openGear®

# openGear®
## Terminal Equipment


ROSS
Video Production Technology


openGear
DFR 8321
FAULT
FAN FAIL

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# openGear®

## THE STORY

Several years ago, Ross Video made a standard definition gear frame and line of terminal equipment products. We called this frame our 8000 Series and it was (is - we still make it) compatible with other industry products from companies like Harris (Leitch), Cobalt Digital and AJA. Given that the 8000 Series rear connector structure was fine for SD but not suitable for HD, we needed a new frame.

Rather than reinvent the wheel and design a new Ross frame, we thought it would be best for us and our customers to find another company in the industry that was willing to let us develop cards compatible with their existing frames. Making a gear frame is a surprising amount of work and effort and we thought if we could simply use an existing one it would be faster and simpler for us, and our customers would have a range of choices available to them. We approached most of the major industry players to discuss this idea explaining the advantage to them would be that by offering competition within their frame they would be able to win a larger share of the market.

Surprisingly, we were told by company after company that we could not make cards compatible with their frames. These companies made no bones about their business model which was designed around getting a couple of their frames into a customer and then lock them in to their solution. Once they got their frames and control system into the customer, since there would be no compatibility with other vendor's products, the customer would have no choice but to go back to them as they needed more equipment. Our approach had always been different. Every one of our analog and digital lines of terminal equipment had compatibility with existing standards. Customers always loved this because they had choice.

So, we had to create our own frame and control system. Instead of doing, yet again, the same thing every other company in the industry was doing, we decided to create an industry standard for terminal equipment. This fit perfectly with our code of ethics "#1: We will always act in our customers' best interest." Having a standard would be great for customers, they would only have one frame and control system to worry about with a wide range of product choices available. If it was great for customers, it would also be great for other players in the industry, especially smaller companies who just did not have the capability to produce a frame and control system. They could create cards for this new frame and sell them into the marketplace and be compatible with the growing openGear® terminal equipment ecosystem. As the new standard took off, Ross would also do well as we got our share of the business. We called this new standard openGear®.

During the development of openGear®, every design element was created around being open and being able to have numerous companies make cards for the system. This is very important to understand since trying to put all of the concepts and ideas about an open system onto an already designed platform would not work very well and would likely fail or be impossible to manage. openGear® was designed from the very start to be open which has allowed for far more flexibility and simplicity than if we had tried to incorporate it after the design was shipping.

*“We decided we should create an industry standard for terminal equipment. This fit perfectly with our code of ethics ‘#1: We will always act in our customers’ best interest.’”*

Becoming an openGear® partner and being able to create openGear® compatible cards is a straightforward process. Companies sign a simple license agreement with Ross Video which gives them access to the hardware and software specifications and the right to use the openGear® logos. Ross Video does not charge any royalties and there is a single annual $1,000 fee to cover some of the openGear® website and other general marketing costs. There are no exclusive rights within openGear® to any card or product type - any company can create any product they like – including those that compete directly with Ross. Open competition on products within the frame is one of the strong reasons customers want to adopt openGear®. Customers can buy the best product to meet their needs, price and delivery from whomever they wish and still have a single frame and control system standard.

Ross Video manufactures all of the frames, power supplies and network cards for openGear®. These are provided to all of the openGear® partners at an OEM discount. Since frames are a loss leader in the industry, the goal here is to consolidate production to increase volumes and hopefully drive costs down over time. Virtually all of the profit on terminal equipment is made on the functional cards that plug into the frame. The frames are generically branded openGear® in the top right corner of the front of the frame and partner companies have a location to add their own brand in the top left corner of the frame before shipping to the end customer.

Every openGear® card can be controlled by DashBoard, the Ross control system software graphical user interface. DashBoard is provided to customers and partners at no cost and can be downloaded from the openGear.tv website. DashBoard allows customers to configure card settings as well as see all of the status and alarm information for openGear® frames and cards. DashBoard is java-based and runs on Windows, Mac and Linux systems, thus fitting right in to virtually any IT environment.

The openGear® frame contains a network card which aggregates the communication from all of the cards in the frame and makes it available to the IP network via the Ethernet Port on the rear of the openGear® frame. Each openGear® card talks to the network card inside the frame using OGP, the openGear® Protocol. Through this protocol, cards describe themselves, indicate how many controls they have, the names of those controls, the minimum and maximum value of each control, as well as a number of other pieces of information. This mechanism allows cards to be controlled by DashBoard with absolutely no changes required in the DashBoard software, the only software a partner needs to write is inside their own card.

Customers benefit in many ways by choosing openGear®. First, they have a wide range of choices and competition within the platform – great products at great prices from a large and growing variety of vendors. Second, openGear® keeps the cost of ownership down significantly by reducing the complexity and the number of systems to learn. Once a customer understands the openGear® frame and DashBoard, they don’t have to relearn it for new openGear® products regardless of which company makes the cards. Third, openGear® can also be much more space efficient since empty frame slots have many other products to fill them instead of being limited to the offerings from only one company. This reduces the number of frames, power supplies and network card slots that the installation requires driving costs down yet again!

The openGear® ecosystem has grown even larger with the addition of openGear® Connect. openGear® Connect opens the DashBoard control and monitoring system beyond openGear® frame-based products. openGear® Connect is for products that for some reason don’t make sense as openGear® cards but could benefit from integration to the DashBoard control system. With openGear® Connect, any equipment that has an Ethernet connection can appear in DashBoard. These frames can contribute alarm and signal status information alongside the openGear® card information. In addition, an openGear® Connect compatible product can also be fully controlled within DashBoard if that company desires. openGear® Connect is made available at no cost and with no royalties required to both customers and other broadcast equipment manufacturers.

Implementing openGear® Connect is quite straightforward; there is a simple no-fee license to sign. Once signed, Ross Video provides all of the documentation required about the openGear® Connect protocol. There is no software of any kind that is required to be written inside DashBoard by another company for their product to become openGear® Connect compatible, they only have to implement the openGear® Connect protocols within their products.

openGear® has had great success with 4 industry awards, more than 25 partner companies on board developing products for the openGear® platform, and new partners joining every month. There is an extremely wide array of solutions available from 3G video, to digital audio, IRDs and fiber. The whole range can be viewed on the openGear.tv website.

We hope you agree that openGear® is an important advancement in the broadcast industry and whether you are a customer or potential partner we would be pleased to speak with you about how openGear® can be of benefit to your organization.

# DFR-8321

## openGear® High Density Modular Frame

The most flexible frame for all your terminal equipment needs.

**2RU Frame**

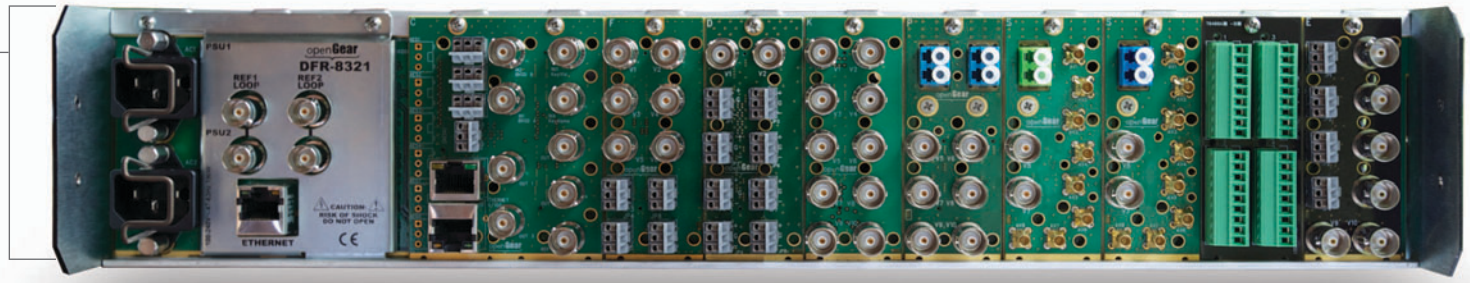
The DFR-8321 is a 2RU modular frame designed to accommodate up to 20 cards from the openGear® family.

**Modular Rear I/O Modules**

Separate rear I/O modules are ordered with card modules offering a mix of BNC, fiber optic and other connections as required. These rear modules are quick and easy to install.

**Common Frame Features**

Two looping reference inputs are buffered and distributed to all module slots. A frame mounted Ethernet port allows a network control module to be added without occupying a module slot. PowerLock cord retainers guard against accidental power loss.




The DFR-8321 is a 2RU high density modular frame, designed to accommodate up to 20 openGear® cards. The 21st slot is reserved for network control.

**MODULAR FRAME ARCHITECTURE**

The DFR-8321 offers the flexibility of independent rear modules for connectivity to a wide array of interfaces such as BNC, twisted-pair audio, and fiber. The DFR-8321 offers a full rear module that offers 10 BNCs per module, or a high density split rear module that offers 5 BNCs per module. Using the split rear module allows for up to 20 independent openGear® solutions to be installed.

**ROBUST POWER SUPPLIES**

The DFR-8321 can accommodate 2 front-loaded PS-8300 power supplies. A single supply can fully power a loaded frame, the addition of a second (optional) supply gives the frame full power redundancy.

Each power supply contains an independent cooling fan, status LED, and a front-mounted power switch.

**COOLING**

The frame has been designed with an advanced cooling architecture with increased ventilation. The front-door mounted fans provide forced air cooling to all cards with front to back cooling. An intelligent fan controller adjusts fan speed with changes in power supply loading and temperature.

**CONTROL**

The DFR-8321 comes standard with Ethernet connectivity for basic configuration and monitoring of openGear® cards through the DashBoard control system. An optional advanced networking card, the MFC-8320-N, provides multiple DashBoard connections and adds advanced features such as DataSafe and optional SNMP (see page 9 for more details).

## Key Features

- 2RU frame houses up to 20 openGear® cards
- Supports any mix of analog, digital, video and audio modules in the same frame
- Modular I/O panels for connector flexibility
- Removable front door for easy fan servicing
- Frames come standard with cooling
- Frames come standard with Ethernet connectivity
- 2 independent looping references with connection to each card slot
- Robust 150 watt power supply with integral cooling
- Optional redundant power supply, hot-swappable for 24/7 operation
- Power switch is accessible from front of rack frame
- Front loading power supplies
- Optional advanced Ethernet based frame controller provides advanced features such as DataSafe
- Optional SNMP control and monitoring
- Power supply and Ethernet based frame controller common to DFR-8310
- 5-year transferable warranty

## Ordering Information

**2RU, 20 Card Slot, 1 Ethernet Control Slot, Single Power Supply**

| | |
|---|---|
| DFR-8321-C | w/ Cooling Fans |
| DFR-8321-CN | w/ Cooling Fans and Advanced Network Control |
| DFR-8321-CNS | w/ Cooling Fans, Advanced Network Control and SNMP |
| PS-8300 | Redundant or Spare Power Supply |
| CFM-8321 | Spare 2RU Cooling Fan Kit |
| MFC-8320-N | 2RU Frame Controller w/ Advanced Network Control |
| FSB-8320 | Rear Support Bars and Bracket |

# DashBoard

## DashBoard Network Control and Monitoring

The DashBoard Control and Monitoring System is a free application, available on the Ross Video website, designed for remote control and monitoring of the open architecture, openGear® platform.

All openGear® solutions can be controlled using DashBoard without the need to upload custom GUIs or install proprietary software.

DashBoard offers the ability to view multiple frames with full control and alarming of all populated slots inside a frame. This simplifies the setup of numerous devices in a large installation and offers the ability to centralize monitoring. The openGear® devices define their controllable parameters and layout to DashBoard, so the control interface is always up-to-date.

Alarms raised by devices in the frame bubble up to the upper most level, making it quick and easy to identify potential failures or problems.

openGear® frames are automatically discovered and are available in the TreeView where they can be custom identified, collapsed to view just the frame, or opened to view available devices in the frame.

Device control and monitoring is simple and easy. Ross Video's GUI gives a quick summary view window displaying the current state of the device, such as input and reference presences, output standard, etc. Control is simplified with multiple categories that group common parameters such as Timing Control, Output Configuration, Proc Control and Alarm Configuration.

DashBoard also offers the ability to upgrade software on devices in the field without the need to replace any on-board components. Batch software upgrades allow multiple cards, of the same model, to be upgraded at one time, right from any DashBoard terminal on the network.

DashBoard allows for multiple control windows to be active and available on one screen which is useful when a functional path involves more than a single device.

DashBoard device window layouts can quickly be saved and recalled, allowing for quick access to frequently used devices. Layouts can consist of a single device window, multiple device windows displayed full screen in tabs, or multiple devices on one shared screen.

## SNMP

openGear® supports SNMP offering an industry standard interface for system wide monitoring applications.

SNMP is loaded direct to the frame eliminating the need for any external gateways and runs on a separate software port allowing for simultaneous control from both DashBoard and SNMP clients. This is useful in applications where system wide monitoring is performed using SNMP and real-time control is performed using DashBoard.

### Features

- Direct to the Frame (no Gateway required)
- Runs on a separate software port than DashBoard
- Software option for MFC-8320-N (field upgradeable)

## Advanced Tree View

DashBoard Enhanced Viewing Plug-in allows for customized views of more complex systems. Custom folders can be created and any device from any frame can be dragged and dropped into the folder to represent logical system functions. Alarming of devices follow with the logical views making identification of critical issues easy to isolate and identify.

### Features

- Quickly identify critical alarms
- Locate specific cards in a particular signal path quicker
- Group specific cards together for simplified maintenance when performing batch upgrades and configurations

## DataSafe

DataSafe dramatically reduces downtime when failed modules are swapped out. All module parameters are stored on the local frame network card and automatically restored when a hot-swap is performed. With some cards reaching well over 100 parameters, including audio channel delays and video proc level, DataSafe ensures a proper reconfiguration of replacement cards without the hassle of trying to remember previous settings.

DataSafe can be enabled or disabled on a per slot basis through the frame's network controller card. DataSafe's intelligent design will only restore parameters when it detects a compatible replacement product. The MFC-8320-N Advanced Networking Card comes standard.

### Features

- Reduce downtime when swapping out a failed module
- Eliminate errors associated with manual reconfigurations



## DashBoard Features

- Remote control and monitoring
- OS independent: Windows, Mac OS/X, Linux
- Automatic discovery of frames and devices
- Practical real-time control
- Alarm reporting
- Multiple frames on a single control network
- Multiple DashBoard applications on a single control network
- TCP / IP based communication
- In-field upgradeability of devices
- No need to upload custom GUIs

# DashBoard

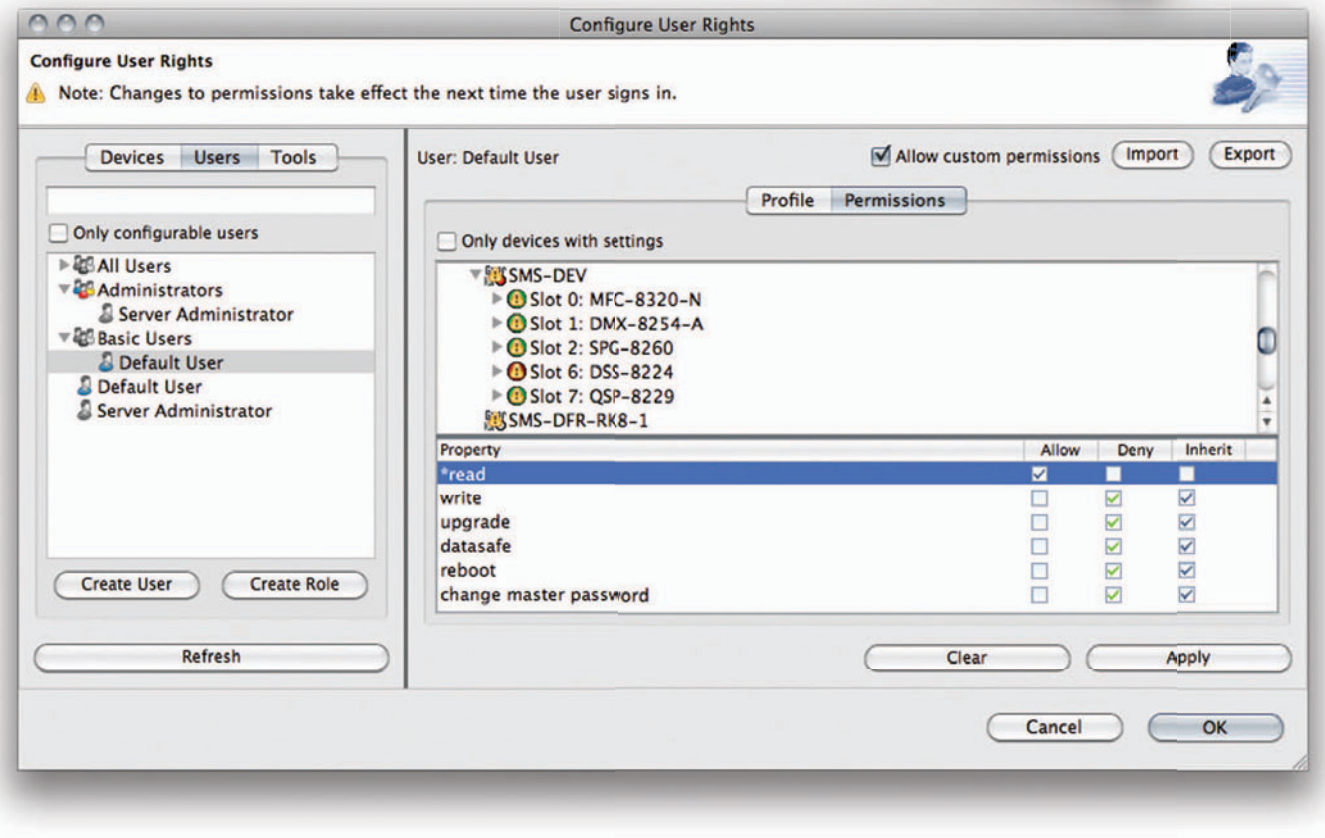
## DashBoard Server and User Rights and Management

DashBoard Server allows the implementation of User Rights and Management to an openGear® network. Frames, cards and individual parameters can be restricted on a per user basis, providing safety and security to your openGear® network.

The DashBoard server is designed to work with the DashBoard v4.0 client software and provides unmatched flexibility with its User Rights and Management Plug-in. The User Rights and Management feature, or “URM”, enables station engineers to assign and manage user permissions, and administer the level of access for authorized users. When deployed through the DB-Server, URM establishes hierarchical user or group level control for various types of devices controlled through DashBoard. For example, administrators can set up and control partitioning of access to entire frames, or individual device facilities for signal processing, network interfaces and I/O. Since URM is compatible with all openGear® devices, it’s simple to deploy to existing infrastructures.

### DashBoard URM Licensing

DashBoard Server does not have a limit on the number of users or roles that can be created. The URM licensing system in DashBoard limits the number of roles and users that can have explicit permissions set against them. Ross Video will provide a FREE license for setting permissions against 2 roles / users. A typical setup for these 2 free sets of permissions would be to setup an ‘Operators’ role and an ‘Engineering’ role. Any number of users can be assigned to each role. Additional licensing options are available through Ross Video.




## Ordering Information

| | |
|---|---|
| DB-URM | User Rights and Management: Unlimited User / Role License |
| DB-SRV-HW | Rack Mountable 1RU Server Hardware Option |

# Rear Module Basics

## -R2 and -R2S (High Density) I/O Available

Select openGear® cards support standard and high density rear I/O modules:

The -R2 rear module occupies 2 slots in the DFR-8321 platform and supports 1 openGear® card. The -R2 rear module is used for solutions that require access to the full I/O connections.

The -R2S rear module occupies 2 slots in the DFR-8321 platform and supports 2 openGear® cards. The -R2S rear module is used for solutions that require less I/O connections.

**EXAMPLE -** Distribution Amplifiers:

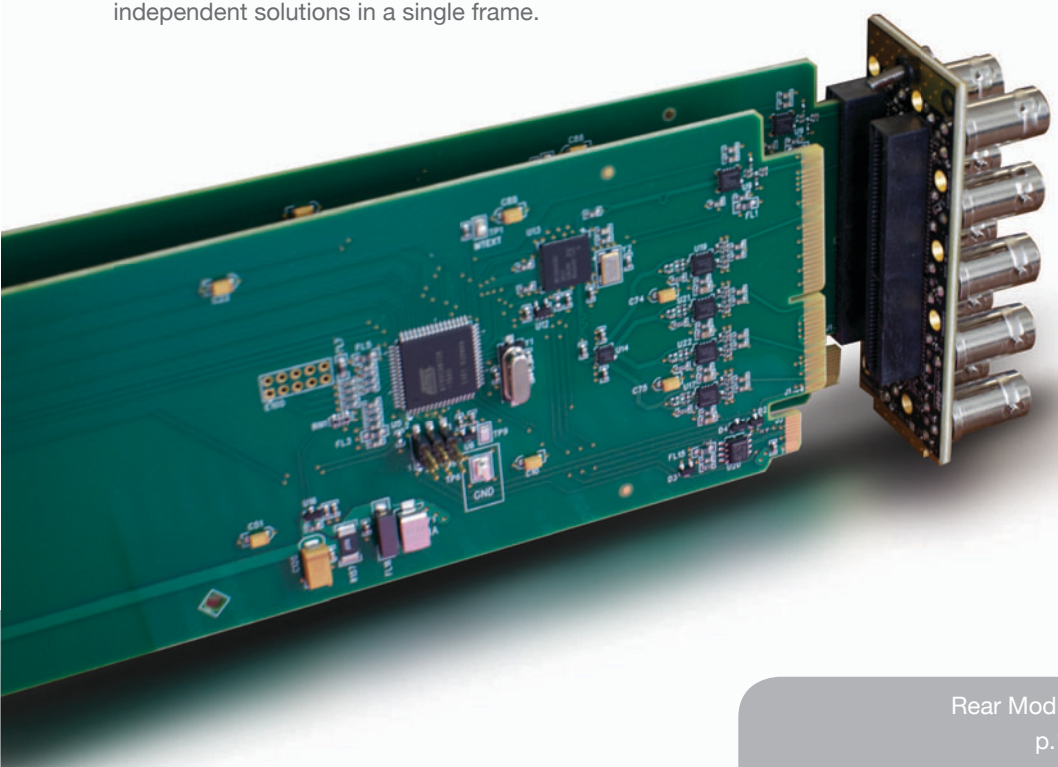
The SRA-8601A openGear® card is designed as a 1x8 DA.

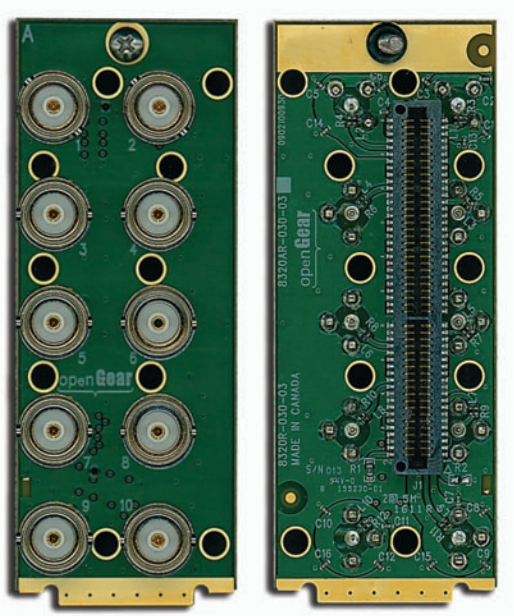
### SRA-8601A-R2

In this configuration, the rear module (-R2) is designed with 1 openGear® card connection and offers 10 BNCs to the openGear® card allowing the operation as a 1x8 DA with up to 10 solutions in a single frame.

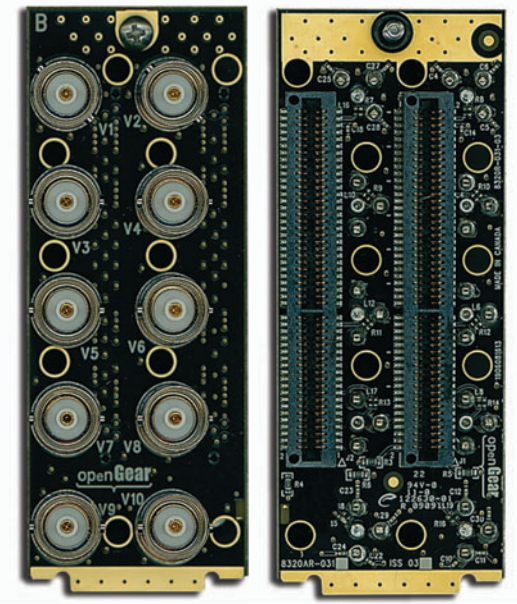
### SRA-8601A-R2S

In this configuration, the rear module (-R2S) is designed with 2 openGear® card connections and offers 5 BNCs to each openGear® card. This allows the SRA-8601 to operate as a 1x4 DA with up to 20 independent solutions in a single frame.





SRA-8601A-R2



SRA-8601A-R2S

# Frame Configuration Tool

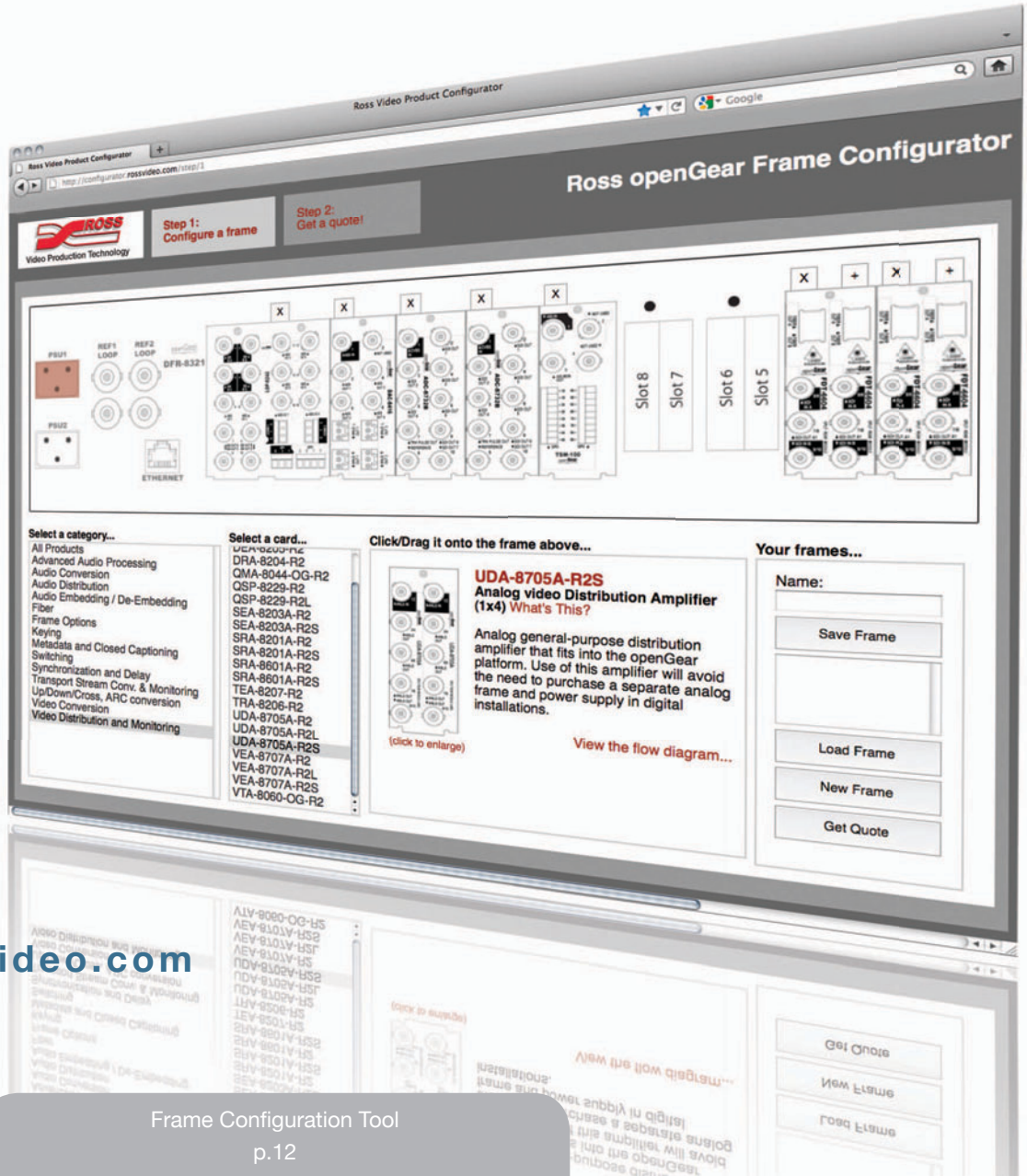
## A simple new way to configure a Ross Video openGear® frame with Ross Video products and accessories.

The Ross Video openGear® Frame Configuration Tool provides a simple way to configure a Ross Video openGear® frame with Ross Video products and accessories online. The tool provides a simple drag and drop interface with product descriptions, rear I/O images and block diagrams all available in one convenient tool. Simply select your product and drag the rear module into an available slot in the frame. Downloadable PDF files are created for each configured frame providing an image of the frame's rear I/O modules and a summary of products and accessories selected for the frame.

With the click of a button, your configuration can be sent to Ross Video for a quote request. Configurations can be saved by creating a project account, and recalled at a later date for changes or additions.

### Features

- Error free configurations with correct rear modules and space / slot allocations
- User-specified, factory configured frames
- Pre-assign your frames' network IP addresses
- Product block diagram and rear I/O image quick views
- Save and recall separate projects

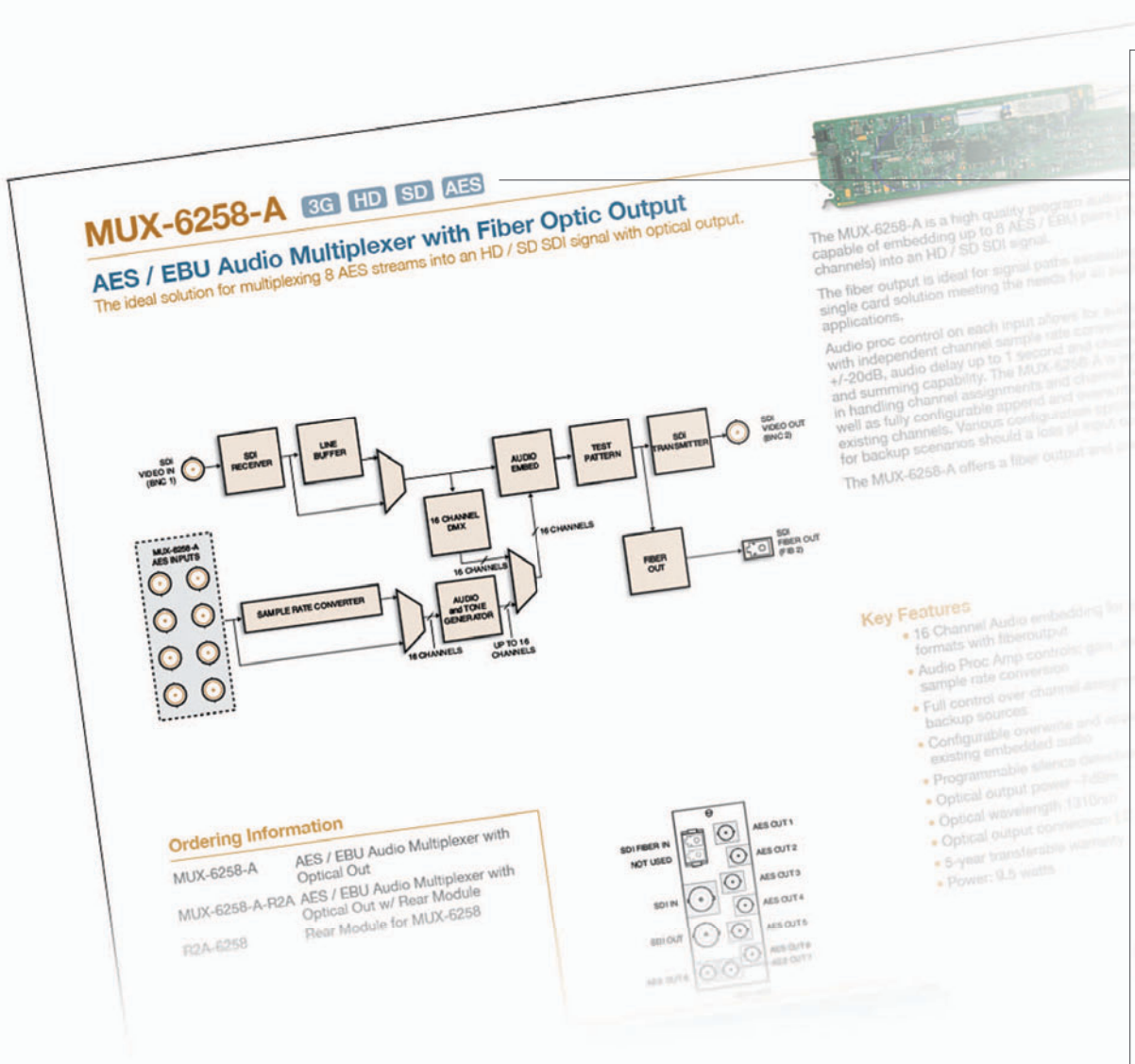



**http://configurator.rossvideo.com**

# Legend

## Quick Reference Tool

A quick and easy way to understand some of the great features each card has to offer.




**3G** 3Gb/s

**HD** HD-SDI

**SD** SD-SDI

**AN-VID** Analog Video

**ASI** DVB-ASI (Asynchronous Serial Interface)

**310** SMPTE-310M

**AES** AES / EBU Audio

**AN-AUD** Analog Audio

**EQ** Video Equalizer

**AFD** Active Format Description Support

**3D** 3D Processing Support

**FS** Frame Synchronizer

**DOLBY** Dolby® Support

**SRA-8601A**
3G / HD / SD SDI Reclocking Amplifier

**SEA-8203A**
HD / SD SDI Equalizing Distribution Amplifier

**DRA-8204**
Dual Serial HD / SD SDI Reclocking Amplifier

**DEA-8205**
Dual Serial HD / SD SDI Equalizing Amplifier

**TRA-8206**
Triple Serial HD / SD SDI Reclocking Amplifier

**TEA-8207**
Triple Serial HD / SD SDI Equalizing Amplifier

**UDA-8705A**
Analog Utility Distribution Amplifier

**VEA-8707A**
Analog Video Equalizing Amplifier

**QSP-8229**
Quad Split

**ADA-8402-A**
AES / EBU Distribution Amplifier - 75Ω

**ADA-8402-B**
AES / EBU Distribution Amplifier - 110Ω

**ADA-8405-C**
Analog Audio and Timecode DA with Remote Gain

# DISTRIBUTION AND MONITORING

UP / DOWN / CROSS, ARC CONVERSION

SYNCHRONIZATION AND DELAY

VIDEO CONVERSION

AUDIO CONVERSION

AUDIO EMBEDDING / DE-EMBEDDING

ADVANCED AUDIO PROCESSING

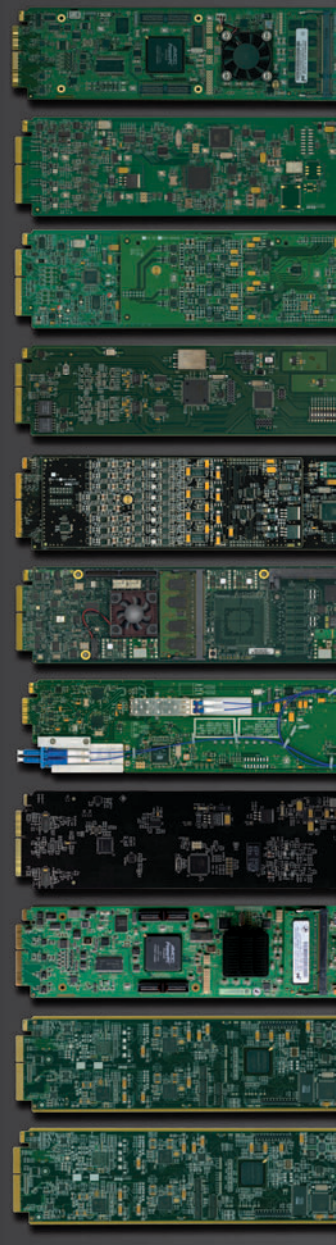
FIBER

SWITCHING

KEYING AND BRANDING

DATA SOLUTIONS

TRANSPORT STREAM MONITORING AND CONVERSION



# SRA-8601A 3G HD SD

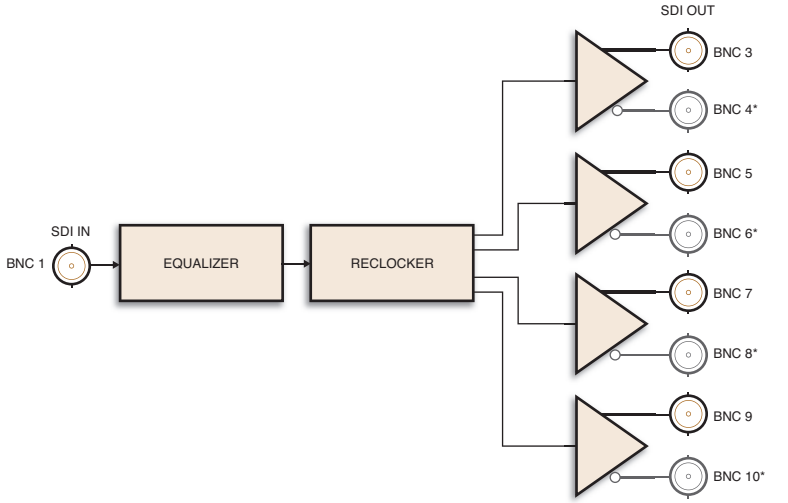
## 3G / HD / SD SDI Reclocking Distribution Amplifier

Highest quality 3G / HD / SD SDI reclocking distribution amplifier.

The SRA-8601A is a 3G / HD / SD SDI distribution amplifier capable of equalizing and reclocking all common serial digital signals. With support for both standard and high-definition signals, the SRA-8601A is the ideal universal SDI distribution amplifier.

The SRA-8601A equalizes the incoming SDI signal, compensating for greater than 300m of cable at 270Mb/s, greater than 120m of cable at 1.485Gb/s, and greater than 80m of cable at 2.97Gb/s. The signal is then reclocked with automatic rate detection for all popular data rates. LED indicators at the front of the card identify the presence of incoming video and the identified signal data rate.

The -R2S high density split rear module can accommodate up to 2x SRA-8601A cards, each configured as a 1x4 DA. When used in a 1x4 configuration, the SRA-8601A outputs are non-inverting, making it an excellent ASI distribution amplifier.




* Only 4 SDI outputs are available when using the -R2S rear module.

## Key Features

- 1x4 or 1x8 3Gb/s distribution amplifier
- Equalizes and reclocks SDI signals of 270Mb/s, 1.485Gb/s, and 2.97Gb/s
- Equalizes greater than 300m of Belden 1694A cable at 270Mb/s, greater than 120m of cable at 1.485Gb/s, or greater than 80m of cable at 2.97Gb/s
- Automatic detection of incoming data rate
- LED indicators for signal presence and data rate
- Excellent input and output return loss
- 20 DAs in the DFR-8321
- 5-year transferable warranty
- Power: 2.9 watts

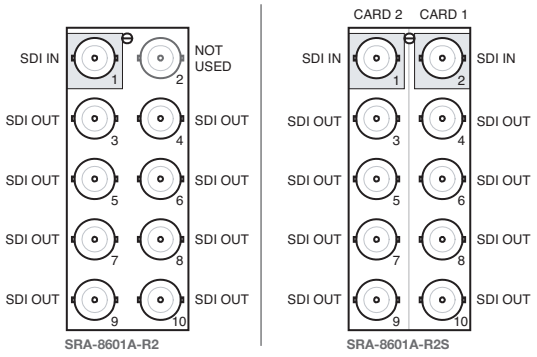
## Ordering Information

**3G / HD / SD SDI Reclocking Amplifier**

| | |
|---|---|
| SRA-8601A | 3G / HD / SD SDI Reclocking DA |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for the SRA-8601A |
| -R2S | Split Rear Module for 2x SRA-8601A |



# SEA-8203A HD SD

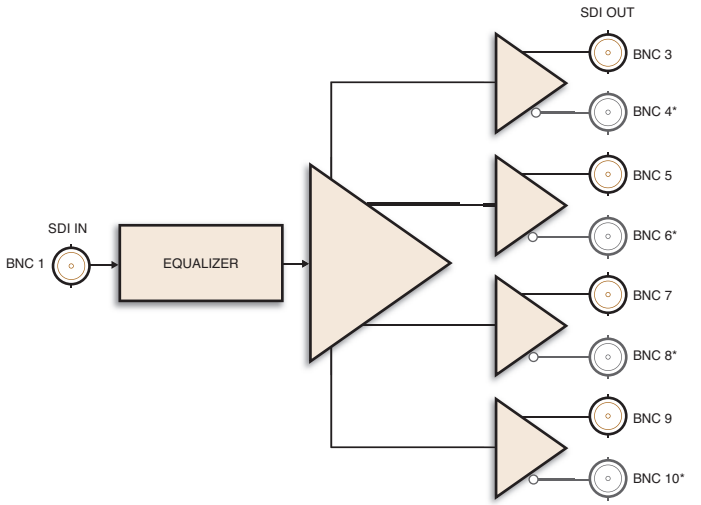
## HD / SD SDI Equalizing Distribution Amplifier

Our best HD / SD SDI equalizing distribution amplifier for all standard and high-definition SDI signals.

The SEA-8203A is an HD / SD SDI distribution amplifier capable of equalizing all common serial digital signals. With support for both standard and high-definition signals, the SEA-8203A is the ideal universal SDI distribution amplifier.

The SEA-8203A equalizes the incoming SDI signal, compensating for up to 300m of cable at 270Mb/s and up to 100m of cable at 1.485Gb/s. The unit's SDI outputs faithfully reproduce the incoming signal, with excellent return loss specifications.

The -R2S high density split rear module can accommodate up to 2x SEA-8203A cards, each configured as a 1x4 DA. When used in a 1x4 configuration, the SEA-8203A outputs are non-inverting, making it an excellent ASI distribution amplifier.




* Only 4 SDI outputs are available when using the -R2S rear module.

## Key Features

- 1x4 (high density) distribution amplifier
- Non-inverting 1x4 output for ASI
- Equalizes all SDI signals from 143Mb/s to 1.485Gb/s
- Equalizes up to 300m of Belden 1694A cable at 270Mb/s, or up to 100m of cable at 1.485Gb/s
- Automatic detection of incoming data rate
- Signal presence and data rate indicator LED
- DashBoard monitoring for input presence and data rate
- Excellent input / output return loss specification
- 20 DAs in the DFR-8321
- 5-year transferable warranty
- Power: 2.9 watts

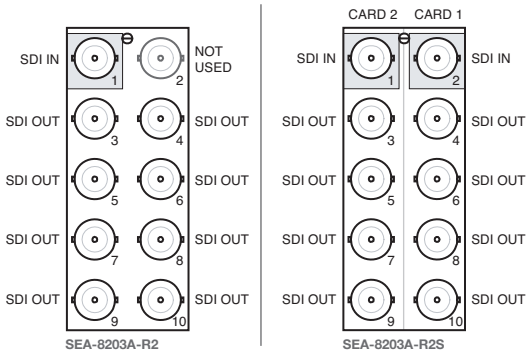
## Ordering Information

**HD / SD SDI Distribution Amplifier**

| | |
|---|---|
| SEA-8203A | HD / SD SDI Equalizing DA |

**Rear Module Suffix (ex: [model]-R2)**

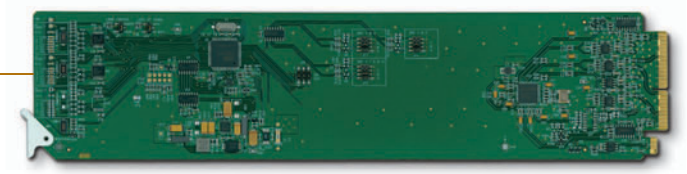
| | |
|---|---|
| -R2 | Rear Module for the SEA-8203A |
| -R2S | Split Rear Module for 2x SEA-8203A |

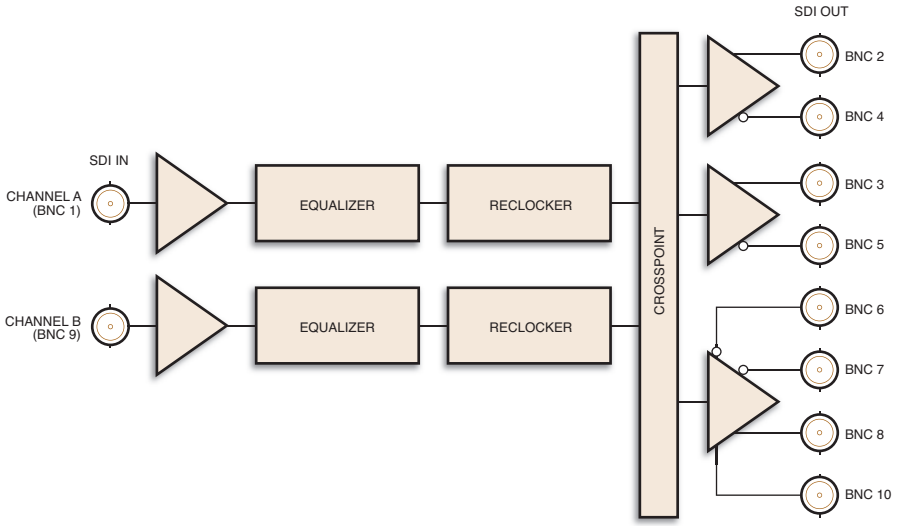


# DRA-8204 HD SD

## Dual Serial HD / SD SDI Reclocking Amplifier

2 independent channels of SDI distribution for standard and high-definition SDI signals.






The DRA-8204 is a 2 channel HD / SD SDI distribution amplifier capable of equalizing and reclocking all common serial digital signals. With 2 independent signal channels, the DRA-8204 provides cost-effective distribution at double the density compared to single channel cards. Support for both standard and high-definition signals makes the DRA-8204 a universal SDI distribution amplifier.

Each channel of the DRA-8204 equalizes the incoming SDI signal, compensating for up to 300m of cable at 270Mb/s and up to 100m of cable at 1.485Gb/s. The signal is then reclocked with automatic rate detection for all popular data rates.

A special feature of the DRA-8204 is the ability to operate in a number of different two or one channel modes. By simply changing a jumper, the DRA-8204 can be configured as a single channel 1:8, a dual channel 1:4 + 1:4, or a dual channel 1:6 + 1:2 distribution amplifier. This unique feature makes adapting the DRA-8204 to different installations quite easy. Each channel is fully independent, and can run at different data rates.

LED indicators at the front of the module identify the presence of incoming video, and the data rate for each independent channel.

### Key Features

- 2 independent channels of SDI distribution on one card!
- Equalizes and reclocks all SDI signals from 143Mb/s to 1.485Gb/s
- Equalizes up to 300m of Belden 1694A cable at 270Mb/s, or up to 100m of cable at 1.485Gb/s
- Automatic detection of incoming data rate
- Flexible channel configurations:
  - single mode 1:8 amplifier
  - dual mode 1:4 + 1:4 amplifiers
  - dual mode 1:6 + 1:2 amplifiers
- LED indicators for signal presence and data rate for each channel
- Excellent input / output return loss specifications
- 10 DAs in the DFR-8321
- 5-year transferable warranty
- Power: 3.7 watts

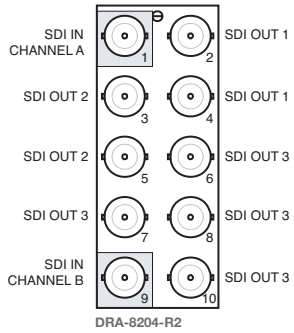
### Ordering Information

**Dual Serial HD / SD SDI Reclocking Amplifier**

DRA-8204 Dual HD / SD SDI Reclocking DA

**Rear Module Suffix (ex: [model]-R2)**

-R2 Rear Module for DRA-8204

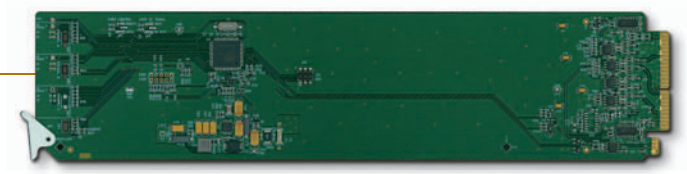



DRA-8204-R2

# DEA-8205 HD SD

## Dual Serial HD / SD SDI Equalizing Amplifier

2 independent channels of SDI distribution for standard and high-definition SDI signals.

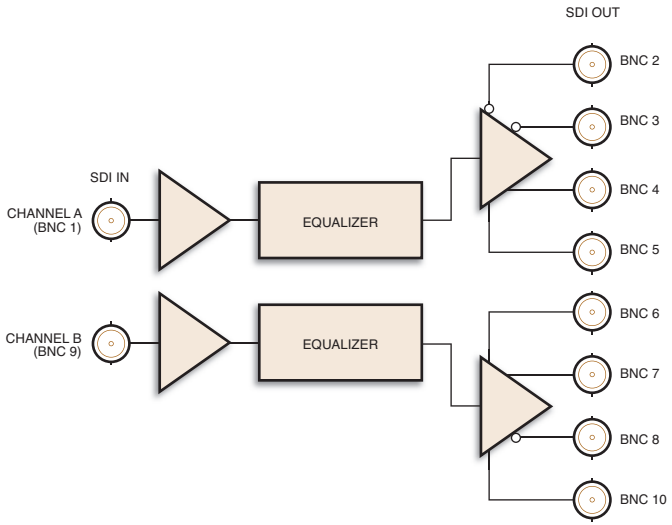


The DEA-8205 is a 2 channel HD / SD SDI distribution amplifier capable of equalizing all common serial digital signals. With 2 independent signal channels, the DEA-8205 provides cost-effective distribution at double the density compared to single channel cards. Support for all data rates between 143Mb/s and 1.485Gb/s makes the DEA-8205 a great choice for high-density SDI distribution.

Each channel of the DEA-8205 equalizes the incoming SDI signal, compensating for up to 300m of cable at 270Mb/s and up to 100m of cable at 1.485Gb/s. 4 SDI outputs are provided for each channel.

Special attention has been taken to ensure the SDI outputs faithfully reproduce the incoming signals, with excellent jitter and return loss specifications.

LED indicators at the front of the module identify the presence of incoming video, simplifying system troubleshooting.




## Key Features

- 2 independent channels of SDI distribution on one card!
- Equalizes and distributes all SDI signals from 143Mb/s to 1.485Gb/s
- Equalizes up to 300m of Belden 1694A cable at 270Mb/s, or up to 100m of cable at 1.485Gb/s
- LED indicators for signal presence
- Excellent input / output return loss specifications
- 4 SDI outputs for each input channel
- 10 DAs in the DFR-8321
- 5-year transferable warranty
- Power: 1.9 watts

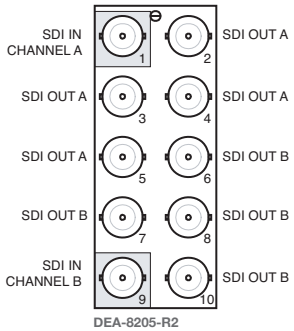
## Ordering Information

**Dual Serial HD / SD SDI Equalizing Amplifier**

DEA-8205 Dual HD / SD SDI Equalizing DA

**Rear Module Suffix (ex: [model]-R2)**

-R2 Rear Module for DEA-8205

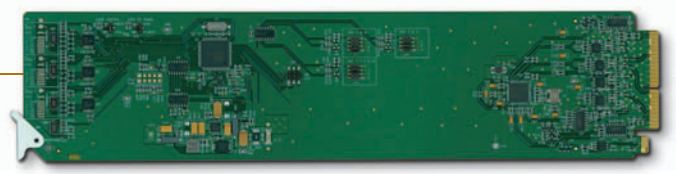



DEA-8205-R2

# TRA-8206 HD SD

## Triple Serial HD / SD SDI Reclocking Amplifier

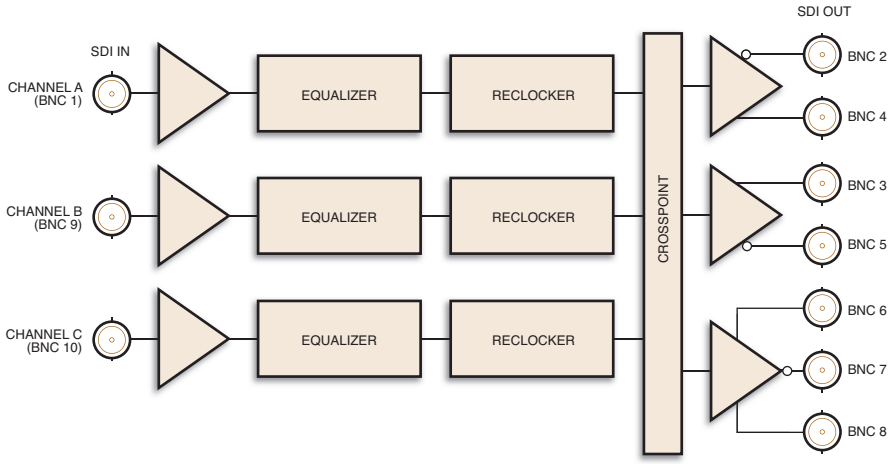
3 independent channels of SDI distribution for standard and high-definition SDI signals.



The TRA-8206 is a 3 channel HD / SD SDI distribution amplifier capable of equalizing and reclocking all common serial digital signals. Support for both standard and high-definition signals makes the TRA-8206 a universal SDI distribution amplifier.

Each channel of the TRA-8206 equalizes the incoming SDI signal, compensating for up to 300m of cable at 270Mb/s and up to 100m of cable at 1.485Gb/s. The signal is then reclocked with automatic rate detection for all popular data rates. Each channel is fully independent, and can run at different data rates.

LED indicators at the front of the module identify the presence of incoming video and the identified signal data rate for each channel.




## Key Features

- 3 independent channels of SDI distribution on one card!
- Equalizes and reclocks all SDI signals from 143Mb/s to 1.485Gb/s
- Equalizes up to 300m of Belden 1694A cable at 270Mb/s, or up to 100m of cable at 1.485Gb/s
- Automatic detection of incoming data rate
- Flexible channel configurations:
  - single mode 1:7 amplifier
  - dual mode 1:4 and 1:3 amplifiers
  - dual mode 1:5 and 1:2 amplifiers
  - triple mode 1:2, 1:2, and 1:3 amplifiers
- LED indicators for signal presence and data rate for each channel
- Excellent input / output return loss specifications
- 10 DAs in the DFR-8321
- 5-year transferable warranty
- Power: 4.0 watts

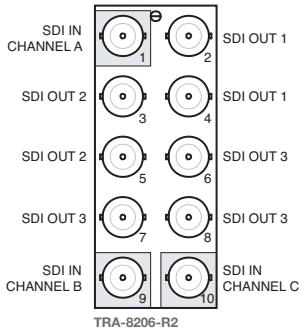
## Ordering Information

**Triple Serial HD / SD SDI Reclocking Amplifier**

TRA-8206 Triple HD / SD SDI Reclocking DA

**Rear Module Suffix (ex: [model]-R2)**

-R2 Rear Module for TRA-8206

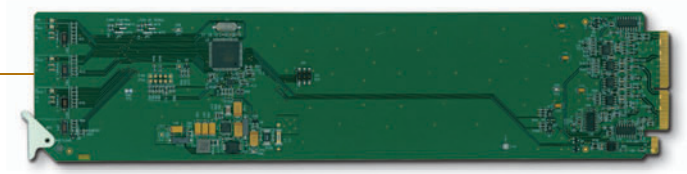



TRA-8206-R2

# TEA-8207 HD SD

## Triple Serial HD / SD SDI Equalizing Amplifier

3 independent channels of SDI distribution for standard and high-definition SDI signals.

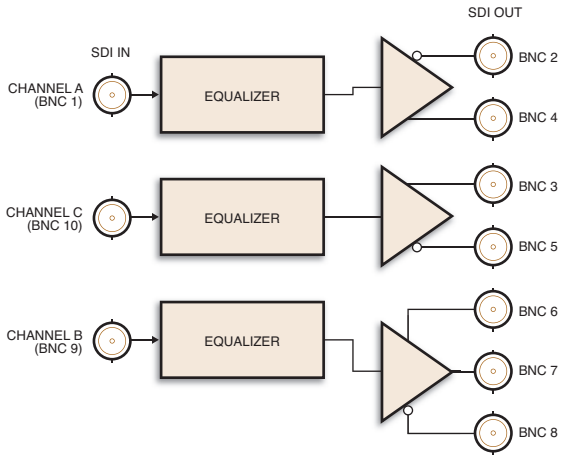


The TEA-8207 is a 3 channel HD / SD SDI distribution amplifier capable of equalizing all common serial digital signals. Support for both standard and high-definition signals makes the TEA-8207 an extremely versatile SDI distribution amplifier.

Each channel of the TEA-8207 equalizes the incoming SDI signal, compensating for up to 300m of cable at 270Mb/s and up to 100m of cable at 1.485Gb/s. One SDI channel provides 3 outputs, and the two other SDI channels provide 2 outputs each.

Special attention has been taken to ensure the SDI outputs faithfully reproduce the incoming signals, with excellent jitter and return loss specifications.

LED indicators at the front of the module identify the presence of incoming video, simplifying system troubleshooting.




## Key Features

- 3 independent channels of SDI distribution on one card!
- Equalizes and distributes all SDI signals from 143Mb/s to 1.485Gb/s
- Equalizes up to 300m of Belden 1694A cable at 270Mb/s, or up to 100m of cable at 1.485Gb/s
- LED indicators for signal presence
- Excellent input / output return loss specifications
- One channel provides 3 SDI outputs and the remaining two channels provide 2 SDI outputs each
- 10 DAs in the DFR-8321
- 5-year transferable warranty
- Power: 2.3 watts

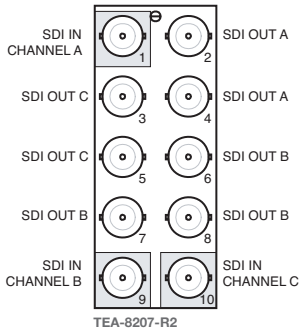
## Ordering Information

**Triple Serial HD / SD SDI Equalizing Amplifier**

TEA-8207 Triple HD / SD SDI Equalizing DA

**Rear Module Suffix (ex: [model]-R2)**

-R2 Rear Module for TEA-8207

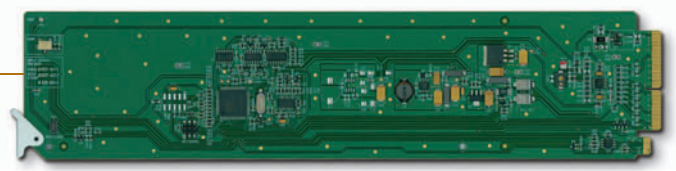



TEA-8207-R2

# UDA-8705A AN-VID

## Analog Utility Distribution Amplifier

A very useful device in HD / SD digital systems where there is a requirement for analog signal distribution.

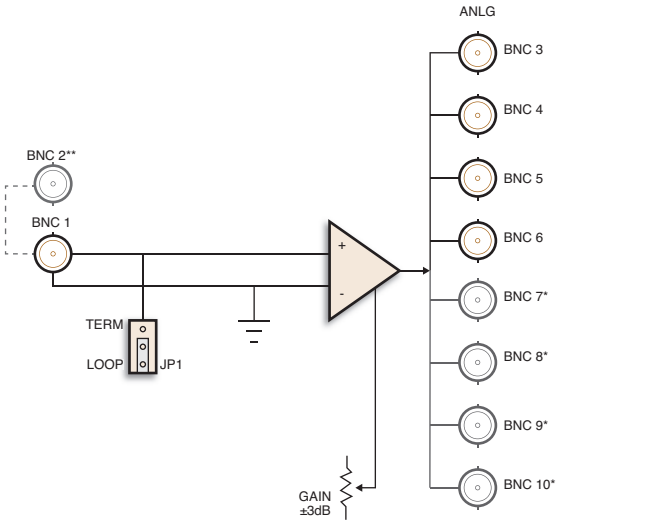


The UDA-8705A is an analog general purpose distribution amplifier in the openGear® platform. Use of this amplifier will avoid the need to purchase a separate analog frame and power supply in digital installations.

This amplifier may be used in any application where equalization and a differential input is not required - an excellent device for composite and tri-level sync distribution.

The use of new generation integrated circuits and innovative engineering has resulted in excellent performance combined with economy.

The -R2S high density split rear module can accommodate up to 2x UDA-8705A cards, each configured as a 1x4 DA. The -R2L offers a 1x8 DA with a passive looping input.




* Only 4 analog outputs are available when using the -R2S split rear module.
** Looping input available with -R2L rear module.

## Key Features

- 1x4 or analog distribution amplifier
- DC coupled
- Wide adjustable gain range of ±3dB
- Low distortion
- Excellent isolation between outputs
- Power to each card is individually fused
- 20 DAs in DFR-8321
- 5-year transferable warranty
- Power: 1.5 watts

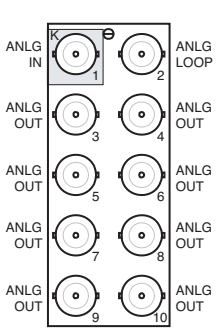
## Ordering Information

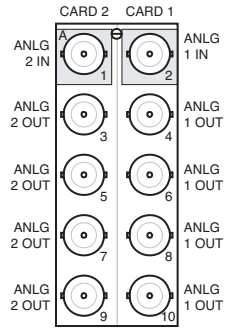
**Analog Utility Distribution Amplifier**

| | |
|---|---|
| UDA-8705A | Analog Utility DA |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for UDA-8705A |
| -R2L | Looping Rear Module for UDA-8705A |
| -R2S | Split Rear Module for 2x UDA-8705A |

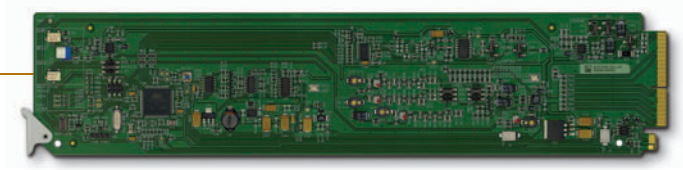


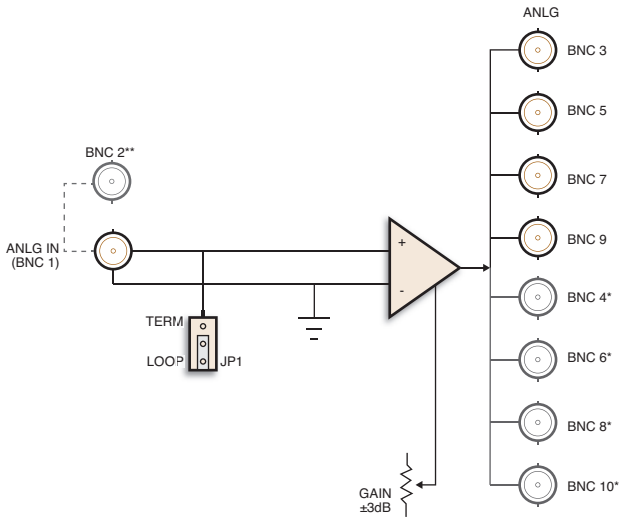



# VEA-8707A AN-VID EQ

## Analog Video Equalizing Distribution Amplifier

Distribution and equalization of analog signals in a mixed digital / analog system without the need for a separate frame.






* Only 4 analog outputs are available when using the -R2S split rear module.
** Looping input available with -R2L rear module.

The VEA-8707A analog equalizing amplifier has been specially developed for use with the openGear® HD / SD SDI frame. Use of this amplifier eliminates the need for a separate analog frame in a mixed digital and analog system.

This amplifier has been designed to manage a wide range of analog video signals with 8 outputs providing precision cable equalization for numerous cable types.

Temperature drift effects are non-existent by use of the latest analog ASIC technology combined with meticulous product engineering. The power to each card is individually fused to prevent failure of any one card from affecting the rest of the system.

The VEA-8707A offers a differential input giving excellent ground loop rejection and supports both AC and DC coupling. Back porch clamping is provided with AC coupling and offers two user-selectable speeds, with DC coupling the clamping can be disabled.

Passive looping of the input signal is provided with use of the -R2L looping rear module.

## Key Features

- Precision equalization of 3 selectable coaxial cable types up to 300m
- Single-control equalization for quick installation
- AC or DC input coupling
- 8 outputs
- Back porch clamping
- Supports tri-level sync distribution
- Clamping speed selectable
- Differential input for gound loop hum rejection
- ±3dB of gain adjustment
- 26ns propagation delay
- 5-year transferable warranty
- Power: 1.6 watts

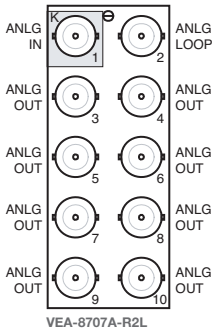
## Ordering Information

**Analog Video Equalizing Amplifier**

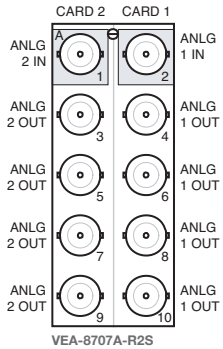
| | |
|---|---|
| VEA-8707A | Analog Video Equalizing DA |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for VEA-8707A |
| -R2L | Looping Rear Module for VEA-8707A |
| -R2S | Split Rear Module for 2x VEA-8707A |



VEA-8707A-R2L

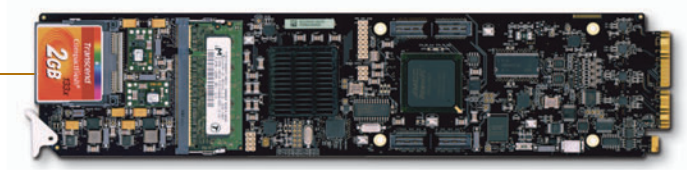


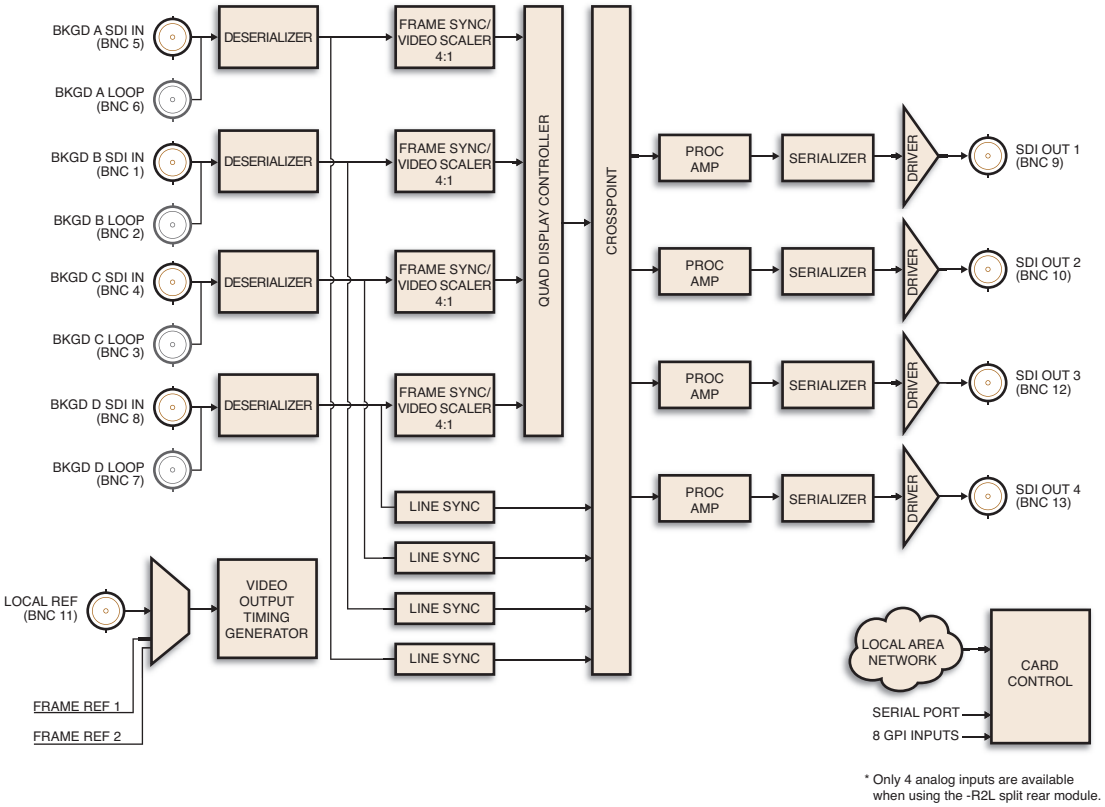
VEA-8707A-R2S

# QSP-8229 3G HD SD 3D

## Quad Split

A cost-effective, single card solution for viewing up to 4 inputs on a single display.






* Only 4 analog inputs are available when using the -R2L split rear module.

The QSP-8229 is a very cost-effective solution for monitoring up to 4 video inputs. The 4 video inputs are combined into a single quad split output with configurable UMD and bordering capability. In addition to the 4 inputs, the QSP-8229 offers 4 independent outputs that can be configured to display either the combined quad output or pass-through of the input, with full proc control, offering additional outputs for use elsewhere.

Unique to the quad processor is passive looping inputs allowing the card to fit into any video path without the need for additional DAs. Looping is performed on the back module ensuring the signal path is not lost even when the processor is removed.

DashBoard control allows each quadrant to optionally display a static source ID and / or borders with fully adjustable color and transparency. Each output can be triggered to display the quad split or full screen with local GPI control or remote DashBoard control. This feature is extremely useful when a full screen image is desired to verify video quality.

## Key Features

- Quad image processor
- 4 passive looping inputs available with the -R2L looping rear module
- 4 configurable outputs, pass-through / quad split
- Source ID labeling
- Quadrant bordering with adjustable width, color and transparency
- Any quadrant can be taken full screen
- <1 frame of processing delay
- Independent proc amp control on each output
- Auto-detection of HD / SD input
- Local GPI control
- 5-year transferable warranty
- Power: 18.4 watts

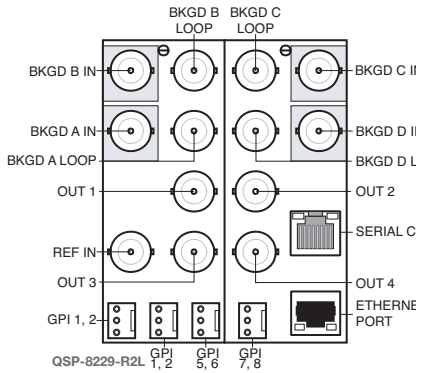
## Ordering Information

**Quad Split**

| | |
|---|---|
| QSP-8229 | Quad Split |

**Rear Module Suffix (ex: [model]-R2)**

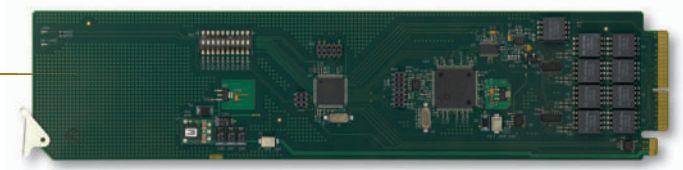
| | |
|---|---|
| -R2 | Rear Module for QSP-8229 |
| -R2L | Looping Rear Module for QSP-8229 |



# ADA-8402-A AES

## AES / EBU Distribution Amplifier – 75Ω

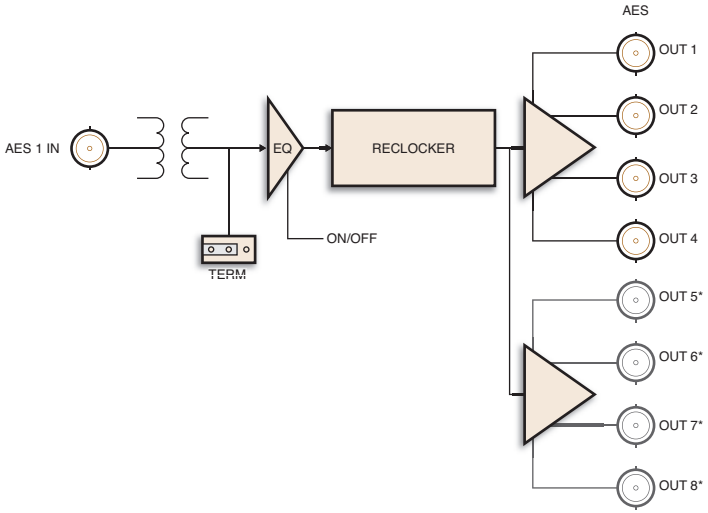
Broadcast quality AES / EBU distribution amplifier with internal audio processing.



The ADA-8402-A is an AES / EBU distribution amplifier designed for broadcast use. It provides 8 copies of the incoming unbalanced AES-3id signal when used with the -R2A full rear module or 4 copies of the incoming signal when used with the -R2AS split rear module. The ADA-8402-A supports audio sampling frequencies from 32kHz to 96kHz. Cable equalization and reclocking techniques enable the ADA-8402-A to recover the incoming digital audio signal reliably.

The ADA-8402-A also includes internal audio processing for independent channel gain, sum (mono), left or right channel only, and ITU1770 LKFS loudness measurements, which are displayed in DashBoard.

The -R2AS high density split rear module can accommodate up to 2x ADA-8402-A cards, each configured as a 1x4 DA, accommodating up to 20 channels of distribution per 2RU frame.




* Only 4 analog outputs are available when using the -R2AS split rear module.

## Key Features

- 1x4 or 1x8 AES distribution amplifier
- Cable equalization and data reclocking on the incoming AES / EBU signal
- Supports audio sampling frequencies from 32kHz to 96kHz
- 75Ω unbalanced AES-3id I/O
- Ideal for distributing Dolby® E and Dolby® Digital signals
- Provides level matching and level control of output signals
- 20 DAs in the DFR-8321
- 5-year transferable warranty
- Power: 2 Watts

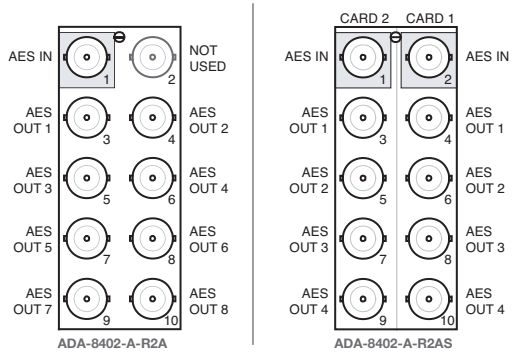
## Ordering Information

**AES / EBU Distribution Amplifier – 75Ω**

| | |
|---|---|
| ADA-8402-A | AES / EBU Audio DA |

**Rear Module Suffix (ex: [model]-R2)**

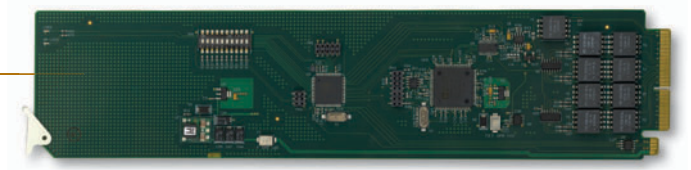
| | |
|---|---|
| -R2A | 75Ω Rear Module for ADA-8402-A |
| -R2AS | 75Ω Split Rear Module for 2x ADA-8402-A |

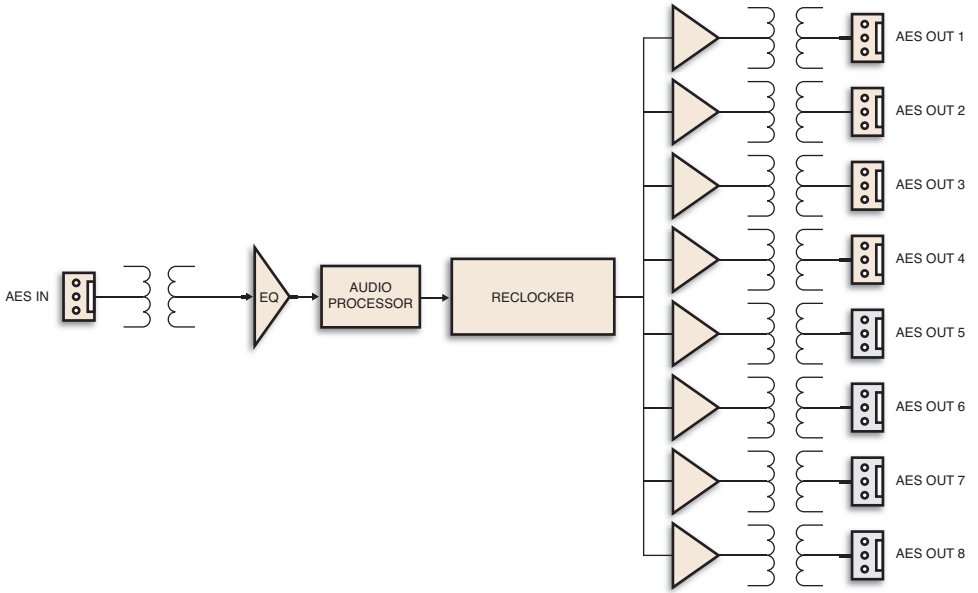


# ADA-8402-B AES

## AES / EBU Distribution Amplifier – 110Ω

Broadcast quality AES / EBU distribution amplifier with internal audio processing.






*Only 4 AES outputs are available when using the -R2BS split rear module.

The ADA-8402-B is an AES / EBU distribution amplifier designed for broadcast use. It provides 8 copies of the incoming balanced AES3 signal when used with the -R2B full rear module or 4 copies of the incoming signal when used with the -R2BS split rear module. The ADA-8402-B supports audio sampling frequencies from 32kHz to 96kHz. Cable equalization and reclocking techniques enable the ADA-8402-B to recover the incoming digital audio signal reliably.

The ADA-8402-B also includes internal audio processing for independent channel gain, sum (mono), left or right channel only, and ITU1770 LKFS loudness measurements, which are displayed in DashBoard.

The -R2BS high density split rear module can accommodate up to 2x ADA-8402-B cards, each configured as a 1x4 DA, accommodating up to 20 channels of distribution per 2RU frame.

## Key Features

- 1x4 or 1x8 AES distribution amplifier
- Cable equalization and data reclocking on the incoming AES / EBU signal
- Supports audio sampling frequencies from 32kHz to 96kHz
- 110Ω balanced AES3 I/O
- Ideal for distributing Dolby® E and Dolby® Digital signals
- Provides level matching and level control of output signals
- 20 DAs in the DFR-8321
- 5-year transferable warranty
- Power: 2 watts

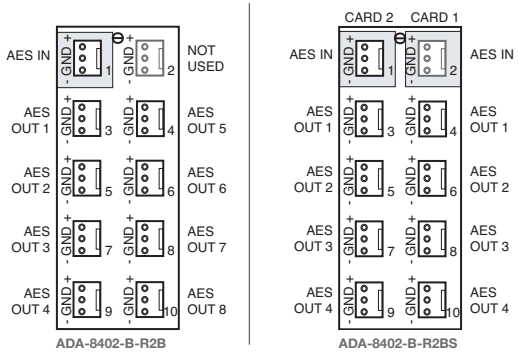
## Ordering Information

**AES / EBU Distribution Amplifier – 110Ω**

| | |
|---|---|
| ADA-8402-B | AES / EBU Audio DA |

**Rear Module Suffix (ex: [model]-R2)**

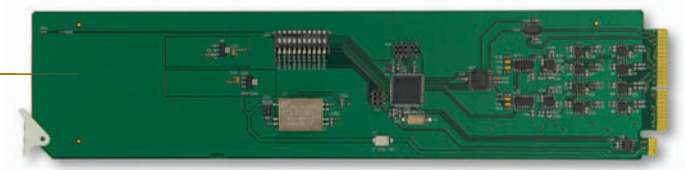
| | |
|---|---|
| -R2B | 110Ω Rear Module for ADA-8402-A |
| -R2BS | 110Ω Split Rear Module for 2x ADA-8402-B |

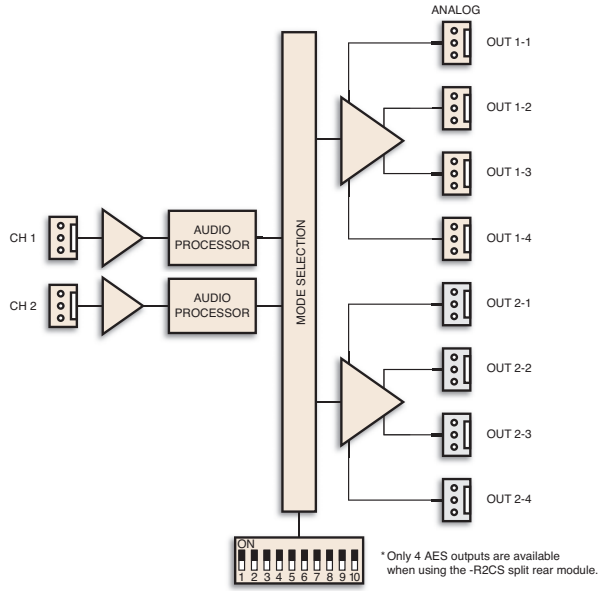


# ADA-8405-C AN-AUD

## Analog Audio and Timecode DA with Remote Gain

Universal 1x8 or dual 1x4 analog audio distribution amplifier with internal audio processing.






* Only 4 AES outputs are available when using the -R2CS split rear module.

The ADA-8405-C is a remote gain analog audio distribution amplifier designed for broadcast use. It can be used as either a mono 1x8, or dual channel (stereo) 1x4 audio DA. When used with the standard -R2C rear module, it provides 8 copies of the single (mono) input signal or 4 copies each of the dual (stereo) inputs.

The -R2CS split rear module can support 2x ADA-8405-C cards, each operating as a 1x4 audio DA. This can be used to separate left and right stereo pair signals to be amplified in separate paths for critical signals.

The ADA-8405-C has internal audio processing for independent channel or stereo gain control and summing capability.

The ADA-8405-C is also ideal for LTC timcode distribution throughout a facility. In 1x8 mode, the ADA-8405-C provides 8 copies of the incoming signal when used with the -R2C rear module.

## Key Features

- Dual 1x4 or single 1x8 analog audio distribution
- +/- 15dB software gain control
- Summing capability
- Low distortion
- 1x4 or 1x8 timecode (LTC) distribution
- 20 cards in a DFR-8321
- Balanced I/O
- 5-year transferable warranty
- Power: 2.6 watts

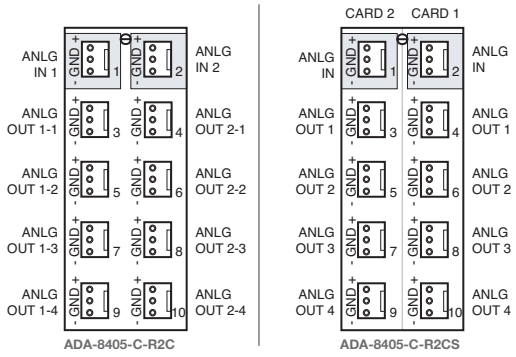
## Ordering Information

**Analog Audio and Timecode DA w/ Remote Gain**

| | |
|---|---|
| ADA-8405-C | Analog Audio and Timecode DA |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2C | Rear Module for ADA-8405-C |
| -R2CS | Split Rear Module for ADA-8405-C |



**UDC-8625A**
3G / HD / SD SDI Multi-Function Format Converter

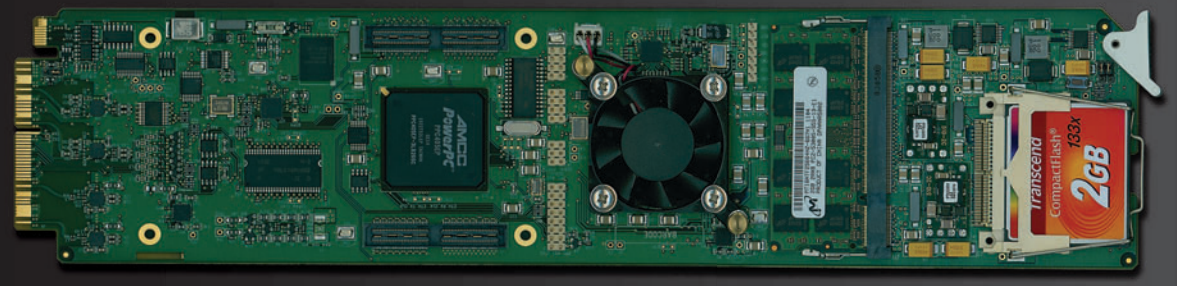
**UDC-8625A-A**
Multi-Function Format Converter

**UDC-8625A-B**
Multi-Function Format Converter

**HDC-8222A**
HD Down Converter and Distribution Amplifier

# UP / DOWN / CROSS, ARC CONVERSION

DISTRIBUTION AND MONITORING




SYNCHRONIZATION AND DELAY

VIDEO CONVERSION

AUDIO CONVERSION

AUDIO EMBEDDING / DE-EMBEDDING

ADVANCED AUDIO PROCESSING

FIBER

SWITCHING

KEYING AND BRANDING

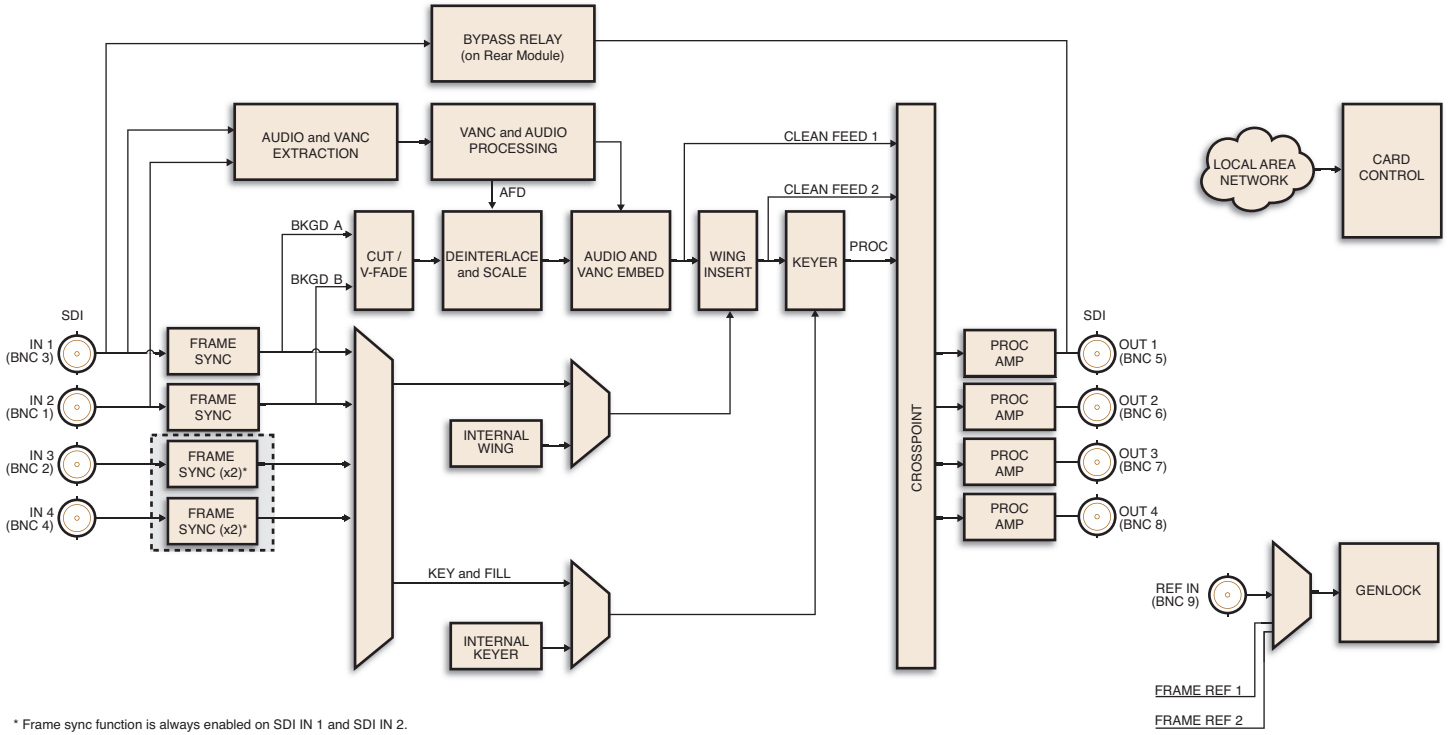
DATA SOLUTIONS

TRANSPORT STREAM MONITORING AND CONVERSION

# UDC-8625A 3G HD SD AFD FS

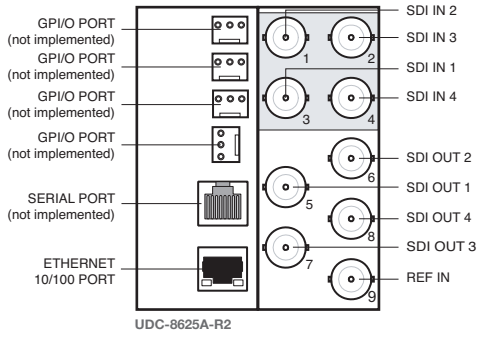
## 3G / HD / SD SDI Multi-Function Format Converter

A multi-function solution for Up / Down / Cross Conversion, Keying, Logo Insertion, A/B Mixing, all with audio video processing, timing, and synchronization.

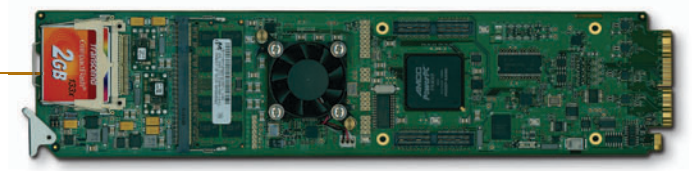



* Frame sync function is always enabled on SDI IN 1 and SDI IN 2.

External Key feature




UDC-8625A-R2



**The UDC-8625A Format Converter**
A feature rich 3G / HD / SD SDI converter that supports all traditional formats including 1080p, 1080i, 720p, 480i, and 576i. Audio and video synchronization is combined with a signal processor, offering full control of the 16 channels of audio, with gain, invert, shuffle and sample rate conversion. Video processing offers adjustment for luma / chroma gain plus black offset with metadata processing including AFD processing and insertion. Pillar bar / letter box (wings) insertion can be achieved with the external fill signal or internally from the logo inserter. A/B inputs can be configured to V-fade or operate in an auto fail-safe mode selecting the secondary input on failure / absence of the primary input.

**The UDC-8625A Keyer**
The UDC-8625A can be operated as a keyer using the external key / fill inputs to key overtop of the PGM input. The operation can be extended to allow for mixing of the background with V-fade transitions behind the keyer by using the second background input.

**The UDC-8625A Logo Inserter**
The UDC-8625A offers internal 2Gb storage for logo insertion supporting static and animated playout with support for TGA, GIF, PNG, BMP and JPG file formats.

**The UDC-8625A A/B Mixer**
For downstream signal mixing the UDC-8625A offers a full audio / video mixing engine that can be configured to perform Fade-Fade, Take-Fade, or Fade-Take transitions with selectable rate control.

**Combined UDC, Keyer, Logo Inserter and A/B Mixer**
Any combination, as required!

**Control**
The UDC-8625A offers complete remote control and monitoring via the DashBoard Control System. Automation support is offered via RS-422 serial control and / or GPI combined with direct Ethernet connectivity for media transfer.

## Key Features

- Up / down / cross conversion of all traditional formats 1080p, 1080i, 720p, 480i, 576i
- Audio / video frame sync with processing
  - Audio - 16 channel embedded processor: gain, invert, shuffle, sample rate conversion
  - Video - luma / chroma gain and black offset
  - Metadata with AFD processing and insertion
- Primary / secondary fail-safe input with auto-changeover
- Internal or external pillar bar / letter box graphic insertion
- Relay bypass on primary input to output
- Keying with external key / fill inputs
- Logo insertion with 2Gb animation store supporting TGA, GIF, PNG, BMP and JPG
- A/B background mixing with Fade-Fade, Take-Fade, Fade-Take
- Automation control via serial RS-422 and / or GPI
- Dedicated Ethernet port for media transfer
- 5-year transferable warranty

## Ordering Information

**3G / HD / SD SDI Multi-Function Format Converter**

| | |
|---|---|
| UDC-8625A | 3G / HD / SD SDI Multi-Function Format Converter |

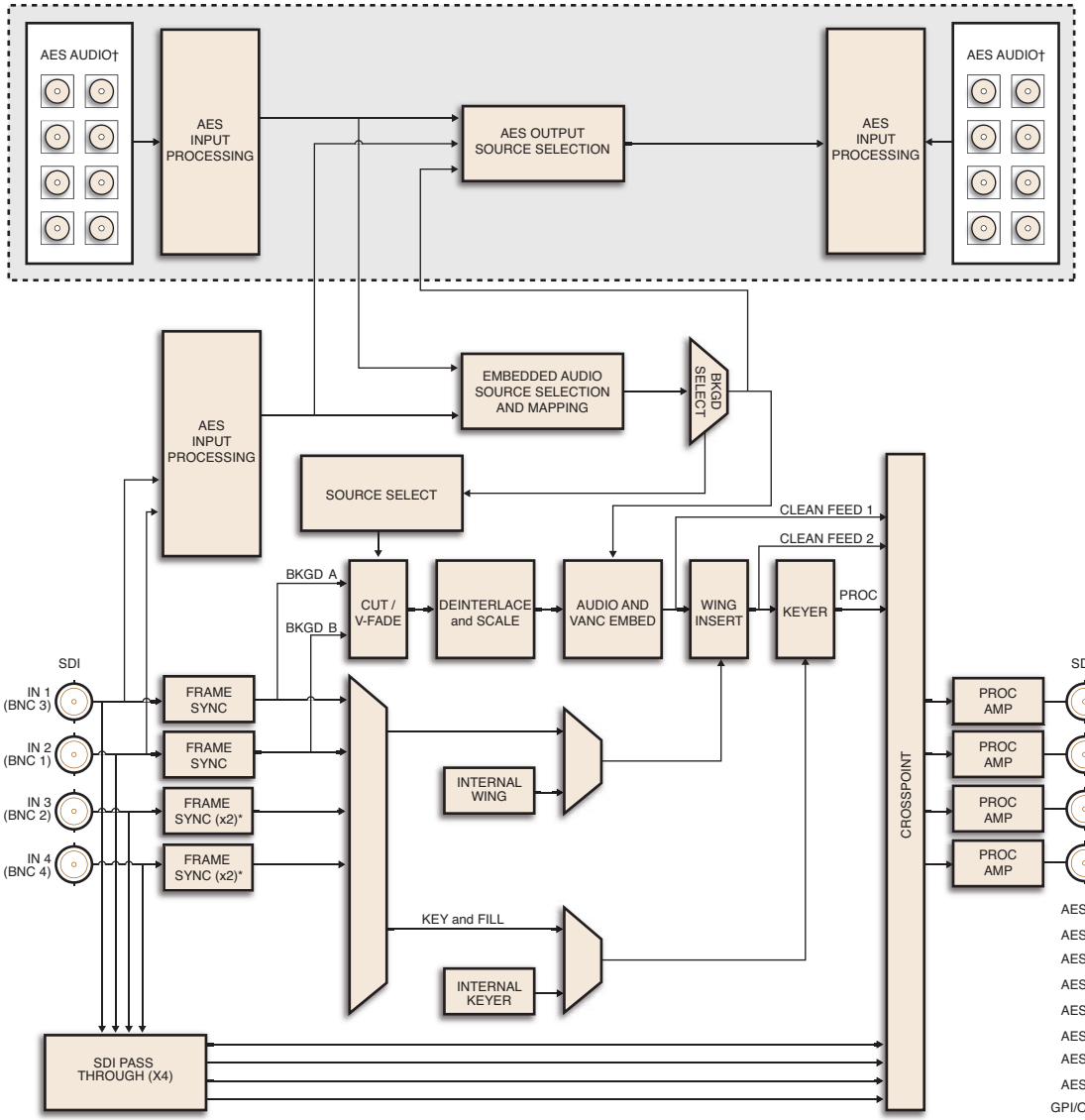
**Rear Module Suffix (ex: [model]-R2)**

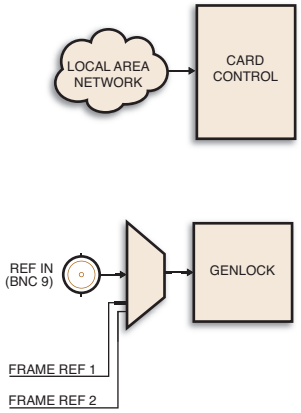
| | |
|---|---|
| -R2 | Rear Module for UDC-8625A |

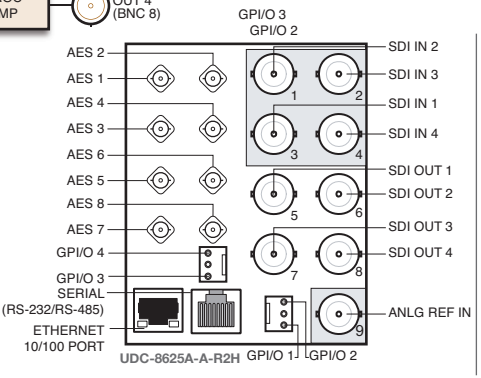
# UDC-8625A-A 3G HD SD AFD FS

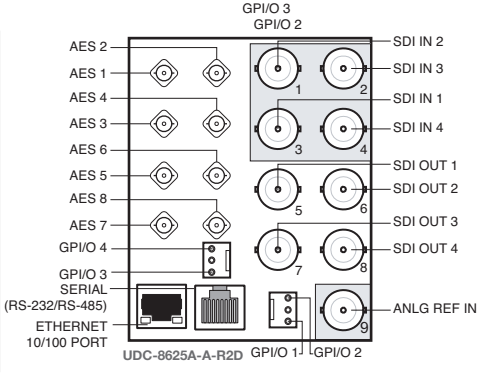
## Multi-Function Format Converter

The UDC-8625A-A is a multi-function solution for Up \ Down \ Cross Conversion, audio embedding and de-embedding, discrete audio processing, Keying, Logo Insertion, A/B Mixing, all with audio video processing, timing, and synchronization.



**The UDC-8625A-A Format Converter**
A feature rich 3G / HD / SD converter that supports all traditional formats including 1080p, 1080i, 720p, 480i, and 576i. Audio and video synchronization is combined with a signal processor, offering full control of the 16 channels of audio with gain, invert, shuffle and sample rate conversion. Video processing offers adjustment for luma / chroma gain plus black offset with metadata processing including AFD processing and insertion. Pillar bar / letter box (wings) insertion can be achieved with the external fill signal or internally from the logo inserter. A/B inputs can be configured to V-Fade or operate in an auto fail-safe mode selecting the secondary input on failure / absence of the primary input.

**The UDC-8625A-A Audio Processor**
The UDC-8625A-A offers everything the UDC-8625A does with the addition of discrete audio processing. The 8 AES I/O can be used as 8 AES inputs, 8 AES outputs, or 4 AES in / 4 AES out and offer embedding, de-embedding and full discrete audio processing functions.

**The UDC-8625A-A Keyer**
The UDC-8625A-A can be operated as a keyer using the external Key / Fill inputs to key over the PGM input. The operation can be extended to allow for mixing of the background with V-Fade transitions behind the keyer by using the second background input.

**The UDC-8625A-A Logo Inserter**
The UDC-8625A-A offers internal 2Gb storage for logo insertion that supports static and animated playout with support for TGA, GIF, PNG, BMP, and JPG file formats.

**The UDC-8625A-A A/B Mixer**
For downstream signal mixing the UDC-8625A-A offers a full audio / video mixing engine that can be configured to perform Fade-Fade, Take-Fade, or Fade-Take transitions with selectable rate control.

**Combined**
Any combination, as required!

**Control**
The UDC-8625A-A offers complete remote control and monitoring via the DashBoard Control System. Automation support is offered via RS-422 serial control and / or GPI combined with direct Ethernet connectivity for media transfer.

## Ordering Information

**Multi-Function Format Converter**

UDC-8625A-A 3G / HD / SD SDI Multi-Function Format Converter

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2H | HD-BNC Audio Rear Module for UDC-8625A-A |
| -R2D | DIN Audio Rear Module for UDC-8625A-A |

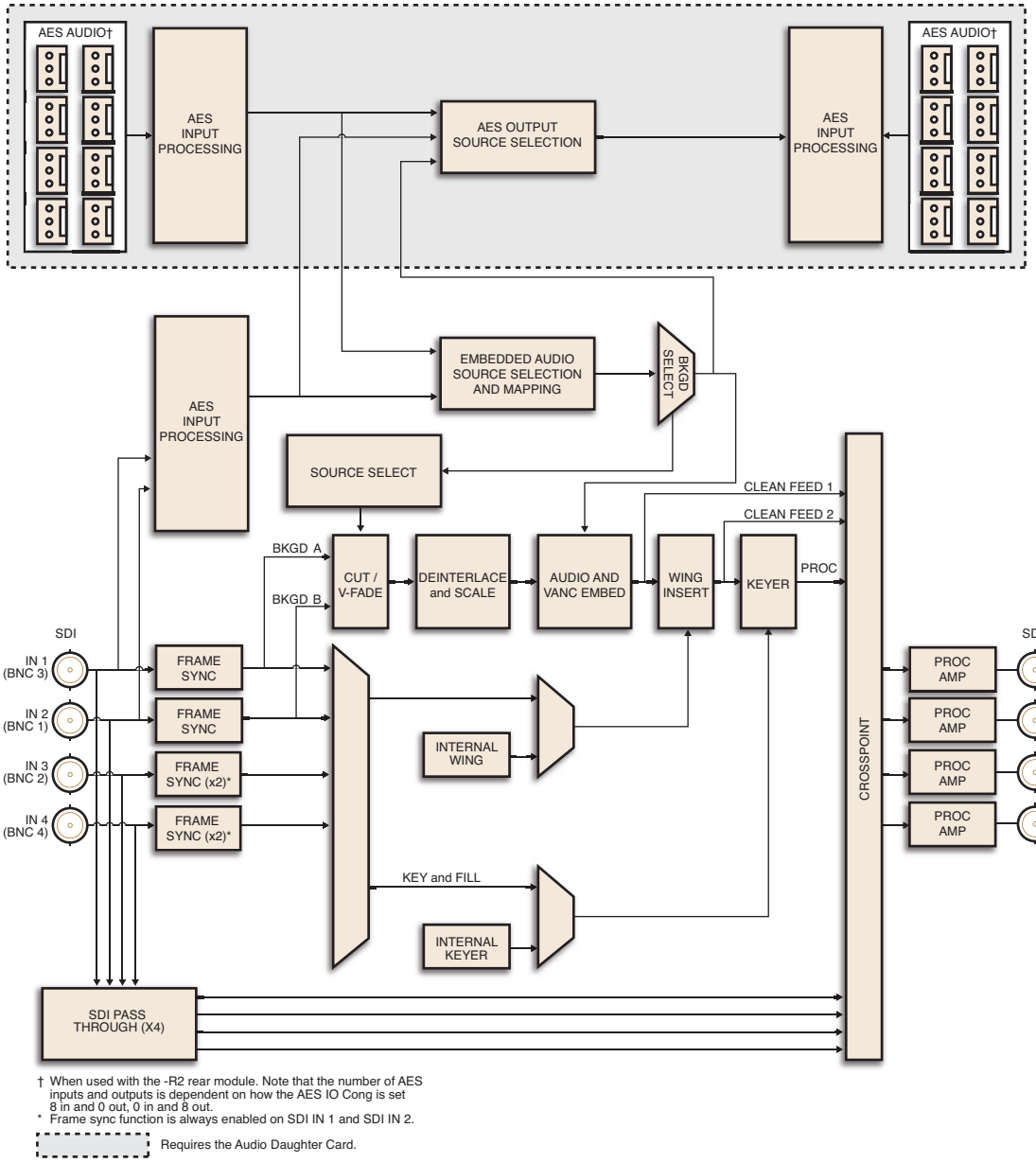
## Key Features

- Up / down / cross conversion of all traditional formats 1080p, 1080i, 720p, 480i, 576i
- Audio / video frame sync with processing
  - Audio - 16 channel embedded processor: gain, invert, shuffle, sample rate conversion
  - Video - luma / chroma gain and black offset
  - Metadata with AFD processing and insertion
- 8 configurable AES I/O: 8 in; 8 out; 4 in / 4 out
- Simultaneous audio embedding and / or de-embedding
- Full discrete AES audio processing, delayed relative to the video
- Simultaneous discrete and embedded processing
- 75Ω unbalanced and 110Ω balanced I/O
- Primary / secondary fail-safe input with auto-changeover
- Internal or external pillar bar / letter box graphic insertion
- Keying with external key / fill inputs
- Logo insertion with 2Gb animation store supporting TGA, GIF, PNG, BMP, and JPG
- A/B background mixing with Fade-Fade, Take-Fade, Fade-Take
- Automation control via serial RS-422 and/or GPI
- Dedicated Ethernet port for media transfer
- 5-year transferable warranty

# UDC-8625A-B 3G HD SD AFD FS

## Multi-Function Format Converter

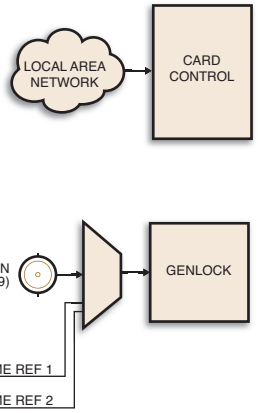
The UDC-8625A-B is a multi-function solution for Up \ Down \ Cross Conversion, audio embedding and de-embedding, discrete audio processing, Keying, Logo Insertion, A/B Mixing, all with audio video processing, timing, and synchronization.

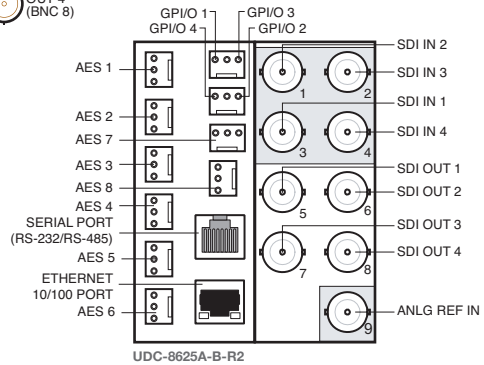



† When used with the -R2 rear module. Note that the number of AES inputs and outputs is dependent on how the AES IO Cong is set 8 in and 0 out, 0 in and 8 out.

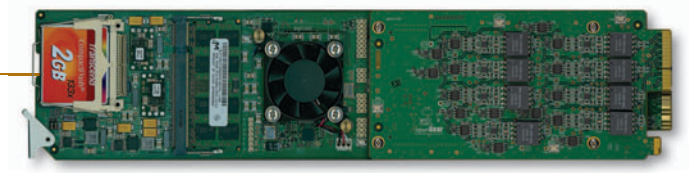
* Frame sync function is always enabled on SDI IN 1 and SDI IN 2.

Requires the Audio Daughter Card.




UDC-8625A-B-R2



**The UDC-8625A-B Format Converter**
A feature rich 3G / HD / SD converter that supports all traditional formats including 1080p, 1080i, 720p, 480i, and 576i. Audio and video synchronization is combined with a signal processor, offering full control of the 16 channels of audio with gain, invert, shuffle and sample rate conversion. Video processing offers adjustment for luma / chroma gain plus black offset with metadata processing including AFD processing and insertion. Pillar bar / letter box (wings) insertion can be achieved with the external fill signal or internally from the logo inserter. A/B inputs can be configured to V-Fade or operate in an auto fail-safe mode selecting the secondary input on failure / absence of the primary input.

**The UDC-8625A-B Audio Processor**
The UDC-8625A-B offers everything the UDC-8625A does with the addition of discrete audio processing. The 8 AES I/O can be used as 8 AES inputs, 8 AES outputs, or 4 AES in / 4 AES out and offer embedding, de-embedding and full discrete audio processing functions.

**The UDC-8625A-B Keyer**
The UDC-8625A-B can be operated as a keyer using the external Key / Fill inputs to key overtop of the PGM input. The operation can be extended to allow for mixing of the background with V-Fade transitions behind the keyer by using the second background input.

**The UDC-8625A-B Logo Inserter**
The UDC-8625A-B offers internal 2Gb storage for logo insertion that supports static and animated playout with support for TGA, GIF, PNG, BMP, and JPG file formats.

**The UDC-8625A-B A/B Mixer**
For downstream signal mixing the UDC-8625A-B offers a full audio / video mixing engine that can be configured to perform Fade-Fade, Take-Fade, or Fade-Take transitions with selectable rate control.

**Combined**
Any combination, as required!

**Control**
The UDC-8625A-B offers complete remote control and monitoring via the DashBoard Control System. Automation support is offered via RS-422 serial control and / or GPI combined with direct Ethernet connectivity for media transfer.

## Ordering Information

**Multi-Function Format Converter**

UDC-8625A-B 3G / HD / SD SDI Multi-Function Format Converter

**Rear Module Suffix (ex: [model]-R2)**

-R2B 110Ω Audio Rear Module for UDC-8625A-B

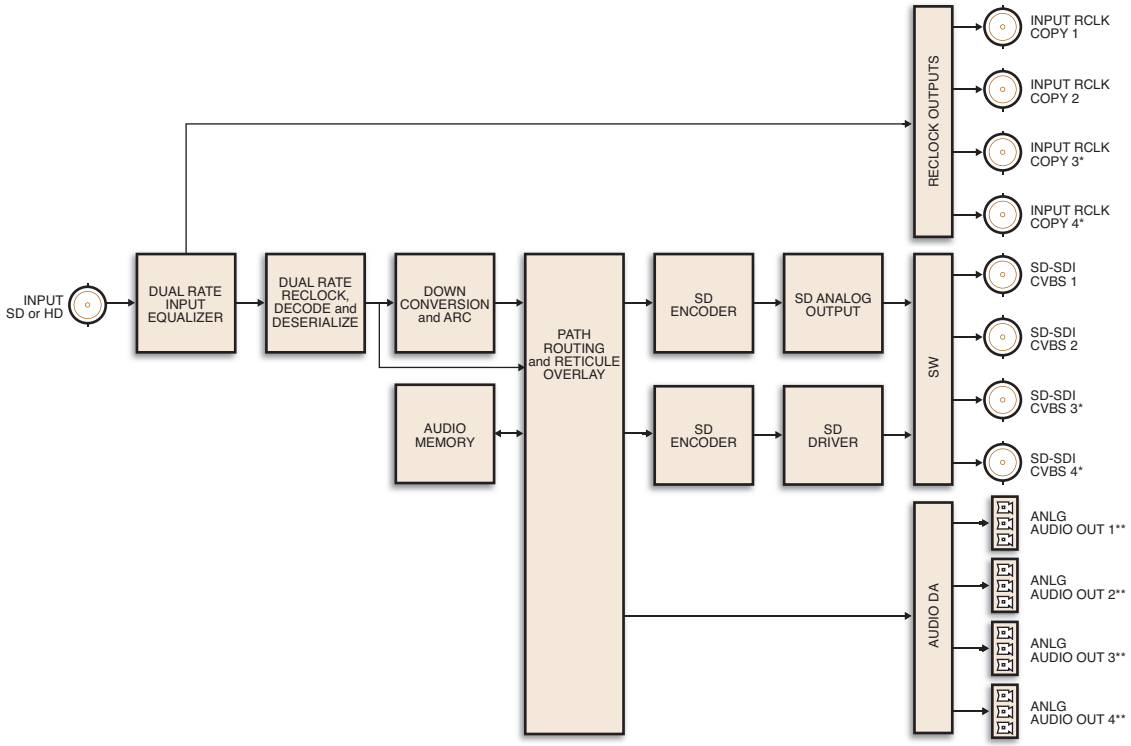
## Key Features

- Up / down / cross conversion of all traditional formats 1080p, 1080i, 720p, 480i, 576i
- Audio / video frame sync with processing
  - Audio - 16 channel embedded processor: gain, invert, shuffle, sample rate conversion
  - Video - luma / chroma gain and black offset
  - Metadata with AFD processing and insertion
- 8 configurable AES I/O: 8 in; 8 out; 4 in / 4 out
- Simultaneous audio embedding and / or de-embedding
- Full discrete AES audio processing, delayed relative to the video
- Simultaneous discrete and embedded processing
- 75Ω unbalanced and 110Ω balanced I/O
- Primary / secondary fail-safe input with auto-changeover
- Internal or external pillar bar / letter box graphic insertion
- Keying with external key / fill inputs
- Logo insertion with 2Gb animation store supporting TGA, GIF, PNG, BMP, and JPG
- A/B background mixing with Fade-Fade, Take-Fade, Fade-Take
- Automation control via serial RS-422 and/or GPI
- Dedicated Ethernet port for media transfer
- 5-year transferable warranty

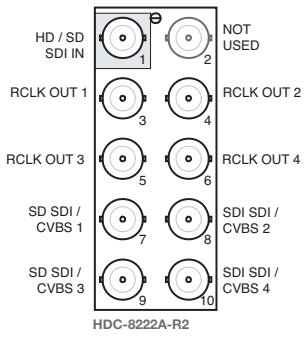
# HDC-8222A HD SD AN-AUD

## HD Down Converter and Distribution Amplifier

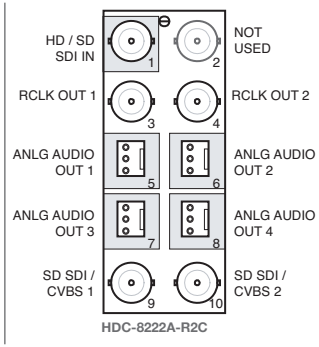
An excellent solution for HD down conversion and distribution with configurable SD and / or composite analog outputs with optional analog audio output.




* Not available when used with -R2C rear module.
** Analog output only available with -R2C rear module.




HDC-8222A-R2




HDC-8222A-R2C

The HDC-8222A is a high quality 1 in / 4 out reclocking HD / SD distribution amplifier combined with 4 configurable analog composite or SDI digital outputs of high quality 10-bit HD down conversion.

The HDC-8222A incorporates full aspect ratio conversion on the output with reticule overlays for full aperture and safe area in both 16x9 and 4x3. Embedded audio, timecode and EIA-608 captions are preserved and passed to the outputs.

The HDC-8222A supports all popular standard and high-definition video formats including 8080psF/.98, 1080pSF/23.98, 1080p/29.97, 1080p/25,1080p/23.98, 1080i/29.97, 1080i/25, 720p/25, 720p/29.97, 720p/50, 720p/59.94, 486i/29.97, 576i/25.

With the -R2C rear module, the HDC-8222A supports audio de-embedding with 4 analog audio outputs.

## Key Features

- Supports all popular formats: 1080pSF/23.98, 1080p/29.97, 1080p/25, 1080p/23.98, 1080i/29.97, 1080i/25,720p/25, 720p/29.97, 720p/50, 720p/59.94, 486i/29.97, 576i/25
- 4 reclocked DA outputs
- 4 selectable SDI digital / analog composite outputs
- Full HD to SD ARC functionality on output 16:9, 14:9, 4:3 center cut
- SD to SD ARC functionality 16:9 / 4:3
- Reticule overlay with safe area and cross-hair
- Embedded audio, timecode and EIA-608 preserved from input to output
- Integrated proc amp
- Optional 4 channel analog audio de-embedding available
- 5-year transferable warranty
- Power: 8 watts

## Ordering Information

**HD Down Converter and Distribution Amplifier**

| | |
|---|---|
| HDC-8222A | HD / SD SDI Down Converter |

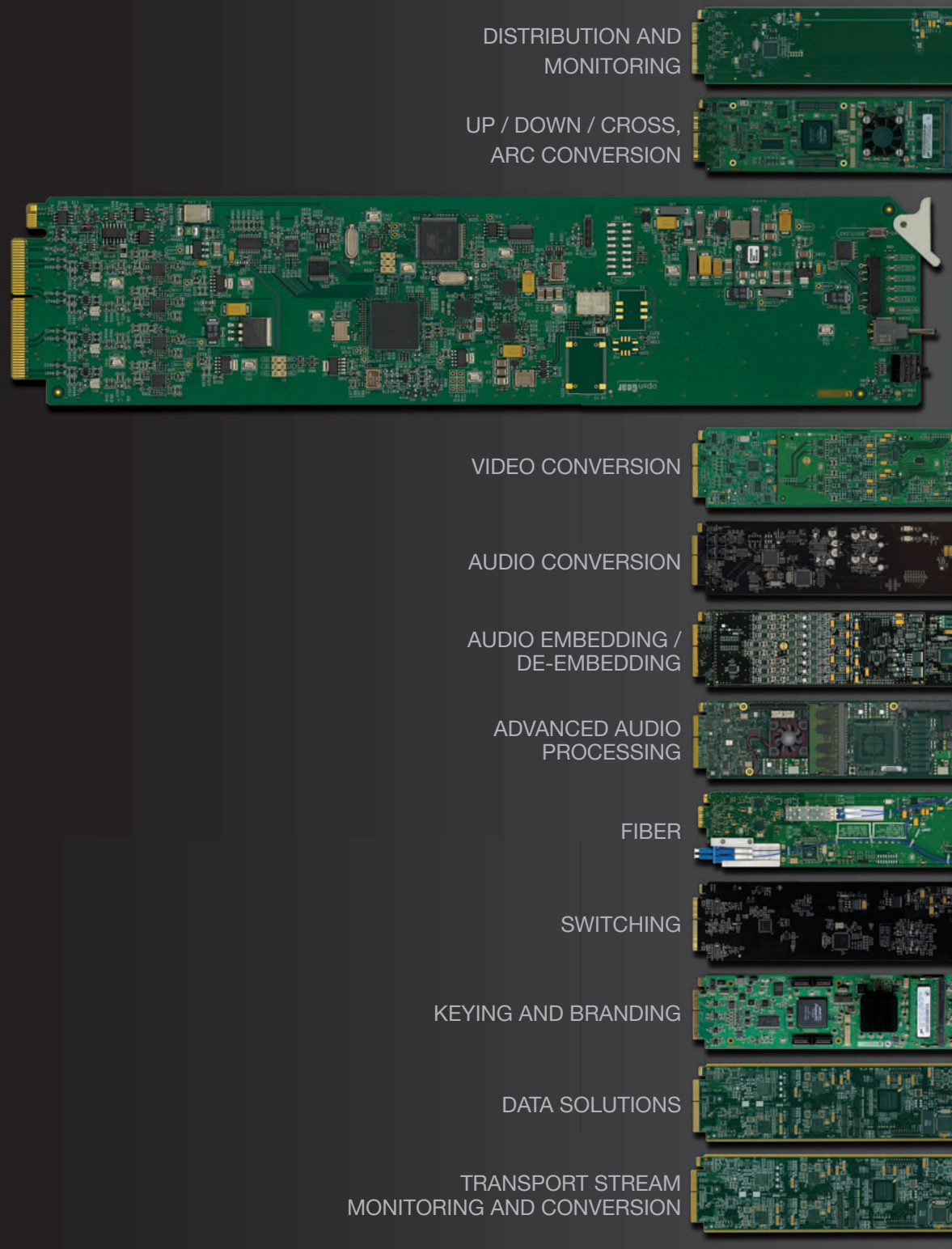
**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for HDC-8222A |
| -R2C | Analog Audio Rear Module for HDC-8222A |

**SFS-8221**
HD / SD SDI Frame Synchronizer

**SPG-8260**
Sync Pulse Generator

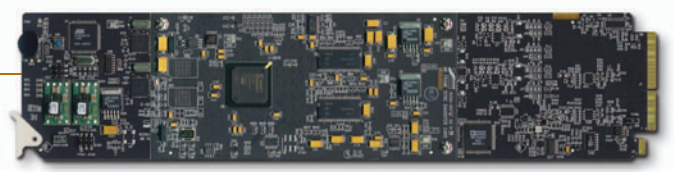
# SYNCHRONIZATION AND DELAY



# SFS-8221 HD SD FS

## HD / SD SDI Frame Synchronizer

Video frame synchronizer for all standard and high-definition SDI signals.



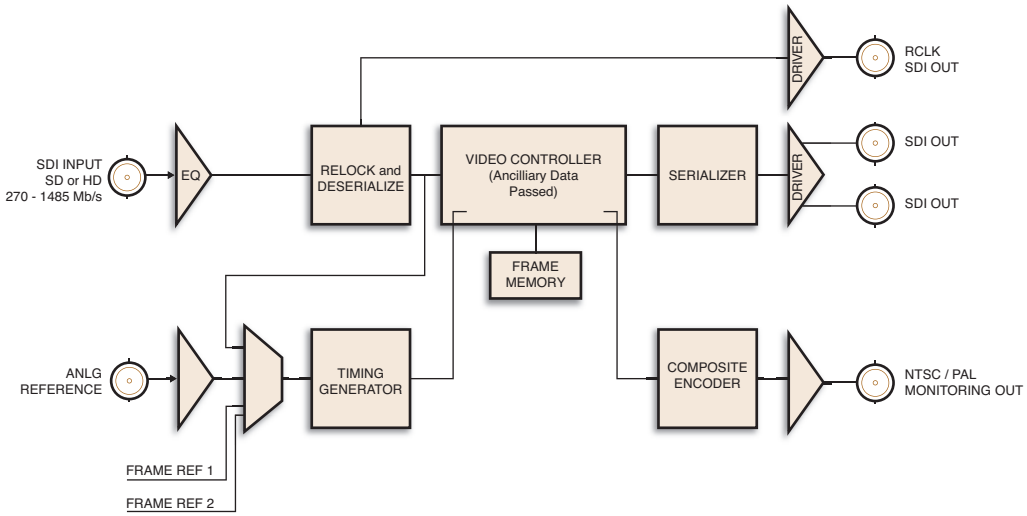
The SFS-8221 is a HD / SD SDI frame synchronizer designed for re-timing applications in both standard and high-definition environments.

The SFS-8221 supports all popular standard and high-definition video formats including 480i, 576i, 720p, 1080i. The format of incoming video is automatically detected, simplifying system setup.

The SFS-8221 accepts an SDI signal of either standard (270Mb/s) or high-definition (1.485Gb/s), automatically equalizing for cable loss and providing a reclocked SDI output. The video is then synchronized to either a frame-wide reference or a local reference. A delay mode is also available for adding fixed delay to the incoming video.

openGear® frames support a distributed frame reference, allowing a single incoming reference sync signal to feed timing information to all modules in a frame. Thus, a single composite or tri-level sync signal can be used for multiple frame synchronizers. Alternatively, each frame synchronizer accepts an additional local reference signal to provide additional system timing flexibility.

Ancillary data (VANC) is protected, and is passed from input to output, ensuring data is not lost during the frame sync operation. Video proc amp and full timing controls are provided.




## Key Features

- Handles all popular formats of SD (270Mb/s) and HD (1.485Gb/s) signals
- Automatically detects the incoming video format
- Re-times incoming video to a local or frame-wide reference signal
- Delay mode to solve system timing problems
- Cleanly handles hot-switching on the input
- Provides up to 105 frames in SD, 18 frames in 1080i/30,14 frames in 1080i/25
- Passes ancillary (VANC) data
- NTSC / PAL monitoring output with Heads-Up Display menu system
- 5-year transferable warranty
- Power: 10.5 watts

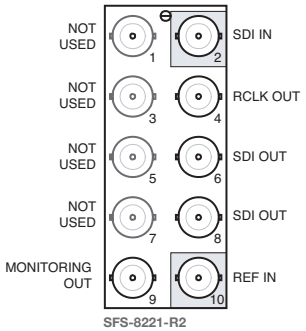
## Ordering Information

**HD / SD SDI Frame Synchronizer**

| | |
|---|---|
| SFS-8221 | HD / SD SDI Frame Synchronizer |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for SFS-8221 |

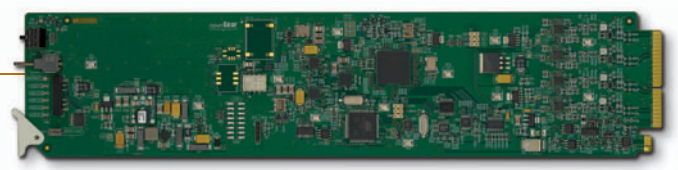


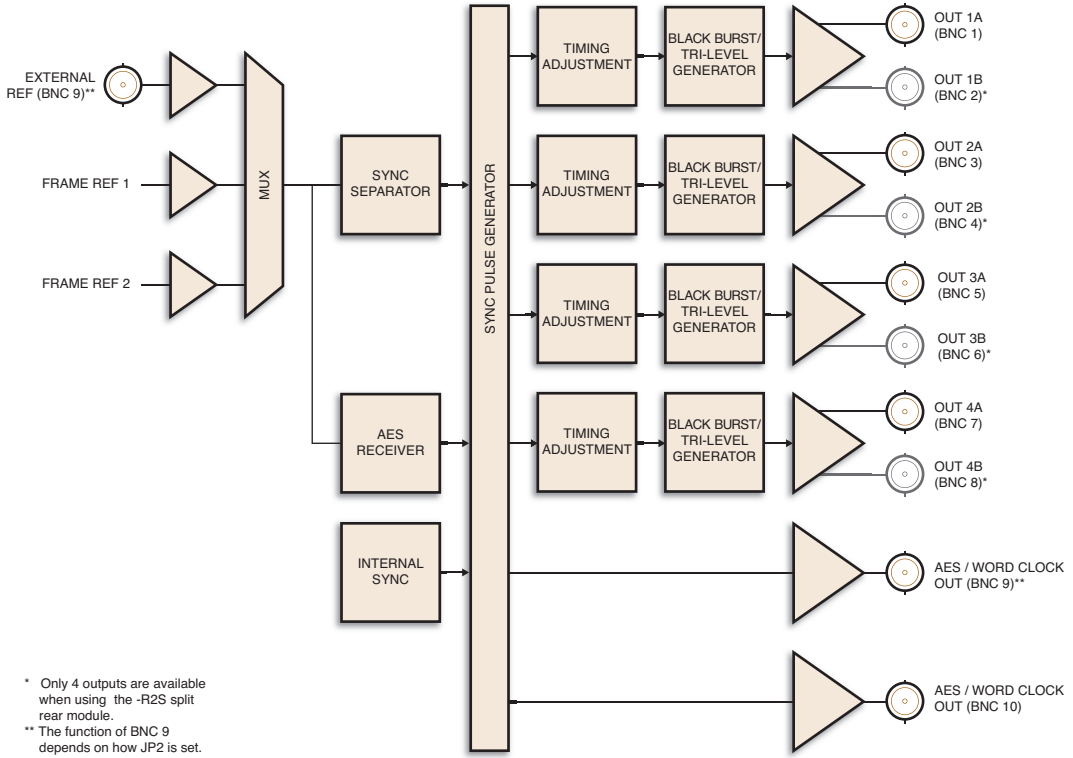
SFS-8221-R2

# SPG-8260

## Sync Pulse Generator

Outputs Tri-level and Color Black on 4 independent pairs of outputs with a dedicated AES or Word Clock output.






* Only 4 outputs are available when using the -R2S split rear module.
** The function of BNC 9 depends on how JP2 is set.

The SPG-8260 sync pulse generator provides 4 pairs of outputs with each pair independently programmed to be either tri-level sync or a composite signal. Each pair of outputs can be independently delayed relative to the incoming reference. The delay is in increments of the output's interface sampling frequency (74.25MHz, 74.25/1.001MHz or 27MHz) up to 1 frame of video.

Tri-level sync output format is selectable from the following formats: 1080i 60, 1080i 50,1080i 59.94, 1080p 23.98/24/25, 1080sF 23.98/24/25, 720p 50, and 720p 59.94.

The SPG-8260 can lock to one of the two frame references, the card local reference input, or free-run using the SPG-8260 internal oscillator. If the selected reference is lost, the SPG-8260 switches to its internal oscillator without disturbing the outputs; when the selected reference returns, the SPG-8260 locks back to the input reference.

The SPG-8260 will generate AES reference or a Word Clock output as well as AES tone for AES outputs.

## Key Features

- Generates 4 pairs of outputs at a different frame rate than reference
- Each pair of outputs can be independently delayed relative to the incoming reference
- HD interfaces conform to SMPTE 274M and SMPTE 296M standards
- SD interfaces conform to SMPTE 170M (NTSC) or PAL standards
- Composite outputs: black or color bars
- Generates an AES reference signal or a Word Clock output
- AES tone available for AES outputs
- Fully compliant with openGear® specifications
- 5-year transferable warranty
- Power: 6 watts

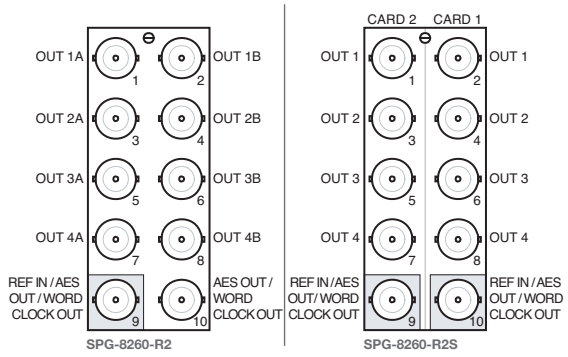
## Ordering Information

**Sync Pulse Generator**

| | |
|---|---|
| SPG-8260 | Sync Pulse Generator |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for SPG-8260 |
| -R2S | Split Rear Module for 2x SPG-8260 |



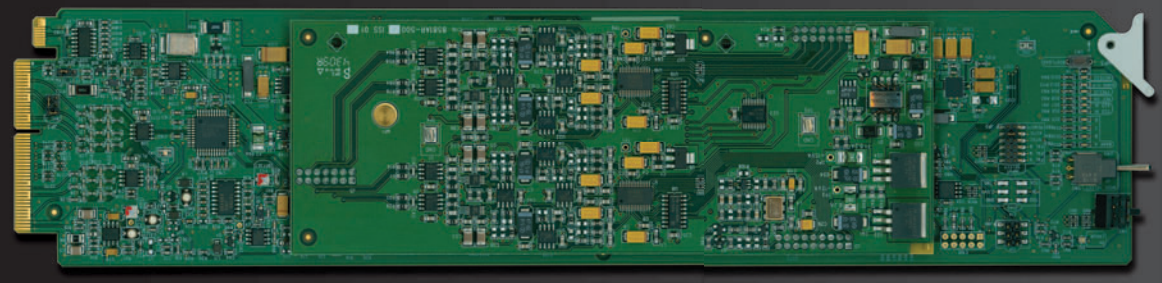
**ADC-8732B (-S)**
Analog Composite to SDI Converter

**ADC-8732B-C (-SC)**
Analog Composite with 4 Channels of Analog Audio to SDI Converter

**ADC-8733A (-S)**
Analog Component to SDI Converter

**ADC-8733A-C (-SC)**
Analog Component with 4 Channels of Analog Audio to SDI Converter

# VIDEO CONVERSION



DISTRIBUTION AND MONITORING

UP / DOWN / CROSS, ARC CONVERSION

SYNCHRONIZATION AND DELAY

AUDIO CONVERSION

AUDIO EMBEDDING / DE-EMBEDDING

ADVANCED AUDIO PROCESSING

FIBER

SWITCHING

KEYING AND BRANDING

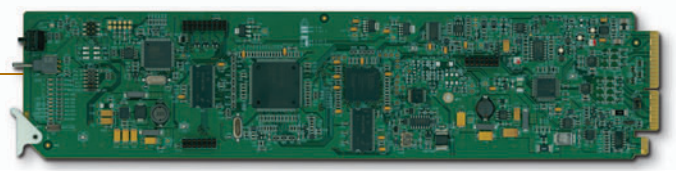
DATA SOLUTIONS

TRANSPORT STREAM MONITORING AND CONVERSION

# ADC-8732B / ADC-8732B-S SD AN-VID FS

## Analog Composite to SDI Converter

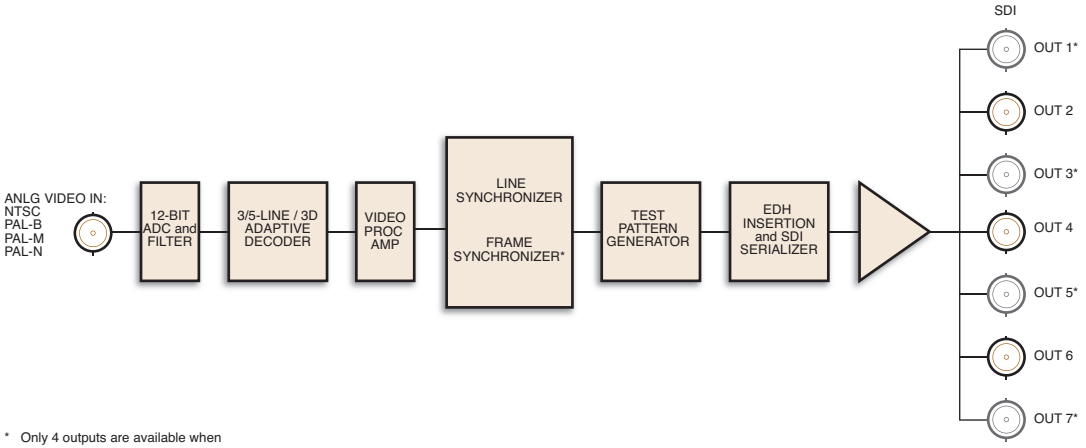
A superior quality analog to digital converter designed to handle tough microwave and satellite feeds as well as all general decoding requirements.



The ADC-8732B is an advanced NTSC / PAL to 10-bit SDI video decoder designed to manage normal and difficult analog feeds. The adaptive comb filter converts analog feeds to SDI with much higher detail and fewer artifacts than found with traditional 3-line decoding. The ADC-8732B comes standard with a built-in line synchronizer, advanced digital proc amp and timebase corrector for decoding non-timebase corrected tape machines or other unstable signals.

The ADC-8732B can optionally be equipped with a full frame synchronizer (-S option) for applications where decoding of microwave or satellite feeds is required.

A tracking pulse output is available for input to the ADL-8520 Audio Tracking Delay Unit to ensure perfectly synchronized video and audio.




* Only 4 outputs are available when using the -R2S split rear module.

## Key Features

- 12-bit A to D quantization
- On-board TBC
- 4x oversampling
- 3D adaptive NTSC decoding
- 5-line adaptive PAL decoding
- Designed to handle difficult, unstable signals
- Passes super-black
- Low jitter
- On-board optional frame sync
- Input loss mode (black, freeze)
- Hot-switch mode (black, freeze)
- 5-year transferable warranty
- Power: 4 watts

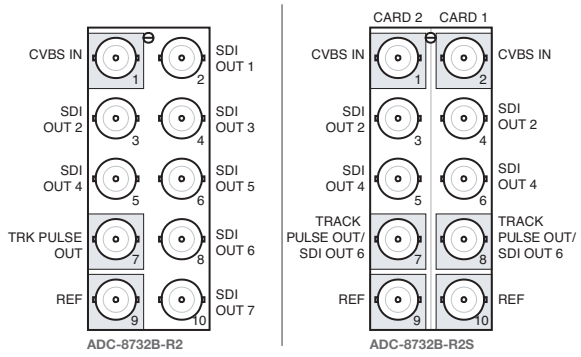
## Ordering Information

**Analog Composite to SDI Converter**

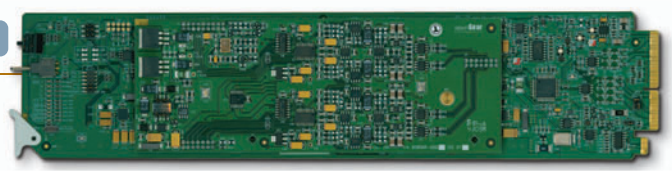
| | |
|---|---|
| ADC-8732B | Analog to SDI |
| ADC-8732B-S | Analog to SDI and Frame Sync |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for ADC-8732B (-S) |
| -R2S | Split Rear Mod for 2x ADC-8732B (-S) |

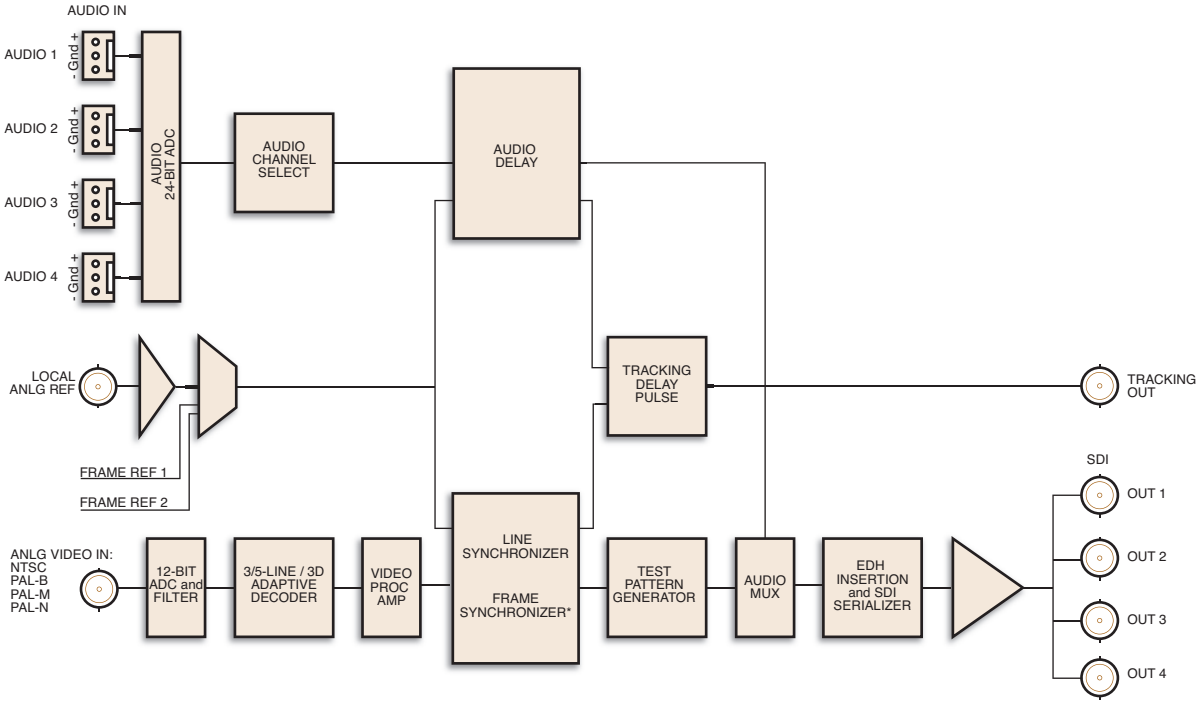


# ADC-8732B-C / ADC-8732B-SC SD AN-VID AN-AUD FS



## Analog Composite with 4 Channels of Analog Audio to SDI Converter

A superior quality analog to digital converter with 4 channels of audio designed to handle tough satellite feeds and general decoding requirements.




A superior quality analog to digital converter with 4 channels of audio designed to handle tough satellite feeds and general decoding requirements.

The ADC-8732B-C (-SC) is a 10-bit broadcast quality video decoder with a 12-bit analog to digital converter supporting 4 channels of analog audio embedding. It is specifically designed for broadcast or production situations in which an analog PAL-B, PAL-M, PAL-N, or NTSC composite signal must be converted to a component SD SDI signal. 4 SD SDI outputs with embedded audio are provided. Analog audio is converted at 24-bit resolution and offers adjustable ±10dBu of gain and delay up to 5 seconds.

The ADC-8732B-C includes the audio processing daughter card and features 4 channels of analog audio embedding plus all the ADC-8732B features.

The ADC-8732B-SC includes a frame synchronizer in addition to all the features available on the ADC-8732B and ADC-8732B-C.

## Key Features

- 12-bit A to D conversion
- 10-bit decoding with 3-line / 5-line / 3D adaptive comb filters
- 4 channels of analog audio A / D with embedding
- Optional frame synchronization
- Freeze modes
- Horizontal and vertical timing adjustments
- Programmable vertical interval blanking
- Proc amp controls
- 24-bit audio ADC resolution, adjustable gain and delay
- Status indicator LEDs on card-edge
- Choice of reference inputs
- 5-year transferable warranty
- Power: 7.8 watts

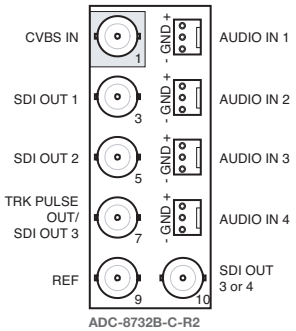
## Ordering Information

**Analog Composite with 4 Channels of Analog Audio to SDI Converter**

| | |
|---|---|
| ADC-8732B-C | Analog to SDI with Embedder |
| ADC-8732B-SC | Analog to SDI with Embedder and Frame Sync |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2C | Rear Module for ADC-8732B-C (-SC) |




ADC-8732B-C-R2

# ADC-8733A / ADC-8733A-S SD AN-VID FS

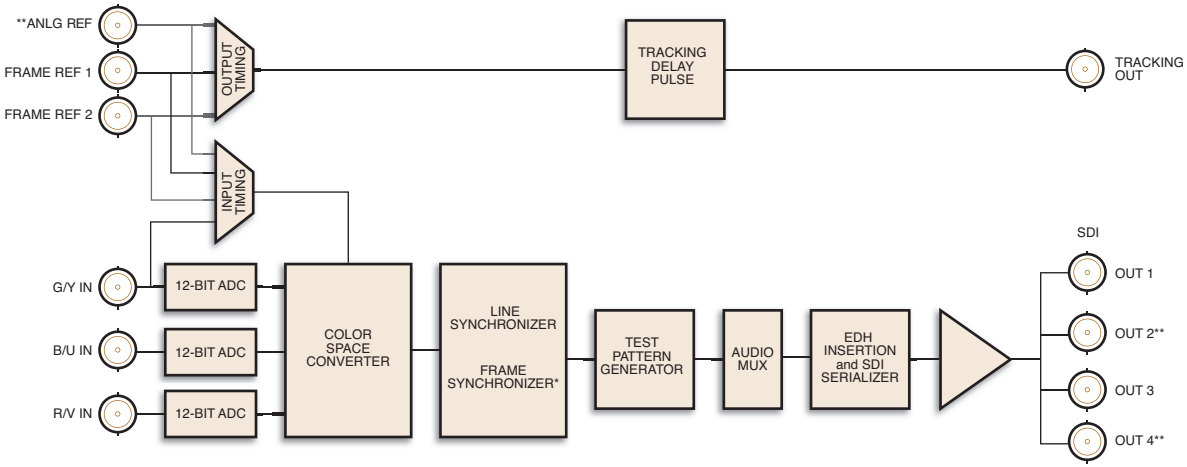
## Analog Component to SDI Converter

High quality conversion of analog component signals into 270Mb/s SDI.

The ADC-8733A (-S) is the perfect solution for converting analog component (YUV / RGB) sources such as VTRs, cameras, and character generators for use in the digital realm. The component YUV / RGB video signal, with or without setup, is converted to 4 SD SDI (SMPTE 259M) outputs employing 2x oversampled 12-bit A to D conversion and high quality digital filtering to ensure superb frequency response.

The ADC-8733A comes standard with a built-in line delay and line synchronizer as well as advanced proc amp controls.

The ADC-8733A-S version comes with frame synchronizer and frame delay modes, capable of synchronizing incoming video to house reference. Various timing modes are available to accommodate most situations. New techniques in frame synchronization contribute to the low power requirements and compact design.




* Available on the ADC-8733A-S only.

** On the -R2S split rear modules, only SDI out 2 and 4 are available.

## Key Features

- YUV input from Betacam, MII and SMPTE / EBU formats
- All RGB input formats supported
- Field-upgradeable frame synchronization option available
- Programmable vertical interval blanking and signal pass-through
- Extensive proc amp controls, pass or clip super black
- Freeze modes, horizontal and vertical timing adjustments
- Tracking delay output for companion audio synchronizer
- Built-in test signals (FF color bars, SDI checkfield)
- 5-year transferable warranty
- Power: 4.5 watts

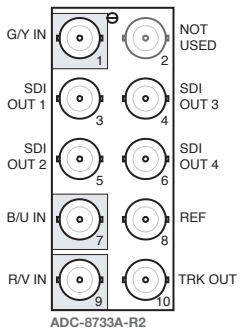
## Ordering Information

**Analog Component to SDI Converter**

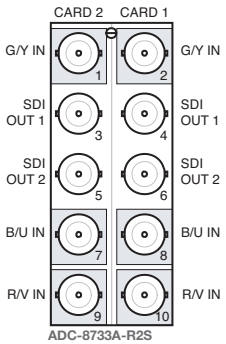
| | |
|---|---|
| ADC-8733A | Analog to SDI |
| ADC-8733A-S | Analog to SDI and Frame Sync |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for ADC-8733A (-S) |
| -R2S | Split Rear Module for 2x ADC-8733A (-S) |

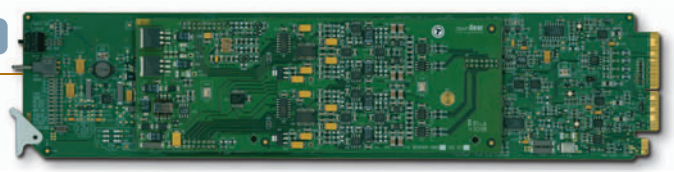



ADC-8733A-R2



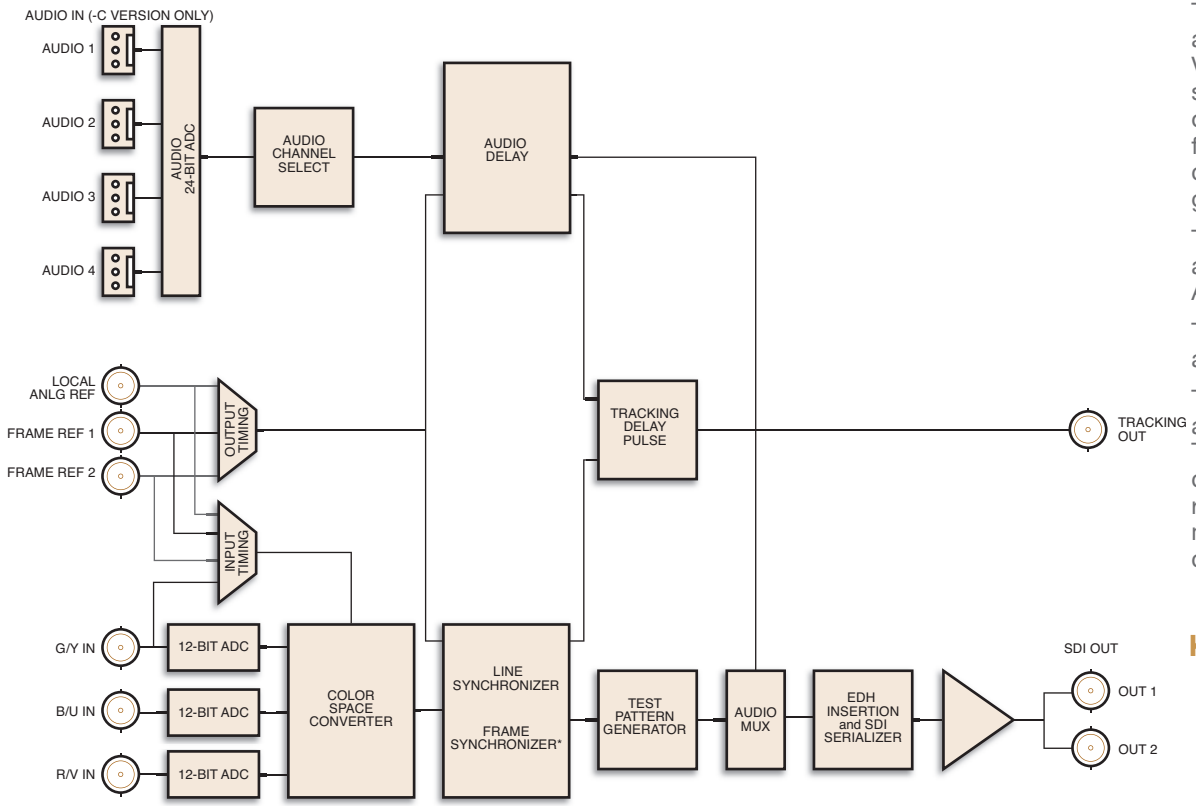

ADC-8733A-R2S

# ADC-8733A-C / ADC-8733A-SC SD AN-VID AN-AUD FS



## Analog Component with 4 Channels of Analog Audio to SDI Converter

High quality conversion of analog component signals with 4 channels of audio to 270Mb/s SDI.




*Available on the ADC-8733A-SC only.

The ADC-8733A-C (-SC) is the perfect solution for converting analog component (YUV / RGB) sources with audio such as VTRs, into the digital realm. The component YUV / RGB video signal, with or without setup, is converted to digital using a 2x oversampled 12-bit A to D conversion and high quality digital filtering to ensure superb frequency response. Analog audio is converted at 24-bit resolution and offers adjustable ±10dBu of gain and delay up to 5 seconds.

The ADC-8733A-C includes the audio processing daughter card and features 4 channels of analog audio embedding plus all the ADC-8733A features.

The ADC-8733A-SC includes a frame synchronizer in addition to all the features available on the ADC-8733A and ADC-8733A-C.

The ADC-8733A-C comes standard with a built-in line delay and line synchronizer as well as advanced proc amp controls. The ADC-8733A-SC version comes with a frame synchronizer, capable of synchronizing incoming video and audio to house reference. Various timing modes are available to accommodate most situations. New techniques in frame synchronization contribute to the low power requirements and compact design.

## Key Features

- Component video with 4 analog audio conversion to SDI input from Betacam, MII and SMPTE / EBU formats
- All RGB input formats supported
- Automatic 525 / 625-line selection
- Programmable vertical interval blanking and signal pass-through
- Extensive proc amp controls
- Freeze modes, horizontal and vertical timing adjustments
- 4 channels of analog audio embedded
- 24-bit audio ADC resolution, adjustable gain and delay
- 5-year transferable warranty
- Power: 8.5 watts

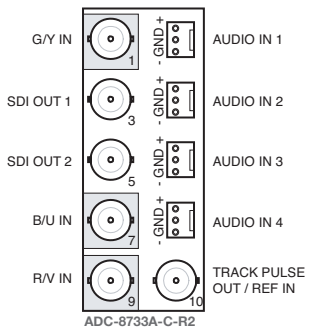
## Ordering Information

**Analog Component with 4 Channels of Analog Audio to SDI Converter**

| | |
|---|---|
| ADC-8733A-C | Analog to SDI and Embedder |
| ADC-8733A-SC | Analog to SDI, Embedder and Frame Sync |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| R2C-8733 | Rear Module for ADC-8733A-C (-SC) |

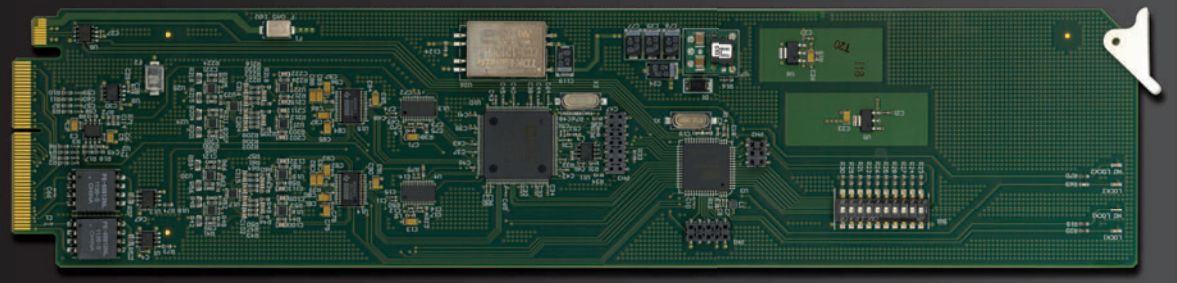



ADC-8733A-C-R2

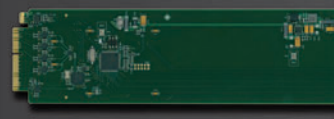
**ADC-8434-A**
Quad Analog Audio to AES Converter

**DAC-8418-A**
Dual AES to Quad Analog Audio Converter

# AUDIO CONVERSION



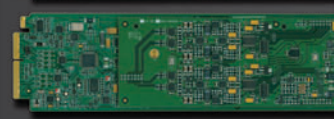
DISTRIBUTION AND MONITORING



UP / DOWN / CROSS, ARC CONVERSION

SYNCHRONIZATION AND DELAY

VIDEO CONVERSION



AUDIO EMBEDDING / DE-EMBEDDING

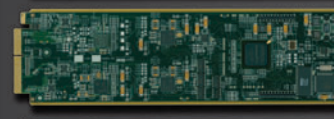
ADVANCED AUDIO PROCESSING

FIBER

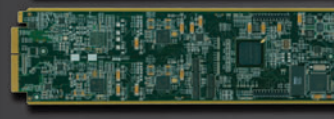
SWITCHING

KEYING AND BRANDING

DATA SOLUTIONS



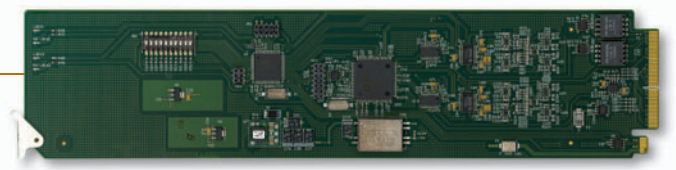
TRANSPORT STREAM MONITORING AND CONVERSION



# ADC-8434-A AES AN-AUD

## Quad Analog Audio to AES Converter

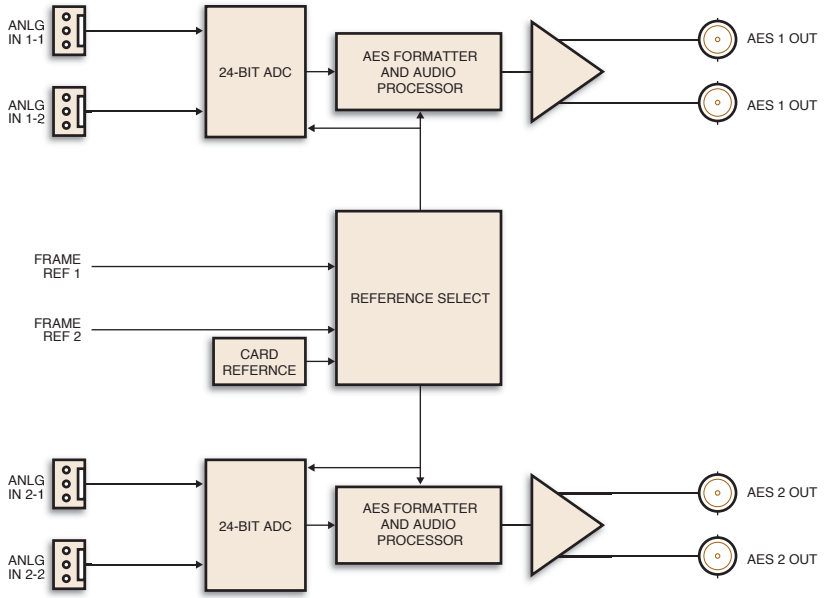
4 channels of analog audio to dual AES / EBU conversion with up to 24-bit ADC resolution.



The ADC-8434-A quad analog audio to AES converter is a broadcast quality, modular solution, which converts 4 analog audio channels to 2, 24-bit, unbalanced AES-3id signals. The ADC-8434-A accepts 4 analog audio signals (2 stereo pairs) and provides 2 copies of each of the 2 AES / EBU output signals.

The ADC-8434-A also has internal audio processing with independent channel gain, master stereo gain, sum (mono), and left or right only selection.

The conversion from analog to digital is performed with 24-bit precision. The ADC-8434-A supports sampling rates of 32kHz to 96kHz with AES (DARS) reference, video black reference, or 48kHz internal reference. The AES output frequency (32kHz to 96kHz) can be determined by the reference selected as long as it is a valid DARS audio reference.




## Key Features

- 4 channels of audio conversion
- Can synchronize to 1 of the 2 frame reference inputs, Digital Audio Reference Signal (DARS) audio reference signal or a video black reference signal
- Supports audio sampling frequencies from 32kHz to 96kHz
- Internal clock generates audio sampling frequencies of 48kHz
- 24-bit technology provides the highest quality signal conversion
- 75Ω unbalanced AES-3id output
- Internal audio signal processing
- Provides level control of output signals
- 5-year transferable warranty
- Power: 4 watts

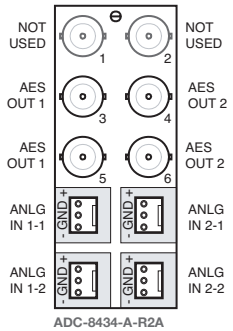
## Ordering Information

**Quad Analog Audio to AES Converter**

ADC-8434-A Quad Analog Audio to AES Converter

**Rear Module Suffix (ex: [model]-R2)**

-R2A 75Ω Rear Module for ADC-8434-A

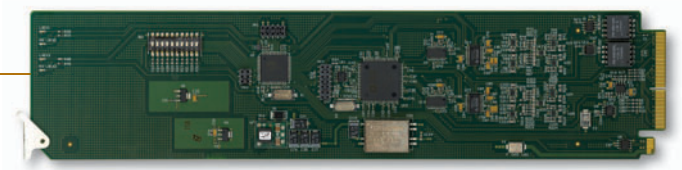


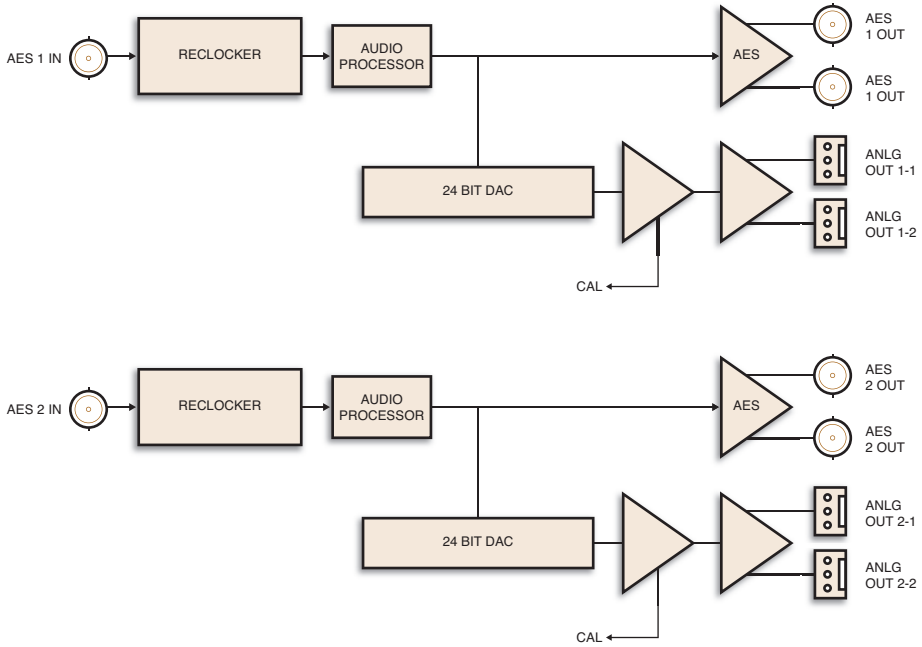
ADC-8434-A-R2A

# DAC-8418-A AES AN-AUD

## Dual AES to Quad Analog Audio Converter

Dual AES / EBU to 4 channels of analog audio conversion with up to 24-bit DAC resolution.






The DAC-8418-A dual AES to quad analog audio converter is a broadcast quality modular product used to convert 2 unbalanced AES digital audio signals into 4 channels of analog audio. The DAC-8418-A supports audio sampling frequencies from 32kHz to 96kHz.

The DAC-8418-A also has internal audio processing with independent channel gain, master stereo gain, sum (mono), and left or right only selection.

It converts the 2 incoming AES / EBU digital audio signals to 2 stereo analog audio signals using 24-bit conversion technology. Cable equalization and reclocking techniques enable the DAC-8418-A to recover the incoming digital audio signals reliably. The DAC-8418-A provides 2 analog outputs for each AES / EBU input and 2 reclocked copies of each AES / EBU input.

## Key Features

- 4 channel audio conversion while providing AES / EBU signal distribution
- Cable equalization and data reclocking on the incoming AES / EBU signals
- Supports audio sampling frequencies from 32kHz to 96kHz
- Internal audio signal processing
- 24-bit technology provides the highest quality signal conversion
- 2 reclocked output copies of each AES / EBU input
- 75Ω unbalanced AES-3id I/O
- Balanced analog audio I/O outputs
- 5-year transferable warranty
- Power: 4 watts

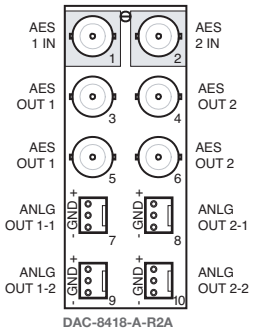
## Ordering Information

**Dual AES to Quad Analog Audio Converter**

| | |
|---|---|
| DAC-8418-A | Dual AES to Quad Analog Audio Converter |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2A | 75Ω Rear Module for DAC-8418-A |



DAC-8418-A-R2A

**MUX-8258-A**
AES / EBU Audio Multiplexer

**MUX-8258-4C (-8C)**
Analog Audio Multiplexer

**MUX-8252-B**
AES / EBU Audio Multiplexer

**MUX-8248**
HD / SD SDI Dolby® Decoder and Audio Multiplexer

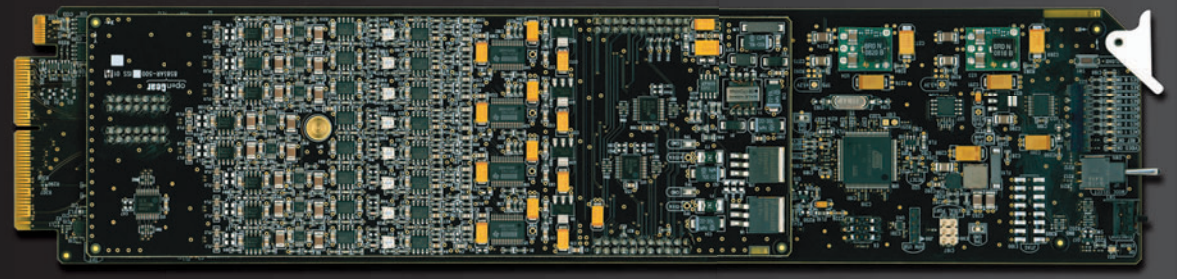
**DMX-8259-A**
AES / EBU Audio De-Multiplexer

**DMX-8259-4C (-8C)**
Analog Audio De-Multiplexer

**DMX-8254-B**
AES / EBU De-Multiplexer

**DMX-8249**
HD / SD SDI Dolby® Decoder and De-Multiplexer

# AUDIO EMBEDDING / DE-EMBEDDING



DISTRIBUTION AND MONITORING

UP / DOWN / CROSS, ARC CONVERSION

SYNCHRONIZATION AND DELAY

VIDEO CONVERSION

AUDIO CONVERSION

ADVANCED AUDIO PROCESSING

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DATA SOLUTIONS

TRANSPORT STREAM MONITORING AND CONVERSION

# MUX-8258-A 3G HD SD AES

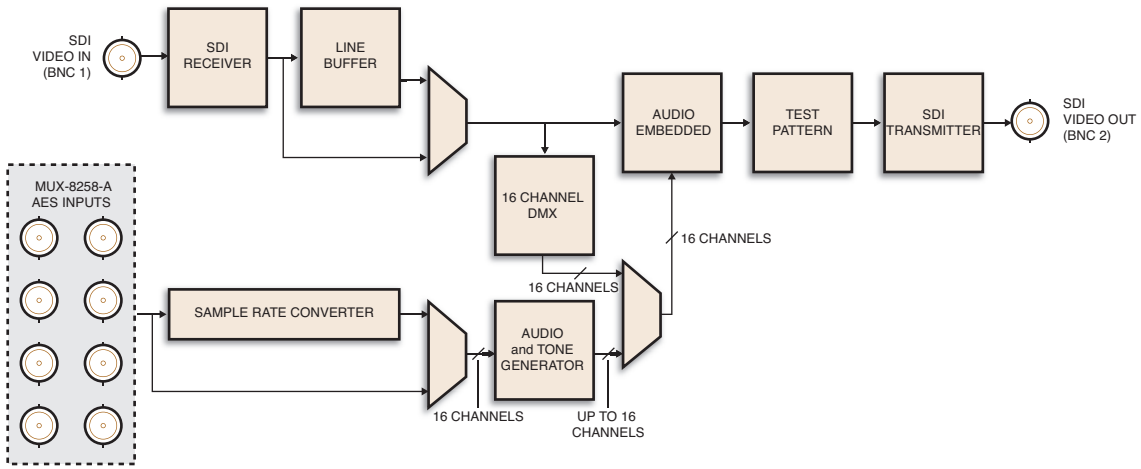
## AES / EBU Audio Multiplexer

The ideal solution for multiplexing 8 AES streams into an HD / SD SDI signal.

The MUX-8258-A is a high quality program audio multiplexer capable of embedding up to 8 AES / EBU pairs (16 audio channels) into an HD / SD SDI signal. Audio proc amp control on each input allows for audio processing with independent channel sample rate conversions, gain of ±20dB, audio delay up to 1 second and channel phase invert and summing capability.

The MUX-8258-A is extremely flexible in handling channel assignments and channel re-mapping as well as fully configurable append and overwrite capability for existing channels. Various configuration options are available for backup scenarios should a loss of input occur.

The MUX-8258-A features 8 AES 75Ω unbalanced inputs.




## Key Features

- 16 channel audio embedding for all popular HD / SD SDI formats
- Audio proc amp controls; gain, invert, delay and sum, sample rate conversion
- Full control over channel assignments, primary and backup sources
- Configurable overwrite and append capability for existing embedded audio
- Programmable video output on SDI input loss
- Backup audio insertion on audio input loss
- Programmable silence detection and timeout thresholds
- No audio breakout cables required
- 5-year transferable warranty
- Power: 8.5 watts

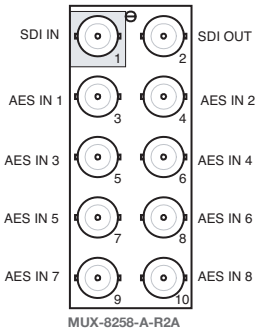
## Ordering Information

**AES / EBU Multiplexer**

MUX-8258-A AES / EBU Audio Multiplexer

**Rear Module Suffix (ex: [model]-R2)**

-R2A Rear Module for MUX-8258-A

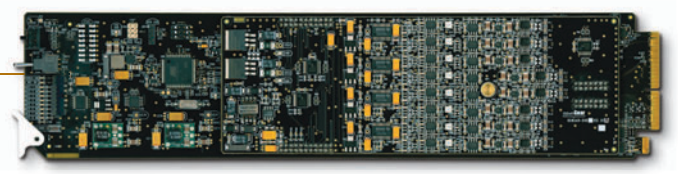


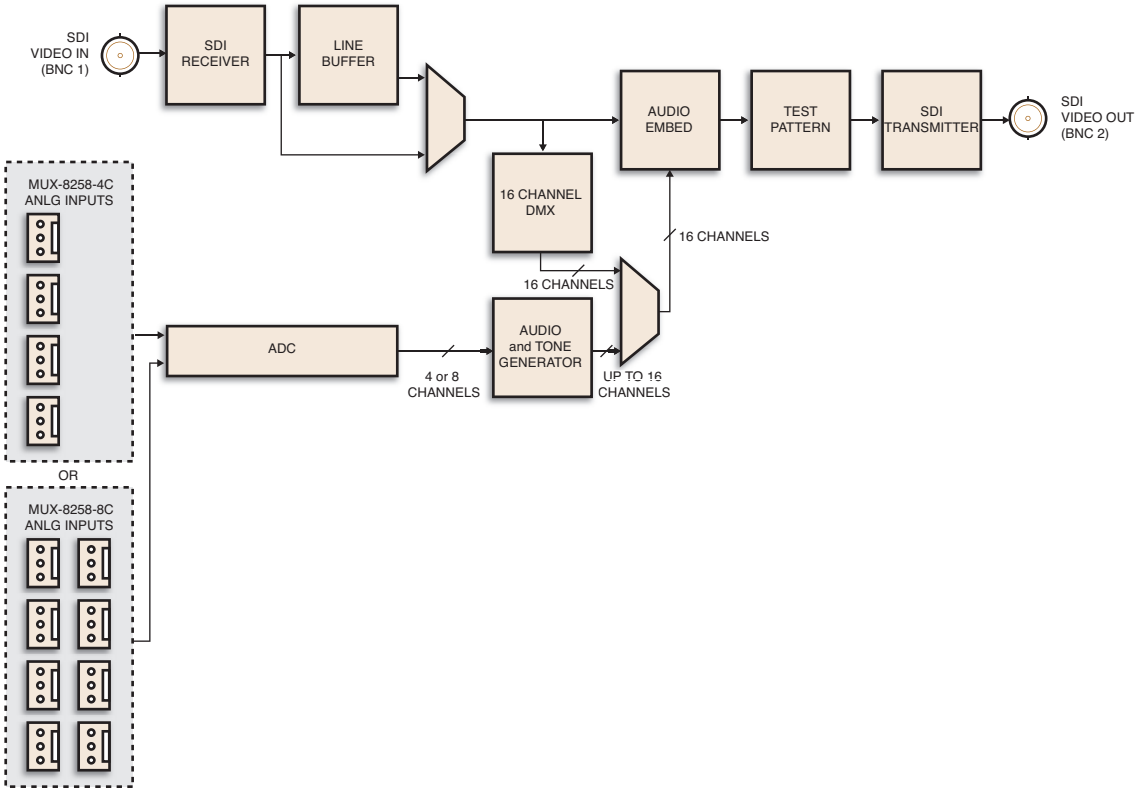
MUX-8258-A-R2A

# MUX-8258-4C / MUX-8258-8C 3G HD SD AN-AUD

## Analog Audio Multiplexer

The ideal solution for multiplexing 4 or 8 analog audio sources into an HD / SD SDI signal.






The MUX-8258-4 (-8C) is a high quality program analog audio multiplexer capable of embedding up to 8 analog audio channels into an HD / SD SDI signal. Audio proc amp control on each input allows for audio processing with independent channel sample rate conversions, gain of ±10dB, audio delay up to 1 second and channel phase invert and summing capability.

The MUX-8258-4C (-8C) is extremely flexible in handling channel assignments and channel re-mapping as well as fully configurable append and overwrite capability for existing channels. Various configuration options are available for backup scenarios should a loss of input occur.

The MUX-8258-4C features 4 analog inputs and the MUX-8258-8C features 8 analog inputs.

## Key Features

- Analog audio embedding for all popular HD / SD SDI formats
- Analog gain done entirely in the analog domain
- Audio proc amp controls; gain, invert, delay and sum
- Full control over channel assignments, primary and backup sources
- Configurable overwrite and append capability for existing embedded audio
- Programmable video output on SDI input loss
- Backup audio insertion on audio input loss
- Programmable silence detection and timeout thresholds
- No audio breakout cables required
- 5-year transferable warranty
- MUX-8258-4C Power: 9.5 watts
- MUX-8258-8C Power: 11 watts

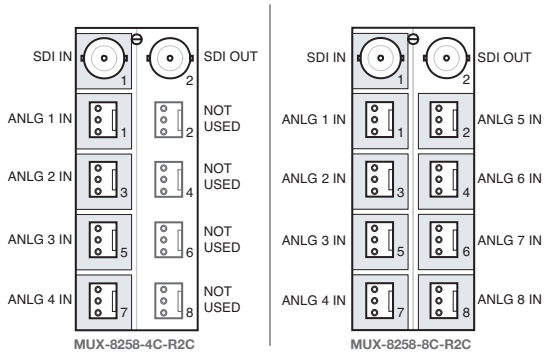
## Ordering Information

**Analog Audio Multiplexer**

| | |
|---|---|
| MUX-8258-4C | 4 CH Analog Audio Multiplexer |
| MUX-8258-8C | 8 CH Analog Audio Multiplexer |

**Rear Module Suffix (ex: [model]-R2)**

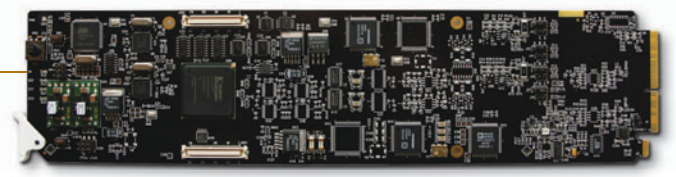
| | |
|---|---|
| -R2C | Rear Module for MUX-8258-4C / MUX-8258-8C |

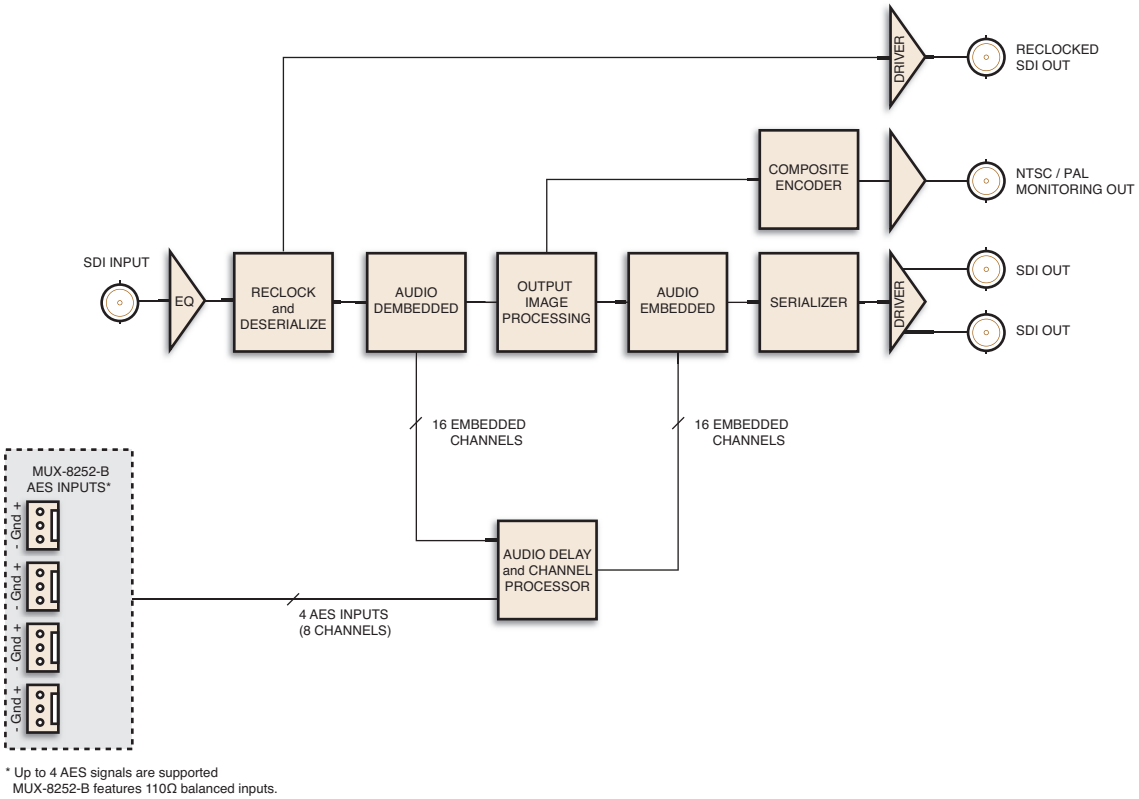


# MUX-8252-B HD SD AES

## AES / EBU Audio Multiplexer

The ideal solution for embedding 4 balanced AES audio streams into an HD / SD SDI signal.






* Up to 4 AES signals are supported
MUX-8252-B features 110Ω balanced inputs.

The MUX-8252-B is a high quality program AES / EBU audio mulitplexer that embeds 2 selectable groups (8 channels) of audio into an HD / SD SDI signal. Audio proc amp control on the input allows for audio processing with independent channel sample rate conversions, gain of ±18db, audio delay up to 1 second and channel phase invert with AES processing for sum, swap, and shuffle.

The MUX-8252-B offers 4 AES inputs, 1 reclocked output, 2 HD / SD SDI processed embedded audio outputs, and 1 analog composite output with the Ross Heads-Up Display for local control.

The MUX-8252-B features 4 AES 110Ω balanced inputs.

## Key Features

- HD / SD SDI SMPTE 259M, 1.485Gb/s and SMPTE 292M, 270Mb/s
- Audio embedding for all popular formats 480i, 576i, 720p, 1080i
- 2 selectable audio groups with selection of overwrite or append
- 4 AES / EBU balanced inputs
- 2 SDI processed outputs
- Audio proc amp controls; gain, phase, delay AES controls, sum, swap, shuffle
- Analog video monitoring output
- 5-year transferable warranty
- Power: 10 watts

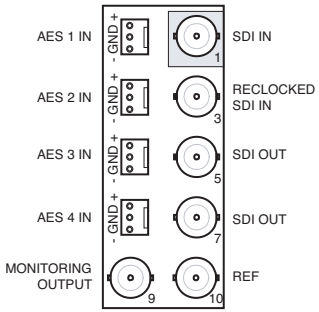
## Ordering Information

**AES / EBU Audio Multiplexer**

MUX-8252-B AES / EBU Audio Mulitplexer

**Rear Module Suffix (ex: [model]-R2)**

-R2B Rear Module for MUX-8252-B

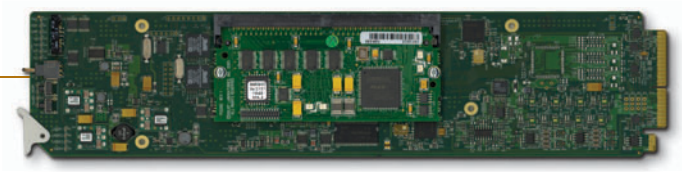


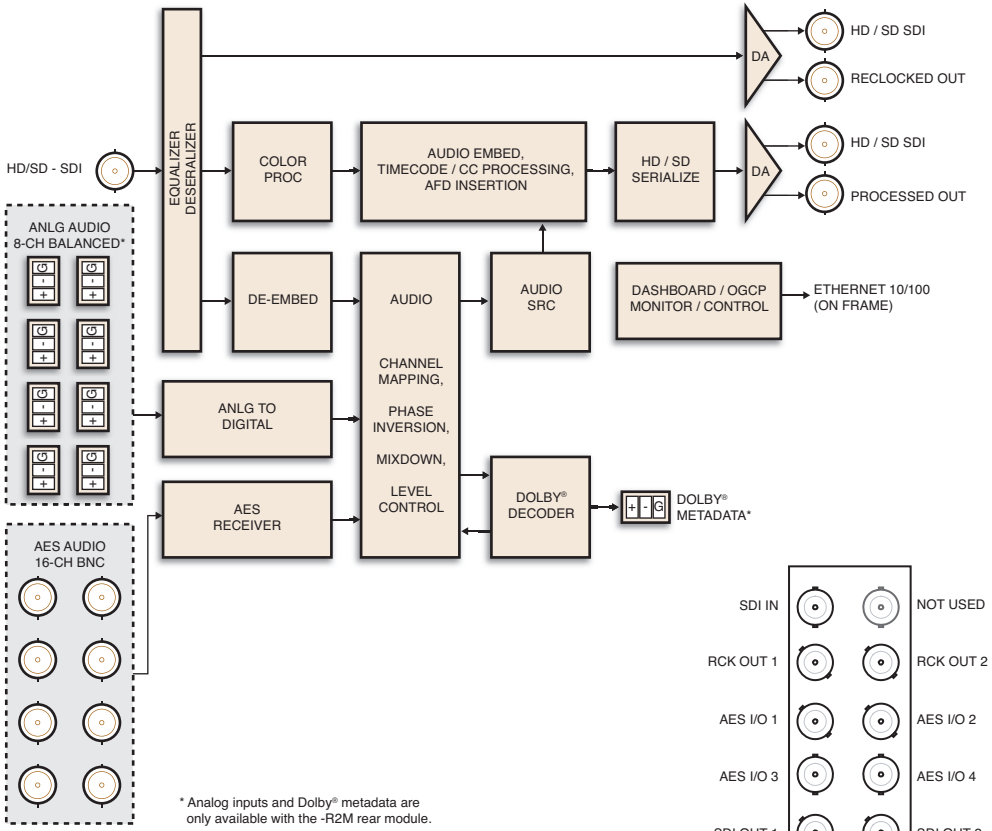

MUX-8252-B-R2B

# MUX-8248 HD SD DOLBY AES

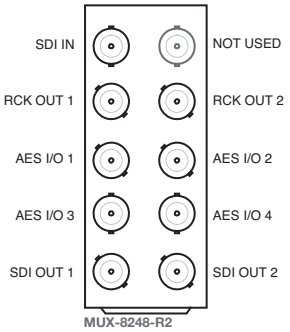
## HD / SD SDI Dolby® Decoder and Audio Multiplexer

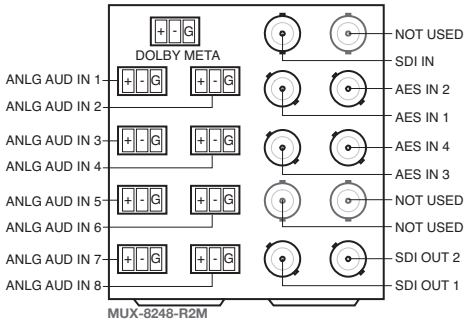
Decode incoming embedded or discrete Dolby® Digital/E and re-embed into an HD / SD SDI signal.






* Analog inputs and Dolby® metadata are only available with the -R2M rear module.




The MUX-8248 is ideal for decoding incoming Dolby® Digital or Dolby® E audio and embedding the AES audio into an HD / SD SDI video signal. When Dolby® Digital or Dolby® E is present on a discrete AES pair or on an embedded audio pair, the decoder produces up to 10 decoded channels, according to the Dolby® sub-format received by the metadata. The resulting channels are then available for mapping, inversion and level adjustment and then embedded into the video signal.

The MUX-8248 offers up to 16 channels of audio embedding, with the option for up to 8 channels of discrete analog audio. In addition to the audio proc controls for channel mapping, inversion and level, 16 channels of selectable sample rate conversion allows for the re-timing of audio. Full video proc control, with user memory allows adjustment of white level, black level, color gain and color phase.

The MUX-8248 can embed Dolby® metadata on the SDI output, sourced from either SDI input video or from the decoder as desired. With the optional analog / metadata the rear module's Dolby® Meta output can provide RS-485 metadata for downstream devices or systems. Metadata on the Dolby® Meta RS-485 output can also be sourced from either SDI input video or from the decoder as desired.

## Key Features

- Handles all popular formats of SD (270Mb/s) and HD (1.485Gb/s) signals
- Dolby® Digital and Dolby® E decoding with optional metadata output
- Up to 16 channels of embedding
- Optional analog audio inputs for embedding
- Audio channel mapping, phase inversion and level control
- Video proc controls with user memory
- 16 channels of sample rate conversion
- HD / SD closed captioning and flexible timecode support
- 4 internal tone generators
- 5-year transferable warranty

## Ordering Information

**HD / SD SDI Dolby® Decoder and Audio Multiplexer**

| | |
|---|---|
| MUX-8248 | Dolby® Decoder and Audio Multiplexer |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for MUX-8248 |
| -R2M | Metadata Rear Module for MUX-8248 |

# DMX-8259-A 3G HD SD AES

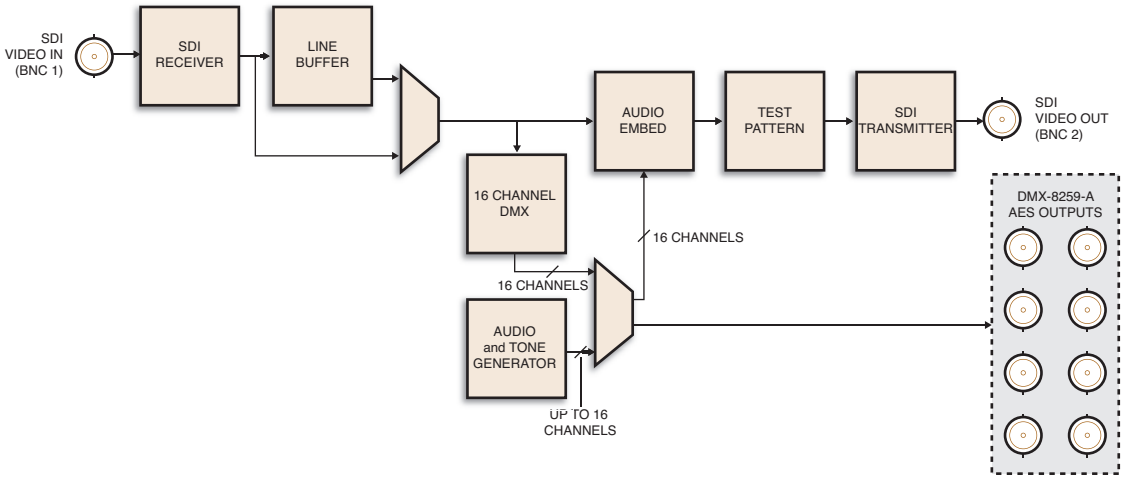
## AES / EBU Audio De-Multiplexer

The ideal solution for de-multiplexing 8 AES streams from an HD / SD SDI signal.

The DMX-8259-A is a high quality program audio de-multiplexer capable of de-embedding up to 8 AES / EBU pairs (16 audio channels) from an HD / SD SDI signal. Audio proc amp control on each channel allows for audio processing with gain of ±20db, audio delay up to 1 second and channel invert.

The DMX-8259-A supports full channel assignment to the discrete outputs. Various configuration options, including internally generated patterns and tones, are available for audio and video output scenarios should a loss of input occur.

The DMX-8259-A features 8 AES 75Ω unbalanced outputs.




## Key Features

- 16 channel audio de-embedding for all popular HD / SD SDI formats
- Audio proc amp controls; gain, invert, and delay
- Assign any embedded channel to any discrete audio output
- Ability to re-map channels in embedded video stream
- Programmable video output on SDI input loss
- Silence output on loss of audio input
- Programmable silence detection and timeout thresholds
- No audio breakout cables required
- 5-year transferable warranty
- Power: 8.5 watts

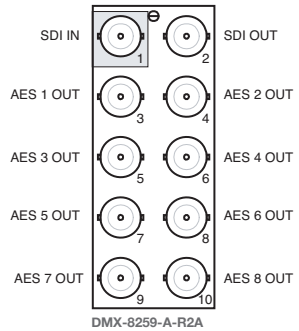
## Ordering Information

**AES / EBU Audio De-Multiplexer**

DMX-8259-A AES / EBU Audio De-Multiplexer

**Rear Module Suffix (ex: [model]-R2)**

-R2A Rear Module for DMX-8259-A

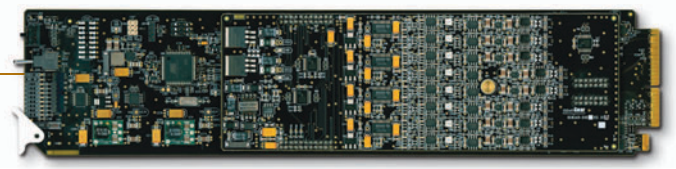


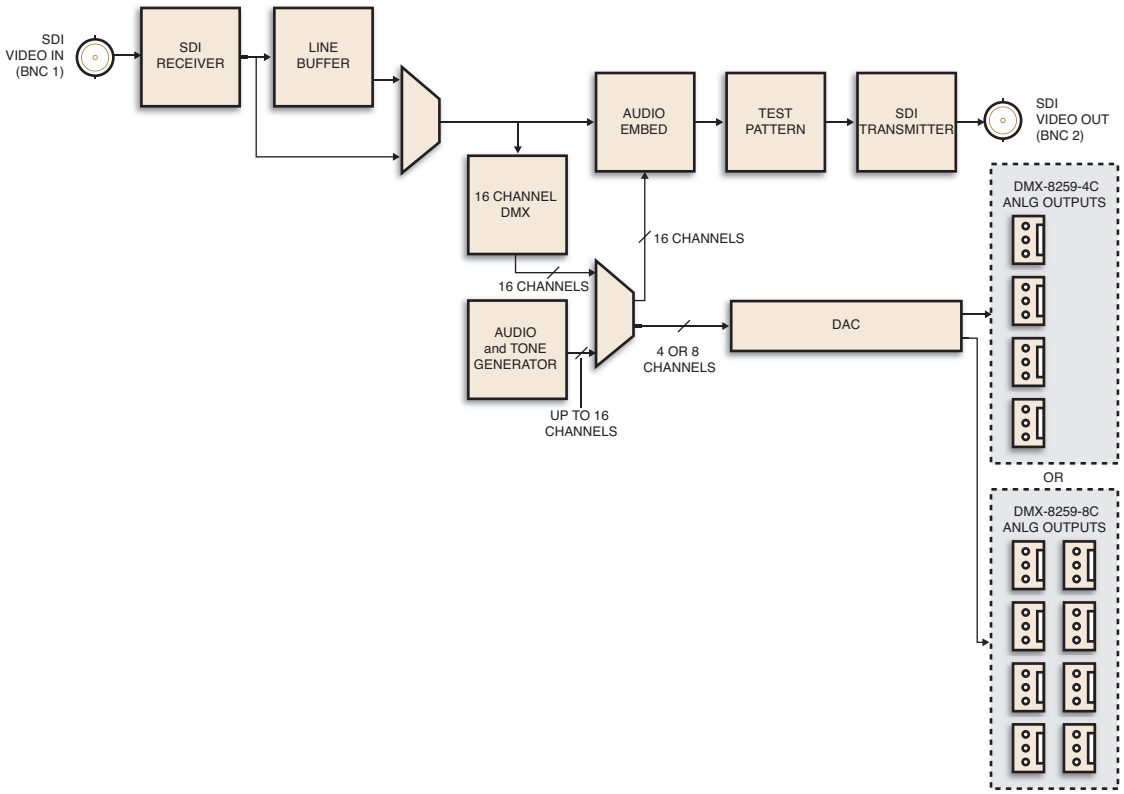
DMX-8259-A-R2A

# DMX-8259-4C / DMX-8259-8C 3G HD SD AN-AUD

## Analog Audio De-Multiplexer

The ideal solution for de-multiplexing 4 or 8 analog audio sources from an HD / SD SDI signal.






The DMX-8259-4C (-8C) is a high quality program audio de-multiplexer capable of de-embedding up to 8 analog audio channels from an HD / SD SDI signal. Audio proc amp control on each channel allows for audio processing with gain of ±10dB, audio delay up to 1 second and channel invert.

The DMX-8259-4C (-8C) supports any channel assignment to the discrete inputs and can re-map any of the existing embedded channels. Various configuration options, including internally generated patterns and tones, are available for audio and video output scenarios should a loss of input occur.

The DMX-8259-4C features 4 analog outputs and the DMX-8259-8C features 8 analog outputs.

## Key Features

- Analog audio de-embedding for all popular HD / SD SDI formats
- Audio proc amp controls; gain, invert, and delay
- Analog gain done entirely in the analog domain
- Assign any embedded channel to any discrete audio output
- Ability to re-map channels in embedded video stream
- Programmable video output on SDI input loss
- Silence output on loss of audio input
- Programmable silence detection and timeout thresholds
- No audio breakout cables required
- 5-year transferable warranty
- DMX-8259-4C Power: 9.5 watts
- DMX-8259-8C Power: 11 watts

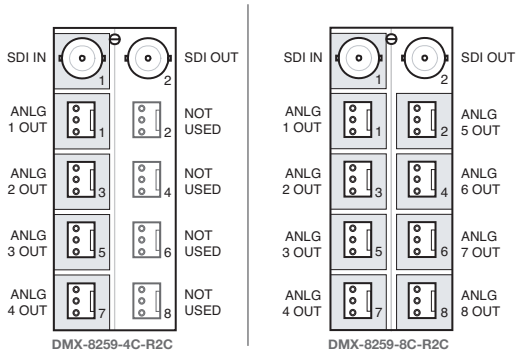
## Ordering Information

**Analog Audio De-Multiplexer**

| | |
|---|---|
| DMX-8259-4C | 4 CH Analog Audio De-Multiplexer |
| DMX-8259-8C | 8 CH Analog Audio De-Multiplexer |

**Rear Module Suffix (ex: [model]-R2)**

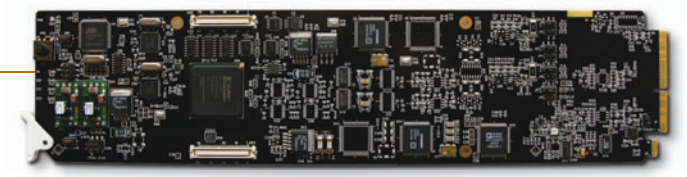
| | |
|---|---|
| -R2C | Rear Module for DMX-8259-4C / DMX-8259-8C |



# DMX-8254-B HD SD AES

## AES / EBU De-Multiplexer

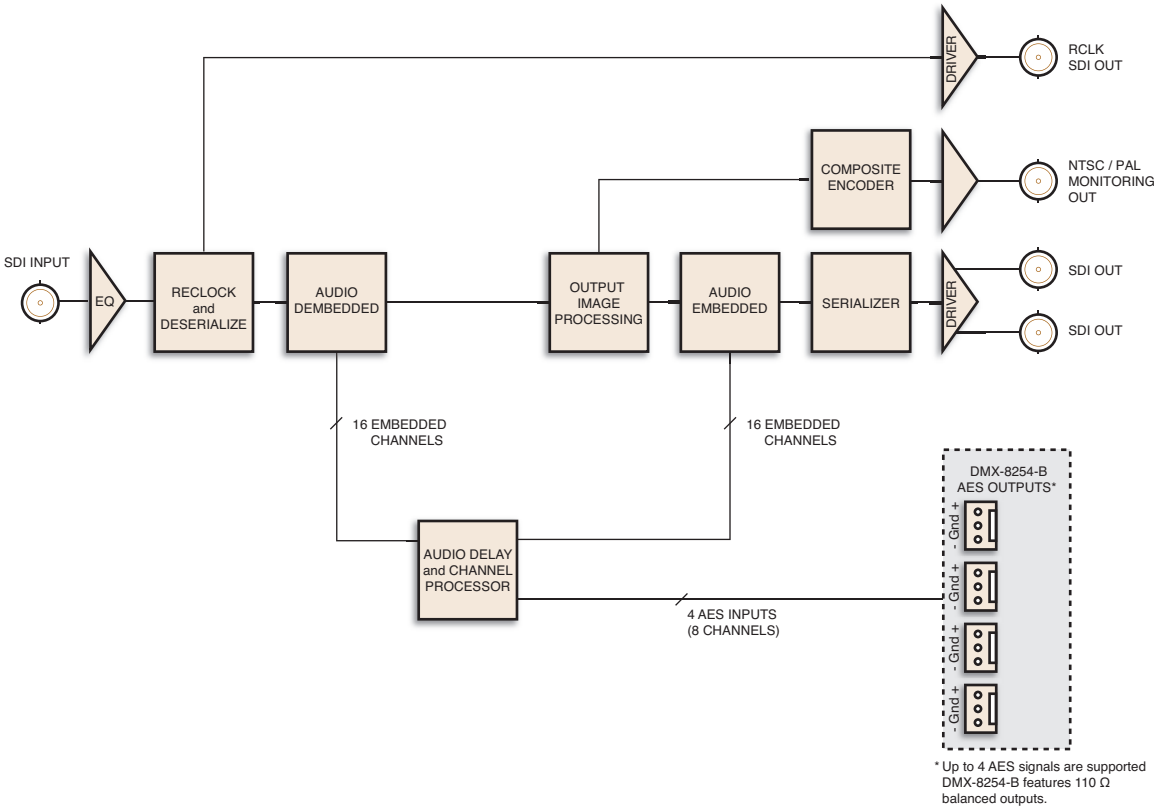
The ideal solution for de-multiplexing 4 balanced AES streams from an HD / SD SDI signal.



The DMX-8254-B is a high quality program AES / EBU audio de-multiplexer that can extract any 2 groups (8 channels) of audio from an embedded stream. Audio proc amp control allows for audio processing with independent channel gain of ±18db, audio delay up to 1 second and channel phase invert with AES processing for sum, swap, and shuffle.

The DMX-8254-B offers 1 reclocked output, 2 HD / SD SDI processed outputs with embedded audio, 4 AES outputs, and 1 analog composite output with the Ross Heads-Up Display for local control.

The DMX-8254-B features 4 AES 110Ω balanced outputs.




## Key Features

- HD / SD SDI SMPTE 259M, 1.485Gb/s and SMPTE 292M, 270Mb/s
- Audio de-embedding from all popular formats 480i, 576i, 720p, 1080i
- 2 selectable audio groups
- 4 AES / EBU balanced ouputs
- 2 SDI processed outputs
- Audio proc amp controls; gain, phase, delay AES controls, sum, swap, shuffle
- Analog video monitoring output
- 5-year transferable warranty
- Power: 10 watts

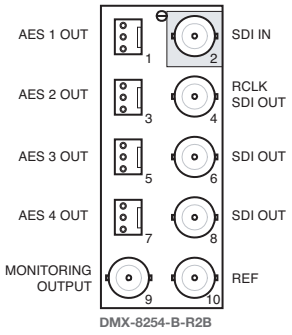
## Ordering Information

**AES / EBU De-Multiplexer**

DMX-8254-B AES / EBU Audio De-Multiplexer

**Rear Module Suffix (ex: [model]-R2)**

-R2B Rear Module for DMX-8254-B

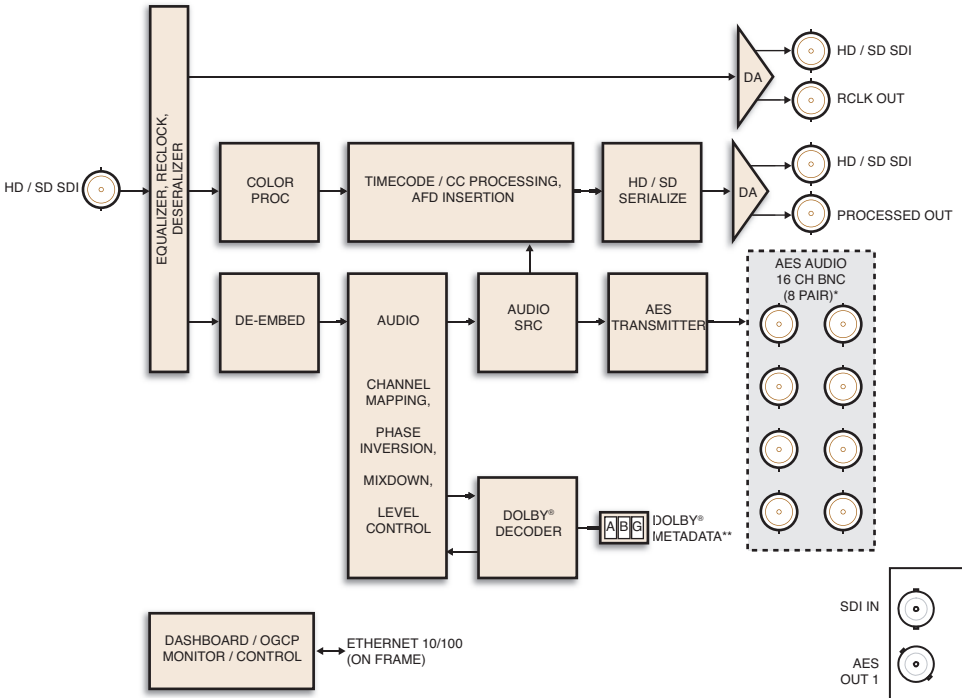



DMX-8254-B-R2B

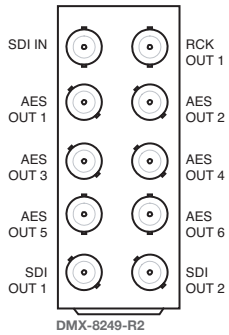
# DMX-8249 HD SD DOLBY AES

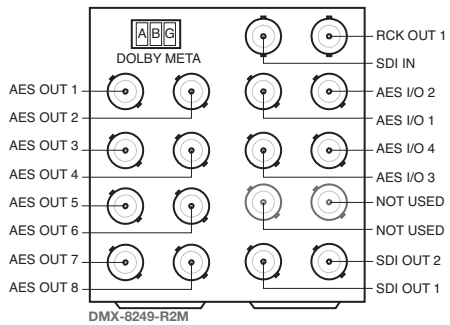
## HD / SD SDI Dolby® Decoder and De-Multiplexer

Decode and de-embed Dolby® Digital/E with discrete AES outputs.




* -R2 supports 6 AES output pairs; -R2M supports 8 AES output pairs.
** Dolby® Metadata port is only available with the -R2M rear module.




The DMX-8249 is ideal for decoding and de-embedding incoming Dolby® Digital or Dolby® E audio. When Dolby® Digital or Dolby® E is present on an embedded audio pair, the decoder produces up to 10 decoded channels, according to the Dolby® sub-format received by the metadata. The resulting channels are then available for mapping, inversion and level adjustment and then output as discrete AES.

The DMX-8249 offers up to 16 channels of audio de-embedding. In addition to the audio proc controls for channel mapping, inversion and level, 16 channels of selectable sample rate conversion allows for the re-timing of audio. Full video proc control, with user memory allows adjustment of white level, black level, color gain and color phase.

With the optional analog / metadata rear module's Dolby® Meta output can provide RS-485 metadata for downstream devices or systems. Metadata on the Dolby® Meta RS-485 output can also be sourced from either SDI input video or from the decoder as desired.

## Key Features

- Handles all popular formats of SD (270Mb/s) and HD (1.485Gb/s) signals
- Dolby® Digital and Dolby® E decoding with optional metadata output
- Up to 16 channels of de-embedding
- 2x processed SDI outputs, 1x reclocked SDI output
- Audio channel mapping, phase inversion and level control
- Video proc controls with user memory
- 16 channels of sample rate conversion
- HD / SD closed captioning and flexible timecode support
- 4 internal tone generators
- 5-year transferable warranty

## Ordering Information

**HD / SD SDI Dolby® Decoder and De-Multiplexer**

| | |
|---|---|
| DMX-8249 | Dolby® Decoder and Audio De-Multiplexer |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for DMX-8249 |
| -R2M | Metadata Rear Module for DMX-8249 |

**NWE-3G**
Nielsen Watermarks Encoder

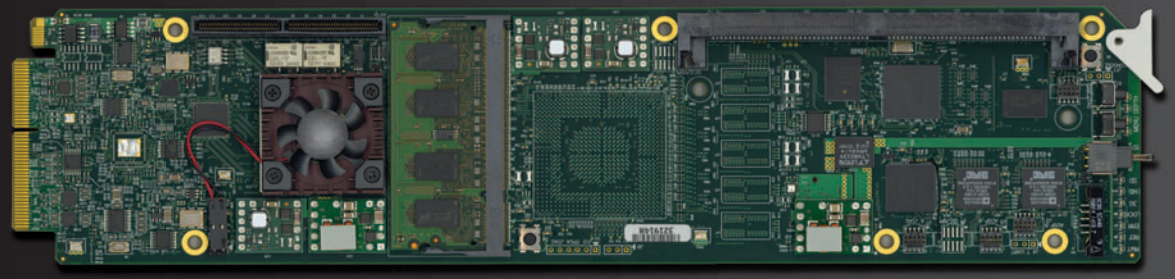
**LDP-8242**
HD / SD SDI Loudness Processor

**FSD-8240**
HD / SD SDI Frame Synchronizer with Dolby® Decoding

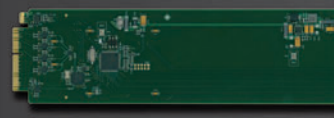
**FSE-8241-E**
HD / SD SDI Frame Synchronizer with Dolby® E Encoding

**FSE-8241-D**
HD / SD SDI Frame Synchronizer with Dolby® Digital Encoding

# ADVANCED AUDIO PROCESSING



DISTRIBUTION AND MONITORING



UP / DOWN / CROSS, ARC CONVERSION

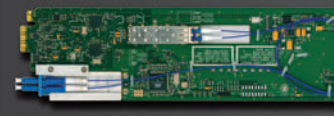
SYNCHRONIZATION AND DELAY

VIDEO CONVERSION

AUDIO CONVERSION

AUDIO EMBEDDING / DE-EMBEDDING

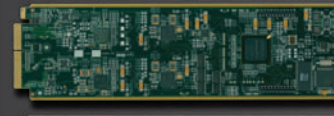
FIBER



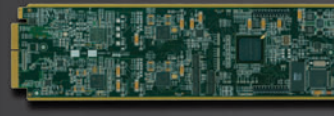
SWITCHING

KEYING AND BRANDING

DATA SOLUTIONS



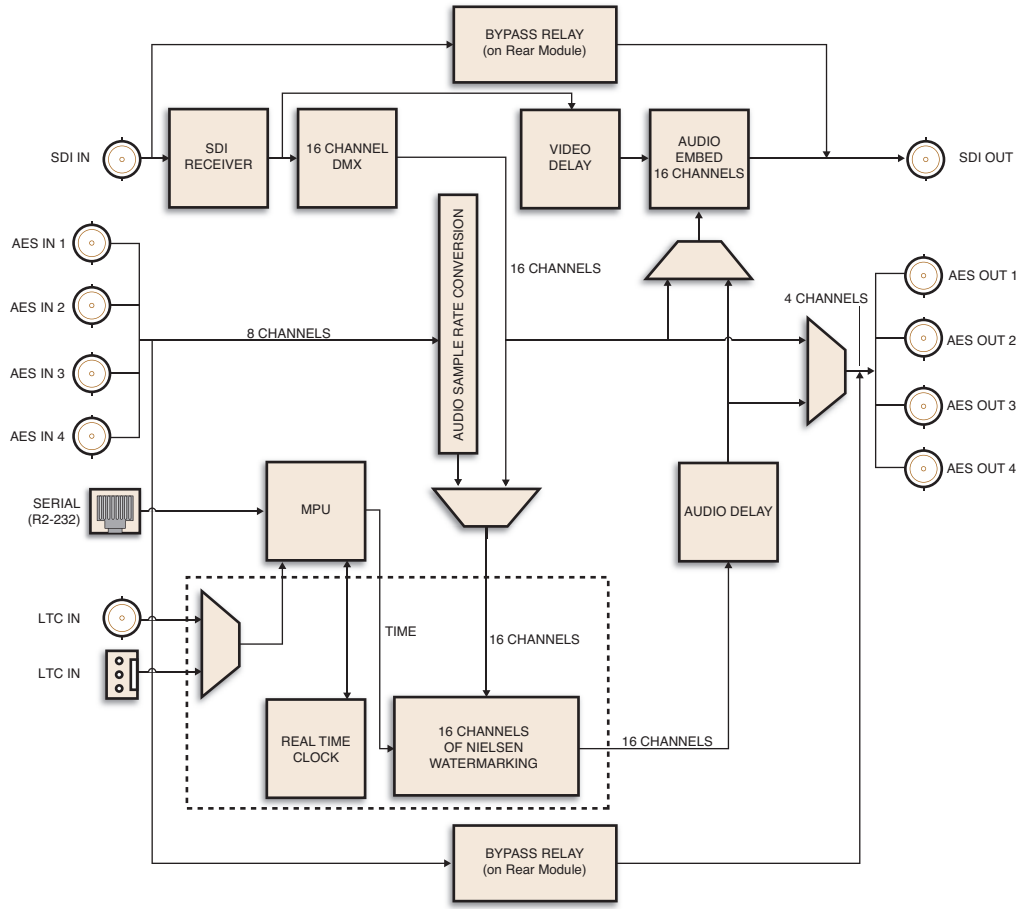
TRANSPORT STREAM MONITORING AND CONVERSION

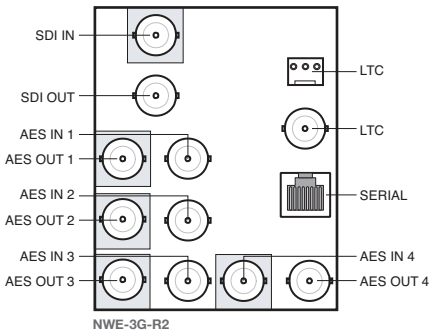


# NWE-3G HD 3G SD AES

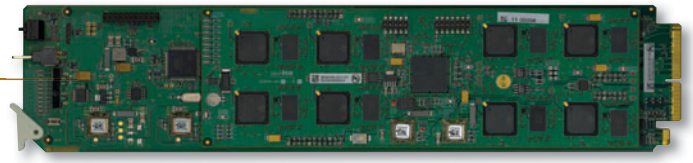
## Nielsen Watermarks Encoder

High quality insertion of Nielsen Watermarks into embedded and / or AES3 digital audio.




NWE-3G-R2



The NWE-3G is the ideal solution for inserting Nielsen Watermarks into the audio for television programming. The timestamp structured watermarks make use of the “SID” (Source Identifier), which is a serial number used by Nielsen and the television industry to uniquely identify program content, to ensure proper crediting of viewing.

The NWE-3G accepts an SDI input (3 Gb/s, 1.5 Gb/s, or 270 Mb/s) and 4 AES-3id digital audio inputs. It applies the watermark to up to 16 PCM audio channels selected from the 16 embedded and 8 AES channels. Embedded audio signals that are watermarked are re-embedded into the same location in the SDI output. AES audio signals that are watermarked are re-encoded into the same AES output.

The module can be configured to support a variety of audio configurations, from a single stereo pair up to two 5.1 surround groups plus two stereo pairs.

The NWE-3G includes a video frame delay to ensure proper audio-video synchronization. The companion rear connector module provides relay bypass of the video and AES signals, allowing the NWE-3G module to be inserted or extracted without interrupting the program path.

The timestamp included in the watermark data can be synchronized to either SMPTE 12M LTC (both balanced and unbalanced inputs are provided) or network time obtained by the frame from an NTP server.

## Key Features

- 3GHz video path with bypass relay protection
- Handles all popular SD and HD video formats, up to 1080p/59.97
- 4 AES-3id paths with bypass relay protection
- Transparent to VANC and HVANC data
- Both video and audio are delayed by one video frame time (two frames for 59.97Hz progressive formats)
- Up to 5 NWE-3G modules can be installed in a single 2RU frame; alternatively, 1 NWE-3G can be installed with up to 16 other cards
- RS232 port for external / automation control and monitoring
- DashBoard control with selectable alarming on video, audio and time inputs
- 5-year transferable warranty

## Nielsen Overview

Nielsen is the preeminent global provider of consumer and audience measurement services. Nielsen knows what consumers watch – and what they buy – and more significantly they provide intelligence to help their clients understand these behaviors in relation to their business. Nielsen is dedicated to innovative methodologies and technologies, allowing them to be at the forefront of how they capture consumer behavior, which is integral to their clients’ business growth.

## Ordering Information

**Nielsen Watermarks Encoder**

| | |
|---|---|
| NWE-3G | Nielsen Watermarks Encoder |

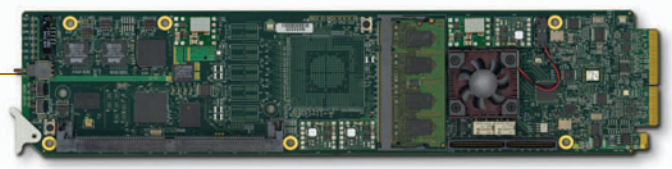
**Rear Module Suffix (ex: [model]-R2)**

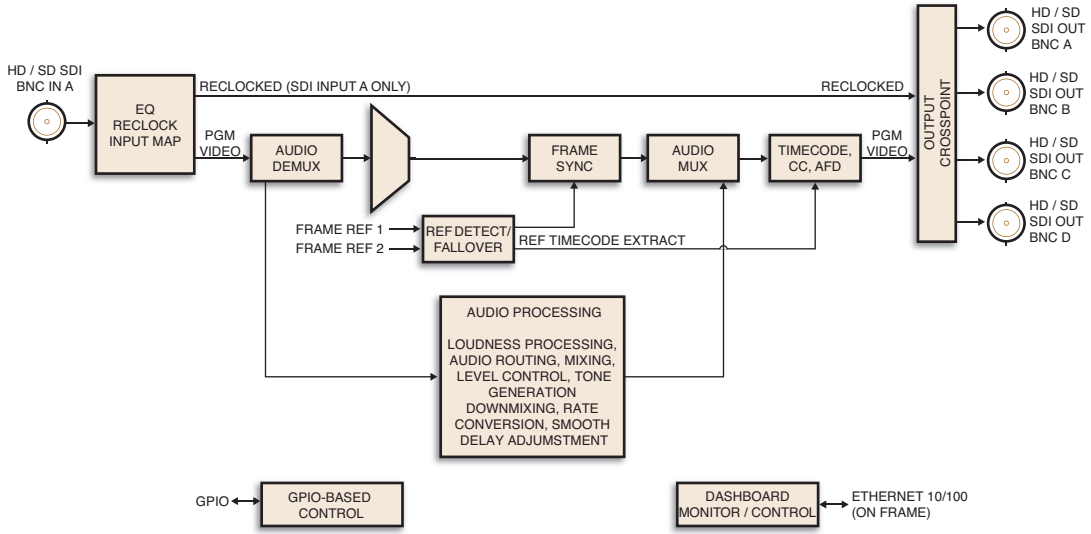
| | |
|---|---|
| -R2 | Rear Module for NWE-3G |

# LDP-8242 HD SD AES

## HD / SD SDI Loudness Processor

Audio loudness processor with Linear Accoustic AEROMAX™.






The LDP-8242 is ideal for correcting irritating loudness differences between programs and commercials. Featuring 24-bit audio processing that supports 16 channels of embedded audio from an HD / SD SDI signal.

With Linear Acoustic AEROMAX™ technology, the card applies loudness control on up to 6 channels of audio from any of the 16 channels of embedded audio. Linear Acoustic AEROMAX™ algorithms use a sophisticated multiband approach to loudness processing. These algorithms can apply multifacted loudness correction specifically targeted to various frequency ranges and other characteristics within the program material, resulting in audio free from abrupt loudness or image shifts while preserving more of the original content than previously possible.

An optional discrete AES option provides 16 channels of discrete audio support, with 8 AES pair BNCs, which can be configured as inputs or outputs. The AES-8242 option provides discrete audio loudness processing as well as 16 channel embedding / de-embedding.

Optional Linear Acoustic UPMAX™ upmixing technology allows legacy stereo program audio to be converted to 5.1 channel audio.

## Key Features

- Loudness processing with Linear Acoustic AEROMAX™ algorithms
- Actively and automatically corrects irritating loudness level changes
- Automatic video delay to match audio processing delay
- Loudness control for stereo or 5.1 audio
- Sophisticated multiband processing
- Audio channel mapping, phase inversion and level control
- 16 channels of sample rate conversion
- Passes all audio channels
- Optional discrete AES I/O for discrete audio processing and 16 channels of embedding / de-embedding
- Optional Linear Acoustic UPMAX™ 5.1 channel upmixing
- Handles all popular formats of SD (270Mb/s) and HD (1.485Gb/s) signals
- 5-year transferable warranty

## Ordering Information

**HD / SD SDI Loudness Processor**

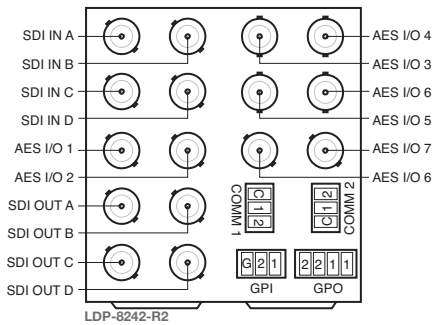
| | |
|---|---|
| LDP-8242 | HD / SD SDI Loudness Processor |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for LDP-8242 |

**Software Options**

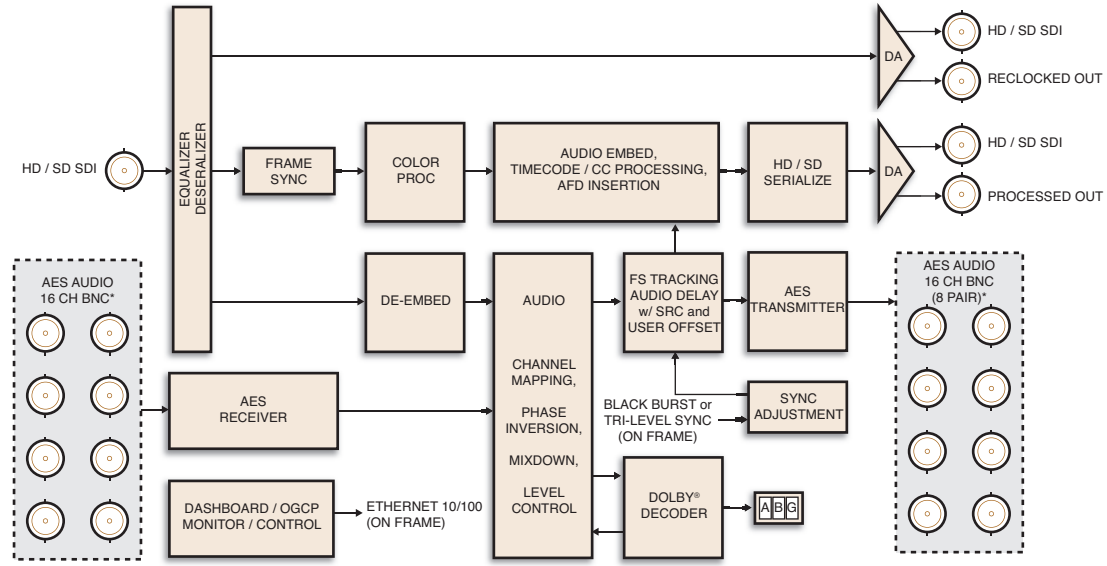
| | |
|---|---|
| AES-8242 | Discrete AES I/O with Audio Multiplexing and De-Multiplexing |
| UMA-8242 | Linear Accoustic UPMAX™ Upmixing |



# FSD-8240 HD SD FS AES DOLBY

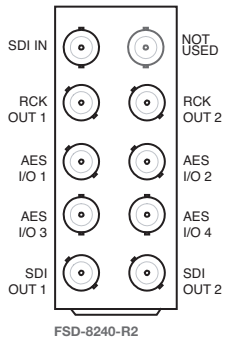
## HD / SD SDI Frame Synchronizer with Dolby® Decoding

Frame synchronizing with Dolby® Digital/E decoding and audio embedding / de-embedding.

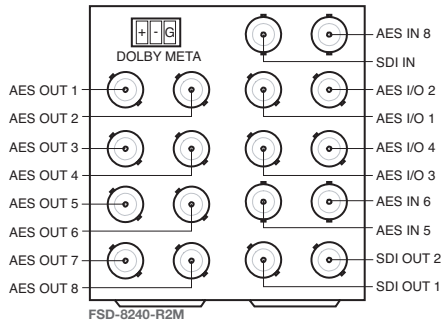



* -R2 supports 4 AES I/O pairs;
-R2M supports 8 AES I/O pairs.

** Dolby® Metadata port is only available with the -R2M rear module.




FSD-8240-R2




FSD-8240-R2M

The FSD-8240 is an HD / SD SDI frame synchronizer and Dolby® decoder with 16 channels of audio embedding or de-embedding. When Dolby® Digital or Dolby® E is present on a discrete AES pair or on an embedded audio pair, the decoder produces up to 10 decoded channels, according to the Dolby® sub-format received by the metadata. The resulting channels are then available for mapping, inversion and level adjustment and then embedded into the video signal.

The FSD-8240 offers glitch-free handling of embedded audio during frame synchronization and a user-adjustable offset to the frame sync to align the Dolby® delay. Video and audio processing controls as well as flexible timecode processing, closed captioning support and AFD code insertion, provide complete signal management for all incoming signals.

The FSD-8240 can embed Dolby® metadata on the SDI output, sourced from either SDI input video or from the decoder as desired. With the optional analog / metadata rear module's Dolby® Meta output can provide RS-485 metadata for downstream devices or systems. Metadata on the Dolby® Meta RS-485 output can also be sourced from either SDI input video or from the decoder as desired.

### Key Features

- Handles all popular formats of SD (270Mb/s) and HD (1.485Gb/s) signals
- Glitch-free handling of embedded audio when a frame is dropped or duplicated
- Dolby® Digital and Dolby® E decoding with optional metadata output
- 16 channels of discrete audio embedding or de-embedding
- User offset to frame sync to align Dolby® delay
- AFD code insertion
- HD / SD closed captioning and flexible timecode support
- Frame sync with up to 13 frames of user-adjustable delay
- 4 internal tone generators
- 5-year transferable warranty

### Ordering Information

**HD / SD SDI Frame Synchronizer with Dolby® Decoding**

| | |
|---|---|
| FSD-8240 | HD / SD SDI Frame Sync w/ Dolby® Decoder |

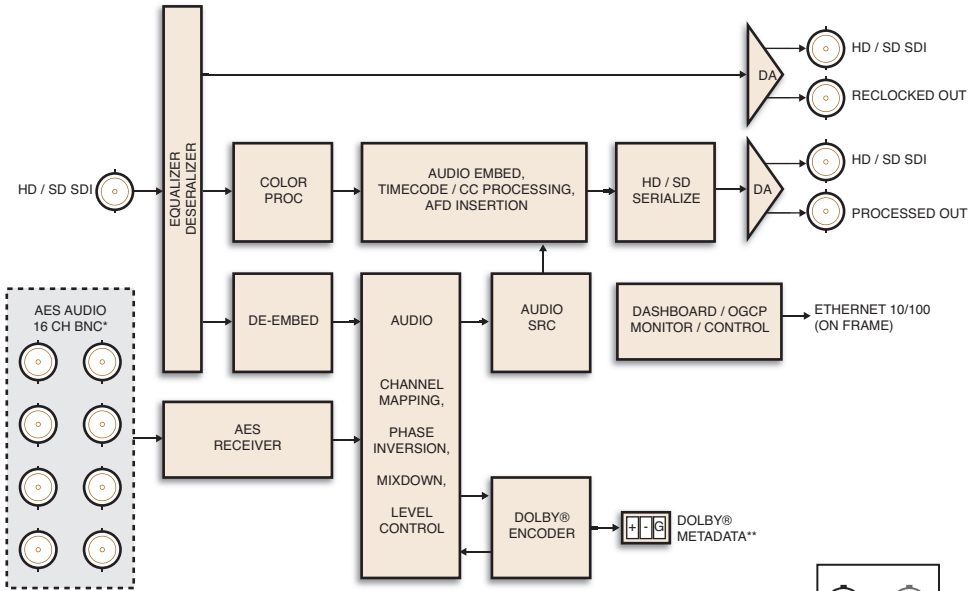
**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for FSD-8240 |
| -R2M | Metadata Rear Module for FSD-8240 |

# FSE-8241-E HD SD FS AES DOLBY

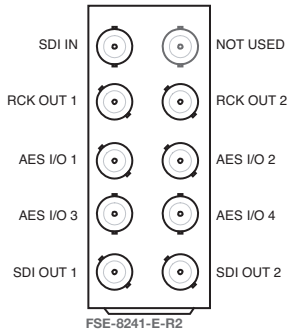
## HD / SD SDI Frame Synchronizer with Dolby® E Encoding

Frame synchronizing with Dolby® E encoding and audio embedding / de-embedding.

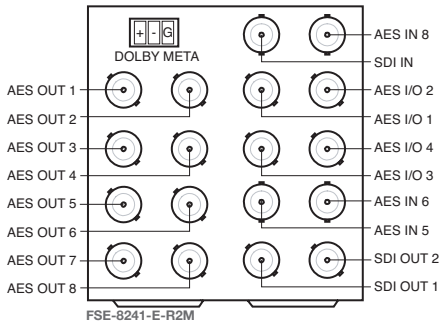



* -R2 supports 4 AES I/O pairs; -R2M supports 8 AES I/O pairs.

** Dolby® Metadata port is only available with the -R2M rear module.




FSE-8241-E-R2




FSE-8241-E-R2M

The FSE-8241-E is an HD / SD SDI frame sync and Dolby® E encoder with 16 channels of audio embedding or de-embedding. The Dolby® E encoder receives different audio sources, from either embedded or discrete inputs and produces an encoded Dolby® pair using either received external metadata or internally generated metadata that can be user-defined using the encoder controls. The encoded pair can be sent from the card as embedded audio or over discrete AES-3id connections as a SMPTE 337M-formatted non-PCM signal.

The FSE-8241-E offers glitch-free handling of embedded audio during frame synchronization and a user-adjustable offset to the frame sync to align the Dolby® delay. Video and audio processing controls as well as flexible timecode processing, closed captioning support and AFD code insertion, provide complete signal management for all incoming signals.

## Key Features

- Handles all popular formats of SD (270Mb/s) and HD (1.485Gb/s) signals
- Glitch-free handling of embedded audio when a frame is dropped or duplicated
- Dolby® E encoding with optional metadata output
- 16 channels of discrete audio embedding or de-embedding
- User offset to frame sync to align Dolby® delay
- AFD code insertion
- HD / SD closed captioning and flexible timecode support
- Frame sync with up to 13 frames of user-adjustable delay
- 4 internal tone generators
- 5-year transferable warranty

## Ordering Information

**HD / SD SDI Frame Synchronizer with Dolby® E Encoding**

| | |
|---|---|
| FSE-8241-E | HD / SD SDI Frame Sync w/ Dolby® E Encoding |

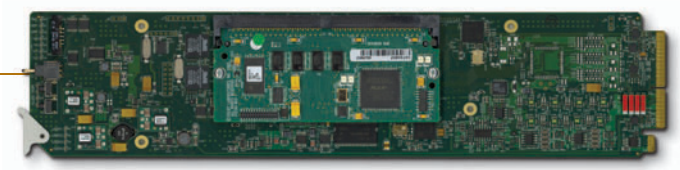
**Rear Module Suffix (ex: [model]-R2)**

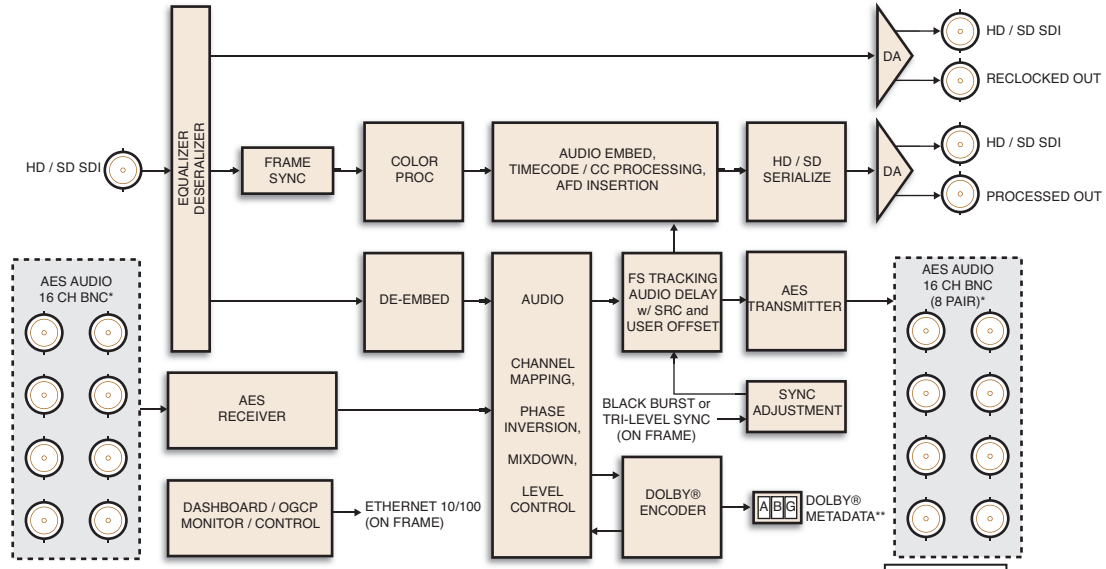
| | |
|---|---|
| -R2 | Rear Module for FSE-8241-E |
| -R2M | Metadata Rear Module for FSE-8241-E |

# FSE-8241-D HD SD FS AES DOLBY

## HD / SD SDI Frame Synchronizer with Dolby® Digital Encoding

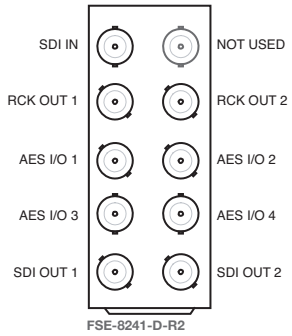
Frame synchronizing with Dolby® Digital encoding and audio embedding / de-embedding.



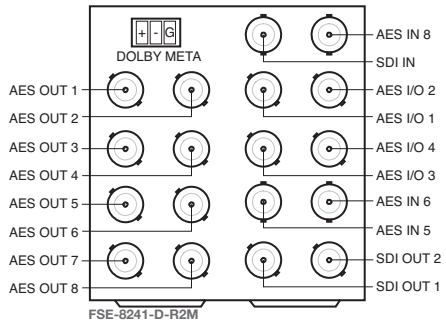



* -R2 supports 4 AES I/O pairs;
-R2M supports 8 AES I/O pairs.

** Dolby® metadata port is only available with the -R2M rear module.




FSE-8241-D-R2




FSE-8241-D-R2M

The FSE-8241-D is an HD / SD SDI frame sync and Dolby® Digital encoder with 16 channels of audio embedding or de-embedding. The Dolby® Digital (AC-3) encoder receives up to 6 different audio sources, from either embedded or discrete inputs and produces an encoded Dolby® pair using either received external metadata or internally generated metadata that can be user-defined using the encoder controls. The encoded pair can be sent from the card as embedded audio or over discrete AES-3id connections as a SMPTE 337M-formatted non-PCM signal.

The FSE-8241-D offers glitch-free handling of embedded audio during frame synchronization and a user-adjustable offset to the frame sync to align the Dolby® delay. Video and audio processing controls as well as flexible timecode processing, closed captioning support and AFD code insertion, provide complete signal management for all incoming signals.

## Key Features

- Handles all popular formats of SD (270Mb/s) and HD (1.485Gb/s) signals
- Glitch-free handling of embedded audio when a frame is dropped or duplicated
- Dolby® Digital encoding with optional metadata output
- 16 channels of discrete audio embedding or de-embedding
- User offset to frame sync to align Dolby® delay
- AFD code insertion
- HD / SD closed captioning and flexible timecode support
- Frame sync with up to 13 frames of user-adjustable delay
- 4 internal tone generators
- 5-year transferable warranty

## Ordering Information

**HD / SD SDI Frame Synchronizer with Dolby® Digital Encoding**

| | |
|---|---|
| FSE-8241-D | HD / SD SDI Frame Sync w/ Dolby® Digital Encoding |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for FSE-8241-D |
| -R2M | Metadata Rear Module for FSE-8241-D |

**FSR-6601**
Single Optical to Electrical Converter

**FSR-6601-H**
Single High Sensitivity Optical to Electrical Converter

**FST-6602**
Single Electrical to Optical Converter

**FDR-6603**
Dual Optical to Electrical Converter

**FDR-6603-H**
Dual High Sensitivity Optical to Electrical Converter

**FDT-6604**
Dual Electrical to Optical Converter

**FSR-6605**
Single Optical to Electrical Converter with Optical Regeneration

**MUX-6258-A**
AES / EBU Audio Multiplexer with Fiber Optic Output

**DMX-6259-A**
AES / EBU Audio De-Multiplexer with Fiber Optic Input

**Optical Splitters**
Single 1x2, 1x4, 1x8 and Dual 1x2, 1x4 Passive
Optical Splitters

**CWDM**
Coarse Wave Division Multiplexing

**DWDM**
Dense Wave Division Multiplexing

DISTRIBUTION AND MONITORING

UP / DOWN / CROSS, ARC CONVERSION

SYNCHRONIZATION AND DELAY

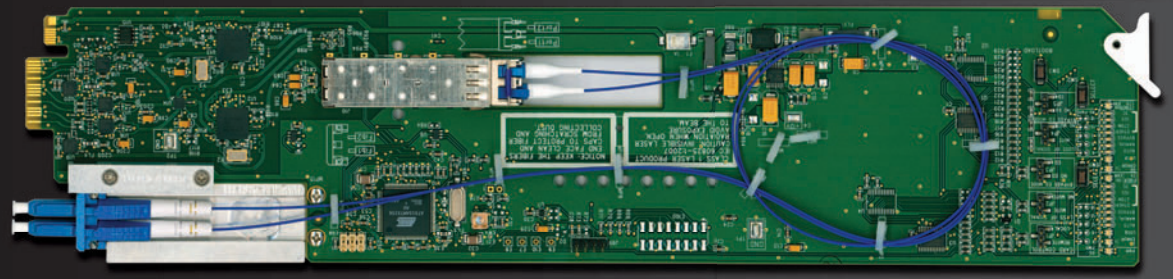
VIDEO CONVERSION

AUDIO CONVERSION

AUDIO EMBEDDING / DE-EMBEDDING

ADVANCED AUDIO PROCESSING

# FIBER



SWITCHING

KEYING AND BRANDING

DATA SOLUTIONS

TRANSPORT STREAM MONITORING AND CONVERSION

# FSR-6601 3G HD SD

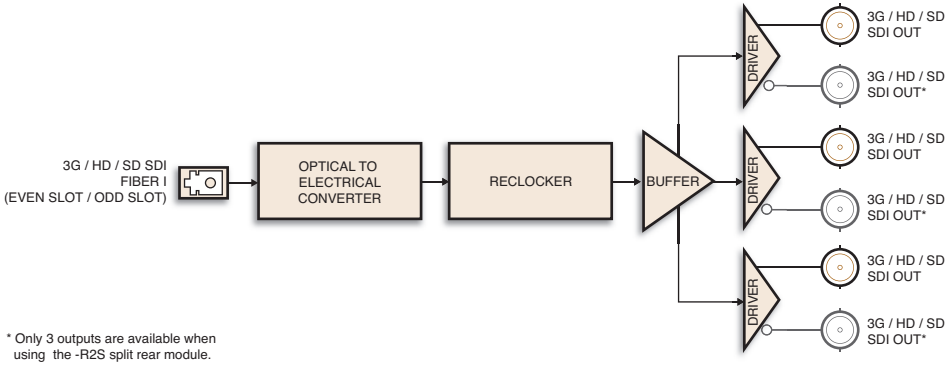
## Single Optical to Electrical Converter

Future-proofed optical products supporting data rates from 143Mb/s to 3Gb/s (1080p).

The FSR-6601 is a fiber optic receiver to serial digital SDI converter that supports serial digital data rates from 143Mb/s up to 2.97Gb/s (1080p). SDI outputs are reclocked providing excellent jitter and return loss specifications.

The FSR-6601 is fully hot-swappable with all active components on the front removable module. No active components are installed on the rear I/O connection module. This design greatly reduces down-time eliminating any need to access the back of the rack frame.

The -R2S high density split rear module can accommodate up to 2x FSR-6601 cards, maximizing the number of conversion channels in a frame. In this configuration, the DFR-8321 supports up to 20 independent channel solutions.




* Only 3 outputs are available when using the -R2S split rear module.

## Key Features

- Optical to Electrical for all SMPTE 424M, SMPTE 259M-C, and SMPTE 292M standards
- Future-proofed 3Gb/s (1080p) design
- Supports single-mode fiber
- Hot-swappable from front of frame with no external connect / reconnect required
- Optical input range 1270nm to 1610nm
- Optical input sensitivity -18dBm
- Optical input connection: LC / UPC
- 6 SDI reclocked outputs, 3 reclocked outputs using the -R2S
- Reclocking on all outputs at 270Mb/s,1.483Gb/s, 1.485Gb/s, 2.967Gb/s, 2.970Gb/s
- 5-year transferable warranty
- Power: 4.5 watts

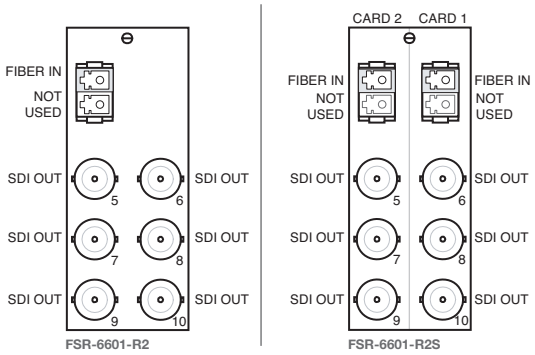
## Ordering Information

**Single Optical to Electrical Converter**

| | |
|---|---|
| FSR-6601 | Single Optical Receiver |

**Rear Module Suffix (ex: [model]-R2)**

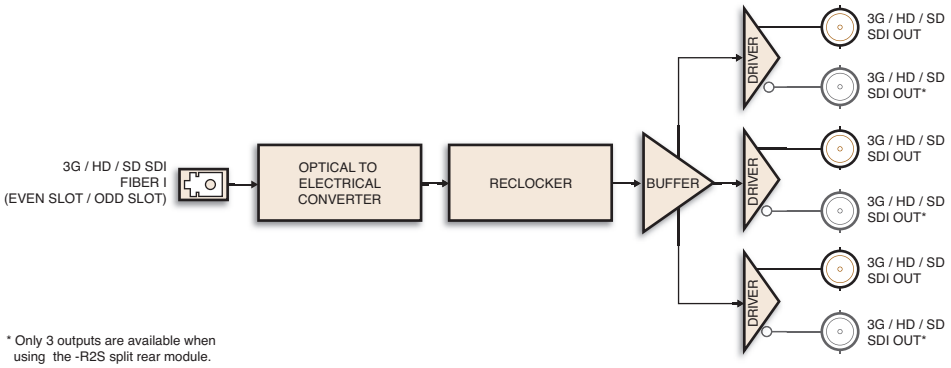
| | |
|---|---|
| -R2 | Rear Module for FSR-6601 |
| -R2S | Split Rear Module for 2x FSR-6601 |



# FSR-6601-H 3G HD SD

## Single High Sensitivity Optical to Electrical Converter

Future-proofed optical products supporting data rates from 143Mb/s to 3Gb/s (1080p).




* Only 3 outputs are available when using the -R2S split rear module.

High sensitivity optical receivers provide an additional 10dB to your link budget over the standard optical receivers.

The FSR-6601-H is a single high sensitivity fiber optic receiver to serial digital SDI converter that supports serial digital data rates from 143Mb/s up to 2.97Gb/s (1080p). SDI outputs are reclocked providing excellent jitter and return loss specifications. The FSR-6601-H is fully hot-swappable with all active components on the front removable module. No active components are installed on the rear I/O connection module. This design greatly reduces down-time eliminating any need to access the back of the rack frame.

The -R2S high density split rear module can accommodate up to 2x FSR-6601-H cards, maximizing the number of conversion channels in a frame. In this configuration, the DFR-8321 supports up to 20 independent channel solutions.

## Key Features

- Optical to Electrical for all SMPTE 424M, SMPTE 259M-C, and SMPTE 292M standards
- Future-proofed 3Gb/s (1080p) design
- Supports single-mode fiber
- Hot-swappable from front of frame with no external connect / reconnect required
- Optical input range 1270nm to 1610nm
- Optical input sensitivity -9dBm to -28dBm
- Optical input connection: LC / UPC
- 6 SDI reclocked outputs, 3 reclocked outputs using the -R2S
- Reclocking on all outputs at 270Mb/s,1.483Gb/s, 1.485Gb/s, 2.967Gb/s, 2.970Gb/s
- 5-year transferable warranty
- Power: 4.5 watts

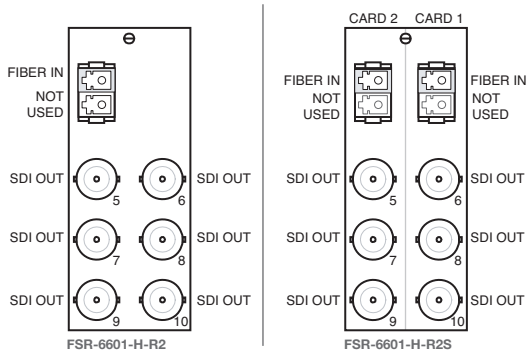
## Ordering Information

**Single High Sensitivity Optical to Electrical Converter**

| | |
|---|---|
| FSR-6601-H | Single Optical Receiver |

**Rear Module Suffix (ex: [model]-R2)**

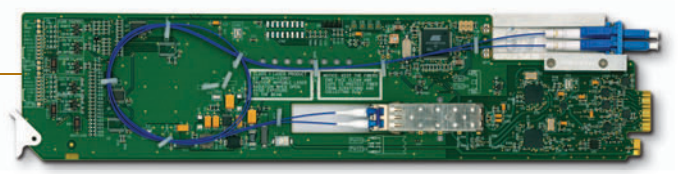
| | |
|---|---|
| -R2 | Rear Module for FSR-6601-H |
| -R2S | Split Rear Module for 2x FSR-6601-H |



# FST-6602 3G HD SD

## Single Electrical to Optical Converter

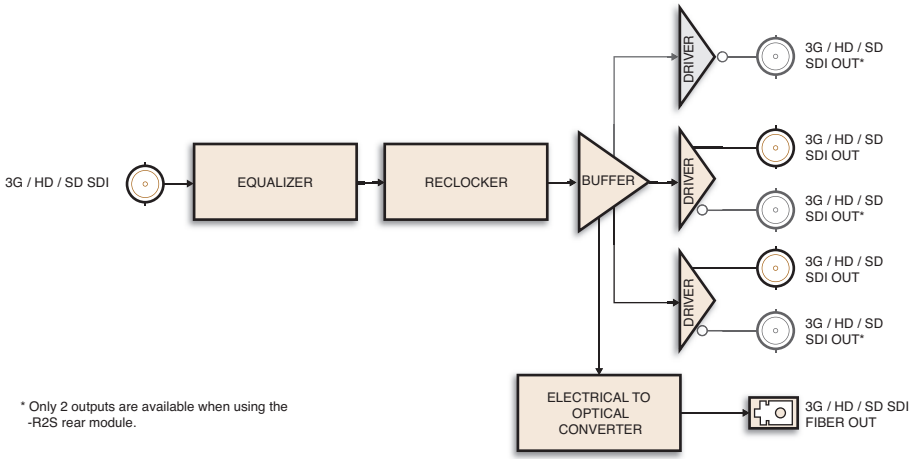
Future-proofed optical products supporting data rates from 143Mb/s to 3Gb/s (1080p).



The FST-6602 is a serial digital SDI to fiber optic transmitter converter that supports serial digital data rates from 143Mb/s up to 2.97Gb/s (1080p). SDI outputs are reclocked copies of the input providing excellent jitter and return loss specifications.

The FST-6602 is fully hot-swappable with all active components on the front removable module. No active components are installed on the rear I/O connection module. This design greatly reduces down-time eliminating any need to access the back of the rack frame.

The -R2S high density split rear module can accommodate up to 2x FST-6602 cards, maximizing the number of conversion channels in a frame. In this configuration, the DFR-8321 supports up to 20 independent channel solutions.




* Only 2 outputs are available when using the -R2S rear module.

## Key Features

- Electrical to Optical for all SMPTE 424M, SMPTE 259M-C, SMPTE 292M standards
- Future-proofed 3Gb/s (1080p) design
- Supports single-mode fiber
- Hot-swappable from front of frame with no external connect / reconnect required
- Optical output power -7dBm
- Optical wavelength 1310nm
- Optical output connection: LC / UPC
- 5 reclocked copies of SDI input with the -R2, 2 reclocked copies of SDI input with the -R2S
- Reclocking on all outputs at 270Mb/s, 1.483Gb/s, 1.485Gb/s, 2.967Gb/s, 2.970Gb/s
- Alarming for signal presence and optical faults
- 5-year transferable warranty
- Power: 4.5 watts

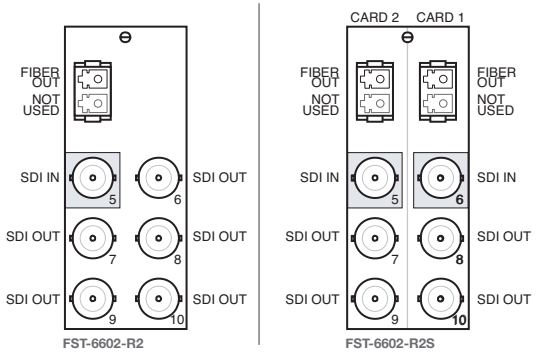
## Ordering Information

**Single Electrical to Optical Converter**

| | |
|---|---|
| FST-6602 | Single Optical Transmitter |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for FST-6602 |
| -R2S | Split Rear Module for 2x FST-6602 |



# FDR-6603 3G HD SD

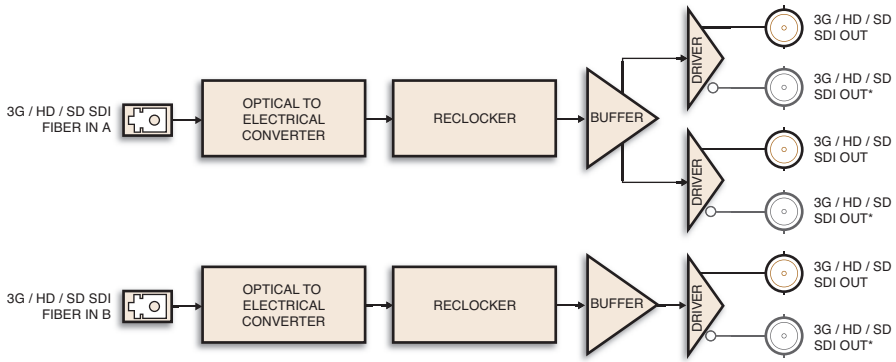
## Dual Optical to Electrical Converter

Future-proofed optical products with 2 channels of conversion on a single card supporting data rates from 143Mb/s to 3Gb/s (1080p).

The FDR-6603 is a dual fiber optic receiver to serial digital SDI converter providing 2 channels of conversion on a single card supporting serial digital data rates from 143Mb/s up to 2.97Gb/s (1080p). SDI outputs are reclocked providing excellent jitter and return loss specifications.

The FDR-6603 is fully hot-swappable with all active components on the front removable module. No active components are installed on the rear I/O connection module. This design greatly reduces down-time eliminating any need to access the back of the rack frame.

The -R2S high density split rear module can accommodate up to 2x FDR-6603 cards, maximizing the number of conversion channels in a frame. In this configuration, the DFR-8321 supports up to 40 independent channel solutions, providing ultra-high density conversion in a 2RU space.




* Only 2 outputs for channel A and 1 output for channel B are available when using the -R2S rear module.

## Key Features

- Optical to Electrical for all SMPTE 424M, SMPTE 259M-C, SMPTE 292M standards
- Future-proofed 3Gb/s (1080p) design
- Supports single-mode fiber
- Hot-swappable from front of frame with no external connect / reconnect required
- Optical input range 1270nm to 1610nm
- Optical input sensitivity -18dBm
- Optical input connection: LC / UPC
- Reclocked SDI outputs
- Reclocking on all outputs at 270Mb/s, 1.483Gb/s, 1.485Gb/s, 2.967Gb/s, 2.970Gb/s
- Alarming for signal presence and input sensitivity
- 5-year transferable warranty
- Power: 5.5 watts

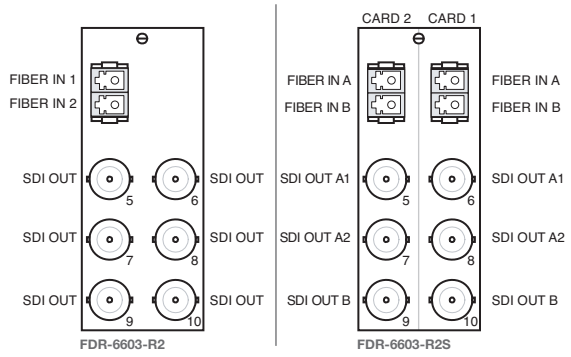
## Ordering Information

**Dual Optical to Electrical Converter**

| | |
|---|---|
| FDR-6603 | Dual Optical Receiver |

**Rear Module Suffix (ex: [model]-R2)**

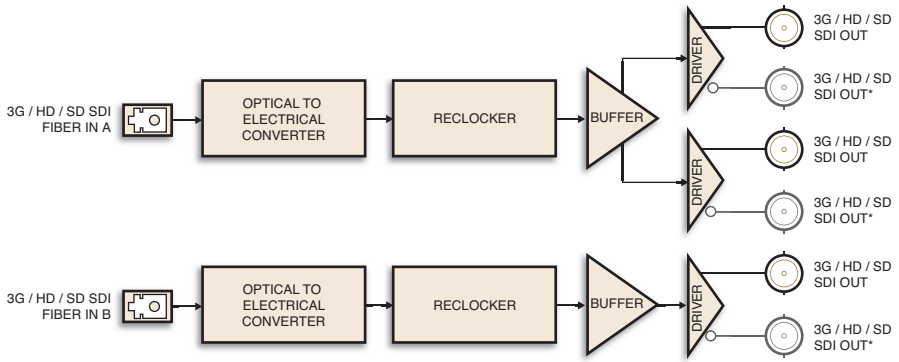
| | |
|---|---|
| -R2 | Rear Module for FDR-6603 |
| -R2S | Split Rear Module for 2x FDR-6603 |



# FDR-6603-H 3G HD SD

## Dual High Sensitivity Optical to Electrical Converter

Future-proofed optical products with 2 channels of conversion on a single card supporting data rates from 143Mb/s to 3Gb/s (1080p).




* Only 2 outputs for channel A and 1 output for channel B are available when using the -R2S rear module.

High sensitivity optical receivers provide an additional 10dB to your link budget over the standard optical receivers.

The FDR-6603-H is a dual high sensitivity fiber optic receiver to serial digital SDI converter providing 2 channels of conversion on a single card supporting serial digital data rates from 143Mb/s up to 2.97Gb/s (1080p). SDI outputs are reclocked providing excellent jitter and return loss specifications. The FDR-6603-H is fully hot-swappable with all active components on the front removable module. No active components are installed on the rear I/O connection module. This design greatly reduces down-time eliminating any need to access the back of the rack frame.

The -R2S high density split rear module can accommodate up to 2x FDR-6603-H cards, maximizing the number of conversion channels in a frame. In this configuration, the DFR-8321 supports up to 40 independent channel solutions, providing ultra-high density conversion in a 2RU space.

## Key Features

- Optical to Electrical for all SMPTE 424M, SMPTE 259M-C, SMPTE 292M standards
- Future-proofed 3Gb/s (1080p) design
- Supports single-mode fiber
- Hot-swappable from front of frame with no external connect / reconnect required
- Optical input range 1270nm to 1610nm
- Optical input sensitivity -9dBm to -28dBm
- Optical input connection: LC / UPC
- Reclocked SDI outputs
- Reclocking on all outputs at 270Mb/s, 1.483Gb/s, 1.485Gb/s, 2.967Gb/s, 2.970Gb/s
- Alarming for signal presence and input sensitivity
- 5-year transferable warranty
- Power: 5.5 watts

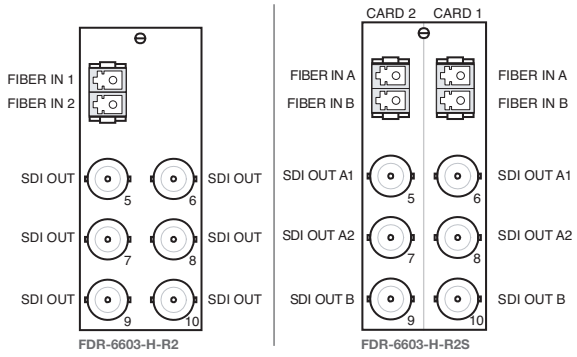
## Ordering Information

**Dual High Sensitivity Optical to Electrical Converter**

| | |
|---|---|
| FDR-6603-H | Dual Optical Receiver |

**Rear Module Suffix (ex: [model]-R2)**

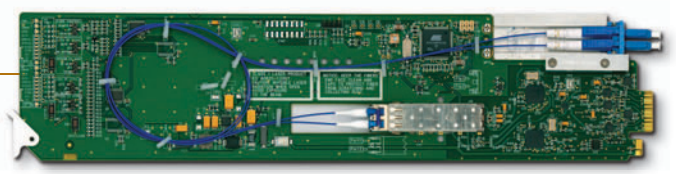
| | |
|---|---|
| -R2 | Rear Module for FDR-6603-H |
| -R2S | Split Rear Module for 2x FDR-6603-H |



# FDT-6604 3G HD SD

## Dual Electrical to Optical Converter

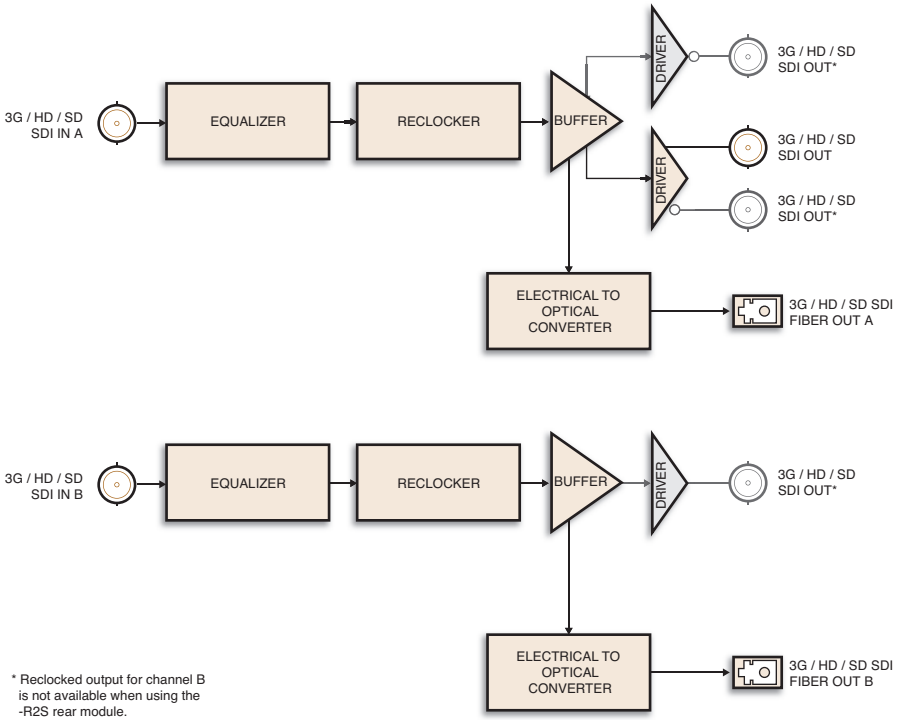
Future-proofed optical products with 2 channels of conversion on a single card supporting data rates from 143Mb/s to 3Gb/s (1080p).



The FDT-6604 is a serial digital SDI to fiber optic transmitter converter that supports serial digital data rates from 143Mb/s up to 2.97Gb/s (1080p). SDI outputs are reclocked copies of the input providing excellent jitter and return loss specifications.

The FDT-6604 is fully hot-swappable with all active components on the front removable module. No active components are installed on the rear I/O connection module. This design greatly reduces down-time eliminating any need to access the back of the rack frame.

The -R2S high density split rear module can accommodate up to 2x FDT-6604 cards, maximizing the number of conversion channels in a frame. In this configuration, the DFR-8321 supports up to 40 independent channel solutions, providing ultra-high density conversion in a 2RU space.




* Reclocked output for channel B is not available when using the -R2S rear module.

## Key Features

- Electrical to Optical for all SMPTE 424M, SMPTE 259M-C, SMPTE 292M standards
- Future-proofed 3Gb/s (1080p) design
- Supports single-mode fiber
- Hot-swappable from front of frame with no external connect / reconnect required
- Optical output power -7dBm
- Optical wavelength 1310nm
- Optical output connection: LC / UPC
- Reclocked SDI outputs
- Reclocking on all outputs at 270Mb/s, 1.483Gb/s, 1.485Gb/s, 2.967Gb/s, 2.970Gb/s
- Alarming for signal presence and optical faults
- 5-year transferable warranty
- Power: 4.5 watts

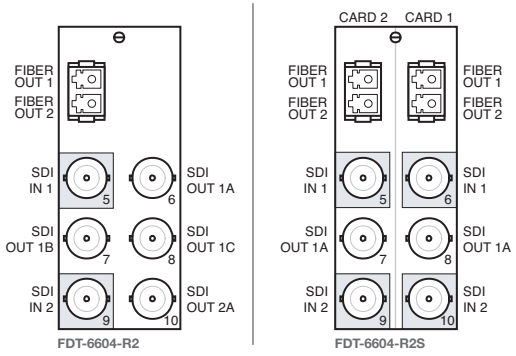
## Ordering Information

**Dual Electrical to Optical Converter**

| | |
|---|---|
| FDT-6604 | Dual Optical Transmitter |

**Rear Module Suffix (ex: [model]-R2)**

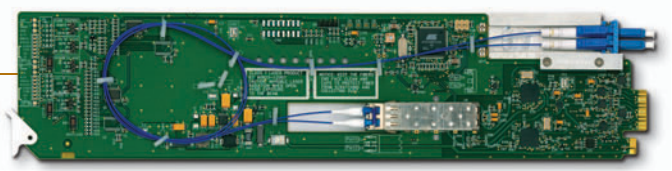
| | |
|---|---|
| -R2 | Rear Module for FDT-6604 |
| -R2S | Split Rear Module for 2x FDT-6604 |



# FSR-6605 3G HD SD

## Single Optical to Electrical Converter with Optical Regeneration

Future-proofed optical products supporting data rates from 143Mb/s to 3Gb/s (1080p).

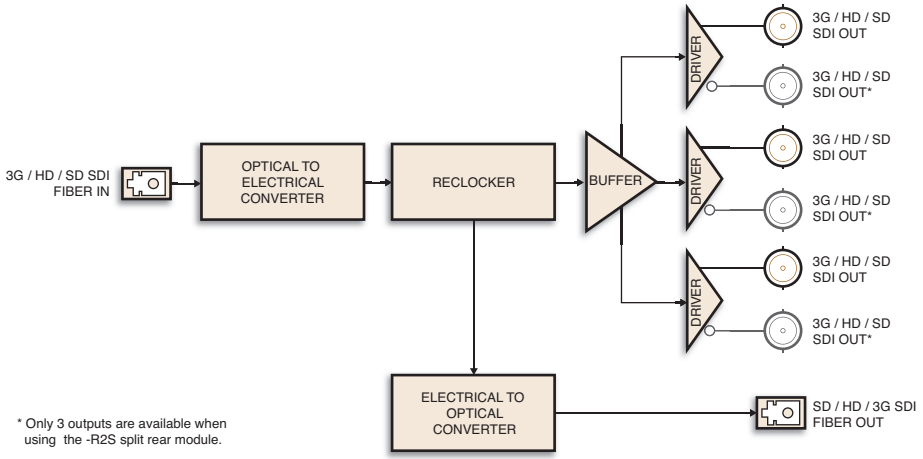


The FSR-6605 is a fiber optic receiver to serial digital SDI converter supporting serial digital data rates from 143Mb/s up to 2.97Gb/s (1080p). SDI outputs are reclocked providing excellent jitter and return loss specifications.

The FSR-6605 provides a regenerated and reclocked optical output, re-launching the optical signal at -7dBm.

The FSR-6605 is fully hot-swappable with all active components on the front removable module. No active components are installed on the rear I/O connection module. This design greatly reduces down-time eliminating any need to access the back of the rack frame.

The -R2S high density split rear module can accommodate up to 2x FSR-6605 cards, maximizing the number of conversion channels in a frame. In this configuration, the DFR-8321 supports up to 20 independent channel solutions.




* Only 3 outputs are available when using the -R2S split rear module.

## Key Features

- Optical to Electrical for all SMPTE 424M, SMPTE 259M-C, SMPTE 292M standards
- Future-proofed 3Gb/s (1080p) design
- Supports single-mode fiber
- Hot-swappable from front of frame with no external connect / reconnect required
- Optical output power -7dBm
- Optical input sensitivity -18dBm
- Optical connections: LC / UPC
- Optical wavelength 1310nm
- Reclocking on all outputs at 270Mb/s, 1.483Gb/s, 1.485Gb/s, 2.970Gb/s
- Alarming for signal presence and optical faults
- Reclocked SDI outputs
- 5-year transferable warranty

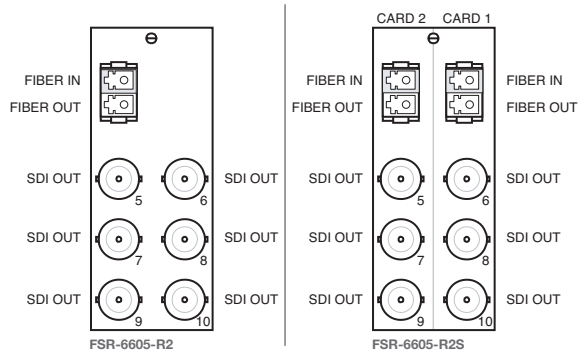
## Ordering Information

**Single Optical to Electrical Converter with Optical Regeneration**

| | |
|---|---|
| FSR-6605 | Optical Regenerator and DA |

**Rear Module Suffix (ex: [model]-R2)**

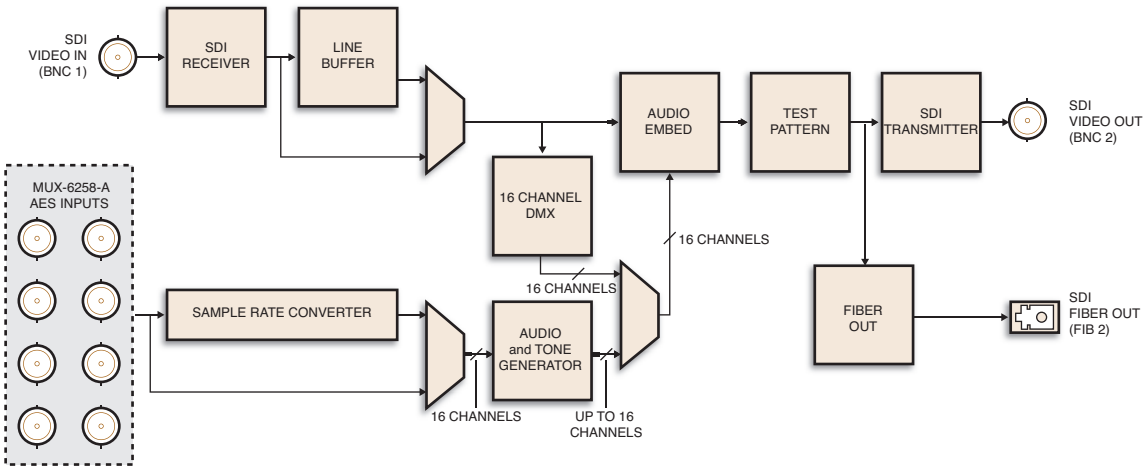
| | |
|---|---|
| -R2 | Rear Module for FSR-6605 |
| -R2S | Split Rear Module for 2x FSR-6605 |



# MUX-6258-A 3G HD SD AES

## AES / EBU Audio Multiplexer with Fiber Optic Output

The ideal solution for multiplexing 8 AES streams into an HD / SD SDI signal with optical output.




The MUX-6258-A is a high quality program audio multiplexer capable of embedding up to 8 AES / EBU pairs (16 audio channels) into an HD / SD SDI signal.

The fiber output is ideal for signal paths exceeding 100m. A single card solution meeting the needs for all audio embedding applications.

Audio proc control on each input allow for audio processing with independent channel sample rate conversions, gain of ±20dB, audio delay up to 1 second and channel phase invert and summing capability. The MUX-6258-A is extremely flexible in handling channel assignments and channel remapping as well as fully configurable append and overwrite capability for existing channels. Various configuration options are available for backup scenarios should a loss of input occur.

The MUX-6258-A offers a fiber output and one coax output.

## Key Features

- 16 channel audio embedding for all popular HD / SD SDI formats with fiber output
- Audio proc amp controls; gain, invert, delay and sum, sample rate conversion
- Full control over channel assignments, primary and backup sources
- Configurable overwrite and append capability for existing embedded audio
- Programmable silence detection and timeout thresholds
- Optical output power -7dBm
- Optical wavelength 1310nm
- Optical output connection: LC
- 5-year transferable warranty
- Power: 9.5 watts

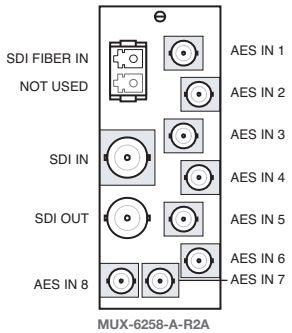
## Ordering Information

**AES / EBU Audio Multiplexer with Fiber Optic Output**

| | |
|---|---|
| MUX-6258-A | AES / EBU Audio Multiplexer w/ Optical Output |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2A | Rear Module for MUX-6258-A |



MUX-6258-A-R2A

# DMX-6259-A 3G HD SD AES

## AES / EBU Audio De-Multiplexer with Fiber Optic Input

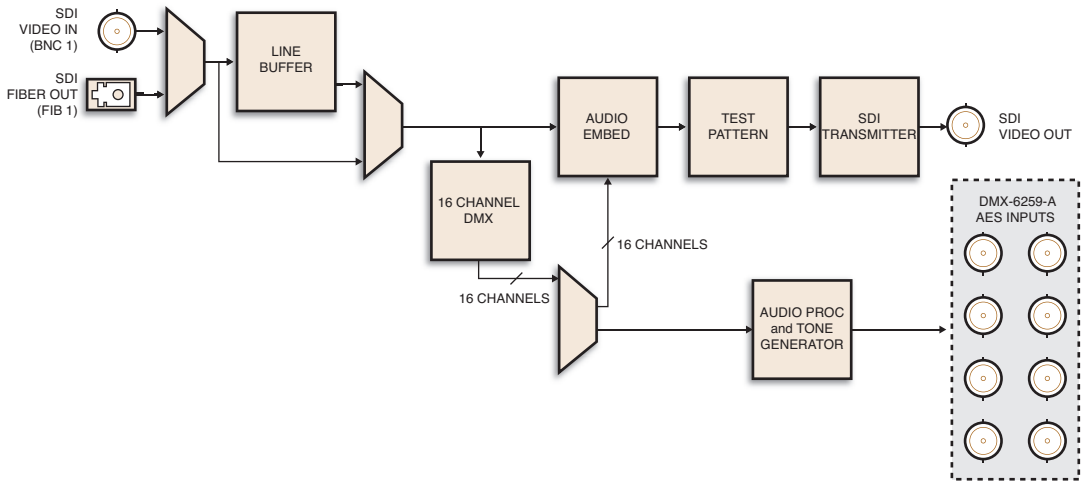
The ideal solution for de-multiplexing 8 AES streams from an HD / SD SDI signal with optical input.

The DMX-6259-A is a high quality program audio de-multiplexer capable of de-embedding up to 8 AES / EBU pairs (16 audio channels) from an HD / SD SDI signal.

The fiber input is ideal for signal paths exceeding 100m. A single card solution meeting the needs for all audio de-embedding applications.

Audio proc control on each channel allow for audio processing with gain of ±20db, audio delay up to 1 second and channel invert. The DMX-6259-A supports full channel assignment to the discrete outputs. Various configuration options, including internally generated patterns and tones, are available for audio and video output scenarios should a loss of input occur.

The DMX-6259-A offers a selectable fiber / coax input.




## Key Features

- 16 channel audio de-embedding for all popular HD / SD SDI formats with fiber input
- Audio proc amp controls; gain, invert, and delay
- Assign any embedded channel to any discrete audio output
- Ability to re-map channels in embedded video stream
- Programmable silence detection and timeout thresholds
- Optical input range 1270nm to 1610nm
- Optical input sensitivity -19dBm
- Optical input connection: LC
- 5-year transferable warranty
- Power: 9.5 watts

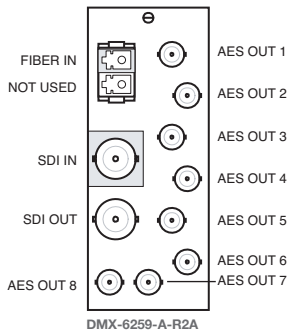
## Ordering Information

**AES / EBU Audio De-Multiplexer with Fiber Optic Input**

| | |
|---|---|
| DMX-6259-A | AES / EBU Audio De-Multiplexer w/ Optical Input |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2A | Rear Module for DMX-6259-A |

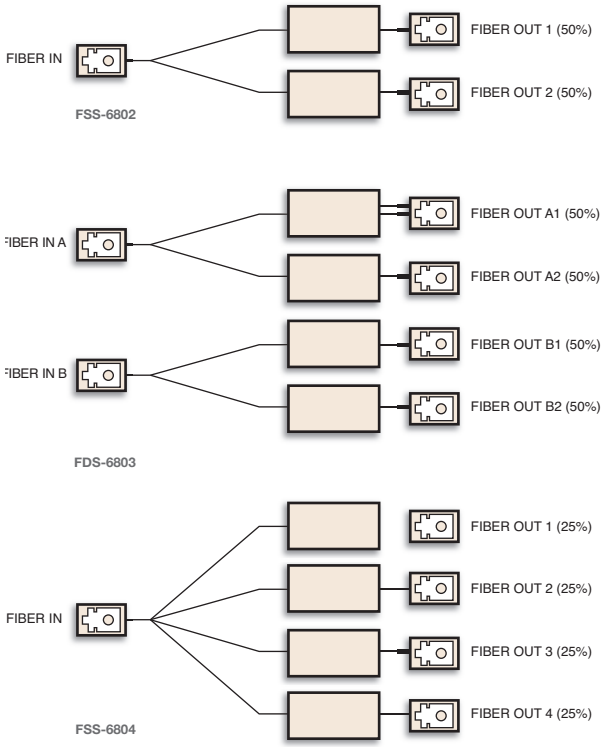


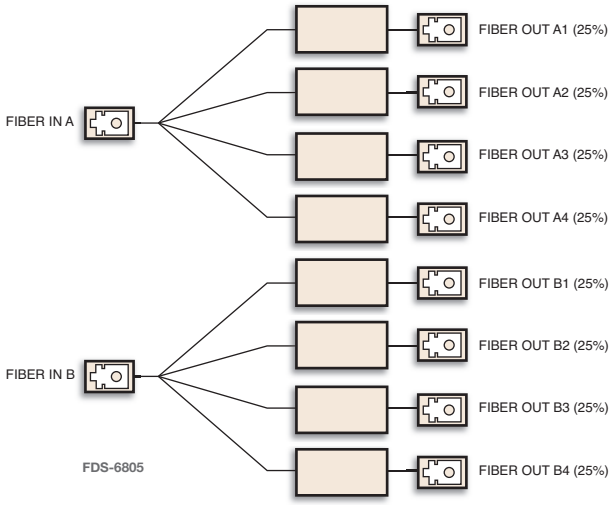
DMX-6259-A-R2A

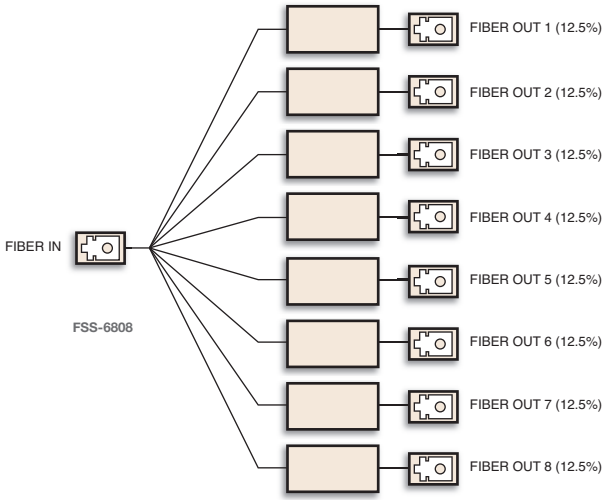
# Optical Splitters 3G HD SD

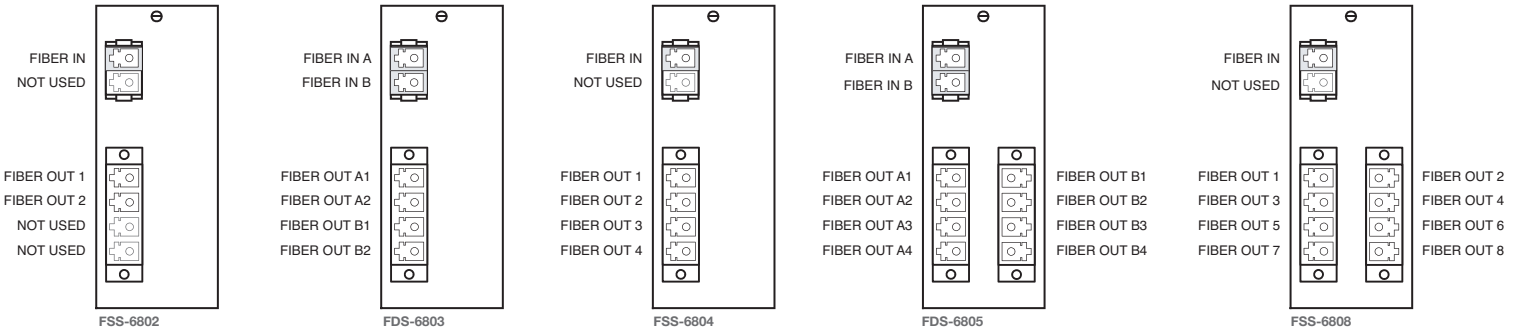
## Single 1x2, 1x4, 1x8 and Dual 1x2, 1x4 Passive Optical Splitters

Distribution of an optical signal to multiple sources without the need for electrical conversion.



Optical splitters take an optical signal and split it into two or more outputs and functions like a distribution amplifier. The optical power at the input is split to the outputs at an even ratio:

- a 1x2 splitter will output 50% of the input's power on each output
- a 1x4 splitter will output 25% of the input's power on each output
- a 1x8 splitter will output 12.5% of the input's power on each output

Optical splitter modules use passive optical circuits. The modules fit the DFR-8321 frame but draw no power. With no active components, modules offer a very high level of reliability.

## Key Features

- Maximum input loss of 4dB on 50% split, 8dBm on 25% split, and 11dBm on 12.5% split
- Optical input range: 1270nm to 1620nm
- Passive modules contain no active components and offer very high reliability
- Latching rear module to prevent accidental removal
- Optical input / output connection: LC / UPC
- Fits DFR-8321 frame, no power required
- 5-year transferable warranty

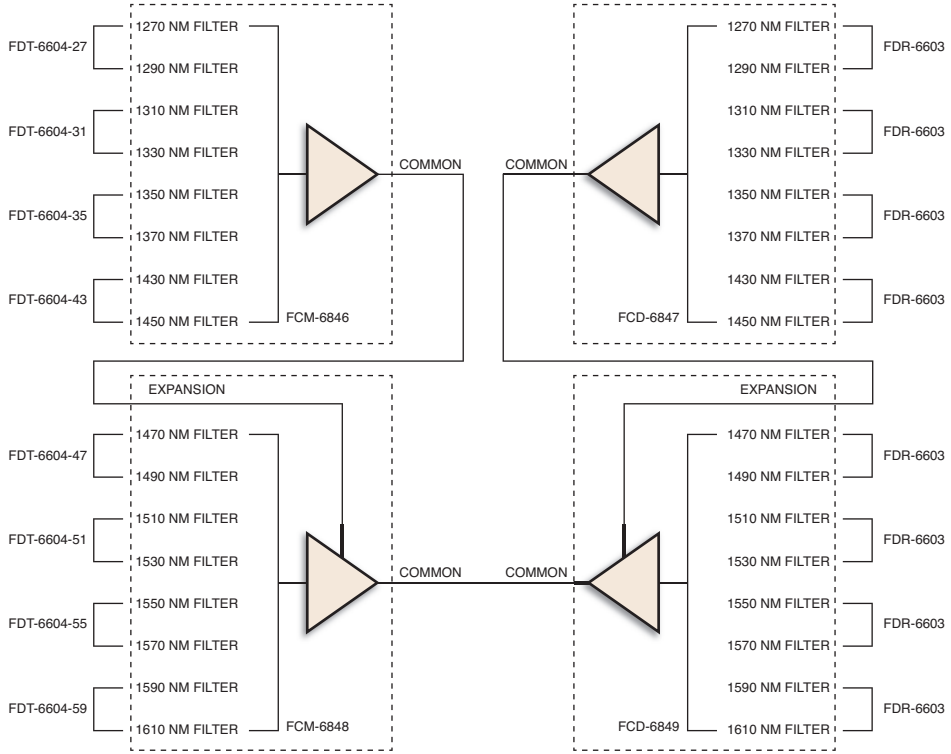
## Ordering Information

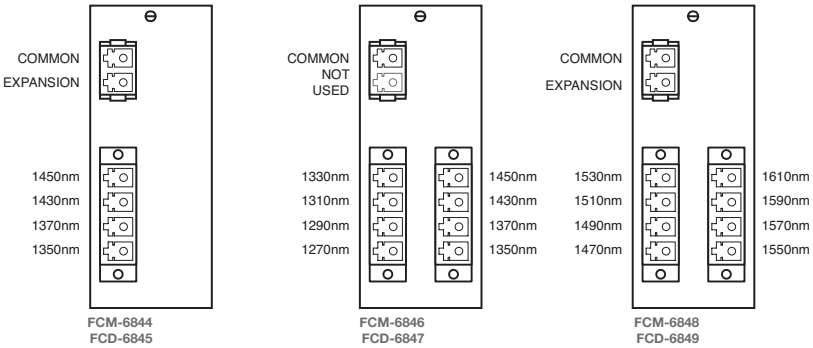
**Optical Splitters**

| | |
|---|---|
| FSS-6802 | Optical 1x2 Splitter |
| FDS-6803 | Dual Optical 1x2 Splitter |
| FSS-6804 | Optical 1x4 Splitter |
| FDS-6805 | Dual Optical 1x4 Splitter |
| FSS-6808 | Optical 1x8 Splitter |

## Coarse Wave Division Multiplexing

Up to 16 channels of bit rate independent signals transmitted on a single fiber using wavelength division multiplexing.



**CWDM Optical MUX / DEMUX**
Three sets of MUX / DEMUX modules are available: a 4 channel with expansion port, an 8 channel, and an 8 channel with expansion port. Using individual, or a combination of modules, allow for the creation of 4, 8, 12, or 16 channel systems. Modules with expansion ports enable the use of existing non-CWDM 1310nm lasers to create 5, 9 and 13 channel systems.

Wavelength MUX / DEMUX modules use passive wavelength filters. The modules fit the DFR-8321 frame but draw no power. With no active components, modules offer a very high level of reliability.

**CWDM Transmitters and Receivers**
Wave division multiplexing allows the use of multiple wavelengths of light on a single fiber, therefore allowing a single fiber to carry multiple signals. Each signal can run at its own bit rate and protocol, independent for the other signals.

Each electrical signal to be multiplexed into the final output must be converted to an optical signal with a unique wavelength by using different lasers on the transmitter. The FDT-6604 dual electrical to optical transmitter comes in 8 product variants, utilizing DFB optical SFPs, with each card transmitting two neighboring wavelengths. The products are identified by a two digit suffix, which identifies the lower wavelength.

Optical to electrical converters use a wide spectrum optical receiver, and will work with any wavelength. Both the FSR-6601 single and the FDR-6603 dual optical to electrical converters are wide spectrum receivers and will function within a CWDM system, regardless of the transmitted wavelengths.

## Key Features

### MUX / DEMUX Features

- Passive CWDM optical MUX and DEMUX modules contain no active components and offer very high reliability
- Optical output connection: LC / UPC
- Supports single-mode fiber
- Expandable from 4 or 8 to 12 or 16 channel systems
- Latching rear module to prevent accidental removal
- Fits DFR-8321 frame, passive modules do not require any power
- 5-year transferable warranty
- Power: 4.5 watts

### Transmitter Features

- Optical to Electrical for all SMPTE 424M, SMPTE 259M-C and SMPTE 292M standards
- Future-proofed 3Gb/s (1080p) design
- Supports single-mode fiber
- Hot-swappable from front of frame with no external connect / reconnect required
- 16 supported optical wavelengths from 1270nm to 1610nm
- Optical output power 0dBm
- Optical output connection: LC / UPC
- Fits DFR-8321 frame, passive modules do not require any power
- 5-year transferable warranty
- Power: 4.5 watts

## Ordering Information

**Multiplexing / De-Multiplexing**

| | |
|---|---|
| FCM-6844 | 4 CH Optical MUX w/ Expansion Port |
| FCD-6845 | 4 CH Optical DEMUX w/ Expansion Port |
| FCM-6846 | 8 CH Optical MUX |
| FCD-6847 | 8 CH Optical DEMUX |
| FCM-6848 | 8 CH Optical MUX w/ Expansion Port |
| FCD-6849 | 8 CH Optical DEMUX w/ Expansion Port |

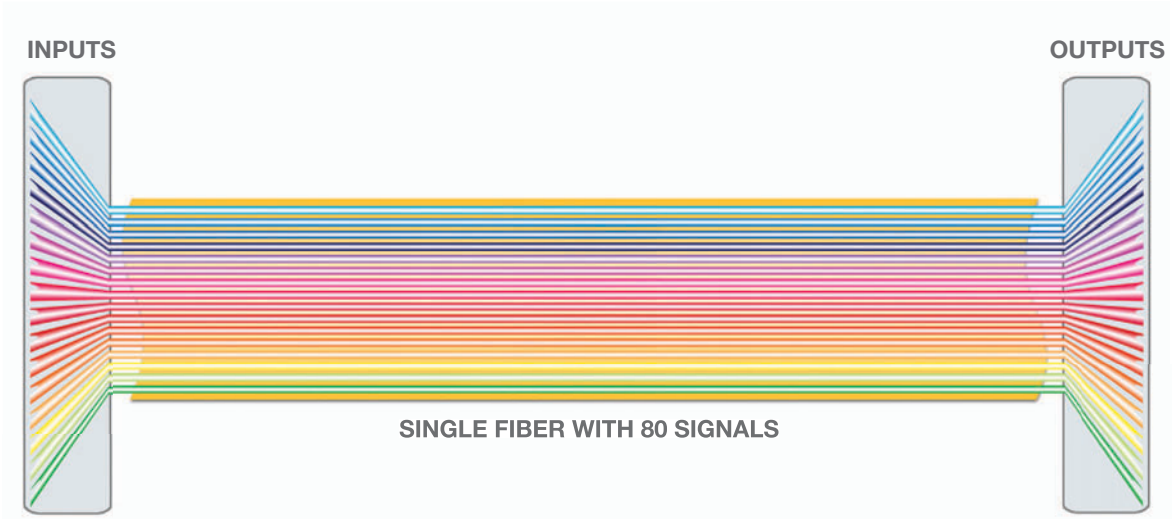
**Transmitters**

| | |
|---|---|
| FDT-6604-27 | 3G / HD / SD SDI Dual Fiber TX (1270nm/1290nm) |
| FDT-6604-31 | 3G / HD / SD SDI Dual Fiber TX (1310nm/1330nm) |
| FDT-6604-35 | 3G / HD / SD SDI Dual Fiber TX (1350nm/1370nm) |
| FDT-6604-43 | 3G / HD / SD SDI Dual Fiber TX (1430nm/1450nm) |
| FDT-6604-47 | 3G / HD / SD SDI Dual Fiber TX (1470nm/1490nm) |
| FDT-6604-51 | 3G / HD / SD SDI Dual Fiber TX (1510nm/1530nm) |
| FDT-6604-55 | 3G / HD / SD SDI Dual Fiber TX (1550nm/1570nm) |
| FDT-6604-59 | 3G / HD / SD SDI Dual Fiber TX (1590nm/1610nm) |
| R2S-6604 | Split Rear Module for 2x FDT-6604 |

# DWDM 3G HD SD

## Dense Wave Division Multiplexing

Up to 80 channels of bit rate independent signals transmitted on a single fiber using wavelength division multiplexing.





Fiber
p.86


**DWDM Optical MUX / DEMUX**
A 1RU chassis provides optical multiplexing for up to 40 wavelengths in either the L or C band spectrums. An expansion port provides multiplexing of the L and C bands to output a total of 80 channels on a single fiber. Wavelength MUX / DEMUX modules use passive wavelength filters. With no active components, modules offer a very high level of reliability.

**DWDM Transmitters and Receivers**
Wave division multiplexing allows the use of multiple wavelengths of light on a single fiber, therefore allowing a single fiber to carry multiple signals. Each signal can run at its own bit rate and protocol, independent for the other signals.

Each electrical signal to be multiplexed into the final output must be converted to an optical signal with a unique wavelength by using different lasers on the transmitter. The FST-6602, single electrical to optical transmitter comes in 80 product variants with each card transmitting unique wavelengths. The products are identified by a three digit suffix, which identifies the wavelength's frequency.

Optical to Electrical converters use a wide spectrum optical receiver and will work with any wavelength. Both the FSR-6601 single and the FDR-6603 Dual Optical to Electrical converters are wide spectrum receivers and will function within the DWDM system, regardless of the transmitted wavelengths.

## Ordering Information

Call Ross Video for details at +1 (613) 652-4886.

## Key Features

### MUX / DEMUX Features

- Passive DWDM optical MUX and DEMUX modules contain no active components and offer very high reliability
- Optical output connection: LC / UPC
- Supports single-mode fiber
- 40 and 80 channel configurations (40 L Band + 40 C Band)
- High density, 1RU chassis supports up to 40 channels
- 5-year transferable warranty

### Transmitter Features

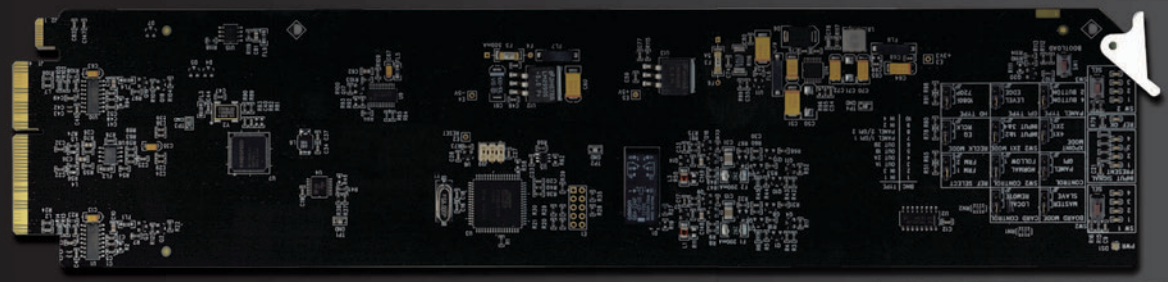
- Optical to Electrical for all SMPTE 424M, SMPTE 292M and SMPTE 259M-C standards
- Future-proofed 3Gb/s (1080p) design
- Supports single-mode fiber
- Hot-swappable from front of frame with no external connect / reconnect required
- 80 supported DWDM wavelengths across L and C bands
- Optical output power 0dBm
- Optical output connection: LC / UPC
- DashBoard alarming for signal presence and optical faults
- Fits into the DFR-8321 openGear® frame
- 5-year transferable warranty

**DSS-8224**
Dual 2x1 or 4x2 HD / SD SDI Switch

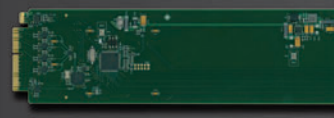
**AVS-8764**
AES / Analog Video Dual 2x1 or 4x2 Switch

**RCM-8120**
Remote Control Modules

# SWITCHING



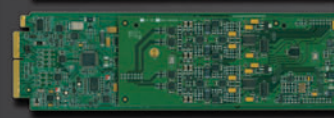
DISTRIBUTION AND MONITORING



UP / DOWN / CROSS, ARC CONVERSION

SYNCHRONIZATION AND DELAY

VIDEO CONVERSION



AUDIO CONVERSION

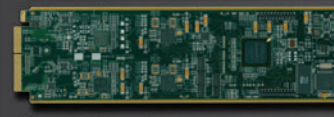
AUDIO EMBEDDING / DE-EMBEDDING

ADVANCED AUDIO PROCESSING

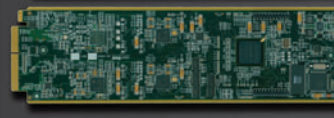
FIBER

KEYING AND BRANDING

DATA SOLUTIONS



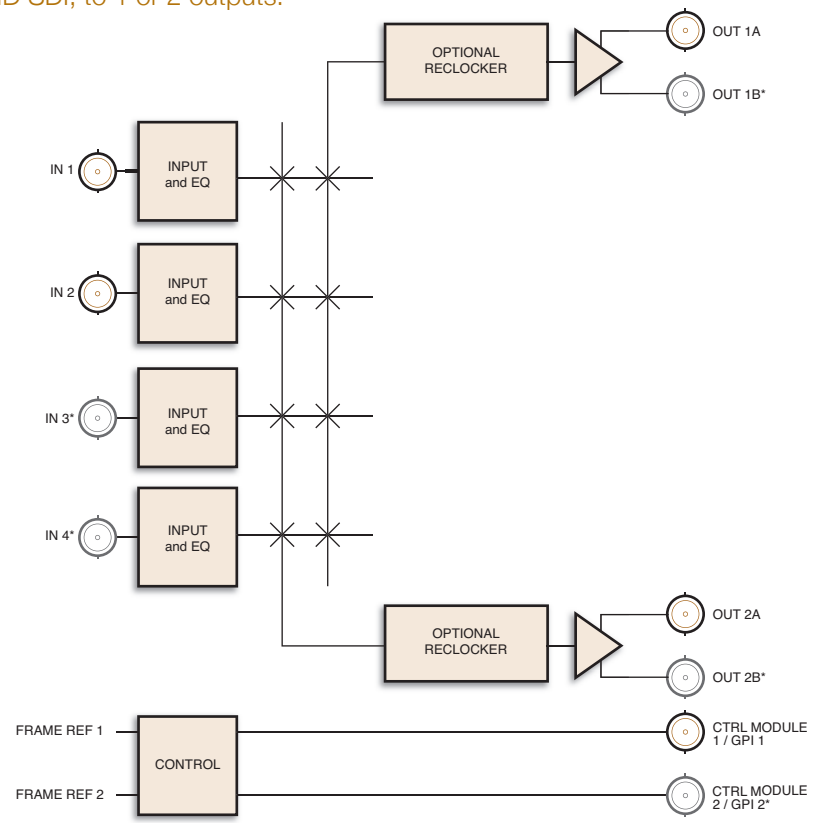
TRANSPORT STREAM MONITORING AND CONVERSION



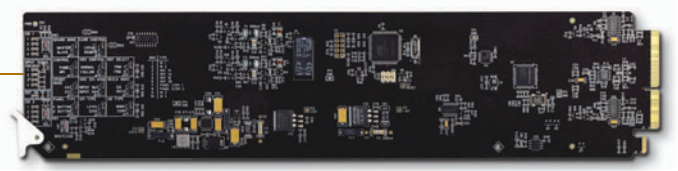
# DSS-8224 HD SD

## Dual 2x1 or 4x2 HD / SD SDI Switch

A convenient and economical solution for systems requiring switching of up to 4 input video sources, SDI and / or HD SDI, to 1 or 2 outputs.




* Outputs not available in 2x2 mode with -R2S rear module.



The DSS-8224 can be configured as a pair of independent 2x1 switches or as a pair of 4x1 switches with common inputs. The DSS-8224 accepts common serial digital signals at 143, 270, 360, 540Mb/s and 1.485Gb/s. All switches are performed in the vertical interval, timed to an external reference. Each switch can be controlled locally at the card-edge by an optional RCM-8120 control module or by GPI. DashBoard and optional SNMP monitoring is provided for input presence, reference present and output status.

The DSS-8224 can be combined, on a common control system, with the AVS-8764 to perform multi-level, analog video, AES audio, and HD / SD SDI switching.

The DSS-8224 can be configured in auto-changeover mode. In this mode, the secondary input is selected when the primary is lost or lock cannot be achieved.

## Key Features

- Dual 2x1 or 4x2 modes
- 2 switches on a single module
- Switches HD SDI and SD serial digital video (143Mb/s to 1.485Gb/s)
- 4 HD / SD SDI inputs, 2 reclocked outputs
- Configurable to 4x2, 4x1, 2x1, or dual 2x1 switch
- 20 2x1 / 10 4x2 switches in 2RU
- Input selection saved to non-volatile RAM
- Vertical interval switching compliant with SMPTE RP168-2002
- Indicators for input signal presence and reference
- Flexible control, remote RCM-8120 module, GPI, card-edge
- 5-year transferable warranty
- Power: 4.5 watts

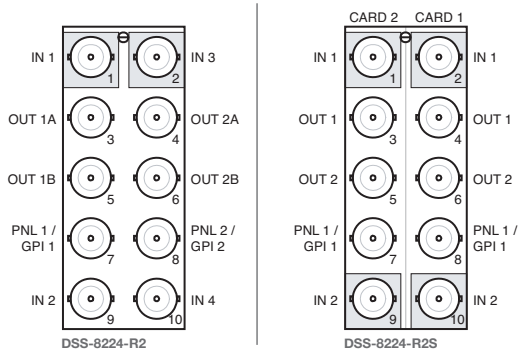
## Ordering Information

**Dual 2x1 or 4x2 HD / SD SDI Switch**

| | |
|---|---|
| DSS-8224 | HD / SD SDI Switch |

**Rear Module Suffix (ex: [model]-R2)**

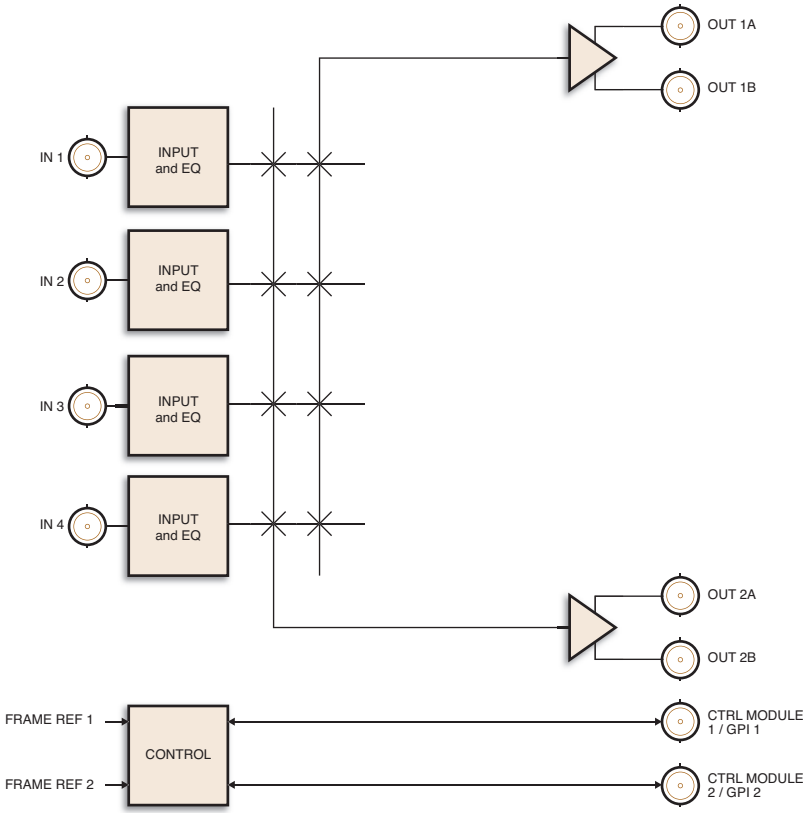
| | |
|---|---|
| -R2 | Rear Module for DSS-8224 |
| -R2S | Split Rear Module for 2x DSS-8224 |

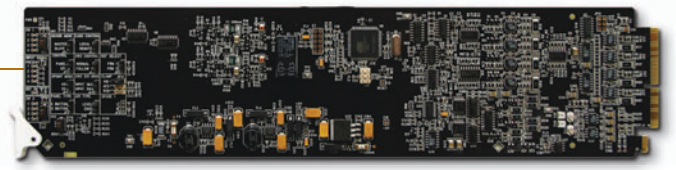


# AVS-8764 AES AN-VID

## AES / Analog Video Dual 2x1 or 4x2 Switch

Provides a convenient and economical solution for systems that require switching of up to 4 input AES audio signals or analog video sources, to 1 or 2 outputs.



The AVS-8764 can be configured as a pair of independent 2x1 switches or as a pair of 4x1 switches with common inputs. The AVS-8764 accepts analog video or AES / EBU audio with the option of unbalanced 75Ω or balanced 110Ω. All switches are performed in the vertical interval, timed to an external reference. Each switch can be controlled locally at the card-edge by an optional RCM-8120 control module or by GPI. DashBoard and optional SNMP monitoring is provided for input presence, reference present and output status.

The AVS-8764 can be combined, on a common control system, with the DSS-8224 to perform multi-level, analog video, AES audio, and HD / SD SDI switching.

## Key Features

- Dual 2x1 or 4x2 modes
- 2 switches on one module
- Analog video or AES audio
- 20 2x1 / 10 4x2 switches in 2RU
- Configurable to 4x2, 4x1, 2x1, or dual 2x1 switch
- 2 selectable frame wide references
- Vertical interval switching timed to external analog video reference
- Remote control modules can control 10 switches
- Clamping mode for video on all inputs
- Selection indicators on front of card
- Flexible control, remote RCM-8120 module, GPI, card-edge
- 5-year transferable warranty
- Power: 2.2 watts

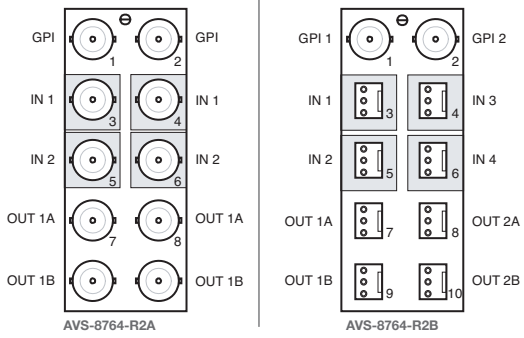
## Ordering Information

**AES / Analog Video Dual 2x1 or 4x2 Switch**

| | |
|---|---|
| AVS-8764 | AES / Analog Video Switch |

**Rear Module Suffix (ex: [model]-R2)**

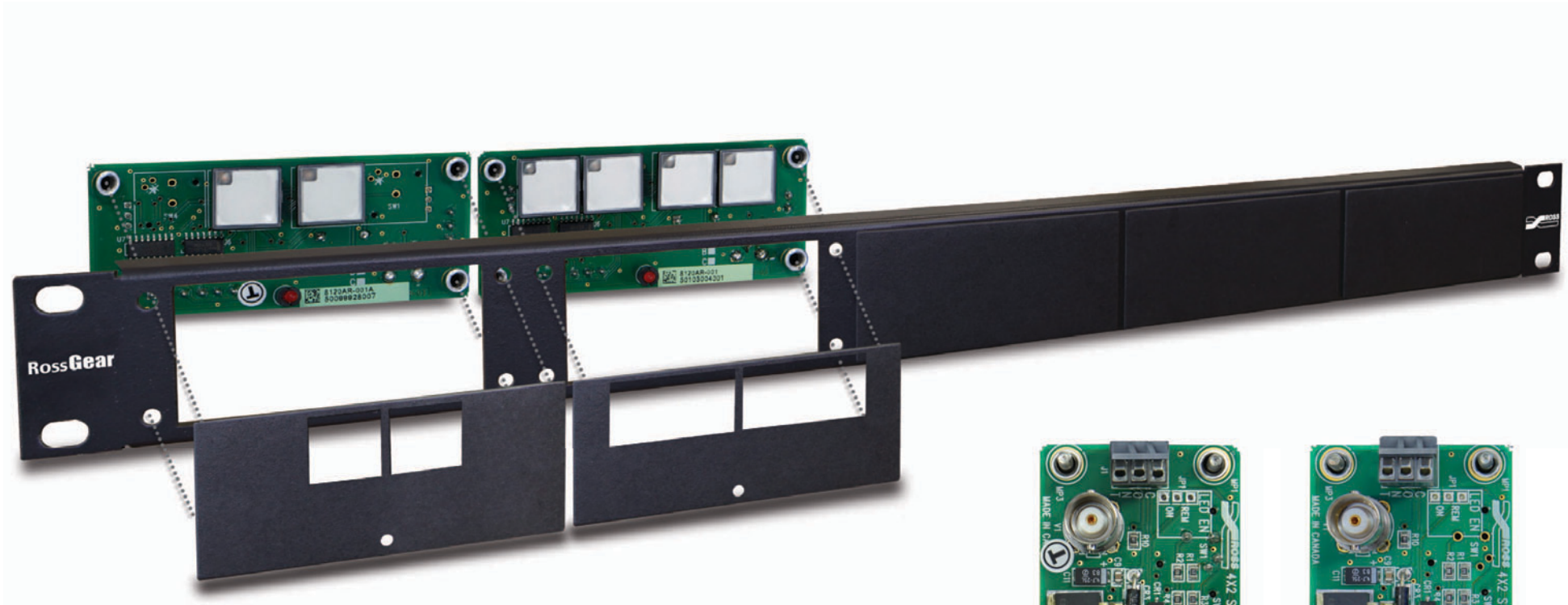
| | |
|---|---|
| -R2A | Unbalanced AES / Analog Video Rear Module or AVS-8764 |
| -R2B | Balanced AES Rear Module for AVS-8764 |



# RCM-8120

## Remote Control Modules

Remote control modules offer standard GPI/O interfaces to control most GPI/O enabled devices, as well as a logic control signal for use with the DSS-8224 Digital Video Switch and the AVS-8764 AES / Analog Video Switch.





RCM-8120


RCM-8120-1

The RCM family of remote control modules provide easy control over the openGear® family of switches in a space saving design.

2 or 4 button models are available for control of the DSS-8224 and the AVS-8624 switches using a discrete logic control connect to the cards using standard BNC video cable. GPI/O is also available for interfacing with many other standard GPI/O controlled devices.

A 2 position hard switch is available for selecting between multiple RCM modules connected to the same control bus, and all modules fit into a convienient 1RU, 19” rack panel.

**RCM-8120:**
Remote Control Module (4 Buttons): controls DSS-8224 and AVS-8764, configurable for 4x1 or Dual 2x1 operation

**RCM-8120-1:**
Remote Control Module (2 Buttons): controls DSS-8224 and AVS-8764

**RCS-8120:**
Dual Remote Control Selector: two interlocked contact closure switches used for simple GPI control or as a delegation switch between 2x RCM-8120 or RCM-8120-1

**MRP-8120:**
Mounting Rack Panel (Holds RCM-8120 & RCM-8120-1): 1RU control panel, holds up to 5 RCM-8120 or RCM-8120-1 Control Modules

**BPM-8120:**
Blank Panel (Cover Plate): blank cover plate for MRP-8120, covers control positions

**DCA-8120:**
In-Desk Mounting Adapter: a rectangular plate for mounting RCM-8120, RCM-8120-1 or RCS-8120 in a desk

## Key Features

- 2 or 4 button control modules
- Discrete logic and GPI/O interfaces
- Multiple modules per control bus
- 2-way selector module
- 19” 1RU mounting rack panel
- Up to 5 modules in a 1RU rack panel
- Blank plates available for rack panel

## Ordering Information

| | |
|---|---|
| RCM-8120 | 4-Button Remote Control Module |
| RCM-8120-1 | 2-Button Remote Control Module |
| RCS-8120 | Dual Remote Control Selector |
| MRP-8120 | 1RU Mounting Rack Panel |
| BPM-8120 | Blank Panel for MRP-8120 |
| DCA-8120 | In-Desk Mounting Adapter |

**MDK-111A-M**
HD / SD Mixer / Keyer with Internal Logo Insertion

**MDK-111A-K**
HD / SD Quad Logo Inserter

DISTRIBUTION AND MONITORING

UP / DOWN / CROSSARC CONVERSION

SYNCHRONIZATION AND DELAY

VIDEO CONVERSION

AUDIO CONVERSION

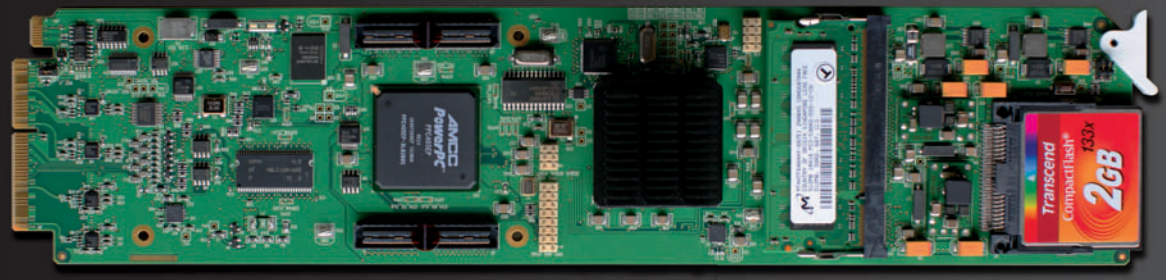
AUDIO EMBEDDING / DE-EMBEDDING

ADVANCED AUDIO PROCESSING

FIBER

SWITCHING

# KEYING AND BRANDING



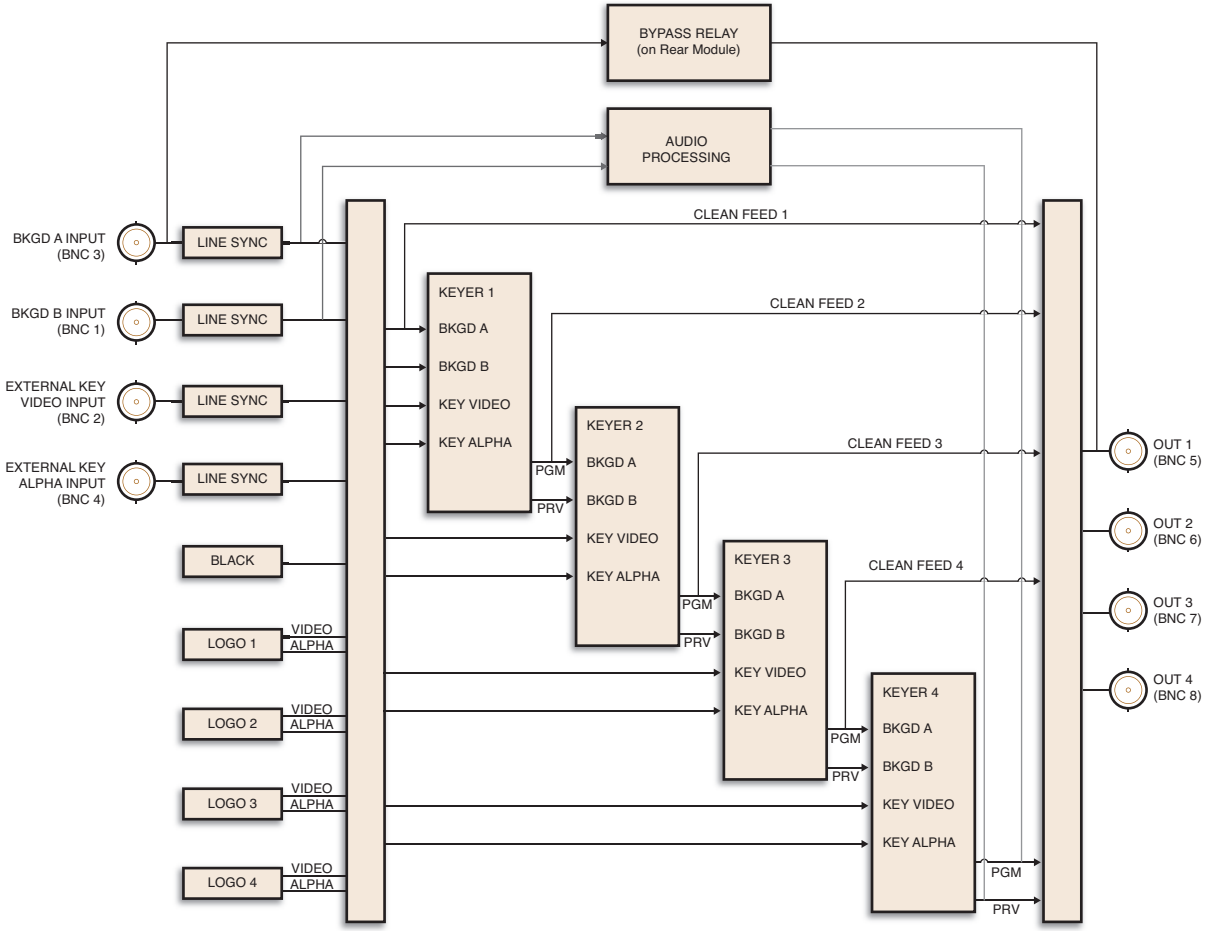

DATA SOLUTIONS

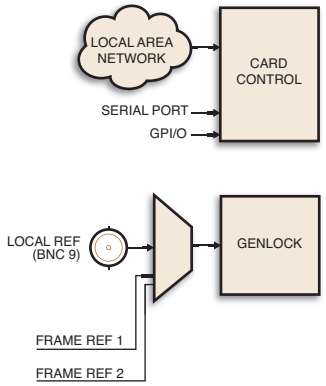
TRANSPORT STREAM MONITORING AND CONVERSION

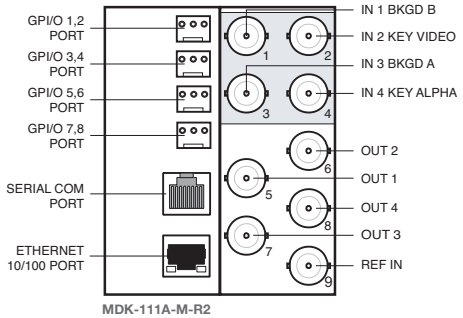
# MDK-111A-M 3G HD SD

## HD / SD SDI Mixer / Keyer with Internal Logo Insertion

4 keyers with simultaneous background mixing, external keying, 3 internal animated logo keys, fade-to-black – with preview.




MDK-111A-M-R2

**Applications**

- Animated Channel Branding Inserter
- Rating Inserter
- Mini-Master Control Switcher
- Downstream Keyer / Branding Engine
- Master Control Bypass Mixer
- Branding / Sponsorship Keyer for Stadiums

The MDK-111A-M is the most advanced HD / SD SDI single card mixer / keyer on the market. The multi-keying function allows simultaneous compositing of both an external key source with up to 3 internally generated logo key sources plus background mixing. For example, the MDK-111A-M can key an external character generator like Ross Video's XPression, over the background video and then key up to 3 internally generated animated logos. Transition control to any layer; BKGD, external key, and / or internal keys is independently controllable. The internal key sources can be any size up to full-screen and can be positioned anywhere. This makes the insertion of trouble slides, content rating bugs, station logos and EAS simple and affordable.

The MDK offers 4 configurable outputs with selections for PGM / PREVIEW and CLEAN. The look-ahead PREVIEW is ideal for live productions providing confidence in quality and accuracy of the next scene to go to air.

The MDK-111A-M offers a wide range of control with a total of 8 configurable GPI/O, M2100 serial interface and full DashBoard Control and Monitoring. The flexible control makes automating logo insertion simple anywhere in the program stream.

Built-in bypass relay from BKGD A to PGM protects your air feed when the device is taken off-line to ensure critical program stream content is not lost.

Compact Flash is provided at the card-edge for local near line storage of logo content with on-board, on-line memory for logo playout. The system is delivered with a 2Gb standard for both Compact Flash and on-line memory.

## Key Features

- HD / SD SDI SMPTE 292M, 1.485Gb/s, SMPTE 259M, 270Mb/s
- Supports 1080PsF/24 and 1080PsF/23.98
- 4 keyers: 1 external key / fill, 3 internal animation keyers
- Bkgd A and Bkgd B inputs with video and audio V-fade and mix with bypass relay for BKGD A to PGM out
- Configurable outputs with Program, Preview, Clean
- Flexible control, 8 GPI/O, M2100 serial
- 2Gb CF storage for multiple still or animated logos, and full screen images
- RossLinq protocol integration
- Independent transition controls for each keyer
- 5-year transferable warranty
- Power: 18.4 watts

## Ordering Information

**HD / SD Mixer / Keyer with Internal Logo Insertion**

| | |
|---|---|
| MDK-111A-M | HD / SD SDI Mixer / Keyer w/ Internal Logo Insertion |

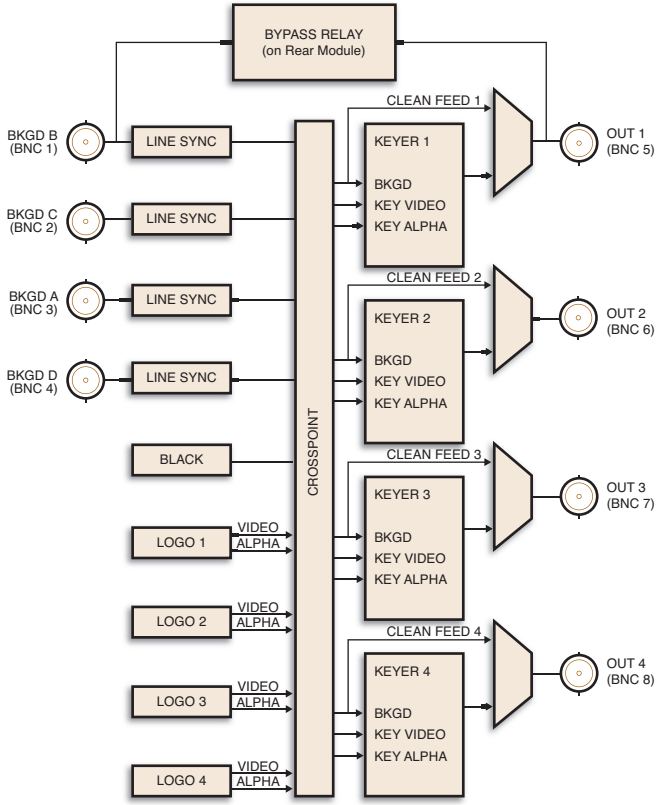
**Rear Module Suffix (ex: [model]-R2)**

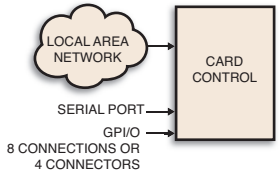
| | |
|---|---|
| -R2 | Rear Module for MDK-111A-M |

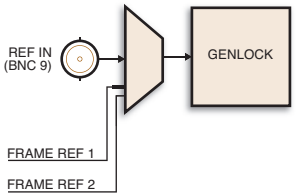
# MDK-111A-K 3G HD SD

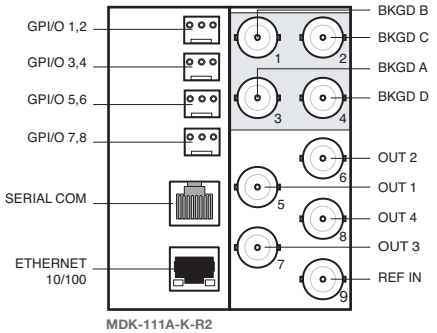
## HD / SD Quad Logo Inserter

4 independent input / output streams with 1 dedicated logo inserter per stream.




MDK-111A-K-R2

**Applications**

- Animated Channel Branding Inserter
- Rating Inserter
- Downstream Bug Inserter
- Trouble Slide Inserter
- Branding / Sponsorship Keyer for Stadiums

The MDK-111A-K is an advanced high density 4 channel quad logo inserter providing cost-effective channel branding. Each of the 4 input streams can independently have an animated logo inserted. For example, the MDK-111A-K can take 4 different input streams, key a logo on each of the streams, outputting 4 streams each with their own unique branding. Each stream has complete independent transition control over the logo insertion. The internal key sources can be any size up to full-frame and can be positioned anywhere on screen. This makes the insertion of trouble slides, content rating bugs, and station ID logos simple and very cost-effective.

The MDK-111A-K offers a total of 8 configurable GPI/O with full DashBoard Control and Monitoring. The GPI/O interface is ideal for simple key in / key out transitions.

Compact Flash is provided at the card-edge for local near line storage of logo content with scalable on-board, on-line memory for logo playout. The system is delivered with 2Gb standard for both Compact Flash and on-line memory.

The MDK-111A-K supports TGA, PNG, BMP and JPG file formats with a dedicated Ethernet connection for transferring images direct to the MDK-111A-K.

## Key Features

- HD / SD SDI SMPTE 259M, 270Mb/s, SMPTE 292M, 1.485Gb/s
- Supports 1080PsF/24 and 1080PsF/23.98
- 4 HD / SD SDI inputs / outputs
- Cost-effective branding
- 4 internal animation keyers, 1 per stream
- LTC input with time-code burn in
- Flexible control with 8 GPI/O and DashBoard
- On-board Ethernet for logo file transfers
- 2Gb CF storage for multiple still or animated logos, and full screen images
- RossLinq protocol integration
- Independent transition controls for each keyer
- 5-year transferable warranty
- Power: 18.4 watts

## Ordering Information

**HD / SD Quad Logo Inserter**

| | |
|---|---|
| MDK-111A-K | HD / SD SDI Quad Logo Inserter |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for MDK-111A-K |

**CDP-100**
VANC Captioning CDP Analyzer

**VAC-100**
VANC Data Authoring Inserter

**GPI-100**
Remote GPI VANC Transmission

**VDD-100**
VANC Data Detector and Trigger

**VRC-100**
VANC Data Monitoring

# DATA SOLUTIONS

DISTRIBUTION AND MONITORING

UP / DOWN / CROSS, ARC CONVERSION

SYNCHRONIZATION AND DELAY

VIDEO CONVERSION

AUDIO CONVERSION

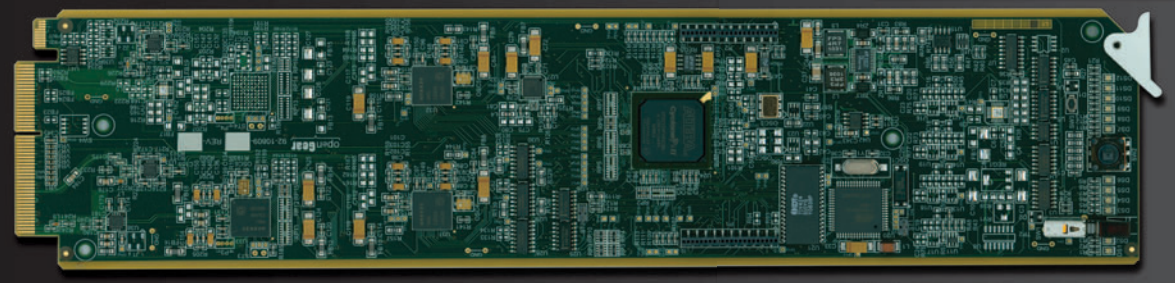
AUDIO EMBEDDING / DE-EMBEDDING

ADVANCED AUDIO PROCESSING

FIBER

SWITCHING

KEYING AND BRANDING

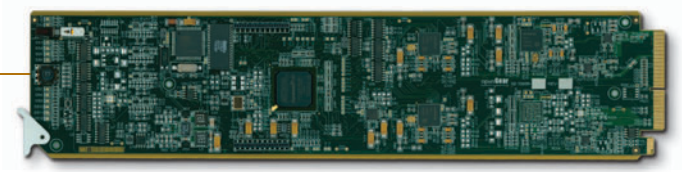


TRANSPORT STREAM MONITORING AND CONVERSION

# CDP-100 HD SD AFD

## VANC Captioning CDP Analyzer

Monitor caption distribution packets for compliance and prevent caption errors within VANC.

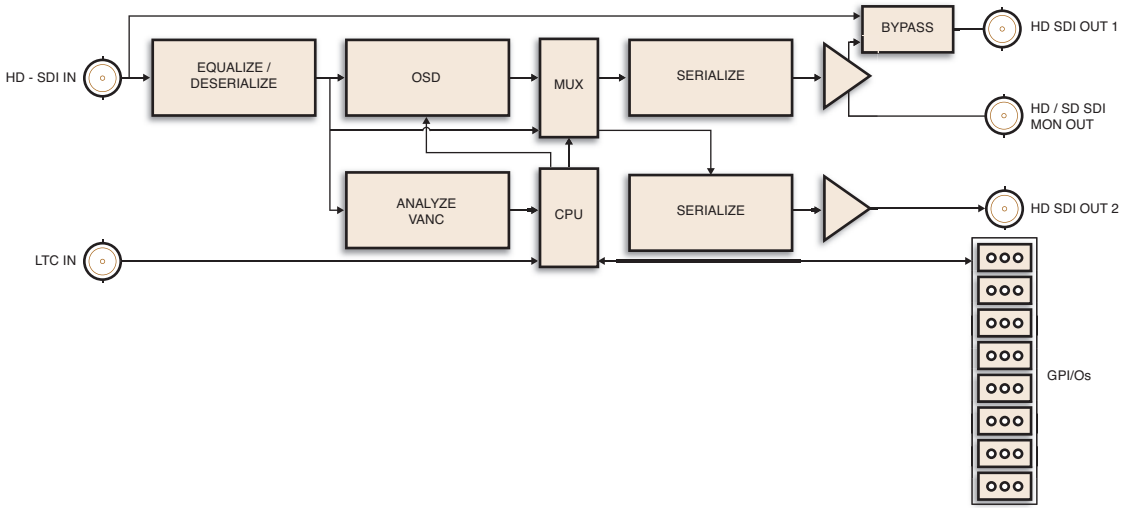


The CDP-100 monitors captioning CDPs in a SMPTE 292 signal for compliance to the SMPTE 334 standard. It reports and logs any variances from the standard.

The card can either run continuously and log errors or stop when it encounters an error. When stopping on an error it can stop immediately or it can stop so that the capture buffer is centered on the error. The product keeps track of when errors occur. Errors can be set to be handled as errors, as warning or to be ignored.

Monitoring can be done as an overlay on the video and / or through the DashBoard interface.

In DashBoard there are controls for running, stopping and clearing errors. There is a log of all errors and the time when each occurred. There is an upload facility to allow the captured CDPs to be moved to a PC for further analysis.




## Key Features

- Use at media ingest to help reject poorly captioned content
- Catching subtle caption errors before they cause problems further down the broadcast chain
- Isolating issues with broadcast equipment and providing a detailed analysis which can be passed on to the manufacturer
- Used by manufacturers to provide compliance with the captioning standards
- 5-year transferable warranty

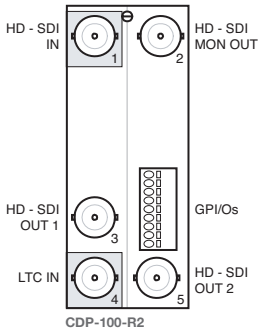
## Ordering Information

**VANC Captioning CDP Analyzer**

CDP-100 CDP Analyzer

**Rear Module Suffix (ex: [model]-R2)**

-R2 Rear Module for CDP-100

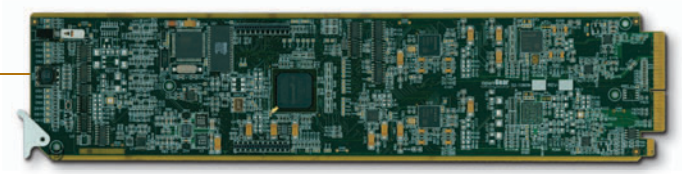


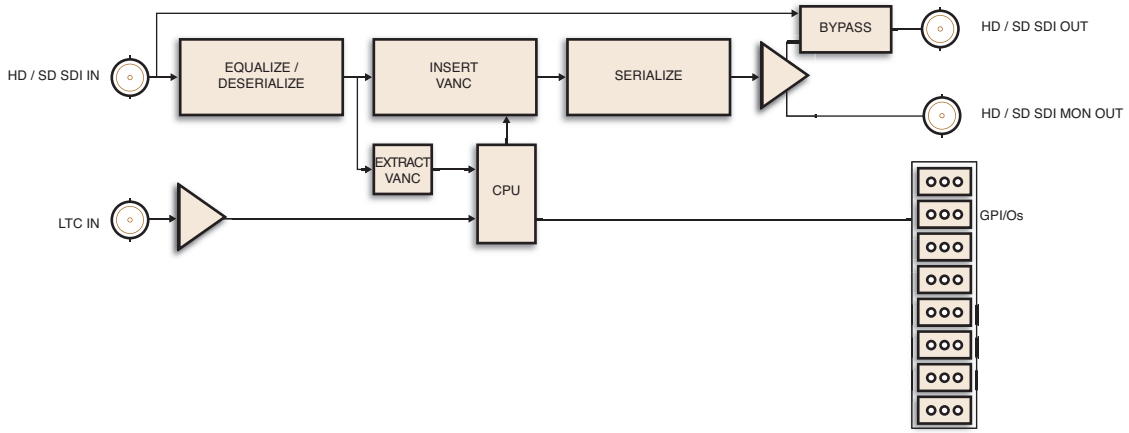

CDP-100-R2

# VAC-100 HD SD AFD

## VANC Data Authoring Inserter

Insert up to 4 metadata or other services into VANC packets, selected and controlled by GPI/O.






The VAC-100 VANC Data Authoring Inserter provides a cost-effective means of authoring and inserting the most common VANC data into a SMPTE 259M or SMPTE 292M signal. The card, through its user interface, allows most types of VANC data to be created and stored within the card. Switches (GPI/Os) can be used to control the VANC data that the card inserts. The card automatically adapts to the video at its input to produce the correct data at its output.

The VAC-100 can author and insert the following VANC data types:

- Active Format Description (AFD) SMPTE 2016
- Audio Metadata SMPTE 2020 method A & B
- Timecode SMPTE 12M-2
- Text Tags to indentify the source of the video
- V-ISAN
- Digital Program Insertion (DPI) Triggers SCTE-104 / SMPTE 2010
- Generic Data for hand-coded data
- Caption Test for testing CEA-708 / SMPTE 334

## Key Features

**Insert into SMPTE 259M and SMPTE 292M:**

- Metadata
- Timecode
- Triggers
- User-defined data

**The VAC-100 helps solve challenges such as:**

- Incorrect audio playout (ex. missing center channel)
- “Postage stamp” images (ex. after two stages of up / down conversion)
- Triggering of downstream equipment
- Closed-caption testing
- 5-year transferable warranty

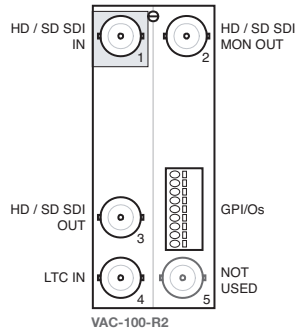
## Ordering Information

**VANC Data Authoring Inserter**

| | |
|---|---|
| VAC-100 | VANC Authoring Inserter |

**Rear Module Suffix (ex: [model]-R2)**

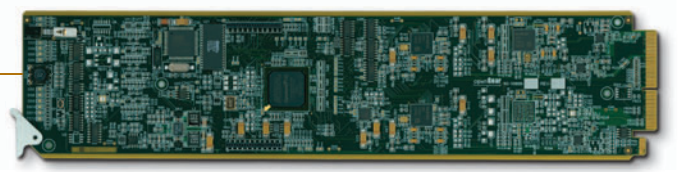
| | |
|---|---|
| -R2 | Rear Module for VAC-100 |

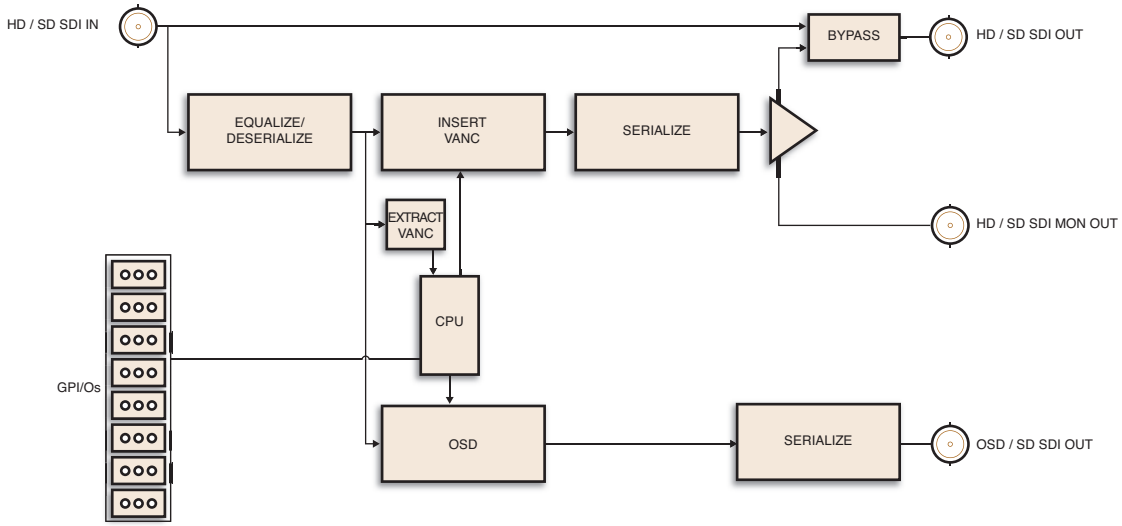


# GPI-100 HD SD

## Remote GPI VANC Transmission

Encodes or decodes up to 8 GPIs as VANC packets.






The GPI-100 enables GPI/O triggers to be carried in the Vertical Ancillary (VANC) data area of an SDI (SMPTE 259M), or HD SDI (SMPTE 292M) video signal, in accordance with SMPTE 291 and other related standards. The GPI-100, as an encoder, reads GPI/O inputs and inserts them into the VANC. As a decoder, it reads the VANC and applies the data to GPI/O outputs. This allows GPI/O enabled equipment to be triggered remotely through the video path.

The GPI-100 provides a simple interface allowing the carriage of GPI/O triggers as part of the video signal. For example:

- The card is set to act as an encoder or a decoder. This determines if the card will read and place the GPI/Os into the VANC (encode) or read the VANC and assert the GPI/Os (decode).
- GPI/O triggers are logged both to the screen and to a log file. The log file can be transferred from the card to the PC.
- Entries in the log file are time stamped. The GPI-100 can be set to use an NTP time server, timecode or its own internal clock as its time reference.
- One GPI-100 can insert trigger for many GPI-100s acting as receivers. There are 8 GPI/Os available and a receiver can act on all or some of them.

## Key Features

**Remote GPI Transmission:**

- Carry 8 GPIs
- Card can be set as encoder or decoder
- 1 encoder can transmit to multiple decoders
- Decoders can selectively respond to some or all GPIs
- Protects equipment from being triggered by other originators
- Logging feature

**The GPI-100 provides remote control of:**

- Station equipment
- Logo insertion equipment
- Switchers
- Replaces obsolete cue tone equipment
- 5-year transferable warranty

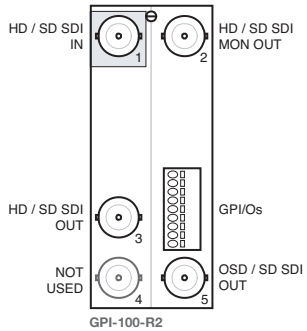
## Ordering Information

**Remote GPI VANC Transmission**

GPI-100 Remote GPI VANC Transmission

**Rear Module Suffix (ex: [model]-R2)**

-R2 Rear Module for GPI-100

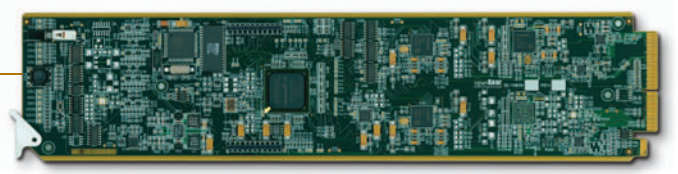



GPI-100-R2

# VDD-100 HD SD AFD

## VANC Data Detector and Trigger

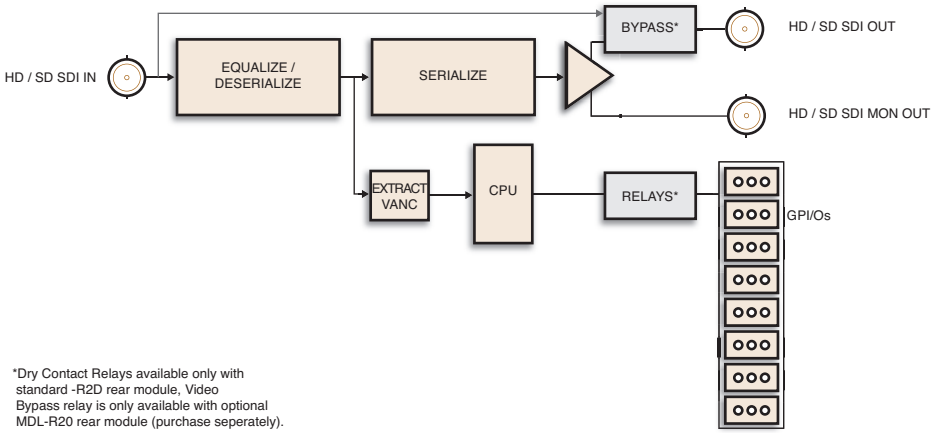
Detect the presence of up to 8 packets in the VANC and signal external devices with GPI/O.



The VDD-100 VANC Data Detector provides a GPI/O trigger based on detecting a specific user-defined packet in the VANC. This makes the VDD-100 ideal for a wide variety of applications including:

- Detecting network branding triggers and controlling existing graphic overlay devices.
- Detecting AFD packets and controling a keyer to replace pillar bars with graphic content.
- Detecting SCTE-104 triggers for digital program insertion

The VDD-100 provides a simple interface allowing the detection of VANC packets in a SMPTE 292M/259M signal.




*Dry Contact Relays available only with standard -R2D rear module, Video Bypass relay is only available with optional MDL-R20 rear module (purchase seperately).

## Key Features

- Detects up to 8 different VANC packets
- Triggers GPI/O outputs
- Matches on DID / SDID and 1 to 20 bytes of packet
- Select which bytes must match with a mask
- Match on packet length or on first ‘n’ bytes
- Remote control of network branding triggers
- Remote control of logo insertion equipment
- Remote control of aspect ratio control
- SCTE-104 decoding
- 5-year transferable warranty

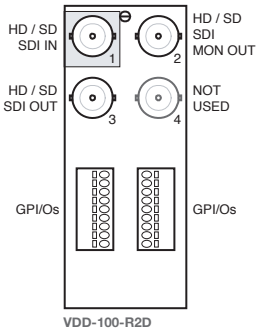
## Ordering Information

**VANC Data Detector and Trigger**

| | |
|---|---|
| VDD-100 | VANC Data Detector and Trigger |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2D | Rear Module w/ Dry Contact Relays for VDD-100 |

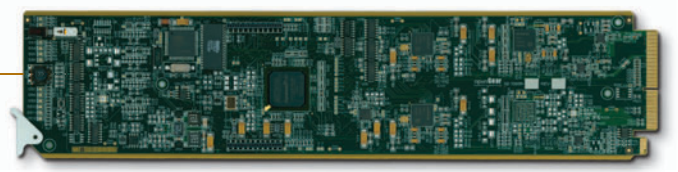


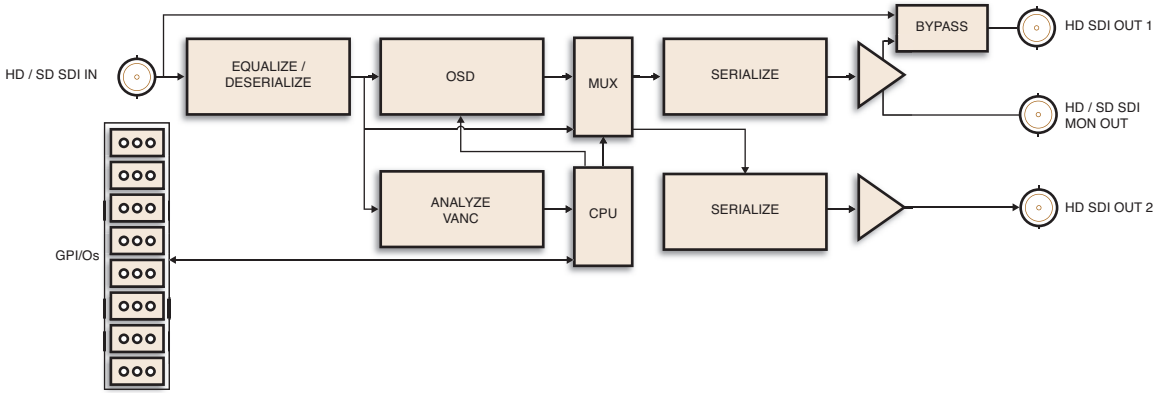

VDD-100-R2D

# VRC-100 HD SD AFD

## VANC Data Monitoring

Monitor and display most common VANC packets with on-screen and GPI/O alerts.






The VRC-100 VANC receiver card provides a simple and highly configurable way of monitoring the VANC data in a SMPTE 292M signal. Information about the VANC content is displayed over the video that contains it. The user has complete control over the data that is decoded and how it is displayed. The card is capable of 8 screen overlay layouts controllable by GPI (switches) or the overlays may be switched automatically on a timed basis. The card detects the presence of the data, whether it is correctly coded and can display the details of the data in a readable form. Alarms in the user interface are triggered if data is not correct or not present. Alarms may be displayed as part of the overlay or may be tied to GPI/Os.

The VRC-100 can monitor such VANC as captioning, CEA-708 including embedded CEA-608; Active Format Description (AFD), SMPTE 2016; Audio Metadata, SMPTE 2020 method A & B; Timecode SMPTE 12M-2; Text Tags, Video Source Identifiers; Redistribution Control (broadcast) Flag, SMPTE RP207; detection of generic data based on DID and SDID; a map showing the contents of the VANC space.

The concept of the VRC-100 is your data your way. Watch your video and overlay as much information about the VANC as you wish to see.

## Key Features

**8 screen overlay layouts of VANC data contained within a SMPTE 292M signal:**

- Closed-captions
- Audio metadata
- AFD
- Timecode
- Broadcast flag
- Triggers
- User-defined data

**The VRC-100 helps solve challenges such as:**

- Closed-caption compliance monitoring
- Monitoring VANC data at ingest
- Confidence checking data insertion
- Trigger and text tag verification
- 5-year transferable warranty

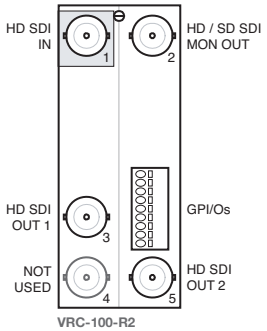
## Ordering Information

**VANC Data Monitoring**

| | |
|---|---|
| VRC-100 | VANC Data and Monitoring |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for VRC-100 |



VRC-100-R2

**ASI-310**
DVB-ASI to SMPTE 310M Converter

**TSD-100**
Transport Stream Detector

**TSM-100**
Transport Stream Monitor

**TSI-100**
Transport Stream Indentifier

DISTRIBUTION AND MONITORING

UP / DOWN / CROSS, ARC CONVERSION

SYNCHRONIZATION AND DELAY

VIDEO CONVERSION

AUDIO CONVERSION

AUDIO EMBEDDING / DE-EMBEDDING

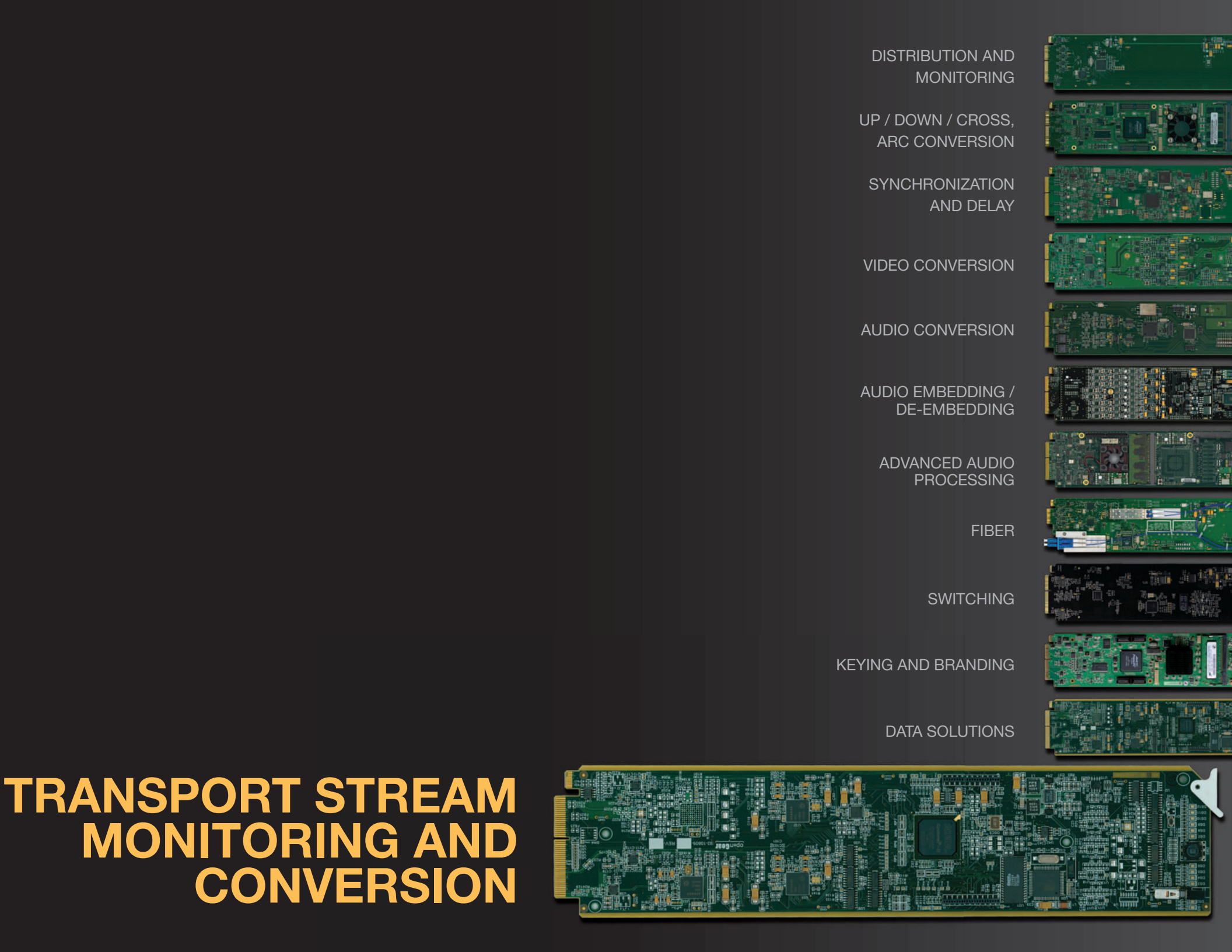
ADVANCED AUDIO PROCESSING

FIBER

SWITCHING

KEYING AND BRANDING

DATA SOLUTIONS

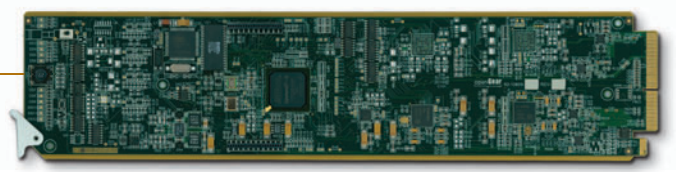


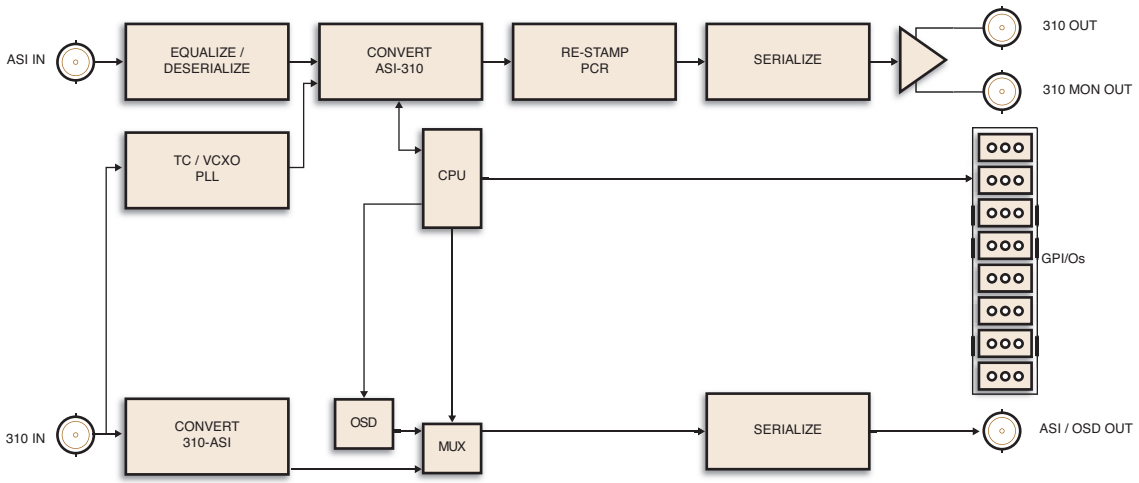
# TRANSPORT STREAM MONITORING AND CONVERSION

# ASI-310 ASI 310

## DVB-ASI to SMPTE 310M Converter

Bi-directional converter between DVB-ASI and SMPTE 310M.






Convert MPEG-2 transport streams between the DVB-ASI and SMPTE 310M formats.

The ASI-310 converter offers a number of unique features to ease integration into your environment.

It can simultaneously convert ASI-to-310 and 310-to-ASI.

The 310 output can be frequency-locked to a reference 310 input or a high-stability on-board temperature-compensated crystal oscillator can be used.

The bit rate is user-selectable (19.392658 or 38.785316Mb/s) as is PCR re-stamping of 310 output stream.

A wide range of ASI input rates can be converted to 310 by adding or deleting null packets as needed to maintain the exact output data rate.

GPI/O outputs can be used to signal error conditions such as loss of video and excessive ASI input rate.

## Key Features

**Simultaneous two-way conversion:**

- Convert ASI to 310 for use by ATSC transmission equipment
- Convert 310 to ASI for use with ASI-based equipment such as analyzers

**The ASI-310 facilitates:**

- The interface from ASI infrastructure to ATSC transmission equipment
- The use of ASI test equipment to inspect 310 signals
- 5-year transferable warranty

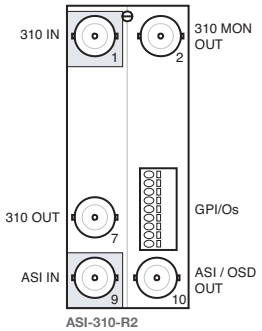
## Ordering Information

**DVB-ASI to SMPTE 310M Converter**

| | |
|---|---|
| ASI-310 | ASI to 310 and 310 to ASI Converter |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2 | Rear Module for ASI-310 |

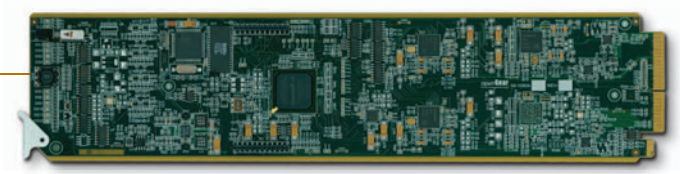


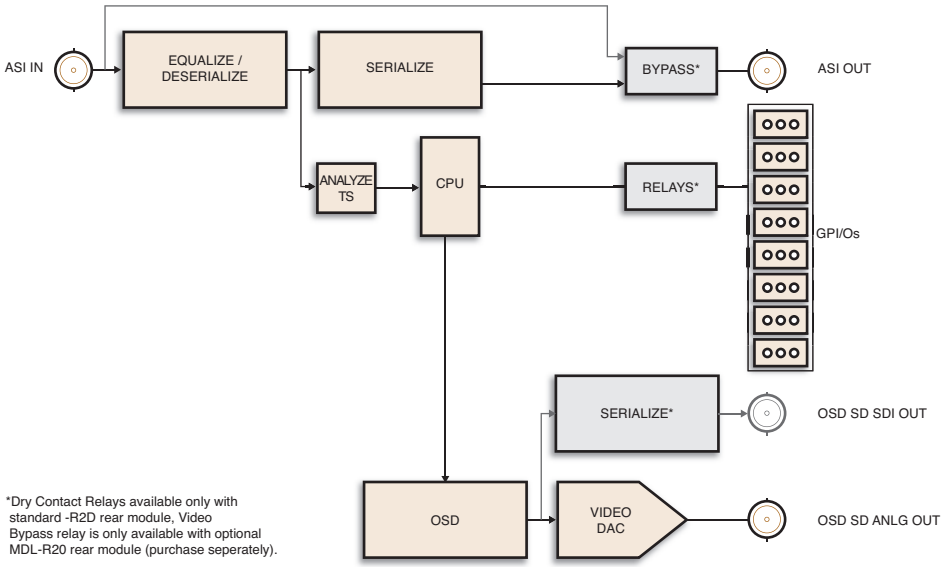
ASI-310-R2

# TSD-100 ASI

## Transport Stream Detector

Detect and monitor up to 8 PIDs assigned to SCTE-35 triggers and signal external devices with GPI/O.






*Dry Contact Relays available only with standard -R2D rear module, Video Bypass relay is only available with optional MDL-R20 rear module (purchase seperately).

The TSD-100 analyzes an MPEG-2 transport stream to identify occurrences of selected components. For example, when SCTE-35 triggers are carried in operator specified PIDs, the TSD-100 can simply use the presence of these PIDs or use the splice commands contained within, to assert a GPI/O output to alert an operator or downstream equipment to the occurrence of the SCTE-35 trigger.

The TSD-100 provides a number of innovative tools to simplify your workflow. For example:

- In “SCTE-35 trigger” mode, GPI/O outputs are controlled by splice-insert commands.
- In “PID detected” mode, each GPI/O output is triggered by the arrival of a transport stream packet with the selected PID, and is then negated after a user-specified timeout.
- Each GPI/O output has an associated user-specified timeout. This lets you control the duration of the output pulse to meet your system requirements.
- Each GPI/O output can indicate either the presence or the absence of the specified PID.

## Key Features

**Detect selected components of an MPEG-2 Transport Stream:**

- Digital Program Insertion Triggers (notification of splice points) (SCTE-35)
- User-defined data / triggers

**The TSD-100 facilitates:**

- Confidence checking of digital insertion triggers prior to distribution
- Notification to monitoring systems
- Triggering of downstream equipment
- Maintains DPI trigger log that can be consulted through DashBoard and downloaded to a PC
- 5-year transferable warranty

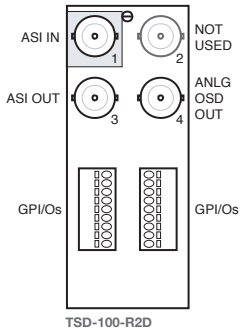
## Ordering Information

**Transport Stream Detector**

| | |
|---|---|
| TSD-100 | Transport Stream Detector |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2D | Rear Module w/ Dry Contact Relays for TSD-100 |

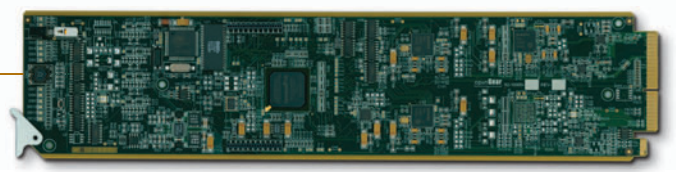



TSD-100-R2D

# TSM-100 ASI

## Transport Stream Monitor

MPEG transport stream monitoring with GPI/O alarming.

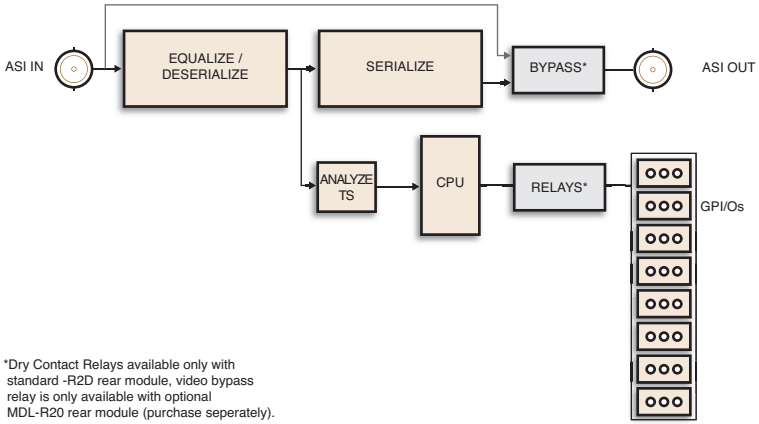


The TSM-100 analyzes an MPEG-2 transport stream for compliance with standards and recommended practices, including ATSC A/78, TR 101 290, and SCTE-142.

TSM-100 inspects the presence and timing of critical MPEG components and verifies the integrity of the overall stream. It classifies each of the components based on the A\78 categories:

- TNC - Technically Non-Conformant
- QOS - Quality of Service
- CM - Component Missing
- POA - Program Off Air
- TOA - Transport Stream Off Air as well as OK

The status of various components is summarized in the overall quality level indicator, and an alarm can be generated to indicate a specified level. Simple alarm status and rich analysis information is also available.




*Dry Contact Relays available only with standard -R2D rear module, video bypass relay is only available with optional MDL-R20 rear module (purchase seperately).

## Key Features

- Monitor MPEG-2 transport stream quality
- Generate alarms if error level exceeds a specified threshold

**The TSM-100 facilitates:**

- Unattended confidence monitoring of transport streams
- Monitoring of multiple streams within an openGear® frame
- Notification to other monitoring systems
- 5-year transferable warranty

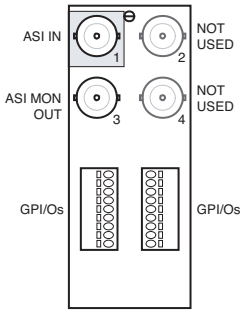
## Ordering Information

**Transport Stream Monitor**

| | |
|---|---|
| TSM-100 | Transport Stream Monitor |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2D | Rear Module w/ Dry Contact Relays for TSM-100 |

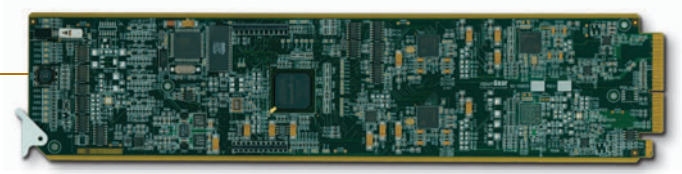



TSM-100-R2D

# TSI-100 ASI

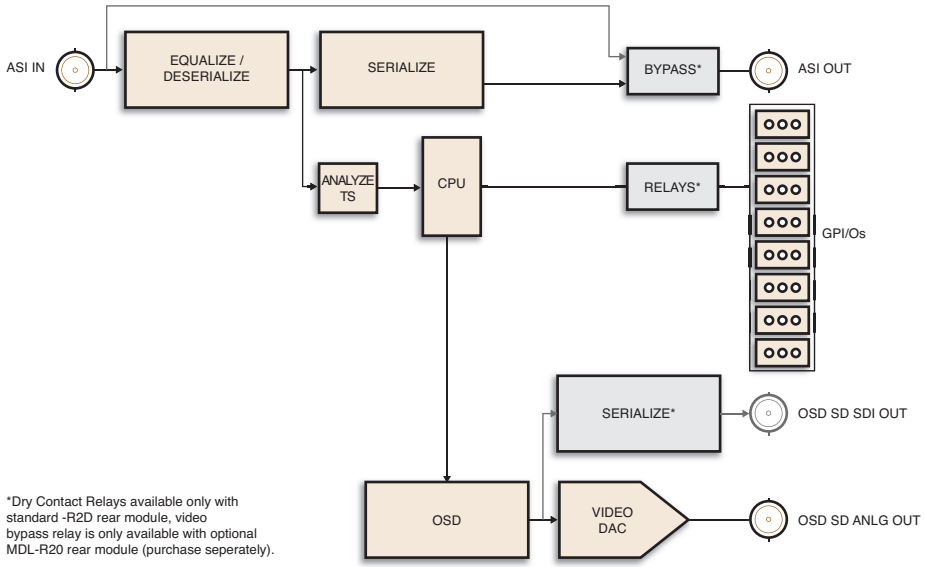
## Transport Stream Identifier

Monitor and signal a remote device when an incorrect transport stream or no transport stream is present.



The TSI-100 monitors the ASI transport stream and provides a GPI/O output when the TSID is not correct. This signal may be used to control other devices or to signal the fault.

The TSI-100 is ideally suited for use in remote television broadcast translators to mute or power off the re-transmitter when the main broadcast goes off the air. It may also be used in a cable head-end for the same purpose.




*Dry Contact Relays available only with standard -R2D rear module, video bypass relay is only available with optional MDL-R20 rear module (purchase seperately).

## Key Features

- Verify transport stream is correct by inspecting its TSID
- GPI/O output to signal a problem or control another device
- Ideal for muting translators when main transmitter is off air
- Connection for both normally open and normally closed operation

**The TSI-100 provides remote control of:**

- Transmitters in a translator
- Cable head-end channel input equipment
- Signals a remote device or alarm when an incorrect transport stream or no transport stream is present
- Simple setup, enter the TSID of the transport stream
- 2 GPI/Os provide both normally open and normally closed signaling
- Unattended operation, set it and forget it
- 5-year transferable warranty

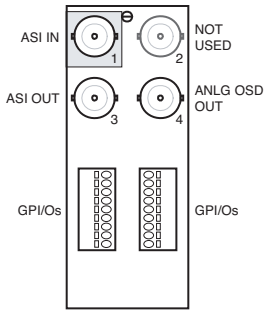
## Ordering Information

**Transport Stream Identifier**

| | |
|---|---|
| TSI-100 | Transport Stream Identifier |

**Rear Module Suffix (ex: [model]-R2)**

| | |
|---|---|
| -R2D | Rear Module w/ Dry Contact Relays for TSI-100 |




TSI-100-R2D

# OPA-8380A

## General Purpose Adapter

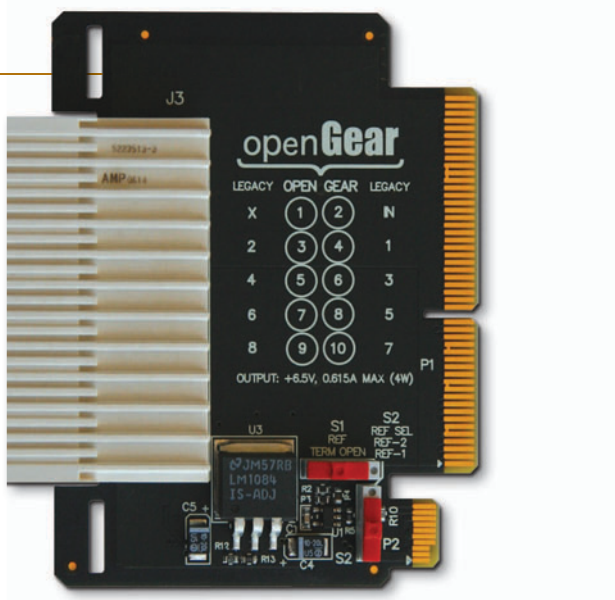
Leaving no customer behind!

The OPA-8380A openGear® adapter is designed to allow existing customers, with RossGear 8000 Series products, to easily migrate existing solutions to the DFR-8321 frame.

The OPA-8380A can also be used in situations where cost-effective SD only solutions are required.

The adapter supports the products listed and may be ordered separately or with an 8000 Series card by using the –OG extension.

Note: The OPA-8380A is not controllable under the DashBoard Control System.




# OPA-8381

## Analog Audio Adapter

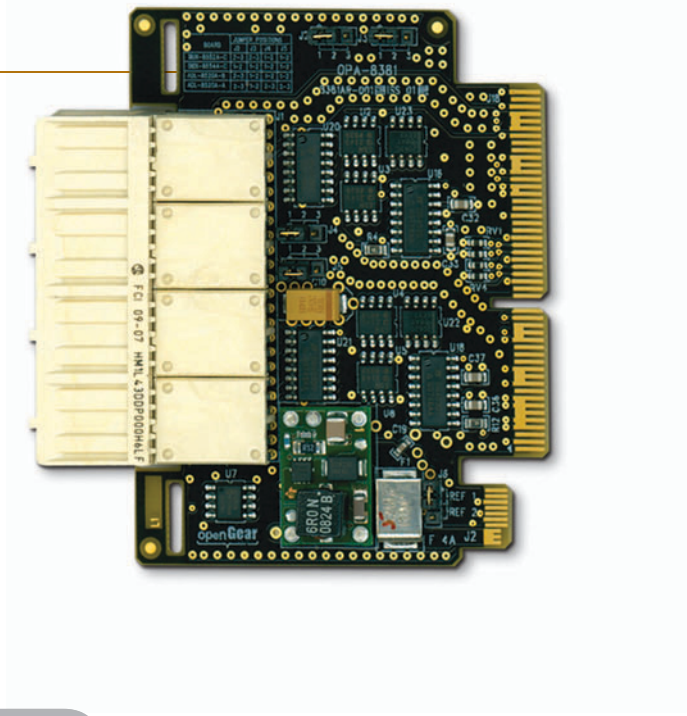
Leaving no customer behind!

The OPA-8381 openGear® adapter is designed to allow existing customers, with RossGear Analog Audio 8000 Series products, to easily migrate existing solutions to the DFR-8321 frame.

The OPA-8381 can also be used in situations where cost effective SD only solutions are required.

The adapter supports the products listed and may be ordered separately
or with an 8000 Series card by using the –OG extension.

Note: The OPA-8381 is not controllable under the DashBoard Control System.



# 8000 SERIES PRODUCTS SUPPORTED BY THE openGear® PLATFORM

## Distribution and Monitoring

| | |
|---|---|
| SRA-8001B | Serial Auto-Reclocking Equalizing Amplifier |
| SEA-8003A | Serial Equalizing Amplifier |
| DSA-8004A | Dual Serial Equalizing Amplifier |
| DRA-8009 | Dual Reclocking Amplifier |
| CMA-8011A | SDI Component Monitoring and Reclocking Amplifier |
| CMA-8011A-7 | SDI Component Monitoring and Reclocking Amplifier |
| QMA-8044 | Quad SDI to Analog Composite Video Monitoring Amplifier |
| VTA-8060 | Video TruckAMP |
| VEA-8007A | Analog Video Equalizing Amplifier |
| UDA-8005A | Analog Utility Distribution Amplifier |
| ADA-8501 | AES / EBU Reclocking Distribution Amplifier |
| ADA-8503 | AES / EBU Fanout Distribution Amplifier |
| ADA-8504 | Dual AES / EBU Reclocking Distribution Amplifier |

## Synchronization and Delay

| | |
|---|---|
| DVB-8020B-S | SDI Frame Synchronizer |
| DVB-8020B-D | SDI Digital Delay Line |
| ADL-8520A | AES / EBU Auto-Tracking Audio Delay Unit |
| ADL-8520A-A | Adds 2 Analog Input Channels to ADL-8520A |
| ADL-8520A-B | Adds Analog Output Signals to ADL-8520A-A |

## Video Conversion

| | |
|---|---|
| DAC-8016A Series | SDI to Analog Composite Converter |
| ADC-8032B Series | Analog Composite to SDI Converter |
| ADC-8033A Series | Analog Component to SDI Video Converter |
| ADC-8035 | Dual Analog Composite to SDI Converter |

## Audio Conversion, Embedding / De-Embedding

| | |
|---|---|
| MUX-8552A | AES / EBU Multiplexer |
| MUX-8552A-C | adds Analog Audio Output |
| DMX-8554A | AES / EBU Demultiplexer |
| DMX-8554A-C | adds Analog Audio Output |

## Keying

| | |
|---|---|
| CDK-111A-M | SDI Digital Mixer / Keyer |
| CDK-111Lite | SDI Digital Mixer / Keyer |

ROSS

# INDEX

## Distribution and Monitoring



## Up / Down / Cross, ARC Conversion



## Synchronization and Delay



## Video Conversion



## Audio Conversion

## Audio Embedding / De-Embedding



## Advanced Audio Processing



## Fiber

## Switching



## Keying and Branding



## Data Solutions



## Transport Stream Monitoring and Conversion



## openGear® Adapters

## openGear Care

Ross Video has a complete range of technical services available to ensure that your openGear terminal equipment installation is a success.

**Operational Training** is available either at Ross headquarters or on-site at your location. Experienced Ross operators will teach your staff to get the most out of your new terminal equipment, and enhance your productions.

**Commisioning** is a service to help get your openGear Terminal Equipment properly configured and installed. This service is performed by factory trained Ross technical staff.

**Technical Training** can be provided at Ross Video or on-site at your location. Technical training will teach your engineering staff the technical details of the terminal equipment you have purchased. Signal flow, system configuration and routine maintenance procedures are some of the topics covered.

openGear comes with a standard 5-year transferable warranty.

**Technical** advice is available simply by telephone, fax or email to Ross Video **- free for the life of your system.**

openGear®



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**Furio / Cambot**
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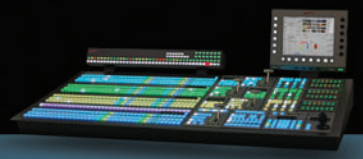

**Vision QMD / Octane, Carbonite, and CrossOver**
Production Switchers

**XPression**
3D HD CG & Motion Graphics

**openGear**
Terminal Equipment

**BlackStorm**
Video Servers

**OverDrive**
Automated Production Control System

**NK Series**
Routing Systems

**Inception**
Social Media Management