

# EMR Audio Router

## Integrated Audio Routing (hybrid routing)



The EMR is a multi-format modular router that provides a high density solution without compromising functionality. The EMR provides a unified platform for routing digital audio, analog audio, MADI audio, data, and time code. The EMR uses a packet routing core that allows for highly dense applications and also provides the flexibility for expansion as demands grow.

A single 6RU frame can accommodate 288x288 AES, 288 data ports, 288x288 time code signals, or a mix of everything in between. Expansion beyond this is as easy as adding another frame. With two 6RU frames, the EMR can accommodate 576x576 AES signals with full redundancy.

The modular design of the EMR means that there are no limitations to the signal formats that can be added to the router, or limitations to the size at which it can be expanded to. Other products that can be combined with the EMR are master control switchers, multi-viewers and more.

### Configuration

The EMR allows any mix of formats within a frame. The inputs and outputs are scalable in blocks of 96 or 48 depending on the format. A system consists of the input stage, the crosspoint, and the output stage. Each input and output device is connected to the crosspoint through a proprietary TDM connection. It is the use of this connection that provides the flexibility for the system to scale and evolve with changing needs.

### Scalability

The EMR can be scaled well beyond a single frame. A single crosspoint module can support up to 16 input modules and 16 output modules, allowing a system to scale to 1536 x 1536 AES. For larger requirements, multiple crosspoint modules can be combined to scale even further. There really is no limit to the range of the EMR.



### Redundancy

Each input and output card in the EMR contains multiple TDM interfaces that allow connections to multiple crosspoints. Each input card provides multiple TDM outputs that can be used for redundant connections, and each output card provides multiple TDM inputs that can be setup to automatically failover if the primary connection fails. The redundancy structure of the EMR minimizes the chances of any failure to the system.

### Control

When combined with MAGNUM, the EMR can be controlled using a wide range of control panels and interfaces. The EMR also provides a SNMP interface to control various configuration options.

### System Integration

When combined with the EQX, the EMR provides the ability to route audio universally across various formats. Embedded audio from EQX video sources can be de-embedded and routed to AES, analog, or MADI destinations. The system also allows discrete audio sources from AES, analog or MADI to be routed to audio embedders on the EQX. This unique system provides maximum flexibility for routing any audio source to any audio destination.

### ►Features & Benefits

#### Audio Routing

- Support for unbalanced/balanced AES, analog, and MADI audio formats
- Sample rate conversion
- Processing capabilities for per channel gain, inversion, mono-mixing, quad-mixing and per channel audio delay
- Advanced audio monitoring for loss, silence, over, phase and mono
- Unique HD video output with audio level display for all audio inputs

#### Port Data Routing

- Support for RS-232 and RS-422 devices (selectable)
- Conversion between RS-232 and RS-422 devices
- Manual or automatic sensing of controlling and controlled devices
- Sony interface for detecting controlling or controlled devices

#### Time Code Routing

- Decoding and encoding capabilities for advanced monitoring
- Handles shuffle speeds up to 70x

#### Advanced System Control & Interfacing

- Supports the full range of Quartz remote control panels
- Full VistaLINK® PRO command & control, SNMP
- Supports a wide selection of control protocols
- Ethernet, Serial RS-422/RS-232 connections
- Full integration with 3rd party automation systems

#### High Availability, 24/7 Design

- Full modular design
- All modules are hot swappable
- All components are front accessible
- Passive I/O
- External MI connection
- Redundant crosspoint
- Redundant power supply
- Comprehensive system monitoring bus
- VistaLINK® PRO SNMP monitoring of I/O modules

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### Specifications

<b>Configuration:</b>		<b>Analog to Digital Conversion:</b>	<b>Electrical:</b>
AES inputs:	Selectable in blocks of 96 or 48	Sampling Freq: 48kHz	EMX6-FR:
AES outputs:	Selectable in blocks of 96 or 48	Freq Response: $\pm 0.05\text{dB}$	AC Mains Input: Auto ranging, 100 $\leftrightarrow$ 240 VAC, 50/60 Hz
Analog inputs:	Selectable in blocks of 48 (stereo)	Input Impedance: 12k $\Omega$ minimum	Max Operating Current: 9.5 A (@ 115 VAC nominal), 4.0 A (@ 220 VAC nominal)
Analog outputs:	Selectable in blocks of 48 (stereo)	Signal Level: 0dBu to 18dBu or 24dBu	Max Power Consumption:
MADI inputs:	Selectable in blocks of 16	Noise: -113dB A-weighted	850 W
MADI outputs:	Selectable in blocks of 16	THD+N: >95dB (typically > 98dB)	Max Module Load: 650 W (40 W per slot)
LTC inputs:	Selectable in blocks of 96 or 48	CMRR: >85dB @ 1kHz	Power Supply Configuration:
LTC outputs:	Selectable in blocks of 96 or 48	Crosstalk: <-95dB	1 supply standard, optional redundant supply requires separate inlet
RS-232/RS-422 ports:	Selectable in blocks of 48 (RS-232 and RS-422 selectable)	I/O Delay: 0.85ms @ 48kHz	Connector: IEC 60320 - 1 per power supply
<b>Audio Inputs - AES:</b>		<b>Digital to Analog Conversion:</b>	EMX3-FR:
Sample Rates:	32kHz, 44.1kHz, 48kHz	Sampling Freq: 48kHz	AC Mains Input: Auto ranging, 100 $\leftrightarrow$ 240 VAC, 50/60 Hz
<b>Balanced Version:</b>		Freq Response: $\pm 0.06\text{dB}$	Max Operating Current: 4.6 A (@ 100 V/60Hz), 1.85A (@ 240 V/50Hz)
Standard:	AES3-1992	Output Impedance: 400 $\Omega$	Max Power Consumption:
Signal Level:	0.2 – 7.0V p-p	Signal Level: 0dBfs to 18dBu or 24dBu	450 W
Impedance:	110 $\Omega$ $\pm 20\%$ , transformer coupled	Noise: -115dB A-weighted	Max Module Load: 360 W (24 W per slot)
DC on Input:	$\pm 50\text{V}$	THD+N: >95dB (typically > 98dB)	Power Supply Configuration:
Connectors:	D50 female	DC Offset: > $\pm 30\text{mV}$	1 supply standard, optional redundant supply requires separate inlet
<b>Unbalanced Version:</b>		Crosstalk: <-95dB	Connector: IEC 60320 - 1 per power supply
Standard:	SMPTE ST 276-1	I/O Delay: 1.3ms @ 48kHz	<b>Maximum Module Load:</b>
Impedance:	75 $\Omega$	Dynamic Range: 24 bits	EMX3-FR: 360W (72W per slot)
Return Loss:	25dB, 0.1 - 6.0kHz	Connectors: D50 female	EMX6-FR: 650W (43W per slot)
Connectors:	DIN 1.0/2.3	<b>Data Input Port:</b>	Fuses: 6.3 amps, 250 Volt ceramic time delay 5 x 20 mm – 2 per power supply
<b>Audio Outputs - AES:</b>		Type: RS-232 and RS-422, selectable	<b>Physical:</b>
Sample Rates:	32kHz, 44.1kHz, 48kHz	Signal Level: 0.2 – 7V p-p	Dimensions:
<b>Balanced Version:</b>		Connectors: D50 female	EMX3-FR: 19"W x 5.25"H x 15.75"D (483mm W x 133mm H x 400mm D)
Signal Level:	2.0 – 7.0V p-p	<b>Data Output Port:</b>	EMX6-FR: 19"W x 10.5"H x 15.75"D (483mm W x 266mm H x 400mm D)
Impedance:	110 $\Omega$ , transformer coupled	Type: RS-232 and RS-422, selectable	Temperature:
DC Isolation:	$\pm 50\text{V}$	Signal Level: 2 – 7V p-p	Module Capacity:
Rise/fall Time:	3.5 – 10ns	Impedance: 110 $\Omega$	EMX3-FR: 5 single slot modules
Connectors:	D50 female	Connectors: D50 female	EMX6-FR: 15 single slot modules
<b>Unbalanced Version:</b>		<b>LTC Reader:</b>	Weight:
Signal Level:	1.0 V p-p $\pm 50\%$	Standard: SMPTE ST 12-1	EMX3-FR: 32lbs (14.5kg) Full
Impedance:	75 $\Omega$	Level: 2 – 4V p-p, unbalanced or balanced	EMX6-FR: 17.4lbs (8kg) Empty
Return Loss:	25dB, 0.1 - 6.0kHz	Speed: 1/30th to 70x play speed, fwd and rev, machine dependent	64lbs (29g) Full
Jitter:	Conforms to ANSI S4.40-1992	Connectors: DIN 1.0/2.3 (unbalanced), D50 female (balanced)	34.8lbs (16kg) Empty
Connectors:	DIN 1.0/2.3	<b>LTC Generator:</b>	
<b>Analog Audio:</b>		Standard: SMPTE ST 12-1	
Sampling Freq:	48kHz	Rise Time: 40 $\pm 10\text{ms}$	
Freq Response:	$\pm 0.08\text{dB}$	Jitter: <2ms	
Output Impedance:	400 $\Omega$	Connectors: DIN 1.0/2.3 (unbalanced), D50 female (balanced)	
Input Impedance:	12k $\Omega$ minimum	<b>Switching Reference:</b>	
Signal Level:	0dBfs = 18dBu or 24dBu	Reference Inputs: 2x BNC, analog 525/625 or DARS	
Noise:	-110dB A-weighted	Impedance: 75 $\Omega$ terminating	
THD+N:	>95dB (typically > 98dB)	Connectors: BNC per IEC 61169-8 Annex A	
DC Offset:	> $\pm 30\text{mV}$	<b>Control:</b>	
Crosstalk:	<-95dB	Ethernet: 2x RJ45	
I/O Delay:	1.3ms @ 48kHz	Serial: RS-232/RS-422 2x D9 female	
Dynamic Range:	24 bits		
Connectors:	D50 female		

### Ordering Information - EMR Audio Router

<b>EMX6-FR</b>	EMX 6RU Router Chassis with 15 slots	<b>Ordering Options</b>	
<b>EMX3-FR</b>	EMX 3RU Router Chassis with 5 slots		
<b>EMX-FC</b>	EMX frame controller		
<b>EMR-IP96-AESU</b>	96 Unbalanced AES inputs with TDM outputs	<b>+6PS</b>	Redundant Power Supply for EMX6-FR
<b>EMR-IP48-AESU</b>	48 Unbalanced AES inputs with TDM outputs	<b>+3PS</b>	Redundant Power Supply for EMX3-FR
<b>EMR-IP96-AESB</b>	96 Balanced AES inputs with TDM outputs	<b>+DLY</b>	Audio delay
<b>EMR-IP48-AESB</b>	48 Balanced AES inputs with TDM outputs		
<b>EMR-IP48-AA</b>	48 Analog stereo inputs with TDM outputs		
<b>EMR-IP96-LTC</b>	96 LTC inputs with TDM outputs		
<b>EMR-IP48-LTC</b>	48 LTC inputs with TDM outputs		
<b>EMR-IP16-MADI</b>	16 MADI inputs with TDM outputs		
<b>EMR-OP96-AESU</b>	96 Unbalanced AES outputs with TDM inputs		
<b>EMR-OP48-AESU</b>	48 Unbalanced AES outputs with TDM inputs		
<b>EMR-IP96-AESB</b>	96 Balanced AES outputs with TDM inputs		
<b>EMR-OP48-AESB</b>	48 Balanced AES outputs with TDM inputs		
<b>EMR-OP48-AA</b>	48 Analog stereo outputs with TDM inputs		
<b>EMR-OP96-LTC</b>	96 LTC outputs with TDM inputs		
<b>EMR-OP48-LTC</b>	48 LTC outputs with TDM inputs		
<b>EMR-OP16-MADI</b>	16 MADI outputs with TDM inputs		
<b>EMR-ADMX-16x16</b>	16 TDM inputs and 16 TDM outputs		