Infrastructure

Infrastructure Quick Reference

Infrastructure

openGear 3.0

High Power 22 Slot

openGear®

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The openGear® 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.

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 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 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!
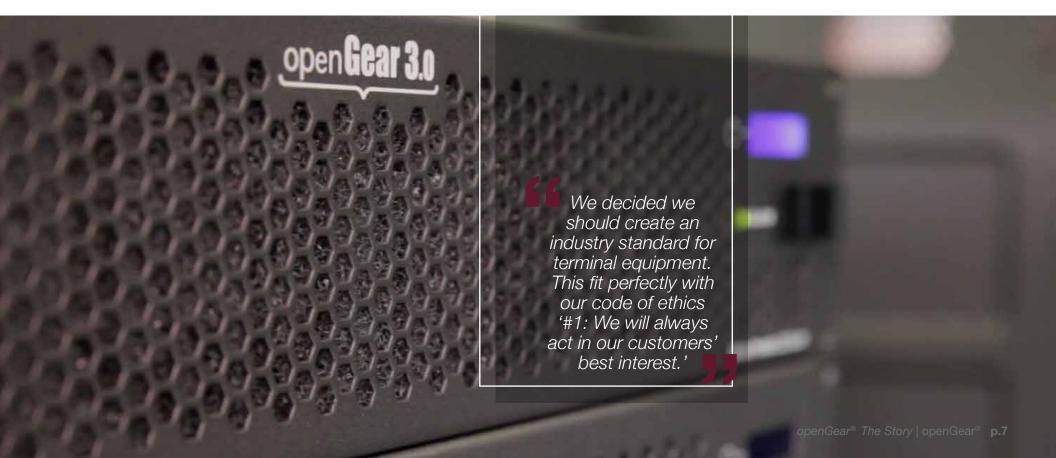
The openGear® ecosystem has grown even larger with the addition of openGear® Connect. openGear® Connect opens the DashBoard control and monitoring system beyond openGear® frame-based products. openGear® Connect is for products that for some reason don't make sense as openGear® cards but could benefit 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 multiple industry awards, more than 60 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.

> "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.'"

openGear® 3.0
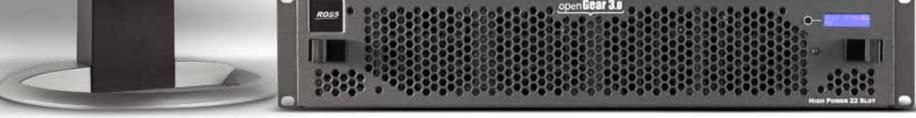
OG3 High Density Modular Frame
High Power, High Speed, and Unsurpassed Flexibility.

Superior flexibility, power and control from the 3rd generation of the openGear® platform. The broadcast world's first and only open-hardware platform, and your platform of choice for your broadcast infrastructure needs.

openGear® 3.0 is the evolution of the industry's first and only open hardware and software platform. The next generation openGear® frame, OG3-FR combines function, flexibility and power with advanced features like high powered 450 watt redundant power supplies, Gigabit Ethernet access to every card slot, 20 openGear® card slots, dedicated 21st and 22nd card slots for network control and internal reference distribution, and a front LCD display for easy frame, IP address and fault identification.

2RU Frame

The OG3-FR is a 2RU modular frame, designed to accommodate up to 20 cards from the openGear® family.
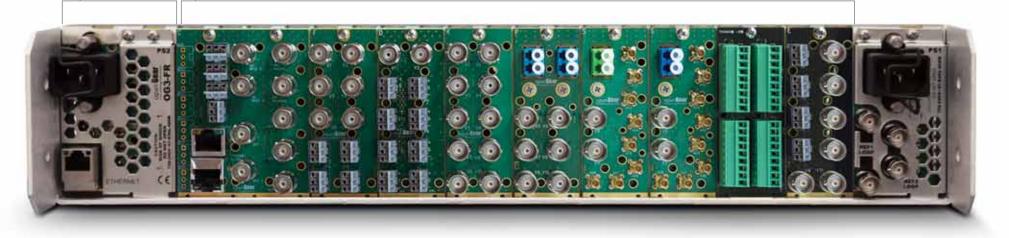
Common Frame Features

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.

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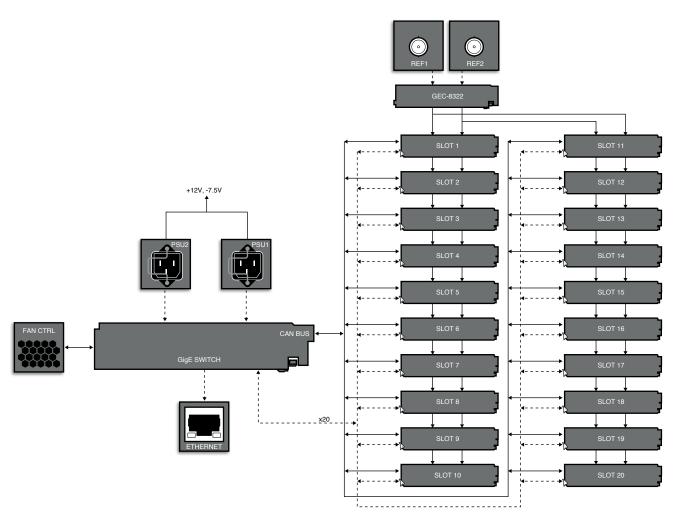
Separate rear I/O modules are ordered with card modules offering a mix of BNC, fiber optic and other connections as required. These rear modules are quick and easy to install.

openGear® 3.0

openGear® High Density Modular Frame
The most flexible frame for all your terminal equipment needs.

Gigabit Ethernet

The openGear® 3.0 frame offers optional gigabit Ethernet to every slot within the OG3-FR chassis, enhancing communication speed, and connection options to all openGear® cards. The openGear® 3.0 frame provides more communication options and flexibility to openGear® card manufacturers; ultimately enhancing the openGear® platform and experience. The 21-port Ethernet switch, built in to the frame's network control card, future-proofs the openGear® 3.0 platform for users and openGear® partners for years to come. Gigabit Ethernet is only available with the Advanced Network Control option.

SNMP

openGear® supports SNMP (Simple Network Management Protocol) 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.

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. DataSafe is only available with the advanced networking control option.

Modular Frame Architecture
The OG3-FR offers the flexibility of independent rear modules for connectivity to a wide array of interfaces such as BNC, twisted-pair audio, and fiber. The independent rear modules are available in different I/O configurations for select cards, including high density split rear modules allowing up to 20 independent openGear® cards in the OG3 frame.

Robust Power Supplies
The OG3-FR can accommodate 2 front-loaded PS-OG3 power supplies. The split outside location of the power supplies makes installation a breeze when utilizing an alternate phase power source. A single 450 watt supply can fully power a loaded frame, and 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 OG3-FR frame has been designed with an advanced cooling architecture with increased ventilation. Front door mounted cooling fans provide forced air cooling to all cards with front to back airflow. An intelligent fan controller adjusts fan speed with changes in power supply loading and temperature. The front door assembly can be removed without tools for quick and easy maintenance.

Control
The OG3-FR 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-0G3-N, adds an on-board Gigabit Ethernet switch, with GigE access to each of the 20 processing card slots. The advanced networking control also allows multiple DashBoard connections and adds advanced features such as DataSafe and optional SNMP.

Key Features
- Robust 450 watt power supply with integral cooling
- Standard Ethernet connectivity
- Optional advanced Ethernet based frame controller with GigE to every slot
- Optional SNMP control and monitoring
- 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
- Front LCD display for name, IP and fault identification
- 2 independent looping references with connection to each card slot
- Optional redundant power supply, hot-swappable for 24/7 operation
- 5-year transferable warranty

Ordering Information

OG3-FR-C	openGear® 3.0 Frame with Cooling
OG3-FR-CN	openGear® 3.0 Frame with Cooling and Advanced GigE Network Control
OG3-FR-CNS	openGear® 3.0 Frame with Cooling, Advanced GigE Network Control and SNMP
PS-OG3	Redundant or Spare 450 watt Power Supply
CFM-OG3	OG3 Spare 2RU Cooling Fan Kit
AFK-OG3	OG3 Air Filter Replacement Kit
FSB-OG3	OG3 Rear Support Bars and Brackets
MFC-OG3-N	OG3 Advanced Network Controller

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.

openGear® 3.0 and DashBoard v6 combine to give you unparalleled, flexible control over openGear® products. 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. PanelBuilder allows users to create custom graphical user interfaces, combining multiple control and status parameters from any combination of cards and frames on a single view. 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 GUI's give 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.

PanelBuilder™

PanelBuilder™ allows users to create custom control interfaces with any combination of openGear® control and monitoring parameters from any combination of openGear® cards and frames. Users can build graphical navigation layouts based on signal flow or equipment location for efficient device and signal monitoring. Custom control panels layouts can provide user, or function specific control windows for specific events or situations that require quick access to various parameters from multiple cards.

Features

- Create custom control layouts
- Group various controls together from multiple products
- Create graphical navigation layouts

Advanced Tree View

DashBoard Tree View 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

... More Than Just openGear®

DashBoard's unsurpassed power comes from its ability to go beyond openGear® control. Now used as a primary control system for Ross Video's NK Routing Systems, BlackStorm Video Servers, and Carbonite Live Production Switchers, DashBoard offers a common control and monitoring platform for a range of Ross Video products.

openGear® connect takes DashBoard even further with the ability to integrate 3rd party web interfaces right in DashBoard.

Highlights

- Control and monitor the Infrastructure product line
- Live production control with Carbonite's LiveAssist™ and BlackStorm Video Server Control
- Control and monitor across the entire openGear® family of products
- Store and access web GUIs for any 3rd party device

Carbonite LiveAssist™

PanelBuilder™

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 v6

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 v6 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.
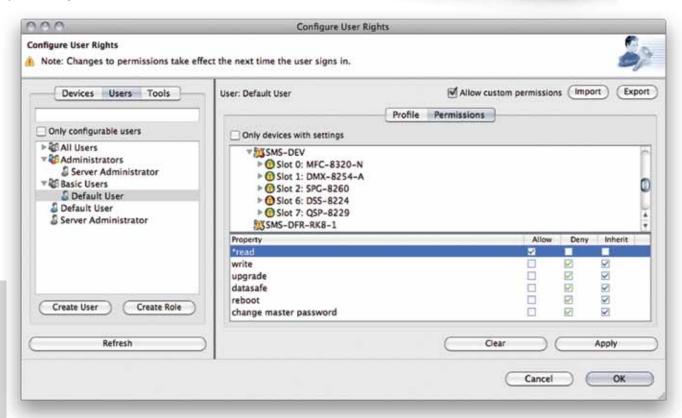
Ordering Information

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 OG3-FR 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 OG3-FR 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-8602 openGear® card is designed as a 1x8 DA.
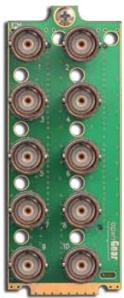
SRA-8602-R2
In this configuration, the rear module (-R2) is designed with 1 openGear® card connection and offers 10 BNCs to the openGear® card allowing the operation as a 1x8 DA with up to 10 solutions in a single frame.
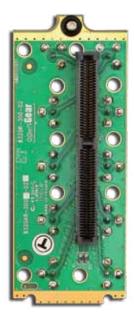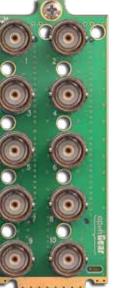
SRA-8602-R2S
In this configuration, the rear module (-R2S) is designed with 2 openGear® card connections and offers 5 BNCs to each openGear® card. This allows the SRA-8602 to operate as a 1x4 DA with up to 20 independent solutions in a single frame.

SRA-8602-R2

SRA-8602-R2S
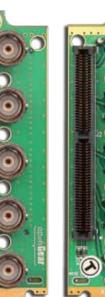
Frame Configuration Tool
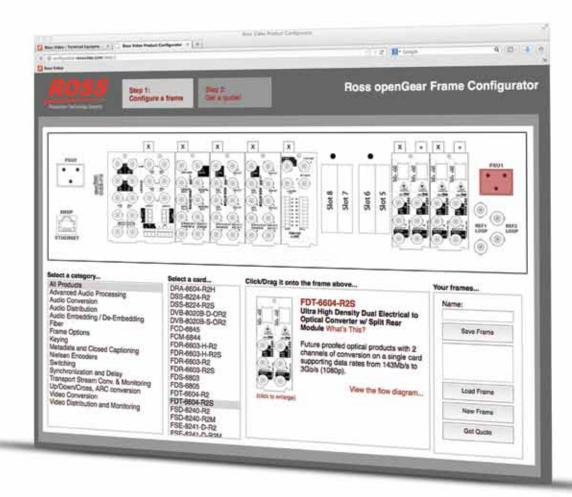
A simple intuitive way to configure a Ross Video openGear®
frame with Ross Video products and accessories.

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
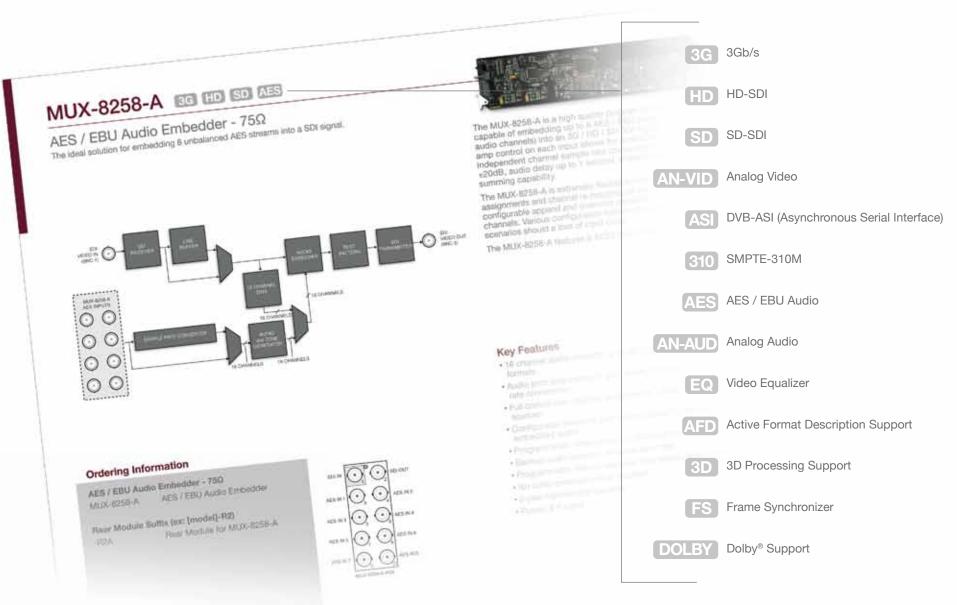
http://configurator.rossvideo.com

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-8602
High Density 3G Reclocking Amplifier

SEA-8603
High Density HD Equalizing Amplifier

DRA-8604
Dual High Density 3G Reclocking Distribution Amplifier

DEA-8605
Dual HD High Density Equalizing Distribution Amplifier

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

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

QRA-8608
Quad High Density 3G Reclocking Distribution Amplifier

QEA-8609
Quad High Density HD Equalizing Distribution Amplifier

UDA-8705A
Analog Utility Distribution Amplifier

VEA-8707A
Analog Video Equalizing Distribution Amplifier

QSP-8229A
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 & Monitoring

Up / Down / Cross, ARC Conversion

Synchronization & Delay

Video Conversion

Audio Conversion

Audio Embedding / De-Embedding

Advanced Audio Processing

Fiber

Switching

Keying & Branding

Data Solutions

Transport Stream Monitoring & Conversion

SRA-8602 `3G` `HD` `SD` `ASI`

High Density 3G Reclocking Amplifier

3G / HD / SD SDI reclocking distribution amplifier with auto fail-over.

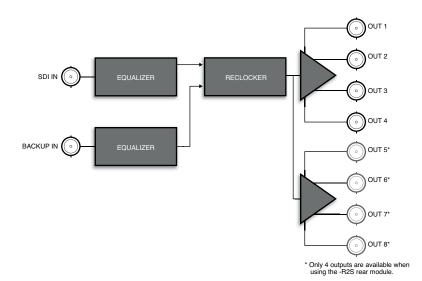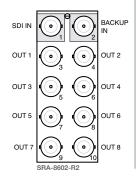The SRA-8602 is a single channel, 3G distribution amplifier capable of equalizing and reclocking all common serial digital signals, including 3G / HD / SD SDI. Non-inverting output drivers make this ideal for distributing DVB-ASI signals as well.

SRA-8602 can be used as a 1x8 DA, using the standard –R2, 10 BNC rear module, or in space critical environments as a high density 1x4 DA, when paired with the –R2S split rear module. This configuration allows for up to 20 1x4 DAs in a single openGear® frame, using 20 cards.

The failover feature enables the SRA-8602 to use a backup input source when the primary input source is lost. Once the SRA-8602 determines that the primary input source is stable for at least 3 seconds, it automatically switches back to the primary source. The –R2 standard rear module is required for auto fail-over. LED indicators at the front of the module identify the presence of incoming video, and the data rate for each independent channel.

Diagram

SDI IN → EQUALIZER → RECLOCKER → OUT 1, OUT 2, OUT 3, OUT 4
BACKUP IN → EQUALIZER → OUT 5*, OUT 6*, OUT 7*, OUT 8*

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

Ordering Information

High Density 3G Reclocking Amplifier

SRA-8602	3G / HD / SD SDI Reclocking DA

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

-R2	Rear Module for 1x8 & ACO
-R2S	Split Rear Module for 2x SRA-8602 (1x4)

Key Features

• 1x8 / 1x4 distribution amplifier
• Equalizes and reclocks all SDI signals from 143Mb/s to 2.97Gb/s
• Non-inverting outputs perfect for DVB-ASI distribution
• Auto failover function (using –R2 rear module)
• Automatic detection of incoming data rate
• Standard and split rear module I/O options
• Up to 10 channels of 1x8 or 20 channels of 1x4 in a single frame
• LED indicators for signal presence and data rate for each channel
• Excellent input / output return loss specifications
• Up to 20 SRA-8602 cards in the OG3-FR frames (using –R2S rear modules)
• 5-year transferable warranty

Rear Module Diagrams

SRA-8602-R2: SDI IN (1), BACKUP IN (2), OUT 1 (3), OUT 2 (4), OUT 3 (5), OUT 4 (6), OUT 5 (7), OUT 6 (8), OUT 7 (9), OUT 8 (10)

SRA-8602-R2S: CARD 2 / CARD 1 — SDI IN (1), SDI IN (2), OUT 1 (3), OUT 1 (4), OUT 2 (5), OUT 2 (6), OUT 3 (7), OUT 3 (8), OUT 4 (9), OUT 4 (10)

SEA-8603 `HD` `SD` `ASI`

High Density HD Equalizing Amplifier
HD / SD SDI equalizing distribution amplifier with auto fail-over.
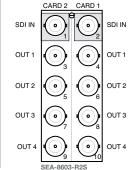
The SEA-8603 is a single channel, HD distribution amplifier capable of equalizing all common serial digital signals, including HD / SD SDI. Non-inverting output drivers make this ideal for distributing DVB-ASI signals as well.

SEA-8603 can be used as a 1x8 DA, using the standard –R2, 10 BNC rear module, or in space critical environments as a high density 1x4 DA, when paired with the –R2S split rear module. This configuration allows for up to 20 1x4 DAs in a single openGear® frame, using 20 cards.

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

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

Key Features
- 1x8 / 1x4 distribution amplifier
- Equalizes all SDI signals from 143Mb/s to 1.485Gb/s
- Non-inverting outputs perfect for DVB-ASI distribution
- Automatic detection of incoming data rate
- Standard and split rear module I/O options
- Up to 10 channels of 1x8 or 20 channels of 1x4 in a single frame
- LED indicators for signal presence and data rate for each channel
- Excellent input / output return loss specifications
- Up to 20 SEA-8603 cards in the OG3-FR frames (using –R2S rear modules)
- 5-year transferable warranty

Ordering Information
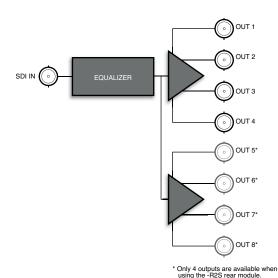
High Density HD Equalizing Amplifier

SEA-8603	HD / SD SDI Equalizing DA

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

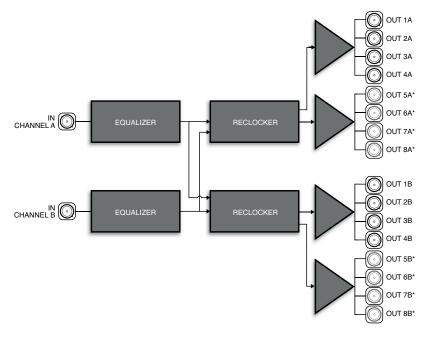|	
-R2	Rear Module for 1x8 & ACO
-R2S	Split Rear Module for 2x SRA-8602 (1x4)

DRA-8604 `3G` `HD` `SD` `ASI`

Dual High Density 3G Reclocking Distribution Amplifier

2 independent channels of 3G / HD / SD SDI distribution with optional high density configuration.
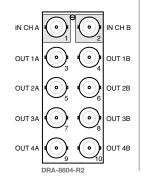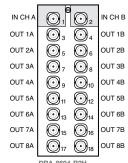
The DRA-8604 is a 2 channel, 3G distribution amplifier capable of equalizing and reclocking all common serial digital signals, including 3G / HD / SD SDI. Non-inverting output drivers make this ideal for distributing DVB-ASI signals as well.

With up to 8 outputs per independent input channel, the DRA-8604 can be used in space critical environments as a dual 1x8 DA, when paired with the –R2H HD-BNC rear module. This configuration allows for up to 20 1x8 DAs in a single openGear® frame, using 10 cards. With the standard 10 BNC rear module, -R2, the DRA-8604 operates as a dual 1x4 distribution amplifier.

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.

The failover feature enables the DRA-8604 to use a backup input source when the primary input source is lost. Once the DRA-8604 determines that the primary input source is stable for at least 3 seconds, it automatically switches back to the primary source.

* Only 4 outputs per channel are available when using the -R2 rear module.

Key Features

- 2 independent channels of SDI distribution on one card
- Equalizes and reclocks all SDI signals from 143Mb/s to 2.97Gb/s
- Non-inverting outputs perfect for DVB-ASI distribution
- Auto failover switch between the two SDI inputs
- Automatic detection of incoming data rate
- Standard BNC and HD-BNC rear module I/O options
- Up to 20 channels of 1x8 distribution in a single frame
- LED indicators for signal presence and data rate for each channel
- Excellent input / output return loss specifications
- 10 DRA-8604 cards in the OG3-FR frames
- 5-year transferable warranty

Ordering Information

Dual High Density 3G Reclocking Amplifier

DRA-8604	Dual 3G Reclocking DA

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

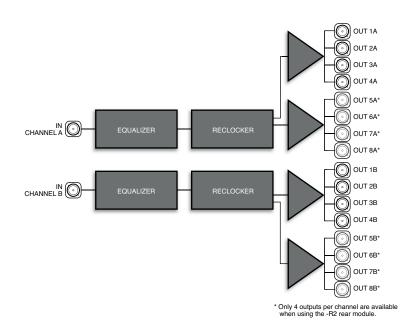|	
-R2	10 BNC Rear Module for Dual 1x4
-R2H	18 HD-BNC Rear Module for Dual 1x8

DRA-8604-R2

DRA-8604-R2H

DEA-8605 HD SD ASI

Dual HD High Density Equalizing Distribution Amplifier
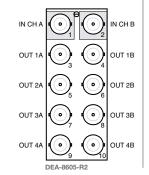2 independent channels of HD / SD SDI distribution with optional high density configuration.
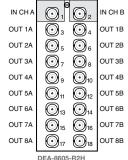
The DEA-8605 is a 2 channel, distribution amplifier capable of equalizing all common serial digital signals, including HD / SD SDI. Non-inverting output drivers make this ideal for distributing DVB-ASI signals as well.

With up to 8 outputs per independent input channel, the DEA-8605 can be used in space critical environments as a dual 1x8 DA, when paired with the –R2H HD-BNC rear module. This configuration allows for up to 20 1x8 DAs in a single openGear® frame, using 10 cards. With the standard 10 BNC rear module, -R2, the DEA-8605 operates as a dual 1x4 distribution amplifier.

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.

Diagram outputs:
OUT 1A, OUT 2A, OUT 3A, OUT 4A
OUT 5A*, OUT 6A*, OUT 7A*, OUT 8A*
IN CHANNEL A — EQUALIZER — RECLOCKER

OUT 1B, OUT 2B, OUT 3B, OUT 4B
OUT 5B*, OUT 6B*, OUT 7B*, OUT 8B*
IN CHANNEL B — EQUALIZER — RECLOCKER

* Only 4 outputs per channel are available when using the -R2 rear module.

Key Features
• 2 independent channels of SDI distribution on one card
• Equalizes all SDI signals from 143Mb/s to 1.485Gb/s
• Non-inverting outputs perfect for DVB-ASI distribution
• Automatic detection of incoming data rate
• Standard BNC and HD-BNC rear module I/O options
• Up to 20 channels of 1x8 distribution in a single frame
• LED indicators for signal presence and data rate for each channel
• Excellent input / output return loss specifications
• 10 DEA-8605 cards in the OG3-FR frames
• 5-year transferable warranty

Ordering Information

Dual HD High Density Equalizing Amplifier

DEA-8605	Dual HD Equalizing DA

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

-R2	10 BNC Rear Module for Dual 1x4
-R2H	18 HD-BNC Rear Module for Dual 1x8

DEA-8605-R2
IN CH A (1), IN CH B (2)
OUT 1A (3), OUT 1B (4)
OUT 2A (5), OUT 2B (6)
OUT 3A (7), OUT 3B (8)
OUT 4A (9), OUT 4B (10)

DEA-8605-R2H
IN CH A (1), IN CH B (2)
OUT 1A (3), OUT 1B (4)
OUT 2A (5), OUT 2B (6)
OUT 3A (7), OUT 3B (8)
OUT 4A (9), OUT 4B (10)
OUT 5A (11), OUT 5B (12)
OUT 6A (13), OUT 6B (14)
OUT 7A (15), OUT 7B (16)
OUT 8A (17), OUT 8B (18)

TRA-8206 `HD` `SD`

Triple Serial HD / SD SDI Reclocking Distribution Amplifier
3 independent channels of HD / SD 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.
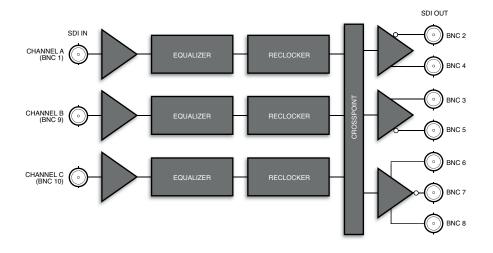

Ordering Information

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

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 TRA-8206 cards in the OG3-FR
- 5-year transferable warranty
- Power: 4.0 watts

TEA-8207 HD SD

Triple Serial HD / SD SDI Equalizing Distribution Amplifier

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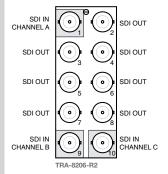
The TEA-8207 is a 3 channel HD / SD SDI distribution amplifier capable of equalizing all common serial digital signals. Support for both standard and high-definition signals makes the TEA-8207 an extremely versatile SDI distribution amplifier.

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.
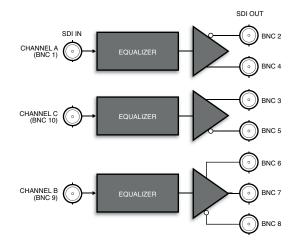
Key Features

- 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 TEA-8207 cards in the OG3-FR
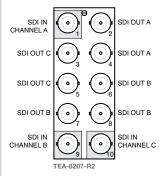- 5-year transferable warranty
- Power: 2.3 watts

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

QRA-8608 `3G` `HD` `SD` `ASI`
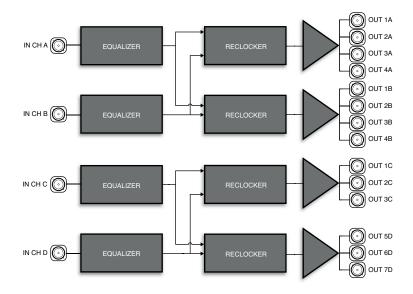
Quad High Density 3G Reclocking Distribution Amplifier
Four channel 3G / HD / SD SDI reclocking distribution amplifier with auto fail-over.

The QRA-8608 is a quad channel, 3G distribution amplifier capable of equalizing and reclocking all common serial digital signals, including 3G / HD / SD SDI. Non-inverting output drivers make this ideal for distributing DVB-ASI signals as well.

QRA-8608 uses 18 HD-BNC rear module, which offers 2 channels of 1x4 distribution, and 2 channels of 1x3 distribution, making it ideal in space critical environments. Our highest density DA from Ross Video allows for up to 40 channels of distribution in a single openGear® frame, using 10 cards.

The failover feature enables the QRA-8608 to use a backup input source when the primary input source is lost and the backup input is stable for at least 3 seconds. Once the QRA-8608 determines that the primary input source is stable for at least 3 seconds, it automatically switches back to the primary source. LED indicators at the front of the module identify the presence of incoming video, and the data rate for each independent channel.

Key Features
- Dual 1x4 and Dual 1x3, quad channel distribution amplifier
- Equalizes and reclocks all SDI signals from 143Mb/s to 2.97Gb/s
- Non-inverting outputs perfect for DVB-ASI distribution
- Auto failover switch between two SDI inputs
- Automatic detection of incoming data rate
- 18 HD-BNC rear module
- 40 channels of distribution in a single frame
- LED indicators for signal presence and data rate for each channel
- Excellent input / output return loss specifications
- Up to 10 QRA-8608 cards in the OG3-FR frames
- 5-year transferable warranty

Ordering Information

Quad High Density 3G Reclocking Amplifier
QRA-8608   Quad 3G Reclocking DA

Rear Module Suffix (ex: [model]-R2)
-R2H   HD-BNC Rear Module

QRA-8608-R2H

QEA-8609 HD SD ASI

Quad High Density HD Equalizing Distribution Amplifier
Four channel HD / SD equalizing distribution amplifier.

The QEA-8609 is a quad channel, HD distribution amplifier capable of equalizing all common serial digital signals, including HD / SD SDI. Non-inverting output drivers make this ideal for distributing DVB-ASI signals as well.

QEA-8609 uses 18 HD-BNC rear module, which offers 2 channels of 1x4 distribution, and 2 channels of 1x3 distribution, making it ideal in space critical environments. Our highest density DA from Ross Video allows for up to 40 channels of distribution in a single openGear® frame, using 10 cards.

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

Key Features
• Dual 1x4 and Dual 1x3, quad channel distribution amplifier
• Equalizes all SDI signals from 143 Mb/s to 1.485 Gb/s
• Non-inverting outputs perfect for DVB-ASI distribution
• Automatic detection of incoming data rate
• 18 HD-BNC rear module
• 40 channels of distribution in a single frame
• LED indicators for signal presence and data rate for each channel
• Excellent input / output return loss specifications
• Up to 10 QEA-8609 cards in the OG3-FR frames
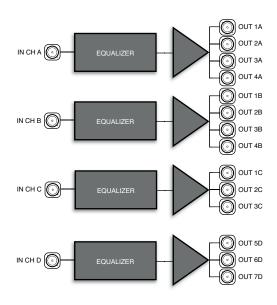• 5-year transferable warranty

Ordering Information

Quad High Density HD Equalizing Amplifier
QEA-8609   Quad HD Equalizing DA

Rear Module Suffix (ex: [model]-R2)
-R2H   HD-BNC Rear Module

QEA-8609-R2H

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.

ANLG
BNC 3
BNC 4*
BNC 5
BNC 6*
BNC 7
BNC 8*
BNC 9
BNC 10*

BNC 2**
BNC 1
TERM
LOOP JP1
GAIN ±3dB

* 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 OG3-FR
- 5-year transferable warranty
- Power: 1.5 watts

Ordering Information

Analog Utility Distribution Amplifier
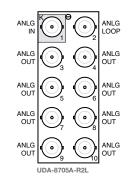
UDA-8705A	Analog Utility DA

Rear Module Suffix (ex: [model]-R2)
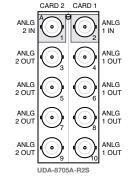
-R2	Rear Module for UDA-8705A
-R2L	Looping Rear Module for UDA-8705A
-R2S	Split Rear Module for 2x UDA-8705A

ANLG IN (1)   ANLG LOOP (2)
ANLG OUT (3)   ANLG OUT (4)
ANLG OUT (5)   ANLG OUT (6)
ANLG OUT (7)   ANLG OUT (8)
ANLG OUT (9)   ANLG OUT (10)
UDA-8705A-R2L

CARD 2   CARD 1
ANLG 2 IN (1)   ANLG 1 IN (2)
ANLG 2 OUT (3)   ANLG 1 OUT (4)
ANLG 2 OUT (5)   ANLG 1 OUT (6)
ANLG 2 OUT (7)   ANLG 1 OUT (8)
ANLG 2 OUT (9)   ANLG 1 OUT (10)
UDA-8705A-R2S

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.
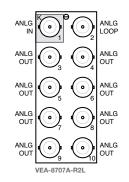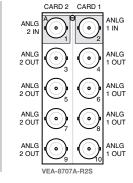
The VEA-8707A analog equalizing amplifier has been specially developed for use with the openGear® 3G / HD / SD SDI frame. Use of this amplifier eliminates the need for a separate analog frame in a mixed digital and analog system.

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.

* Only 4 analog outputs are available when using the -R2S split rear module.
** Looping input available with -R2L 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 ground 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-8229A `HD` `SD` `3D`
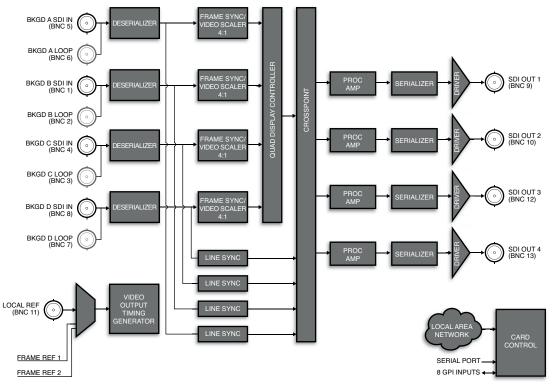
Quad Split

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

The QSP-8229A 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-8229A 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.
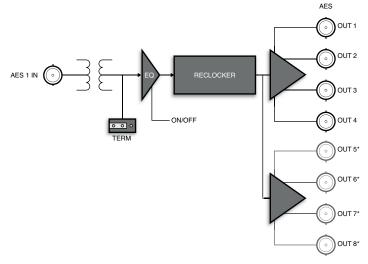
Unique to the quad processor is passive looping inputs allowing the card to fit into any video path without the need for additional DAs. Looping is performed on the back module ensuring the signal path is not lost even when the processor is removed.

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.

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

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-8229A	Quad Split

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

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

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 AES3 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 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 OG3-FR
- 5-year transferable warranty
- Power: 2 Watts

Ordering Information

AES / EBU Distribution Amplifier – 75Ω
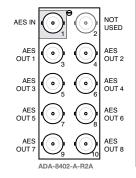
ADA-8402-A	AES / EBU Audio DA

Rear Module Suffix (ex: [model]-R2)
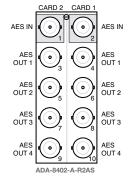
-R2A	75Ω Rear Module for ADA-8402-A
-R2AS	75Ω Split Rear Module for 2x ADA-8402-A

ADA-8402-A-R2A

ADA-8402-A-R2AS

ADA-8402-B `AES`

AES / EBU Distribution Amplifier – 110Ω
Broadcast quality AES / EBU distribution amplifier with internal audio processing.

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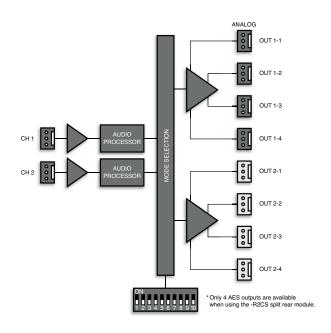
The -R2BS high density split rear module can accommodate up to 2x ADA-8402-B cards, each configured as a 1x4 DA, accommodating up to 20 channels of distribution per 2RU frame.

*Only 4 AES outputs are available when using the -R2BS 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
- 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 OG3-FR
- 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-8402-B-R2B

ADA-8402-B-R2BS

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.

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.

*Only 4 AES outputs are available when using the -R2CS split 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 OG3-FR frame
- Balanced I/O
- 5-year transferable warranty
- Power: 2.6 watts

Ordering Information

Analog Audio and Timecode DA w/ Remote Gain
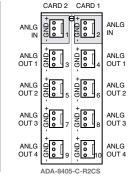
ADA-8405-C   Analog Audio and Timecode DA

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

-R2C   Rear Module for ADA-8405-C

-R2CS   Split Rear Module for ADA-8405-C

ADA-8405-C-R2C

ADA-8405-C-R2CS

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

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

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

HDC-8223 /-S
HD Monitoring Down Converter and Distribution Amplifier

Up / Down / Cross, ARC Conversion

Synchronization & Delay

Video Conversion

Audio Conversion

Audio Embedding / De-Embedding

Advanced Audio Processing

Fiber

Switching

Keying & Branding

Data Solutions

Transport Stream Monitoring & Conversion

UDC-8625A 3G HD SD AFD FS
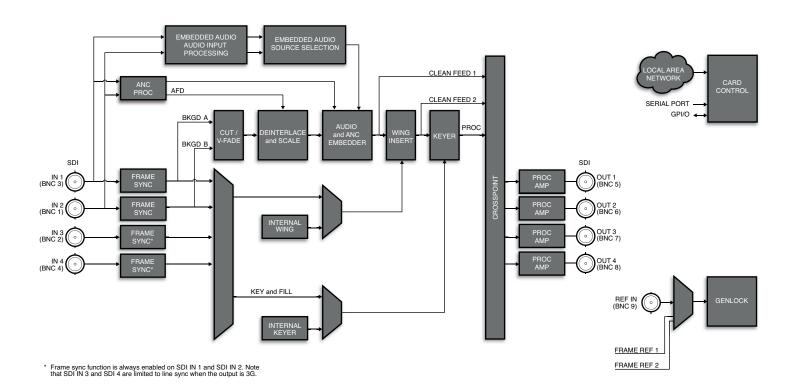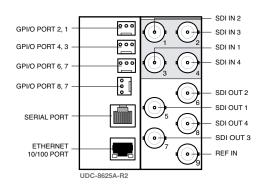
3G / HD / SD SDI Multi-Function Format Converter
A multi-function solution for Up / Down / Cross, ARC Conversion, Keying, Logo Insertion, A/B Mixing, all with audio video processing, timing, and synchronization.

EMBEDDED AUDIO AUDIO INPUT PROCESSING

EMBEDDED AUDIO SOURCE SELECTION

ANC PROC

AFD

BKGD A

BKGD B

CUT / V-FADE

DEINTERLACE and SCALE

AUDIO and ANC EMBEDDER

WING INSERT

KEYER

PROC

CLEAN FEED 1

CLEAN FEED 2

LOCAL AREA NETWORK

CARD CONTROL

SERIAL PORT

GPI/O

SDI

IN 1 (BNC 3)

IN 2 (BNC 1)

IN 3 (BNC 2)

IN 4 (BNC 4)

FRAME SYNC

FRAME SYNC

FRAME SYNC*

FRAME SYNC*

CROSSPOINT

INTERNAL WING

PROC AMP

PROC AMP

PROC AMP

PROC AMP

SDI

OUT 1 (BNC 5)

OUT 2 (BNC 6)

OUT 3 (BNC 7)

OUT 4 (BNC 8)

KEY and FILL

INTERNAL KEYER

REF IN (BNC 9)

GENLOCK

FRAME REF 1

FRAME REF 2

* Frame sync function is always enabled on SDI IN 1 and SDI IN 2. Note that SDI IN 3 and SDI IN 4 are limited to line sync when the output is 3G.

GPI/O PORT 2, 1

GPI/O PORT 4, 3

GPI/O PORT 6, 7

GPI/O PORT 8, 7

SERIAL PORT

ETHERNET 10/100 PORT

SDI IN 2

SDI IN 3

SDI IN 1

SDI IN 4

SDI OUT 2

SDI OUT 1

SDI OUT 4

SDI OUT 3

REF IN

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. ARC configurations can be saved and recalled via GPI or DashBoard. 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 Frame Sync
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, ARC 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
- Ability to create and recall ARC configuration profiles
- 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`

3G / HD / SD SDI Multi-Function Format Converter with Unbalanced Audio

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

† Note that the number of AES inputs and outputs is dependent on how the AES IO Cong is set: 8 in and 0 out, 4 in and 4 out, 0 in and 8 out.
* Frame sync function is always enabled on SDI IN 1 and SDI IN 2. Note that SDI IN 3 and SDI 4 are limited to line sync when the output is 3G.

Requires the audio daughter card and the appropiate rear module.

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. ARC configurations can be saved and recalled via GPI or DashBoard. 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

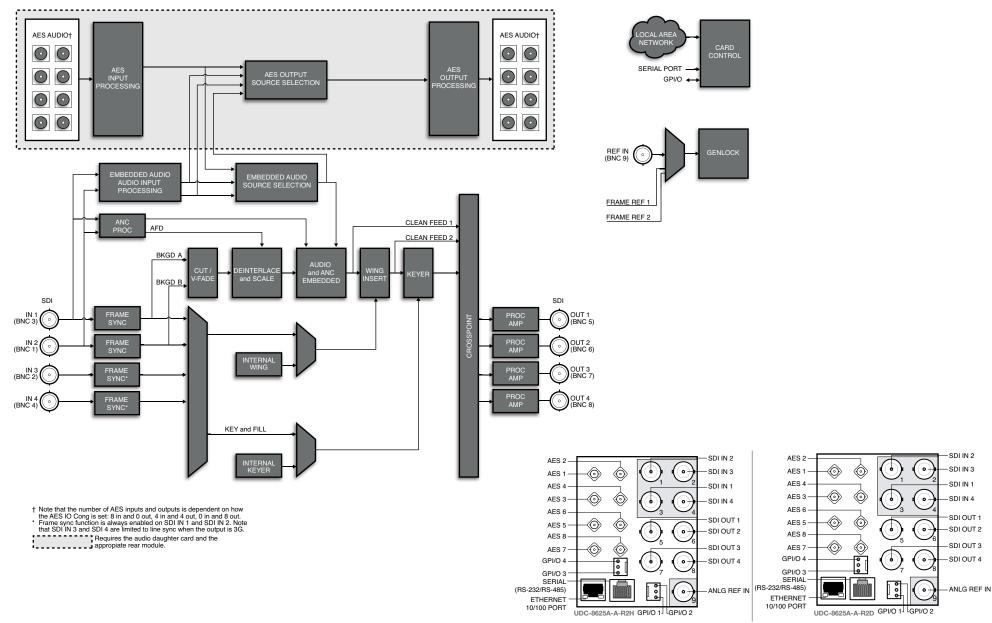UDC-8625A-A 3G / HD / SD SDI Multi-Function Format Converter

Rear Module Suffix (ex: [model]-R2)
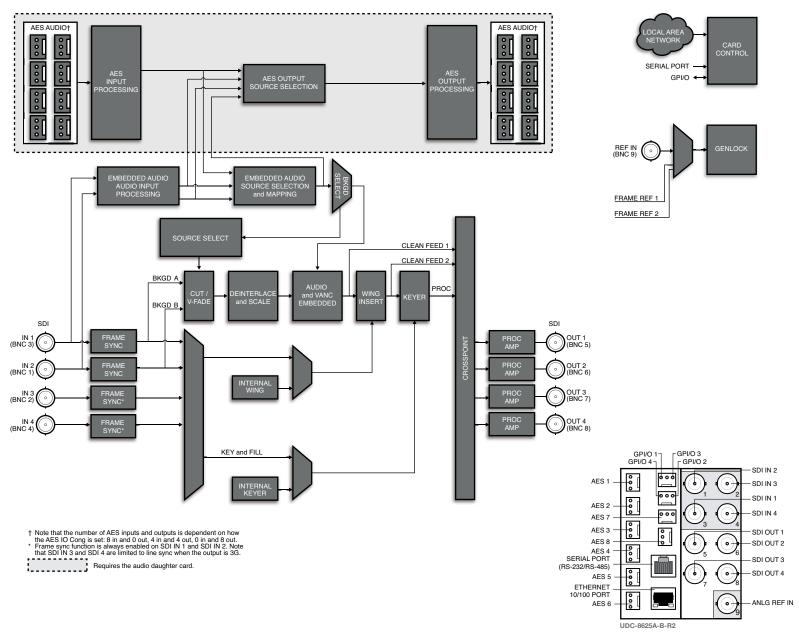
-R2H   HD-BNC Audio Rear Module for UDC-8625A-A
-R2D   DIN Audio Rear Module for UDC-8625A-A

Key Features

- Up / down / cross, ARC 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 or 110Ω balanced I/O
- Primary / secondary fail-safe input with auto-changeover
- Internal or external pillar bar / letter box graphic insertion
- Ability to create and recall ARC configuration profiles
- 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

3G / HD / SD SDI Multi-Function Format Converter with Balanced Audio

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

AES AUDIO†

AES INPUT PROCESSING

AES OUTPUT SOURCE SELECTION

AES OUTPUT PROCESSING

AES AUDIO†

LOCAL AREA NETWORK

CARD CONTROL

SERIAL PORT

GPI/O

EMBEDDED AUDIO AUDIO INPUT PROCESSING

EMBEDDED AUDIO SOURCE SELECTION and MAPPING

BKGD SELECT

REF IN (BNC 9)

GENLOCK

FRAME REF 1

FRAME REF 2

SOURCE SELECT

CLEAN FEED 1

CLEAN FEED 2

BKGD A

BKGD B

CUT / V-FADE

DEINTERLACE and SCALE

AUDIO and VANC EMBEDDED

WING INSERT

KEYER

PROC

SDI

IN 1 (BNC 3)

IN 2 (BNC 1)

IN 3 (BNC 2)

IN 4 (BNC 4)

FRAME SYNC

FRAME SYNC

FRAME SYNC*

FRAME SYNC*

CROSSPOINT

INTERNAL WING

PROC AMP

PROC AMP

PROC AMP

PROC AMP

SDI

OUT 1 (BNC 5)

OUT 2 (BNC 6)

OUT 3 (BNC 7)

OUT 4 (BNC 8)

KEY and FILL

INTERNAL KEYER

† Note that the number of AES inputs and outputs is dependent on how the AES IO Cong is set: 8 in and 0 out, 4 in and 4 out, 0 in and 8 out.
* Frame sync function is always enabled on SDI IN 1 and SDI IN 2. Note that SDI IN 3 and SDI IN 4 are limited to line sync when the output is 3G.

Requires the audio daughter card.

GPI/O 1
GPI/O 4
GPI/O 3
GPI/O 2

AES 1
AES 2
AES 7
AES 3
AES 8
AES 4
SERIAL PORT (RS-232/RS-485)
AES 5
ETHERNET 10/100 PORT
AES 6

SDI IN 2
SDI IN 3
SDI IN 1
SDI IN 4

SDI OUT 1
SDI OUT 2
SDI OUT 3
SDI OUT 4

ANLG REF IN

1 2
3 4
5 6
7 8
9

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. ARC configurations can be saved and recalled via GPI or DashBoard. 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

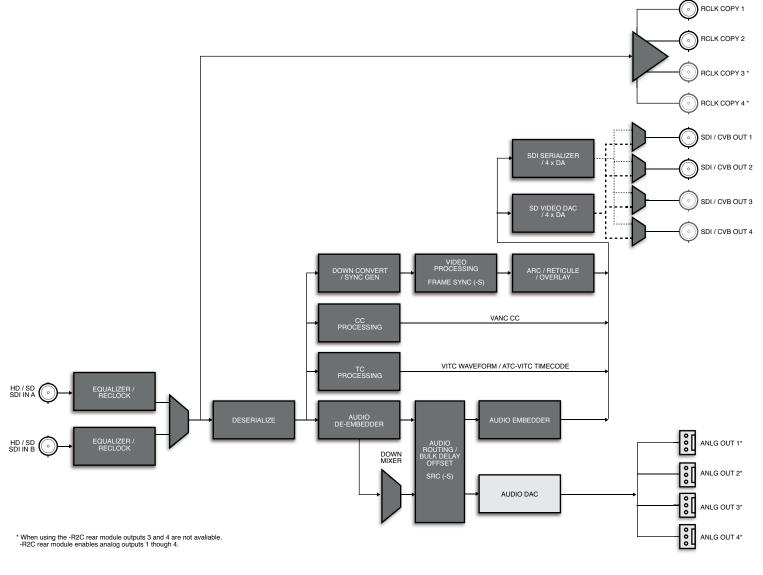UDC-8625A-B 3G / HD / SD SDI Multi-Function Format Converter
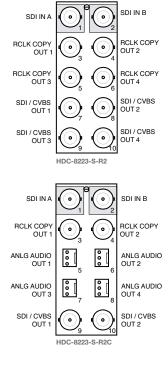
Rear Module Suffix (ex: [model]-R2)

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

Key Features

- Up / down / cross, ARC 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 or 110Ω balanced I/O
- Primary / secondary fail-safe input with auto-changeover
- Internal or external pillar bar / letter box graphic insertion
- Ability to create and recall ARC configuration profiles
- 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-8223 /-S `HD` `SD` `AN-AUD` `FS`

HD Monitoring Down Converter and Distribution Amplifier

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

RCLK COPY 1

RCLK COPY 2

RCLK COPY 3 *

RCLK COPY 4 *

SDI / CVB OUT 1

SDI / CVB OUT 2

SDI / CVB OUT 3

SDI / CVB OUT 4

SDI SERIALIZER / 4 x DA

SD VIDEO DAC / 4 x DA

DOWN CONVERT / SYNC GEN

VIDEO PROCESSING

FRAME SYNC (-S)

ARC / RETICULE / OVERLAY

CC PROCESSING

VANC CC

TC PROCESSING

VITC WAVEFORM / ATC-VITC TIMECODE

HD / SD SDI IN A

EQUALIZER / RECLOCK

HD / SD SDI IN B

EQUALIZER / RECLOCK

DESERIALIZE

AUDIO DE-EMBEDDER

AUDIO EMBEDDER

DOWN MIXER

AUDIO ROUTING / BULK DELAY OFFSET

SRC (-S)

AUDIO DAC

ANLG OUT 1*

ANLG OUT 2*

ANLG OUT 3*

ANLG OUT 4*

* When using the -R2C rear module outputs 3 and 4 are not avaliable.
-R2C rear module enables analog outputs 1 though 4.

HDC-8223-S-R2

SDI IN A	1	2	SDI IN B
RCLK COPY OUT 1	3	4	RCLK COPY OUT 2
RCLK COPY OUT 3	5	6	RCLK COPY OUT 4
SDI / CVBS OUT 1	7	8	SDI / CVBS OUT 2
SDI / CVBS OUT 3	9	10	SDI / CVBS OUT 4

HDC-8223-S-R2C

SDI IN A	1	2	SDI IN B
RCLK COPY OUT 1	3	4	RCLK COPY OUT 2
ANLG AUDIO OUT 1	5	6	ANLG AUDIO OUT 2
ANLG AUDIO OUT 3	7	8	ANLG AUDIO OUT 4
SDI / CVBS OUT 1	9	10	SDI / CVBS OUT 2

The HDC-8223 is a 2 in / 4 out reclocking HD / SD distribution amplifier combined with 4 software configurable analog composite or SDI digital outputs with 10-bit HD down conversion. The HDC-8223 includes 2 inputs, which can be manually selected, or set up in automatic failover configuration mode. The HDC-8223-S adds a video frame synchronizer with full frame delay control and incorporates audio sample-rate conversion for glitch-free audio when a frame is added or dropped.

The HDC-8223 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-8223 supports all popular standard and high-definition video formats including 1080psF/.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-8223 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 software 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 audio and video proc amp
- Optional 4 channel analog audio de-embedding available
- Frame Synchronizer (HDC-8223-S)
- Provides full vertical and horizontal offset and frame delay controls. (HDC-8223-S)
- Glitch-free handling of embedded audio when a frame is dropped or duplicated. (HDC-8223-S)
- 5-year transferable warranty
- Power: 8 watts

Ordering Information

HD Monitoring Down Converter and Distribution Amplifier

HDC-8223   HD / SD SDI Down Converter
HDC-8223-S   HD / SD SDI Down Converter with Frame Sync

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

-R2   Rear Module for HDC-8223
-R2C   Analog Audio Rear Module for HDC-8223

SFS-8622-A
3G / HD / SD SDI Frame Synchronizer

SPG-8260
Sync Pulse Generator

Distribution & Monitoring

Up / Down / Cross, ARC Conversion

Synchronization & Delay

Video Conversion

Audio Conversion

Audio Embedding / De-Embedding

Advanced Audio Processing

Fiber

Switching

Keying & Branding

Data Solutions

Transport Stream Monitoring & Conversion
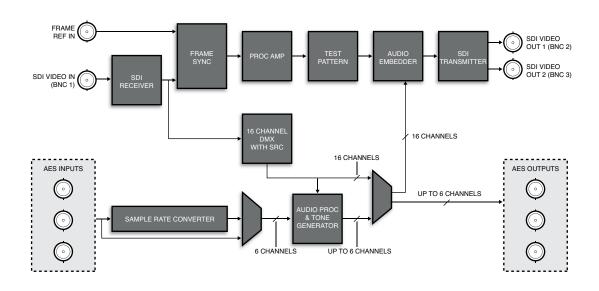
SFS-8622-A HD SD FS

3G / HD / SD SDI Frame Synchronizer
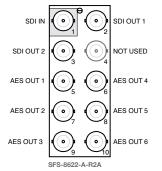A/V frame synchronizer with AES embedding / de-Embedding

The SFS-8622-A 3G A/V frame synchronizer is the ideal solution for synchronizing, timing and processing both audio and video in 3G, high definition, and standard definition applications.

The SFS-8622-A supports all popular formats, including 480i, 576i, 720p, 1080i, and 1080p. Input video format is automatically detected to simplify operation combined with an onboard test pattern generator, with user selectable patterns in the event of input signal loss. The input signal is locked and re-timed to the reference input, with an additional adjustable delay of up to 28 frames.
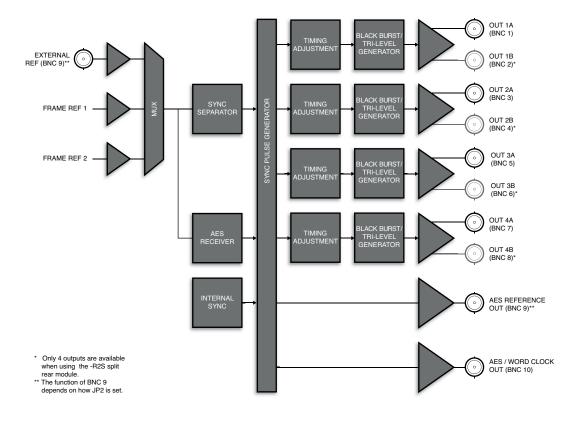
Audio processing for up to 16 channels, with embedding / de-embedding of up to 12 channels, is available using the 6 AES3 BNC connectors. Audio processing includes, independent sample rate conversion, delay, swap, sum and mute with pass-through support for Dolby E or Dolby Digital. Audio I/O can be configured, via DashBoard, as either 6 AES inputs, 6 AES outputs, or bi-directional with 3 Inputs and 3 outputs.

Key Features

- Supports all popular formats: 480i, 576i, 720p, 1080i, 1080pSF, 1080p
- 6 AES3 BNC connections for audio embedding / de-embedding, with sample rate conversion
- 2 processed SDI outputs
- Onboard test generator for loss of input conditions
- Auto input format detection
- Onboard video proc amp
- A/V delay of up to 28 frames
- Passes ancillary VANC Data
- Onboard audio proc amp, including individually assignable audio delay, swap, sum, and mute
- Full software configuration and signal status, via Dashboard control system.
- 5-year transferrable warranty

Ordering Information

3G / HD / SD-SDI Frame Synchronizer

SFS-8622-A	3G / HD / SD-SDI Frame Synchronizer

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

-R2A	Rear Module for SFS-8622-A

SFS-8622-A-R2A

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.

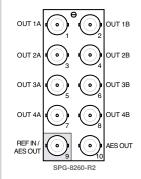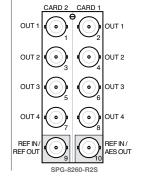The SPG-8260 sync pulse generator provides 4 pairs of outputs with each pair independently programmed to be either tri-level sync or a composite signal. Each pair of outputs can be independently delayed relative to the incoming reference. The delay is in increments of the output's interface sampling 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 output as well as AES tone for AES outputs.

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

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 a 48 kHz AES reference signal 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

SPG-8260-R2

SPG-8260-R2S

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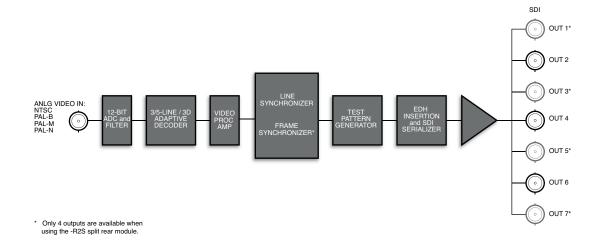Analog Component with 4 Channels of Analog Audio
to SDI Converter

Video
Conversion

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.

ANLG VIDEO IN:
NTSC
PAL-B
PAL-M
PAL-N

12-BIT ADC and FILTER → 3/5-LINE / 3D ADAPTIVE DECODER → VIDEO PROC AMP → LINE SYNCHRONIZER / FRAME SYNCHRONIZER* → TEST PATTERN GENERATOR → EDH INSERTION and SDI SERIALIZER →

SDI
- OUT 1*
- OUT 2
- OUT 3*
- OUT 4
- OUT 5*
- OUT 6
- OUT 7*

* 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
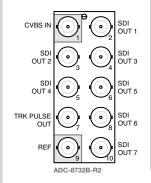- Power: 4 watts

Ordering Information
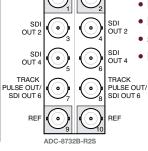
Analog Composite to SDI Converter

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-R2

- CVBS IN — 1
- SDI OUT 1 — 2
- SDI OUT 2 — 3
- SDI OUT 3 — 4
- SDI OUT 4 — 5
- SDI OUT 5 — 6
- TRK PULSE OUT — 7
- SDI OUT 6 — 8
- REF — 9
- SDI OUT 7 — 10

ADC-8732B-R2S

CARD 2   CARD 1

- CVBS IN — 1
- CVBS IN — 2
- SDI OUT 2 — 3
- SDI OUT 2 — 4
- SDI OUT 4 — 5
- SDI OUT 4 — 6
- TRACK PULSE OUT/ SDI OUT 6 — 7
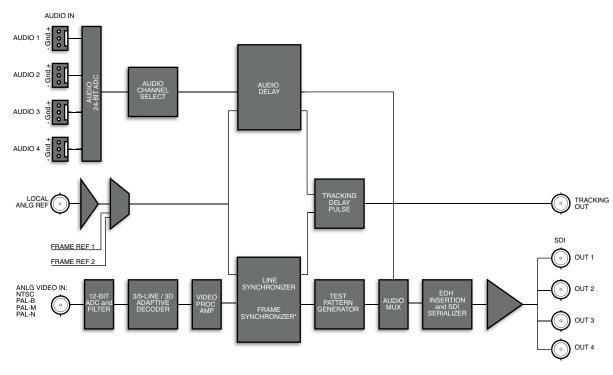- TRACK PULSE OUT/ SDI OUT 6 — 8
- REF — 9
- REF — 10

ADC-8732B-C (-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.

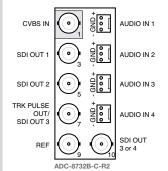The ADC-8732B-C (-SC) is a 10-bit broadcast quality video decoder with a 12-bit analog to digital converter supporting 4 channels of analog audio embedding. It is specifically designed for broadcast or production situations in which an analog PAL-B, PAL-M, PAL-N, or NTSC composite signal must be converted 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.
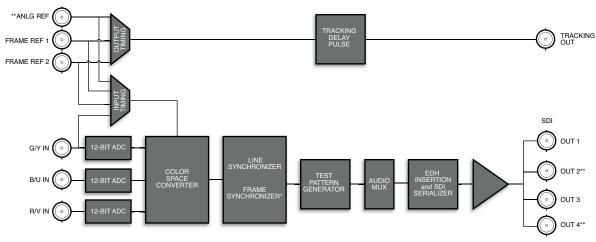
Key Features

- 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 (-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
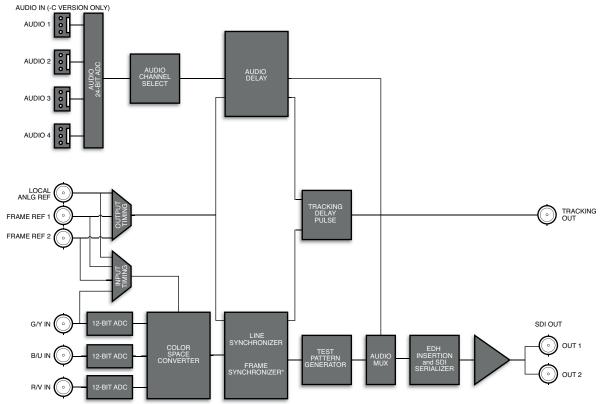
Analog Component to SDI Converter

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-C (-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.

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.

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

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

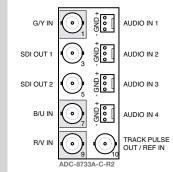|	
ADC-8733A-C	Analog to SDI and Embedder
ADC-8733A-SC	Analog to SDI, Embedder and Frame Sync

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

-R2	Rear Module for ADC-8733A-C (-SC)

ADC-8733A-C-R2

ADC-8434-A
Quad Analog Audio to Dual AES Converter
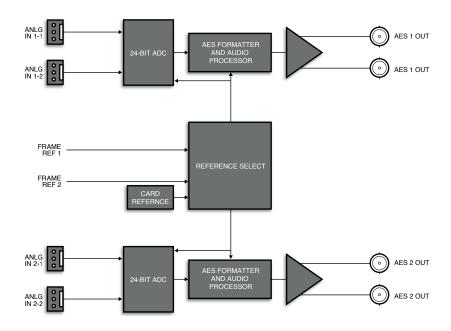
DAC-8418-A
Dual AES to Quad Analog Audio Converter

Audio Conversion

ADC-8434-A `AES` `AN-AUD`

Quad Analog Audio to Dual AES Converter
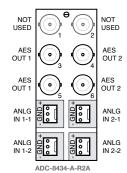4 channels of analog audio to dual AES / EBU conversion with up to 24-bit ADC resolution.

The ADC-8434-A quad analog audio to dual AES converter is a broadcast quality, modular solution, which converts 4 analog audio channels to 2, 24-bit, unbalanced AES3 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.
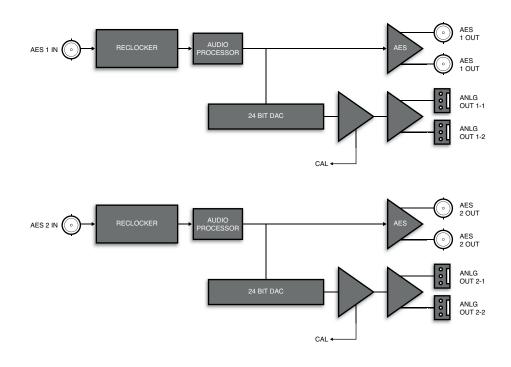
Key Features
- 4 channels of audio conversion
- Can synchronize to 1 of the 2 frame reference inputs, Digital Audio Reference Signal (DARS) audio reference signal or a video black reference signal
- Supports audio sampling frequencies from 32kHz to 96kHz
- Internal clock generates audio sampling frequencies of 48kHz
- 24-bit technology provides the highest quality signal conversion
- 75Ω unbalanced AES3 output
- Internal audio signal processing
- Provides level control of output signals
- 5-year transferable warranty
- Power: 4 watts

Ordering Information

Quad Analog Audio to Dual AES Converter

ADC-8434-A — Quad Analog Audio to Dual 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.
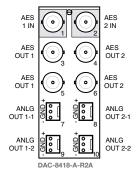
The DAC-8418-A also has internal audio processing with independent channel gain, master stereo gain, sum (mono), and left or right only selection.

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 AES3 I/O
- Balanced analog audio 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

MUX-8258-A
AES / EBU Audio Embedder - 75Ω

MUX-8258-B
AES / EBU Audio Embedder - 110Ω

MUX-8258-4C /-8C
3G / HD / SD SDI Analog Audio Embedder

DMX-8259-A
AES / EBU Audio De-Embedder - 75Ω

DMX-8259-B
AES / EBU Audio De-Embedder - 110Ω

DMX-8259-4C /-8C
3G / HD / SD SDI Analog Audio De-Embedder

Distribution & Monitoring

Up / Down / Cross, ARC Conversion

Synchronization & Delay

Video Conversion

Audio Conversion

Audio Embedding /
De-Embedding

Advanced Audio Processing

Fiber

Switching

Keying & Branding

Data Solutions

Transport Stream Monitoring & Conversion

MUX-8258-A 3G HD SD AES
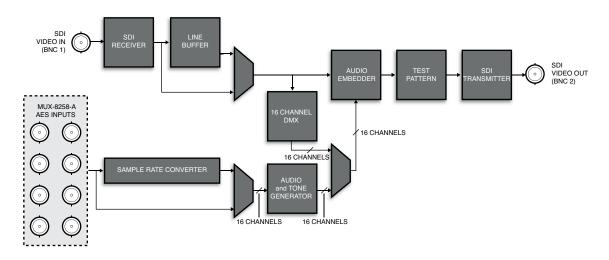
AES / EBU Audio Embedder - 75Ω
The ideal solution for embedding 8 unbalanced AES streams into a SDI signal.

The MUX-8258-A is a high quality program audio embedder capable of embedding up to 8 AES / EBU pairs (16 discrete audio channels) into an 3G / HD / SD SDI signal. Audio proc amp control on each input allows for audio processing with independent channel sample rate conversions, gain control of ±20dB, audio delay up to 1 second, 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 AES3 75Ω unbalanced inputs.

Block Diagram

SDI VIDEO IN (BNC 1) → SDI RECEIVER → LINE BUFFER → AUDIO EMBEDDER → TEST PATTERN → SDI TRANSMITTER → SDI VIDEO OUT (BNC 2)

MUX-8258-A AES INPUTS → SAMPLE RATE CONVERTER

16 CHANNEL DMX

AUDIO and TONE GENERATOR

16 CHANNELS

Key Features
- 16 channel audio embedding for all popular 3G / 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 Audio Embedder - 75Ω

MUX-8258-A   AES / EBU Audio Embedder

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

-R2A   Rear Module for MUX-8258-A

SDI IN   SDI OUT
AES IN 1   AES IN 2
AES IN 3   AES IN 4
AES IN 5   AES IN 6
AES IN 7   AES IN 8

**MUX-8258-A-R2A**

MUX-8258-B `3G` `HD` `SD` `AES`

AES / EBU Audio Embedder – 110Ω

The ideal solution for embedding 8 balanced AES streams into a SDI signal.

The MUX-8258-B is a high quality program audio embedder capable of embedding up to 8 AES / EBU pairs (16 audio channels) into an 3G / 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-B 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-B features 8 AES 110Ω balanced inputs.

Key Features

- 16 discrete channel audio embedding for all popular 3G / 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
- Balanced 110Ω AES inputs
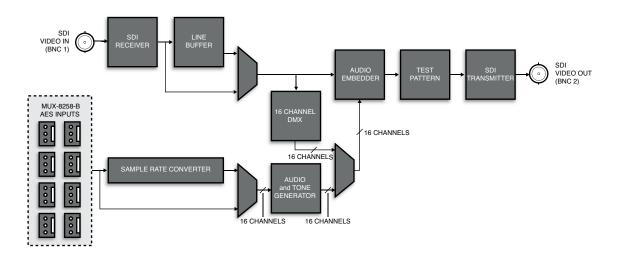- No audio breakout cables required
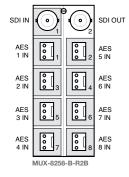- 5-year transferable warranty
- Power: 8.5 watts

Ordering Information

AES / EBU Audio Embedder - 110Ω

MUX-8258-B   AES / ABU Audio Embedder

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

-R2B   Rear Module for MUX-8258-B
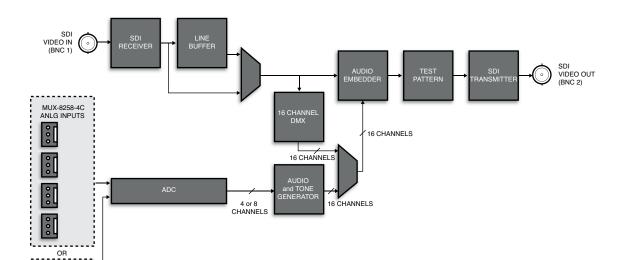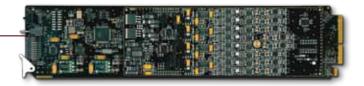
MUX-8258-4C /-8C `3G` `HD` `SD` `AN-AUD`

3G / HD / SD SDI Analog Audio Embedder

The ideal solution for embedding 4 or 8 analog audio sources into a 3G / HD / SD SDI signal.

The MUX-8258-4 /-8C is a high quality program analog audio embedder capable of embedding up to 8 analog audio channels into an 3G / 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, 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 balanced analog audio inputs and the MUX-8258-8C features 8 balanced analog audio inputs.

Key Features

- Analog audio embedding for all popular HD / SD SDI formats
- Analog gain processed 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 Embedder

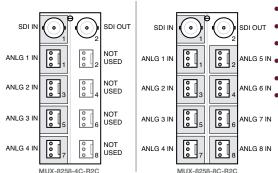|	
MUX-8258-4C	4 CH Analog Audio Embedder
MUX-8258-8C	8 CH Analog Audio Embedder

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

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

DMX-8259-A `3G` `HD` `SD` `AES`
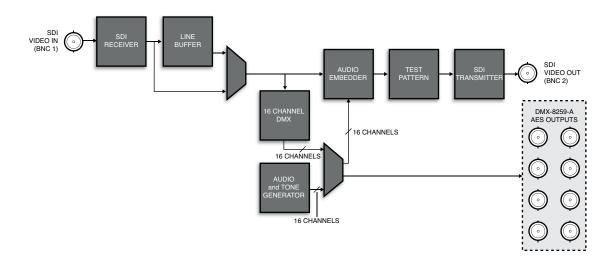
AES / EBU Audio De-Embedder - 75Ω

The ideal solution for de-embedding 8 AES streams from a SDI signal.
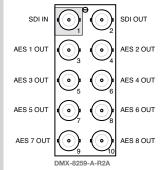
The DMX-8259-A is a high quality program audio de-embedder capable of de-embedding up to 8 AES / EBU pairs (16 audio channels) from an 3G / HD / SD SDI signal. Audio proc amp control on each channel allows for audio processing with gain of ±20db, audio delay up to 1 second and channel invert.

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 discrete channel audio de-embedding for all popular 3G / 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-Embedder - 75Ω

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

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

-R2A   Rear Module for DMX-8259-A


DMX-8259-A-R2A

DMX-8259-B `3G` `HD` `SD` `AES`

AES / EBU Audio De-Embedder – 110Ω

The ideal solution for de-embedder 8 balanced AES streams from a SDI signal.

The DMX-8259-B is a high quality program audio de-embedder capable of de-embedding up to 8 AES / EBU pairs (16 audio channels) from a 3G / 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-B 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-B features 8 AES 110Ω unbalanced outputs

Key Features

- 16 channel audio de-embedding for all popular 3G / 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
- Balanced 110Ω AES outputs
- No audio breakout cables required
- 5-year transferable warranty
- Power: 8.5 watts

Ordering Information
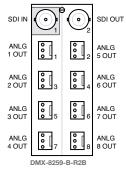
AES / EBU Audio De-Embedder - 110Ω

DMX-8259-B   AES / ABU Audio De-Embedder

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

-R2B   Rear Module for DMX-8259-B

DMX-8259-B-R2B

DMX-8259-4C /-8C `3G` `HD` `SD` `AN-AUD`
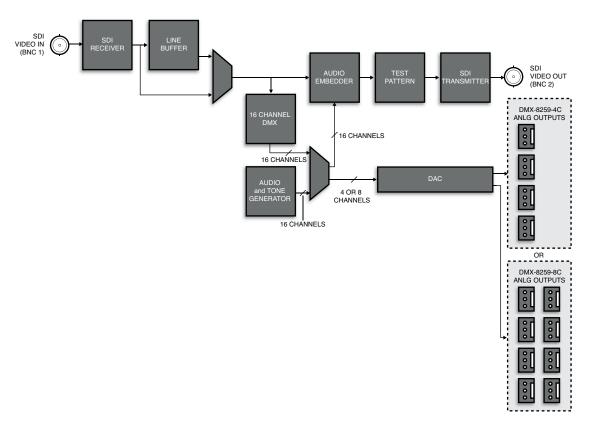
3G / HD / SD SDI Analog Audio De-Embedder
The ideal solution for de-embedding 4 or 8 analog audio sources from a 3G / HD / SD SDI signal.

The DMX-8259-4C /-8C is a high quality program audio de-embedder capable of de-embedding up to 8 analog audio channels from an 3G / 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 processed 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
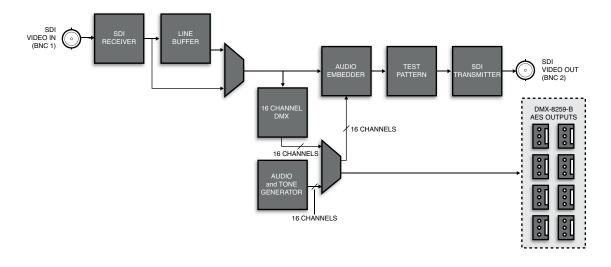- DMX-8259-4C Power: 9.5 watts
- DMX-8259-8C Power: 11 watts

Ordering Information
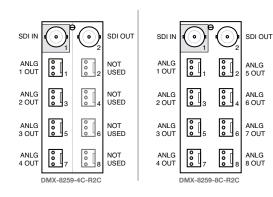
Analog Audio De-Embedder

DMX-8259-4C	4 CH Analog Audio De-Embedder
DMX-8259-8C	8 CH Analog Audio De-Embedder

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

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

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

Distribution & Monitoring

Up / Down / Cross, ARC Conversion

Synchronization & Delay

Video Conversion

Audio Conversion

Audio Embedding / De-Embedding

Advanced Audio Processing

Fiber

Switching

Keying & Branding

Data Solutions
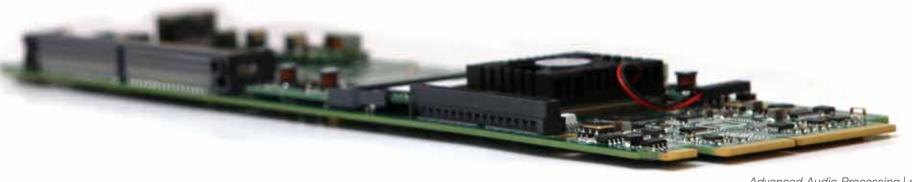
Transport Stream Monitoring & Conversion

LDP-8242 [HD] [SD] [AES]
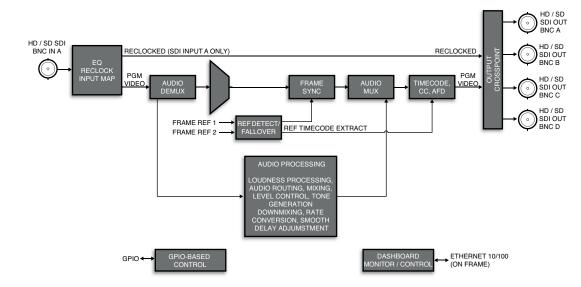
HD / SD SDI Loudness Processor
Audio loudness processor with Linear Accoustic AEROMAX™.
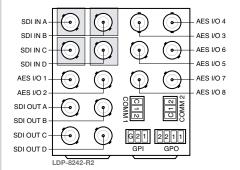
The LDP-8242 is ideal for correcting irritating loudness differences between programs and commercials. Featuring 24-bit audio processing that supports 16 channels of embedded audio from an HD / SD SDI signal.

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
- Ideal for bringing your station Compliance with the Calm Act
- 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` `DOLBY` `AES`

HD / SD SDI Frame Synchronizer with Dolby® Decoding
Frame synchronizing with Dolby® Digital/E decoding and audio embedding / de-embedding.

Block diagram labels:
- EQUALIZER DESERALIZER
- HD / SD SDI (input)
- FRAME SYNC
- COLOR PROC
- AUDIO EMBED, TIMECODE / CC PROCESSING, AFD INSERTION
- HD / SD SERIALIZE
- DA → HD / SD SDI, RECLOCKED OUT
- DA → HD / SD SDI, PROCESSED OUT
- AES AUDIO 16 CH BNC*
- DE-EMBEDDER
- AUDIO
- CHANNEL MAPPING, PHASE INVERSION, MIXDOWN, LEVEL CONTROL
- FS TRACKING AUDIO DELAY w/ SRC and USER OFFSET
- AES TRANSMITTER
- AES AUDIO 16 CH BNC (8 PAIR)*
- AES RECEIVER
- BLACK BURST or TRI-LEVEL SYNC (ON FRAME)
- SYNC ADJUSTMENT
- DASHBOARD / OGCP MONITOR / CONTROL
- ETHERNET 10/100 (ON FRAME)
- DOLBY® DECODER
- A B C

-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.

Ordering Information
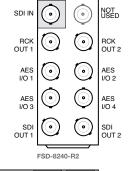
HD / SD SDI Frame Synchronizer with Dolby® Decoding	
FSD-8240	HD / SD SDI Frame Sync w/ Dolby® Decoder

Rear Module Suffix (ex: [model]-R2)	
-R2	Rear Module for FSD-8240
-R2M	Metadata Rear Module for FSD-8240

FSD-8240-R2 rear module:
- SDI IN
- NOT USED
- RCK OUT 1
- RCK OUT 2
- AES I/O 1
- AES I/O 2
- AES I/O 3
- AES I/O 4
- SDI OUT 1
- SDI OUT 2

FSD-8240-R2M rear module:
- DOLBY META (+ - G)
- AES IN 8
- SDI IN
- AES OUT 1
- AES OUT 2
- AES OUT 3
- AES OUT 4
- AES OUT 5
- AES OUT 6
- AES OUT 7
- AES OUT 8
- AES I/O 2
- AES I/O 1
- AES I/O 4
- AES I/O 3
- AES IN 6
- AES IN 5
- SDI OUT 2
- SDI OUT 1

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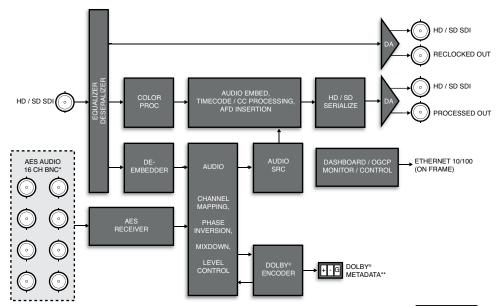
The FSD-8240 can embed Dolby® metadata on the SDI output, sourced from either SDI input video or from the decoder as desired. With the optional analog / metadata rear module's Dolby® Meta output can provide RS-485 metadata for downstream devices or systems. Metadata on the Dolby® Meta RS-485 output can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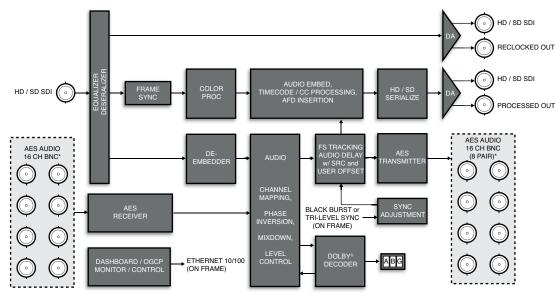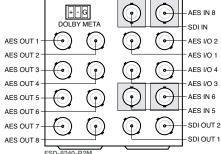- 5-year transferable warranty

FSE-8241-E `HD` `SD` `FS` `DOLBY` `AES`

HD / SD SDI Frame Synchronizer with Dolby® E Encoding
Frame synchronizing with Dolby® E encoding and audio embedding / de-embedding.

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 AES3 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.

* -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.

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-E-R2

FSE-8241-E-R2M

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
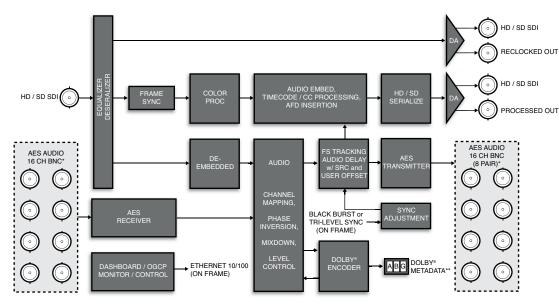
FSE-8241-D `HD` `SD` `FS` `DOLBY` `AES`

HD / SD SDI Frame Synchronizer with Dolby® Digital Encoding
Frame synchronizing with Dolby® Digital encoding and audio embedding / de-embedding.
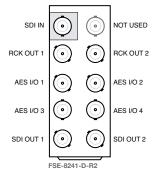
The FSE-8241-D is an HD / SD SDI frame sync and Dolby® Digital encoder with 16 channels of audio embedding or de-embedding. The Dolby® Digital (AC-3) encoder receives up to 6 different audio sources, from either embedded or discrete inputs and produces an encoded Dolby® pair using either received external 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 AES3 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.

-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

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

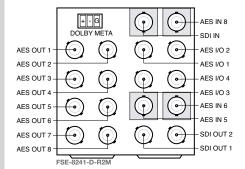| HD / SD SDI Frame Synchronizer with Dolby® Digital Encoding	
FSE-8241-D	HD / SD SDI Frame Sync w/ Dolby® Digital Encoding
Rear Module Suffix (ex: [model]-R2)	
-R2	Rear Module for FSE-8241-D
-R2M	Metadata Rear Module for FSE-8241-D

FSE-8241-D-R2M

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 Embedder with Fiber Optic Output

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

SFS-6622-A
3G / HD / SD SDI Frame Synchronizer with Fiber Optic
Input & Output

Optical Splitters
Single 1x2, 1x4, 1x8 & Dual 1x2, 1x4 Passive Optical Splitters

CWDM
Coarse Wave Division Multiplexing

FES-6941
Single Link Ethernet Fiber Transceiver (WDM)

FES-6942
Single Link Ethernet Fiber Transceiver (Dual Fiber)

FED-6943
Dual Link Ethernet Fiber Transceiver (WDM)

FED-6944
Dual Link Ethernet Fiber Transceiver (Quad Fiber)

FET-6945
Triple Link Ethernet Fiber Transceiver (WDM)

FET-6946
Triple Link Ethernet Fiber Transceiver (WDM & Dual Fiber)

CES-8940
Gigabit Ethernet Switch

Distribution & Monitoring

Up / Down / Cross, ARC Conversion

Synchronization & Delay

Video Conversion

Audio Conversion

Audio Embedding / De-Embedding

Advanced Audio Processing

Fiber

Switching

Keying & Branding

Data Solutions

Transport Stream Monitoring & Conversion
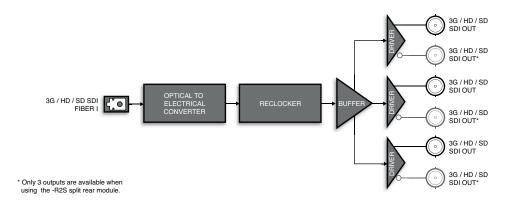
FSR-6601 3G HD SD

Single Optical to Electrical Converter

Single channel SDI optical to electrical converter supporting data rates from 143Mb/s to 2.97Gb/s.

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 card. 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 2 FSR-6601 cards, maximizing the number of conversion channels in a frame. In this configuration, the OG3-FR supports up to 20 independent channel solutions.

3G / HD / SD SDI FIBER I → OPTICAL TO ELECTRICAL CONVERTER → RECLOCKER → BUFFER → DRIVER

3G / HD / SD SDI OUT
3G / HD / SD SDI OUT*
3G / HD / SD SDI OUT
3G / HD / SD SDI OUT*
3G / HD / SD SDI OUT
3G / HD / SD SDI OUT*

* 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
- Comes with a patented Ross Lock fiber locking mechanism for guaranteed connection in adverse circumstances
- 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 2 FSR-6601

FIBER IN NOT USED
SDI OUT 5   SDI OUT 6
SDI OUT 7   SDI OUT 8
SDI OUT 9   SDI OUT 10
FSR-6601-R2

CARD 2   CARD 1
FIBER IN NOT USED   FIBER IN NOT USED
SDI OUT 5   SDI OUT 6
SDI OUT 7   SDI OUT 8
SDI OUT 9   SDI OUT 10
FSR-6601-R2S

FSR-6601-H `3G` `HD` `SD`

Single High Sensitivity Optical to Electrical Converter
Single channel High Sensitivity SDI optical to electrical converter supporting data rates from 143Mb/s to 2.97Gb/s

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 OG3-FR supports up to 20 independent channel solutions.

Block Diagram

3G / HD / SD SDI FIBER I → OPTICAL TO ELECTRICAL CONVERTER → RECLOCKER → BUFFER → DRIVER

- DRIVER → 3G / HD / SD SDI OUT
- DRIVER → 3G / HD / SD SDI OUT*
- DRIVER → 3G / HD / SD SDI OUT
- DRIVER → 3G / HD / SD SDI OUT*
- DRIVER → 3G / HD / SD SDI OUT
- DRIVER → 3G / HD / SD SDI OUT*

* 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 -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
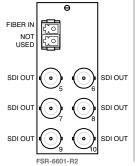- 5-year transferable warranty
- Power: 4.5 watts

Ordering Information

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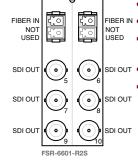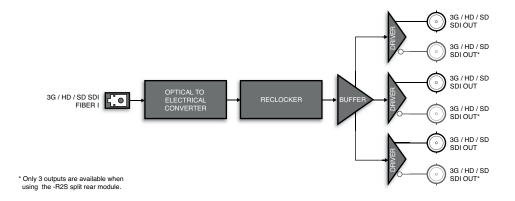FSR-6601-H   Single Optical Receiver

Rear Module Suffix (ex: [model]-R2)
-R2   Rear Module for FSR-6601-H
-R2S   Split Rear Module for 2x FSR-6601-H

FSR-6601-H-R2
FIBER IN
NOT USED
SDI OUT 5   SDI OUT 6
SDI OUT 7   SDI OUT 8
SDI OUT 9   SDI OUT 10

FSR-6601-H-R2S
CARD 2   CARD 1
FIBER IN NOT USED   FIBER IN NOT USED
SDI OUT 5   SDI OUT 6
SDI OUT 7   SDI OUT 8
SDI OUT 9   SDI OUT 10

FST-6602 `3G` `HD` `SD`

Single Electrical to Optical Converter
Single channel electrical to optical converter 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 OG3-FR supports up to 20 independent channel solutions.

3G / HD / SD SDI → EQUALIZER → RECLOCKER → BUFFER → ELECTRICAL TO OPTICAL CONVERTER

DRIVER → 3G / HD / SD SDI OUT*

3G / HD / SD SDI FIBER OUT

DRIVER → 3G / HD / SD SDI OUT
DRIVER → 3G / HD / SD SDI OUT*

DRIVER → 3G / HD / SD SDI OUT
DRIVER → 3G / HD / SD SDI OUT*

* 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 / 0dBm (CWDM)
- Optical wavelength: 1310nm or CWDM
- 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
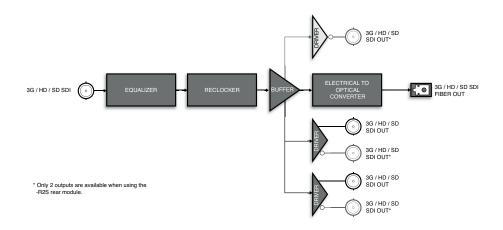- 5-year transferable warranty
- Power: 4.5 watts

Ordering Information

Single Electrical to Optical Converter
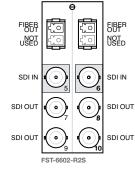
FST-6602	Single Optical Transmitter, 1310nm
FST-6602-XX	Single Optical Transmitter, CWDM

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

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

FIBER OUT NOT USED

SDI IN 5
SDI OUT 6
SDI OUT 7
SDI OUT 8
SDI OUT 9
SDI OUT 10

FST-6602-R2

CARD 2   CARD 1

FIBER OUT NOT USED   FIBER OUT NOT USED

SDI IN 5   SDI IN 6
SDI OUT 7   SDI OUT 8
SDI OUT 9   SDI OUT 10

FST-6602-R2S

FDR-6603 3G HD SD

Dual Optical to Electrical Converter

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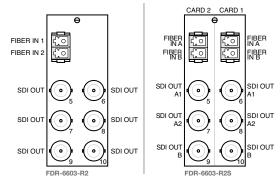
The FDR-6603 is a dual fiber optic receiver to serial digital SDI converter providing 2 channels of conversion on a single card supporting serial digital data rates from 143Mb/s up to 2.97Gb/s (1080p). SDI outputs are reclocked providing excellent jitter and return loss specifications.

The FDR-6603 is fully hot-swappable with all active components on the front removable card. 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 2 FDR-6603 cards, maximizing the number of conversion channels in a frame. In this configuration, the OG3-FR supports up to 40 independent channel solutions, providing ultra-high density conversion in a 2RU space.

(Block diagram)

3G / HD / SD SDI FIBER IN A → OPTICAL TO ELECTRICAL CONVERTER → RECLOCKER → BUFFER → DRIVER → 3G / HD / SD SDI OUT / 3G / HD / SD SDI OUT* / DRIVER → 3G / HD / SD SDI OUT / 3G / HD / SD SDI OUT*

3G / HD / SD SDI FIBER IN B → OPTICAL TO ELECTRICAL CONVERTER → RECLOCKER → BUFFER → DRIVER → 3G / HD / SD SDI OUT / 3G / HD / SD SDI OUT*

* 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
- 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
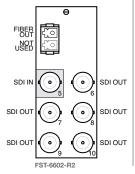- Power: 5.5 watts

Ordering Information

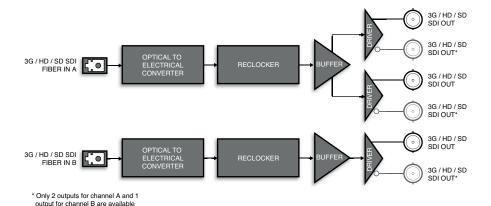**Dual Optical to Electrical Converter**

FDR-6603	Dual Optical Receiver

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

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

(Rear module diagrams)

FIBER IN 1, FIBER IN 2, SDI OUT 5, SDI OUT 6, SDI OUT 7, SDI OUT 8, SDI OUT 9, SDI OUT 10
FDR-6603-R2

CARD 2 / CARD 1
FIBER IN A, FIBER IN B, SDI OUT A1 5, SDI OUT A1 6, SDI OUT A2 7, SDI OUT A2 8, SDI OUT B 9, SDI OUT B 10
FDR-6603-R2S

FDR-6603-H 3G HD SD

Dual High Sensitivity Optical to Electrical Converter

Dual channel High Sensitivity SDI optical to electrical converter supporting data rates from 143Mb/s to 2.97Gb/s.

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 card. 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.
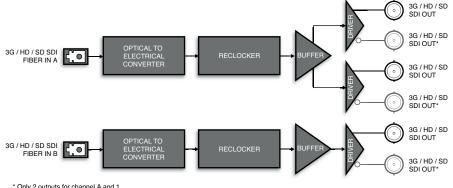
The -R2S high density split rear module can accommodate up to 2 FDR-6603-H cards, maximizing the number of conversion channels in a frame. In this configuration, the OG3-FR supports up to 40 independent channel solutions, providing ultra-high density conversion in a 2RU space.

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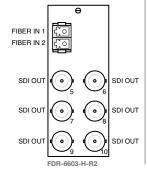
Dual High Sensitivity Optical to Electrical Converter
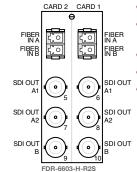
FDR-6603-H   Dual Optical Receiver

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

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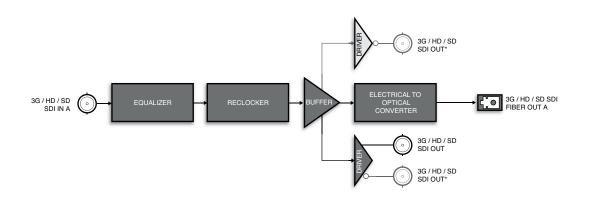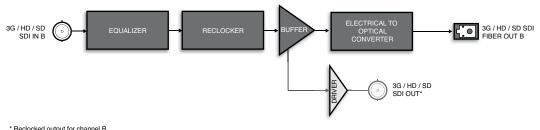
FDR-6603-H-R2

FDR-6603-H-R2S

FDT-6604 `3G` `HD` `SD`

Dual Electrical to Optical Converter
Dual channel electrical to optical converter supporting data rates from 143Mb/s to 3Gb/s (1080p).

3G / HD / SD SDI IN A → EQUALIZER → RECLOCKER → BUFFER → DRIVER → 3G / HD / SD SDI OUT*
BUFFER → ELECTRICAL TO OPTICAL CONVERTER → 3G / HD / SD SDI FIBER OUT A
DRIVER → 3G / HD / SD SDI OUT
DRIVER → 3G / HD / SD SDI OUT*

3G / HD / SD SDI IN B → EQUALIZER → RECLOCKER → BUFFER → ELECTRICAL TO OPTICAL CONVERTER → 3G / HD / SD SDI FIBER OUT B
DRIVER → 3G / HD / SD SDI OUT*

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

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 card. 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 2 FDT-6604 cards, maximizing the number of conversion channels in a frame. In this configuration, the OG3-FR supports up to 40 independent channel solutions, providing ultra-high density conversion in a 2RU space.

Ordering Information
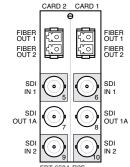
Dual Electrical to Optical Converter

FDT-6604	Dual Optical Transmitter, 1310nm
FDT-6604-XX	Dual Optical Transmitter, CWDM

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

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

Key Features

- Electrical to Optical for all SMPTE 424M, SMPTE 259M-C, SMPTE 292M standards
- Supports single-mode fiber
- Hot-swappable from front of frame with no external connect / reconnect required
- Optical output power: -7dBm / 0dBm (CWDM)
- Optical wavelength: 1310nm or CWDM
- 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

FDT-6604-R2

FIBER OUT 1
FIBER OUT 2
SDI IN 1 — 5
SDI OUT 1A — 6
SDI OUT 1B — 7
SDI OUT 1C — 8
SDI IN 2 — 9
SDI OUT 2A — 10

FDT-6604-R2S

CARD 2   CARD 1
FIBER OUT 1
FIBER OUT 2
FIBER OUT 1
FIBER OUT 2
SDI IN 1 — 5
SDI IN 1 — 6
SDI OUT 1A — 7
SDI OUT 1A — 8
SDI IN 2 — 9
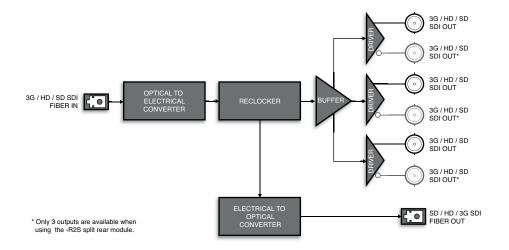SDI IN 2 — 10

FSR-6605 `3G` `HD` `SD`

Single Optical to Electrical Converter with Optical Regeneration
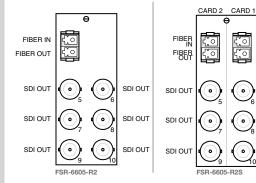Single channel SDI optical to electrical converter supporting data rates from 143Mb/s to 2.97Gb/s.

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 card. 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 2 FSR-6605 cards, maximizing the number of conversion channels in a frame. In this configuration, the OG3-FR supports up to 20 independent channel solutions.

Diagram

3G / HD / SD SDI FIBER IN → OPTICAL TO ELECTRICAL CONVERTER → RECLOCKER → BUFFER → DRIVER

- DRIVER → 3G / HD / SD SDI OUT
- DRIVER → 3G / HD / SD SDI OUT*
- DRIVER → 3G / HD / SD SDI OUT
- DRIVER → 3G / HD / SD SDI OUT*
- DRIVER → 3G / HD / SD SDI OUT
- DRIVER → 3G / HD / SD SDI OUT*

ELECTRICAL TO OPTICAL CONVERTER → SD / HD / 3G SDI FIBER OUT

* 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
- 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 2 FSR-6605

FSR-6605-R2
FIBER IN
FIBER OUT
SDI OUT 5   SDI OUT 6
SDI OUT 7   SDI OUT 8
SDI OUT 9   SDI OUT 10

FSR-6605-R2S
CARD 2   CARD 1
FIBER IN   FIBER IN
FIBER OUT   FIBER OUT
SDI OUT 5   SDI OUT 6
SDI OUT 7   SDI OUT 8
SDI OUT 9   SDI OUT 10
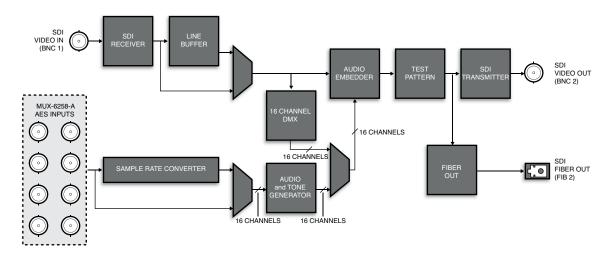
MUX-6258-A `3G` `HD` `SD` `AES`

AES / EBU Audio Embedder with Fiber Optic Output
The ideal solution for embedding 8 AES streams into an 3G / HD / SD SDI signal with optical output.

The MUX-6258-A is a high quality program audio embedder capable of embedding up to 8 AES / EBU pairs (16 audio channels) into an 3G / 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 / 0dBm (CWDM)
- Optical wavelength: 1310nm or CWDM
- Optical output connection: LC
- 5-year transferable warranty
- Power: 9.5 watts

Ordering Information

AES / EBU Audio Embedder with Fiber Optic Output

MUX-6258-A	AES / EBU Audio Embedder w/ Optical Output
MUX-6258-A-XX	AES / EBU Audio Embedder w/ CWDM Optical Output
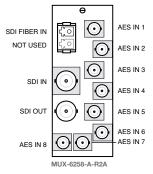
Rear Module Suffix (ex: [model]-R2)

-R2A	Rear Module for MUX-6258-A

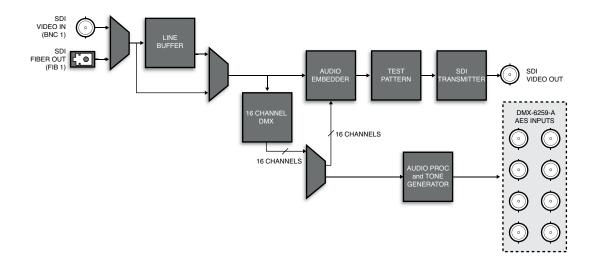MUX-6258-A-R2A

DMX-6259-A `3G` `HD` `SD` `AES`

AES / EBU Audio De-Embedder with Fiber Optic Input

The ideal solution for de-embedding 8 AES streams from an 3G / HD / SD SDI signal with optical input.

The DMX-6259-A is a high quality program audio de-embedder capable of de-embedding up to 8 AES / EBU pairs (16 audio channels) from an 3G / 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. Standard and high sensitivity optical receivers are available to accommodate various link budgets and transmission distances.

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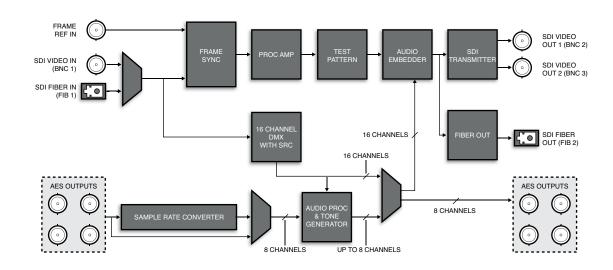
The DMX-6259-A offers a selectable fiber / coax input.

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 sensitivity -9dBm to -28dBm, w/ high sensitivity receiver (-H)
- Optical input connection: LC
- 5-year transferable warranty
- Power: 9.5 watts

Ordering Information

AES / EBU Audio De-Embedder with Fiber Optic Input
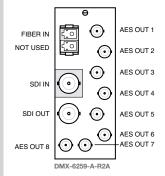
DMX-6259-A	AES / EBU Audio De-Embedder w/ Optical Input
DMX-6259-A-H	AES / EBU Audio De-Embedder w/ High Sensitivity Optical Receiver

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

-R2A	Rear Module for DMX-6259-A

SFS-6622-A

3G / HD / SD SDI Frame Synchronizer with Fiber Optic Input & Output

A/V frame synchronizer with AES embedding / de-embedding and fiber optic input and output

The SFS-6622-A 3G A/V frame synchronizer is the ideal solution for timing and processing both audio and video in 3G, high definition, and standard definition SD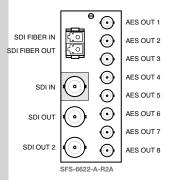I applications. Fiber optic inputs and outputs makes this card ideal for mixed format electrical / optical installations.

The input on the SFS-6622-A is software selectable between BNC and fiber optic LC connectors, and can accept all popular formats, including 480i, 576i, 720p, 1080i, and 1080p. Input video is automatically detected to simplify operation and configuration. The output format automatically follows the input format and are available both as Standard BNC and Fiber Optic LC Connectors.

Input video format is automatically detected to simplify operation combined with an onboard test pattern generator, with user selectable patterns in the event of input signal loss. The input signal is locked and re-timed to the reference input, with an additional adjustable delay of up to 28 frames. When the fiber optic input is used, optical power levels and alarms are presented in DashBoard.
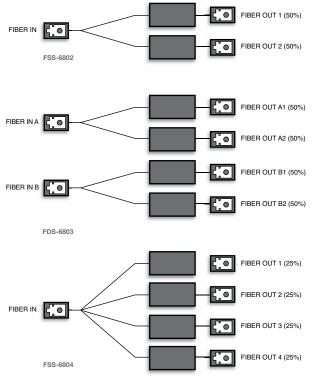
Audio processing for up to 16 channels, with embedding / de-embedding, is available using the 8 AES3 HD-BNC connectors. Audio processing includes, independent sample rate conversion, delay, swap, sum and mute with pass-through support for Dolby E or Dolby Digital. Audio I/O can be configured, via DashBoard, as either 8 AES inputs, 8 AES outputs, or bi-directional with 4 inputs and 4 outputs.

Key Features
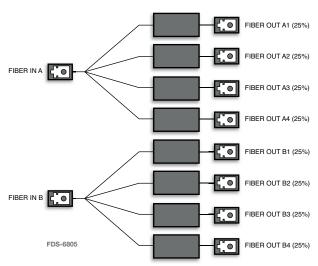
- BNC electrical or single mode fiber optic LC input
- Simultaneous dual BNC electrical and single mode fiber optic LC outputs
- Optical output power of -7dBm @1310nm
- Optical receiver sensitivity of -18 dBm
- Supports all popular formats: 480i, 576i, 720p, 1080i, 1080pSF, 1080p
- 8 AES3 HD-BNC connections for audio embedding / de-embedding, with sample rate conversion
- Onboard test generator for loss of input conditions
- Auto input format detection
- Onboard video proc amp
- A/V delay of up to 28 frames
- Passes ancillary VANC Data
- Onboard audio proc amp, including individually assignable audio delay, swap, sum, mute
- Full software configuration and signal status, via DashBoard control system.
- 5-year transferrable warranty

Ordering Information

3G / HD / SD-SDI Frame Synchronizer

SFS-6622-A   3G / HD / SD-SDI Frame Synchronizer

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

-R2A   Rear Module for SFS-6622-A

SFS-6622-A-R2A
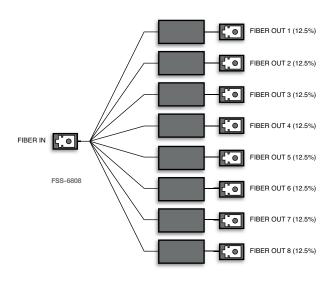
Optical Splitters 3G HD SD
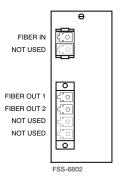
Single 1x2, 1x4, 1x8 & Dual 1x2, 1x4 Passive Optical Splitters
Distribution of an optical signal to multiple sources without the need for electrical conversion.
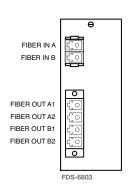
FIBER IN

FIBER OUT 1 (50%)
FIBER OUT 2 (50%)

FSS-6802

FIBER IN A

FIBER OUT A1 (50%)
FIBER OUT A2 (50%)

FIBER IN B

FIBER OUT B1 (50%)
FIBER OUT B2 (50%)

FDS-6803

FIBER IN

FIBER OUT 1 (25%)
FIBER OUT 2 (25%)
FIBER OUT 3 (25%)
FIBER OUT 4 (25%)

FSS-6804

FIBER IN A

FIBER OUT A1 (25%)
FIBER OUT A2 (25%)
FIBER OUT A3 (25%)
FIBER OUT A4 (25%)

FIBER IN B

FIBER OUT B1 (25%)
FIBER OUT B2 (25%)
FIBER OUT B3 (25%)
FIBER OUT B4 (25%)

FDS-6805

FIBER IN

FIBER OUT 1 (12.5%)
FIBER OUT 2 (12.5%)
FIBER OUT 3 (12.5%)
FIBER OUT 4 (12.5%)
FIBER OUT 5 (12.5%)
FIBER OUT 6 (12.5%)
FIBER OUT 7 (12.5%)
FIBER OUT 8 (12.5%)

FSS-6808

FIBER IN
NOT USED

FIBER OUT 1
FIBER OUT 2
NOT USED
NOT USED

FSS-6802

FIBER IN A
FIBER IN B

FIBER OUT A1
FIBER OUT A2
FIBER OUT B1
FIBER OUT B2

FDS-6803

FIBER IN
NOT USED

FIBER OUT 1
FIBER OUT 2
FIBER OUT 3
FIBER OUT 4

FSS-6804

FIBER IN A
FIBER IN B

FIBER OUT A1   FIBER OUT B1
FIBER OUT A2   FIBER OUT B2
FIBER OUT A3   FIBER OUT B3
FIBER OUT A4   FIBER OUT B4

FDS-6805

FIBER IN
NOT USED

FIBER OUT 1   FIBER OUT 2
FIBER OUT 3   FIBER OUT 4
FIBER OUT 5   FIBER OUT 6
FIBER OUT 7   FIBER OUT 8

FSS-6808

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
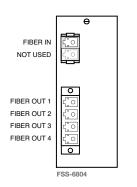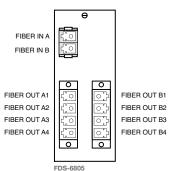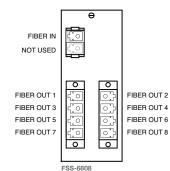
Optical splitter modules use passive optical circuits. The modules fit the OG3-FR frame but draw no power. With no active components, modules offer a very high level of reliability.

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 OG3-FR frame, no power required
- 5-year transferable warranty

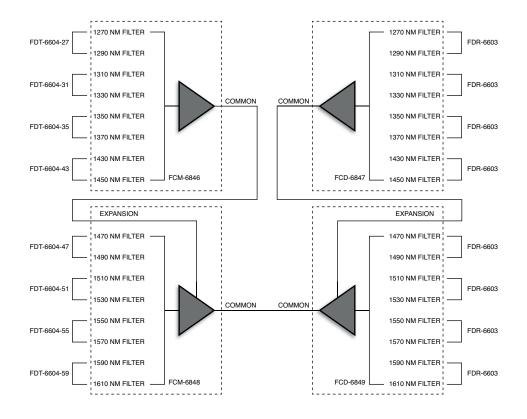## Ordering Information

Optical Splitters

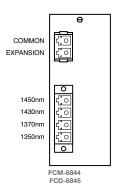|	
FSS-6802	Optical 1x2 Splitter
FDS-6803	Dual Optical 1x2 Splitter
FSS-6804	Optical 1x4 Splitter
FDS-6805	Dual Optical 1x4 Splitter
FSS-6808	Optical 1x8 Splitter

CWDM `3G` `HD` `SD`
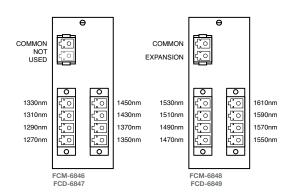
Coarse Wave Division Multiplexing

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

FDT-6604-27
1270 NM FILTER
1290 NM FILTER

FDT-6604-31
1310 NM FILTER
1330 NM FILTER

FDT-6604-35
1350 NM FILTER
1370 NM FILTER

FDT-6604-43
1430 NM FILTER
1450 NM FILTER

COMMON

FCM-6846

1270 NM FILTER — FDR-6603
1290 NM FILTER

1310 NM FILTER — FDR-6603
1330 NM FILTER

1350 NM FILTER — FDR-6603
1370 NM FILTER

1430 NM FILTER — FDR-6603
1450 NM FILTER

COMMON

FCD-6847

EXPANSION

FDT-6604-47
1470 NM FILTER
1490 NM FILTER

FDT-6604-51
1510 NM FILTER
1530 NM FILTER

FDT-6604-55
1550 NM FILTER
1570 NM FILTER

FDT-6604-59
1590 NM FILTER
1610 NM FILTER

COMMON

FCM-6848

EXPANSION

1470 NM FILTER — FDR-6603
1490 NM FILTER

1510 NM FILTER — FDR-6603
1530 NM FILTER

1550 NM FILTER — FDR-6603
1570 NM FILTER

1590 NM FILTER — FDR-6603
1610 NM FILTER

COMMON

FCD-6849

COMMON
EXPANSION

1450nm
1430nm
1370nm
1350nm

**FCM-6844
FCD-6845**

COMMON
NOT
USED

1330nm   1450nm
1310nm   1430nm
1290nm   1370nm
1270nm   1350nm

**FCM-6846
FCD-6847**

COMMON
EXPANSION

1530nm   1610nm
1510nm   1590nm
1490nm   1570nm
1470nm   1550nm

**FCM-6848
FCD-6849**

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 OG3-FR 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. All Ross openGear® fiber transmitters have the option for CWDM output. 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 FST-6602 single transmitter, MUX-6258 audio mux and Ethernet products come in 16 different product variants. CWDM products are identified by a two digit suffix, which identifies the lower wavelength.

For example, dual channel products like the FDT-6604-27 will transmit 1270nm on its first channel, and 1290nm on its second channel. Single channel products like the MUX-6258-55 will output 1550nm.

Optical to electrical converters use a wide spectrum optical receiver, and will work with any wavelength. All 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 OG3-FR frame, passive modules do not require any power
- 5-year transferable warranty
- Power: 4.5 watts

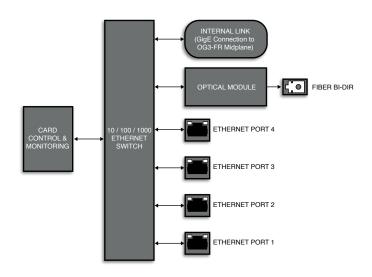## Ordering Information

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

FES-6941 `GigE`

Single Link Ethernet Fiber Transceiver (WDM)
6 Port, Gigabit Ethernet switch with single link, bi-directional fiber transceiver.
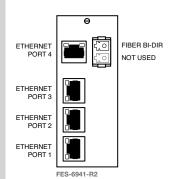

The FES-6941 is a dedicated 6 port, Gigabit Ethernet switch. 4 Copper ports provide 1Gb/s connectivity for multiple Ethernet enabled devices or links to additional network switches. 1 optical port provides an Ethernet link over a single, bi-directional fiber connection for extended distances. An additional port is available for the OG3 frame's optional internal GigE controller.

The FES-6941 is available in 2 varieties: The FES-6941-20A/B transceiver pair is capable of running up to a 20km link between 2 transceivers. The FES-6941-40A/B transceiver pair is capable of running up to 40km link, by using a higher output power and higher receiver sensitivity SFP.

Using WDM (Wave Division Multiplexing), a bi-directional link can be obtained using 1310nm and 1550nm wavelengths over a single fiber link. When using WDM single fiber link, the two FES-6941 transceivers at each end of the link must complement each other in regards to their wavelength TX and RX.

Key Features
- 4 independent copper Gigabit Ethernet ports
- Copper Ethernet connection: RJ45
- Bi-directional single fiber WDM connection
- Optical connection: LC
- Internal GigE midplane connection
- SNMP compliant
- 5-year transferable warranty

Input Optical Sensitivity & Wavelength
- 20km A: -22dBm @ 1550nm
- 20km B: -23dBm @ 1310nm
- 40km A: -23dBm @ 1550nm
- 40km B: -23dBm @ 1310nm

Output Power & Wavelength
- 20km A: -8dBm @ 1310nm
- 20km B: -8dBm @ 1550nm
- 40km A: -3dBm @ 1310nm
- 40km B: -5dBm @ 1550nm

Ordering Information

Single Link Ethernet Transceiver, Single Fiber

FES-6941-20A	20km WDM 1310 TX / 1550 RX
FES-6941-20B	20km WDM 1550 TX / 1310 RX
FES-6941-40A	40km WDM 1310 TX / 1550 RX
FES-6941-40B	40km WDM 1550 TX / 1310 RX

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

-R2	Rear Module for FES-6941

FES-6941-R2
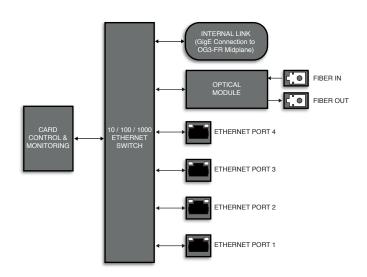
FES-6942 `GigE`

Single Link Ethernet Fiber Transceiver (Dual Fiber)
6 Port, Gigabit Ethernet switch with single link, dual fiber transceiver.
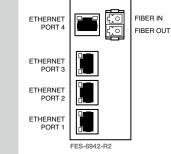
The FES-6942 is a dedicated 6 port, Gigabit Ethernet switch. 4 copper ports provide 1Gb/s connectivity for multiple Ethernet enabled devices or links to additional network switches. 1 dual fiber optical port provides an Ethernet link over a dual fiber connection for extended distances.

The FES-6942 is available in several varieties: The FES-6942-20 transceiver is capable of running up to a 20km link between a 2nd FES-6942-20, or any other transceivers of similar specifications. 40km and 80km variations are also available and achieved by using higher output power transmitters and higher sensitivity receiver SFPs.

CWDM options are available in standard and high sensitivity SFPs for use with external CWDM multiplexer and de-multiplexer systems. Up to 16 independent optical signals can be multiplexed down a single fiber. This allows up to 8 full duplex, gigabit Ethernet links over a single fiber, or any combination of audio, video and data optical signals using other Ross Video CWDM fiber products.

Key Features
- 4 independent copper Gigabit Ethernet ports
- Copper Ethernet connection: RJ45
- Dual LC Optical Connection
- Internal GigE midplane connection
- SNMP compliant
- 5-year transferable warranty

Input Optical Sensitivity & Wavelength
- 20km: -22dBm
- 40km: -24dBm
- 80km: -24dBm
- CWDM: -24dBm
- CWDM-H: -32dBm

Output Power & Wavelength
- 20km: -8dBm @ 1310nm
- 40km: -2dBm @ 1310nm
- 80km: 0dBm @ 1550nm
- CWDM: 0dBm @ 1270nm – 1610nm
- CWDM-H   2dBm @ 1270nm – 1610nm

Ordering Information

Single Link, Dual Fiber

FES-6942-20	20km
FES-6942-40	40km
FES-6942-80	80km
FES-6942-XX*	CWDM
FES-6942-XXH*	CWDM + High Sensitivity

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

-R2	Rear Module for FES-6942

* CWDM wavelength identifier; ex: XX = 31 for 1310nm. See page 86 of the Infrastructure Catalog for CWDM multiplexing.

FES-6942-R2
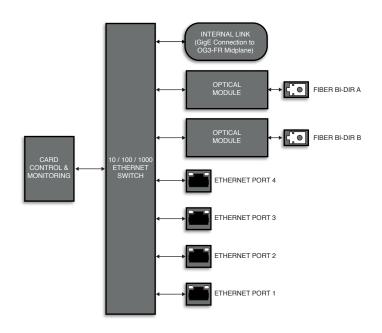
FED-6943 `GigE`

Dual Link Ethernet Fiber Transceiver (WDM)
7 Port, Gigabit Ethernet switch with dual link, bi-directional fiber transceiver.

The FED-6943 is a dedicated 7 port, Gigabit Ethernet switch. 4 Copper ports provide 1Gb/s connectivity for multiple Ethernet enabled devices or links to additional 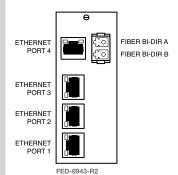network switches. 2 optical ports provide Ethernet links over two, bi-directional fiber connections for extended distances. An additional port is available for the OG3 frame's optional internal GigE controller.

The FED-6943 is available in 2 varieties: The FED-6943-20A/B transceiver pair is capable of running up to a 20km link between 2 transceivers. The FED-6943-40A/B transceiver pair is capable of running up to 40km link, by using a higher output power and higher receiver sensitivity SFP.

Using WDM (Wave Division Multiplexing), a bi-directional link can be obtained using 1310nm and 1550nm wavelengths over a single fiber link. When using WDM single fiber link, the two FED-6943 transceivers at each end of the link must complement each other in regards to their wavelength TX and RX.

Key Features
- 4 independent copper Gigabit Ethernet ports
- Copper Ethernet connection: RJ45
- 2 bi-directional single fiber WDM connection
- Optical connection: LC
- Internal GigE midplane connection
- SNMP compliant
- 5-year transferable warranty

Input Optical Sensitivity & Wavelength
- 20km A: -22dBm @ 1550nm
- 20km B: -23dBm @ 1310nm
- 40km A: -23dBm @ 1550nm
- 40km B: -23dBm @ 1310nm

Output Power & Wavelength
- 20km A: -8dBm @ 1310nm
- 20km B: -8dBm @ 1550nm
- 40km A: -3dBm @ 1310nm
- 40km B: -5dBm @ 1550nm

Ordering Information

Dual Link Ethernet Transceiver, Dual Fiber

FED-6943-20A	20km WDM 1310 TX / 1550 RX
FED-6943-20B	20km WDM 1550 TX / 1310 RX
FED-6943-40A	40km WDM 1310 TX / 1550 RX
FED-6943-40B	40km WDM 1550 TX / 1310 RX

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

-R2	Rear Module for FED-6943

FED-6943-R2
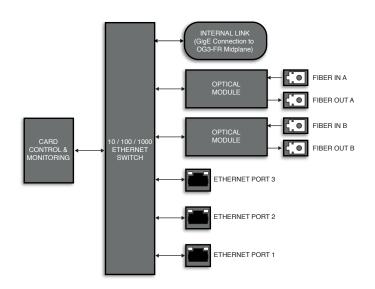
FED-6944 GigE

Dual Link Ethernet Fiber Transceiver (Quad Fiber)
6 Port, Gigabit Ethernet switch with dual link, quad fiber transceivers.

The FED-6944 is a dedicated 6 port, Gigabit Ethernet switch. 3 copper ports provide 1Gb/s connectivity for multiple Ethernet enabled devices or links to additional network switches. 4 optical ports provide an Ethernet link over two, dual fiber connections for extended distances. An additional port is available for the OG3 frame's optional internal GigE controller.

The FED-6944 is available in several varieties: The FED-6944-20 transceiver is capable of running up to a 20km link between a 2nd FED-6944-20, or any other transceivers of similar specifications. 40km and 80km variations are also available and achieved by using higher output power transmitters and higher sensitivity receiver SFPs.

CWDM options are available in standard and high sensitivity SFPs for use with external CWDM multiplexer and de-multiplexer systems. Up to 16 independent optical signals can be multiplexed down a single fiber. This allows up to 8 full duplex, gigabit Ethernet links over a single fiber, or any combination of audio, video and data optical signals using other Ross Video CWDM fiber products.

Ordering Information

Dual Link Ethernet Transceiver, Quad Fiber

FED-6944-20	20km
FED-6944-40	40km
FED-6944-80	80km
FED-6944-XX*	CWDM
FED-6944-XXH *	CWDM + High Sensitivity

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

-R2	Rear Module for FED-6944

* CWDM wavelength identifier; ex: XX = 31 for 1310nm. See page 86 of the Infrastructure Catalog for CWDM multiplexing.

FED-6944-R2

Key Features
- 3 independent copper Gigabit Ethernet ports
- Copper Ethernet connection: RJ45
- Quad LC Optical Connection
- Internal GigE midplane connection
- SNMP compliant
- 5-year transferable warranty

Input Optical Sensitivity & Wavelength
- 20km: -22dBm
- 40km: -24dBm
- 80km: -24dBm
- CWDM: -24dBm
- CWDM-H: -32dBm

Output Power & Wavelength
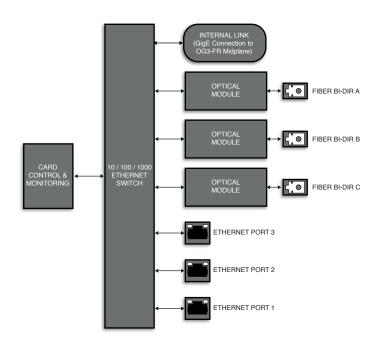- 20km: -8dBm @ 1310nm
- 40km: -2dBm @ 1310nm
- 80km: 0dBm @ 1550nm
- CWDM: 0dBm @ 1270nm – 1610nm
- CWDM-H 2dBm @ 1270nm – 1610nm

FET-6945 `GigE`

Triple Link Ethernet Fiber Transceiver (WDM)
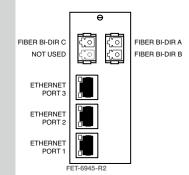7 Port, Gigabit Ethernet switch with triple link, bi-directional fiber transceivers.

The FET-6945 is a dedicated 7 port, Gigabit Ethernet switch. 3 Copper ports provide 1Gb/s connectivity for multiple Ethernet enabled devices or links to additional network switches. 3 optical ports provide Ethernet links over three, bi-directional fiber connections for extended distances. An additional port is available for the OG3 frame's optional internal GigE controller.

The FET-6945 is available in 2 varieties: The FET-6945-20A/B transceiver pair is capable of running up to a 20km link between 2 transceivers. The FET-6945-40A/B transceiver pair is capable of running up to 40km link, by using a higher output power and higher receiver sensitivity SFP.

Using WDM (Wave Division Multiplexing), a bi-directional link can be obtained using 1310nm and 1550nm wavelengths over a single fiber link. When using WDM single fiber link, the two FET-6945 transceivers at each end of the link must complement each other in regards to their wavelength TX and RX.

Key Features
- 3 independent copper Gigabit Ethernet ports
- Copper Ethernet connection: RJ45
- 3 bi-directional single fiber WDM connections
- Optical connection: LC
- Internal GigE midplane connection
- SNMP compliant
- 5-year transferable warranty

Input Optical Sensitivity & Wavelength
- 20km A: -22dBm @ 1550nm
- 20km B: -23dBm @ 1310nm
- 40km A: -23dBm @ 1550nm
- 40km B: -23dBm @ 1310nm

Output Power & Wavelength
- 20km A: -8dBm @ 1310nm
- 20km B: -8dBm @ 1550nm
- 40km A: -3dBm @ 1310nm
- 40km B: -5dBm @ 1550nm

Ordering Information

Triple Link Ethernet Transceiver, Triple Fiber

FET-6945-20A	20km WDM 1310 TX / 1550 RX
FET-6945-20B	20km WDM 1550 TX / 1310 RX
FET-6945-40A	40km WDM 1310 TX / 1550 RX
FET-6945-40B	40km WDM 1550 TX / 1310 RX

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

-R2	Rear Module for FET-6945

FET-6945-R2

FET-6946 GigE

Triple Link Ethernet Fiber Transceiver (WDM & Dual Fiber)
7 Port, Gigabit Ethernet switch with triple link, dual bi-directional plus dual fiber transceivers.
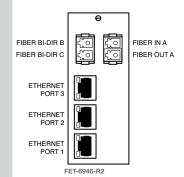
The FET-6946 is a dedicated 7 port, Gigabit Ethernet switch. 3 copper ports provide 1Gb/s connectivity for multiple Ethernet enabled devices or links to additional network switches. 2 optical ports provide 2 Ethernet links over two, bi-directional fiber connections and 2 additional optical ports provide a 3rd Ethernet link over dual fiber connections. An additional port is available for the OG3 frame's optional internal GigE controller.

The FET-6946 is available in 2 varieties: The FET-6946-20A/B transceiver pair is capable of running up to a 20km link between 2 transceivers. The FET-6946-40A/B transceiver pair is capable of running up to 40km link, by using a higher output power and higher receiver sensitivity SFP.

Using WDM (Wave Division Multiplexing), a bi-directional link can be obtained using 1310nm and 1550nm wavelengths over a single fiber link. When using WDM single fiber link, the two FET-6946 transceivers at each end of the link must complement each other in regards to their wavelength TX and RX.

Key Features
- 3 independent copper Gigabit Ethernet ports
- Copper Ethernet connection: RJ45
- Quad fiber connection
- Optical connection: LC
- Internal GigE midplane connection
- SNMP compliant
- 5-year transferable warranty

Input Optical Sensitivity & Wavelength
- 20km A: -22dBm @ 1550nm
- 20km B: -23dBm @ 1310nm
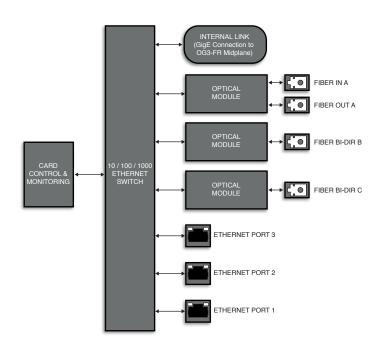- 40km A: -23dBm @ 1550nm
- 40km B: -23dBm @ 1310nm

Output Power & Wavelength
- 20km A: -8dBm @ 1310nm
- 20km B: -8dBm @ 1550nm
- 40km A: -3dBm @ 1310nm
- 40km B: -5dBm @ 1550nm

Ordering Information

Triple Link Ethernet Transceiver, Dual Bi-Directional plus Dual Fiber

FET-6946-20A	20km WDM 1310 TX / 1550 RX
FET-6946-20B	20km WDM 1550 TX / 1310 RX
FET-6946-40A	40km WDM 1310 TX / 1550 RX
FET-6946-40B	40km WDM 1550 TX / 1310 RX

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

-R2	Rear Module for FET-6946

FET-6946-R2

CES-8940
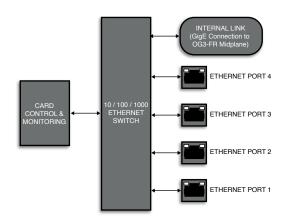
Gigabit Ethernet Switch
4 Port Ethernet Switch

The CES-8940 is a dedicated 5 port, Gigabit Ethernet switch. 4 copper ports provide 1Gb/s connectivity for multiple Ethernet enabled devices or links to additional network switches. An additional port connects into the OG3-FR's midplane for the optional GigE frame controller card.

The CES-8940 is ideal for linking multiple openGear® frames, or other Ethernet enabled devices within a single rack. With its modular, high density design, it can help reduce or simplify IT cabling during a new install, or provide a quick and easy way to add new Ethernet devices within a rack containing an openGear® frame without the need for larger external switches.

Diagram

INTERNAL LINK (GigE Connection to OG3-FR Midplane)

CARD CONTROL & MONITORING

10 / 100 / 1000 ETHERNET SWITCH

ETHERNET PORT 4

ETHERNET PORT 3

ETHERNET PORT 2

ETHERNET PORT 1

Key Features
- 4 independent copper Gigabit Ethernet ports
- Copper Ethernet connection: RJ45
- Internal GigE midplane connection
- VLAN configuration via DashBoard
- Trunking configuration via DashBoard
- SNMP compliant
- 5-year transferable warranty

Ordering Information

Gigabit Ethernet Switch

CES-8940	Gigabit Ethernet Switch

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

-R2	Rear Module for CES-8940

ETHERNET PORT 4

ETHERNET PORT 3

ETHERNET PORT 2

ETHERNET PORT 1

CES-8940-R2

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

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

RCM-8120
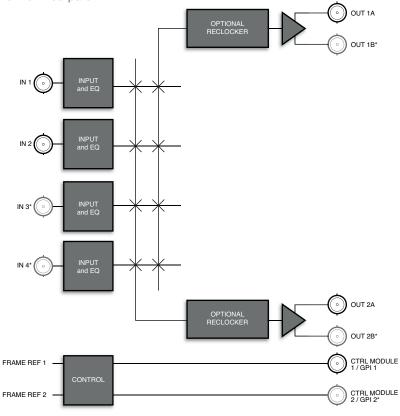Remote Control Modules

Switching

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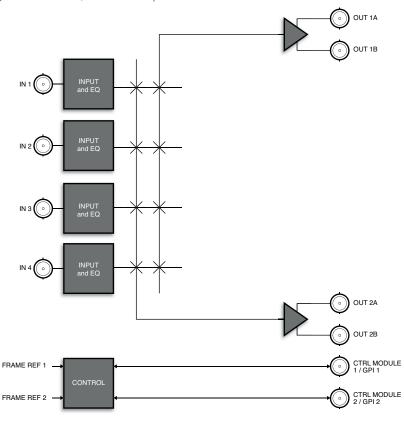
The DSS-8224 can be configured in auto-changeover mode. In this mode, the secondary input is selected when the primary is lost or lock cannot be achieved.

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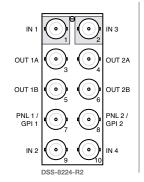
Dual 2x1 or 4x2 HD / SD SDI Switch
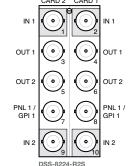
DSS-8224   HD / SD SDI Switch

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

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

DSS-8224-R2

DSS-8224-R2S

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.


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
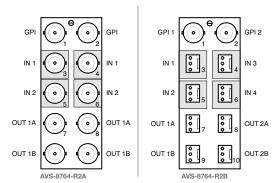
Key Features

- 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

AVS-8764-R2A

AVS-8764-R2B

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
• 5-year transferable warranty

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 SDI Mixer / Keyer with Internal Logo Insertion

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

Keying & Branding
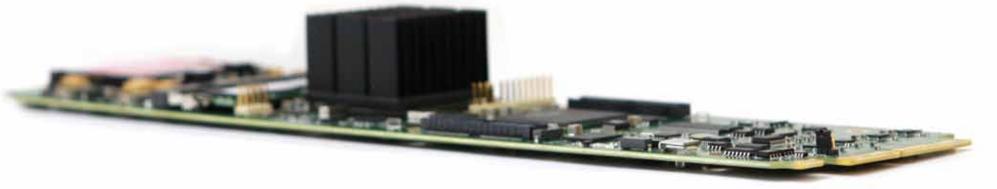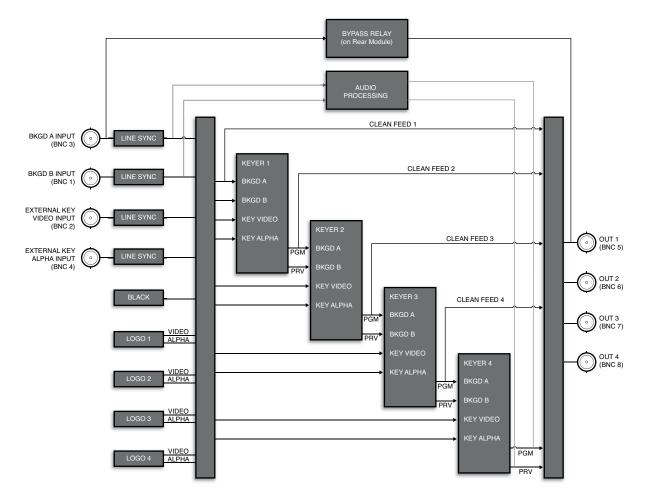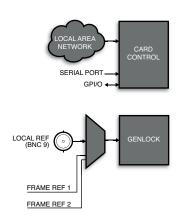
MDK-111A-M HD SD
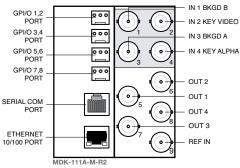
HD / SD SDI Mixer / Keyer with Internal Logo Insertion

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

BYPASS RELAY
(on Rear Module)

AUDIO
PROCESSING

LOCAL AREA
NETWORK

CARD
CONTROL

SERIAL PORT

GPI/O

CLEAN FEED 1

BKGD A INPUT
(BNC 3)

LINE SYNC

BKGD B INPUT
(BNC 1)

LINE SYNC

CLEAN FEED 2

LOCAL REF
(BNC 9)

GENLOCK

KEYER 1

BKGD A

BKGD B

KEY VIDEO

KEY ALPHA

EXTERNAL KEY
VIDEO INPUT
(BNC 2)

LINE SYNC

FRAME REF 1

FRAME REF 2

KEYER 2

BKGD A

CLEAN FEED 3

OUT 1
(BNC 5)

EXTERNAL KEY
ALPHA INPUT
(BNC 4)

LINE SYNC

PGM

PRV

BKGD B

KEY VIDEO

KEY ALPHA

OUT 2
(BNC 6)

BLACK

KEYER 3

BKGD A

CLEAN FEED 4

PGM

BKGD B

OUT 3
(BNC 7)

LOGO 1

VIDEO
ALPHA

PRV

KEY VIDEO

KEY ALPHA

KEYER 4

BKGD A

OUT 4
(BNC 8)

LOGO 2

VIDEO
ALPHA

PGM

BKGD B

PRV

LOGO 3

VIDEO
ALPHA

KEY VIDEO

KEY ALPHA

LOGO 4

VIDEO
ALPHA

PGM

PRV

GPI/O 1,2
PORT

IN 1 BKGD B

GPI/O 3,4
PORT

IN 2 KEY VIDEO

IN 3 BKGD A

GPI/O 5,6
PORT

IN 4 KEY ALPHA

GPI/O 7,8
PORT

SERIAL COM
PORT

OUT 2

OUT 1

OUT 4

ETHERNET
10/100 PORT

OUT 3

REF IN

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 Compact Flash 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
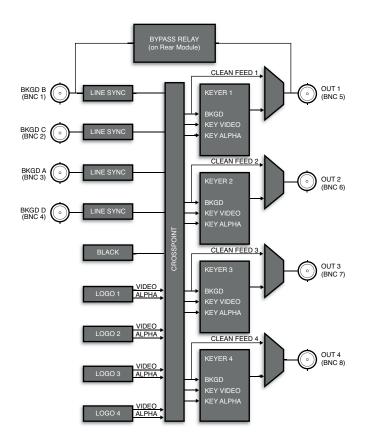
MDK-111A-K HD SD
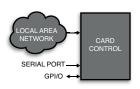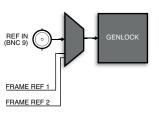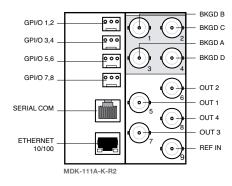
HD / SD Quad Logo Inserter
4 independent input / output streams with 1 dedicated logo inserter per stream.

BYPASS RELAY
(on Rear Module)

CLEAN FEED 1

BKGD B
(BNC 1)

LINE SYNC

KEYER 1

BKGD
KEY VIDEO
KEY ALPHA

OUT 1
(BNC 5)

BKGD C
(BNC 2)

LINE SYNC

BKGD A
(BNC 3)

LINE SYNC

CLEAN FEED 2

KEYER 2

BKGD
KEY VIDEO
KEY ALPHA

OUT 2
(BNC 6)

BKGD D
(BNC 4)

LINE SYNC

BLACK

CLEAN FEED 3

KEYER 3

BKGD
KEY VIDEO
KEY ALPHA

OUT 3
(BNC 7)

LOGO 1

VIDEO
ALPHA

LOGO 2

VIDEO
ALPHA

CLEAN FEED 4

KEYER 4

BKGD
KEY VIDEO
KEY ALPHA

OUT 4
(BNC 8)

LOGO 3

VIDEO
ALPHA

LOGO 4

VIDEO
ALPHA

CROSSPOINT

LOCAL AREA
NETWORK

CARD
CONTROL

SERIAL PORT
GPI/O

REF IN
(BNC 9)

GENLOCK

FRAME REF 1

FRAME REF 2

GPI/O 1,2
GPI/O 3,4
GPI/O 5,6
GPI/O 7,8

SERIAL COM

ETHERNET
10/100

BKGD B
BKGD C
BKGD A
BKGD D

OUT 2
OUT 1
OUT 4
OUT 3
REF IN

1 2
3 4
6
5
8
7
9

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

Distribution & Monitoring

Up / Down / Cross, ARC Conversion

Synchronization & Delay

Video Conversion

Audio Conversion

Audio Embedding / De-Embedding

Advanced Audio Processing

Fiber

Switching

Keying & Branding
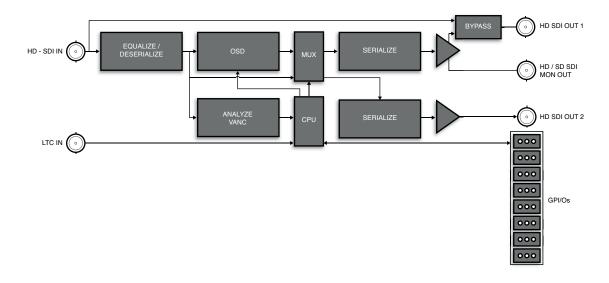
Data Solutions

Transport Stream Monitoring & 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
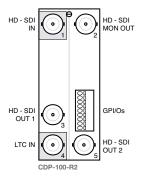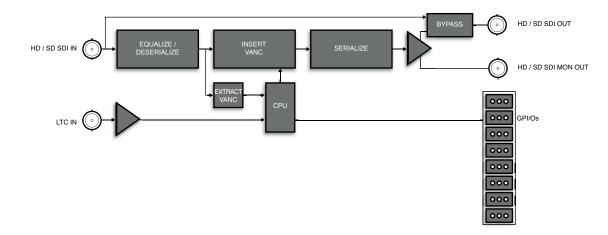- 5-year transferable warranty

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 identify 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
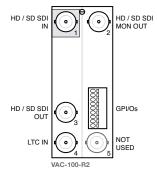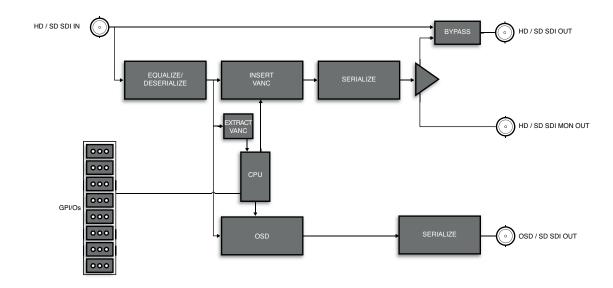- 5-year transferable warranty

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

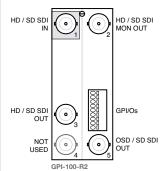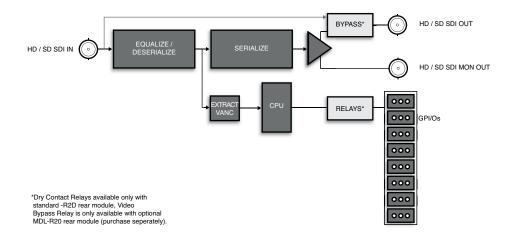• 5-year transferable warranty

Ordering Information

Remote GPI VANC Transmission

GPI-100   Remote GPI VANC Transmission

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

-R2   Encoding Rear Module for GPI-100

-R2D   Decoding 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 controlling 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.

Block Diagram

HD / SD SDI IN → EQUALIZE / DESERIALIZE → SERIALIZE → BYPASS* → HD / SD SDI OUT

HD / SD SDI MON OUT

EXTRACT VANC → CPU → RELAYS* → GPI/Os

*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

HD / SD SDI IN — 1
HD / SD SDI MON OUT — 2
HD / SD SDI OUT — 3
NOT USED — 4
GPI/Os   GPI/Os

VDD-100-R2D

VRC-100 `HD` `SD` `AFD`
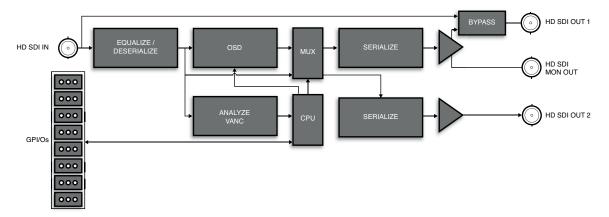
VANC Data Monitoring
Monitor and display most common VANC packets with on-screen and GPI/O alerts.
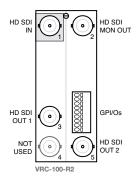
The VRC-100 VANC receiver card provides a simple and highly configurable way of monitoring the VANC data in a SMPTE 292M signal. Information about the VANC content is displayed over the video that contains it. The user has complete control over the data that is decoded and how it is displayed. The card 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 & Monitoring
Up / Down / Cross, ARC Conversion
Synchronization & Delay
Video Conversion
Audio Conversion
Audio Embedding / De-Embedding
Advanced Audio Processing
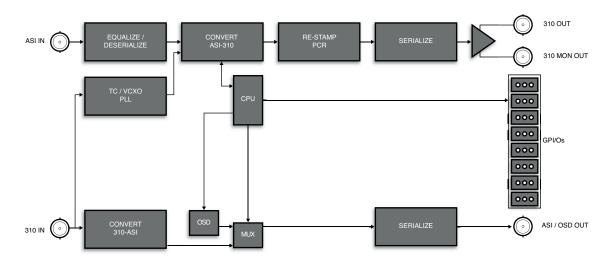Fiber
Switching
Keying & Branding
Data Solutions

Transport Stream
Monitoring & 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
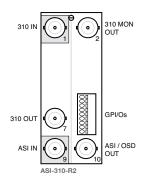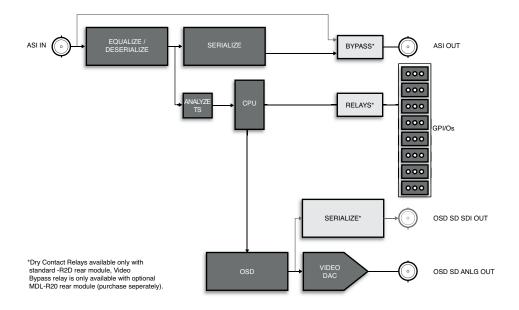
Ordering Information

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.

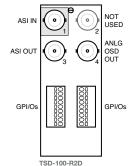ASI IN → EQUALIZE / DESERIALIZE → SERIALIZE → BYPASS* → ASI OUT

ANALYZE TS → CPU → RELAYS* → GPI/Os

SERIALIZE* → OSD SD SDI OUT

OSD → VIDEO DAC → OSD SD ANLG OUT

*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
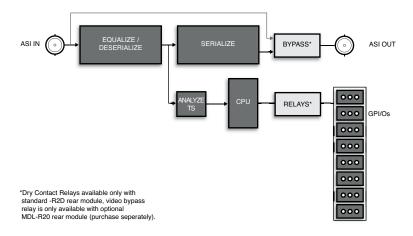
The TSD-100 facilitates:

- 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

ASI IN — 1
NOT USED — 2
ASI OUT — 3
ANLG OSD OUT — 4
GPI/Os
GPI/Os

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
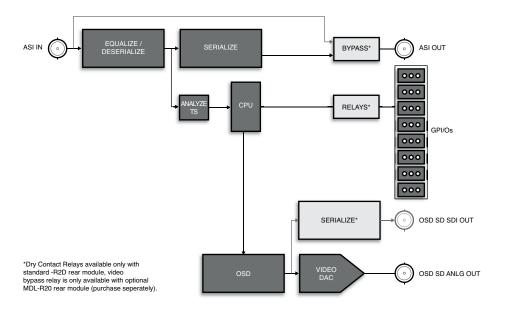
The TSM-100 facilitates:
- Unattended confidence monitoring of transport streams
- Monitoring of multiple streams within an openGear® frame
- Notification to other monitoring systems
- 5-year transferable warranty

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!
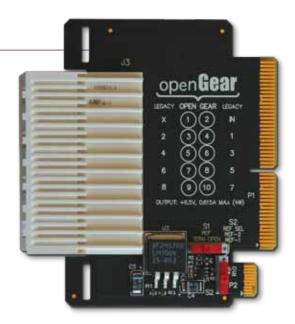
The OPA-8380A openGear® adapter is designed to allow existing customers, with RossGear 8000 Series products, to easily migrate existing solutions to the OG3-FR frame.

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 cards using OPA-8380A is not controllable under the DashBoard control system.

OPA-8381

Analog Audio Adapter
Leaving no customer behind!
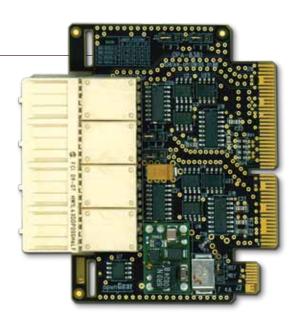
The OPA-8381 openGear® adapter is designed to allow existing customers, with RossGear Analog Audio 8000 Series products, to easily migrate existing solutions to the OG3-FR frame.

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 cards using OPA-8381 is not controllable under the DashBoard control system.

8000 SERIES PRODUCTS SUPPORTED BY THE openGear® PLATFORM

Distribution and Monitoring

SEA-8003A	Serial Equalizing Amplifier
DSA-8004A	Dual Serial Equalizing Amplifier
CMA-8011A	SDI Component Monitoring and Reclocking Amplifier
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

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

NIELSEN
ENCODERS

Table of Contents

NWE-3GA `3G` `HD` `SD` `AES`

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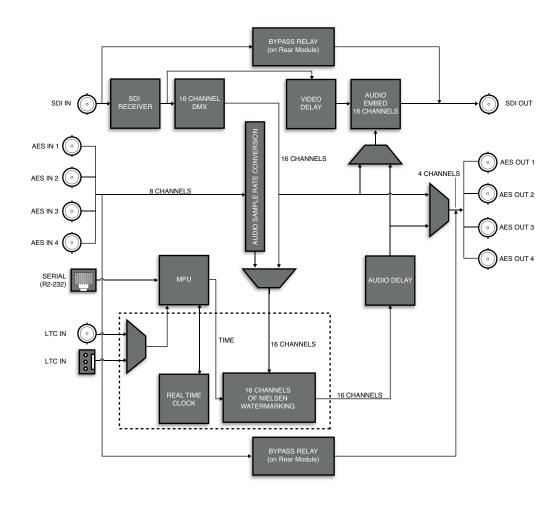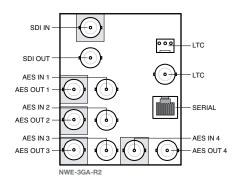High quality insertion of Nielsen Watermarks into embedded and / or AES3 digital audio.

The NWE-3GA 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-3GA accepts an SDI input (3 Gb/s, 1.5 Gb/s, or 270 Mb/s) and 4 AES3 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-3GA 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-3GA 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.

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.

Key Features

• 3 Gb/s video path with bypass relay protection

• Handles all popular SD and HD video formats, up to 1080p/59.97

• 4 AES3 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-3GA modules can be installed in a single 2RU openGear® frame; alternatively, 1 NWE-3GA 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

Ordering Information

Nielsen Watermarks Encoder

NWE-3GA   Nielsen Watermarks Encoder

Rear Module Suffix (ex: [model]-R2)
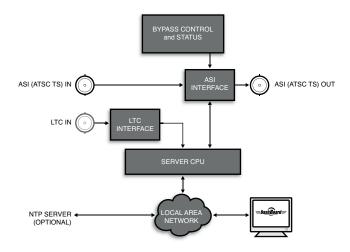
-R2   Rear Module for NWE-3GA

NWE-TS ASI

Nielsen Watermarks Encoder for ATSC Transport Streams

High quality insertion of Nielsen Watermarks into AC3 audio.

BYPASS CONTROL and STATUS

ASI (ATSC TS) IN   ASI INTERFACE   ASI (ATSC TS) OUT

LTC IN   LTC INTERFACE

SERVER CPU

NTP SERVER (OPTIONAL)   LOCAL AREA NETWORK   DashBoard

LTC IN   ASI IN   ASI OUT

NWE-TS

The NWE-TS is the ideal solution for inserting Nielsen Watermarks into the audio of television programming that is carried in an ATSC Transport Stream (TS). For watermarking uncompressed audio in SDI or AES3 signals, see the companion product NWE-3GA.

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-TS accepts a DVB-ASI input, containing a 19.39 Mbps ATSC TS. It applies the watermark to up to 10 user-selected audio streams which can be 5.1-channel surround, stereo or mono. All watermarked audio streams are reinserted into the output TS with the same timing relative to the video as they had upon arrival at the NWE-TS input.

The NWE-TS can be configured to assign different SID values to each of the selected audio streams, making it suitable for use with both single-program and Multi-Program Transport Streams (MPTS).

The NWE-TS includes a TS delay buffer, to ensure proper audio-video synchronization.

The ASI interface provides relay bypass, allowing the TS to pass transparently through the unit when power is off or bypass has been activated by the front-panel pushbutton.

The timestamp included in the watermark data can be synchronized to either SMPTE 12M unbalanced LTC or network time obtained via the network connection from an NTP server.

Key Features

• 270 MHz ASI path, with bypass relay protection

• Accepts any 19.39 Mbps ATSC ASI Transport Stream, including MPTS

• Watermarks up to 10 audio programs

• Transparent to PSI, PSIP, and all elementary streams except the watermarked audio streams

• 1RU Linux-based server platform with SLC SSD (Solid State Disk) for high reliability

• LTC unbalanced input

• DashBoard control, with selectable alarming

• Front-panel bypass control and LED indicators for system status

• 3-year transferable warranty

• Can be paired with a Ross Video ASI-310 dual converter for watermarking of a SMPTE 310 TS

Ordering Information

Nielsen Watermarks Encoder

NWE-TS   Nielsen Watermarks Encoder for ATSC Transport Streams

Table of Contents

ADA-9503
AES / EBU Fanout Distribution Amplifier

SEA-9003
SDI Equalizing Amplifier

SEA-9203
SDI Equalizing Amplifier

SRA-9601
3G / HD / SD Reclocking Distribution Amplifier

Distribution & Monitoring

Conversion
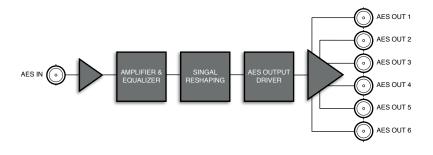
Audio Embedding / De-Embedding

Fiber

ADA-9503 AES

AES / EBU Fanout Distribution Amplifier
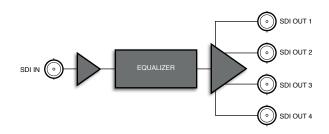
Key Features

- AES / EBU 75Ω unbalanced distribution
- Automatic cable equalization
- Signal reshaping enhances signal integrity
- Supports all data rates from 22 to 100kHz
- 6 AES / EBU 75Ω unbalanced outputs

Diagram labels: AES IN → AMPLIFIER & EQUALIZER → SINGAL RESHAPING → AES OUTPUT DRIVER → AES OUT 1, AES OUT 2, AES OUT 3, AES OUT 4, AES OUT 5, AES OUT 6

SEA-9003 SD

SDI Equalizing Amplifier

Key Features
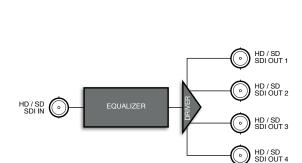
- Automatic equalization for up to 305m (1,000 ft) of cable at 270Mb/s
- Supports data rates from 143Mb/s to 360Mb/s
- 4 equalized and re-shaped SDI outputs
- Excellent I/O specifications

Diagram labels: SDI IN → EQUALIZER → SDI OUT 1, SDI OUT 2, SDI OUT 3, SDI OUT 4

SEA-9203 `HD` `SD`

SDI Equalizing Amplifier

Key Features

- Accepts all SDI signals from 143Mb/s to 1.485Gb/s
- Automatic cable equalization up to 305m (1,000 ft) of input cable at 270Mb/s or up to 100m (325 ft) at 1.485Gb/s
- 4 equalized SDI outputs
- Excellent I/O specifications
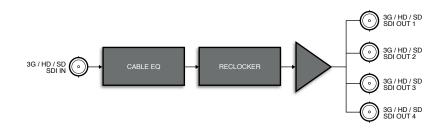
SRA-9601 `3G` `HD` `SD`

3G / HD / SD Reclocking Distribution Amplifier

Key Features

- 4 Reclocked, non-inverting SDI outputs
- Equalizes and reclocks SDI signals of 270Mb/s, 1.485Gb/s, and 2.97Gb/s
- Equalizes >300m of Belden 1694A cable at 270Mb/s, >120m at 1.485Gb/s, and >80m at 1.97Gb/s
- Automatic detection of incoming data rate
- Excellent I/O specifications

ADC-9032
Analog Composite to SDI Video Converter

ADC-9033
Analog Composite / Component / YC to SDI Video Converter

ADC-9532
Analog Audio to AES / EBU Converter

DAC-9516
AES / EBU to Analog Audio Converter

SHC-9642
SDI to HDMI Converter

Conversion
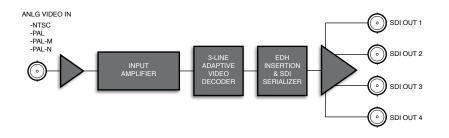
ADC-9032 `SD`

Analog Composite to SDI Video Converter

ANLG VIDEO IN
-NTSC
-PAL
-PAL-M
-PAL-N

INPUT AMPLIFIER → 3-LINE ADAPTIVE VIDEO DECODER → EDH INSERTION & SDI SERIALIZER →

SDI OUT 1
SDI OUT 2
SDI OUT 3
SDI OUT 4
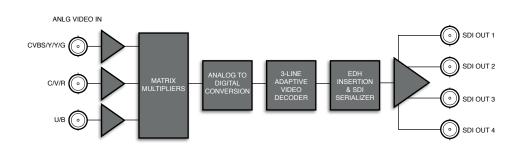
Key Features

• Accepts NTSC, PAL, PAL-N, PAL-M signals
• Input proc amp
• 10-bit A to D quantization and signal path
• 3-line adaptive comb filter
• 4 SDI outputs

ADC-9033 `SD`

Analog Composite / Component / YC to SDI Video Converter

ANLG VIDEO IN

CVBS/Y/Y/G
C/V/R
U/B

MATRIX MULTIPLIERS → ANALOG TO DIGITAL CONVERSION → 3-LINE ADAPTIVE VIDEO DECODER → EDH INSERTION & SDI SERIALIZER →

SDI OUT 1
SDI OUT 2
SDI OUT 3
SDI OUT 4

Key Features
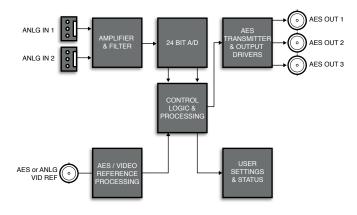
• Accepts analog composite or component inputs
• NTSC, PAL, PAL-N, PAL-M operation
• YUV input from Beta/MII and SMPTE / EBU formats
• All RGB formats supported
• 4 SDI outputs

ADC-9532

Analog Audio to AES / EBU Converter

Key Features

- 24-bit DAC resolution
- Selectable 32, 44.1, and 48kHz sampling rate
- Continuously adjustable 0 dBFS output level on analog input levels from +12 dBu to +30 dBu
- Locks to analog video or AES reference
- Terminal strips for easy hookup of balanced audio cables

DAC-9516 [AN-AUD] [AES]

AES / EBU to Analog Audio Converter

Key Features
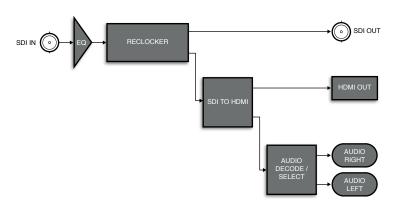
- 24-bit DAC resolution
- Operates at 32, 44.1, and 48kHz
- Automatic cable equalization >610m (2,000 ft)
- Continuously adjustable full scale output level from +12 to +27 dBu
- Terminal strips for easy hookup of balanced audio cables

SHC-9642 `3G` `HD` `SD` `AN-AUD`

SDI to HDMI Converter

Key Features

- Supports all SDI Formats up to 3Gb/s (1080p60)
- Reclocked SDI Output
- Analog audio RCA Outputs
- User Selectable YCbCr or RGB output
- Automatic colorspace detection for HD or SD
- USB Port for upgrades

MUX-9258-A
AES / EBU Embedder

DMX-9259-A
AES / EBU De-Embedder

Audio Embedding /
De-Embedding
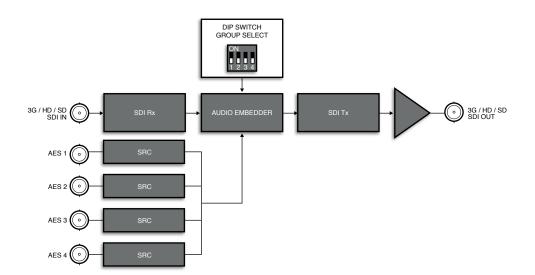
MUX-9258-A `3G` `HD` `SD`

AES / EBU Embedder

DIP SWITCH GROUP SELECT

ON
1 2 3 4

3G / HD / SD SDI IN → SDI Rx → AUDIO EMBEDDER → SDI Tx → 3G / HD / SD SDI OUT

AES 1 → SRC
AES 2 → SRC
AES 3 → SRC
AES 4 → SRC

Key Features

- 8 channel audio embedding for all popular 3G / HD / SD SDI signals
- 4 AES / EBU inputs
- Sample rate conversion with bypass option
- User assignable embedded group selection
- Cascade option for 16 channels of embedding on a single SDI stream using 2 units
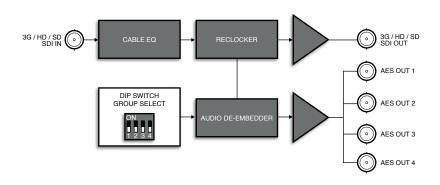
DMX-9259-A `3G` `HD` `SD`

AES / EBU De-Embedder

3G / HD / SD SDI IN → CABLE EQ → RECLOCKER → 3G / HD / SD SDI OUT

DIP SWITCH GROUP SELECT

ON
1 2 3 4

AUDIO DE-EMBEDDER → AES OUT 1 / AES OUT 2 / AES OUT 3 / AES OUT 4

Key Features

- 8 channel audio de-embedding for all popular 3G / HD / SD SDI signals
- 4 AES / EBU outputs
- User assignable group selection for de-embedding
- Cascade option for 16 channels of de-embedding on a single SDI stream using 2 units

FDR-9647-LC
3G / HD / SD Dual Channel Fiber Receiver

FDR-9647-ST
3G / HD / SD Dual Channel Fiber Receiver

FDT-9648-LC
3G / HD / SD Dual Channel Fiber Transmitter

FDT-9648-ST
3G / HD / SD Dual Channel Fiber Transmitter

FDB-9649-LC
3G / HD / SD Dual Channel Fiber Transceiver

FDB-9649-ST
3G / HD / SD Dual Channel Fiber Transceiver

Fiber

FDR-9647-LC `3G` `HD` `SD`

3G / HD / SD Dual Channel Fiber Receiver

Key Features
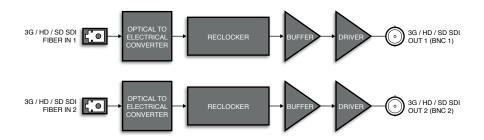
- Optical to Electrical for all SMPTE 424M, SMPTE 259M-C, SMPTE 292M standards
- Supports single-mode fiber
- Optical input range 1270nm to 1610nm
- Optical input sensitivity -3dBm to -18dBm
- Optical input connection: LC / UPC

FDR-9647-ST `3G` `HD` `SD`
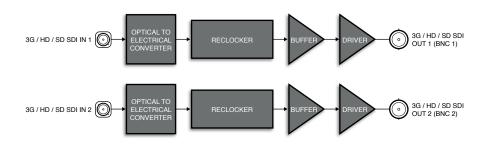
3G / HD / SD Dual Channel Fiber Receiver

Key Features

- Optical to Electrical for all SMPTE 424M, SMPTE 259M-C, SMPTE 292M standards
- Supports single-mode fiber
- Optical input range 1270nm to 1610nm
- Optical input sensitivity -3dBm to -18dBm
- Optical input connection: ST / UPC
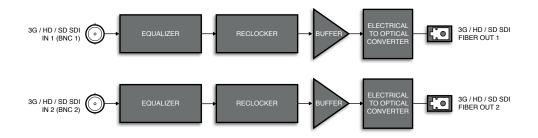
FDT-9648-LC 3G HD SD

3G / HD / SD Dual Channel Fiber Transmitter

3G / HD / SD SDI IN 1 (BNC 1) → EQUALIZER → RECLOCKER → BUFFER → ELECTRICAL TO OPTICAL CONVERTER → 3G / HD / SD SDI FIBER OUT 1

3G / HD / SD SDI IN 2 (BNC 2) → EQUALIZER → RECLOCKER → BUFFER → ELECTRICAL TO OPTICAL CONVERTER → 3G / HD / SD SDI FIBER OUT 2

Key Features

- Electrical to Optical for all SMPTE 424M, SMPTE 259M-C, SMPTE 292M standards
- Supports single-mode fiber
- Optical output power >-7dBm
- Optical wavelength 1310nm
- Optical output connection: LC / UPC

FDT-9648-ST 3G HD SD

3G / HD / SD Dual Channel Fiber Transmitter

3G / HD / SD SDI IN 1 (BNC 1) → EQUALIZER → RECLOCKER → BUFFER → ELECTRICAL TO OPTICAL CONVERTER → 3G / HD / SD SDI OUT 1

3G / HD / SD SDI IN 2 (BNC 2) → EQUALIZER → RECLOCKER → BUFFER → ELECTRICAL TO OPTICAL CONVERTER → 3G / HD / SD SDI OUT 2

Key Features

- Electrical to Optical for all SMPTE 424M, SMPTE 259M-C, SMPTE 292M standards
- Supports single-mode fiber
- Optical output power >-7dBm
- Optical wavelength 1310nm
- Optical output connection: ST / UPC

FDB-9649-LC `3G` `HD` `SD`

3G / HD / SD Dual Channel Fiber Transceiver

3G / HD / SD SDI IN (BNC 1) → EQUALIZER → RECLOCKER → BUFFER → OPTICAL TO ELECTRICAL CONVERTER → 3G / HD / SD SDI FIBER OUT

3G / HD / SD SDI FIBER IN → OPTICAL TO ELECTRICAL CONVERTER → RECLOCKER → BUFFER → DRIVER → HD / 3G / SD SDI OUT (BNC 2)

Key Features

- Electrical to Optical for all SMPTE 424M, SMPTE 259M-C, SMPTE 292M standards
- Supports single-mode fiber
- Optical output wavelength 1310nm @ >-7dBm
- Optical input range 1270nm to 1610nm @ -3dBm to -18dBm
- Optical connection: LC / UPC

FDB-9649-ST `3G` `HD` `SD`

3G / HD / SD Dual Channel Fiber Transceiver

3G / HD / SD SDI IN (BNC 1) → EQUALIZER → RECLOCKER → BUFFER → OPTICAL TO ELECTRICAL CONVERTER → 3G / HD / SD SDI OUT

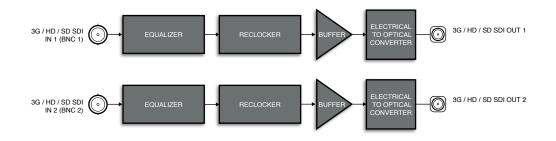3G / HD / SD SDI IN → OPTICAL TO ELECTRICAL CONVERTER → RECLOCKER → BUFFER → DRIVER → HD / 3G / SD SDI OUT (BNC 2)
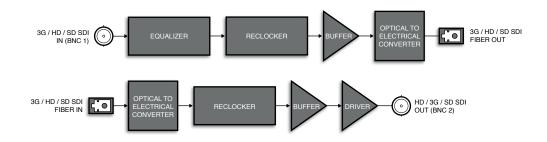
Key Features

- Electrical to Optical for all SMPTE 424M, SMPTE 259M-C, SMPTE 292M standards
- Supports single-mode fiber
- Optical output wavelength 1310nm @ >-7dBm
- Optical input range 1270nm to 1610nm @ -3dBm to -18dBm
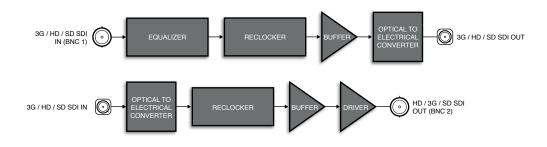- Optical connection: ST / UPC

Table of Contents

NK Series Routing System

Ross Video's NK Series Routing Systems are a comprehensive family of routing solutions. NK Series offers a wide variety of matrix sizes & types, flexible control panels, and a powerful control system to tie everything together. Whether it's a small utility router, or a large mission critical facility system, NK Series offers a solution to fit your budget and needs.

NK Series Routers are available in sizes ranging from 16x4 to 144x144. Any matrix type can be built into a system with any combination of other NK matrices - all united under one control system.

Initially created by well-known Australian design engineer, Joe Talia (and team), NK Series Routers have a long history and heritage. The team continues inspired work on this router line at our subsidiary, Ross Video Pty's facilities in Melbourne, Australia.

NK Routers represent great value, are backed by a 5-year warranty, and include world-renowned Ross Video technical support.

Feel free to visit **www.rossvideo.com**, contact us at **solutions@rossvideo.com**, or reach out to your local Ross Video sales representative or reseller.

At-A-Glance Features

NK SERIES CROSSPOINT MATRICES

- Comprehensive product family
- Full range, from utility to facility solutions
- 16x4 to 144x144 sizes
- Wide range of matrix types
- Modular 64x, 72x, and 144x designs
- 144x feature redundant crosspoint matrices, power and control

NK SERIES CONTROL SYSTEM

- Full featured control system
- Distributed control architecture with no single point of failure
- Powerful and intuitive DashBoard Control System for configuration and monitoring
- Range of highly flexible control panels
- Virtual routing and resource management
- Serial and GPI automation interfaces

NK Series Router Family

10RU

3RU

2RU

1RU

	16 x 4	16 x 16	32 x 32	34 x 34	64 x 64	72 x 72	144 x 144
3G / HD / SD	NK-3G164 (-RCP)	NK-3G16 (-RCP)	NK-3G34	NK-3G34	NK-3G64	NK-3G72	NK-3G144-X
AES / EBU Audio	NK-D164 (-RCP)	NK-D16 (-RCP)	NK-D32		NK-D64		
Analog Audio	NK-A164	NK-A16	NK-A32		NK-A64		
Analog Video	NK-V164	NK-V16	NK-V32				
Data (RS-422)		NK-M16	NK-M32				

UTILITY ROUTING

Utility routers include the 16x4, 16x16, 32x32 and 34x34 sizes and are available in a wide range of signal types including 3G / HD / SD SDI, Analog Video, AES / EBU Digital Audio, Stereo Analog Audio and Machine Control (RS-422). The compact design, and compelling price points make these routers a great solution for a wide variety of applications from standalone single crosspoint to larger multi-crosspoint systems.

MID-SIZE ROUTING

Mid-sized routers, 64x64 and 72x72 are modular and expandable in groups of 8 inputs and 8 outputs. They include 3G / HD / SD SDI, AES / EBU Digital Audio and Stereo Analog Audio signal types. These routers fill a unique niche in a demanding, yet price sensitive, segment of the market. The modular design lends itself to future growth and serviceability.

FACILITY ROUTING

The large NK-3G144-X is a scalable router designed to function in mission critical, high availability environments. The NK-3G144-X uses a common set of I/O boards and can be expanded in groups of 8 inputs and outputs to 144x144. This system is fully 3G compliant and will pass 3G / HD / SD SDI signals in addition to ASI. A key feature of this matrices is superior redundancy. It has been architected to be equipped with fully redundant power supplies, dual redundant crosspoints and dual redundant control cards.

DashBoard

NK Control and Monitoring

Virtual Control Panels

- Builtin templates for quick and easy router operation, from the click of a mouse, or touch of a touchscreen
- Access to every source, destination and level
- Perfect for a master engineering panel, or single cut-bus operator panel

Monitor, Control, Configure and Protect

DashBoard offers flexible control, configuration and monitoring over the entire NK router line and its control components. Using the NK-IPS Network Bridge, multiple DashBoard clients can run simultaneously to configure and monitor the NK router line, including signal status on each I/O port across multiple routers.

DashBoard provides intuitive control panel configuration, including crosspoint and function assignment for each button, macro programming, and menu structure building across the entire range of NK control panels. Configuration extends to all NK control devices including GPI/O modules, 3rd party protocol translators and the NK-VRC Virtual Routing Core.
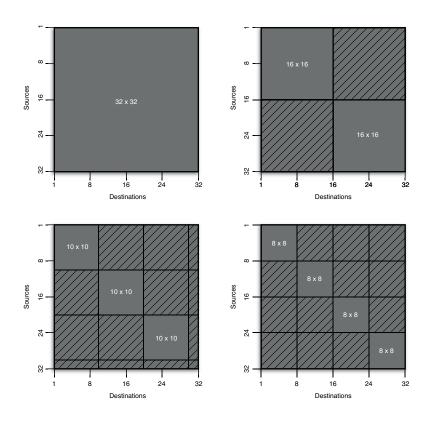
Virtual control panels and the virtual switchboard are an engineer's dream, offering access to every crosspoint with the click of a mouse, or the press of a finger on a touch screen. Monitor, Control, Configure and Protect your NK routing system with DashBoard v6.

Intuitive Control and Monitoring

- Program remote control panel crosspoints and functions
- Configure router levels and break-away options
- Monitor crosspoints with the Virtual Switch Board

NK Series System Overview

Partitioning

Each NK Series router can be configured with up to 8 partitions, effectively making two or more smaller routers from one larger one. Each partition can be assigned to a unique or common switching level. As an example, a single analog video matrix could be partitioned into 3 sections to switch YUV or RGB signals.

Router Partitioning

The example at top shows crosspoint assignments when a 32 x 32 router is partitioned. The image displays a 32 x 32 router with no partitions (top left); a 32 x 32 router partitioned as two 16 x 16 routers (top right); a 32 x 32 router partitioned as three 10 x 10 routers (lower left); and a 32 x 32 router partitioned as four 8 x 8 routers (lower right).

Control Panels

The NK Series offers 3 highly flexible, yet simple and intuitive control panels that can be configured to operate as an menu driven source / destination switching, cut-bus or multi-cutbus panel. Every control panel in the system can be independently configured to meet the needs of the particular operator position at which it is deployed.

Legend

NK-3G144-X [3G] [HD] [SD]

Scalable 144x144 3G / HD / SD SDI Router

Key Features

- Compact size
- Data rates 143Mb/s to 3Gb/s
- Handles 3G / HD / SD SDI and DVB-ASI
- Supports SMPTE 259M, 292M, 344M and 424M
- 144x144 expandable from 8x8 in groups of 8
- Cable equalizing inputs
- Individually selectable reclocking outputs with programmable slew rate
- Hot swappable power supplies, I/O Cards and crosspoint cards
- Redundant universal power supplies included
- Forced air cooling with intelligent fan control
- Black burst or Tri-Level Sync input with programmable switch point
- Integrated NK Series Control
- Carbonite eXtreme ready
- Optional redundant crosspoint / control cards
- 5-year transferable warranty

3G	3Gb/s
HD	HD-SDI
SD	SD-SDI
AN-VID	Analog Video
AN-AUD	Analog Audio
AES	AES / EBU Audio
DATA	Serial Machine Control

NK-3G144-X
Scalable 144x144 3G / HD / SD SDI Router

NK-3G72
Scalable 72x72 3G / HD / SD SDI Router

NK-3G64
Scalable 64x64 3G / HD / SD SDI Router

NK-3G Utility Series
3G / HD / SD SDI Utility Routers

NK-3G-RCP Series
3G / HD / SD SDI Utility Routers with Built-in Control Panels

NK-V
Analog Video Router Series

Video Routers
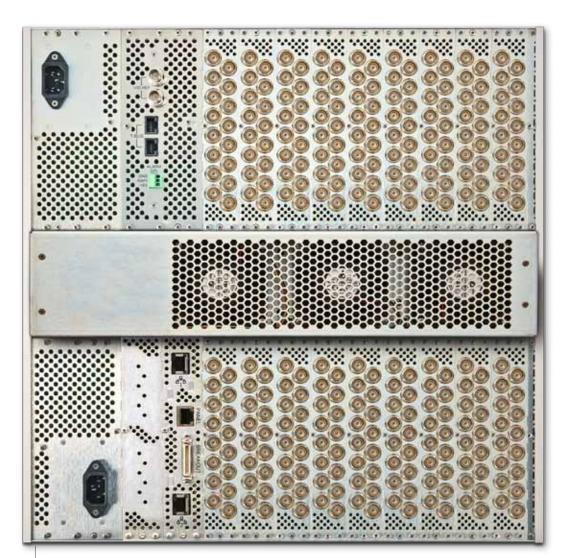
Audio Routers

Machine Control Routers

Control Panels

Control System Components

NK-3G144-X `3G` `HD` `SD`

Scalable 144x144 3G / HD / SD SDI Router

Key Features

- Compact size
- Data rates 143Mb/s to 3Gb/s
- Accepts 3G / HD / SD SDI and DVB-ASI
- Supports SMPTE 259M, 292M, 344M and 424M
- 144x144 expandable from 8x8 in groups of 8
- Cable equalizing inputs
- Individually selectable reclocking outputs
- Hot swappable power supplies, I/O Cards and crosspoint cards
- Redundant universal power supplies included
- Forced air cooling with intelligent fan control
- Black burst or Tri-Level Sync input with programmable switch point
- Integrated NK Series Control
- Carbonite eXtreme ready
- Optional redundant crosspoint / control cards
- 5-year transferable warranty

NK-3G144-X

Technical Specifications

	NK-3G144-X
INPUTS	
Connection	75Ω BNC
Total # of Inputs	up to 144
Return Loss	>15dB 5MHz to 1.5 GHz >10dB 1.5GHz to 3.0GHz
Cable EQ	up to 100m Belden 1694 or equivalent
OUTPUTS	
Connection	75Ω BNC
Total # of Outputs	up to 144
Clocking	automatic reclock at SMPTE 259M, 292M, 344M, 424M & DVB-ASI
Level	800mV p–p ±10%
Return Loss	>15dB 5MHz to 1.5 GHz >10dB 1.5GHz to 3.0GHz
PERFORMANCE	
Jitter	<0.2 UI additive
Data Rates	143Mb/s to 3Gb/s
Overshoot	<10%
Rise Time	automatic at SMPTE 259M, 259M, 292M, 344M, 424M & DVB-ASI
GENERAL	
Partitioning	up to 8 partitions with independent level assignment
Configuration	basic via web browser or comprehensive via DashBoard Control System via NK-IPS
Dimensions	10RU, depth 32.0cm
Power Consumption	<500W
Power Supply	+15 V DC, 32A

Specifications subject to change without prior notice.

Ordering Information

NK-3G144-X Routers

NK-3G144-X   144x144 3G / HD / SD SDI Router
NK-3G144(128)-X 128x128 3G / HD / SD SDI Router
NK-3G144(96)-X   96x96 3G / HD / SD SDI Router
NK-3G144(64)-X   64x64 3G / HD / SD SDI Router

NK-3G144-X Router Components

NK-3G-FRM-144-X 144x144 3G / HD / SD SDI Router Frame
NK-I3G   8 Channel 3G / HD / SD Input Card
NK-I3G-RC   Frame Connector Strip for two NK-I3G Cards
NK-O3G   8 Channel 3G / HD / SD Output Card
NK-O3G-RC   Frame Connector Strip for two NK-O3G Cards
NK-144X3G   Redundant 144x144 Crosspoint Board
NK-C3G   Redundant Controller
NK-P3G   Spare NK-3G Series Power Supply

NK-3G72 `3G` `HD` `SD`

Scalable 72x72 3G / HD / SD SDI Router

Key Features

- Compact size
- Data rates 143Mb/s to 3Gb/s
- Accepts 3G / HD / SD SDI and DVB-ASI
- Supports SMPTE 259M, 292M, 344M and 424M
- 72x72 expandable from 8x8 in groups of 8
- Cable equalizing inputs
- Reclocking outputs
- Excellent performance and specifications
- Low power consumption
- Integrated NK Series Control
- Universal power supply included
- Optional redundant power
- 5-year transferable warranty

NK-3G72

Technical Specifications

	NK-3G72
INPUTS	
Connection	75Ω BNC
Total # of Inputs	up to 72
Return Loss	>15dB 5MHz to 1.5 GHz >10dB 1.5GHz to 3.0GHz
Cable EQ	100m Belden 1694 or equivalent
OUTPUTS	
Connection	75Ω BNC
Total # of Outputs	up to 72
Clocking	automatic reclock at SMPTE 259M, 292M, 344M, 424M & DVB-ASI
Level	800mV p–p ±10%
Return Loss	>15dB 5MHz to 1.5 GHz, >10dB 1.5GHz to 3.0GHz
PERFORMANCE	
Jitter	<0.2 UI additive
Data Rates	143Mb/s to 3Gb/s
Overshoot	<10%
Rise Time	automatic at SMPTE 259M, 259M, 292M, 344M, 424M & DVB-ASI
GENERAL	
Partitioning	up to 8 partitions with independent level assignment
Configuration	basic via web browser or comprehensive via DashBoard Control System via NK-IPS
Dimensions	3RU, depth 12.0cm
Power Consumption	60W
Power Supply	+15 V DC

Specifications subject to change without prior notice.

Ordering Information

NK-3G72 Router

NK-3G72   72x72 3G / HD / SD SDI Router

NK-3G72(32)   32x32 3G / HD / SD SDI Router

NK-3G72 Router Components

NK-3G72-FRM   72x72 3G / HD / SD SDI Router Frame

NK-I3G72   8 Channel 3G / HD / SD Input Card

NK-O3G72   8 Channel 3G / HD / SD Output Card

NK-P3   Spare, Non-Redundant 100W, +15V Power Supply

NK-3G72 Rack Mount Redundant Power

NK-RP1/P   Rack Mount, 1RU, 100W, +15V Redundant Power Supply*

NK-D12/P   NK-RP1/P Power Supply Cable for NK-3G72

*For more information on the rack mount power supply system, please see page 216

NK-3G64 3G HD SD

Scalable 64x64 3G / HD / SD SDI Router

Key Features

- Data rates 143Mb/s to 3Gb/s
- Accepts 3G / HD / SD SDI and DVB-ASI
- Supports SMPTE 259M, 292M, 344M and 424M
- 64x64 expandable to 72x72
- Cable equalizing inputs
- Reclocking outputs
- Excellent performance and specifications
- Low power consumption
- Integrated NK Series Control
- Universal power supply included
- Optional redundant power
- 5-year transferable warranty

NK-3G64

Technical Specifications

	NK-3G64
INPUTS	
Connection	75Ω BNC
Total # of Inputs	64
Return Loss	>15dB 5MHz to 1.5 GHz >10dB 1.5GHz to 3.0GHz
Cable EQ	100m Belden 1694 or equivalent
OUTPUTS	
Connection	75Ω BNC
Total # of Outputs	64
Clocking	automatic reclock at SMPTE 259M, 292M, 344M, 424M & DVB-ASI
Level	800mV p–p ±10%
Return Loss	>15dB 5MHz to 1.5 GHz, >10dB 1.5GHz to 3.0GHz
PERFORMANCE	
Jitter	<0.2 UI additive
Data Rates	143Mb/s to 3Gb/s
Overshoot	<10%
Rise Time	automatic at SMPTE 259M, 259M, 292M, 344M, 424M & DVB-ASI
GENERAL	
Partitioning	up to 8 partitions with independent level assignment
Configuration	basic via web browser or comprehensive via DashBoard Control System via NK-IPS
Dimensions	3RU, depth 12.0cm
Power Consumption	60W
Power Supply	+15 V DC

Specifications subject to change without prior notice.

Ordering Information

NK-3G64 Routers

NK-3G64   64x64 3G / HD / SD SDI Router

NK-3G64(32)   32x32 3G / HD / SD SDI Router

NK-3G64 Router Components

NK-3G64-FRM   64x64 3G / HD / SD SDI Router Frame

NK-I3G64   8 Channel 3G / HD / SD Input Card

NK-O3G64   8 Channel 3G / HD / SD Output Card

NK-P3   Spare, Non-Redundant 100W, +15V Power Supply

NK-3G64 Rack Mount Redundant Power

NK-RP1/P   Rack Mount, 1RU, 100W, +15V Redundant Power Supply*

NK-D12/P   NK-RP1/P Power Supply Cable for NK-3G64

*For more information on the rack mount power supply system, please see page 216

NK-3G Utility Series 3G HD SD

3G / HD / SD SDI Utility Routers

Key Features

- Compact size
- Data rates 143Mb/s to 3Gb/s
- Cable equalizing inputs
- Accepts 3G / HD / SD SDI and DVB-ASI
- Supports SMPTE standards 259M, 292M, 344M, and 424M
- Reclocking outputs
- 16x4, 16x16, 34x34 fixed sizes
- Excellent performance and specifications
- Low power consumption
- Integrated NK Series Control
- Universal power supply included
- Optional redundant power
- 5-year transferable warranty

NK-3G164

NK-3G16

NK-3G34

Technical Specifications

	NK-3G164	NK-3G16	NK-3G34
INPUTS			
Connection	75Ω BNC	75Ω BNC	75Ω BNC
Total # of Inputs	16	16	34
Return Loss	>15dB 5MHz to 1.5 GHz	>15dB 5MHz to 1.5 GHz	>10dB 1.5GHz to 1.5 GHz
Cable EQ	up to 100m Belden 1694 or equivalent	up to 100m Belden 1694 or equivalent	up to 100m Belden 1694 or equivalent
OUTPUTS			
Connection	75Ω BNC	75Ω BNC	75Ω BNC
Total # of Outputs	4	16	34
Clocking	automatic reclock at SMPTE 259M, 292M, 344M, 424M & DVB-ASI	automatic reclock at SMPTE 259M, 292M, 344M, 424M & DVB-ASI	automatic reclock at SMPTE 259M, 292M, 344M, 424M & DVB-ASI
Level	800mV p–p ±10%	800mV p–p ±10%	800mV p–p ±10%
Return Loss	15dB 5MHz to 1.5 GHz	15dB 5MHz to 1.5 GHz	10dB 1.5GHz to 1.5 GHz
PERFORMANCE			
Jitter	<0.2 UI additive	<0.2 UI additive	<0.2 UI additive
Data Rates	143Mb/s to 3Gb/s	143Mb/s to 3Gb/s	143Mb/s to 3Gb/s
Overshoot	<10%	<10%	<10%
Rise Time	automatic at SMPTE 259M, 259M, 292M, 344M, 424M & DVB-ASI	automatic at SMPTE 259M, 259M, 292M, 344M, 424M & DVB-ASI	automatic at SMPTE 259M, 259M, 292M, 344M, 424M & DVB-ASI
GENERAL			
Partitioning	up to 8 partitions with independent level assignment		
Configuration	web browser via NK-IPS, DashBoard Control System via NK-IPS		
Dimensions	1RU, depth 6.4cm	1RU, depth 6.4cm	2RU, depth 6.4cm
Power Consumption	16W	16W	30W
Power Supply	+15 V DC	+15 V DC	+15 V DC

Specifications subject to change without prior notice.

Ordering Information

NK-3G164, NK-3G16 & NK-3G34 Routers

NK-3G164   16x4 3G / HD / SD SDI Router

NK-3G16   16x16 3G / HD / SD SDI Router

NK-3G34   34x34 3G / HD / SD SDI Router

NK-3G164, NK-3G16 & NK-3G34 Rack Mount Redundant Power

NK-RP1/P   Rack Mount, 1RU, 100W, +15V Redundant Power Supply

NK-D12/PN   NK-RP1/P Power Supply Cable for NK-3G164, NK-3G16 & NK-3G34

NK-3G164, NK-3G16 & NK-3G34 External Redundant Power

NK-P1   Spare or Redundant, 50W, +15V External Power Supply*

NK-DRY   Y Cable for two NK-P1 External Power Supplies

*For more information on the rack mount power supply system, please see page 216

NK-3G-RCP Series `3G` `HD` `SD`

3G / HD / SD SDI Utility Routers with Built-in Control Panels

Key Features

- Self contained routing matrix and RCP-NK1 control panel
- 1RU panel / router combination
- No external control system required
- Available on 16x16 and 16x4 SDI routers
- Ideal for high density, standalone systems
- 5-year transferable warranty

NK-3G164-RCP

NK-3G16-RCP

Technical Specifications

	NK-3G164-RCP	NK-3G16-RCP
INPUTS		
Connection	75Ω BNC	75Ω BNC
Total # of Inputs	16	16
Return Loss	>15dB 5MHz to 1.5 GHz	>15dB 5MHz to 1.5 GHz
Cable EQ	up to 100m Belden 1694 or equivalent	up to 100m Belden 1694 or equivalent
OUTPUTS		
Connection	75Ω BNC	75Ω BNC
Total # of Outputs	4	16
Clocking	automatic reclock at SMPTE 259M, 292M, 344M, 424M & DVB-ASI	automatic reclock at SMPTE 259M, 292M, 344M, 424M & DVB-ASI
Level	800mV p–p ±10%	800mV p–p ±10%
Return Loss	15dB 5MHz to 1.5 GHz	>15dB 5MHz to 1.5 GHz,
PERFORMANCE		
Jitter	<0.2 UI additive	<0.2 UI additive
Data Rates	143Mb/s to 3Gb/s	143Mb/s to 3Gb/s
Overshoot	<10%	<10%
Rise Time	automatic at SMPTE 259M, 259M, 292M, 344M, 424M & DVB-ASI	automatic at SMPTE 259M, 259M, 292M, 344M, 424M & DVB-ASI
GENERAL		
Partitioning	up to 8 partitions with independent level assignment	
Configuration	web browser or comprehensive via DashBoard Control System via NK-IPS	
Dimensions	1RU, depth 6.4cm	1RU, depth 6.4cm
Power Consumption	16W	16W
Power Supply	+15 V DC	+15 V DC

Specifications subject to change without prior notice.

Ordering Information

3G / HD / SD SDI Routers

NK-3G164-RCP   16x4 3G / HD / SD SDI Router with RCP-NK1 Control Panel

NK-3G16-RCP   16x16 3G / HD / SD SDI Router with RCP-NK1 Control Panel

NK-3G164 & NK-3G16 Rack Mount Redundant Power

NK-RP1/P   Rack Mount, 1RU, 100W, +15V Redundant Power Supply

NK-D12/PN   NK-RP1/P Power Supply Cable for NK-3G164 & NK-3G16

NK-3G164 & NK-3G16 External Redundant Power

NK-P1   Spare or Redundant, 50W, +15V External Power Supply*

NK-DRY   Y Cable for two NK-P1 External Power Supplies

*For more information on the rack mount power supply system, please see page 216

NK-V AN-VID

Analog Video Router Series

Key Features

- Compact size
- Wide band router with 230MHz bandwidth
- Suitable for NTSC, PAL, RGB, YUV, bi-level and tri-level reference routing
- Supports standard definition, high-definition and wide band display signals
- 16x4, 16x16, 32x32 fixed sizes
- Excellent performance and specifications
- Low power consumption
- Integrated NK Series Control
- Universal power supply included
- Optional redundant power
- 5-year transferable warranty

NK-V164-HQ

NK-V16-HQ

NK-V32-HQ

Technical Specifications

	NK-V164-HQ	NK-V16-HQ	NK-V32-HQ
INPUTS			
Connection	75Ω BNC	75Ω BNC	75Ω BNC
Total # of Inputs	16	16	32
Nominal Input Level	1 V p-p	1 V p-p	1 V p-p
Maximum Input Level	2 V p-p	2 V p-p	2 V p-p
Clamping Method	AC coupled with sync-tip clamping		
Clamping DC Adjustment	between blanking = 0 V and sync-tip = 0V		
Return Loss	44dB	44dB	44dB
OUTPUTS			
Connection	75Ω BNC	75Ω BNC	75Ω BNC
Total # of Outputs	4	16	32
Level	1 V p-p	1 V p-p	1 V p-p
Coupling	DC coupled	DC coupled	DC coupled
Return Loss	30dB	30dB	30dB
PERFORMANCE			
Differential Gain	0.05%	0.05%	0.05%
Differential Phase	0.05°	0.05°	0.05°
Frequency Response	30MHz, ±0.1dB 60MHz, ±1dB 230MHz, -3dB	30MHz, ±0.1dB 60MHz, ±1dB 230MHz, -3dB	<30MHz, ±0.1dB 60MHz, ±1dB 230MHz, -3dB
Noise	-76dB peak	-76dB peak	-76dB peak
Crosstalk	-60dB, 5MHz	-60dB, 5MHz	-60dB, 5MHz
Transmit Time	2ns	2ns	2ns
Timing Scatter	0.5° Fsc	0.5° Fsc	0.5° Fsc
GENERAL			
Partitioning	up to 8 partitions with independent level assignment		
Configuration	web browser or comprehensive via DashBoard Control System configuration via NK-IPS		
Dimensions	1RU, depth 6.4cm	1RU, depth 6.4cm	2RU, depth 6.4cm
Power Consumption	12W	12W	26W
Power Supply	±15 V DC	±15 V DC	±15 V DC

Specifications subject to change without prior notice.

Ordering Information

NK-V Routers

NK-V164-HQ	16x4 Analog Video Router
NK-V16-HQ	16x16 Analog Video Router
NK-V32-HQ	32x32 Analog Video Router

NK-V Rack Mount Redundant Power

NK-RP1/PN	Rack Mount, 1RU, 100W, ±15V Redundant Power Supply
NK-D12/PN	NK-RP1/PN Power Supply Cable for NK-V164-HQ, NK-V16-HQ & NK-V32-HQ

NK-V External Redundant Power

NK-PN1	Spare or Redundant, 50W, ±15V External Power Supply*
NK-DRY	Y Cable for two NK-PN1 External Power Supplies

For more information on the rack mount power supply system, please see page 216

NK-D64-75
AES / EBU Digital Audio Router (75Ω)

NK-D-75 Series
AES / EBU Digital Audio Router Series (75Ω)

NK-D-75-RCP Series
AES / EBU Digital Audio Routers with Built-in
Control Panels (75Ω)

NK-D64-110
AES / EBU Digital Audio Router (110Ω)

NK-D-110 Series
AES / EBU Digital Audio Router Series (110Ω)

NK-D-110-RCP Series
ASE / EBU Digital Audio Routers with Built-in
Control Panels (110Ω)

NK-A64
Stereo Analog Audio Router

NK-A-HQ Series
Stereo Analog Audio Router Series

Video Routers

Audio
Routers

Machine Control Routers

Control Panels

Control System Components

NK-D64-75 AES

AES / EBU Digital Audio Router (75Ω)

Key Features

- Compact size
- AES / EBU routing system
- Data rates 32 to 192KHz
- Passes Dolby® and other compressed audio
- 75Ω unbalanced BNC inputs and outputs
- 64x64 expandable from 8x8 in groups of 8
- Excellent performance and specifications
- Low power consumption
- Integrated NK Series Control
- Universal power supply included
- Optional redundant power
- 5-year transferable warranty

NK-D64-75

Technical Specifications

	NK-D64-75
INPUTS	
Connection	75Ω unbalanced BNC
Total # of Inputs	64
Level	1 V p-p
Cable EQ	up to 300m Belden 1694
OUTPUTS	
Connection	75Ω unbalanced BNC
Total # of Outputs	64
Clocking	non-reclocking
Level	1 V p-p
PERFORMANCE	
Jitter	<2ns (0.013 UI)
Data Rates	32 to 192kHz
GENERAL	
Partitioning	up to 8 partitions with independent level assignment
Configuration	web browser or comprehensive via DashBoard Control System configuration via NK-IPS
Dimensions	3RU, depth 12.0cm
Power Consumption	10W
Power Supply	+15 V DC

Specifications subject to change without prior notice.

Ordering Information

NK-D64-75 Routers

NK-D64-75   64x64 AES / EBU Digital Audio Router (75Ω)

NK-D64-75(32)   32x32 AES / EBU Digital Audio Router (75Ω)

NK-D64-75 Router Components

NK-D-FRM-75   64x64 AES / EBU Digital Audio Router (75Ω) Frame

NK-IDE-75   8 Channel AES / EBU Input Card (75Ω)

NK-ODE-75   8 Channel AES / EBU Output Card (75Ω)

NK-P3   Spare, Non-Redundant 100W, +15V Power Supply

NK-D64-75 Rack Mount Redundant Power

NK-RP1/P   Rack Mount, 1RU, 100W, +15V Redundant Power Supply*

NK-D12/P   NK-RP1/P Power Supply Cable for NK-D64-75

*For more information on the rack mount power supply system, please see page 216

NK-D-75 Series AES

AES / EBU Digital Audio Router Series (75Ω)

Key Features

- Compact size
- AES / EBU routing system
- Data rates 32 to 192KHz
- Passes Dolby® and other compressed audio
- 75Ω unbalanced BNC inputs and outputs
- 16x4, 16x16, 32x32 fixed sizes
- Excellent performance and specifications
- Low power consumption
- Integrated NK Series Control
- Universal power supply included
- Optional redundant power
- 5-year transferable warranty

NK-D164-75

NK-D16-75

NK-D32-75

Technical Specifications

	NK-D164-75	NK-D16-75	NK-D32-75
INPUTS			
Connection	75Ω unbalanced BNC	75Ω unbalanced BNC	75Ω unbalanced BNC
Total # of Inputs	16	16	32
Level	1 V p-p	1 V p-p	1 V p-p
Cable EQ	up to 300m Belden 1694	up to 300m Belden 1694	up to 300m Belden 1694
OUTPUTS			
Connection	75Ω unbalanced BNC	75Ω unbalanced BNC	75Ω unbalanced BNC
Total # of Outputs	4	16	32
Clocking	non-reclocking	non-reclocking	non-reclocking
Level	1 V p-p	1 V p-p	1 V p-p
PERFORMANCE			
Jitter	<2ns (0.013 UI)	<2ns (0.013 UI)	<2ns (0.013 UI)
Data Rates	32 to 192kHz	32 to 192kHz	32 to 192kHz
GENERAL			
Partitioning	up to 8 partitions with independent level assignment		
Configuration	web browser or comprehensive via DashBoard Control System configuration via NK-IPS		
Dimensions	1RU, depth 6.4cm	1RU, depth 6.4cm	2RU, depth 6.4cm
Power Consumption	7.5W	7.5W	15W
Power Supply	+15 V DC	+15 V DC	+15 V DC

Specifications subject to change without prior notice.

Ordering Information

NK-D164-75, NK-D16-75 & NK-D32-75 Routers

NK-D164-75   16x4 AES / EBU Digital Audio Router (75Ω)

NK-D16-75   16x16 AES / EBU Digital Audio Router (75Ω)

NK-D32-75   32x32 AES / EBU Digital Audio Router (75Ω)

NK-D164-75, NK-D16-75 & NK-D32-75 Rack Mount Redundant Power

NK-RP1/P   Rack Mount, 1RU, 100W, +15V Redundant Power Supply

NK-D12/PN   NK-RP1/P Power Supply Cable for NK-D164-75, NK-D16-75 & NK-D32-75

NK-D164-75, NK-D16-75 & NK-D32-75 External Redundant Power

NK-P1   Spare or Redundant, 50W, +15V External Power Supply*

NK-DRY   Y Cable for Two NK-P1 External Power Supplies

*For more information on the rack mount power supply system, please see page 216

NK-D-75-RCP Series AES

AES / EBU Digital Audio Routers with Built-in Control Panels (75Ω)

Key Features

- Self contained routing matrix and RCP-NK1 control panel
- 1RU panel / router combination
- No external control system required
- Available on 16x16 and 16x4 SDI AES routers
- Ideal for high density, standalone systems

NK-D164-75-RCP

NK-D16-75-RCP

Technical Specifications

	NK-D164-75-RCP	NK-D16-75-RCP
INPUTS		
Connection	75Ω unbalanced BNC	75Ω unbalanced BNC
Total # of Inputs	16	16
Level	1 V p-p	1 V p-p
Cable EQ	up to 300m Belden 1694	up to 300m Belden 1694
OUTPUTS		
Connection	75Ω unbalanced BNC	75Ω unbalanced BNC
Total # of Outputs	4	16
Clocking	non-reclocking	non-reclocking
Level	1 V p-p	1 V p-p
PERFORMANCE		
Jitter	<2ns (0.013 UI)	<2ns (0.013 UI)
Data Rates	32 to 192kHz	32 to 192kHz
GENERAL		
Partitioning	up to 8 partitions with independent level assignment	
Configuration	web browser or comprehensive via DashBoard Control System configuration via NK-IPS	
Dimensions	1RU, depth 6.4cm	1RU, depth 6.4cm
Power Consumption	7.5W	7.5W
Power Supply	+15 V DC	+15 V DC

Specifications subject to change without prior notice.

Ordering Information

AES Routers

NK-D16-75-RCP   16x4 Unbalanced AES Router with RCP NK1 Control Panel

NK-D164-75-RCP   16x4 Unbalanced AES Router with RCP NK1 Control Panel

NK-D164-75-RCP & NK-D16-75-RCP Rack Mount Redundant Power

NK-RP1/P   Rack Mount, 1RU, 100W, +15V Redundant Power Supply

NK-D12/PN   NK-RP1/P Power Supply Cable for NK-D164-75-RCP & NK-D16-75-RCP

NK-D164-75-RCP & NK-D16-75-RCP External Redundant Power

NK-P1   Spare or Redundant, 50W, +15V External Power Supply*

NK-DRY   Y Cable for two NK-P1 External Power Supplies

*For more information on the rack mount power supply system, please see page 216

NK-D64-110 AES

AES / EBU Digital Audio Router (110Ω)

Key Features

- Compact size
- AES / EBU routing system
- Data rates 32 to 192KHz
- Passes Dolby® and other compressed audio
- 110Ω balanced DB25 inputs and outputs
- 64x64 expandable from 8x8 in groups of 8
- Excellent performance and specifications
- Low power consumption
- Integrated NK Series Control
- Universal power supply included
- Optional redundant power
- 5-year transferable warranty

NK-D64-110

Technical Specifications

	NK-D64-110
INPUTS	
Connection	110Ω balanced DB25 connectors
Total # of Inputs	64
Level	1-7 V p-p
Cable EQ	up to 100m Belden B1800B
OUTPUTS	
Connection	110Ω balanced DB25 connectors
Total # of Outputs	64
Clocking	non-reclocking
Level	2-4 V p-p
PERFORMANCE	
Jitter	<2ns (0.013 UI)
Data Rates	32 to 192kHz
GENERAL	
Partitioning	up to 8 partitions with independent level assignment
Configuration	basic web browser via NK-IPS or comprehensive via DashBoard Control System & NK-IPS
Dimensions	3RU, depth 12.0cm
Power Consumption	10W
Power Supply	+15 V DC

Specifications subject to change without prior notice.

Ordering Information

NK-D64-110 Routers

NK-D64-110   64x64 AES / EBU Digital Audio Router (110Ω)

NK-D64-110(32)   32x32 AES / EBU Digital Audio Router (110Ω)

NK-D64-110 Router Components

NK-D-FRM-110   64x64 AES / EBU Digital Audio Router (110Ω) Frame

NK-IDE-110   8 Channel AES / EBU Input Card (110Ω)

NK-ODE-110   8 Channel AES / EBU Output Card (110Ω)

NK-P3   Spare, Non-Redundant 100W, +15V Power Supply

NK-D64-110 Rack Mount Redundant Power

NK-RP1/P   Rack Mount, 1RU, 100W, +15V Redundant Power Supply*

NK-D12/P   NK-RP1/P Power Supply Cable for NK-D64-110

NK-D-110 Series AES

AES / EBU Digital Audio Router Series (110Ω)

Key Features

- Compact size
- AES / EBU routing system
- Data rates 32 to 192KHz
- Passes Dolby® and other compressed audio
- 110Ω balanced DB25 inputs and outputs
- 16x4, 16x16, 32x32 fixed sizes
- Excellent performance and specifications
- Low power consumption
- Integrated NK Series Control
- Universal power supply included
- Optional redundant power
- 5-year transferable warranty

NK-D164-110

NK-D16-110

NK-D32-110

Technical Specifications

	NK-D164-110	NK-D16-110	NK-D32-110
INPUTS			
Connection	110Ω balanced DB25 connectors	110Ω balanced DB25 connectors	110Ω balanced DB25 connectors
Total # of Inputs	16	16	32
Level	1-7 V p-p	1-7 V p-p	1-7 V p-p
Cable EQ	up to 100m Belden B1800B	up to 100m Belden B1800B	up to 100m Belden B1800B
OUTPUTS			
Connection	110Ω unbalanced DB25 connectors	110Ω unbalanced DB25 connectors	110Ω unbalanced DB25 connectors
Total # of Outputs	4	16	32
Clocking	non-reclocking	non-reclocking	non-reclocking
Level	2-4 V p-p	2-4 V p-p	2-4 V p-p
PERFORMANCE			
Jitter	<2ns (0.013 UI)	<2ns (0.013 UI)	<2ns (0.013 UI)
Data Rates	32 to 192kHz	32 to 192kHz	32 to 192kHz
GENERAL			
Partitioning	up to 8 partitions with independent level assignment		
Configuration	basic web browser via NK-IPS or comprehensive via DashBoard & NK-IPS		
Dimensions	1RU, depth 6.4cm	1RU, depth 6.4cm	2RU, depth 6.4cm
Power Consumption	7.5W	7.5W	15W
Power Supply	+15 V DC	+15 V DC	+15 V DC

Specifications subject to change without prior notice.

Ordering Information

NK-D164-110, NK-D16-110 & NK-D32-110 Routers

NK-D164-110   16x4 AES / EBU Digital Audio Router (110Ω)

NK-D16-110   16x16 AES / EBU Digital Audio Router (110Ω)

NK-D32-110   32x32 AES / EBU Digital Audio Router (110Ω)

NK-D164-110, NK-D16-110 & NK-D32-110 Rack Mount Redundant Power

NK-RP1/P   Rack Mount, 1RU, 100W, +15V Redundant Power Supply

NK-D12/PN   NK-RP1/P Power Supply Cable for NK-D164-110, NK-D16-110 & NK-D32-110

NK-D164-110, NK-D16-110 & NK-D32-110 External Redundant Power

NK-P1   Spare or Redundant, 50W, +15V External Power Supply*

NK-DRY   Y Cable for Two NK-P1 External Power Supplies

*For more information on the rack mount power supply system, please see page 216

NK-D-110-RCP Series AES

ASE / EBU Digital Audio Routers with Built-in Control Panels (110Ω)

Key Features

- Self contained routing matrix and RCP-NK1 control panel
- 1RU panel / router combination
- No external control system required
- Available on 16x16 and 16x4 SDI AES routers
- Ideal for high density, standalone systems

NK-D164-110-RCP

NK-D16-110-RCP

Technical Specifications

	NK-D164-110-RCP	NK-D16-110-RCP
INPUTS		
Connection	110Ω balanced DB25 connectors	110Ω balanced DB25 connectors
Total # of Inputs	16	16
Level	1-7 V p-p	1-7 V p-p
Cable EQ	up to 100m Belden B1800B	up to 100m Belden B1800B
OUTPUTS		
Connection	110Ω unbalanced DB25 connectors	110Ω unbalanced DB25 connectors
Total # of Outputs	4	16
Clocking	automatic reclock at SMPTE 259M, 292M, 344M, 424M & DVB-ASI	automatic reclock at SMPTE 259M, 292M, 344M, 424M & DVB-ASI
Level	2-4 V p-p	2-4 V p-p
PERFORMANCE		
Jitter	<2ns (0.013 UI)	<2ns (0.013 UI)
Data Rates	32 to 192kHz	32 to 192kHz
GENERAL		
Partitioning	up to 8 partitions with independent level assignment	
Configuration	basic web browser via NK-IPS or comprehensive via DashBoard & NK-IPS	
Dimensions	1RU, depth 6.4cm	1RU, depth 6.4cm
Power Consumption	7.5W	7.5W
Power Supply	+15 V DC	+15 V DC

Specifications subject to change without prior notice.

Ordering Information

AES Routers

NK-D16-110-RCP   16x16 Balanced AES Router with RCP NK1 Control Panel

NK-D164-110-RCP   16x4 Balanced AES Router with RCP NK1 Control Panel

NK-D164-110-RCP & NK-D16-110-RCP Rack Mount Redundant Power

NK-RP1/P   Rack Mount, 1RU, 100W, +15V Redundant Power Supply

NK-D12/PN   NK-RP1/P Power Supply Cable for NK-D164-110-RCP & NK-D16-110-RCP

NK-D164-110-RCP & NK-D16-110-RCP External Redundant Power

NK-P1   Spare or Redundant, 50W, +15V External Power Supply*

NK-DRY   Y Cable for two NK-P1 External Power Supplies

*For more information on the rack mount power supply system, please see page 216

NK-A64 AN-AUD

Stereo Analog Audio Router

Key Features

- Compact size
- Balanced inputs (can be wired unbalanced)
- Wide band frequency response
- Common mode rejection >60dB
- 64x64 expandable from 8x8 in groups of 8
- Excellent performance and specifications
- Low power consumption
- Integrated NK Series Control
- Universal power supply included
- Optional redundant power
- 5-year transferable warranty

NK-A64

Technical Specifications

	NK-A64
INPUTS	
Connection	DB25 connector
Total # of Inputs	64
Input Impedance	24kΩ
Nominal Input Level	+4dBu or -10dBu (solder link selectable)
Maximum Input Level	+24dBu
OUTPUTS	
Connection	balanced active differential DB-25
Total # of Outputs	64
Output Impedance	50Ω
Nominal Output Level	+4dBu or -10dBu (selectable via solder links per output)
Maximum Output Level	+24dBu
PERFORMANCE	
Frequency Response	±0.1 dB 20Hz to 20kHz -3dB, 100kHz
Distortion	0.005%
Noise	-90dB below +4dBu
Crosstalk	below noise
GENERAL	
Number of Levels	dual independent crosspoint layers
Control Level	no
Partitioning	up to 8 partitions per layer with independent level assignment
Configuration	web browser via NK-IPS, DashBoard Control System via NK-IPS
Dimensions	3RU, depth 12.0cm
Power Consumption	75W
Power Supply	±15 V DC

Specifications subject to change without prior notice.

Ordering Information

NK-A64 Routers

NK-A64   64x64 Stereo Analog Audio Router

NK-A64(32)   32x32 Stereo Analog Audio Router

NK-A64 Router Components

NK-A-FRM   64x64 Stereo Analog Audio Router Frame

NK-IA   8 Channel Stereo Analog Input Card

NK-OA   8 Channel Stereo Analog Output Card

NK-P3   Spare, Non-Redundant 100W, +15V Power Supply

NK-A64 Rack Mount Redundant Power

NK-RP1/PN   Rack Mount, 1RU, 100W, ±15V Redundant Power Supply*

NK-D12/P   NK-RP1/PN Power Supply Cable for NK-A64

*For more information on the rack mount power supply system, please see page 216

NK-A-HQ Series AN-AUD

Stereo Analog Audio Router Series

Key Features

- Compact size
- Balanced inputs (can be wired unbalanced)
- Wide band frequency response
- Common mode rejection >60dB
- 16x4, 16x16, 32x32 fixed sizes
- Excellent performance and specifications
- Low power consumption
- Integrated NK Series Control
- Universal power supply included
- Optional redundant power
- 5-year transferable warranty

NK-A164-HQ

NK-A16-HQ

NK-A32-HQ

Technical Specifications

	NK-A164-HQ	NK-A16-HQ	NK-A32-HQ
INPUTS			
Connection	DB25 connector	DB25 connector	DB25 connector
Total # of Inputs	16	16	32
Input Impedance	24kΩ	24kΩ	24kΩ
Nominal Input Level	+4dBu or -10dBu (solder link selectable)		
Maximum Input Level	+24dBu	+24dBu	+24dBu
OUTPUTS			
Connection	balanced active differential DB-25		
Total # of Outputs	4	16	32
Output Impedance	50Ω	50Ω	50Ω
Nominal Output Level	+4dBu or -10dBu (selectable via solder links per output)		
Maximum Output Level	+24dBu	+24dBu	+24dBu
PERFORMANCE			
Frequency Response	±0.1 dB 20Hz to 20kHz -3dB, 100kHz	±0.1 dB 20Hz to 20kHz -3dB, 100kHz	±0.1 dB 20Hz to 20kHz -3dB, 100kHz)
Distortion	0.005%	0.005%	0.005%
Noise	-90dB below +4dBu	-90dB below +4dBu	-90dB below +4dBu
Crosstalk	below noise	below noise	below noise
GENERAL			
Number of Levels	dual independent crosspoint layers		
Control Level	no	no	no
Partitioning	up to 8 partitions per layer with independent level assignment		
Configuration	web browser or comprehensive via DashBoard Control System configuration via NK-IPS		
Dimensions	1RU, depth 6.4cm	1RU, depth 6.4cm	2RU, depth 6.4cm
Power Consumption	19W	19W	38W
Power Supply	±15 V DC	±15 V DC	±15 V DC

Specifications subject to change without prior notice.

Ordering Information

NK-A164-HQ, NK-A16-HQ & NK-A32-HQ Routers

NK-A164-HQ   16x4 Stereo Analog Audio Router

NK-A16-HQ   16x16 Stereo Analog Audio Router

NK-A32-HQ   32x32 Stereo Analog Audio Router

NK-A164-HQ, NK-A16-HQ & NK-A32-HQ Rack Mount Redundant Power

NK-RP1/PN   Rack Mount, 1RU, 100W, ±15V Redundant Power Supply

NK-D12/PN   NK-RP1/PN Power Supply Cable for NK-A164-HQ, NK-A16-HQ & NK-A32-HQ

NK-A164-HQ, NK-A16-HQ & NK-A32-HQ External Redundant Power
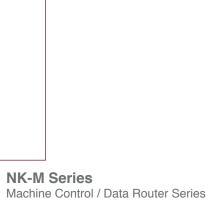
NK-PN1   Spare or Redundant, 50W, ±15V External Power Supply*

NK-DRY   Y Cable for Two NK-PN1 External Power Supplies

*For more information on the rack mount power supply system, please see page 216

NK-M Series
Machine Control / Data Router Series

Machine Control Routers

NK-M Series DATA

Machine Control / Data Router Series

Key Features

- Compact size
- Supports RS-422
- True reciprocal switching
- Allows one master to multiple slaves
- Auto port direction switching
- 16 port and 32 port fixed sizes
- Excellent performance and specifications
- Low power consumption
- Integrated NK Series Control
- Universal power supply included
- Optional redundant power
- 5-year transferable warranty

NK-M16

NK-M32

Technical Specifications

	NK-M16	NK-M32
INPUTS		
Connection	DB-9 female connector / chassis	DB-9 female connector / chassis
Total # of Inputs	16	32
Electrical Standard	RS-422	RS-422
PERFORMANCE		
Data Rate	up to 115.2kBd	up to 115.2kBd
GENERAL		
Configuration	web browser via NK-IPS DashBoard Control System via NK-IPS	
Dimensions	1RU, depth 6.4cm	2RU, depth 6.4cm
Power Consumption	9W	15W
Power Supply	+15 V DC	+15 V DC

Specifications subject to change without prior notice.

Ordering Information

Machine Control / Data Routers

NK-M16   16 Port RS-422 Machine Control Router

NK-M32   32 Port RS-422 Machine Control Router

Rack Mount Redundant Power

NK-RP1/P   Rack Mount, 1RU, 100W, +15V Redundant Power Supply

NK-D12/PN   NK-RP1/P Power Supply Cable for NK-M16 & NK-M32

External Redundant Power

NK-P1   Spare or Redundant, 50W, +15V External Power Supply*

NK-DRY   Y Cable for Two NK-P1 External Power Supplies

RCP-NK1
Local or Remote Control Panel

RCP-NKM
Remote Control Panel

RCP-NKQ
Remote Control Panel

Video Routers

Audio Routers

Machine Control Routers

Control Panels

Control System Components

RCP-NK1

Local or Remote Control Panel

Key Features

- 40 fully illuminated LED backlit buttons
- Slim design: 1RU, depth 4.4cm
- Full function programmable control panel
- Configurable as cut-bus, multi-cutbus or menu driven source / destination switching control panel
- Control up to 8 levels, across 16 breakaways
- Removable keycaps for labeling of button functions using transparent inserts
- Can be mounted on the front of any NK-16 router, providing an integrated 1RU routing and control solution
- Phantom-powered via T-Bus
- 5-year transferable warranty

RCP-NK1

Overview

The RCP-NK1 is a simple and cost-effective control panel that can be used in a wide variety of applications.

Ideally suited as a menu driven source / destination switching control panel for small routers or as a cut-bus or multi-cutbus control panel for any sized router, the RCP-NK1 features 40 soft, fully programmable backlit keys arranged in a 32 + 8 configuration for convenient function key layout.

Each button can be configured to operate as a source, destination, breakaway, level select or macro function. Additionally protect, take and panel lock functions can be programmed to any button. Using source and destination shift buttons, a single RCP-NK1 can access up to 48 sources or destinations.

Multiple RCP-NK1's can be tied together to operate as a single, larger panel. By doing this, the tied RCP-NK1's can operate as a larger menu driven source / destination switching panel, or a larger cut bus panel with a single button per source access.

The variable backlight allows labels to be read in low light control room conditions, making this panel ideal for a wide range of environments.

Ordering Information

RCP-NK1   40 LED Illuminated Button Local / Remote Control Panel

RCP-NK1 Applications

NK-A16-HQ

RCP-NK1
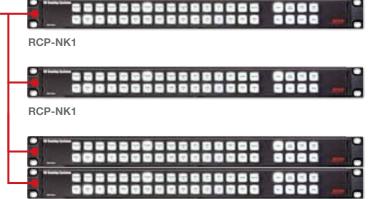
Menu driven source / destination switching control for a router up to 16 x 16

NK-D32-75

Two Linked **RCP-NK1** Panels

Two linked panels can be used as menu driven source / destination switching control for a router up to 32 x 32

NK-3G72

RCP-NK1

Satellite panel to control a limited number of sources and destinations for any router

RCP-NK1

Macro panel to quickly restore saved configurations or commonly made switches

Two Linked **RCP-NK1** Panels

Two linked panels can be used as a larger cut bus panel

RCP-NKM

Remote Control Panel

Key Features

- 40 fully illuminated LED backlit buttons
- Backlit 16x2 LCD display
- Slim design: 1RU, depth 4.4cm
- Full function, programmable control panel
- Configurable as cut-bus, multi-cutbus or menu driven source / destination switching control panel
- Control up to 32 levels, across 16 breakaways
- Removable keycaps for labeling of button functions using transparent inserts
- Universal power supply included
- 5-year transferable warranty

RCP-NKM

Overview

The RCP-NKM is the most popular NK Series control panel and finds a home in a wide range of applications due to its familiarity, flexibility and cost-effectiveness.

The RCP-NKM has all of the same button programmability as the RCP-NK1 (source, destination, breakaway, level select, macro, protect, take and panel lock), and adds a backlit 16x2 LCD display for display of source and destination names, system warnings and errors.

Additionally, the RCP-NKM adds the ability to create menus which enables the grouping of sources and destinations based on physical requirements (studios, edit suites, QC racks) or categories (servers, cameras, monitors). Menu navigation buttons programmed onto the RCP-NKM also enable quick access between menus.

Multiple RCP-NKMs can be tied together to operate as a single, larger panel. By doing this, the tied RCP-NKMs can operate as a larger menu driven source / destination switching panel or a larger cut bus panel with a single button per source access. The variable backlight allows labels to be read in low light control room conditions, making this panel ideal for a wide range of environments.

Ordering Information

RCP-NKM   40 Button and LCD Display Control Panel
NK-5V2A   Shelf Spare Power Supply for the RCP-NKM

RCP-NKM Application

NK-3G72

RCP-NKM
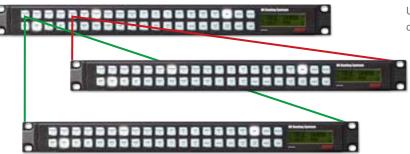
Using menus, menu driven source / destination switching control of routers up to 72 x72

RCP-NKM

Satellite panel to control a limited number of sources and destinations for any router

RCP-NKM Features

Quickly see the source routed to each destination on the display by selecting a destination

Using menus, users can quickly access specific categories of sources and destinations

RCP-NKQ

Remote Control Panel

Key Features

- 17 backlit graphic LCD keys
- Slim design: 1RU, depth 4.4cm
- Full function, programmable control panel
- Menu driven and single key configurations
- 8 backlight colors
- Unique multi-level menu programming
- Configure with web browser or DashBoard Control System
- Universal power supply included
- 5-year transferable warranty

RCP-NKQ

Overview

The RCP-NKQ offers unmatched flexibility and ease-of-use. Ideal for use in OB trucks or production houses where configurations change regularly and is equally useful in studios where unlimited configurations enable fast and simple customized setups of each panel.

The RCP-NKQ remote control panel offers 17 colored backlit graphic LCD keys with multiple menus, enabling users to easily navigate through the system with just a few key presses.

Using the menu function, users can quickly navigate through hundreds of sources and destinations, making it an ideal menu driven source / destination switching panel for any size router.
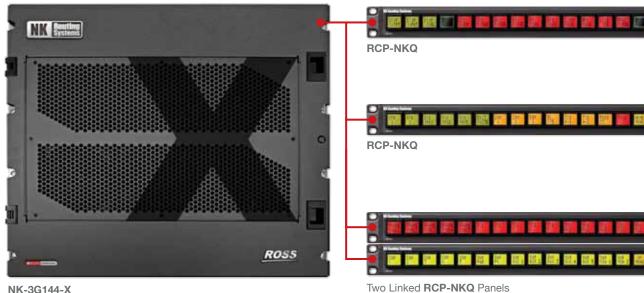
As with all the control panels, each button can be programmed to function as a source, destination, breakaway, level select, macro, protect, take and panel lock button.

Custom key labels (up to 10 characters across 2 lines) and colors are all user-definable. These labels are configured offline using the DashBoard Control System, and then sent to the RCP-NKQ panel to change its configuration.

Ordering Information

RCP-NKQ   17 LCD Illuminated Button Control Panel
NK-5V2A   Shelf Spare Power Supply for the RCP-NKQ

RCP-NKQ Applications

NK-3G144-X

RCP-NKQ

Macro panel to quickly restore saved configurations or commonly made switches

RCP-NKQ

Engineering menu driven source / destination switching control panel

Two Linked **RCP-NKQ** Panels
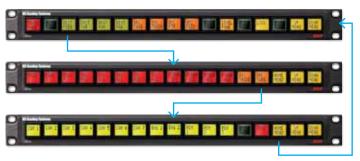
Two linked panels, one to select sources and the other to select destinations for even faster menu driven source / destination switching control

RCP-NKQ Features

Press and hold a destination button to see the source currently routed to that destination

Menu navigation buttons enable the user to quickly scroll through the list of sources or destinations

NK-IPS
Network Bridge

NK-NET
T-Bus to Ethernet Adapter

NK-VRC
Virtual Routing Core

NK-GPI
General Purpose Interface

NK-3RD
Third Party Router Interface

NK-SCP/A
ASCII / RS-232 Control Interface

NK-SCP/K2
RS-485 Control Interface

NK-RP1
Redundant Power Supply

Control System Components

NK-IPS

Network Bridge

Key Features

- Compact size: 1RU, depth 2.4cm
- Password protection to prevent unauthorized changes
- Front panel status and communications indicators
- 8 port hub for T-Bus connected devices
- 10/100 Ethernet port
- Supports static or DHCP assigned IP addressing
- Universal power supply included
- Optional redundant power
- 5-year transferable warranty

NK-IPS

The NK-IPS Network Bridge is the external gateway to all NK Series devices for configuration, firmware upgrades, monitoring and remote control.

The NK-IPS provides an Ethernet port that connects to a LAN or directly to a computer. This port is used to communicate to a web browser or DashBoard Control System to configure and control the NK Series Routing System.

NK-IPS is also equipped with a buffered 8-port T-Bus hub. T-Bus is the RS-485 based communications system the NK Series uses to communicate between devices such as control panels and frames. Each T-Bus port can support multiple devices in a daisy chain configuration.

Alarm status and monitoring is displayed via DashBoard control system, enabling users to locate errors and troubleshoot problems.

Ordering Information

NK-IPS   Network IP Configuration Device

NK-IPS External Redundant Power

NK-P1   Spare or Redundant, 50W, +15V External Power Supply

NK-DRY   Y Cable for two NK-P1 External Power Supplies
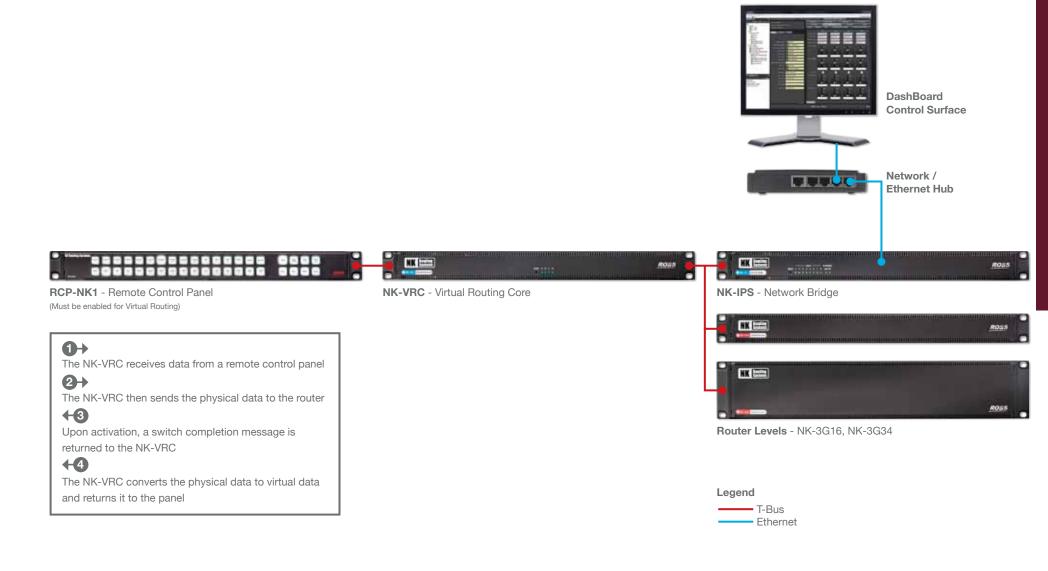
NK-IPS Rack Mount Redundant Power

NK-RP1/P   Rack Mount, 1RU, 100W, +15V Redundant Power Supply*

NK-D12/P   NK-RP1/P Power Supply Cable for NK-IPS
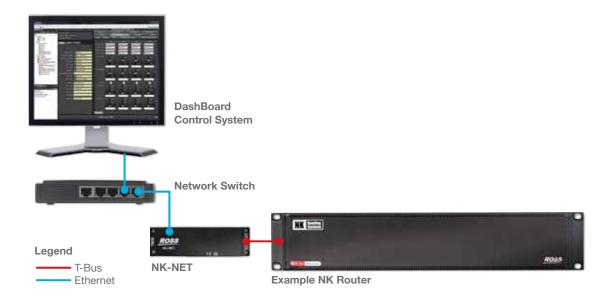
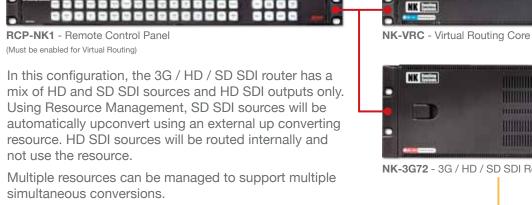*For more information on the rack mount power supply system, please see page 216

NK-NET

T-BUS to Ethernet Adapter
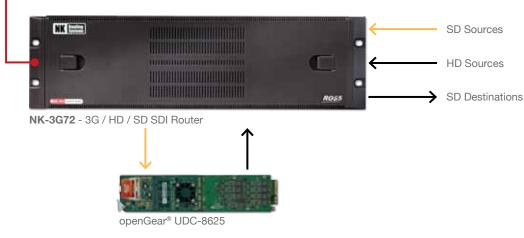
Key Features

- Enables Ethernet Configuration of any NK Router from Dashboard
- Ships FREE and automatically included with every NK Router (orderable separately as well for legacy installations)
- Configures both the router and up to 4 T-BUS connected NK panels
- Replaces the need for an IPS for simple, router installations – saves costs, saves space, saves complexity.
- Powered by T-BUS connection, no external power supply required

DashBoard Control System

Network Switch

Legend
T-Bus
Ethernet

NK-NET

Example NK Router

Overview

In an effort to simplify NK routing solutions, and provide a significant cost savings and provide a more cost-effective routing solution, Ross has introduced the new NK-NET configuration dongle. This simple, unobtrusive dongle provides users the ability to configure a router, and up to 4 NK remote control panels via Dashboard, without the need of an NK-IPS. NK-NET ships at no extra charge with the purchase of all NK series routers. NK-NET can also be purchased as a stand-alone item for legacy systems.

Restrictions of NK-NET Applications

- NK-NET requires the router to host the connection. Use NK-IPS to support panels directly.
- NK-NET does not support advanced mapping. Use VRC for virtual routing configurations.
- NK-NET only allows a single Dashboard connection.
- NK-NET does not support MC-1 or Carbonite Extreme.

Ordering Information

NK-NET   T-BUS to Ethernet Adapter (Ships FREE and automatically included with every NK Router)

NK-VRC

Virtual Routing Core

Key Features

- Virtual routing controller
- Provides virtual routing and resource management for any NK Series Routing System
- Allows physical sources and destinations to be mapped virtually
- Manages routing of signals between different router levels using external resources
- 1,000 virtual input mappings
- 1,000 virtual output mappings
- Front panel status indicators
- Universal power supply included
- Requires DashBoard Control System
- Optional redundant power
- 5-year transferable warranty

NK-VRC

The NK-VRC Virtual Routing Core adds virtual routing and resource management to any NK Series Routing System. Virtual routing and resource management is an important requirement in larger routing systems, especially those with multiple levels.

Virtual routing provides the ability to assign physical sources and destinations to virtual sources and destinations. Without the NK-VRC, tied switching of sources and destinations will always switch the same physical inputs and outputs across multiple routers. The NK-VRC enables a more flexible setup where the sources and destinations do not have to be identically connected across multiple levels.

Additionally, the NK-VRC enables resource management or path finding in an NK Series Routing System. Resource management enables routing of signals between different router types (such as analog and digital). This is done by using resources to convert between one format to another (such as an analog to digital converter).

Resource management simplifies the operation of a router system by routing signals through a resource from one router to another, without having the user know which source and destination the resource is connected to. Once configured, the system will be able to automatically find the path between routers.

Multiple resources can be managed to enable more than one signal path between routers.

Ordering Information

NK-VRC   Virtual Routing Core Device

NK-VRC External Redundant Power
NK-P1   Spare or Redundant, 50W, +15V External Power Supply
NK-DRY   Y Cable for two NK-P1 External Power Supplies

NK-VRC Rack Mount Redundant Power
NK-RP1/P   Rack Mount, 1RU, 100W, +15V Redundant Power Supply*
NK-D12/P   NK-RP1/P Power Supply Cable for NK-VRC

*For more information on the rack mount power supply system, please see page 216

NK-IPS & NK-VRC

System Diagrams

DashBoard Control Surface

Network / Ethernet Hub

RCP-NK1 - Remote Control Panel
(Must be enabled for Virtual Routing)

NK-VRC - Virtual Routing Core

NK-IPS - Network Bridge

Router Levels - NK-3G16, NK-3G34

1 ➡
The NK-VRC receives data from a remote control panel

2 ➡
The NK-VRC then sends the physical data to the router

⬅ **3**
Upon activation, a switch completion message is returned to the NK-VRC

⬅ **4**
The NK-VRC converts the physical data to virtual data and returns it to the panel

Legend
━━━ T-Bus
━━━ Ethernet

NK-VRC

Applications

NK-VRC Resource Management - Application #1

RCP-NK1 - Remote Control Panel
(Must be enabled for Virtual Routing)

NK-VRC - Virtual Routing Core

In this configuration, the 3G / HD / SD SDI router has a mix of HD and SD SDI sources and HD SDI outputs only. Using Resource Management, SD SDI sources will be automatically upconvert using an external up converting resource. HD SDI sources will be routed internally and not use the resource.

Multiple resources can be managed to support multiple simultaneous conversions.

SD Sources

HD Sources

SD Destinations

NK-3G72 - 3G / HD / SD SDI Router

Legend

— T-Bus
— SD SDI
— HD SDI

openGear® UDC-8625

NK-VRC Resource Management - Application #2

RCP-NK1 - Remote Control Panel
(Must be enabled for Virtual Routing)

NK-VRC - Virtual Routing Core

In this configuration, the digital audio router can select any of the sources on the analog audio router and vice versa. Conversions between analog and digital is handled using external openGear® resources. The NK-VRC automatically handles the routing to and from the resources between the two router levels.

Multiple resources can be managed to support multiple links between routers.

Analog Sources
Analog Destinations

NK-A16-HQ - Analog Audio Router

openGear® - **ADC-8434**   openGear® - **DAC-8418**

Digital Sources
Digital Destinations

NK-D16-75 - Digital Audio Router

Legend

— T-Bus
— Analog Audio
— Digital Audio

NK-GPI

General Purpose Interface

Key Features
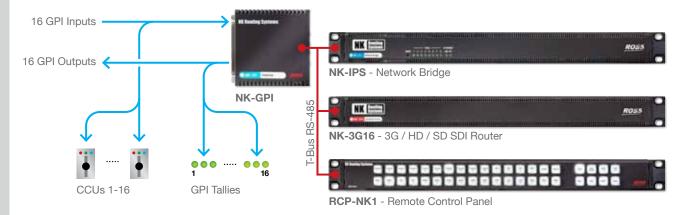
- 16 GPI inputs and outputs
- Return / latch mode
- Easy to install and operate
- Phantom-powered via the T-Bus
- 5-year transferable warranty

NK-GPI

Overview

The NK-GPI is a stand-alone, universal, general purpose interface for the Ross Video NK Series family of routers. Providing both GPI inputs and outputs, the NK-GPI enables flexible GPI control, configured from a web browser or the DashBoard Control System, via the NK-IPS. The NK-GPI also supports both GPI input return and latch modes.

NK-GPI System Diagram

16 GPI Inputs

16 GPI Outputs

NK-GPI

CCUs 1-16

GPI Tallies

1   16

T-Bus RS-485

NK-IPS - Network Bridge

NK-3G16 - 3G / HD / SD SDI Router

RCP-NK1 - Remote Control Panel

Ordering Information

NK-GPI   GPI Interface Unit

NK-3RD

Third Party Router Interface

Key Features

- Enables third-party control via
    - Pro-Bel SW-P-08
    - GrassValley GVG-7000
    - Jupiter ESswitch
- Works with any NK Series router
- Supports crosspoint switch commands
- Supports crosspoint status requests
- Up to 1,024 outputs can be controlled
- Up to 1,024 inputs can be controlled
- Supports up to 16 levels
- Matrix number configurable up to 16
- Virtual routing supported (requires NK-VRC)
- Firmware upgradeable via DashBoard Control System
- Easy configuration
- Front panel status indicators
- Universal power supply included
- Optional redundant power
- 5-year transferable warranty

NK-3RD
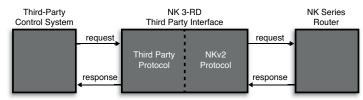
Overview

The NK-3RD Third Party Router Interface enables a third-party control system to control an NK Series routing system using the Pro Bel SW-P-08 or the Grass Valley Jupiter ESswtich protocol.

Using this protocol, an NK Series router can emulate a Probel router or interface to Grass Valley products via ESswitch (limited to crosspoint switching and crosspoint status / tally requests), allowing control of the NK Series router via a third-party automation system.

Block Diagram Example of Protocol Emulation

Ordering Information

NK-3RD   Third Party Router Interface

NK-3RD External Redundant Power

NK-P1   Spare or Redundant, 50W, +15V External Power Supply

NK-DRY   Y Cable for two NK-P1 External Power Supplies

NK-3RD Rack Mount Redundant Power

NK-RP1/P   Rack Mount, 1RU, 100W, +15V Redundant Power Supply*

NK-D12/P   NK-RP1/P Power Supply Cable for NK-3RD

*For more information on the rack mount power supply system, please see page 216

NK-SCP/A

ASCII / RS-232 Control Interface

Key Features
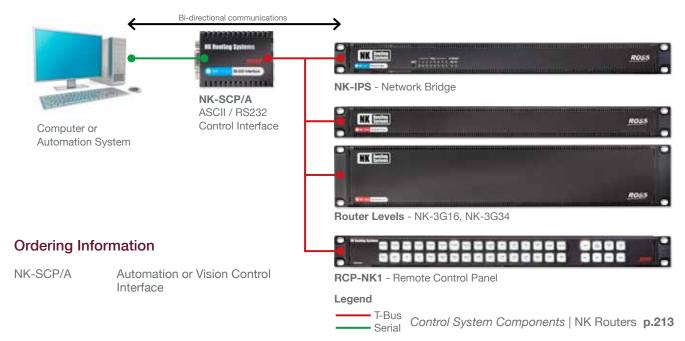
- Allows NK router control via RS-232
- Automation system interface
- Easy to install and operate
- Phantom-powered via the T-Bus
- 5-year transferable warranty

NK-SCP/A

Overview

The NK-SCP/A Control Interface enables an RS-232 device, such as an automation system, computer terminal, video production switcher or other such device to control NK Series routers using the ASCII protocol. Any combination of NK Series routers can be controlled with a maximum size of 255 inputs and 255 outputs with up to 8 levels. The bi-directional protocol includes crosspoint status monitoring and crosspoint switching. Crosspoint switching can be performed using individual levels or through user-defined breakaway mapping.

NK-SCP/A System Diagram

Bi-directional communications

Computer or
Automation System

NK-SCP/A
ASCII / RS232
Control Interface

NK-IPS - Network Bridge

Router Levels - NK-3G16, NK-3G34

RCP-NK1 - Remote Control Panel

Legend
— T-Bus
— Serial

Ordering Information

NK-SCP/A   Automation or Vision Control
                  Interface

Control System Components | NK Routers **p.213**

NK-SCP/K2

RS-485 Control Interface
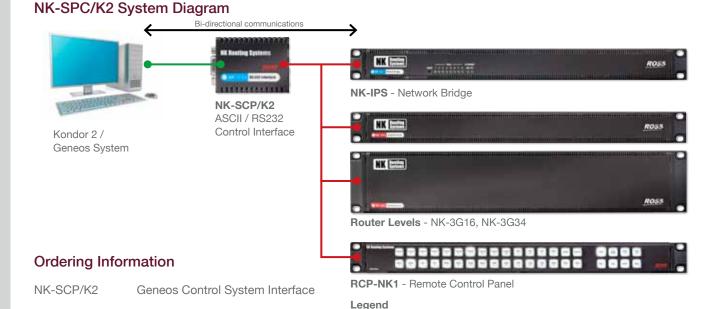
Key Features

- Allows NK routers to operate as a Kondor 2 / Geneos level
- Easy to install and operate
- Phantom-powered via the T-Bus
- 5-year transferable warranty

NK-SCP/K2

Overview

The NK-SCP/K2 allows Kondor 2 Routing Systems to be extended by using NK Series routers. Any combination of NK Series routers can be added to a Kondor 2 system with a maximum size of 255 inputs and 255 outputs with up to 8 levels. Kondor 2 inputs, outputs and levels are directly mapped to NK Series inputs, outputs and levels, with no user mapping required.

NK-SPC/K2 System Diagram

Bi-directional communications

Kondor 2 / Geneos System

NK-SCP/K2
ASCII / RS232
Control Interface

NK-IPS - Network Bridge

Router Levels - NK-3G16, NK-3G34

RCP-NK1 - Remote Control Panel

Legend
— T-Bus
— Serial

Ordering Information

NK-SCP/K2   Geneos Control System Interface

NK-RP1

Redundant Power Supply

- Fault tolerant NK power supply option
- Supplies redundant power for up to 4 routers or devices
- GPI alarm output
- Front access for easy module replacement
- 5-year transferable warranty

NK-RP1

Supported Devices

- All NK 16, 32, 34, 64 and 72 routers
- NK-IPS Network Bridge
- NK-VRC Virtual Routing Core

Device Connectors
- DB-9:
    - All NK-164 routers
    - All NK-16 routers
    - All NK-32 routers
    - All NK-34 routers
    - NK-IPS Network Bridge
    - NK-VRC Virtual Routing Core
    - NK-3RD Third Party Router Interface
- Neutrik Speakon®:
    - All NK-64 routers
    - All NK-72 routers

NK-RP1

The NK-RP1 offers a reliable, fault tolerant and fail-safe option for NK Series routers and peripheral devices. The NK-RP1 supplies redundant power for up to 4 routers and devices for a total power consumption of 100 watts. The NK-RP1 provides GPI outputs to indicate alarms, in the event a power supply has failed. The heartbeat LED on the front of the unit also blinks if a PSU has failed.

During normal operation, the design of the NK-RP1 enables balancing of the power load, delivering high reliability to all connected routers and devices. When configured as a dual redundant positive and negative power supply, the NK-RP1 has greater than 80% efficiency as a negative power source, providing both efficient and low-temperature operation.

The NK-RP1 comes standard as a positive power rail supply. A negative power rail option may be installed as an upgrade by simply removing the front panel and inserting the NK-RP1-NEG option card (required for NK-A16/32 and NK-V16/32 router levels).

Ordering Information
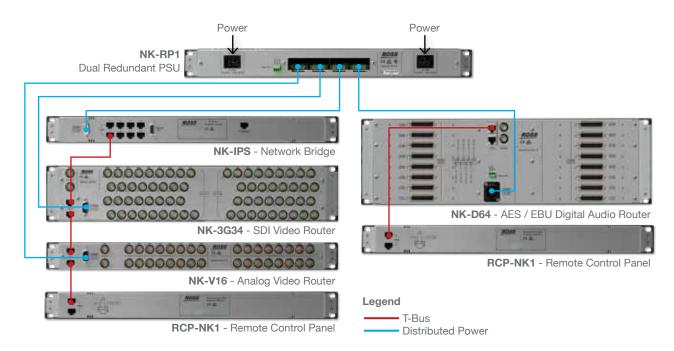
NK-RP1/P   NK Series Dual Redundant Power Supply, +15 Volt (100W)
NK-RP1/PN   NK Series Dual Redundant Power Supply, +/-15 Volt (100W)
NK-RP1-NEG   -15 Volt regulator module for NK-RP1/P (50W max)
NK-D12/PN   PSU cable for NK-RP1/PN, 1.2m, 9-pin D connector, +/-15 Volt
NK-D12/P   PSU cable for NK-RP1/PN, 1.2m, Neutrik Speakon® connector, +15 Volt

NK-RP1 System Diagram

Power   Power

NK-RP1
Dual Redundant PSU

NK-IPS - Network Bridge

NK-3G34 - SDI Video Router

NK-V16 - Analog Video Router

RCP-NK1 - Remote Control Panel

NK-D64 - AES / EBU Digital Audio Router

RCP-NK1 - Remote Control Panel

Legend
— T-Bus
— Distributed Power

Technical Specifications

PERFORMANCE	
Input	100 to 240 V @ 1.5 A (47 to 63 Hz)
Positive Output	+15 V @ 6.67 A (100W)
Negative Output	-15 V @ 3.33A (optional)
Maximum Total Output	100W
Relative +/- Output	see table below
GENERAL	
On-Board Cooling	2 x 4.0cm fans
Dimensions	1RU x 19.0cm deep

Specifications subject to change without prior notice.

Relative + / - Power Output

	POWER DISTRIBUTION (watts)						
POSITIVE POWER	100	90	80	70	60	50	40
NEGATIVE POWER	0	8.4	16.8	25.2	33.6	42	50

Table of Contents

MC1 - Your One Card Master

Cost-Effective Master Control System.

Robust

Built to meet the demands of 24/7 operation. A dedicated card-based solution provides complete program path protection using input bypass relays, protecting your channel output. Our hot-swap system allows a single spare MC1-MK card to replace any on-air channel card, and have all of the channel's parameters automatically recalled to the replacement MC1-MK card. The optional control panel offers an extra layer of redundancy in addition to the tactile feedback only available in a physical control panel.

Simple

Intuitive DashBoard operation allows for an easy transition, and brings operators up to speed quickly. Simple scaling solutions allow for additional openGear® cards; add an additional channel by adding a 2nd MC1-MK, or add a variety of additional functions such as Loudness Processing, Dolby™ Encoding, and Nielsen watermarking.

Affordable

At *$3,495*, the MC1-MK is the most affordable, dedicated master control solution. Legendary, lifetime Ross support and 5-year warranty make MC1 an excellent value.

MC1 SqueezeBack & Voice Over

SqueezeBack

- Perform smooth on-air SqueezeBack transitions to reveal another video source or graphic
- Transition to pre-squeezed effects with standard transitions
- Squeeze in any direction, on either X or Y axis, or both
- 4 Presets for quick effect recalls on the fly

Audio Over

- Flexible audio/voice over mixing
- Variable program audio duck level
- Audio over gain control
- Preset mixing with transition control

... More than Master Control

The MC1-MK Mixer/Keyer openGear® card can be used without an NK router for stand-alone applications including any combination of the following:

- Stand-alone Branding and Logo insertion
- Stand-alone Emergency A/B mixing
- Stand-alone EAS insertion
- Stand-alone Audio / Voice over mixing
- Stand-alone SqueezeBack

MC1 Branding Solutions

Attracting viewers in a highly competitive market is not getting any easier, but strengthening your brand can help. The evolution of branding has continued well beyond the traditional station logos in the corner of television set. Animated logos, attention-catching teasers, and information updates are all a part of today's master control and branding demands. Integrated branding and centralized graphics play a key role in brand consistency and strength and help to reduce costs. Finding simple, flexible, and cost-effective ways to strengthen your brand should be easy. Ross Video's MC1 offers a variety of solutions to fit your branding requirements and budget. Enhance and simplify your channel branding with Ross Video's MC1!

Solution 1:
MC1's Integrated Media Store with External Key / Fill Support

Four downstream keyers offer the flexibility to add multiple layers of animated logo insertion and branding. Branding content is brought to air from the on-board 2GB internal media store and the external key and fill inputs for external graphic support.

Solution 2:
MC1's Integrated Media Store with XPression LiveCG

XPression LiveCG is an economical way to enhance your branding with eye-catching graphics. Simply load XPression LiveCG software onto your own workstation, connect it and MC1 to the same local area network, and you have a tightly integrated CG / Master Control System. XPression's intuitive user interface makes it easy to build compelling 3D graphics, add logos on multiple layers and create beautiful titles. Ordering and playout using XPression's rundown-style sequencer, renders directly into MC1's MediaStore™, enhancing the flexibility and power of the MC1 Master Control System.

Solution 3:
MC1's Integrated Media Store and XPression Full Motion Graphics

Upgrade to Full Motion Graphics with XPression Player, Studio, or Blue Box editions for a cost-effective graphics engine, producing beautiful, multi-layered graphics with ease. These packages offer powerful graphics playout, with the option for graphics creation and 3rd party automation, fully compatible with all of the XPression graphics workflow tools.

DashBoard

Take Control Of Any Channel

Multi-Channel Control
Assign control to independent MC1s for multi-channel control on-the-fly

Channel ID
Instantly identify the channel under control

PGM / PST
• Direct control of 10 inputs, 20 with shift
• Mnemonics

Transition Control
Cut, V-Fade, Cut / Fade, Mix, Fade / Cut

On Air SqueezeBack Transition

Transition Speed
3 user-configurable quick select transition rates

PST Transition
• Pre-select next event with full control over BKGD, KEY1, KEY2, KEY3, KEY4
• Full next event preview

Take
Transition PST, including BKGD and up to 4 keyers to PGM

Audio Metering
Confidence monitoring of both PGM and PST audio

Lock
Lock out the touchscreen

Timer
Count up segment timer

4 SqueezeBack Presets For Quick Recall

Fade To Black / Fade To Silence

Automation On / Off

PGM Audio Gain
• Adjust PGM audio level
• Configurable reset on transition

Flexible Audio Over Mixing

Hot Keys
Take keyers direct on /off the PGM output with one button

Configuration Menu

SIGNAL STATUS

• Monitor video, audio and reference signals

HARDWARE PERFORMANCE

• Monitor operating temperatures and other hardware parameters

PRODUCT CONFIGURATION

• Configure audio and video formats and parameters

• Setup GPI control and tally outputs

• Configure external automation protocols

• Configure on-board Ethernet parameters for remote control and file transfers

• Setup router configuration and sources

• Emergency Alert System configuration

• Configure select personality parameters

On-Air Logo Menu

• File navigation / conversion

• Logo attribute, X/Y position, loop, play

On-Air Keyer Menu

• Easy assignment of preloaded logo's to keyers

• Key setup with transparency, clip, and gain

• Key type selection

• External Key / Fill setup

DashBoard Control | MC1 **p.225**

MC1 Panel

Beautiful Ergonomics, Smooth and Responsive Operation
Multi-Channel Control in a Compact Design

Enable and Disable Remote Automation Control
• Quickly Take Manual Control of Any Master Control Channel

Squeezeback Preset Quick Recall
• Recall up to 4 SqueezeBack Presets Per Channel

Instant Control Of Up To 10 Master Control Channels

Customizable Color Scheme
• Program, Preset and Other Buttons can be Color Coded to Denote the Channel being Controlled

16 Button Program Bus
• Shift Access to 30 Router Sources

Source Mnemonics
• Name Button Sources
• Select Color and Contrast

16 Button Preset Bus
• Shift Access to 30 Router Sources

Transition Type Selection
• Choose from Cut, V-Fade, Cut-Fade, Dissolve, Fade-Cut and Squeeze

Transition Rate Select
• Choose from Slow, Medium and Fast with user selectable frame rates

High Contrast Display
• Device Status
• Auto-Follow Menus

Audio Gain Control
• Quickly Adjust Live Audio Levels

Program Keys and AO Row
• Directly Take Keys and Audio
  Over to Air

Key and VO Source Mnemonic
• Name Button Sources
• Select Color and Contrast

Preset Keys and AO Row
• Assign Keys and Audio Over to the
  Next Transition

Take Button
• Easy Access Take Button with High
  Visibility

Transition Include Buttons
• Include Background Video and
  Squeeze in Next Transition

Fade to Black
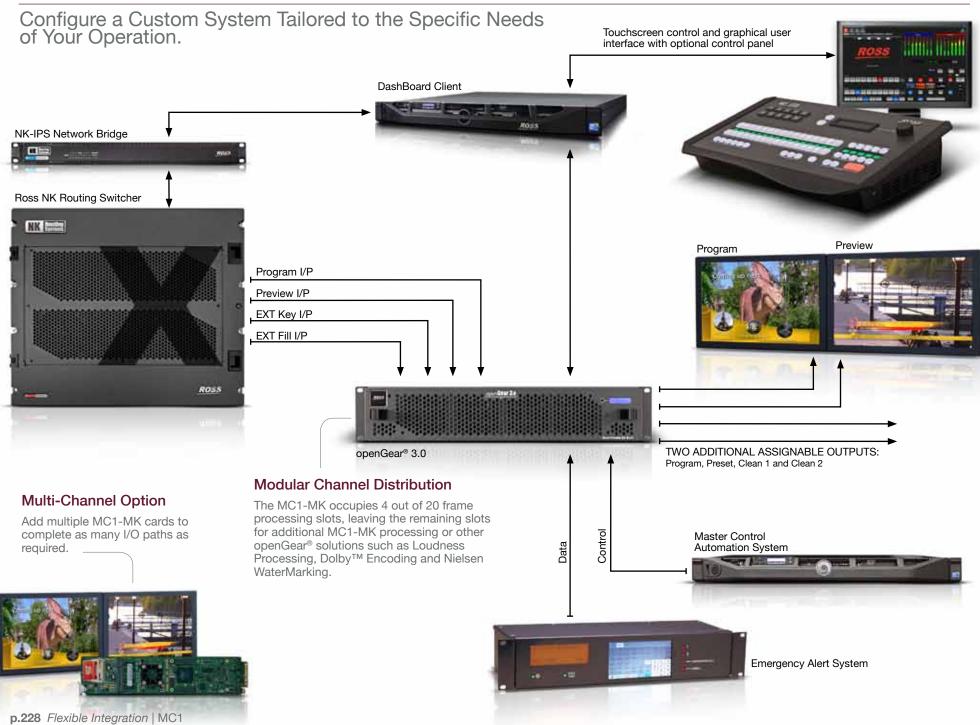
Robust, Reliable and Affordable

The optional MC1 control panel is fully customizable and supports scalable multi-channel operation.

The panel's customizable soft-touch buttons with program-mable mnemonics and instant control of up to 10 channels, with easily accessible menus that auto-follow, brings the MC1 to a whole new level—ensuring a reliable and smooth experience.

The panel can be installed in-desk or rack mount and includes a redundant power supply option. The panel con-nects directly to each MC1 via Ethernet, providing greater installation flexibility.

Flexible Integration

Configure a Custom System Tailored to the Specific Needs
of Your Operation.

Touchscreen control and graphical user
interface with optional control panel

DashBoard Client

NK-IPS Network Bridge

Ross NK Routing Switcher

Program I/P

Preview I/P

EXT Key I/P

EXT Fill I/P

Program

Preview

openGear® 3.0

TWO ADDITIONAL ASSIGNABLE OUTPUTS:
Program, Preset, Clean 1 and Clean 2

Modular Channel Distribution

The MC1-MK occupies 4 out of 20 frame
processing slots, leaving the remaining slots
for additional MC1-MK processing or other
openGear® solutions such as Loudness
Processing, Dolby™ Encoding and Nielsen
WaterMarking.

Multi-Channel Option

Add multiple MC1-MK cards to
complete as many I/O paths as
required.

Data

Control

Master Control
Automation System

Emergency Alert System

Ordering Information

MC1 Features

- Cost-effective modular design
- Multi-channel control
- Touchscreen control surface
- Ease-of-use manual control
- Hot key operation
- Full next event preview
- Direct control of 10 inputs, 20 with shift
- Programmable PGM / PST transition toggle
- 4 Branding Keyers with internal storage and playout
- External Key / Fill graphics input
- Embedded audio processing
- Fade to Black / Silence
- PGM audio level control
- Audio confidence monitoring
- Automation interface
- Integrated EAS text crawl with optional AudioOver
- 8 assignable GPI/O
- PGM protection relay
- 4 assignable outputs, PGM, PST, CLEAN
- Configurable SqueezeBack with 4 presets for quick effect recall
- Flexible Audio / Voice over with preset transitions

SYSTEM	DETAILS
MC1-164	HD / SD 16 Input Master Control
MC1-16	HD / SD 16 Input Master Control with 12 Aux Buses
MC1-32	HD / SD 32 Input Master Control (Configurable to 72)
MC1-64	HD / SD 64 Input Master Control (Configurable to 72)
MC1-128	HD / SD 128 Input Master Control (Configurable to 144)

Standard System Includes:
- 1 NK-IPS NK Network IP Configuration Device
- 1 MC1-MK A/V Mixer Keyer
- 1 0G3-FR-CN openGear® Frame with Network Control
- DashBoard Control Software

MC1 CONTROL PANEL	DETAILS
MC1-PANEL-16	MC1 Control Panel with 16 Source Buttons. Control up to 10 MC1 Channels.
MC1-PANEL-16-999	Extended Warranty for the Panel (adds 1-year)
PS-MC1-PANEL-16	Redundant Power Supply for MC1-PANEL-16

SYSTEM	DETAILS
MC1-MK	Additional Multi-Channel or Backup MC1-MK A/V Mixer Keyer
0G3-FR-CN	openGear® 22 Slot Frame with Network Control
PS-0G3	Redundant Power Supply for 0G3-FR-CN Frame
MC1-EAS-C	4 Channel Analog audio Emergency Alert Interface
MC1-EAS-A	8 Channel Digital AES audio Emergency Alert Interface
MC1-PortEx	Comtrol Network Port Expander Interface (Required for EAS support)
MC1 CONTROL OPTIONS	**DETAILS**
MC1-TS	Widescreen 22″ LCD Touchscreen Display
MC1-DB-CLN	1RU Rackmount Control PC w/ Redundant PSU and DVI Output, Windows OS

ROUTER CONTROL OPTIONS	DETAILS
RCP-NK1	40 LED Illuminated Button Local / Remote Control Panel

COMMISSIONING PACKAGES	DETAILS
MC1-COM-1ST	Onsite Commissioning, 1st Day
MC1-COM-ADD	Onsite Commissioning, Additional Day
MC1-COM-REM	Remote Commissioning

* Commissioning packages are based on size and scale of the installation and the components involved.

Audio
Monitoring
Bridge
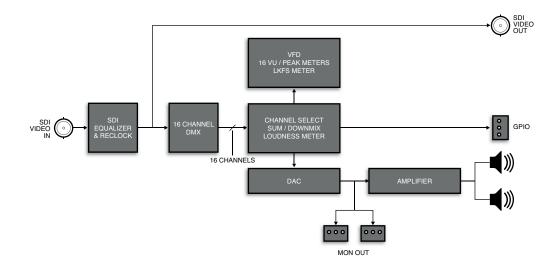
Table of Contents

MB-650 3G HD SD

Monitoring Bridge
3G / HD / SD SDI embedded audio monitoring bridge.

The MB-650 monitoring bridge is a compact, 2RU audio monitoring bridge for embedded audio. Designed to meet the demands of broadcast audio monitoring requirements, the MB-650 is capable of de-embedding up to 16 channels of audio from an incoming SDI signal. The audio monitoring bridge provides both visual and aural monitoring with built-in front panel display and speakers.

16 digital VU/PPM meters monitor all 16 channels of embedded audio, while an intuitive control surface allows for easy channel source and mode selection for the built-in speakers. A meter and numerical display provides loudness measurements according to ITU1770/1771 LKFS. Additional information such as true peak, input signal data and type are also displayed on screen.

High quality, full-range speakers, along with a high performance class D stereo amplifier, offer excellent sound quality suitable for any monitoring environment. The front panel also includes a volume control and a 1/4 inch headphone jack. The rear of the MB-650 provides a single SDI input with reclocked SDI output and 2 channels of analog audio outputs.

Key Features

• 3G / HD / SD SDI input with integrated 16 channel de-embedder

• Monitoring of up to 16 channels of embedded audio

• Reclocked SDI output

• High Power Class D Stereo Audio Amplifier

• Onboard 5.1 Surround sound Lt/Rt downmixer

• True Peak VU or LKFS Loudness level display, with full 16 channel monitoring display

• Redundant Power Supply Option

• Headphone & Analog Audio Outputs

• Easy audio source and mode selection

• Ethernet connection to Dashboard Control System for monitoring, control and software upgrades

• 1-year transferable warranty

Ordering Information

Audio Monitoring Bridge

MB-650	Audio Monitoring Bridge
PS-MB-650	Redundant or Spare Power Supply

Master
Sync and
Reference

Table of Contents

SRG-4400 3G HD SD

Master Reference and Test Signal Generator

The SRG-4400 is a 1RU state of the art master reference and 3G / HD / SD SDI test signal generator designed to exacting specifications. The SRG-4400 is the ideal choice for supplying all of the required reference timing and test signals needed in today's complex broadcast facilities. It provides all the reference (Color Black, tri-level sync), timing and test signals, including LTC and VITC, together with analog audio, AES audio and Word Clock / DARS, needed to satisfy any application in PAL, NTSC, SD SDI, HD SDI, & 3G SDI and mixed standard installations.

The SRG-4400 ships standard with hot-swappable dual power supplies which are accessible from the front panel. Adding the companion ACO-4400, Automatic Changeover unit, the SRG-4400 supplies the reliability needed in modern facility timing systems.

The SRG-4400 comes with advanced networking control via the DashBoard control system. The SRG-4400 also has NTP (Network Time Protocol) and GPS time synchronization options.

SRG-4400

Redundancy and Master / Slave Operations
The SRG-4400 is designed to run as a master in standalone or under an external reference input. Where it is critical to have a backup master reference, the ACO-4400 auto changeover unit complements the SRG-4400. This can be user configured to monitor and changeover analog video, SDI video, timecode and AES/EBU digital audio signals.

Inputs (BNC)
75 Ω looping reference
10 MHz terminating reference

Outputs (BNC)
2 Analog Composite Black
2 Analog Composite Test Pattern
6 Color Black/Tri-Level (3 independent pairs)
4 3G / HD / SD SDI Color Black with embedded silence (2 independent pairs)
4 3G / HD / SD SDI Test Patterns with embedded tone (2 independent pairs)
1 10 MHz reference output

Balanced Audio/AES/LTC Outputs
30 pin high density connector

Unbalanced AES Audio
2 AES
1 DARS

Word Clock (BNC)
1 Word Clock output

Timecode Outputs
4 LTC balanced outputs
VITC

Key Features
• 4 independent pairs of Black-Burst / Tri-level sync reference output

• 2 independent pairs of 3G / HD / SD SDI Black and Test pattern outputs (with embedded audio)

• AES digital audio outputs

• Composite analog video Test and Black outputs

• DARS (Digital Audio Reference) outputs

• LTC outputs

• Word Clock outputs

• NTP Time Synchronization (optional)

• GPS Time Synchronization (optional)

• IP based control and monitoring via DashBoard

• 3-year transferable warranty

Ordering Information

Master Reference and Test Signal Generator	
SRG-4400	Master Reference and Test Signal Generator
GPS-4400-8M	GPS receiver/antenna option with 8m cable
GPS-4400-35M	GPS receiver/antenna option with 35m cable
GPS-4400-100M	GPS receiver/antenna option with 100m cable
GPS-4400-200M	GPS receiver/antenna option with 200m cable
NTP-4400	NTP Time Synchronizing option

ACO-4400 `3G` `HD` `SD`

Automatic Changeover System for SRG-4400

ACO-4400

The ACO-4400 is a 1RU automatic changeover system which, when combined with both the Primary and Backup SRG-4400 units, provides a fully redundant and fault tolerant master reference system. Up to 12 signal types can be fed from a pair of SRG-4400 Reference Generators, and the ACO-4400 handles automatic failover / changeover function based on any single signal failure, creating a fully fault tolerant system. To allow for mixed format requirements and offer maximum flexibility, each channel can be set to measure analog color black, 3G/ HD/ SD SDI video, or AES/EBU audio (75 Ohm). Each channel has a Primary input, a Backup input, a Common output and a relay that switches one of the inputs to the Common output. All channels measure both the "primary and "backup" signals.

The ACO-4400 ships standard with dual "hot swappable" power supplies which are directly accessible from the front panel.

Key Features
• Up to 12 channels of redundancy
• All channels are user configurable
• Front panel audible and visual fault indication
• Manual override capability
• All channels can measure analog color black, 3G/HD/SD SDI, HD tri-level sync, Timecode & AES/EBU Audio
• All Channels will switch if one channel fails
• Hot swappable redundant power supplies
• Clear fault indication on front panel LCD
• 3-year transferable warranty

Ordering Information

Automatic Changeover System

ACO-4400   Automatic Changeover System for SRG-4400

Introductory Pages

Distribution & Monitoring

Up / Down / Cross, ARC Conversion

Synchronization & Delay

Video Conversion

Audio Conversion

Audio Embedding / De-Embedding

Advanced Audio Processing

Fiber

Switching

Keying & Branding

Data Solutions

Transport Stream & Monitoring

Nielsen Encoders

GearLite

Distribution & Monitoring

Conversion

Audio Embedding / De-Embedding

Fiber

Control System Components

MC1

Audio Monitoring Bridge

Master Sync and Reference

Infrastructure

Ross Video has a complete range of technical services available to ensure that your Infrastructure 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 system, and enhance your productions.

Commisioning is a service to help get your Infrastructure 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 system you have purchased. Signal flow, system configuration and routine maintenance procedures are some of the topics covered.

Infrastructure comes standard with a 5-year comprehensive warranty, and GearLite with a 3-year comprehensive warranty. **Extended Warranties** are available for an annual fee.

Visit **WWW.rossvideo.COM** for the latest information on the complete line of Ross products and services.

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ROSS®
LIVING LIVE!

Furio / CamBot
Robotic Camera Systems

Acuity, Carbonite, and CrossOver
Production Switchers

XPression
Motion Graphics

openGear®
Terminal Equipment

BlackStorm
Video Servers

OverDrive / DashBoard
Control Systems

NK Series
Routing Systems

Inception
News and Social Media

Ross Mobile Productions
Mobile Productions