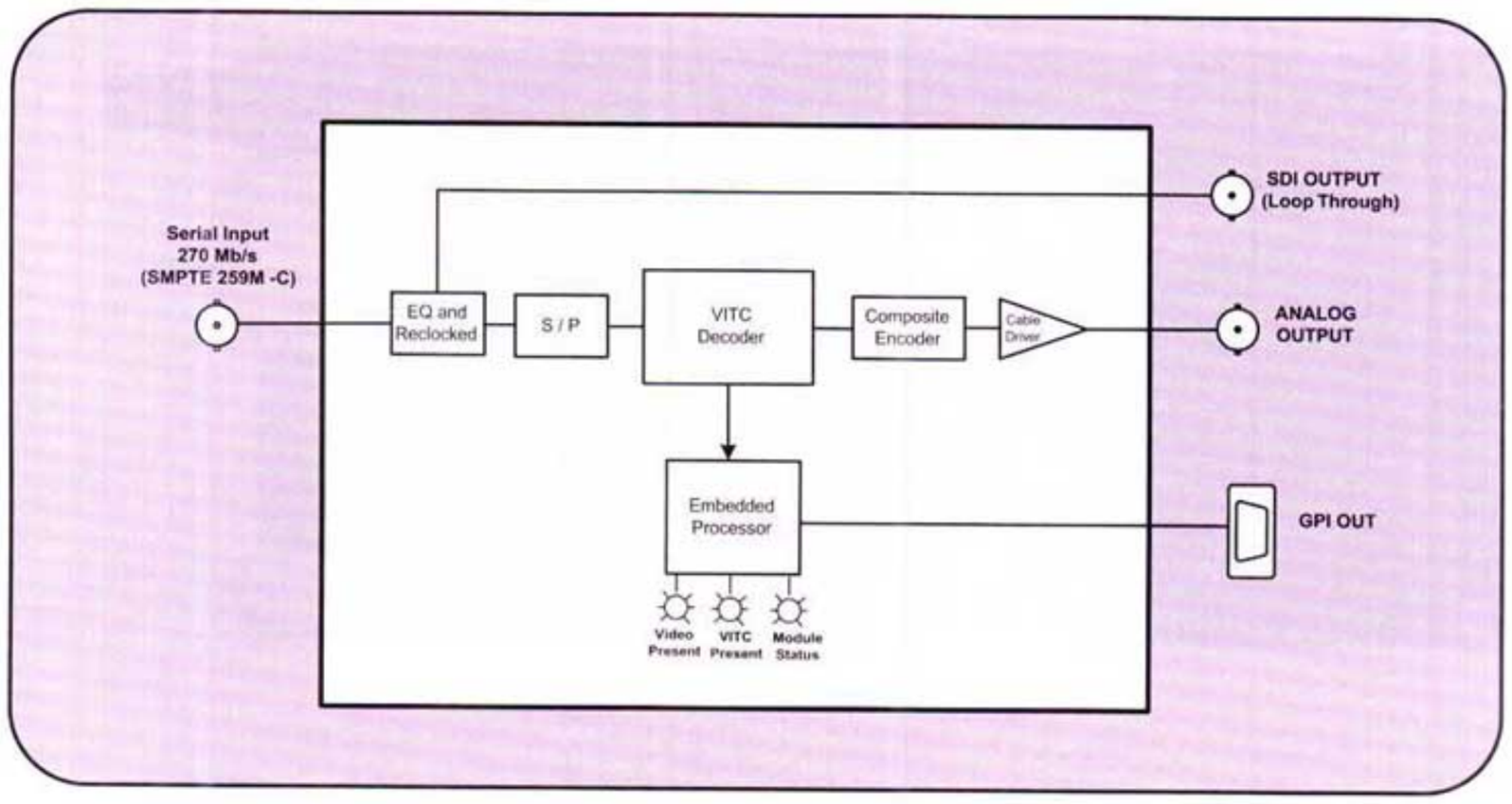
The 7721GPI-D SDI GPI-D Decoder extracts GPI data that has been embedded into a 270 Mb/s SDI video signal by the Evertz 8010TM GPI embedder. The GPI data is decoded from the user bits on a specified VITC line and 6 general purpose optoisolated outputs are provided.

See "GPI Transmission System Application Note" in the technical paper section of this catalog.

Features

- Automatic detection of 525 and 625 line SDI video input
- Six TTL level GPO signals activate when corresponding GPI inputs on 8010TM are activated
- One reclocked SDI video output
- Card edge LEDs indicate video signal and data presence and module fault
- A composite video output with (on-screen display) is provided for card edge setup
- Timecode, user bits and GPO status shown on on screen display
- GPO status shown on OSD (on-screen display)

7721GPI-D Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M-C - 525 or 625 line component
Connector:	BNC per IEC 169-8
Equalization:	Automatic 150m @ 270Mb/s with Belden 8281 (or equivalent)
Return Loss:	> 15 dB up to 270 Mb/s

Serial Video Outputs (Reclocked):

Number of Outputs:	1
Standard:	Same as input
Connector:	BNC per IEC 169-8
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

General Purpose Outputs:

Number of Outputs:	6
Type:	Opto-isolated, active low with internal pull-ups to user supplied voltage (provides +5V which may be used for this purpose)
Connector:	Female High Density DB-15
Signal Level:	+5V nominal

Analog Monitoring Video Output:

Standard:	NTSC, (SMPTE 170M), PAL (ITU624-4)
Number of Outputs:	1 with on screen display
Connector:	BNC per IEC 169-8
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 5 MHz (shallow ramp)

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:

7721GPI-D	SDI GPI 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

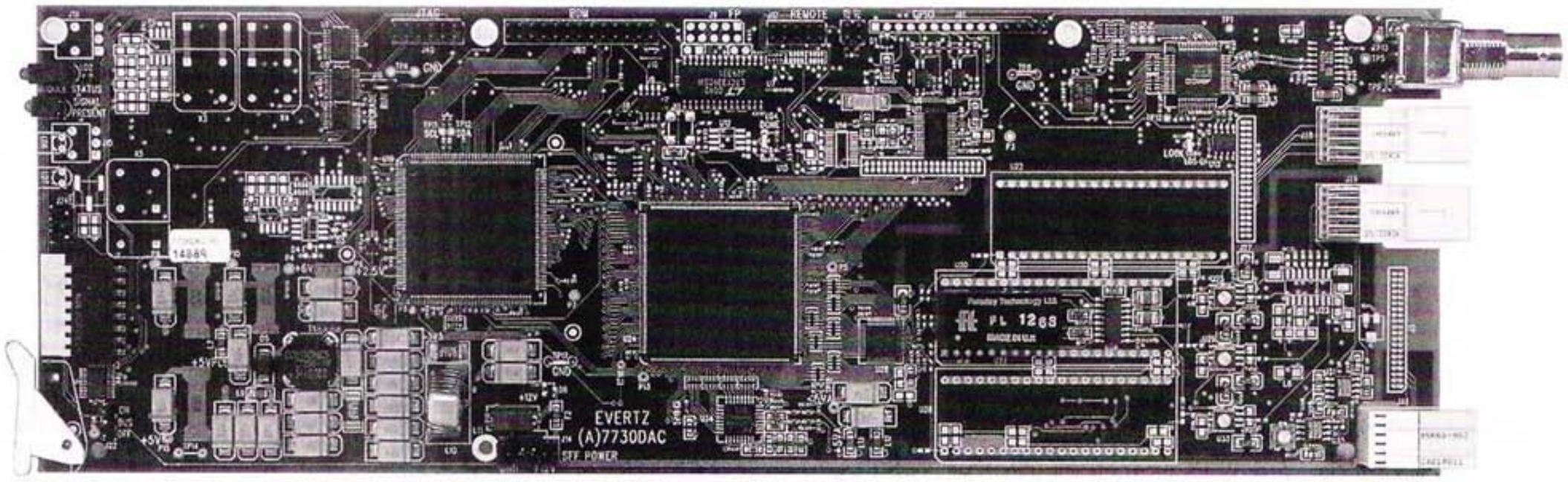
Enclosures:

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

HD SDI to HD Component Analog Video Converter

1h

Model 7730DAC-HD



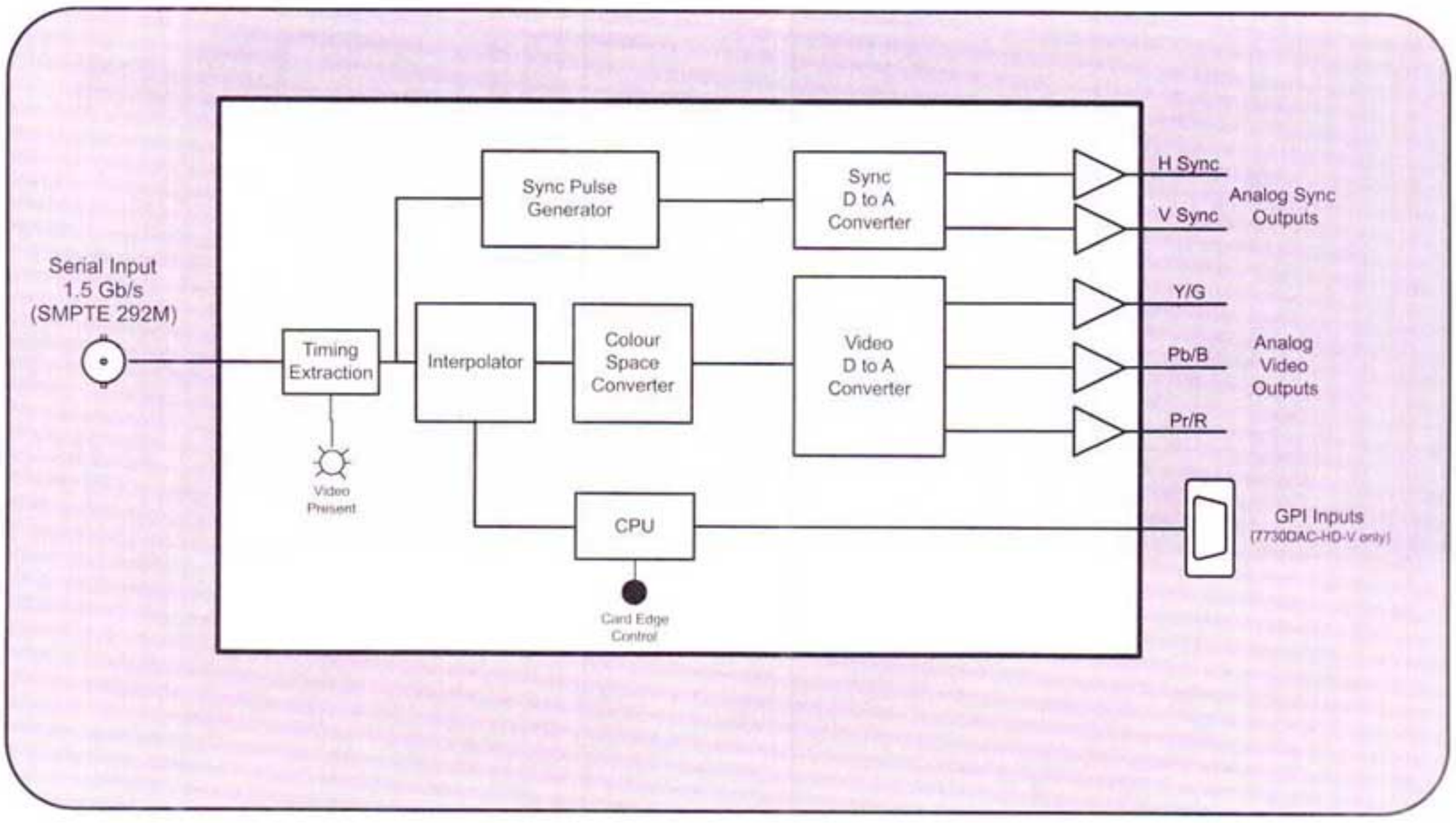
The 7730DAC-HD is a professional quality digital to analog converter for HDTV. The 7730DAC-HD supports all signal standards specified in SMPTE 274M and SMPTE 296M.

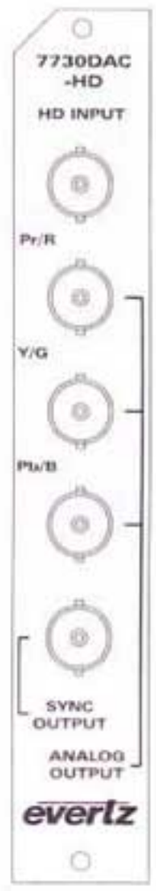
Card edge control allows the user to select RGB, YPrPb or VGA outputs. User controlled 4:3 alignment markers also allow for convenient framing of the video signal. The 7730DAC-HD is available in two versions to easily interface to standard broadcast monitors or VGA computer monitors.

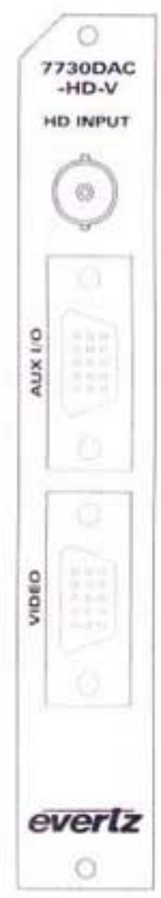
Features

- 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







Specifications

Serial Video Input:

Standard:	SMPTE 292M
Connector:	BNC input per IEC 169-8
Equalization:	Automatic 125m @ 1.5Gb/s with Belden 1694 (or equivalent)

Analog Video Outputs:

Standard:	SMPTE 274M, 296M
Video:	1V p-p YPrPb/RGB or 0.7V p-p VGA
Sync:	300m TTL
Impedance:	75Ω
Connector:	4 BNC per IEC 169-8 (7730DAC-HD) Female High Density DB15 (7730DAC-HD-V)

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: HD D to A Converter:

7730DAC-HD:	YPrPb/RGB +Sync via BNC Outputs
7730DAC-HD-V:	VGA Output + GPI via High Density DB-15

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:

WPVGABNC5:	VGA to BNC - 6' Monitor Adapter Cable

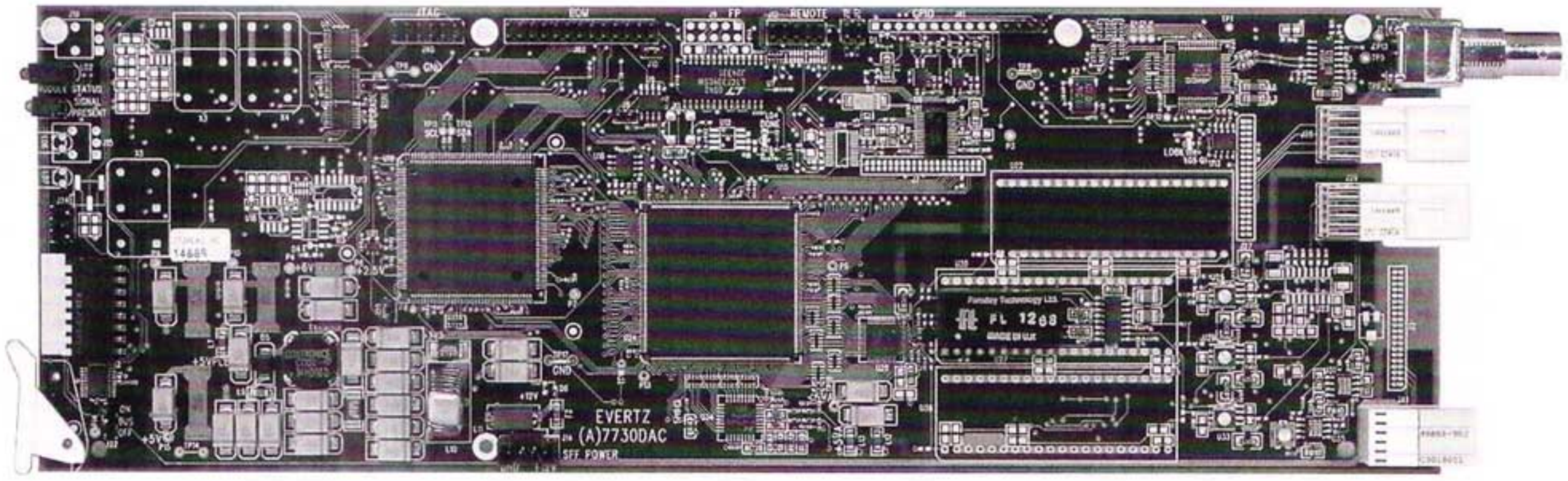
Enclosures:

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

SDI to Component Analog Video Converter

1h

Model 7730DAC

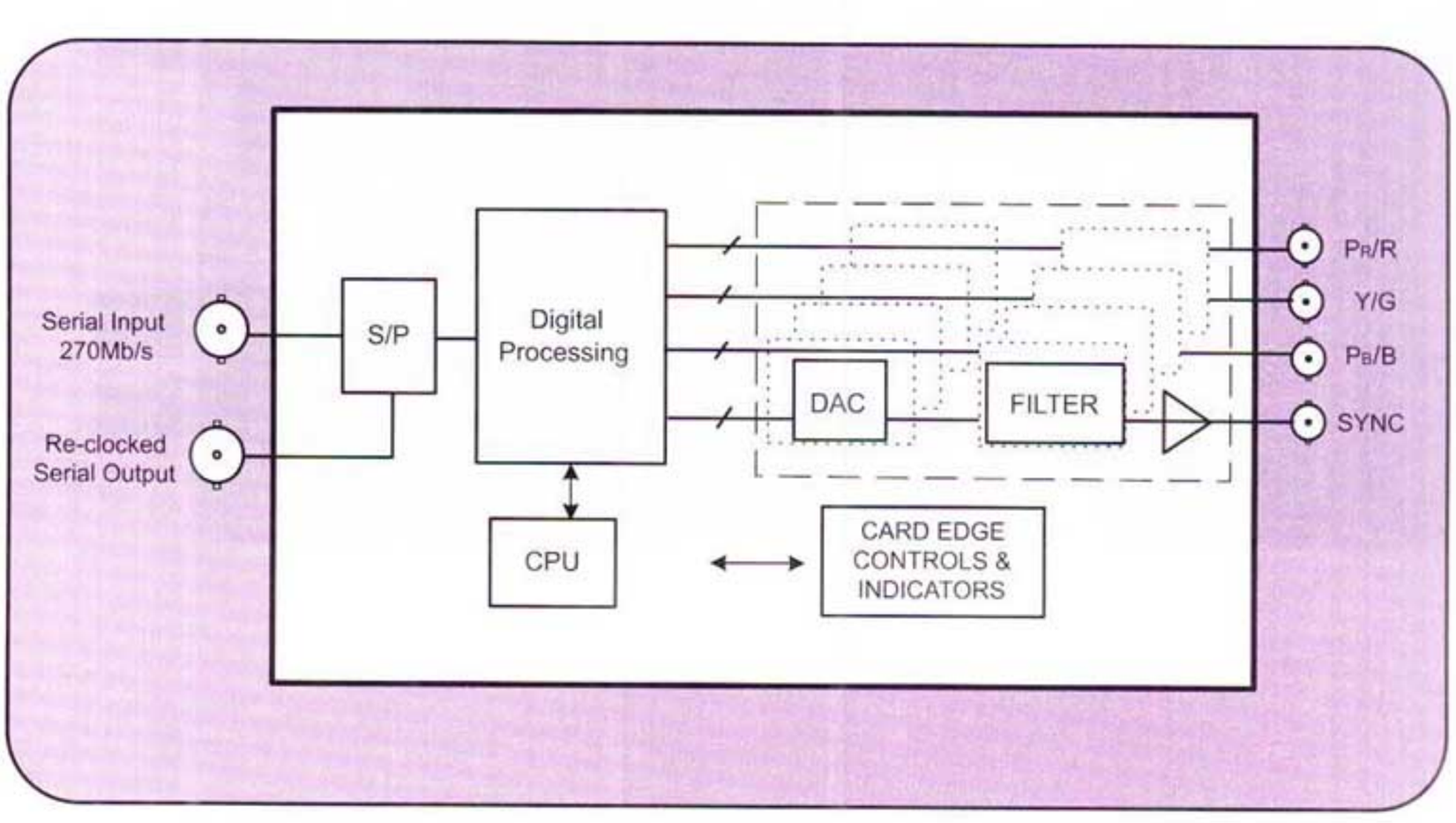


The 7730DAC is a broadcast quality 270Mb/s, 525/625 line serial digital video to component analog converter. One re-clocked SDI output is available and the output formats include YPbPr (SMPTE and EBU), GBR, Betacam and MII with a sync output. Sync may also be applied to Y/Green or all components. Setup pedestal, VBI blanking, H blanking size and edge shaping are some of the additional features.

Features

- 525/625 line operation
- 2x over-sampling
- 10-bit conversion and signal path
- Built-in color bars test signal for monitor anlignment and DAC calibration
- Automatic line standard switching
- De-jitter SDI clock for superior picture stability
- Full CCIR601 filter specifications
- 1 Re-clocked SDI output
- Setup pedestal On/Off control
- VANC data and VBI masking
- H Blanking size and edge shaping
- Sync on Y/Green or all components
- Separate composite sync output
- RGB, SMPTE/EBU component, Betacam and MII
- Card edge controls

7730DAC Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M-C, 270Mb/s, 525/625 component
Connector:	BNC input per IEC 169-8
Impedance:	75Ω
Return Loss:	> 15dB to 270MHz

Serial Video Output:

Reclocked outputs:	1
Connector:	NBC per IEC 169-8
Signal Level:	800mV ± 10%
Rise & Fall Time:	400-700ps
Overshoot:	< 10%

Analog Video Outputs:

Standard:	SMPTE, EBU, RGB, Betacam and MII, 525 and 625 line auto switching
Level:	0.7Vp-p nominal, 1Vp-p nominal with sync
Impedance:	75Ω
Return Loss:	> 40dB to 5MHz
Quantizing:	10 bits
Over-sampling:	2X
Filtering:	CCIR 601
S/N Ratio:	> 65dB

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: SDI D to A Converter

7730DAC:	YPrPb/RGB + Sync via BNC 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

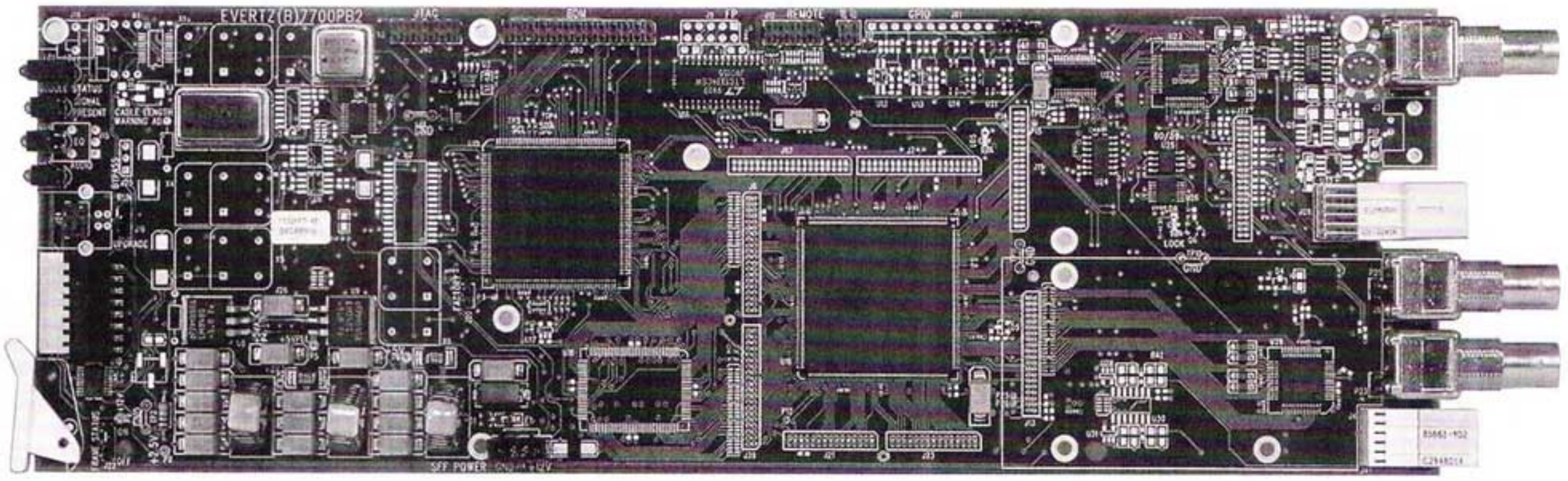
Enclosures:

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

HDTV Progressive Format Translator

1i

Model 7732PFT-HD



The 7732PFT-HD Progressive Format Translator converts 1.5 Gb/s HDTV digital video in the 1080p/24sF format to 1080i/60, thus allowing the source material to be viewed at a higher video refresh eliminating the annoying 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 is detected, a 3:2 pulldown of the picture is inserted resulting in a 1080i/60 output. Determination of the output sequence of the fields is determined from a 6 Hz input pulse or from 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 1080i/60, or any other 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
- 3/2 cadence of output set from 6 Hz pulse input or incoming 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

Card Edge LEDs

- Video signal presence
- Pull down active
- Module status
- Local fault

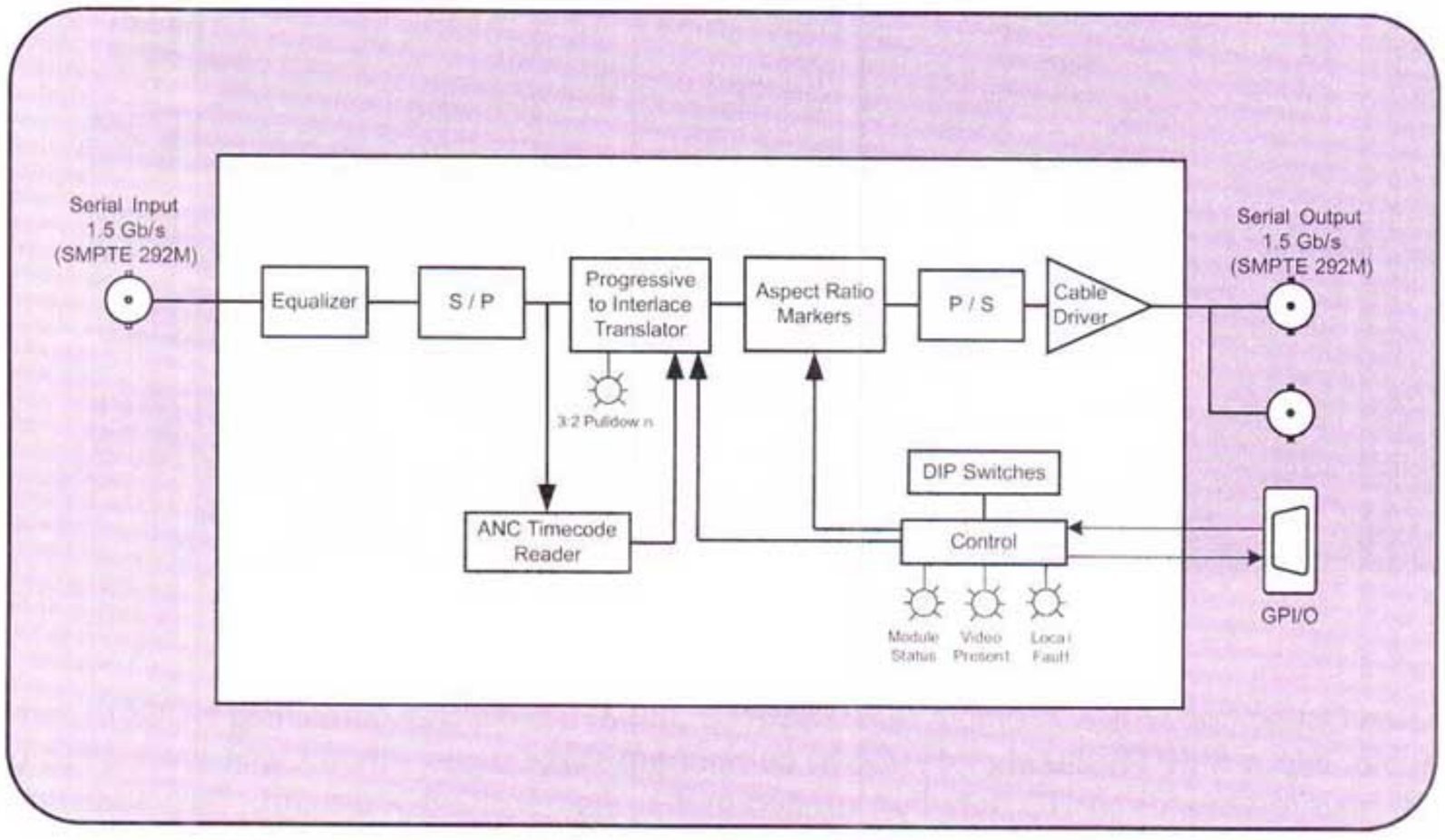
Input:

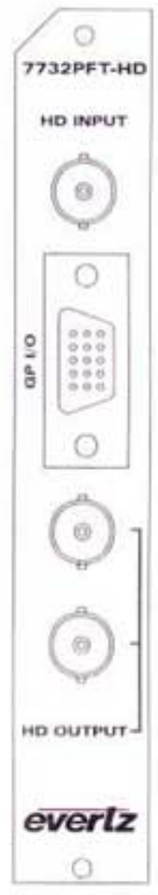
- SMPTE 292M - 1.5Gb/s serial digital 1080p/24sF (24Fps)
- Transparent pass-through input for all other SMPTE 292M HD video formats
- Auto equalization to 130m

Outputs:

- 2 serial HD SDI processed outputs
- When 3:2 pull down mode is active the 1080p/24sF (24Fps) input video is format converted to 1080i/60 (30Fps) on the output

7732PFT-HD Block Diagram





Specifications

Serial Video Input (1080p/24sF):

Standard:	SMPTE 292M
Connector:	BNC per IEC 169-8
Equalization:	Automatic to 130m @ 1.5Gb/s with Belden 1694 (or equivalent)

Serial Video Outputs with 3:2 pulldown (1080i/60):

Connectors:	2 BNCs per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	200ps nominal
Overshoot:	<10% of amplitude
Wide Band Jitter:	<0.2UI

GPIO:

Connector:	Female High Density DB-15
Impedance:	Optio 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

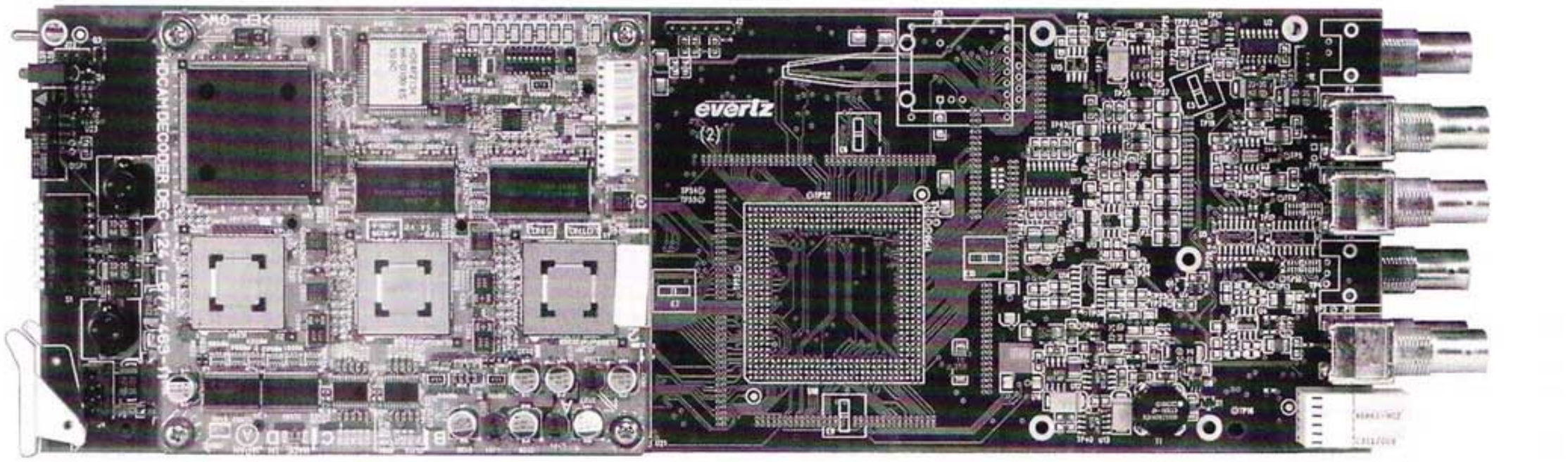
+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

Enclosures:

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

1i

Model 7770DS-HD



The 7770DS-HD, HDTV Decompression Codec converts a 270Mb/s SDTi (SMPTE 305M) input signal containing HDCAM compressed data with embedded AES audio, into a SMPTE 292M (1.485Gb/s) component serial digital stream with embedded or separate AES audio. The 7770DS-HD also re-embeds VANC data that existed in the original HD-SDI stream. Two additional stereo analog audio channels are also available for local monitoring. The 7770DS-HD supports 1080i/59.94, 1080i/50, 1080p/29.97sF, 1080p/25sF, 1080p/23.97sF, 1035i/59.94 field rates.

The 7770DS-HD occupies two card slots and can be housed in either 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.

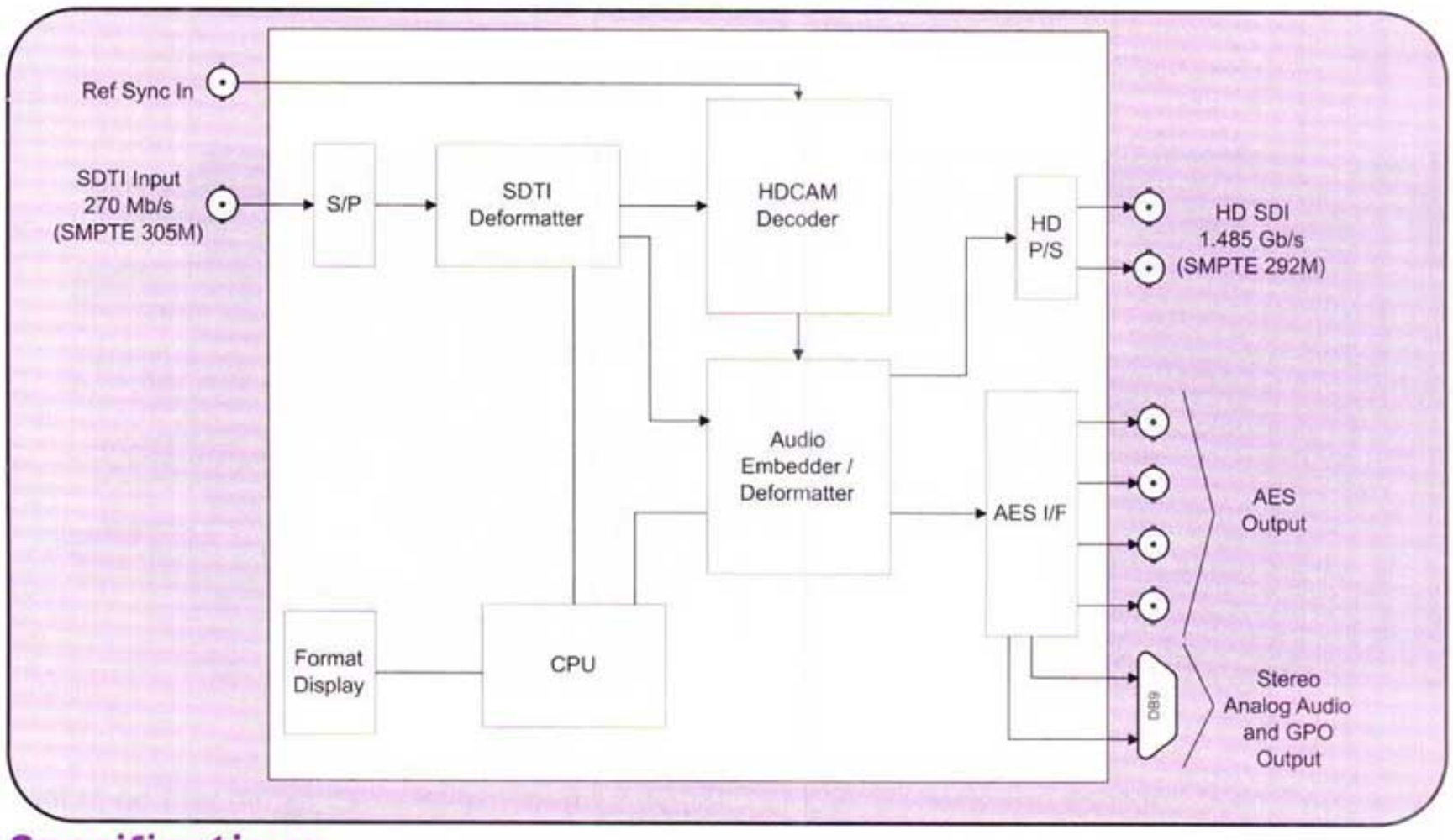
Features

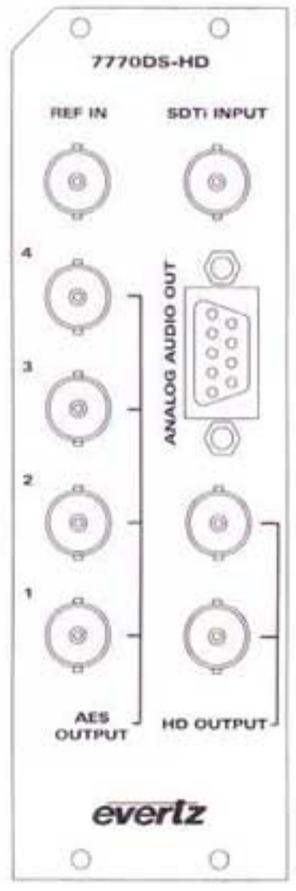
- Industry proven HDCAM video decompression for origination quality video
- Supports 1080i/59.94, 1080i/50, 1080p/29.97sF, 1080p/25sF, 1080p/23.98sF, 1035i/59.94 field rates
- Automatic detection of 1035i/1080i active lines
- Detection of uncompressed SD or compressed HD input stream and outputs GPO control for downstream equipment
- Handles up to four channels of embedded AES audio
- Audio delay processing to match video decompression delay
- Re-embeds original VANC data in outgoing HD-SDI stream
- Four separate stereo AES unbalanced outputs
- One stereo analog audio output
- Genlock reference input
- Fully hot swappable from front of frame

Status Indication:

- Input signal presence
- 1035i/1080i active lines
- Field rate

7770DS-HD Block Diagram





Specifications

SDTI Video Input:

Standard:	SMPTE 259M-C (270Mb/s) SMPTE 305M data formatting
Number of Inputs:	1
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Return Loss:	>15dB @ 270Mb/s

Reference Input:

Connector:	1 BNC per IEC 169-8
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 Serial Video Output:

Standard:	SMPTE 292M (1080i/59.94, 1080i/50,1080i/29.98sF 1080i/25sF, 1080i/23.98sF, 1035i/59.94)
Number of Outputs:	2
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V +/- 0.5V
Rise and Fall Time:	<200ps nominal
Overshoot:	<10% of amplitude
Wide Band Jitter:	<0.2UI
HDSDI Out to SDTi In Adjustment:	0 to +10.8ms (adjustable) relative to video delay (requires reference input)

AES Audio Outputs:

Standard:	SMPTE 276M, single ended AES
Number of Outputs:	4
Connector:	BNC per IEC 169-8
Sampling Rate:	48khz
Impedance:	75Ω
Resolution:	24-bit

Analog Audio Outputs:

Number of Outputs:	2
Type:	Balanced analog audio
Connector:	Female DB-9
Output impedance:	66Ω
Signal Level:	0db FS >20dB, into high impedance load (>10K Ω) Not good for low impedance loads (i.e. 600Ω)
Frequency Response:	50Hz to 20khz: +/- 0.20dB
SNR:	>85dB (50Hz to 20kHz)
THD+N:	65dB @ 1kHz, 0dB FS, typical

GPO:

Number of Outputs:	1
Connector:	1 pin on DB9
Type:	TTL

SDTi to Output Delay:

Video:	2 frames
AES:	
Evertz Source:	5 frames
Sony Source:	2 frames
VANC:	9 fields

Electrical:

Voltage:	+12VDC
Power:	12 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:

7770DS-HD	HD Decompression CODEC

Ordering Options:

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

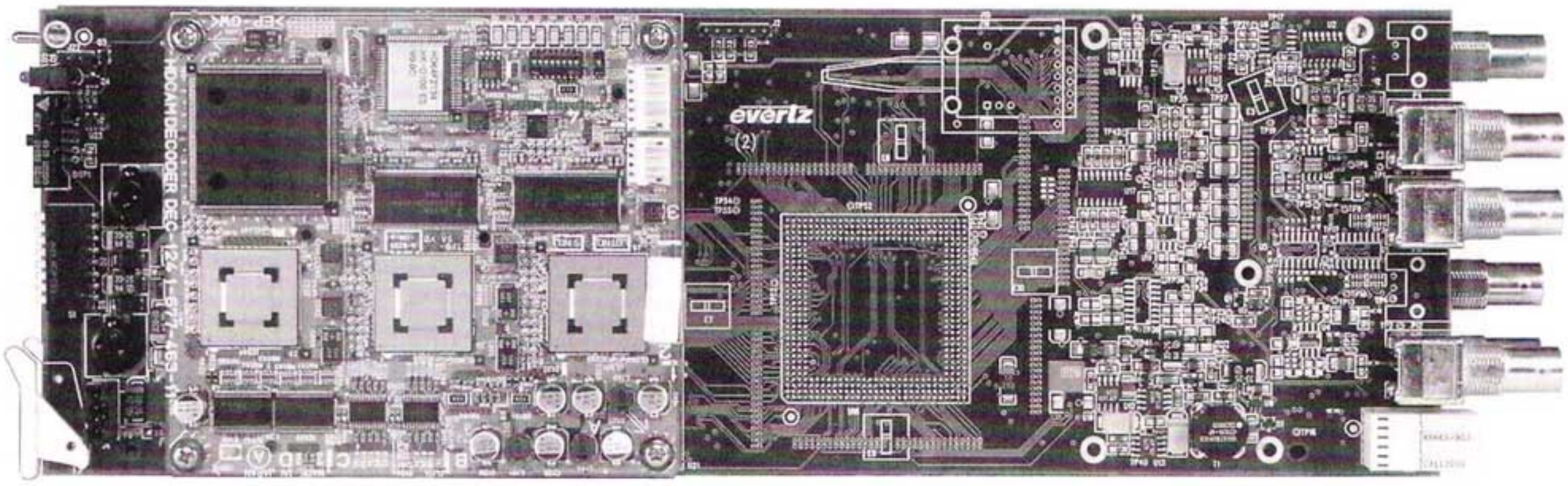
Rear Plate Suffix	
+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

Enclosures:

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

1i

Model 7770CS-HD



The 7770CS-HD, HDTV Compression Codec encodes one SMPTE 292M (1.485Gb/s) serial digital video signal with up to four AES channels of embedded or separate audio, into one 270Mb/s SDTi (SMPTE305M) compliant output stream. The 7770CS-HD also preserves VANC data in the incoming HD-SDI stream and transports this across the 270Mb/s SDTi interface. Automatic detection and support of 1080i/59.94, 1080i/50, 1080p/29.97sF, 1080p/25sF, 1080p/23.98sF, 1035i/59.94 field rates is provided.

The 7770CS-HD occupies two card slots and is housed in either 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 up to 1 module.

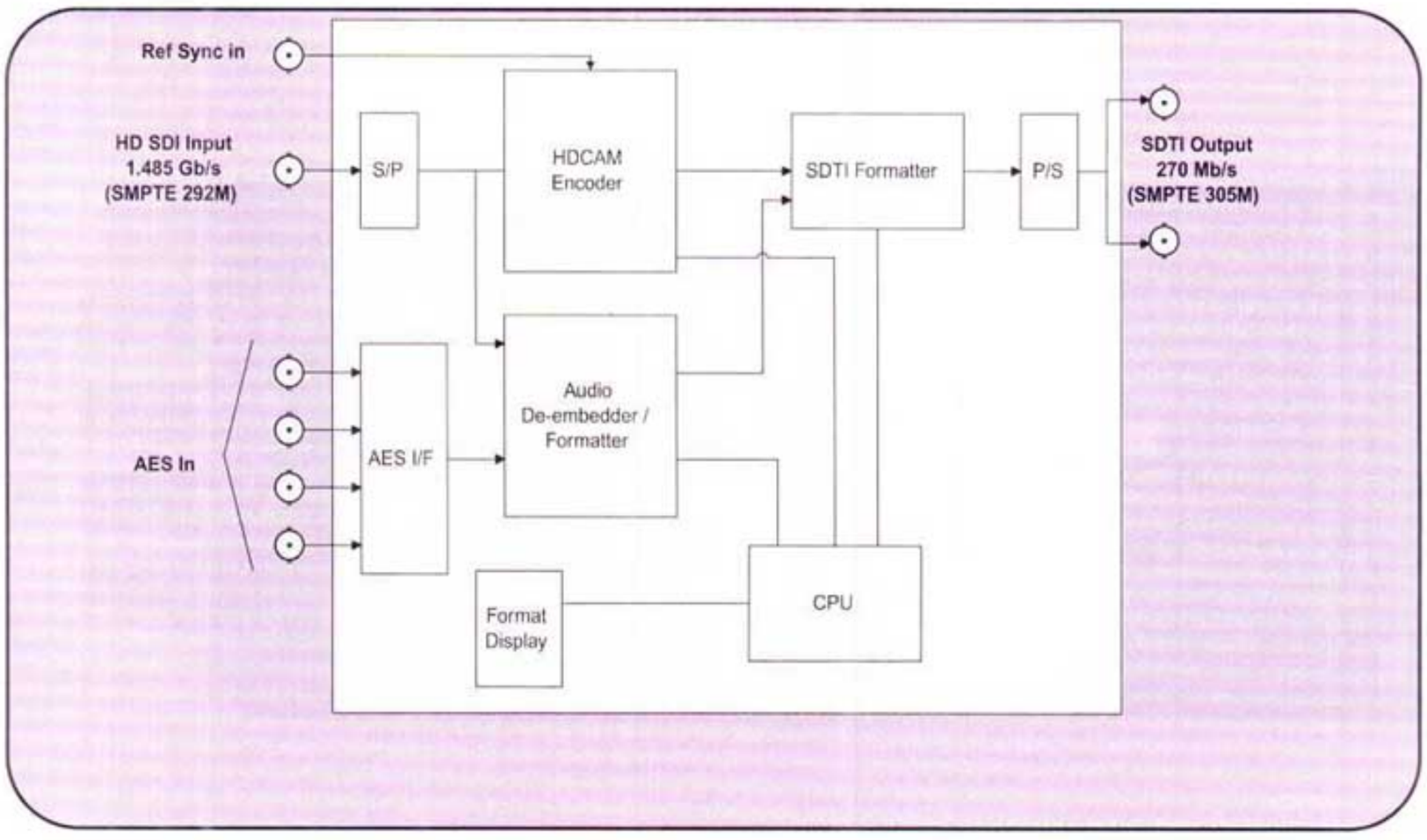
Features

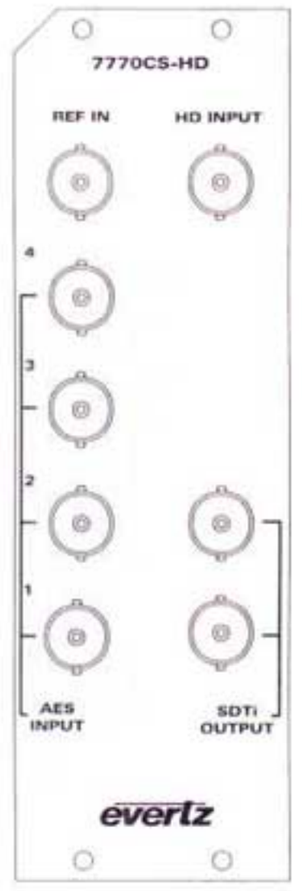
- Industry proven HDCAM video compression for origination quality video
- Supports 1080i/59.94, 1080i/50, 1080p/29.97sF, 1080p/25sF, 1080p/23.98sF, 1035i/59.94 field rates
- Automatic detection of 1035i/1080i active lines
- Accepts up to four channels of embedded or separate AES audio
- No compression applied to AES audio streams
- Preserves VANC from input HD-SDI stream
- SMPTE 305M compliant 270Mb/s output stream
- EDH insertion on SDTi output
- Genlock reference input
- Fully hot swappable from front of frame

Status Indication:

- Input signal presence
- 1035i/1080i active lines
- Field rate

7770CS-HD Block Diagram





Specifications

HD Serial Video Input:

Standard:	SMPTE 292M, (1080i/59.94, 1080i/50, 1080p/29.97sF, 1080p/25sF, 1080p/23.98sF, 1035i/59.94)
Number of Inputs:	1
Connector:	BNC per IEC 169-8
Equalization:	Automatic to 125m @ 1.5Gb/s with Belden 1694A or equivalent

SDTI Video Output:

Standards:	SMPTE 259M-C (270Mb/s) SMPTE 305M
Number of Outputs:	2
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	740ps nominal
Overshoot:	<10% of amplitude
Return Loss:	>15dB up to 270Mb/s
Wide Band Jitter:	<0.2UI
Embedded VANC:	One 20-bit group as per SMPTE337M
Embedded Audio:	Two 24-bit groups as per SMPTE 272M-A source selectable from embedded audio on HD input or external AES inputs
SDTi Out to HDSDI In Adjustment:	0 to -10.8ms (adjustable) relative to video delay (requires reference input)

AES Audio Inputs:

Standard:	SMPTE 276M, single ended AES
Number of Inputs:	4
Signal Level:	1V p-p ±0.1V
Connector:	BNC per IEC 169-8
Sampling Rate:	48khz
Impedance:	75Ω balanced
Resolution:	24-bit

Reference Input:

Connector:	1 BNC per IEC 169-8
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

Input to SDTi Delay:

Video:	3 frames
AES:	< 2 msec
VANC:	9 fields

Electrical:

Voltage:	+12VDC
Power:	12 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:

7770CS-HD	HD 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:

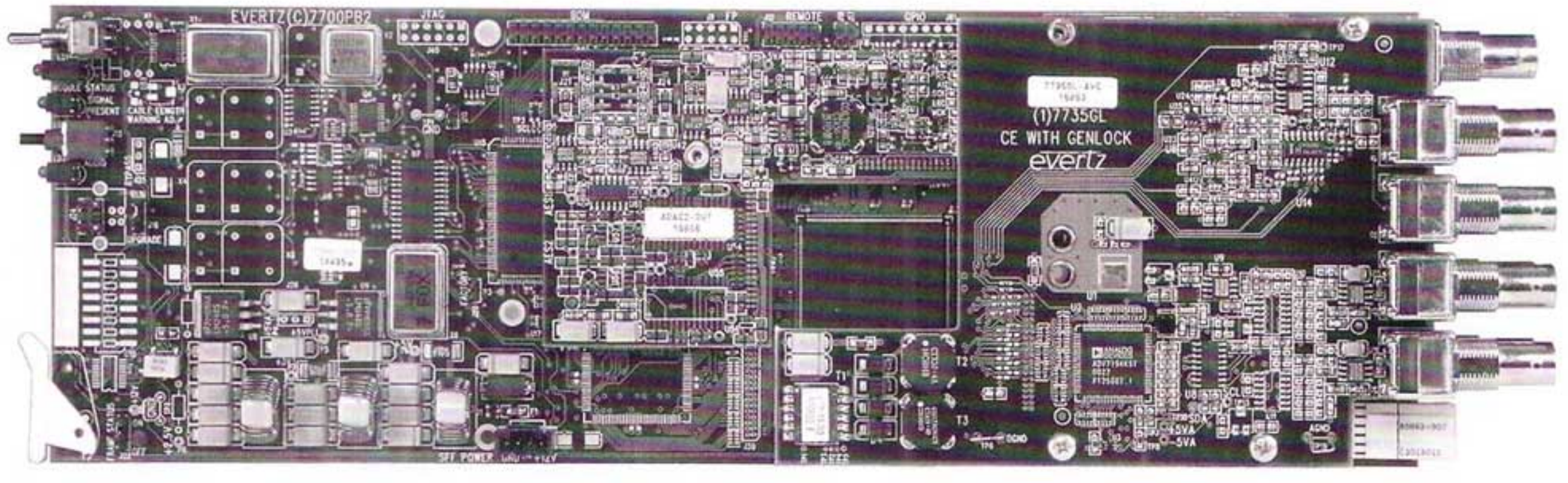
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

SDI Video D to A with Line Buffer, Quad Audio DAC with SoftSwitch™

1j

Model 7735AVC-LB



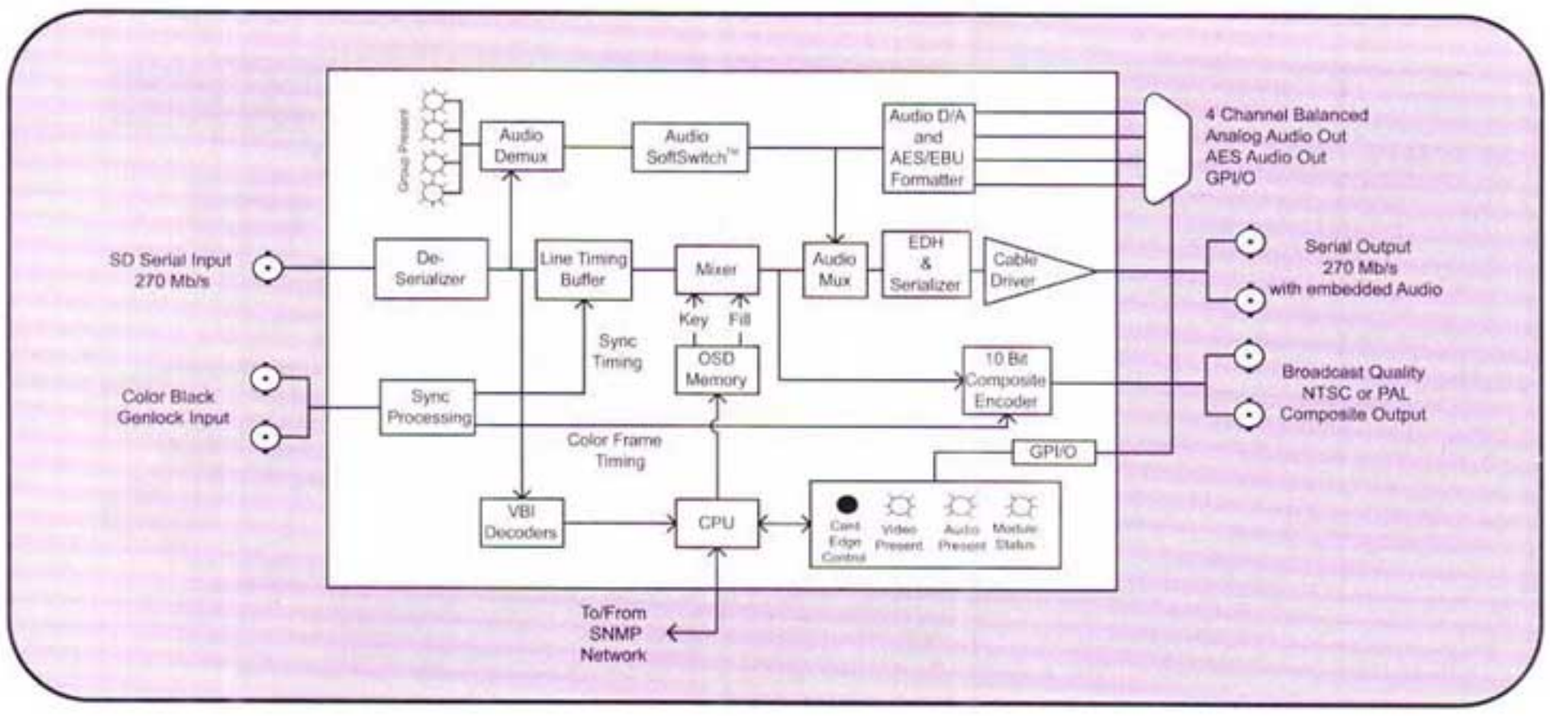


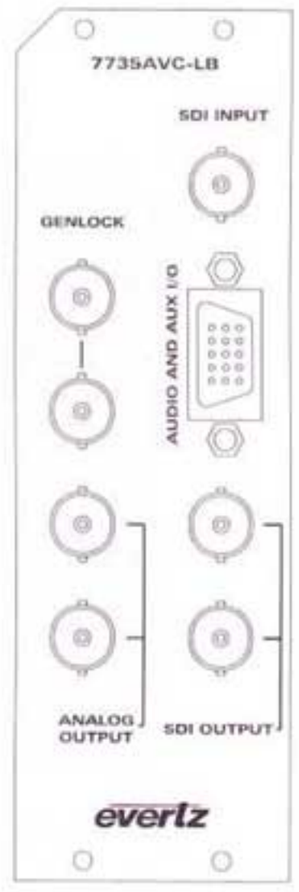
The 7735AVC-LB is a 10-bit component SDI to composite analog converter with line synchronizing buffer, audio demultiplex and digital to analog converter. The 7735AVC-LB is also equipped with Evertz's SoftSwitch™ technology which mitigates audio pops during hot-switching while maintaining consistent video and audio sequences and formats. In addition, 7735AVC-LB modules are VistaLINK™ - enabled 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.

Features

- One SDI 525 or 625, 270 Mb/s component digital video input
- Two SDI 525 or 625, 270 Mb/s component digital video outputs
- Two composite analog video outputs
- Genlock reference loop input for proper timing and color framing
- Line synchronizing buffer allows re-timing of output video up to one line
- Embedded audio on input is de-embedded and re-embedded after re-timing
- Hot-switch audio pop mitigation through SoftSwitch™ technology
- One group (4 channels of audio) is de-multiplexed from the incoming digital video
- 4 adjustable analog audio outputs can be set so both are a mono mix of the selected channel pair
- Two pair of stereo balanced analog outputs and 2 AES digital audio outputs
- RS-232 data logging port to log fault conditions
- Two GPI and one GPO to control and report user definable fault conditions through high density DB15 connector
- Bulkhead panel is available to facilitate wiring to the high density DB15 connector (up to 7 - 7735AVC-LB modules can be wired to each bulkhead panel)
- Comes with ConfigSet software to upload or download board configurations to a PC. Setups can be copied from one module to another to facilitate configuration of large numbers of modules
- VistaLINK™ - enabled offering remote monitoring, control and configuration capabilities via SNMP (using VistaLINK™ PRO or 9000NCP 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

7735AVC-LB Block Diagram





Specifications

Serial Digital Video Input:

Standard:	SMPTE 259M-C 525 or 625 line
Connector:	BNC per IEC 169-8
Termination:	75Ω
Equalization:	Automatic >200m @ 270Mb/s with Belden 8281 (or equivalent)
Return Loss:	>15dB up to 270MHz
Embedded Audio:	SMPTE 272M-A

Serial Digital Video Output:

Standard:	SMPTE 259M-C 525 or 625 line
Number of Outputs:	2
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	470ps nominal
Overshoot:	<10% of amplitude
Embedded Audio:	SMPTE 272M-A

Genlock Input:

Type:	NTSC (SMPTE 170M) Color black 1V p-p
Number of Inputs:	2
Connector:	BNC per IEC 169-8
Termination:	High impedance loop through
Return Loss:	>35dB up to 10MHz
SNR:	>50dB
Levels:	Max: 2Vp-p video Min: Sync level 150m

Analog Video Output:

Standard:	NTSC, SMPTE 170M, PAL, ITU624-4
Number of Outputs:	2
Connector:	BNC per IEC 169-8
Signal Level:	1V nominal (user adjustable from menu)
DC Offset:	0V ±0.02V
Return Loss:	> 35dB up to 5MHz
Frequency Response:	0.1dB to 4 MHz, 0.15dB to 5.5 MHz
Differential Phase:	< 0.5 (<0.3 typical)
Differential Gain:	< 0.5% (<0.3 % typical)
SNR:	> 78dB to 5 MHz

Analog Audio Output:

Number of Outputs:	4
Type:	Balanced analog audio
Connector:	Female High Density DB-15
Output Impedance:	33Ω
Sampling Frequency:	48kHz
Signal Level:	0dB FS =>8 to 24dBu (user settable)

***NOTE**: High impedance loads only (10 kΩ) Not for use with low impedance loads (i.e. 600Ω)*

Frequency Response:	< 0.05dB (20Hz to 15kHz) < 0.1dB (20Hz to 20kHz)
Dynamic Range:	> 84dB RMS
THD+N:	> 74dB RMS @ 1kHz, relative to 14dBu > 63dB RMS @ 20Hz to 20kHz, relative to 14dBu
Crosstalk:	< -75dB RMS (20Hz to 20kHz)

AES Audio Outputs:

Number of Outputs:	2
Standard:	SMPTE 276M, single ended synchronous or asynchronous AES
Connectors:	High-density female DB-15
Resolution:	20 bits (from embedded audio)
Sampling Rate:	48 kHz
Impedance:	75Ω unbalanced

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

Number of Inputs:	2
Number of Outputs:	1
Type:	Opto-isolated, active low with internal pull-ups to +5V
Connector:	Female High Density DB-15
Signal Level:	+5V nominal

Control and Data Logging Serial Port:

Standard:	RS-232
Connector:	Female High Density DB-15
Format:	As per AVC Control/Status Protocol Document (contact factory)

Electrical:

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

Physical:

Number of slots:	2

Ordering Information:

7735AVC-LB	SDI Video D to A with Line Buffer, Quad Audio DAC with SoftSwitch™

Accessories:

9000NCP	VistaLINK™ General Purpose Network Control Panel

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

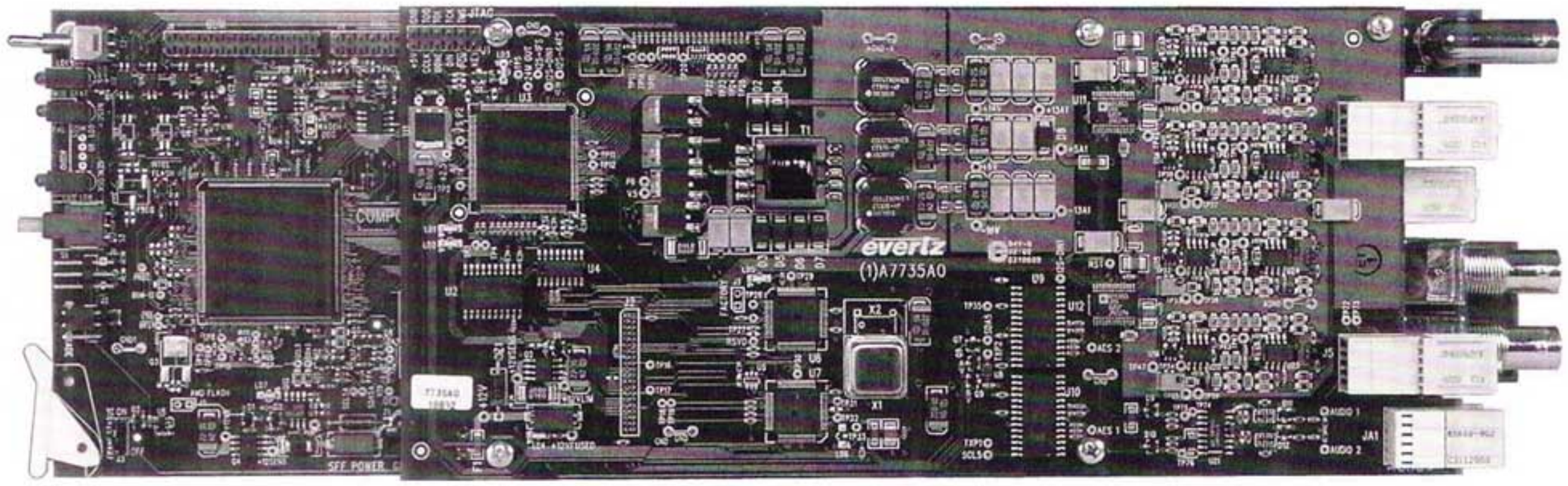
Enclosures:

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

Component Video D to A with optional Frame Synchronizer Audio Demux and Audio DAC

Model 7735CEM (-A4, AES)





The 7735CEM 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 or AES inputs/outputs can be packaged with the encoder to create a video/audio frame synchronizer/conversion package.

The 7735CEM 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 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

The features of all 7735CEM's are:

- One component serial digital input (525 or 625)
- One composite analog video output WITHOUT OSD text or audio bargraphs
- Internal processing to maintain 10 bit digital video quality
- 10-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
- EDH analysis on SDI input
- 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
- Adjustable free running frequency
- 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
- Two GPI inputs are available to modify the display characteristics
- Two GPI/O output to indicate user definable fault conditions
- GPI/O's are available on a DB9 connector

- VistaLINK™ - enabled offering remote monitoring, control and configuration capabilities via SNMP (using VistaLINK™ PRO or 9000NCP 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

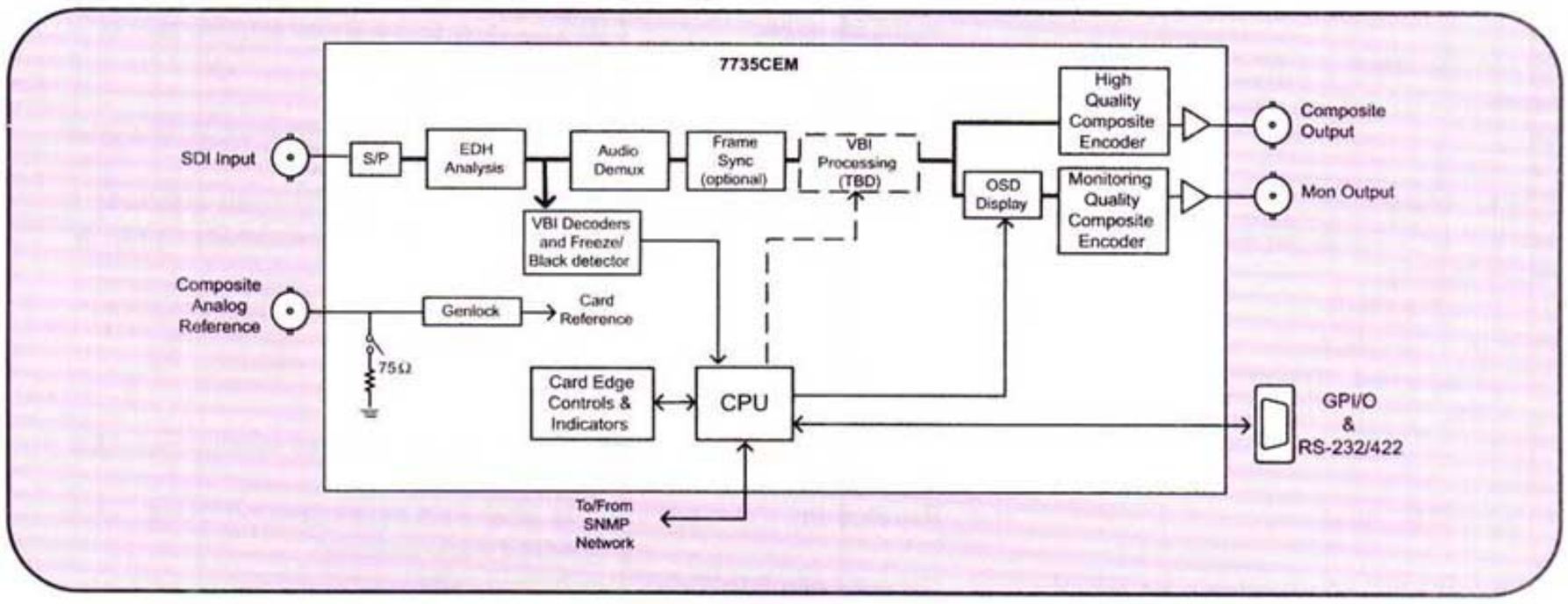
The Features of "-A4" option are:

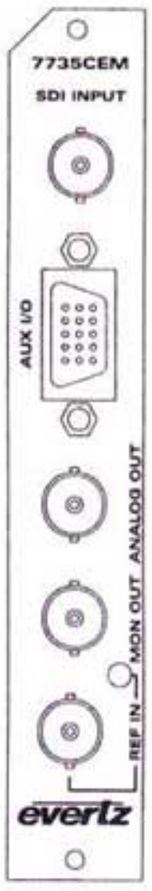
- One group (4 channels) of synchronous 20-bit audio is de-multiplexed from the incoming digital video
- 2 unbalanced AES audio inputs (up to 48kHz, 24-bits) on BNC
- User selects EITHER the de-embedded audio or the input AES audio
- The selected audio is delayed equivalently to the video delay with 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 dalay
- Loss of video modes: pass audio, mute audio

The Features of "-AES" option are:

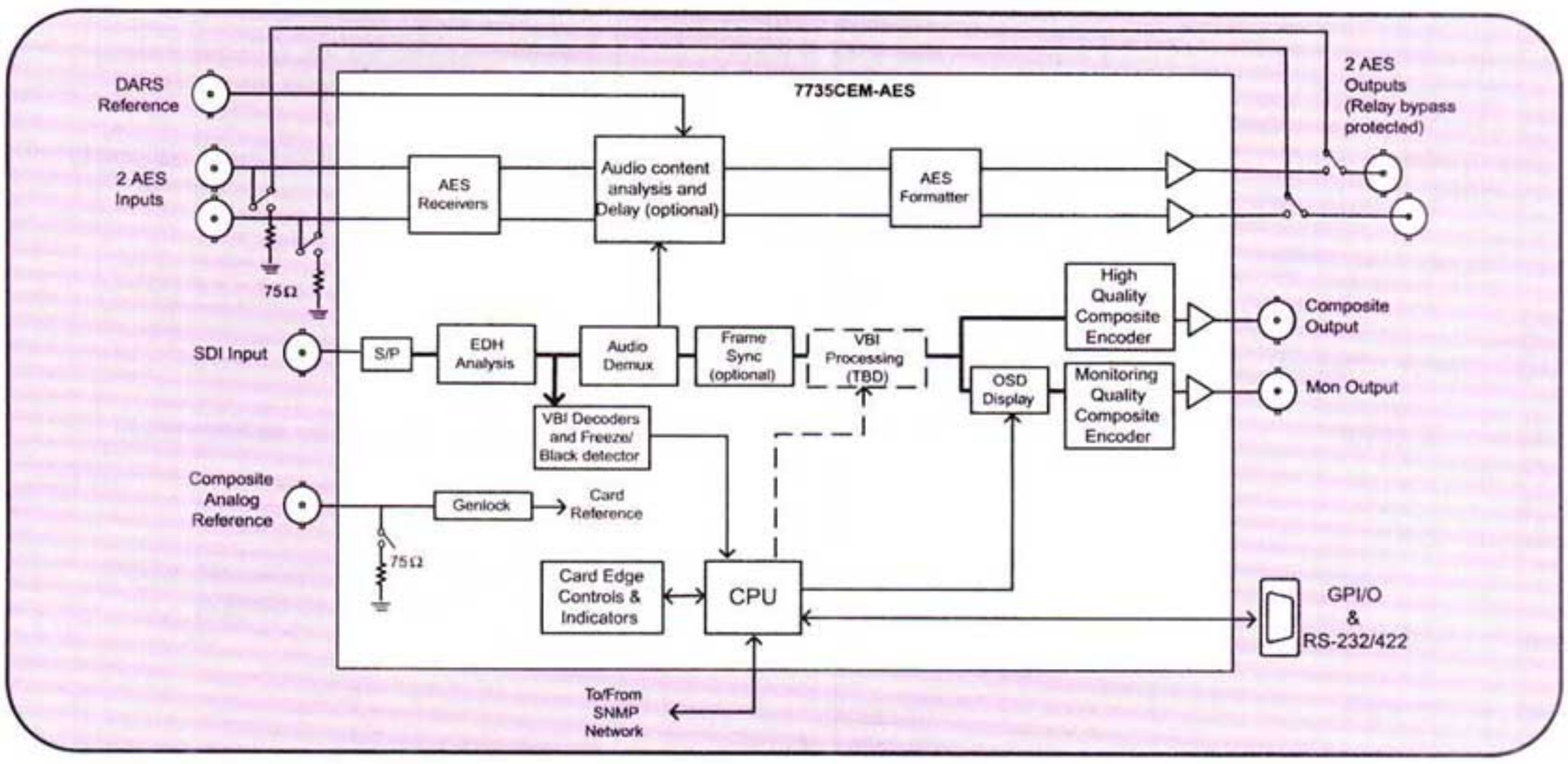
- 75Ω coaxial (unbalanced) AES inputs (2) on BNC
- One group (4 channels of audio) is de-multiplexed on the incoming digital video
- User selects EITHER the de-embedded audio or the input AES audio
- Audio delay equivalent to video delay (with +S option)
- Additional audio delay of up to 5 seconds
- 2 unbalanced AES audio outputs
- Loss of video modes: pass audio, mute audio
- Bypass relay protection that allows removing the card without re-wiring AES audio

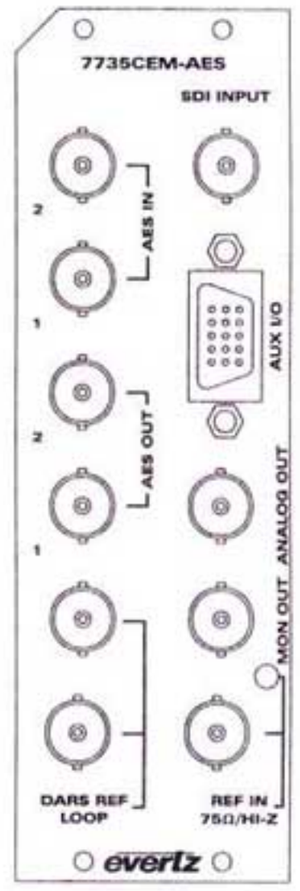
7735CEM Block Diagram



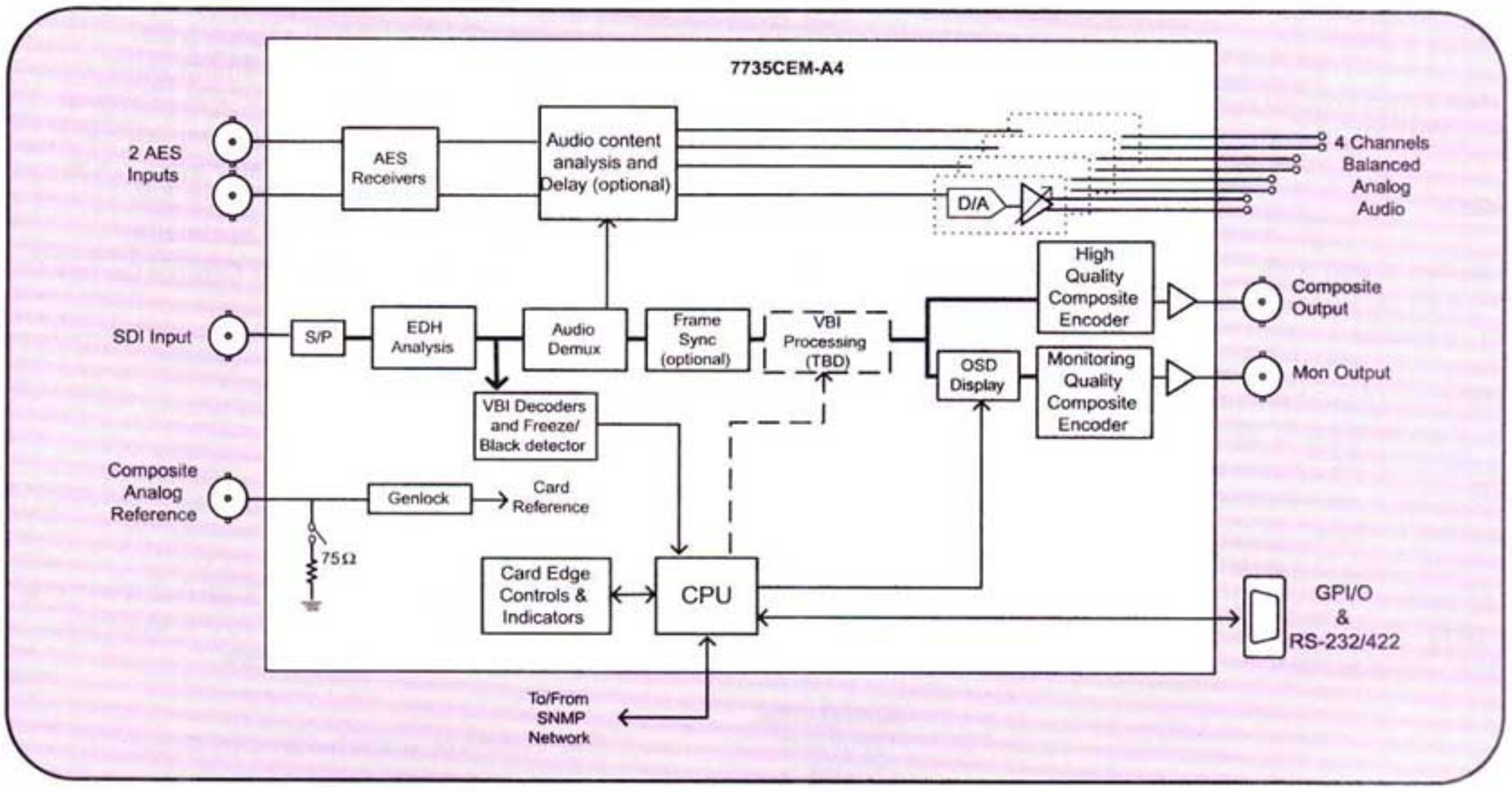


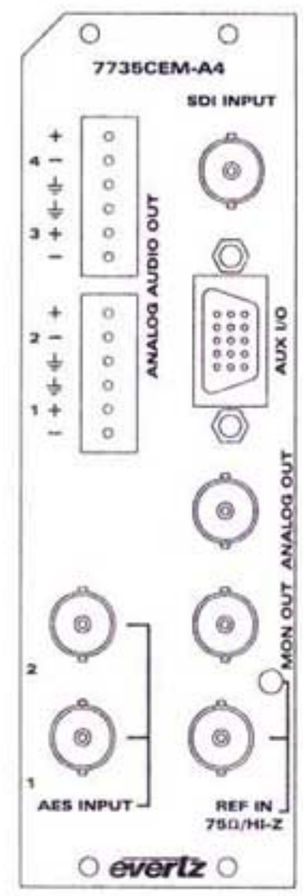
7735CEM-AES Block Diagram





7735CEM-A4 Block Diagram





Component Video D to A with optional Frame Synchronizer Audio Demux and Audio DAC

Specifications

Analog Broadcast Video Output:

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Input:	1
Connector:	BNC per IEC 169-8
Signal Level:	1V nominal
Output Impedance:	75Ω
DC Offset:	0V +/- 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:	±10%
Black level control range:	±7.5 IRE
Chroma level control range:	±10%
Hue control range:	±15 deg. (NTSC only)
Minimum Delay:	3µs
Maximum Delay:	1 frame + 3µs (+S option only)

Reference Video Input:

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Inputs:	1
Connector:	BNC per IEC 169-8
Signal Level:	1V nominal (0.5V to 1.5V)
Frequency Lock Range:	±75ppm from nominal
Input Impedance:	75Ω or High impedance (jumper selectable)
Return Loss:	>25dB to 10MHz
Max Subcarrier Jitter:	< 3 degrees
Free-Running Frequency Control Range:	> +/- 10 ppm (> +/- 270Hz)

Analog Monitoring Video Output:

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Outputs:	1
Connector:	BNC per IEC 169-8
Signal Level:	1V nominal
Output Impedance:	75 Ω
Return Loss:	>35dB to 10MHz

Serial Video Input:

Standard:	SMPTE 259M-C - 525 or 625 line component
Number of Outputs:	1
Connector:	BNC per IEC 169-8
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
Frequency Lock Range:	±75ppm from nominal
Lock up time on a hot switch:	TBD

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 and AES only):

Number of Inputs:	2
Input Standard:	SMPTE 276M, single ended synchronous or asynchronous PCM AES
Connector:	BNC per IEC 169-8
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:	3.5µsec

AES Audio Outputs (AES only):

Number of Outputs:	2
Output Standard:	SMPTE 276M, single ended synchronous AES
Connector:	BNC per IEC 169-8
Resolution:	24 bits when AES inputs selected, 20 bits when embedded audio selected
Output Sampling Rate:	Synchronous 48kHz
User Bits:	Transferred to output in a non-real-time, non-block-contiguous manner
Minimum I/O Delay:	4.5µs

General Purpose In/Out:

Number of Inputs:	2 (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 DB-9
Signal Level:	+5V nominal

Serial Port:

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:	9.25 Watts CEM + 16.75 Watts (-A4 option)
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Physical:

Number of slots:	1 for non-audio versions 2 for audio versions (-AES, -A4)

Ordering Information:

7735CEM:	Component SDI to composite analog video encoder with optional frame synchronizer
7735CEM-A4:	Component SDI to composite analog video and audio encoder with optional frame synchronizer
7735CEM-AES:	Component SDI to composite analog video and audio encoder with optional frame synchronizer and two AES inputs and two AES outputs **(not available in standalone enclosure)**
9000NCP	VistaLINK™ General Purpose Network Control Panel

Accessories:

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

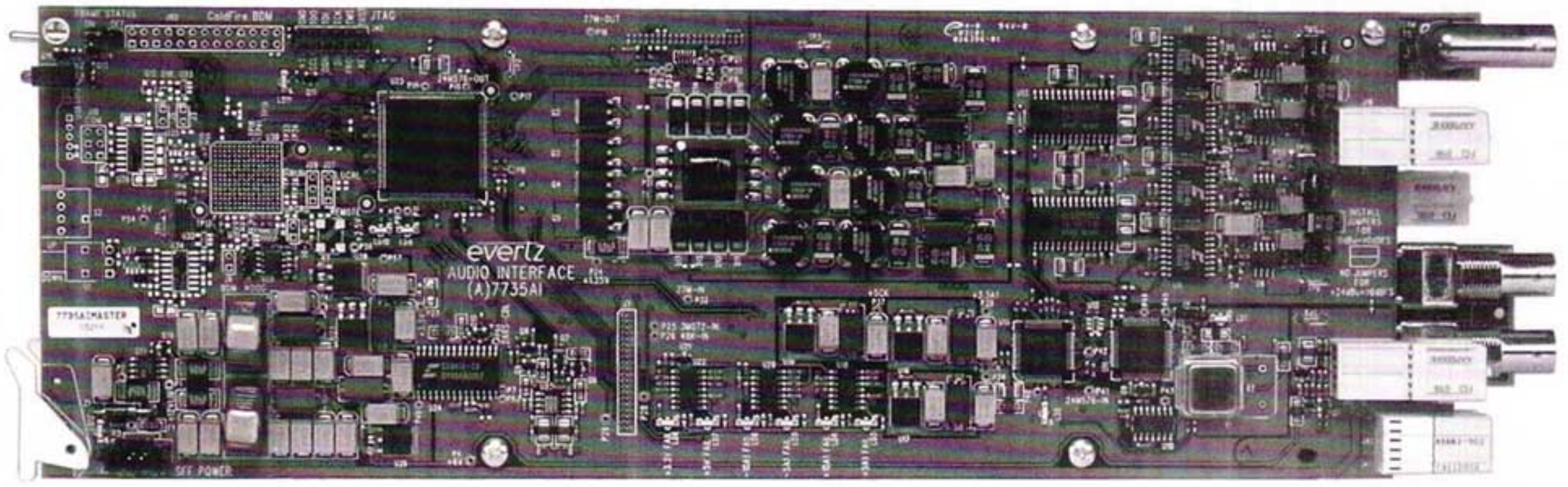
Enclosures:

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

Composite Video A to D with optional Frame Synchronizer, Quad Audio ADC & Audio Embedder

Model 7735CDM (-A4, -AES)





The 7735CDM line of composite analog video to serial digital video converters are broadcast quality decoders with an extensive list of additional features. Composite analog video is converted to 10-bit parallel data and decoded to 4:2:2 digital component video using Faroudja patented technology. In addition, high quality audio analog to digital conversion or AES inputs can be packaged with the decoder to create a video/audio frame synchronizer with audio embedder.

The 7735CDM product features various video processing functions such as VITC, closed captioning and Source Idenfication decoding and monitoring, as well as monitoring for black and freeze conditions. The audio is processed, by the CPU, 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 composite analog composite 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

- 10-bit, 8fsc sampling of input video
- Internal processing to maintain 10-bit digital video quality
- Patented Faroudja adaptive 2D comb filtering technology
- Chroma AGC available, if desired
- User adjustable input video processing functions: black level, gain, hue, saturation (when chroma AGC is enabled)
- One composite analog input (NTSC or PAL-B). 75Ω or high-Z, jumper configurable input impedance
- One SDI 525 or 625, 270 Mb/s component digital video output without OSD text or audio bargraphs
- One monitoring composite analog video output with OSD text and bar graph 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 (if -s option ordered)
- Infinitely variable output phase (27MHz clock increments)
- Freeze modes: Rev 2 hardware: black
- Freeze modes: Rev A and greater hardware: black, freeze
- Pot adjustable free running frequency
- 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 condition
  Image enhancement and noise reduction controls included
  TBC mode available for non-time base corrected signalss
- Two GPI inputs are available to modify the display characteristics
- Two GPO output to indicate user definable fault conditions
- GPI/Os are available on a DB9 connector
- RS-232 Data logging port to log fault conditions
- VistaLINK™ - enabled offering remote monitoring, control and configuration capabilities via SNMP (using VistaLINK™ PRO or 9000NCP 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

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
- Additional audio delay (5 seconds) or Advance (1 frame)
- 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

The Features of "-AES" option are:

- 75Ω coaxial (unbalanced) AES inputs (2) on BNC
- Audio delay equivalent to video delay
- Additional audio delay (5 seconds) or Advance (1 frame)
- One group (2 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

Composite Video A to D with optional Frame Synchronizer, Quad Audio ADC & Audio Embedder

Specifications

Analog Video Input:

Standard:	NTSC (SMPTE 170M), PAL (ITU624-4)
Number of Inputs:	1
Connector:	BNC per IEC 169-8
Signal Level:	1V nominal
Freq. Lock Range:	±75ppm from nominal
Input Lvl Ctrl Range:	±15%
Black Lvl Ctrl Range:	±5 IRE
Chroma Lvl Ctrl Range:	±20% (only if chroma AGC enabled)
Hue Ctrl Range:	±20 deg. (NTSC only)
Input Impedance:	75Ω or high impedance (jumper selectable)
Return Loss:	>40dB up to to 10MHz
Hot Switch Lock up time:	Between 15-45 frames (may be longer with noisy signals)

Reference Video Input:

Standard:	NTSC (SMPTE 170M), PAL (ITU624-4)
Number of Inputs:	1
Connector:	BNC per IEC 169-8
Signal Level:	1V nominal
Freq. 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 Inputs:	1
Connector:	BNC per IEC 169-8
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:	1
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise/Fall Time:	900ps nominal
Overshoot:	<10% of amplitude
Return Loss:	>8dB to 270MHz (Rev. 2 PCB) >15dB to 270MHz
Embedded Audio:	SMPTE 272M-A

Decoder Performance (SDI output only):

Frequency Response:	<±0.1dB (100kHz to 4.1Mhz)
Differential Gain:	<+/-0.5% typical
Differential Phase:	<+/-0.2 deg typical
Noise Floor:	< -60dB RMS (VBI lines, black video, 15kHz to 5 MHz)
C/L Gain:	<±0.5%
C/L Delay:	<±9ns
Minimum Delay:	3.25 lines
Maximum Delay:	1 frame plus 3.25 lines

Analog Audio Input ("-A4" version):

Number of Inputs:	4
Type:	Balanced analog audio
Connector:	Removable terminal strip
Input Impedance:	20k Ω minimum (differential)
Sampling Freq.:	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 -0.5dB FS
THD+N:	<0.001% (>100dB) @ 1kHz, -0.5dB FS (rev 2) <0.001% (>100dB) @ 20Hz to 20kHz, -0.5dB FS (input video locked to genlock video)
CMRR:	> 100dB @ 1kHz

AES Audio Inputs (-AES version):

Number of Inputs:	2
Input Standard:	SMPTE 276M, single ended synchronous or asynchronous PCM AES
Connector:	BNC per IEC 169-8
Resolution:	24 bits
Sampling Rate:	32kHz to 48kHz

AES Audio Outputs (-4 & -AES version):

Number of Outputs:	2
Output Standard:	SMPTE 276M, single ended synchronous AES
Connector:	BNC per IEC 169-8
Resolution:	24 bits
Sampling Rate:	48kHz synchronous
User Bits:	Transferred to output in a non-real-time, non-block-contiguous manner
Minimum I/O Delay:	2.5µs (-AES versions) 2.1µs (-A4 versions)

General Purpose In/Out:

Number of Inputs:	2 (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 DB-9
Signal Level:	+5V nominal

Serial Port:

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:	10 Watts CDM + 9 Watts (-A4 option) = 19 Watts total
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Physical:

Number of Slots:	1 for non-audio versions 2 for audio versions (-AES, -A4)

Ordering Information:

7735CDM	Analog video A to D with optional frame synchronizer
7735CDM-A4	Composite analog video to SDI decoder OSD and VistaLINK™ monitoring, control & fault reporting with optional frame synchronizer
7735CDM-AES	Composite analog video to SDI decoder OSD and VistaLINK™ monitoring, control and fault reporting, with two AES inputs and two AES outputs with optional frame synchronizer **(not available in standalone enclosure)**

Accessories:

9000NCP	VistaLINK™ General Purpose Network Control Panel

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-CMultiframe
+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

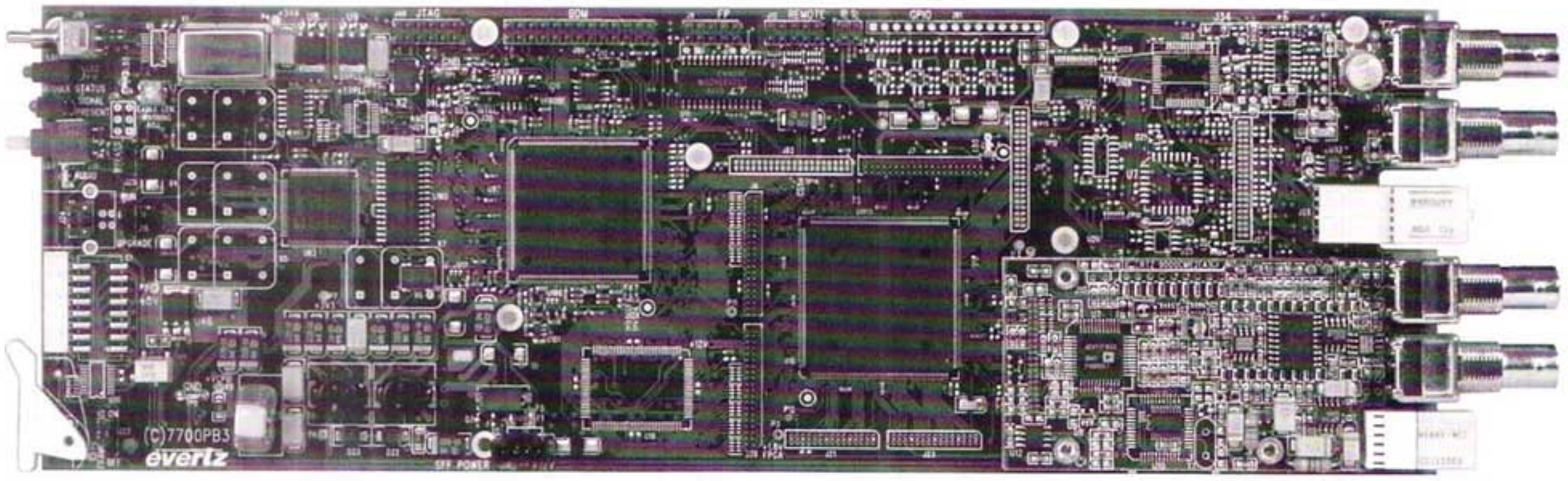
SDI Frame Synchronizer with Embedded Audio & AES Support

1I

Model 7745FS-EAES

Dolby E PARTNER

VistaLINK™



The 7745FS-EAES SDI video and audio frame synchronizer is designed to retime a 270 Mb/s SMPTE 259M (525 or 625 line) input to a local reference 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.

The 7745FS-EAES Frame Synchronizer contains an extensive list of additional features, including AES or embedded audio synchronization. The user can choose to have either 1 group from the upstream embedded audio or audio from the 2 AES inputs synchronized and embedded on the output and output as AES. In addition, Evertz Vistalink™ processing will analyze and report video and audio problems via an On-Screen-Display, or remotely via SNMP.

When the Processing (+P) option is added the frame synchronizer has the ability to adjust video parameters such as brightness, contrast and saturation, and audio parameters such as gain, mixing stereo pairs into monaural and reassignment of audio channels within the group.

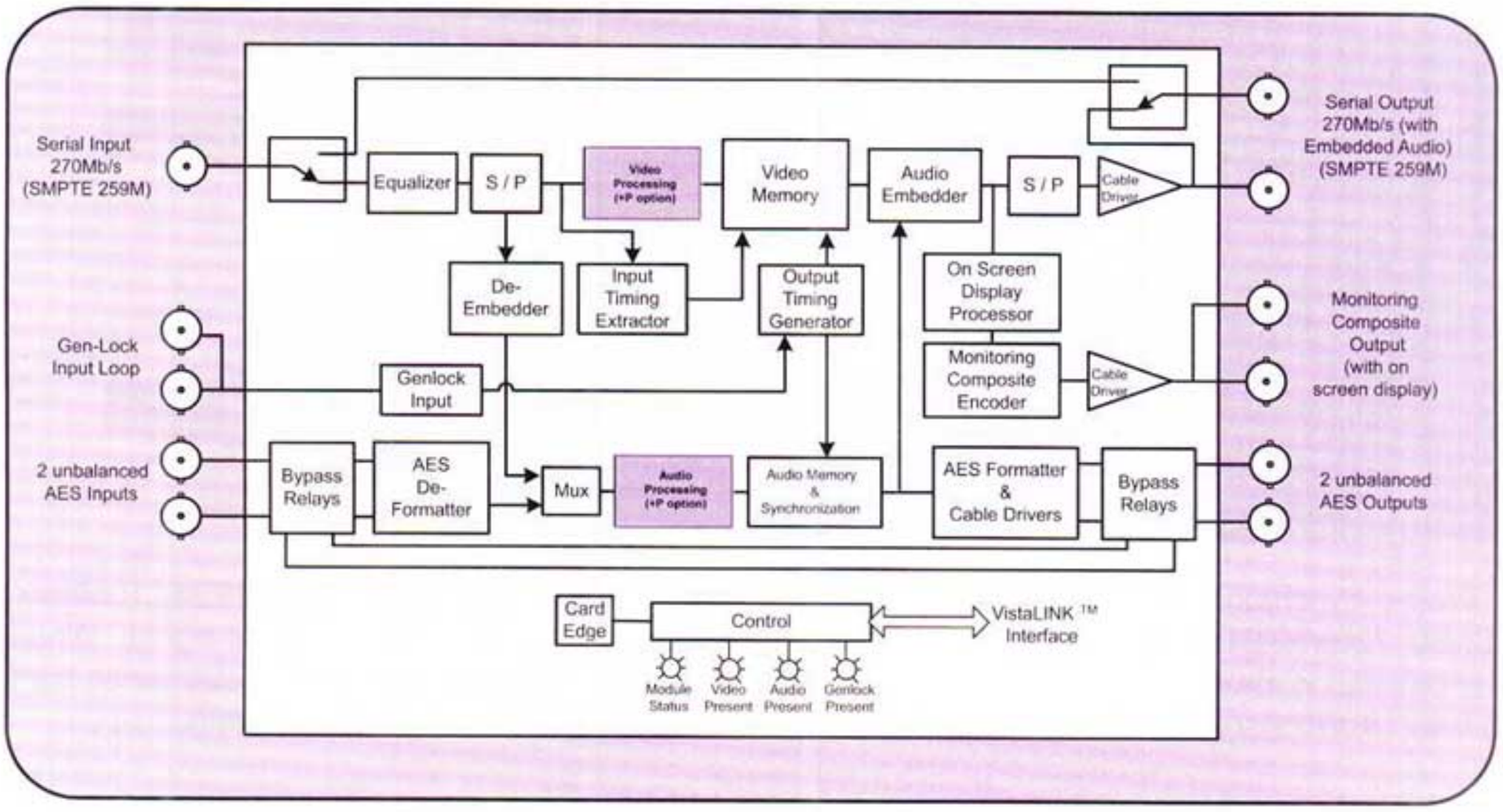
Features

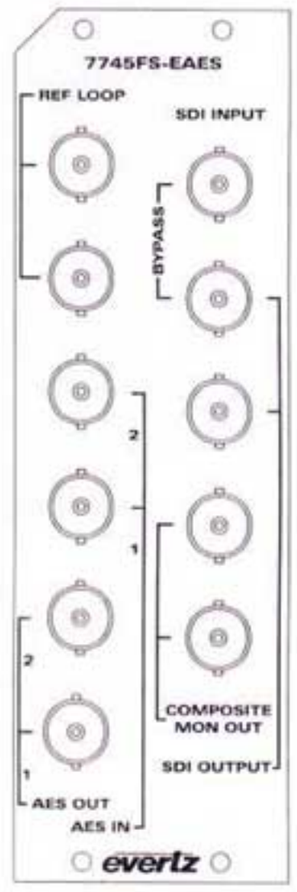
- SDI 525 or 625, 270 Mb/s component digital video input
- Bypass protected SDI 525 or 625, 270 Mb/s component digital video output, without OSD text or audio bargraphs
- Additional SDI output, non-bypass protected (same as bypass protected SDI output)
- Composite analog reference input loop (NTSC or PAL-B)
- Programmable output phase with respect to reference input (in 27MHz clock increments)
- One frame video synchronizer
- EDH encoding on SDI output
- Dolby E compliant
- Freeze on last good frame, or field, or go to Black on loss of video
- Adjustable free running frequency
- Two composite analog video outputs with OSD text and bargraph graphics
- 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 menu is available to configure the various features of the module
- Flexible configuration of the text and audio bar graph information displays
- On screen messages can be triggered by the configured fault conditions
- Synchronizes two external AES signals or 1 group of embedded audio to the video
- Synchronized audio is output as 2 AES signals and embedded onto the SDI video output
- AES outputs bypass relay protected on power loss
- Selected audio source is delayed equivalent to the video delay through the synchronizer
- Additional, user selected, audio delay may be added to, or removed from the delay used to match the video
- Minimum audio input to output delay - 98 samples when video delay is less than 64 lines
- Audio Sample Rate Converters can be disabled
- Selectable audio pass or mute when video input missing
- VistaLINK™ - enabled offering remote monitoring, control and configuration capabilities via SNMP (using VistaLINK™ PRO or 9000NCP 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 with +P Option

- Adjustable video black level (brightness), Y level (contrast) and chroma level (saturation)
- Independently adjustable audio levels on all channels
- Ability to combine stereo pairs to monaural
- Reassignment of audio channels within the embedded group

7745FS-EAES Block Diagram





Specifications

Serial Digital Video Input:

Standard:	SMPTE 259M-C (270Mb/s)
Number of Inputs:	1
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
Equalization:	Automatic 300m @ 270Mb/s Belden 8281(or equivalent)
Return Loss:	>15dB to 270MHz

Serial Digital Video Output:

Standard:	SMPTE 259M-C - 525 or 625 line component
Number of Outputs:	1 bypass relay protected 1 non-protected
Connector:	BNC per IEC 169-8
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
Wide Band Jitter:	< 0.2 UI

Reference Video Input:

Type:	NTSC, SMPTE 170M or PAL, ITU624-4 Color black 1Vp-p Composite Bi-level sync (525i/59.94 or 625i/50) 300mV
Number of Inputs:	2 (loop thru)
Connector:	BNC per IEC 169-8
Termination:	High impedance loop through
Return Loss:	>35dB up to 10MHz
SNR:	>50dB
Levels:	Max. 2Vp-p video Min. Sync level 150mV

Analog Monitoring Video Output:

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Outputs:	2
Connector:	BNC per IEC 169-8
Signal Level:	1V nominal
Output Impedance:	75Ω
Return Loss:	>35dB up to 10MHz

AES Audio Inputs and Outputs :

Standard	SMPTE 276M, single ended AES
Number of Inputs:	2
Number of Outputs:	2
Connector:	BNC per IEC 169-8
Resolution:	24-bits
Sampling Rate:	Synchronous or Asynchronous (32kHz to 48kHz on inputs, 48kHz on outputs)
User Bits:	Transferred to output with < 12ms delay

Input to Output Processing Delay:

Video Processing Delay	
Synchronizing:	3 µs to 1 frame 3 µs
Output Phasing:	up to 1 frame of additional delay
Audio Processing Delay	
AES Input to Output:	140 samples when video delay is less than 64 lines Same as video delay when video delay is greater than 64 lines
Embedded to Aes:	4.5 ms to 1 frame plus 4.5 ms
Aes to Embedded:	4.5 ms to 1 frame plus 4.5 ms

Processing Functions: (+P option only)

Video	
Black Level:	+/- 7%
Luminance gain:	+/- 6dB
Chroma gain:	+/- 6dB
Audio Gain:	+/- 24dB

Physical:

Number of Slots:	2

Electrical:

Voltage:	+12V DC
Power:	< 12 Watts
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Ordering Information:

7745FS-EAES	SDI Frame Synchronizer with Embedded Audio and AES Support

Ordering Options

+P	Video and audio processing functions

Accessories:

9000NCP	VistaLINK™ General Purpose Network Control Panel

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:

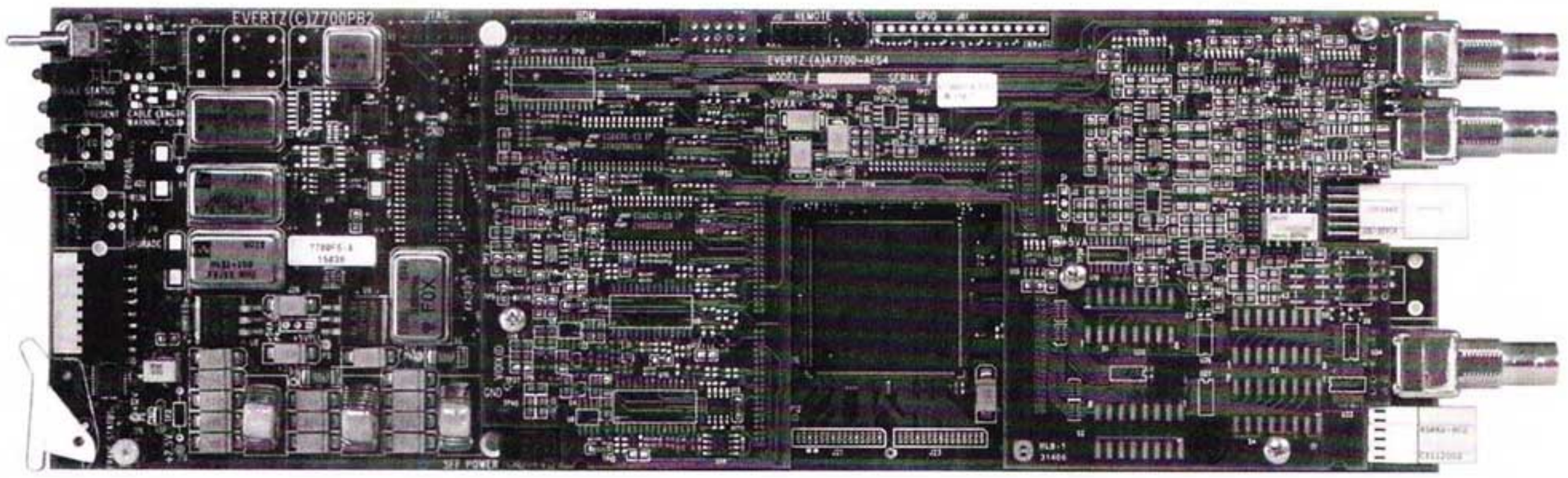
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules

Note: This module not available in a standalone enclosure

Model 7745FS-HD

Dolby E PARTNER

VistaLINK™ Your Eyes & Ears for Monitoring Single or Multi-Channel Operations



The 7745FS-HD series HDTV Frame Synchronizers are designed to retime a SMPTE 292M (1080i/60, 1080i/59.94, 1080i/50, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94 or 480p/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 7745FS-HD is available in two versions to suit various application requirements.

	Synchronizes			AES Audio	
Model	Video	Embedded	AES	Inputs	Outputs
7745FS-HD	Yes	Removes	No	-	--
7745FS-EAES4-HD	Yes	Demux and mux 2 Groups	4	4	4

On the basic 7745FS-HD version only the video signal is synchronized, and any audio present at the video input will be removed. On the 7745FS-EAES4-HD version, the user can choose to have either 2 groups from the upstream embedded audio or audio from the 4 AES inputs synchronized and embedded on the output video and output as AES. The 7745FS-EAES4-HD can also pass all VANC data. The 7745FS-EAES4-HD also has the ability to set the audio delay independently from the video delay.

When the Processing (+P) option is added, the frame synchronizer has the ability to adjust video parameters such as brightness, contrast and saturation, and audio parameters such as gain, mixing stereo pairs into monaural and reassignment of audio channels within the groups.

Features

- Synchronizes 1080i/60, 1080i/59.94, 1080i/50, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94 or 480p/59.94
- Minimum video input to output delay - 3 lines
- Maximum video input to output delay - 1 frame plus 3 lines
- Additional frames of delay can be added (3 frames on basic version, 7 frames on EAES4 version)
- Program Video output bypass relay protected on power loss or GPI (GPI not available on EAES4 version)
- Programmable output phase with respect to reference input
- Freeze on last good frame, or field, or go to black on loss of video
- Front panel LEDs indicate: module fault, video, audio and gen lock present
- GPI Input control of Relay Bypass and Freeze (not available on EAES4 version)
- GPO Output indicating Loss of Input Video (not available on EAES4 versions)
- Serial remote data logging
- VistaLINK™ - enabled offering remote control and configuration capabilities via SNMP (using VistaLINK™ PRO or 9000NCP 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:

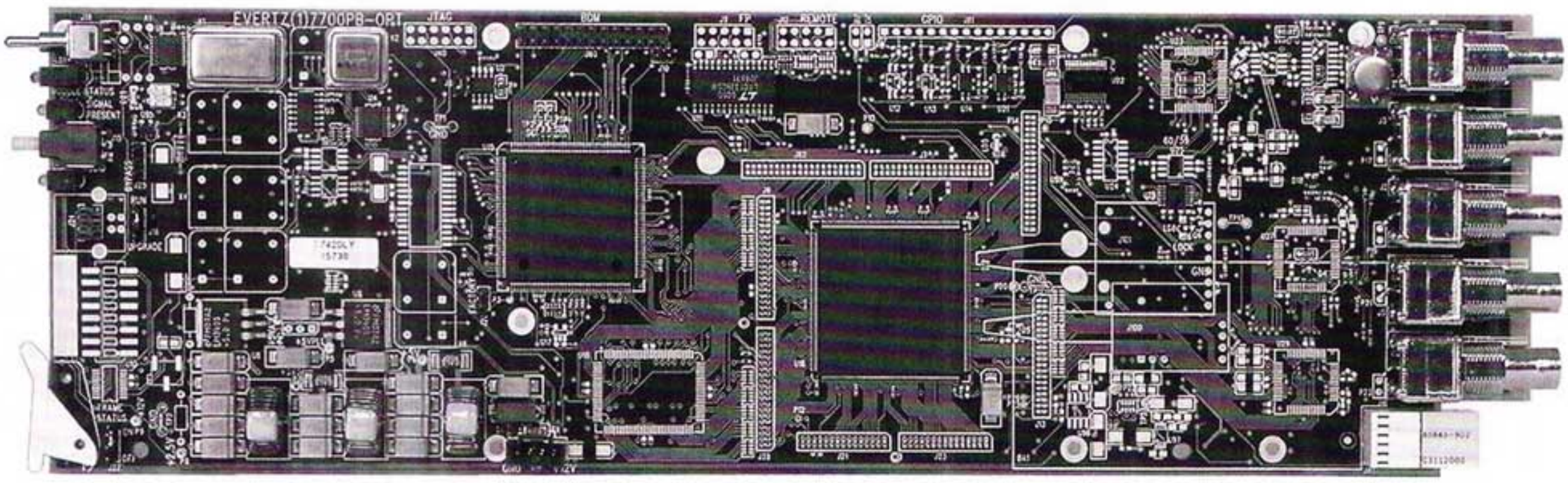
- Synchronizes four external AES signals or 2 groups of embedded audio to the video
- Synchronized audio is output as 4 AES signals and embedded on output video
- AES outputs bypass relay protected on power loss
- Minimum audio input to output delay - 98 samples when video delay is less than 64 lines
- Maximum audio input to output delay - 7 frames
- Separate control of video and audio delay
- Audio Sample Rate Converters can be disabled
- Synchronizes VANC data (including RP188 time codes) starting after switch line
- Dolby E compliant

Additional Features when +P option added:

- Adjustable video black level (brightness), Y level (contrast) and chroma level (saturation)
- Independently adjustable audio levels on all channels
- Ability to combine stereo pairs to monaural
- Reassignment of audio channels within the embedded groups

1I

Model 7742DLY-HD



The 7742DLY-HD is a full function HD 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 7742DLY-HD will delay all VBI and Ancillary data including embedded audio along with the video. The 7742DLY-HD is capable of over 2 seconds of HD delay (refer to website for updated delay information). The delay can be set in frames, lines and samples or in seconds.

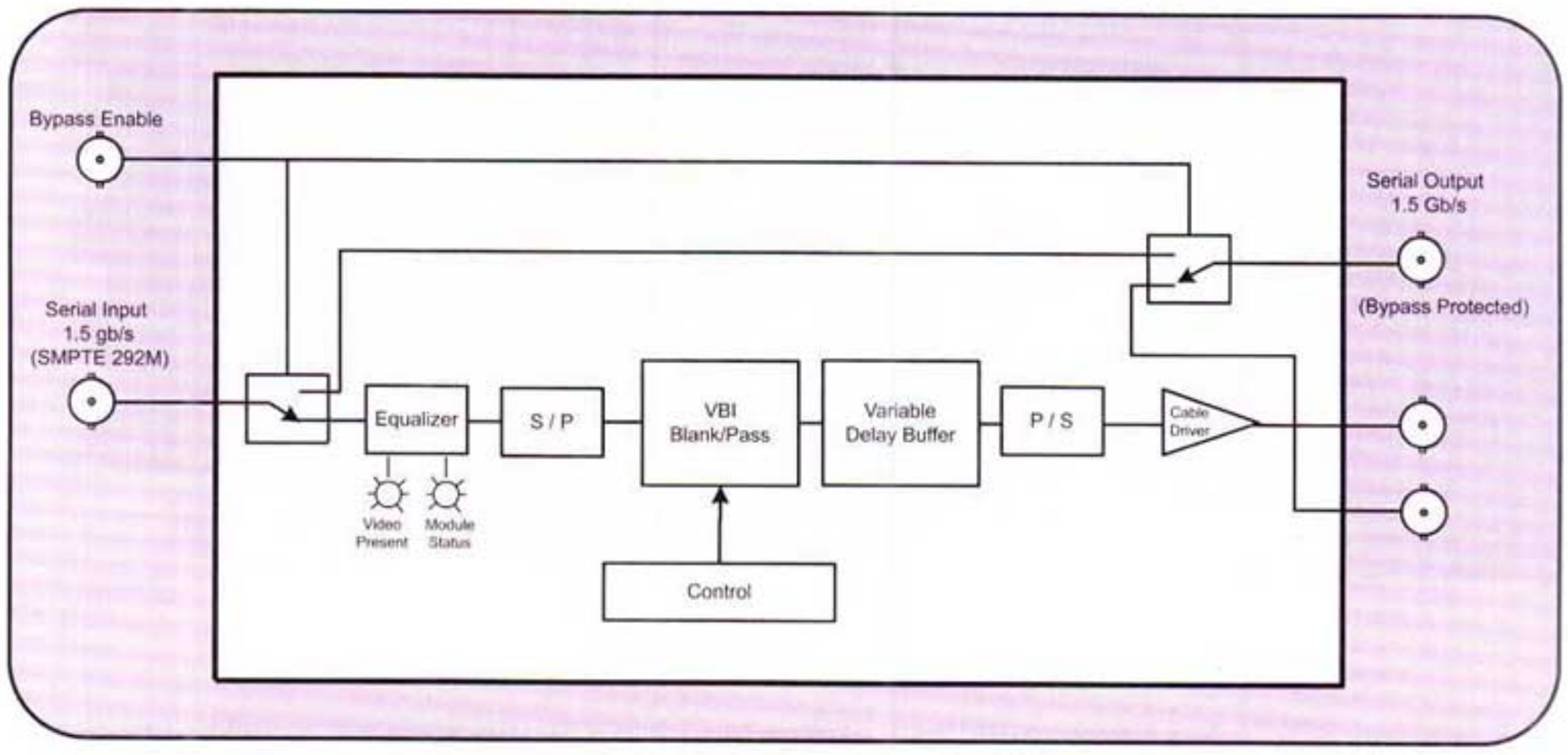
With the broadcast environment in mind, the modules feature bypass relay protection one output.

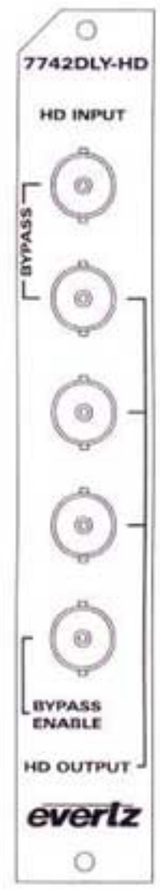
The 7742DLY-HD module is housed in a 3RU frame that will hold up to 15-7742DLY-HD modules or a 1RU frame that will hold up to 3 modules.

Features

- Full signal delay capability including VBI and ANC DATA for SMPTE 292M (1.5Gb/s) signals
- Delay programmable in frames, lines and samples or in seconds
- Setup via VistaLINK™ PRO config or via com port
- Bypass relay for program path protection on power loss
- Over 2 seconds of HD delay

7742DLY-HD Block Diagram





Specifications

HD Video Input:

Standard:	SMPTE 292M (1.5Gb/s)
Connector:	BNC per IEC 169-8
Equalization:	Automatic 75m @ 1.5Gb/s with Belden 1694 (or equivalent)
Relay Bypass Mode:	GPI activated loop through of 50m Loss of power loop through of 100m
Return Loss:	>15 dB up to 1GHz >10 dB up to 1.5 GHz (with relay)

HD Video Output:

Number of Outputs:	3
Connectors:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ± 0.5V
Rise and Fall Time:	200ps nominal
Overshoot:	<10% of amplitude
Wide Band Jitter:	<0.15 UI

Electrical:

Voltage:	+12VDC
Power:	6 Watts
Safety:	ETL listed Complies with EU safety directives
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Physical:

Number of Slots:	1

Functional:

Minimum Delay:	815 nsec
Maximum Delay:	Approx 2 seconds

Ordering Information:

7742DLY-HD	HD Video Delay

Ordering Options

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

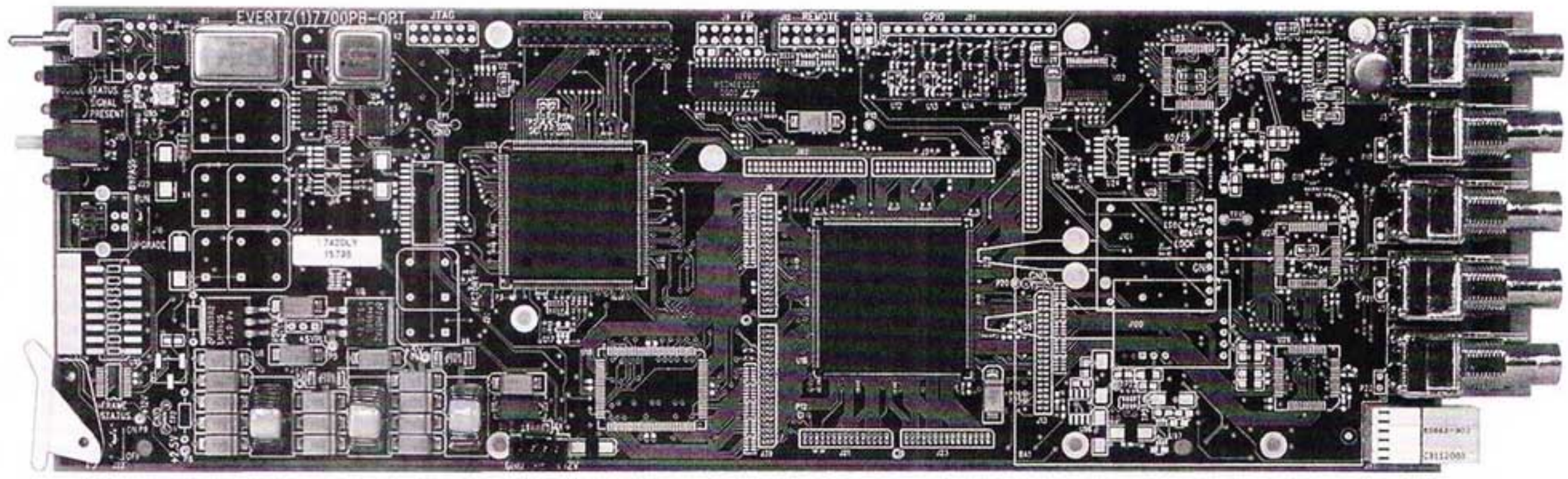
Rear Plate Suffix

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

Enclosures:

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

Model 7740DLY/7742DLY



The 7740DLY and 7742DLY are full function SDI Video Delay modules 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.

These units will delay all VBI and Ancillary data including embedded audio along with the video. The 7740DLY is capable of delaying video up to 0.5 seconds. The 7742DLY is capable of up to 2.3 seconds of delay. The delay can be set in frames, lines and samples or in seconds.

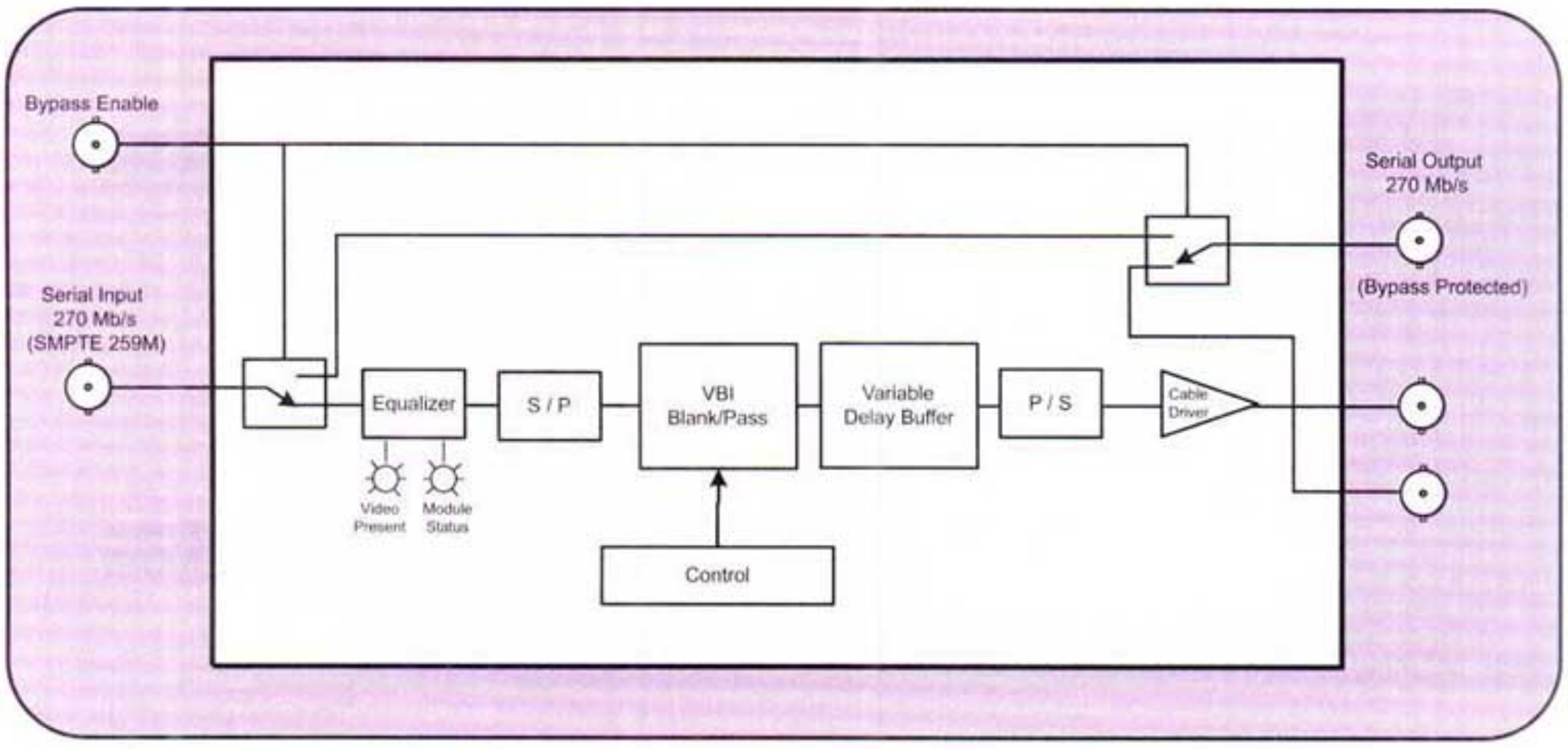
With the broadcast environment in mind, the modules feature bypass relay protection on one output.

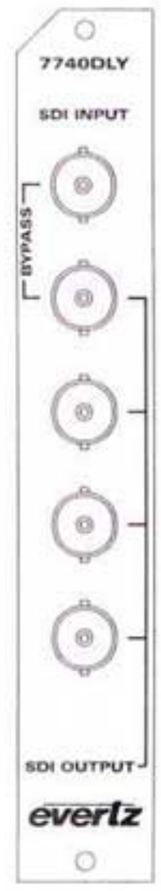
The 7740DLY and 7742DLY modules are housed in a 3RU frame that will hold up to 15 modules or a 1RU frame that will hold up to 3 modules.

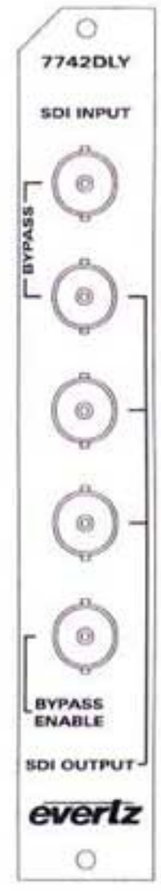
Features

- Full signal delay capability including VBI and ANC DATA
- Setup via on screen menu
- Delay programmable in frames, lines and samples or in seconds
- Dual standard, 525 or 625
- Bypass relay for program path protection on power loss
- 7740DLY for up to 0.5 seconds of delay
- 7742DLY for up to 2.3 seconds of delay

7740DLY/7742DLY Block Diagram







Specifications

Serial Video Inputs:

Standard:	SMPTE 259M-C (270 Mb/s)
Connector:	BNC input per IEC 169-8
Equalization:	Automatic to 210m with Belden 8281 or equivalent cable
Return Loss:	> 15 dB up to 270 Mb/s

Serial Video Outputs:

Number of Outputs:	1 with relay bypass, 2 additional outputs
Connector:	BNC per IEC 169-8
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

Electrical:

Voltage:	+12VDC
Power:	6 Watts
Safety:	ETL Listed
	Complies with EU safety directives
EMI/RFI:	Complies with FCC Part 15, Class A
	EU EMC Directive

Physical:

Number of Slots:	1

Functional:

Minimum Delay:	815 nsec (22 samples)
Maximum Delay:	
Model 7740DLY	525 line: 17 frames, 625 line: 14 frames (approx 0.5 seconds)
Model 7742DLY	525 line: 70 frames, 625 line: 59 frames (approx 2.3 seconds)

Ordering Information:

7740DLY	SDI Video Delay (0.5 seconds max)
7742DLY	SDI Video Delay (2.3 seconds max)

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

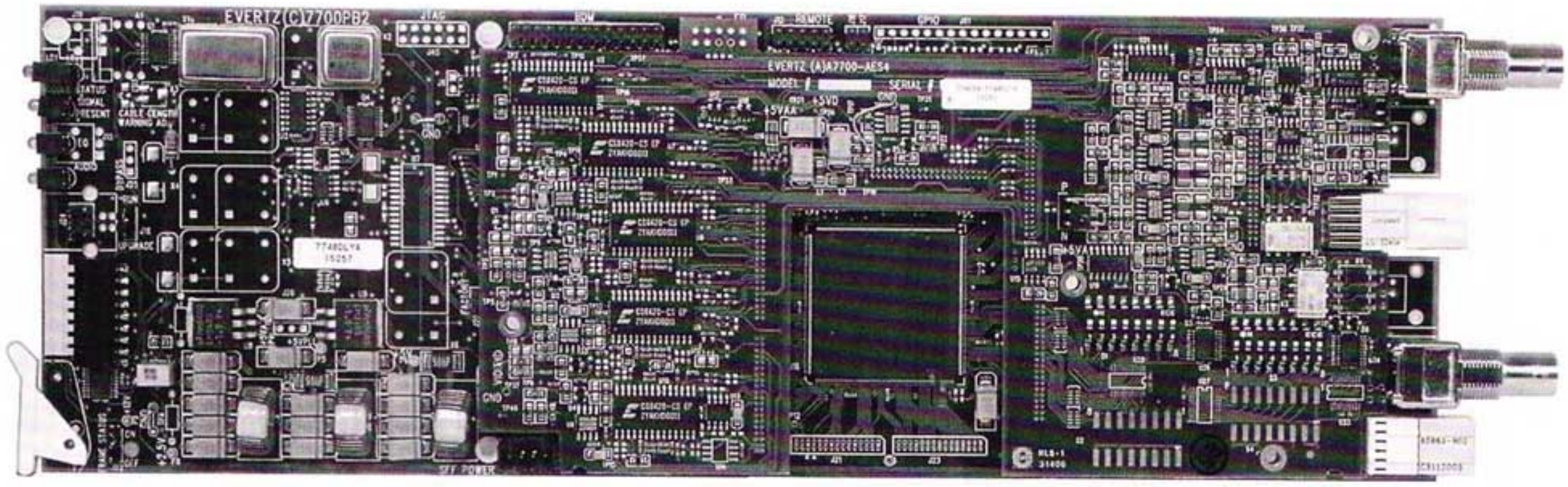
Enclosures:

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

Quad AES Delay

1I

Model 7740DLY-AES4

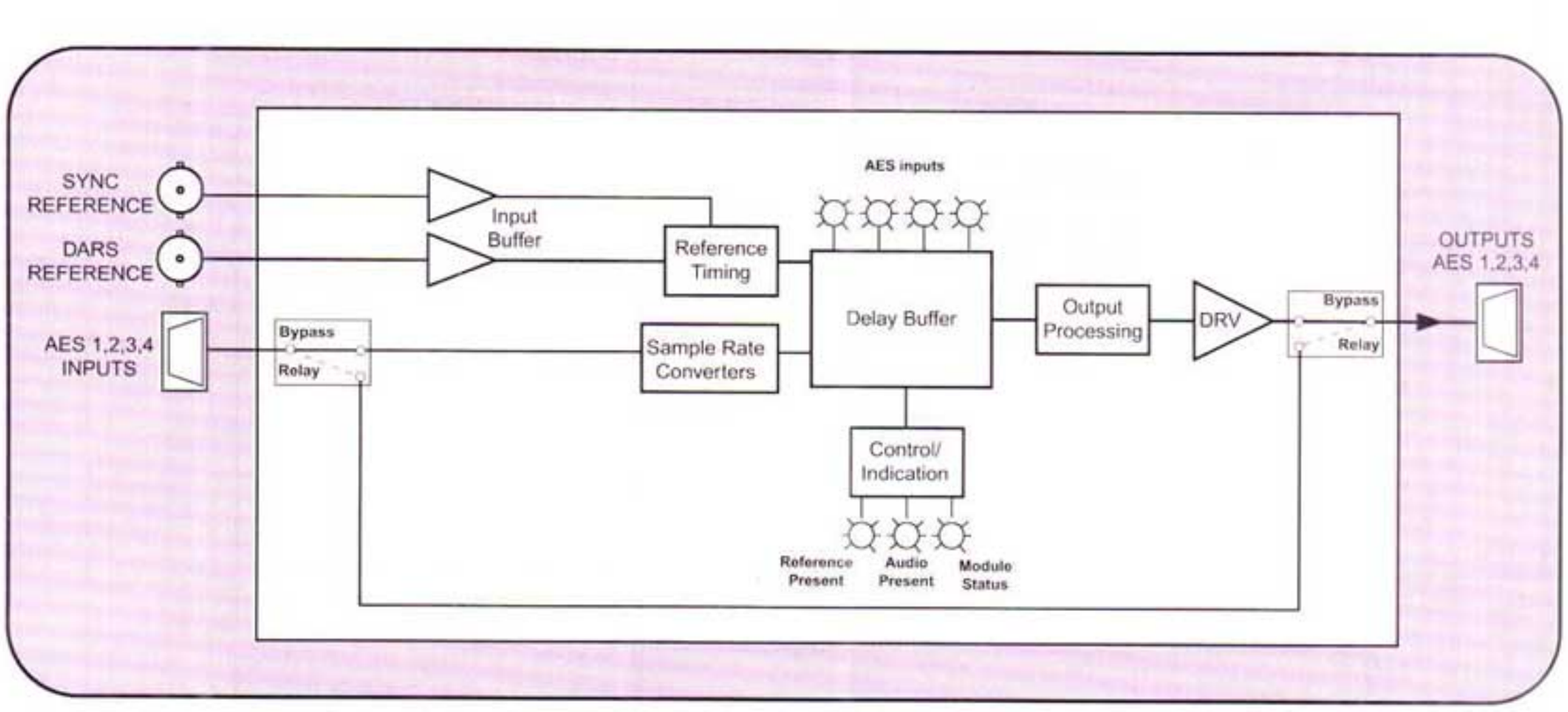


The 7740DLY-AES4 digital audio delay provides a cost effective method of retiming AES Audio. The module accepts either an analog composite sync or AES digital audio reference, and maximum of four asynchronous / synchronous 48kHz unbalanced AES digital audio inputs; and provides four synchronous outputs with selectable delay values. Each AES pair can be sample rate converted along with independent channel swap operation. External loop-through connections can be applied to cascade delays in order to achieve longer delay values.

Features

- Automatically detect and lock to either external analog composite sync or AES digital audio reference
- Delay four 48kHz unbalanced AES digital audio inputs simultaneously
- Independent controls for each AES input pair
- Supports audio sample resolutions of 20 and 24 bits
- Selectable sample rate conversion or pass through input audio processing
- Support audio channel swap operation for all AES inputs simultaneously
- Selectable fine or coarse delay in 1.04 ms (50 samples) or video field, respectively
- Maximum delay of 2.13 seconds and 2.56 seconds for NTSC and PAL mode, respectively
- Bypass relay outputs at the loss of power
- Card edge LEDs indicate reference presence, audio input presence and swap mode operation.

7740DLY-AES4 Block Diagram





Specifications

AES Audio Inputs and Outputs:

Standard:	SMPTE 276
Number of Inputs:	4 AES @ 48kHz
Number of Outputs:	4 AES @ 48kHz
Connector:	15 pin High density D
Resolution:	20 or 24-bit
Sampling Rate:	48 khz
Signal Level:	1V p-p

Video Reference:

Type:	NTSC or PAL colour black nominal 1 Vp-p composite bi-level sync (525i or 625i) 300mV nomial
Connector:	1 BNC per IEC 169-8
Termination:	75Ω (jumper selectable)

AES Digital Audio Reference:

Standard:	SMPTE 276M
Connector:	BNC per IEC 169-8
Resolution:	20 or 24-bit
Sampling Rate:	48 khz
Impedance:	75Ω

Analog Composite Sync Reference:

Standard:	NTSC or PAL 1Vp-p or color black or composite bi-level sync 300 mV
Connector:	BNC per IEC 169-8
Impedance:	75Ω

Electrical:

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

Phyiscal:

Number of Slots:	1

Ordering Information:

7740DLY-AES4	Quad AES Delay (includes breakout cable for High Density DB15 to 8 BNC's)

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

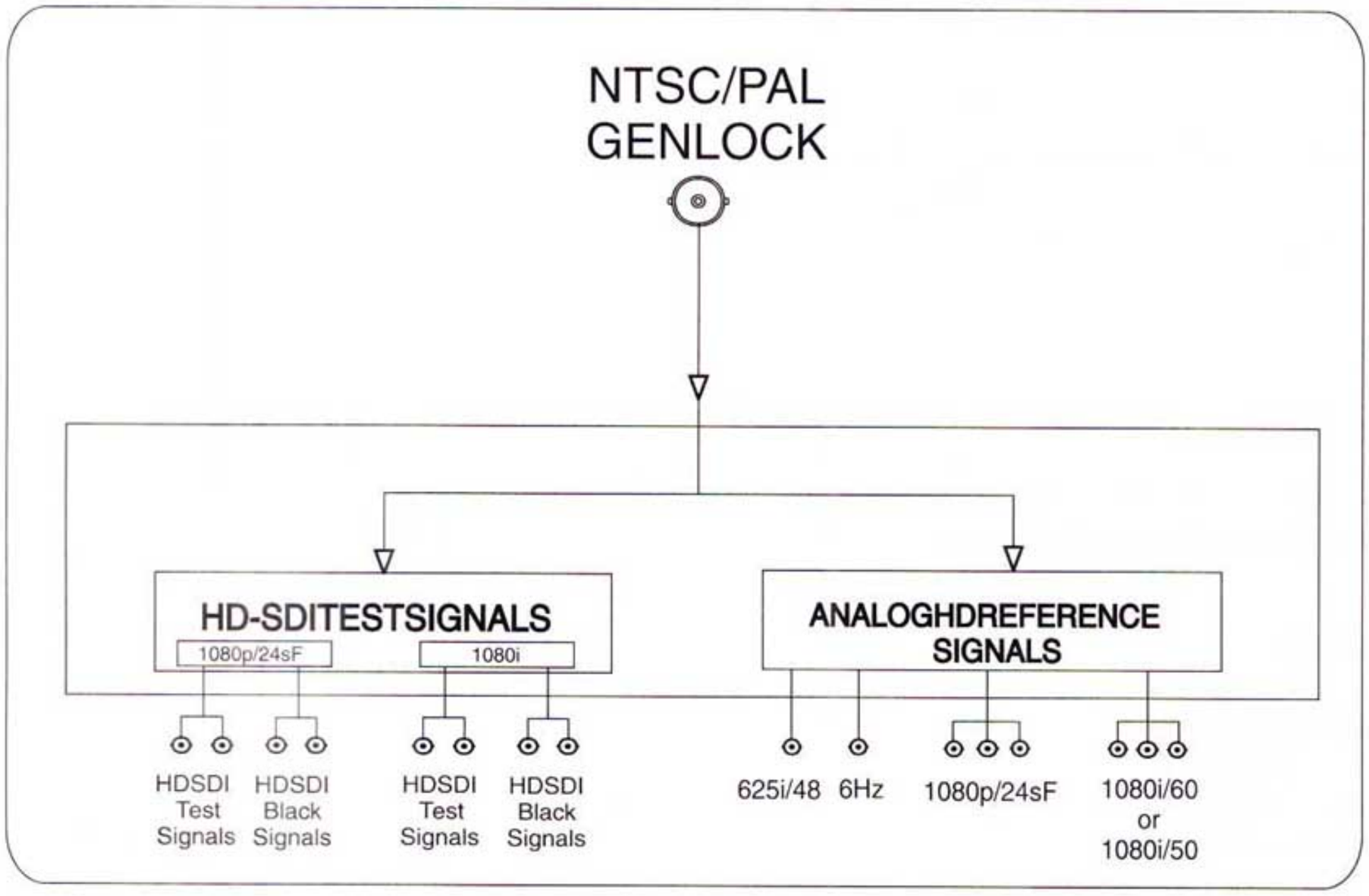
Enclosures:

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

HD Reference Generator/ Test Set System

1m

Model PKG7752RGTS-HD



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.

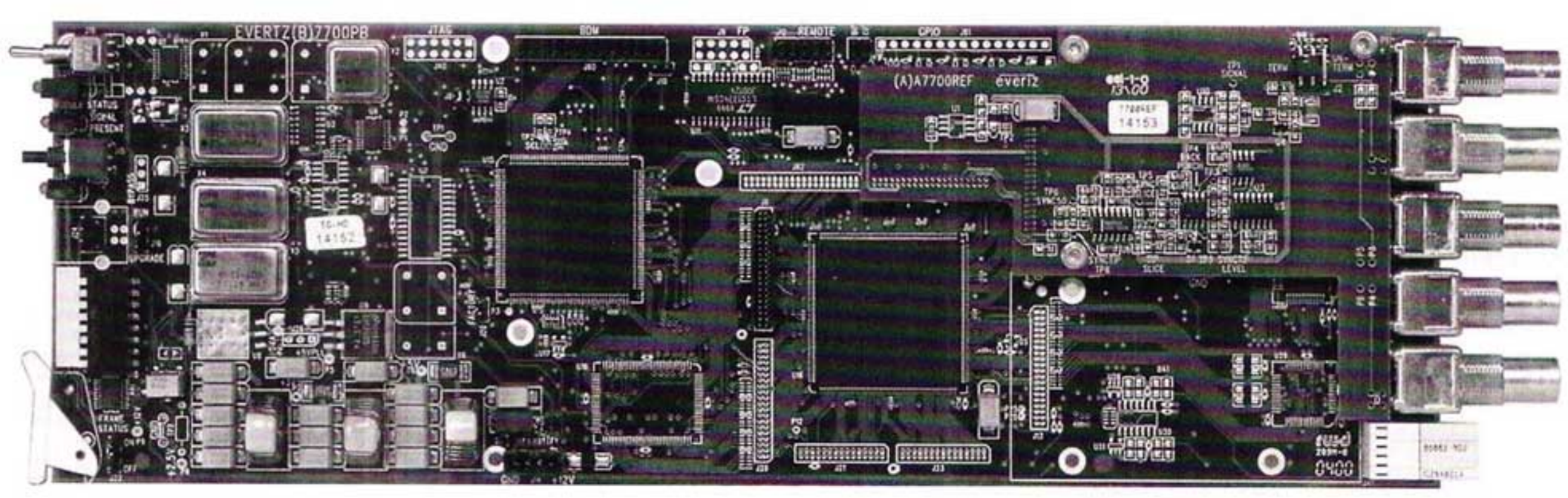
Features

- 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

HD Test Signal Generator

1m

Model 7750TG-HD



The 7750TG-HD Test Signal Generator provides a cost-effective method of generating 1.5 Gb/s HDTV test signals. The 7750TG-HD is ideal for checking signal path integrity, or to determine system performance over varying cable lengths. The 7750TG-HD generates test signals in a wide variety of SMPTE 292M video formats and offers four 1.5 Gb/s outputs.

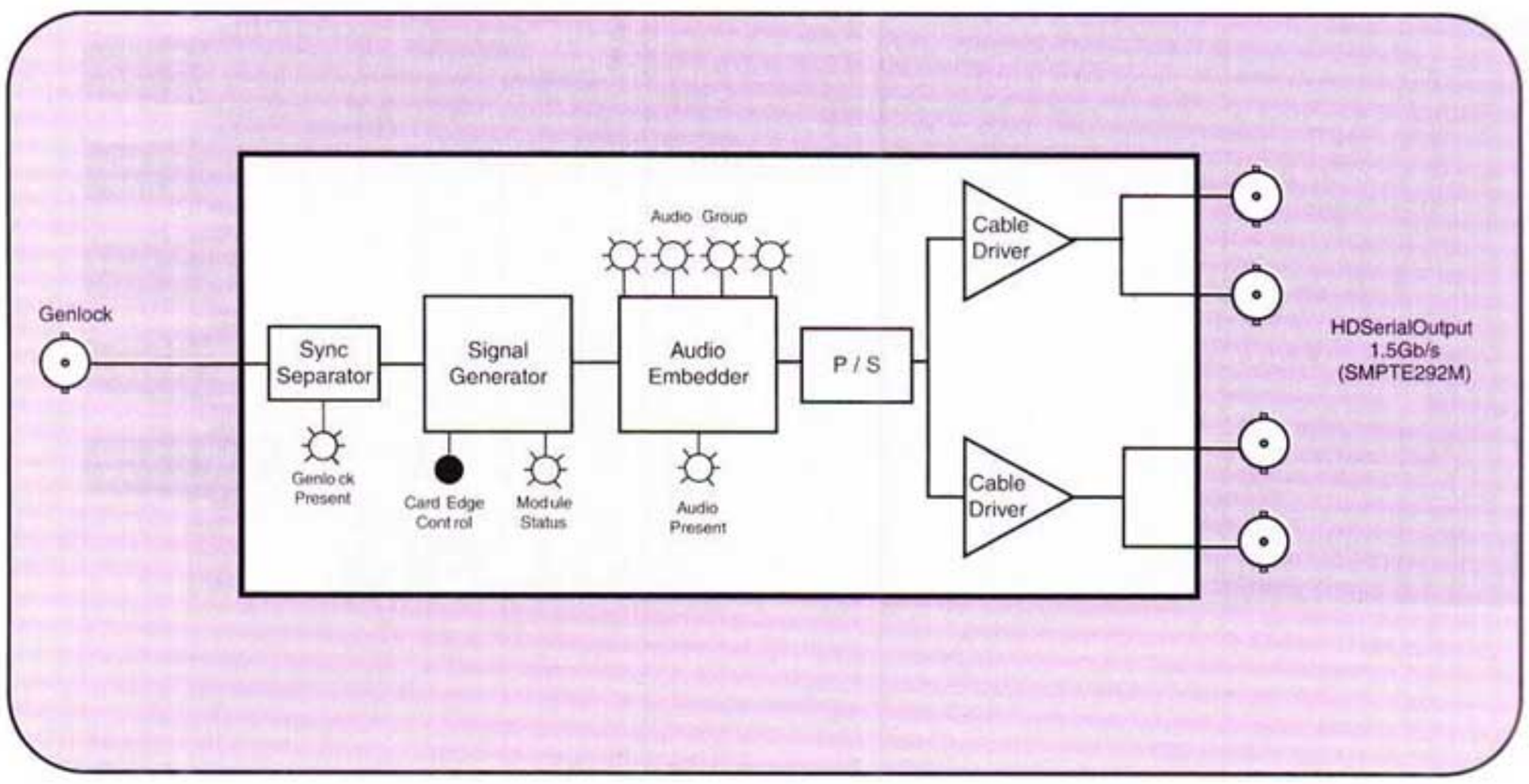
The 7750TG-HD provides an analog genlock input that allows you to synchronize the test signals to your plant horizontal and vertical timing.

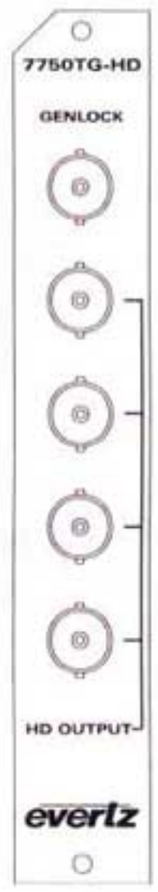
Separate audio tones can be embedded into each channel of one of the four embedded audio groups. The user can select which of the audio groups the tones will be embedded into. The Audio level is fixed at -20 dB full scale.

Features

- Wide variety of 1080i, 1035I, 1080p and 720p output formats
- 8 position DIP switch selects output format
- Card edge toggle switch selects test signal
- Selectable gen lock input format - bi-level or tri-level sync, colour black
- 4 embedded audio tones, selectable audio group assignment
- 4 output drivers
- On screen display of test signal names
- On screen setup menu
- Tally output upon loss of gen lock
- Front panel LEDs indicate gen lock presence, module fault and audio signal presence on the output

7750TG-HD Block Diagram





Specifications

Genlock Input:

Type:	DIP switch 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:	1 BNC input per IEC 169-8
Termination:	75Ω (jumper selectable)

HD Serial Video Output:

Number of Outputs:	4
Standard:	SMPTE 292M (Selectable as follows) 1080i/60, 1080i/59.94, 1080i/50, 1080p/30,1080p/30sF, 1080p/29.97, 1080p/29.97sF, 1080p/25, 1080p/25sF, 1080p/24, 1080p/24sF, 1080p/23.98, 1080p/23.98sF, 720p/60, 720p/59.94, 720p/50, 1035i/60, 1035i/59.94
Embedded Audio:	Up to 4 tones in one audio group as specified in SMPTE 299M. Selectable tone frequencies (from 60Hz to 10kHz) and audio group. Audio Level is set to -20 dB full scale
Connectors:	4 BNC per IEC 169-8
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:	<0.20UI

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-HD	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

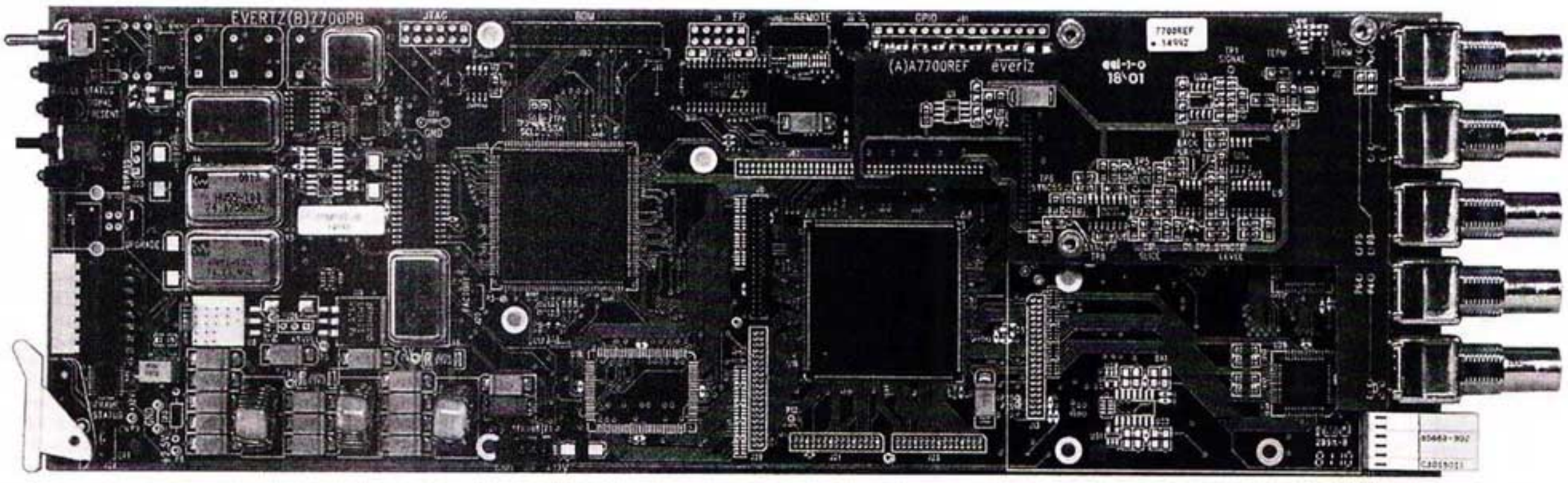
Enclosures:

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

Dual HD Test Signal Generator with Embedded Audio

1m

Model 7750TG2-HD



The 7750TG2-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 7750TG2-HD is ideal for checking signal path integrity, or to determine system performance over varying cable lengths. In single link mode, the 7750TG2-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 7750TG2-HD outputs a 4:4:4 test signal on two dual-link 4:4:4 outputs.

The 7750TG2-HD provides for an analog genlock input (tri-level or bi-level) 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. In dual link mode, the selected audio group can be embedded into either or both links. The audio level is fixed at -20dB full scale.

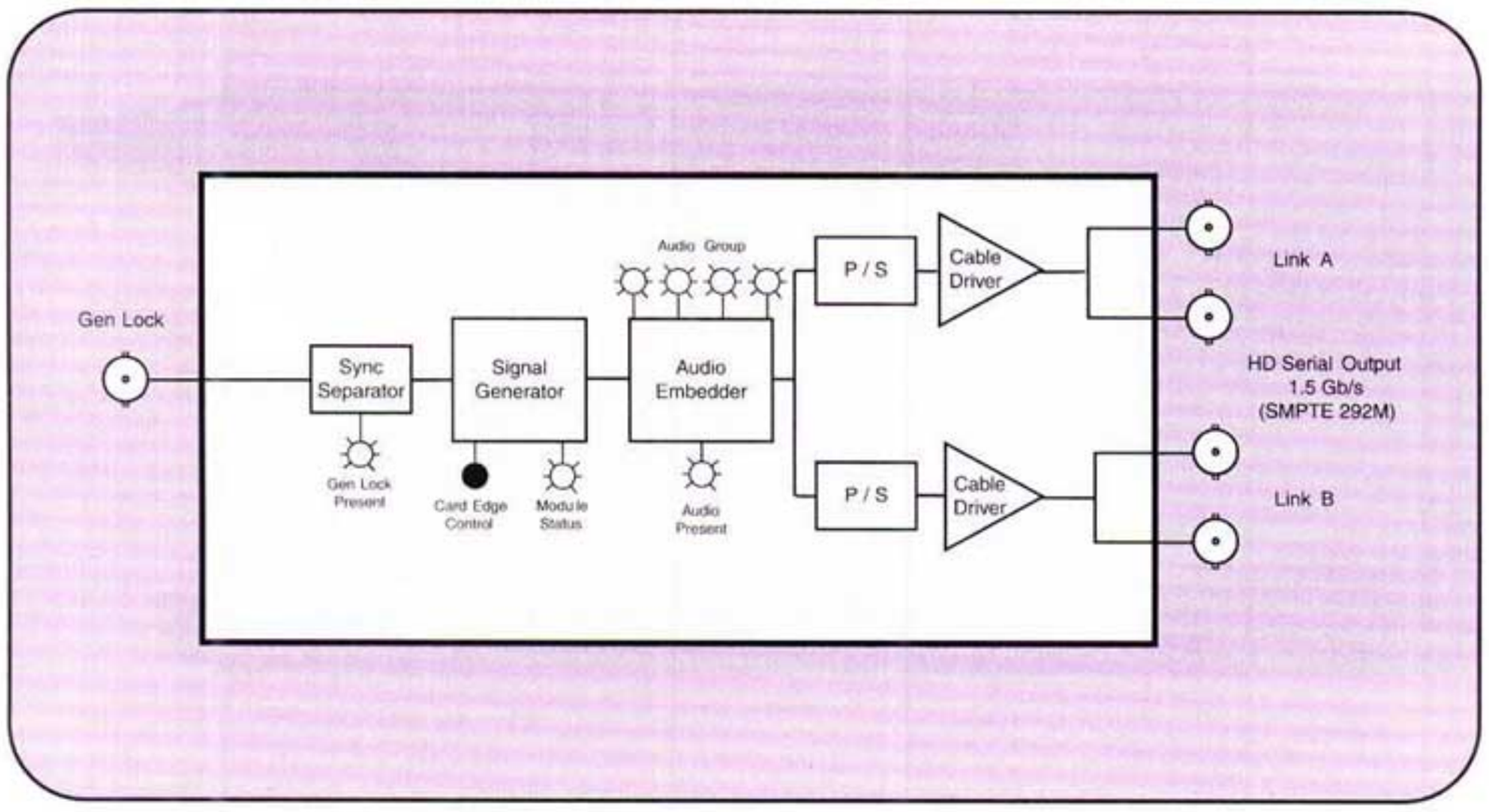
Features

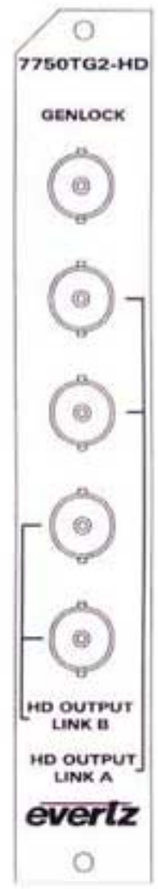
- Wide variety of 1080i, 1080p, 1035i and 720p output formats
- 8 position DIP switch selects output format, single or dual link and genlock reference
- Card edge toggle switch selects test signal
- Selectable genlock input format; bi-level or tri-level sync or color black
- 4 embedded audio tones, selectable audio group assignment
- Single link mode outputs 4:2:2 black on link B and selected 4:2:2 test signals on link A
- Dual link mode outputs 4:4:4 signal on link A and B in YC_bC_r or GBRA
- On screen display of test signal names
- On screen setup menu
- On screen text message can be used for source identification
- Card edge LEDs indicate module health, genlock presence as well as embedded audio presence/group
- Embedded audio and on screen displays can be inserted on either or both links

Dual HD Test Signal Generator with Embedded Audio

1m

7750TG2-HD Block Diagram





Specifications

Genlock 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:	1 BNC input per IEC 169-8.
Termination:	75Ω (jumper selectable)

HD Serial Video Outputs:

Standard:	SMPTE 292M, 4:2:2 YC_bC_r, 4:4:4 YC_bC_r, or 4:4:4 GBRA selectable 1080i/60, 1080i/59.94, 1080i/50, 1080p/30,1080p/30sF, 1080p/29.97, 1080p/29.97sF, 1080p/25, 1080p/25sF, 1080p/24, 1080p/24sF, 1080p/23.98, 1080p/23.98sF, 720p/60, 720p/59.94, 720p/50, 1035i/60, 1035i/59.94
Number of Outputs:	
Single Link Mode:	2 outputs of selected test signal (Link A) 2 outputs of black video (Link B)
Dual Link Mode:	2 dual link outputs of selected test signal
Embedded Audio:	Up to 4 tones in one audio group as specified in SMPTE 299M Selectable tone frequencies (from 60 Hz to 10kHz) and audio group
Connectors:	4 BNC per IEC 169-8
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:	<0.2UI

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:

7750TG2-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

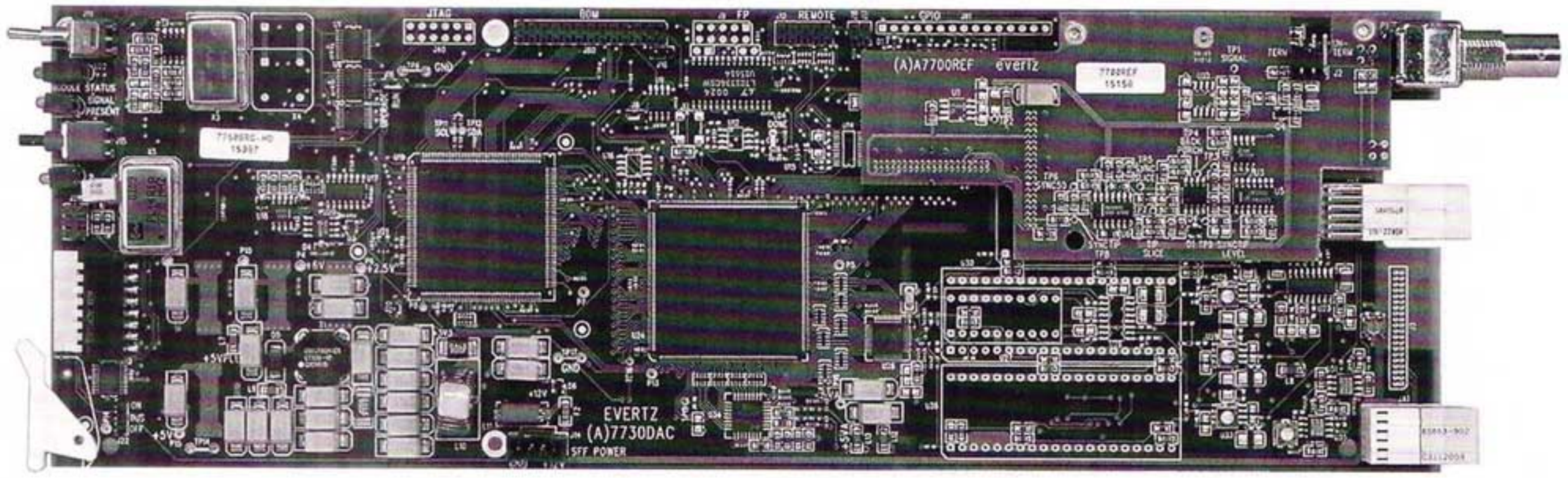
Enclosures:

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

HD Tri-Level Sync Generator

1m

Model 7750SRG-HD



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.

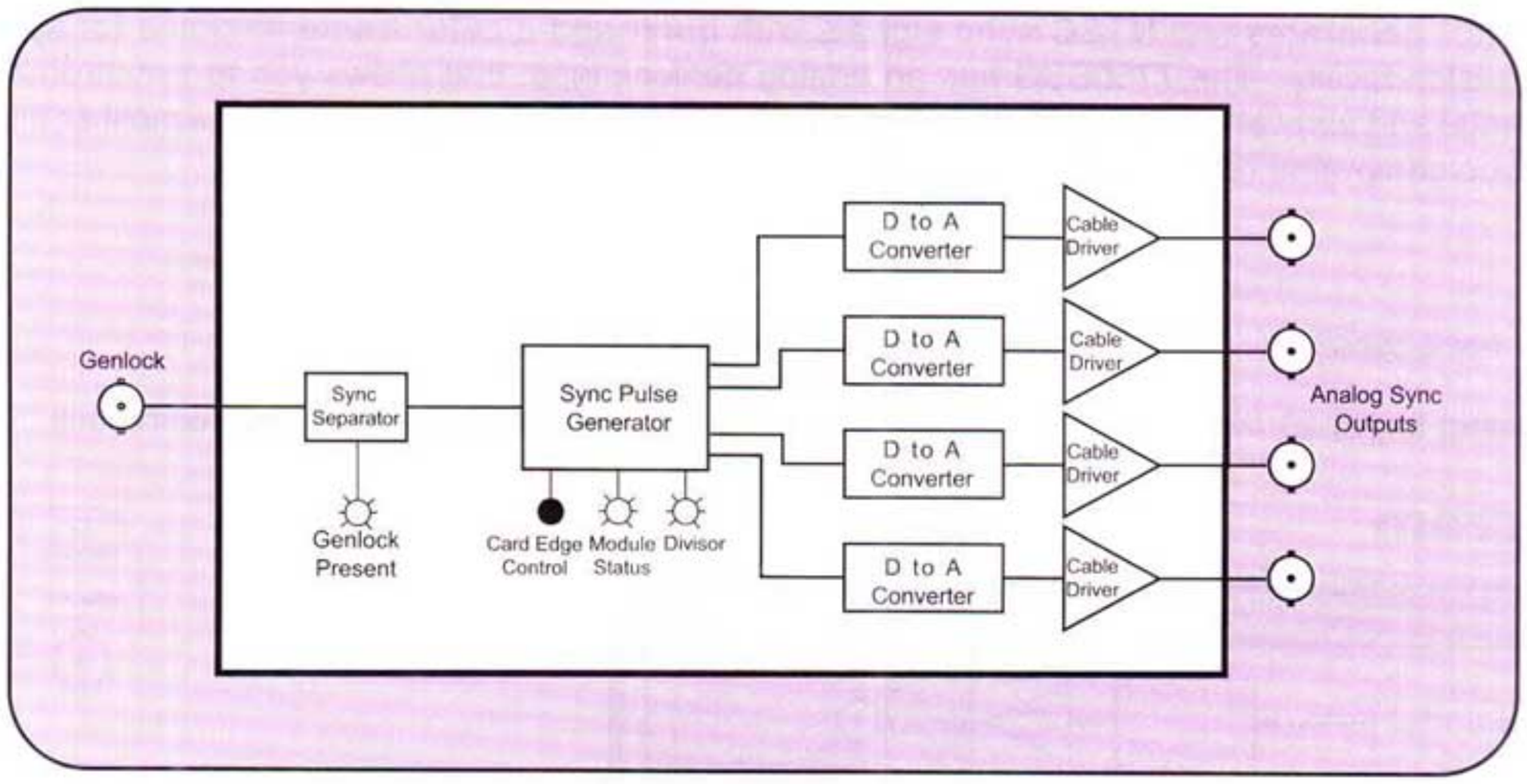
The 7750SRG-HD generates all analog sync signals defined by SMPTE 274M (1080i/p) and SMPTE 296M (720p) as well as those required for NTSC, PAL and slow PAL (625i/48) applications. The four independent sync outputs can be configured to output different sync signals. The common combinations of HDTV and SD analog sync outputs can be selected via card edge control.

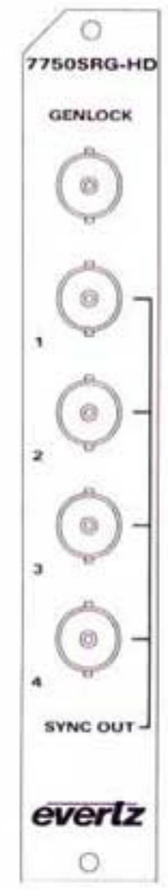
In conjunction with the 7700ADA-HD Analog Distribution Amplifier and the 7750TG-HD HDTV Test Signal Generator, this module will fulfill all of your slave sync generation requirements. (See the PKG7752RGTS-HD system brochure for details on our HDTV Reference Generator Test Set System applications)

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, NTSC, PAL and slow PAL sync output sync signals
- HSDL tri level sync for 2K data transfers
- 4 separate analog sync signal outputs
- 8 position DIP switch selects combinations of sync signal available
- Front panel LEDs indicate gen lock presence, module fault

Block Diagram 7750SRG-HD





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

1/1.001MultipleSetV iaDIPSwitchWhereApplicable
(See7750SRG-HDmanualformoreswitchsettings)

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 169-8
Termination: 75 Ω (jumper selectable)

Analog Sync Outputs:

Number of Outputs: 4
Standard: SMPTE 274M, 296M, NTSC, PAL, 6 Hz TTL, HDSL (Selectable as per above Table)
Connectors: 4 BNC per IEC 169-8
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

NTSC Slave Sync Generator

1m

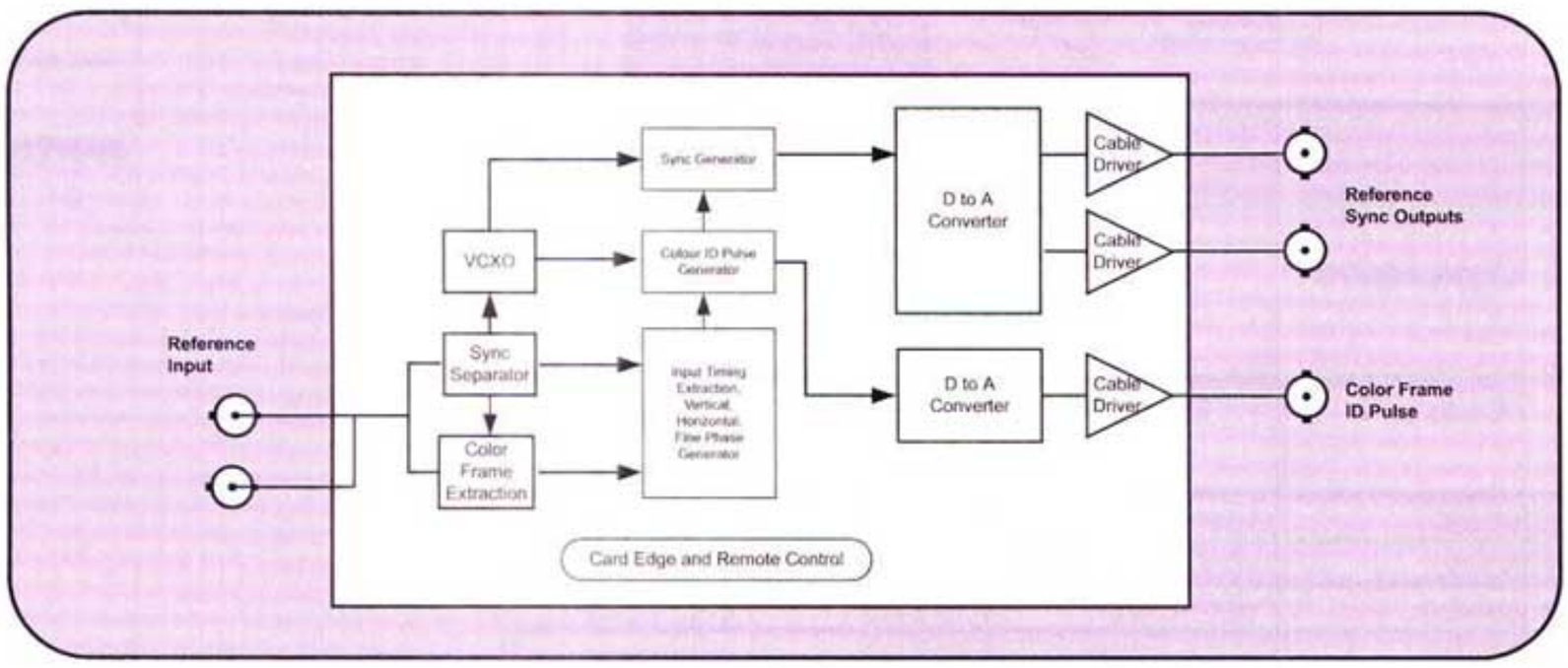
Model 7750SSG

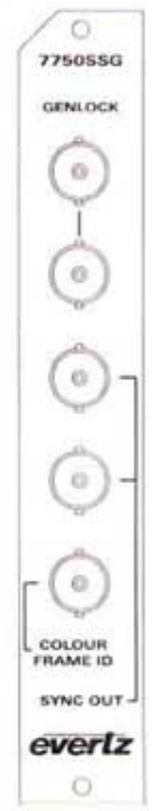
The 7750SSG Slave Sync Generator generates two NTSC sync signals with burst and a color frame ID pulse for synchronizing various devices in a television facility. The 7750SSG has an analog genlock input that allows you to synchronize the sync signals to your plant horizontal and vertical timing. In conjunction with the 7700ADA Analog Distribution Amplifier this module will fulfill all of your slave sync generation requirements.

Features

- NTSC color black genlock with color frame decode
- Free-runs with no genlock reference
- Phase adjustment of outputs with respect to genlock input
- 2 Separate signal outputs
- TTL Color Frame ID signal
- Front panel LEDs indicate genlock presence and module fault

7750SSG Block Diagram





Specifications

Genlock Input:

Type:	NTSC (SMPTE 170M) Color Black
Connector:	2 BNC per IEC 169-8
Termination:	High impedance loop through
Return loss:	>35 dB up to 10 MHz
SNR:	> 50dB
Levels:	1 +0.5Vp-p
Max Subcarrier Jitter:	< 1 degrees

Analog Sync Outputs:

Number of Outputs:	2
Signal Output Level:	1V p-p
Connector:	BNC per IEC 169-8
SYNC Level:	40IRE nominal
Burst Level:	40IRE nominal
DC Offset:	Back porch at 0V ± 100mV
Return Loss:	>35 dB up to 5 MHz
SC/H Phase:	< 1 degree
Sync rise/fall time:	140 ± 20ns
V Phasing:	Infinite lines
H Phasing:	Infinite samples (37ns/sample)
Fine Phasing:	± 24 degrees, in 0.24 degree increments

Color Frame ID Pulse Output:

Signal:	TTL amplitude active pulse high during field 1 of color field sequence
Connector:	BNC per IEC169-8
Impedance:	75Ω
DC Offset:	0V ± 100mV

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:

7750SSG	NTSC Slave 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

Model 7750TG

The 7750TG Test Signal Generator provides a cost SDTV 270 Mb/s test signals for use in a wide variety of applications. The 7750TG is an ideal tool for checking signal path integrity, or determining system performance over varying cable lengths. The 7750TG generates test signals in 525 line and 625 line SMPTE 259M-C video formats and offers four 270 Mb/s outputs. A wide variety of signals are available for component and composite link verification as well as monitor alignment.

The 7750TG provides an analog genlock input that allows you to synchronize the test signals to your plant horizontal and vertical timing.

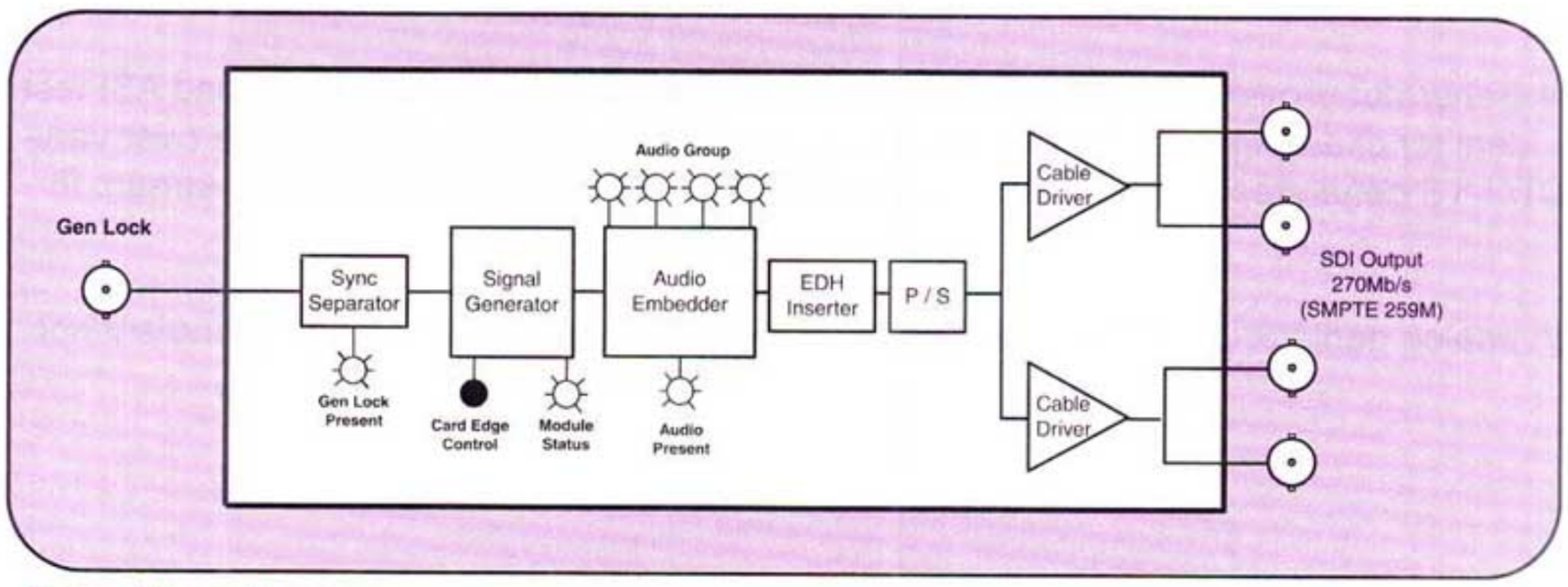
Error detection and handling (EDH) is embedded on all outputs for digital link performance verification.

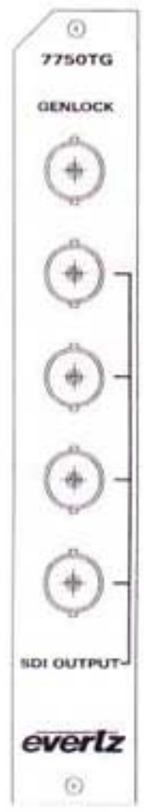
Separate audio tones can be embedded into each channel of one of the four embedded audio groups. The user can select which of the audio groups the tones will be embedded into. The Audio level is fixed at -20dB full scale.

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
- Front panel LEDs indicate genlock presence and module health

7750TG Block Diagram





Specifications

Genlock Input:

Type:	NTSC or PAL color black 1 V p-p Composite Bi-level sync (525 Line or 625 Line) 300mV or 4V
Connector:	1 BNC input per IEC 169-8.
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 MPTE 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 169-8
Signal Level:	800mV nominal
DC Offset:	0V ± 0.5V
Rise and Fall Time:	900ps 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

Phyical:

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

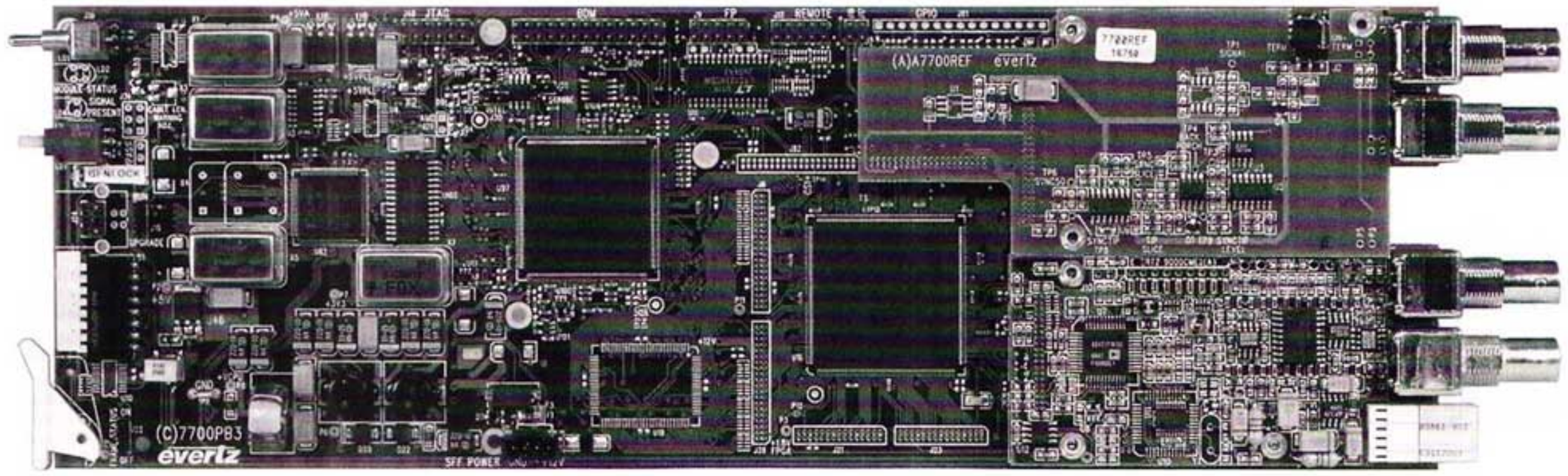
Enclosures:

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

Transport Stream Generator

1m

Model 7750TG-TS



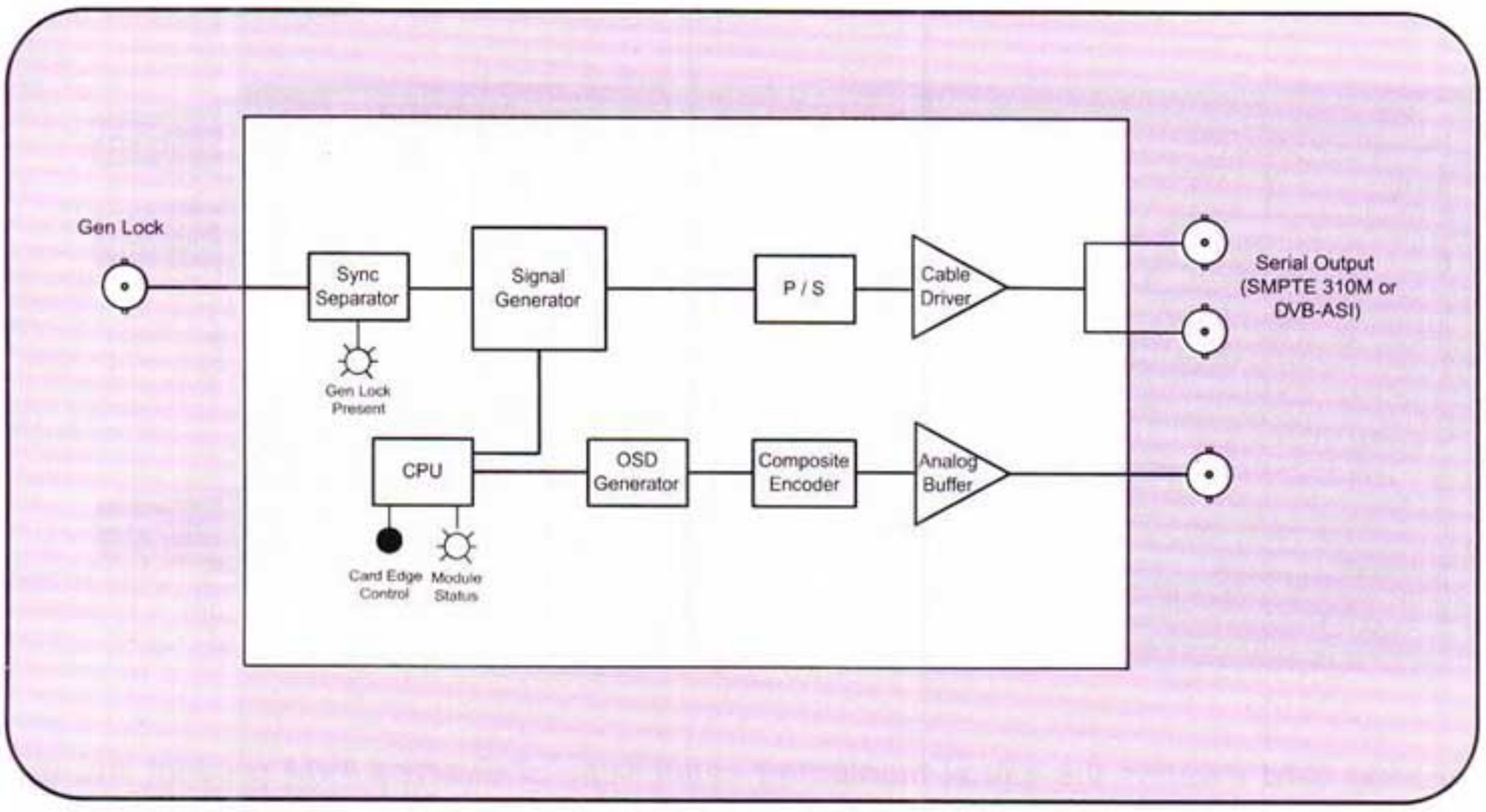
The 7750TG-TS Test Signal Generator provides a cost-effective method of generating SMPTE 310M and ASI test signals. The 7750TG-TS is ideal for checking signal path integrity, or to determine system performance over varying cable lengths. The 7750TG-TS generates test signals in either SMPTE 310M or DVB-ASI 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 colour 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
- Front panel LEDs indicate gen lock presence, and module status

7750TG-TS Block Diagram





Specifications

Genlock Input:

Type:	Menu selectable - depends on output video format NTSC or PAL Colour Black 1 V p-p Composite Bi-level sync (525i) 300 mV
Connector:	1 BNC per IEC 169-8
Termination:	75Ω (jumper selectable)

Serial Transport Stream Outputs:

Standard:	SMPTE 310M (19.4 Mb/s) or DVB ASI (16 to 50Mb/s) (switch selectable)
Number of Outputs:	2
Connector:	BNC per IEC 169-8
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

Analog Video Output:

Standard:	NTSC (SMPTE 170M)
Number of Outputs:	1
Connector:	BNC per IEC 169-8
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:

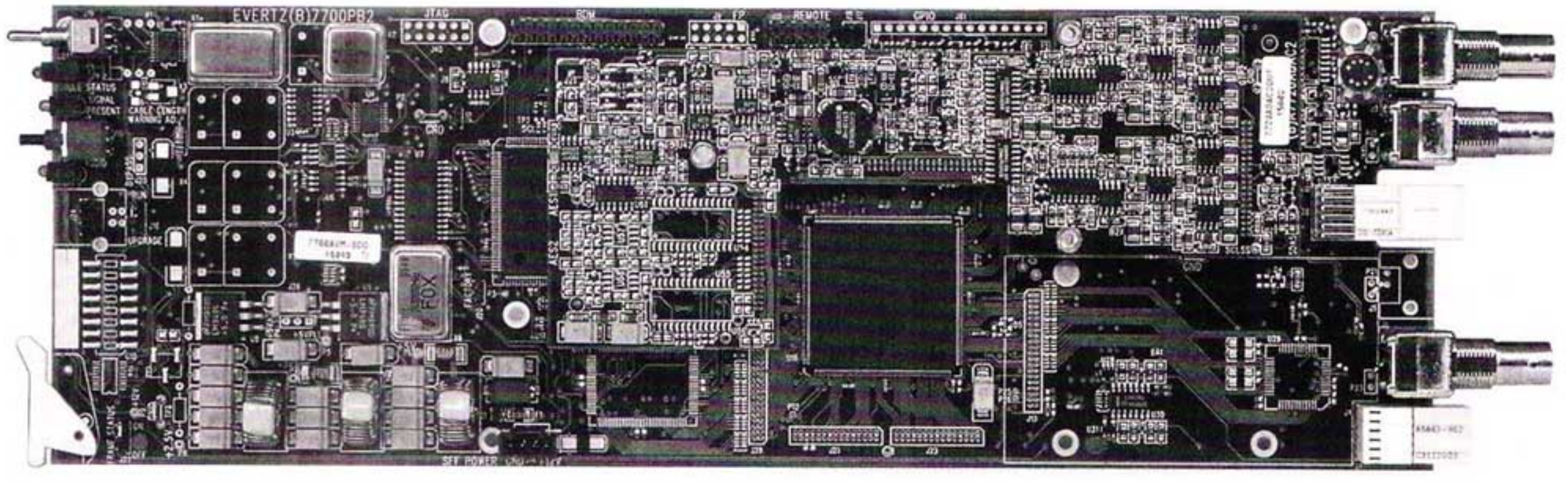
7700FR-C	3RU Multiframe which holds 15 modules
7701FR	1RU Multiframe which holds 3 modules
S7701FR	Standalone enclosure

SDI Closed Caption & XDS Decoder & EIA608 Analyzer

1n

Model 7760CCM





The 7760CCM closed captioning monitoring card extends the signal monitoring capabilities of Evertz's 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. The more common packet types such as 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 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 is also VistaLINK™-enabled, offering remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP).

The single-slot, 7760CCM module fits conveniently into Evertz's 7700FR-C, 7701FR frames or standalone enclosure.

Features

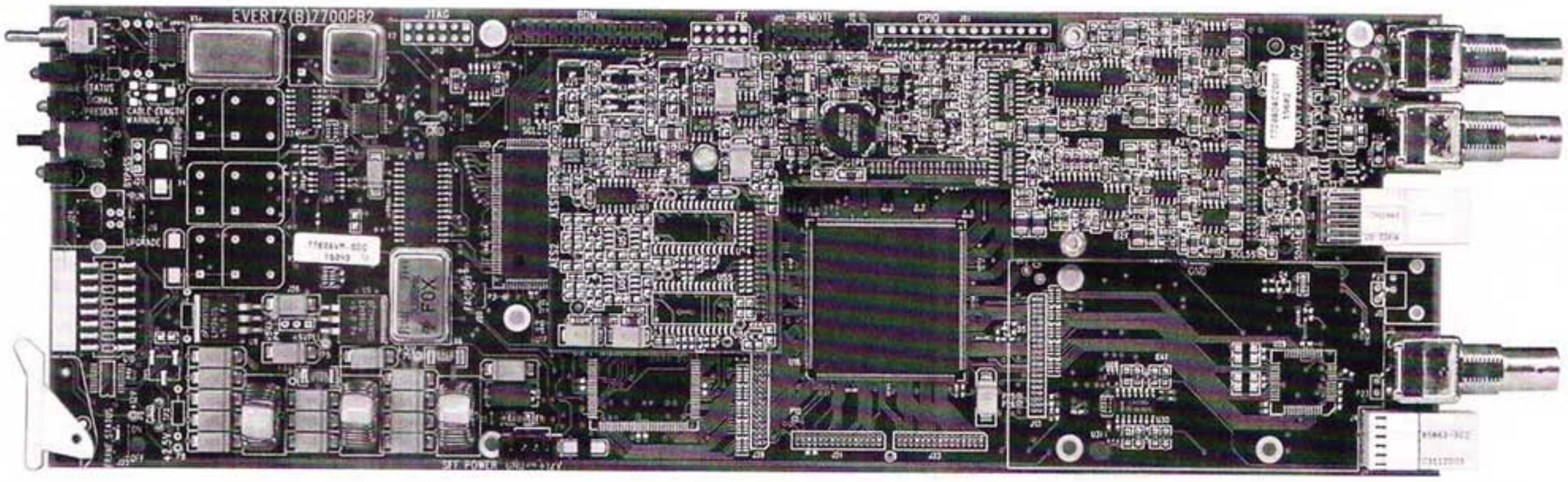
- One SD, 270 Mb/s component digital video input, 525 or 625 lines, auto-detected or manually set
- One re-clocked SD video output
- Decodes and displays closed captioning on fields 1 and 2 as per EIA Standard EIA/CEA-608-B
- User selectable closed captioning channel (1-4), text channel (1-4) and eXtended Data Services (XDS) for video "burn-in"
- Decodes Line 21 XDS packets containing 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's 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™-enabled offering remote monitoring, control and con-figuration 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

SDI Closed Caption & XDS Decoder and EIA608-708 Translator

1n

Model 7760CCM-T





The 7760CCM-T Closed Captioning, XDS and EIA608-EIA708 Translator card is functionally similar to the 7760CCM card, with the additional feature of a EIA608 to EIA708 Standard translator. The single-slot, 7760CCM-T module fits conveniently into Evertz's 7700FR-C, 7701FR frames or standalone enclosures.

The 7760CCM-T closed captioning monitoring card extends the signal monitoring capabilities of Evertz's AVM product line by focusing on closed captioning and eXtended Data Services (XDS) data packets carried within Line 21 of the Vertical Blanking Interval (VBI). Compliant with the EIA Standard EIA/CEA-608-B, the 7760CCM-T can be used to monitor the content of Line 21 for pre-distribution monitoring or regulatory compliance.

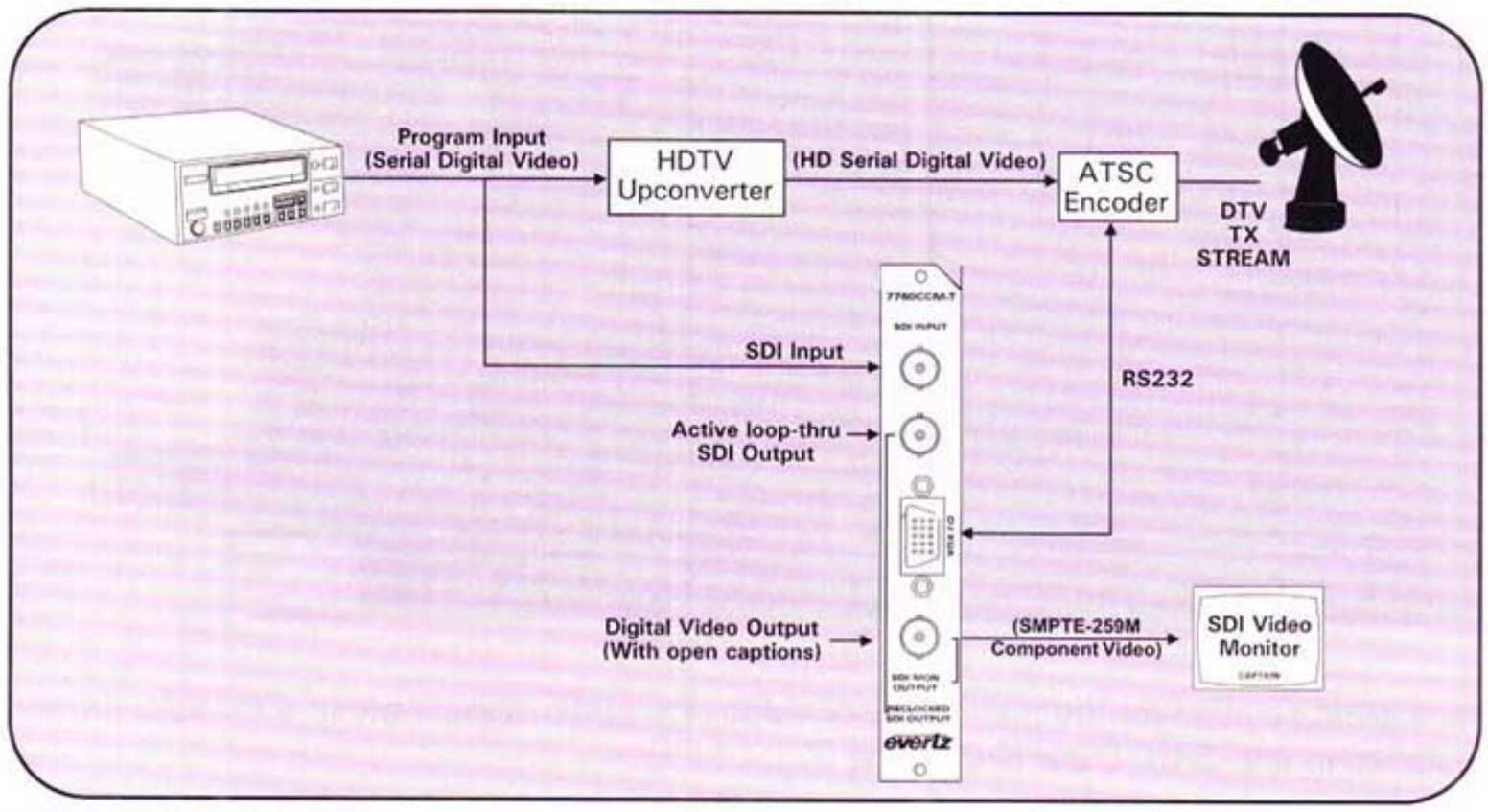
The 7760CCM-T is capable of decoding Line 21, fields 1 and 2 data and displaying the information on the SDI video output. One of four closed captioning channels (CC1-CC4) and one of four text service channels (T1-T4) can be simultaneously displayed on the video output. In addition, the scrolling XDS display supports all data packets. The more common packet types such as 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™-enabled, offering remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP).

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
- EIA608 to EIA708 translator
- Supports SMPTE 333M and Grand Alliance Protocol for convenient interface to most ATSC Encoders
- 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 containing 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's 7700FR-C 3RU, 7701FR 1RU frames and standalone 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™-enabled offering remote monitoring, control and con- figuration 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

7760CCM-T Block Diagram



Specifications

Serial Digital Input:

Standard:	SMPTE 259M-C - 525 or 625-line component serial digital video, 270Mb/s
Connector:	1 BNC per IEC 169-8
Termination:	75 Ω
Equalization:	Automatic >225m @ 270 Mb/s with Belden 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
Monitor:	1
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	470ps nominal
Overshoot:	<10% of amplitude

General Purpose Interface (GPI) Input/Output:

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:	38400
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-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

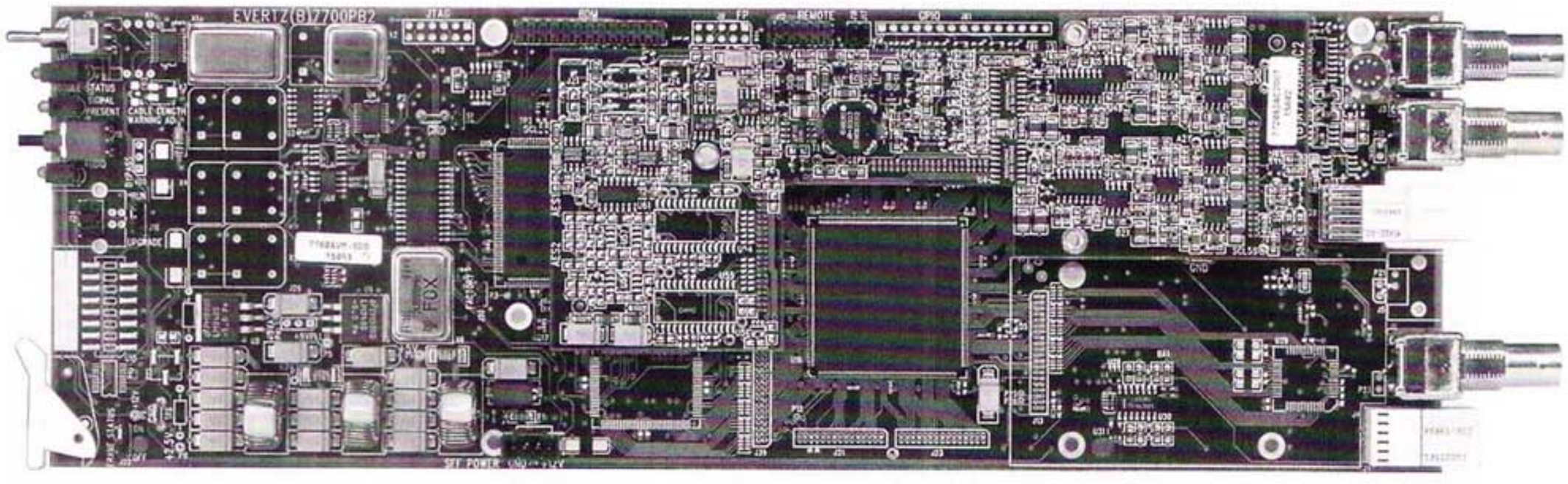
Rear Plate Suffix	
+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

Enclosures:

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



Model 7760AVM



The 7760AVM series of products provide a great solution for the monitoring of video and audio signals within a modern broadcast facility. Up to15 modules can be installed in one 3RU 7700FR-C frame.

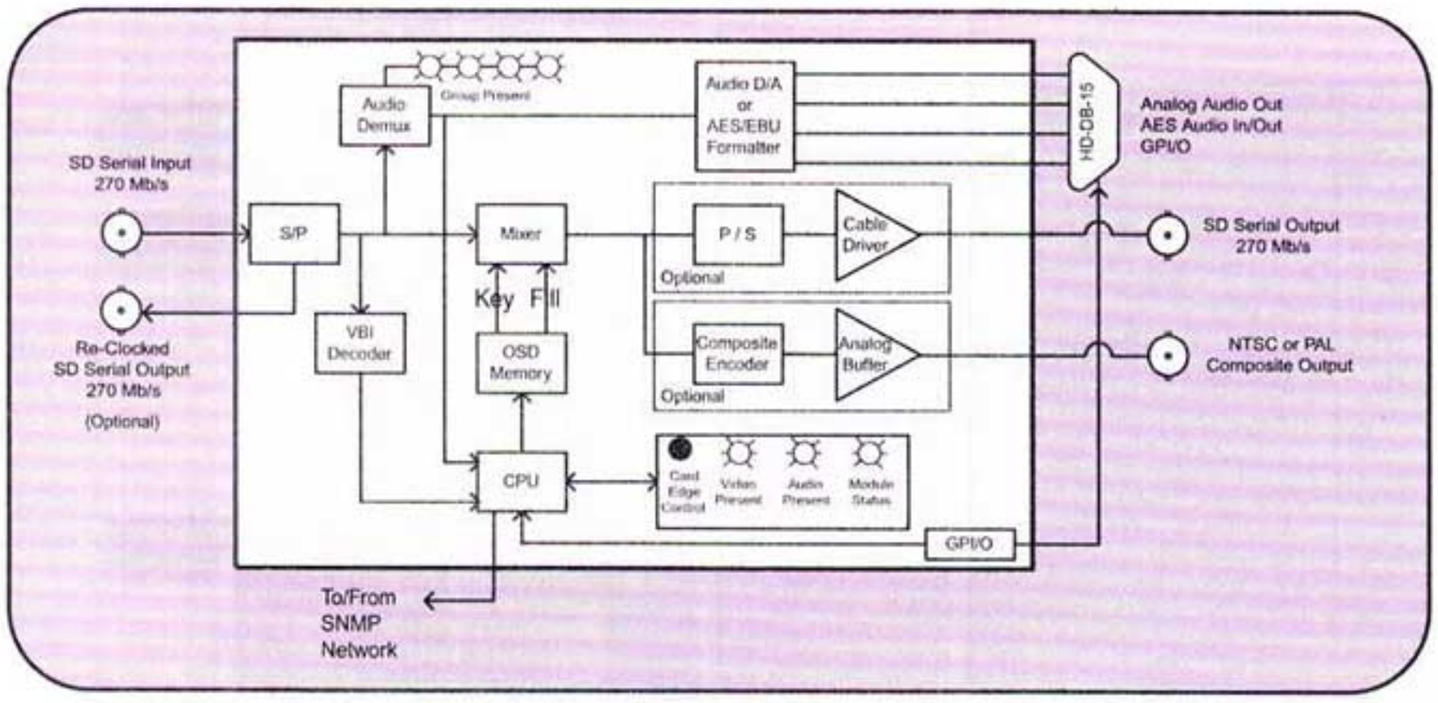
The 7760AVM accepts a Standard Definition Serial Digital Video input signal and provides an SDI, or composite video output along with analog audio outputs. Audio bargraphs are optionally superimposed on the video outputs by a linear keyer system. Along with the video and audio outputs, a reclocked version of the serial digital video input signal is also provided.

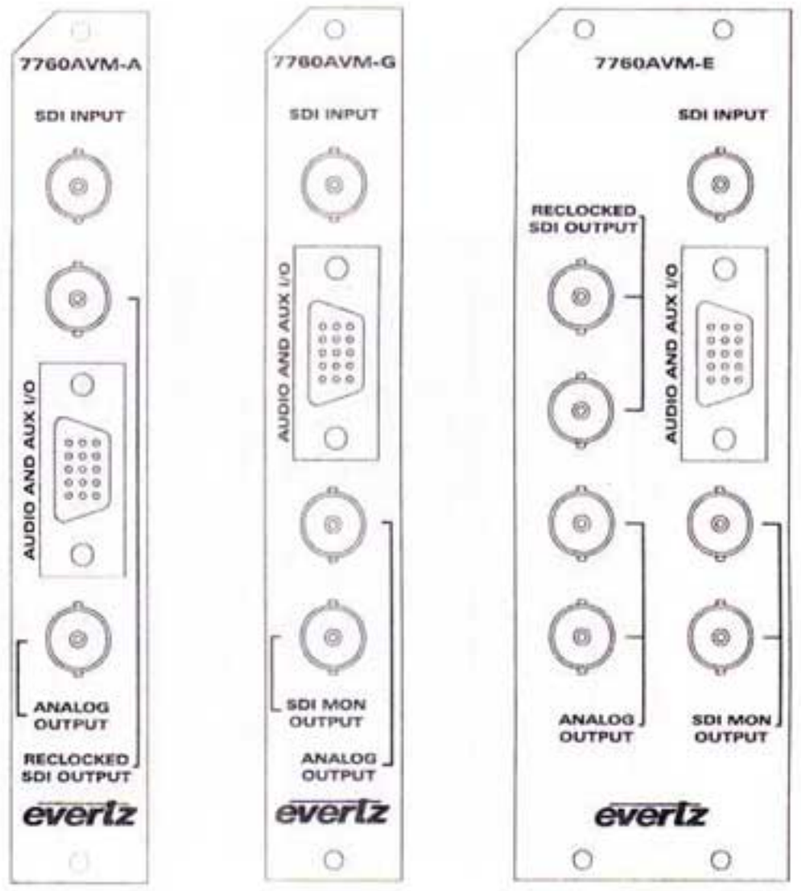
	7760AVM-X						
Feature x =	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Reclocked SDI Output	1	1	1	1	2	2	0
SDI Outputs with Superimposed Information	0	1	0	1	2	2	1
Composite analog outputs with superimposed information	1	0	1	0	2	2	1
Closed Caption Decoding *(analog outputs only, not on SDI outputs)	Y	N	Y	N	Y	Y	Y
AES/EBU Digital Audio Inputs	0	0	2	2	0	2	0
AES/EBU Digital Audio Outputs	2	2	0	0	2	0	2
Analog Audio Outputs	4	4	4	4	4	4	4
Max. Number of cards in a 7700FR-C	15	15	15	15	7	7	15

Features:

- One SDI 525 or 625, 270 Mb/s component digital video input
- One group (4 channels of audio) is demultiplexed from the incoming digital video and VU/PPM level Bargraphs are keyed into the output video
- 4 analog audio outputs available for content monitoring
- Analog audio output levels are adjustable
- Analog audio outputs can be set so both are a mono mix of the selected channel pair
- 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
- Program rating (V-Chip) display
- VistaLINK™ monitoring, control and configuration of an extensive list of error and fault conditions
- Large font display of VITC, SID, Program rating and fault messages
- A comprehensive on screen display is available to configure the various features of the module
- AVM configware software allows you to quickly copy configurations to multiple modules
- 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 errors
- Detects frozen or black video (patent pending)
- Two GPI inputs are available to modify the display characteristics
- Fault conditions trigger On Screen messages, GPI outputs and can be logged on an RS-232 data logging port
- XDS decoding and display on output video (Network name, Network call letters, program name and time of day)

7760AVM Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M-C - 525 or 625 line component
Connector:	BNC IEC 169-8
Equalization:	Automatic >200m @ 270 Mb/s with Belden 8281 (or equivalent)
Return Loss:	> 15 dB up to 270 Mb/s
Embedded Audio:	SMPTE 272M-A

Serial Video Output:

Standard:	Same as Input
Reclocked Outputs:	1 on versions A, B, C, & D 2 on versions E and F
Monitor Outputs:	1 on versions B, D and G 2 on versions E and F
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	470ps nominal
Overshoot:	<10% of amplitude
Embedded Audio:	SMPTE 272M-A

Analog Video Output:

Standard:	NTSC, SMPTE 170M, PAL, ITU624-4
Number of Outputs:	1 on versions A, C and G 2 on versions E and F
Connector:	BNC per IEC 169-8
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 5 MHz (shallow ramp)
Processing Delay:	1.9µs

Audio Bar Graphs:

Number of Graphs:	4 level (1 group) and 2 phase meters
Type:	VU, PPM, AES/EBU, BBC, DIN, NORDIC N9

Analog Audio Output:

Number of Outputs:	4
Type:	Balanced analog audio
Connector:	Female High Density DB-15
Output Impedance:	33Ω
Sampling Frequency:	48kHz
Signal Level:	0dBu to 24dBu (User definable)
Note:	High impedance loads only (10kΩ) Not good for low impedance load(i.e. 600 Ω)
Frequency Response:	50Hz to 20kHz: +/- 0.20dB
SNR:	>85dB (50Hz to 20 kHz)
THD+N:	65 dB @ 1kHz, 0 dB FS, typical

AES Audio Inputs and Outputs:

Number of Inputs:	2 on versions C, D and F
Number of Outputs:	2 on versions A, B, E and G
Standard:	SMPTE 276M, single ended AES
Connectors:	Female High Density DB-15
Resolution:	24-bit
Sampling Rate:	48 kHz
Impedance:	75 Ω unbalanced

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

Number of Inputs:	2
Number of Outputs:	1
Type:	Opto-isolated, active low with internal pull-ups to +5V
Connector:	Female High Density DB-15
Signal Level:	Max: 2Vp-p video Min: Sync level 150mV

Data Logging Serial Port:

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

Physical:

Number of slots:	1 option (A, B, C, D or G) 2 (E or F)

Electrical:

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

Ordering Information:

7760AVM-X:	SDI Video and Audio Monitoring/Conversion with VistaLINK™ support (See Chart for product designations)

Rack Mount Bulkhead Breakout Panels (BHP):

7760AVM-BHP-10	Bulkhead Breakout panel for 10 AVMs includes 10 WPAVMIO-1-0-3F - 3' cables
7760AVM-BHP-5	Bulkhead Breakout panel for 5 AVMs includes 5 WPAVMIO-1-0-3F - 3' cables

Ordering Options

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

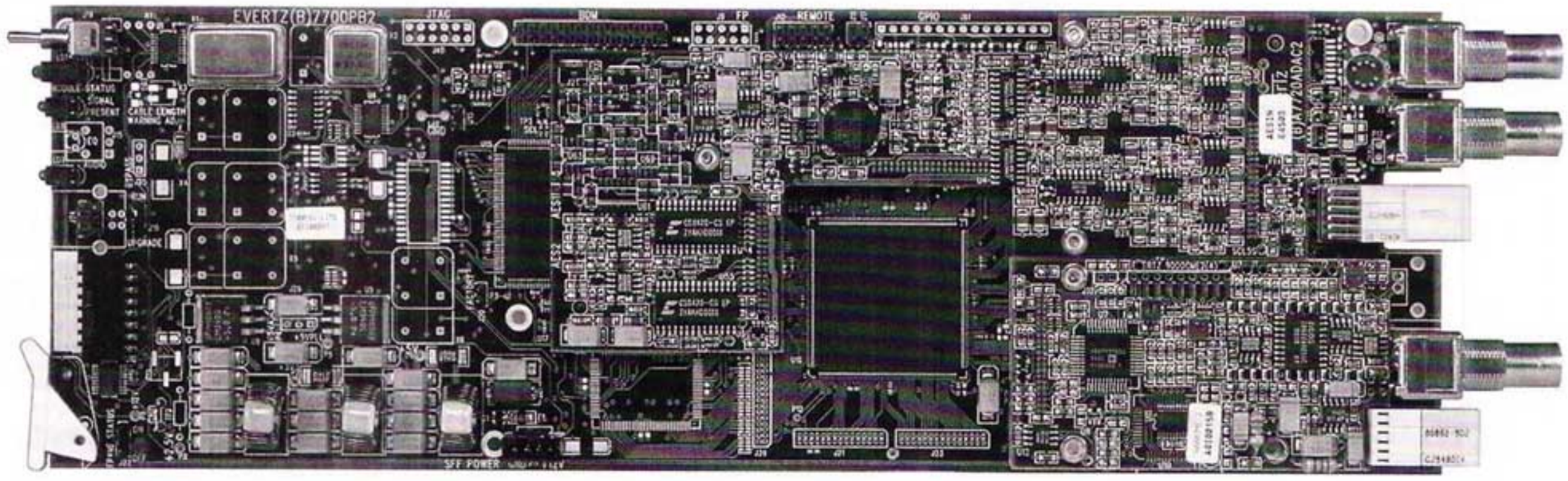
Rear Plate Suffix	
+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

Enclosures:

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

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

Model 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-LiteB allows for monitoring of external or embedded AES audio but does not supply de-multiplexed AES audio out.

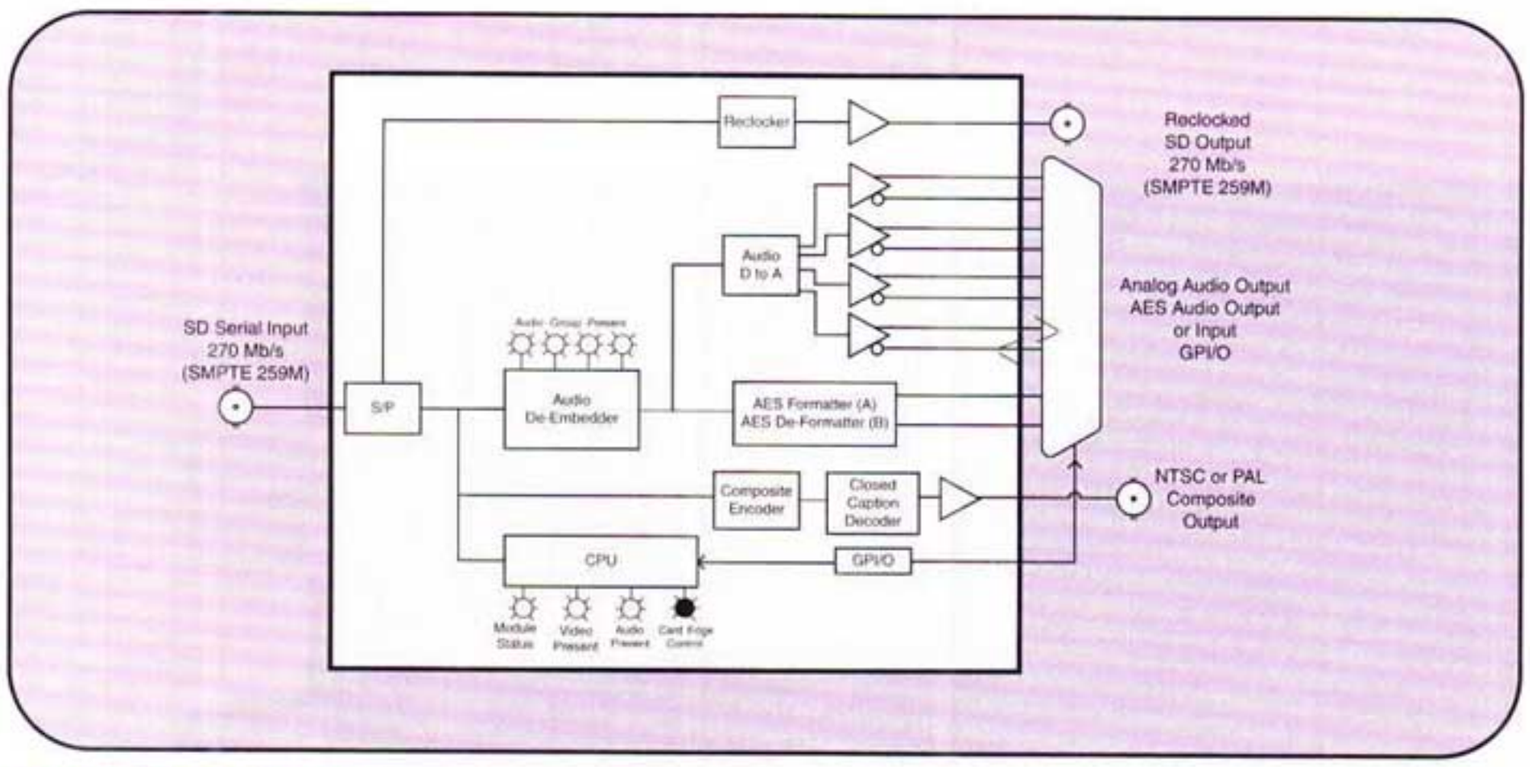
Features

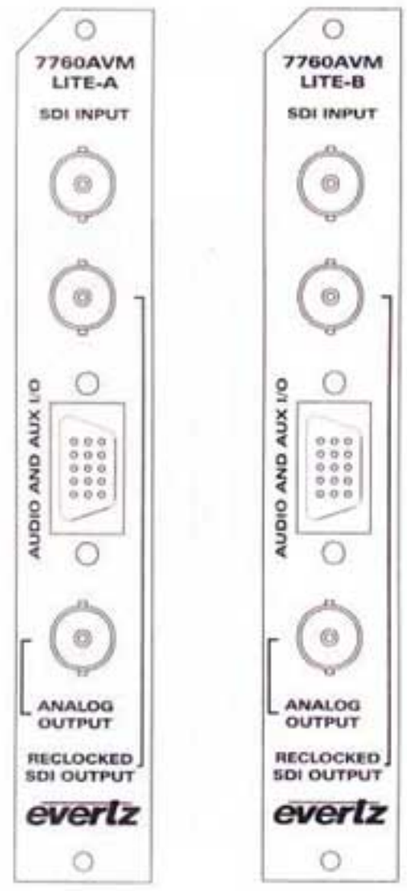
- 1 Reclocked SDI output
- Composite analog (NTSC/PAL-B) output
- 4 Balanced analog audio outputs
- 2 AES digital audio outputs or inputs
- 1 General purpose output to indicate the loss of video and/or audio
- Built in closed caption decoder with on/off control via dip switch and GPI
- Audio group selection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





Specifications

Serial Video Input:

Standard:	SMPTE 259M-C 525 or 625 line component
Connector:	BNC IEC 169-8
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 IEC 169-8
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 IEC 169-8
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 loadsi.e. 600Ω
Frequency Resp.:	50Hz to 20kHz: +/- 0.20dB
SNR:	>85dB (50Hz to 20 kHz)
THD+N:	65 dB@ 1kHz, 0 dBFS, typical
Resolution:	24-bit

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

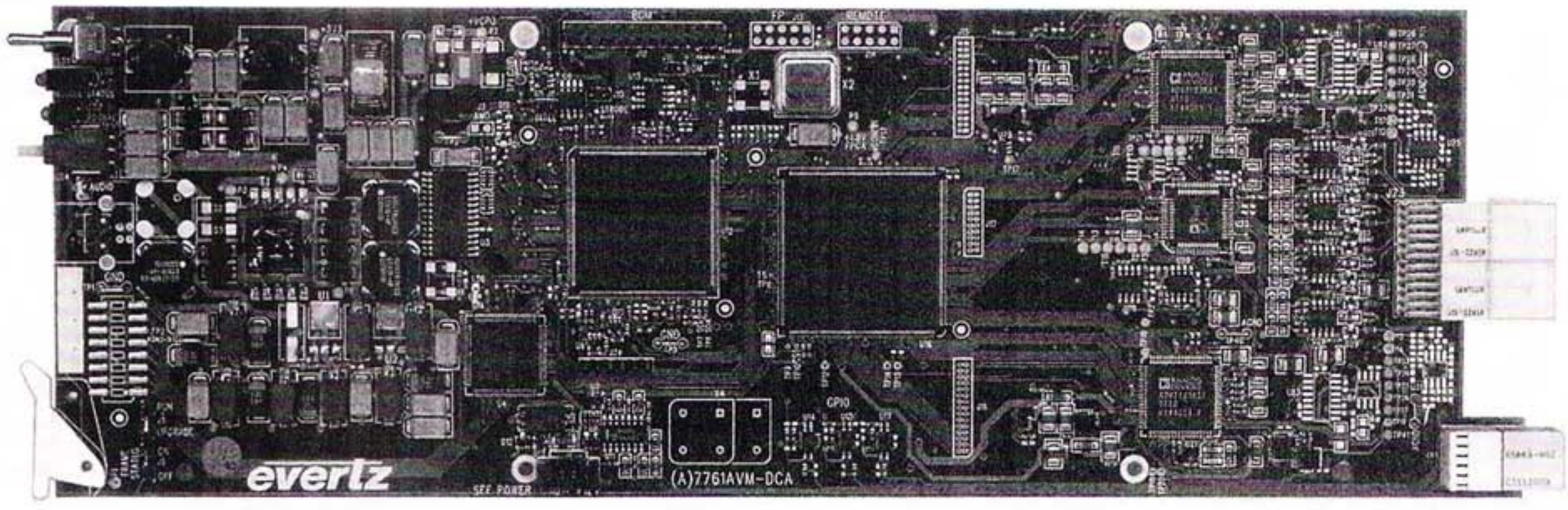
+3RU	3RU Rear Plate for use with 7700FR-C Multiframe
+1RU	1RU Rear Plate for use with 7701FR Multiframe
+SA	Standalone Enclosure Rear Plate

Enclosures:

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



Model 7761AVM2-DC and 7761AVM2-SDC



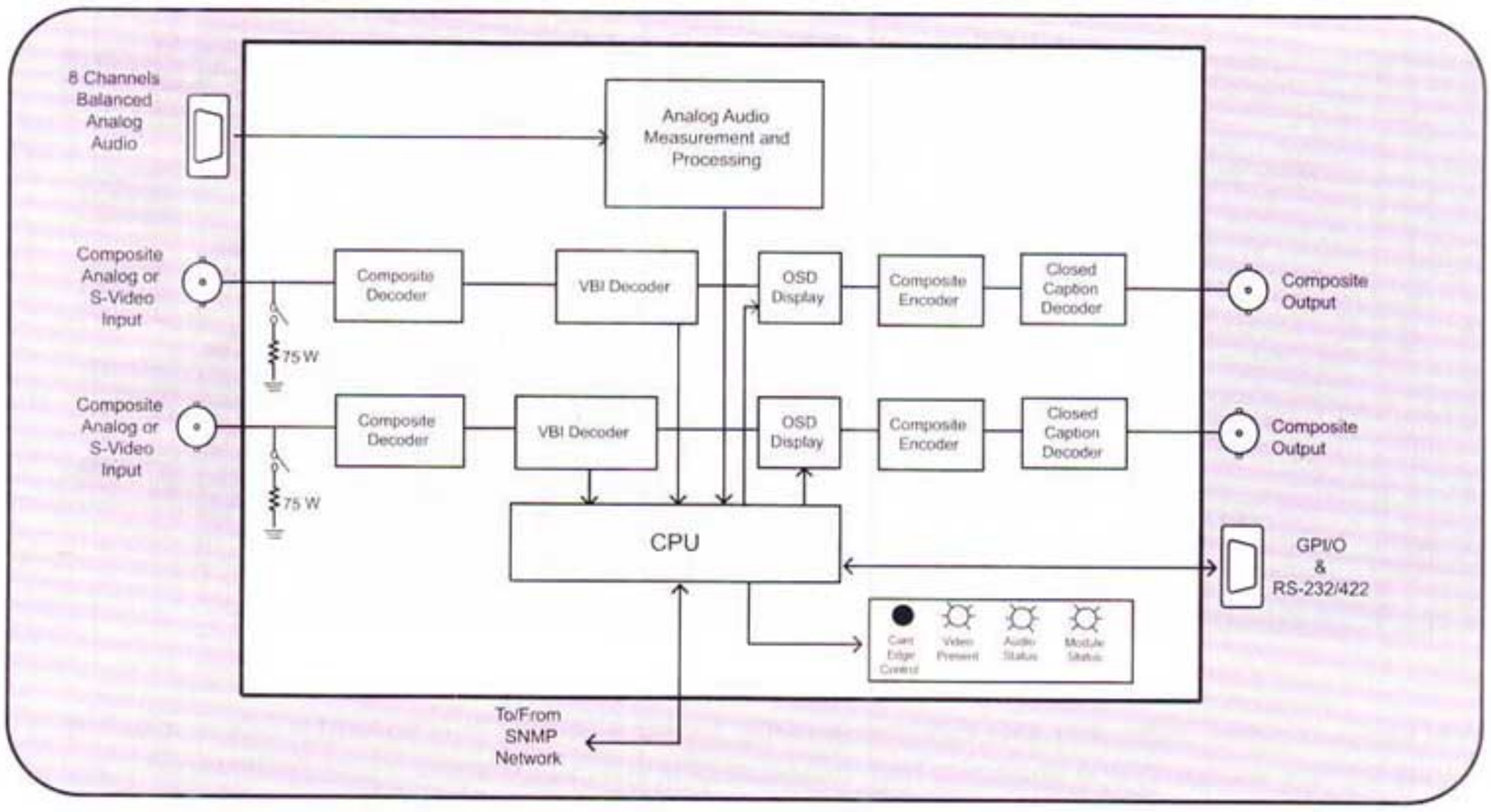
The 7761AVM2-DC Dual Channel Composite Video and Analog Audio and 7761AVM2-SDC Dual S-Video and Analog Audio monitoring cards perform a number of video, audio and vertical blanking interval (VBI) data analysis, quality control and monitoring functions similar to that of the 7760AVM line of audio/video 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™.

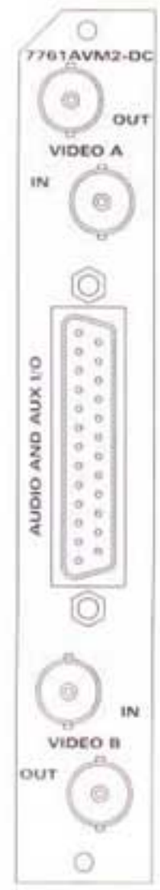
VistaLINK™ offers remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP) giving the flexibility to manage operations, including signal monitoring and module configuration, from SNMP-enabled control systems (Manager or NMS).

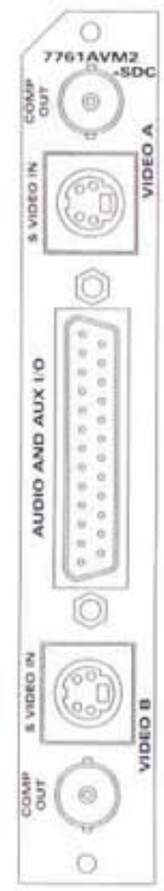
Features

- 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™-enabled 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

7761AVM2-DC/-SDC Block Diagram







Specifications

Analog Video Input:

Standard:	NTSC (SMPTE 170M), PAL (ITU624-4)
Number of Inputs:	2
Connector:	BNC per IEC 169-8
Signal Level:	1V nominal
DC Offset:	0V +/- 1V
Input Impedance:	75Ω
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:	75Ω

Analog Audio Input:

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

Analog Video Output:

Standard:	NTSC (SMPTE 170M) PAL (ITU624-4)
Number of Outputs:	2
Connector:	BNC per IEC 169-8
Signal Level:	1V nominal
DC Offset:	0V ±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 (Coming Soon)

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

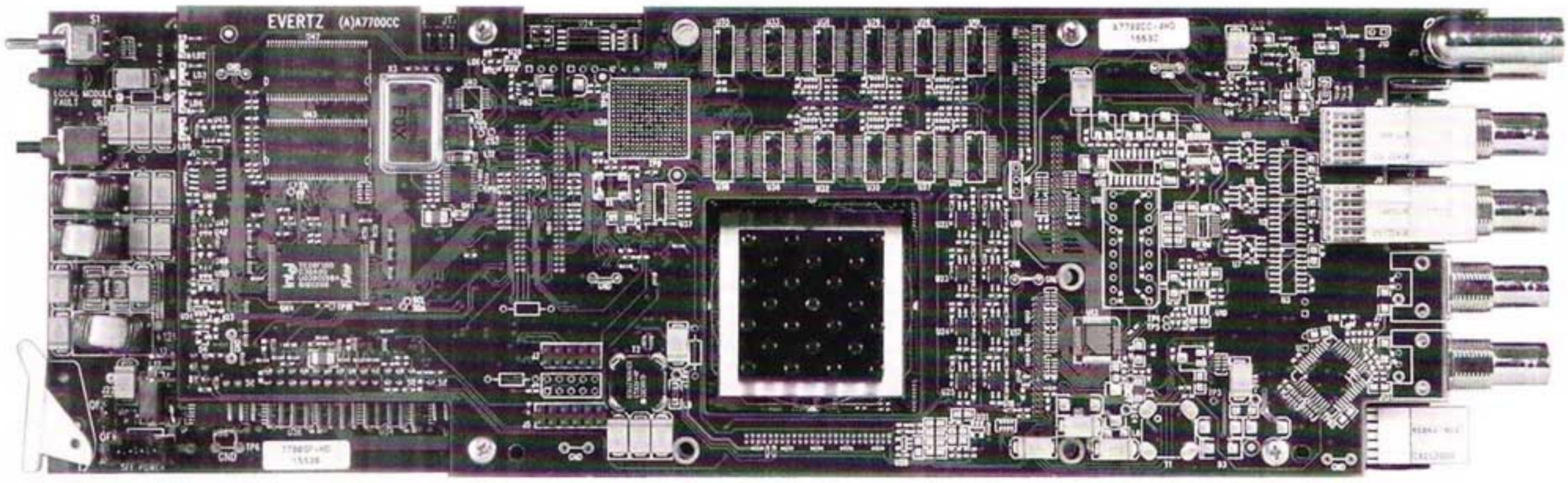
Breakout Panels and Cables:

7761AVM-BHP-15	Bulkhead Breakout Panel for 15 x 7761AVM-DC cards (includes 15-3ft cables)
WA7761AVMBHP3F	Breakout cable (3ft) for 7761AVM-DC models

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



Model 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™-enabled, 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-enabled control systems (Manager or NMS) locally or remotely.

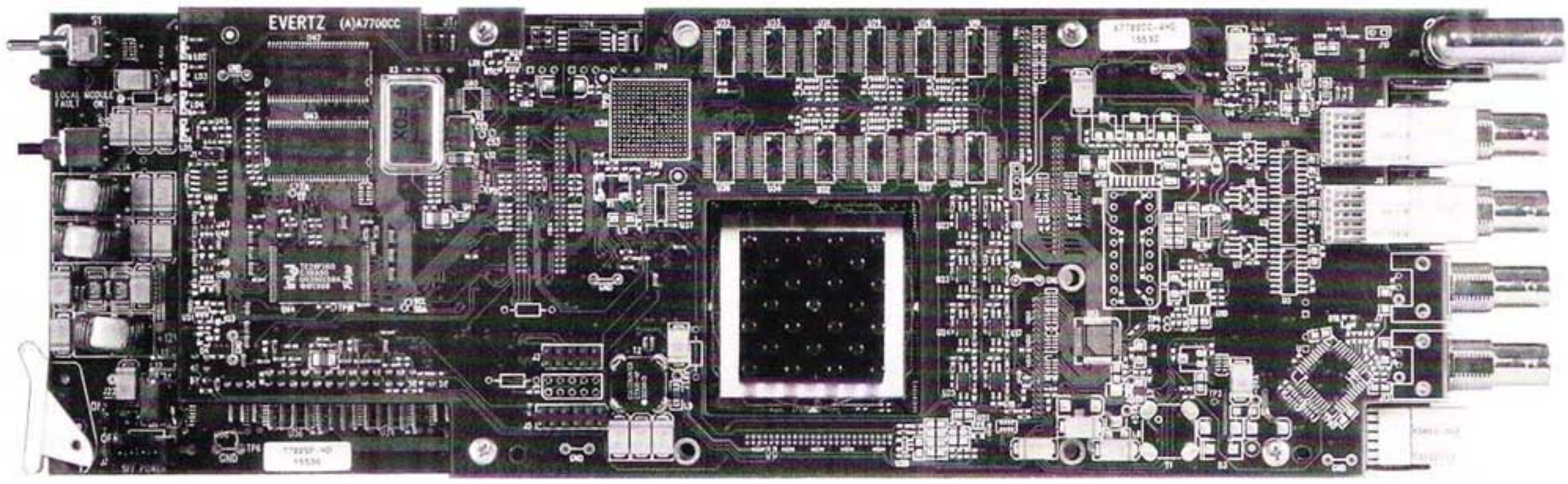
Features

- 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 loop input for proper timing (not available 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
- 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
- VistaLINK™-enabled 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
- 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

Analog Quattro™, Four Analog Video & Quad Split with Analog Audio Monitoring



Model 7766AVM-4A



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.

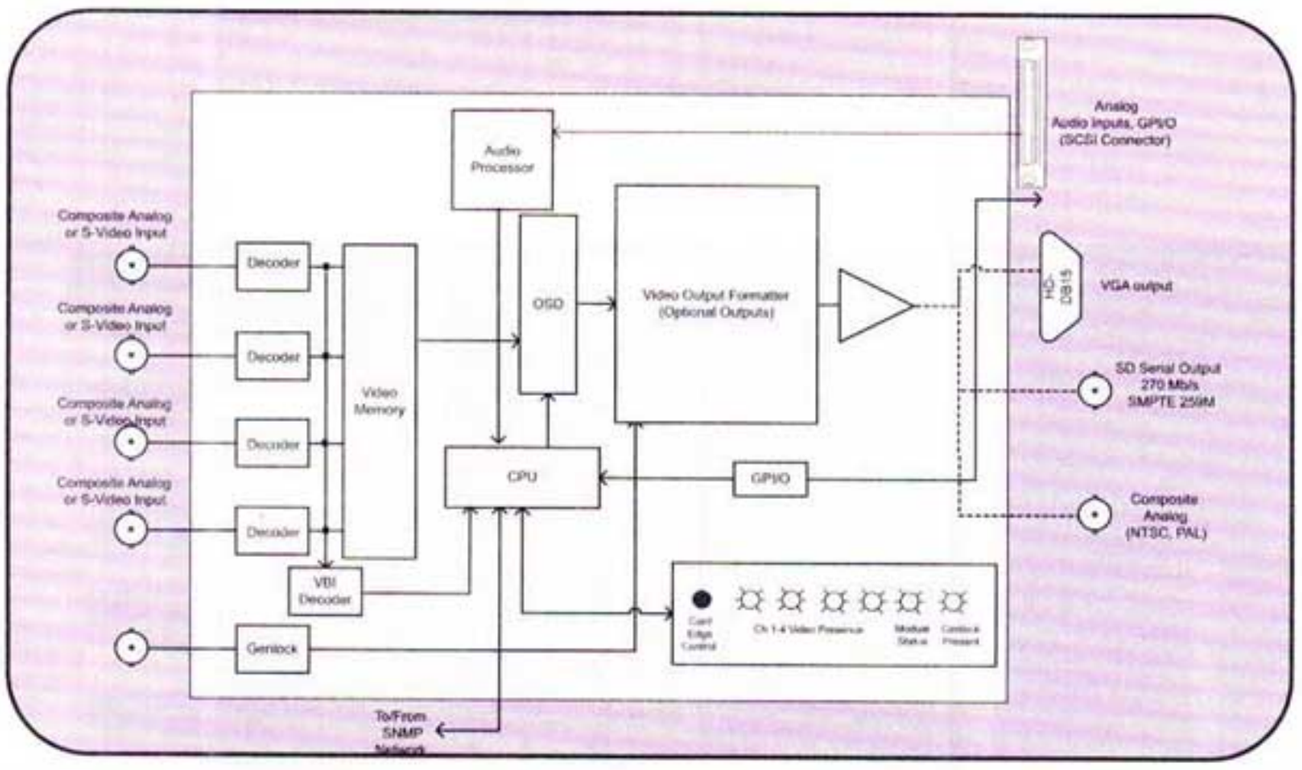
Equipped with standard features including an on-screen, menu-driven display, user configurable audio level and phase bar graphs, and status windows, the 7766AVM-4A/-S4A can simultaneously display four video signals and external analog audio with on-screen audio, video and data status information through 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.

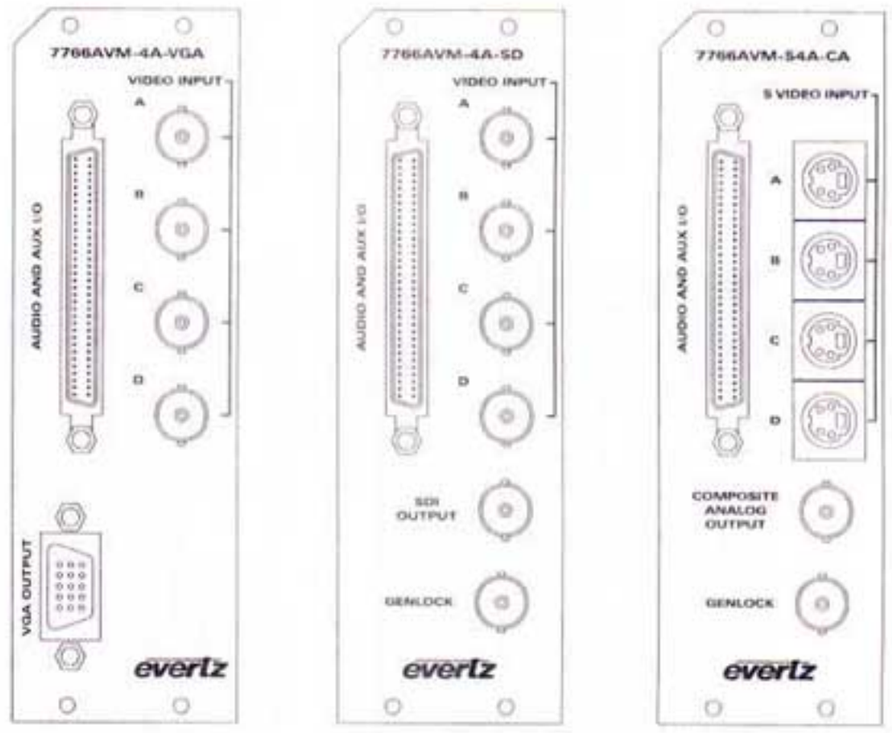
The 7766AVM-4A/-S4A cards are VistaLINK™ enabled offering remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage operations including signal monitoring and card configuration from SNMP-enabled control systems (Manager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

7766AVM-4A Block Diagram





Specifications

Analog Video Input:

Standard:	NTSC (SMPTE 170M) PAL (ITU624-4)
Number of Inputs:	4
Connector:	BNC input per IEC 169-8
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:	8 (4 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 169-8
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 169-8
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) colour black
Level:	1Vp-p nominal
Connector:	BNC per IEC 169-8

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

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

Enclosures:

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

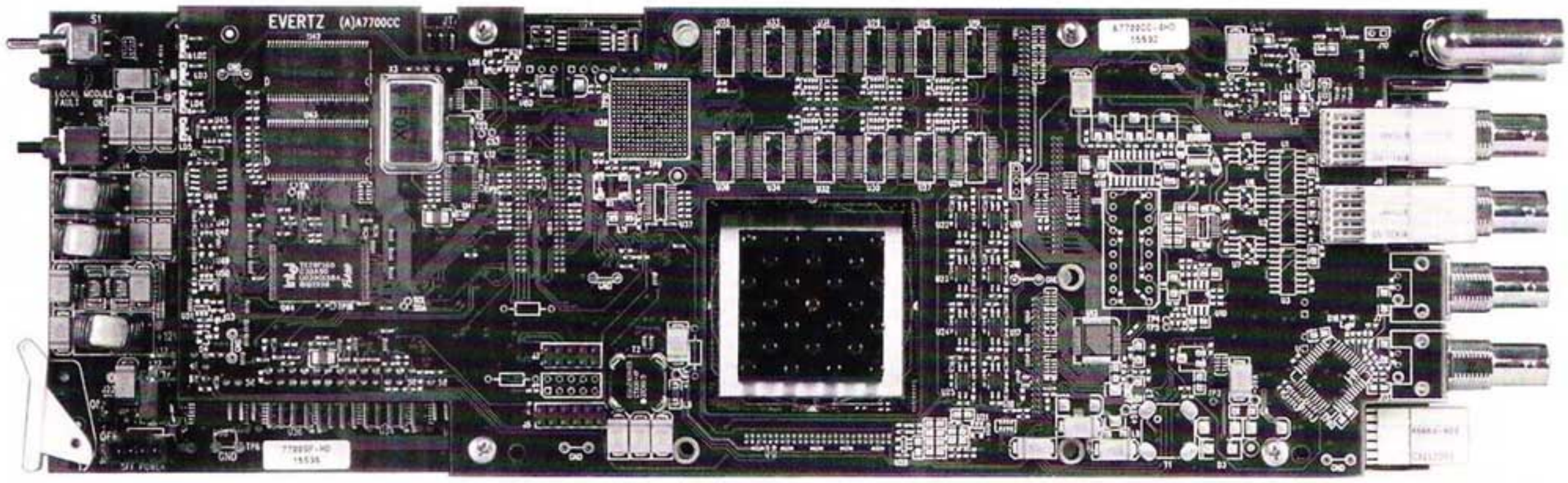
Breakout Panels and Cables:

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	Bulkhad 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

Video-only Quattro™ Quad Split Display Monitoring



Model 7765AVM-4V-VGA
Model 7766AVM-4V-VGA
Model 7766AVM-S4V-VGA



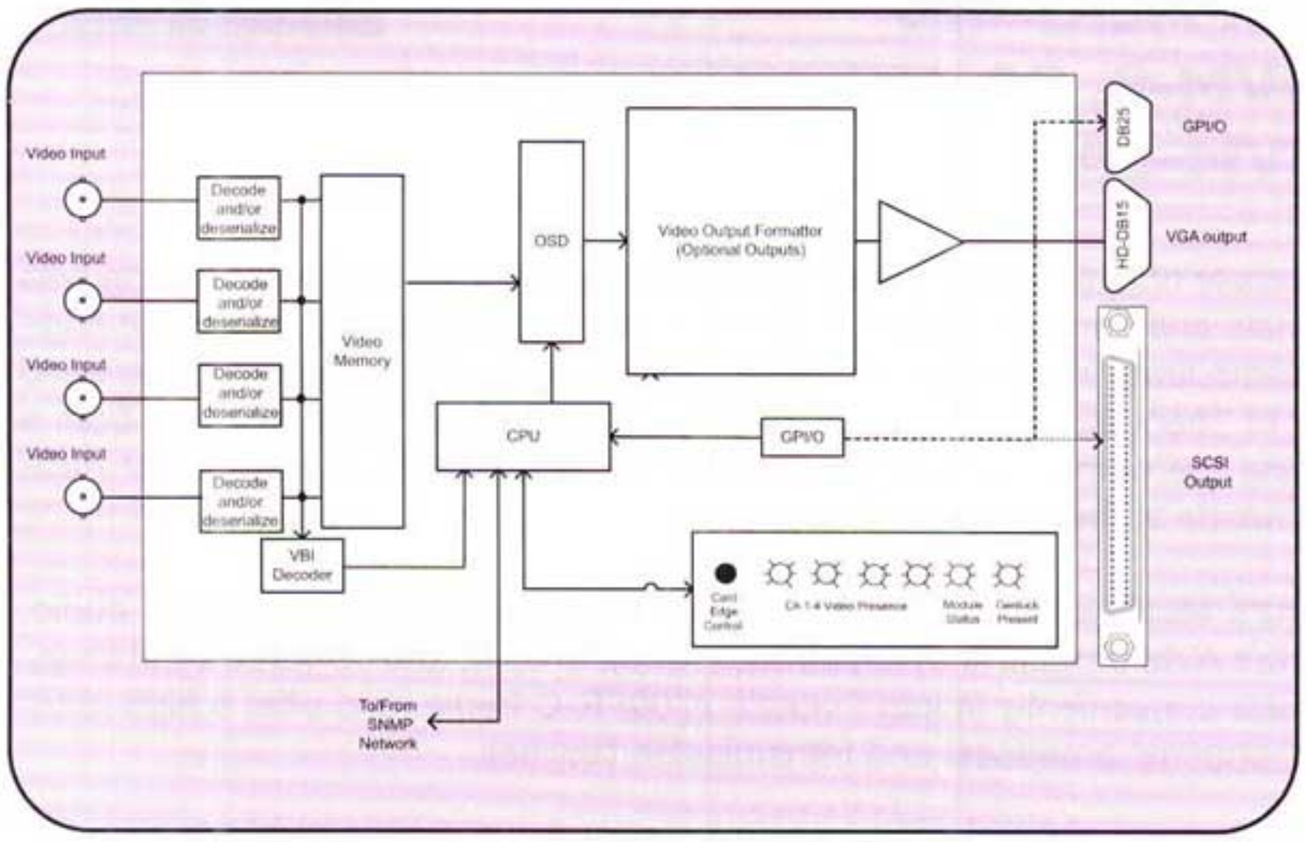
Equipped with standard video-only monitoring features including an on-screen, menu-driven display and user configurable status windows, the 7765AVM-4V-VGA video-only Quattro™ and 7766AVM-4V-VGA video-only analog Quattro™ can simultaneously display four SDI/601 video signals through a VGA output, supporting 4:3 and 16:9 aspect ratios. Furthermore, 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 cards fit conveniently into Evertz's 7700FR-C frame.

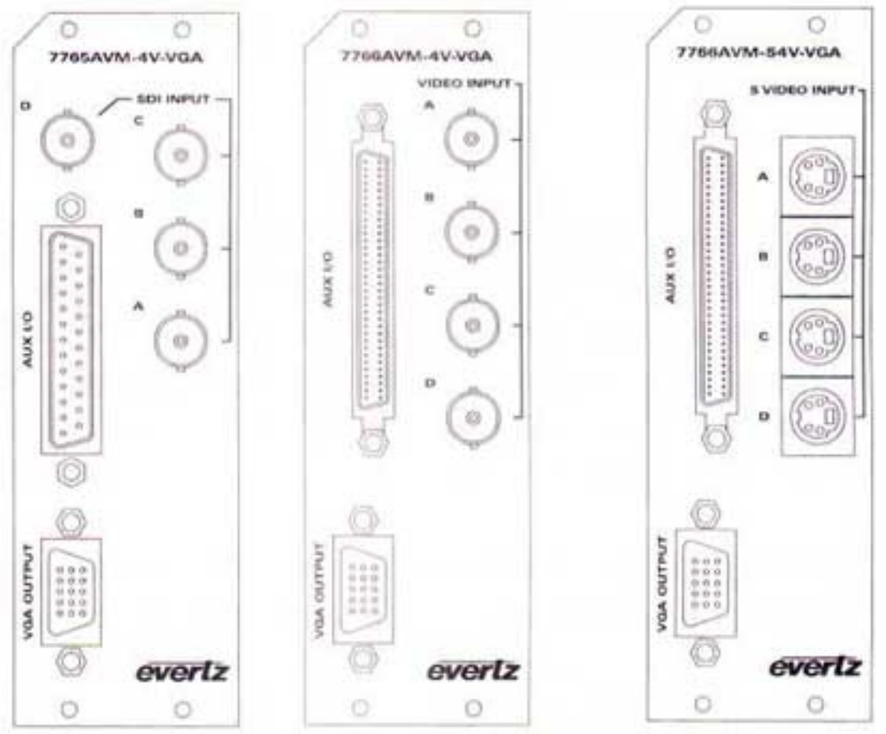
The 7765AVM-4V-VGA and 7766AVM-4V-VGA/7766AVM-S4V-VGA cards are also VistaLINK™-enabled, offering remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP). This product feature offers another solution to manage operations including signal monitoring and module configuration from SNMP-enabled control systems (Manager or NMS) locally or remotely.

Features

- Four SDI/601 525 line or 625 line, 270 Mb/s component digital video inputs (7765AVM-4V-VGA)
- Four composite analog (NTSC or PAL) video inputs (7766AVM-4V-VGA)
- Optional four S-video inputs (7766AVM-S4V-VGA)
- Decodes vertical interval time code (VITC) and VBI Source ID packets, and burns the ID into the picture
- A comprehensive on screen display is available to configure the various features of the module
- Detects frozen (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
- Quadrant, expanded and H/V delay viewing modes
- Single analog RGB type output
- Twelve GPI inputs are available to modify the display characteristics
- Four GPO outputs to indicate user definable fault conditions
- GPI I/Os are available on a DB-25 connector RS-232 or RS-422 serial port (jumper configurable), with support for Probel and TSL under monitor display protocols
- VistaLINK™-enabled 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

7765AVM-4V/7766AVM-4V & S4V VGA Block Diagram





Specifications

Serial Digital Input (7765AVM-4V-VGA):

Standard:	SMPTE 259M-C, 525 or 625 lines component (525 line input only on 7765AVM-4/-4A-HD)
Number of Inputs:	4
Connector:	BNC per IEC 169-8
Termination:	75Ω
Equalization:	Automatic >225m @ 270 Mb/s with Belden 8281 (or equivalent)
Return Loss:	>15dB up to 270MHz
Embedded Audio:	SMPTE 272M-A

Analog Video Input (7766AVM-4V-VGA):

Standard:	NTSC (SMPTE 170M) or PAL (ITU624-4)
Number of Inputs:	4
Connector:	BNC per IEC 169-8
Signal Level:	1V nominal
DC Offset:	0V +/- 1V
Input Impedance:	75Ω
Return Loss:	>40dB up to 5MHz

S-Video Input (7766AVM-S4V-VGA):

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 Video Output :

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

General Purpose In/Out (7765AVM-4V-VGA):

Number of Inputs:	12 (configurable)
Number of Outputs:	4 (dedicated)
Type:	Opto-isolated, active low with internal pull-ups to +5V
Connector:	Female DB-25
Input signal:	Closure to ground
Signal Level:	+5V nominal

General Purpose In/Out (7766AVM versions only):

Number of Inputs:	4 (configurable)
Number of Outputs:	4 (dedicated)
Type:	Opto-isolated, active low with internal pull-ups to +5V
Connector:	68-pin SCSI
Input signal:	Closure to ground
Signal Level:	+5V nominal

Data Input/Output Serial Port:

Number of Ports:	1 RS-232 or 1 RS-422 (jumper selectable)
Connector:	Female DB-25 (7765AVM-4V-VGA) and Female 68-pin SCSI (7766AVM-4V-VGA and 7766AVM-S4V-VGA)
Baud Rate:	Up to 1 Mbaud
Format:	RS-232 8 bits, no parity, 2 stop bits and no flow control

Electrical:

Voltage:	+12VDC
Power:	24 Watts
EMI/RFI:	Complies with FCC Part 15, Class A and EU EMC directive

Physical:

Number of slots:	2

7765AVM-4V-VGA	Four SDI Video-Only Quattro(™) Quad-Split Display with analog RGB output and rear plate for 3RU frame
7766AVM-4V-VGA	Four Composite Analog Video-Only Quattro(™) quad-split display with analog RGB output and rear plate for 3RU frame (includes 1x 7766AVM-4A-BHP-1 & 1 breakout cable for AUX I/O)
7766AVM-S4V-VGA	Four S-video, Video-Only Quattro(™) Quad-Split display with analog RGB output and rear plate for 3RU frame (includes 1x 7766AVM-4A-BHP-1 & 1 breakout cable for AUX I/O)

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

Breakout Panels and Cables:

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)

Model PKG7765MVM-8, - 8A, -12, -12A, -16, -16A
PKG7766MVM-8A, -12A, -16A
CUSTOM "CSTM" MVM PACKAGES
MODULE ONLY 7765MVM-8, 8A
7766MVM-8A



There seems to be no limitation to the number of specialty channels being offered to television viewers worldwide. Along with the ever-expanding number of digital television channels and services comes an ever-increasing load on the broadcast engineer to ensure that no information is missing. At the same time, in an effort to reduce operational costs, we are seeing a trend where large television networks are adopting a policy of "centralcasting" thereby originating numerous "local" services from a central Network Operation Center (NOC) and reducing the number of fully equipped and staffed facilities required at each remote location, but increasing the facility monitoring needs at the central location.

Optimized for multiple video signal monitoring, Evertz's MultiViewer Monitoring product line simultaneously extends audio, video and data signal integrity monitoring (as per Evertz's AVM product line) capabilities for up to 8, 12 and 16 video input channels - optimized to fit 16:9 or 4:3 displays. MVM modules conveniently fit into Evertz's 7700FR-C frame, and offer a high-resolution and cost-effective monitor-wall solution for multi-channel broadcast and transmission facilities.

The packages come equipped with 7700FC VistaLINK™ Frame Controllers and are VistaLINK™ ready, offering remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP). The 7700FC VistaLINK™ Frame Controller card provides a single point of access to communicate with VistaLINK™-enabled 7700 series of cards. The 7700FC provides a 10Base-T/100Base-TX Ethernet port and communication is facilitated through the use of Simple Network Management Protocol (SNMP). The 7700FC 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. This product feature offers another solution to manage operations including signal monitoring and module configuration from SNMP-enabled control systems (Manager or NMS) locally or remotely.

Features

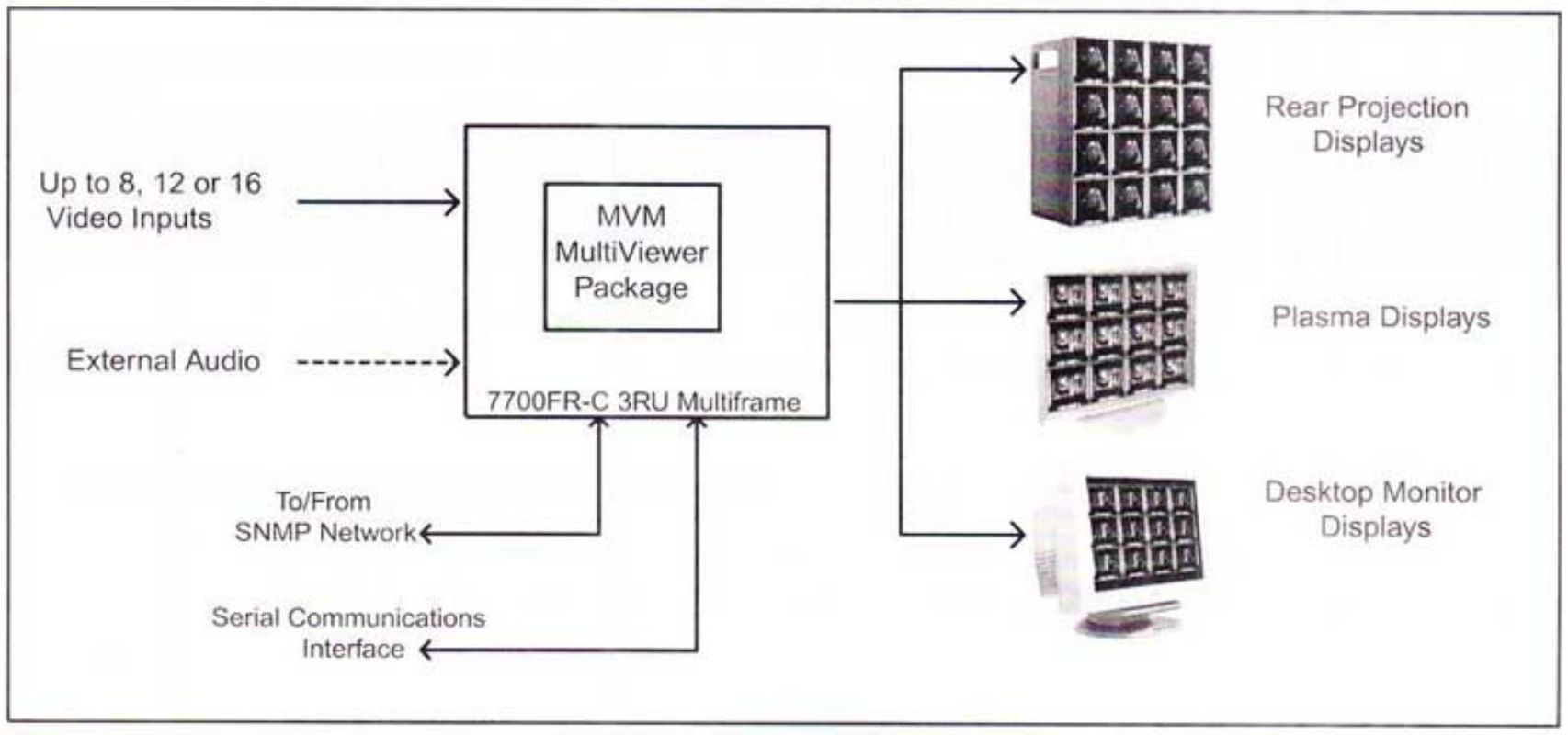
7765AVM-4-M and 7765AVM-4A-M Modules:

- Eight, twelve and sixteen SDI/601 525 or 625 line, 270 Mb/s component digital video inputs with embedded-only (7765MVM-8, -12, -16) or embedded and external AES/EBU audio (7765MVM-8A, -12A, -16A) monitoring and status display
- On-screen audio level and phase bar graphs, decoded XDS, Source ID (UMD) and fault alerts
- H/V delay and expanded view display
- User-configurable error conditions monitored with four fault condition alert messages per video input
- Standard analog RGB (VGA-type) output, optimized for 4:3 rear-projection type displays and 16:9 plasma displays
- Up to 60 user-configurable GPI inputs (MVM-16) available for display modifications, tally indicators, display borders, display modes and UMDs (up to 20 user-configurable GPIs on MVM-16A)
- External AES audio (MVM-xA versions only) and GPI I/Os are available on DB-25 connectors with optional Bulkhead Breakout Panels
- RS-232 or RS-422 serial port (jumper configurable) for interface to external equipment via communication protocols
- System configuration and channel monitoring through VistaLINK™ with 3RU 7700FR-C frame and a 7700FC VistaLINK™ Frame Controller module

7766AVM-4A-M and 7766AVM-S4A-M Modules:

- Eight, twelve and sixteen composite analog (NTSC or PAL) video inputs with external analog audio (7766MVM-8A, -12A, -16A) monitoring and status display
- On-screen audio level and phase bar graphs, decoded XDS, Source ID (UMD) and fault alerts
- H/V delay and expanded view display
- User-configurable error conditions monitored with four fault condition alert messages per video input
- Standard analog RGB (VGA-type) output, optimized for 4:3 rear-projection type displays and 16:9 plasma displays
- Up to 20 user-configurable GPI inputs available for display modifications, tally indicators, display borders and display modes
- RS-232 or RS-422 serial port (jumper configurable) for interface to external equipment via communication protocols
- External analog audio, serial communication ports and GPI I/Os available on 68-pin SCSI connectors with optional Bulkhead Breakout Panels
- System configuration and channel monitoring through VistaLINK™ with 3RU 7700FR-C frame and a 7700FC VistaLINK™ Frame Controller module

Typical Application Diagram



Specifications

Serial Digital Input (7765AVM-4-M):

Standard:	SMPTE 259M-C, 525 or 625 lines component
Number of Inputs:	up to 8, 12, or 16
Connector:	BNC per IEC 169-8
Termination:	75Ω
Equalization:	Automatic >225m @ 270 Mb/s with Belden 8281 (or equivalent)
Return Loss:	>15dB up to 270MHz
Embedded Audio:	SMPTE 272M-A

Analog Video Input (7765AVM-4A-M):

Standard:	NTSC, SMPTE 170M or PAL, ITU624-4
Number of Inputs:	4
Connector:	BNC per IEC 169-8
Signal Level:	1V nominal
DC Offset:	0V +/- 1V
Input Impedance:	75Ω
Return Loss:	>40dB up to 5MHz

S-Video Input (7766AVM-S4A-M):

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 (7766AVM-4A-M & 7766AVM-S4A-M):

Number of Inputs:	8 (4 balanced inputs per video input channel)
Connector:	68-pin SCSI
Input Impedance:	20 kΩ minimum (differential)
Sampling Frequency:	48kHz
Peak Signal and Common Mode Level:	30 dBu

Ethernet:

Network Type:	Ethernet 10 Base-T 802.3 (10 Mbps)/ Fast Ethernet 100 Base-TX IEEE 802.3u (100 Mbps) baseband CSMA/CD local area network
Connector:	RJ-45

Analog Video Output:

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

Audio Bar Graphs:

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

General Purpose Interface I/O (GPI/GPO)(7765MVM-4-M):

Number of Inputs:	12 (user-configurable) per module
Number of Outputs:	4 (user-configurable) per module
Type:	Opto-isolated, active low with internal pull-ups to +5V
Connector:	Female DB-25
Input signal:	Closure to ground
Signal Level:	+5V nominal

General Purpose Interface I/O (GPI/GPO) (7765MVM-4A-M, 7766AVM-4A-M & 7766AVM-S4A-M):

Number of Inputs:	4 (user-configurable) per module
Number of Outputs:	4 (user-configurable) per module
Type:	Opto-isolated, active low with internal pull-ups to +5V
Connector:	Female 68-pin SCSI (7766 modules) Female DB-25 (7765 modules)
Input signal:	Closure to ground
Signal Level:	+5V nominal

Data Input/Output Serial Port:

Number of Ports:	1 RS-232 or 1 RS-422 (jumper selectable)
Connector:	Female 68 pin SCSI (7766 modules) Female DB-25 (7765 modules)
Baud Rate:	Up to 1 Mbaud
Format:	RS-232: 8 bits, no parity, 2 stop bits and no flow control

Electrical:

Voltage:	+12VDC
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC directive

Module	Electrical	Physical
PKG7765MVM-8/-8A or PKG7766MVM-8A:	~80W	7
PKG7765MVM-12/-12A or PKG7766MVM-12A:	~100W	9
PKG7765MVM-16/-16A or PKG7766MVM-16A:	~125W	11

Ordering Information (PKG7765MVM) - SDI MultiViewer System

			SYSTEM MODULES	
SDI VIDEO	PACKAGE ORDERING #	DESCRIPTION	EMBEDDED	EXTERNAL
8	PKG7765MVM-8	Up to 8-window display, embedded audio, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C)	YES	NO
8	PKG7765MVM-8A	Up to 8-window display, embedded and/or external AES/EBU audio, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C)	YES	YES
12	PKG7765MVM-12	Up to 12-window display, embedded audio, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C)	YES	NO
12	PKG7765MVM-12A	Up to 12-window display, embedded and/or external AES/EBU audio, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C)	YES	YES
16	PKG7765MVM-16	Up to 16-window display, embedded audio, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C)	YES	NO
16	PKG7765MVM-16A	Up to 16-window display, embedded and/or external AES/EBU audio, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C)	YES	YES

Ordering Information 7766MVM MultiViewer System

			SYSTEM MODULES	
SDI VIDEO	PACKAGE ORDERING #	DESCRIPTION	EMBEDDED	EXTERNAL
8	PKG7766MVM-8A	Up to 8-window display, video & analog audio monitoring, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame	YES	YES
12	PKG7766MVM-12A	Up to 12-window display, video & analog audio monitoring, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C). Also	YES	YES
16	PKG7766MVM-16A	Up to 16-window display, video & analog audio monitoring, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C). Also includes BHP for analog audio breakout 4 break-	YES	YES

Ordering Information 7765MVM & 7766MVM Modules Only

			SYSTEM MODULES	
SDI VIDEO	MODULE ORDERING #	DESCRIPTION	EMBEDDED	EXTERNAL
8	7765MVM-8	Up to additional 8-window display, embedded audio. Used with existing 7700FR-C frame and 7700FC VistaLINK™ Frame Controller	YES	NO
8	7765MVM-8A	Up to additional 8-window display, embedded and/or external AES/EBU audio. Used with existing 7700FR-C frame and 7700FC VistaLINK™ Frame Controller	YES	YES
8	7766MVM-8A	Up to 8-window display, video & analog audio monitoring. Used with existing 7700FR-C frame and 7700FC VistaLINK™ Frame Controller from PKG7766MVM-8A. Also includes 2 audio breakout cables	YES	YES

Ordering Information (PKG7765MVM-CSTM) - Mixed Input Type Packages

VIDEO INPUTS				PACKAGE ORDERING #	DESCRIPTION
TOTAL	SDI	ANALOG	S-VIDEO		
8	4	4	-	PKG7765MVM-8-CSTM1	Eight channel MultiViewer which supports 4 SD-SDI video with embedded audio and 4 composite analog video inputs with external analog audio inputs.
8	4	4	-	PKG7765MVM-8A-CSTM1	Eight channel MultiViewer which supports 4 SD-SDI video inputs with embedded/external AES/EBU (2 channel) audio and 4 composite analog video inputs with external analog audio inputs.
8	4	-	4	PKG7765MVM-8-CSTM2	Eight channel MultiViewer which supports 4 SD-SDI video with embedded audio and 4 S-video inputs with external analog audio inputs.
8	4	-	4	PKG7765MVM-8A-CSTM2	Eight channel MultiViewer which supports 4 SD-SDI video inputs with embedded/external AES/EBU (2 channel) audio and 4 S-video inputs with external analog audio inputs.
12	8	4	-	PKG7765MVM-12-CSTM1	Twelve channel MultiViewer which supports 8 SD-SDI video with embedded audio and 4 composite analog video inputs with external analog audio inputs.
12	4	8	-	PKG7765MVM-12-CSTM2	Twelve channel MultiViewer which supports 4 SD-SDI video with embedded audio and 8 composite analog video inputs with external analog audio inputs.
12	8	-	4	PKG7765MVM-12-CSTM3	Twelve channel MultiViewer which supports 8 SD-SDI video with embedded audio and 4 S-video inputs with external analog audio inputs.
12	4	-	8	PKG7765MVM-12-CSTM4	Twelve channel MultiViewer which supports 4 SD-SDI video with embedded audio and 8 S-video inputs with external analog audio inputs.
12	4	4	4	PKG7765MVM-12-CSTM5	Twelve channel MultiViewer which supports 4 SD-SDI video with embedded audio and 4 composite analog video inputs with external analog audio inputs and 4 S-video inputs with external analog audio inputs.

Ordering Information (PKG7765MVM-CSTM) - Mixed Input Type Packages

VIDEO INPUTS				PACKAGE ORDERING #	DESCRIPTION
TOTAL	SDI	ANALOG	S-VIDEO		
12	8	4	-	PKG7765MVM-12A-CSTM1	Twelve channel MultiViewer which supports 8 SD-SDI video inputs with embedded/external AES/EBU (2 channel) audio and 4 composite analog video inputs with external analog audio inputs.
12	4	8	-	PKG7765MVM-12A-CSTM2	Twelve channel MultiViewer which supports 4 SD-SDI video inputs with embedded/external AES/EBU (2 channel) audio and 8 composite analog video inputs with external analog audio inputs.
12	8	-	4	PKG7765MVM-12A-CSTM3	Twelve channel MultiViewer which supports 8 SD-SDI video inputs with embedded/external AES/EBU (2 channel) audio and 4 S-video inputs with external analog audio inputs.
12	4	-	8	PKG7765MVM-12A-CSTM4	Twelve channel MultiViewer which supports 4 SD-SDI video inputs with embedded/external AES/EBU (2 channel) audio and 8 S-video inputs with external analog audio inputs.
12	4	4	4	PKG7765MVM-12A-CSTM5	Twelve channel MultiViewer which supports 4 SD-SDI video with embedded/external AES/EBU (2 channel) audio and 4 composite analog video inputs with external analog audio inputs and 4 S-video inputs with external analog audio inputs.
16	12	4	-	PKG7765MVM-16-CSTM1	Sixteen channel MultiViewer which supports 12 SD-SDI video with embedded audio and 4 composite analog video inputs with external analog audio inputs.
16	8	8	-	PKG7765MVM-16-CSTM2	Sixteen channel MultiViewer which supports 8 SD-SDI video with embedded audio and 8 composite analog video inputs with external analog audio inputs.
16	4	12	-	PKG7765MVM-16-CSTM3	Sixteen channel MultiViewer which supports 4 SD-SDI video with embedded audio and 12 composite analog video inputs with external analog audio inputs.
16	12	-	4	PKG7765MVM-16-CSTM4	Sixteen channel MultiViewer which supports 12 SD-SDI video with embedded audio and 4 S-video inputs with external analog audio inputs.

Ordering Information (PKG7765MVM-CSTM) - Mixed Input Type Packages

VIDEO INPUTS				PACKAGE ORDERING #	DESCRIPTION
TOTAL	SDI	ANALOG	S-VIDEO		
16	8	-	8	PKG7765MVM-16-CSTM5	Sixteen channel MultiViewer which supports 8 SD-SDI video with embedded audio and 8 S-video inputs with external analog audio inputs.
16	4	-	12	PKG7765MVM-16-CSTM6	Sixteen channel MultiViewer which supports 4 SD-SDI video with embedded audio and 12 S-video inputs with external analog audio inputs.
16	4	4	8	PKG7765MVM-16-CSTM7	Sixteen channel MultiViewer which supports 4 SD-SDI video with embedded audio, 4 composite analog inputs with external analog audio inputs and 8 S-video inputs with external analog audio inputs.
16	8	4	4	PKG7765MVM-16-CSTM8	Sixteen channel MultiViewer which supports 8 SD-SDI video with embedded audio, 4 composite analog inputs with external analog audio inputs and 4 S-video inputs with external analog audio inputs.
16	4	8	4	PKG7765MVM-16-CSTM9	Sixteen channel MultiViewer which supports 4 SD-SDI video with embedded audio, 8 composite analog inputs with external analog audio inputs and 4 S-video inputs with external analog audio inputs.
16	12	4	-	PKG7765MVM-16A-CSTM1	Sixteen channel MultiViewer which supports 12 SD-SDI video inputs with embedded/external AES/EBU (2 channel) audio and 4 composite analog video inputs with external analog audio inputs.
16	8	8	-	PKG7765MVM-16A-CSTM2	Sixteen channel MultiViewer which supports 8 SD-SDI video inputs with embedded/external AES/EBU (2 channel) audio and 8 composite analog video inputs with external analog audio inputs.
16	4	12	-	PKG7765MVM-16A-CSTM3	Sixteen channel MultiViewer which supports 4 SD-SDI video inputs with embedded/external AES/EBU (2 channel) audio and 12 composite analog video inputs with external analog audio inputs.

Ordering Information (PKG7765MVM-CSTM) - Mixed Input Type Packages

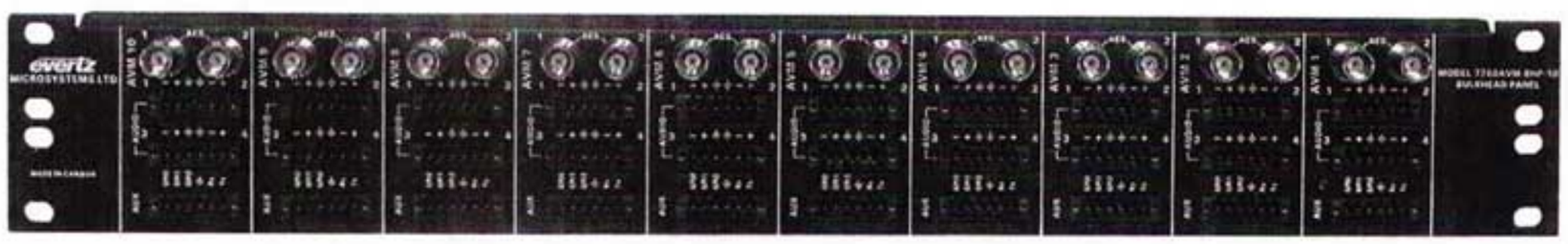
VIDEO INPUTS				PACKAGE ORDERING #	DESCRIPTION
TOTAL	SDI	ANALOG	S-VIDEO		
16	12	-	4	PKG7765MVM-16A-CSTM4	Sixteen channel MultiViewer which supports 12 SD-SDI video with embedded/external AES/EBU (2 channel) audio and 4 S-video inputs with external analog audio inputs.
16	8	-	8	PKG7765MVM-16A-CSTM5	Sixteen channel MultiViewer which supports 8 SD-SDI video with embedded/external AES/EBU (2 channel)audio and 8 S-video inputs with external analog audio inputs.
16	4	-	12	PKG7765MVM-16A-CSTM6	Sixteen channel MultiViewer which supports 4 SD-SDI video with embedded/external AES/EBU (2 channel) audio and 12 S-video inputs with external analog audio inputs.
16	4	4	8	PKG7765MVM-16A-CSTM7	Sixteen channel MultiViewer which supports 4 SD-SDI video with embedded/external AES/EBU (2 channel) audio, 4 composite analog inputs with external analog audio inputs and 8 S-video inputs with external analog audio inputs.
16	8	4	4	PKG7765MVM-16A-CSTM8	Sixteen channel MultiViewer which supports 8 SD-SDI video with embedded/external AES/EBU (2 channel) audio, 4 composite analog inputs with external analog audio inputs and 4 S-video inputs with external analog audio inputs.
16	4	8	4	PKG7765MVM-16A-CSTM9	Sixteen channel MultiViewer which supports 4 SD-SDI video with embedded/external AES/EBU (2 channel) audio, 8 composite analog inputs with external analog audio inputs and 4 S-video inputs with external analog audio inputs.

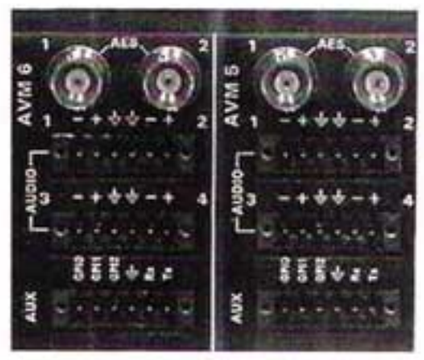
AVM Bulkhead Breakout Panels

Models 7760AVM-BHP-5
7760AVM-BHP-10
7761AVM-DC-BHP-15
7765AVM-4A-BHP-7
7766AVM-4A-BHP-4
7766AVM-4A-BHP-1

Bulkhead Breakout Panels (BHP) provide a convenient way of connecting audio and auxiliary input and output signals into module rear plate D-connectors. Each BHP may be outfitted with BNCs and/or terminal strips, extending AES, GPI/O, Tx/Rx and GND connections. BHPs occupy 1RU, 2RU or 3RU of rack space and are designed for mounting at the rear of the rack panel. BHPs include standard 3ft. adapter cables to connect with rear plate D-connectors.

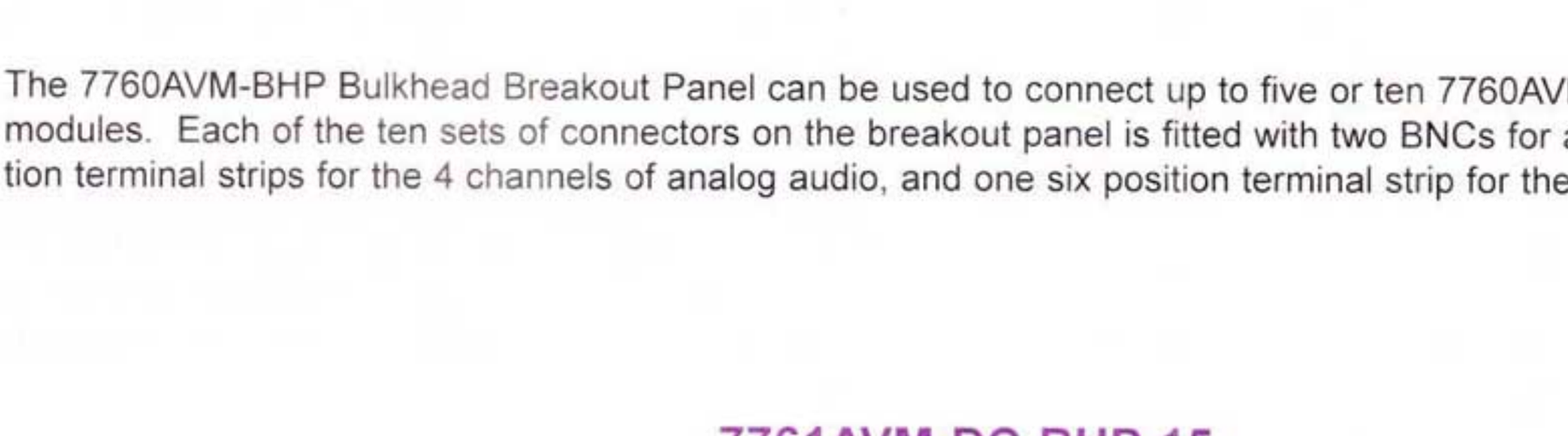
7760AVM-BHP-5, 7760AVM-BHP-10





The 7760AVM-BHP Bulkhead Breakout Panel can be used to connect up to five or ten 7760AVM & up to seven 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.

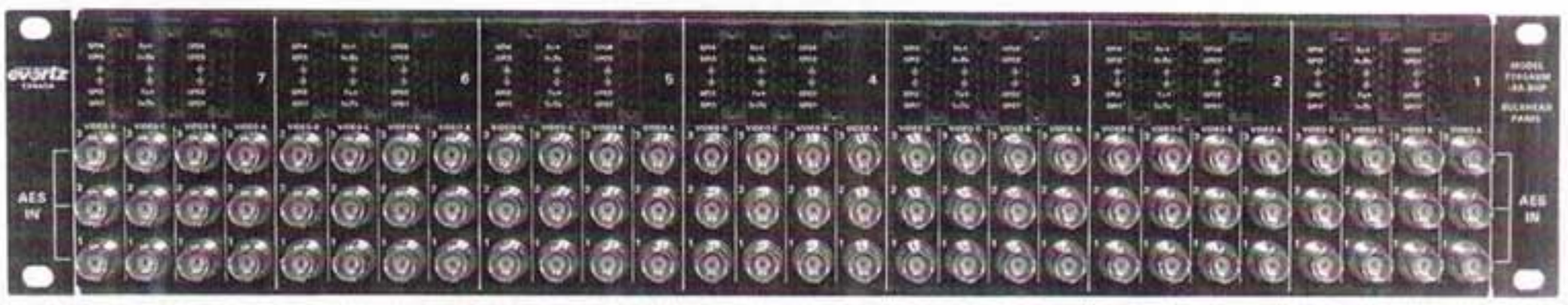
7761AVM-DC-BHP-15





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 15 7761AVM-DC modules.

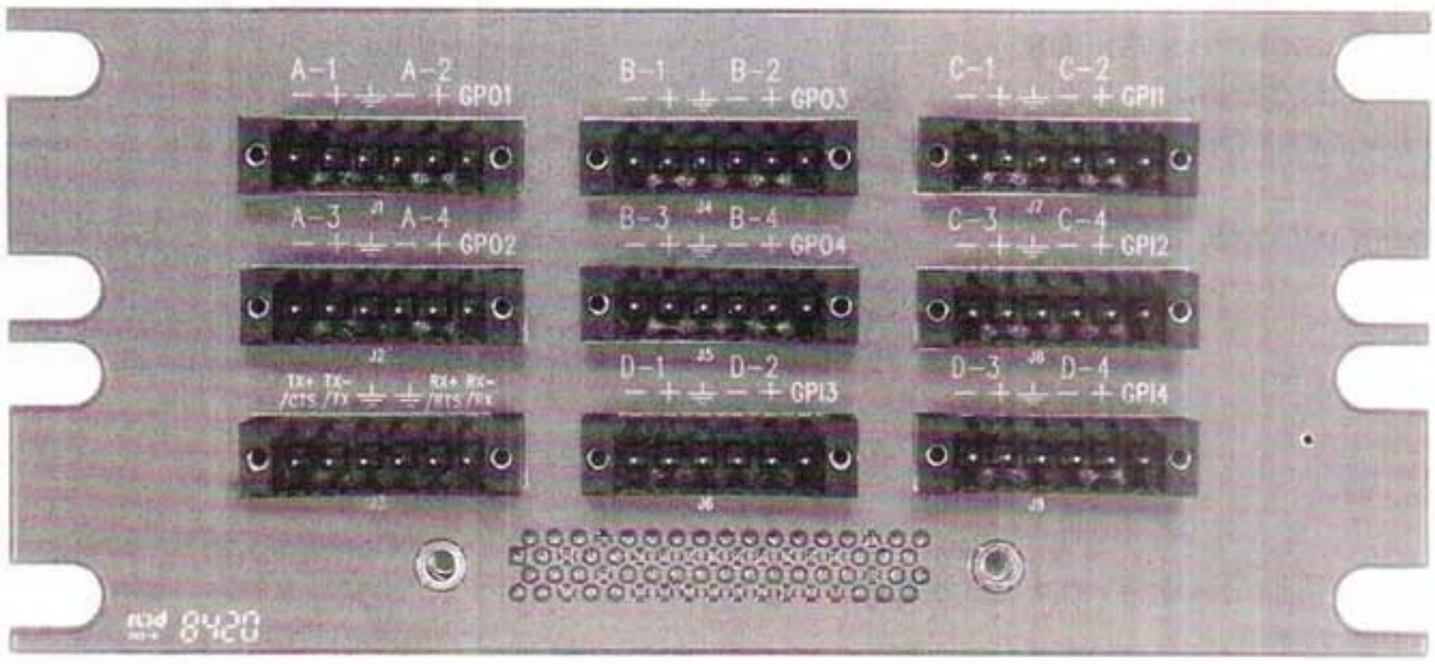
7765AVM-4A-BHP-7





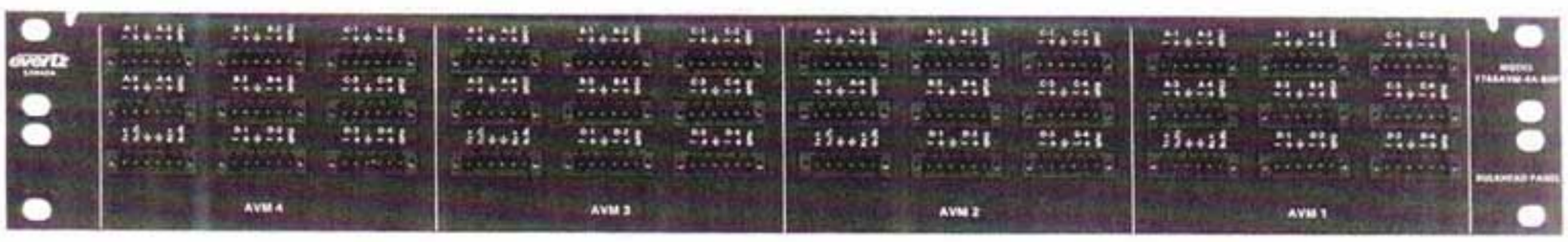
The 7765AVM-4A-BHP Bulkhead Breakout Panel provides a convenient way of connecting AES/EBU audio and GPI I/O signals into the DB-25 on 7765AVM-4A modules.

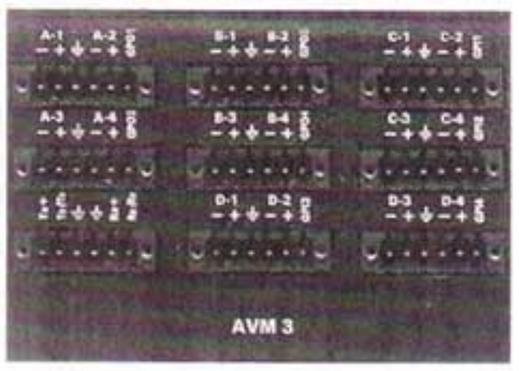
7766AVM-4A-BHP-1



The 7766AVM-4A-BHP Bulkhead Breakout Panel 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.

7766AVM-4A-BHP-4





Ordering Information

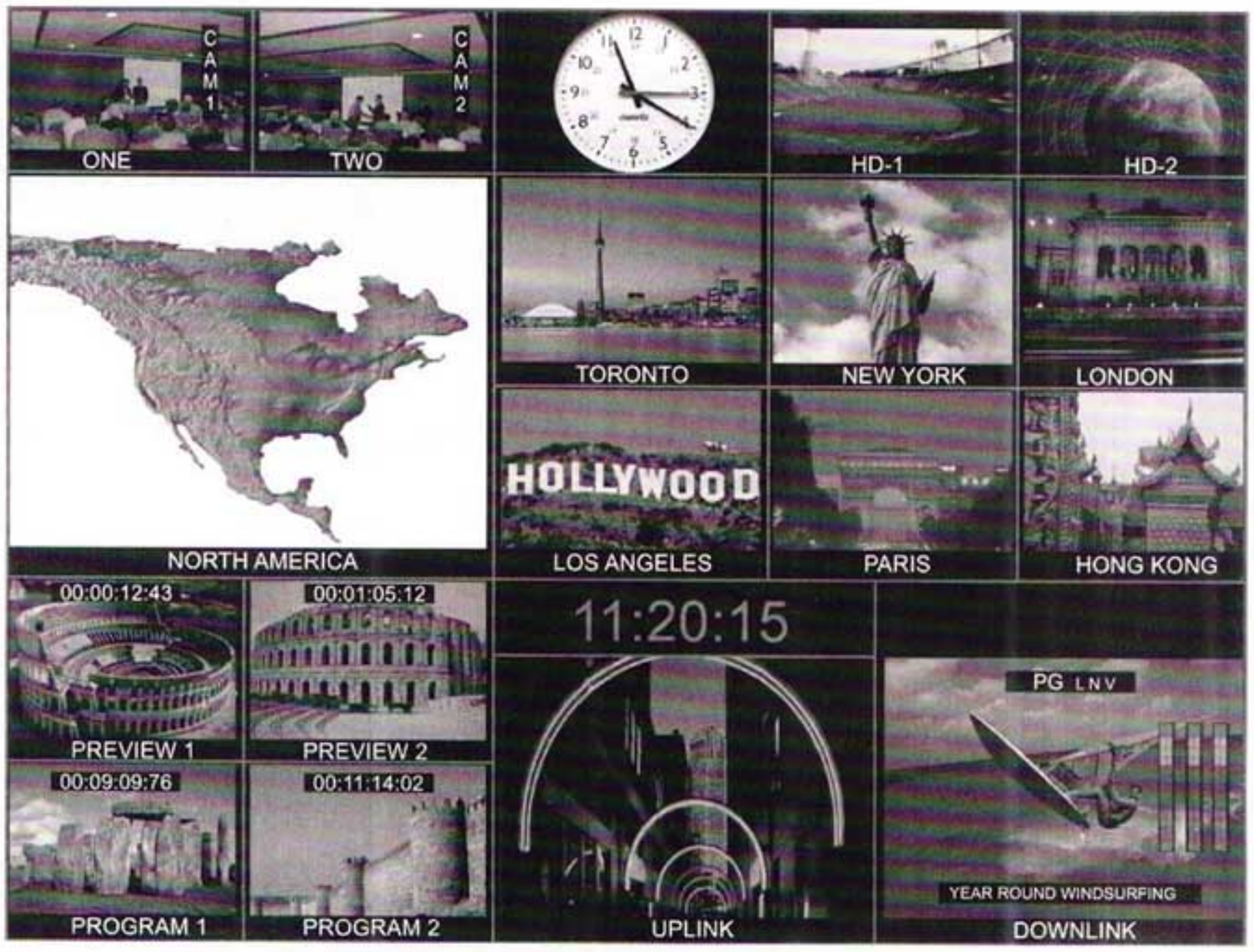
7760AVM-BHP-5	Bulkhead Breakout Panel for 5 x 7760AVMs (includes 5-3ft cables)
7760AVM-BHP-10	Bulkhead Breakout Panel for 10 x 7760AVMs (includes 10-3ft cables)
	(Optional Cables - WPAVMIO-1-0-1F (1' Adapter Cable)
	WPAVMIO-1-0-3F (3' Adapter Cable)
	WPAVMIO-1-0-6F (6' Adapter Cable)
7761AVM-DC-BHP-15	Bulkhead Breakout Panel for 15 x 7761AVM-DCs (includes 15-3ft cables)
7765AVM-4A-BHP-7	Bulkhead Breakout Panel for 7 x 7765AVM-4A (includes 7-3ft cables)
7766AVM-4A-BHP-4	Bulkhead Breakout Panel for 4 x 7766AVM-4A (includes 4-3ft cables)
7766AVM-4A-BHP-1	Bulkhead Breakout Panel for 1 x 7766AVM-4A (inlucdes 1-3ft cable)

MVP - Multi-image Display and Monitoring System



Model 3000MVP

- Broadcast and computer video inputs
- Auto-detecting HD, SD and analog video inputs
- 4:3, 16:9 and 9:16 output display modes
  - On screen display (OSD):
  - Audio level bar and phase graphs
  - Decode up to 2 groups of audio
  - Map analog or AES audio to video input
  - Real time video, audio and data signal status
  - Decoded closed captioning
  - Decoded time code
  - Fault alert messages
  - Tally, border, under monitor and side-monitor displays
  - User configurable clocks and timers
  - Independent window size adjustment



Features

Modular:
- Fully hot-swappable, front-loading input and output modules and dual redundant power supplies

Expandable:
- 15-slot frame with octal auto-detecting video input modules
- Daisy-chain frames for a multitude of videos displayed on a single or multiple screen

Redundant
- Optional second power supply unit
- Optional second display processor card

Configuration, Control and Monitoring
- Layout and system configuration through "MVP Express" Layout Editor
- Quick access configuration control through 9000NCP Control Panel
- Monitoring through VistaLINK™ PRO Network Management Software. VistaLINK™ offers remote monitoring via Simple Network Management Protocol (SNMP) giving the flexibility to manage operations, including signal monitoring and module configuration, from SNMP-enabled control systems (Manager or NMS)
- Border/Tally and UMD interface to common switchers through published protocols

Signal Monitoring/Fault Alarming
- User definable fault conditions, thresholds and durations through configuration software tool
- Additional Monitoring Features:
  - Regionalized freeze and black detection
  - Input Expandable view to quarter and full screen
  - On-screen active picture display resizing
  - Closed caption and Teletext detection, display and XDS monitoring option
  - Configurable on-screen audio bar graph (with ballistics) and signal status display
  - Monitored Conditions: Loss of video, Picture freeze, Picture black, Loss of Active Picture, Peak Video Level, Black Level, Input Standard detection, AP/FF EDH Errors, Loss of Audio, Audio Silence, Audio Format, Audio Phase Reversal, Audio too loud, Audio Mono Detection, Loss of VITC, Loss of Source ID, Loss of Program Rating (V-Chip), Loss of Closed Captioning, GPI, Active Format (Region) Description (AFD) detection, Teletext (subtitle) detection, source input change-over, logo presence,WINK detection.

Applications

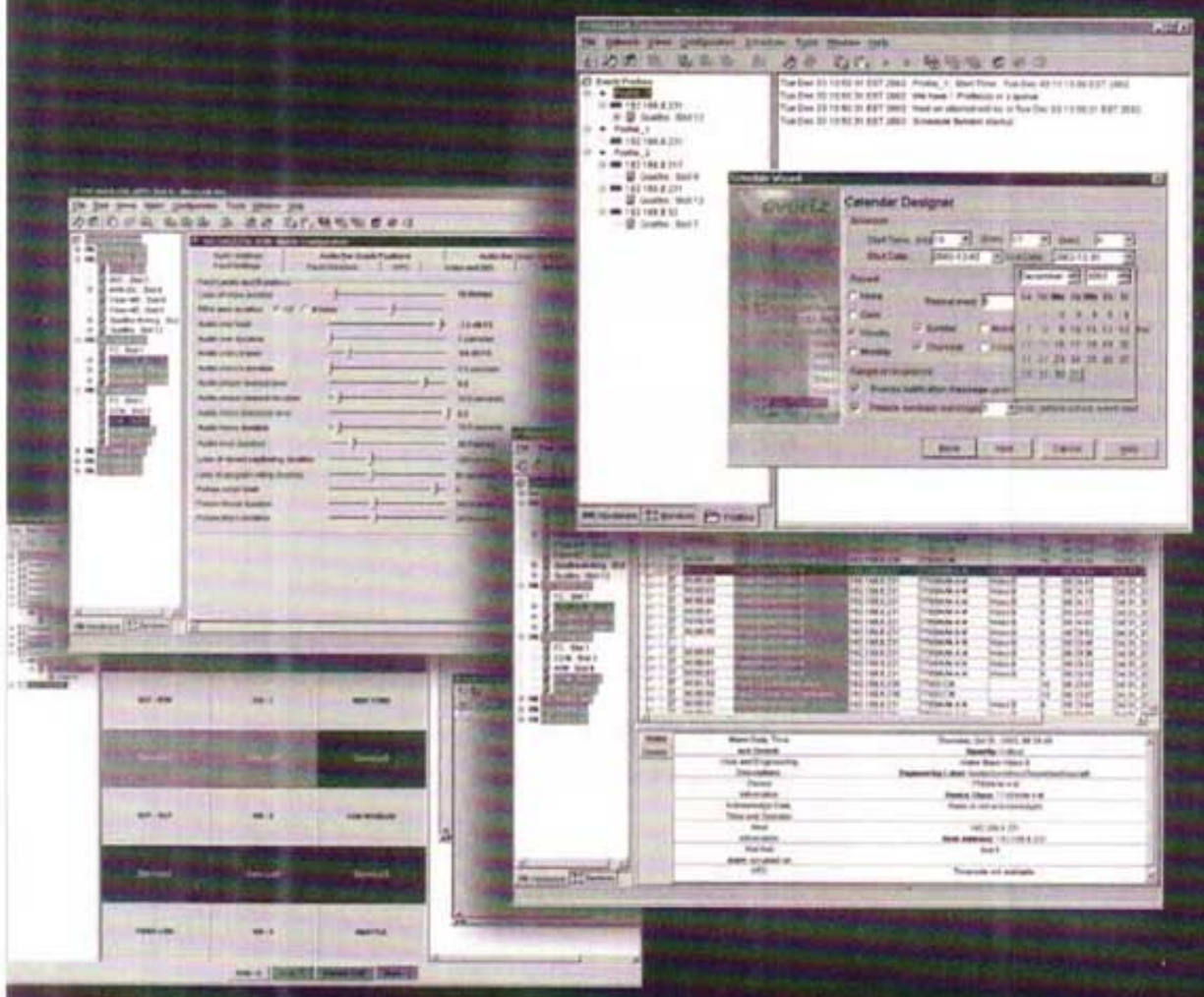
Broadcast Applications:
- Broadcast Facility/Master Control
- Satellite Uplink and Downlink Facilities
- Production and Post Production
- Control Room
- OB Vans

Enterprise (Non-broadcast) Applications:
- Surveillance and Security
- Traffic and Transportation Control
- Defense
- Video Conferencing
- Gaming and Entertainment
- Information Displays

The Most Advanced & Comprehensive Multi-Image Display and Monitoring System...



Whether utilizing a single input signal status monitoring card or a multi-input Quattro™, Evertz's hot-swappable, modular "AVM" products boost your signal monitoring capacity and confidence through both local on-screen displays and remote monitoring via VistaLINK™ - Evertz's extensive, end-to-end, networked monitoring and management solution using Simple Network Management Protocol (SNMP).



Evertz's Multi-image display and monitoring products are VistaLINK™ enabled and may be monitored from anywhere in the world through VistaLINK™ PRO - customized, complete, uncomplicated and cost-effective monitoring and configuration application software, uniting Evertz's VistaLINK™- enabled AVM, Fiber and Conversion product lines. If faults occur on monitored incoming or outgoing signals throughout the video enterprise network, an alert is sent through the network - in effect acting as "your eyes and ears" for monitoring!



MVP

Any input,
- Auto-detecting HD,SD and Analog video
- S-Video and computer video
- Analog or AES/EBU audio

Any output,
- Up to 1600x1200 output resolution
- Analog and digital clocks
- Dynamic UMD and borders
- On screen display audio bars, status and fault monitoring

Any size,
- Dynamic display window resizing, cropping and placement

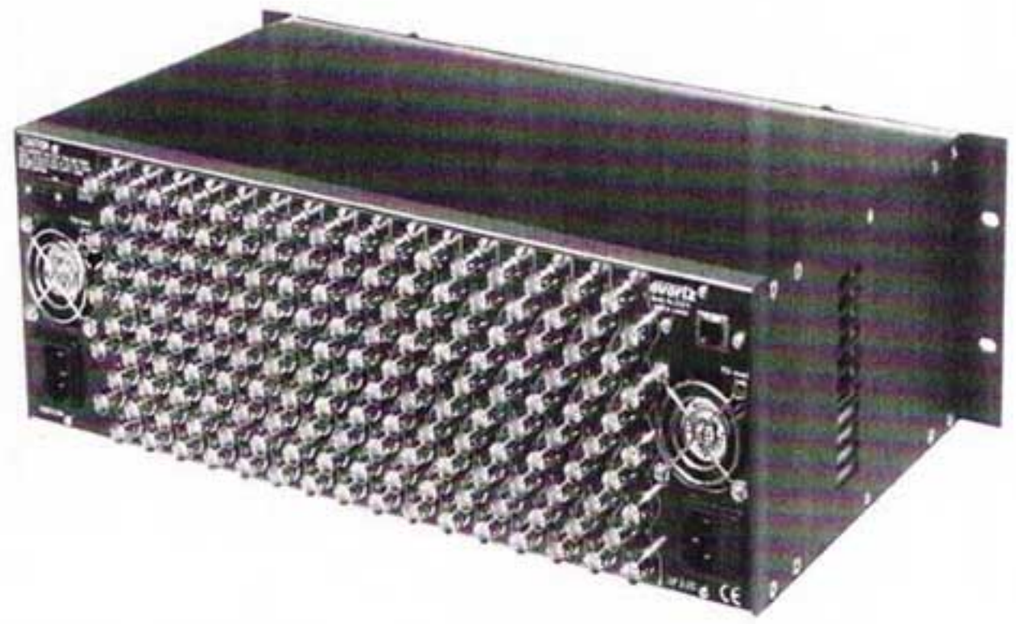
Any time...

Multi-Image Display & Monitoring System

Ordering Information: Contact factory or your local dealer for packages

Model 500FR





Specifications

Electrical :

AC Mains Input: Auto ranging, 100 to 240 VAC, 50/60 Hz

Maximum Power Dissipation: 160 W

Fuses: 3 amp, 250 Volt time delay
5x20mm - 2 per power supply

Power Supply Configuration: External power supply adapter

Physical:

Dimensions: 19"W x 5.25"H x 9.25"D

Module Capacity: 16 single slot modules

Weight: 32 lbs. (14.5 Kg) (Full)

Certification:

Safety: ETL Listed
Complies with CE Safety Directive

EMC: Complies with FCC part 15, Class A
EU EMC Directive

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

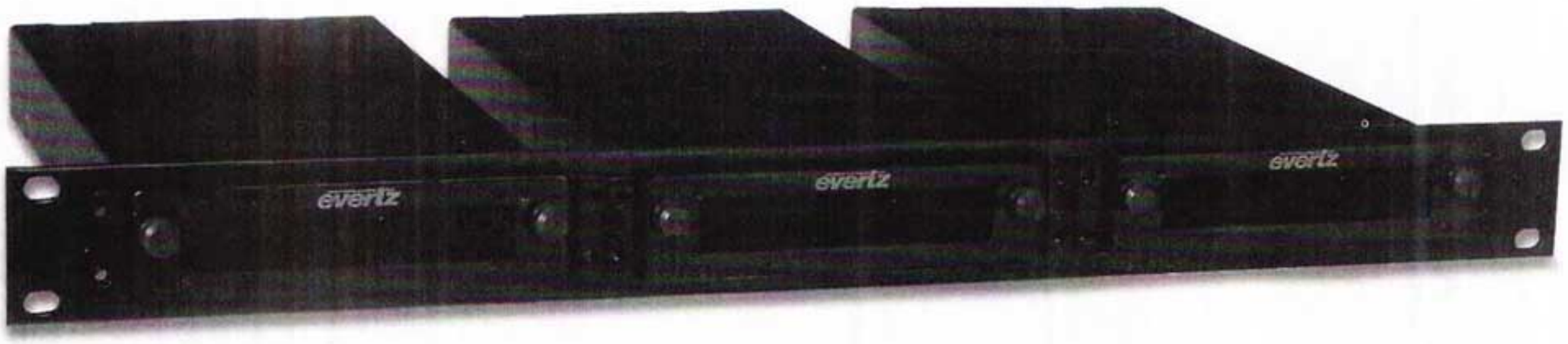
Ordering Information:

500FR Compact High Density Distribution Frame

Ordering Options: exponent

500PS Redundant power supply

Model S501FR



3 - S501FR & S501FR-RP

Electrical :

Voltage: 12VDC Nominal
Auto ranging, 100 to 240VAC power adapter

Power: 10 W

Fuse: Internal self resetting fuse

Connector: 2.5 mm DC power jack

Certification:

Safety: ETL Listed
Complies with EU Safety Directive

EMC: Complies with FCC part 15, Class A
Complies with EU EMC Directives

Physical:

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

Ordering Information: exponent

S501FR Standalone Compact High Density Distribution Frame

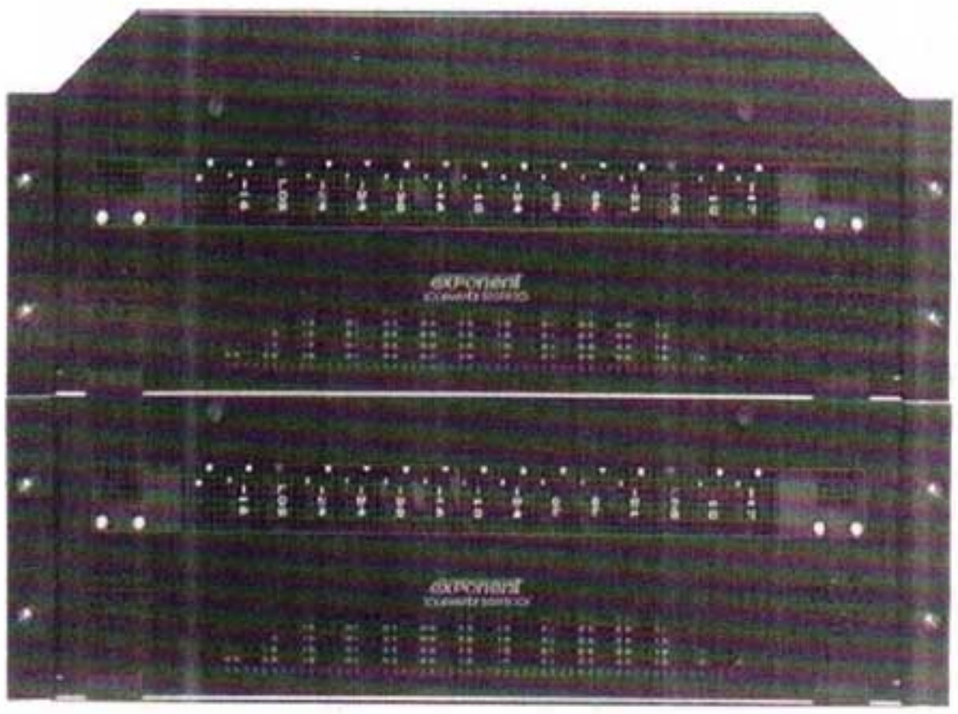
Accessories:

S501FR-RP Rackmount panel mounts 3, S501FR enclosure in 1RU rack space

An Industry Comparison

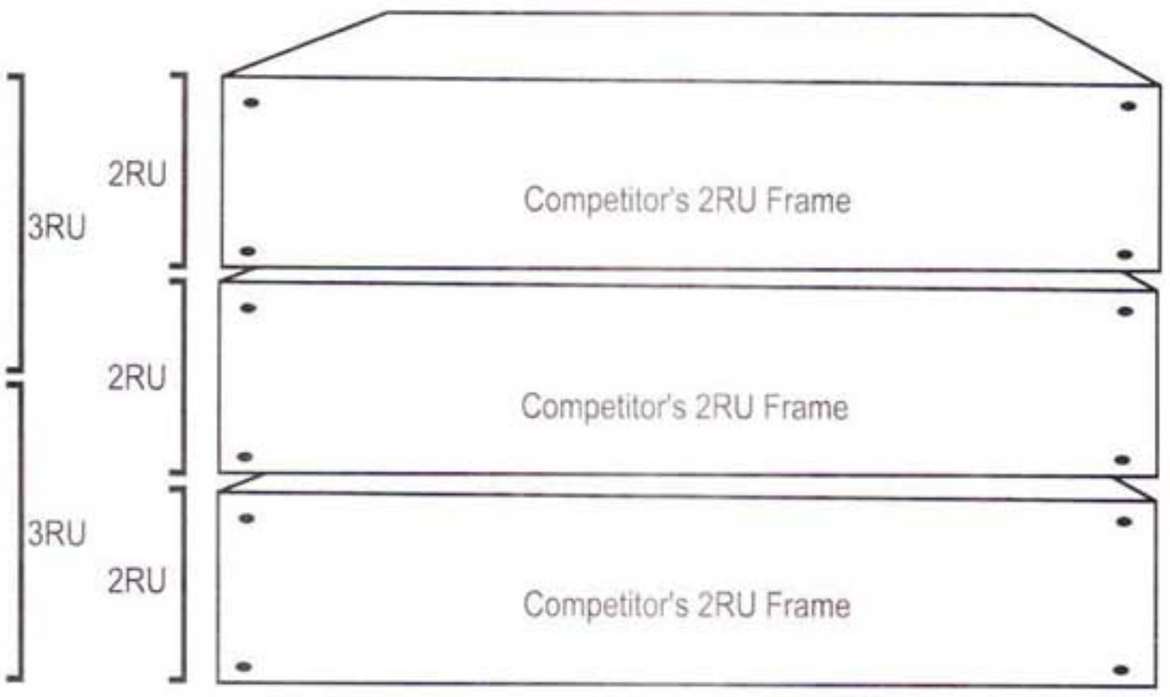
(based on 6RU of Rack Space)

Evertz exponent DA Frame



VS

Competitor's DA Frame



Total Number of Output BNC'S per 6RU= 288

Total Power Suppilies per 6RU= 4 (with redundancy)

Total Number of Output BNC'S per 6RU= 240-270
(Depending on manufacturer)

Total Power Suppilies per 6RU= 6 (with redundancy)

Notes:

1) Evertz achieves the highest density with 288 BNC outputs (per 6RU)
2) Evertz uses less power supplies thus less points of failure
3) Evertz is a very competitive solution for high volume DA installations

Combo HD/SD SDI Reclocking Distribution Amplifier

Model 500DA-HD

The Evertz 500DA-HD Reclocking Distribution Amplifier provides reliable distribution of your HDTV and SDTV SDI 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 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 500DA-HD DA's are 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 for quality monitoring

Inputs:

- Auto detects SMPTE 259M (143 to 540 Mb/s), SMPTE 292M (1.5 Gb/s) signals or DVB-ASI signals

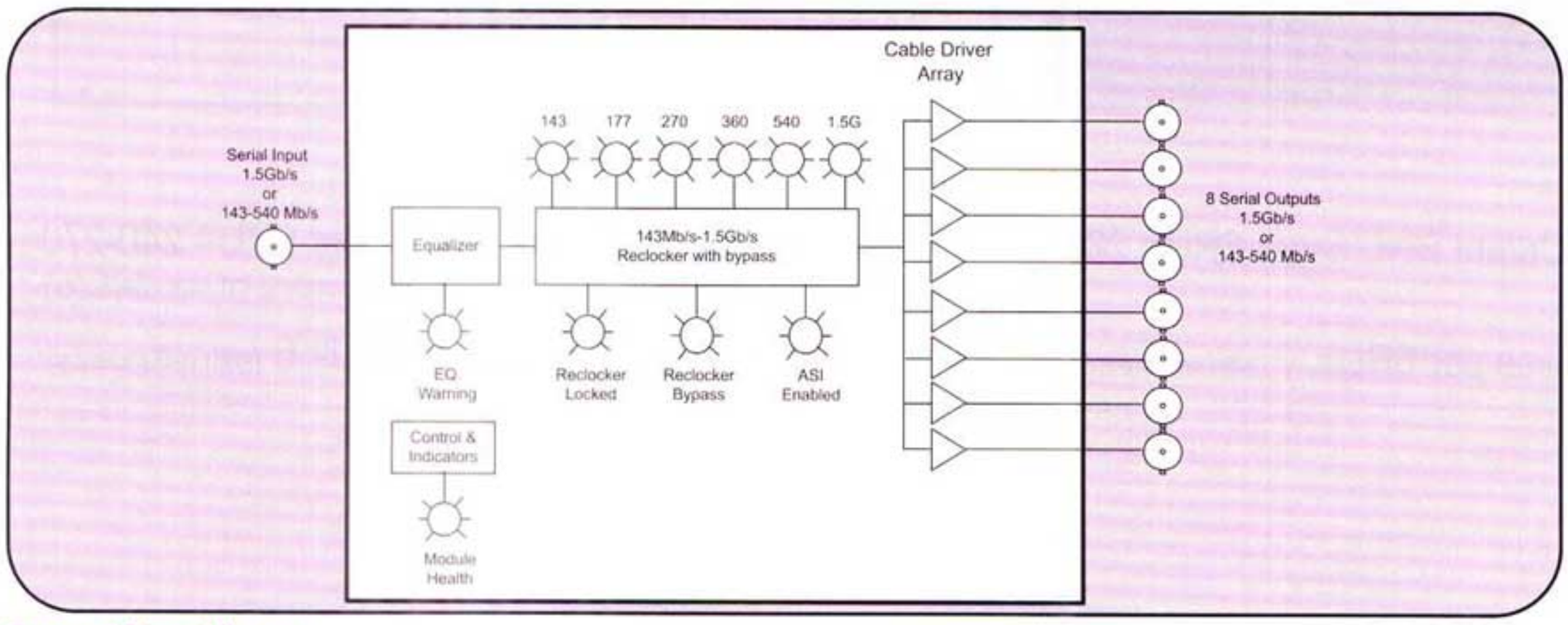
Outputs:

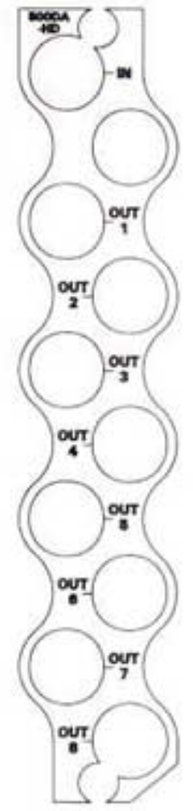
- Independent isolated output drivers to ensure no cross channel loading effects (i.e. no need to terminate unused outputs)

Card Edge LEDs:

- Module Health Status
- Max. Equalization Warning
- Reclocker Locked
- Bitrate Indication

500DA-HD Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 292M, SMPTE 259M-A, B, C, D (143 to 540Mb/s), SMPTE 310M or DVB-ASI
Connector:	BNC input per IEC 169-8
Equalization:	Automatic to 350m @ 270Mb/s, 100m @1.5Gb/s with Belden 1694 (or equivalent)
Return Loss:	> 15dB up to 1.0 Gb/s > 10dB up to 1.5 Gb/s

Serial Video Outputs:

Number of Outputs:	8 Reclocked
Connector:	BNC per IEC 169-8
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 > 10db up to 1.5 Gb/s
Wideband Jitter:	< 0.2 UI

Physical:

Number of Slots:	1

Electrical:

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

Ordering Information:

500DA-HD	Combo HD/SD SDI Reclocking Distribution Amplifier (1 x 8)

Enclosure:

	exponent
500FR	Compact High Density Distribution Frame
S501FR	Standalone enclosure

Combo HD/SD SDI Dual Reclocking Distribution Amplifier (32 1x4 DA's in 3RU Rack Space)

Model 500DA2Q-HD

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 360 Mb/s), SMPTE 344M (540 Mb/s), DVB-ASI or SMPTE 310M (19.4 Mb/s) or any other SDI signal within the 143 Mb/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

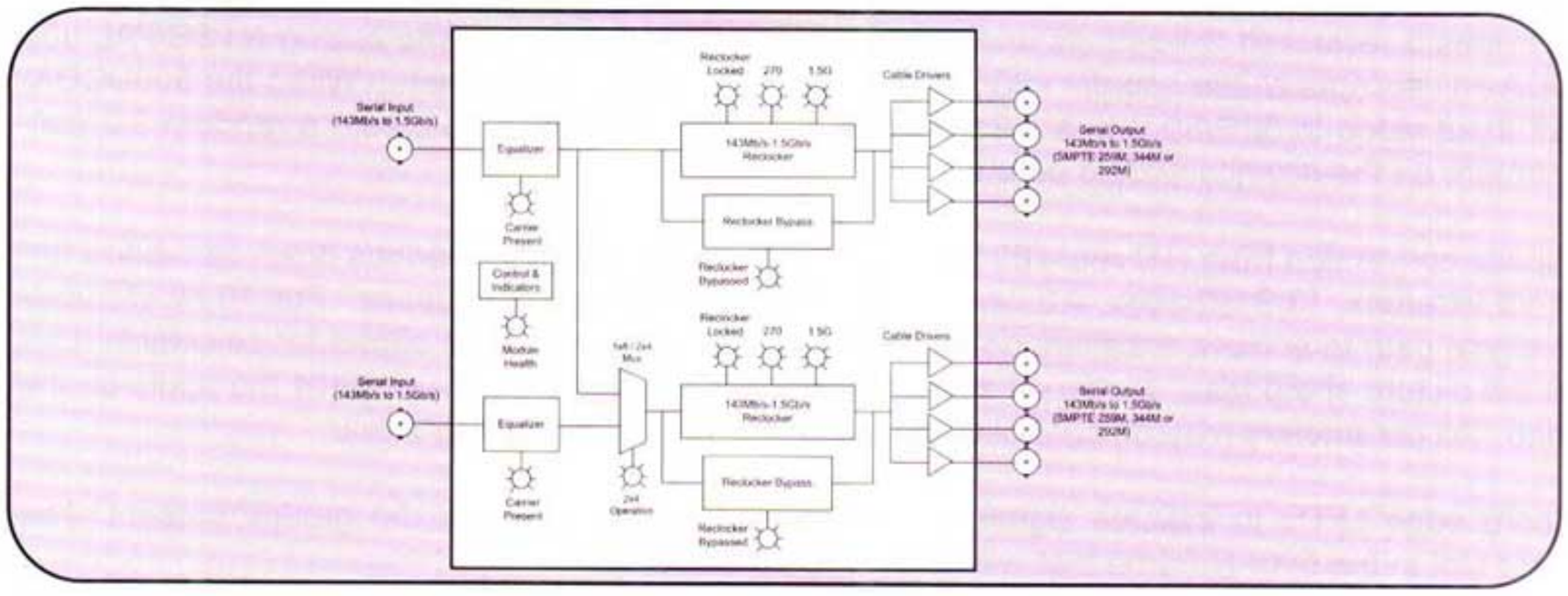
- Normal mode for SMPTE 292M (1.5 Gb/s) SMPTE 259M (143 - 360 Mb/s) or SMPTE 344M (540 Mb/s) signals - autodetects correct bit rate
- Jumper selectable mode for DVB-ASI
- Jumper selectable non-reclock mode for SMPTE 310M(19.4Mb/s) signals or any other SDI signal within the 143 Mb/s to 1.5 Gb/s range
- 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

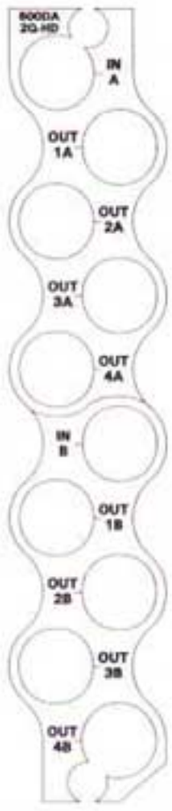
Card Edge LEDs:
- Module Health Status
- 2x4 mode operation
- Reclocker rate detection
- Reclocker Locked
- Carrier Present

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 1694) @1.5Gb/s

Outputs:
- 4 reclocked outputs per input
- Jitter < 0.2UI

500DA2Q-HD Block Diagram





Specifications

Serial Video Input:

Standards

Reclocked:	SMPTE 292M (1.5 Gb/s), SMPTE 259M (143 to 360 Mb/s), SMPTE 344M (540 Mb/s), DVB-ASI
Non-reclocked:	SMPTE 310M (19.4 Mb/s) Any SDI signal in the143Mb/s to 1.5 Gb/s range
Connectors:	2 BNC per IEC 169-8
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:	(mode set by jumper)
2 x 4 Mode:	4 reclocked from each input Reclockers can by bypassed separately for each input
1 x 8 Mode:	8 reclocked from Input A (1) Reclockers can by bypassed
Connector:	BNC per IEC 169-8
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:

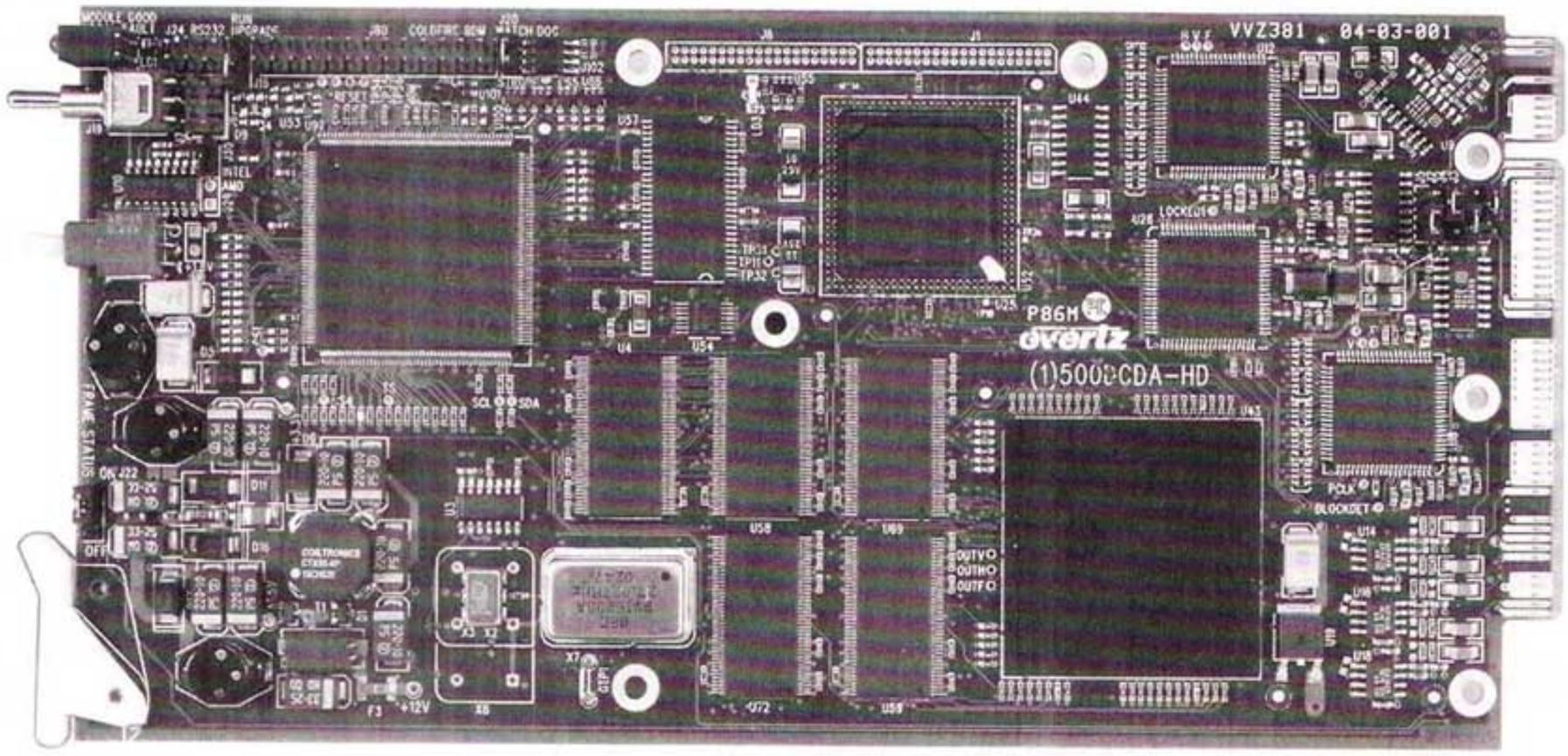
500DA2Q-HD	Combo HD/SD SDI Dual Reclocking Distribution Amplifier (2 - 1 x 4)

Enclosure:

500FR	exponent Compact High Density Distribution Frame
S501FR	Standalone enclosure

HD Downconverter & Distribution Amplifier

Model 500DCDA-HD



The 500DCDA-HD exponent is a reclocking high definition serial digital video distribution amplifier and a high quality down-converter for 1.5 Gb/s HDTV signals. It can also function as a monitoring distribution amplifier for standard definition 270 Mb/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/24sF input video to 525i/60 with a 3:2 pulldown, it inserts extra fields to create a random 3:2 pulldown cadence of the picture content on the downconverted output.

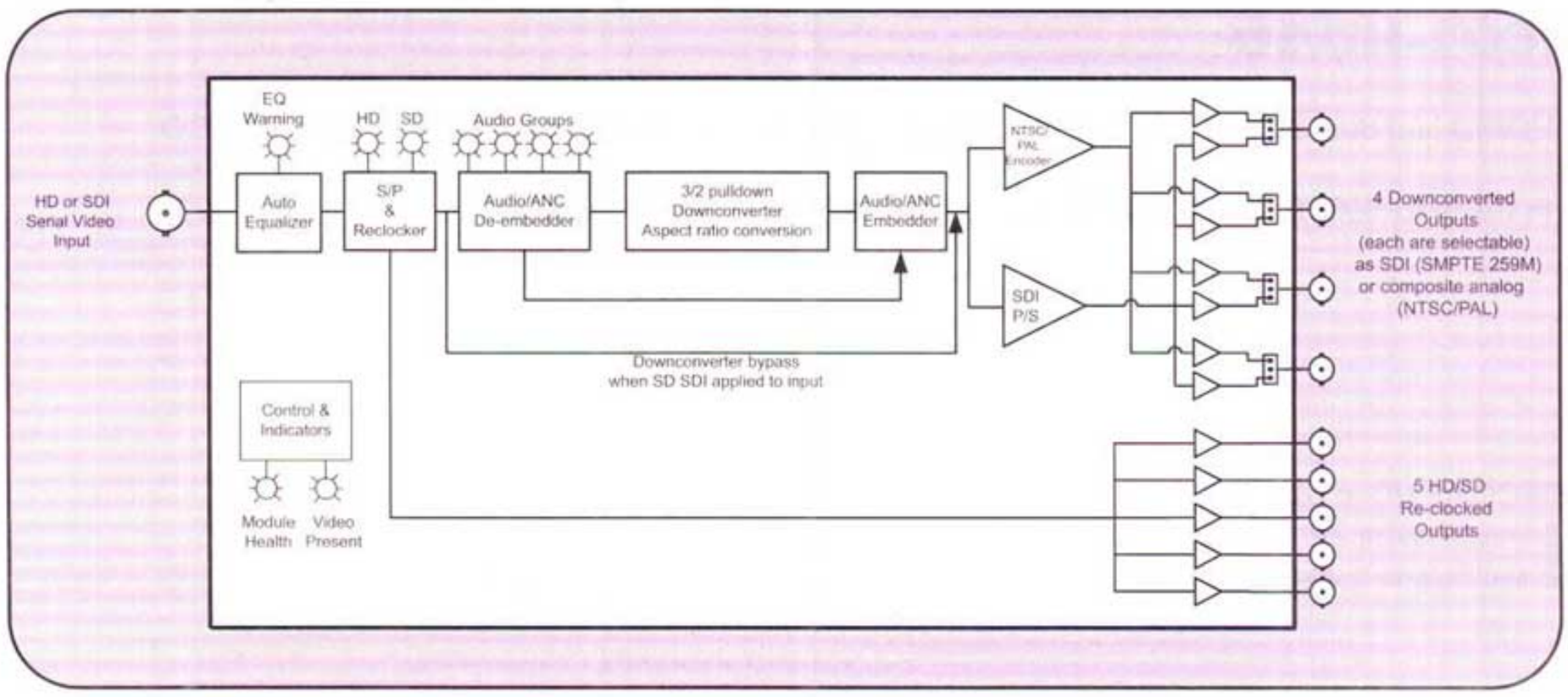
The 500DCDA-HD has color space conversion from ITU rec. 709 to ITU rec. 601, and will provide various down converted formats such as 16:9 letterbox, 14:9 letterbox, 13:9 letterbox, 4:3 center crop, and 4:3 anamorphic squeeze. Full 10 bit processing is provided throughout the signal path to achieve excellent 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.

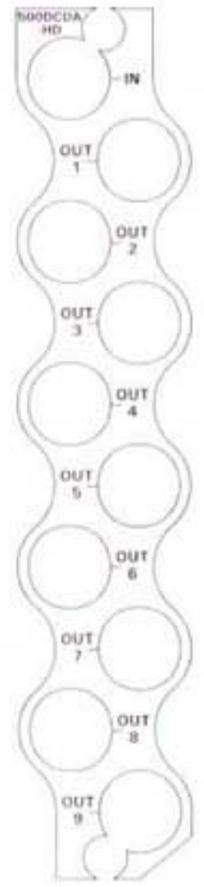
The 500DCDA-HD provides card edge LEDs to indicate signal present, genlock present and audio groups present. The 500DCDA-HD occupies one card slot in the 500FR frame that will hold up to 16 modules.

Features

- Serial digital 1.5 Gb/s HD input per SMPTE 292M
- Supports most international standards including 1080i/60, 1080i/59.94, 1080i/50, 480p/59.94, 480p/60, 720p/60 & 720p/59.94, 1080p/24sF and 1080i/23.98sF
- Will also accept 270 Mb/s SD input SDI per SMPTE 259M in a pass through mode - auto senses HD or SD inputs (feature not implement at the time of writing)
- 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 (random cadence)
- 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)
- Card Edge LEDs for signal presence, equalization warning, audio groups present, module status
- Tally output on Frame Status bus upon loss of input signal

500DCDA-HD Block Diagram





Specifications

Serial Video Input:

Standard:	SMPTE 259M 270 Mb/s - pass through mode SMPTE 292M - auto-detects standard, SMPTE 274M, SMPTE 296M, (1080i/60, 1080i/59.94, 1080i/50, 480p/59.94, 480p/60, 720p/60 & 720p/59.94, 1080p/24sF and 1080i/23.98sF)
Connector:	BNC per IEC 169-8
Input Equalization:	Automatic to 100m @ 1.5Gb/s with Belden 1694 or equivalent cable.
Return Loss:	>15 dB up to 1.5GHz

Reclocked Serial Video DA Outputs:

Standard:	Same as input (SMPTE 259M or SMPTE 292M)
Number of Outputs:	4 Per Card reclocked
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	200ps nominal for HD 750ps nominal for SD
Overshoot:	<10% of amplitude
Return Loss:	> 15 dB at 1.5 Gb/s
Jitter:	< 0.2 UI

Downconverted Composite Analog Video Outputs:

Standards:	Analog composite NTSC (SMPTE 170M) if input is 59.94Hz or Analog composite PAL (ITU-R BT.470) if input is 50Hz
Number of Outputs:	up to 3 Per Card (jumper selectable)
Connectors:	BNC per IEC 169-8
Signal Level:	1 V p-p nominal
DC Offset:	0V ±0.1V
Return Loss:	>35dB up to 5 MHz
Frequency Response:	0.1dB to 4 MHz, 01.5dB to 5.5 MHz
Differential Phase:	<0.5°(<0.3° typical)
Differential Gain:	<0.5% (<0.3 % typical)
SNR:	>78dB to 5 MHz (shallow ramp)
Impedance:	75 Ω

Downconverted Serial Video Outputs:

Standard:	SMPTE 259M-C (270 Mb/s)
Number of Outputs:	up to 3 Per Card (jumper selectable)
Connector:	BNC per IEC 169-8
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

Input to Output Processing Delay:

Video Delay:	2 to 4 frames depending on input video format and processing mode.
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:

500DCDA-HD	HD Downconverter and Distribution Amplifier

Enclosures: exponent

500FR	Compact High Density Distribution Frame
S501FR	Standalone enclosure

Combo HD & SD Digital Auto Signal 2x1 Change Over

Model 500ACO2-HD/SD

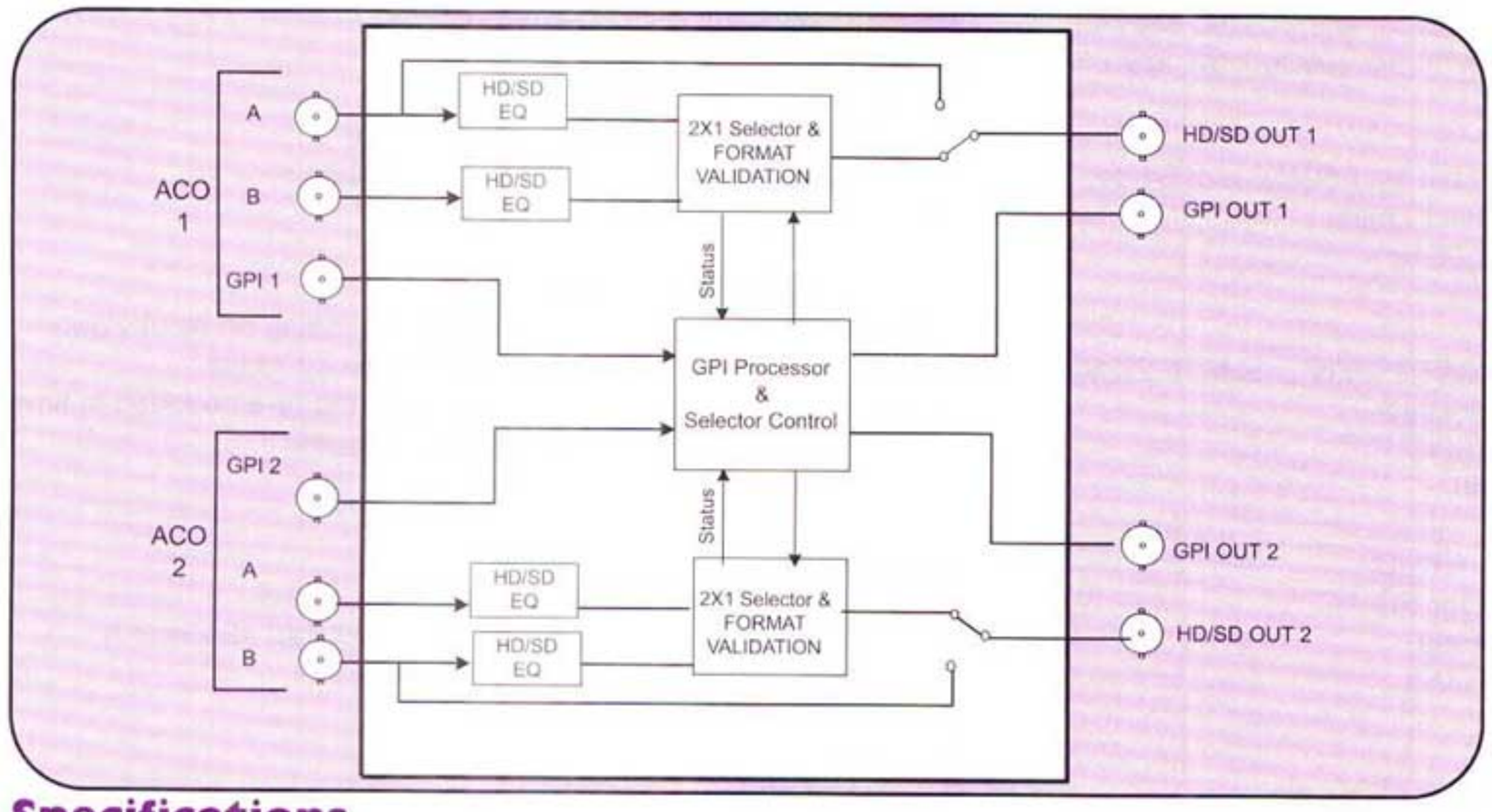
The Evertz 500ACO2-HD/SD is a dual HD/SD SDI autochangeover. It serves as an SDI extension to our 5600ACO.

This device is housed in the 3RU 500FR exponent frame that will hold up to 16 modules.

Features

- Extension of the 5600ACO for HD or SD SDI
- Can be operated as 2 independent 2x1 via GPI control
- Can be operated as 2 standalone autochangeover's

500AC02-HD/SD Block Diagram



Specifications

Serial Video Input:

Standard:	SMPTE 259-C (270Mb/s)
Connector:	BNC input per IEC 169-8
Equalization:	Automatic to 200m @ 270Mb/s, 75m @ 1.5Gbp/s Belden 1694A
Return Loss:	> 15dB up to 270Mb/s

Serial Video Output:

Standard:	SMPTE 259-C (270Mb/s)
Number of Outputs:	1
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ± 0.5V
Overshoot:	<10% of amplitude
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:

500ACO2-HD/SD	Combo HD & SD Digital Auto Signal Change Over

Enclosures:

500FR	exponent Compact High Density Distribution Frame
S501FR	Standalone enclosure

Model 500DA

The Evertz 500 DA Reclocking Distribution Amplifier provides inexpensive distribution of your SMPTE 310M and SMPTE 259M serial digital video signal at rates of 19.4 Mb/s and 143 Mb/s to 540 Mb/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 500DA has been designed for use as a SMPTE 310M (19.4 Mb/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

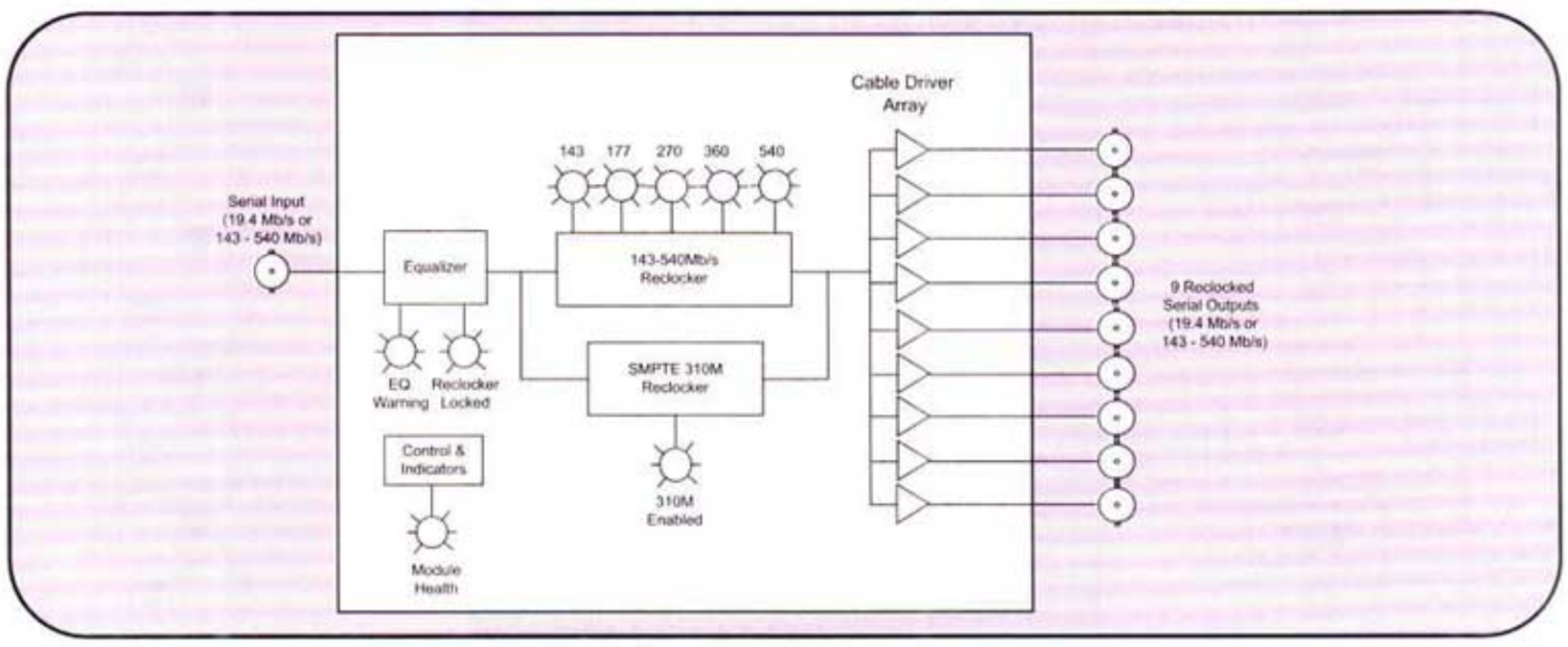
- Normal mode for SMPTE 259M (143 to 540 Mb/s) or DVB-ASI signals - autodetects correct bitrate
- Jumper Selectable mode for SMPTE 310M (19.4 Mb/s)
- Fully hot-swappable from front of frame with no BNC disconnect required
- Independent isolated output drivers to ensure no cross channel loading effects (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

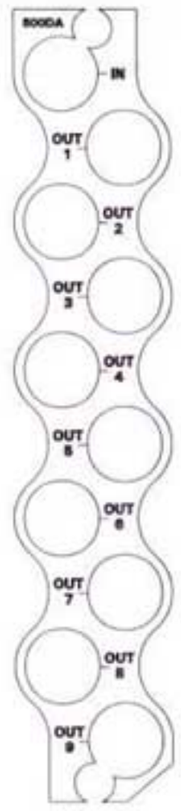
Input:
- SMPTE 259M A, B, C, D (143 Mb/s to 540Mb/s), DVB-ASI, SMPTE 310M (19.4 Mb/s) (jumper selectable)
- Return loss > 15dB up to 540Mb/s
- 440m auto eq. at 270Mb/s (Belden 1694A)
- 380m auto eq. at 270Mb/s (Belden 1694A) with HDSDI modules within 500FR

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

500DA Block Diagram





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 input per IEC 169-8
Equalization:	Automatic to 440m @ 270Mb/s with Belden 1694A Automatic to 380m @270Mb/s Belden 1694A with HDSDI modules within 500FR
Return Loss:	> 15dB up to 540Mb/s

Serial Video Output:

Number of Outputs:	9 Reclocked
Connector:	BNC per IEC 169-8
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: exponent

500FR	Compact High Density Distribution Frame
S501FR	Standalone enclosure

SDI Dual Reclocking Distribution Amplifier (2 1x4 SDI DA's in 3RU Rack Space)

Model 500DA2Q

The Evertz 500DA2Q Reclocking Distribution Amplifier provides the highest density DA in the industry allowing up to 32 SDI distribution amplifiers in a 3RU rack space. It provides inexpensive distribution of your SMPTE 259M (143 to 360 Mb/s), SMPTE 344M (540Mb/s), or SMPTE 310M (19.4 Mb/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 500FR exponent frame that will hold up to 16 modules.

Features

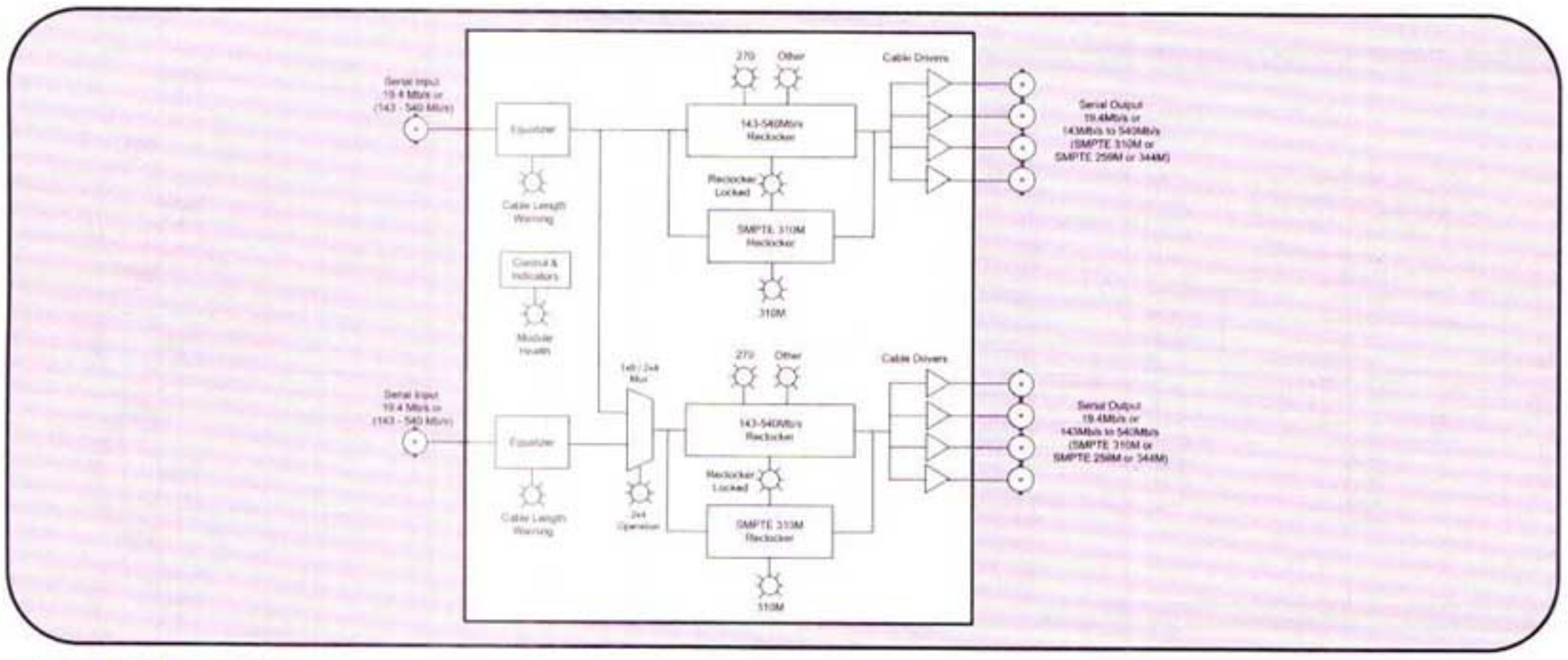
- Normal mode for SMPTE 259M (143-360 Mb/s), SMPTE 344M (540Mb/s) or DVB-ASI signals - autodetects correct bit rate
- Jumper selectable mode for SMPTE 310M (19.4 Mb/s) signals
- Configurable as 1 DA with 8 outputs or 2 DAs with 4 outputs each
- Fully hot-swappable from front of frame with no BNC disconnect 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

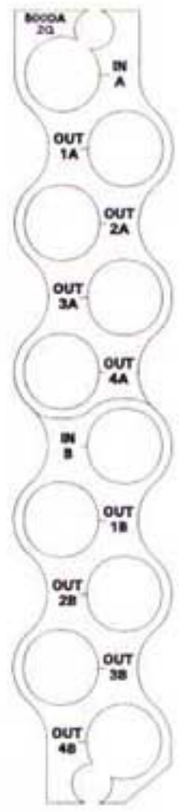
Card Edge LEDs:
- Module Health Status
- 2x4 mode operation
- Reclocker rate (detection)
- Reclocker Locked
- Max. Equalization Warning

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

500DA2Q Block Diagram





Specifications

Serial Video Input:

Standards	
Reclocked:	SMPTE 259M (143 to 360 Mb/s) SMPTE 344M (540 Mb/s), SMPTE 310M (19.4 Mb/s) DVB-ASI
Non-reclocked:	Any SDI signal in the143Mb/s to 540 Mb/s range
Connectors:	2 BNC per IEC 169-8
Equalization:	Automatic to 400m @ 270 Mb/s with Belden 1694A or equivalent cable (325m in mixed HD-SDI/SD-SDI frame applications)
Return Loss:	> 15 dB up to 270 Mb/s

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 169-8
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
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

Ordering Information:

500DA2Q	SDI Dual Reclocking Distribution Amplifier (2 - 1 x 4)

Enclosure:

500FR	exponent Compact High Density Distribution Frame
S501FR	Standalone enclosure

Model 500VMDA

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 y

The 500VMDA is housed in the 500FR exponent frame that will hold up to 16 modules.

Features

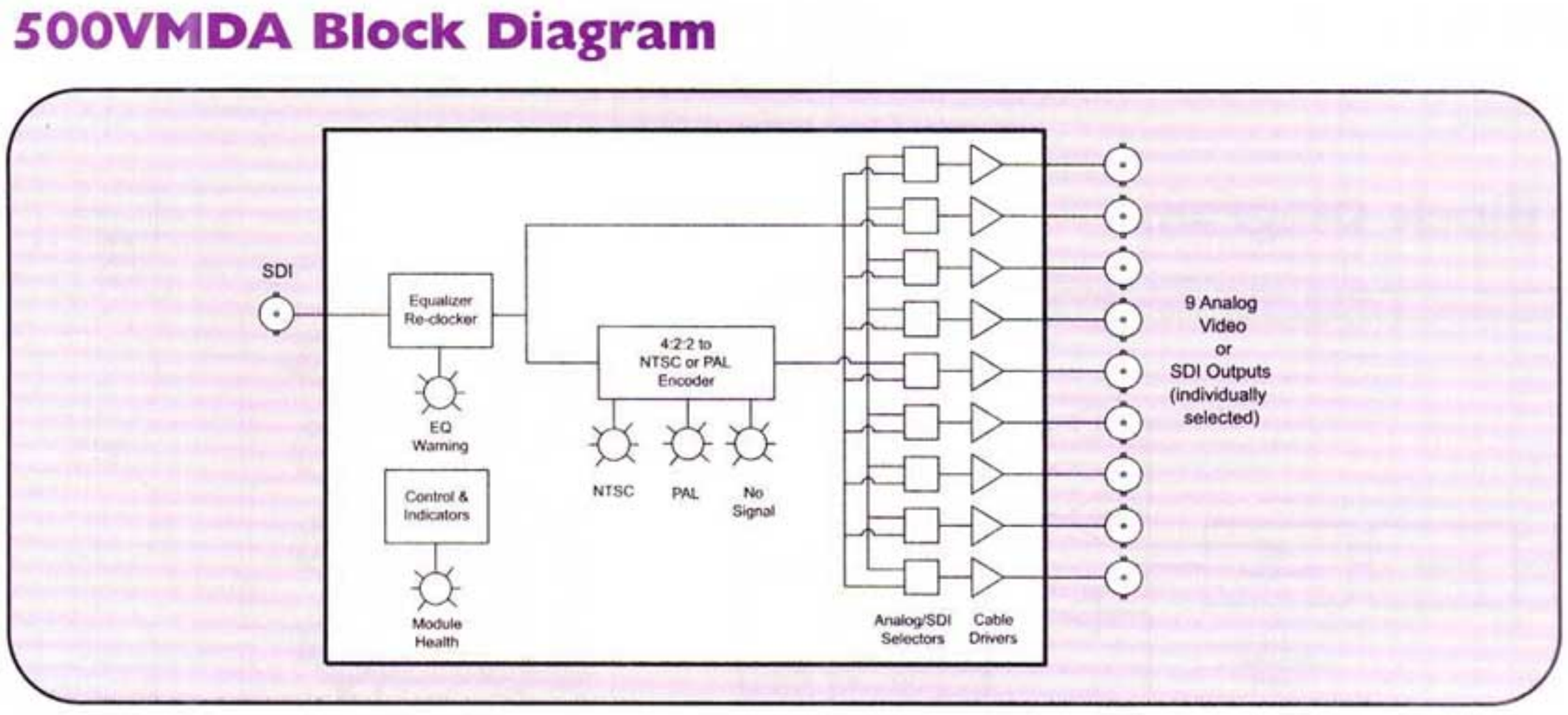
- Fully hot-swappable from front of frame with no BNC disconnect required
- Tally output on Frame Status bus upon loss of input signal

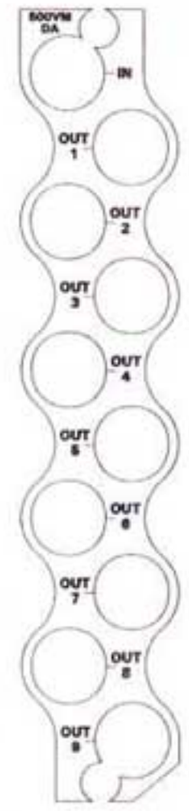
Output:
- 9 outputs selectable as SDI or composite analog (NTSC/PAL)
- Independent isolated output drivers to ensure not cross channel leading effects (i.e. no need to terminate unused outputs)
- Selectable NTSC pedestal on/off

Input:
- Supports SMPTE 259 (270Mb/s) video

Card Edge LEDs:
- Reclocker Locked
- Max. Equalization Warning
- Module Health Status
- Video present, cable length warning and video standard LEDs

500VMDA Block Diagram





Specifications

Serial Video Input:

Standards:	SMPTE 259M-C (270 Mb/s) 525 or 625 line.
Connector:	1 BNC per IEC 169-8
Equalization:	Automatic to 415m @ 270 Mb/s with Belden 1694A or equivalent cable (340m with HD-SDI modules within 500FR frame)
Return Loss:	> 15 dB up to 270 Mb/s

Serial Video Output:

Number of Outputs:	Up to 9 reclocked outputs (jumper selectable)
Connector:	BNC per IEC 169-8
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

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 169-8
Signal Level:	1 V p-p nominal
DC Offset:	0V ±0.1V
Return Loss:	> 35 dB up to 5 MHz

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:

500VMDA	SDI Monitoring Reclocking Distribution Amplifier

Enclosure:

500FR	exponent Compact High Density Distribution Frame
S501FR	Standalone enclosure

Balanced AES Audio Distribution Amplifier

Model 500DA-AESB

The 500DA-AESB is a four output reclocking and auto equalizing DA for unbalanced 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 500ADA-AESB is housed in the 3RU 500FR exponent frame that will hold up to 16 modules.

Features

- Data reclocking provides jitter reduction

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

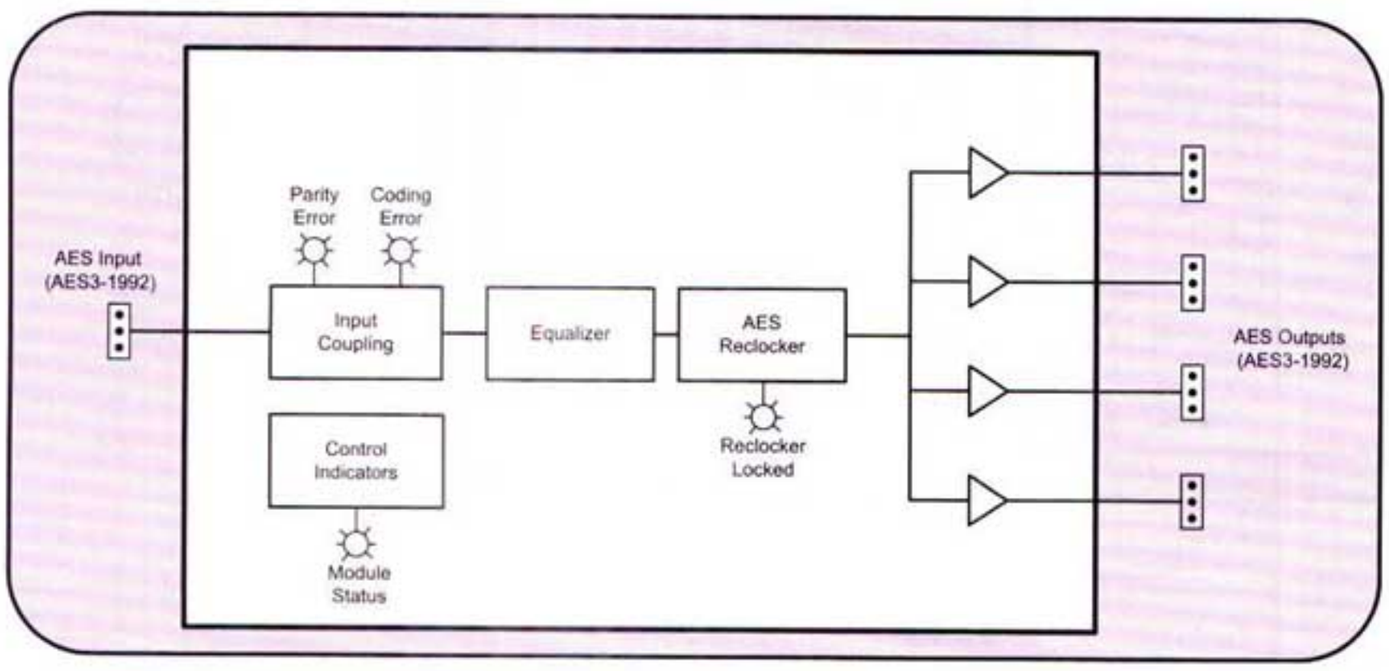
Outputs:

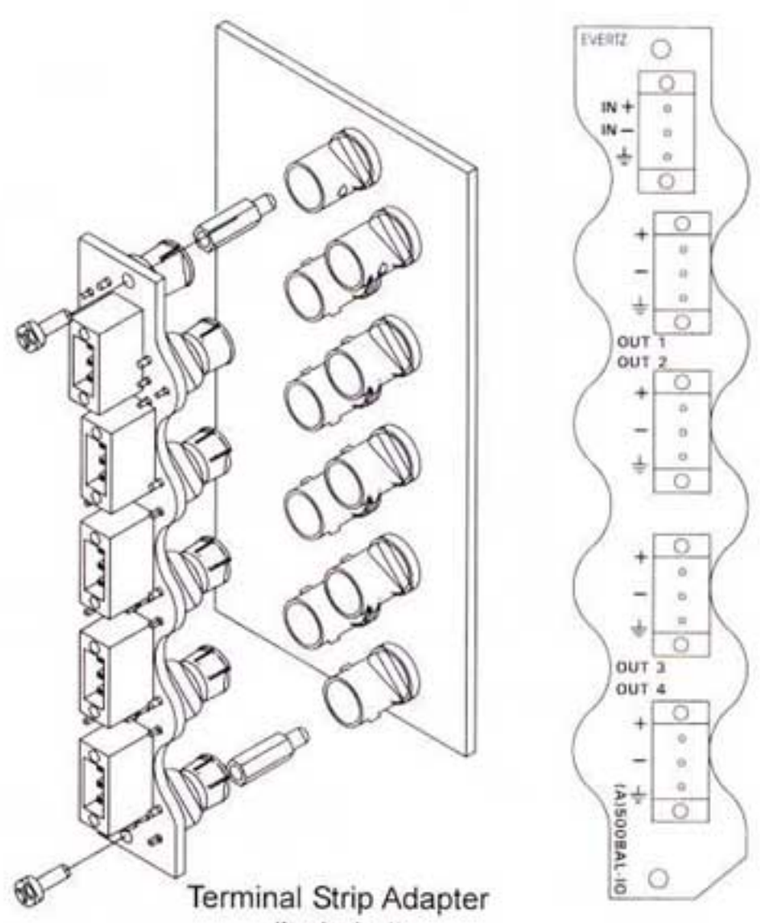
- Four 110Ω balanced

Card Edge LEDs:

- Module Health Status
- Error LED indication for input PLL out of lock, parity error or biphase coding error
- Reclocked locked

500DA-AESB Block Diagram





Terminal Strip Adapter (included)

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:

	exponent
500FR	Compact High Density Distribution Frame
S501FR	Standalone enclosure

Model 500DA-AESU

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 500ADA-AESU is housed in the 3RU 500FR *exponent* frame that will hold up to 16 modules.

Features

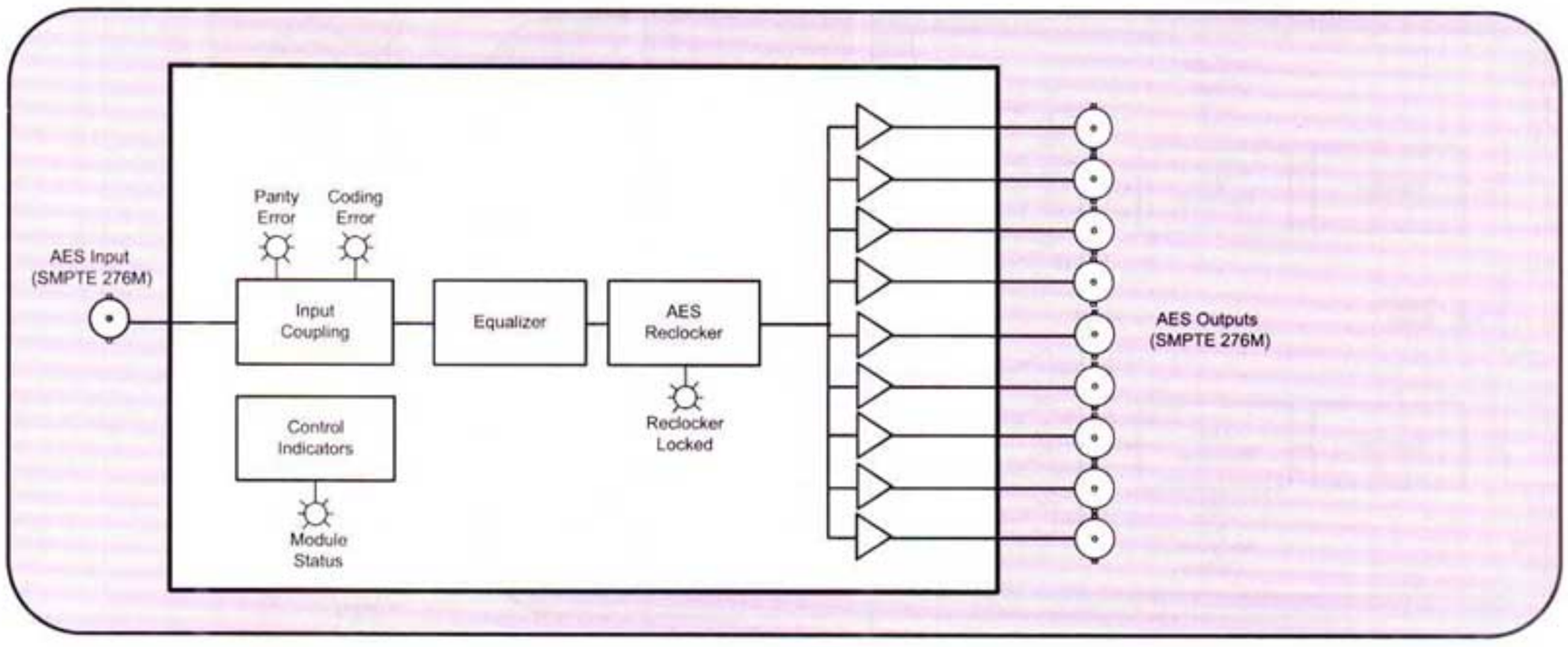
- Data reclocking provides jitter reduction

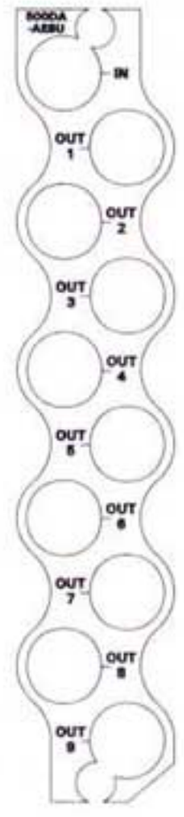
Inputs:
- SMPTE 276M standard for AES audio on 75Ω coax
- EQ and reclock provide extended cable length compensation (>1500m)
- Transformer coupled 75Ω unbalanced input

Outputs:
- Nine 75Ω coax outputs

Card Edge LEDs:
- Module Health Status
- Error LED indication for input PLL out of lock, parity error or biphase coding error
- Reclocker locked

500DA-AESU Block Diagram





Specifications

AES Input:

Standard:	SMPTE 276M
Number of Inputs:	1
Connector:	BNC input per IEC 169-8
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 169-8
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:

	exponent
500FR	Compact High Density Distribution Frame
S501FR	Standalone enclosure

Dual Unbalanced AES Audio Distribution Amplifier

Model 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 reclocked outputs for applications where a larger numbers of outputs is required.

The 500DA2Q-AESU is housed in the 500FR exponent frame that will hold up to 16 modules.

Features

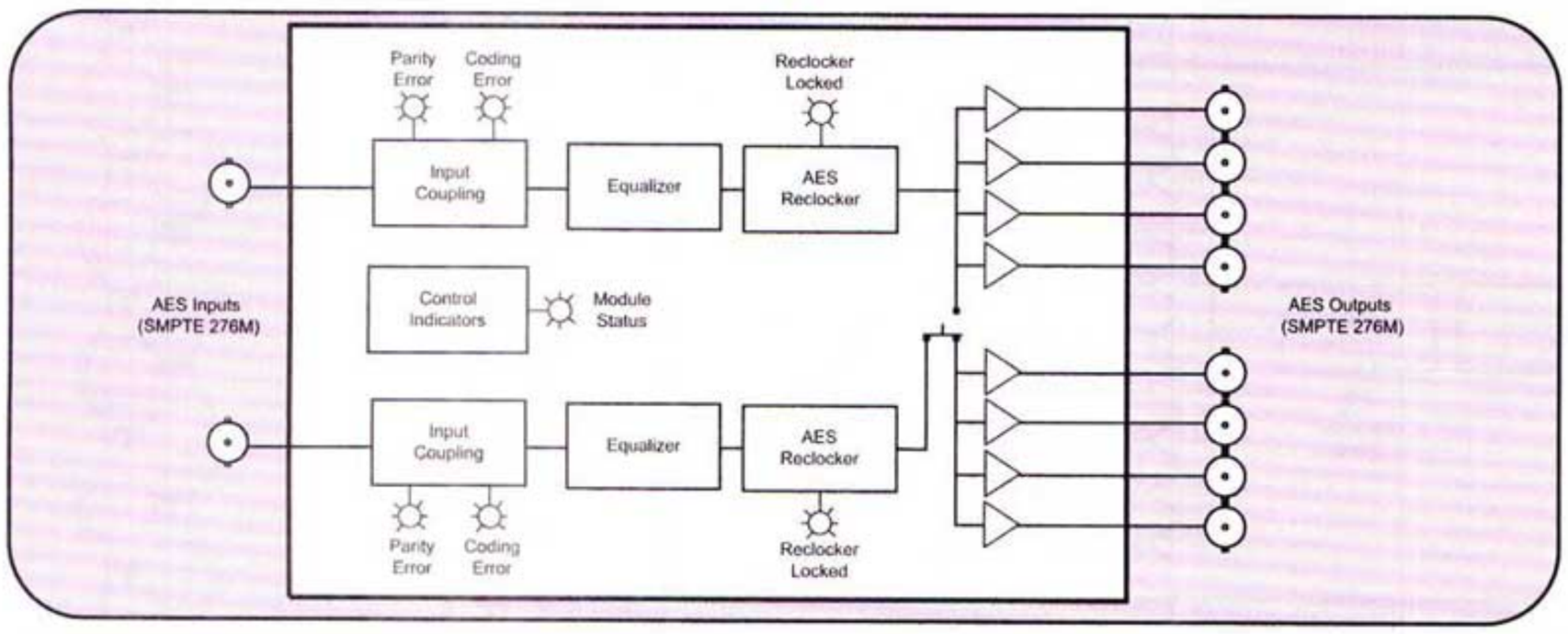
- Supports SMPTE 276M standard for AES audio on 75Ω coax
- 2 independent distribution amplifiers with 4 reclocked outputs provides jitter reduction
- Can be configured as one 8 output distribution amplifier
- Automatic equalization provides extended cable length capabilities
- Card edge indicators for PLL out of lock, parity error or bi-phase coding errors
- Tally output of input error conditions

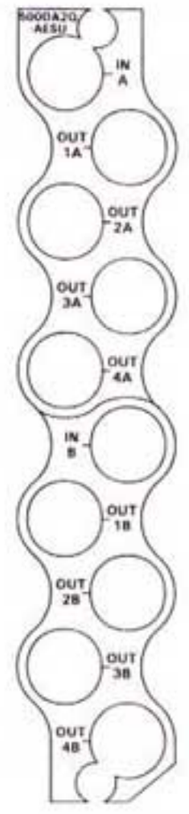
Card Edge LEDs:
- Module Health Status
- Error LED indication for input PLL out of lock, parity error or biphase coding error
- Reclocker locked

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 reclocked outputs per input

500DA2Q-AESU Block Diagram





Specifications

AES Audio Inputs:

Number of Inputs:	2
Standard:	SMPTE 276M, single ended AES
Connectors:	BNC per IEC 169-8
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 reclocked outpus per input (normal) 8 outputs from input 1 (jumper selectable)
Standard:	SMPTE 276M, single ended AES
Connectors:	BNC per IEC 169-8
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 Monitoring & Distribution Amplifier

Model 500AMDA-AESU

The 500AMDA-AESU is a five output reclocking and auto equalizing Audio Monitoring & Distribution Amplifier for unbalanced 75Ω AES signals. It is also a high quality 24-bit audio DAC. The 500AMDA-AESU automatically equalizes up to 1500m of Belden 1694A coax and provides reclocked outputs. The 500AMDA-AESU converts one AES/EBU digital signal to 2 balanced analog audio outputs. The input sample rates supported are 44.1kHz and 48kHz. Analog audio output levels may be set individually from the front panel.

Evertz's SoftSwitch™ technology mitigates audio pops during hot-switching the AES input and maintains consistent audio sequences and formatted output. It ensures that AES devices downstream will receive properly formated AES signals always. Hence downstream devices are protected from "hot switched" upstream AES routers. SoftSwitch™ is an option on the XXXXX.

Level control is provided via a card edge toggle. The full scale digital signal can be calibrated to product analog peak levels ranging from 12dBu to 24dBu 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

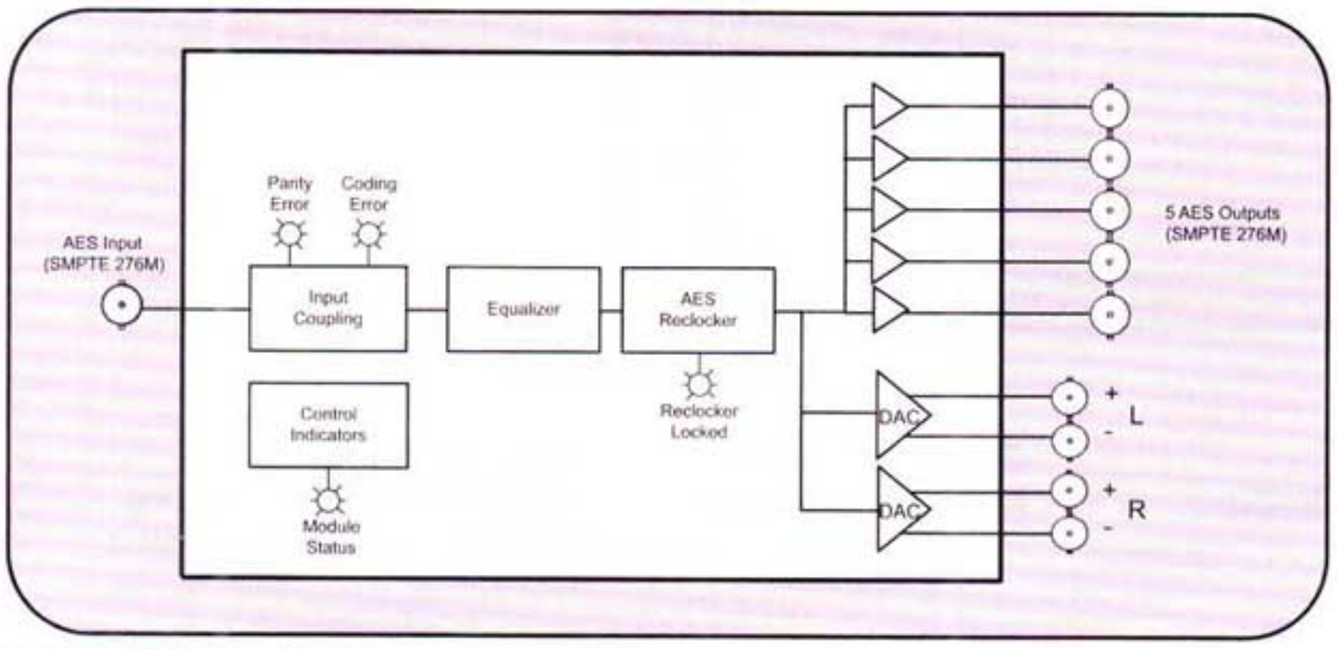
- 24-bit, high-quality D/A conversion
- 44.1 and 48kHz sampling rates supported
- 0dBFS programmable from 12dBu to 25dBu
- Support for 2 channels of balanced analog audio (1 AES/EBU)
- Optional SoftSwitch™ technology for protection against hot-switch formating errors & provides audio pop mitigation

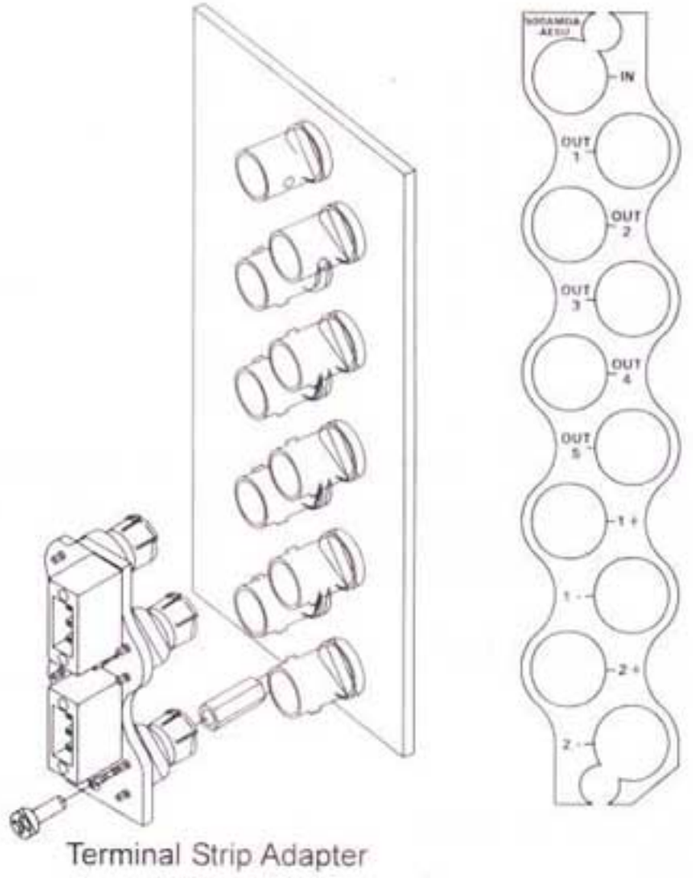
Inputs:
- SMPTE 276M standard for AES audio on 75Ω coax
- EQ and reclock provide extended cable length compensation (>1500m)

Outputs:
- Five 75Ω coax outputs
- 2 balanced analog audio outputs

Card Edge LEDs:
- Module Health Status
- Error LED indication for input PLL out of lock, parity error or biphase coding error
- Reclocker locked

500AMDA Block Diagram





Terminal Strip Adapter (included)

Specifications

AES Input:

Standard:	SMPTE 276M
Number of Inputs:	1
Connector:	BNC input per IEC 169-8
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:	44.1kHz and 48kHz

AES Output:

Number of Outputs:	5 Unbalanced AES
Connector:	BNC per IEC 169-8
Output Level:	1V p-p
Output Impedance:	75Ω
Return Loss:	>25dB 100kHz to 6MHz

Analog Audio Outputs:

Number of Outputs:	2
Connector:	Two 3 pin removable terminal strips (screwdown adapter module included)
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)
I/O Delay:	0.92m Sec

Ordering Information:

500AMDA-AESU	AES Monitoring Distribution Amplifier (5 AES out & 2 balanced analog out)

Ordering Options:

+SS	Optional SoftSwitch™

Enclosure:

500FR	exponent Compact High Density Distribution Frame
S501FR	Standalone enclosure

Analog Video Distribution Amplifier

500ADA

The 500ADA Analog Distribution Amplifier is a general purpose amplifier for distributing 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.

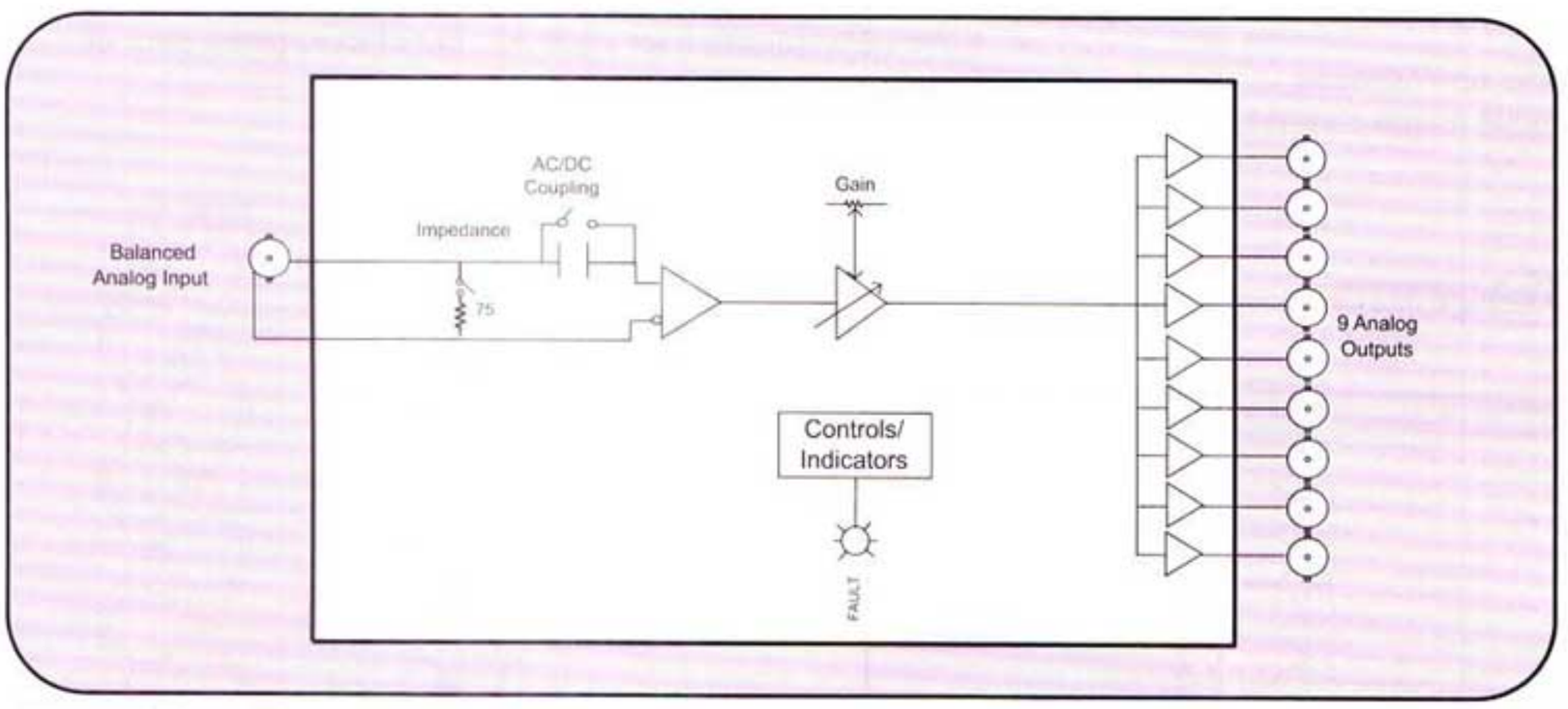
Features

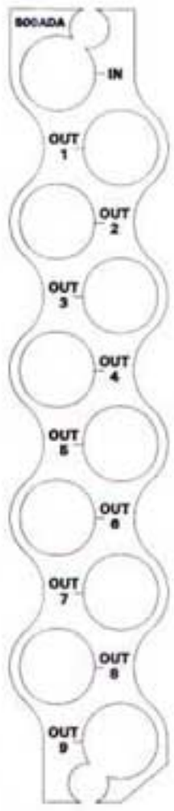
- 75Ω or high impedance input (jumper selectable)
- High common mode range and common mode rejection ratio (CMRR)
- Gain control
- Jumper selectable AC or DC coupling
- Looping feature with external "T" connector
- Consistent input impedance if card power is lost

Card Edge LEDs:

- Module status/Local Fault
- Power supply status

500ADA Block Diagram





Specifications

Analog Video Input:

Standards:	Any analog video format, up to 2Vp-p and 30MHz bandwidth
Connector:	1 BNC input per IEC 169-8
Common mode range:	>6Vp-p
CMRR:	>70dB to 1kHz
Signal amplitude:	2.5Vp-p max
Impedance:	75Ω terminated, 35kΩ Hi-Z (jumper selectable)
Coupling:	AC or DC (jumper selectable)
Return loss:	>40dB to 10MHz, >30dB to 30MHz

Analog Video Outputs:

Number of Outputs:	9 Per Card
Connector:	BNC per IEC 169-8
Output impedance:	75Ω
Gain control range:	± 5dB
Freq. Response:	<+/-0.05dB (to 5.5MHz)
Differential Gain:	<0.17 %
Differential Phase:	< 0.19 deg
C/L gain inequality:	<+/-0.1%
C/L Delay:	<+/-2nsec
Output isolation:	42dB to 10MHz, 32dB 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	Analog Video Distribution Amplifier (1 x 9)

Enclosures:

500FR	exponent Compact High Density Distribution Frame
S501FR	Standalone enclosure

500ADA-EQ

The 500ADA-EQ Analog Distribution Amplifier is a general purpose amplifier for distributing 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.

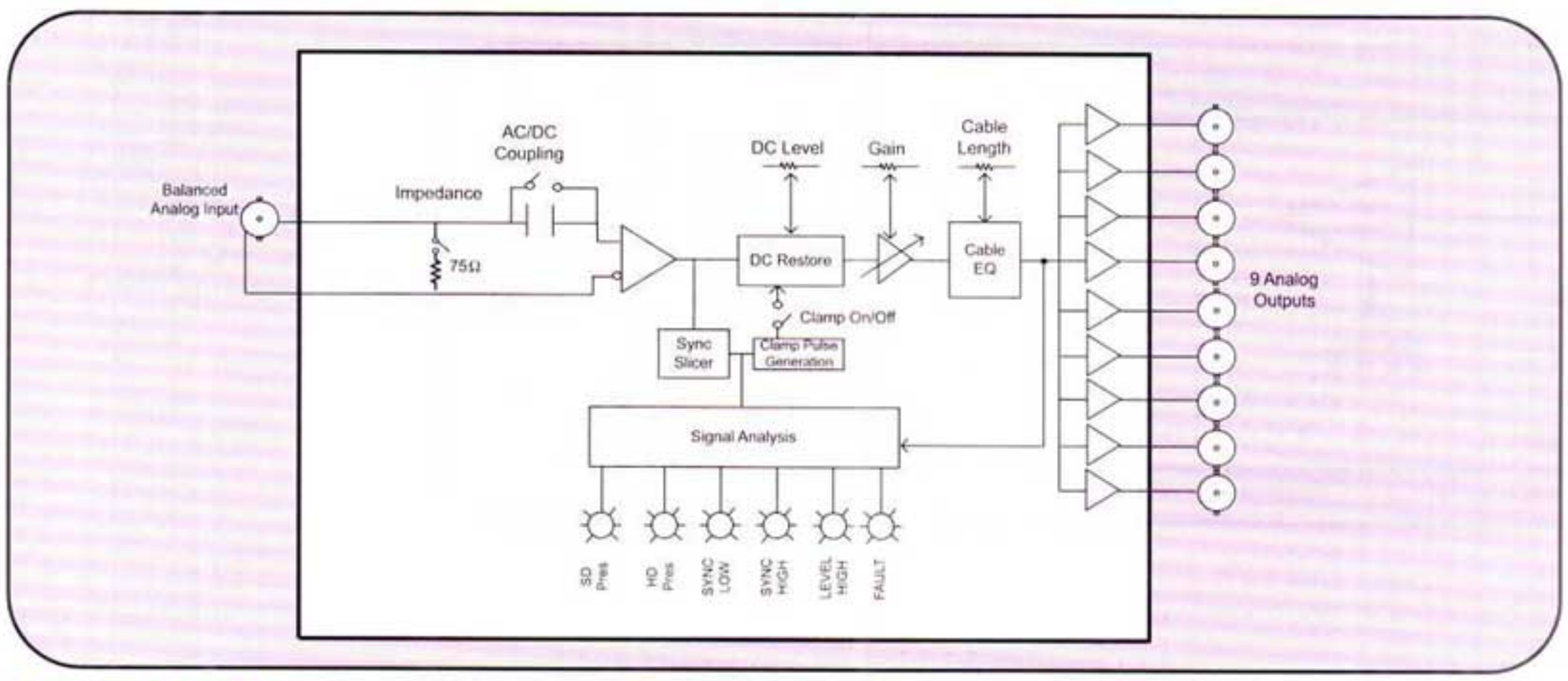
Features

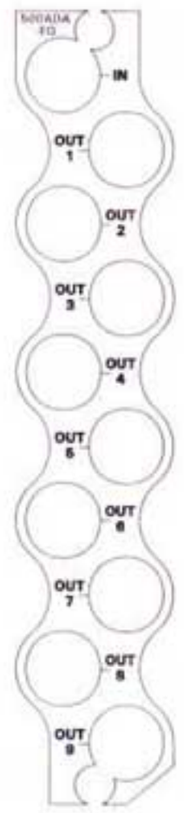
- 75Ω or high impedance input (jumper selectable)
- High common mode range and common mode rejection ratio (CMRR)
- Gain control
- Jumper selectable AC or DC coupling
- Jumper selectable fast or slow back porch clamp
- DC level control when clamp is enabled
- Cable equalizer adjustment range: 0 to 300m of 8281 or 1694
- 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

500ADA-EQ Block Diagram





Specifications

Analog Video Input:

Standards:	Any analog video format, up to 2Vp-p and 30MHz bandwidth
Connector:	1 BNC input per IEC 169-8
Common mode range:	>6Vp-p
CMRR:	>70dB to 1kHz
Signal amplitude:	2.5Vp-p max
Cable equalizer:	0 to 300m of Belden 8281 or 1694 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 169-8
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 1694 (to 5.5MHz) < ±0.15dB for 100 to 300m Belden 8281 or 1694 (to 5.5MHz)
Differential Gain:	<0.17 % 0 to 300m
Differential Phase:	< 0.19 deg 0 to 300m
C/L gain inequality:	<+/-0.1% for all cable lengths
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:	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 Amplier with Cable Equalization (1 x 9)

Enclosure:

500FR	exponent Compact High Density Distribution Frame
S501FR	Standalone enclosure

Analog Audio Distribution Amplifier

500ADA-AUD

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.

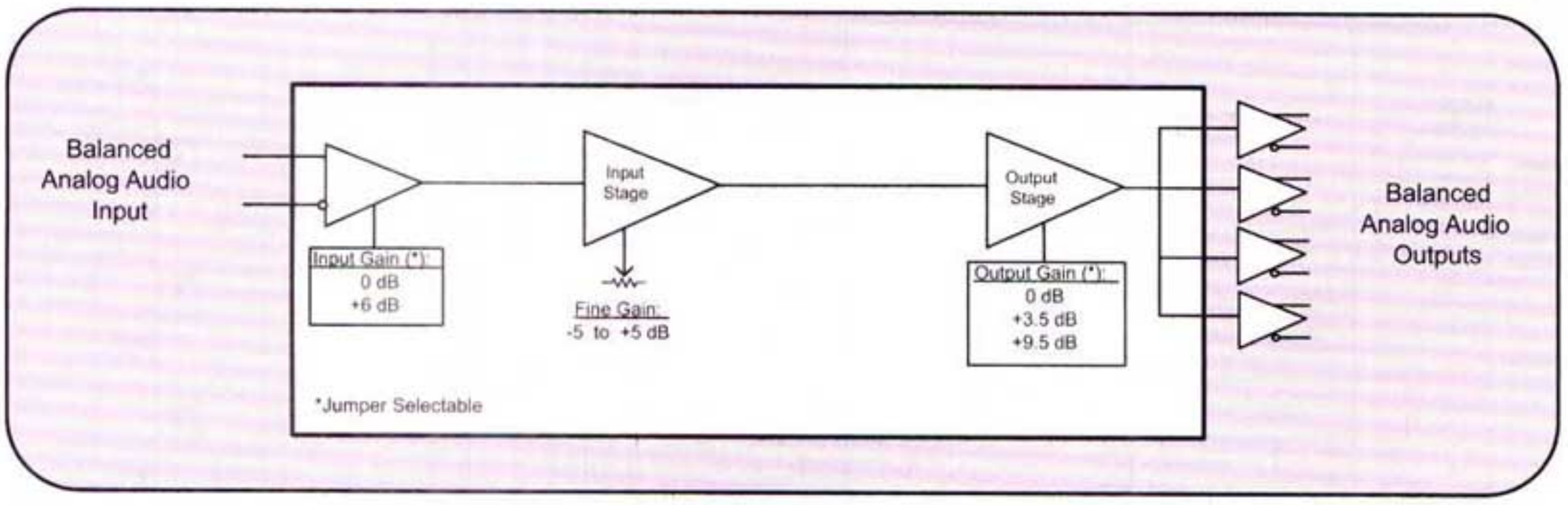
Features

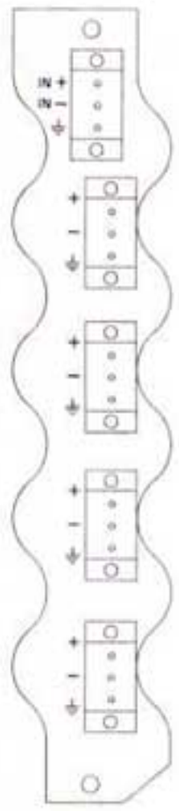
- Differential and single ended input (automatic single ended to differential conversion)
- High impedance inputs
- Low impedance outputs
- Wide gain adjustment range
- High common mode range and common mode rejection ratio
- Very high SNR
- Very low THD+N

Card Edge LEDs:

- Module status/Local Fault
- Power supply status

500ADA-AUD Block Diagram





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:	> ±22 V
+6 dB input gain:	> ±7 V
Input impedance:	
0 dB input gain:	44 kW
+6 dB input gain:	26 kW

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 ohm load
Output impedance:	66Ω
Freq. Response:	+/-0.03 dB 20 Hz to 20 kHz
THD+ Noise:	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 (1 x 4)

Enclosures:

500FR	exponent Compact High Density Distribution Frame
S510FR	Standalone enclosure

500ADA-W

The 500ADA-W is a SDIF-2 Word Clock distribution amplifier. It provides a 1X9 fan out. 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 9 maximum output signal of 5V.

The 500ADA-W is housed in the 3RU 500FR exponent frame that will hold up to 16 modules.

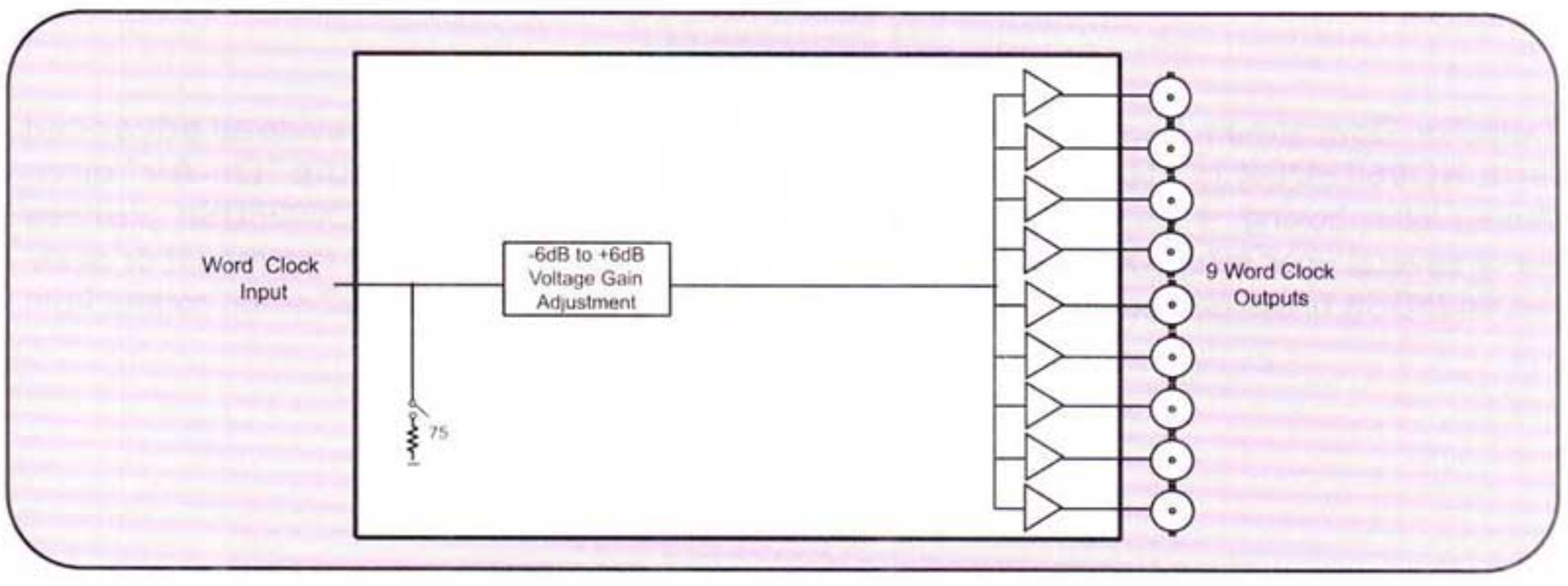
Features

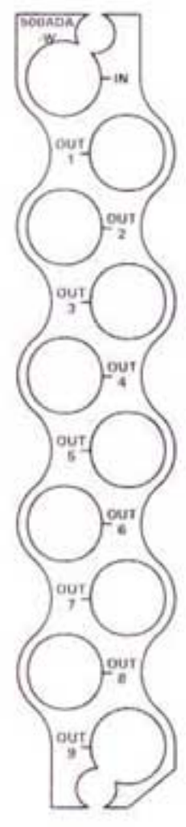
- Jumper selectable 75Ω or high impedance (1kΩ typical) input
- DA has voltage gain adjustment range from -6dB to +6dB
- Outputs can drive into 75Ω loads

Card Edge LEDs:

- Module status/Local Fault
- Power supply status

500ADA-W Block Diagram





Specifications

Word Clock Input:

Standard:	SDIF-2 Word Clock
Level:	0 to 5V (terminated or unterminated)
Connector:	BNC per IEC 169-8
Impedance:	Selectable 75Ω or high impedance (1k typical)

Word Clock Ouputs:

Number of outputs:	9
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:

	exponent
500FR	Compact High Density Distribution Frame
S510FR	Standalone enclosure

High Definition Downstream Keyer

Model HD9625DSK

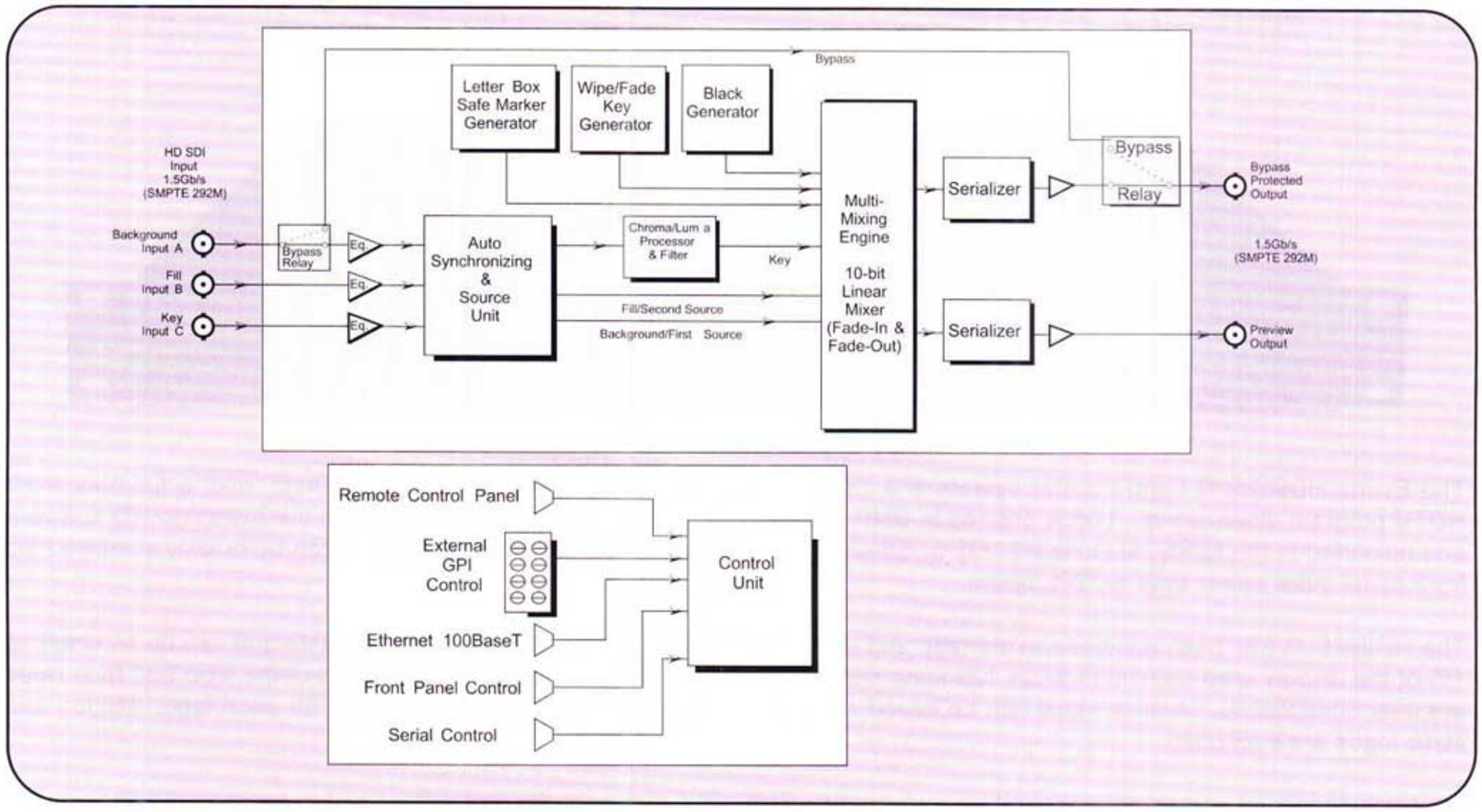


The Evertz HD9625DSK High Definition Downstream Keyer system incorporates the latest technology to provide an advanced fully digital keyer. The Evertz HD9625DSK is ideal for mixing key and fill HDTV signals in the "On-Air" environment. The system also features letter boxing, a safe area/safe title, wipes, fades and more. The HD9625DSK provides storage and retrieval capabilities of several user setups and presets from the front panel, or from optional rackmount or desktop remote control panel. The HD9625DSK offers GPI control for fade and wipe transitions and RS-232/422 serial control from automation systems.

Features

- Program output bypass protected for on-air applications (optional)
- Both mix and additive keying modes provided
- Auto-timing HDTV key, fill, and background inputs (up to 1 line)
- GPI and RS-232/422 inputs for fade/transition control
- Internal black generator for fade to black applications
- Built-in letter box generator for non 16x9 aspect ratio cropping
- Safe area/safe title on preview channel
- 12-bit processing linear keying providing high quality results for both transparency and soft edges
- Control of key gain and offset are provided
- Full control and status is provided from the front panel display
- Level triggered programmable GPI's
- HD user programmable presets are provided
- Optional rack mount or desktop remote control panel
- Optional redundant power supply
- Optional bypass relay for program output

HD9625DSK Block Diagram



Specifications

Serial Digital Video Input:

Standard:	SMPTE 292M 1.485 Gb/s 1080i/60, 1080i/59.94, 1080/50, 1080p/24(sF), 1080p/23.98(sF), 720p/60, 720p/59.94, 480p/60, 480p/59.94
Number of Inputs:	3
Connector:	BNC per IEC 169-8
Equalization:	Automatic to 100m @1.5 Gb/s with Belden 1694 (or equivalent) 25m with bypass relay installed
Impedance:	75Ω

Digital Video Output:

Standard:	Same as input
Number of Outputs:	2
Connector:	BNC per IEC 169-8
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

Control:

Serial Control:	RS-232/422, 8 bits, no parity 9600, 19200, 38400, 57600 baud computer control of all functions
Upgrade:	RS-232, 57600 baud, 8 bits, no parity for firmware upgrades

General Purpose In/Out:

Number of inputs:	8
Number of outputs:	4
Type:	Opto isolated, active low
Connector:	Femal High Density DB-15
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:

Power:	Auto ranging 100-240VAC 50/60Hz 30VA
Safety:	ETL Listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

HD9625DSK	HD Downstream Keyer

Ordering Options:

+DCP	Optional Desktop Control Panel
+RCP	Optional Rack Mount Remote Control Panel
+HBP	Optional cable loop on program input and bypass protected output up to 25m of Belden 1694
+2PS	Redundant power supply

HD Logo Inserter

Model HD9625LG

METACAST 2 ENABLED



The Evertz HD9625LG Logo Inserter system is a complete package that will key one or many "bugs" over a full bandwidth HDTV program video signal. Logos created in BMP, Tiff, or TGA file formats can be imported into the Instalogo HD software and uploaded to the HD9625LG via RS-232 or Ethernet. Logos are stored in flash memory and can be quickly accessed via front panel quick select keys or GPI inputs.

The HD9625LG has been designed to manage and store multiple logos. The size of each is variable and can be as small as 1% of the display area (minimum width 128 luma samples, minimum height 2 lines). The position of the logo and fade rates are user controllable. Multiple logos can be keyed simultaneously with independent fade control for each logo. Motion and static logos are supported.

Now includes serial support for temperature probe input. This input allows for the insertion of air temperature readings and is controlled like any other logo.

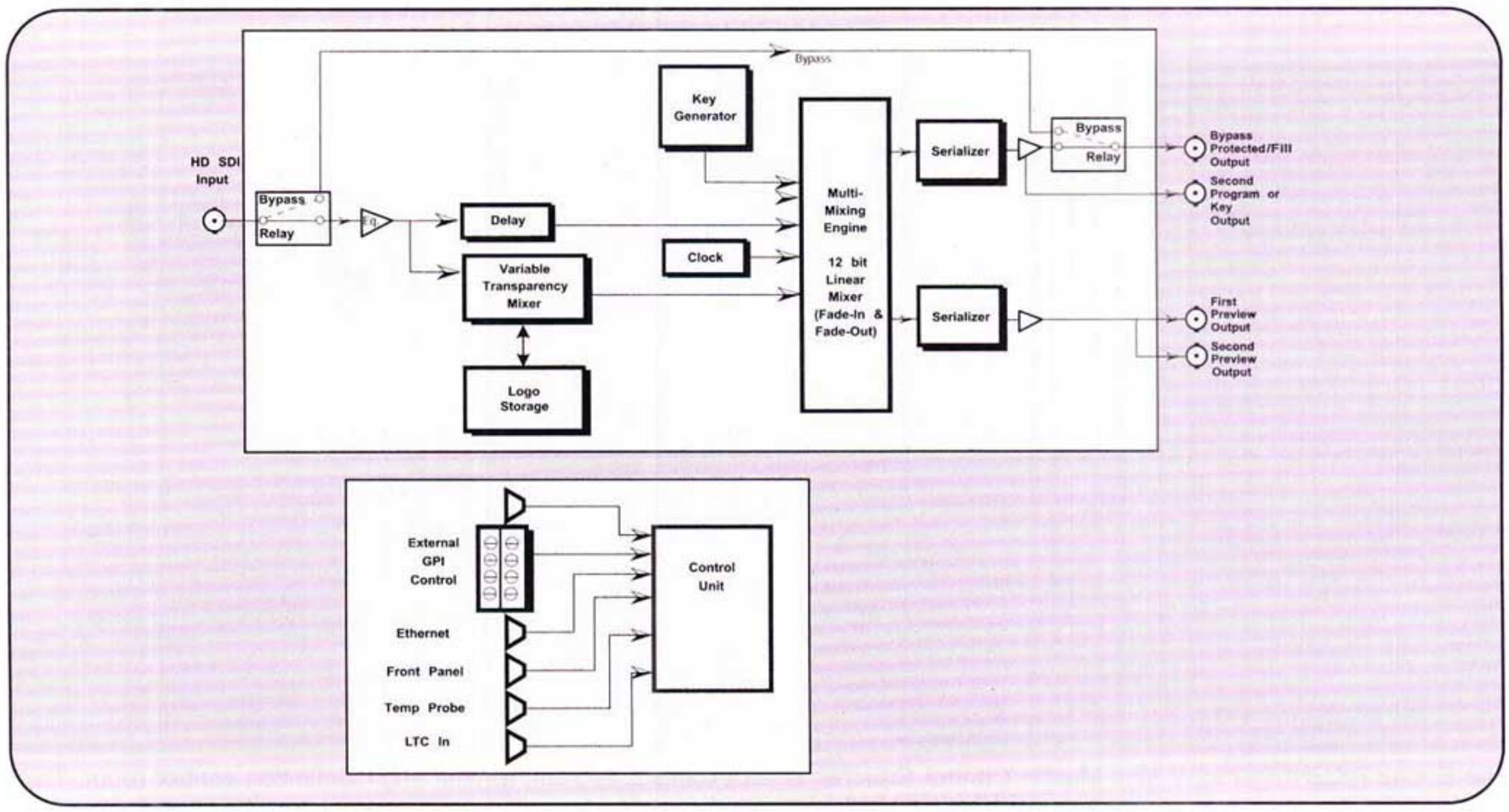
The EAS crawl support allows for connection to an existing EAS decoder. This RS232 connection allows weekly tests (white text on green), watch alerts (white on yellow) and warnings (white on red) to be scrolled across the native HD video with no need for format conversion. The variable height text font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

Features

- Stores and inserts animated and static logos
- Multiple simultaneous logos can be keyed with independent fade control
- Incorporates a full linear keyer
- Full 12-bit linear fade-in and fade-out control provided
- Front panel, RS-232/422 remote control and GPI contact closure
- Download logos from standard PC using RS-232 or Ethernet using Evertz Instalogo HD Software (provided)
- Supports 1080p, 1080i, 720p, 1035i, 1080psF, 480p video formats
- LTC input for "Breakfast" clocks
- EAS supports all new alert codes including child abduction emergency
- Key/Fill output menu option for feeding master control
- Preview output for Logo placement setup
- Standard system has 128 Mbytes of storage
- Automatic input equalization up to 100m of Belden 1694 (Cable length specifications are different if bypass option is purchased)
- FTP file transfer & maintenance
- Optional bypass relay for program output
- Optional redundant power supply
- Optional rack mount or desk top remote control panel
- Optional air temperature probe
- Optional EAS crawl support for Sage and TFT Decoders

Evertz is proud to introduce the NOMAD Lite PC software application. This easy to use graphics interface, integrates the speed of fast Ethernet, with the ease of drag and drop functionality to deliver a central access point to Evertz keyer products. Using this software allows you to upload media files to one or many units simply by clicking and dragging the item from the explorer like window, into the device tree. This powerful interface allows you to extract and move media items from one device to another using the same easy drag and drop style. For more complicated multi unit installations, you can set custom device groups. This allows for media content to be dropped on a custom grouping and automatically uploaded to the ganged units in one easy step.

HD9625LG Block Diagram



Specifications

Serial Digital Video Input:

Standard:	SMPTE 292M 1.485 Gb/s 1080i/60, 1080i/59.94, 1808/50, 1080p/24(sF), 1080p/23.98(sF), 720p/60, 720p/59.94, 480p/60, 480p/59.94
Number of Inputs:	1
Connector:	BNC per IEC 169-8
Equalization:	Automatic up to 100m @1.5 Gb/s with Belden 1694 (or equivalent) 25m with bypass relay installed
Impedance:	75Ω

Digital Video Output:

Standard:	Same as input
Number of Outputs:	4
Connector:	BNC per IEC 169-8
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

Control:

Serial Control:	RS-232/422, 8 bits, no parity 9600, 19200, 38400, 57600 baud computer control of all functions
Upgrade:	RS-232, 57600 baud, 8 bits, no parity for firmware upgrades
Logo Transfer:	TCP/IP, 100Base T

General Purpose In/Out:

Number of inputs:	8
Number of outputs:	4
Type:	Opto isolated, active low
Connector:	Femal High Density DB-15
Signal level:	+5V nominal

Serial Remote Control: RS-232/422 interface, 9 pin "D" connector

Physical:

Dimensions:	19"W x 1.75"H x 18.75"D (483mm W x 45mm H x 477mm D)
Weight:	8lbs. (3.5Kg)

Electrical:

Power:	Auto ranging 100-240VAC 50/60Hz 30VA
Safety:	ETL Llisted Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

HD9625LG	HD Logo Inserter with front panel control

Ordering Options:

+RCP	Optional rackmount remote control panel
+DCP	Optional desk top remote control panel
+HBP	Optional Bypass Relay
+2PS	Redundant power supply
+LG-TP	Optional Air Temperature Probe
+EAS	Optional EAS crawl insertion
EAS-UPGRADE	Upgrade of existing HD9625LG to HD9625LG+EAS

HD Mini Master Control Switcher Package

Model PKGHD9625SW

METACAST 2 ENABLED



The Evertz PKGHD9625SW Mini Master Control Switcher is an excellent addition to your High Definition control room. This dual unit solution incorporates the best switching technology with the proven transition and channel branding techniques that has brought Evertz to the forefront of High Definition Television. Add to this, Emergency Alert Services and SoftSwitch™ audio processing, and you have the most advanced media switcher available today.

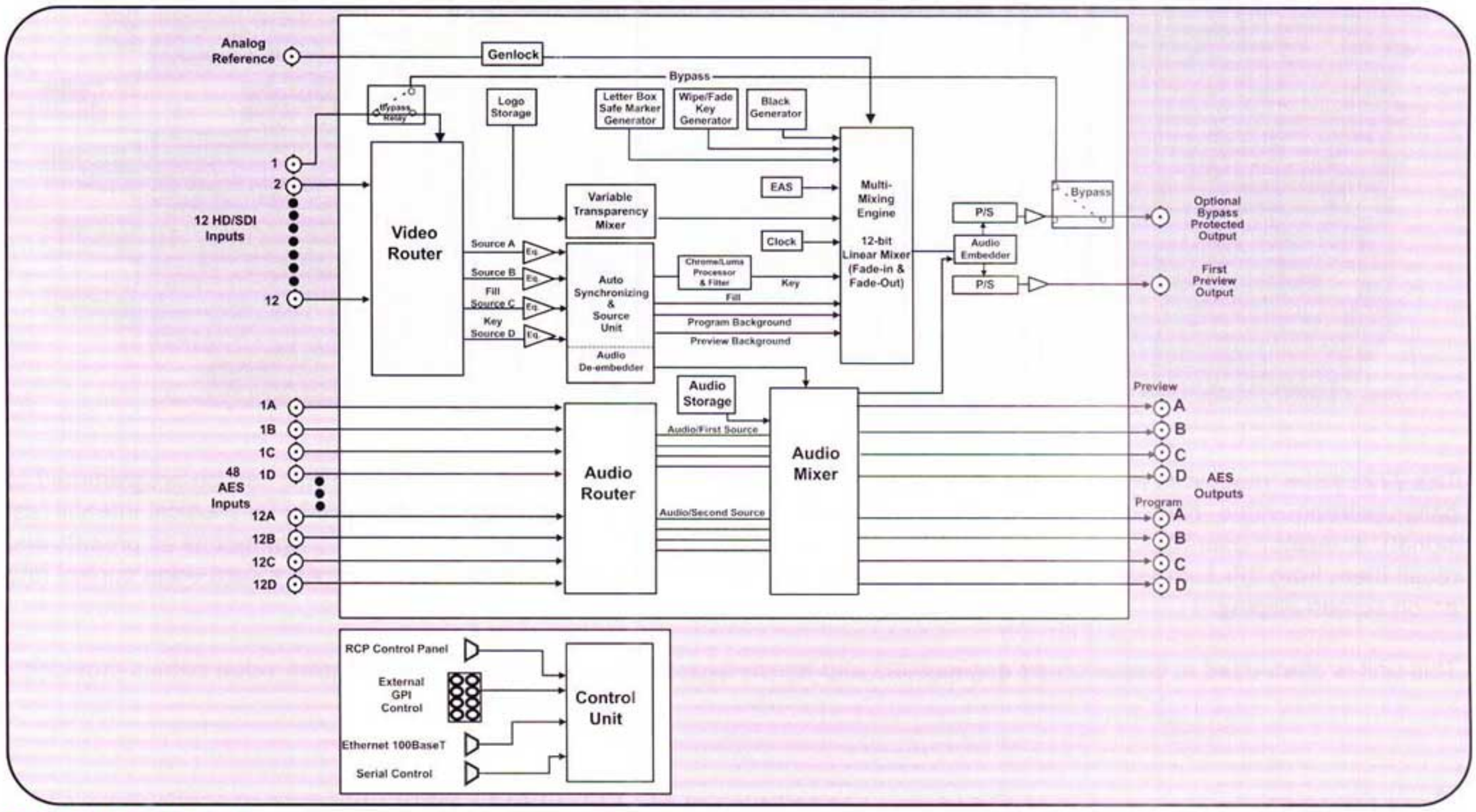
The Evertz PKGHD9625SW includes all the functionality found in our X Series Router, seamlessly married together with our advanced Logo Inserter and Downstream keyer. This complete system allows you to fully control up to 12 input video signals and up to 48 AES audio inputs. You can perform voice-overs, wipes, fades, fade to black and a host of other features, all from the convenience of the single remote control panel.

Features

- 12 Input HD Video Switcher with 12 input AES switcher for discrete 5.1 Dolby
- Program/Preview Transition Mixer for HD video and up to 4 audio pairs
- Downstream keyer with mix and additive modes
- Variety of smooth Transitions including Cut, Fade, Fade to-from Black and 8 angles of Wipes
- Optional EAS support - Emergency Alert Crawls from TFT or Sage systems
- HD Multiple Logo Inserter with Animation
- LTC input for Breakfast Clocks
- Single Remote Control Panel for Router/Keyer/Logo functions
- Built-in Black Generator
- 12 Bit Video Processing
- Control of key gain & offset are provided
- Multiple Control Interface Options including GPI, RS232 and Rackmount Control Panel
- Built-in +/- 1/2 line autotimers for video
- "Pop" free AES Audio Switch with Evertz patented SoftSwitch™ Technology
- System comprised of two 1RU rack frames and a remote 1RU control panel
- Audio bypass mode for Dolby E
- Optional video and audio input bypass relay for power failure bypass protection

Evertz is proud to introduce the NOMAD Lite PC software application. This easy to use graphics interface, integrates the speed of fast Ethernet, with the ease of drag and drop functionality to deliver a central access point to Evertz keyer products. Using this software allows you to upload media files to one or many units simply by clicking and dragging the item from the explorer like window, into the device tree. This powerful interface allows you to extract and move media items from one device to another using the same easy drag and drop style. For more complicated multi unit installations, you can set custom device groups. This allows for media content to be dropped on a custom grouping and automatically uploaded to the ganged units in one easy step.

PKGHD9625SW Block Diagram



Specifications

Serial Video Input:

Standard:	SMPTE 292M 1.485 Gb/s, 1080i/60, 1080i/59.94, 1080i/50, 1080p/24(sF), 1080p/23.98(sF), 720p/60, 720p/59.94, 480p/60, 480p/59.94
Number of Inputs:	12
Connector:	BNC per IEC 169-8
Equalization:	Automatic up to 100m @1.5 Gb/s with Belden 1694 (or equivalent) 25m with bypass relay installed
Return Loss:	> 15 dB up to 1.5 Gb/s

Serial Video Output:

Standard:	Same as input
Number of Outputs:	1 Program, 1 Preview
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ± 0.5V
Rise and Fall Time:	200ps nominal
Overshoot:	<10% of amplitude
Jitter:	<0.2 UI

AES Audio Inputs:

Standard:	SMPTE 276M single ended AES
Number of Inputs:	12 per buss, 4 busses
Connector:	BNC per IEC 169-8

AES Audio Outputs:

Standard:	SMPTE 276M single ended AES
Number of Outputs:	4 Program, 4 Preview
Connector:	BNC per IEC 169-8
Signal Level:	1Vp-p
Reference:	From Video General Reference

Video Reference:

Type:	Menu selectable - depends on video format HD Tri-level Sync NTSC or PAL Colour Black 1 V p-p Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV
Connectors:	2 BNC per IEC 169-8
Termination:	High impedance loop through

Control:

Serial Control:	RS-232/422, 8 bits, no parity, 9600, 19200, 38400, 57600 baud computer control of all functions
Upgrade:	RS-232, 57600 baud, 8 bits, no parity for firmware upgrades
Logo Transfer:	TCP/IP, 100Base T

General Purpose In/Out:

Number of inputs:	8
Number of outputs:	4
Type:	Opto isolated, active low
Connector:	Female High Density DB-15
Signal level:	+5V nominal

Physical:

Dimensions:	
Switcher Electronics:	19"W x 3.5"H x 18.75"D (483mm W x 90mm H x 477mm D)
Control Panel:	19"W x 1.75"H x 4.25" (483mm W x 45mm H x 110mm D)
Weight (total):	17lbs. (7.8Kg)

Electrical:

Power:	Autoranging 100-240 V AC 50/60 Hz, 60 VA
Safety:	ETL listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

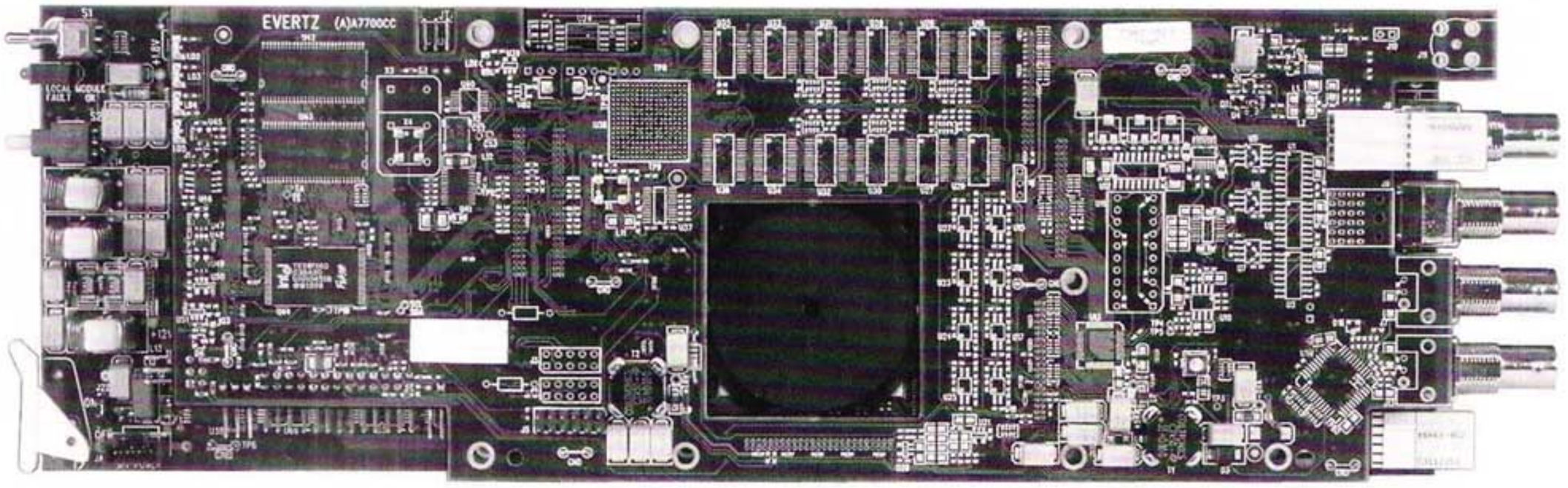
PKGHD9625SW	HD Mini Master Switcher

Ordering Options:

+HBP	Optional Bypass Relay
+2PS	Redundant power supply
+CF128	Card Flash memory expansion with 128 Meg card
+CF1G	Card Flash memory expansion with 1 Gigabyte card
+MEM1G	Intrnal memory expansion to 1 Gigabyte
+LG-TP	Optional Air Temperature Probe
+EAS	Optional EAS Crawl Insertion
+GVG110	Optional GVG110 control interface

SDI VBI Sidechain Bridge

Model 7725VBI-K



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.

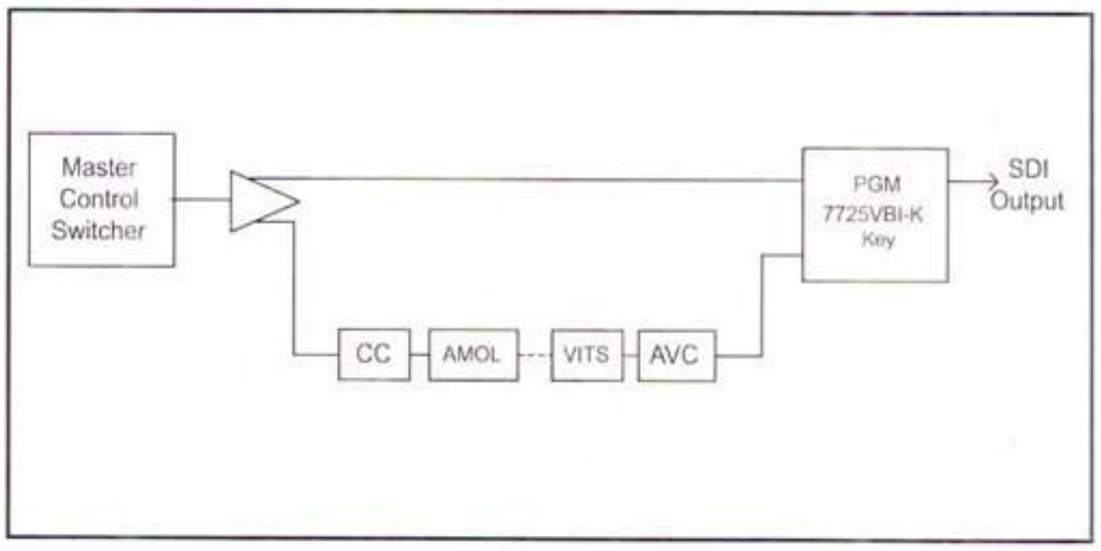
Features:

- 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.

Applications:

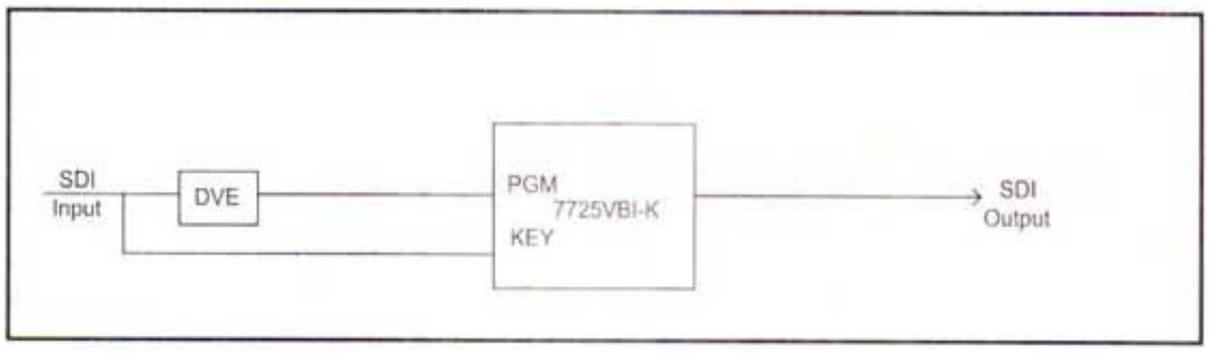
Master control output chain protection

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 so that if one unit fails the network output will fail. The 7721VBI-K provides the capability to create a "side chain" whereby the main program path feeds directly into the program input of the device and the "chained" string of VBI insertion products feed the secondary key input.



Line 21 caption squeeze back bypass (VBI 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. The 7721VBI-K device will provide a bypass of VBI around the processing device

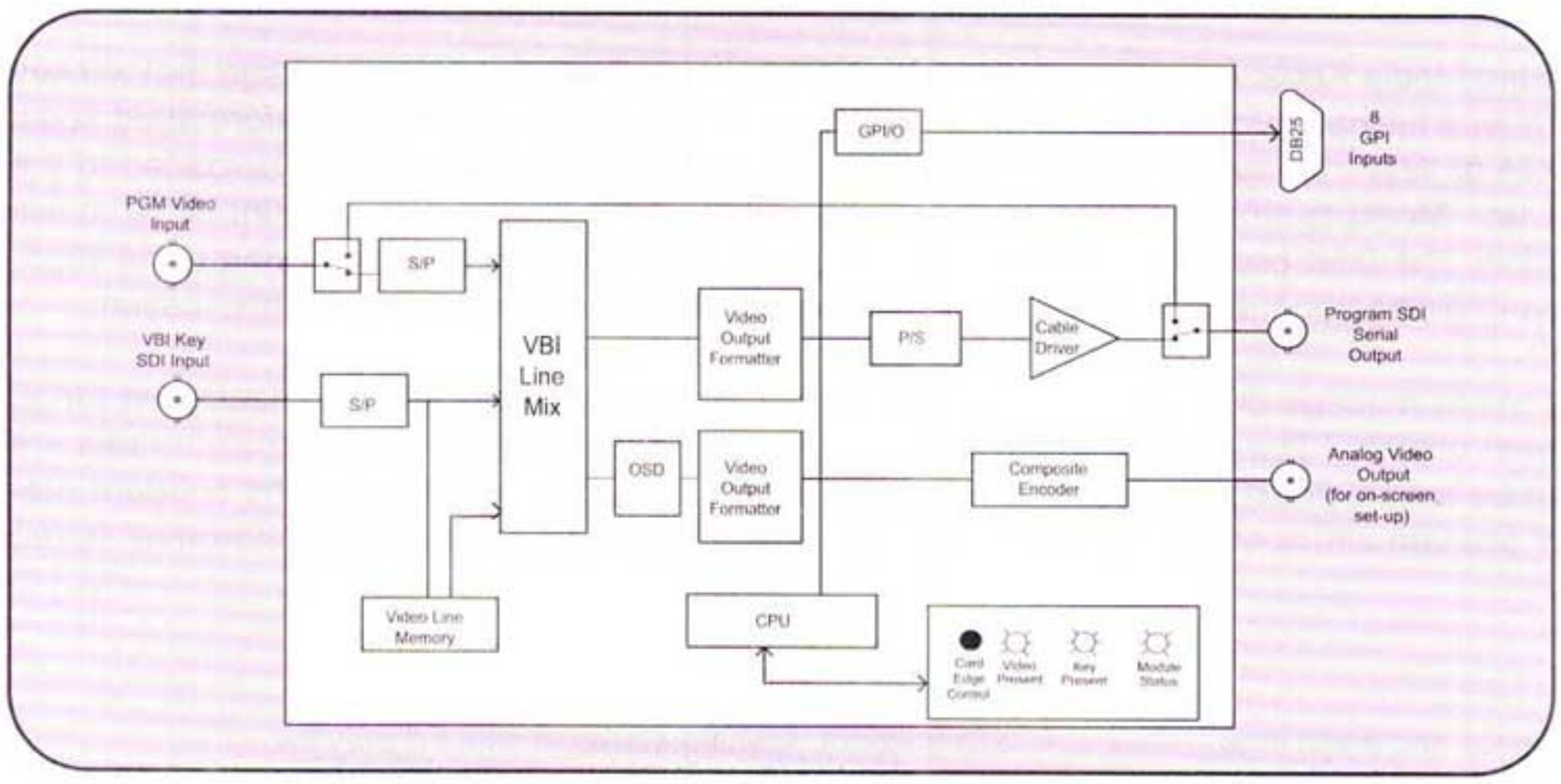


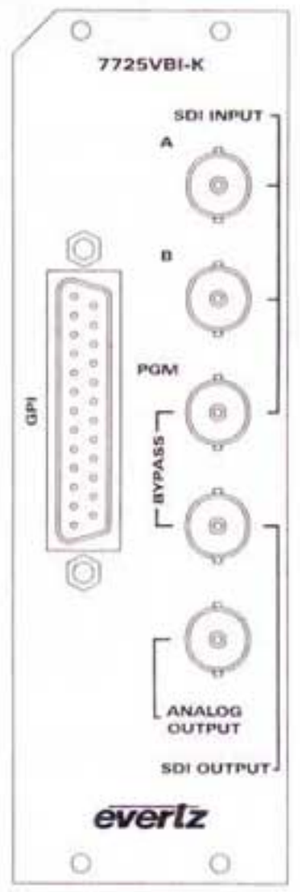
VBI Line Shuffler

By providing the same feed to both inputs of the 7721VBI-K the unit will allow the user to modify the VBI and move lines as necessary.



7725VBI-K Block Diagram





Specifications:

Serial Video Input:

Standard:	SMPTE 259M-C
Number of Inputs:	1 for Program video 1 for Key Signal to insert
Connector:	BNC input per IEC 169-8
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 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	470ps 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 169-8
Signal Level:	1V nominal
DC Offset:	0V +/- 0.1V
Return Loss:	>35dB up to 5MHz
Frequency Response:	0.8dB to 4 MHz
Differential Phase:	<0.9deg. (<0.6deg. 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::

Number of slots:	2

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

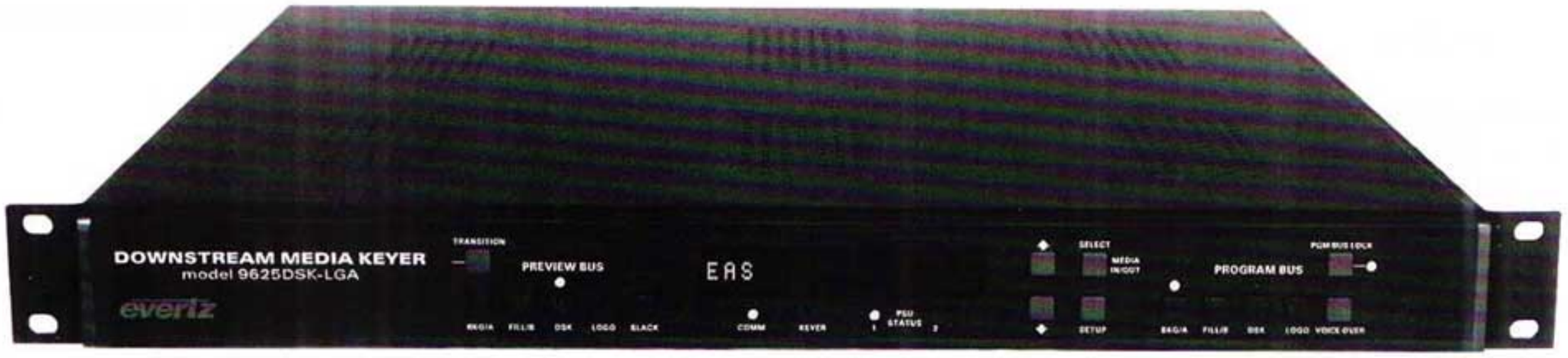
Enclosures:

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

SDI Downstream Media Keyer System

Model 9625DSK-LGA

METACAST 2 ENABLED



The Evertz 9625DSK-LGA Downstream Media Keyer system is a complete SDI Logo and Audio Insertion package that will key one or many static/animated "bugs" over a full bandwidth SDI program 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 InstaLogo software and uploaded to the 9625DSK-LGA via RS-232 or Ethernet. Media is stored in flash memory and can be quickly accessed via front panel, quick select keys, GPI inputs and automation. The DSK provides a 12-bit processing path for linear and additive keying using separate/external key sources or self keying giving you the option of video switching or mixing depending on your application.

The 9625DSK-LGA has been designed to manage and store multiple media objects. The size of each is variable and range from 1/25th to full screen for on screen objects. The position of the logo, fade rates, clip association and animation rates are user controllable. Up to 9 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". Audio objects are stored as stereo 16-bit, 48kHz WAV format.

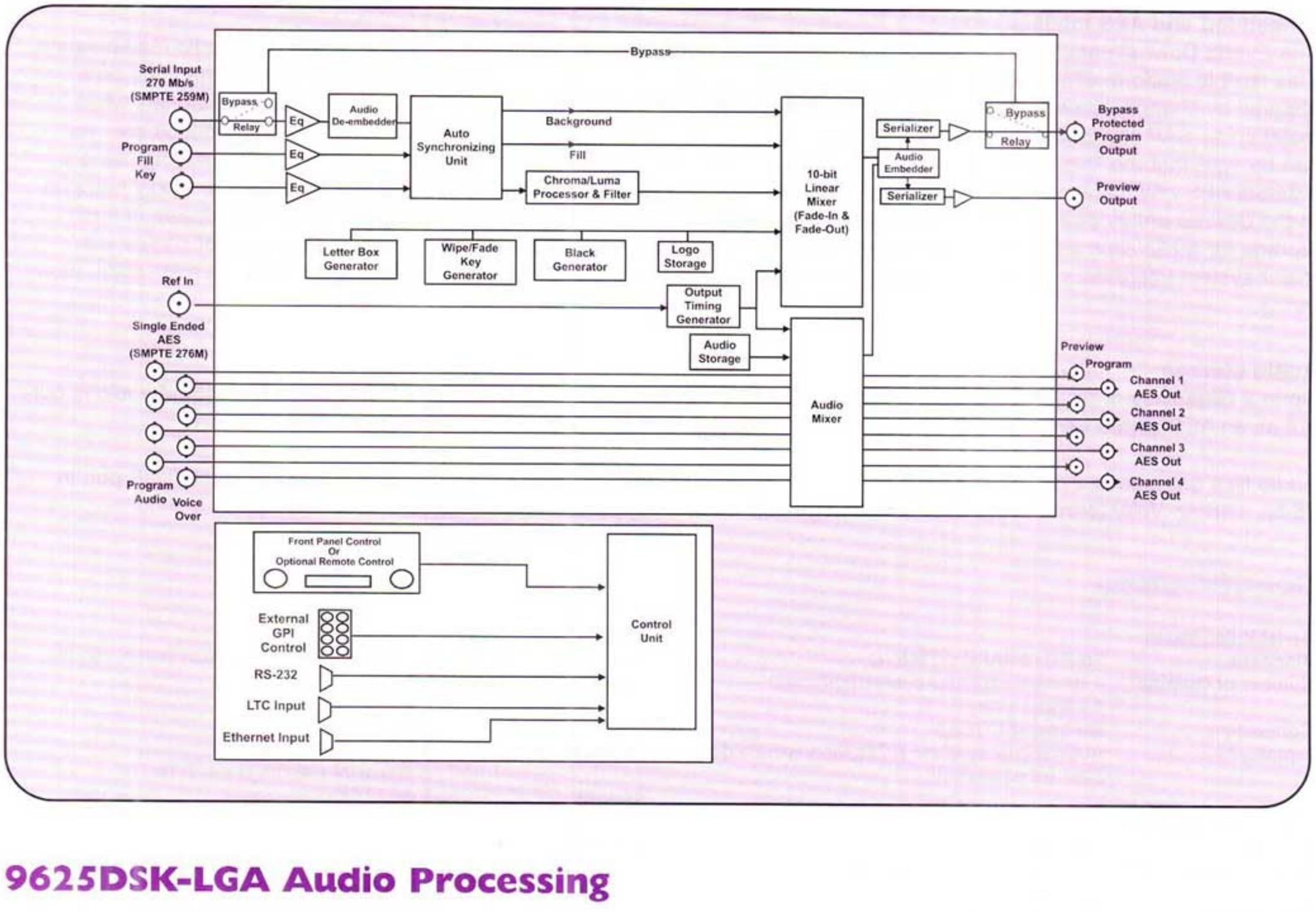
Features

- Stores and inserts static or animated logos and audio clips
- Multiple simultaneous logos can be keyed with independent fade control
- Incorporates a high quality variable transparency mixer that provides various transparency levels to your logos
- Full 10-bit linear fade-in and fade-out control provided
- Free Windows media conversion software InstaLogo
- Ethernet for quick downloads
- Supports 625 line and 525 line video standards
- Fade all out capability provided on program output
- Standard 128MB internal flash storage
- Automatic equalization up to 250m (Belden 8281 or equivalent cable)
- Output bypass relay protected, video and audio, embedded and non
- Eight AES stereo pair inputs and eight AES stereo pair outputs
- Includes embedded audio mixing with 4 AES group de-embedding and re-embedding for voice over and clip inserts
- Automation control by RS422 or RS232 plus programmable GPIs and GPOs
- SDI mixer or downstream keyer with full preview
- Full 4 AES channel audio mixing plus full 4 AES channel voice-over for Dolby 5.1
- Adjustable transition rates for cut, fade, horizontal and vertical wipes
- Fade to black and fade to silence
- Linear and additive keying using separate/external key/fill sources or self-keying (minimum 12-bit processing)
- Clip, gain, rate and transparency adjustment
- MetaCast 2 automation support
- Optional storage and playout for up to 1 Gigabyte of internal flash storage
- Optional front panel Compact Flash for additional 128MB or 1GB storage
- Optional temperature probe for temperature logos
- Optional redundant power supply for broadcast applications
- Optional rackmount or desktop remote control panels
- Optional EAS crawl support for Sage and TFT Decoders

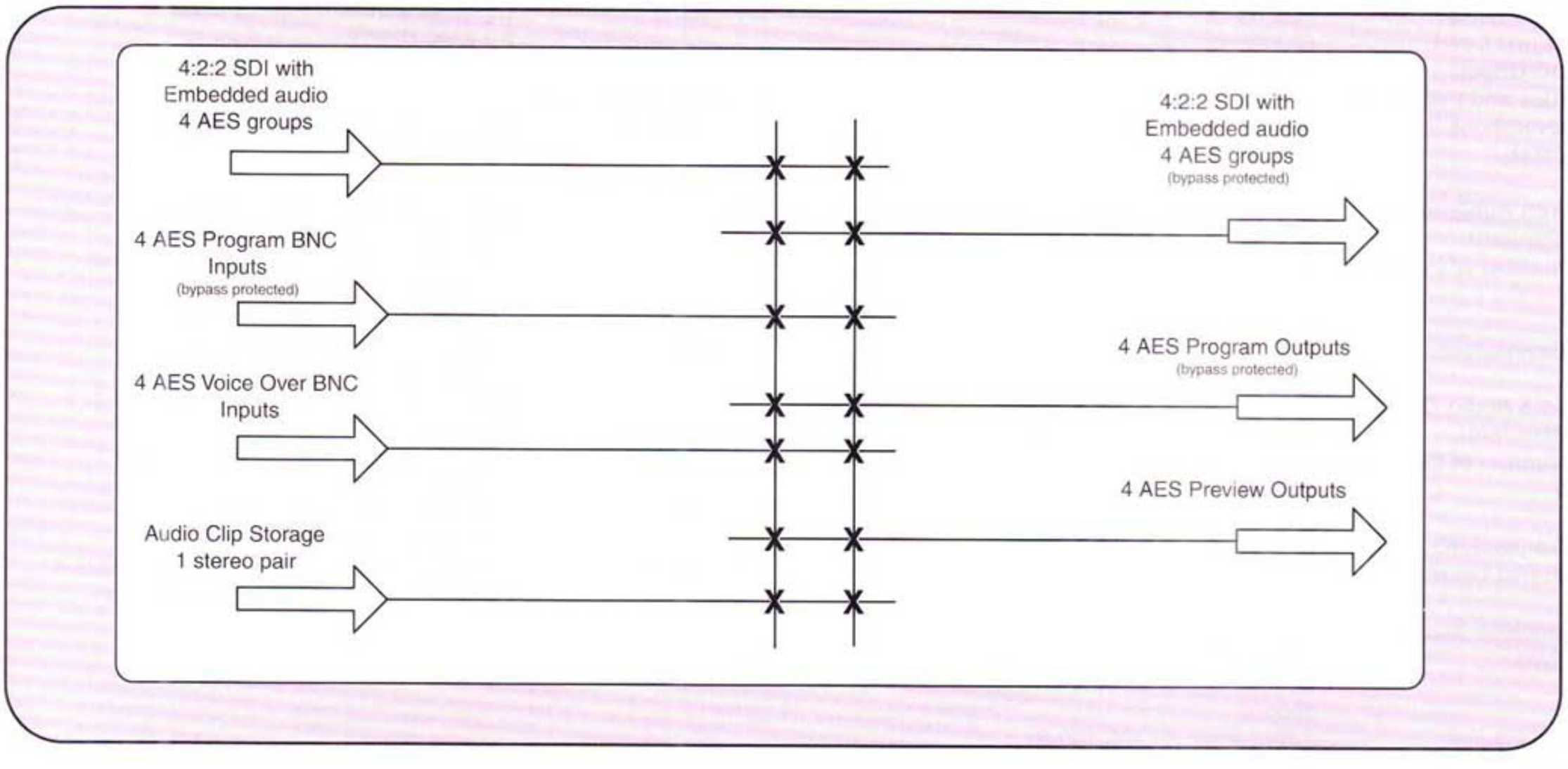


Evertz is proud to introduce the NOMAD Lite PC software application. This easy to use graphics interface, integrates the speed of fast Ethernet, with the ease of drag and drop functionality to deliver a central access point to Evertz keyer products. Using this software allows you to upload media files to one or many units simply by clicking and dragging the item from the explorer like window, into the device tree. This powerful interface allows you to extract and move media items from one device to another using the same easy drag and drop style. For more complicated multi unit installations, you can set custom device groups. This allows for media content to be dropped on a custom grouping and automatically uploaded to the ganged units in one easy step.

9625DSK-LGA Block Diagram



9625DSK-LGA Audio Processing



SDI Downstream Media Keyer System

Model 9625DSK-LGA

METACAST 2 ENABLED

Embedded and AES mixing

The Evertz Downstream Media Keyer is at the forefront in audio switching and embedded/de-embedded audio manipulation. This flexible platform allows you to select your upstream source channels and remap them to your output channels on a channel by channel basis. This flexibility allows you to move main program audio to the secondary audio channels while maintaining SAP channels and inserting audio clips and voice over inputs. Whatever your audio swapping needs are, you can be sure that the Evertz Downstream Media Keyer can handle it. The audio mixer can perform A/B/C/D mixing using 8 external AES channel inputs or 8 embedded AES channels. The 4 external voice over AES channels can be easily mapped to the desired embedded AES channels allowing for external audio device support. Add to this up to 2 Gigabytes of flash storage for audio clips and you can see why the Downstream Media Keyer has been chosen as the keyer of choice with major system integrators. Any embedded or external audio channels can be mapped to the preview channels for audio monitoring.

Audio storage

Up to 2 Gigabytes of digital audio clips can be stored and played out with the Compact Flash option. The stored audio is output as an AES stereo pair, which can be mixed with any of the other inputs to the audio mixer.

Audio files are loaded over the standard Ethernet interface, the RS-232 port or from the front panel Compact Flash port in 16-bit, 48KHz .WAV format using Evertz InstaLogo software.

Specifications

Serial Video Input:

Standard:	SMPTE 259M-C (270Mb/s)
Number of Outputs:	1 Background (input bypass protected) 1 Fill and 1 Key
Connectors:	BNC per IEC 169-8
Equalization:	Automatic up to 200m @270 Mb/s with Belden 8281 (or equivalent)

Serial Video Output:

Standard:	Same as input
Number of Outputs:	1 Program bypass protected 1 Preview
Connectors:	BNC per IEC 169-8
Impedance:	75Ω
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	900ps nominal
Overshoot:	<10% of amplitude (All outputs terminated)
Jitter:	<0.2UI

AES Audio Inputs:

Standard:	SMPTE 276M single ended AES
Number of Inputs:	4 AES Channels Program (bypass protected), 4 AES Channels Voice Over
Connectors:	BNC per IEC 169-8

AES Audio Outputs:

Standard:	SMPTE 276M single ended AES
Number of Outputs:	4 AES Channels Program (bypass protected), 4 AES Channels Preview
Connectors:	BNC per IEC 169-8
Signal Level:	1Vp-p

Genlock Input:

Type:	NTSC or PAL colour black 1V p-p Composite bi-level sync (525 line or 625 line) 300mV
Connector:	1 BNC input per IEC 169-8
Termination:	75Ω

Serial Remote Control:

RS-232 interface, 9 pin "D" Connector for automation control can be factory set for RS-422

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 115/230 V AC 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:

9625DSK-LGA	SDI Downstream Media Keyer System

Ordering Options:

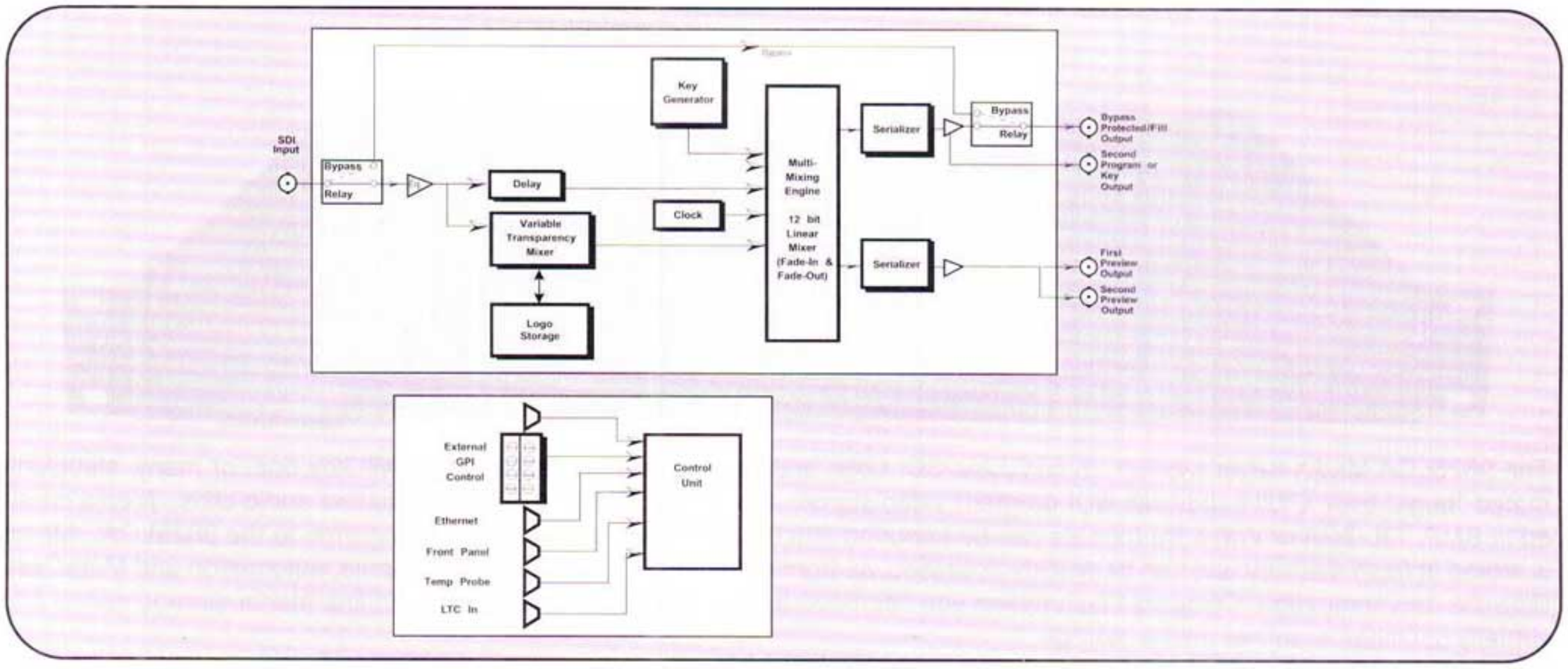
+DCP	Optional desktop remote control panel (Replaces front panel control)
+RCP	Optional rack mount remote control panel (Replaces front panel control)
+2PS	Optional redundant power supply
+CF128	Optional card flash expansion port with 128MB card
+CF1G	Optional card flash expansion port with 1 Gigabyte card
+MEM1G	Optional internal memory expansion to 1 Gigabyte
+LG-TP	Optional air temperature probe
+EAS	Optional EAS crawl insertion
9600LG-TP	Optional air temperature probe for all 9625 & HD9625 products (for existing hardware)

Accessories:

WA-1525	Optional 15-25 Pin Adapter for GP10 port

Model 9625LG

METACAST 2 ENABLED



Specifications

Serial Video Input:

Standard:	Serial component SMPTE 259M-C
Number of Inputs:	1
Connector:	BNC per IEC 169-8
Impedance:	75Ω
Signal Level:	800mV ±10%
Equalization:	Automatic up to 200m @270 Mb/s with Belden 8281 (or equivalent)

Serial Video Output:

Standard:	Serial component SMPTE 259M
Number of Outputs:	2 Program (1 output bypass protected) 1 Preview
Connector:	BNC per IEC 169-8
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

Genlock Input:

Type:	NTSC or PAL colour black 1V p-p composite bi-level sync (525 line or 625 line)
Connector:	1 BNC input per IEC 169-8

Serial Remote Contol:

RS-232 interface, 9 pin "D" Connector for automation control

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 30VA
Safety:	ETL Listed Complies with EU Safety Directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

9625LG	SDI Logo Inserter

Ordering Options & Accessories:

+DCP	Optional desktop remote control panel (Replaces front panel control)
+RCP	Optional rack mount remote control panel (Replaces front panel control)
+2PS	Optional redundant power supply
+CF128	Optional card flash expansion port with 128MB card
+CF1G	Optional card flash expansion port with 1 Gigabyte card
+MEM1G	Optional internal memory expansion to 1 Gigabyte
+LG-TP	Optional air temperature probe
+EAS	Optional EAS crawl insertion
9600LG-TP	Optional air temperature probe for all 9625 & HD9625 products (for existing hardware)

Evertz is proud to introduce the NOMAD Lite PC software application. This easy to use graphics interface, integrates the speed of fast Ethernet, with the ease of drag and drop functionality to deliver a central access point to Evertz keyer products. Using this software allows you to upload media files to one or many units simply by clicking and dragging the item from the explorer like window, into the device tree. This powerful interface allows you to extract and move media items from one device to another using the same easy drag and drop style. For more complicated multi unit installations, you can set custom device groups. This allows for media content to be dropped on a custom grouping and automatically uploaded to the ganged units in one easy step.

SDI Media Keyer System

Model 9625LGA

METACAST 2 ENABLED



The 9625LGA Media Keyer system. A complete SDI Logo and Audio Insertion package that will key one, or many, static/animated "bugs" over a full bandwidth SDI program 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 InstaLogo software and transferred to the 9625LGA. Media is stored in flash memory and can be quickly accessed via front panel, quick select keys, GPI inputs, automation and MetaCast. With the new 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 9625LGA has been designed to manage and store multiple logos. The size of each is variable and range 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 Keyer Voice Over audio input allows for 1 button audio switching

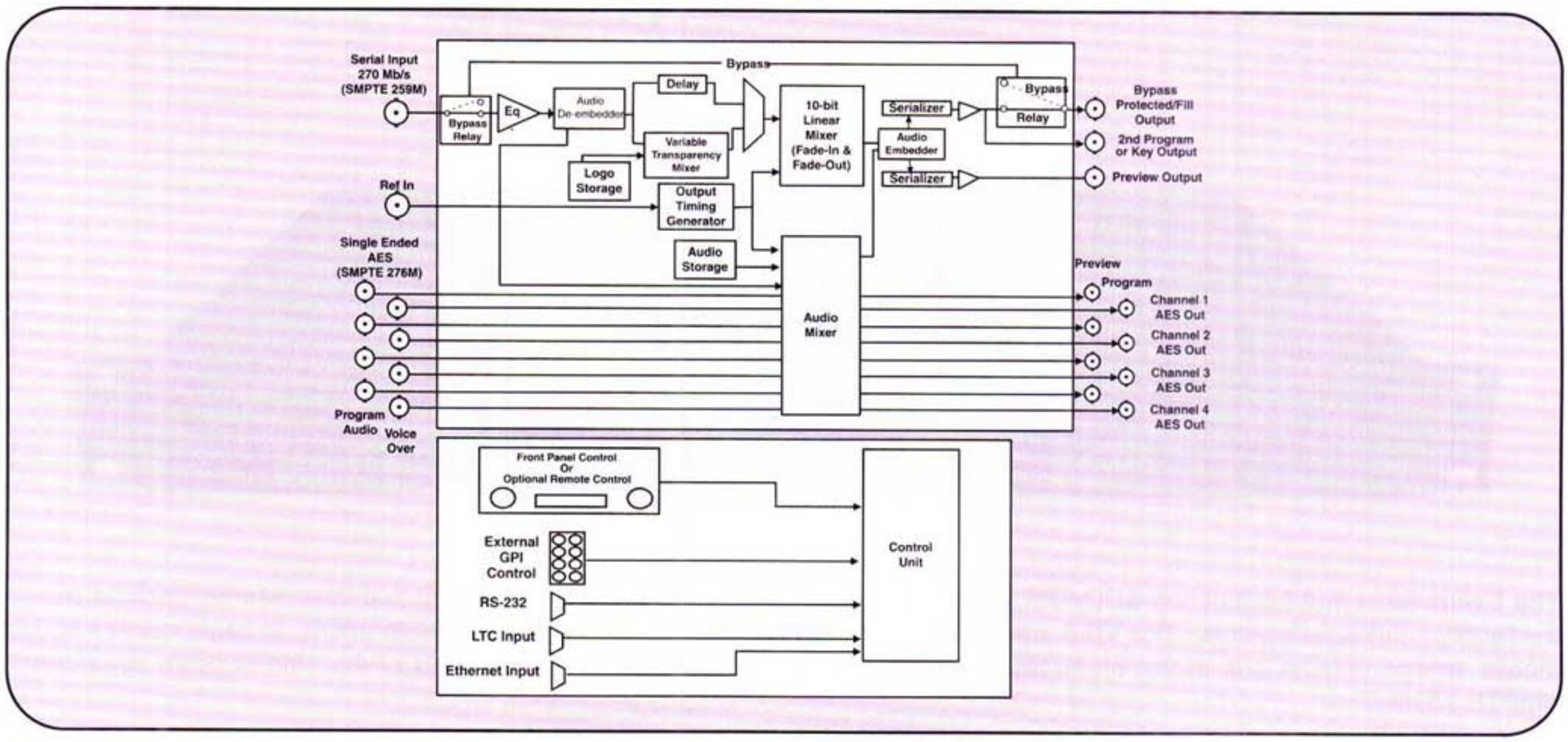
The EAS crawl support allows for connection to an existing EAS decoder. This RS232 connection allows weekly tests (white text on green), watch alerts (white on yellow) and warnings (white on red) to be scrolled across the native HD video with no need for format conversion. The variable height text font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

Features

- Stores and inserts static and animated logos and audio clips
- Multiple simultaneous logos can be keyed with independent fade control
- Incorporates a high quality variable transparency mixer that provides various transparency levels to your logos
- Full 12-bit linear fade-in and fade-out control provided
- Front panel or RS-232/RS-422 (Rack-mount or Desk-top) remote control
- 8 programmable GPI contact closures
- Download media from a standard Windows PC running InstaLogo™ software
- Audio clip to logo associations
- 1 button alternate audio voice overs
- EAS supports all new alert codes including child abduction emeregency
- Quad AES for discreet 5-1 Dolby
- FTP file transfer and maintenance
- Supports 625 line and 525 line video standards
- Fade all out capability provided on program video output
- Standard 128MB flash storage
- Automatic equalization up to 250m (Belden 8281 or equivalent cable)
- Program output bypass relay protected
- Optional 1GB internal flash storage
- Optional redundant power supply
- Optional removable 128MB or 1GB compact flash storage
- Optional rackmount or desktop remote control panels
- Optional EAS crawl support for Sage and TFT Decoders

Evertz is proud to introduce the NOMAD Lite PC software application. This easy to use graphics interface, integrates the speed of fast Ethernet, with the ease of drag and drop functionality to deliver a central access point to Evertz keyer products. Using this software allows you to upload media files to one or many units simply by clicking and dragging the item from the explorer like window, into the device tree. This powerful interface allows you to extract and move media items from one device to another using the same easy drag and drop style. For more complicated multi unit installations, you can set custom device groups. This allows for media content to be dropped on a custom grouping and automatically uploaded to the ganged units in one easy step.

9625LGA Block Diagram



Specifications

Serial Video Input:

Standard:	Serial component SMPTE 259M-C
Number of Inputs:	1
Connector:	BNC per IEC 169-8
Impedance:	75Ω
Signal Level:	800mV ±10%
Equalization:	Automatic up to 200m @270 Mb/s with Belden 8281 (or equivalent)

Serial Video Output:

Standard:	Serial component SMPTE 259M
Number of Outputs:	2 Program (1 output bypass protected) 1 Preview
Connector:	BNC per IEC 169-8
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

AES Audio Inputs:

Standard:	SMPTE 276M single ended AES
Number of Inputs:	4 Program, 4 Alternate
Connector:	BNC per IEC 169-8

AES Audio Outputs:

Standard:	SMPTE 276M single ended AES
Number of Outputs:	4 Program, 4 Preview
Connector:	BNC per IEC 169-8
Signal Level:	1Vp-p

Genlock Input:

Type:	NTSC or PAL colour black 1V p-p composite bi-level sync (525 line or 625 line)
Connector:	1 BNC input per IEC 169-8

Serial Remote Contol:

RS-232 interface, 9 pin "D" Connector for automation control

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 30VA
Safety:	ETL Listed Complies with EU Safety Directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

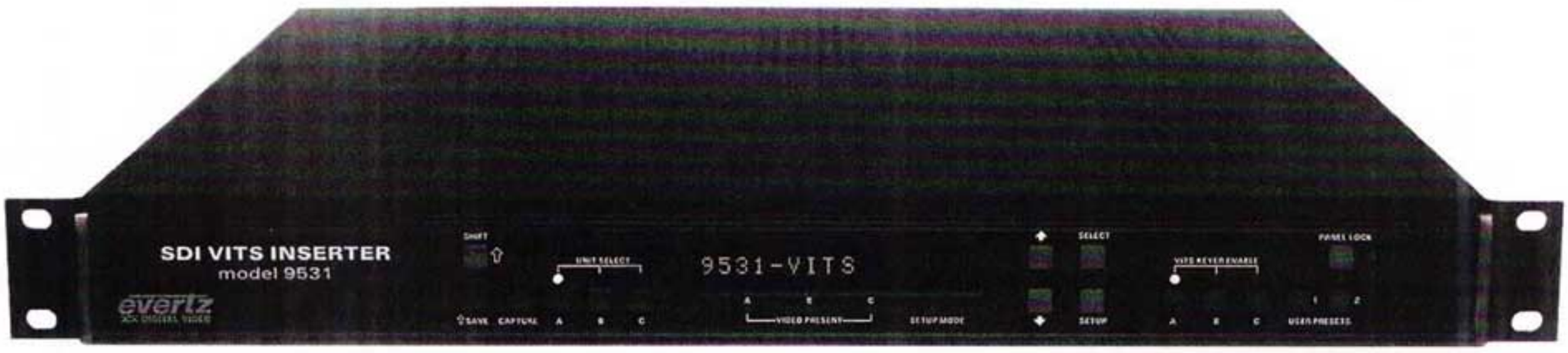
9625LGA	SDI Media Keyer Systen

Ordering Options & Accessories:

+RCP	Optional rackmount remote control panel
+DCP	Optional desk top remote control panel
+2PS	Redundant power supply
+LG-TP	Optional Air Temperature Probe
+EAS	Optional EAS Crawl Insertion
+CF128	Optional card flash expansion port with 128 Megabyte card
+CF1G	Optional card flash expansion port with 1 Gigabyte card
+MEM1G	Optional internal flash expansion to 1 Gigabyte
+CWL	Optional crawl support
WA-1525	Optional 15-25 pin adapter for all 9625 & HD9625 products

SDI VITS Inserter

Model 9531



The Evertz 9531 is a full function SDI VITS inserter designed for Vertical Interval Test Signal and data inserter applications at the facility input/output points. The VITS inserter is ideal for digital applications such as satellite uplink, at cable headends, on mobile vehicle outputs and at the broadcast transmitter input. The input and output video of this unit is serial component SMPTE 259M-C.

The VITS inserter is capable of inserting different test signals on multiple VBI lines. The two modes of operation are capture and insertion mode. While in capture mode, the unit can capture a range of lines in the VBI and active video to non-volatile memory for future insertion. The system is able to capture and store up to 64 user test signals. It also features up to 32 pre-programmed factory installed test signals for both 525 and 625 video standards.

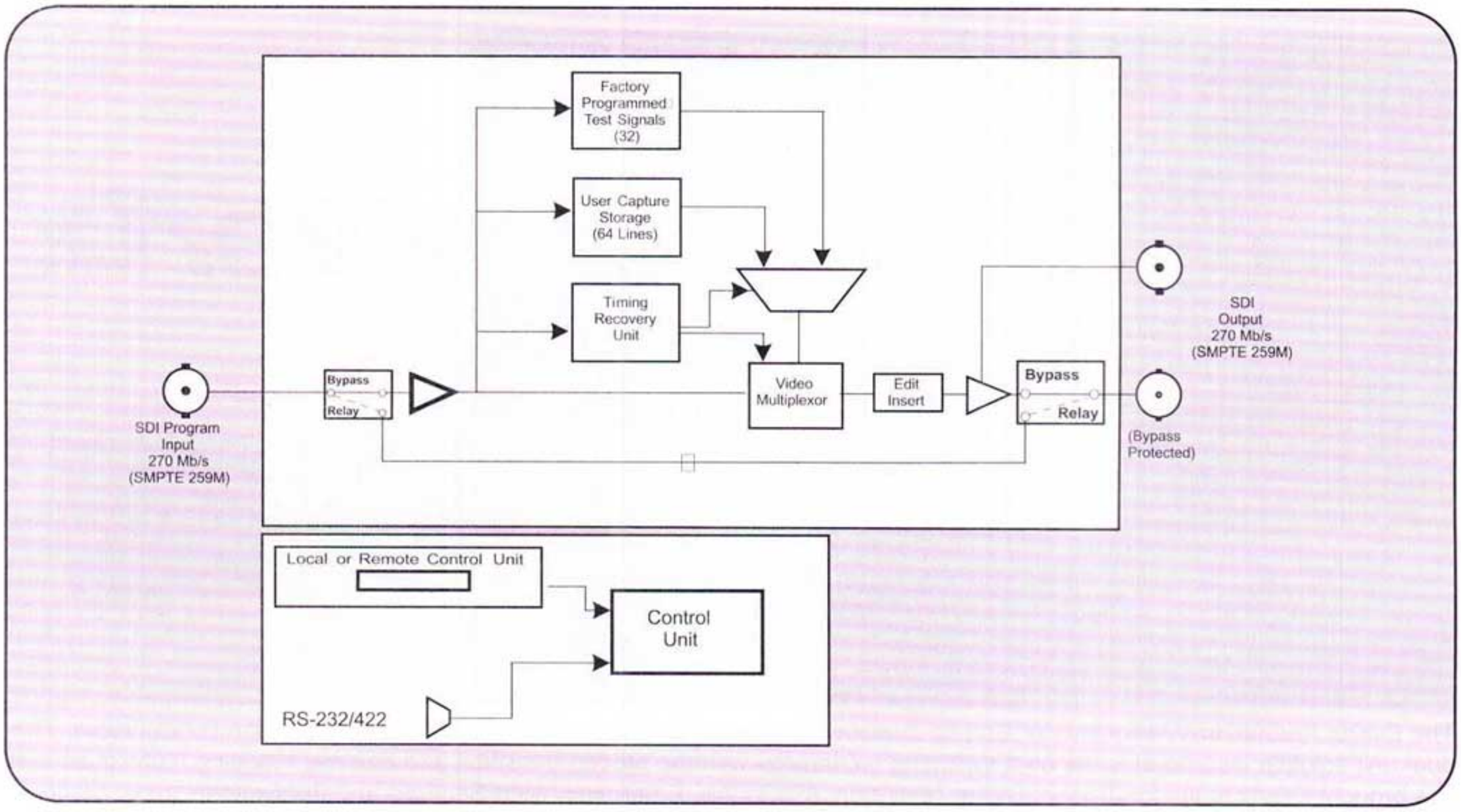
The device has been designed with the broadcast environment in mind and features bypass relay protection for the program output and a dual power supply option.

The Evertz 9531 is housed in a compact 1RU frame. The frame can be ordered with 1 VITS inserter or with 3 VITS inserters installed. The functions of each channel are idential and can be programmed independently of each other.

Features

- SDI VITS capture/generator device
- Dual standard: 525 line or 625 line
- Program output bypass relay protected
- Available with 1 or 3 VITS inserters in 1RU housing
- Front panel or GPI activated
- Extensive library of factory preset test signals
- Up to 64 user line patterns may be captured from any VBI line for later insertion on any VBI line
- Any number of VBI lines can be independently blanked out in one or both fields
- Line selection is fully dynamic and controllable from the front panel
- Non-volatile memory protects current configuration in case of power loss
- Optional redundant power supply

9531 Block Diagram



Specifications

Serial Digital Video Input:

Standard:	SMPTE 259M-C 525 or 625 line component
Connector:	BNC per IEC 169-8
Equalization:	Automatic up to 300m @ 270 Mb/s Belden 8281 (or equivalent)
Return Loss:	>15dB up to 540 Mb/s

Serial Digital Video Output:

Standard:	Same as Input
Number of Outputs:	1 with relay bypass, 1 additional output
Connector:	BNC per IEC 169-8
Impedance:	75Ω
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

Serial Remote Ctl: RS-232 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 30VA
Safety:	ETL listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Ordering Information:

9531	Single channel VITS Inserter
9531-3	Three channel VITS Inserter

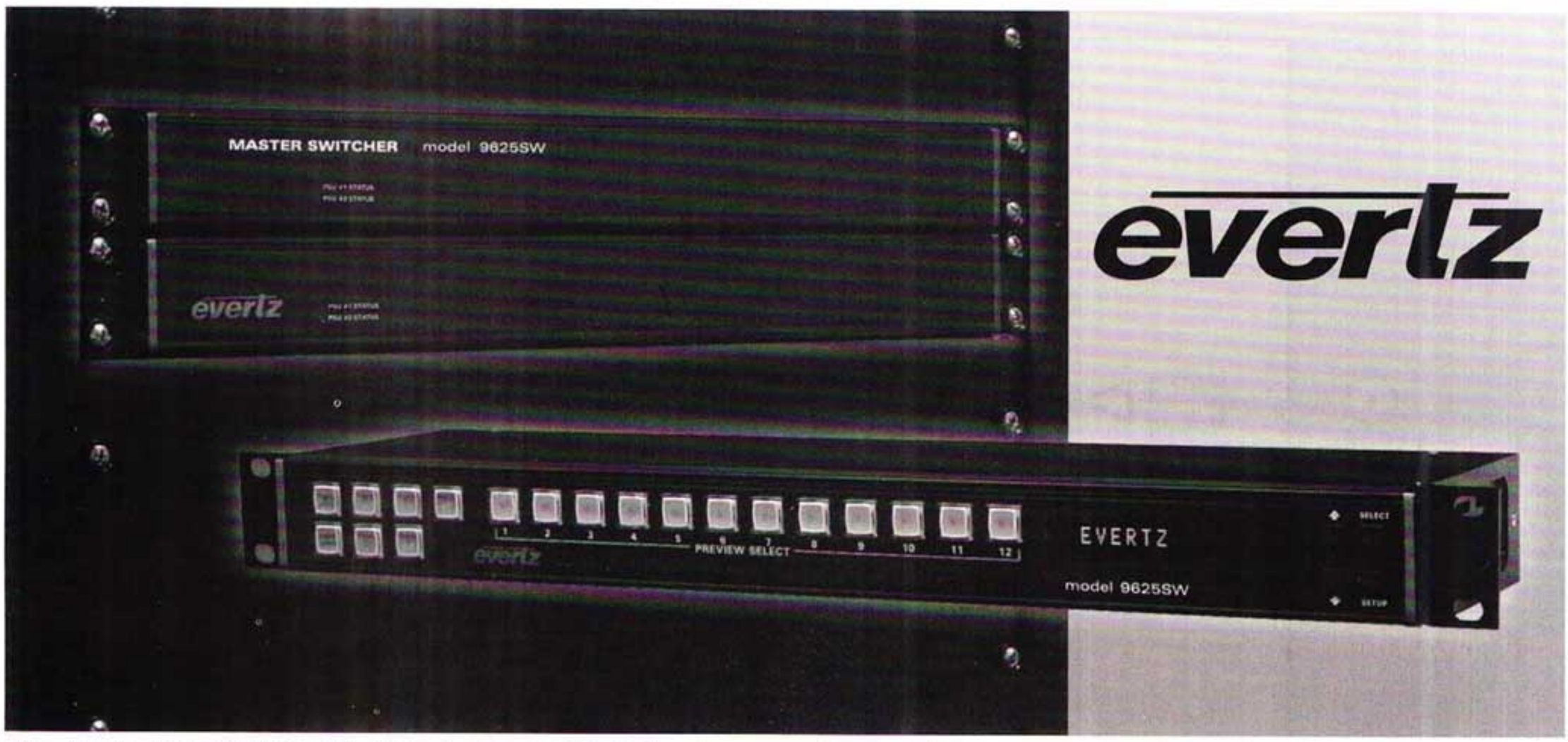
Ordering Options:

+2PS	Redundant power supply
+RCP	Rack mount remote control panel

SDI Mini Master Control Switcher Package

Model PKG9625SW

METACAST 2 ENABLED



The Evertz PKG9625SW Mini Master Control Switcher is an excellent addition to your Standard Definition control room. This dual unit solution incorporates the best switching technology with the proven transition and channel branding techniques that has brought Evertz to the forefront of Digital Television. Add to this, Emergency Alert Services and SoftSwitch™ audio processing, and you have the most advanced media switcher available today.

The Evertz PKG9625SW includes all 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.

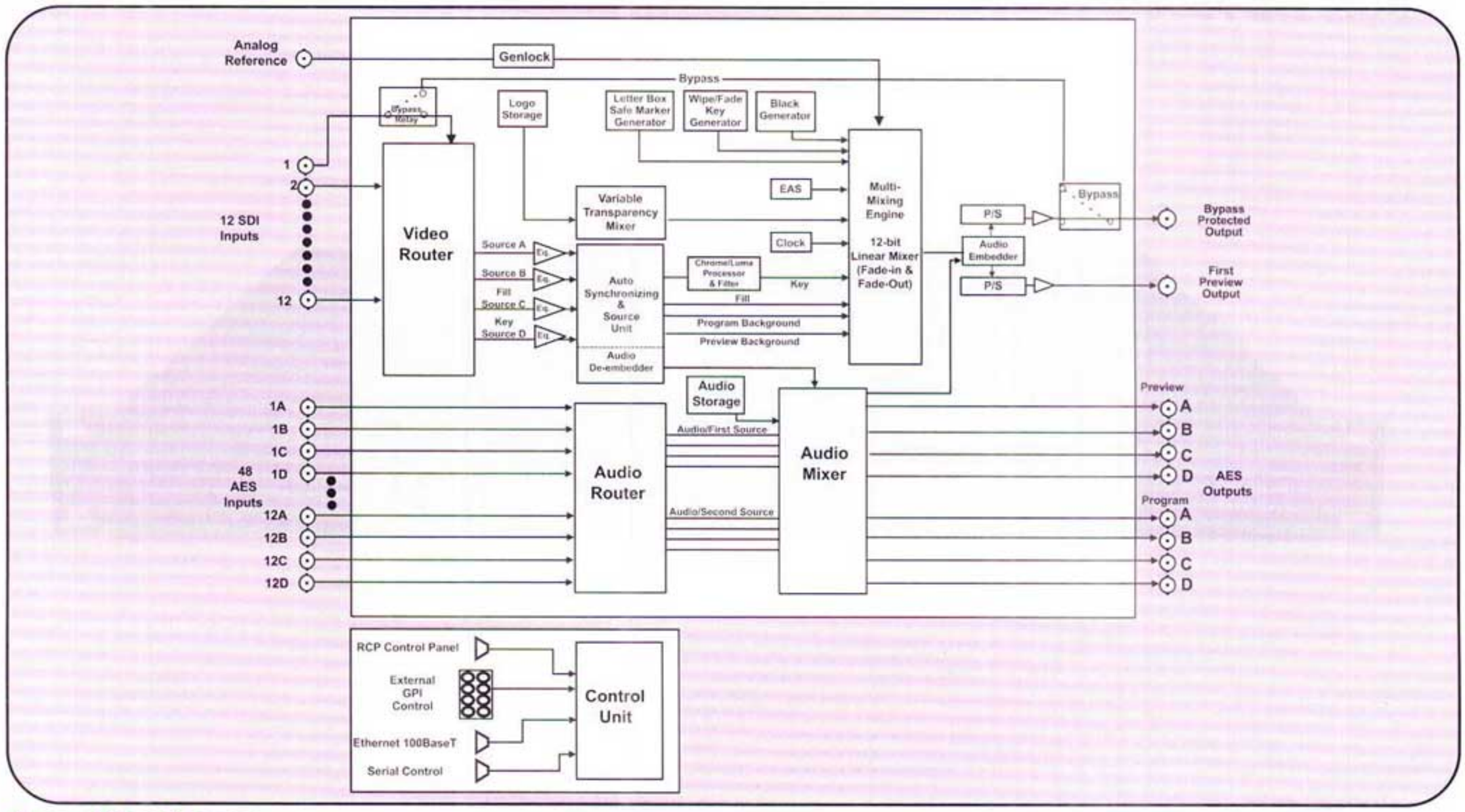
Features

- 12 Input SD Video Switcher with Quad 12 input AES switcher
- Program/Preview Transition Mixer for SD video and up to 4 audio pairs
- Downstream keyer with mix and additive modes
- Variety of smooth Transitions including Cut, Fade, Fade to-from Black and 8 angles of Wipes
- Optional EAS support - Emergency Alert Crawls from TFT or Sage systems
- SD Multiple Logo Inserter with Animation
- LTC input for Breakfast Clocks
- Single Remote Control Panel for Router/Keyer/Logo functions
- Built-in Black Generator
- 12 Bit Video Processing
- Control of key gain & offset are provided
- Multiple Control Interface Options including GPI, RS232 and Rackmount Control Panel
- Built-in +/- 1/2 line autotimers for video
- "Pop" free AES Audio Switch with Evertz patented SoftSwitch™ Technology
- System comprised of two 1RU rack frames and a remote 1RU control panel
- Audio bypass mode for Dolby E
- Video and audio input bypass relay for power failue protection

Evertz is proud to introduce the NOMAD Lite PC software application. This easy to use graphics interface, integrates the speed of fast Ethernet, with the ease of drag and drop functionality to deliver a central access point to Evertz keyer products. Using this software allows you to upload media files to one or many units simply by clicking and dragging the item from the explorer like window, into the device tree. This powerful interface allows you to extract and move media items from one device to another using the same easy drag and drop style. For more complicated multi unit installations, you can set custom device groups. This allows for media content to be dropped on a custom grouping and automatically uploaded to the ganged units in one easy step.

SDI Mini Master Control Switcher Package

PKG9625SW Block Diagram



Specifications

Serial Video Input:

Standard:	SMPTE 259M-C (270Mb/s)
Connector:	BNC per IEC 169-8
Equalization:	Automatic up to 100m @270Mb/s with Belden 1694 (or equivalent)
Return Loss:	> 15 dB up to 270Mb/s

Serial Video Output:

Standard:	Same as input
Number of Outputs:	1 Program, 1 Preview
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ± 0.5V
Rise and Fall Time:	750ps nominal
Overshoot:	<10% of amplitude
Jitter:	<0.2 UI

AES Audio Inputs:

Standard:	SMPTE 276M single ended AES
Number of Inputs:	12 per buss, 4 busses
Connector:	BNC per IEC 169-8 on 2 breakout panels provided

AES Audio Outputs:

Standard:	SMPTE 276M single ended AES
Number of Outputs:	4 Program, 4 Preview
Connector:	BNC per IEC 169-8 on 2 breakout panels provided
Signal Level:	1Vp-p
Reference:	From Video General Reference

Video Reference:

Type:	Menu selectable - depends on video format NTSC or PAL Colour Black 1 V p-p Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV
Connectors:	2 BNC per IEC 169-8
Termination:	High impedance loop through

Control:

Serial Control:	RS-232/422, 8 bits, no parity, 9600, 19200, 38400, 57600 baud computer control of all functions
Upgrade:	RS-232, 57600 baud, 8 bits, no parity for firmware upgrades
Logo Transfer:	TCP/IP, 100Base T

General Purpose In/Out:

Number of inputs:	8
Number of outputs:	4
Type:	Opto isolated, active low
Connector:	Female High Density DB-15
Signal level:	+5V nominal

Physical:

Dimensions:	
Switcher Electronics:	19"W x 3.5"H x 18.75"D (483mm W x 90mm H x 477mm D)
Control Panel:	19"W x 1.75"H x 4.25" (483mm W x 45mm H x 110mm D)
Weight (total):	17lbs. (7.8Kg)

Electrical:

Power:	Autoranging 100-240 V AC 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:

PKG9625SW	SDI Mini Master Switcher Package

Ordering Options:

+2PS	Redundant power supply
+CF128	Card Flash memory expansion with 128 Megabyte card
+CF1G	Card Flash memory expansion with 1 Gigabyte card
+MEM1G	Intrnal memory expansion to 1 Gigabyte
+LG-TP	Optional Air Temperature Probe
+EAS	Optional EAS Crawl Insertion
+GVG110	Optional GVG110 control interface

HD SDI Graticule Generator

Model HD9590



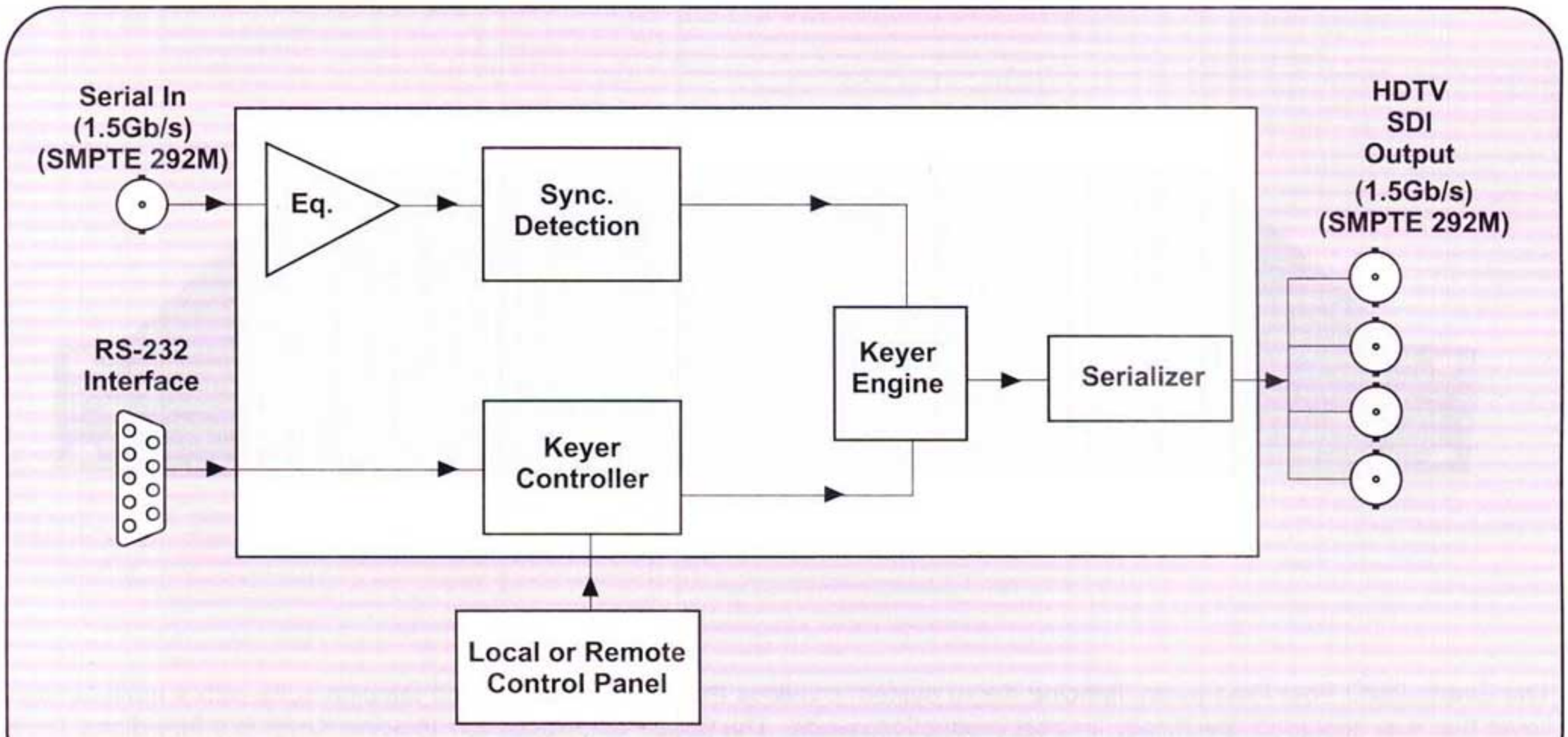
The HD9590 Graticule Generator is an easy to use, one rack unit, multi format digital video graticule generator that keys various alignment markers over a high definition video picture. These alignment markers facilitate film transfer, post production and quality control measurements relating to picture location for various film aspect ratios, safe action and title areas as well as picture center.

All of the functions of the HD9590 Graticule Generator are available from the front panel or one of two remote control panels. Choose from the many factory programmed presets or define your own. The HD9590 allows for multiple user defined presets that can be re-called and re-defined at any time.

Features

- Keys graticule markers directly into SMPTE 292M serial digital video
- 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
- 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
- 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

HD9590 Block Diagram



Specifications

Serial Video Input:

Standard:	SMPTE 292M
SMPTE 274M:	1080i/60, 1080i/59.94, 1080i/50, 1080p/24(sF) 1080p/25(sF), 1080p/23.98(sF)
SMPTE 296M:	720p/60, 720p/59.94
Connector:	BNC input per IEC 169-8
Impedance:	75Ω
Signal Level:	800mV ± 10%
Equalization:	Automatic 100m @ 1.5Gb/s with Belden 1694 (or equivalent)

Serial Video Output:

Number of Outputs:	4
Standard:	Same as input
Connector:	4 BNC's per IEC 169-8
Impedance:	75Ω
Signal Level:	800mV nominal
DC Offset:	0V ± 0.5V
Rise and Fall Time:	200ps nominal
Overshoot:	<10% of amplitude
Wideband Jitter:	<0.2UI

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 30VA
Safety:	ETL listed
	Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A
	EU EMC Directive

Ordering Information:

HD9590	HD SDI Graticule Generator

Ordering Options:

+RCP	Rackmount remote control
+DCP	Desktop remote control unit

Post Production Telecine Keyer

Model 9580



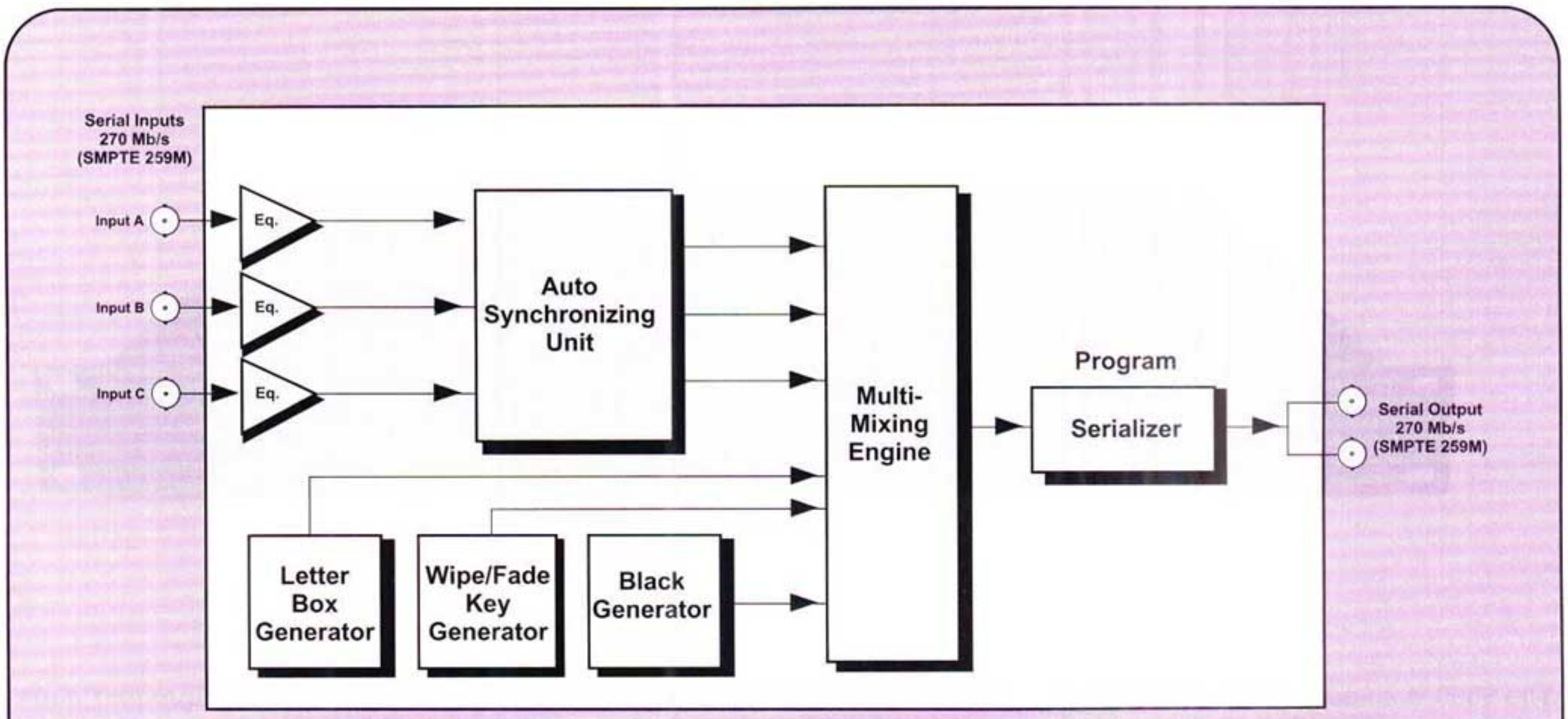
The Evertz 9580 Post Production Telecine Keyer system provides the post production and telecine suite with a multi-function keyer that was designed specifically for post production needs. The 9580 Post Production Telecine Keyer is a fully digital keyer that was designed with a scaleable size kept in mind so it will fit most post production applications that can be presented.

The 9580 Post Production Telecine Keyer system features linear keying, side-by-side comparisons, letter boxing, wipes, fades and more. The 9580 Post ProductionTelecine Keyer consists of a one RU frame with front panel control or optional remote control. The 9580 Post Production Telecine Keyer is an ideal addition to the Evertz KeyLog Tracker Telecine Logging and Configuration Management Tool.

Features

- Side-by-side comparisons
- Wipes - horizontal, vertical, diagonal left or right
- Auto-timing SDI inputs
- Adjustable fades and wipes
- Automatic precision letter boxing for 4:3 and 16:9 aspect ratios
- On Screen display for setup menu
- Factory and user presets
- 12-bit linear keying
- Safe area / safe title markers
- Operates with 525 or 625 line SMPTE 259M-C video signals
- Optional Rack Mount or Desk Top Remote Control unit

9580 Block Diagram



Specifications

Serial Digital Video Input:

Standard:	SMPTE 259M-C 270 Mb/s 525i/59.94, 625i/50
Number of Inputs:	3
Connector:	BNC per IEC 169-8
Equalization:	Automatic to 200m with Belden 8281 (or equivalent)
Impedance:	75Ω

Serial Digital Video Output:

Standard:	Same as input
Number of Outputs:	2
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ± 0.5V
Rise and Fall Time:	900ps nominal
Overshoot:	<10% of amplitude
Wide Band Jitter:	< 0.2UI
Impedance:	75Ω

Serial Remote Ctl:

RS-232/422 interface, 9 pin "D" connector

Physical:

Dimensions:	19"W x 1.75"H x 18.75"D (483mm W x 45mm H x 477mm D)
Weight:	8lbs (3.5Kg)

Electrical:

Power:	Auto ranging 100-240VAC 50/60Hz 30VA
Safety:	ETL Listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Ordering Information:

9580	Post Production Telecine Keyer

Ordering Options:

+RCP	Rackmount remote control panel
+DCP	Desk top remote control unit

SDI Graticule Generator

Model 9590



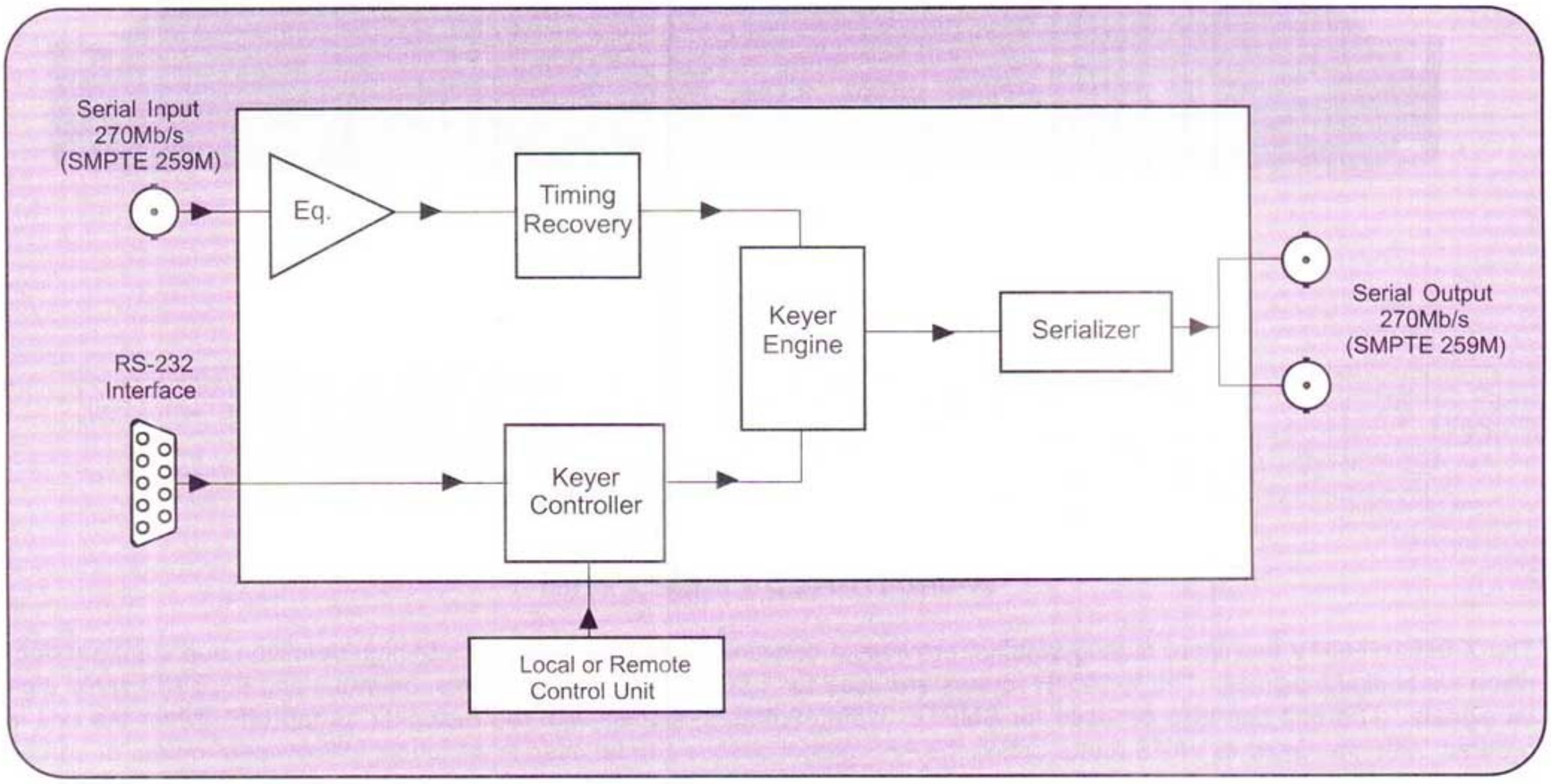
The 9590 is an easy to use, one rack unit, dual standard digital video graticule generator that keys various alignment markers over a source video picture to facilitate film transfer, post production and quality control measurements relating to picture location for various film aspect ratios, safe action 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

Block Diagram 9590



Specifications

Serial Video Input:

Standard:	Serial component SMPTE 259M-C
Connector:	BNC per IEC 169-8
Impedance:	75Ω
Signal Level:	800mV ±10%
Equalization:	Automatic to 200m @270 Mb/s with Belden 8281 (or equivalent)

Serial Video Output:

Standard:	Serial component SMPTE 259M-C
Number of Outputs:	2 per frame.
Connector:	BNC per IEC 169-8
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 30VA
Safety:	ETL listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

9590	SDI Digital Graticule Generator

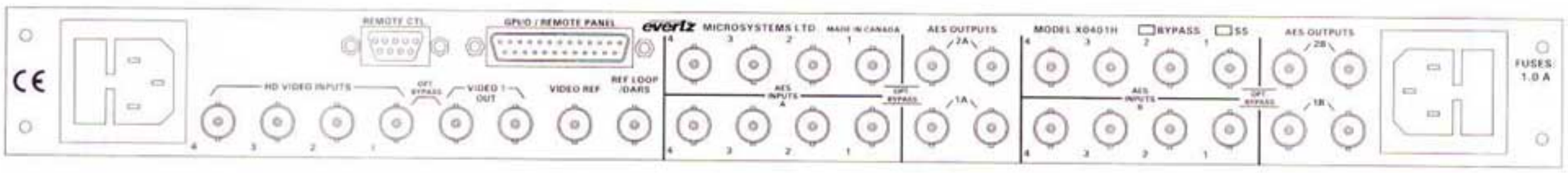
Ordering Options:

+RCP	Rackmount remote control
+DCP	Desktop remote control unit

4 X 1 HDTV Router
With Quad 4x1 AES Audio

Model X-0401H





X-0401H-AES4 Rear Panel

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. 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.

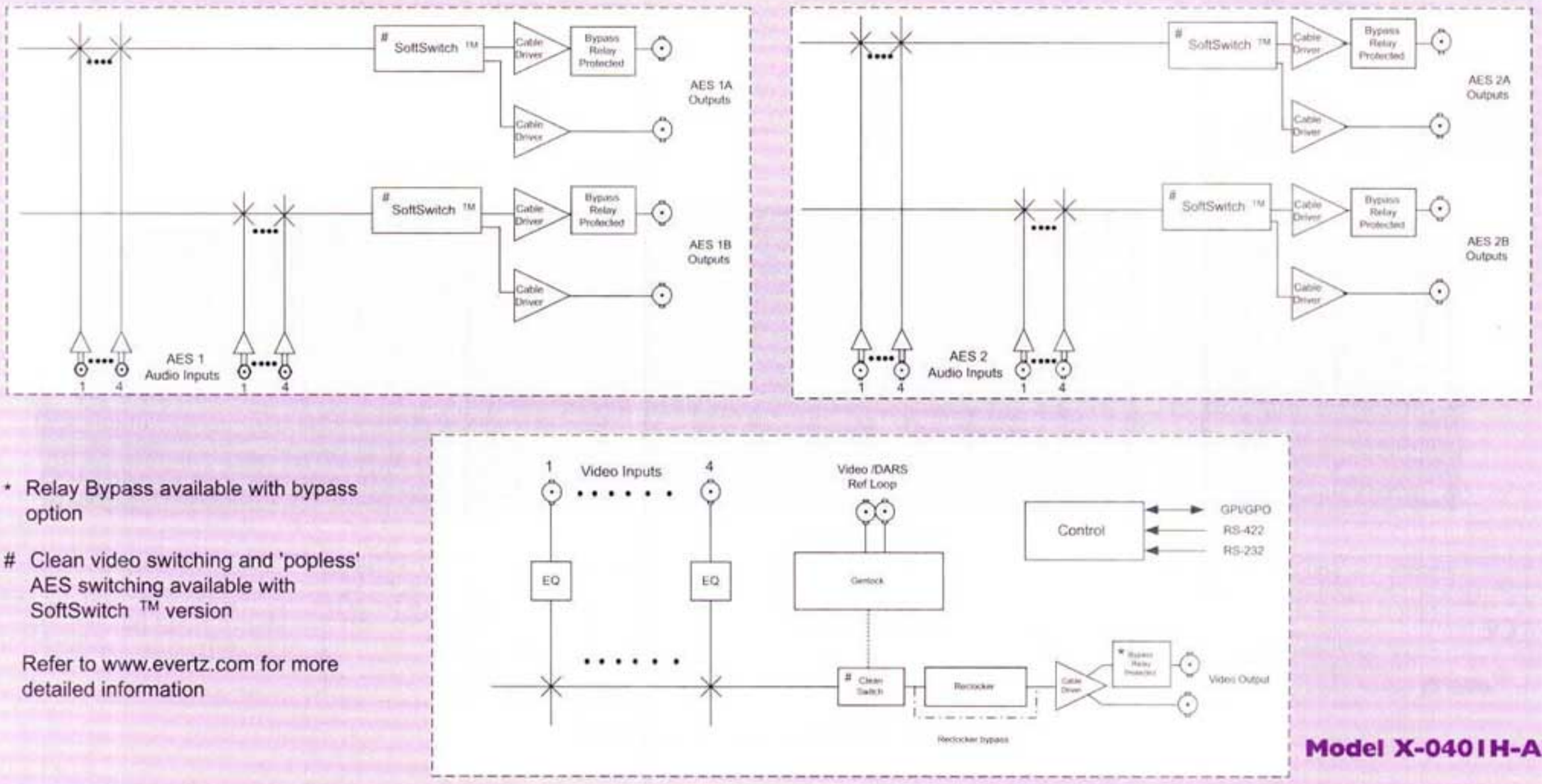
SoftSwitch™ Features (X-0401H-AES4-HSS)

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 +/- 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.

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
- 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

4 X 1 HDTV Router
With Quad 4x1 AES Audio



* Relay Bypass available with bypass option

\# Clean video switching and 'popless' AES switching available with SoftSwitch ™ version

Refer to www.evertz.com for more detailed information

Model X-0401H-AES4

Specifications

Video Inputs:

Standard:	SMPTE 292M (1.5Gb/s), SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s) and DVB-ASI SMPTE 310M with reclocker turned off
Number of Inputs:	4
Connector:	BNC per IEC 169-8
Equalization:	Automatic up to 100m @1.485Gb/s with Belden 1694 (or equivalent) cable (50m on input 1 when the +HBP is installed)
Return Loss:	> 15 dB up to 1.5 Gb/s
Input Timing (On X-0401H-AES4-HSS 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 Input 1 bypass protected with +HBP option
Connector:	BNCper IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	200ps for SMPTE 292 470ps for SMPTE 259M
Overshoot:	<10% of amplitude
Return Loss:	> 15 dB up to 1 Gb/s, > 12dB up to 1.5Gb/s
Jitter:	< 0.2 UI
Output Timing (On X-0401H-AES4-HSS 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 169-8
Signal Level:	1 V p-p ± 10%

AES Audio Outputs (AES4 versions only):

Standards:	SMPTE 276M single ended AES
Number of Outputs:	2 per bus, 4 busses Input 1 bypass protected with +HBP option
Connector:	BNC per IEC 169-8
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 Colour 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 169-8
Termination:	
Standard models:	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 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 169-8
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 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-232 or 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 30VA
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™

Ordering Options:

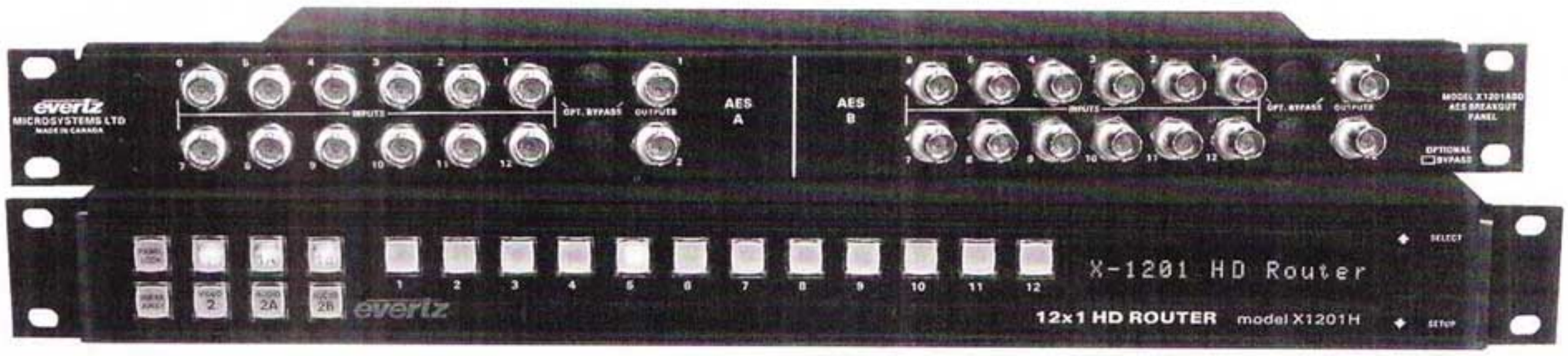
+HBP	Optional bypass relay
+2PS	Redundant power supply
+RCP	Rackmount remote control panel (replaces front control panel)

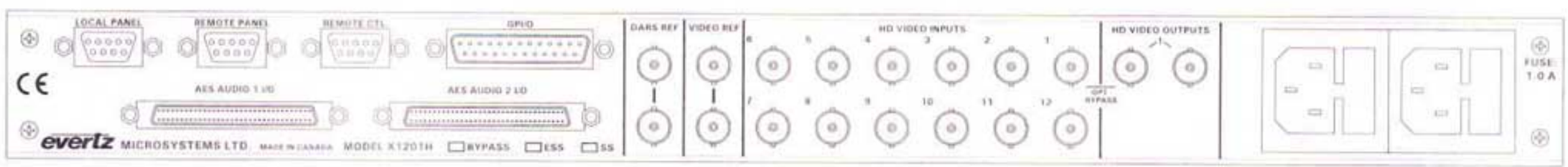
Accessories:

X-0401H-PANEL	Additional Remote Control Panel (works in addition to front control panel)

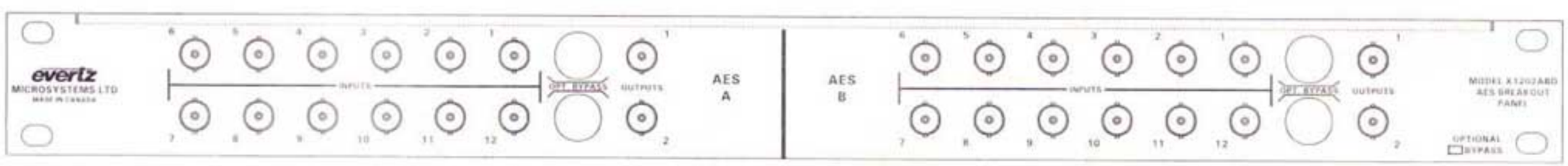
12 X 1 HDTV Router
With Dual or Quad 12x1 AES Audio

Model X-1201H





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 digitial 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. 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 +/- 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.

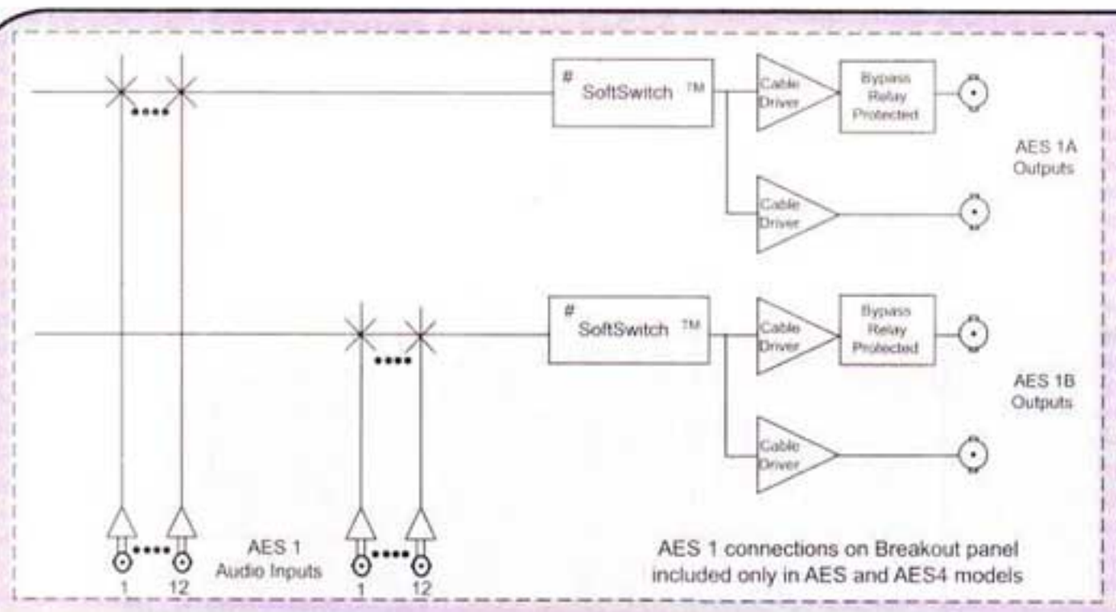
Optional Embedded SoftSwitch™ Features (+HES Option)

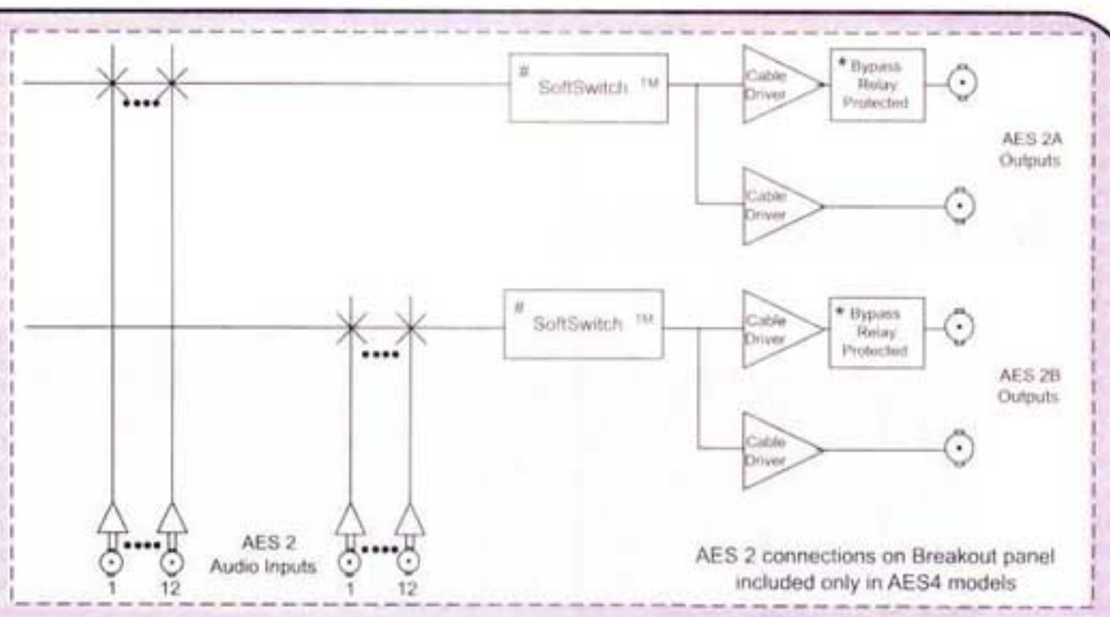
Routers equipped with the Embedded SoftSwitch™ option have all the features of the SoftSwitch™ versions as well as the following additional features. The embedded audio on the video buss uses Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed (for HD video only).

Features

- Supports SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s) and DVB-ASI video signals
- Switch point is fully controlable 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 any version
- Parallel GPI and RS-232 serial control
- Programmable source input names available on front panel
- Optional video and audio input relay bypass for power failure bypass protection
- Bypass verification test using main menu
- Optional dual power supply configuration
- Field upgradable firmware as new features become available
- Programmable tally output bus
- RS-422 remote control via GVG TEN-XL protocol
- SoftSwitch™ option is available to provide clean video and popless AES switching
- Embedded SoftSwitch™ option is available to provide clean video and popless AES and embedded audio switching

12 X 1 HDTV Router
With Dual or Quad 12x1 AES Audio

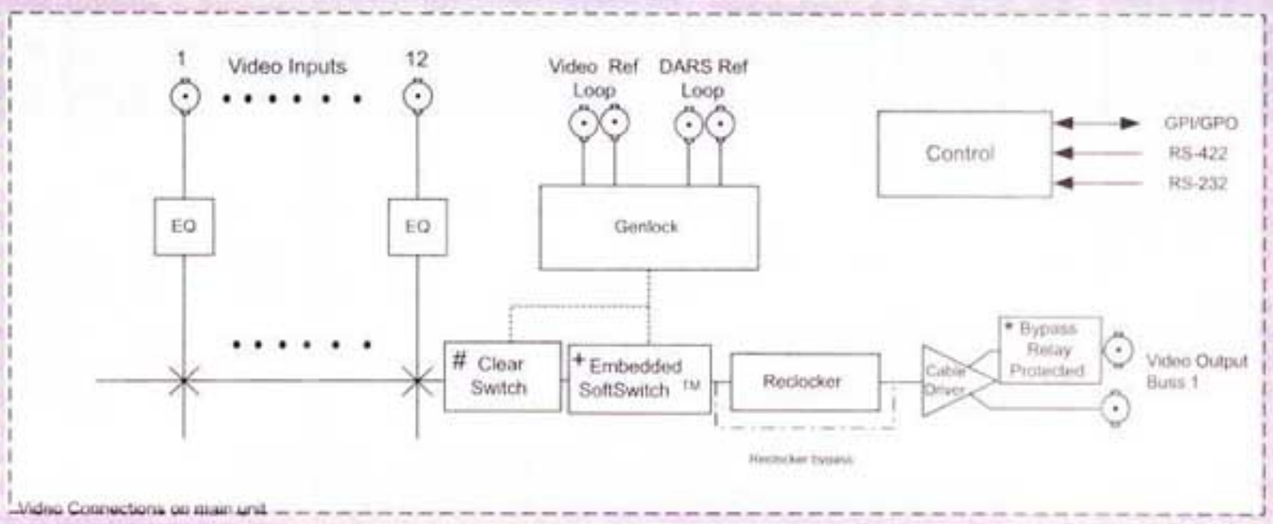




- Relay Bypass available with bypass option

\# Clean video switching and 'popless' AES switching available with SoftSwitch ™ version

Refer to www.evertz.com for more detailed information



Model X-1201H

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 169-8
Equalization:	Automatic 100m @ 1.485Gb/s with Belden 1694 (or equivalent) (50m on input 1 with +HBP option)
Return Loss:	> 15dBV up to 1.5Gb/s
Input Timing (On +HSS and +HES Optioned 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 169-8
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 Optioned 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. Output phasing for HD Video only

AES Audio Inputs:

Standard:	SMPTE 276M single ended AES
Number of Inputs:	12 per buss, 2 or 4 busses optional
Connector:	BNC per IEC 169-8 on breakout panels provided

AES Audio Outputs:

Standard:	SMPTE 276M single ended AES
Number of Outputs:	2 per buss, 2 or 4 busses optional Input 1 bypass protected with +HBP option
Connector:	BNC per IEC 169-8 on breakout panels provided
Signal Level:	1V p-p
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 Colour Black 1 V p-p Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV
Connectors:	2 BNC per IEC 169-8
Termination:	High impedance loop through

DARS Reference (On +HSS and +HES Optioned Routers):

Type:	Digital Audio Signal with 48kHz sample rate
Standard:	SMPTE 276M single ended AES
Connector:	2 BNC per IEC 169-8
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 30VA
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-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:

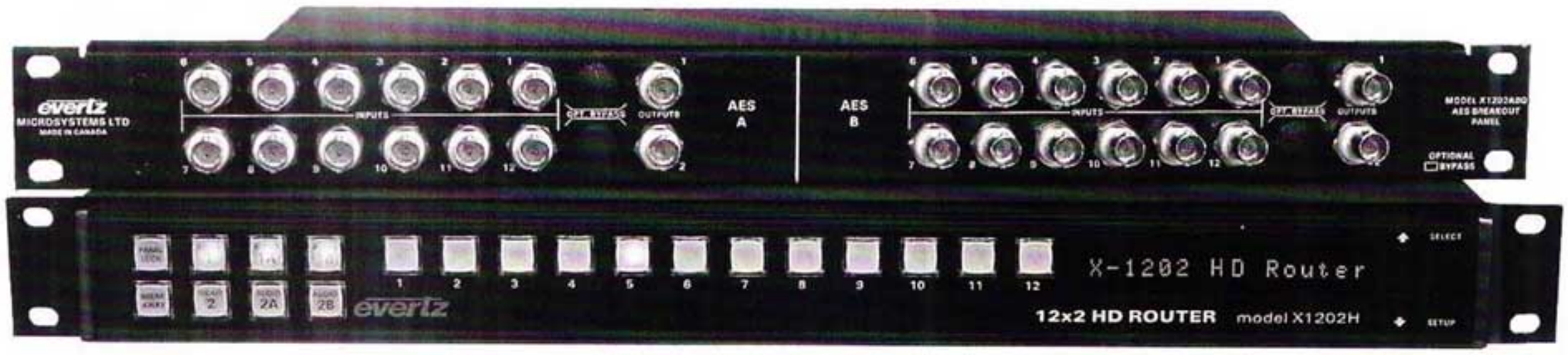
+HSS	SoftSwitch™ Option
+HES	Embedded SoftSwitch™ Option
+HBP	Bypass Relay Protection
+2PS	Redundant Power Supply
+RCP	Rack Mount Remote Control Panel (replaces front control panel)

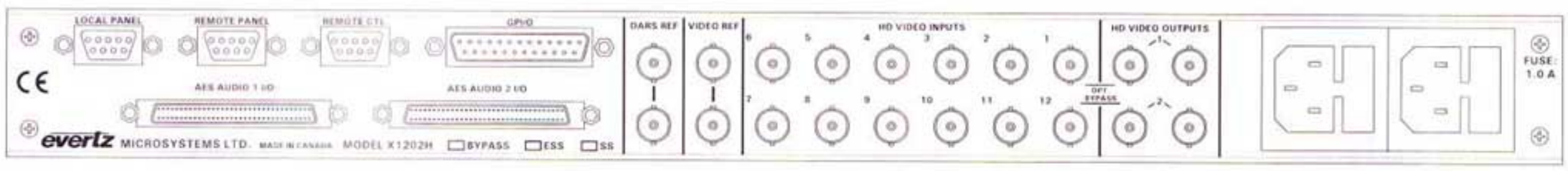
Accessories:

X-1201H-PANEL	Additional Remote Control Panel(works in addition to front control panel)

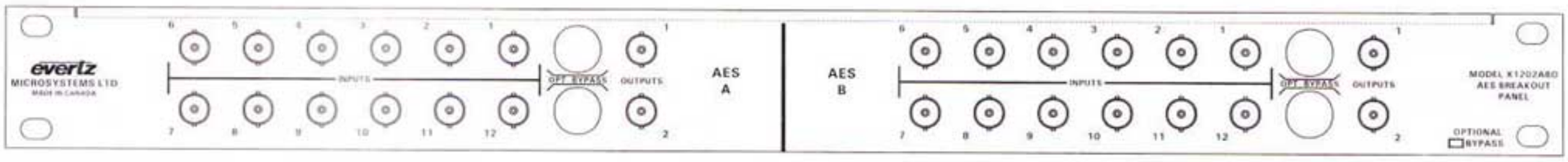
12 X 2 HDTV Router
With Dual or Quad 12x2 AES Audio

Model X-1202H





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 digitial 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. 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 +/- 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.

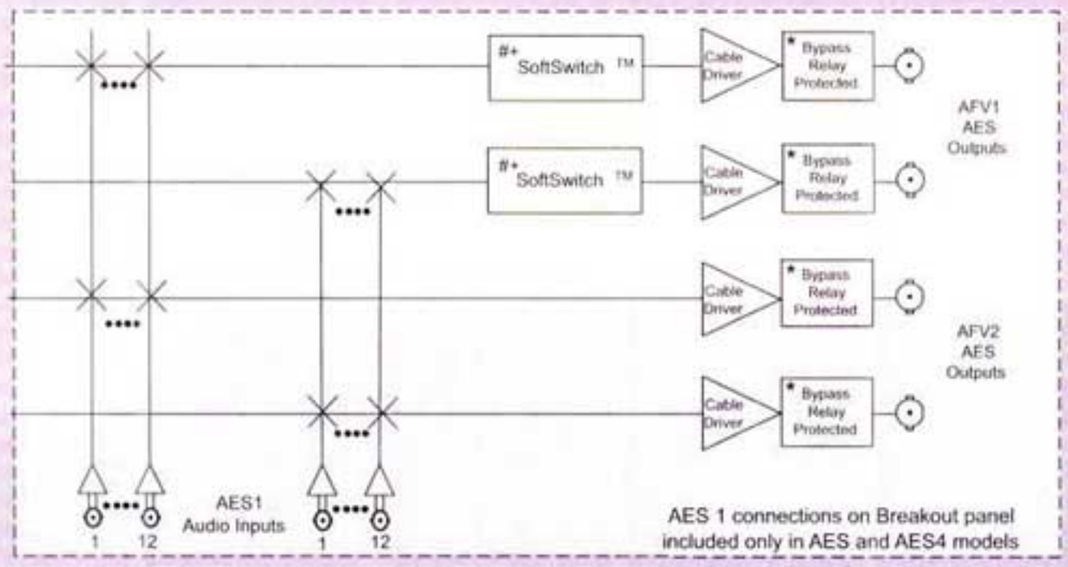
Optional Embedded SoftSwitch™ Features (+HES Option)

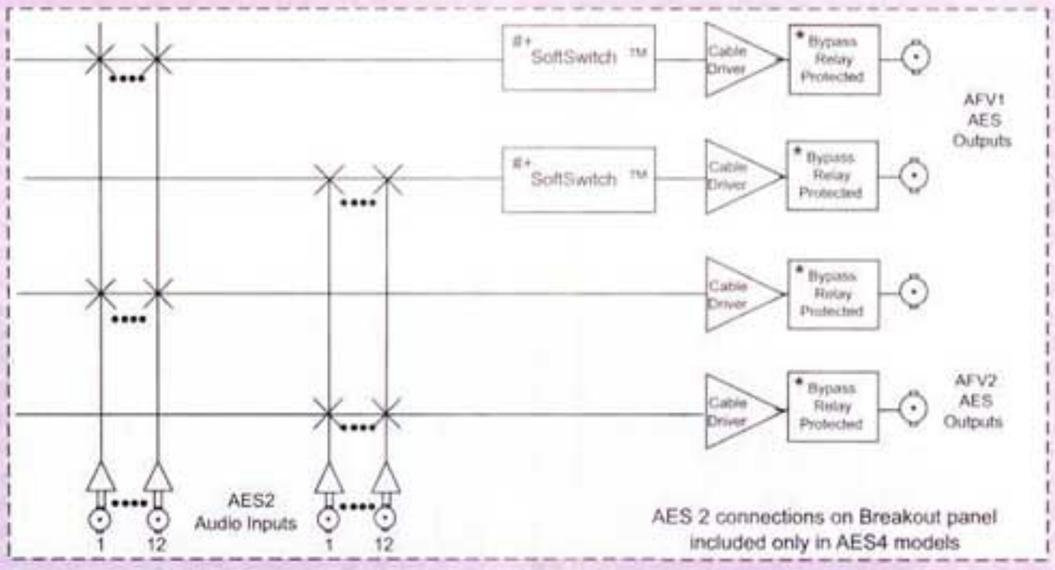
Routers equipped with the Embedded SoftSwitch™ option have all the features of the SoftSwitch™ versions as well as the following additional features. The embedded audio on the Video 1 buss uses Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed (for HD Video only).

Features

- Supports SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s) and DVB-ASI video signals
- Inputs can operate at 1.5Gb/s or 270Mb/s selectable
- Switch point is fully controlable 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 any version
- Parallel GPI and RS-232 serial control
- Programmable source input names available on front panel
- Optional video and audio input relay bypass for power failure bypass protection
- Bypass verification test using main menu
- Optional dual power supply configuration
- Field upgradable firmware as new features become available
- Programmable tally output bus
- RS-422 remote control via GVG TEN-XL protocol
- SoftSwitch™ option is available to provide clean video and popless AES switching
- Embedded SoftSwitch™ option is available to provide clean video and popless AES and embedded audio switching

12 X 2 HDTV Router
With Dual or Quad 12x2 AES Audio

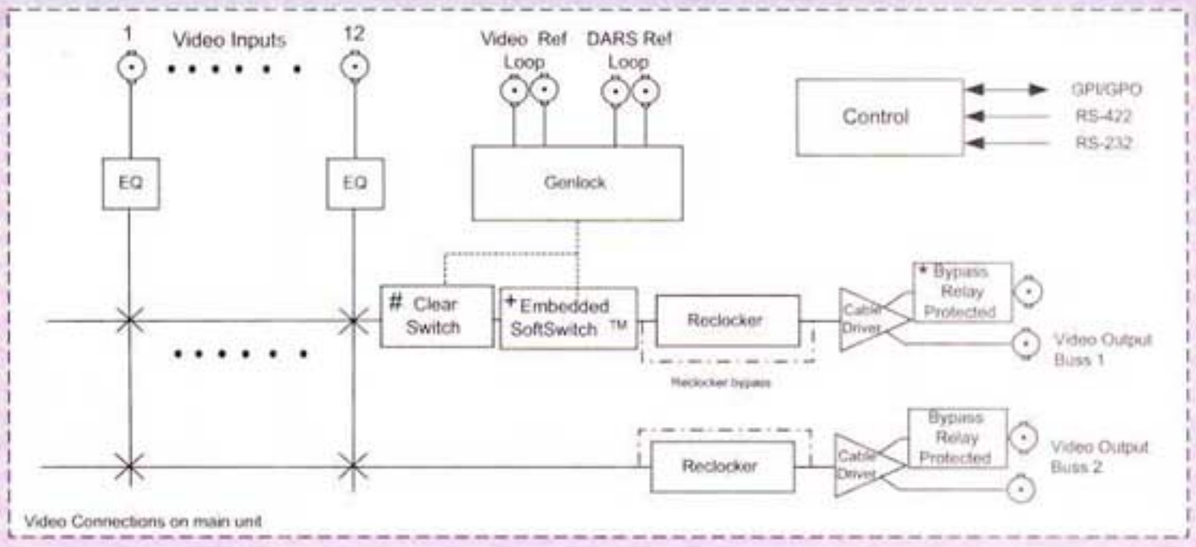




- Relay Bypass available with bypass option

\# Clean video switching and 'popless' AES switching available with SoftSwitch ™ version

Refer to www.evertz.com for more detailed information



Model 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 169-8
Equalization:	Automatic 100m @ 1.485Gb/s with Belden 1694 (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 Optioned 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 Inputs 1 & 12 bypass protected with +HBP option
Connector:	BNC per IEC 169-8
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 Optioned 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. Output phasing for HD Video only

AES Audio Inputs:

Standard:	SMPTE 276M single ended AES
Number of Inputs:	12 per buss, 2 or 4 busses optional
Connector:	BNCper IEC 169-8 on breakout panels provided

AES Audio Outputs:

Standard:	SMPTE 276M single ended AES
Number of Outputs:	2 per buss, 2 or 4 busses optional Input 1 & 12 bypass protected with +HBP relay option
Connector:	BNC per IEC 169-8 on breakout panels provided
Signal Level:	1V p-p
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 Colour Black 1 V p-p Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV
Connectors:	2 BNC per IEC 169-8
Termination:	High impedance loop through

DARS Reference (On +HSS and +HES Optioned Routers):

Type:	Digital Audio Signal with 48kHz sample rate
Standard:	SMPTE 276M single ended AES
Connector:	2 BNC per IEC 169-8
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 30 VA
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-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:

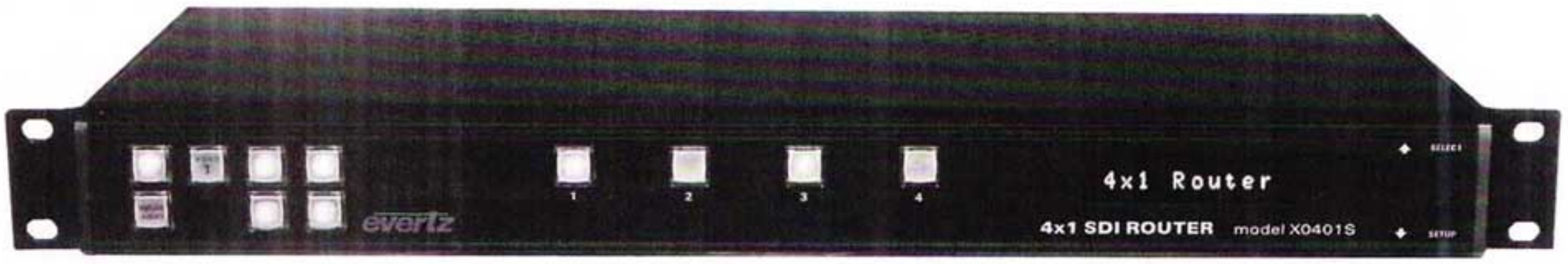
+HSS	SoftSwitch™ Option
+HES	Embedded SoftSwitch™ Option
+HBP	Bypass Relay Protection
+2PS	Redundant Power Supply
+RCP	Rack Mount Remote Control Panel (replaces front control panel)

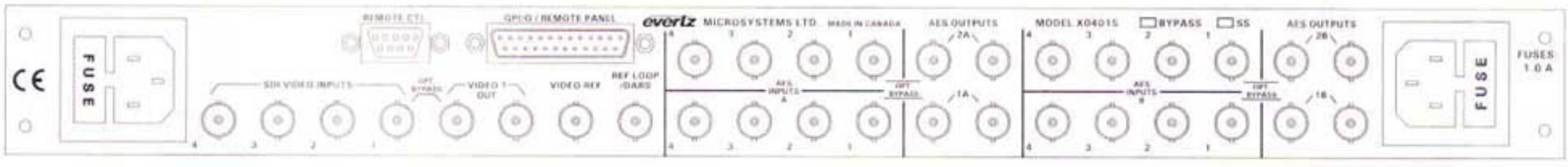
Accessories:

X-1202H-PANEL	Additional Remote Control Panel(works in addition to front control panel)

4 X 1 SDI Router
With Quad 4x1 AES Audio

Model X-0401S





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.

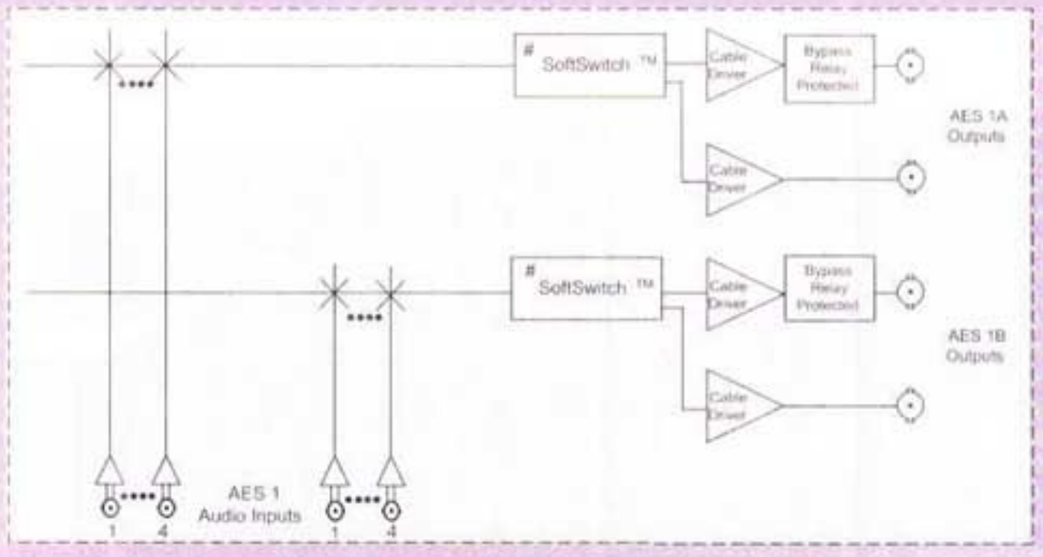
The router electronics are housed in a 1RU rackmount frame and is controlled from the built-in front panel controls. Each model can also be purchased with an optional rack mount remote control panel that replaces the built-in control panel. All units can also be controlled by contact closures on the GPI control port or through the RS-232 or RS-422 serial remote control port using industry standard switcher protocols.

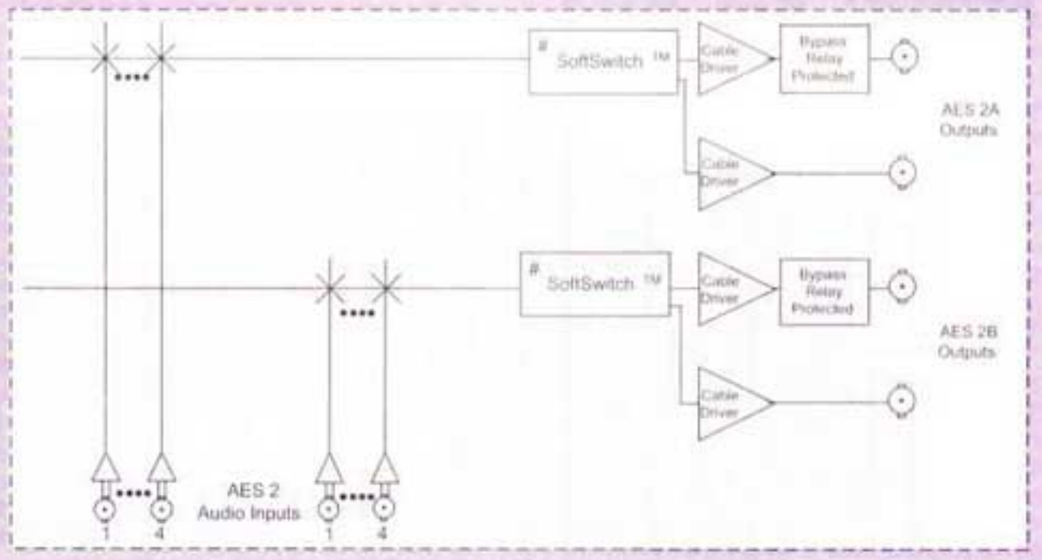
SoftSwitch™ Features (X-0401S-AES4-SS)
Routers equipped with SoftSwitch™ have the following additional features. The video output has adjustable vertical timing with respect to the genlock input, and line synchronizers on the video inputs can accommodate differences in timing up to approximately +/- 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.

Features

- Supports SMPTE 259M (270, 360 or 540Mb/s) or DVB-ASI video signals
- Supports SMPTE 310M (19.4Mb/s) signals with reclocker turned off
- 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
- Optional video and audio input relay bypass for power failure bypass protection
- Bypass verification test using main menu
- Optional dual power configuration
- Field upgradeable firmware as new features become available
- Programmable tally output bus
- RS-422 remote control via GVG TEN-XL protocol
- SoftSwitch™ version provides clean video and popless AES switching

4 X 1 SDI Router
With Quad 4x1 AES Audio

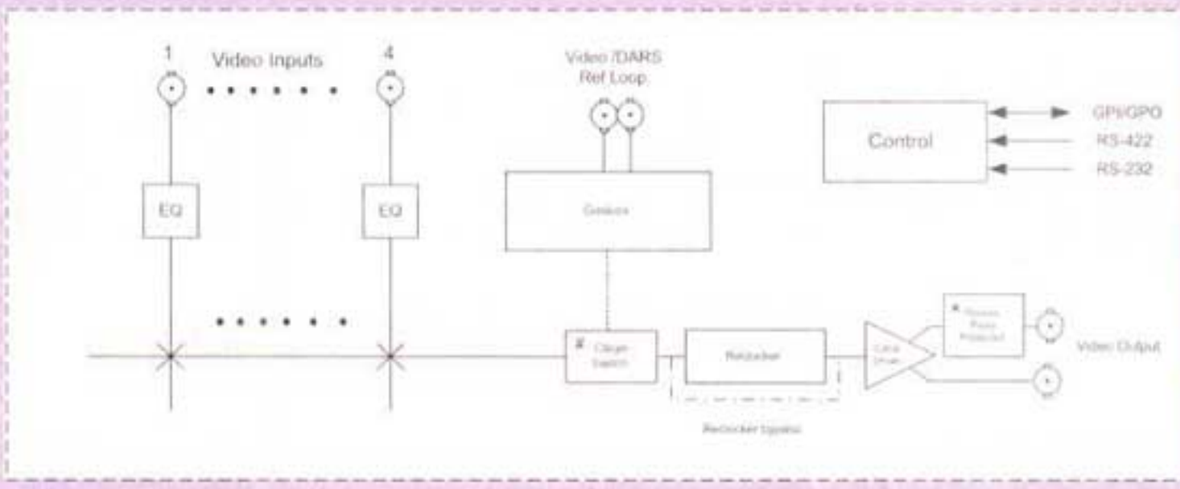




- Relay Bypass available with bypass option

\# Clean video switching and 'popless' AES switching available with SoftSwitch ™ version

Refer to www.evertz.com for more detailed information



Model X-0401S

5

Specifications

SD Video Inputs:
Standard: SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s) and DVB-ASI
SMPTE 310M with reclocker turned off
Number of Inputs: 4
Connector: BNC per IEC 169-8
Equalization: Automatic up to 250m @ 270 Mb/s with Belden 8281 (or equivalent) cable
Return Loss: > 15 dB up to 540 Mb/s
Input Timing (On X-0401S-AES4-SS 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: BNCper IEC 169-8
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 540 Mb/s
Jitter: < 0.2 UI
Output Timing (On X0401S-AES4-SS 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 169-8
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 169-8
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 Colour Black 1 V p-p
Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV
Connectors: 2 BNC per IEC 169-8
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 X0401S-AES4-SS 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 169-8
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-232 or 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 30VA
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

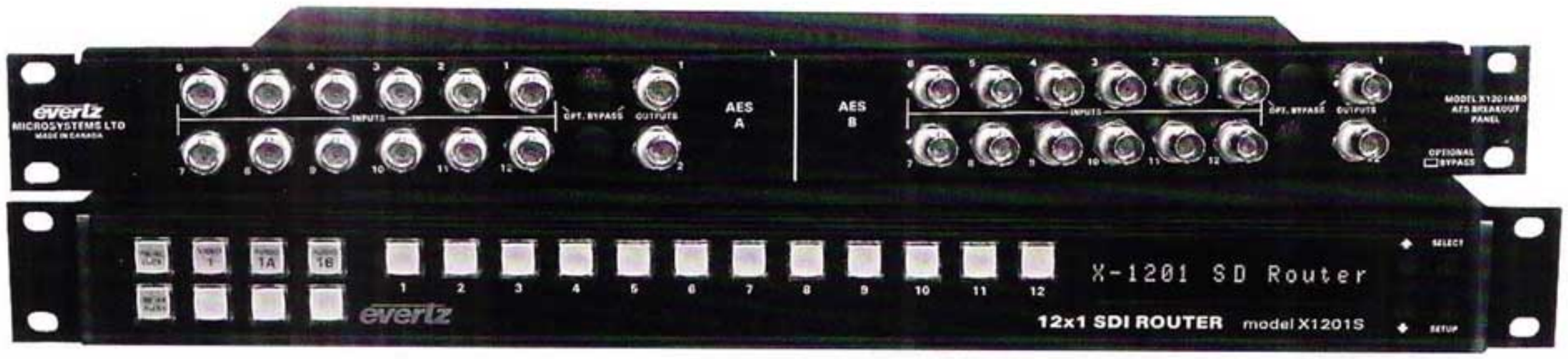
Ordering Information:
X-0401S 4X1 SDI video router
X-0401S-AES4 4x1 SDI video router with 4 (4x1) of AES busses
X-0401S-AES4-SS 4x1 SDI video router with 4 (4x1) of AES busses and SoftSwitch™

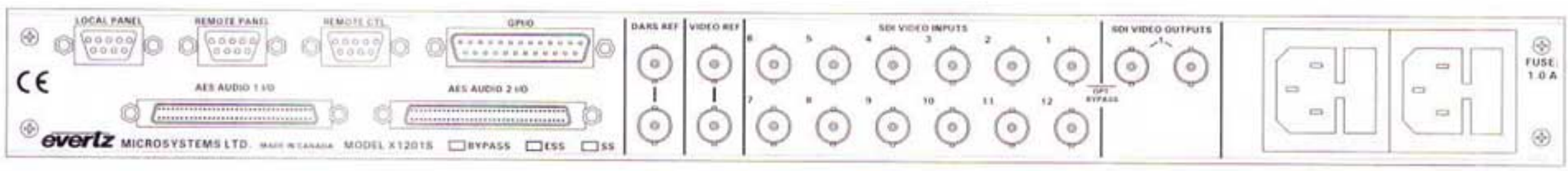
Ordering Options:
+BP Optional bypass relay
+2PS Redundant power supply
+RCP Rackmount remote control panel (replaces front control panel)

Accessories:
X-0401S-PANEL Additional Remote Control Panel (works in addition to front control panel)

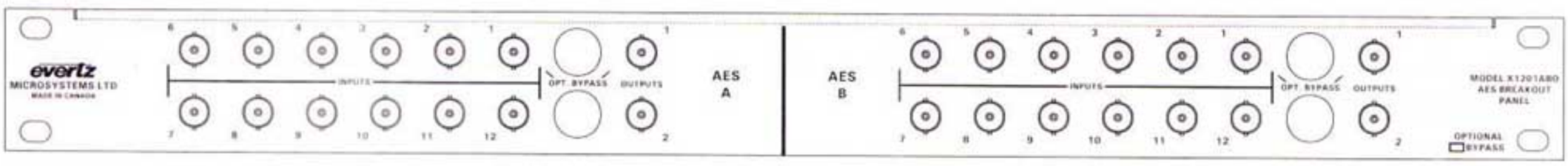
12 X 1 SDI Router
With Dual or Quad 12x1 AES Audio

Model 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. 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 +/- 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.

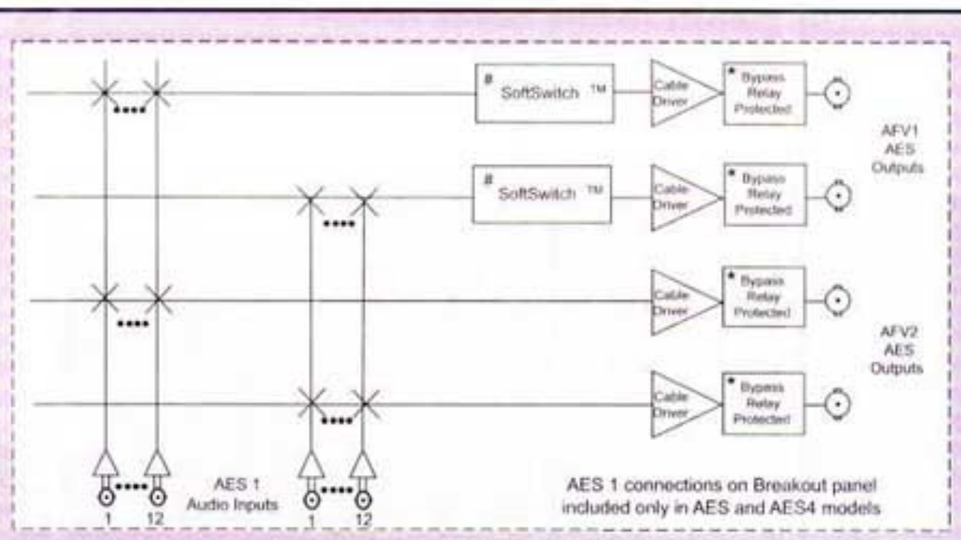
Optional Embedded SoftSwitch™ Features (+ES Option)

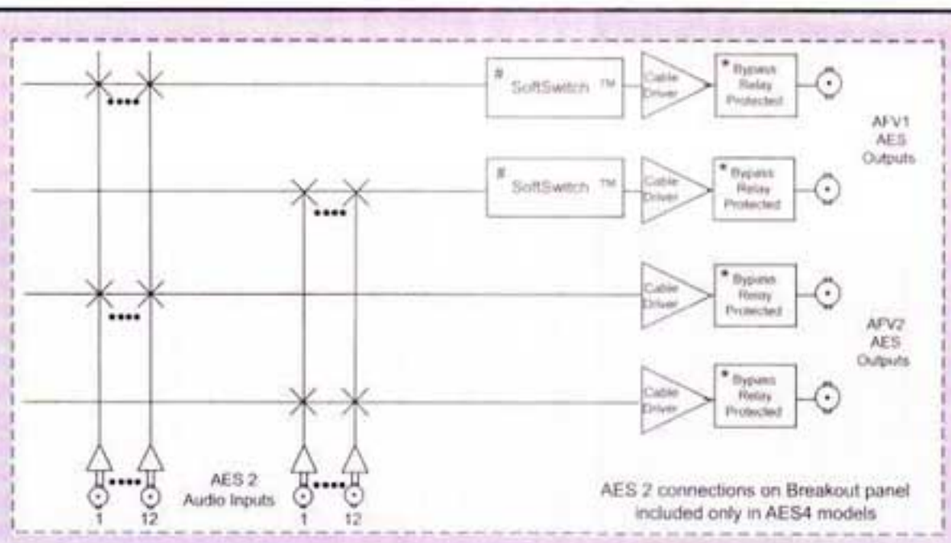
Routers equipped with the Embedded SoftSwitch™ option have all the features of the SoftSwitch™ versions as well as the following additional features. The embedded audio on the video buss uses Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed.

Features

- Supports SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s) and DVB-ASI video signals
- 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 any version
- Parallel GPI and RS-232 serial control
- Programmable source input names available on front panel
- Optional video and audio input relay bypass for power failure bypass protection
- Bypass verification test using main menu
- Optional dual power supply configuration
- Field upgradable firmware as new features become available
- Programable tally output bus
- RS-422 remote control via GVG TEN-XL protocol
- SoftSwitch™ option provides clean video and popless AES switching
- Embedded SoftSwitch™ option is available to provide clean video and popless AES and embedded audio switching

12 X 1 SDI Router
With Dual or Quad 12x1 AES Audio

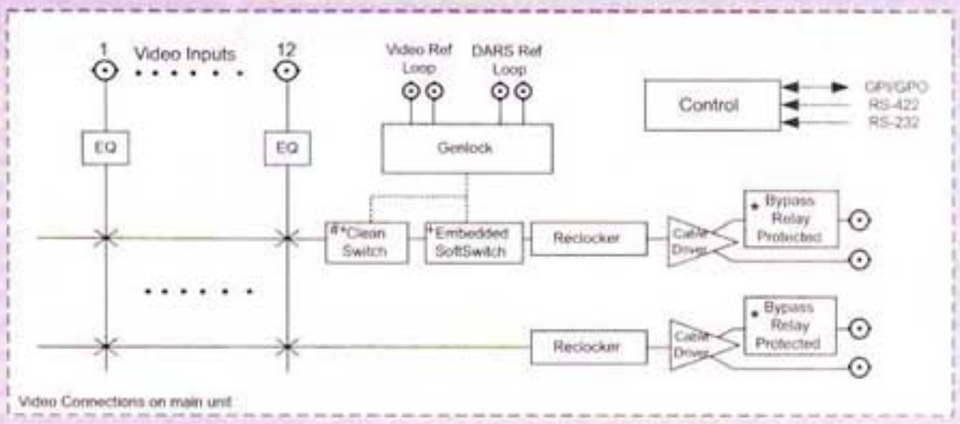




- Relay Bypass available with bypass option

\# Clean video switching and 'popless' AES switching available with SoftSwitch ™ version

Refer to www.evertz.com for more detailed information



Model X-1201S

Specifications

SDI Video Inputs:

Standard:	SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s) and DVB-ASI
Number of Inputs:	12
Connector:	BNC per IEC 169-8
Equalization:	Automatic up to 250m @ 270 Mb/s with Belden 8281 (or equivalent) cable
Return Loss:	> 15 dB up to 540 Mb/s

Input Timing (On +SS and +ES Optioned Routers)

Input Range:	Measured with respect to the Genlock reference ±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 169-8
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 540 Mb/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 *Coarse phase* parameter. The active video content will align to the nearest line

AES Audio Inputs:

Standard:	SMPTE 276M single ended AES
Number of Inputs:	12 per buss, 2 or 4 busses optional
Connector:	BNC per IEC 169-8 on breakout panels provided

AES Audio Outputs:

Standard:	SMPTE 276M single ended AES
Number of Outputs:	2 per buss, 2 or 4 busses optional Input 1 bypass protected with +BP option
Connector:	BNC per IEC 169-8 on breakout panels provided
Signal Level:	1V p-p
Reference:	Video Genlock Reference DARS reference available with +SS or +ES options

Video Reference:

Type:	Menu selectable - depends on video format NTSC or PAL Colour Black 1 V p-p Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV
Connectors:	2 BNC per IEC 169-8
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 169-8
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 30VA
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:

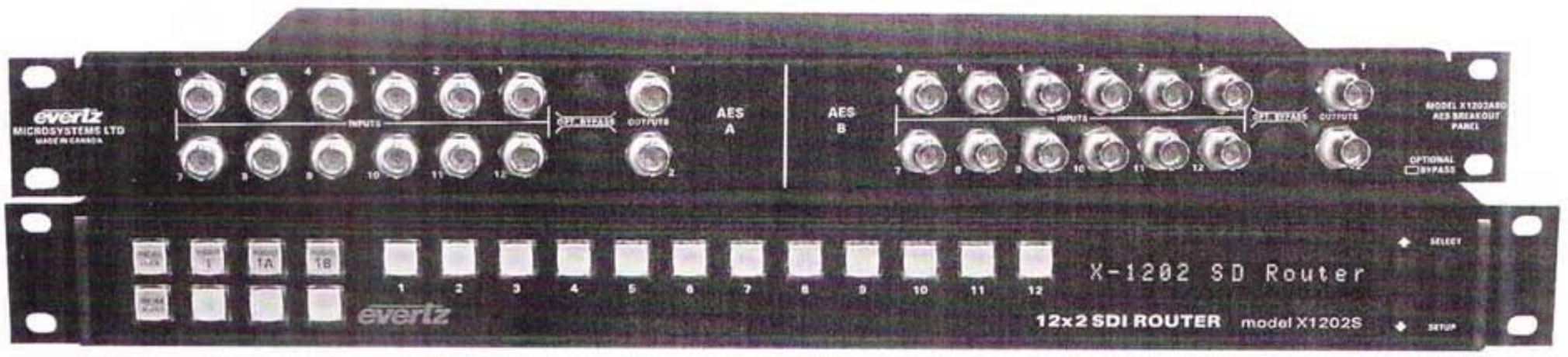
+SS	SoftSwitch™Option
+ES	Embedded SoftSwitch™ Option
+BP	Bypass Relay Protection
+2PS	Redundant Power Supply
+RCP	Rack Mount Remote Control Panel (replaces front control panel)

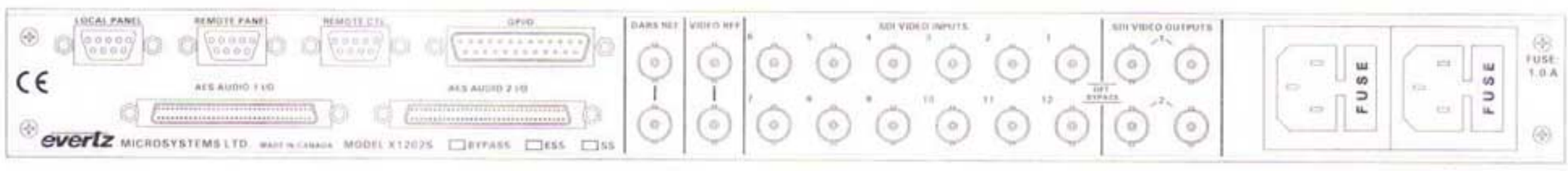
Accessories:

X-1201S-PANEL	Additional remote control panel (works in addition to front control panel)

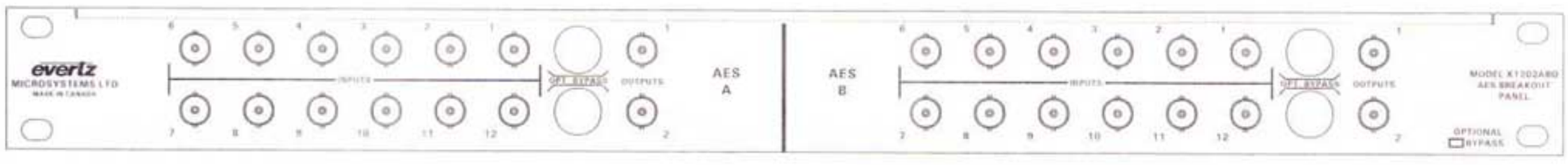
12 X 2 SDI Router
With Dual or Quad 12x2 AES Audio

Model 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. 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 +/- 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.

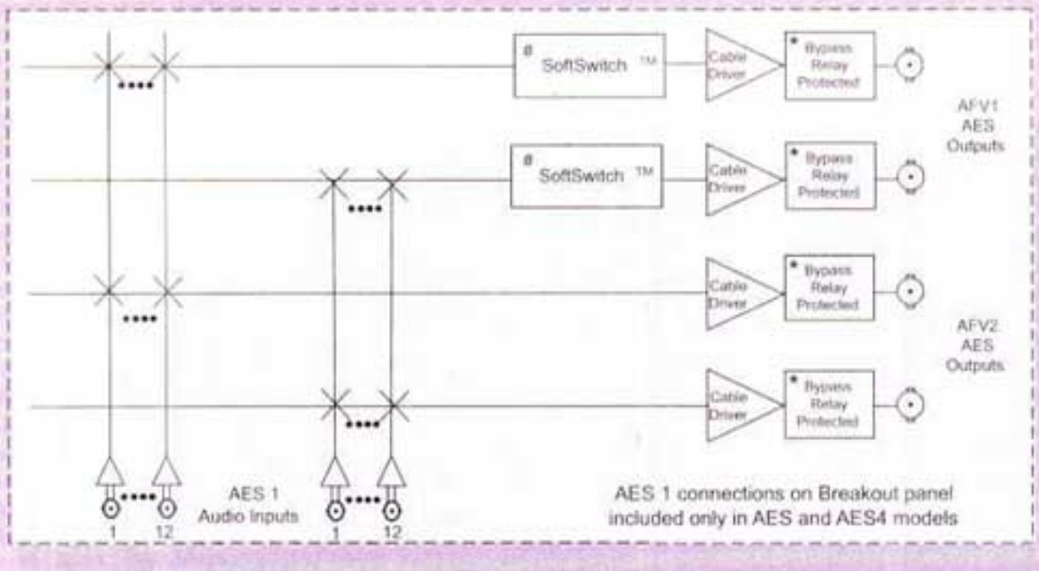
Optional Embedded SoftSwitch™ Features (+ES Option)

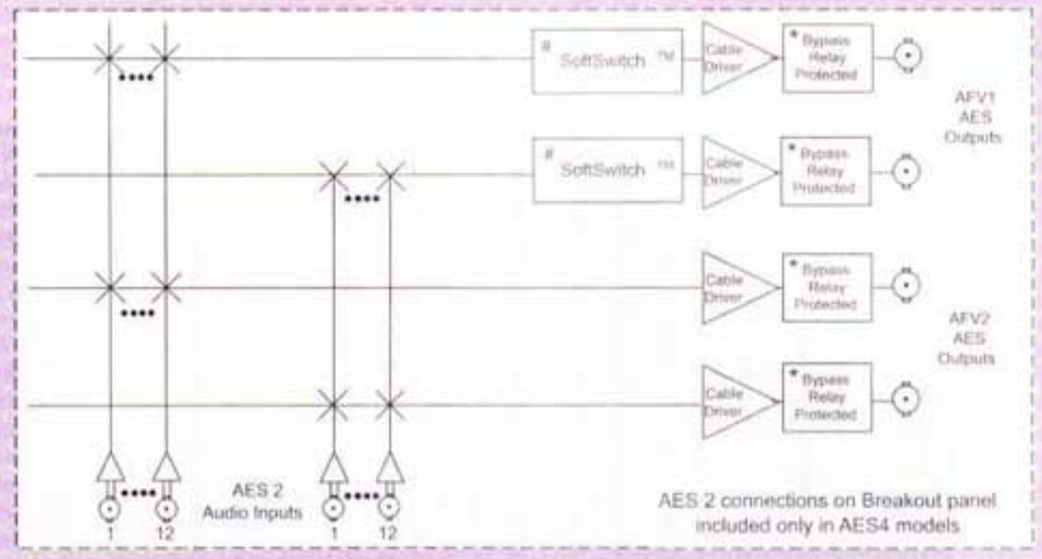
Routers equipped with the Embedded SoftSwitch™ option have all the features of the SoftSwitch™ versions as well as the following additional features. The embedded audio on the Video 1 buss uses Evertz patent pending SoftSwitch™ technology to eliminate audible pops when switches are performed.

Features

- Supports SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s) and DVB-ASI video signals
- 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 any version
- Parallel GPI and RS-232 serial control
- Programmable source input names available on front panel
- Optional video and audio input relay bypass for power failure bypass protection
- Bypass verification test using main menu
- Optional dual power supply configuration
- Field upgradable firmware as new features become available
- Programable tally output bus
- RS-422 remote control via GVG TEN-XL protocol
- SoftSwitch™ option is available to provide clean video and popless AES switching
- Embedded SoftSwitch™ option is available to provide clean video and popless AES and embedded audio switching

12 X 2 SDI Router
With Dual or Quad 12x2 AES Audio

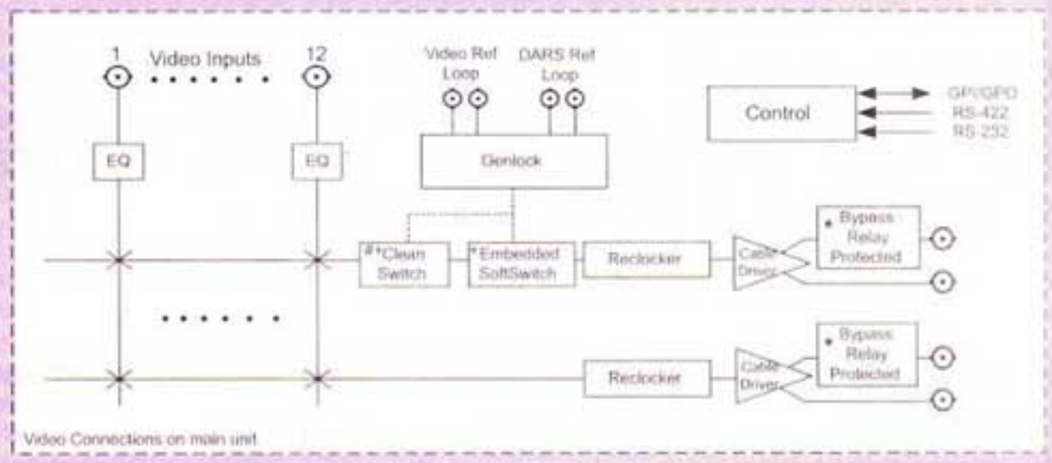




- Relay Bypass available with bypass option

\# Clean video switching and 'popless' AES switching available with SoftSwitch ™ version

Refer to www.evertz.com for more detailed information



Model X-1202S

Specifications

SDI Video Inputs:

Standard:	SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s) and DVB-ASI
Number of Inputs:	12
Connector:	BNC per IEC 169-8
Equalization:	Automatic up to 250m @ 270 Mb/s with Belden 8281 (or equivalent)
Return Loss:	> 15 dB up to 540 Mb/s

Input Timing (On +SS and +ES Optioned Routers)

Input Range:	Measured with respect to the Genlock reference ±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 169-8
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 540 Mb/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 *Coarse phase* parameter. The active video content will align to the nearest line

AES Audio Inputs:

Standard:	SMPTE 276M single ended AES
Number of Inputs:	12 per buss, 2 or 4 busses optional
Connector:	BNC per IEC 169-8 on breakout panels provided

AES Audio Outputs:

Standard:	SMPTE 276M single ended AES
Number of Outputs:	2 per buss, 2 or 4 busses optional Input 1 and 12 bypass protected with +BP option
Connector:	BNC per IEC 169-8 on breakout panels provided
Signal Level:	1V p-p
Reference:	From Video General Reference DARS reference available with +SS or +ES options

Video Reference:

Type:	Menu selectable - depends on video format NTSC or PAL Colour Black 1 V p-p Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV
Connectors:	2 BNC per IEC 169-8
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 169-8
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 30VA
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)

Accessories:

X-1202S-PANEL	Additional remote control panel (works in addition to front control panel)

4 X 1 SDI Router with Optional AES

Model X-9504



The X-9504 Serial Digital Video router routes 270, 360, & 540Mb/s serial digital signals. The unit can be controlled from the front panel controls, via an optional remote control panel, through GPI controls or a serial control port. The unit is a 1RU rack mount frame which accepts and outputs SMPTE 259M and optionally SMPTE 276M AES audio signals. The output video signal is switched to the desired input based on the genlock input video timing.

Features

- Operates with 525 or 625 line SMPTE 259M video signals
- Optional dual 4x1 AES router - audio follow or break away modes
- Multi-rate operation - 270Mb/s, 360Mb/s, 540Mb/s
- Special version available to route 19.4Mb/s signals
- Front panel or optional remote control panel operation
- 225m automatic input cable equalization with Belden 8281 (or equivalent)
- Genlock referenced switch, (accepts standard NTSC or PAL black burst signals)
- GPI switch control
- Optional redundant power supply

Specifications

Serial Video Input:

Standard:	SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s)
Number of Inputs:	4
Connector:	BNC IEC 169-8
Equalization:	Automatic up to 225m @270Mb/s with Belden 8281 (or equivalent)
Return Loss:	> 15dB up to 540Mb/s

Serial Video Output:

Standard:	SMPTE 259M (270Mb/s, 360Mb/s, 540Mb/s)
Number of Outputs:	1 (re-clocked)
Connector:	BNC IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ± 0.5V
Rise and Fall Time:	470ps nominal
Overshoot:	< 10% of amplitude
Return Loss:	> 15dB up to 540Mb/s
Wide Band Jitter:	< 0.2UI

AES Audio Input (X-9504-AES-C):

Standard:	SMPTE 276M single ended AES
Number of Inputs:	4 per channel
Connector:	BNC IEC 169-8
Rates:	28kHz->52kHz

AES Audio Output (X-9504-AES-C):

Standard:	SMPTE 276M single ended AES
Number of Outputs:	1 per channel
Connector:	BNC IEC 169-8
Rates:	28kHz->52kHz

GPI Control Port: High Z, opto isolated I/O

Remote Control Port:
9 pin RS-232/422
GVG Ten XL

Genlock Input:

Type:	Menu selectable - depends on video format NTSC or PAL Colour Black 1 V p-p Composite Bi-level sync (525i/59.94 or 625i/50) 300mV
Connector:	BNC per IEC 169-8
Termination:	High impedance loop through

Physical:

Dimensions:	19"W x 1.75"H x 18.75"D (483mm W x 45mm H x 477mm D)
Weight:	8lbs. (3.5Kg)

Electrical:

Voltage:	110 - 230 Volts AC, 50/60 Hz
Fuse Rating:	250 V, 1 amp time dealy
Power:	30 VA
Safety:	ETL Listed Complies with EU safety directives
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

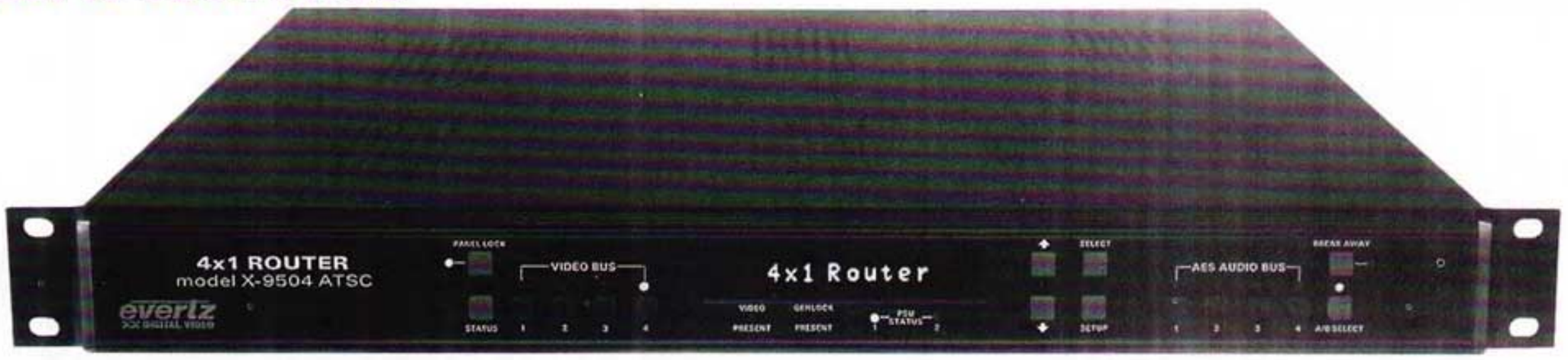
X-9504	4X1 SDI Router
X-9504-AES-C	4X1 SDI router with dual AES audio routers

Ordering Options:

+2PS	Redundant Power Supply
+BP	Optional Video Bypass Relay
+AES-BP	Optional AES Bypass Relay
+RCP	Rackmount remote control panel

4 X 1 ATSC 19.4Mb/s Router

Model X-9504 ATSC



The X-9504 ATSC Serial Digital Video router routes 19.4Mb/s (SMPTE 310M) serial digital signals. The unit can be controlled from the front panel controls, via an optional remote control panel, through GPI controls or a serial control port. The unit is a 1RU rack mount frame which accepts and outputs SMPTE 310M and optionally SMPTE 276M AES audio signals. The output video signal is switched to the desired input based on the genlock input video timing.

5

Features

- Operates with SMPTE 310M video signals
- Optional dual 4x1 AES router - audio follow or break away modes
- Front panel or optional remote control panel operation
- 225m automatic input cable equalization with Belden 8281 (or equivalent)
- Genlock referenced switch, (accepts standard NTSC or PAL black burst signals)
- GPI switch control
- Optional redundant power supply

Specifications

Serial Video Input:

Standard:	SMPTE 310M, 19.4 Mb/s
Number of Inputs:	4
Connector:	BNC, IEC 169-8
Equalization:	Automatic up to 225m @ 270Mb/s with Belden 8281 (or equivalent)
Return Loss:	>15dB up to 540Mb/s

Serial Video Output:

Standard:	SMPTE 310M 19.4Mb/s
Number of Outputs:	1 (re-clocked)
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ± 0.5V
Rise and Fall Time:	470ps nominal
Overshoot:	<10% of amplitude
Return Loss:	>15dB upt to 540Mb/s
Wide Band Jitter:	<0.2 UI

Genlock Input:

Type:	Menu selectable - depends on video format NTSC or PAL Colour Black 1 V p-p Composite Bi-level sync (525i/59.94 or 625i/50) 300mV
Connector:	BNC per IEC 169-8
Termination:	High impedance loop through

GPI Control Port: High Z, opto isolated I/O

Remote Control Port:
9 pin RS-232/422, GVG Ten XL

Physical:

Dimensions:	19"W x 1.75"H x 18.75"D (483mm W x 45mm H x 477mm D)
Weight:	8lbs. (3.5Kg)

Electrical:

Voltage:	110 - 230 Volts AC, 50/60 Hz
Fuse Rating:	250 V, 1 amp time dealy
Power:	30 VA
Safety:	ETL Listed Complies with EU safety directives
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

X-9504-ATSC	4X1 ATSC 19.4Mb/s router

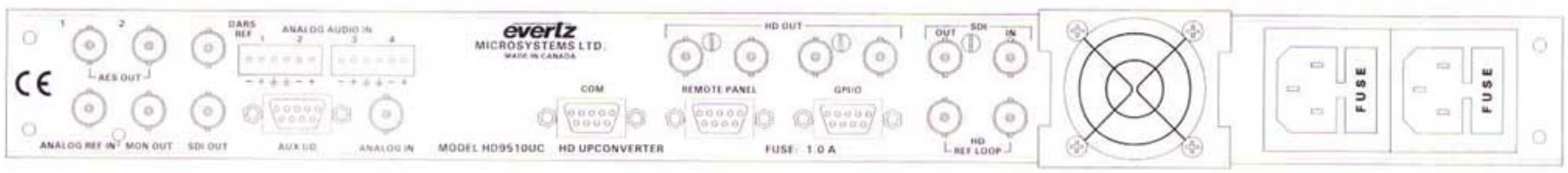
Ordering Options:

+2PS	Redundant power supply
+BP	Optional Video Bypass Relay
+RCP	Rackmount remote control panel

HD Upconverter

Model HD9510UC





HD9510UC Rear Panel

Advanced High Performance Upconverter (1RU Front Panel Control)

The Evertz HD9510UC Upconverter converts a standard definition 525i/59.94 4:2:2 (SMPTE-259M-C) input signal to 1080i/59.94, 1035i/59.94 or 720p/59.94 high definition (SMPTE 292M) video format. Advanced ASIC design results in optimal quality up-conversion with minimum artifacts. The HD9150UC also handles conversion to 480p/59.94 in a SMPTE 292M bit-stream. (SMPTE 349M)

The Evertz Upconverter provides complete support for 4:3 to 16:9 aspect ratio conversion. The system provides access to the common 4:3 to 16:9 choices; 16:9 anamorphic stretch, 4:3 with side panels, 16:9 letterbox zoom to full size and 14:9 letterbox zoom to full size 14:9 with side panels.

The Upconverter unit accepts 1 group of embedded audio on the input and re-embeds 1 group into the HD SMPTE 292M 1.5Gbs output. The re-embedded audio is compliant to SMPTE 299M and will have appropriate delay added to compensate for video delay incurred by the upconversion process, thus avoiding the need for external de-embedding and re-embedding of audio.

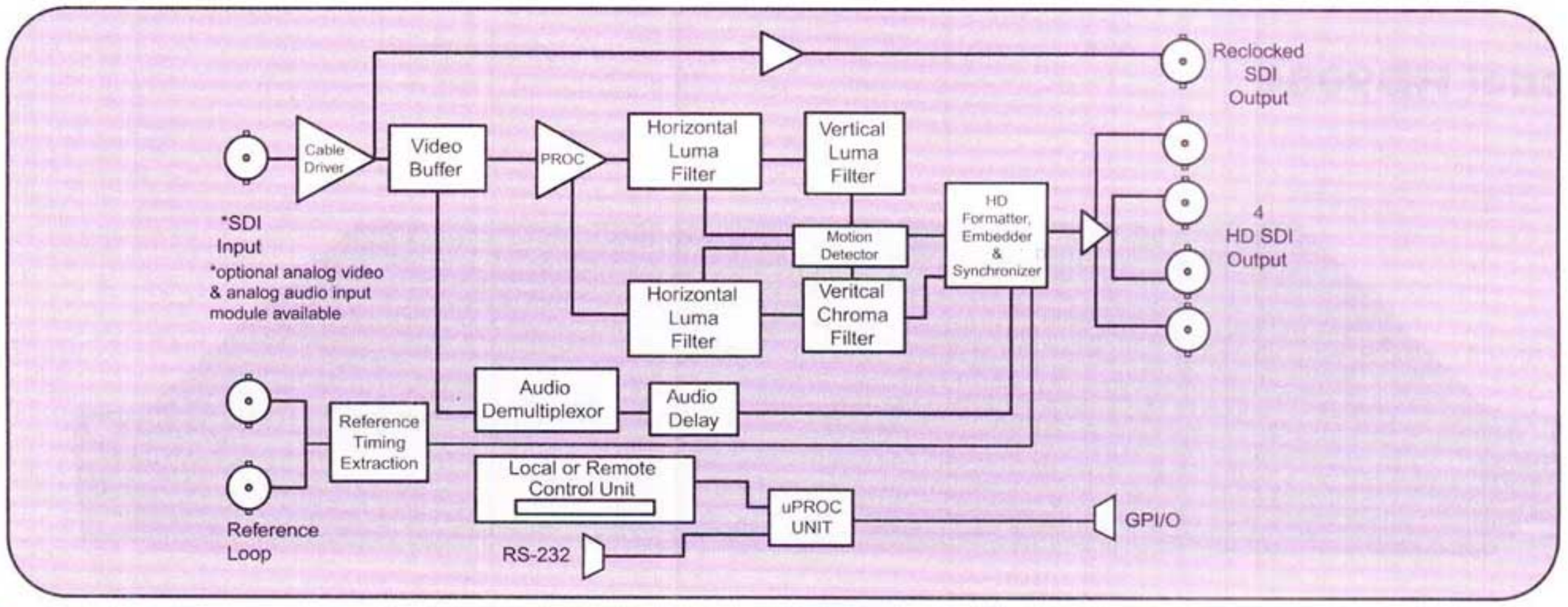
An optional composite video decoder and audio D to A converter module can be ordered for facilities which are currently using analog video and audio signals. For those analog facilities which will be transitioning to SDI in the future, the composite decoder can be bypassed at any time and the SDI input may be then be used.

The Upconverter electronics is housed in a 1RU rack mount frame. The standard Upconverter has built-in front panel controls, but can also be purchased with a rack mount remote control panel that replaces the built-in control panel (RCP version).

Features

- SDI 4:2:2 input with reclocked loop thru
- 4 HD serial digital (1.485 Gb/s) outputs
- Outputs 1035i, 1080i, in 29.97Hz frame rate and 720p, 480p in 59.94Hz frame rat
- Passes 1 group of embedded audio to the output, with added audio delay to match the video delay
- 64 filter settings and motion detection algorithm ensure highest performance and video quality
- Selectable aspect ratio conversion
- Front panel control or remote rack mount control (optional)
- Available redundant power supply
- Optional analog video and 4 channel audio interface for analog facilities
- Field upgradeable firmware as new features become available
- Adjustable output timing with respect to NTSC or Tri-level sync genlock reference
- Minimum processing delay (3 msec) or 1 frame delay when referenced to input video

HD9510UC Block Diagram:



Specifications:

Serial Video Input:

Standards:	525 line SMPTE 259M-C (270Mb/s) with Group 1 SMPTE 272M embedded audio
Number of Inputs:	1
Connector:	BNC per IEC 169-8
Equalization:	Automatic up to 200m @ 270 Mb/s with Belden 8281 or equivalent cable

Reclocked Serial Video Output:

Standard:	Same as Input
Number of Outputs:	1
Connector:	BNC per IEC 169-8
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

HD Serial Video Output:

Number of Outputs:	4
Standard:	SMPTE 292M (Selectable as follows) 480p/59.94, 720p/59.94, 1080i/59.94, 1035i/59.94
Embedded Audio:	One audio group as specified in SMPTE 299M
Connector:	BNC per IEC 169-8
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

Video Reference:

Type:	Menu selectable NTSC Colour Black (1 V p-p) or Composite Bi-level sync (300 mV) HD Tri-level Sync
Connectors:	BNC per IEC 169-8
Termination:	High impedance loop through

Analog Video Input (For +CD-A4 option):

Standard:	NTSC, SMPTE 170M
Number of Inputs:	1
Connector:	BNC per IEC 169-8
Signal Level:	1V nominal
Input Impedance:	75Ω
Return Loss:	>30dB to 10MHz

Analog Audio Input (For +CD-A4 option):

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) @ 1kHz, -0.5 dB FS
CMRR:	>100dB @ 1kHz

COM Port:

Standard:	RS-232
Baud Rate:	57,600
Connector:	9 pin female "D"

General Purpose Inputs:

Number of Inputs:	7
Function:	Preset select (4), Future use (3)
Type:	Opto-isolated, active low with internal pull-ups to externally supplied voltage
Connector:	Female DB-9
Signal Level:	closure to ground

Upconverter Processing:

Internal paths between functional blocks:	12 bits
Mathematical coefficients:	12 bits
Internal processing:	Up to 36 bits
Output modes:	16:9 anamorphic stretch, 4:3 with side panels, 16:9 letterbox zoom to full size and 14:9 letterbox zoom to full size 14:9 with side panels.
Motion detection:	field/frame/mixed
Processing delay:	3 msec to 1 Frame, dependent on reference and output phasing
Filtering:	Independent H and V filters

Electrical:

Voltage:	Autoranging 100 - 240 Volts AC, 50/60 Hz
Fuse Rating:	250 V, 1amp time delay
Power:	30 VA
Safety:	ETL Listed, complies with EU safety directives
EMI/RFI:	Complies with FCC Part 15 Class A regulations Complies with EU EMC directive

Physical:

Dimensions:	19"W x 1.75"H x 14.5"D (483mm W x 45mm H x 368mm D)
Weight:	7lbs. (3.1Kg)

Ordering Information:

HD9510UC	HD Upconverter

Ordering Options:

+2PS	Redundant power supply
+RCP	Rackmount remote control panel
+CD-A4	Analog video and audio interface option

HD DTV Caption Encoder

Model HD9084



The HD9084 DTVCC Caption Processor is a comprehensive, compact solution for all HD Advanced Closed Caption and SD Closed Caption requirements. Simultaneous HD-SDI and SDI video I/O paths provide a one-box solution with the following functionality:

- Simultaneous encoding of new captions onto HD and SD video
- Transcoding and translation of captions from an SD source onto HD video
- Transcoding of captions from an HD source onto SD video
- Processing of captions from SD-SDI video source to send to a compression encoder

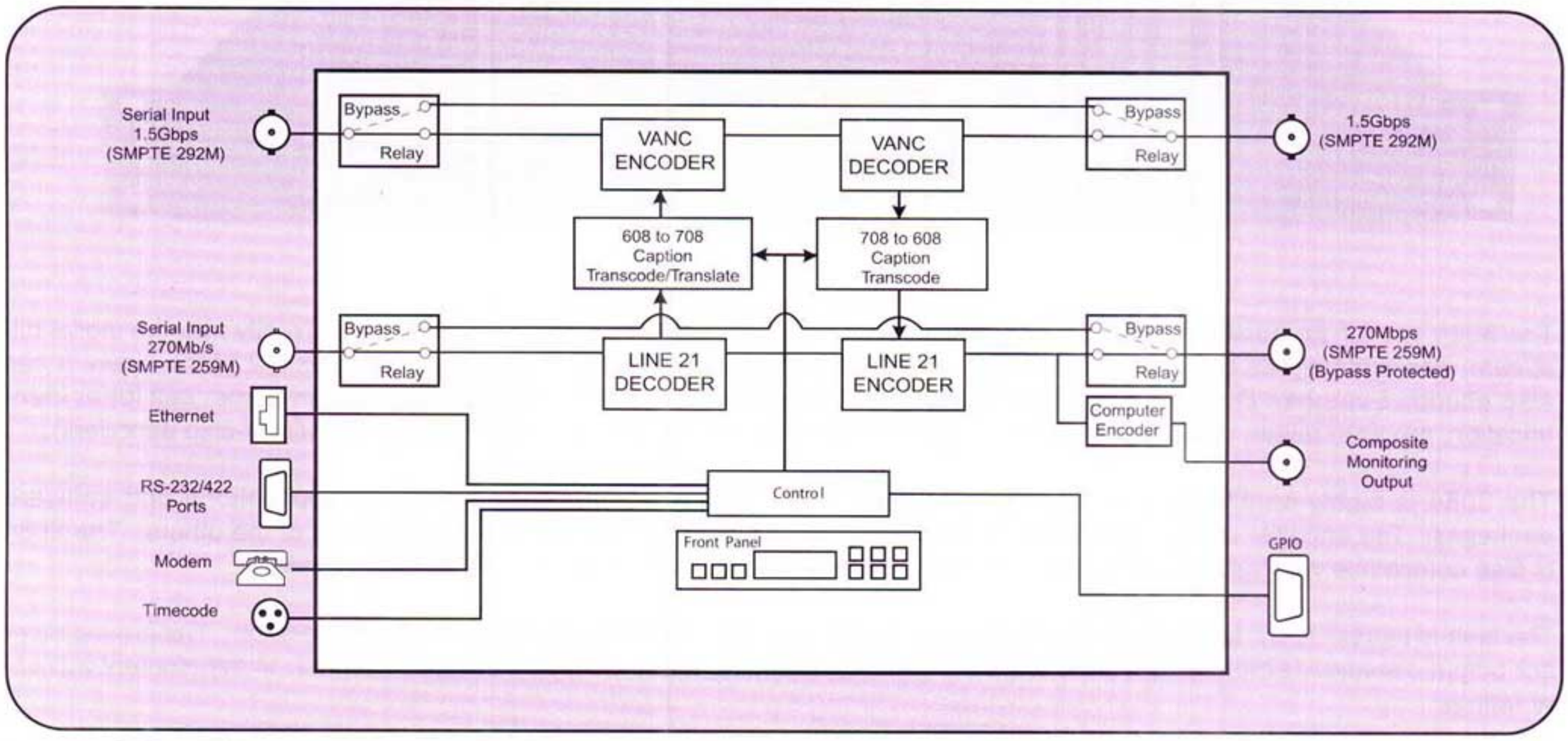
The SMPTE-292M HD-SDI video path supports 720p, 480p, or 1080i video formats. Advanced Captions are stored in the VANC of HD-SDI as per SMPTE-334M. The SMPTE-259M SDI video path supports EIA-608 captions stored on video line 21 of component digital video. Both video paths include bypass relay protection. A redundant power supply is also offered as an option.

HD9084 supports various types of communications interface, including RS-232/422 serial, telephone modem, Ethernet TCP/IP and parallel GPI control.

HD9084 is easily configured using the front panel or remotely through the various communications ports.

Whether your source material is mastered in standard definition or high definition, HD9084 has the desired features to make it an integral part of your Closed Caption system.

HD9084 Block Diagram



Specifications:

HDTV Serial Digital Video Input:

Standard:	SMPTE 292M 1.485 Gb/s, 1080i, 720p, 480p
Number of Inputs:	1
Connector:	BNC per IEC 169-8
Equalization:	Automatic up to 75m @1.5 Gb/s with Belden 1694 (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 169-8
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 169-8
Equalization:	Automatic 200m @ 270Mb/s Belden 1694 (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) 1 monitoring out (composite analog)
Connector:	BNC per IEC 169-8
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

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 DTV Caption Encoder

Ordering Options:

+2PS	Optional redundant power supply
+MDM2	Second internal modem option

SDI Closed Caption Encoder

Model 8084



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 packets into field 2 supporting such services as TSID, station name, call letter identification, program name, classification, remaining air time and content advisory ratings (compatible with V-chip decoders).

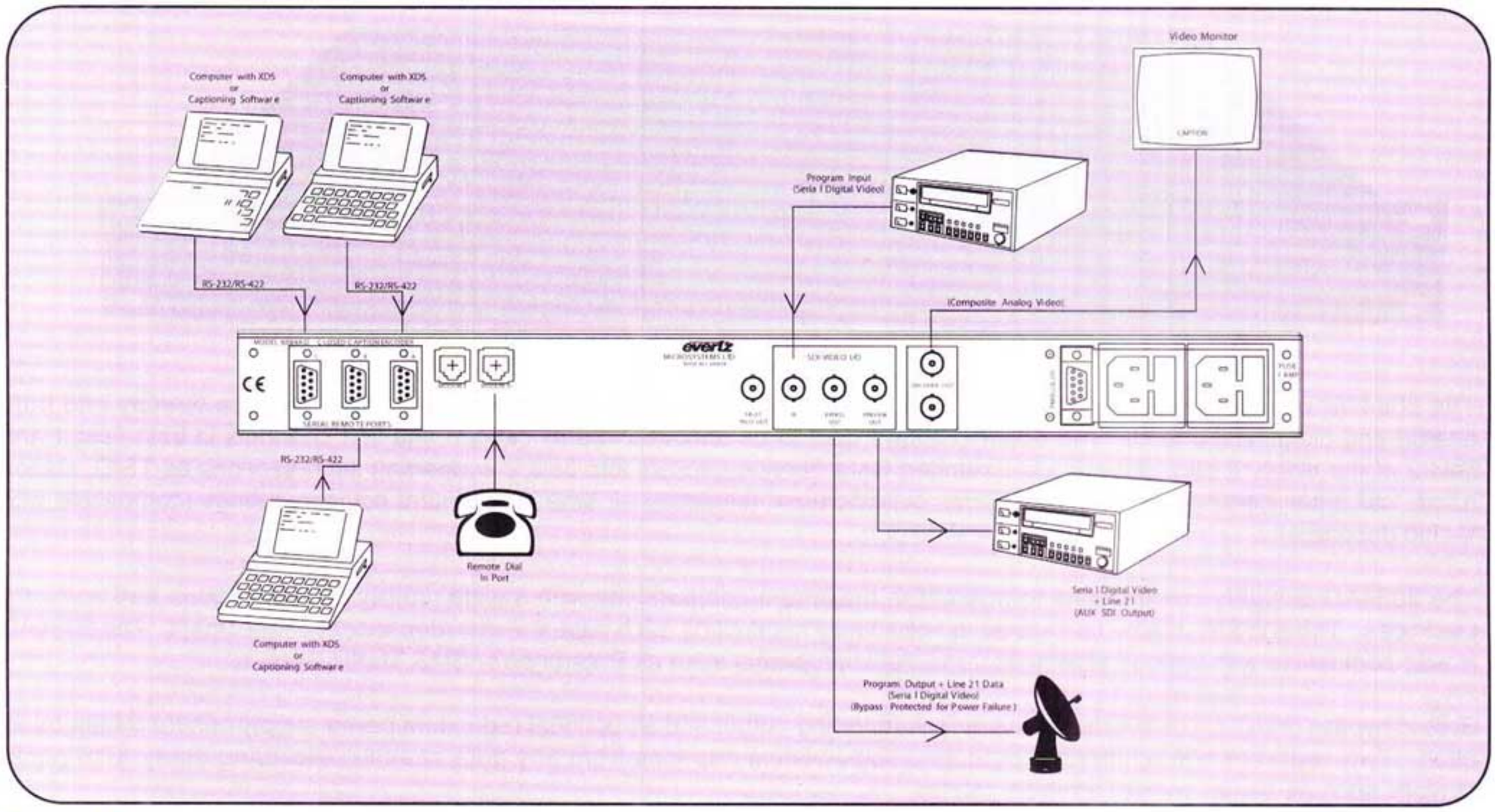
The 8084 is highly configurable to guarantee maximum compatibility with a wide variety of applications and software packages. The encoder can be configured to individually manipulate each data stream independent of the others. The 8084 is also compatible with various automation and traffic programs such as Enterprise's "BMS Traffic System".

The 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 such as V-chip content advisory ratings.

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 to encode program information
  including V-chip content advisory ratings
- V-chip blocking codes selectable from front panel menus.
- Support for all four V-chip rating systems
- 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, XDS or V-chip 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 (270 Mb/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

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:

8084	SDI Caption Encoder

Ordering Options:

+MDM2	Second internal modem option
+2PS	Redundant power supply
+LTC	Optional LTC input

Analog & SDI Closed Caption Encoder

Model 8084AD



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 packets into field 2 supporting such services as TSID, station name, call letter identification, program name, classification, remaining air time and content advisory ratings (compatible with V-chip decoders).

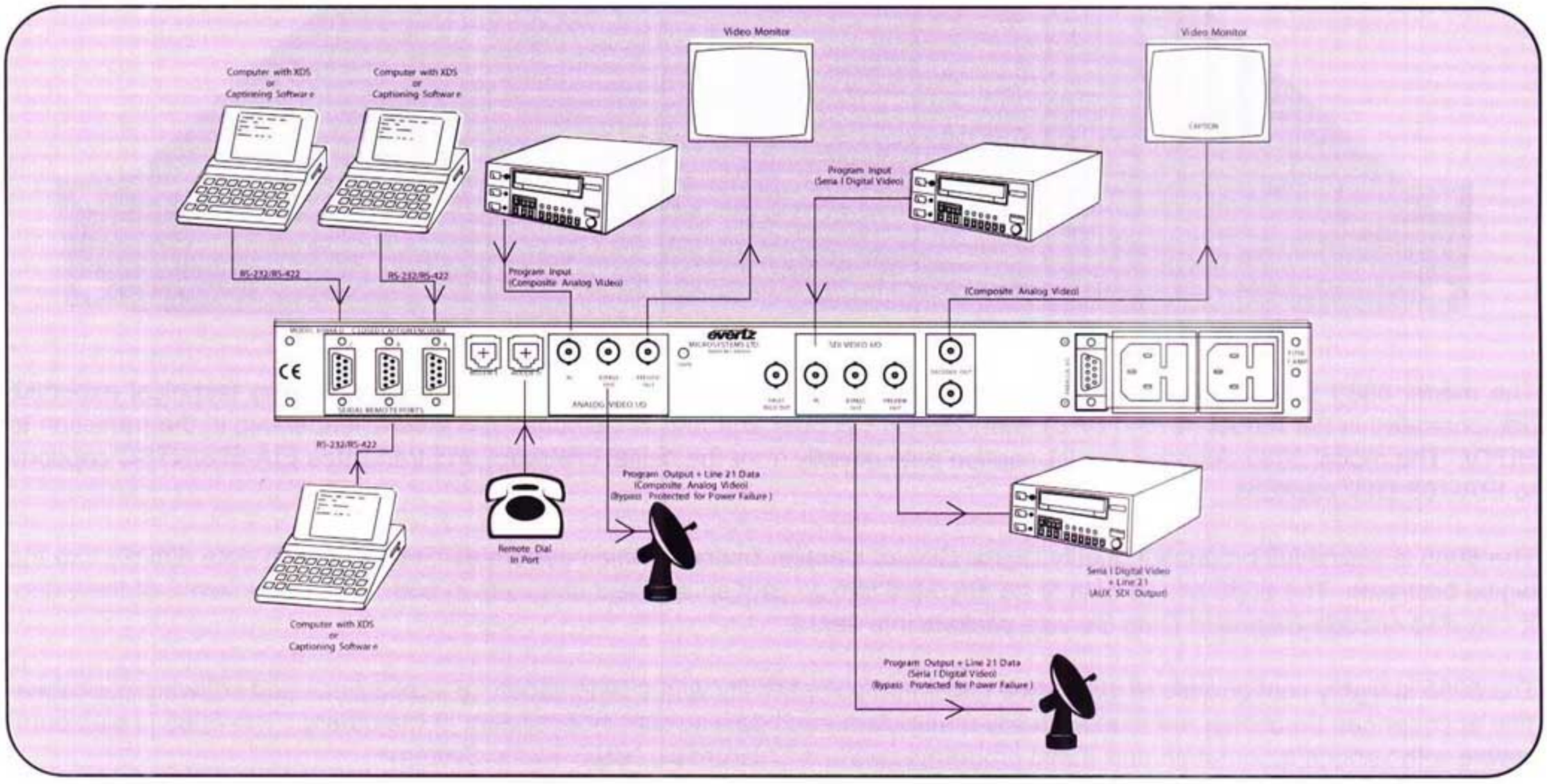
The 8084AD is highly configurable to guarantee maximum compatibility with a wide variety of applications and software packages. The encoder can be configured to individually manipulate each data stream independent of the others. The 8084AD is also compatible with various automation and traffic programs 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 such as V-chip content advisory ratings.

Features

- Keys directly into a 525 line or 625 line component (4:2:2) digital video bitstream and composite analog video signal
- Upstream caption source is selectable between analog or digital video feeds
- 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 8084AD by the captioning software
- Support for Extended Data Service to encode program information including V-Chip content advisory ratings
- V-Chip blocking codes selectable from front panel menus
- Support for all four V-Chip rating systems
- Selectable V-Chip default rating after timeout
- 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 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
- Separate built-in composite analog monitoring decoders for each video path to provide real-time verification of encoded data. The decoded captions, text, XDS or V-Chip 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
- 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

8084AD Connection Diagram



Specifications

Serial Digital Video:

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

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, 30 VA
Safety:	ETL Listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15, Class A EU EMC Directive

Ordering Information:

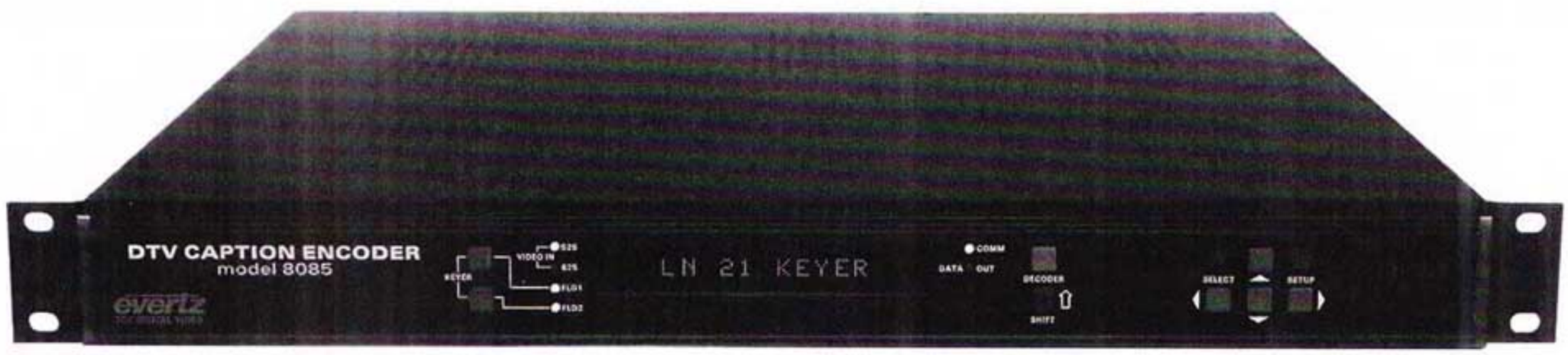
8084AD	Analog & SDI Captioning Encoder

Ordering Options:

+MDM2	Second internal modem option
+2PS	Redundant power supply
+LTC	Optional LTC input

Combo SDI Caption Encoder & EIA608 to EIA708 Translator

Model 8085



The model 8085 DTV Closed Caption Encoder expands on the existing digital video closed captioning technical expertise demonstrated in our model 8075 DTV Closed Caption Encoder and further demonstrates Evertz leadership in the transition to HDTV. The model 8085 decodes line 21 caption data directly from the digital bitstream and translates EIA-608/NTSC captions to EIA-708 DTV captions.

The 8085 is also a full broadcast quality Digital Closed Caption Encoder which generates line 21 caption data directly into the digital bitstream. The 8085 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 packets into field 2.

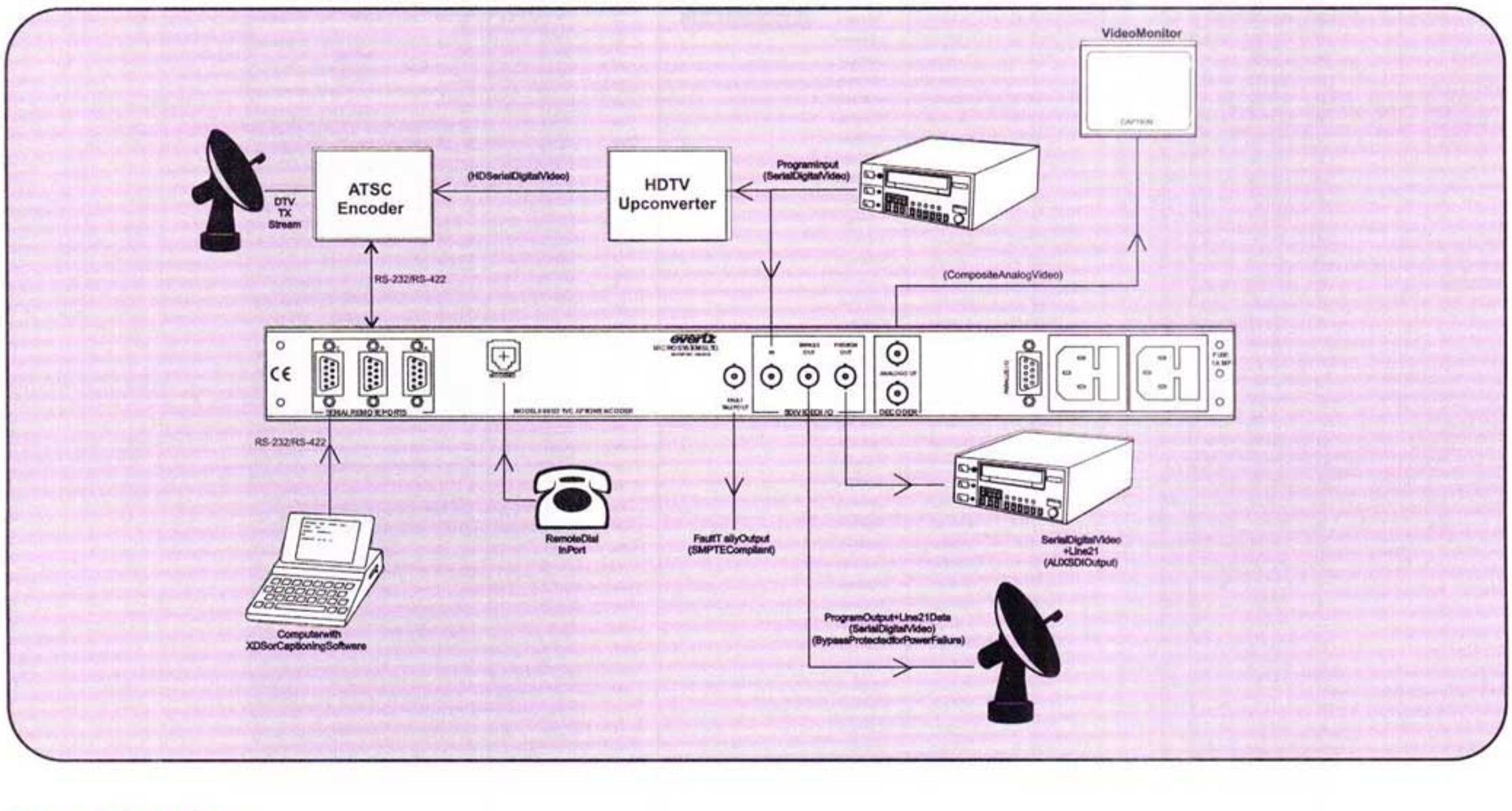
The 8085 is highly configurable to guarantee maximum compatibility with a wide variety of applications and software packages. The encoder can be configured to individually manipulate each data stream independent of the others. The 8085 is also compatible with various automation and traffic programs such as Enterprise's "BMS Traffic System".

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 such as V-Chip content advisory ratings.

- Transcodes standard EIA-608 captions to the equivalent advanced DTV EIA-708 captions
- Transmits EIA-608 caption data and DTV caption data to the DTV encoder via RS-232 or RS-422
- Supports the two common DTV encoder protocols - Grand Alliance "push" protocol and SMPTE 333M "pull" protocol
- 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
- Support for text insertion from articles stored in the 8085 by the captioning software
- Support for Extended Data Service to encode program information including V-Chip content advisory ratings
- Individual caption and text data streams can be passed, modified or removed from the incoming video
- Monitor mode allows caption data to be read directly from line 21 of the digital bitstream and output on the RS-232 serial port
- SMPTE 269M fault reporting output
- A front panel or GPI activated relay bypass mode is provided along with a bypass relay for power failure protection which allows the input video to pass through the 8085 unprocessed
- Three serial ports allow simultaneous control of the 8085 from three computers, for applications such as in house captioning, XDS insertion and more...
- Built in modem interface for dial-up real time captioning
- 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
- Real-time verification of encoded data via a built-in composite analog monitoring decoder. The decoded captions, text, XDS or V-Chip data are inserted as open captions on the analog video output
- Composite decoder can display these XDS packet types: Network Name, Call Letters, Program Name, Program Length, Time in Show, Program Type, Program Description, Program Rating
- EDH Packet checksum correction ensures SDI video integrity to downstream equipment
- 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

Combo SDI Caption Encoder & EIA608 to EIA708 Translator

8085 Connection Diagram



Specifications

Serial Digital Video:

Standard:	SMPTE 259M-C (270 Mb/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:	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 n/a) 1200 baud to 14.4 kbaud V.32BIS compatible
Parallel GPI:	DB-9 female

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

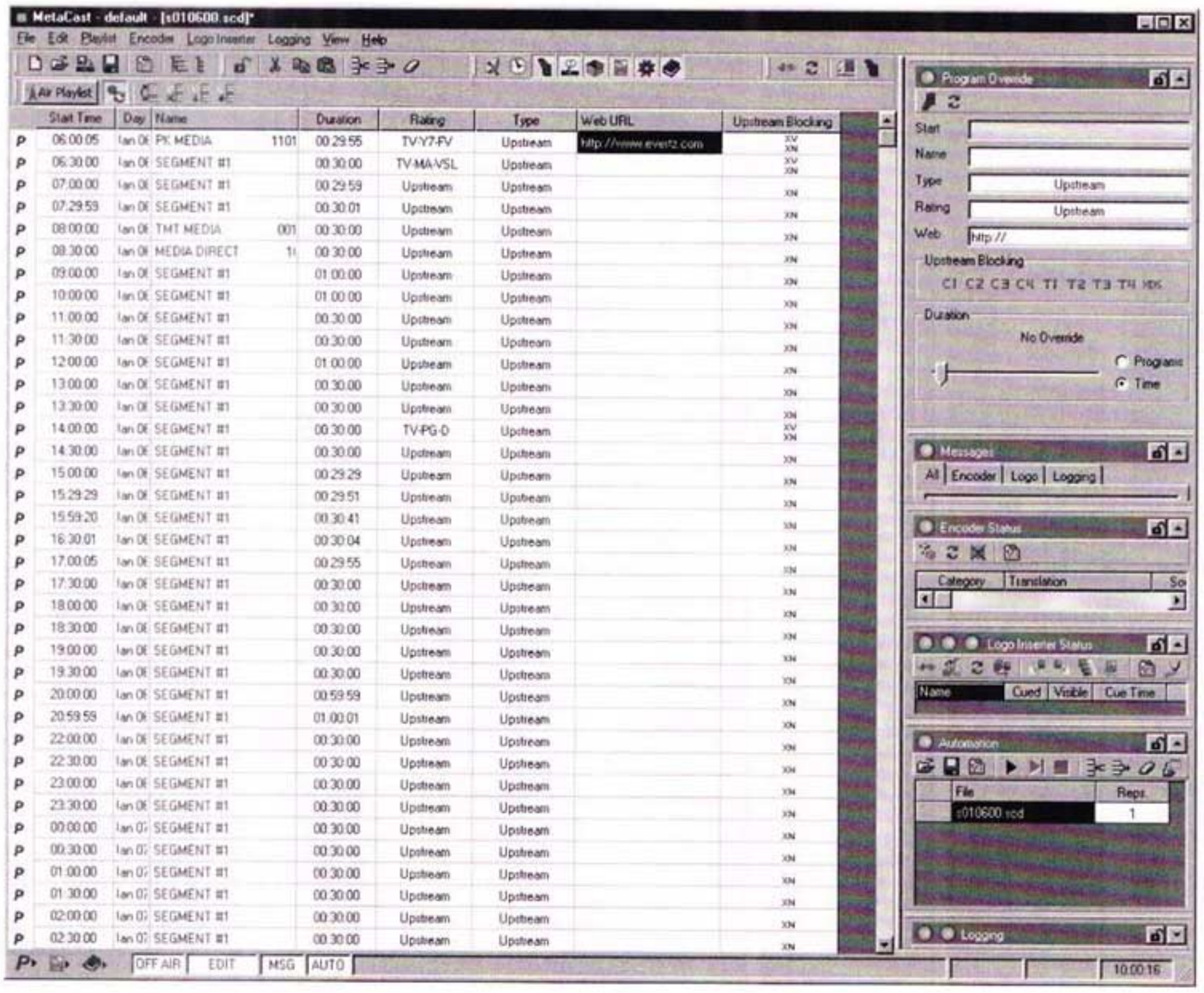
Ordering Information:

8085	Combo SDI Caption Encoder & EIA608 to EIA708 Translator

Ordering Options:

+2PS	Redundant power supply

MetaCast II XDS V-CHIP/URL/Logo Schedule Software



Overview

This Windows™ application has been designed to simplify the encoding of V-Chip, XDS and Logo information by gathering data from pre-compiled playlists or schedules. MetaCast 2 also eliminates the need for regular human intervention by automatically identifying the next day's playlist by using standard date related file names or the built-in scripting feature.

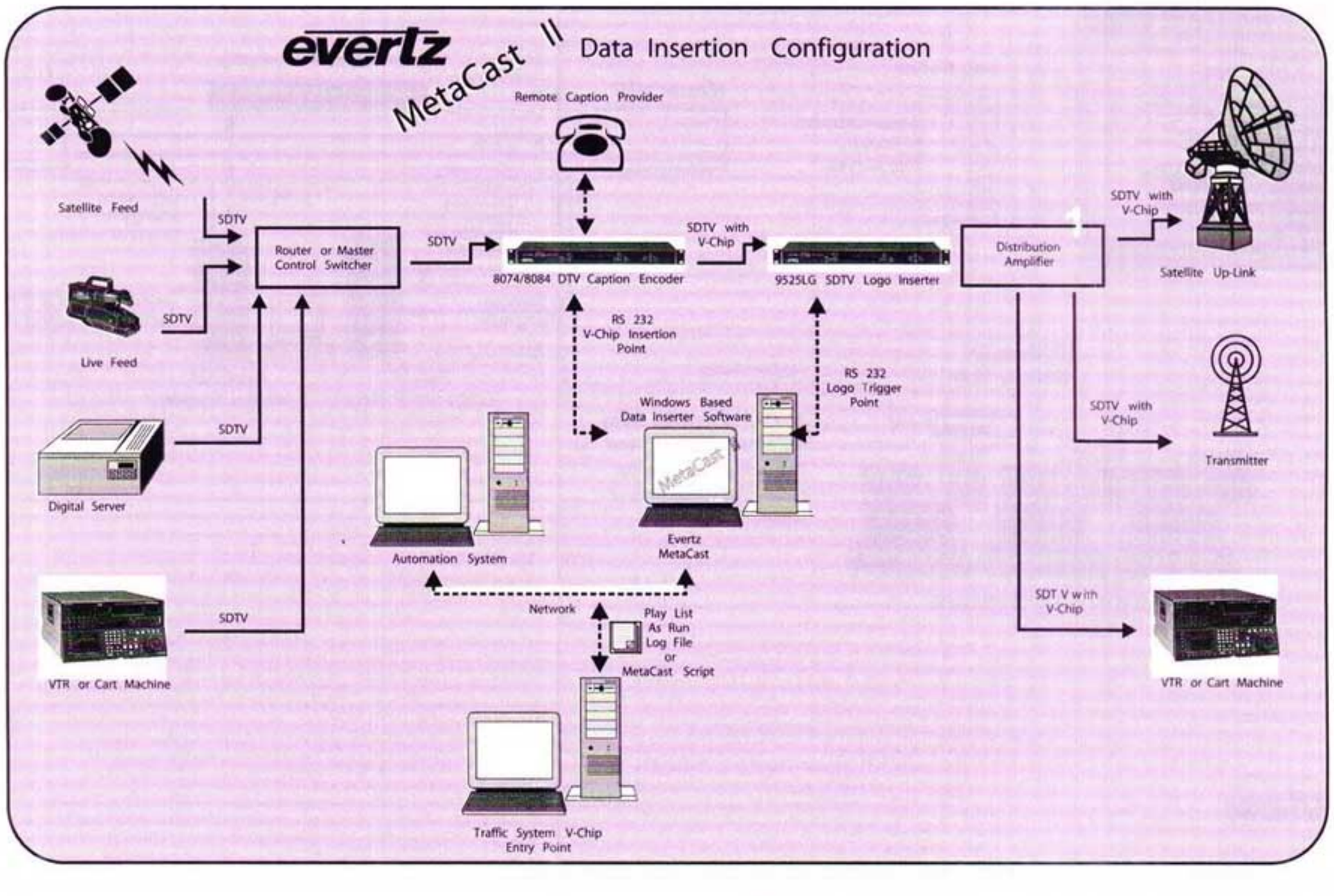
Setup

Metacast 2 requires a direct connection to an Evertz 8084/8084AD Digital Closed Caption Encoder and/or Logo Inserter and a playlist file supplied by either an Enterprise BMS Traffic System or created using the software's built-in schedule creation utilities.

Features

- Ability to control multiple encoders and Logo Inserters by running additional instances of MetaCast 2 on the same computer (limited only by the number of available com ports). Basic purchase supports 4 units (NT or 2000 only)
- MetaCast 2 allows the user to create an unlimited number of configurations
- MetaCast 2 can schedule a wide variety of information, including program rating, program title, program type, URL, network name, station call letters, transmission signal identifier (TSID), system time & time zone and Logos
- Multiple configurations are identified by a unique user selectable naming convention
- Multiple rating systems include US TV parental guidelines (TVPG), MPAA, Canadian English & Canadian French language
- Playlist or manual mode depends on the available source of program information
- Text based scripting allows other traffic systems to create files compatible with the MetaCast 2 schedules
- Multiple instances of MetaCast 2 are treated as unique and sepa rate from one another. Use 1 PC to control multiple encoders running from separate sources (Playlist and/or schedule) and simultaneously encode different rating systems
- User defined offset time allows MetaCast 2 to broadcast in multiple time zones from one playlist as well as roll programs forward or back to accommodate programs that may run short or long
- Ability to block individual upstream channels so that only the desired XDS & Caption information leaves the encoder
- MetaCast 2's sophisticated error checking algorithms will monitor the encoder's & inserter's memory to ensure packets & logos are actually being broadcast all while clearly informing the user of any problems MetaCast 2 will intelligently attempt to re-send data & logo to the device
- Program logging allows alert messages to be logged, saved and printed for later retrieval and verification
- A new edit mode allows for maintenane and creation of schedules while other schedules are running

MetaCast II XDS V-CHIP/URL/Logo Schedule Software



Playlist Mode:

- MetaCast 2 will gather program information from a playlist produced by an Enterprise BMS Traffic System (Requires Enterprise's Win DEI Interface)
- Automatic pickup of the next day's playlist according to a user-defined date-based file name
- Custom mapping files can assign user-defined playlist program types to those specified in the EIA-608 standard
- Override functions to change any parameter of the currently scheduled program or to queue changes for the next program
- Insert a default station/network web page without entering it into the traffic system

PC Hardware Recommendations:

- Windows™ operating system (2000, XP)
- 10 MB of hard drive space
- 2 MB video card
- 1024 x 768 monitor resolution (17" monitor)
- 1 free serial port per encoder or inserter
- Max 2 instances with Win 98SR2, 9625DSK-LGA, 9625LG, 9625LGA, PKGHD9625SW, PKG9625SW
- Max 4 instances with WIN2K or XP

Schedule Mode:

- MetaCast 2 will take program information from a schedule created with the built-in spreadsheet based editor
- Create and save schedules to disk to later be loaded on the broadcast date
- Flexible scripting language allows the user to create a week's worth of programming in multiple schedule files and tell the software to repeat that sequence indefinitely.
- MetaCast 2 will load and run each new schedule as the previous one expires
- Override functions allow the user to alter any parameter of the current program and have the MetaCast 2 return to the normal schedule when that show ends

Ordering Information:

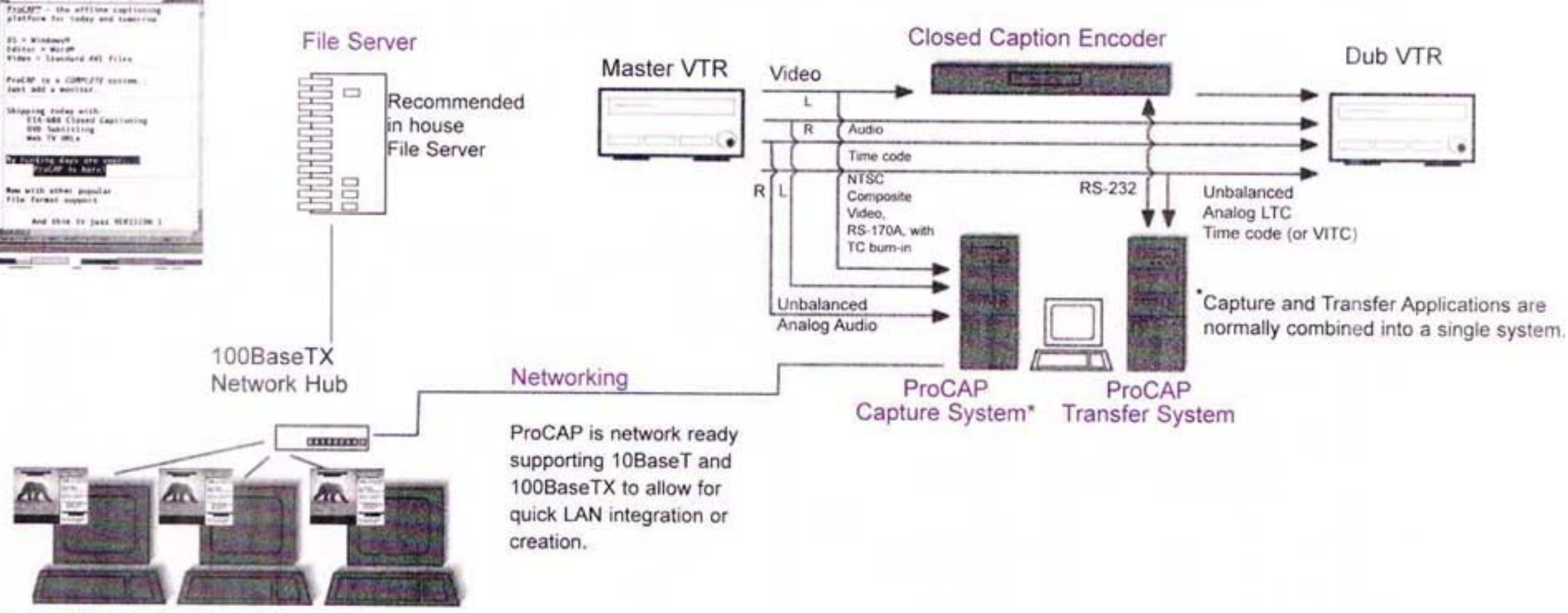
MetaCast II Metacast 2 XDS V-Chip/URL/Logo Schedule Software

Compatible Evertz Hardware:

- 8084 Closed Caption Encoder
- 8084AD Closed Caption Encoder
- HD9084 DTV Caption Encoder
- 9525DSK-LG Downstream Keyer with Logo Inserter (+RCP, DCP and 9525x as well
- 9525LG Logo Inserter (+RCP + DCP as well)
- HD9625LG High Definition Logo Inseerter (+RCP + DCP as well)

ProCAP Offline Closed Captioning Authoring System





Overview

ProCAP is a complete offline nonlinear captioning system that allows a user to capture source video and stereo audio, author captions, edit and preview the captions, and encode the captions to video.

It is a standalone system that is network ready for future requirements.

ProCAP is designed to allow businesses to easily adapt to future closed captioning mandates and changes in technology requirements.

ProCAP Author Application - extending the functionality of Microsoft ® Word, ProCAP allows users to import or create transcripts, author and edit captions, caption styles, format and position, all in a single pass or in multiple passes. Using the Windows ® multimedia subsystem for nonlinear playback, ProCAP adds caption preview over resizable video for WYSIWYG display, timing and positioning.

ProCAP Capture Application - capturing source video with time code burn-in and stereo audio, ProCAP offers selectable and configurable compression codecs. Source clips are stored as standard Microsoft video files.

ProCAP Transfer Application - ensuring accurate and consistent encoding of captions to video, transfer files generated from the Authoring System can be sent to the Transfer Application over a network or on a floppy diskette. ProCAP and other popular caption file formats are supported.

Common Configurations - Captioning Systems

Standalone - ProCAP can be configured as a single system that allows for non-concurrent source capture, closed caption authoring and transfer through encoder back to video. All standalone systems are network ready to meet future requirements.

Networked – ProCAP can be configured as a distributed networked system that allows for independent source capture, closed caption authoring and transfer operations. As pictured in the above diagram, any number of Authoring Systems can be networked to a Capture and Transfer System. Additional Authoring, Capture and/or Transfer Systems can be added as required. A central file server is recommended in installations with two or more PA workstations.

Requirements for Authoring Systems: Number of ProCAP Part # PA workstations required, existing SVGA computer monitors, existing 100Base TX Network Hub(s).

Requirements for Capture and Transfer Systems: Number of ProCAP Part # PCT (or PC and PT) systems required, Evertz 8084 (or existing compatible encoder), existing SVGA computer monitors, existing Network.

ProCAP Offline Closed Captioning Authoring System

Supported Standards

EIA-608 Recommended Practice for Line 21 Data Service, mandatory and optional support for Closed Captioning
EIA-708-B Digital Television (DTV) Closed Captioning
Avid MetaSync import
Omneon Video Networks Media Server System interface

ProCAP Authoring System

Part #	Description
PA-SW-Base	ProCAP Authoring Software, supporting Line 21 closed captioning
PA-SW-DVD	Software option to PA-SW-Base, supporting DVD subtitling
PA-SW-708	Software option to PA-SW-Base, supporting DTV closed captioning
PA-SW-FULL	ProCAP Authoring Software, supporting all standards

Part # PA-SW-xxx, System Requirements:

Minimum Hardware Specifications
Intel P4 1.8+GHz
512+MB Memory
20+GB Drive Storage
GEForce4+ nVidia AGP Graphis Adapter
Digital Sound Card
Monitor supporting 1280x1024@70Hz

Minimum Software Specifications
Windows XP Professional
Office XP, Small Business Edition

ProCAP Capture System

Part #	Description
PC-HW	ProCAP Capture System - 1RU, turnkey solution

Part # PC-HW - System Specifications:

Hardware Specifications
30+hours (30GB) Video Storage
Video In, Composite video (BNC) and S-Video (MiniDIN)
Audio In, Unbalanced analog stereoline input (MiniJack), input impedance 10K
Preview Out: Composite video (BNC) and Unbalanced analog stereo line output (MiniJack)

Software Specifications
Windows XP Professional
Mpeg1 Video Capture Software, user configurable settings, up to 3Mbps for 320x240 video, up to 384Kbps stereo audio

ProCAP Transfer System

Part #	Description
PT-SW	ProCAP Transfer Software
PCT-TC	ProCAP Transfer PCI Time Code Reader Adapter (Adrienne PCI-VLTC/RDR)

Part # PT-SW, System Requirements:

Minimum Hardware Specifications
Intel P4 1.8+GHz
512+MB Memory
20+GB Drive Storage
ProCAP Transfer PCI Time Code Reader Adpater
Monitor supporting 1024x768

Minimum Software Specifications
Windows 2000 Workstation
Office 2000, Small Business Edition

ProCAP Support

All ProCAP software and systems come with one year of support, which includes basic telephone assistance and general software releases published within the year. Software upgrades for access to new features can be purchased thereafter. ProCAP systems carry the leading brand-name manufacturer's warranty.

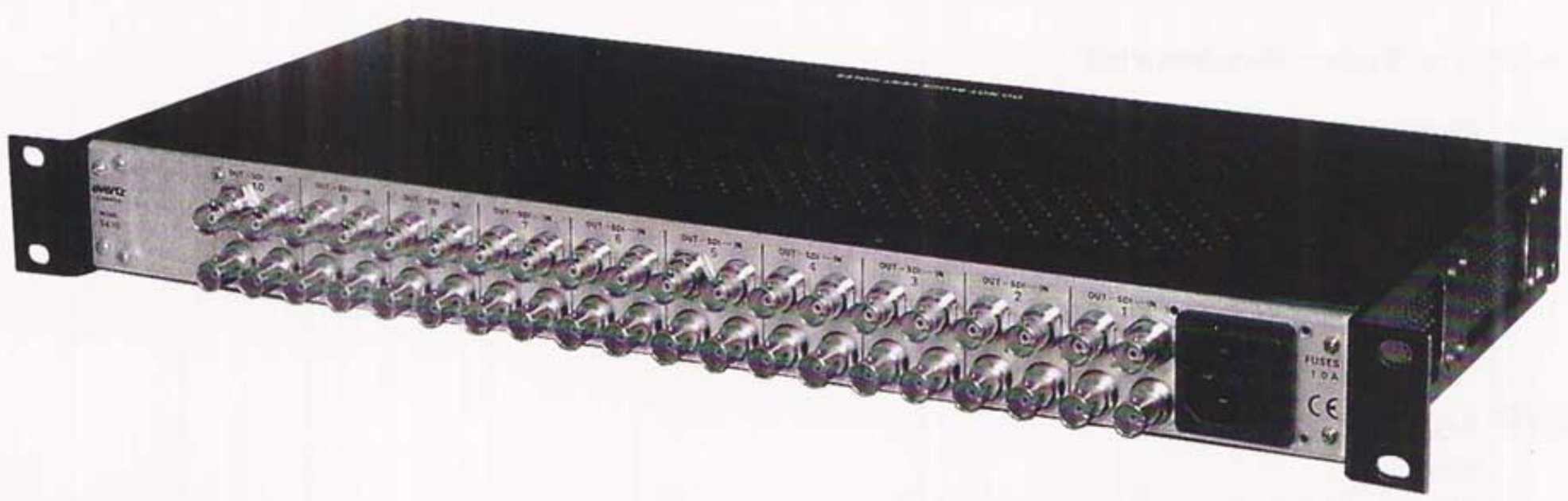
Specifications are subject to change without notice

Please contact Evertz directly for hardware inquiries

Multivert
(10 SDI to Analog Monitoring Converter)

Model 3410





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 capablity 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.

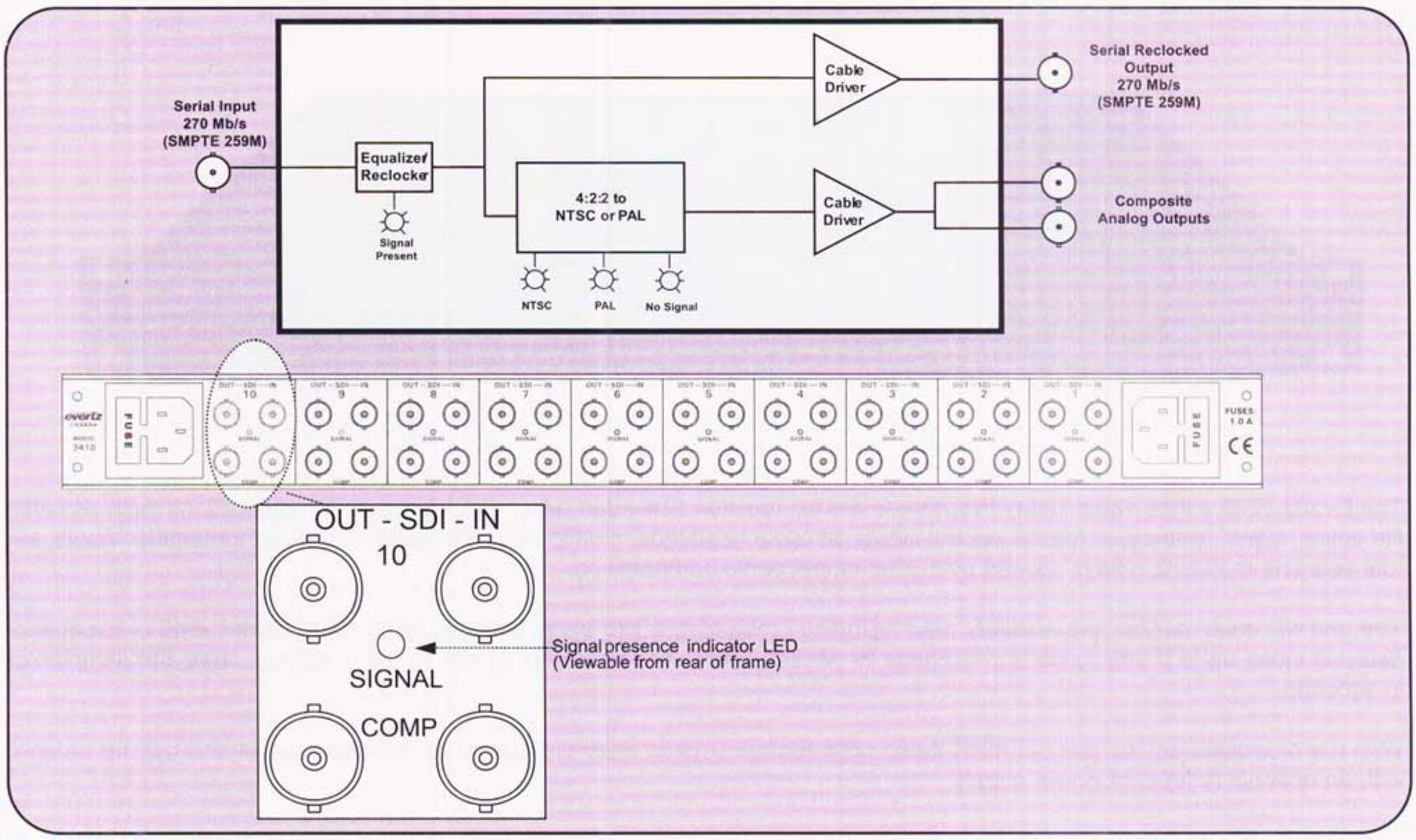
Having the Multivert mounted in the rear of the monitor racks eliminates the need for long analog cable runs from modular converters in the equipment rack room to the monitors, thus eliminating the need for analog equalizing DA's.

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

Multivert
(10 SDI to Analog Monitoring Converter)

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 169-8
Return Loss:	> 15 dB up to 540 Mb/s
Impedance:	75Ω

Serial Digital Video Outputs:

Standard:	Serial component 270 Mb/s (SMPTE 259M-C)
Number of Outputs:	10 (1 per converter)
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	900ps 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 169-8
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 VA
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

SDI Video Delay Unit

Model 9540/9542



The Evertz 9540 series Video Delay Processors are full function SDI video delay units 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.

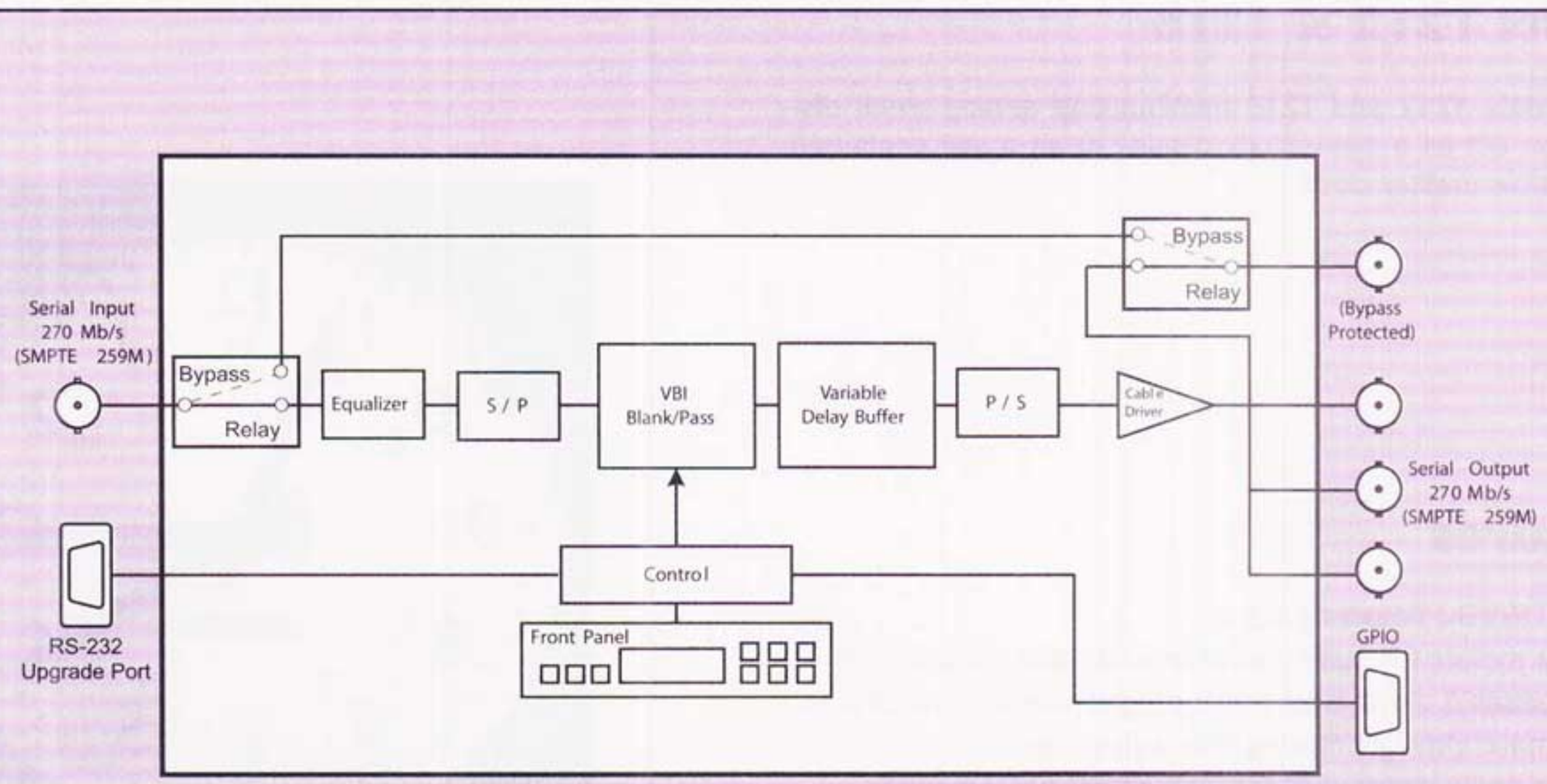
The unit will delay all VBI and Ancillary data including embedded audio along with the video. The Model 9540 is capable of delaying video up to 0.5 seconds (2.3 seconds for Model 9542). The Video Delay can be set in frames, lines and samples or in seconds.

With the broadcast environment in mind these units feature bypass relay protection for the video signal and can be ordered with an optional redundant power supply.

Features

- Automatic detection of 525 and 625 line SDI video on the input
- Full signal delay capability involving VBI and ANC Data
- Up to 0.5 seconds of programmable video delay (9540)
- Up to 2.3 seconds of programmable video delay (9542)
- Delay programmable in frames, lines and samples or in seconds
- Bypass relay for program path protection on power loss
- User definable presets for commonly used settings
- Programmable blanking of selected lines of VBI
- Front panel menu system to program delays & VBI blanking
- Front panel display of status & control
- Optional redundant power supply

9540/9542 Block Diagram



Specifications

Serial Digital Video Input:

Standard:	Serial component SMPTE 259M-C
Equalization:	Automatic up to 200m with Belden 8281 (or equivalent)
Connector:	BNC per IEC 169-8
Return Loss:	> 15 dB up to 270 Mb/s

Serial Video Output With Embedded Audio

Number of Outputs:	4 (1 is bypass relay protected)
Standard:	SMPTE 259M-C
Connector:	BNC per IEC 169-8
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

Serial Remote:

RS-232 interface, 9 pin "D"connector for upgrading firmware

Functional:

Minimum Delay:	815ns (22 samples)
Maximum Delay:	
9540	Approximately 0.5 seconds
9542	Approximately 2.3 seconds

GPIO:

Number of Inputs:	3
Number of Outputs:	1
Type:	Opto-isolated, active low with internal pull-ups to user supplied Voltage (Provides 5V which may be used for this purpose)
Connector:	Female High Density 9 pin "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 30 VA
Safety:	ETL listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Ordering Information:

9540	SDI video delay (up to 0.5 sec. delay)
9542	SDI video delay (up to 2.3 sec. delay)

Ordering Options:

+2PS	Redundant power supply

Analog Clock Display

Model 1212 & 1216

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 looses 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

Specifications:

Time Code:

Standard:	SMPTE 12M
Connectors:	Screw terminal block
Input Level:	1 V p-p nominal
Input Impedance:	40 KΩ 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:	Autoranging 115/230 VAC 50/60 Hz 30 VA 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

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.

Model 1275A



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.

Specifications

Functional:

Code input: SMPTE/EBU Time code
20kΩ balanced or unbalanced
DQS-B6 available on special order

Accuracy: Approximately 1 second per week on internal crystal oscillator

Timezone: +/- 12 hours. Offset from SMPTE/EBU code input (1 hour increments)

Electrical:

Power:

1275A-110: 115V 60Hz 15VA

1275A-220: 220V 50Hz 15VA

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

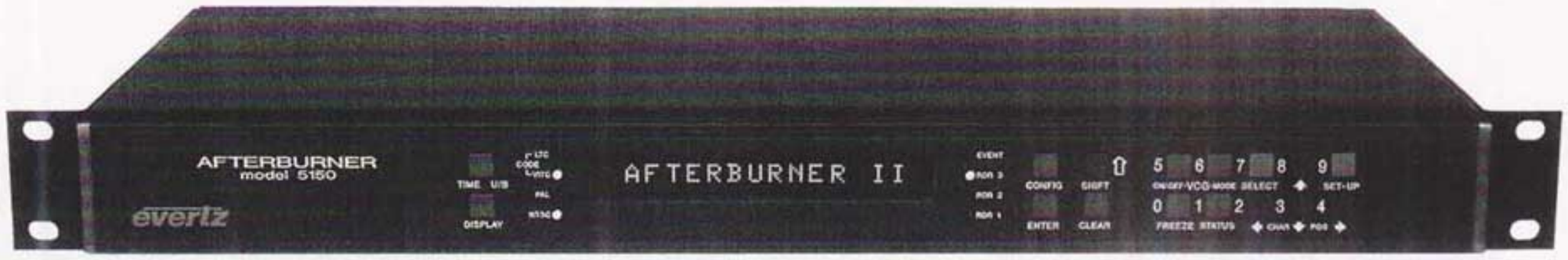
Ordering Information:

1275A-110 Digital Clock Display 115V/60Hz

1275A-220 Digital Clock Display 220V/50Hz

For DQS-B6 Order 1275A-xxx-DQS

Model 5150



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 KeyKode 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 employes 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.

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
Impedence:	High 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, 30VA
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

Time Code Generator/Reader with Character Inserter

Model 5010



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

Model 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

Model 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 Generator/Reader with Character Inserter

Time Code Feature Comparison

	5010-GPSII	5010-VITC-GPSII	5950	5010	5010-VITC
LTCGenerator	✓	✓		✓	✓
AdjustableOutputLevel		✓		✓	✓
VITCGenerator		✓			✓
LTCReader	✓	✓	✓	✓	✓
VITCReader		✓	✓		✓
VITCtoL TCT ranslator		✓	✓		✓
LTCtoVITCT ranslator		✓			✓
LTCRe-shaper			✓		
PALandNTSC	✓	✓	✓	✓	✓
ColourFraming	✓	✓		✓	✓
DropFrame	✓	✓	✓	✓	✓
SetUser Bits (0-9,A-F)	✓	✓		✓	✓
TransferRDR.T imeorUBtoGEN,UB	✓	✓		✓	✓
SMPTE ↔ EBU Timecodetranslator				✓	✓
Date/TimeZoneinUserBits	✓	✓		✓	✓
Momentaryandcontinue.Jam-sync	✓	✓		✓	✓
CharacterGenerator	✓	✓	✓	✓	✓
On-screenprogrammingmenu	✓	✓	✓	✓	✓
GPSReferenced TimeCode	✓	✓			
SerialRemoteControl				✓	✓
GPIRemoteControl	✓	✓		✓	✓
GPOutputs	✓	✓		✓	✓

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, High 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: 115/230 V AC 50/60 Hz, 30 VA
Safety: ETLListed
Complies with EU safety directive
EMI/RFI: Complies with FCC Part 15 Class A
EU EMC Directive

Ordering Information:

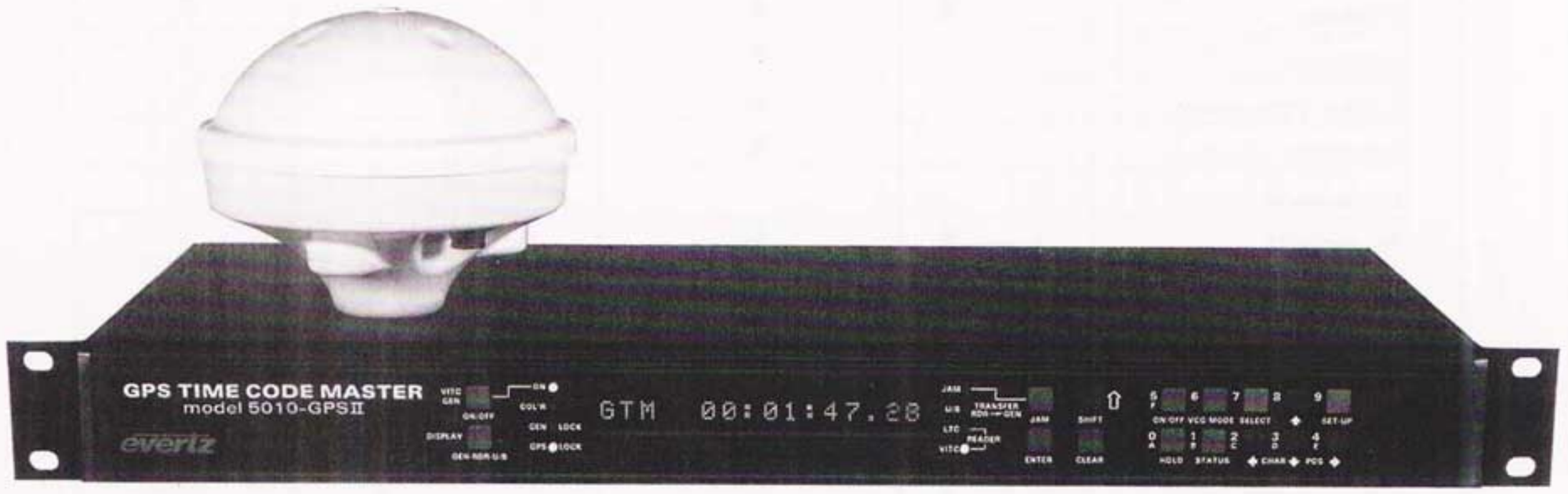
5010 Time Code Generator/Reader
5010-24Fps NTSC/24Fps Time Code Generator/Reader
5010-VITC Time Code Generator/Reader with VITC
5010-VITC-24Fps NTSC/24Fps Time Code Generator/Reader with VITC

Ordering Options:

+BP Optional bypass relay for 5010-VITC, and 5010-VITC-24Fps

Time Code Generator/Reader with Character Inserter, and GPS Antenna

Model 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 longer 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

Time Code Generator/Reader with Character Inserter, and GPS Antenna

Model 5010-VITC-GPSII

Features

As well as having all the listed 5010-GPSII features, the 5010-GPSII-VITC 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

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 µsec
Jitter:	< 2 µsec

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:	Comp. Video 1V p-p, 75Ω terminated
Outputs:	2 Comp. 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:	Comp. video 1V p-p, High 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

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:	115/230VAC 50/60 Hz, 30VA
Safety:	ETL listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Informaton:

Comes with standard GPS Receiver and 50 ft. weather-proof cable

5010-GPSII	Time Code Generator with GPSII
5010-VITC-GPSII	VITC Time Code Generator with GPSII

Ordering Options:

+BP	Bypass relay for 5010-GPSII & 5010-VITC-GPSII
WA-T76	100 Feet Weatherproof Cable for GPS Receiver
WA-T11	400 Feet Weatherproof Cable for GPS Receiver

Time Code Analyzer

Model 5300

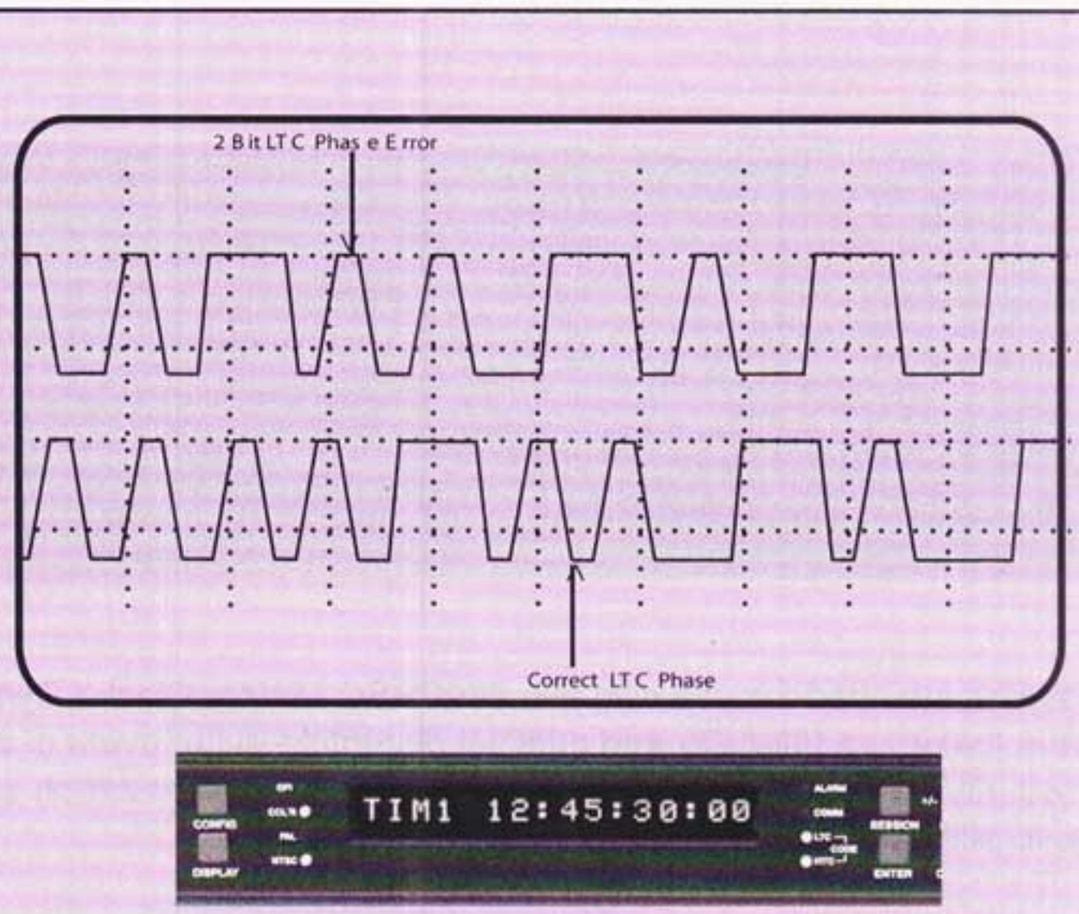


The Model 5300 LTC/VITC Time Code Analyzer combines the latest LSI technology with sophisticated microcontroller firmware to provide a powerful, flexible time code analyzer system. The model 5300, a LTC/VITC reader / analyzer and multi-function character inserter is an invaluable verification and troubleshooting 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 169-8
Speed:	Still frame to <40x play, VTR dependant
Connector:	BNC per IEC 169-8

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 169-8

LTC Translator:

Connector:	XLR Type 3 pin male
Level:	Adjustable 0.5V to 4.5V p-p
Rise Time:	40 ± 10µsec
Jitter:	<2 µsec
Gen Lock:	Reader input video 1 V p-p, High 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, 30VA
Safety:	ETL Listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

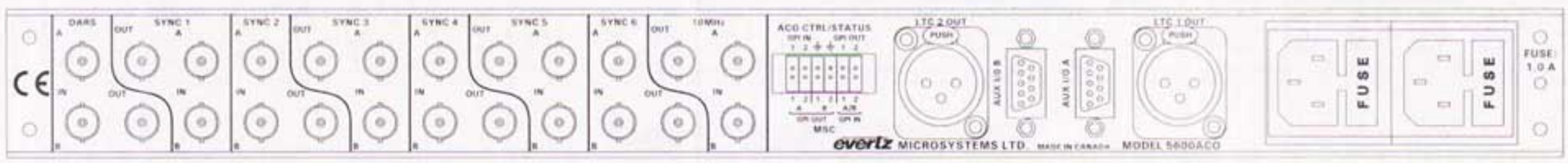
Ordering Information:

5300	Time Code Analyzer

Inputs and Outputs

	INPUT	OUTPUT
SYNC	12 BNC	6 BNC
10MHz	2 BNC	1 BNC
DARS	2 BNC	1 BNC
LTC	2 DB9	2 MALE XLR
GPIO	2 DB9	Terminal Strip

5600ACO Rear Panel



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, colour black, 10 MHz
Number: 8 groups each consisting of two inputs and one output
Connector: BNC per IEC 169-8

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. 10kΩ 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 AUXI/O A
2 GPI outputs connected from Master B through AUXI/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: Autoranging 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:

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:

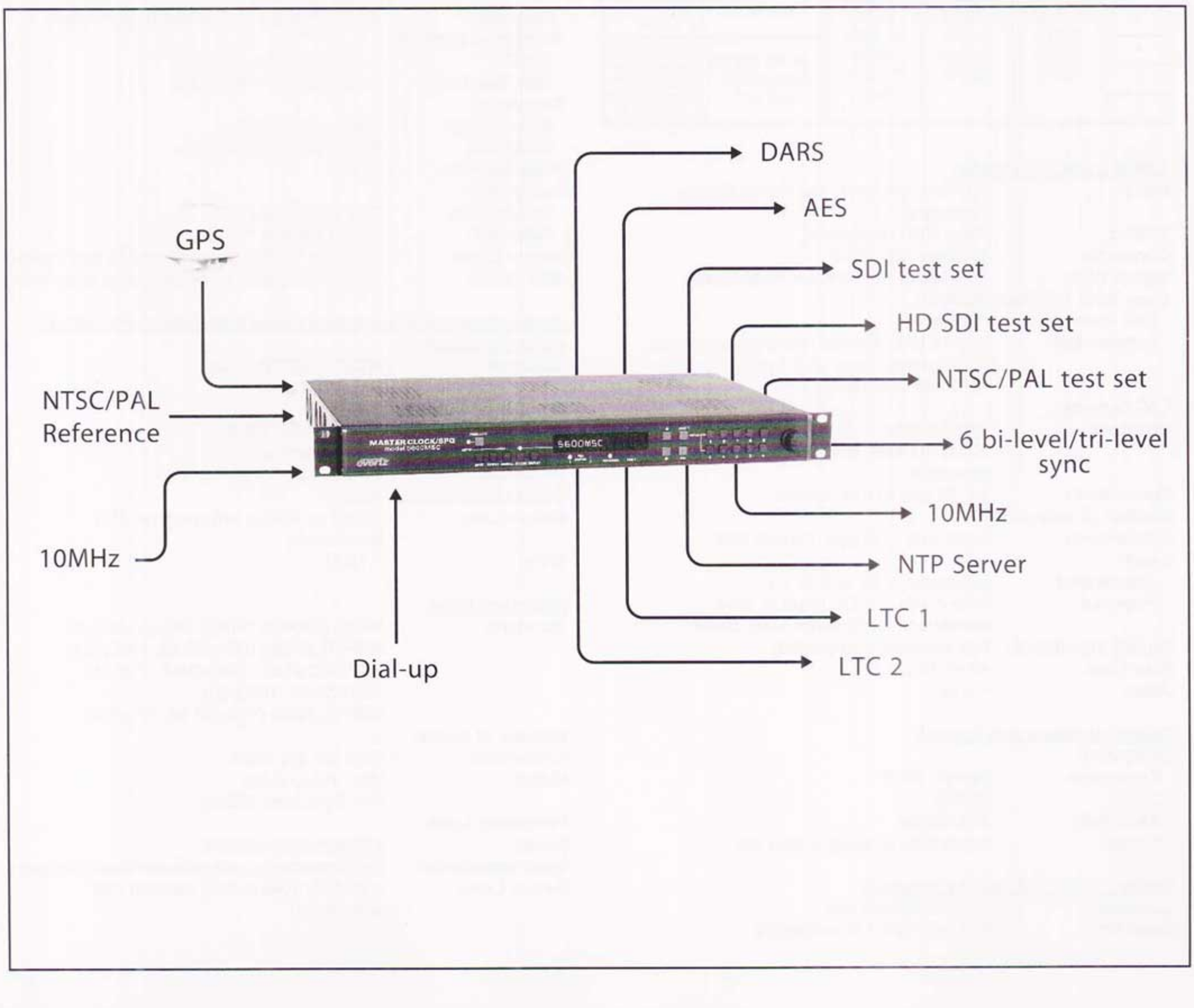
5600ACO Automatic Changeover System complete with 2 power supplies, 2 power cords and 3 DB9 cables

Master SPG / Master Clock System

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
- Optional Modem for reference time dial up
- Optional analog TG output, with DARS and Analog audio tones
- Optional SD SDI test generator outputs
- Optional HD SDI test generator outputs
- Optional Network Time Protocol Server (NTP server support)
- 16 digit Alpha-numeric display, with 16 pushbuttons
- Rack mountable
- Optional redundant power supply
- Automatic changeover unit available for dual redundant systems applications
- Optional SD SDI test generator outputs
- Optional Network Time Protocol Server (NTP server support)

Redundant Master Clock/SPG System with Auto Changeover



Specifications:

Analog Sync Outputs:

Standards:	NTSC (SMPTE 170M), PAL (ITU624-4), SMPTE 274M (1080p/23.98, 1080p/24, 1080p/23.98sF, 1080p/24sF, 1080i/50, 1080i/59.94, 1080i/60) SMPTE 296M (720p/59.94, 720p/60)
Connector:	6 BNC per IEC 169-8
Number of Outputs:	6 (2 banks of 3) configured as: 6 colour black (black & burst) - selectable with VITC On/Off or 6 HD tri-level sync or 3 colour black (black & burst) and 3 HD tri-level sync All outputs independently timeable
DC Offset:	0V +/- 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	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, B or C	NTSC
2					NTSC
3					PAL
4				3 of any signals from groups A, B or C	1080i/59.94
5					720p/59.94
6					1080/23.94

10MHz Input and Output:

Input:	0.5 Vp-p min level, 75Ω (Relay Bypass Protected)
Output:	1Vpp (75Ω terminated)
Connector:	BNC per IEC 169-8
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 +/- 0.1.ppm) GPS with +G option

LTC Outputs:

Standard:	SMPTE 12M NTSC 2/4 field; PAL 4/8 field menu selectable
Frame Rate:	24, 25 and 30 Fps nominal
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:	66Ω balanced (unpowered)
Rise Time:	40 +/- 10 µs
Jitter:	< 2 µs

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: (NTP port with "+T" option installed):

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

GPS Receiver (with "+G" option installed)

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)

DARS & AES Test Generator Outputs (with "+STG" option installed)

Standard:	
Unbalanced:	SMPTE 276M single ended AES (24-bits) (1Vpp into 75Ω)
Balanced:	AES3-1992 (24-bits) (4Vpp unterminated)
Number of Outputs:	
DARS:	1 unbalanced, 1 balanced
AES Test Gen:	1 unbalanced, 1 balanced
Connector:	
Unbalanced:	BNC per IEC 169-8
Balanced:	Removable Terminal Strip
Sampling Rate:	48 kHz
Impedance:	
Unbalanced:	75Ω unbalanced
Balanced:	110Ω balanced
Return Loss:	>25dB to 10MHz (with external 75 termination)
AES Tones:	Menu selectable - same as analog audio tones

Analog Composite Video Test Signal Generator (with "+STG" option installed)

Standard:	NTSC (SMPTE 170M) PAL (ITU624-4)
Number of Outputs:	1
Connector:	BNC per IEC 169-8
Signal Level:	1V p-p nominal
DC Offset:	0V ± 0.1V
Output Impedance:	75Ω
Return Loss:	>35dB to 10MHz (with external 75Ω termination)
SNR:	> 75dB

Reference Input:

Standard:	NTSC (SMPTE 170M), PAL (ITU624-4) SMPTE 274M (1080p/23.98, 1080p/24, 1080p/23.98sF, 1080p/24sF, 1080i/50, 1080i/59.94, 1080i/60) SMPTE 296M (720p/59.94, 720p/60)
Number of Inputs:	1
Connector:	BNC per IEC 169-8
Video:	Max: 2Vp-p video Min: Sync level 150mV
Frequency Lock Range:	± 50ppm from nominal
Input Impedance:	High impedance - external termination required
Return Loss:	> 25dB to 10MHz (with external 75Ω termination)

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:	66Ω
Signal Level:	-20 to +2 dBu into 10 K ohm load

HDTV Test Generator Outputs (with "+HTG" option installed)

Standards:	SMPTE 292M, 4:2:2, YCbCr, (1080i/50, 1080p/29.97, 1080p/29.97sF, 1080p/25, 1080p/25sF, 1080p/23.98, 1080p/23.98sF, 720p/59.94, 1035i/59.94)
Number of Outputs:	2 outputs of selected test signal 2 outputs of black video
Embedded Audio:	Up to 4 tones 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 test signal or black or both outputs. Audio Level is set to -20 dB Full Scale
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V +/-0.5V
Rise and Fall Time:	200ps nominal
Overshoot:	< 10% of amplitude
Jitter:	< 0.20 UI
Genlock Input:	HD Tri-level Sync or NTSC or PAL Color Black1V p-p, (provided from one of the Sync outputs)

SDI Test Generator Outputs (with "+STG"option installed)

Standard:	SMPTE 259M-C (270 Mb/s)
Number of Outputs:	2 outputs of selected test signal 2 outputs of black video
Connectors:	BNC per IEC 169-8
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
Jitter:	< 0.2 UI
Genlock:	Provided internally by 5600MSC

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 + 5volts
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:	Autoranging 100 - 240 Volts AC, 50/60 Hz 30VA
Configuration:	Optional redundant supply available with +2PS option
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

Ordering Information:

5600MSC	Master SPG / Master Clock System
5600ACO	Automatic Change Over System (see individual brochure)

Ordering Options (5600MSC):

+2PS	Redundant power supply
+M	Modem Option
+G	GPS Option (includes GPS receiver and 50' weatherproof cable)
+T	Network Time Protocol (Call factory for availability)
+STG	NTSC/PAL test signal generator Audio tone generator (analog) DARS generator (balanced & unbalanced) AES generator (balanced & unbalanced) PLUS an SDI Test Generator with 2 SDI test signals and 2 SDI black
+HTG	HD SDI Test Generator with 2 HD SDI test signals & 2 HDSDI black

Accessories:

WA-T76:	100' weatherproof cable for GPS receiver
WA-T11:	400' weatherproof cable for GPS receiver

VITC/LTC Time Code Reader
Character Inserter

Model 5950



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.

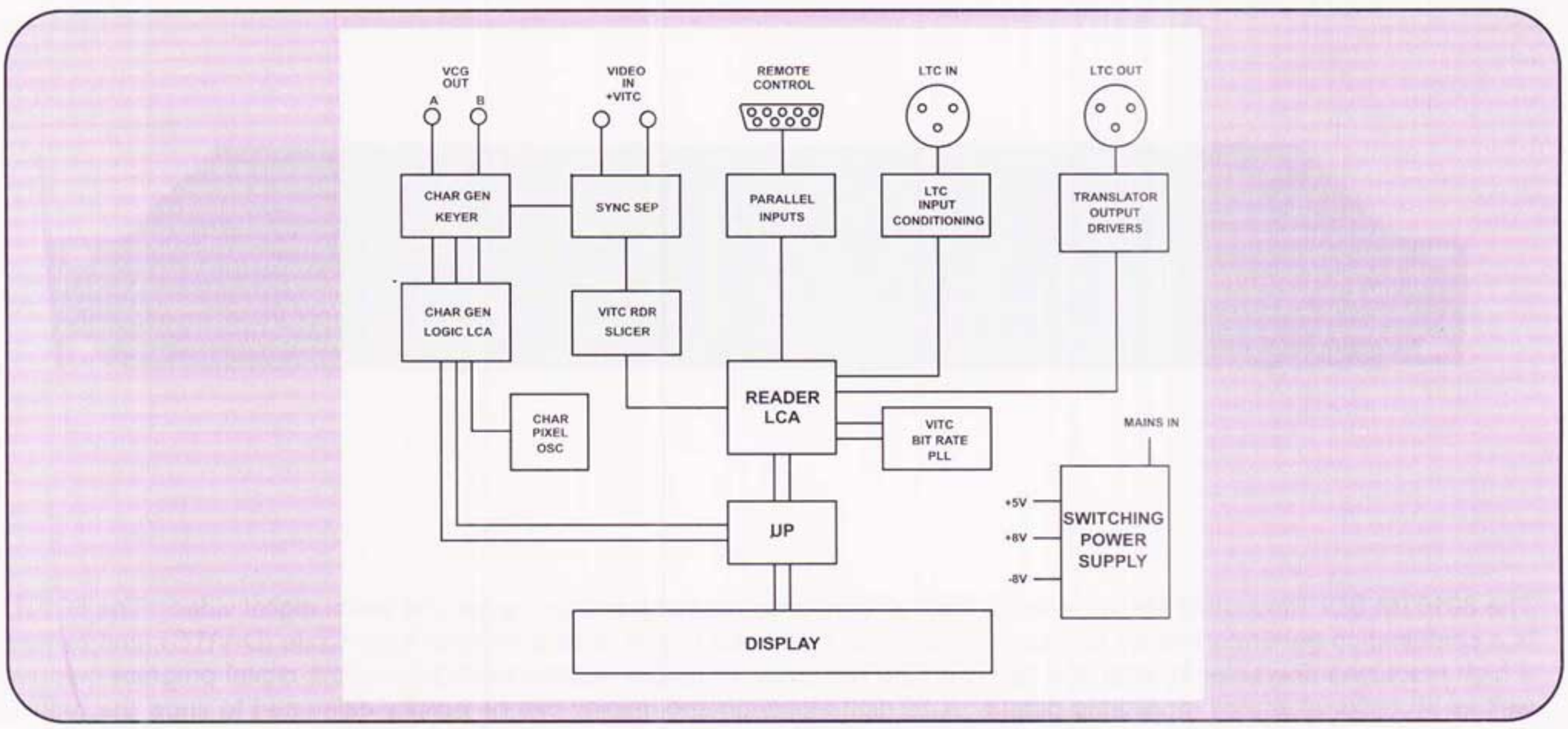
The high resolution Character Inserter can display Time code, User bits, or both. 3 Character sizes: 8, 16, and 32 lines are available. The Characters can be white with or without a black background, or black with or without a white background. The windows are separately positionable on the raster and 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

VITC/LTC Time Code Reader Character Inserter

Model 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 169-8
Speed:	Still frame to <40x play, VTR dependant
Impedence:	High Z

LTC Translator:

Connector:	XLR Type 3 pin male
Signal 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, 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 169-8

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, 30VA
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

SDI Time Code Generator/Reader with Character Inserter

Model 8010TM



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.

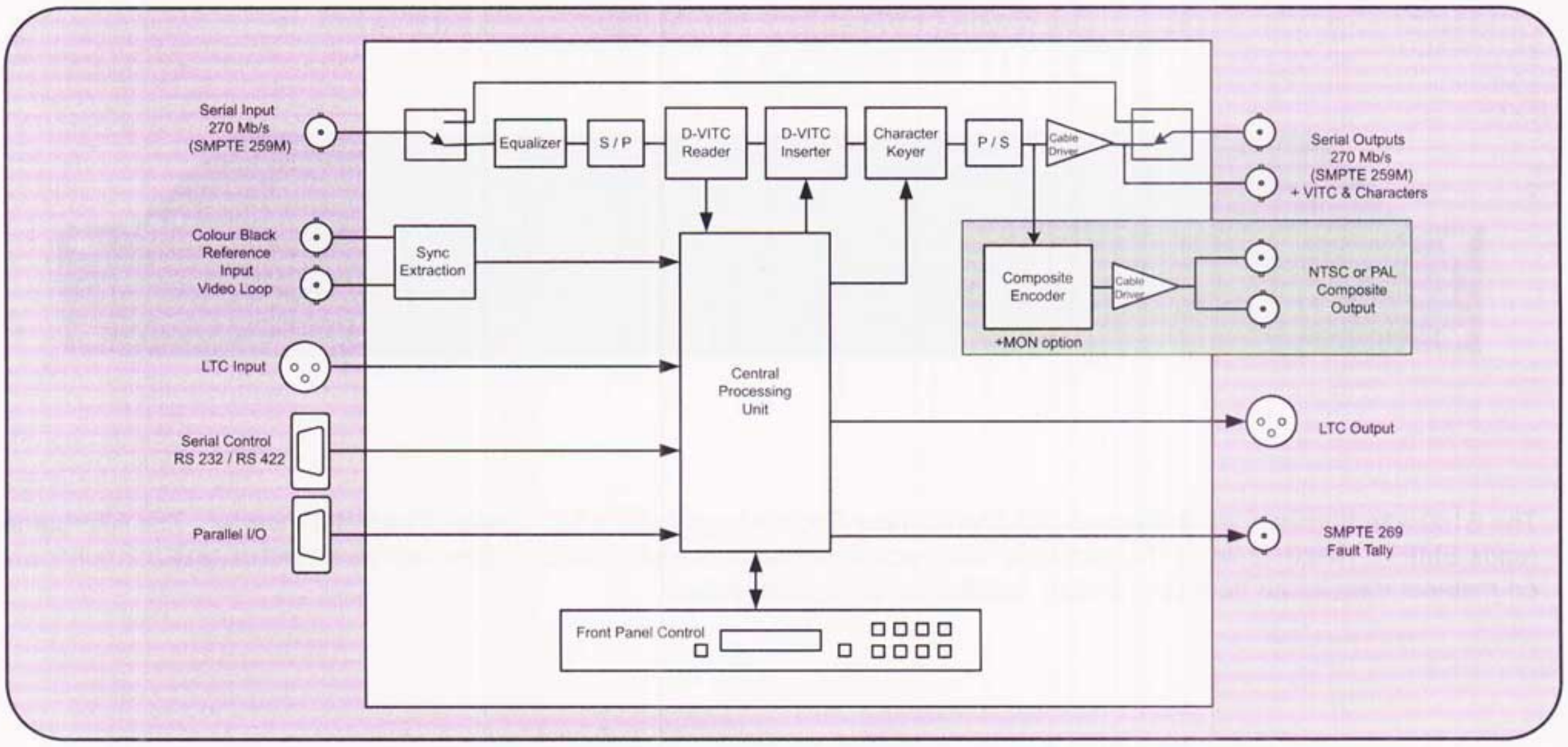
The 8010TM will accept 525 or 625 line component digital video. The 8010TM's time code generator can be preset to lock to the digital program video either by simple frame locking, or where necessary it will colour lock to an analog Colour Reference in accordance with the 4 field NTSC or 8 field PAL colour 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 VITS and character insertion

SDI Time Code Generator/Reader with Character Inserter

8010TM Block Diagram



Specifications:

Serial Digital Video Input:

Standards:	SMPTE 259M-C (270 Mb/s)
Connector:	1 BNC input per IEC 169-8
Equalization:	Automatic 200m @ 270 Mb/s with Belden 8281 or equivalent cable 150m @ 270 Mb/s when bypass relay is active
Return Loss:	> 15 dB up to 540 Mb/s

Serial Digital Video Outputs:

Number of Outputs:	1 with relay bypass, 1 additional output
Connector:	BNC per IEC 169-8
Signal Level:	800 mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	900 ps nominal
Overshoot:	<10% of amplitude
Return Loss:	> 15 dB up to 540 Mb/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 169-8
Signal Level:	1 V p-p nominal, internally adjustable
DC Offset:	0V ±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:	75Ω

Electrical:

Power:	Auto ranging 100-240VAC 50/60Hz 30VA
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 7.75" D. (483mm W x 45mm H x 196mm D)
Weight:	7 lbs. (3.2 Kg)

Ordering Information:

8010TM	SDI Time Code Generator/Reader with Character Inserter

Ordering Options:

+MON	Analog Monitoring Option
+BP	Bypass Relay Option

Model 8150



The 8150 Afterburner is a full featured SDI DVITC Time Code Reader, with a full function Character Inserter. The Afterburner reads SMPTE RP201 3 line VITC and keys field accurate video and audio time codes as well as KeyKode 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 Inserter, 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 time code 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 Beldon 8281 (or equivalent)
Connector:	1 BNC input

Serial Digital Outputs:

Connector:	2 BNC, (270 Mb/s) SMPTE 259M compliant.
Analog Monitor:	(Optional) 1 BNC 1V 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 VA
Saftey:	ETL Listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Ordering Information:

8150	SDI Afterburner

Ordering Option:

+MON	Analog Monitoring Option

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HD Time Code Generator/Reader

Model HD9010TM



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 preset to lock to the input video or to an analog colour black or tri-level sync signal. When generating 24Fps timecode it will also lock to a SMPTE 318M 10 field reference or 6Hz pulse.

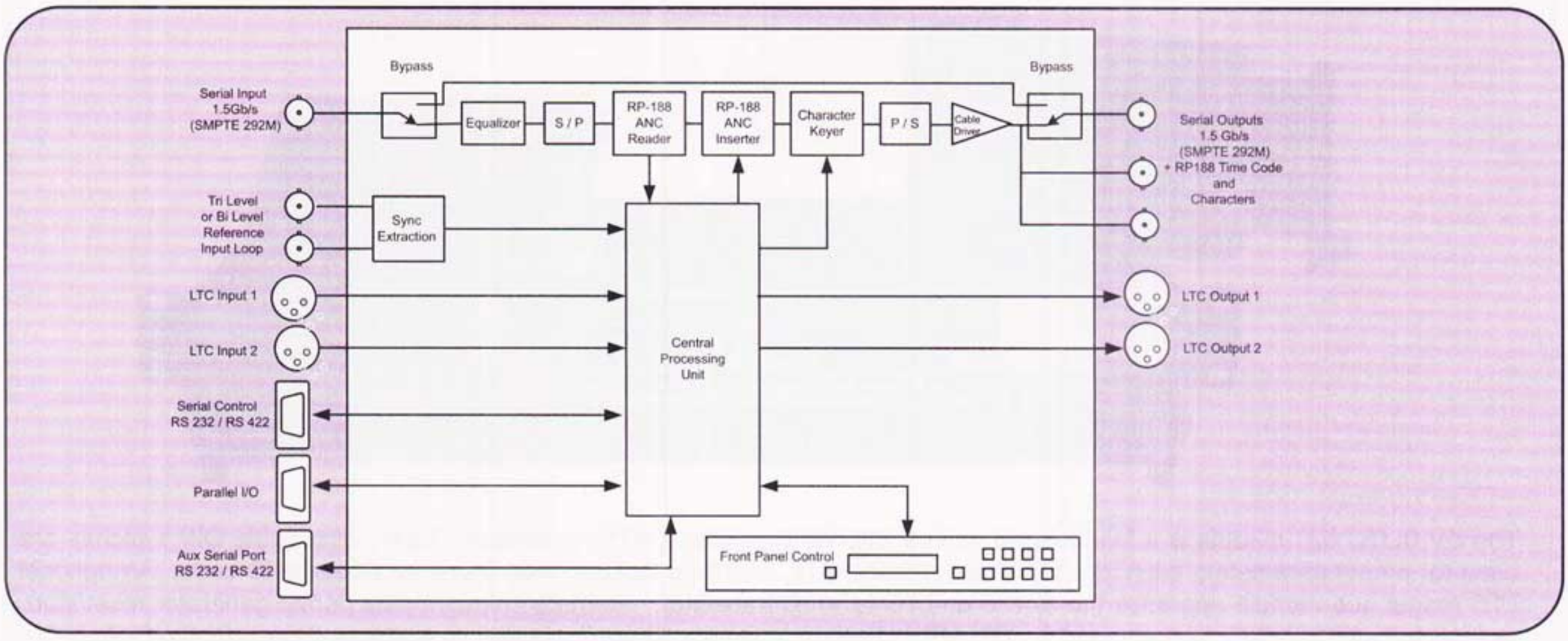
The HD9010TM generators can be slaved to incoming LTC or ATC or can be set to free run. The generators may also be momentarily synchronized to one of the readers, and then continue to increment normally regardless of the reader code. The second LTC output normally follows the primary output, however 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 high-resolution character inserter provides independently positionable windows to show time and user bits for the generator and readers simultaneously. Two character sizes 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 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 colour black, HD Tri-level sync
- Locks to SMPTE 318M 10 field reference or 6Hz input when generating 24Fps code
- 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
- Two vertical sizes of character windows, white or black on contrasting background,
- Front panel display and control using menu system
- Parallel GPI/O and serial remote control
- Field upgradable 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 and the 1/1.001 divisor versions where applicable software selectable or autodetect
Connector:	BNC per IEC 169-8
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 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±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 ± 10 µs
Jitter:	< 2 µs

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 HD Tri-level Sync NTSC or PAL Colour Black 1 V p-p Composite Bi-level sync (525i/59.94 or 625i/50) 300 mV
Connectors:	2 BNC per IEC 169-8
Termination:	High impedance loop through

General Purpose In/Out:

Number:	5 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 Ctl:

Standard:	RS-232, 57600 baud
Connector:	9 pin female "D"
Control:	Computer control of all functions, 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 30VA
Safety:	ETL listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

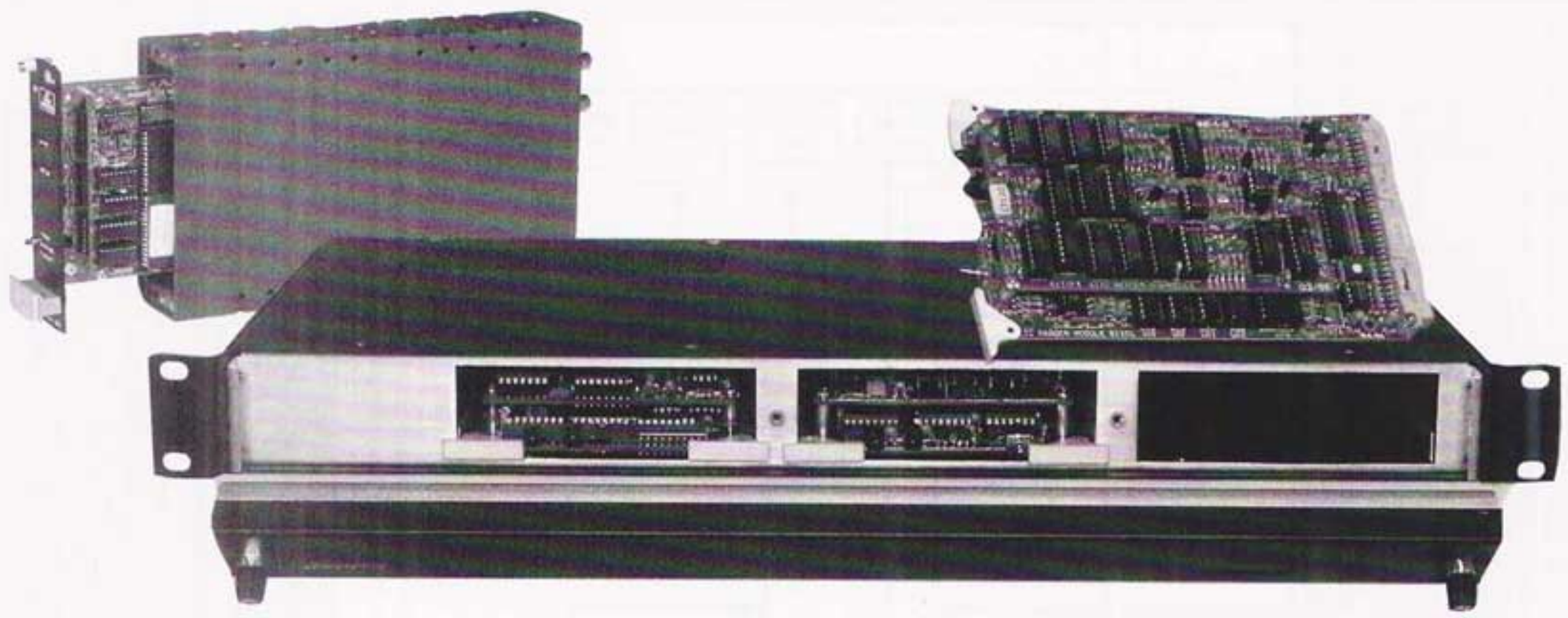
HD9010TM	HD Time Code Generator/Reader

Ordering Options:

+HBP	Bypass Relay Protection
+2PS	Redundant Power Supply

VITC Timecode Generator/Translator

Model 621



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 colour framing, Source ID or GPIs)

Specifications:

Video:

Input:	1V p-p High Z loop
Connectors:	2 BNC
Output:	Composite video 1V p-p
Differential Gain:	< 0.5%
Differential Phase:	< 0.5 degree
Frequency Response:	± 0.5dB to 5MHz

Longitudinal Code Reader (LTC 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

621x:	VITC Generator & Source ID Encoder
621x-LTR:	LTC to VITC Translator & Source ID Encoder
S621x-LTR:	Standalone NTSC/PAL LTC to VITC Translator & Source ID Encoder
S621D-LTR:	Standalone NTSC/PAL LTC to VITC Translator for use with 4025TR Film Footage Encoder

Ordering Options:

+M	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

Model 622

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.

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
- User bits encoded with a special code from an EV-BLOC 621 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

Specifications:

Video:

Input:	Composite video 1v p-p High impedance bridging input loop 2 BNC connectors
Output:	Composite video 1v p-p 2 BNC connectors
Differential Gain:	< 0.5%
Differential Phase:	< 0.5 degree
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)

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)

Video Character Generator (VCG option):

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

622x:	VITC to LTC Translator
622x-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

Ordering Options:

+M	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

LTC Reader, Phase Restorer

Model 623

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 trememdous 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.

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
- VITC to LTC translator for use with LTC only editing equipment or readers
- RS-232 interface for sending time code to a PC

Specifications:

Longitudinal Code Reader:

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)

Vertical Interval Code Reader (623-VIR):

Input:	Composite video with SMPTE 12M VITC
Speed:	Still frame to more than 20 times play speed
Modes:	Individual lines, pair of lines, range of lines, auto (first valid line of code) forward and reverse (machine dependent)

LTC Translator:

Output:	Play speed regenerated SMPTE/EBU LTC phase-locked to video input at play speed
Level:	Level 0dBm, 1/4" stereo phone jack

Serial Remote Control:

RS-232/RS-422 9 pin "D" connector
Computer access to all functions including Reader Time and User Bit data

Ordering Information: **LTC Reader, Phase Restorer**

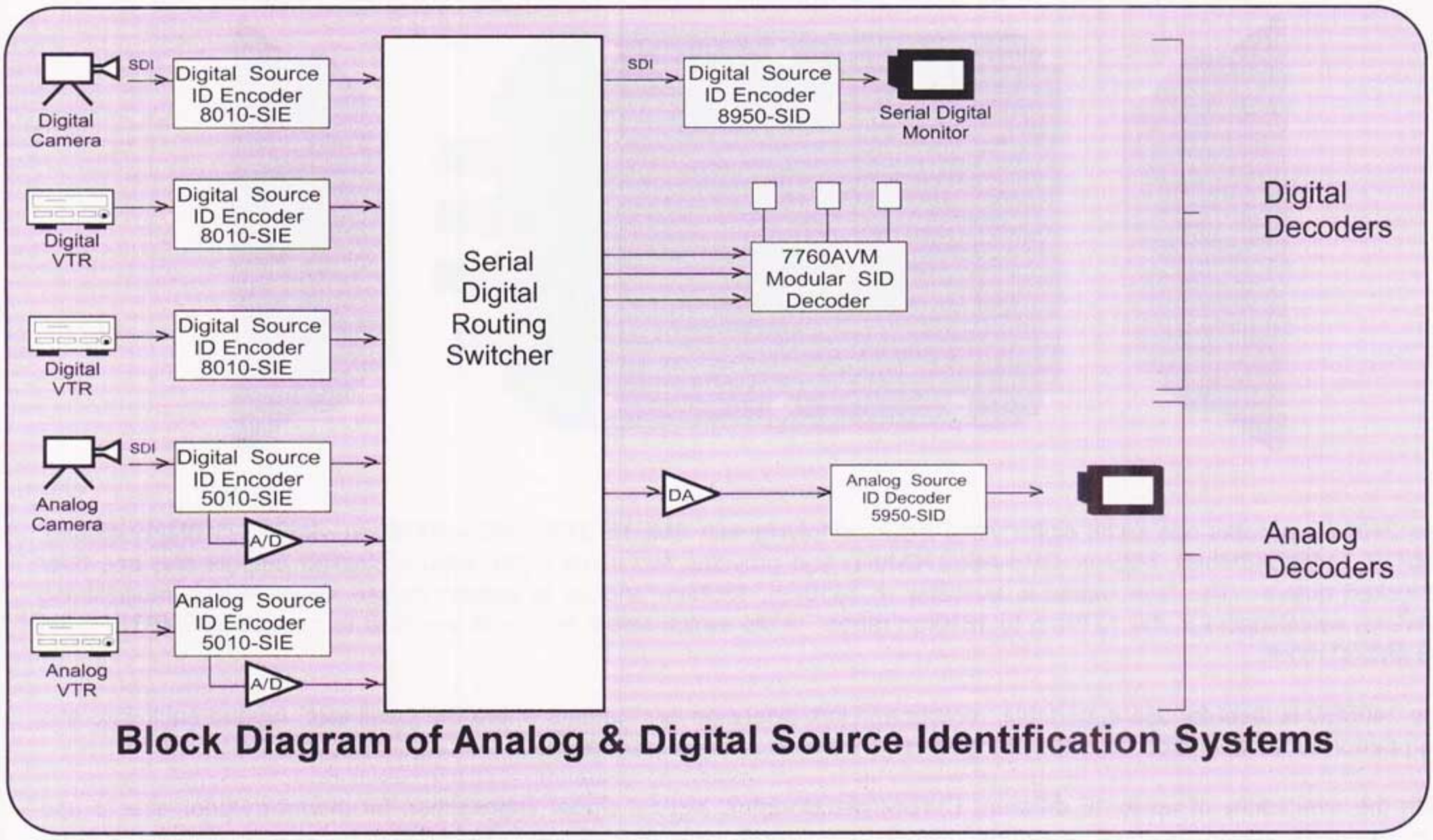
X = N for NTSC or P for PAL (Please specify when ordering)

623x:	LTC/VITC Reader Translator
623x-VIR:	LTC/VITC Reader Translator with VITC Submodule
S623x:	Standalone LTC/VITC Reader Translator
S623x-VIR:	Standalone LTC/VITC Reader with VITC Submodule

Enclosure:

4600T-3S:	1RU Frame - serial I/O (3 modules max)
with	power supply

Vertical Interval Source ID Block Diagram



Block Diagram of Analog & Digital Source Identification Systems

Evertz has developed a line of analog and digital source identification encoders and decoders for use by broadcasters and other large facilities. These units have the ability to encode source ID, along with VTR time code and status into the vertical interval using Vertical Interval time code. Decoders at the monitors extract this information and display it in the picture or on under monitor displays. The range of equipment includes standalone encoders and decoders and modular decoders which are ideally suited for monitoring walls. The technology used in these devices can be readily adapted to specialized requirements for any facility.

(Contact factory for further information or to discuss specific applications)

SDI Miniature Optical Transmitter, 19.4Mb/s - 1.5Gb/s

Model 2405EO



The 2405EO accepts one serial digital video input complying with SMPTE 259M(143 - 360Mb/s), SMPTE 310M(19.4Mb/s), SMPTE 344M(540Mb/s), M2S or DVB-ASI(270Mb/s) and provides two serial digital BNC reclocked outputs and one fiber reclocked output. The fiber output is available in 1310nm, 1550nm and up to sixteen coarse wave division multiplexing (CWDM) wavelengths in the 1270nm to 1610nm range. A dip switch select feature is provided to operate in SMPTE 310M (19.4Mb/s) mode.

The 2405EO is ideal for use in portable, remote and link extension applications where the small size, rugged enclosure and high performance operation meet the stringent requirements of these applications.

With the availability of up to 16 different CWDM wavelengths, optical signal aggregation for indoor/outdoor events and remote applications is now possible. When combined with the Evertz 7705CWDM Coarse Wave Division Multiplexor/Demultiplexor products, up to sixteen independent signal types on separate wavelengths can be combined on a single fiber.

The 2405EO is available with SC, ST and FC connector options.

Features

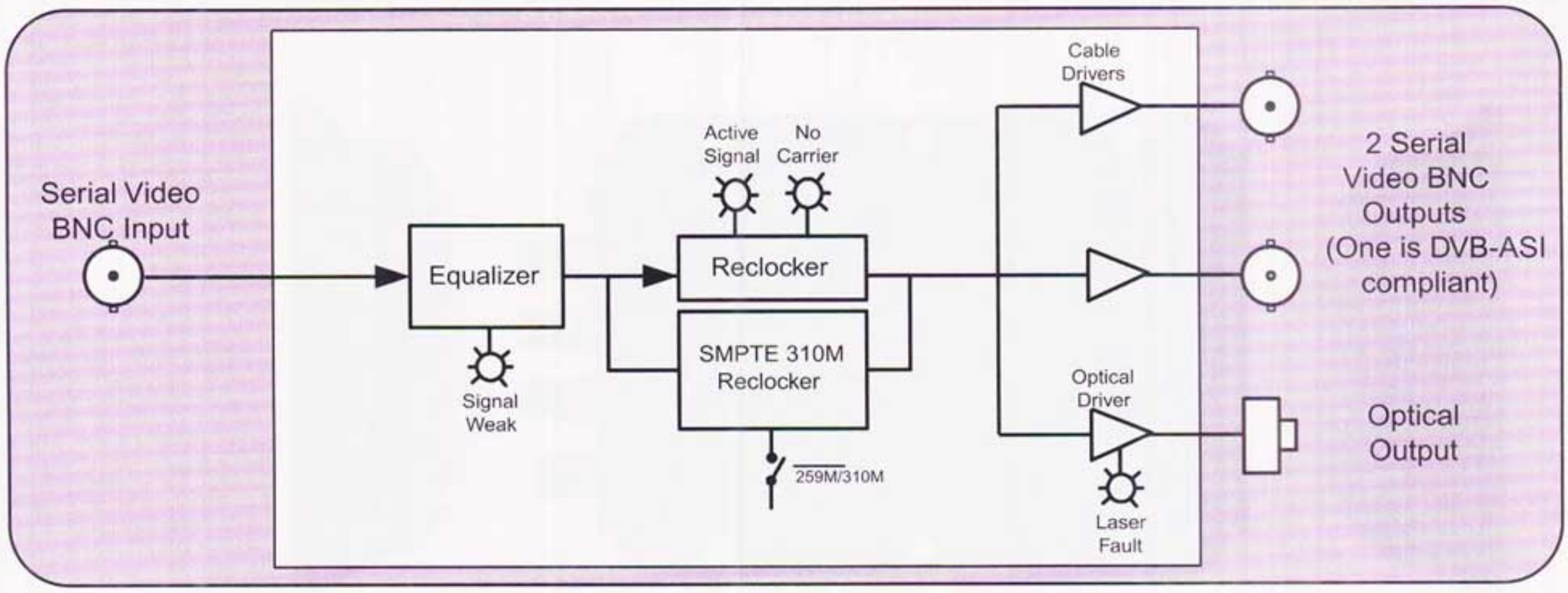
- Reclocking for all for SDTV video rates including SMPTE 259M (143Mb/s-360Mb/s), SMPTE 310M (19.4Mb/s), SMPTE344M(540Mb/s), M2S and DVB-ASI (270Mb/s)
- Available in 1310nm, 1550nm and sixteen different CWDM wavelengths (ITU-T G.694.2 compliant)
- Automatic laser shutdown on absence of input signal for extended laser life
- Supports multi-mode and single mode fiber
- Immunity to video Pathological signals
- Long reach transmission capability
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation

Card Edge LED's:

- Signal presence
- Maximum equalization warning
- Laser fault

SDI Miniature Optical Transmitter, 19.4Mb/s - 1.5Gb/s

2405EO Block Diagram



Specifications

Standards: SMPTE 259M (A, B, C, D), SMPTE 297M, SMPTE310M, SMPTE344M, M2S, & DVB-ASI

Serial Video BNC Input:

Number of Inputs:	1
Connector:	BNC input per IEC 169-8
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 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 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:	-7.5 dBm± 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) No Flanges: 6"L x 3.5"W x 1"H (152mm L x 89mm 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: *SDI Miniature Optical Transmitter*

2405EO3F	1310nm FP, Laser
2405EO5D	1550nm DFB Laser

CWDM Applications:

2405EO27	1270nm, CWDM DFB Laser
2405EO29	1290nm, CWDM DFB Laser
2405EO31	1310nm, CWDM DFB Laser
2405EO33	1330nm, CWDM DFB Laser
2405EO35	1350nm, CWDM DFB Laser
2405EO37	1370nm, CWDM DFB Laser
2405EO43	1430nm, CWDM DFB Laser
2405EO45	1445nm, CWDM DFB Laser
2405EO47	1470nm, CWDM DFB Laser
2405EO49	1490nm, CWDM DFB Laser
2405EO51	1510nm, CWDM DFB Laser
2405EO53	1530nm, CWDM DFB Laser
2405EO55	1550nm, CWDM DFB Laser
2405EO57	1570nm, CWDM DFB Laser
2405EO59	1590nm, CWDM DFB Laser
2405EO61	1610nm, CWDM DFB Laser

All 2405 modules include power supply
Note: *Enclosure with side mount flanges ships standard*

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

Case Option Suffix

+NF	Enclosure without mounting flanges

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

HD Miniature Optical Transmitter, 19.4Mb to 1.5Gb/s

Model 2405EO-HD



The 2405EO-HD accepts one serial digital video input complying with SMPTE 292M (1.485Gb/s) and provides two serial digital BNC reclocked outputs and one reclocked fiber output. The fiber output is available in 1310nm, 1550nm and up to sixteen Coarse Wave Division Multiplexing (CWDM) wavelengths in the 1270nm to 1610nm range. The module provides a non-reclock feature to operate at data rates from 19.4Mb/s to 1.5Gb/s.

The 2405EO-HD is ideal for use in portable, remote and link extension applications where the small size, rugged enclosure and high performance operation meet the stringent requirements of these applications.

With the availability of up to 16 different CWDM wavelengths, optical signal aggregation for indoor/outdoor events and remote applications is now possible. When combined with the Evertz 7705CWDM Coarse Wave Division Multiplexor/Demultiplexor products, up to sixteen independent signal types on separate wavelengths can be combined on a single fiber.

The 2405EO-HD is available with SC, ST and FC connector options.

Features

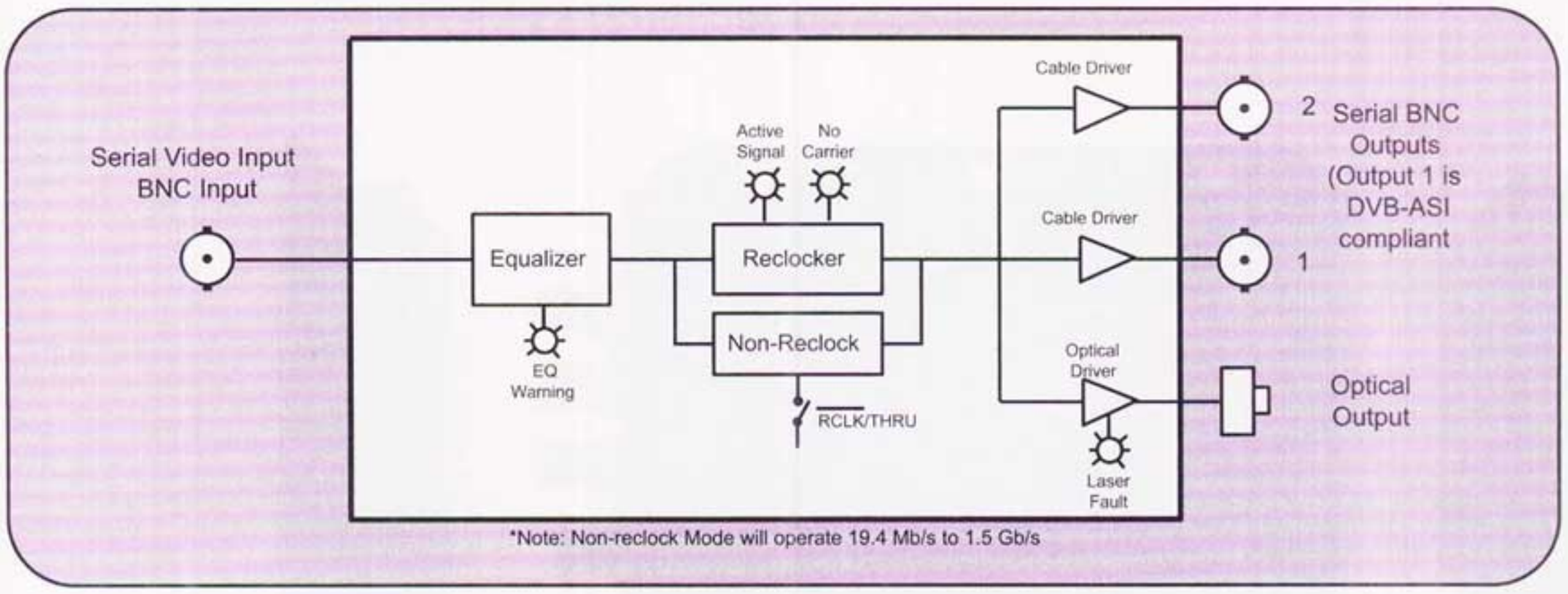
- Operation from 19.4Mb/s to 1.5Gb/s
  - Reclocking for SMPTE 292M (1.485Gb/s)
  - Non-reclocking for all other rates from 19.4 Mb/s to 1.5Gb/s including SMPTE 259M, SMPTE 305M, SMPTE 310M, M2S, DVB-ASI
- Available in 1310nm, 1550nm and sixteen different CWDM wave lengths (ITU-T G.694.2 compliant)
- Automatic laser shutdown on absence of input signal for extended laser life
- Supports multi-mode and single-mode fiber
- Immunity to video Pathological signals
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation

Card Edge LED's:

- Signal presence
- Maximum equalization warning
- Laser fault

HDTV Miniature Optical Transmitter, 19.4Mb to 1.5Gb/s

2405EO-HD Block Diagram



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 input per IEC 169-8
Equalization:	Automatic to 125m @ 1.485Gb/s with Belden 1694 (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 169-8
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:	-7.5 dBm± 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) No Flanges: 6"L x 3.5"W x 1"H (152mm L x 89mm 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: *HD Miniature Optical Transmitter, 19.4Mb/s to 1.5Gb/s*

2405EO3F-HD	1310nm, FP Laser
2405EO3D-HD	1310nm, DFB Laser
2405EO5D-HD	1550nm, DFB Laser

CWDM Applications:

2405EO27-HD	1270nm, CWDM DFB Laser
2405EO29-HD	1290nm, CWDM DFB Laser
2405EO31-HD	1310nm, CWDM DFB Laser
2405EO33-HD	1330nm, CWDM DFB Laser
2405EO35-HD	1350nm, CWDM DFB Laser
2405EO37-HD	1370nm, CWDM DFB Laser
2405EO43-HD	1430nm, CWDM DFB Laser
2405EO45-HD	1445nm, CWDM DFB Laser
2405EO47-HD	1470nm, CWDM DFB Laser
2405EO49-HD	1490nm, CWDM DFB Laser
2405EO51-HD	1510nm, CWDM DFB Laser
2405EO53-HD	1530nm, CWDM DFB Laser
2405EO55-HD	1550nm, CWDM DFB Laser
2405EO57-HD	1570nm, CWDM DFB Laser
2405EO59-HD	1590nm, CWDM DFB Laser
2405EO61-HD	1610nm, CWDM DFB Laser

All 2405 modules include power supply
Note: *Enclosure with side mount flanges ships standard*

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

Case Option Suffix	
+NF	Enclosure without mounting flanges

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

Model 2405OE



The 2405OE accepts a SMPTE 259M(143-360Mb/s), SMPTE 310M(19.4Mb/s), SMPTE 344M(540Mb/s), M2S or DVB-ASI(270Mb/s) optical input signal and provides two reclocked electrical outputs for further signal distribution. On loss of optical signal the unit can switch over to an SDI electrical input. A dip switch select feature provides reclocking for SMPTE 310M (19.4Mb/s) signals.

The 2405OE is ideal for use in portable, remote and link extension applications where the small size, rugged enclosure and high performance operation meet the stringent requirements of these applications.

The 2405OE is available with SC, ST and FC connector options.

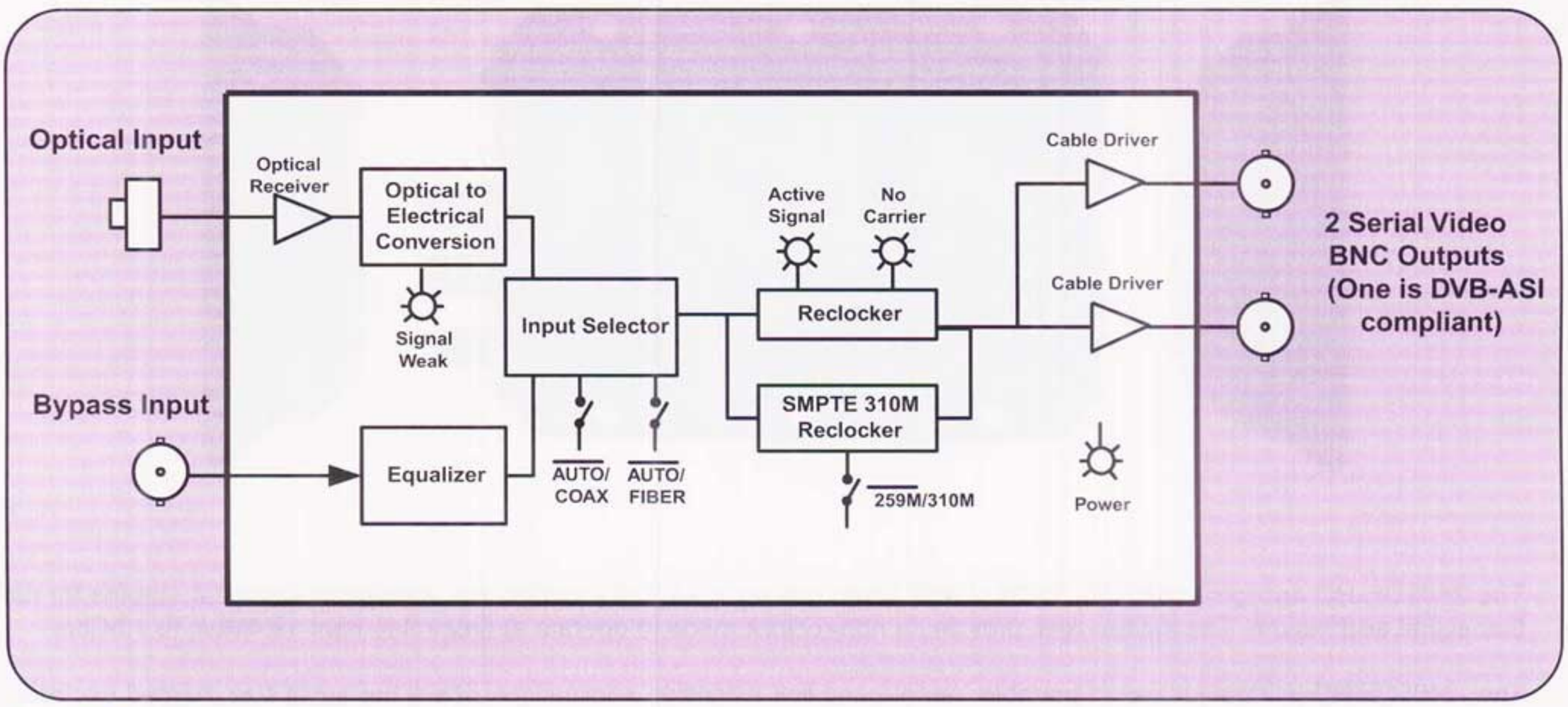
Features

- 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 multi-mode and single-mode fiber
- High optical input sensitivity
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation

Card Edge LED's:

- Signal presence
- Weak optical signal warning

2405OE Block Diagram



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 input per IEC 169-8
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:	-29 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 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 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) No Flanges: 6"L x 3.5"W x 1"H (152mm L x 89mm 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 Optical Receiver, 19.4Mb/s or 143-540Mb/s

All 2405 modules include power supply

Note: *Enclosure with side mount flanges ships standard*

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

Case Option Suffix

+NF	Enclosure without mounting flanges

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

HD Miniature Optical Receiver, 19.4Mb/s to 1.5Gb/s

Model 2405OE-HD



The 2405OE-HD accepts a SMPTE 292M (1.485 Gb/s) optical input and provides two reclocked electrical outputs for further signal distribution. The module also provides a non-reclock mode to operate at data rates from 19.4Mb/s to 1.5Gb/s.

The 2405OE-HD is ideal for use in portable, remote and link extension applications where the small size, rugged enclosure and high performance operation meet the stringent requirements of these applications.

The 2405OE-HD is available with SC, ST and FC connector options.

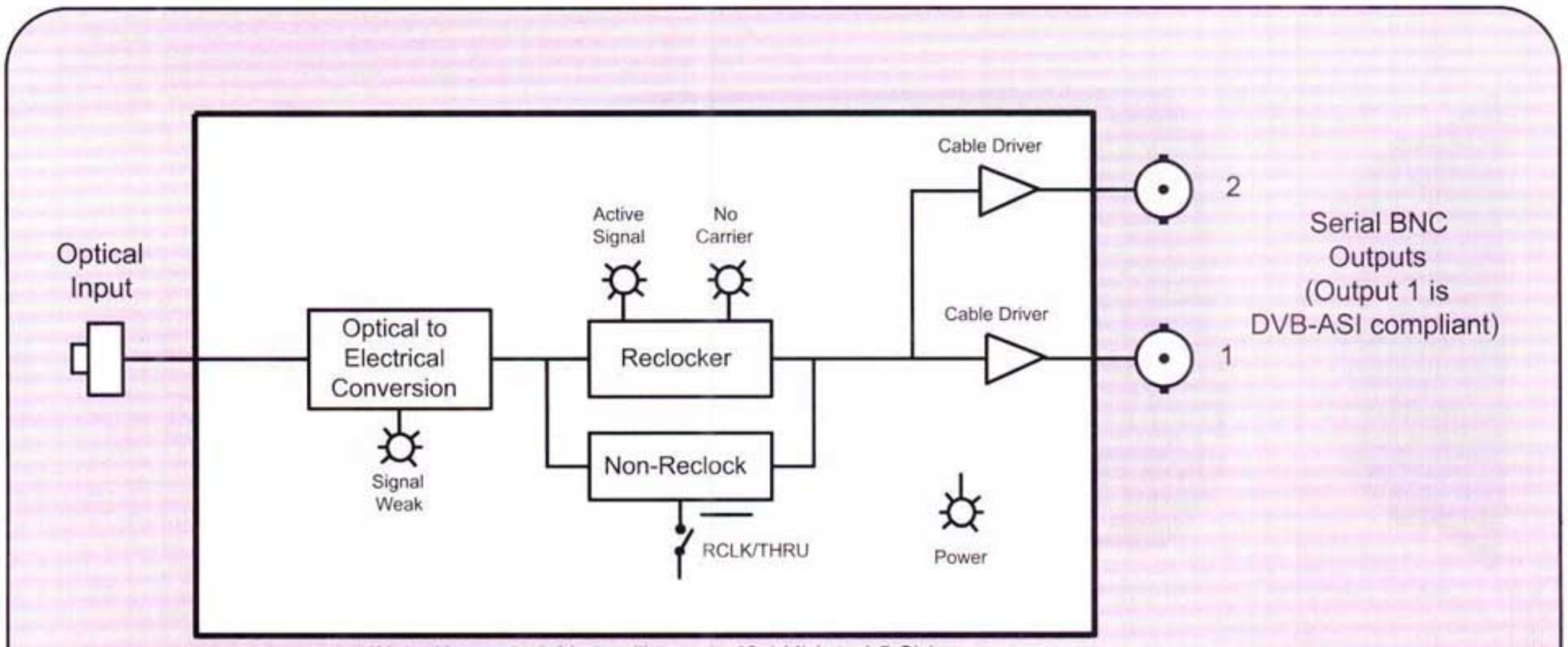
Features

- 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 multi-mode and single-mode fiber
- Rugged, small form factor enclosure
- Low Power, +12 VDC operation,on threaded connector

Card Edge LED's:

- Signal presence
- Weak optical signal warning

2405OE-HD Block Diagram



*Note: Non-reclock Mode will operate 19.4 Mb/s to 1.5 Gb/s

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:	0dBm
Optical Sensitivity:	-18dBm
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 169-8
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

Physical:

Dimensions:	With Flanges: 6"L x 4"W x 1"H (152mm L x 114mm W x 25mm H) No Flanges: 6"L x 3.5"W x 1"H (152mm L x 89mm 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

Note: *Enclosure with side mount flanges ships standard*

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

Case Option Suffix:

+NF	Enclosure without mounting flanges

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

HD Miniature Digital to Analog Converter

Model 2430DAC-HD



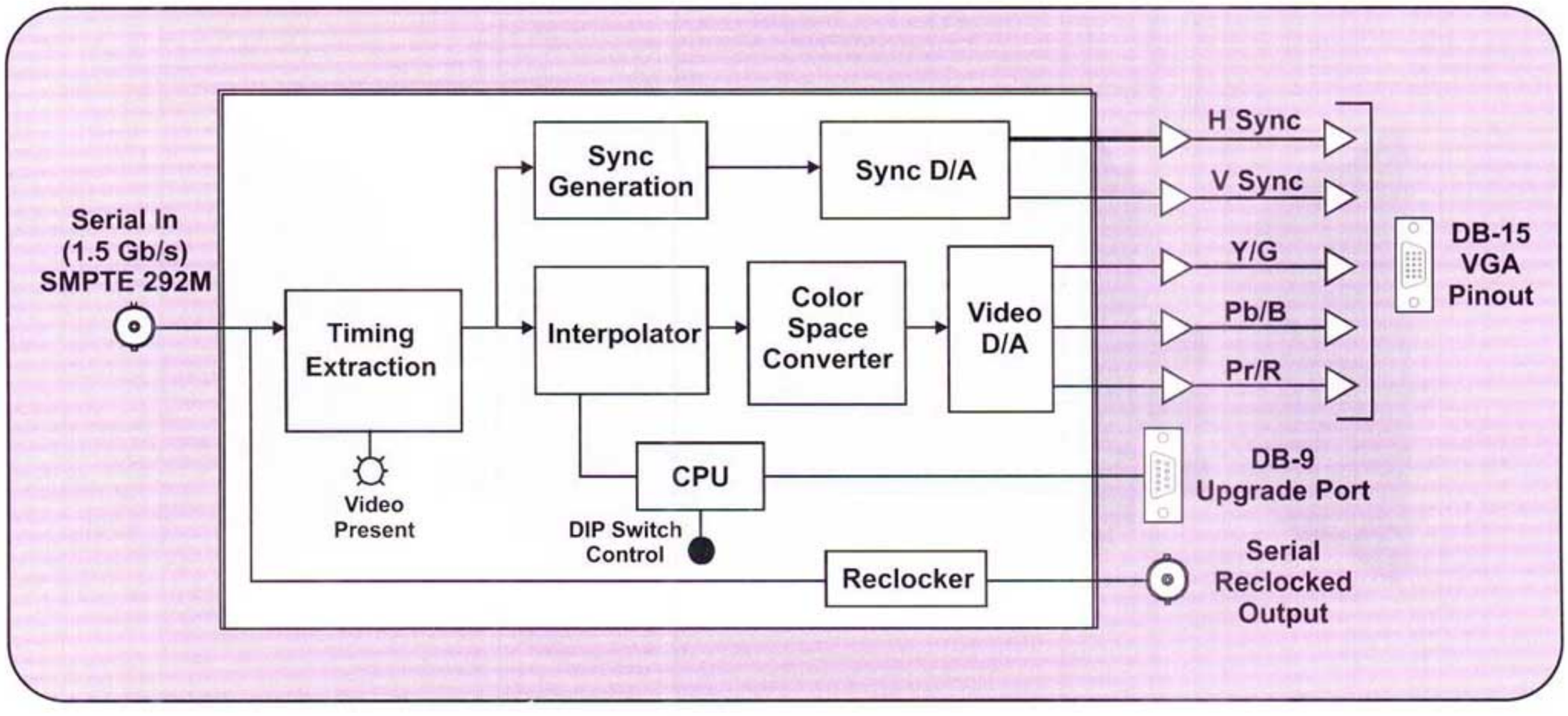
The 2430DAC-HD is a professional quality digital to analog converter for HDTV. The 2430DAC-HD supports all signal standards specified in SMPTE 240M, SMPTE 274M and SMPTE 296M.

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 plates 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)
Connector:	1 BNC per IEC 169-8
Equalization:	Automatic 125m @ 1.5Gb/s with Belden 1694 (or equivalent)

Serial Video Output Reclocked:

Standard:	Same as input
Number of Outputs:	1
Connector:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	200 ps nominal
Overshoot:	<10% of amplitude
Wide Band Jitter:	<0.20UI

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:	75Ω
DC Offset:	0V ±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

HD Miniature Monitoring Downconverter

Model 2410MD-HSN



The 2410MD-HSN Monitoring Downconverter provides an inexpensive method of confidence monitoring your 1.5 Gb/s HDTV 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 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.

Model	HD 1.5 Gb/s Reclocked Outputs (292M)	Down Converted Outputs	
		Component SDI (259M)	Composite Analog (NTSC/PAL)
2410MD-HSN	2	1	2

Features

Indicator LED:

- Signal presence
- Module Status

Down-conversion Format:

- Letter Box
- Side Crop
- 4x3 Squeeze

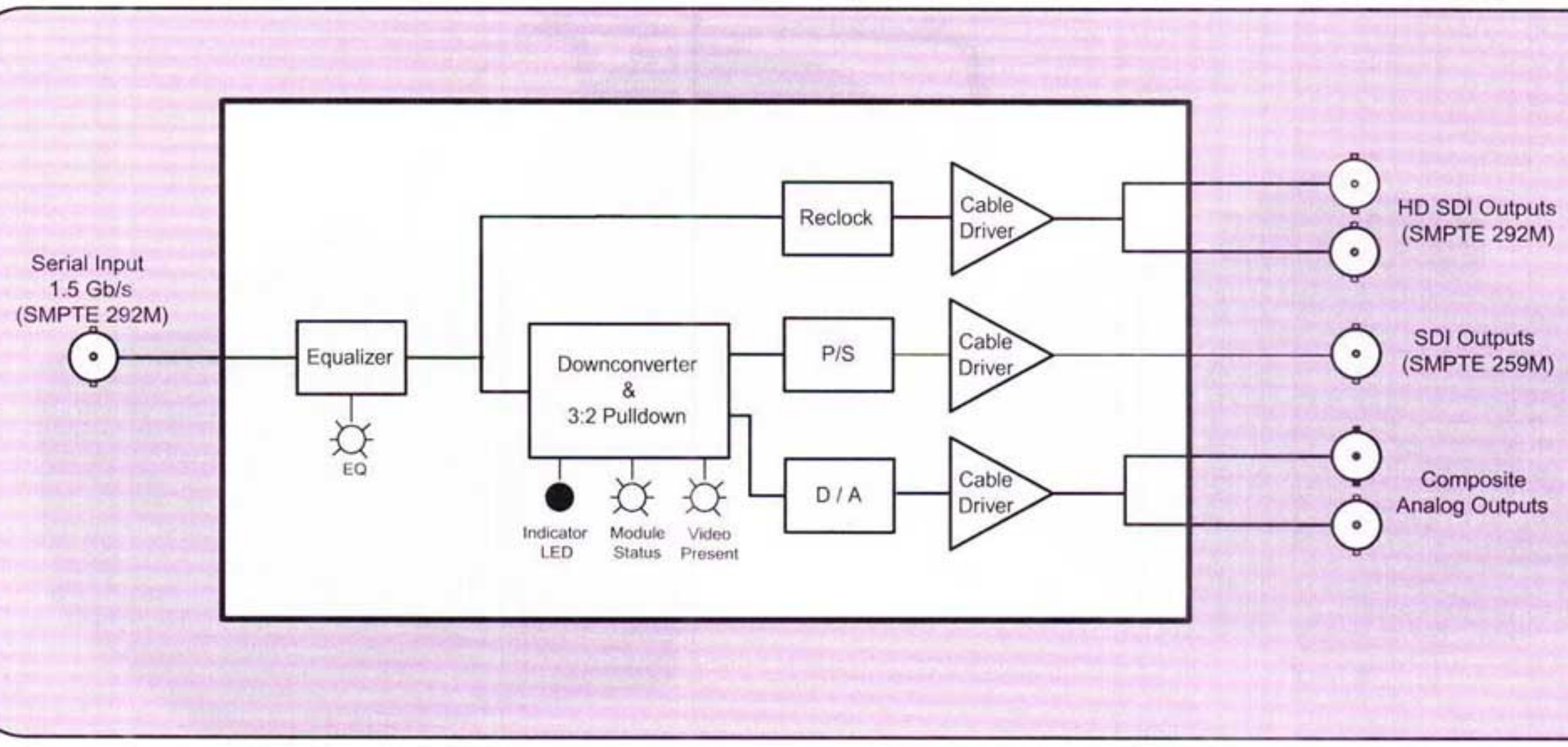
Input:

- 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 & 1080-25sF

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 169-8
Impedance:	75Ω
Equalization:	Automatic 75m @ 1.5Gb/s with Belden 1694 (or equivalent)

HD Reclocked Video Output:

Standard:	Same as input
Connectors:	2 BNC per IEC 169-8
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

SDTV Serial Digital Video Output:

Standard:	Serial component 270 Mb/s (SMPTE 259M-C) 525i/59.94 if input is 1080i/59.94 or 1080p/23.98sF video 625i/50 if input is 1080i/50 or 1080p/25sF
Connectors:	1 BNC per IEC 169-8
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

Analog Video Output:

Standard:	Analog composite NTSC if input is 1080i/59.94 or 1080p/23.98sF video Analog composite PAL if input is 1080i/50 or 1080p/25sF video
Connectors:	2 BNC per IEC 169-8
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 x4" 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

Mobile Fiber Optic System

Model PKG7700MFOS



The PKG7700MFOS is a WDM or 16 wavelength CWDM Mobile Fiber Optic system capable of providing a fiber optic link up to a 50 km (31 mile) range. The system has a capacity for multiple wavelengths on one fiber and is fully bi-directional.

Complete systems consisting of transit cases, frames, TAC-4 fiber optic cable with hermaphroditic connectors, cable reel, and an AC/DC Changeover unit (7700PCO) can be purchased.

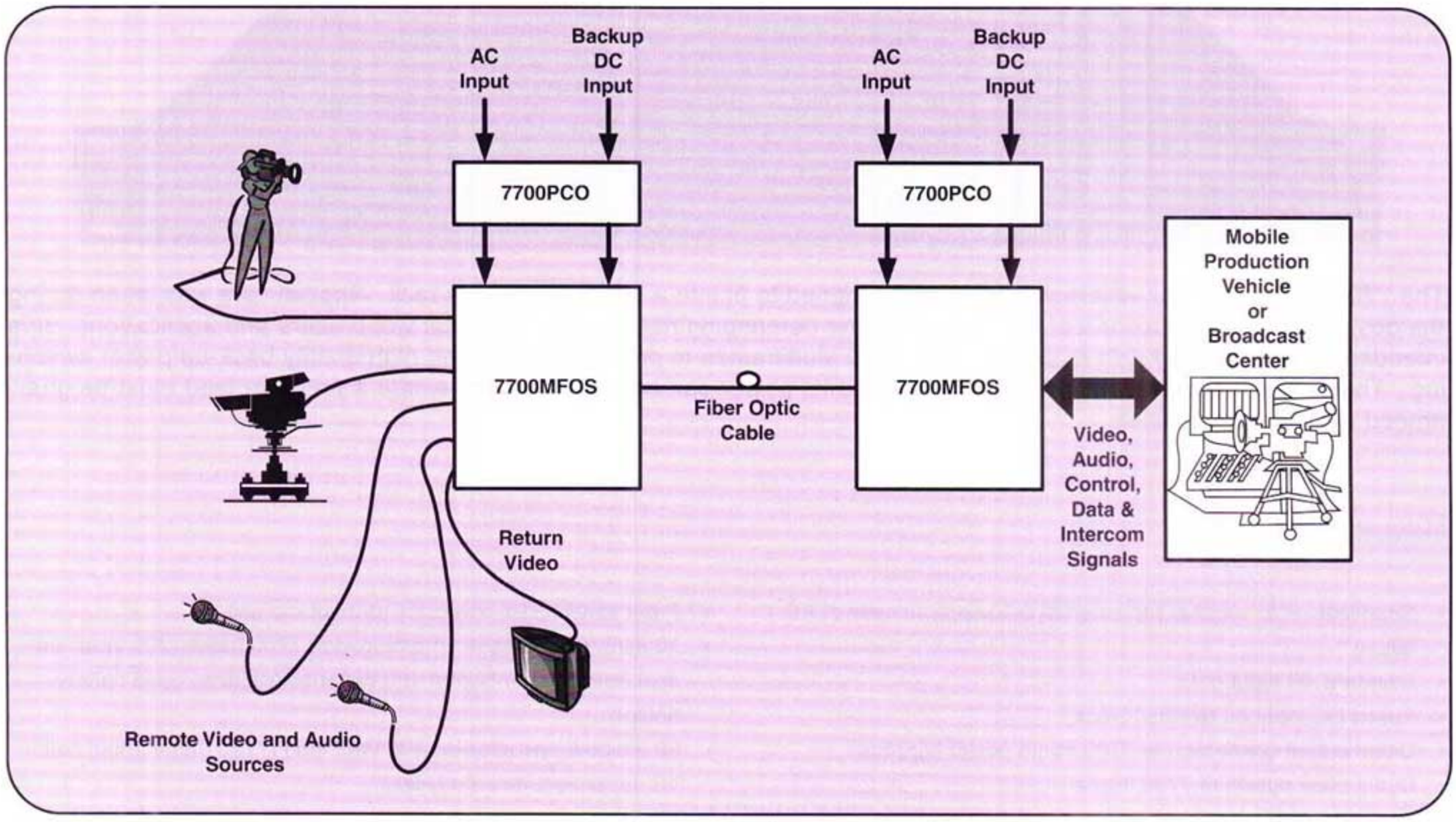
Signal Types Supported:

- 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 - up to 50km range (31 miles)
- WDM or up to 16 wavelength CWDM operation
- Capacity for multiple wavelengths over single fiber
- Fully bi-drectional
- Interference and hum immune
- Many signal types supported
- Easy to set up and use - replaces bulky cable harnesses
- Heavy-duty TAC-4 cable with hermaphroditic connectors
- Complete system - heavy duty transit cases, frames, fiber-optic cable and reel
- Standard Evertz frames - any Evertz 77xx series card can be utilized

PKG7700MFOS Typical Application Diagram



Ordering Information:

Ordering Information:

PKG7700MFOS: Mobile Fiber Optic System housed in the 7700FR-C 3RU Multiframe includes the following:

7700FR-C	3RU Multiframe with power supply and rear plate
MBL-IRC-420	Impact Resistant Transit Case
MBL-IRCBP-TAC4-3-ST	Breakout Cable
MBL-FCR-TAC4-300	Cable Reel with 300 meters of cable

Ordering Options:

Rear Plate and Fiber Connector must be specified at time of order
Eg: Model +SC +3RU

7700PS	Redundant power supply
7700PCO	AC/DC Power Changeover Unit

Connector Suffix

+SC	SC/PC
+ST	ST/PC
+FC	FC/PC

Power Changeover Unit

Model 7700PCO



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 Multiframes to provide reliable and high quality back-up power switching. This is ideal for remote applications where mains power can be intermittent or where a program feed must be guaranteed available 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 LEDs reflect the state of the unit
- 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)

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" (44.5 mm)

Width: 19" (483 mm)

Depth: 11.2" (285 mm)

Weight: Approx 7 lbs (3.2 Kg)

Ordering Information:

Note: *Enclosure with side mount flanges ships standard*

7700PCO Power Changeover Unit

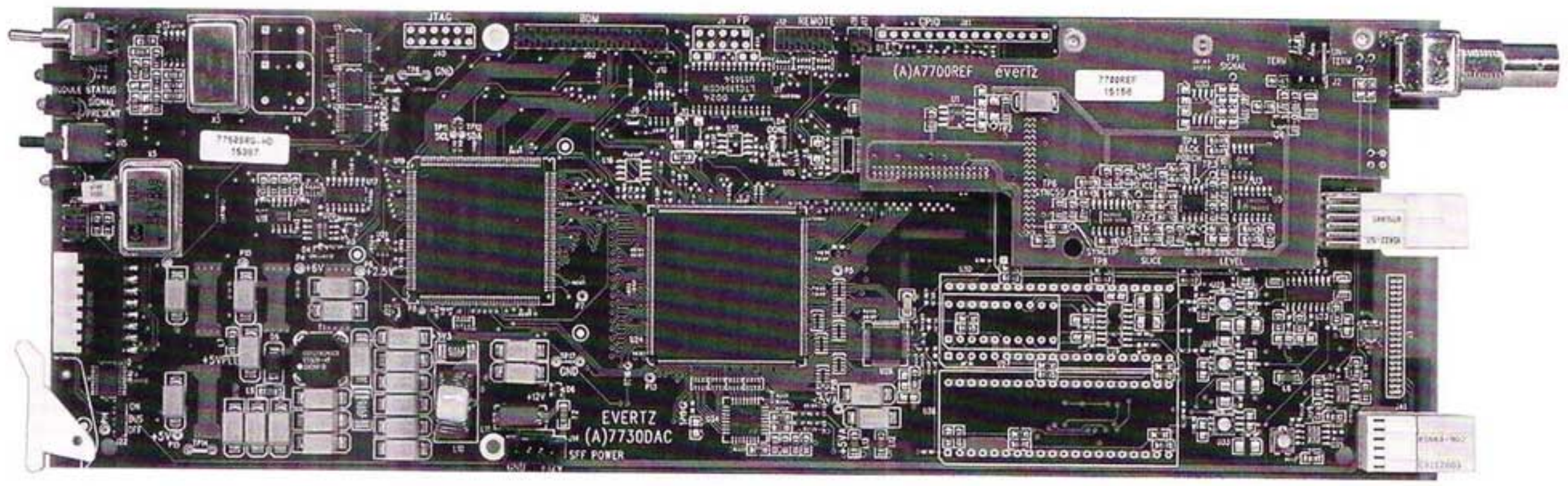
Ordering Options:

IRCBH+AB Anton Bauer Impact Resistant Quad Battery Holder

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HD Tri-Level Sync Generator

Model 7750SRG-HD



The 7750SRG-HD generates various bi-level & tri-level sync signals for both HD and SD applications. The 7750SRG-HD can be referenced to color black (NTSC or PAL) or allowed to free-run.

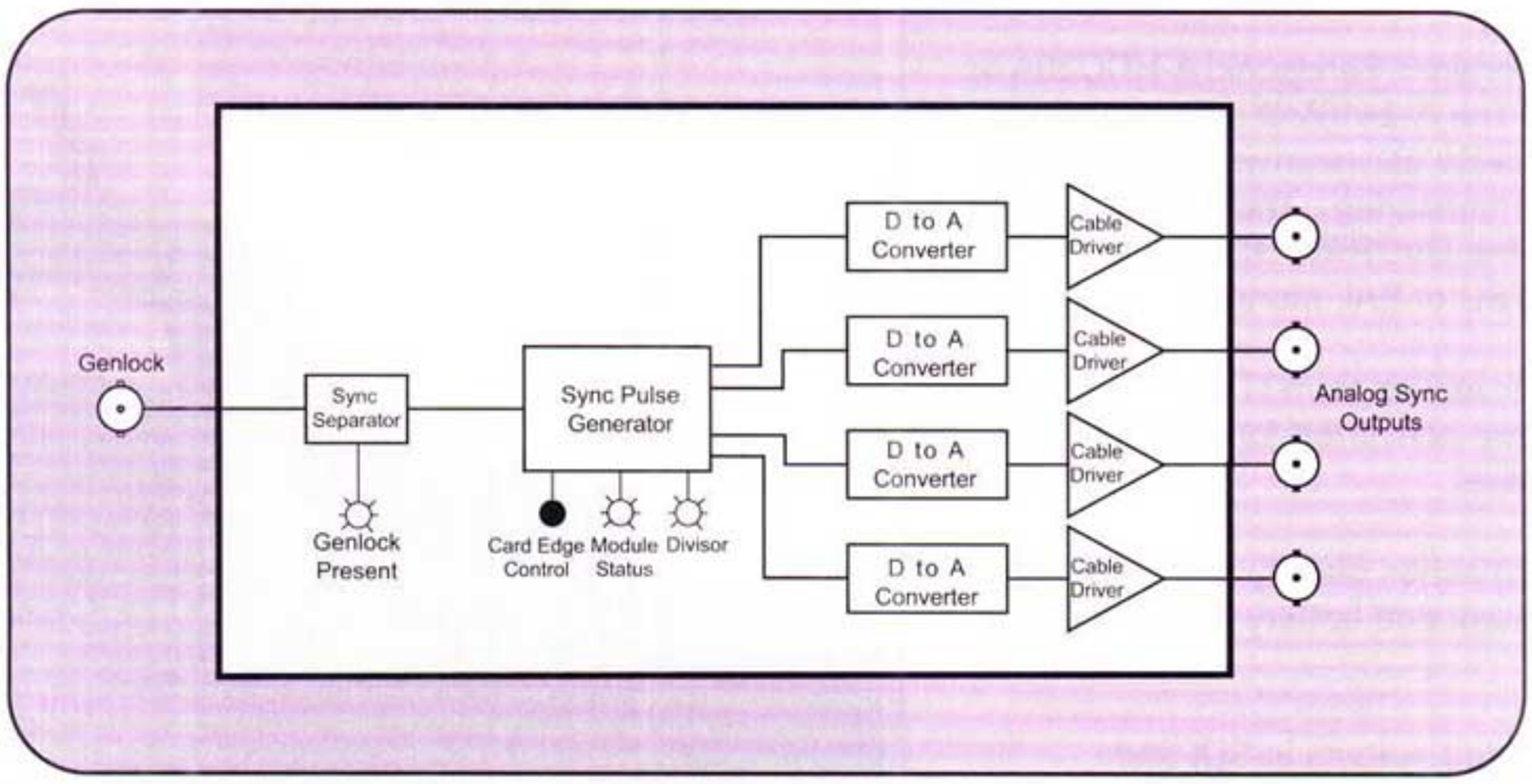
The 7750SRG-HD can generate all analog sync signals defined by SMPTE 274M (1080i/p) and SMPTE 296M (720p) as well as various composite sync signals such as 525i/60, 625i/50 and 625i/48. All common combinations of HD and SD analog sync outputs can be selected via card edge control. (See table)

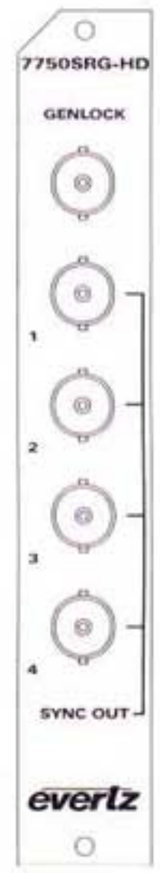
In conjunction with the 7700ADA analog distribution amplifier, this module will fulfill all of your slave sync generation requirements. (Refer to our 7752RGTS-HD system brochure for details on our HDTV Reference Generator Test Set System application)

Features

- Locks to color black NTSC or PAL, or free-runs
- Selectable frame rate divisor of 1 or 1/1.001
- 4 separate analog sync signal outputs
- Wide variety of 1080i, 1035i, 1080p, 720p, 525i/60, 625i/50, 625i/48 composite sync output combinations
- HDSL Data Sync output for dual link data telecine transfers
- 6 Hz or 1 Hz TTL pulse shows relationship between HD & SD Sync outputs
- DIP switch selectable combinations of sync signals (See table)
- Card edge LEDs indicate genlock presence and module fault

Block Diagram 7750SRG-HD





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 169-8
Termination: 75 Ω (jumper selectable)

Analog Sync Outputs:
Number of Outputs: 4
Standard: SMPTE 274M, 296M, NTSC, PAL, 6 Hz TTL, HDSL (Selectable as per above Table)
Connectors: 4 BNC per IEC 169-8
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

PANASONIC DVCPRO HD HDSDI
Monitoring Downconverter Adapter

Model A-2410MD

The A-2410MD is an essential tool for your Panasonic A-HDC20A or A-HDC27V DVCPRO HD Camera. The A-2410MD uses the serial digital output from the camera to provide downconverted composite analog outputs for local and remote monitoring. The A-2410MD supports all the HD video formats from the DVCPRO HD camera to allow signal viewing on standard NTSC or PAL monitors.

The A-2410MD has colour space conversion from ITU rec. 709 to ITU rec. 601, and provides three down converted formats: letterbox, 4:3 side crop and anamorphic squeeze.

The rugged, lightweight A-2410MD attaches directly to the rear of the DVCPRO HD camera and has an integrated battery mount for easy installation and use.

The A-2410MD provides downconverted outputs in SDI and NTSC/PAL. With its fixed out algorithm, the A-2410MD provides a constant NTSC or PAL output regardless of the camera's capture frame rate.



Features

Input:

- Mounts on the rear of the Panasonic A-HDC20A or A-HDC27V camera
- HDSDI from Panasonic camera
- Auto input standard detect

Down-converter Outputs:

- 2 SDI and 2 Composite Analog Outputs
- Letter box, side cut, squeeze formats
- 4:3 markers
- ITU rec. 709 to ITU rec. 601 color space conversion

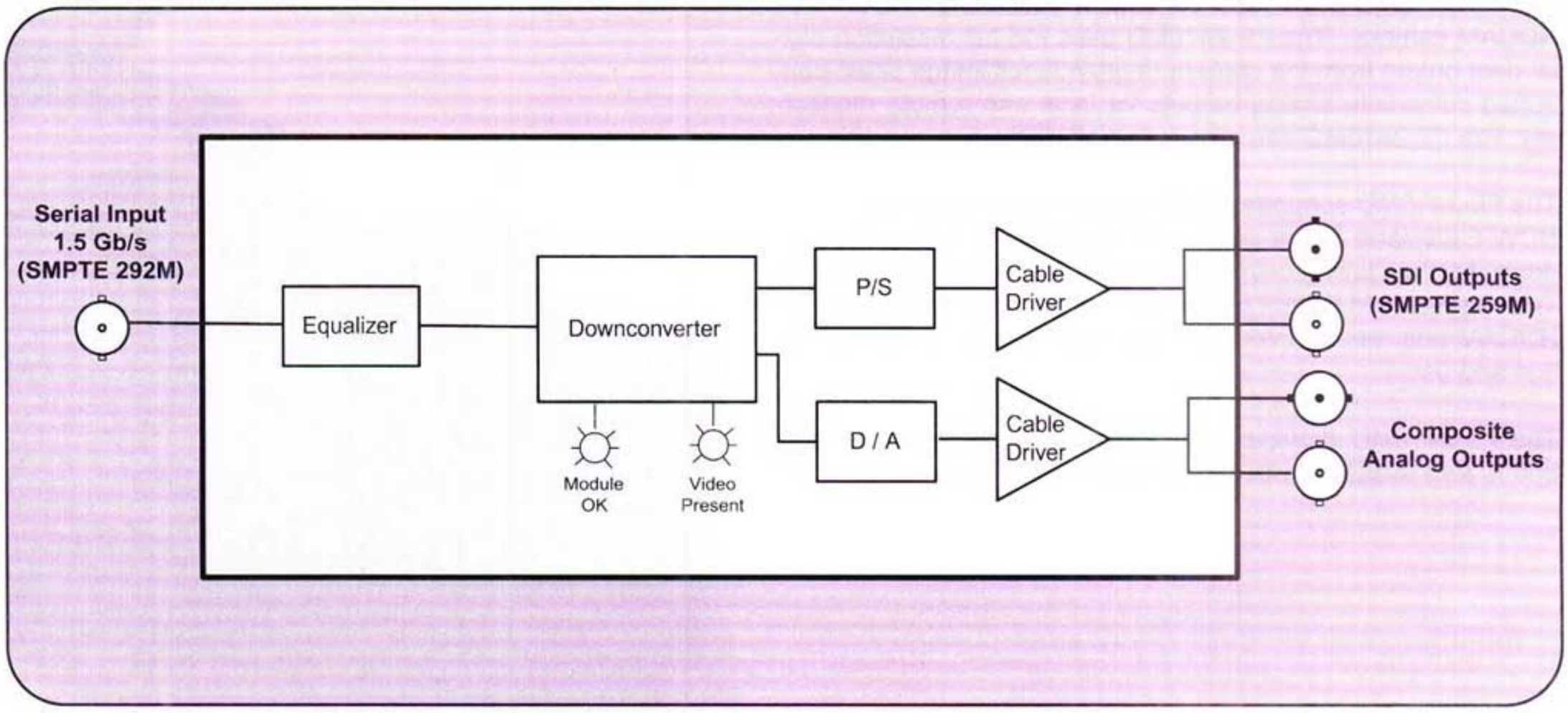
Power:

- 12VDC input from battery connector or Ext. DC Connector passed on to the camera
- Supports Anton Bauer, V-Groove Lithium and PAG Batteries

Status Indicators:

- Video Input Present
- Module Operating OK

A-2410MD Block Diagram



Specifications

Video Input:

Standard:	1.485 Gb/sec SMPTE 292M - autodetect All standards supported in A-HDC20A and A-HDC27V cameras
Connector:	1 BNC per IEC 169-8

SDI Serial Video Outputs:

Standard:	Serial component 270 Mb/s (SMPTE 259M-C)
Connectors:	2 BNC per IEC 169-8
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

Analog Video Outputs:

Number of Outputs:	2
Standard:	NTSC or PAL
Connectors:	2 BNC per IEC 169-8
Signal Level:	1 V p-p nominal
DC Offset:	0V ±0.1V
Return Loss:	> 45 dB up to 6 MHz

Electrical:

Voltage:	+ 12VDC - powered from battery Pack adapter or external DC
Connector:	4 pin male XLR
Power:	10 watts
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Physical:

Dimensions:	6 " H x 6 " W x 2.25 " D (150 mm H x 150 mm W x 60 mm D)
Weight:	approx. 1.5 lbs. (0.7 Kg)

Ordering Information:

(Battery adapter must be ordered with A-2410MD. Please specify correct part number when placing order)

A-2410MD-SN	Panasonic DVCPRO HD HDSDI Monitoring Downconverter

Ordering Options

Battery Adapter Plate must be specified at time of order
Eg: Model + AB

Battery Suffix

+AB	Anton Bauer Battery Adapter
+IDX	V Groove Sony Battery Adapter
+PAG	PAG Battery Adapter

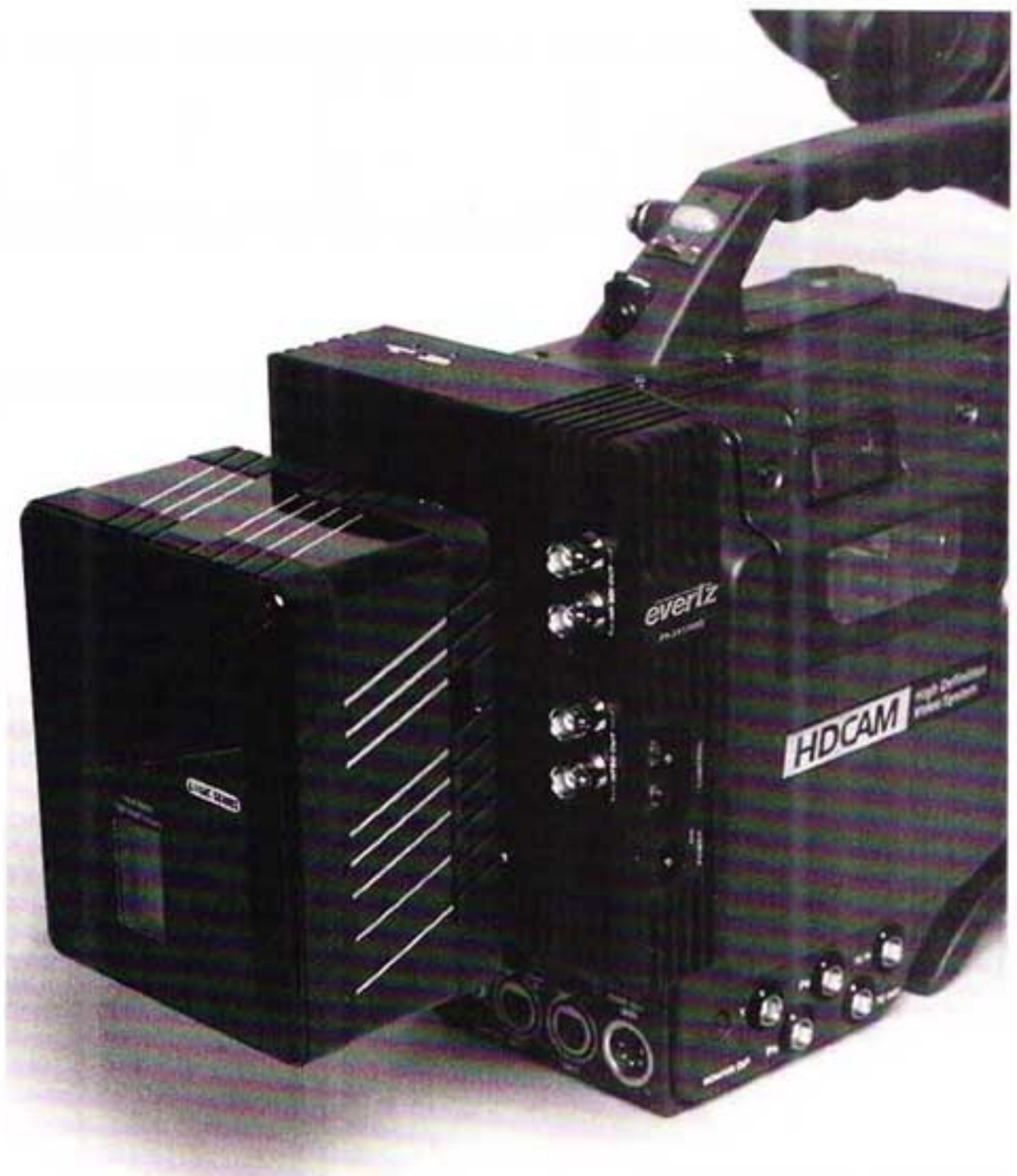
SONY HDCAM HDSDI
Monitoring Downconverter Adapter

Model F9-2410MD

The F9-2410MD is an essential tool for your SONY HDW-F900 HDCAM camera. The F9-2410MD uses the full resolution digital data output from the camera to provide full image down-converted composite analog outputs for local and remote monitoring. The F9-2410MD can also output HDSDI.

The F9-2410MD supports all HD video formats from the HDW-F900, and in the case of 1080p/24sF will do a 3:2 pull-down on the down-converted outputs for flicker free viewing. The rugged, light weight F9-2410MD attaches to the rear of the HDCAM and has an integrated battery mount for easy installation and use.

The F9-2410MD provides two analog downconverted outputs and is also available with two optional HDSDI outputs.



Features

Input:
- Mates with the 50 pin connector on the rear of the Sony FW900 camera when mounted
- Auto input standard detect

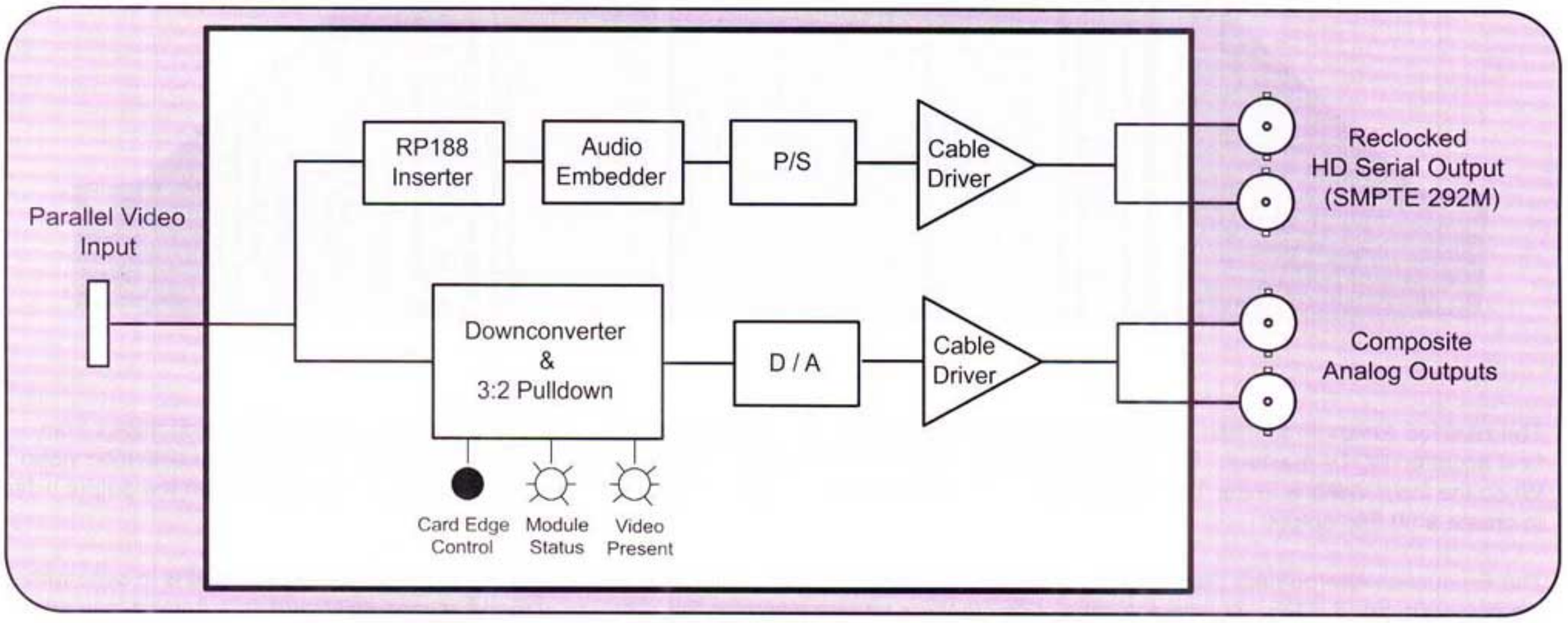
Down-converter Outputs:
- 2 composite analog NTSC or PAL outputs
- Letter box, side cut, squeeze formats
- 4:3 markers
- ITU rec. 709 to ITU rec. 601 color space conversion

HD Output:
- 2 SMPTE 292M outputs with embedded audio and RP188 time code

Power:
- 12VDC input from battery connector or Ext DC Connector passed on to the camera
- Supports Anton Bauer, Sony Lithium and PAG Batteries

Status Indicators:
- Video Input Present
- Module Operating OK

F9-2410MD Block Diagram



Specifications

Video Input:

Standard:	1080i/60, 1080i/59.94, 1080i/50, 1080p/25sF 1080p/24sF and 1080p/23.98sF
Connector:	50 pin camera connector

HDTV Serial Digital Video Outputs:

Standard:	SMPTE 292M
Connector:	2 BNC per IEC 169-8
Impedance:	75Ω
Signal Level:	800mV ±10%
Rise and Fall Time:	200ps nominal
Overshoot:	<10% of amplitude
Wide Band Jitter:	< 0.2 UI

Analog Video Outputs:

Number of Outputs:	2
Standard:	NTSC or PAL
Connectors:	2 BNC per IEC 169-8
Signal Level:	1 V p-p nominal
DC Offset:	0V ±0.1V
Return Loss:	> 45 dB up to 6 MHz

Electrical:

Voltage:	12 VDC from Camera Battery
Power:	10 Watts
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Physical:

Dimensions:	6 " H x 6 " W x 2.25 " D (150 mm H x 150 mm W x 60 mm D)
Weight:	approx. 1.5 lbs. (0.7 Kg)

Ordering Information:

F9-2410MD-HN	Sony HDCAM HDSDI Monitoring Downconverter with 2 composite analog (NTSC/PAL) and 2 HD 1.5Gb/s outputs

Ordering Options

Battery Adapter Plate must be specified at time of order
Eg: Model + AB

Battery Suffix	
+AB	Anton Bauer Battery Adapter
+IDX	V Groove (Sony) Battery Adapter
+PAG	PAG Battery Adapter

HD Production Afterburner

Model HD9155, HD9155-AUD, HD9155Q, HD9155Q-AUD



The HD9155 Series Production Afterburners are a family of powerful devices designed to facilitate the creation of off-line videotapes from field acquired HDTV masters. The Production Afterburner downconverts the HDTV input video to SDI and analog standard definition video. When the input video is in the 1080p/24sF format the HD9155 Series Production Afterburners also create a 2:3 pulldown on the output video to create a 30 Fps output.

The Production Afterburners read the LTC or RP188 ancillary time code and make burn-in windows and new time code that is in sync with the downconverted video. The original time code 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 time code or from the LTC. The Production Afterburners automatically generate video time code for the standard definition VTR that is converted from 24 to 30 Fps, and delayed to match the complete A frame cycle of video delay through the Production Afterburner.

The HD9155 series Production Afterburners can be easily configured using 9150 Configware™ software utility supplied with the unit. These graphical software interfaces allow the user to store multiple configurations for the HD9155 and load them as required.

The HD9155 Series Production Afterburners are available in two downconverter qualities. The original HD9155 versions have a monitoring downconverter and provide two SDI and two analog downconverted outputs with characters and VITC suitable for on the set monitoring or compressed digitisation in an non-linear editing system. The HD9155Q versions have a high quality downconverter and provide two clean SDI downconverted outputs with VITC suitable for creation of high quality viewing copies. The HD9155Q versions also provide one SDI and one analog monitoring output with VITC and Characters suitable for on the set monitoring or creation of tapes for non-linear editing systems.

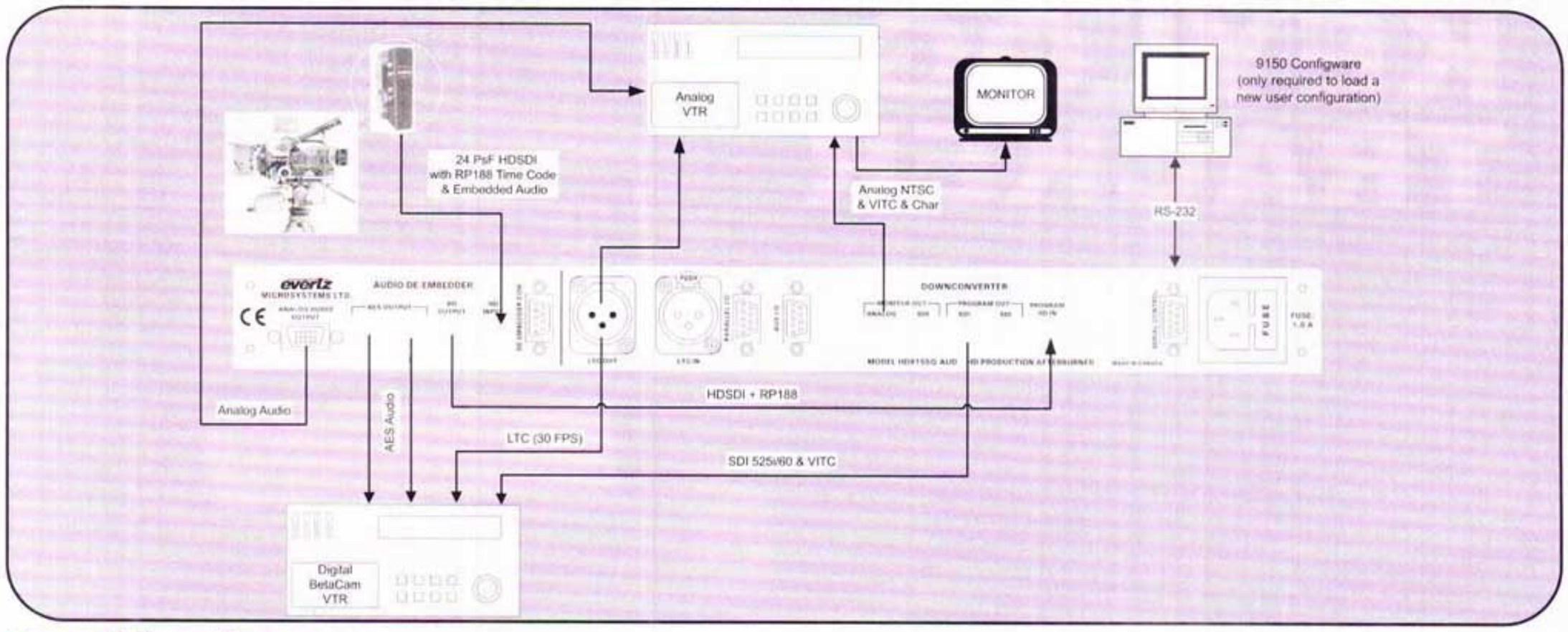
When the AUD option is installed (model HD9155-AUD and HD9155Q-AUD), the Production Afterburner now has the ability to de-embed AES audio from the incoming HD bitstream, and delay it so that it is in time with the output video from the downconverter. The AUD option provides 2 AES outputs and 4 analog audio outputs and a front panel headphone jack for monitoring the audio.

(For Post Production Version Refer to Model HD9150PS)

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
- Reads RP188 ancillary time code or LTC
- Character inserter for display of time and user bits as well as picture 2:3 pulldown
- Creates 2:3 pulldown when downconverting 1080p/23.98sF video to NTSC.
- 2:3 cadence is determined from a 6Hz pulse input, RP188 time code or LTC
- Converts aspect ratio from 16:9 to 4:3 in anamorphic, letterbox or centre crop mode
- LTC time code reader and generator converts 24 Fps to 30 Fps and re-times the time code to the output video
- AUD versions provide AES and analog audio delayed to match the video output
- AUD versions provide front panel monitoring of audio with volume control
- Front panel switches for downconverter mode, Char Inserter On/Off and Configuration Select, (and monitor volume & channel select on AUD version)
- User defined configurations can be downloaded using 9150 Configware™ software (included)

HD9155 Configuration for 1080p/24sF



Specifications

HDTV Serial Digital Video Input:

Standard:	SMPTE 292M, 1080i/50, 1080i/59.94, 1080p/23.98sF, 1080p/25sF, 720p/59.94 software selectable or autodetect
Connector:	1 BNC per IEC 169-8
Equalization:	Automatic to 130m @ 1.5Gb/s with Belden 1694 or equivalent cable

SDTV Serial Digital Video Output:

Standard:	Serial component 270 Mb/s (SMPTE 259M-C) 525i/59.94 if input is 1080i/59.94, 1080p/23.98sF or 720p/59.94 625i/50 if input is 1080i/50, 1080p/25sF
Connectors:	BNC per IEC 169-8
Standard version:	2 monitor
"Q" Version:	2 program, 1 monitor
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	900ps nominal
Overshoot:	<10% of amplitude
Return Loss:	> 15 dB
Wide Band Jitter:	< 0.2 UI

Analog Monitor Video Output:

Standard:	Analog composite NTSC if input is 1080i/59.94, 1080p/23.98sF or 720p/59.94 video Analog composite PAL if input is 1080i/50 or 1080p/25sF video
Connectors:	BNC per IEC 169-8
Standard version:	2
"Q" Version:	1
Signal Level:	1 V p-p nominal, internally adjustable
DC Offset:	0V ±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:	75Ω

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

Ancilliary Time Code Reader:

Standard:	SMPTE RP188
Line Select:	Autodetect valid lines in vertical interval
Frame Rate:	24, 25 and 30 Fps nominal

AES Audio Outputs (HD9155-AUD & HD9155Q-AUD Only):

Number of Outputs:	2 AES
Standard:	SMPTE 276M, single ended synchronous or asynchronous AES
Connectors:	BNC per IEC 169-8
Sampling Rate:	48 kHz
Impedance:	75Ω unbalanced

Analog Audio Outputs (HD9155-AUD & HD9155Q-AUD Only):

Number of Outputs:	4
Type:	Balanced analog audio
Connector:	Female HD DB15
Output Impedance:	66 Ω balanced
Sampling Frequency:	48kHz
Signal Level:	0dB FS =>8 to 24dBu into 10 kΩ loads 0dB FS =>8 to 22dBu into 600 Ω loads
Frequency Response:	< ± 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)

Serial Remote Control:

Standard:	RS-232, 57600 baud
Connector:	9 pin female "D"
Control:	Computer control of all functions

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)

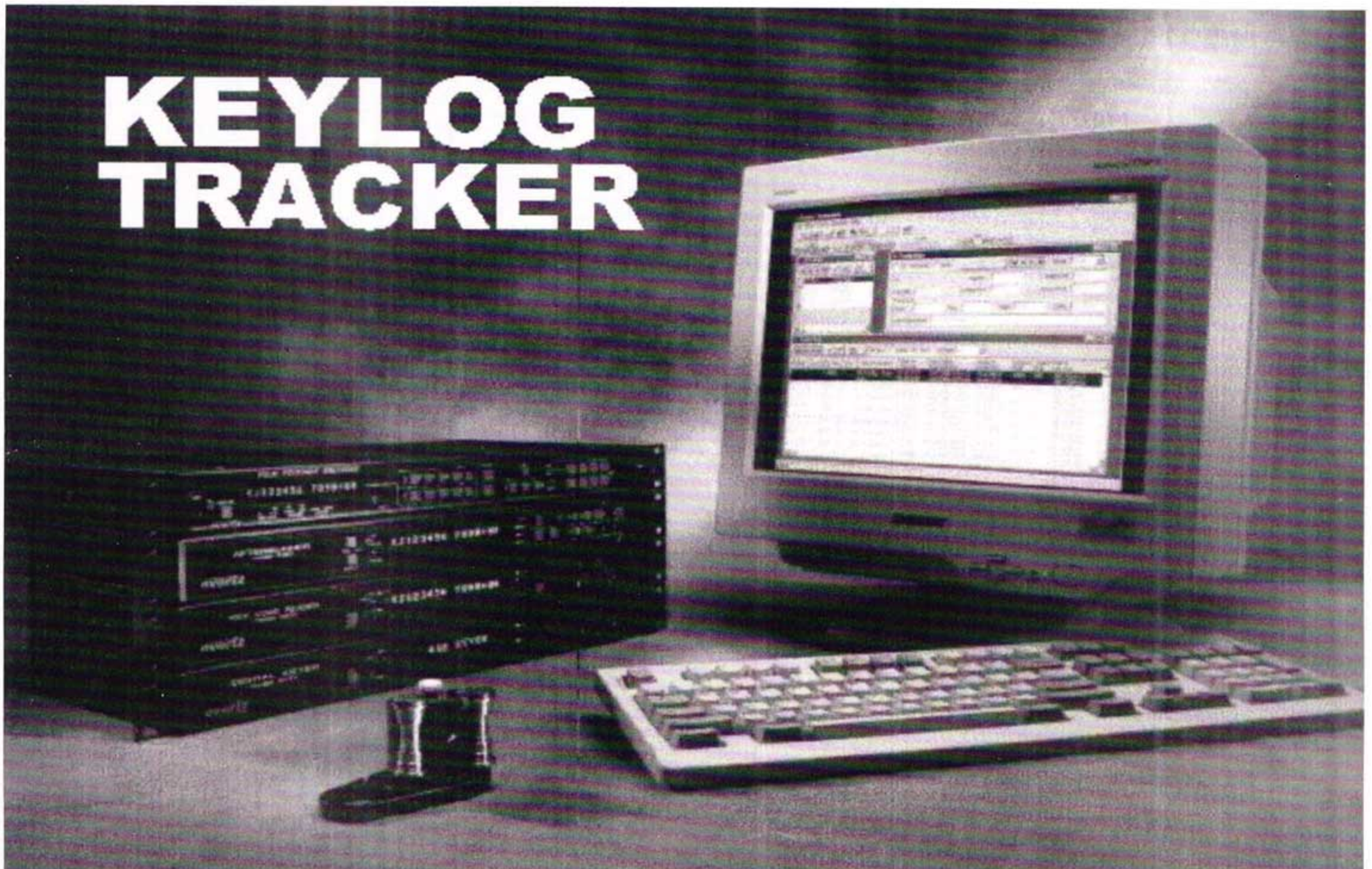
Electrical:

Power:	Auto ranging 100-240VAC 50/60 Hz 30 VA
Safety:	ETL listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

HD9155	HD Production Afterburner
HD9155-AUD	HD Production Afterburner with AES & Analog Audio (includes HD DB-15 to XLR breakout cable)
HD9155Q	HD Production Afterburner with High Quality Downconverter
HD9155Q-AUD	HD Production Afterburner with High Quality Downconverter, AES & Analog Audio (includes HD DB-15 to XLR breakout cable)
HDQ UPGRADE	Upgrade for HD9155 products to HD9155Q

KEYLOG TRACKER



The Evertz Film Post Production System helps you keep track of all aspects of your Film to Tape transfer session.

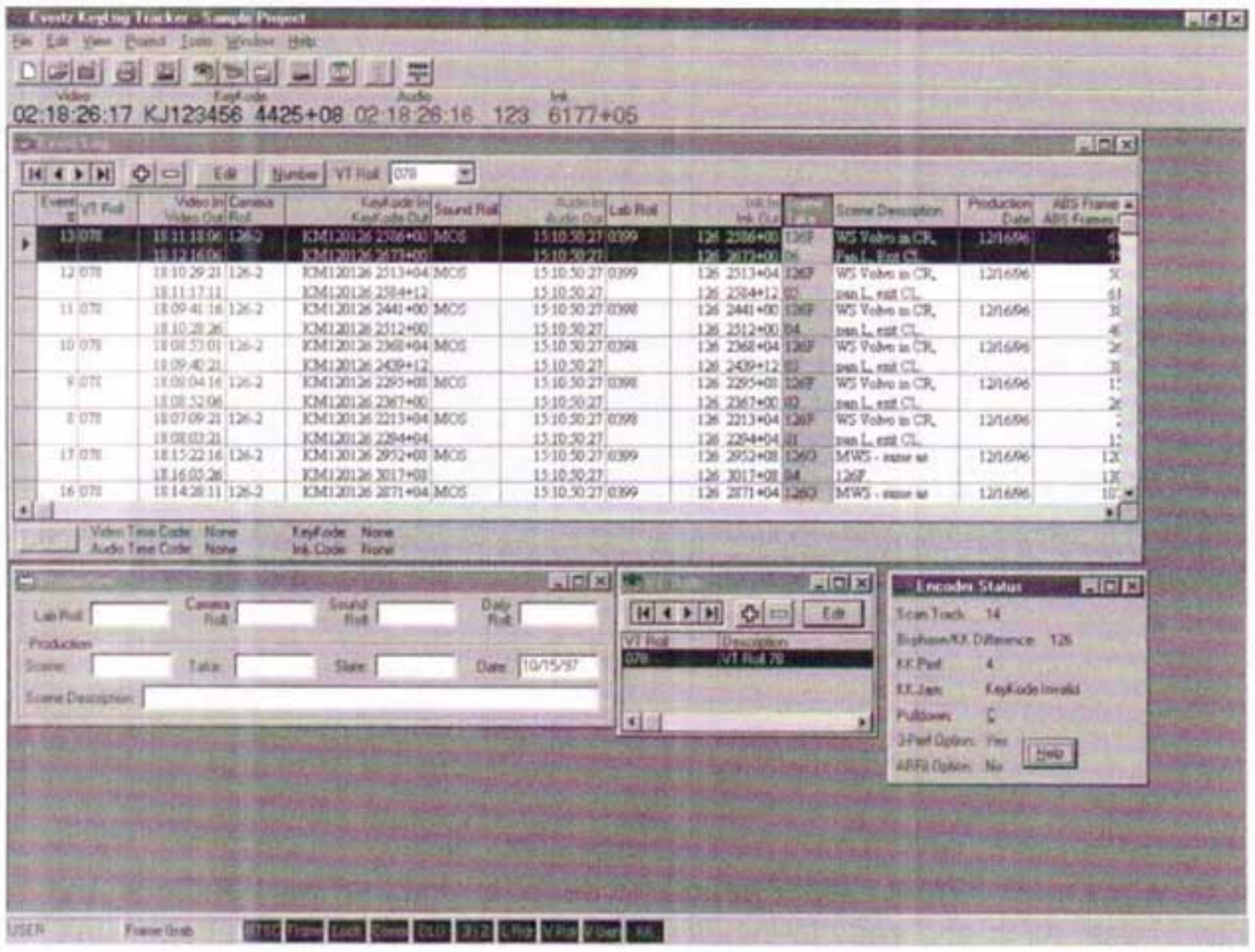
KEYLOG TRACKER is an intuitive graphical user interface that provides more flexibility to the Evertz Film Post Production System than ever before.

KEYLOG TRACKER (which runs on standard Windows 9X capable computer hardware) gives you access to a host of new capabilities for the system including more character windows, simultaneous KeyKode and Ink number handling, and several new Time code modes to mention a few.

KEYLOG TRACKER centralizes the control of your current hardware, performs frame accurate logging of Video and Audio Time codes, KeyKode, Ink numbers, 3/2 pulldown, and related production data, and provides extensive database management capabilities for the resulting project data. The Evertz Film Post Production System uses function specific hardware units to perform the bulk of the real time processing. This dedicated hardware reads and generates Video Time code, reads KeyKode and Film Time code, inserts Vertical Interval Time code and character burn-ins into analog and digital program video, and keeps track of the 3/2 pulldown under the control of **KEYLOG** TRACKER.

evertz

Keylog Tracker



Character Windows

KEYLOG TRACKER gives you access to 12 separate character windows to display Video Time code, Audio Time code, KeyKode, 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 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 KeyKode 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 KeyKode 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, KeyKode or Ink numbers to name a few.

The Event Tracker allows you to trim time codes, KeyKode 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:
  Win98 Second Edition (recommended)
  Win95B, WinNT 4 SP 4 or later, Win 2000,
  Win XPPro
- RAM: 128 MB recommended,
  64 MB minmum
- 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 4025TR and 9025 Series Film Footage Encoders. Upgrades available for older systems. Contact factory.

Model *5550* Decoder & UV-3 Universal Film Data Reader



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 KeyKode reader heads can be mounted on a telecine or other film transport, to recover KeyKode 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 KeyKode 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, Philips, ITK and Sony Telecines and Flat beds etc. The universal mounting bracket offers easy to use rotational positioning for hassle free installation
- The KeyKode/Film Time code heads can be ordered in different configurations depending on your application
- The head "floats" laterally on precision guides to assure perfect KeyKode 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 Touch-less 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 Phillips Spirit, ITK Millennium and Cintel C-Reality
- 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 KeyKode and Film Time code at speeds other than play speed in forward and reverse
- Front panel display of KeyKode or Film Time code.
- Automatic sensor intensity control is especially useful when tracking various film densities on a single roll
- Separate intensity controls for KeyKode and Film Time code
- 16 digit alpha-numeric front panel display
- 19" rackmountable hardware

KeyKode Reader Heads

The Evertz Universal Film Data reader system can be used with any of the Evertz Film Footage Encoders to encode KeyKode & 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 KeyKode 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	Keykode	ARRI	Aaton	Touchless
KR-65			B	B			
KR-16/35	B	B		B			
UV-3	B	B		B	B	B	
UVT-3	B	B		B	B	B	B
UVS-3*	B	B		B	B	B	B

*SpecialV ersionforSonyT elecine

Specifications

Multi-Function Reader Head Interface (UV series head):
Connector: 15 pin High Density female "D"
Max. Cable Length: 50 feet

KeyKode Reader Head Interface (KR series heads):
Connector: 8 pin miniature female DIN
Max. Cable Length: 50 feet

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 VA.
Safety: ETL Listed
Complies with EU safety directive
EMI/RFI: Complies with FCC Part 15 Class A,
EU EMC Directive

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)

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

Reader Heads may be ordered separately. (Does not include mounting bracket or cable) (See model selection chart above)

Accessories:

EV-BRKT	Universal Reader Mounting Bracket
FDL-SHIMS	Shim kit for BTS, FDL 60/90, Quadra
CINTEL-SHIM	Shim kit for Cintel C-Reality 16/35 heads
WA-S19	C-Reality Cable Harness
WA-F49	50ft extender cable for KR series heads
WA-P57	50ft extender cable for UV series heads
KKFILM16MM	16mm Kodak Keykode Verification Film
KKFILM35MM	35mm Kodak KeyKode Verification Film

SD Film Footage Encoder

Model SD9025TR



The SD9025TR Film Footage Encoder is designed to simplify the management of your film to tape transfers for standard definition video. Under control of the powerful KeyLog Tracker™ software, the SD9025TR Film Footage Encoder permits the seamless integration of video and audio time code, film KeyKode and production information whether you are transferring to 25 or 30 Fps standard 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.

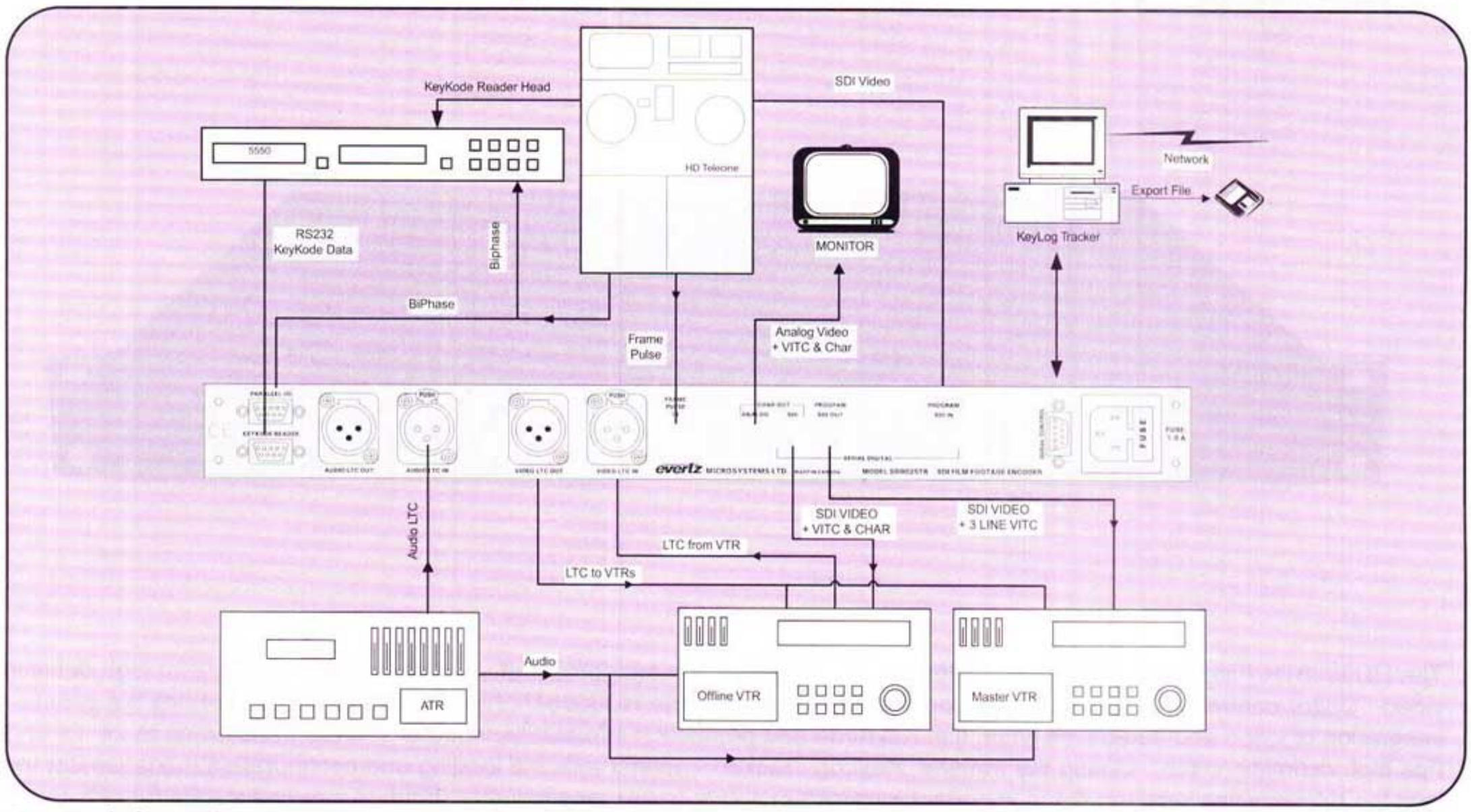
The SD9025TR encodes the time code and KeyKode into SMPTE RP201 3-line VITC on one SDI output, and provides separate SDI and analog outputs with VITC and burned in characters for offline editing copies. Separate LTC inputs and outputs for the audio and video timecodes, allows handling of mixed film rate and video rate time code. The programmable telecine interface allows the encoder to interface to a wide variety of telecine configurations.

The SD9025TR can be easily configured using the KeyLog Tracker™ software supplied with the unit. This graphical user interfaces allow the user to store multiple configurations for the SD9025TR.

Features:

- Accepts SMPTE 259M (270 Mb/s), 525i/59.94 and 625i/50
- Encodes video and audio time code, KeyKode, pulldown and other film transfer information in SMPTE RP201 3-line VITC on program SDI output
- Over 20 Character burn-in windows for time codes, KeyKode, and other film transfer information can be enabled continuously or as a virtual slate at the start of each event on offline SDI and analog video outputs
- Interfaces to Evertz 5550 or 5500 KeyKode Readers
- Separate LTC generators for video and audio time code operating at 30 and 25 Fps can be slaved to telecine bi-phase or incoming LTC on the video and audio LTC readers
- Multiple project configurations can be stored and recalled to facilitate easy setup of the system from job to job using the Evertz KeyLog Tracker™ software
- Transfers can be logged using GPI, Frame Grab or preselected log points using the Evertz KyeLog Tracker™ software
- Programmable Telecine interface supports all popular telecines

SD9025TR Typical Configuration



Specifications

SDTV Serial Digital Video Input:

Standard:	SMPTE 259M-C (270 Mb/s) 525i/59.94 or 625i/50
Connector:	BNC per IEC 169-8
Equalization:	Automatic to 200m @ 270 Mb/s with Belden 8281 (or equivalent)
Return Loss:	> 15 dB up to 270 Mb/s

SDTV Serial Digital Video Output:

Standard:	Same as Input
Connectors:	BNC per IEC 169-8
Outputs:	1 Program with RP201 3-line VITC 1 Character output with RP201 3-line VITC and Character Burn-ins
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	900ps nominal
Overshoot:	<10% of amplitude
Return Loss:	> 15 dB
Wide Band Jitter:	< 0.15 UI

Analog Monitor Video Output:

Standard:	Analog composite NTSC if input is 525i/59.94 Analog composite PAL if input is 625i/50
Connectors:	BNC per IEC 169-8
Output:	1 Character output with RP201 3-line VITC and Character Burn-ins
Signal Level:	1 V p-p nominal, internally adjustable
DC Offset:	0V ±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)

LTC Generators:

Standard:	SMPTE 12M
Frame Rate:	25 and 30 Fps nominal
Connectors:	3 pin male XLR type connector.
Level:	Adjustable, 0.5V to 4.5V p-p

LTC Readers:

Standard:	SMPTE 12M
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

Telecine Interface:

Bi-Phase Tach:	1, 2, 5 or 10 pulses per frame, TTL level
Frame Pulse:	1.6 Vpp active low, (1 pulse per film frame) or TTL Level FRID (1 edge per film frame)

Parallel I/O Interface:

Inputs (default):	Film Transfer Rate (24/30 Fps), Video Standard Select Film Frame Centering, Event Log GPI
Connector:	9 pin female "D"

KeyKode Reader Interface:

Standard:	RS-232, 9600 or 38400 baud, 7 bit even parity. Compatible with Evertz, ARRI, CP and RIM decoders
Connector:	9 pin female "D"
Control:	Computer control

KeyLog Tracker™ Interface:

Standard:	RS-232, 57600 baud
Connector:	9 pin female "D"
Control:	Computer control of all functions using KeyLog Tracker™ software

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 30 VA
Safety:	ETL Listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

SD9025TR	SD Film Footage Encoder (Including KeyLog Tracker)
SD9025TR/5500/UV-3	SD Film Footage Encoder System including KeyLog Tracker, KeyKode Decoder and UV-3 Head

Ordering Options:

Vista Vision	Vista Vision option for Film Footage Encoders
65/70MM	65mm/70mm option for Film Footage Encoders
2 Perf	35mm 2 perf option for Film Footage Encoders

HD Film Footage Encoder

Model HD9025TR



The HD9025TR Film Footage Encoder is designed to simplify the management of your film to tape transfers for high definition video. Under control of the powerful KeyLog Tracker™ software, the HD9025TR Film Footage Encoder permits the seamless integration of video and audio time code, film KeyKode and production information whether you are transferring to 24, 25 or 30 Fps 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.

The HD9025TR encodes the time code, KeyKode and production information in SMPTE RP215 VANC data. Separate LTC inputs and outputs for the audio and video time code, allows handling of mixed film rate and video rate time code. The programmable telecine interface allows the encoder to interface to a wide variety of telecine configurations.

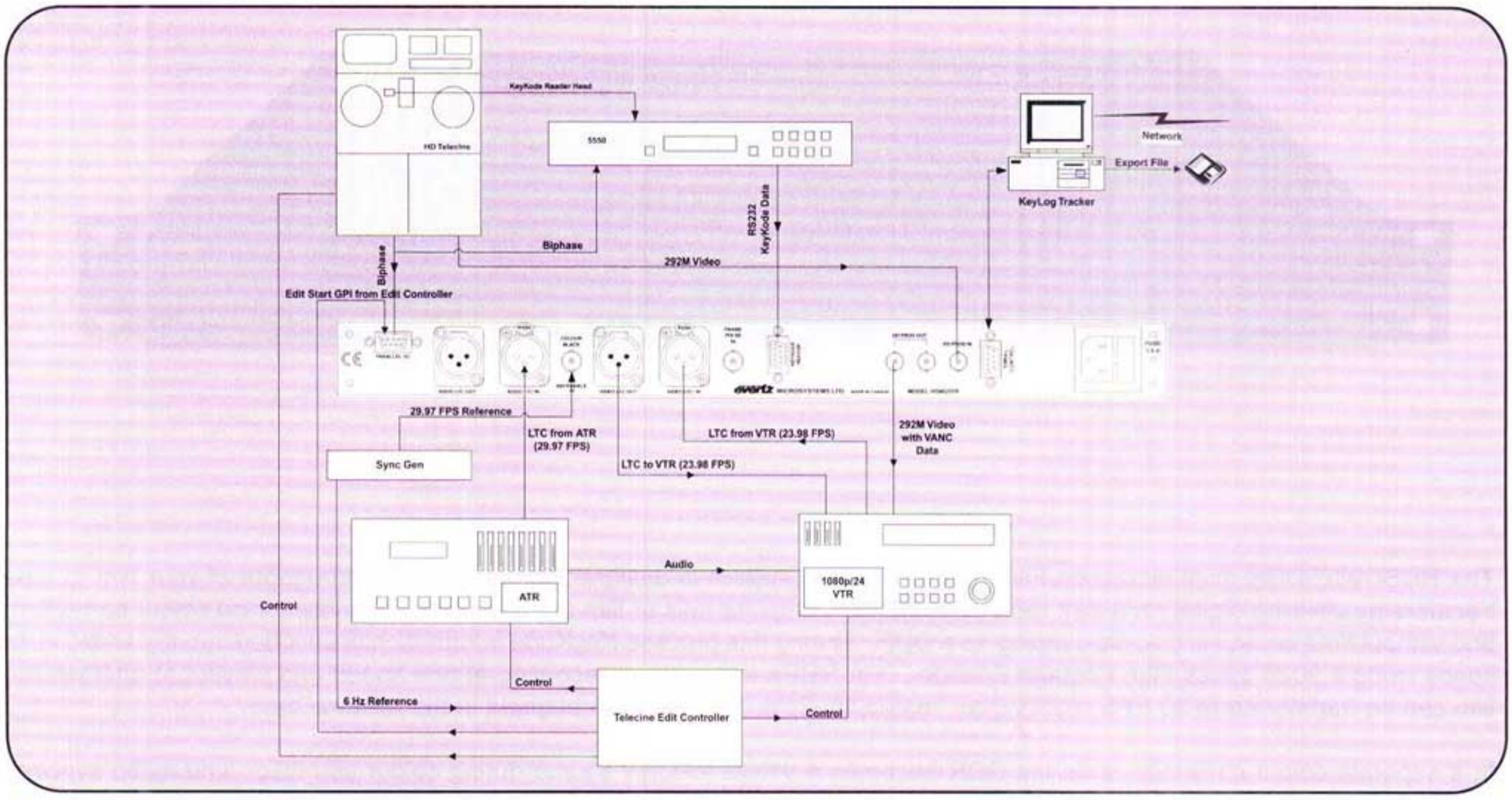
The HD9025TR can be easily configured using the Evertz popular KeyLog Tracker™ software supplied with the unit. This graphical user interfaces allow the user to store multiple configurations for the HD9025TR.

The HD9025TR is the ideal device to upgrade Standard Definition telecine bays for HDTV capability. For new HD/SD installations we recomend the HDSD9025TR.

Features:

- Accepts SMPTE 292M, 1080i/59.94, 1080i/50 and 1080p/23.98sF serial digital video
- Encodes video and audio time code, KeyKode, pulldown and other film transfer information in the vertical ancillary data area of SMPTE 292M video according to SMPTE RP215
- Over 20 character burn-in windows for time codes, KeyKode, and other film transfer information can be enabled continuously or as a virtual slate at the start of each event
- Interfaces to Evertz 5550 or 5500 KeyKode Readers
- Separate LTC generators for video and audio time code operating at 30, 25 and 24 Fps can be slaved to telecine bi-phase or incoming LTC on the video and audio LTC readers
- Multiple project configurations can be stored and recalled to facilitate easy setup of the system from job to job using the KeyLog Tracker™ software
- Transfers can be logged using GPI, Frame Grab or preselected log points using the KeyLog Tracker™ software
- Programmable Telecine interface supports all popular HD telecines

HD9025TR Typical Configuration for 1080p/24sF



Specifications

Serial Digital Video Input:

Standard:	SMPTE 292M 1.5Gb/s (1080i/59.94, 1080i/50, 1080p/23.98sF)
Connector:	BNC input per IEC 169-8
Equalization:	Automatic 100m @ 1.5Gb/s with Belden 1694 (or equivalent)

Serial Digital Video Outputs:

Number of Outputs:	2 with VANC data and character burn-ins
Standard:	Same as input
Connectors:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	200ps nominal
Overshoot:	<10% of amplitude
Wide Band Jitter:	< 0.15 UI

LTC Generators:

Standard:	SMPTE 12M
Frame Rate:	Video LTC: 24, 25 and 30 Fps nominal Audio LTC: 25 and 30 Fps nominal
Connectors:	3 pin male XLR type connector.
Level:	Adjustable, 0.5V to 4.5V p-p

LTC Readers:

Standard:	SMPTE 12M
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

Telecine Interface:

Bi-Phase Tach:	1, 2, 5 or 10 pulses per frame, TTL level
Frame Pulse:	1.6 V p-p active low, (1 pulse per film frame) or TTL Level FRID (1 edge per film frame)

Parallel I/O Interface:

Inputs (default):	Film Transfer Rate (24/30 Fps) Video Standard Select Film Frame Centering Event Log GPI
Connector:	9 pin female "D"

KeyKode Reader Interface:

Standard:	RS-232, 9600 or 38400 baud, 7 bit even parity. Compatible with Evertz, ARRI, CP and RIM decoders
Connector:	9 pin female "D"

KeyLog Tracker™ Interface:

Standard:	RS-232, 57600 baud
Connector:	9 pin female "D"
Control:	Computer control of all functions using KeyLog Tracker™ software

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 30 VA
Safety:	ETL listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

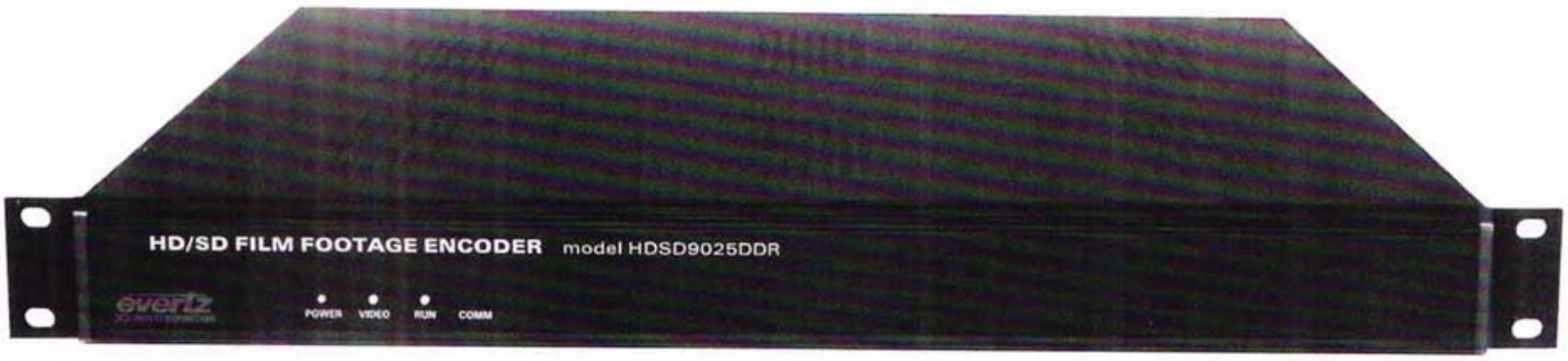
HD9025TR	HD Film Footage Encoder including KeyLog Tracker™
HD9025TR/5550/UV-3	HD Film Footage Encoder System including KeyLog Tracker™, KeyKode Decoder & UV-3 Head

Ordering Options:

Vista Vision	Vista Vision option for Film Footage Encoders
65/70MM	65mm/70mm option for Film Footage Encoders
2 Perf	35mm 2 perf option for Film Footage Encoders

HD/SD DDR Film Footage Encoder

Model HDSD9025DDR



The HDSD9025DDR multi resolution Film post production system is designed to improve the throughput of your film to tape transfers by ultilizing digital hard disk recorders (DDR). Complete rolls of film are transferred with little or no colour correction, and without time consuming audio syncing, to a DDR. During this process KeyKode information is encoded into the VANC data space using a 9025 series Film Footage Encoder. For DDRs that support recording at one speed and playout at another, the film can be transferred at 30 FPS realizing an immediate 25% increase in throughput in the telecine bay.

In a separate colour correction suite the DDR becomes a virtual telecine source during colour correction and audio syncing. KeyKode information recorded on the DDR is recovered by the HDSD9025DDR before it is removed by the colour corrector. The recovered Keykode, video and audio time codes, and production data associated with the material are re-encoded on the colour corrected video before it is recorded on the master VTR.

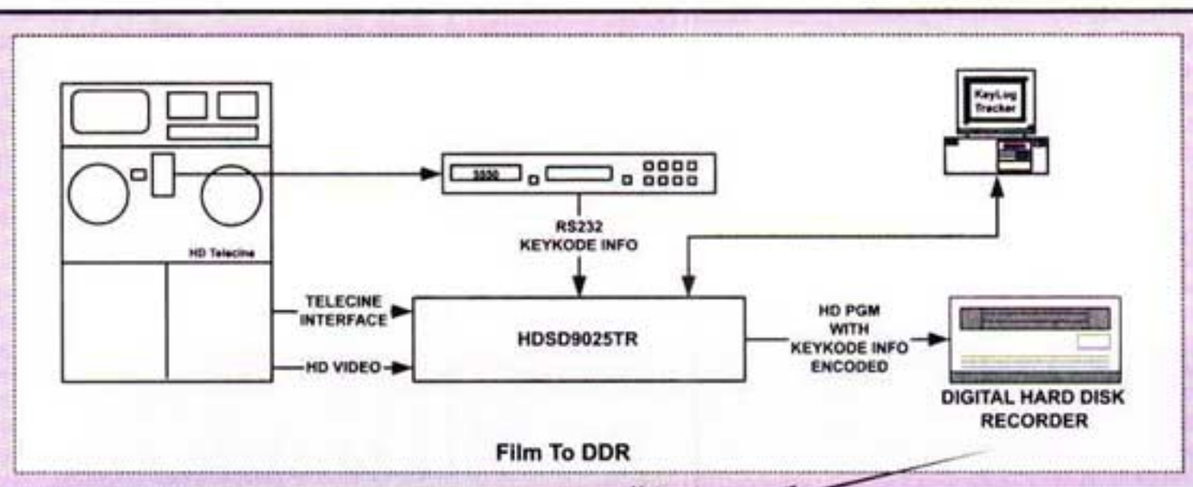
Under control of the powerful KeyLog TRACKER™ software, the HDSD9025DDR Film Footage encoders permit the seamless integration of video and audio timecodes, film KeyKode and production information whether you are transferring to 25 or 30Fps standard definition video, or to 24, 25 or 30Fps high definition video. During colour correction and audio syncing, 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 standard definition mode, the HDSD9025DDR encodes the timecodes and KeyKode into industry standard SMPTE RP201 3-line VITC on one SDI output, and provides separate SDI and analog outputs with burned in characters for offline editing copies. In high definition mode, the HDSD9025DDR encodes the timecodes, KeyKode and production information into industry standard SMPTE RP215 vertical ancillary (VANC) data packets. Downconverted copies can be made for offline editing by connecting the HDSD9025DDR's second output to the HD9150Q HD Afterburner. Separate LTC inputs and outputs for the audio and video timecodes, allows handling of mixed film rate and video rate timecodes.

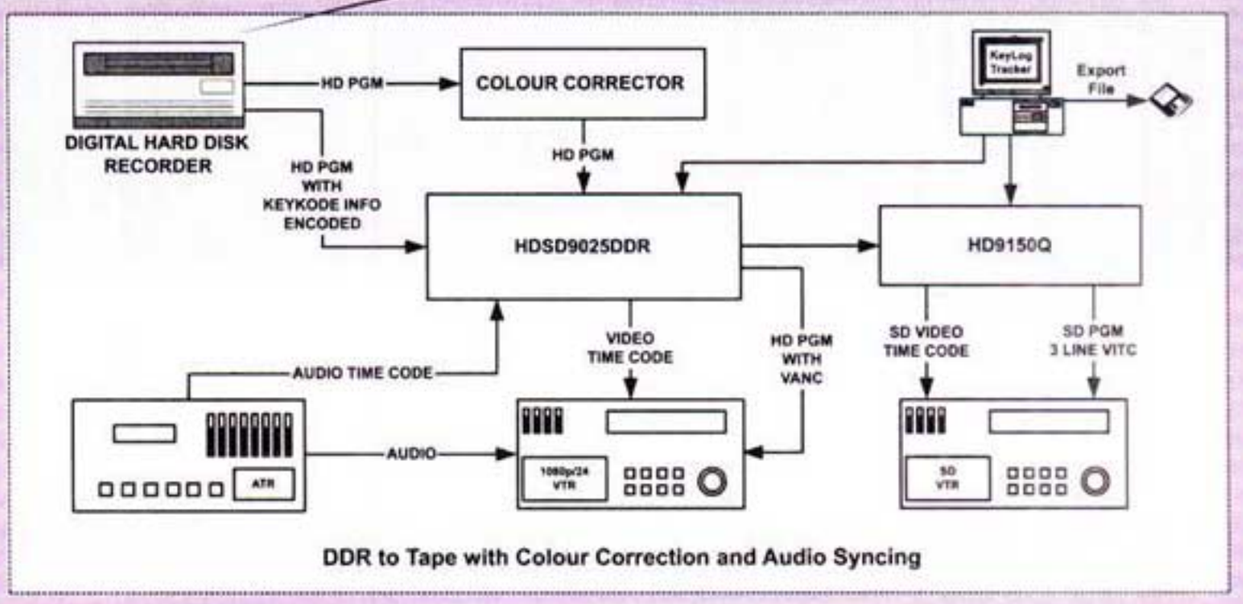
Features:

- HDSD9025DDR operating in high definition mode accepts SMPTE 292M (1.485 Gb/s) 1080i/59.94, 1080i/50 1080p/29.97sF, 1080p/25sF and 1080p/23.98sF digital video
- HDSD9025DDR operating in standard definition mode accepts SMPTE 259M (270 Mb/s) 525i/59.94 and 625i/50 digital video
- Interfaces to Specter Virtual Datacine and industry standard DDRs that record and play back RP215 VANC data
- 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 high definition video and SMPTE RP201 3-Line VITC for standard definition video
- HDSD9025DDR has separate inputs and outputs for STDV and HDTV video
- Auxiliary HD and SD video inpuits read KeyKode encoded in VANC before it is removed by the colour corrector
- Character burns available on SDI and monitor Analog outputs for SDTV
- Programmable telecine interface also allows it to be used in traditional film to tape applications.

HDSD9025DDR Typical Configuration



Film To DDR



DDR to Tape with Colour Correction and Audio Syncing

Specifications

HDTV Serial Digital Video Inputs:

Standard:	SMPTE 292M (1.485 Gb/s) 1080i/59.94, 1080i/50, 1080p/23.98sF
Number of Inputs:	2
Connector:	BNC per IEC 169-8
Equalization:	Automatic to 100m @ 1.5Gb/s with Belden 1694 (or equivalent)

HDTV Serial Digital Video Outputs:

Number of Outputs:	2 with RP215 VANC data and character burn-ins
Standard:	Same as input
Connectors:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	200ps nominal
Overshoot:	<10% of amplitude
Wide Band Jitter:	< 0.15 UI

SDTV Serial Digital Video Inputs:

Standard:	SMPTE 259M-C (270 Mb/s) 525i/59.94 or 625i/50
Number of Inputs:	2
Connector:	BNC per IEC 169-8
Equalization:	Automatic to 200m @ 270 Mb/s with Belden 8281 (or equivalent)
Return Loss:	> 15 dB up to 270 Mb/s

SDTV Serial Digital Video Output:

Standard:	Same as Input
Connectors:	BNC per IEC 169-8
Outputs:	1 Program with RP201 3-line VITC 1 Character output with RP201 3-line VITC and Character Burn-ins
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:	< 0.15 UI

Analog Monitor Video Output:

Standard:	Analog composite NTSC if input is 525i/59.94 Analog composite PAL if input is 625i/50
Connectors:	BNC per IEC 169-8
Output:	1 Character output with RP201 3-line VITC and Character Burn-ins
Signal Level:	1 V p-p nominal, internally adjustable
DC Offset:	0V ±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)

LTC Generators:

Standard:	SMPTE 12M
Frame Rate:	Video LTC: 24, 25 and 30 Fps nominal Audio LTC: 25 and 30 Fps nominal
Connectors:	3 pin male XLR type connector
Level:	Adjustable, 0.5V to 4.5V p-p

LTC Readers:

Standard:	SMPTE 12M
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

Telecine Interface:

Bi-Phase Tach:	1, 2, 5 or 10 pulses per frame, TTL level
Frame Pulse:	1.6 V p-p active low, (1 pulse per film frame) or TTL Level FRID (1 edge per film frame)

Parallel I/O Interface:

Inputs (default):	Film Transfer Rate (24/30 Fps) Video Standard Select Film Frame Centering Event Log GPI
Connector:	9 pin female "D"

KeyKode Reader/DataCine Interface:

Standard:	RS-232, 9600 or 38400 baud, 7 bit even parity Compatible with Evertz, ARRI, CP and RIM decoders
Connector:	9 pin female "D"

KeyLog Tracker Interface:

Standard:	RS-232, 57600 baud
Connector:	9 pin female "D"
Control:	Computer control of all functions using KeyLog Tracker™ software

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:	115/230 V AC 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:

HDSD9025DDR	HD/SD DDR Film Footage Encoder(for DDR Applications including KeyLog Tracker™)

Ordering Options:

Vista Vision	Vista Vision option for Film Footage Encoders
65/70MM	65mm/70mm option for Film Footage Encoders
2 Perf	35mm 2 perf option for Film Footage Encoders

HD/SD Film Footage Encoder

Model HDSD9025TR



The new multi resolution Film post production system is designed to simplify the management of your film to tape transfers for both standard definition and high definition video. Under control of the powerful KeyLog Tracker™ software, the HDSD9025TR Film Footage encoder permits the seamless integration of video and audio time code, film KeyKode and production information whether you are transferring to 25 or 30Fps standard definition video, or 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.

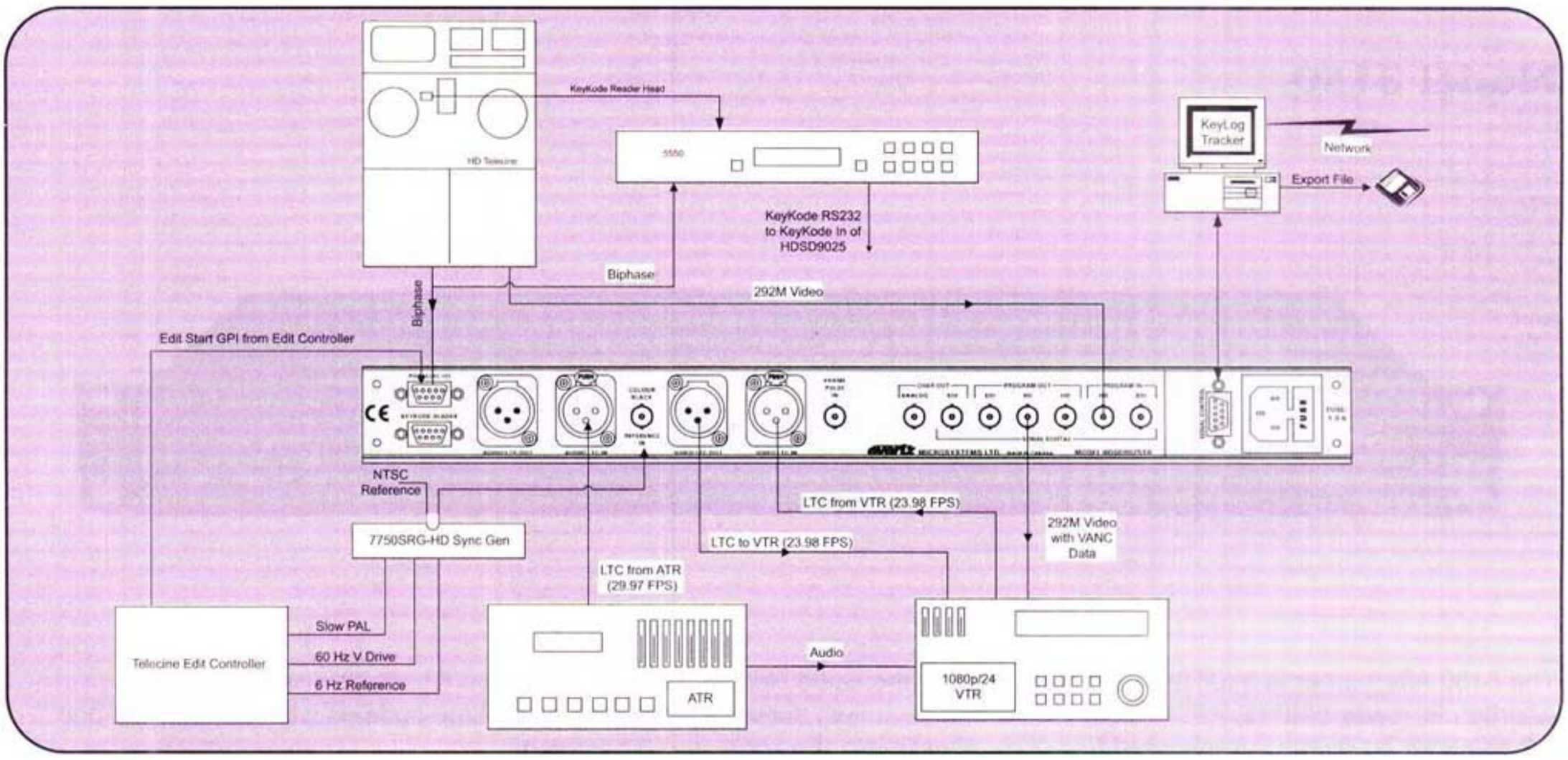
In standard definition mode, the HDSD9025TR encodes the time code and KeyKode into SMPTE RP201 3-line VITC on one SDI output, and provides separate SDI and analog outputs with burned in characters for offline editing copies. In high definition mode, the HDSD9025TR encodes the time code, KeyKode and production information in SMPTE RP215 data. Separate LTC inputs and outputs for the audio and video time code, allows handling of mixed film rate and video rate time code. The programmable telecine interface allows the encoder to interface to a wide variety of telecine configurations.

The HDSD9025TR can be easily configured using the KeyLog Tracker™ software supplied with the unit. This graphical user interfaces allow the user to store multiple configurations for the HDSD9025TR.

Features:

- Accepts SMPTE 259M (270 Mb/s) 525i/59.94 and 625i/50 digital video in standard definition mode
- Accepts SMPTE 292M (1.485 Gb/s) 1080i/59.94 and 1080i/50 and 1080p/23.98sF digital video in high definition mode
- Separate inputs and outputs for STDV and HDTV video
- Separate SDI program output with VITC and offline SDI and analog video output with VITC and characters available for SDTV
- Encodes film transfer information in SMPTE RP215 vertical ancillary data for high definition video and SMPTE RP201 3-Line VITC for standard definition video
- Over 20 Character burn-in windows for time codes, KeyKode, and other film transfer information can be enabled continuously or as a virtual slate at the start of each event
- Interfaces to Evertz 5550 or 5500 KeyKode Readers
- Programmable Telecine interface supports all popular telecines
- Separate LTC generators for video and audio time code operating at 30, 25 and 24 Fps can be slaved to telecine bi-phase or incoming LTC on the video and audio LTC readers
- Multiple project configurations can be stored and recalled to facilitate easy setup of the system from job to job using the KeyLog Tracker™ software
- Transfers can be logged using GPI, Frame Grab or preselected log points using the KeyLog Tracker™ software

HDSD9025TR Typical Configuration for 1080p/24sF



Specifications

HDTV Serial Digital Video Input:

Standard:	SMPTE 292M (1.485 Gb/s) 1080i/59.94, 1080i/50, 1080p/23.98sF
Connector:	BNC per IEC 169-8
Equalization:	Automatic to 100m @ 1.5Gb/s with Belden 1694 (or equivalent)

HDTV Serial Digital Video Outputs:

Number of Outputs:	2 with RP215 VANC data and character burn-ins
Standard:	Same as input
Connectors:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	200ps nominal
Overshoot:	<10% of amplitude
Wide Band Jitter:	< 0.15 UI

SDTV Serial Digital Video Input:

Standard:	SMPTE 259M-C (270 Mb/s) 525i/59.94 or 625i/50
Connector:	BNC per IEC 169-8
Equalization:	Automatic to 200m @ 270 Mb/s with Belden 8281 (or equivalent)
Return Loss:	> 15 dB up to 270 Mb/s

SDTV Serial Digital Video Output:

Standard:	Same as Input
Connectors:	BNC per IEC 169-8
Outputs:	1 Program with RP201 3-line VITC 1 Character output with RP201 3-line VITC and Character Burn-ins
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	900ps nominal
Overshoot:	<10% of amplitude
Return Loss:	> 15 dB
Wide Band Jitter:	< 0.15 UI

Analog Monitor Video Output:

Standard:	Analog composite NTSC if input is 525i/59.94 Analog composite PAL if input is 625i/50
Connectors:	BNC per IEC 169-8
Output:	1 Character output with RP201 3-line VITC and Character Burn-ins
Signal Level:	1 V p-p nominal, internally adjustable
DC Offset:	0V ±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)

LTC Generators:

Standard:	SMPTE 12M
Frame Rate:	Video LTC: 24, 25 and 30 Fps nominal Audio LTC: 25 and 30 Fps nominal
Connectors:	3 pin male XLR type connector.
Level:	Adjustable, 0.5V to 4.5V p-p

LTC Readers:

Standard:	SMPTE 12M
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

Telecine Interface:

Bi-Phase Tach:	1, 2, 5 or 10 pulses per frame, TTL level
Frame Pulse:	1.6 V p-p active low, (1 pulse per film frame) or TTL Level FRID (1 edge per film frame)

Parallel I/O Interface:

Inputs (default):	Film Transfer Rate (24/30 Fps) Video Standard Select Film Frame Centering Event Log GPI
Connector:	9 pin female "D"

KeyKode Reader Interface:

Standard:	RS-232, 9600 or 38400 baud, 7 bit even parity Compatible with Evertz, ARRI, CP and RIM decoders
Connector:	9 pin female "D"

KeyLog Tracker Interface:

Standard:	RS-232, 57600 baud
Connector:	9 pin female "D"
Control:	Computer control of all functions using KeyLog Tracker™ software

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 30 VA
Safety:	ETL listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

HDSD9025TR	HD/SD Film Footage Encoder including KeyLog Tracker™
HDSD9025TR/5550/UV-3	HD/SD Film Footage Encoder system including KeyLog Tracker™, KeyKode Decoder and UV-3 Head

Ordering Options:

Vista Vision	Vista Vision option for Film Footage Encoders
65/70MM	65mm/70mm option for Film Footage Encoders
2 perf	35mm 2 perf option for Film Footage Encoders

SDI Afterburner

Model 8150



The 8150 Afterburner is a full featured SDI DVITC Time Code Reader, with a full function Character Inserter. The Afterburner reads SMPTE RP201 3 line VITC and keys field accurate video and audio time code as well as KeyKode 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 Inserter, 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 Beldon 8281 (or equivalent)
Connector:	1 BNC input

Serial Digital Outputs:

Connector:	2 BNC, (270 Mb/s) SMPTE 259M compliant.
Analog Monitor:	(Optional) 1 BNC 1V 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 VA
Safety:	ETL Listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC directive

Ordering Information:

8150	SDI Afterburner

Ordering Option:

+MON	Analog Monitoring Option

HD Afterburner/Downconverter

Model HD9150, HD9150Q



The HD9150 Series Afterburner/Downconverters are powerful devices designed to facilitate the creation of off-line video tapes from HDTV masters. The Afterburners downconvert the HDTV input video to SDI and analog standard definition video. When the input video is in the 1080p/24sF format the HD9150 series also create a 2:3 pulldown on the output video to create a 30 Fps output. The Afterburners can operate in a 'film mode' working with telecine masters or a 'video mode' working with field acquired HDTV.

In 'film mode' the Afterburner/Downconverters read the film transfer data that was recorded in the VANC data area by the HD9025TR Film Footage Encoder (SMPTE RP215) during the telecine transfer and make burn-in windows. The essential time code and KeyKode data are also converted into 3-line VITC and output 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 HD9150 is directly reading the HD9025TR output.

The HD9150 Series Afterburners/Downconverters are available in two downconverter qualities. The original HD9150 versions have a monitoring downconverter and provide two SDI and two analog downconverted outputs with characters and VITC suitable for monitoring or compressed digitisation in an non-linear editing system. The HD9150Q versions have a high quality downconverter and provide two clean SDI downconverted outputs with VITC suitable for creation of high quality viewing copies. The HD9150Q versions also provide one SDI and one analog monitoring output with VITC and Characters suitable for monitoring or creation of tapes for non-linear editing systems.

In 'video mode' the Afterburners read the RP188 ancillary time code, RP215 film ANC or LTC and makes burn-in windows and new 30 Fps time code that is in sync with the downconverted video. The original 24 Fps time code 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 time code or from the LTC.

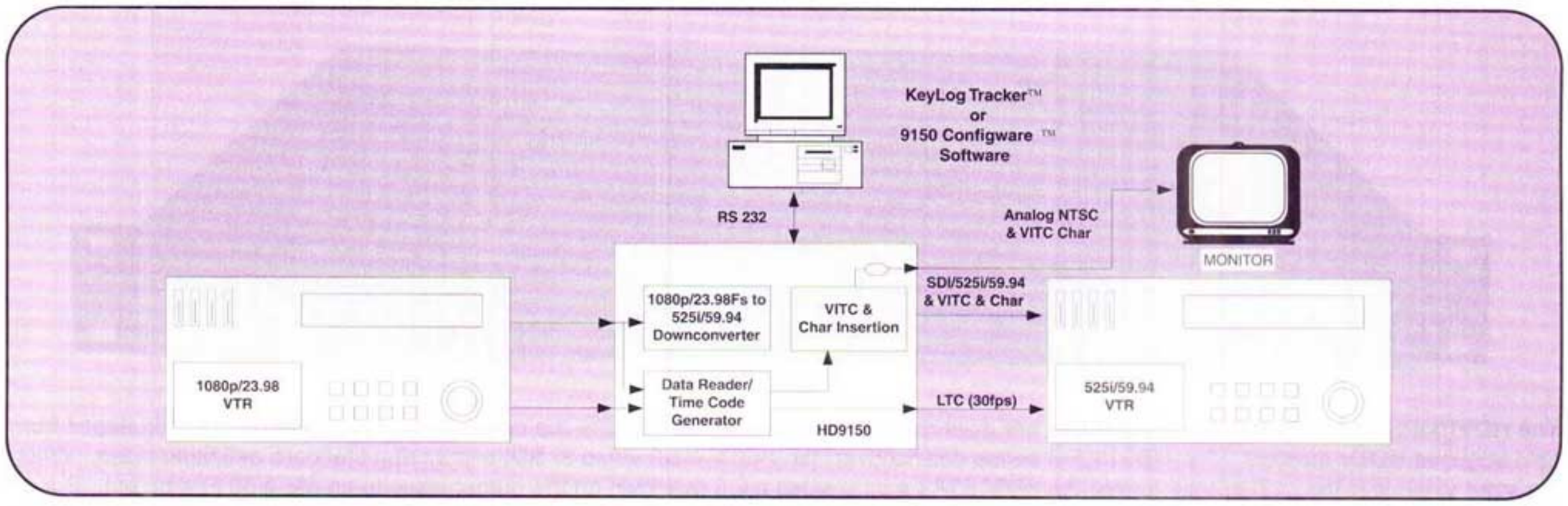
The Afterburners automatically generate video time code for the standard definition VTR that is converted from 24 to 30 Fps, and delayed to match the complete A frame cycle of delay through the Afterburner.

The HD9150 Series Afterburner/Downconverters can be easily configured using the new multi-resolution version of Evertz popular KeyLog Tracker™ software or from the 9150 Configware™ software tool supplied with the unit. These graphical software interfaces allow the user to store multiple configurations for the HD9150 series.

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
- Reads RP188 ancillary timecode, RP215 film ANC or LTC
- Character inserter for display of time and user bits as well as picture 2:3 pulldown
- Creates 2:3 pulldown when downconverting 1080p/23.98sF video to NTSC
- 2:3 cadence is determined from a 6Hz pulse input, RP188 time code or LTC
- Converts aspect ratio from 16:9 to 4:3 in anamorphic, letterbox or centre crop mode
- LTC time code reader and generator converts 24 Fps to 30 Fps and re-times the time code to the output video
- Reads film transfer information from RP215 vertical ancillary data in 'Film mode'
- Reads RP188 ancillary time code in 'Video mode'
- Control from Evertz KeyLog Tracker™ software or 9150 Configware™ software

HD9150 Typical Application



Specifications

HDTV Serial Digital Video Input:

Standard:	SMPTE 292M, 1080i/50, 1080i/59.94, 1080p/23.98sF, 1080p/25sF or 720p/59.94 software selectable or autodetect
Connector:	1 BNC per IEC 169-8
Equalization:	Automatic to 130m @ 1.5Gb/s with Belden 1694 or equivalent cable

SDTV Serial Digital Video Output:

Standard:	Serial component 270 Mb/s (SMPTE 259M-C) 525i/59.94 if input is 1080i/59.94, 1080p/23.98sF or 720p/59.94 625i/50 if input is 1080i/50 or 1080p/25sF
Connectors:	BNC per IEC 169-8
Standard version:	2 monitor
"Q" Version:	2 program, 1 monitor
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	900ps nominal
Overshoot:	<10% of amplitude
Return Loss:	> 15 dB
Wide Band Jitter:	< 0.2 UI

Analog Monitor Video Output:

Standard:	Analog composite NTSC if input is 1080i/59.94, 1080p/23.98sF or 720p/59.94 video Analog composite PAL if input is 1080i/50 or 1080p/25sF video
Connectors:	BNC per IEC 169-8
Standard version:	2
"Q" Version:	1
Signal Level:	1 V p-p nominal, internally adjustable
DC Offset:	0V ±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:	75Ω

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

Ancilliary Time Code Reader:

Standard:	SMPTE RP188 or RP215
Line Select:	Autodetect valid lines in vertical interval
Frame Rate:	24, 25 and 30 Fps nominal

Serial Remote Control:

Standard:	RS-232, 57600 baud
Connector:	9 pin female "D"
Control:	Computer control of all functions

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)

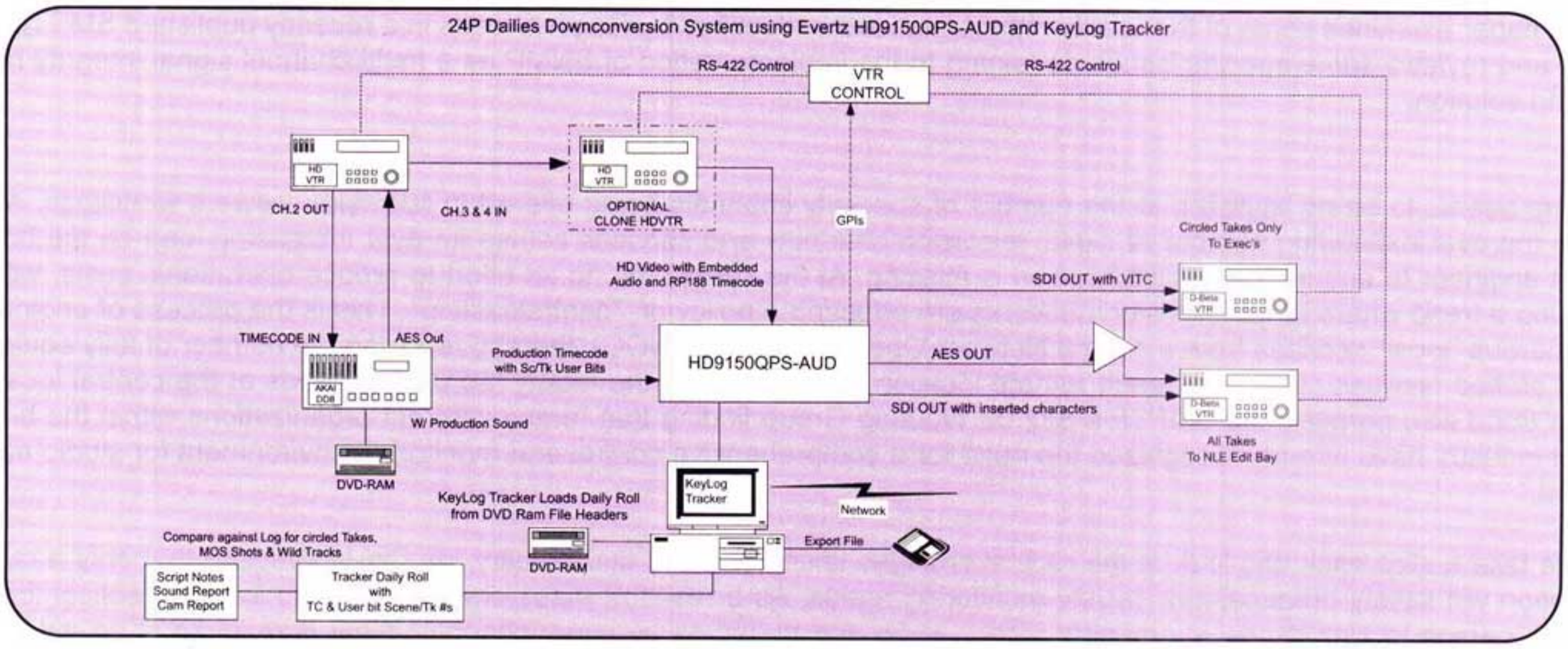
Electrical:

Power:	Auto ranging 100-240VAC 50/60 Hz 30 VA
Safety:	ETL listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

HD9150	HD Afterburner/Downconverter (includes 9150 Configware™ software)
HD9150Q	HD Production Afterburner with High Quality Downconverter (includes 9150 Configware™ software)
HDQ UPGRADE	Upgrade for all HD9150 products to HD9150Q

HD9150PS-AUD Typical Application



Specifications

HDTV Serial Digital Video Input:

Standard:	SMPTE 292M, 1080i/50, 1080i/59.94, 1080p/23.98sF, 1080p/25sF, 720p/59.94 software selectable or autodetect
Connector:	1 BNC per IEC 169-8
Equalization:	Automatic to 130m @ 1.5Gb/s with Belden 1694 or equivalent cable

SDTV Serial Digital Video Output:

Standard:	Serial component 270 Mb/s (SMPTE 259M-C) 525i/59.94 if input is 1080i/59.94, 1080p/23.98sF or 720p/59.94 625i/50 if input is 1080i/50 or 1080p/25sF
Connectors:	BNC per IEC 169-8
Standard version:	2 monitor
"Q" Version:	2 program, 1 monitor
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	900ps nominal
Overshoot:	<10% of amplitude
Return Loss:	> 15 dB
Wide Band Jitter:	< 0.2 UI

Analog Monitor Video Output:

Standard:	Analog composite NTSC if input is 1080i/59.94, 1080p/23.98sF or 720p/59.94 video Analog composite PAL if input is 1080i/50 or 1080p/25sF video
Connectors:	BNC per IEC 169-8
Standard version:	2
"Q" Version:	1
Signal Level:	1 V p-p nominal, internally adjustable
DC Offset:	0V ±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:	75Ω

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

Ancilliary Time Code Reader:

Standard:	SMPTE RP188
Line Select:	Autodetect valid lines in vertical interval
Frame Rate:	24, 25 and 30 Fps nominal

AES Audio Outputs:

Number of Outputs:	2 AES
Standard:	SMPTE 276M, single ended synchronous or asynchronous AES
Connectors:	BNC per IEC 169-8
Sampling Rate:	48 kHz
Impedance:	75Ω unbalanced

Analog Audio Outputs:

Number of Outputs:	4
Type:	Balanced analog audio
Connector:	Female HD DB15
Output Impedance:	66Ω balanced
Sampling Frequency:	48kHz
Signal Level:	0dB FS =>8 to 24dBu into 10 kΩ loads 0dB FS =>8 to 22dBu into 600 Ω loads
Frequency Response:	< ± 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)

Serial Remote Control:

Standard:	RS-232, 57600 baud
Connector:	9 pin female "D"
Control:	Computer control of all functions

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 30 VA
Safety:	ETL listed Complies with EU safety directive
EMI/RFI:	Complies with FCC Part 15 Class A EU EMC Directive

Ordering Information:

HD9150PS-AUD	HD Post Slate Afterburner with audio processing (includes HD DB-15 to XLR breakout cable)
HD9150QPS-AUD	HD Post Slate Afterburner with High Quality Downcverter, AES & Analog Audio (includes HD DB-15 to XLR breakout cable)
HDQ UPGRADE	Upgrade for all HD9150PS products to HD9150QPS

Considerations for Multi-Channel Signal-Integrity Monitoring

By David Strachan, Director of Sales and Orest Holyk, Product Development Manager

Since the publication of SMPTE's S22.02 Advanced System Control Architecture Working Group's Summary Report in the May, 2000 SMPTE Journal, much has been written and discussed on the subject of monitoring and maintaining video and audio quality in both digital and transitioning-to-digital television facilities. In addition, a number of articles on employing various architectures and networking tools within the traditional facility to ensure signal integrity have also been published. This paper examines some of the facility monitoring issues identified by Roger Crooks in a recently published SMPTE article, and reviews some specific issues pertaining to the implementation of SNMP as a multi-channel signal integrity monitoring solution.

There seems to be no limitation to the number of specialty channels being offered to television viewers worldwide. Along with the ever-expanding number of digital television channels and services comes an ever increasing load on the broadcast engineer to ensure that no information is missing. At the same time, in an effort to reduce operational costs, we are seeing a trend where large television networks are adopting a policy of "centralcasting". This is the process of originating numerous "local" services from a central Network Operation Center (NOC), thereby reducing the number of fully equipped and staffed facilities required at each remote location, but increasing the facility monitoring needs at the central location. This trend also parallels the SMPTE's S22.02 Working Group finding that "many different organizations within the broadcast industry have already recognized the need for a comprehensive control and monitoring environment for studio equipment."

If we take a step back and look at the radical changes taking place in our industry, we can appreciate that only a radical solution will satisfy broadcasters' facility monitoring needs. As a result of these changes, it is no longer practical for any single person to simultaneously monitor video, audio and metadata on every channel. What is required is an automatic system, which activates an alarm if one of the services or a component thereof, is missing or has developed a fault. We need to know precise details of where the error has occurred and what exactly is wrong, so that the correct action can be taken all the while maintaining high quality levels of service.

In his SMPTE article, Roger Crooks identifies a facility monitoring strategy as a key, strategic factor in the transition to a networked operation. With the transition-to-digital era upon us, we must be concerned not only with signal quality, but also with the continuity of the video and multiple audio channels as well as VBI data associated with each channel, regardless of the number of television channels. Traditionally, the task of monitoring channels has required a plethora of gadgets specifically designed to check each function. But even with the best equipment, it is difficult to watch up to a hundred picture monitors and impossible to monitor the levels and phases of hundreds of audio channels. Even Crooks states that "...in the past there were racks of equipment, such as waveform monitors, checking the actual signal [while] today with digital signals, signal monitoring is of limited use. However, tracking the health of the equipment that stores and moves these signals is critical." Not surprisingly, during recent facility visits, a number of questions from end-users regarding possible facility monitoring strategies arose since most decision-makers are addressing their monitoring needs and are also looking at implementing networked monitoring solutions.

Local and Remote Facility Monitoring

Although a remote monitoring solution centralizes operations, offering remote configuration, automatic alarming and data logging, it is the localized equipment that monitors signal integrity and reports the information to the central facility through a network. Considerations for local signal monitoring should therefore include the following parameters (ref. Figure 1):

- Video continuity (video presence, video not black, video not frozen and EDH errors if the complete chain is EDH-enabled),
- Audio continuity (audio volume too high or too low, phase reversed and balance),
- Data continuity (close captioning presence, V-chip parental guidance presence, time stamps and source ID presence), and
- Signal path integrity or signal strength especially when using fiber for long-haul transport.

In addition, audio monitoring itself presents further considerations in handling capabilities especially with various "flavors" of audio including stereo analog, AES/EBU, embedded, Dolby E, Dolby-D or AC-3/5.1 within in the facility. In transitioning facilities, a number of audio formats may be in use at a particular time requiring monitoring equipment to be versatile. An interesting dilemma arises for audio monitoring equipment when monitoring surround sound - if audio becomes silent on the two rear channels while still present in general, should this trigger an audio alarm? Perhaps!

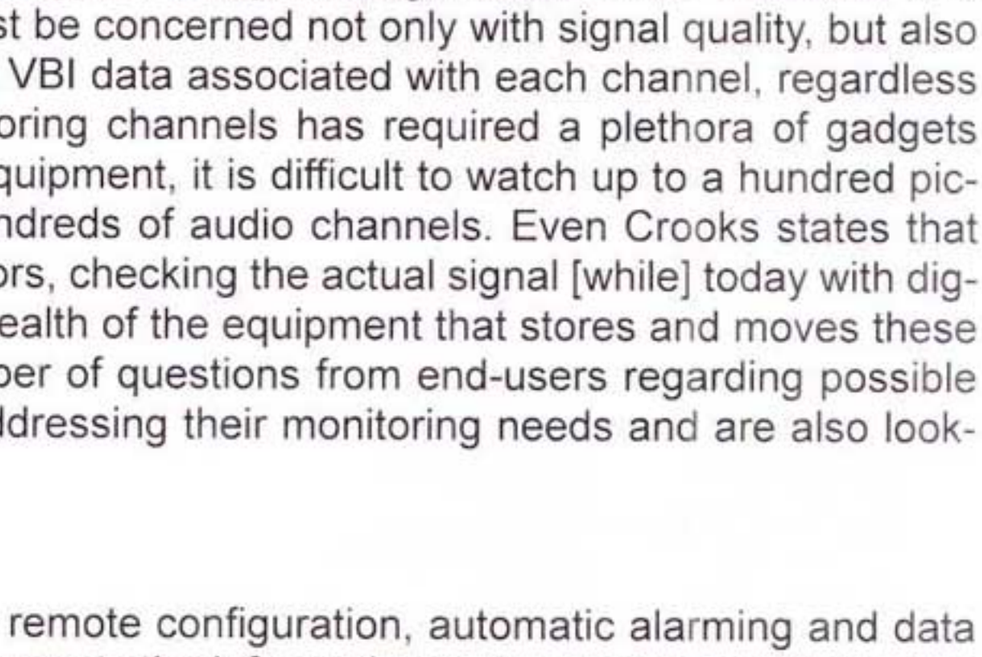


Figure 1: Signal Integrity Monitoring through Local On-Screen Display

For an effective facility monitoring strategy, Crooks offers important advice by suggesting to first address the big picture to understand the facility's workflow. Subsequently, local and remote signal monitoring follows with the identification of key operation or demarcation points within the facility's broadcast chain. Analyses of the "smaller picture" by identifying these demarcation points are critical to the implementation of a monitoring solution especially to maintain signal integrity and service quality.

Remote Monitoring Market Trends

Now, if recent observations hold true, then it appears that the unofficial trend toward a networking communication protocol standard, for remote signal health status monitoring and reporting between equipment and a central location, is the use of Simple Network Management Protocol (SNMP). From a facility monitoring, signal-integrity perspective, this appears to be the most preferred route because it is a proven solution, offering simple network strategies, and is a widely available, open standard. Again according to Crooks on SNMP, "by consolidating all monitoring at a central location, it is easy to determine the condition of all the equipment in a facility. Being a network-based protocol, this can also be used to monitor systems at remote locations and other facilities." For similar reasons, SNMP has been employed in the telecommunications industry for many years, and the increasing complexity of the television industry along with the need for a networked reporting tool makes the adoption of SNMP techniques a truly worthwhile pursuit in broadcasting too.

Simple Network Management Protocol (SNMP)

SNMP is an open standard computer network protocol developed by the Internet Engineering Task Force (IETF), which enables different devices sharing the network, to communicate with each other. For monitoring video, audio and data, we need to have a local detecting device, which automatically reports all errors detected to a central alarm and error logging station. We need to be able to interrogate the detector from the central station to determine the status of any signal we wish to monitor. We also need to be able to configure devices in the network and to receive feedback that our instructions have been carried out. Finally, we need to enable our monitor and control tasks from a networked computer terminal anywhere in the world. All of these requirements can be accomplished by using SNMP as shown in Figure 2.

There are three basic components to SNMP:

1. Managed Objects, each with unique addresses (OID), which communicate with the Network Management System (NMS) through an "Agent".
2. A virtual database that lists all the unique variables (managed objects with unique addresses) being monitored and which both the Agent and Manager understand - referred to as the Management Information Base (MIB).
3. A Network Manager referred to as the Network Management System (NMS).

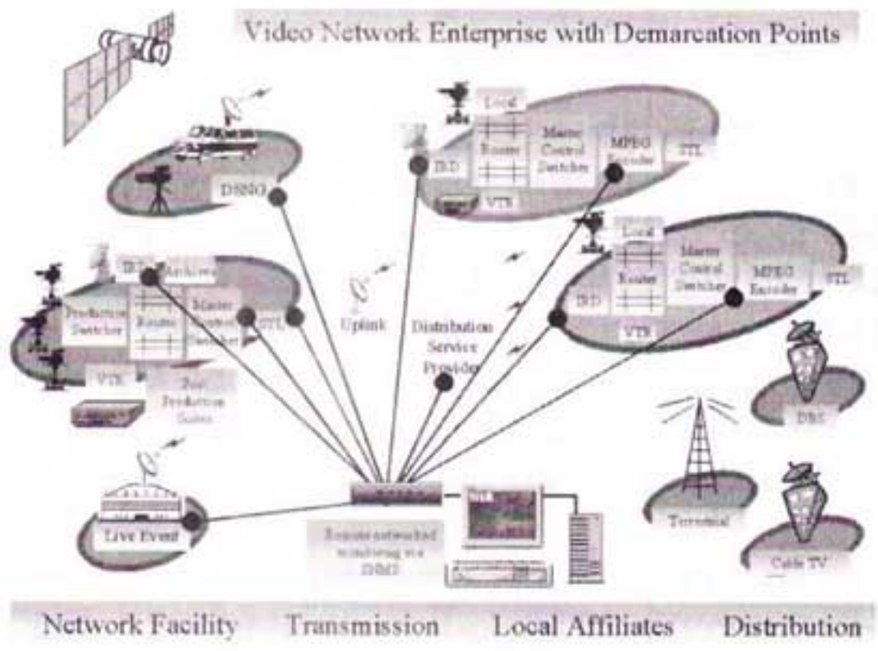


Figure 2: Simple SNMP Network Set-up with Local Monitoring and Demarcation Points

Each Managed Object (a product or device with device features/variables) has a unique address. These unique addresses are known as Object Identifiers (OID). Each enterprise (company) subscribing to the SNMP system, will have been provided first with a unique OID for the company, then in turn will have allocated a unique OID to each of it's SNMP-enabled managed objects. The SNMP Management Information Base (MIB) is a virtual blueprint of the assigned OIDs and serves as the common dictionary between SNMP components. A unique string of characters, preceding the instruction, steers the command to the intended device. This string includes a numerical representation of everything from the standards organization, which issued the numbers, to the target device in the system. Subsequent managed object OID characters for enterprise equipment will locate the required device and the specific parameters within that device.

GET, SET and TRAP

A simple set of instructions is used in the SNMP system to facilitate communication between the manager and the managed devices. These are GET, SET and TRAP. In the case of a facility monitoring system, a GET command, as the name implies, is used when the computer wants to get the status of some variable at the monitored end, usually at a specific demarcation point. The SNMP-enabled monitoring device will respond with the requested value.

Similarly, the SET command is used when the computer wishes to set a parameter value at the monitored end. For example there may be a need to set a silence detector to -50dBm instead of -55dBm. Finally, the monitoring device autonomously sends a TRAP message when a condition has changed. In most cases, TRAPs are associated with fault condition alarms, which are detected by the localized monitoring equipment. As Crooks writes, "if a fan dies, a message will be sent over the network to the monitoring workstation." True, but in order for an SNMP network to report on a monitored parameter, that parameter must first be coded into the MIB or virtual blueprint of parameters. For example, if the chassis fan dies, a chassis MIB must exist so that the event can be reported to the NMS and eventually the end-user. Subsequently, when looking at an SNMP monitored system solution, a strategic list of key parameters to monitor and control should be identified by the end-user prior to implementation.

SNMP Simplicity and Security

With facility transition demands ever increasing, one of the greatest limitations facing facility managers is time...time to plan, design, and implement equipment into a modern facility. With many factors such as mandates, budgets, legacy assets and personnel to deal with, implementation delays due to complicated monitoring and control solutions are likely the least desirable. Therefore, decision-makers search for simple, cost-effective solutions to meet their needs. With SNMP, an effective, networked monitoring solution is possible, but is still distant from simply being "plug-and-play".

In addition, as it should already be obvious, the "S" in SNMP is not an acronym for "secure". Apart from community strings present with SNMP data packets, there are no additional security measures in place, such as encryption, to protect information travelling over the SNMP network. This may not be a particular problem for a facility employing a private, local network where security concerns are limited to login passwords. However, the lack of security could potentially pose a problem if the SNMP packet is sent over IP from a remote location to a central facility. Furthermore, beyond the LAN consideration for the use and configuration of firewalls is necessary in order to accept SNMP packets from remote locations. Efforts are underway by standardizing bodies to implement a more secure version of SNMP without increasing the complexity of this protocol.

Equipment interoperability

Another key consideration for a remote facility monitoring strategy is equipment interoperability. This issue is not only economically important when considering the re-employment of legacy equipment assets, but also operationally important when attempting to consolidate operations under one control system. It is also important to realize that neither may be possible. As identified by the S22 Working Group "due to differing product lines and market direction, each of these systems will have likely been derived from a different set of requirements." Product differentiation has always been used by competitors to gain the upper hand with end-users, but when considering a facility monitoring system, ideally one manager should be interoperable with third-party equipment as it is definitely not feasible or practical to use additional managers.

A frequently asked question, and a common issue with today's SNMP network management and control system offerings can be summarized by the "too many chiefs" analogy. Most third-party equipment manufacturers offer some form of SNMP Manager (NMS) with minimal differentiation, creating considerable confusion for the end-decision maker about which is the best to implement. For Manager developers, selling a Manager is very attractive as it not only serves as the "brain" for facility monitoring but also is a lucrative revenue generator. However, end-users are in a quandary for several understandable reasons. They are unsure which Managers offer the most robust solution, which interfaces the best with all third-party equipment - either legacy and/or new, who is responsible for fixing interface and/or equipment problems when they arise, and which Manager developer will continue to support the product for the long-term.

To ease the burden of making a hasty decision too soon, a common solution employed by many facilities so far has been HP OpenView (Network Node Manager). For those facilities with some IT experience, HP OpenView offers all SNMP networking tools and the convenience of experimentation without the cost of installing customized SNMP application software or the hassle of complicated equipment set-up. This "diagnostic" tool also allows facilities to test potential user interfaces not only for problem-solving engineers and technicians who require in-depth information and statistics about monitored signals, but also for front-line operators who need simple user-friendly GUIs for immediate problem identification and solution implementation.

Furthermore, equipment interoperability efforts among third-party equipment manufacturers are underway. As reported by Ken Kerschbaumer in Broadcasting & Cable, Harris has initiated a Connectivity Partnership that includes at least 18 third-party equipment manufacturers including GVG, Sea Change, Snell & Wilcox and Evertz. Harris' centralcasting focus unites a number of third-party equipment manufacturers with specialties throughout the broadcast chain, ensuring that connectivity works through their BRAIN approach. Similarly, Evertz has also initiated a partnership effort with third-party SNMP Manager developers to proactively develop SNMP communication interfaces, thereby offering end-users a proven solution for local and remote facility monitoring. Evertz's VistaLINK™ Partnership Program establishes end-user confidence and eases the SNMP Manager implementation decision.

The Threat of Too Many Alarms

As with the boy who cried wolf too many times, over-alarming, especially for non-critical events, will render a newly-implemented, networked facility monitoring solution useless as operators begin to ignore subsequent alarms. Receiving too many frivolous alarms should be avoided through good NMS control, with the ability to identify which alarms are critical while filtering non-critical "noise". It is important to be able to predetermine and set an acceptable threshold and time duration, which may be tolerated, before initiating an alarm. An alarm does not need to sound every time the star of a show stops talking, but if there is no audio for 30 seconds an alarm should sound.

In addition, there are several forms of an alarm. Crooks identifies the possibility of SNMP alarming technicians or repair people via email, pager or cell phone notification, however the primary alarm is still destined to a manned, centralized facility in the form of a TRAP. Front-line operators can acknowledge the alarm, switch to a back-up signal and take the problem off-line without any downtime. The faulty signal is then addressed and repaired by a technician without the customer ever noticing or complaining. Off-line notification for repair and maintenance through e-mail or pagers becomes a user-definable, secondary function, and is only effective if it fits the facility's workflow.

Conclusion

SNMP is an effective tool for monitoring both incoming and departing signals from local signal monitoring equipment located at strategic locations throughout the video enterprise network. If there are no problems then no alarms are raised. However when a problem exists, an alert is sent through the SNMP network notifying the operator and in effect acting as your "eyes and ears" in our ever-expanding digital television universe!

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"THE RIGHT TIME": MASTER CLOCKS

by

David. Strachan

REAL TIME AND VIDEO TIME

What time is it? The general public expects broadcasters to provide them with the correct time. Broadcasters also need a time reference to run their automation systems. It all sounds very simple and in PAL countries maybe it is, but in NTSC countries, it is not quite as simple as it seems.

In countries using 625 line, 50 Hz television systems, there are exactly 25 video frames per second (Fps). But in NTSC countries the number of frames per second is not a whole number. There are 29.97 video frames per second and broadcasters have a choice of either running their clocks from 60Hz time code, which is not locked to video, or 29.97Fps, DROP-FRAME time code which is locked to video. Drop-frame time code was invented to overcome the time difference between NTSC video time and real time of day.

VIDEO TIME

NTSC is based on a sequence of 30 frames, but as NTSC is running at the slower rate of 29.97 frames per second, the 30 frame sequence takes longer than one second to complete. Time code is measured in Hours, Minutes, Seconds and Frames, but in the NTSC world, the "seconds" are actually longer than real seconds. Standard (non-drop frame) time code drifts away from real time by a factor of 1000/1001, or 3.6 seconds every hour. In other words, in a one hour period, the slower 29.97Fps video contains only 107,892 (27.98 x 60 x 60) frames, whereas 30Fps video would display 108,000 (30 x 60 x 60) frames per hour (an extra 108 frames). The non-drop frame time code at 29.97Fps will take 1 hour and 3.6 seconds to complete 108,000 frames and the time code will read 01:00:03:18. Drop frame time code, was invented to correct this discrepancy. Contrary to common belief, drop-frame time code does not drop any video frames. It is only the frame count within the time code which is modified, to drop the extra 108 "counted" frames and restore the duration to a true time period of 1 hour. Drop-frame time code does this by skipping the first two frames of every minute (2 frames x 60 minutes = 120 frames), except on the 10s of minutes (2 frames x 6 = 12, as there are 6 x 10 minutes in the hour). 120 - 12 = 108. Tables 1 to 3 illustrate the differences.

Frame rate	Video frames per hour	Time code after 108,000 video frames	Time code after 1 hour
30 non-drop	108,000	01:00:00:00	01:00:00:00
29.97 non-drop	107,892	01:00:00:00	00:59:56:12
29.97 drop-frame	107,892	01:00:03:18	01:00:00:00

Table 1: Non-drop frame and drop-frame time code

Note that the actual video frame rate is 29.97002617 Fps instead of the approximate value of 29.97. Drop-frame time code does not correct for this and the resulting error is about 75 milliseconds per day or approximately ½ second per week. This error is usually corrected on a daily basis by using the "jam-sync" method, described later.

REAL TIME

Some Master Clock systems generate non-drop frame time code at 60Hz and this time can be accurately locked to GPS or to a national time standard source. The master clock will also have it's own high stability oscillator, so that accurate time can be maintained for short periods in the event that the connection to the GPS or other reference is lost.

60Hz time code, however, is unrelated to NTSC video, so this signal cannot be used for automation systems or for anything involving NTSC video. To solve this problem, some manufacturers offer a separate jam-sync device. Such a device is referenced to both video time code and true time of day time code and at specific times, the unit can be triggered to re-write the time code to line up with the video. The jam-sync will normally be carried out in the early hours of the morning, at a non-sensitive time of day.

A 29.97Fps Drop-Frame video time code generator can also be programmed to jam the output time code to the real time clock at certain non-sensitive times. Table 2 shows the accumulated time errors.

Duration	Drop Frame Time code	Video (non-drop) Time code
1 hour	3.1 ms	3.6 secs
1 day	75.7 ms	1.4 min
1 week	528 ms	10 min

Table 2: Time Drift in NTSC Time codes

Continuous jam-sync is a possibility and is offered by some manufacturers. This may be used if the automation system can tolerate the jitter induced by the difference in frame rates of 30 and 29.97Fps. In most cases this is not a practical solution.

GPS, UTC AND LEAP SECONDS

No discussion of "real time" is complete without defining what is meant by real time. There are many different times zones around the globe and the airlines and other organizations, use Universal Coordinated Time (UTC) to provide a single international time standard. Universal Coordinated Time is sometimes referred to as Greenwich Mean Time, because it is the time in Greenwich Village, England, on the zero degree line of longitude when daylight saving time is not applied. Today, precise time is inexpensively available on GPS receivers, but GPS time is not actually the same time as UTC, because the earth's speed of rotation is not exactly 60x60x24 seconds per day. It is approximately 1ms slower. So although the GPS system uses precise atomic clocks, which were synchronized to UTC on January 6, 1980, since then there has been an accumulated time drift of 13 seconds between precise GPS time and UTC. This difference has been corrected periodically by adding leap seconds*, to keep the world's time to within 0.9 seconds of the correct astrological time. GPS time is not corrected for leap seconds, however leap second data is carried on the signal in the form of the accumulated number of leap seconds since January 6, 1980. Master clock systems use GPS time, together with the leap second count, to determine current UTC.

Time offsets for local time and daylight saving time, are best introduced locally and various products are available to handle these issues.

** Leap seconds are introduced when necessary and usually at midnight on June 30 or December 31 as decreed by the International Earth Rotation Service (IERS) based in Paris, France.*
http://hpiers.obspm.fr/eop-pc/
Since they were first introduced, leap seconds have always been positive (a second has been added). A record of leap second insertions can be found at
http://www.boulder.nist.gov/timefreq/pubs/bulletin/leapsecond.htm

VIDEO TIMING AND THE SPG

Video timing is like automobile engine timing. Neither has anything to do with real time, but more to do with ensuring that things happen at the right time in a sequence. If you don't want to see annoying glitches in your TV picture, all video signals need to be properly "timed" at the input to a video switcher The television station's Sync Pulse Generator (SPG) has the job of synchronizing all video signals within a facility. And, as you may want to mix signals from different facilities, all SPGs need to operate on the same frequency. This requires that SPGs all be fitted with a high stability oscillator - same requirement as for a master clock.

Early generation SPGs were required to supply separate sync pulses for H drive, V drive, color burst and other signals necessary to synchronize a wide variety of products from different manufacturers. These pulses are no longer necessary as most analog and digital products can now lock to color black (black burst). For convenience, many modern SPGs provide several black burst outputs with independently adjustable timing. This is useful when supplying synchronizing references to cameras and other devices, which are at different distances from the central switcher. Video arriving from cameras at the end of long cables, will experience longer delays, so sync references to these cameras should be advanced, compared with reference signals being supplied to closer cameras. Digital Video Effects (DVE) equipment will also delay video signals, so black burst signals feeding DVEs might also need to be advanced.

In recent years, HDTV has come onto the scene and this creates a string of new requirements. Tri-level sync signals are needed for various different video frame rates and different numbers of lines per frame.

AUDIO SYNCHRONIZATION

To avoid audio "pops", all broadcast digital audio feeds, need to be frequency locked to 48KHz and also phase referenced to the video. There is therefore a need for a digital audio reference signal (DARS). Dolby E requires special attention (see Dolby E).

TV STATION COMPUTERS

It is not only the broadcast automation system which requires true time of day. There will also be many computers on the house network, which need accurate time. Network Time Protocol (NTP) was designed for this purpose.

ALL IN ONE BOX

To accommodate all of these requirements, one company, Evertz, has introduced a combined Sync Pulse Generator and Master Clock. The new 1RU product, known as the 5600MSC, has it's own high stability oscillator (a common requirement for all of these devices) with external reference to GPS or to another time standard authority via modem. The new product, complete with all available options, provides the following array of reference signals:

6 color black signals, independently timeable in frames, lines and cycles of sub carrier.
6 Tri-Level Sync outputs, independently timeable in frames, lines and samples
1 Frequency Reference, 10 MHz input/output
1 PAL or NTSC Test Signals
1 DARS output (balanced and unbalanced)
1 AES Tones (balanced and unbalanced)
1 Stereo Analog Audio Tones (balanced)
2 SDI Digital Black
2 SDI Test Signals
2 HDSDI Black
2 HDSDI Test Signals
1 NTP (Network Time Protocol) output
2 Different and programmable LTC time codes
2 GPI inputs and 2 GPI outputs

The 6 genlock outputs may be configured as 6 black burst, 3 black burst and 3 tri-level sync or 6 tri-level sync. However these might be configured, all of these outputs are independently timeable. Different HDTV tri-level sync signals such as 1080i/60 and 720p/60 can be available simultaneously, as can NTSC and PAL black bursts.

The 10MHz reference may be used either to lock the 5600MSC to a cesium or rubidium crystal source, or to provide a high stability frequency reference to another device, e.g. another SPG.

There is wide range of analog, SDI and HDSDI test signals and these can be field upgradeable if necessary. The digital audio signals are available both on a balanced 110 ohm Phoenix connector and on unbalanced 75 ohm BNCs.

There are two time code outputs. The primary output is available on a balanced XLR and on a separate auxiliary 9 pin 'D' connector. The secondary time code is available on the 'D' connector only. These two time codes can support various combinations of requirements, such as:

- 60Hz and 29.97Fps drop frame
- 23.98Fps non-drop 29.97Fps non-drop
- UTC and Local Time (29.97Fps drop-frame or 25Fps)
- Local Time (or UTC) and advanced time to accommodate down stream delays.

An automatic changeover is available for use with two 5600MSCs, to ensure continuity of time and synchronization signals to the television facility.

SUMMARY

One of the best sources of reference for both frequency and time of day, is the Global Positioning System. From a GPS receiver, the Master Clock can derive UTC and should also be able to add the appropriate time offset and provide corrected local time. Table 3 contains a list of the various corrections which need to be made by the Master Clock.

		Offset	Master Clock Update
1	Earth speed drift/day	1ms	Leap second correction made approximately every 18 months as determined by IERS.
2	NTSC drift/day	75ms	Usually daily
3	Local Time	-	At time of installation only
4	Daylight Saving Time	1 hour	Twice per year

Table 3- Required Time Corrections

The above corrections are made to the time code outputs, without disturbing any of the video signals. This correction is called a jam-sync. NTSC has a 4 field color sequence and PAL* has an 8 field color sequence, so to avoid disturbing the video, there will be a discrepancy between UTC and the time code output, after a color correction of the time code numbers occurs. The maximum discrepancies for NTSC drop frame time code will be 2 fields (33ms) after a daily jam-sync and for PAL (EBU time code) it will be 2 fields (40ms), after a leap second insertion. In NTSC countries, if you jam-sync daily, drop frame time code may also be used to drive slave clocks. The maximum time drift will be 75ms. 60Hz time code is not related to video and is not affected by jam-sync operations.

The Evertz 5600MSC may be programmed in advance, to make time and time code number changes automatically without disturbing the video.

** The PAL 8 field television system runs at 50 fields per second, so one field has a duration of 20ms and one PAL cycle is completed in 160ms. At this rate there are 6.25 PAL cycles per second. When a leap second is added, the extra 0.25 cycles (2 fields or 40ms) cannot be accommodated.*

Designing Fiber Optic Systems

David Strachan

Everyone knows that fiber optics can carry a huge amount of data. There are more benefits to using fiber optics in broadcast applications than you might realize. This article describes how to design a system to link two facilities with multiple video, audio and data channels in both directions.

Fiber Optics

Fiber optics has many advantages over copper. You can build much longer point to point links using fiber than is possible with conventional wire cables, the bandwidth is much wider, it is lighter and it occupies less space. By careful adoption of the available tools, you can also multiplex many signals of different types onto a single fiber link. The link can even be bi-directional.

Lasers and LEDS

Electrical to optical video converters generally have a BNC coaxial cable connector at the input and a fiber optic connector on the output. In order to get the digital bits down the fiber optic cable, a light emitting device is used, onto which the digital signal is modulated. Either a laser or an LED (Light Emitting Diode) is used for this purpose. Lasers are more expensive, but they have significant advantages over LEDs. Lasers concentrate the light into a narrow beam at a unique wavelength. This narrow beam can travel much further than the diverging light emitted from an LED. Even if distances are short, the additional signal strength offered by lasers gives the system designer many more options to employ patch panels, splitters and other devices. Multiple signals can also be carried over a single fiber by using lasers of different wavelengths. This is not possible with LEDs.

Single-mode and multi-mode

Fiber optic cable is available in single-mode and multi-mode types (Fig 1). Multi-mode cable has a larger core diameter (50um or 62.5um) than single-mode fiber (9um core diameter). When light travels down multi-mode fiber it is reflected at different angles as it propagates down the transmission path. These multiple reflections cause the light to spread out in time as it propagates down the fiber, making it more difficult for the receiver to recover the data. Single-mode fiber being much narrower, confines the optical signal to a straighter path with fewer reflections. As a result, optical signal dispersion is significantly reduced, which translates into a cleaner signal. Longer transmission lengths can therefore be achieved with single mode cable. It is also a bonus that single-mode fiber can now be purchased for the same or less than multi-mode fiber.

Single-mode and multi-mode cable should not be mixed in the same system. However, if really necessary, it is possible to use multi-mode fiber downstream of single-mode fiber, as the larger diameter multi-mode fiber will collect most of the light emitted from the single mode fiber. You can never use single mode fiber, or any single-mode components such as CWDM devices, downstream of multi-mode fiber.

Fiber Optic Characteristics

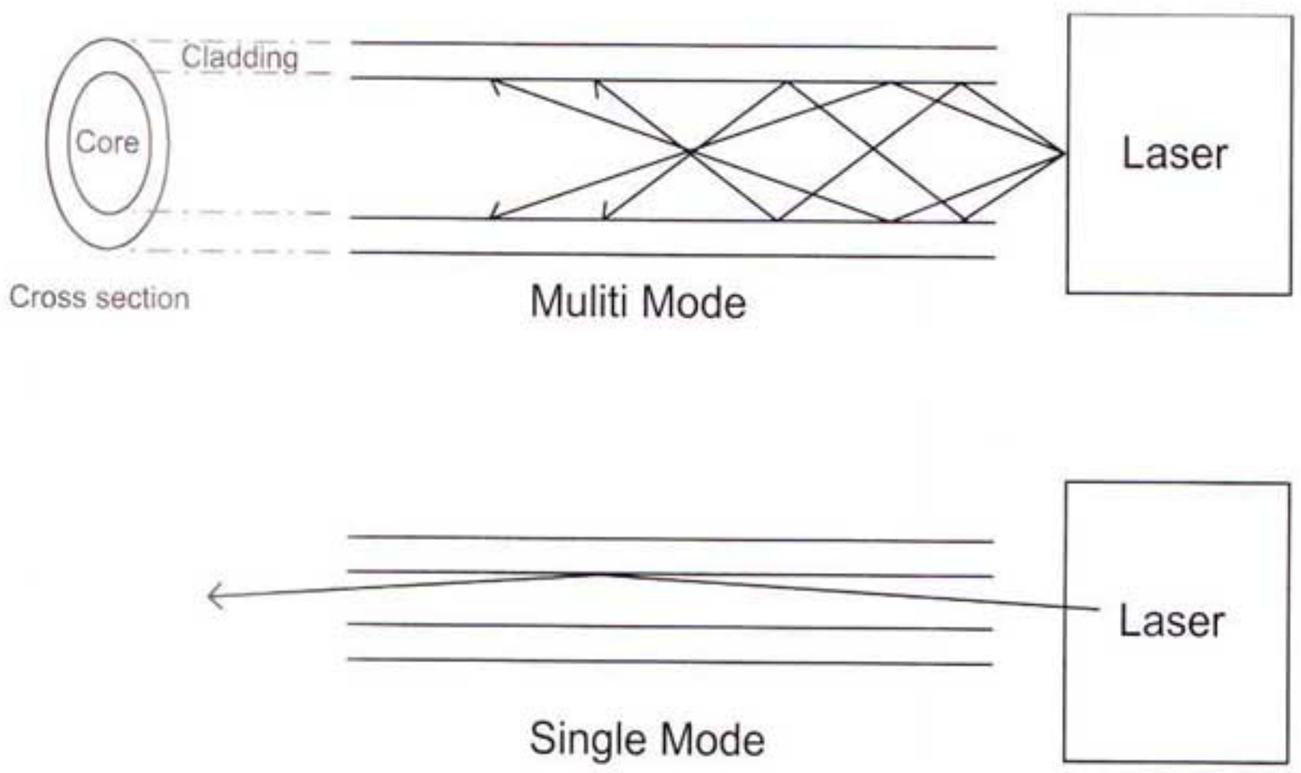


Fig. 1 Multi-Mode and Single Mode

The standard fiber optic cables in use today, have attenuation characteristics similar to those in Fig. 2. As can be seen, the minimum attenuation occurs at wavelengths around 1310nm and 1550nm. Laser manufacturers have consequently designed a wide range of lasers for these specific wavelengths, where attenuation is less than 0.4dB per km.

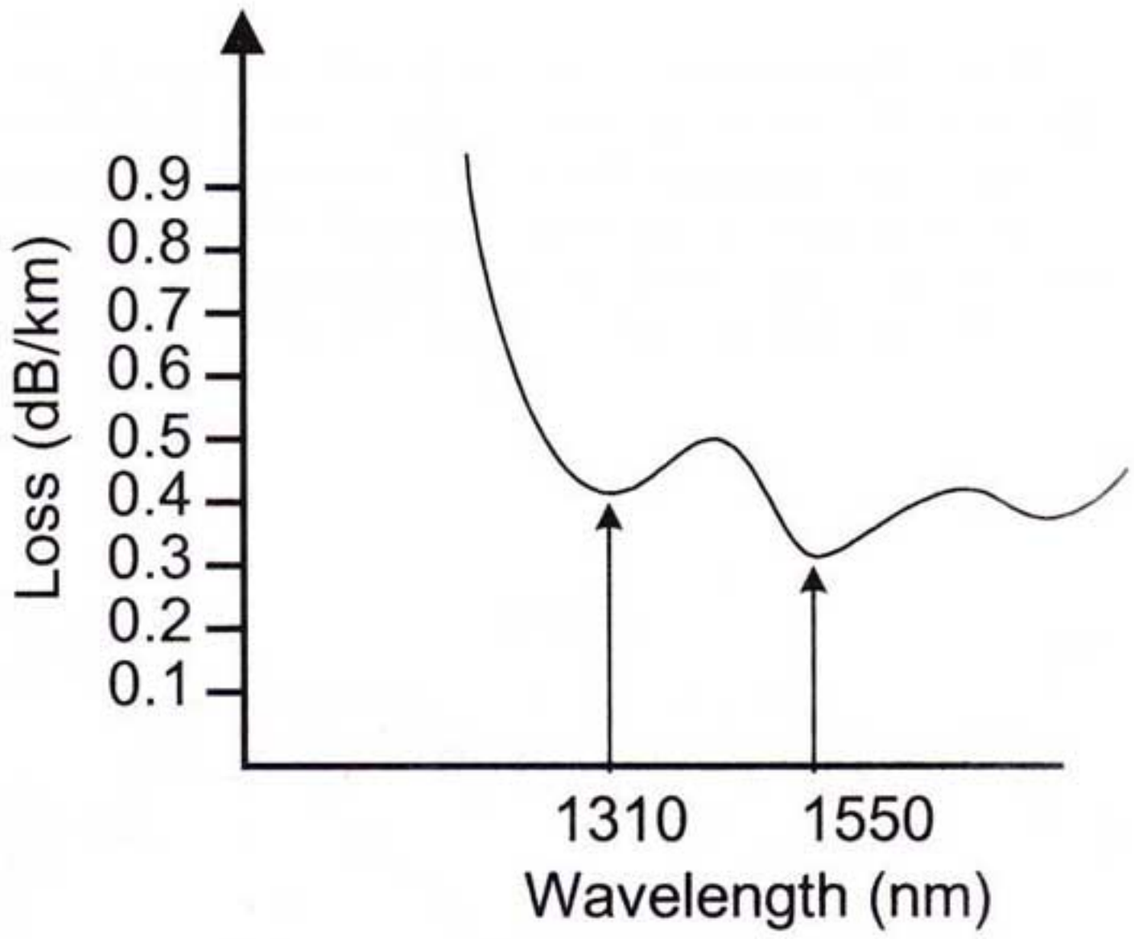


Fig 2. Minimum loss at 1310nm and 1550nm

One signal, one way

A simple one way link is shown in Fig. 3. The electrical to optical converter uses a laser, or perhaps an LED, to transmit the light at 1310nm or 1550nm. The optical to electrical converter at the receiver end, has an optical detector and an electrical re-clocking amplifier. The output typically appears on a co-axial BNC connector.

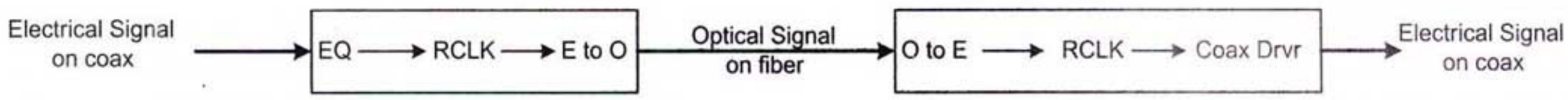


Fig 3. Simple one way fiber link

Doubling up

By employing Wave Division Multiplexing (WDM) two signals at two different wavelengths of 1310nm and 1550nm, can be conveniently carried on the same fiber. See Fig. 4. The first WDM combines the two signals while a second WDM at the other end of the link, separates the two wavelengths again. More on WDM later.

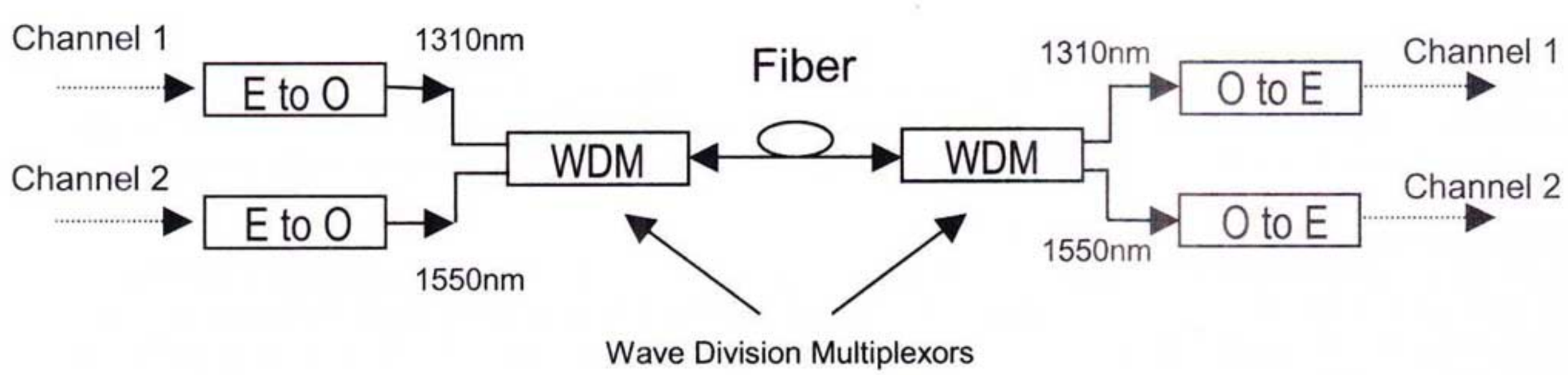


Fig 4. Combining two signals onto one fiber

Going both ways

If we want our fiber link to be bi-directional, we need to employ lasers at both ends. As the lasers will be transmitting towards each other, we need to ensure that they do not affect each other's performance. The best solution is to utilize optical isolators built into each laser, to prevent the light coming from the other end, from affecting the center wavelength stability and performance characteristics of the local transmitting laser. Some laser types, (e.g. DFB lasers) are more susceptible to interference than other laser types (e.g. FP). Laser types will be explained in a later section. Evertz uses built-in optical isolators on any laser type which could be affected by reverse transmission effects or back reflections, in bi-directional fiber links.

A key component in bi-directional fiber links is the combiner device, which combines and separates the bi-directional signals at each end, as shown in Figure 5. These devices route the source light from the lasers directly to the fiber line, without permitting it to get back into the local lasers. Some systems, which are specifically designed for bi-directional applications, may have built-in directional couplers. Note that a bi-directional system should only be built with directional splitters, if the optical path loss is less than 14dB. Otherwise it is possible that the output of the local laser will be reflected back into the local receiver. Evertz publishes tables for bi-directional system, to help the designer choose whether to employ a single fiber, dual fibers or WDM techniques using two or more fibers.

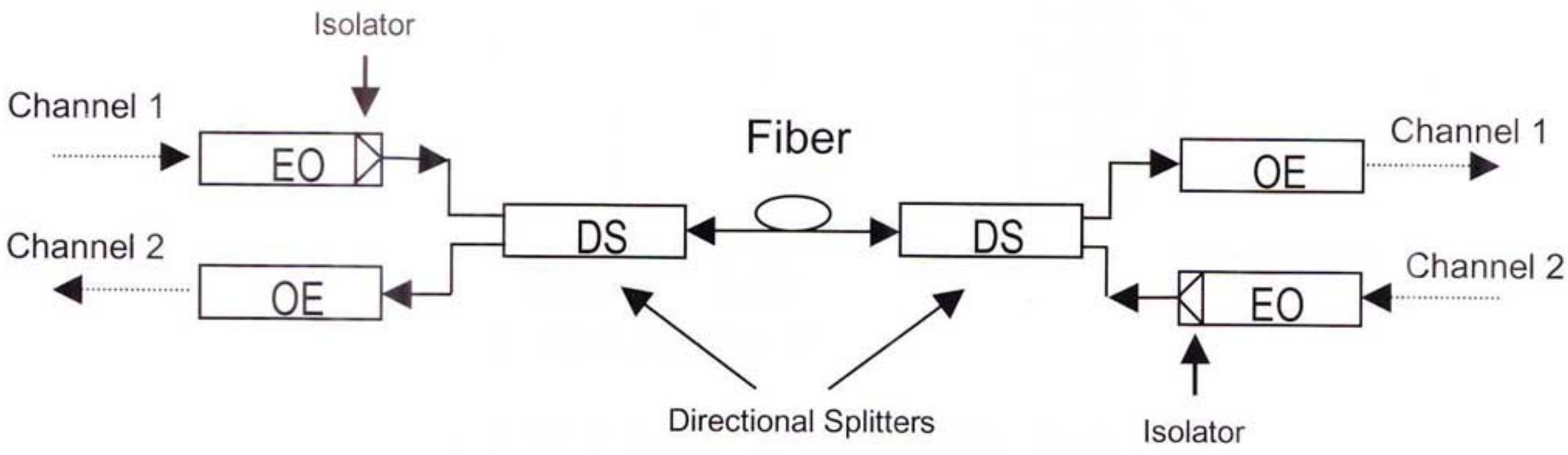


Fig 5. Bi-Directional Video

Digital video and audio

Digital video is often transported over long distances using fiber optics. If audio is embedded in a digital video bit stream, it will be automatically transmitted over a fiber optic link along with the video. This applies to SDI at 270Mb/s and HDSDI at 1.485Gbps.

Time Division Multiplexing

Digital audio can be transmitted in a similar way to digital video. The bit rate used for 48Khz digital audio broadcasting is 3.073Mbs, so by using Time Division Multiplexing (TDM) techniques, multiple audio channels may be transmitter over the same fiber. TDM techniques permit multiplexing of such signals as SDI video and separate ASE audio. This has the advantage that if the video or audio fails, the other signal will be unaffected. Other signals which may be multiplexed using TDM, include data and time code.

Analog video and audio

Although it is possible to modulate a laser beam with an analog signal, these days it is expedient to use digital techniques. Modern fiber transmitters for analog audio and composite analog video, usually convert these signals to digital, before transmitting them. TDM solutions can again be employed to multiplex analog audio and video signals onto the same fiber and even multiple video and audio signals onto the same fiber.

Other signal types

In addition to digital and analog video and audio, broadcasters have a need to transmit an ever growing variety of signal types. These include time code, RS-232/422/485 remote control, intercom, L band and IF band satellite signals, DS3, T1, Ethernet for computer networks and so on. These can all be accommodated on a single fiber by employing the appropriate multiplexing devices.

WDM, CWDM and DWDM

We previously mentioned the use of WDM for combining two signals. Coarse Wave Division Multiplexing (CWDM) extends the number of feeds which may be carried. This is achieved by broadening the bands used in the 1310 and 1550nm areas of the spectrum. As can be seen in Fig. 6, wavelengths used in the 1550 attenuation trough, can range from 1470 to 1610nm. A similar group of wavelengths can be used around the 1310nm trough and by combining these two groups, up to 16 channels can be multiplexed onto one fiber. CWDM wavelengths are 20nm wide and are fairly easily created. To further increase the number of channels carried, DWDM (Dense Wave Division Multiplexors) can be employed. DWDM wavelengths are typically only 1.6nm wide and require much more sophisticated technology to maintain the assigned wavelengths.

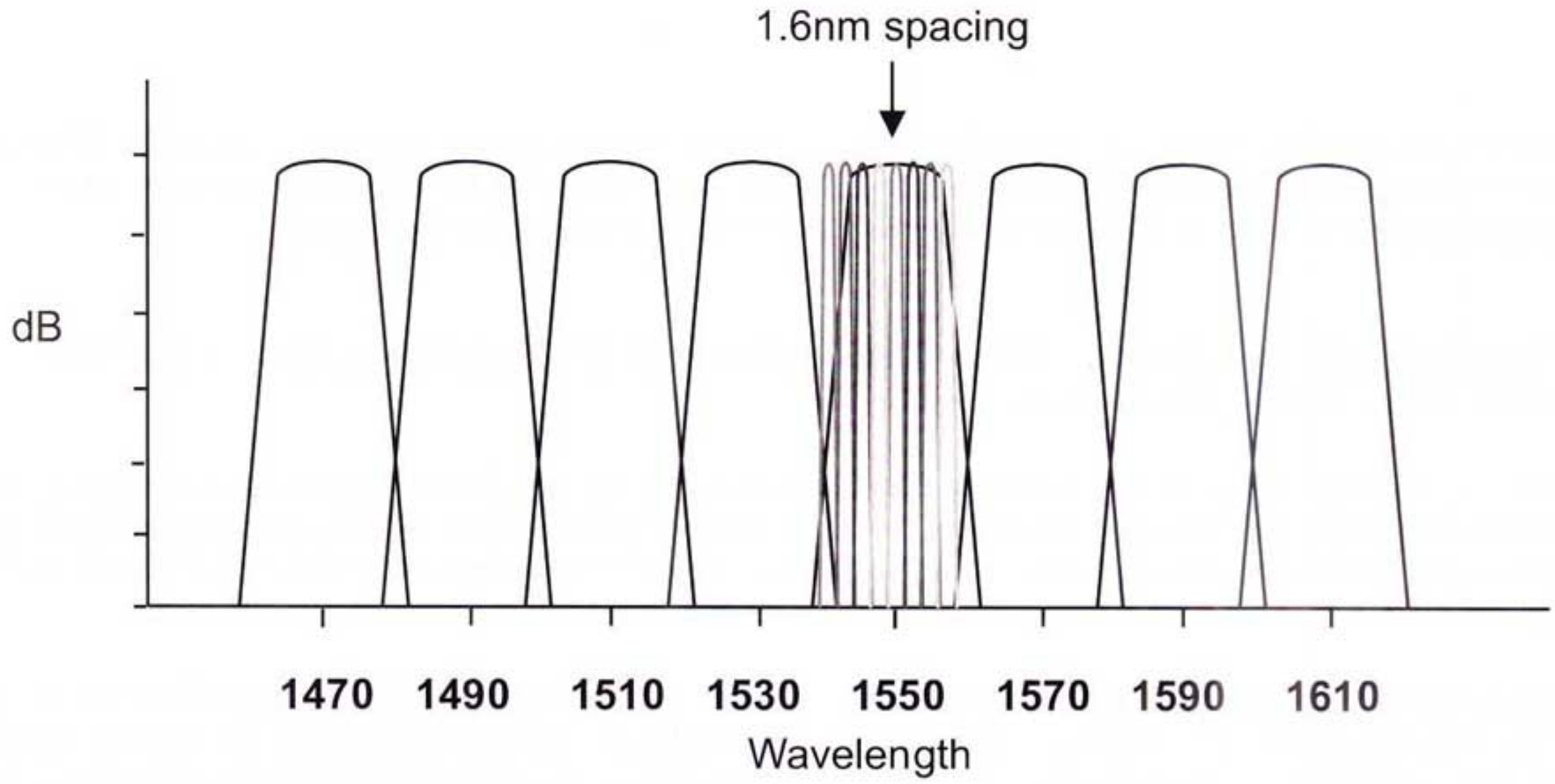


Fig 6. CWDM and DWDM

Putting it all together

There are many different solutions to the problems of getting different signal types from one place to another. The ideal solution will depend upon the distance between the two locations, whether the fiber is owned or leased, if the audio is embedded or separate and a variety of other factors. There are modules available to convert most signals types from copper to fiber and to multiplex different signal types together. The challenge is to find the most economical solution.

Loss budget

Although this topic has been saved to last, loss budget is actually the first thing to consider, as it is an essential requirement that the signals get from point A to point B and still retain a healthy margin of signal strength. It is best to start with a simple calculation of the laser power at the source, minus the anticipated losses in the fiber (calculated from published specifications for the fiber being used). The remaining signal power can then be compared with the sensitivity of the receiver to see how much margin is available. Here's an example:

Laser power:	-7.5dBm
Fiber attenuation:	0.4dB per kilometer
Fiber length:	20Km
Receiver sensitivity:	-29dBm
Connector loss:	0.5dB
Number of connectors:	2

The loss in the fiber cable is 20 x 0.4 = 8dB. We need to add an allowance for connector loss and there are 2 connectors. At 0.5dB loss per connector, this adds 1dB to our loss budget. The power level at the input to the receiver is therefore -7.5dBm -8dB -1dB = -16.5dBm.

The receiver sensitivity is -29dBm, so the margin is 29-16.5 = 12.5dB. Typically we would like to leave a 3dB safety margin, so in this case we still have 8.5dB of margin to play with. The margin decides how many other products could be added. These might be multiplexors, splitters, patch panels, etc and by looking up the insertion loss of each of these devices, we can easily determine if they can be employed in our system. If the loss budget is exceeded, we might need to choose a more powerful laser option.

Deeper Stuff

After we have made a rough calculation of the loss budget to determine the available power margin, we can decide if further calculations are warranted. If margins are minimal and we are using high frequencies as in HDTV, we will want to consider other factors which might affect the performance of the overall fiber system Here's a look at the most important variables.

Laser Types

There are two basic types of lasers; Fabry-Perot (FP) and Distributed Feedback (DFB) and both types are available for 1310nm and 1550nm. We need to choose which type best suites our needs.

Fabry-Perot lasers are the simplest and the least expensive, but the wavelengths of light they emit contain too many side bands for the most critical applications. The spread in wavelengths is measured as Full Width Half Max (FWHM), as shown in Fig 7. An FP laser might typically have an FWHM of around 4nm. Evertz uses 1310nm FP lasers for lower data rate and shorter distances, as they are the most economical.

DFB lasers were developed to satisfy the need for narrow, precise wavelengths as illustrated. Typically a DFB laser might have an FWHM of 0.2nm. These lasers employ a filtering system, which reflects (feeds back) light of only one specific wavelength into the cavity where the light amplification is taking place. The light is evenly distributed throughout the cavity; hence the name Distributed Feedback laser. DFB lasers are used for the more demanding applications and always for CWDM applications.

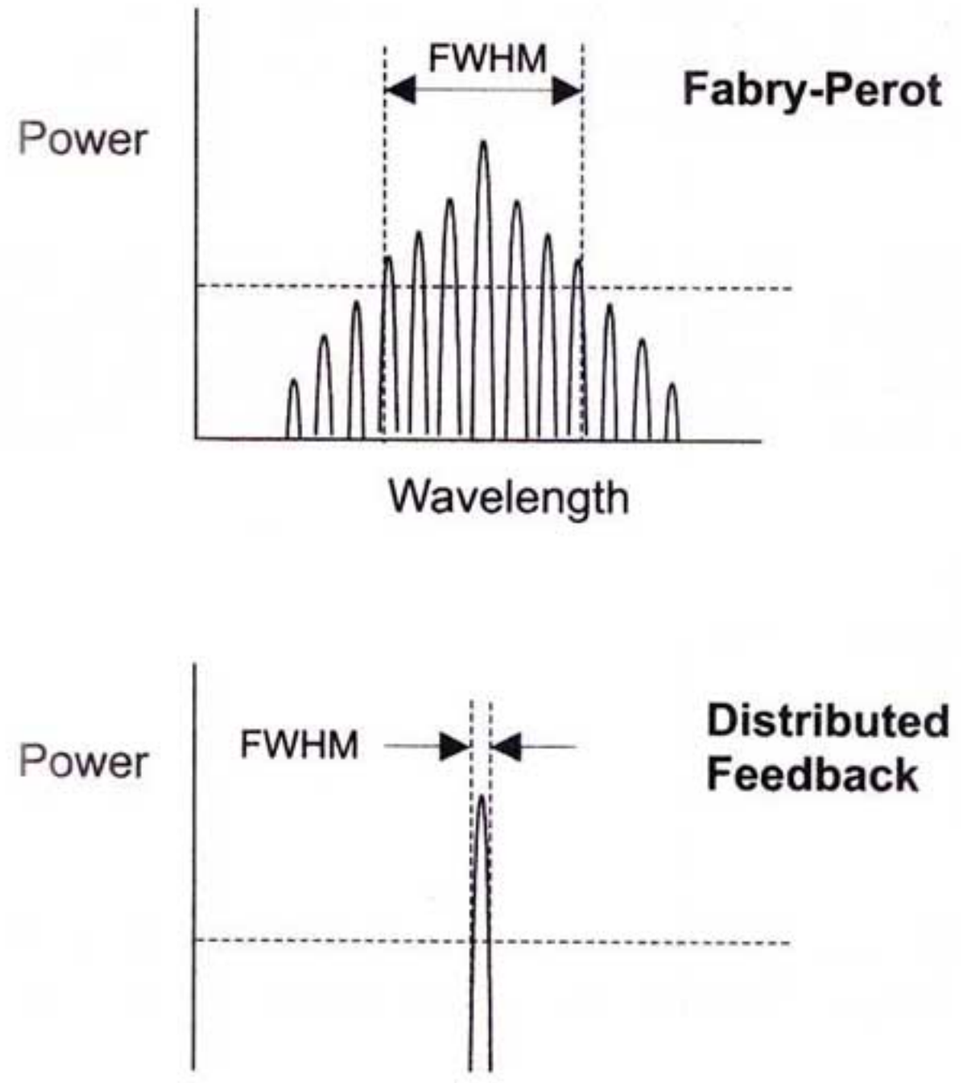


Fig 7. FP and DFB linewidths

Chromatic Dispersion

Different wavelengths of light will travel at slightly different speeds in optical fiber, due to the variation of refractive index with wavelength. Therefore two pulses carried on two different wavelengths, will arrive at the destination at two different times. The time difference is very small and measured in picoseconds, but it can pose problems for Fabry-Perot lasers. A pulse transmitted on an FP laser will suffer dispersion as it travels down the fiber optic cable because the different wavelengths will be traveling at different speeds. Fig. 8 shows how a square pulse of light becomes attenuated and deteriorates into a classical "eye pattern" as it propagates down the fiber and is affected by attenuation and dispersion. (Note that there is a difference between the fixed displacement in time caused by dispersion and the low frequency and high frequency shifting in time caused by jitter. However, the challenge presented to the optical receiver for recovery of the data, is similar).

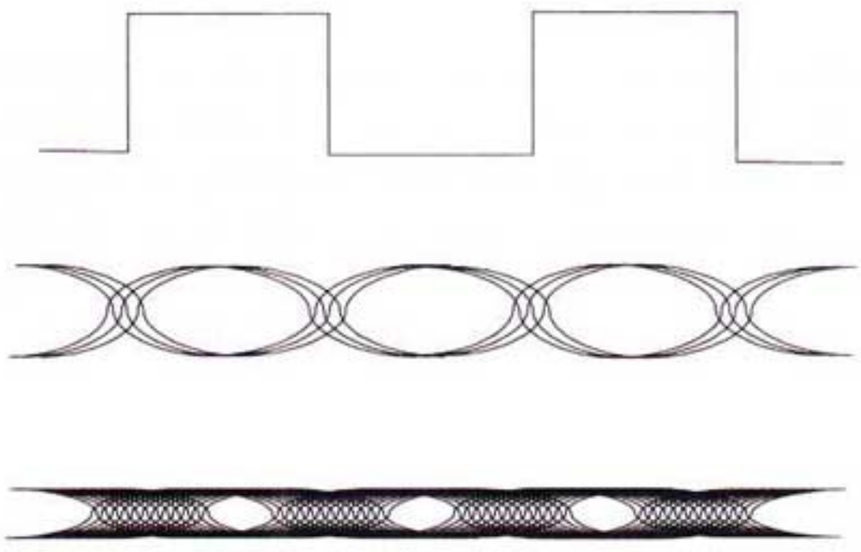


Fig. 8 Typical Eye Pattern

For products operating at frequencies up to 270Mbs, chromatic dispersion is not a significant factor. But for frequencies over 1Gb/s and particularly if margins are slim, we need to consider the affects of dispersion.

Dispersion becomes critical when the time difference between the arriving signals is a significant percentage of the period of the clock rate being used, because at some point, the optical receiver will not be able to distinguish between one bit and the next one.The bit rate for HDTV is 1.485Gb/s, so 1 bit is transmitted in 673ps (the period of one bit). The maximum allowable jitter in HDTV, as defined in SMPTE292M, is 0.2u.i. where u.i. is the period of 1 bit. (In practice, 0.2u.i. is not easy to achieve without incurringa high price penalty, and many of today's HDTV devices exceed these gitter specs).

In fiber optics we tend to use 0.3u.i as the maximum tolerable dispersion and the maximum permissible "Dispersion Jitter" for HDTV can be calculated at 0.3u.i. x 673 = 201.9ps. The same calculation for SDTV reveals 1,110ps.

FWHM for FP lasers is typically 4nm and for DFB lasers it is typically 0.2nm.
(Actually values for the fiber type being employed should be checked).

Chromatic Dispersion (CD) at a particular operating wavelength, is measured in ps/nm.km. For standard Corning SMF-28 optical fiber this is around 2 for 1310nm and 17 for 1550nm (Fig 9).

$$CD = ps/nm.Km$$
or
$$Km = ps/CD.nm$$

The following table uses the above formula and the above values to derive maximum distances in km attributable to Chromatic Dispersion. (Note that these distances are theoretical values for dispersion only. Other characteristics, such as the fiber attenuation, will generally have more influence as limiting factors and many of the distances quoted will never be attainable).

	Fabry-Perot		**DFB**	
	1310	**1550**	**1310**	**1550**
HDTV	25km	3km	500km	58km
SDTV	137km	32km	2,750km	323km

Table 1. Theoretical chromatic dispersion limits - other factors will generally be far more restrictive

Deeper Stuff

After we have made a rough calculation of the loss budget to determine the available power margin, we can decide if further calculations are warranted. If margins are minimal and we are using high frequencies as in HDTV, we will want to consider other factors which might affect the performance of the overall fiber system Here's a look at the most important variables.

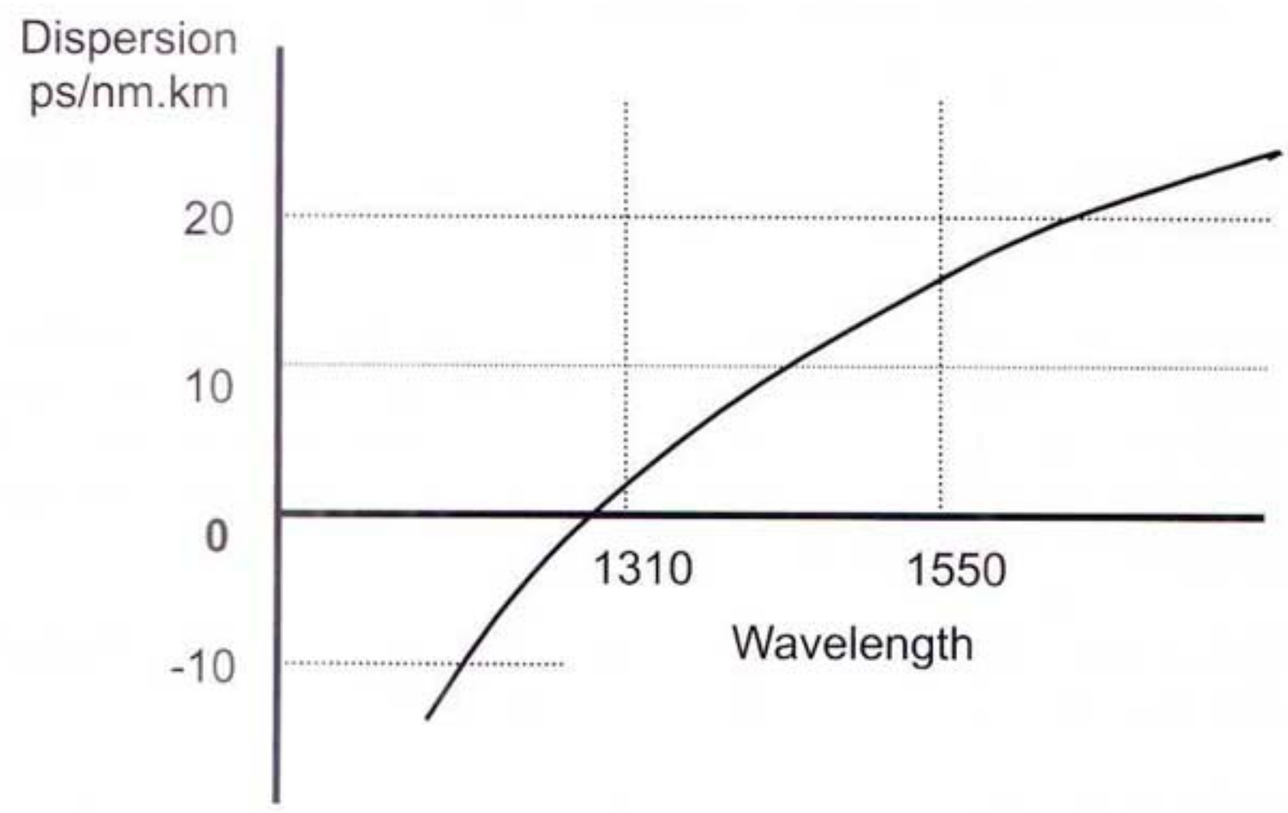
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Fig 7. FP and DFB linewidths



Dispersion Characteristics of Optical Fiber

The amount of chromatic dispersion experienced in optical fiber is dependent on the wavelength of the light being transmitted. This can be seen in Fig 9.

EIA-608 and EIA-708 Closed Captioning

by Sarkis Abrahamian

In NTSC and SMPTE 259M digital system, captions are encoded onto line 21 of the Vertical Blanking Interval (VBI). The captioning standard is defined by EIA-608. For HD-SDI EIA-708, space is provided in the SMPTE 292M serial digital bit stream to encode captions, typically on line 9. Three HD caption transport protocols are currently used: SMPTE 334M, SMPTE 333M, and Grand Alliance protocol.

Closed Captioning is the process of electronically encoding television speech in such a way that, although it is invisible to the regular viewer, a decoder in the television set (or a special set top box) can decode the spoken word and display it as text in the picture area. The encoding process relies on an operator translating the speech into written text. In the NTSC and SD-SDI television system in North America, the captioning data is transmitted in the vertical interval, outside the normal viewing area of the picture. A new method of encoding has been created for HDTV, and will be described later in the paper.

For NTSC, SD-SDI, and HD-SDI closed captioning, the spoken word may be translated into captions either in real time, or off-line for transmission later. Real time live translation relies on a skilled stenographer, to type captions along with the speaker ad send the data via modem. Until quite recently, off-line captioning had been carried out using video tape machines, but the advent of compression and non linear editing techniques now enables the work to be accomplished much faster using suitable hardware and software, such as ProCAP.

The Federal Communications Commission

The Television Decoder Circuitry Act of 1990, requires that all television sets sold in the USA with screens 13" or larger, shall contain decoding circuitry enabling the display of closed captioned material. With the introduction of digital television, the Federal Communications Commission is proposing new rules to ensure that closed captioning services be maintained on the new digital receivers.

In 1997, the Federal Communications Commission adopted rules that require an increasing amount of captioned programming over an eight-year transition period, with 100% of all new non-exempt programming required to be captioned by January 1, 2006.

NTSC Closed Captioning

In the NTSC television format, line 21 in the vertical blanking interval (VBI) has been allocated to carry closed captioning information. In the television station, an NTSC closed captioning encoder is used to place the data on line 21. At home, either a recent model television, or a special set top decoder, may be used to decode the closed captions and key the text onto the screen. Both fields of the NTSC signal may be used for this purpose (see Figure 1).

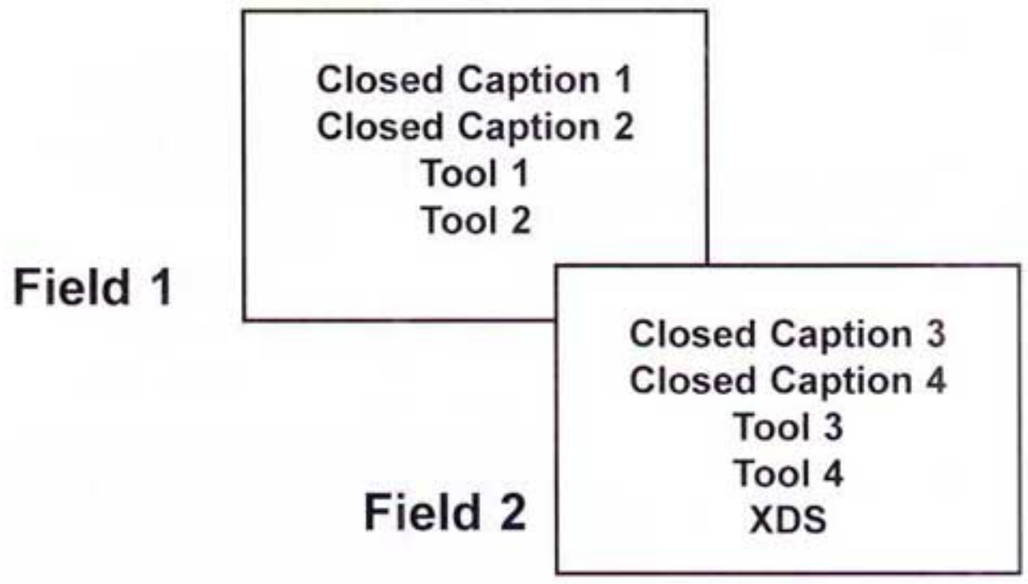


Figure 1 - Line 21 Closed Captions

Field 1 carries two Caption Channels CC1 and CC2 and two Text Channels T1 and T2. Field 2 carries additional Caption Channels CC3 and CC4, Text Channels T3 and T4 and Extended Data Services (XDS) data. (Captions and text may be placed on either field whereas XDS data is restricted to Field 2). Each field can contain only two characters at one time. In NTSC there are 60 fields per second, so the whole system can transmit a total of 2 x 60 = 120 characters per second. Text and XDS information only change occasionally or not at all, whereas captions change constantly.

Captions may be displayed in "Roll Up", "Paint on" or "Pop Up" modes. Roll Up mode was designed to facilitate comprehension of message during live events. Captions are wiped on from the left and then roll up as the next line appears underneath. 1, 2, 3 or 4 lines typically remain on the screen at the same time. In Paint On mode, a single line of text is wiped onto the screen, remains there briefly and then disappears. Pop Up mode is less distracting than the other two, but the complete sentence must be pre-assembled off screen. It is then "popped" onto the screen as a completed message at the appropriate time. In all modes, captions may be positioned at different locations on the screen.

Text may occupy half a screen or the whole screen. XDS data can include Time of Day, Program Name, Program Rating based on the TV Parental Guidelines and the Transmission Signal Identifier (TSID).

SD-SDI Closed Captioning

Television facilities operating in the Serial Digital Interface (SD-SDI) 601 standard, also use line 21 to carry the closed caption information. SD-SDI 601 closed caption encoders perform a similar function to NTSC closed caption encoders, except that the video signal being passed is component digital. It is important to preserve this format, as the majority of viewers still have NTSC receivers. When converting the SDI signal to NTSC, most encoders add 7.5 IRE setup to all lines including line 21. The EIA 608 waveform specification, however, stipulates that there should be no setup on line 21. In order to comply with this anomaly, it is necessary for the SD-SDI closed caption encoder to shift the closed caption data down by 7.5 IRE on line 21, so that it emerges from the NTSC encoder without setup. This practice necessitates using digital video values, which are outside the legal limits specified in SMPTE 125M.

It can be noted at this point, that the digitizing process produces 7 bits plus 1 parity bit for each text character. As we have seen, we can transmit 120 characters per second, so this translates into a bit rate of 8 x 120 = 960 bits per second.

HD-SDI Closed Captioning

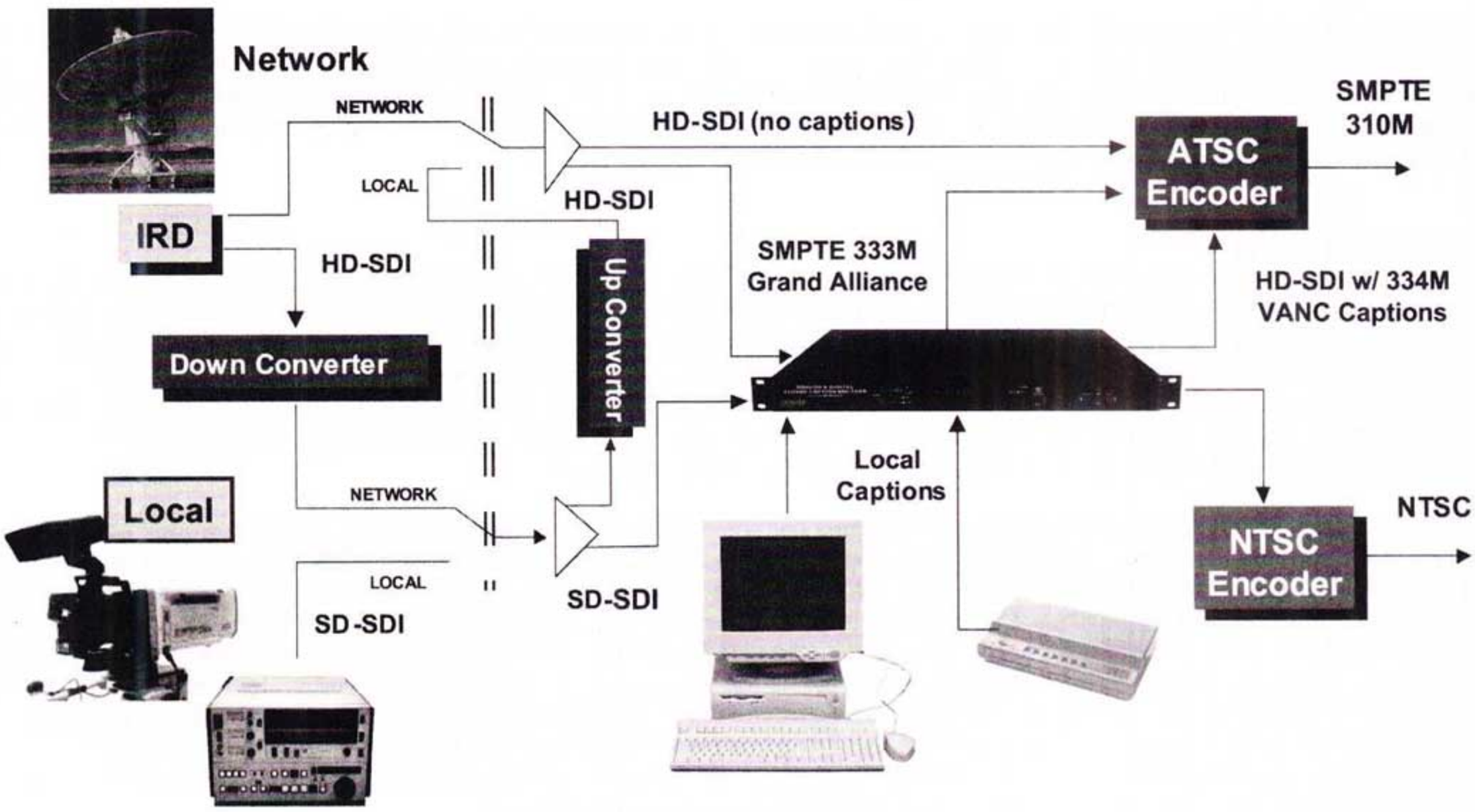
HD-SDI Closed Captioning is the migration of earlier analog techniques employed for NTSC, to the new digital domain as defined by the Advanced Television Systems Committee (ATSC). The Closed Captioning standard is defined by the Electronic Industries Alliance in EIA-708. The transport of the Caption Channel is defined in the ATSC A/53 and A/54 documentation. The digital system, allocates a data rate of 9600bps for closed captioning use. This is 10 times as much capacity as in the NTSC system and opens up the capability to offer embellished text characteristics, multi-colors, more language channels and many other features. Caption positioning, appearance, and other characteristics will be controllable by the viewer at home.

The HD-SDI closed caption and related data is carried in three separate portions of the HD-SDI bitstream. These are the Picture User Data, the Program Mapping Table (PMT) and the Event Information Table (EIT). The caption text and window commands are carried in the HD-SDI Transport Channel (which in turn is carried in the Picture User Bits). The HD-SDI Caption Channel Service Directory is carried in the PMT and optionally for cable in the EIT. To ensure compatibility between analog/SD-SDI closed captioning (EIA-608) and HD-SDI closed captioning (EIA-708), the HD-SDI Transport Channel is designed to carry both formats.



Scenario 1: HDTV - Captioning

The first scenario shows a conventional closed caption encoder (such as models 8084 or 8084AD) used to encode captions onto line 21 of the SD-SDI signal, together with an EIA-608 to EIA-708 converter (model 7760CCM-T). The SD-SDI signal, complete with line 21 captioning, is either up-converted to HD-SDI or is transmitted as analog NTSC to service existing NTSC television sets. For HD-SDI transmission, the data is extracted and converted to the EIA-708 standard in the 7760CCM-T. This data is then passed to an ATSC Encoder for broadcasting. The 7760CCM-T also decodes captions and XDS information for verification using an on screen display.



Scenario 2: HDTV - Captioning

The second scenario shows the 8085 or HD9084. These devices perform the dual function of standard definition (EIA-608) and high definition (EIA-708) closed captions. These units take the place of the existing closed caption encoder and the 7760CCM-T shown in scenario 1.

The HD9084 is a multi-functional box, able to encode and decode both EIA-608 and EIA-708 captions. It supports all ATSC protocols, which include SMPTE 334M (VANC Captions), SMTE 333M, and Grand Alliance. Local EIA-608 and EIA-708 captions are inserted into the HD9084 via RS232 serial port or via modem.

1080p/24 - Review

by David Strachan

The 1080p/24 format has become widely popular for transferring film images to HDTV tape at the native 24 frames per second film rate. No doubt, the immediate appeal of 1080p/24, encouraged both Sony and Panasonic to expedite development of their 24p cameras, to enable cinematographers to record directly into this video format. These cameras have enjoyed a tremendous reception by those eager to try 24p, as an alternative to 35mm film. The following is a review of the new format and some of the tools available to take advantage of the technology.

The 1080p/24 format

Video, in North America, runs at 29.97 frames per second (Fps). Video in most other parts of the world runs at 25Fps. Film for the world's theatres, still runs internationally at 24Fps, so the 1080p/24 video format is perfect for the interchange of media between film and video. Well almost - there is still a problem. Sooner or later, someone is going to want a video copy in standard definition and this involves frame rate conversion to 29.97Fps. To do this, we require our original material to run at 23.98Fps. (29.97/30 is the same ratio as 23.98/24 - actually 1000/1001. Conversion from 24Fps to 29.97Fps would involve a complex and expensive standards converting process and from 24Fps to 30Fps NTSC would remove the color!). 23.98Fps is therefore a popular frame rate for much of the material being shot in HDTV, but for simplicity most people refer to the format at 24p.

1080p/24 represents a video format containing 1920 pixels per line and 1080 active lines per picture, scanned progressively at 24Fps. If we examine the current process of transferring 24Fps film to 30Fps (29.97) NTSC, we realize quite quickly that there must be a better way. In order to increase the frame rate, the telecine machine, employs a 2:3 pull-down scheme, which results in every other film frame being used to generate 3 video fields, instead of two. Nowadays, digital compression schemes are used to minimize the amount of bandwidth, or hard drive space, occupied by the video and the first thing an MPEG-2 system does, is to search for and discard the extra fields associated with a 2:3 sequence. During the decompression stage, the MPEG-2 system recreates the additional fields, which are needed to comply with the NTSC frame rate of 30Fps. As the images were initially scanned at only 24Fps, it is clearly counterproductive to increase the frame rate by adding images early in the transmission chain. Far better to defer this process, ideally until the video signal arrives at its destination. (In the film world, the frame rate is doubled to 48Fps in the movie theatre, by projecting each frame twice, thereby reducing the flicker to an acceptable level).

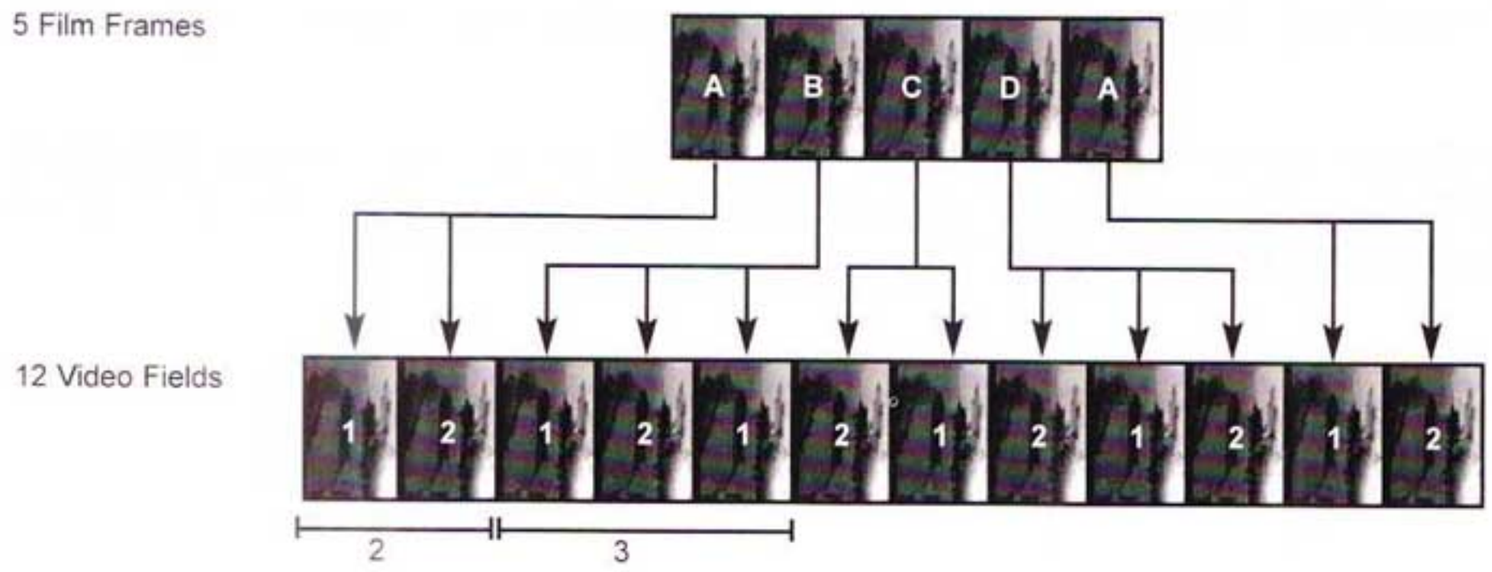


Fig. 1 - 2:3 pull-down for NTSC

Acquisition in 1080p/24

We have seen that, the 1080p/24 camera actually needs to run at 23.98Fps if we are going to want NTSC pictures for any reason. An example of an immediate need for NTSC, is for use with a Steadicam camera stabilizing system, which usually comes with a small NTSC monitor. Most 24p cameras do not offer NTSC outputs and to solve this problem, Evertz makes a down-converter, which adapts to the camera and adds the 2:3 pull-down sequence to the 23.98Fps video and converts it from HDTV to NTSC. The same device also converts the HDTV component analog camera output to HDSDI, with embedded audio and embedded VANC (Vertical Ancillary) time code. A time code converter is also available from Evertz to translate between 23.98 and 29.97Fps, the later being commonly used for the audio time code. (More on time code later).

The Film to Tape Transfer Process

In the production of a movie, sequences that need to be filmed at a particular location, are generally shot during the same session. This is preferable to returning to the same site and having to re-assemble all the equipment. The different film clips are later physically cut and joined in the order dictated by the script. In the early days, re-editing the film was often necessary and was far from convenient, so nowadays the video "Dailies" are converted to video and edited using Non-Linear Editing (NLE) techniques. This process generates an Edit Decision List (EDL), which can be simply rearranged as required by the director. It is not until the EDL is finalized, that the actual film is cut and re-assembled in the required sequence.

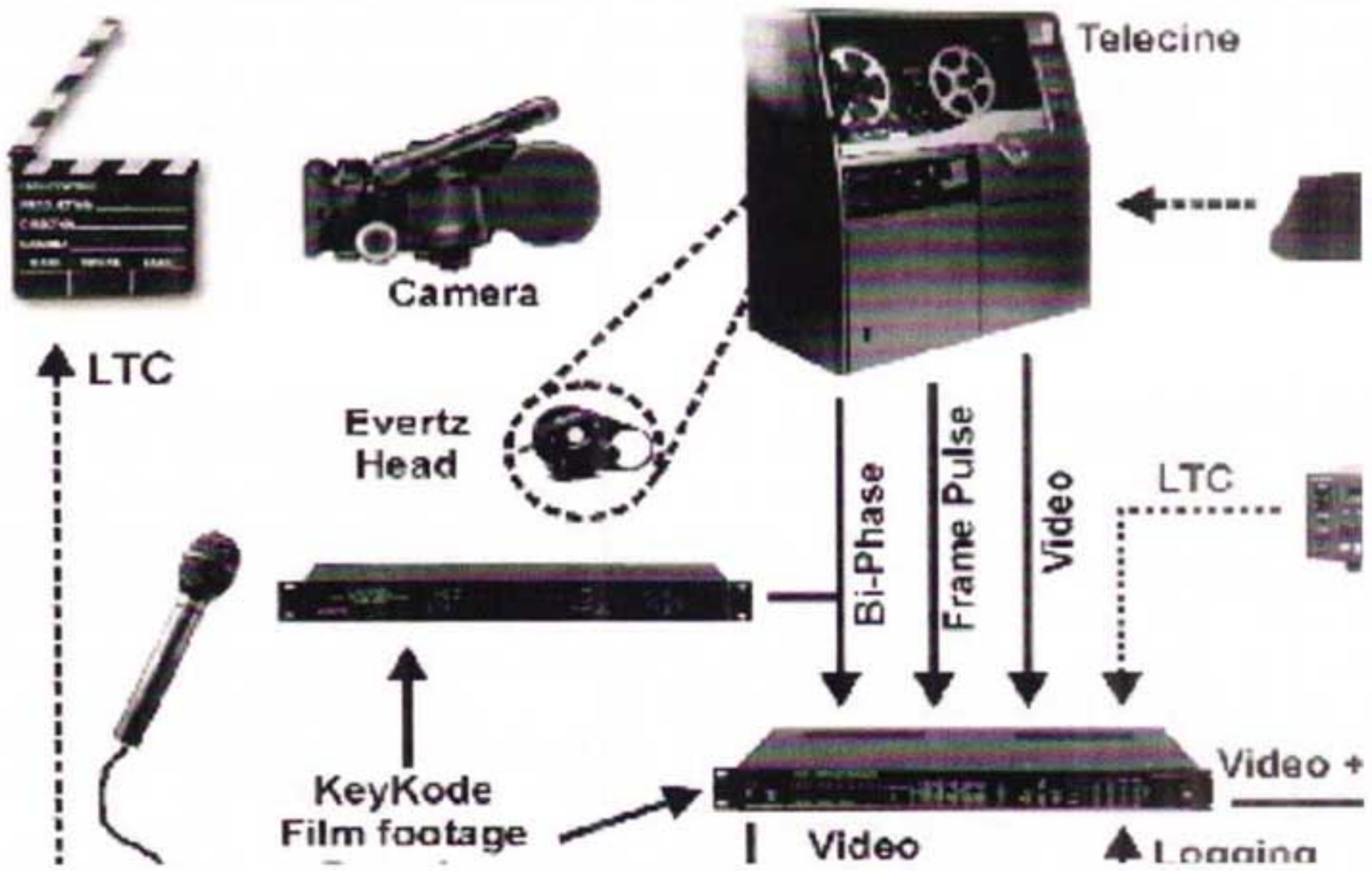


Fig 2 - The Film To Tape Transfer Process

During the filming process, the initial reference point for sound to picture synchronization, is the electronic clapper board (Fig 2). The camera sees the precise moment when the clapper closes and the microphone picks up the "click" at the same instant. Time code, recorded with the audio on the Digital Audio Tape (DAT) recorder, is used as a reference for the start time. When the film is loaded onto the telecine, the starting frame is positioned into the gate and the Evertz film reading head reads the optical KeyKode film edge number. The Telecine Edit Controller ensures that, from this point on, the telecine and the DAT machine track each other in time. The Film Footage Encoder accepts the KeyKode, bi-phase, frame pulse and video from the telecine and the LTC from the DAT machine and generates 3 line VITC (Vertical Interval Time Code) to insert on the NTSC or PAL signal. An internal character generator also supplies an analog video signal with "burned" in time code and KeyKode numbers. Finally, the Windows based KeyLog Tracker software in the computer, logs all of these parameters, together with dates, times, scene numbers and other program data. In NTSC or PAL, the 3 line VITC contains video time code on line 14 of the VBI (Vertical Blanking Interval), film edge numbers on line 15 and audio time code on line 16. When the analog video tape has been made, the video is transferred to an Avid, or other NLE device, for editing. The NLE uses the 3 line VITC to track which piece of film and which audio from the DAT machine, was used to generate a particular video clip.

Digital HDTV formats do not support 3 line VITC. The required audio and video time code and the film edge numbers, are recorded in the VANC (Vertical Ancillary) data area of the HDTV digital video bit stream. (Early HDTV VTRs did not have this capability). See Metadata for more details about this.

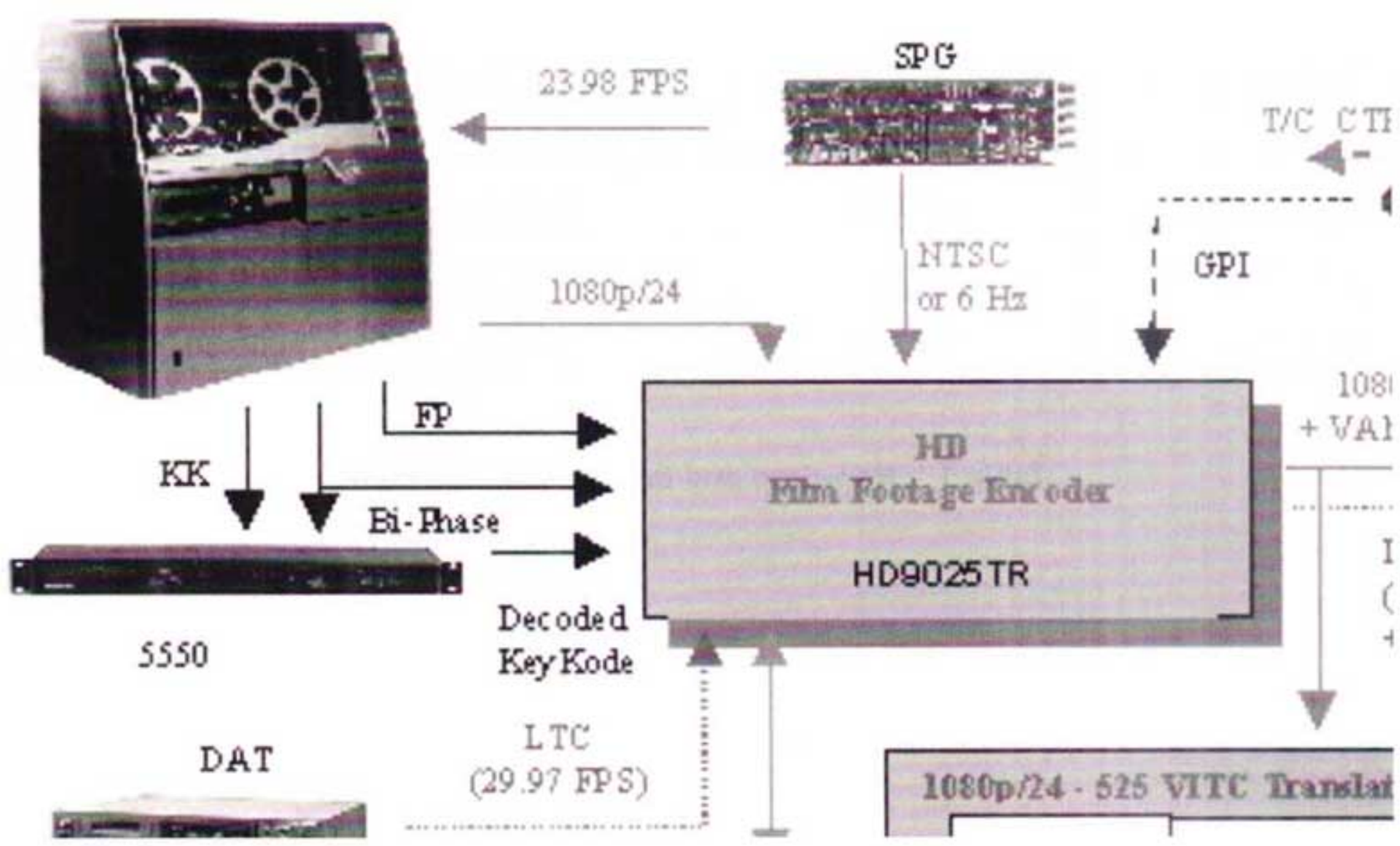


Fig 3 - 1080p/24 Film to Tape Transfer

Fig. 3 shows how an Evertz HDTV Film Footage Encoder and a VITC Translator-Afterburner, are used to generate a standard definition video clip with 3 line VITC, which can again be used by a standard Non-Linear Editor. The HD9025TR accepts all of the usual telecine pulses and the audio time code (at 29.97Fps) from the DAT recorder and, for 1080p/24 applications, generates the require time code at 23.98Fps. This video time code, the audio time code and the film KeyKode, are then inserted into the VANC area of the HDTV bit stream. The HDTV signal, carrying the VANC data is then passed on to the HD9150 "Afterburner" which performs the following tasks. The 1080p/24 (or 1080i/60) video is converted to 480i/60 digital video as well as to NTSC, both with 3 line VITC information. The time code and KeyKode data is also "burnt" into the NTSC monitor for reference during the film to tape transfer process. The Afterburner also applies the required 2:3 pull-down.

24psF

So where does the 24psF (segmented Frame) format fit into the 1080p/24 picture? Well, for many years telecine machines have been scanning the film progressively and then converting the progressively scanned image into an interlaced image compatible with the NTSC or PAL television format. This is exactly what happens in the 24sF format. All television lines in one frame, are progressively scanned in sequence from 1 to 1080. The complete frame is scanned in a 24th of a second. All the odd lines are stored in one buffer (in sequence, 1,3,5, etc) and the even lines in another (2,4,6, etc). These two fields are then successively dispatched down the video cable at 48 fields per second (fps), in the same way as in an interlaced television signal. But there is one major difference. Line 2 in a conventional interlaced image would not be scanned until after all the odd lines of field 1 have been scanned. This means that any movement in the top end of the picture will be captured successively by lines 1 and 3, but then line 2 will not capture the interim movement until much later in the cycle. In a progressively scanned system (and in the 24 psF system) the movement on line 2 is captured in the correct sequence, between line 1 and line 3. In the 24psF system, it would be quite feasible to incorporate a buffer in the display monitor to display the lines in the correct sequence at 24 Frames per second, but even if the picture is displayed as an interlaced picture (lines 1,3,5....2,4,6, etc) at 48 fields per second, the movement on line 2 will still be correctly positioned, because it was originally scanned before line 3. The higher picture rate of 48 fps is also much more compatible with the human persistence of vision than 24 pictures per second, which is not acceptable. 24psF is a convenient way of utilizing circuitry designed for interlace field rates at the same time as reconstructing a progressively scanned image for display at a faster picture rate. In practice, nearly everyone using the 24p format, is actually using 24psF or 23.98psF.

Time Code

We have talked about 3 line VITC and time code for audio and video. We also need to talk about drop frame and non-drop frame time code and how this applies to the 24p format.

Time code is measured in Hours, Minutes, Seconds and Frames. There always has to be a whole number of frames per second in the time code count (30), but as the video rate is 29.97Fps, the standard non-drop frame time code drifts away from real time by a factor of 1000/1001, or 3.6 seconds every hour. In other words, in a true one hour period*, the slower 29.97Fps video, displays only 107,892 (27.98x60x60) frames, whereas 30Fps video would display 108,000 (30x60x60) frames per hour (an extra 108 frames). The non-drop frame time code at 29.97 Fps will take 1 hour and 3.6 seconds to complete 108,000 frames. Drop frame time code, was invented to correct this discrepancy. Contrary to common belief, drop-frame time code does not drop any video frames. It is only the frame count within the time code which is modified, to drop the extra 108 "counted" frames and restore the duration to a true time period of 1 hour. Drop-frame time code does this by skipping the first two frames of every minute (2 frames x 60 minutes = 120 frames), except on the 10s of minutes (2 frames x 6 = 12, as there are 6 x 10 minutes in the hour). 120 - 12 = 108. Tables 1 and 2 illustrate the differences.

Frame Rate	Video frames per hours	Timecode after 108,000 video	Timecode after 1 hour
30 non-drop	108,000	01:00:00:00	01:00:00:00
29.97 non-drop	107,892	01:00:00:00	00:59:56:12
29.97 drop-frame	107,892	01:00:03:18	01:00:00:00

Table 1 - Non-drop and drop-frame time code

Drop-frame count
00:00:00:01
00:00:00:02
00:00:00:03
00:00:00:29
00:00:01:00
00:00:01:01
00:00:59:29
00:01:00:02
00:01:00:03
00:01:59:29
00:02:00:02
00:02:00:03
00:09:59:29
00:10:00:00
00:10:00:01

Table 2 - How drop-frame time code jumps over certain frames - difference in italics at the minutes but not tens of minutes

* Note that the actual video frame rate is 29.97002617Fps instead of the approximate value of 29.97. Drop-frame time code does not correct for this but, as the resulting error is only about 75 milliseconds per day, this small error need only be corrected if the time code is being used for master clock applications.

Time code for 23.98Fps

Although 23.98Fps is not a whole number, no drop-frame system exists for this format. Consequently, time code for 23.98Fps video, cannot be associated with true time of day. A one hour program run at 24 Fps, will contain 24 x 60 x 60 = 86,400 frames. The same sequence shot at 23.98Fps, will also contain 86,400 frames, but as the frame rate is slower, the sequence will take longer to complete. The time code will still read 01:00:00:00, but the actual duration of the 23.98Fps sequence will be 1 hour and 3.6 seconds. (This may be computed using the same 1000/1001 ratio to determine the time duration). When 2:3 pull-down is applied, to derive 29.97Fps, some systems offer the user a choice of selecting drop?frame or non-drop frame time code for the output. For pure editing functions, where time of day is irrelevant, non-drop frame is preferred, so that the two sets of numbers do not drift apart. Some systems retain the original 23.98 time code information in the new 29.97 time code user bits. The Evertz HD9150 Afterburner, can display both time codes, burnt onto the SDTV screen.

Fig. 1 shows how the 2:3 pull-down sequence is repeated every 4 film frames and every 5 video frames (10 fields). Time code is normally set to ":00" at the start of the 'A' frame. Fig. 4 shows how the time code tracks the changes throughout one sequence of the 2:3 pull-down and how the HD9150 delays the video by 5 frames to ensure that the output is in phase with the input. The standard definition video time code at 29.97Fps, would be labeled :00, :01, :02, :03 and :04, for the five frames shown. The video delay through this equipment is exactly five frames, so that the 'A' frames at the input and output may be aligned. Optionally, the same delay may also be applied to the audio.

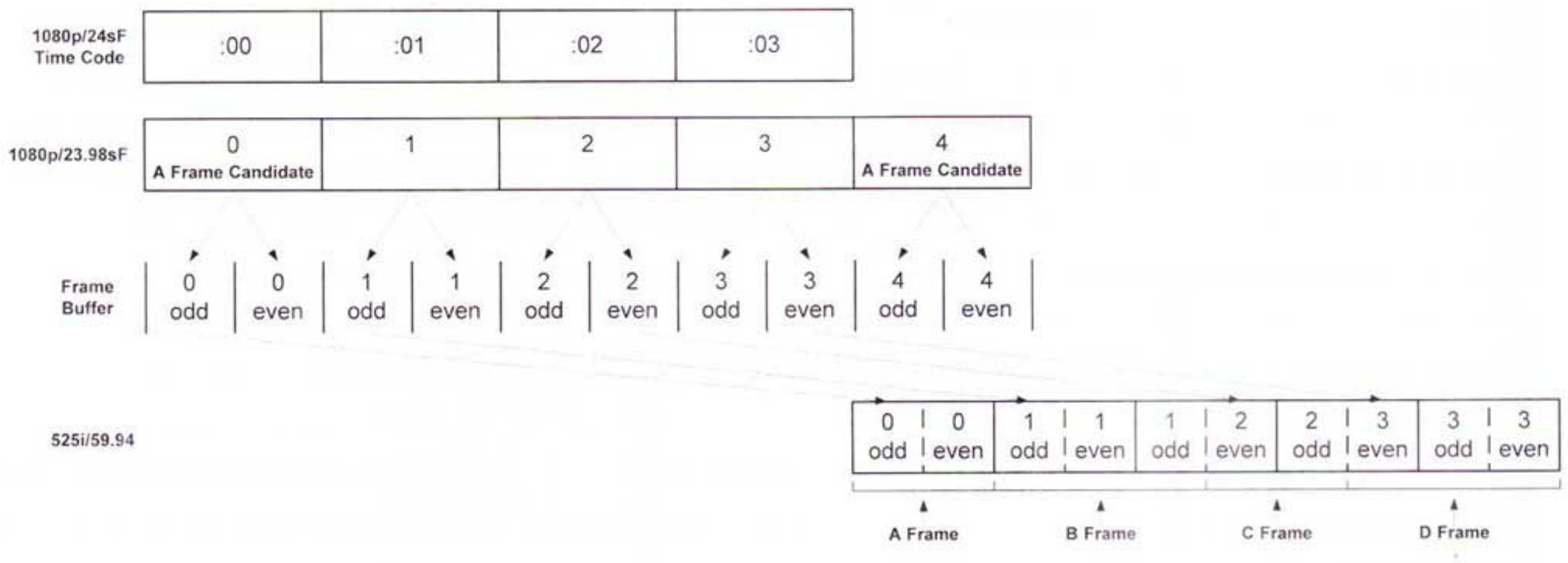


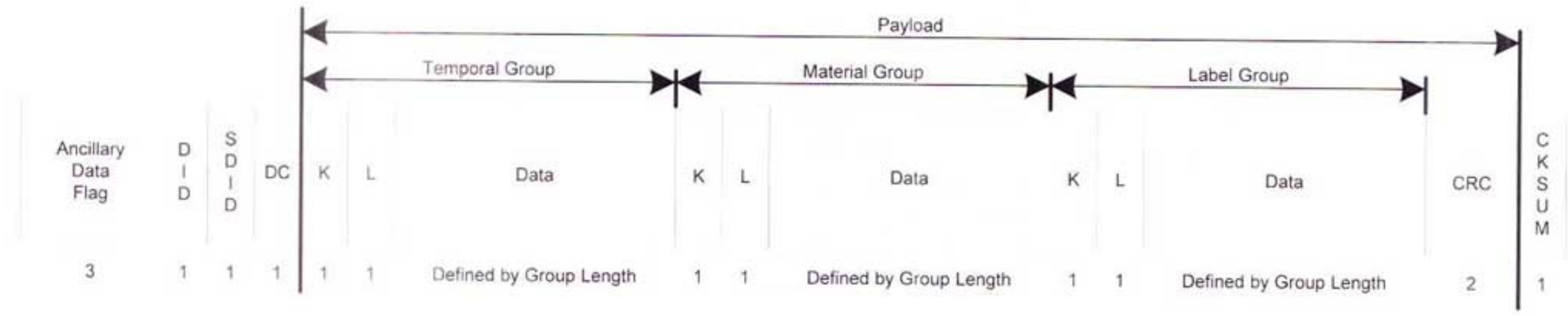
Fig. 4 - Time code conversion with 2:3 pull-down

In PAL countries, time code is not such an issue. As the color television system runs at a true 25Fps, most problems relate to needing 23.98Fps for North America or Japan, or 24Fps for the movie theatres.

Metadata

SMPTE's RP215 provides the recommended practice for encoding film transfer information into Vertical Ancillary Data. This data falls into the following three categories:

- Temporal - this data is the minimum required if conventional 3 line VITC is to be recovered
- Material - Data which identifies individual shots
- Label - Data which identifies the video tape



Data Item	Length	Name	Description
1	4	Video TC	Video Time Address (BCD)
2	4	Video BG	Video Binary Groups (Hex)
3	4	Audio TC	Audio Time Address (BCD)
4	4	Audio BG	Audio Binary Groups (Hex)
5	1	Audio Phase	Audio to Video Bit Phase
6	1	KK MFG	Film Manufacturer Letter (ISO)
7	1	KK Emulsion	Film Emulsion Letter (ISO)
8	8	KK	Key Number (BCD)
9	4	Ink Prefix	
10	3	INk	Ink Feet + Frames (BCD)
11	1	Pulldown	Film PUlldown
12	1	Swquence	Film Sequence
13	4	ABS Frames	Absolute Film Frames
14	1	Video Format	Video Format Id
15	1	Audio Modulus	Audio Frame Modulus
16	1	Film Format	Film Format ID
17	1	Film Rate	Film Transfer Rate
Temporal Group Length	44		

Table 4 - Temporal Group Data Items

Data Item	Length	Name	Description
18	4	Tag	Database Index Tag
19	3	Flags	RP 135 Film TC Flags (Bitmapped)
20	4	Equip ID	RP 135 Film TC Equipment ID (ISO)
21	4	Prod Date	Date of Production
22	8	Daily Roll	Daily Roll (ISO)
23	8	Cam Roll	Camera Roll (ISO)
24	8	Sound Roll	Sound Roll (ISO)
25	8	Lab Roll	Lab Roll (ISO)
26	8	Scene	Scene Number (ISO)
27	4	Take	Take Number (ISO)
28	8	Slate	Slate Number (ISO)
Material Group Length	67		

Table 5 - Material Group Data Items

Data Item Number	Length	Name	Description
28	8	VT Roll	Video Tape Roll (ISO)
29	20	Title	Show Title (ISO)
30	8	Episode	Episode Number (ISO)
31	20	Facility	Facility Name (ISO)
32	40	Misc	Miscellaneous Data
Label Group Length	96		

Table 6 - Label Group Data Items

1080p/24 Support Products

The NTSC tape machine and the DAT recorder must operate at 30Fps (or 29.97Fps). However the 1080p/24 video operates at 23.98Fps. Therefore there is a need for a reference generator, which can be genlocked to NTSC, but can provide a 23.98Fps HDTV reference. Such a reference is available from the Evertz 7750SRG-HD Slave Reference Generator, which also offers tri-level sync for 1080i/59.94 and 625 lines at 23.98Fps ("Slow PAL"). The product also generates a 6Hz pulse (30 - 24), which coincides with the start of the 'A' frames. This card is used by telecines, telecine edit controllers and 23.98 to 29.97 time code converters. Conveniently, the unit plugs into the same frame used by many other HDTV products including a 2:3 pull?down card, down converters, HDTV DAs and HDSDI to VGA adaptors.

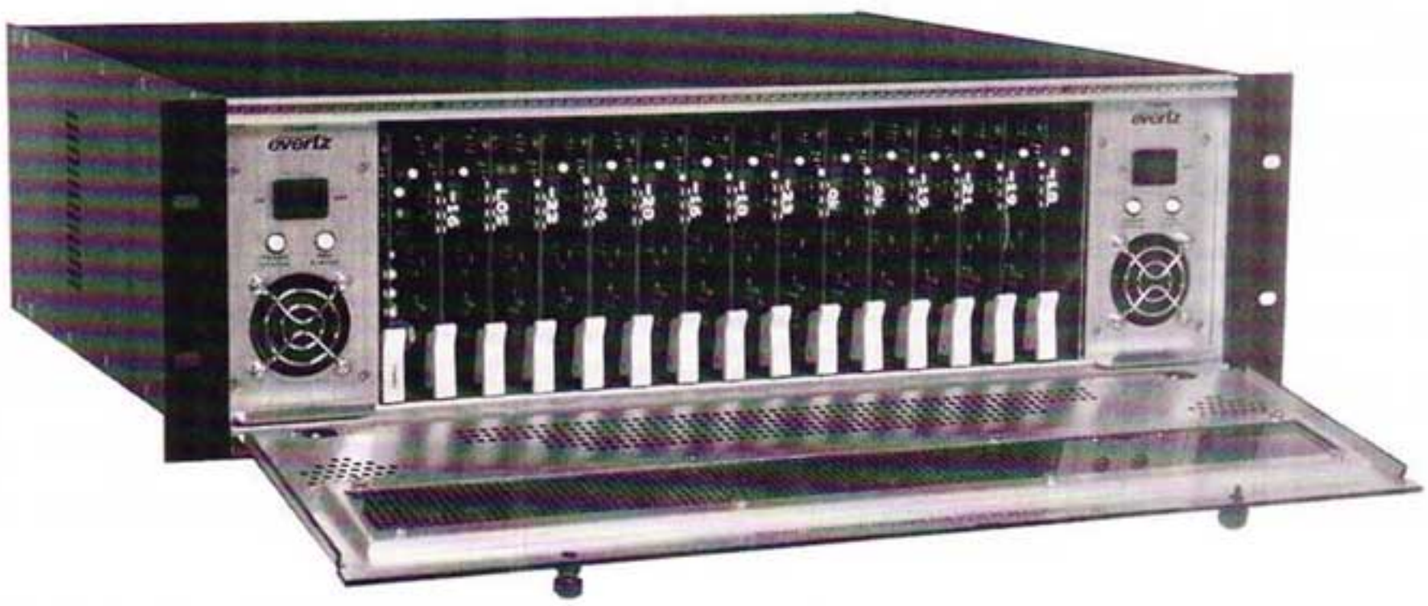


Fig. 5 - Evertz 7700FR frame with plug-in HDTV cards

Conclusions

The 1080p/24 format brings us a little bit closer to an international video format and in many ways, it is capable of challenging traditional 35mm film production. There are, however, still some subtle differences, which we must be aware of when deciding which frame rate to use. The decision to shoot in 23.98, 24 or 25 Fps must be based upon which part of the world the end product will screened the most and whether it will be seen on television or in the movie theatres.

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GPI VERTICAL INTERVAL TRANSMISSION SYSTEM

OVERVIEW

The GPI Vertical interval transmission system provides a method of transporting simple 'contact closure' information along a video path in the user bits of vertical interval time code (VITC). In order for this system to operate correctly, there are three basic requirements, which need to be met in order to allow the receiving location to decode the information correctly AND accurately. The time code carrier for the GPI information must is standard SMPTE 12M vertical interval time code. Although the GPI information may also be encoded into longitudinal time code, the preferred carrier is vertical interval time code as it passed through along with the video signal, and can easily be routed around a video plant or from plant to plant via satellite.

Standard Video levels for VITC are required in order for the receiving devices to decode this information properly and reliably.

ENCODING

GPI information is encoded into the VITC using a method that increases the robustness and reliability of the overall transmission system. The encoding format includes the following three features:

1. The binary group flags of the timecode are set to the eight-bit character mode. (Binary Group 0 bit is set to 1 and binary group bits 1 and 2 are set to 0).

2. The most significant bit (msb) of each user bit byte pair of data is set to 1. As an example, each byte must be: 10000000, or displayed in HEX format: 80.

3. The byte formed by user bit groups 1 and 2 (normally shown on the right of user bits displays) is to set to the ASCII characters ^S or ^T (HEX values 13 or 14 respectively). With the msb set the resulting value HEX 93 or 94.

Evertz has two encoders and two decoders that can be used for this system. When encoding GPI information onto analog video, the model 621 VITC generator is used. When encoding GPI information onto SDI video, the model 8010 Time code generator is used. When decoding from analog video the 622 VITC reader is used. When decoding from SDI video the 7721GPI-D module is used. Care must be taken that the encoder is set to the correct mode for encoding GPI information, or the companion decoder will not be able to reliably recover the GPI information. The chart below shows the input and output pins for the various encoders and decoders, and the corresponding user bit values that will be encoded.

	Encoder Input Pins		Decoder Output Pins		Encoded
GPI #	621	8010	622	7721GPI-D	User Bit Data
1	5	4	2	4	81
2	9	5	1	8	82
3	4	8	3	3	84
4	8	7	8	1	88
5	3	6	4	13	90

The 621 VITC generator is always set to the GPI mode when the LTC option is not fitted, When the 621 has the LTC option fitted, DIP switch 1 of SW1 controls whether GPI information will be encoded or not. It must be set to the Off position to encode GPI information

The 8010 DVITC generator has several operating modes. In order to correctly encode GPI information the GEN MODE menu item must be set to the Gmode time rctl setting so that the three encoding requirements above are met. There are 5 GPI inputs on the Parallel I/O connector on the rear panel that will be encoded into the user bits when the 8010 is set to this mode. Just setting the user bits manually from the front when the GEN MODE is set to Gmode time data will not meet the above requirements. When the GPI inputs are open (high) the resulting user bits can be shown on the front panel as: 80 80 80 93. Note: There is no direct way of viewing the Binary group flags using the 8010. The transmitted VITC is now in the correct GPI encoding format and ready to be decoded by the companion decoders. When one of the GPI inputs is closed to ground, a corresponding bit is set in user bit groups 7 and 8 (the digit pair on the left of the user bit display).

TRANSMISSION METHODS

Live Transmission

The recommended method for transmitting GPI triggers is to have the 8010 placed as close possible to the transmission end. This prevents the possibility of other equipment removing, corrupting or otherwise modifying the encoded GPI's and the associated signal. This also provides a constant stream of data for downstream decoders to lock onto. The downstream devices do not have to search for the transmitted GPI line(s).

Recorded GPI Transmissions

Although not the most ideal method of transmission, this method is quite acceptable. There are a few things that should be done to assure reliable decoding of data at the receiving decoders.

1. Make sure that the video server or VTR is recording the lines that contain the VITC with GPI trigger events encoded. Also on playback, many video servers and VTRs blank of particular lines especially in the VBI. Be sure that the lines used to record the VITC with GPIs encoded are properly passed.

2. Make sure there are a few frames of the GPI encoded VITC signal recorded prior to the actual GPI event. This allows the decoders a chance to "lock" onto the signal before the GPI event occurs providing a clean trigger.

3. Make sure there are a few frames of the GPI encoded VITC signal recorded with the GPI bit cleared off after the actual GPI event. On the analog 622 decoder, the GPI outputs will automatically be released if incoming GPI encoded VITC is lost. On the 7721GPI-D digital decoder, there is a menu setting that determines if the last state of the GPI will be held ore released if the incoming GPI encoded VITC signal is lost. So, if a GPI is not specifically released before switching to another feed, the last state of the GPI may be held.

4. Compression through MPEG Encoders / decoders is acceptable as long the integrity of the GPI triggers is maintained. For band width purposes, many MPEG encoders transmit only the active picture area. Our GPI encoders / decoders allow insertion in the active picture area. The 8010 and 7721GPI-D SDI devices allow the VITC to be up to line 31 in the active picture. The 621 and 622 analog devices require special firmware to allow lines up to 24 for NTSC and 25 for PAL.

DECODING

For the decoder device to properly decode the incoming encoded GPI information, the same 3 requirements are required by the decoder. Note: The older analog system may function without the use of the binary group flag being set but this flag is required in the SDI system. Both Analog and digital decoders have the capability of decoding selected lines, or being placed into auto mode. Depending on how the system is to be used, will depend on how the decoder is configured.

On the 7721GPI-D digital decoder, there is an on screen display that shows the decoded time and user bits and the states of the binary group flags. This can be used to verify that the signal has been encoded correctly. See the 7721GPI-D manual for further information.

AUTO MODE

In this mode, the GPI decoder will scan the VBI looking for VITC. When it encounters an active line it will then "LOCK" onto this line and begin reading/ decoding this line. Auto mode is best suited for systems where the GPI encoded VITC line may occur in any area of the VBI. This may be the case when the decoder is receiving signals from different transmission locations are used and the GPI encoded VITC has been encoded on different lines for each of these sources.

NOTE: The analog decoder will lock onto the first line containing VITC even if it does not have the GPI encoding format present. If there is another set of VITC without GPI information encoded on a lower line number then the 622 will not properly decode the GPI information. For this reason, you must use manual line select mode when you are transmitting multiple sets of VITC and decoding using analog decoders. The 7721GPI-D digital decoder will only lock onto VITC lines that have a valid GPI encoding format present. Auto mode is suitable unless you are encoding multiple sets of GPI encoded VITC in the video signal.

LINE SELECT MODE

With this mode, you can be line specific. For example, if multiple GPI triggers are required for various equipment downstream, multiple lines may be sent simultaneously in the video signal. By selecting a particular line to decode downstream the GPI decoder will ignore all other lines and data being sent and only deal with its selected line. This feature is available in both the digital and analog decoders.

An additional feature with the analog decoder is that it allows for line ranges. In this mode, the decoder can be set to watch at range of lines for a GPI trigger. This allows the decoder to exclude some lines where other VITC may be located while looking for GPI encoded VITC in a range of lines. (e.g. the GPI information may be on line 15 for one device, line 16 for another device, etc. or if the actual trigger line is unknown at the time of setup.)

SYSTEM LATENCY

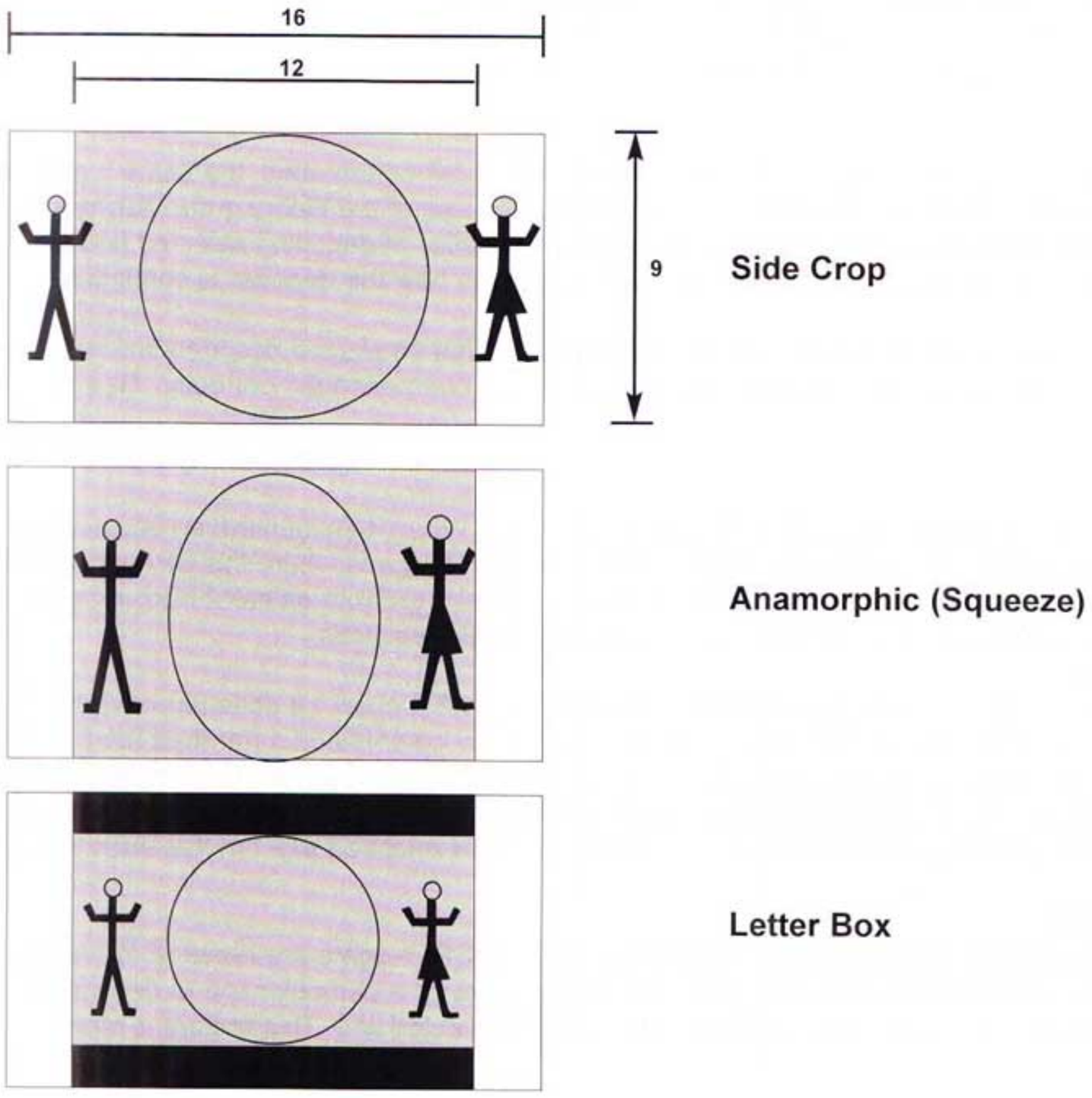
The input to output latency between GPI closure on the encoder and GPI closure on the decoder is 2 to 3 frames, depending on when the GPI was closed with respect to the video frame.

HDTV Down Converters

The Economies of HDTV and SDTV Monitoring

In the early days of serial digital video, it was practical to re-employ existing low cost NTSC/PAL monitors to view the new pictures. Many monitoring D to A encoders were manufactured to fill this monitoring requirement. At the same time, there was a need for broadcast quality NTSC/PAL encoders for transmission. Similarly, now that HDTV is upon us, there is a need to monitor our pictures in NTSC/PAL and also with SDI monitors. And once again there is a need for a broadcast quality device to enable shows originating in HDTV to be simulcast or recorded in SDTV.

One company which has addressed all of these needs is Evertz Microsystems Ltd. This company designed its modular plug-in HDTV monitoring down converters even before they built their SDI monitoring and broadcast quality converters. All of these products use the same 3RU frame, so HD and SD products can co-exist together with analog video, audio, fiber and almost any type of broadcast converter or processor you can imagine.



The HDTV Monitoring Down Converter

As the requirement in most cases is simply to see a picture on a cheap monitor, the main issue is price. Also, as SDTV monitors are usually 4:3, there is a need for some simple aspect ratio conversion from the HDTV 16:9 format. Aspect ratio conversion is needed for both monitoring and broadcast quality down-converters, so let's first address this issue
As can be seen in the illustration, when we display a 16:9 picture on a 4:3 (12:9) monitor, the picture becomes anamorphic (tall thin people). To correct this problem, we have a choice of clipping the edges or making the whole picture smaller and providing a "letter box" solution as it's know. The anamorphic solution uses all the horizontal lines of the 4:3 raster (480 for NTSC). Clipping discards video information at the start and end of each line. For the letter box solution, we have to re-map the picture to occupy less lines. The unused lines are left black at the top and bottom of the picture.

Whatever system we use for aspect ration conversion, we have also to reduce the resolution from 1920 x 1080 (or 1280 x 720) to 720 x 480. In the case of a monitoring down-converter this is generally achieved by a process known as "decimation". In this process, some of the pixels are simply discarded. The results are quite adequate for monitoring, but not for broadcasting, where a true 10-bit picture with maximum standard definition resolution is desired. If the HDTV picture is in the 1080p/24sF format, the frame rate also has to be increased by adding a 3:2 pull-down sequence.
Evertz offers a range of monitoring down-converters, with outputs of HDTV, SDTV and NTSC or PAL. All down converters in the 7710 series, as it is known, provide great pictures for monitoring.

Broadcast Quality

In the case of a broadcast down-converter, we need to be able to accept any type of HDTV signal, with or without embedded audio and with or without closed captions or other VBI data and produce a 10 bit, high quality SMPTE 259M SDI or NTSC or PAL signal with the same attributes. Here is a summary of the required tasks:

- Detection of HDTV standard
- De-interlace any interlaced signal
- Add 3:2 pull-down to 24psF material
- Select either field based or frame based processing
- Select desired aspect ratio
- Color Space conversion for ITU Rec. 709 to ITU Rec. 601
- Delay audio to match video processing delay
- Re-embed 2 groups of audio in the SDI signal
- Convert 708 VANC captions to 608 line 21 captions

De-interlacing is only required for interlaced HDTV signals (e.g.1080i/59.94). It is used in order to restore motion dependent elements to their correct positions in the down-converted raster. This requires some explanation. In 1080i/59.94 television, the interlaced line 2 commences 16.667ms after the start of line 1 and 16.636ms after the start of line 3. Any significant movement on line 2 will be displaced in time, because of the delay in scanning field 2 after the scanning of field 1 has been completed. This will cause motion related artifacts. For interlaced material, it is therefore desirable to provide compensation for horizontally and vertically displaced motion. These corrections are enabled by selecting the frame based mode of the down-converter. In frame based mode, the signal is de-interlaced and both horizontal and vertical motion adaptive interpolators are employed to correct the motion displacement. The de-interlacing process converts each field into a full 1080 line frame at 59.94 frames per second. This signal is subsequently re-interlaced into the new SDTV output format, with significantly reduced motion artifacts.

In field based mode, the down-converter handles each field separately, converting input field 1 to output field 1 and input field 2 to output field 2. This mode adds the least delay to the down-converter, but does not correct for inter field motion artifacts. Also, because the processing uses only each field (540 lines of information instead of 1080), the resulting images are softer than with the frame based mode. The down-converter also employs selectable horizontal and vertical cut-off scalers, which provide control over the sharpness of the picture.

Evertz offers two broadcast quality down-converters, as shown in the accompanying table.

		Video			Audio		VANC captions
Model	**SDI**	**Monitor Analog**	**Broadcast Analog**	**Embedded in**	**AES out**	**Embedded out**	
7711HDC-S	2	2	-	-	-	-	-
7711HDC-SN-EAES4	2	2	2	2 groups	4	2 groups	Yes

Both versions handle all HDTV standards which are down-convertible to ITU-Rec 601, NTSC or PAL, including 1080p/23.98sF. Two embedders and two de-embedders process eight channels of audio. Complete control over which audio group is to be de-embedded and re-embedded is provided. (Each group contains 2 AES/EBU channels, which means 4 mono channels). The de-embedded signal is also made available as AES/EBU digital audio, on a D9 connector installed on the rear module.

All Evertz down-converters utilize an on-screen menu scheme to facilitate set up procedures. Using the card edge toggle switch and button, you can program the module for standards, frame or field based de-interlacing, letter box panel colors, audio options and other desired functions. You have complete control over the analog output level, hue and saturation.

Tests have shown that the Evertz broadcast quality down converter, is subjectively as good as any on the market, for program content from stills to fast paced sporting events. The 7711HDC-SN-EAES4 also offers more features than competing products, so it is no wonder that the latest HDTV trucks in the USA have chosen Evertz for their down-converter needs along with up-converters, DAs, routers, logo inserters and other devices.

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Warranty & Liability

Evertz warrants all of its products manufactured by Evertz against defects in materials and workmanship for a period of one (1) year from the date of original purchase. If you transfer ownership, this warranty is automatically transferred to the new owner and remains in effect for the original one (1) year period.

During the warranty period, we will repair or at our option replace at no charge any unit that proves to be defective, provided it is returned after proper authorization, with shipping prepaid to an identified Evertz repair center.

This warranty is expressed in lieu of all other warranties including implied warranties of merchantability or fitness. In no event will Evertz be liable for any special incidental or consequential damages.

Evertz liability under this warranty shall be limited solely to the cost of any necessary repairs to replacements of or refunds of Buyer's purchase price for, the Products, components thereof or replacement parts thereof, and Evertz assumes no risk, and shall not in any case be liable, for any special, incidental or consequential damages, or any other indirect damages arising from breach of warranty or contract, negligence or any other legal theory, including, without limitation, loss of good-will, profits or revenue, loss of use of the Products or any associated equipment, cost of capital, cost of any substitute, facilities or services, down-time costs, or claims of any party dealing with Buyer for such damages.

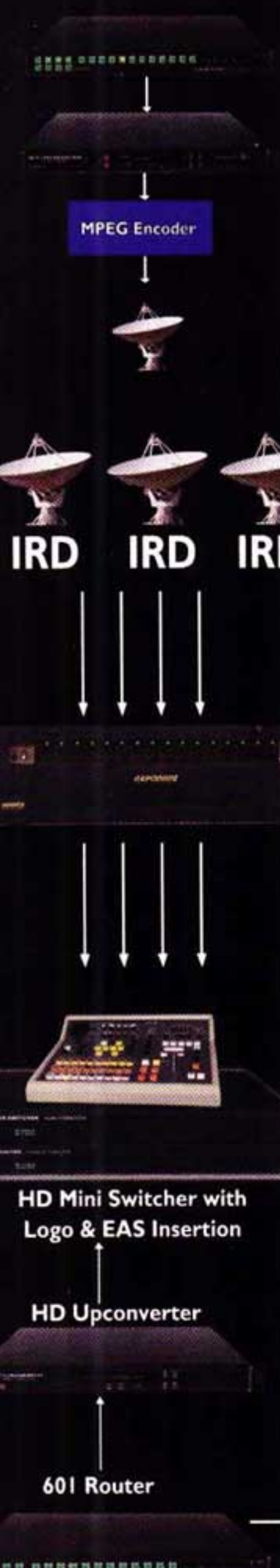
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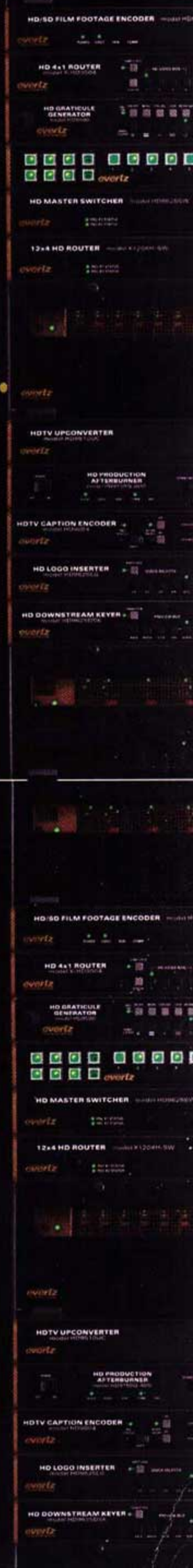
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