DRS Audio Routing Systems
Share AES/analog/MADI and time code in one unified system that scales up to 7680X7680 mono
Product Overview

The DRS Family of audio routing switchers lets you mix digital and analog audio within a single frame. This powerful system approach is based on a flexible 1RU distributed architecture providing rugged reliability in an affordable, feature-rich package. For nearly four decades, PESA has provided the best in product solutions. With the DRS, we have incorporated our familiar enterprise switch design into our compact and large scale analog and digital switching systems. With PESA routers, you’ll find the most advanced hardware and software control systems available to the broadcast or professional markets. DRS is an ideal solution for mobile production and broadcast facilities using current audio and video formats while providing future flexibility to handle tomorrow’s transition into the digital routing world.

Data Exchange Unit - At the heart of every DRS configuration is a Data Exchange Engine, or DXE frame, where the actual signal routing function takes place. Each DXE can interface with up to 24 input or output frames – up to a total of 1536 inputs and 1536 outputs. The DXE and its associated signal I/O frames are called a channel group. Packetized data is routed over a gigabit Ethernet network between signal frames through the DXE to deliver desired input signals to desired output connections. Frame-to-DXE cable lengths may be up to 100 meters using CAT5E cable.

DRS Grows as Your Needs Grow - Systems expanded beyond 1536 inputs or outputs can easily be configured by adding additional channel groups. Expanded DRS installations may contain up to five channel groups, with individual EDXE frames interconnected by fiber optic cable, for a system maximum of 7680 inputs and 7680 outputs.

A Wide Variety of Signal Frame Options - Signal I/O frames (audio and time code) are the entry and exit points for signals routed through the DRS. Several audio frame variants are available to easily accommodate virtually any router requirement. Each 1RU audio frame provides 128 audio channels, available as all input channels or all output channels; or as a split frame available as two banks of input channels, allowing up to 64 inputs each of AES and analog in the same frame. Other split frame variants allow up to 64 outputs each of AES and analog audio, or 64 input ports and 64 output ports of the same or mixed signal types. Time code frames are available as dedicated input or output frames, and each frame supports 64 time code signals. Signal I/O frames are available with your choice of BNC, ELCO or 6-pin pluggable external signal connectors.

The Industry Leader in Audio Routing - With our expandable DRS Series Router, PESA truly raises the bar for distributed routing systems. DRS is a full-featured 24 bit, 96 kHz routing system for audio and time code signals offering versatility and features, limited only by your imagination, in a series of single rack unit frames. A true distributed routing system, DRS uses high-speed multiplexing technology for signal distribution, rather than a crosspoint matrix array. Each 1RU I/O frame provides 128 signal ports and can be located virtually anywhere in your facility. Systems are scalable from 64X64 up to 7680X7680. Most system interconnections are made using common CAT5E cable and standard RJ-45 connectors; and in most configurations, full redundancy of every link in the router system is possible.

Distributed Routing Convenience - In broadcast, production studio and large mobile studio applications, DRS brings input signal ports in close proximity to audio sources such as satellite receivers, live production suites or servers; while output ports can be located close to audio consoles, master control rooms and post-production facilities. With DRS, audio and time code signals are easily available anywhere you need them.

Simplify Your Audio Wiring – With DRS unique signal processing technology, complex and cumbersome wiring schemes and cable routing are a thing of the past - and less complex wiring requirements with fewer cables keep signal quality high - saving time and money in both installation and maintenance. Whatever your application, DRS distributed routing technology will dramatically reduce the complexity of your audio set-up.

System Architecture

[Diagram of System Architecture]
Audio De-Embedding and Embedding

In addition to standard signal I/O frames, the DRS system also includes two special purpose circuit cards for de-embedding (DEMUX-3G Card) and embedding (MUX-3G Card) digital audio with SDI video that marry the video routing capability of the Cheetah Video Matrix Routers with the audio routing capability of the Cheetah DRS Audio Router. Both cards are compatible with SDI video signals up to 3Gbps and compliant with SMPTE 259M, 292M and 424M. Audio may be de-embedded from any SD, HD or 3G signal, and embedded to a HD or 3G SDI signal. Audio signals present on an incoming HD-SDI video signal are passed through to the output with no modification – even if the audio signals are de-embedded for use elsewhere. These cards are used in place of the HD/3G-SDI video input buffer and video output combiner cards in a Cheetah video router mainframe. The audio portion of each card integrates with a DRS channel group through an available DXE I/O port using common CAT5E cable, up to 100M in length.

The Cheetah DEMUX-3G card provides 16 HD-SDI video inputs and de-embeds all audio groups and channels from all sixteen video signals. Up to 2561 de-embedded audio signals may be selected as input sources for the DRS channel group. The Cheetah MUX-3G card provides 16 SDI video output channels and embeds any of up to 2561 audio signals selected from DRS input sources to any of the HD or 3G video output signals. Any audio input signal to DRS – AES, embedded, MADI or analog – can become the input source for the video MUX card for embedding onto a video output signal. In DRS system configuration, the DEMUX-3G card functions as a signal input frame, and the MUX-3G card functions as a signal output frame. Full digital signal processing and stereo remedies may be applied to embedded audio signals.

MultiChannel Audio Digital Interface (MADI)

MultiChannel Audio Digital Interface, or MADI, defines a digital data multiplexing technology conforming to standards defined by AES10 1991 and AES10 2003. PESA’s Multi-Channel Audio Digital Interface (MADI) Adapter for DRS allows MADI compliant audio data streams to interface with a DRS router. Available as an input or output device for DRS, MADI technology allows routing of up to 64 AES compliant audio channels over a single coaxial cable. Each MADI adapter is a stand-alone module that can support up to 2 separate 64-channel input or output MADI data streams or as a single 64 input X 64 output in a single frame. For installations requiring multiple modules a rack-mount frame is available. Each frame is one rack-unit (RU) in height and houses up to four individual MADI modules.

Features

- Distributed routing between signal frames
- Simplified wiring schemes and cabling requirements
- 128 I/O signals in a 1 RU frame
- Choice of external signal connector types
- Scalable from 64X64 up to 7680 x 7680
- In-field expansion capability
- Signal transport via Gig-E Ethernet or optional fiber optic converter modules
- Supports routing of native Dolby-E signals
- Allows simultaneous routing of AES and analog audio, embedded, MADI and time code signals
- Allows mix of synchronous and asynchronous signals
- Digital signal processing (DSP) on audio input and output signals
  - Gain adjustment
  - Phase Inversion
  - Delay
  - L/R Summing
  - L/R Swapping
  - AES pair breakaway
- Internal signal generator can insert a test signal into any audio output channel you select from the following available test signals:
  - Audio silence
  - Steady and sweep test tones
  - White noise
  - Pink noise

1. 128 channels for DXE and 256 channels for E-DXE
2. Due to signal compression, DRS DSP and Stereo remedies are not usable with Dolby-E signals.
Components and Formats

DRS Input Devices
Connector Type - Signal Format

- BNC - AES Audio
  75 Ohm, Unbalanced
- BNC - Time Code
  Single-Ended
- ELCO - AES Audio
  110 Ohm, Balanced
- ELCO - Analog Audio
  Balanced Inputs
- 6-Pin Pluggable - AES Audio
  110 Ohm, Balanced
- 6-Pin Pluggable - Analog Audio
  Balanced Inputs
- MADI Input Adapter

DRS Output Devices
Connector Type - Signal Format

- BNC - AES Audio
  75 Ohm, Unbalanced
- BNC - Time Code
  Single-Ended
- ELCO - AES Audio
  110 Ohm, Balanced
- ELCO - Analog Audio
  Balanced Outputs
- 6-Pin Pluggable - AES Audio
  110 Ohm, Balanced
- 6-Pin Pluggable - Analog Audio
  Balanced Outputs
- MADI Output Adapter

Cheetah Video Router Frame

(Demux and Mux cards install inside Cheetah Video Router Frame)
Series C: 64X64 Mono, 32X32 Stereo, and 32X32 AES Audio

Housed in a 1RU frame, the DRS Series C offers several models of audio routing solutions for analog and digital signal formats. Analog frames supporting up to 64X64 mono or 32X32 Stereo are available as well as 32X32 AES-75 and 64X64 AES-110. Based on PESA’s distributed routing technology, the DRS Series C combines high-end audio signal management features to mix and match AES-110, AES-75, Mono Audio, and Stereo Audio. Each frame includes an on-board controller and power supply module to operate with our Cattrax control and management software. Redundant power is optional.

Features
- AES/ analog or time code in one common package
- 1RU supports 64X64 mono channels
- Models available for A/D and D/A combinations
- Select from BNC, ELCO, or 6-pin pluggable connectors
- Operates with Cattrax control and diagnostics software

Specifications
- BNC - AES Audio (75 Ohm)
- 6 Pin Pluggable or ELCO - AES or Analog Audio
- DSP options - Gain, delay, L/R sum, L/R swap, breakaway
- Internal generator options - silence, sweep tone, white noise, pink noise
- Redundant power supply option

Series C: 128X128 Mono, 64X64 Stereo, and 64X64 AES Audio

Housed in a 2RU system, the DRS Series C offers several models of audio routing solutions for analog and digital signal formats. Analog frames supporting up to 128X128 mono or 64X64 Stereo are available as well as 64X64 AES-75 and 128X128 AES-110. Based on PESA’s distributed routing technology, the DRS Series C combines high-end audio signal management features to mix and match AES-110, AES-75, Mono Audio, and Stereo Audio. Each frame includes an on-board controller and power supply module to operate with our Cattrax control and management software. Redundant power is optional.

Features
- AES/ analog or time code in one common package
- 1RU supports 128X128 mono channels
- Models available for A/D and D/A combinations
- Select from BNC, ELCO, or 6-pin pluggable connectors
- Operates with Cattrax control and diagnostics software

Specifications
- BNC - AES Audio (75 Ohm)
- 6 Pin Pluggable or ELCO - AES or Analog Audio
- DSP options - Gain, delay, L/R sum, L/R swap, breakaway
- Internal generator options - silence, sweep tone, white noise, pink noise
- Redundant power supply option
Series M: Mid-sized Audio Routing Systems for Analog and AES/EBU (DXE)

With our award winning Cheetah DRS Series Router, PESA truly raises the bar for distributed routing systems. DR5 is a full-featured 24 bit, 96 kHz routing system for audio and time code signals, offering versatility and features limited only by your imagination, in a series of single rack unit frames. A true distributed routing system, DR5 uses high-speed multiplexing technology for signal distribution, rather than a crosspoint matrix array. Each 1RU I/O frame provides 128 signal ports and can be located virtually anywhere in your facility. Systems are scalable from 64X64 up to 2048X2048. Most system interconnections are made using common CAT5E cable and standard RJ-45 connectors; and in most configurations, full redundancy of every link in the router system is possible.

**Features**
- Distributed routing between signal frames
- 128 I/O per 1RU frame
- Select from BNC, ELCO or 6 pin pluggable connectors
- Build systems up to 2048 X 2048
- Full redundant system options available

**Specifications**
- BNC - AES Audio (75 Ohm)
- 6 Pin Pluggable or ELCO - AES or Analog Audio
- DSP options - Gain, delay, L/R sum, L/R swap, breakaway
- Internal generator options - silence, sweep tone, white noise, pink noise
- Interconnects: CATx between frames, fiber between DXE

Series E: Enterprise Audio Routing Systems for Analog and AES/EBU (E-DXE)

Designed specifically for large venue environments, the PESA Enterprise Audio Routing System provides a "unified" solution for audio and time code applications. At the heart of each distributed audio system is a 1RU Data Exchange Engine (DXE) chassis that connects up to 24 independent I/O frames which can be stacked to serve as a centralized system; or each I/O frame can be independently located at the source several miles away by using fiber optic cabling interconnects. Each I/O frame supports up to 128 inputs or outputs for a total of 1536 X 1536 with one DXE. By adding additional DXE units, systems can be populated up to 7680 X 7680 using five DXE chassis. The Cheetah Enterprise DRS allows users to integrate AES/EBU, Analog Audio, MADI and Time Code - all within one distributed system.

**Features**
- AES/ analog / MADI / time code in one common package
- 1RU supports 128 channels per I/O
- Select from BNC, ELCO, or 6-pin pluggable connectors
- Build systems that support up to 7680 X 7680
- Add up to 24 chassis per one DXE
- Get up to 1536 X 1536 using just one E-DXE chassis

**Specifications**
- BNC - AES Audio (75 Ohm)
- 6 Pin Pluggable or ELCO - AES or Analog Audio
- DSP options - Gain, delay, L/R sum, L/R swap, breakaway
- Internal generator options - silence, sweep tone, white noise, pink noise
- Interconnects: CATx between frames, fiber between DXE
Series M: Data Exchange Engine (DXE) Audio Processor

One DXE is required for every DRS Series M System. A second DXE may be added to any group for full data stream redundancy. Each DXE provides 8 Frame I/O Ports for connection with signal frames, MADI adapters or Cheetah Mux/Demux video cards, up to a group total of 512 inputs and 512 outputs. DXE frames are equipped with at least one PERC1000 Frame Controller device; a second frame controller may be added for control redundancy. A second power supply may be added to any DXE frame for full power redundancy. The frame controller in each DXE communicates over a 10/100 Ethernet link; adding a second frame controller creates an additional network device for control redundancy.

Series E: Enterprise Data Exchange Engine (E-DXE) Audio Processor

One DXE is required for every DRS Series E System. A second E-DXE may be added to any group for full data stream redundancy. Each E-DXE provides 24 Frame I/O Ports for connection with signal frames, MADI adapters or Cheetah Mux/Demux video cards, up to a group total of 1536 inputs and 1536 outputs. E-DXE frames are equipped with at least one PERC1000 Frame Controller device; a second frame controller may be added for control redundancy. A second power supply may be added to any E-DXE frame for full power redundancy. The frame controller in each DXE communicates over a 10/100 Ethernet link; adding a second frame controller creates an additional network device for control redundancy.
### Series M and E: AES Unbalanced, 75 Ohm, BNC, 64 AES pair

Dedicated input or dedicated output BNC connector frames for AES audio provide 64 AES digital audio channels for unbalanced signals. Each AES channel carries a pair of mono audio signals, therefore 64 AES input or output channels occupy the full 128 audio signal capacity of the frame. With input frames, audio pairs are separated and routed through DRS as two completely independent audio signals. With output frames, any two audio signals routed through DRS may be selected to form the output pair for a specific AES output channel. Each frame provides two power supply module slots. One power supply is required for frame operation; a second power supply may be added for power redundancy.

### Series M and E: AES Unbalanced, 75 Ohm, BNC, Two 32 AES pair

Split I/O BNC connector type signal frames for AES audio each provide 32 AES digital audio input channels and 32 AES digital audio output channels for unbalanced signals through 64 rear panel connectors. Since each AES channel carries a pair of mono audio signals, 32 input channels and 32 output channels fill the 128 audio channel capacity of the frame as 64 input signals and 64 output signals. AES digital input signal pairs are separated and routed through DRS as two completely independent audio signals. Any two audio signals routed through DRS may be selected to form the output pair for a specific AES digital output channel. Each frame provides two power supply module slots. One power supply is required for frame operation; a second power supply may be added for power redundancy.

### Series M and E: AES Balanced, 110 Ohm, 6 pin or ELCO, 64 AES pair

PESA offers two connector choices in dedicated input or dedicated output frames for balanced AES digital audio channels. Each frame provides 64 AES digital audio channels through either ELCO block style connectors or 6-pin pluggable style connectors. Each balanced input or output connection through either connector type is available with AC coupled or DC coupled signal connection points. Because each AES channel carries a pair of mono audio signals, 64 AES input or output channels occupy the full 128 audio channel capacity of the frame. With input frames, audio pairs are separated and routed through DRS as two completely independent audio signals. With output frames, any two audio signals routed through DRS may be selected to form the output pair for a specific AES output channel. Each frame provides two power supply module slots. One power supply is required for frame operation; a second power supply may be added for power redundancy.
Series M and E: AES Balanced, 110 Ohm, 6 pin or ELCO, Two 32 AES pair

Split I/O signal frames for balanced AES digital audio are available with two connector style choices. Each frame provides 32 AES digital audio input channels and 32 AES digital audio output channels through either ELCO block style connectors or 6-pin pluggable style connectors. Each balanced input or output connection through either connector type is available with AC coupled or DC coupled signal connection points. Since each AES channel carries a pair of mono audio signals, 32 input channels and 32 output channels fill the 128 audio channel capacity of the frame as 64 input signals and 64 output signals. AES digital input signal pairs are separated and routed through DRS as two completely independent audio signals. Any two audio signals routed through DRS may be selected to form the output pair for a specific AES digital output channel. Each frame provides two power supply module slots. One power supply is required for frame operation; a second power supply may be added for power redundancy.

Series M and E: Analog Balanced, 6 pin or ELCO, 128 channels

PESA offers two connector choices in dedicated input or dedicated output frames for balanced analog audio signals. Each frame provides 128 analog audio channels through either ELCO block style connectors or 6-pin pluggable style connectors. Input analog audio signals are converted and routed through DRS in the same digital format as AES signals – and may be selected as a source for analog or AES output channels. Any DRS input signal, whether digital or analog, may be selected for output as an analog signal. Selected signals, regardless of input signal format, are converted to analog format through the analog output frame. Each frame provides two power supply module slots. One power supply is required for frame operation; a second power supply may be added for power redundancy.

Series M and E: Analog Balanced, 6 pin or ELCO, two 64 channel pair

Split I/O signal frames for balanced analog audio are available with two connector style choices. Each frame provides 64 analog audio input channels and 64 analog audio output channels through either ELCO block style connectors or 6-pin pluggable style connectors. The entire 128 audio channel capacity of the frame is filled with the combination of input and output signals. Input analog audio signals are converted and routed through DRS in the same digital format as AES signals – and may be selected as a source for analog or AES output channels. Any DRS input signal, whether digital or analog, may be selected for output as an analog signal. Selected signals, regardless of input signal format, are converted to analog format through the analog output frame. Each frame provides two power supply module slots. One power supply is required for frame operation; a second power supply may be added for power redundancy.
Series M and E: Time code, BNC, 64 channels

Dedicated input or dedicated output BNC connector frames for time code data provide 64 channels for single-ended signals. Each time code signal occupies the routing capacity of two audio signals, therefore 64 input or output channels of time code data fill the 128 signal capacity of the frame. Time code data inputs must be routed to time code output frame channels. Time code will not pass through a standard audio output channel or audio frame. Each frame provides two power supply module slots. One power supply is required for frame operation; a second power supply may be added for power redundancy.

Series M and E: Mixed Analog / AES, 6 pin or ELCO, Dual I/O channels

Mixed I/O signal frames allow 32 AES pair and 64 mono analog signals, as banks of 64 audio channels in various input/output combinations, to be routed simultaneously through a single 1RU frame. Balanced I/O connections are provided for both analog and AES digital audio signals. Mixed frames are available with two connector style choices - ELCO block style connectors or 6-pin pluggable style connectors. Available signal format combinations are shown in the following table. The entire 128 audio channel capacity of the frame is filled with the combination of input and output signals. Each frame provides two power supply module slots. One power supply is required for frame operation; a second power supply may be added for power redundancy.

<table>
<thead>
<tr>
<th>Available Mixed Analog/ AES Digital Signal Frames</th>
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<tbody>
<tr>
<td>32 AES Inputs - ELCO</td>
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<tr>
<td>64 Analog Inputs - ELCO</td>
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<tr>
<td>64 Analog Inputs - 6-pin Connectors</td>
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<tr>
<td>64 Analog Outputs - ELCO</td>
</tr>
<tr>
<td>64 Analog Outputs - 6-pin Connectors</td>
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</table>
PESA’s mixed connector signal frames offer an additional layer of flexibility to our mixed I/O frames by allowing not only combinations of 32 AES pair and 64 analog signals in the same frame; but they also provide a choice of connector type for each signal format, or allow a mix of both balanced and unbalanced connection points for AES digital signals. Each balanced input for an AES pair offers your choice of AC or DC signal coupling. All analog inputs are balanced. Mixed connector frames are available with two combinations of connector style - ELCO block style connectors for balanced analog or AES and BNC connectors for unbalanced AES; or 6-Pin pluggable connectors for balanced signals and BNC connectors for unbalanced AES. Available signal format combinations are shown in the following table. The entire 128 audio channel capacity of the frame is filled with the combination of input and output signals. Each frame provides two power supply module slots. One power supply is required for frame operation; a second power supply may be added for power redundancy.

### Typical DRS Channel Group

![Diagram of a typical DRS channel group](image-url)
In addition to standard signal I/O frames, the DRS M-Series and E-Series system also includes an option card for embedding (MUX-3G Card) digital audio with SDI video to marry the video routing capability of the Cheetah Video Matrix Routers with the audio routing capability of the Cheetah DRS Audio Router. The DRS MUX card is compatible with SDI video signals up to 3Gbps and compliant with SMPTE 259M, 292M and 424M. Audio may be embedded to a SD/HD/3G-SDI signal.

The Cheetah MUX-3G card provides 16 SD/HD/3G-SDI video output channels and embeds any of up to 256 audio signals selected from DRS input sources to any of the SD/HD/3G-SDI video output signals. Any audio input signal to DRS – AES, embedded, MADI or analog – can become the input source for the video MUX card for embedding onto a video output signal. In DRS system configuration, the MUX-3G card functions as a signal output frame. Full digital signal processing and stereo remedies may be applied to embedded audio signals.

**Specifications**

* MUX option card for Cheetah Digital Video Routing Switcher family
* Supports 16 channels of digital video for SD/HD/3G-SDI
* Supports optional redundant DXE or E-DXE processors
* Allows for any audio input signal - AES, Analog, MADI

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In addition to standard signal I/O frames, the DRS systems include a special purpose circuit cards for de-embedding (DEMUX-3G Card) digital audio from SDI, HD-SDI, or 3G-SDI. The card resides in the Cheetah video frame and marries the video routing capability of the Cheetah Video Matrix Routers with the audio routing capability of the Cheetah DRS Audio Router. This card is compatible with SDI video signals up to 3Gbps and compliant with SMPTE 259M, 292M and 424M. Audio may be de-embedded from any SD, HD or 3G signal.

The Cheetah DEMUX-3G card provides 16 SDI video inputs and de-embeds all audio groups and channels from all sixteen video signals. Up to 256 de-embedded audio signals may be selected as input sources for the DRS channel group. In DRS system configuration, the DEMUX-3G card functions as a signal input frame. Full digital signal processing and stereo remedies may be applied to embedded audio signals.

**Specifications**

* DEMUX option card for Cheetah Digital Video Routing Switcher family
* Supports 16 channels of digital video for SD/HD/3G-SDI
* Supports optional redundant DXE or E-DXE processors
* Allows for de-embedding to any audio signal - AES, Analog, MADI

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### Model | Description | Part Number
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DRS MUX Card | Output combiner with audio embedding | CH-OUTPUT-MUX-BNC

### Model | Description | Part Number
--- | --- | ---
DRS DEMUX Card | Input card with audio de-embedding | CH-INPUT-DEMUX-BNC
For installations requiring multiple MADI modules, PESA offers a rack mount kit that support up to 4 MADI input or output modules in a 1RU chassis frame. All connections are easily accessible from the rear, and all status LEDs are visible from the front of the frame. Power for all four modules is obtained from a single power supply integral to the rack mount kit.

### Specifications

- Supports standards for AES10-1991 and AES10-2003
- Compact size for under-table or rack mount options
- 2 separate 64 channel MADI data streams
- RJ-45 connects modules to DXE or E-DXE audio processor frame
- Supports redundant control management
- Rack mount frame holds up to 4 modules in 1RU

### Model and Description

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Part Number</th>
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<tr>
<td>DRS MADI Input Module</td>
<td>MADI Dual 64 Channel Module-Input</td>
<td>DRS-FRM-IMADI-BNC</td>
</tr>
<tr>
<td>DRS MADI Output Module</td>
<td>MADI Dual 64 Channel Module- Output</td>
<td>DRS-FRM-OMADI-BNC</td>
</tr>
<tr>
<td>DRS MADI Input/Output Module</td>
<td>MADI with 64 inputs and 64 outputs</td>
<td>DRS-FRM-IOMADI-BNC</td>
</tr>
<tr>
<td>DRS Rack Mount Tray</td>
<td>1RU rack mount with power supply</td>
<td>DRS-1RU-TRAY</td>
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</table>
DRS Audio - Series E
Enterprise Distributed Audio to build systems up to 7680X7680

DRS-EDXE Processor Frame
Connections supporting systems up to 1536X1536 per frame

BNC - 64 Ports
Digital Audio | Time Code

6-Pin Pluggable - 128 Ports
Digital Audio | Analog Audio

ELCO - 128 Ports
Digital Audio | Analog Audio | Time Code

ELCO - Input and Output
Digital Audio: 32 Port Input / 32 Port Output
Analog Audio: 64 Port Input / 64 Port Output

6-Pin Pluggable - Input and Output
Digital Audio: 32 Port Input / 32 Port Output
Analog Audio: 64 Port Input / 64 Port Output

ELCO Input / BNC Output
Digital Audio: 32 Port Input / 32 Port Output
Analog Audio: 64 Port Input / 64 Port Output

6-Pin Pluggable Input / BNC Output
Digital Audio: 32 Port Input / 32 Port Output
Analog Audio: 64 Port Input / 64 Port Output

MADI
2 channels of 64 AES Audio

DRS-EDXE-1310 Data Exchange Engine with 1310nm Fiber IO
DRS-EDXE-NF Data Exchange Engine with out Fiber IO

DRS-FRM-IAES-BNC BNC, AES Audio Input, 75 Ohm
DRS-FRM-OAES-BNC BNC, AES Audio Output, 75 Ohm
DRS-FRM-64-IOAES-BNC BNC, AES Audio Input/Output
DRS-FRM-64-ITC-BNC BNC, Time Code Input
DRS-FRM-64-OTC-BNC BNC, Time Code Output

DRS-FRM-IAAES-W 6-Pin Pluggable, AES Audio Input, 110 Ohm
DRS-FRM-OAES-W 6-Pin Pluggable, AES Audio Output, 110 Ohm
DRS-FRM-64-IOAES-W 6-Pin Pluggable, AES Audio Input/Output
DRS-FRM-IAA-W 6-Pin Pluggable, Analog Audio Input
DRS-FRM-OAA-W 6-Pin Pluggable, Analog Audio Output
DRS-FRM-64-IOAA-W 6-Pin Pluggable, Analog Audio Input/Output

DRS-FRM-IAAES-ELCO ELCO, AES Audio Input, 110 Ohm
DRS-FRM-OAES-ELCO ELCO, AES Audio Output, 110 Ohm
DRS-FRM-64-IOAES-ELCO ELCO, AES Audio Input/Output
DRS-FRM-IAA-ELCO ELCO, Analog Audio Input, 110 Ohm
DRS-FRM-OAA-ELCO ELCO, Analog Audio Output, 110 Ohm
DRS-FRM-64-IOAA-ELCO ELCO, Analog Audio Input/Output

DRSFRM64-IAAIAES-E ELCO, Analog Audio Input/AES Audio Input
DRSFRM64-IAESOAES-E ELCO, AES Audio Input/Analog Audio Output
DRSFRM64-IAAOAES-E ELCO, Analog Audio Input/AES Audio Output
DRSFRM64-OAAOAES-E ELCO, Analog Audio Output/AES Audio Output

DRSFRM64-IAAIAES-EB ELCO, Analog Audio Input/BNC, AES Audio Input
DRSFRM64-IAESOAES-EB ELCO, AES Audio Input/BNC, AES Audio Output
DRSFRM64-IAAOAES-EB ELCO, Analog Audio Input/BNC, AES Audio Output
DRSFRM64-OAAOAES-EB ELCO, Analog Audio Output/BNC, AES Audio Output

DRSFRM64-IAAIAES-WB 6-Pin Pluggable, Analog Audio Input/BNC, AES Audio Input
DRSFRM64-IAESOAES-WB 6-Pin Pluggable, AES Audio Input/BNC, AES Audio Output
DRSFRM64-IAAOAES-WB 6-Pin Pluggable, Analog Audio Input/BNC, AES Audio Output
DRSFRM64-OAAOAES-WB 6-Pin Pluggable, Analog Audio Output/BNC, AES Audio Output

DRS-FRM-IMADI-BNC MADI Input Adapter Module
DRS-FRM-OMADI-BNC MADI Output Adapter Module
DRS-FRM-OMADI-BNC MADI input/output module
DRS-1RU-TRAY Rack Mount Kit for Up To 4 MADI Modules, w/Power Supply
**DRS Audio - Series M**

Enterprise Distributed Audio to build systems up to 2048X2048

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**DRS-DXE Processor Frame**
Connections supporting systems up to 512X512 per frame

**BNC - 64 Ports**
Digital Audio | Time Code

**6-Pin Pluggable - 128 Ports**
Digital Audio | Analog Audio

**ELCO - 128 Ports**
Digital Audio | Analog Audio | Time Code

**ELCO - Input and Output**
Digital Audio: 32 Port Input / 32 Port Output
Analog Audio: 64 Port Input / 64 Port Output

**6-Pin Pluggable - Input and Output**
Digital Audio: 32 Port Input / 32 Port Output
Analog Audio: 64 Port Input / 64 Port Output

**ELCO Input / BNC Output**
Digital Audio: 32 Port Input / 32 Port Output
Analog Audio: 64 Port Input / 64 Port Output

**6-Pin Pluggable Input / BNC Output**
Digital Audio: 32 Port Input / 32 Port Output
Analog Audio: 64 Port Input / 64 Port Output

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**MADI**
2 channels of 64 AES Audio

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**DRS-DXE-850** Data Exchange Engine with 850nm Fiber IO
**DRS-DXE-1310** Data Exchange Engine with 1310nm Fiber IO
**DRS-DXE-NF** Data Exchange Engine with out Fiber IO

**DRS-FRM-AES-BNC** BNC, AES Audio Input, 75 Ohm
**DRS-FRM-OAES-BNC** BNC, AES Audio Output, 75 Ohm
**DRS-FRM-64-AES-BNC** BNC, AES Audio Input/Output
**DRS-FRM-64-ITC-BNC** BNC, Time Code Input
**DRS-FRM-64-OTC-BNC** BNC, Time Code Output

**DRS-FRM-IAES-W** 6-Pin Pluggable, AES Audio Input, 110 Ohm
**DRS-FRM-OAES-W** 6-Pin Pluggable, AES Audio Output, 110 Ohm
**DRS-FRM-64-IIOAES-W** 6-Pin Pluggable, AES Audio Input/Output

**DRS-FRM-IAA-W** 6-Pin Pluggable, Analog Audio Input
**DRS-FRM-OAA-W** 6-Pin Pluggable, Analog Audio Output
**DRS-FRM-64-IOAA-W** 6-Pin Pluggable, Analog Audio Input/Output

**DRS-FRM-IAES-ELCO** ELCO, AES Audio Input, 110 Ohm
**DRS-FRM-OAES-ELCO** ELCO, AES Audio Output, 110 Ohm
**DRS-FRM-64-IAAES-ELCO** ELCO, AES Audio Input/Output
**DRS-FRM-IAA-ELCO** ELCO, Analog Audio Input, 110 Ohm
**DRS-FRM-OAA-ELCO** ELCO, Analog Audio Output, 110 Ohm
**DRS-FRM-64-IOAA-ELCO** ELCO, Analog Audio Input/Output

**DRS-FRM64-IAAES-E** ELCO, Analog Audio Input/AES Audio Input
**DRS-FRM64-IAAES-E** ELCO, Analog Audio Input/AES Audio Input
**DRS-FRM64-IAAES-E** ELCO, Analog Audio Input/AES Audio Input

**DRS-FRM64-IAAES-W-B** 6-Pin Pluggable, Analog Audio Input/BNC, AES Audio Input
**DRS-FRM64-IAAES-W-B** 6-Pin Pluggable, AES Audio Input/BNC, AES Audio Input
**DRS-FRM64-IAAES-W-B** 6-Pin Pluggable, AES Audio Input/BNC, AES Audio Input

**DRS-FRM-IMADI-BNC** MADI Input Adapter Module
**DRS-FRM-OMADI-BNC** MADI Output Adapter Module
**DRS-FRM-IOMADI-BNC** MADI Input/Output Adapter Module
**DRS-1RU-TRAY** Rack Mount Kit for Up To 4 MADI Modules, w/Power Supply
DRS Audio - Series C
Compact Audio Systems for 32 AES or 64 Mono Analog

64 mono inputs | 64 mono outputs
6 pin pluggable frame for IO

64 AES inputs | 64 AES outputs
6 pin pluggable frame for IO

64 mono inputs | 64 AES outputs
6 pin pluggable frame for IO

64 AES inputs | 64 mono outputs
6 pin pluggable frame for IO

32 AES inputs | 32 AES outputs
75 Ohm BNC frame for IO

64 mono inputs | 32 AES outputs
6 pin pluggable frame inputs and BNC outputs

64 AES inputs | 32 AES outputs
6 pin pluggable frame inputs and BNC outputs

ELCO
64 Analog Inputs | 64 Analog Outputs

The DRS is a full-featured 24 bit, 96 kHz routing system for audio and time code signals, offering versatility and features limited only by your imagination, in a series of single rack unit frames. A true distributed routing system, DRS uses high-speed multiplexing technology for signal distribution, rather than a crosspoint matrix array. Each 1RU I/O frame provides 128 signal ports and can be located virtually anywhere in your facility. System interconnections are made using common CAT5e cable and standard RJ-45 connectors; and in most configurations, full redundancy of every link in the router system is possible.

Features
* Distributed routing between signal frames
* 64 I/O per 1RU frame
* Select from BNC, ELCO or 6 pin pluggable connectors
* Build systems up to 64X64 Mono Analog and 32X32 AES

Specifications
* BNC - AES Audio (75 Ohm)
* 6 Pin Pluggable or ELCO - AES or Analog Audio
* DSP options - Gain, delay, L/R sum, L/R swap, breakaway
* Internal generator options - silence, sweep tone, white noise, pink noise
* Interconnects: CATx between frames

Part Numbers

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRS64SA-IAAOAES-W</td>
<td>Analog 110 Ohm input</td>
</tr>
<tr>
<td></td>
<td>6-Pin Pluggable to 6-Pin Pluggable</td>
</tr>
<tr>
<td>DRS64SA-IAAOAES-WB</td>
<td>Analog 110 Ohm input</td>
</tr>
<tr>
<td></td>
<td>6-Pin Pluggable to BNC</td>
</tr>
<tr>
<td>DRS64SA-IAESOA-W</td>
<td>AES 110 Ohm input</td>
</tr>
<tr>
<td></td>
<td>6-Pin Pluggable to 6-Pin Pluggable</td>
</tr>
<tr>
<td>DRS64SA-IAESOA-WB</td>
<td>AES 75 Ohm input</td>
</tr>
<tr>
<td></td>
<td>BNC to 6-Pin Pluggable</td>
</tr>
<tr>
<td>DRS64SA-I0AA-W</td>
<td>Analog 110 Ohm input</td>
</tr>
<tr>
<td></td>
<td>6-Pin Pluggable to 6-Pin Pluggable</td>
</tr>
<tr>
<td>DRS64SA-I0AES-BNC</td>
<td>AES 75 Ohm input</td>
</tr>
<tr>
<td></td>
<td>BNC to BNC</td>
</tr>
<tr>
<td>DRS64SA-I0AES-W</td>
<td>AES 110 Ohm input</td>
</tr>
<tr>
<td></td>
<td>6-Pin Pluggable to 6-Pin Pluggable</td>
</tr>
</tbody>
</table>
# DRS Audio - Series C

Compact Audio Systems for 64 AES or 128 Analog

## Features

- Distributed routing between signal frames
- 64 I/O per 1RU frame
- Select from BNC, ELCO or 6 pin pluggable connectors
- Build systems up to 64X64 Mono Analog and 32X32 AES

## Specifications

- BNC - AES Audio (75 Ohm)
- 6 Pin Pluggable or ELCO - AES or Analog Audio
- DSP options - Gain, delay, L/R sum, L/R swap, breakaway
- Internal generator options - silence, sweep tone, white noise, pink noise
- Interconnects: CATx between frames

## Part Numbers

- **DRS128SA-IAAOAES-W**: Analog 110 Ohm input | AES 110 Ohm output
  6-Pin Pluggable to 6-Pin Pluggable
- **DRS128SA-IAAOAES-WB**: Analog 110 Ohm input | AES 75 Ohm output
  6-Pin Pluggable to BNC
- **DRS128SA-IAESOAA-W**: AES 110 Ohm input | Analog 110 Ohm output
  6-Pin Pluggable to 6-Pin Pluggable
- **DRS128SA-IAESOAA-WB**: AES 75 Ohm input | Analog 110 Ohm output
  BNC to 6-Pin Pluggable
- **DRS128SA-IOAA-W**: Analog 110 Ohm input | Analog 110 Ohm output
  6-Pin Pluggable to 6-Pin Pluggable
- **DRS128SA-IOAES-BNC**: AES 75 Ohm input | AES 75 Ohm output
  BNC to BNC
- **DRS128SA-IOAES-W**: AES 110 Ohm input | AES 110 Ohm output
  6-Pin Pluggable to 6-Pin Pluggable
Product Specifications

Analog Audio Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector Type</td>
<td>6 pin detachable, 2 balanced signals per connector, ELCO/EDAC 120, 32 balanced signals per connector</td>
</tr>
<tr>
<td>Input Level</td>
<td>0 dBFS (full scale digital) = +24 dBu, +18 dBu or +12 dBu, GUI selectable</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>20 K Ohms, Balanced</td>
</tr>
<tr>
<td>Common Mode Rejection</td>
<td>&gt;74 dB minimum, &gt;90 dB typical (20 Hz - 20 kHz)</td>
</tr>
<tr>
<td>Output Levels</td>
<td>0 dBFS=+24dBu, +18 dBu or +12 dBu, GUI selectable A/D, D/A</td>
</tr>
<tr>
<td>Output Impedance</td>
<td>130 Ohms; balanced</td>
</tr>
<tr>
<td>Resolution</td>
<td>24 bits/sample, 96 kHz sample rate</td>
</tr>
<tr>
<td>Frequency Response</td>
<td>+/- 0.1 dB (20 Hz - 20 kHz)</td>
</tr>
<tr>
<td>THD+N</td>
<td>&lt;0.02% @ 1 kHz, &lt;20 dBu</td>
</tr>
<tr>
<td>Cross Talk</td>
<td>&lt;95 dB</td>
</tr>
<tr>
<td>Dynamic Range</td>
<td>96 dB</td>
</tr>
</tbody>
</table>

AES/EBU Audio Specification

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector Type</td>
<td>6 pin detachable, one balanced AES stream per connector, ELCO/EDAC 120-16 balanced AES streams per connector, BNC - one single-ended AES stream per connector</td>
</tr>
<tr>
<td>Input Level</td>
<td>0.5 - 7.0 Vp-p balanced, 0.5 - 2.0 Vp-p single-ended</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>110 Ohms balanced, 75 Ohms single-ended</td>
</tr>
<tr>
<td>Input Sample Rate</td>
<td>32 kHz - 96 kHz</td>
</tr>
<tr>
<td>Output Level</td>
<td>nominal 2 Vp-p balanced, 1 Vp-p single-ended</td>
</tr>
<tr>
<td>Output Impedance</td>
<td>110 Ohms balanced, 75 Ohms single-ended</td>
</tr>
<tr>
<td>Output Sample Rate</td>
<td>48 kHz or 96 kHz, GUI selectable</td>
</tr>
<tr>
<td>Dolby Support</td>
<td>48 kHz synchronous Dolby/ Dolby E are supported</td>
</tr>
</tbody>
</table>

MADI Audio Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector Type</td>
<td>BNC</td>
</tr>
<tr>
<td>Input Level</td>
<td>200 mV, 2.0 Vp-p</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>75 Ohm</td>
</tr>
<tr>
<td>Output Level</td>
<td>1 Vp-p</td>
</tr>
<tr>
<td>Output Impedance</td>
<td>75 Ohm</td>
</tr>
<tr>
<td>MADI Port Mode</td>
<td>Each MADI port may support 28, 32, 56, or 64 synchronous audio streams, GUI selectable</td>
</tr>
</tbody>
</table>

Digital Signal Processing Specifications (cont.)

Phase/Inversion

Independent Control for each input and output, GUI selectable.

Stereo Remedies

Independent Control for each pair of inputs and outputs. The L and R channels of each pair may be individually set to L, R, L+R or L-R. All stereo remedies are GUI selectable.

Time Code Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O Connector Type</td>
<td>BNC, unbalanced</td>
</tr>
<tr>
<td>Input Level</td>
<td>0.7 to 3.3 Vp-p MAX</td>
</tr>
<tr>
<td>Input Impedence</td>
<td>75 Ohms single-ended</td>
</tr>
<tr>
<td>Input Number</td>
<td>64</td>
</tr>
<tr>
<td>Input &amp; Output Connector Type</td>
<td>BNC</td>
</tr>
<tr>
<td>Output Level</td>
<td>1.3 Vp-p +/- 0.3 V MAX</td>
</tr>
<tr>
<td>Output Impedence</td>
<td>75 Ohms single-ended</td>
</tr>
<tr>
<td>Output Number</td>
<td>64</td>
</tr>
<tr>
<td>System Distortion</td>
<td>0.2% at 1xTimecode speed; 1.0% at 5xTimecode speed</td>
</tr>
</tbody>
</table>

Maximum I/O Size Per Frame - Series M and E

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>5RU = 256x256 Mono</td>
<td>(includes 1RU DXE distribution frame)</td>
</tr>
<tr>
<td>9RU = 512x512 Mono</td>
<td>(includes 1RU DXE distribution frame)</td>
</tr>
<tr>
<td>16RU = 1024x1024 Mono</td>
<td>(includes 2x1RU DXE distribution frames)</td>
</tr>
<tr>
<td>36RU = 2048x2048 Mono</td>
<td>(includes 4x1RU DXE distribution frames)</td>
</tr>
</tbody>
</table>

Environmental & Miscellaneous

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC Input Connectors</td>
<td>IEC 320C6 socket (accepts IEC 320 C5 line cord)</td>
</tr>
<tr>
<td>Requirement</td>
<td>Power 60 VA Max per frame</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>90-260 VAC, 47-63 Hz</td>
</tr>
<tr>
<td>Operational Temperature</td>
<td>0-40 degrees C</td>
</tr>
<tr>
<td>Operational Humidity</td>
<td>90% Non-Condensing</td>
</tr>
<tr>
<td>Mechanical Dimensions</td>
<td>1RU 1.75” H x 19.00” W x 14.75” D</td>
</tr>
<tr>
<td>Weight</td>
<td>12lbs</td>
</tr>
</tbody>
</table>

Digital Signal Processing Specifications*

Gain Adjustment

Independent, +/- 6 dB adjustment in 0.1 dB increments for each input and output, GUI selectable.

Audio Delay

Independent delay elements for inputs and outputs. Unrestricted mode provides 0.341 milliseconds (>10 NTSC frames) for each input and output. Restricted mode provides up to 1.365 seconds (>40 NTSC frames) of delay per input and output for a limited number of channels. All delay parameters are GUI selectable.

Total Delay (propagation delay)

1.2ms min. input to output

* Due to signal compression, DRS DSP and Stereo remedies are not usable with Dolby-E signals.
Warranty:
Products manufactured by PESA are manufactured for performance and reliability. PESA warrants these products against defects and workmanship for a period of three years.

Services:
Customer support is available 24 hours a day, 7 days a week by calling 1-800-323-7372.

International customers call +1 (256) 726-9222.

In addition to our customer service support center, we offer extended warranties and online technical resources via our web site at: www.pesa.com

On site or factory training is available for control system operations, technical, and maintenance training. Contact our technical support group for additional information.

Spares can be ordered through your area sales representative.

Specifications subject to change without notice.