MUX-8258 Series User Guide

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Our mission is to:

1. Provide a Superior Customer Experience
    - offer the best product quality and support
2. Make Cool Practical Technology
    - develop great products that customers love

Ross has become well known for the Ross Video Code of Ethics. It guides our interactions and empowers our employees. I hope you enjoy reading it below.

If anything at all with your Ross experience does not live up to your expectations be sure to reach out to us at *solutions@rossvideo.com*.

David Ross
CEO, Ross Video
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Ross Video Code of Ethics

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1. We will always act in our customers' best interest.
2. We will do our best to understand our customers' requirements.
3. We will not ship crap.
4. We will be great to work with.
5. We will do something extra for our customers, as an apology, when something big goes wrong and it's our fault.
6. We will keep our promises.
7. We will treat the competition with respect.
8. We will cooperate with and help other friendly companies.
9. We will go above and beyond in times of crisis. *If there's no one to authorize the required action in times of company or customer crisis - do what you know in your heart is right. (You may rent helicopters if necessary.)*

MUX-8258 Series · User Guide

- Ross Part Number: **8258DR-004-09**
- Release Date: August 1, 2019.

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Patents

Patent numbers US 7,034,886; US 7,508,455; US 7,602,446; US 7,802,802 B2; US 7,834,886; US 7,914,332; US 8,307,284; US 8,407,374 B2; US 8,499,019 B2; US 8,519,949 B2; US 8,743,292 B2; GB 2,419,119 B; GB 2,447,380 B; and other patents pending.

Notice

The material in this manual is furnished for informational use only. It is subject to change without notice and should not be construed as commitment by Ross Video Limited. Ross Video Limited assumes no responsibility or liability for errors or inaccuracies that may appear in this manual.

Safety Notices

Refer to the "**Important Regulatory and Safety Notices**" document that accompanied your product.

Statement of Compliance

This product has been determined to be compliant with the applicable standards, regulations, and directives for the countries where the product is marketed.

Compliance documentation, such as certification or Declaration of Compliance for the product is available upon request by contacting techsupport@rossvideo.com. Please include the product; model number identifiers and serial number and country that compliance information is needed in request.

EMC Notices

US FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a Commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio

communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

> **Notice** — *Changes or modifications to this equipment not expressly approved by Ross Video Ltd. could void the user's authority to operate this equipment.*

Canada

This Class "A" digital apparatus complies with Canadian ICES-003 and part 15 of the FCC Rules.

Cet appareil numerique de la classe "A" est conforme a la norme NMB-003 du Canada.

European Union

This equipment is in compliance with the essential requirements and other relevant provisions established under regulation (EC) No 765/2008 and Decision No 768/2008/EC referred to as the "New Legislative Framework".

> **Warning** — *This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.*

Australia/New Zealand

This equipment is in compliance with the provisions established under the Radiocommunications Act 1992 and Radiocommunications Labeling (Electromagnetic Compatibility) Notice 2008.

Korea

This equipment is in compliance with the provisions established under the Radio Waves Act.

Class A equipment (Broadcasting and communications service for business use)

This device is a business-use (Class A) EMC-compliant device. The seller and user are advised to be aware of this fact. This device is intended for use in areas outside home.

Type of Equipment	User's Guide
A급 기기 (업무용 방송통신기자재)	이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.
Class A Equipment (Industrial Broadcasting & Communication Equipment)	This equipment is **Industrial (Class A) electromagnetic wave suitability equipment** and seller or user should take notice of it, and this equipment is to be used in the places except for home.

International

This equipment has been tested under the requirements of CISPR 22:2008 or CISPR 32:2015 and found to comply with the limits for a Class A Digital device.

> **Notice** — *This is a Class A product. In domestic environments, this product may cause radio interference, in which case the user may have to take adequate measures.*

Maintenance/User Serviceable Parts

Routine maintenance to this openGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "**Contact Us**" section of this manual. All openGear products are covered by a generous 5-year warranty

and will be repaired without charge for materials or labor within this period. See the "**Warranty and Repair Policy**" section in this manual for details.

Environmental Information

The equipment may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.

If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration. You can also contact Ross Video for more information on the environmental performances of our products.

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Introduction

This guide covers the installation, configuration, and use of the MUX-8258 series. The following chapters are included:

- **“Introduction**” summarizes the guide and provides important terms, and conventions.
- “**Before You Begin**” provides general information to keep in mind before installing and configuring your card.
- “**Hardware Overview**”provides a basic introduction to the hardware features including the cabling and monitoring features of the rear module.
- “**Physical Installation**” provides instructions for the physical installation of the card and its rear module, and provides an overview of connecting input and output devices to the rear module.
- “**Configuration**” provides a general overview of the user controls available on the MUX-8258.
- “**Software Upgrades**” provides instructions for upgrading the software for your MUX-8258 using DashBoard.
- “**DashBoard Menus**” summarizes the MUX-8258 menus, items, and parameters in DashBoard.
- “**Card-edge Menus**” summarizes the card-edge menu system of legacy MUX-8258 cards.
- “**Specifications**” provides technical specification details on the MUX-8258.
- “**Service Information**”provides information on the warranty and repair policy for your card.
- “**Glossary**” provides a list of terms used throughout this guide.

Related Publications

It is recommended to consult the following Ross documentation before installing and configuring your MUX-8258 series card:

- ***DashBoard User Manual***, Ross Part Number: 8351DR-004
- ***MFC-OG3-N and MFC-8322-S User Manual***, Ross Part Number: 8322DR-004
- ***OG3-FR Series User Manual***, Ross Part Number: 8322DR-005
- ***OGX-FR Series User Manual***, Ross Part Number: 8322DR-204

Documentation Conventions

Special text formats are used in this guide to identify parts of the user interface, text that a user must enter, or a sequence of menus and sub-menus that must be followed to reach a particular command.

Interface Elements

Bold text is used to identify a user interface element such as a dialog box, menu item, or button. For example:

In the **Network** tab, click **Apply**.

User Entered Text

Courier text is used to identify text that a user must enter. For example:

In the **Language** box, enter **`English`**.

Referenced Guides

Text set in bold and italic represent the titles of referenced guides, manuals, or documents. For example:

For more information, refer to the ***DashBoard User Manual***.

Menu Sequences

Menu arrows are used in procedures to identify a sequence of menu items that you must follow. For example, if a step reads "**File** > **Save As**," you would click the **File** menu and then click **Save As**.

Important Instructions

Star icons are used to identify important instructions or features. For example:

✶ Contact your IT department before connecting to your facility network to ensure that there are no conflicts. They will provide you with an appropriate value for the IP Address, Subnet Mask, and Gateway for your device.

Contacting Technical Support

At Ross Video, we take pride in the quality of our products, but if problems occur, help is as close as the nearest telephone.

Our 24-hour Hot Line service ensures you have access to technical expertise around the clock. After-sales service and technical support is provided directly by Ross Video personnel. During business hours (Eastern Time), technical support personnel are available by telephone. After hours and on weekends, a direct emergency technical support phone line is available. If the technical support person who is on call does not answer this line immediately, a voice message can be left and the call will be returned shortly. This team of highly trained staff is available to react to any problem and to do whatever is necessary to ensure customer satisfaction.

- **Technical Support**: (+1) 613-652-4886
- **After Hours Emergency**: (+1) 613-349-0006
- **E-mail**: techsupport@rossvideo.com
- **Website**: http://www.rossvideo.com

Before You Begin

If you have questions pertaining to the operation of your card, contact us at the numbers listed in the section "**Contacting Technical Support**" on page 14. Our technical staff is always available for consultation, training, or service.

Overview

The MUX-8258 is a high quality program analog multiplexer that is extremely flexible in handling channel assignments and channel re-mapping as well as fully reconfigure, append, and overwrite capability for existing channels.

MUX-8258-A and MUX-8258-B Overview

The MUX-8258-A and MUX-8258-B are capable of embedding up to eight AES/EBU pairs (16 audio channels) into an HD/SD-SDI signal. Audio proc control on each input allows for audio processing with independent channel Sample Rate Conversion (SRC), gain of +/-20dB, audio delay up to 1 second and channel phase invert and summing capability. If the input is a synchronous 48kHz signal, the audio can be embedded into the SDI signal unaltered. If the input is not a synchronous 48kHz signal, it may be converted using SRC before it is embedded on the SDI output.

Note that the MUX-8258-A offers eight 75ohm unbalanced AES connections while the MUX-8258-B offers eight 110ohm balanced AES connections.

MUX-8258-C Overview

The MUX-8258-C includes one multi-rate SDI input which supports up to 16 channels of embedded audio and four or eight channels of analog audio inputs (MUX-8258-4C and MUX-8258-8C respectively). The MUX-8258-C is capable of embedding up to eight analog audio channels into an HD/SD-SDI signal. Audio proc controls on each input allows for gain control of +/- 10dB, audio delay up to 1 second and channel phase invert and summing capability.

Features

The following features make the MUX-8258 the ideal solution for multiplexing analog audio sources into an HD/SD-SDI signal:

- Supports HD-SD SDI SMPTE 292M (1.5Gbps), SMPTE 259M (270Mbps), and SMPTE 424M (3Gbps)[1]
- MUX-8258-A provides eight AES-3id 75ohm unbalanced inputs with SRC
- MUX-8258-B provides eight AES-3id 110ohm balanced inputs with SRC
- MUX-8258-4C provides four analog inputs
- MUX-8258-8C provides eight analog inputs
- MUX-8258-A supports embedding of non-PCM data such as Dolby® Digital and Dolby® E
- One SDI processed output
- Audio embedding for all popular formats: 480i, 576i, 720p, 1080i, and 1080p[1] (Level A)
- Full control over channel assignments, primary and backup sources
- Audio proc controls such as gain, invert, delay and sum
- Internally generated test patterns and test tones
- Programmable video output on SDI input loss

1. Not supported when the card is installed in the DFR-8310 series frames.

- Automatic input video format detection
- Backup audio insertion on audio input loss
- Programmable silence detection and timeout thresholds
- Ability to strip VANC data from specific or all lines of a video output
- Reports status and configuration remotely via the DashBoard Control System
- Fits openGear frames
- 5-year transferable warranty

Functional Block Diagrams

This section provides functional block diagrams that outline the workflow of the MUX-8258.

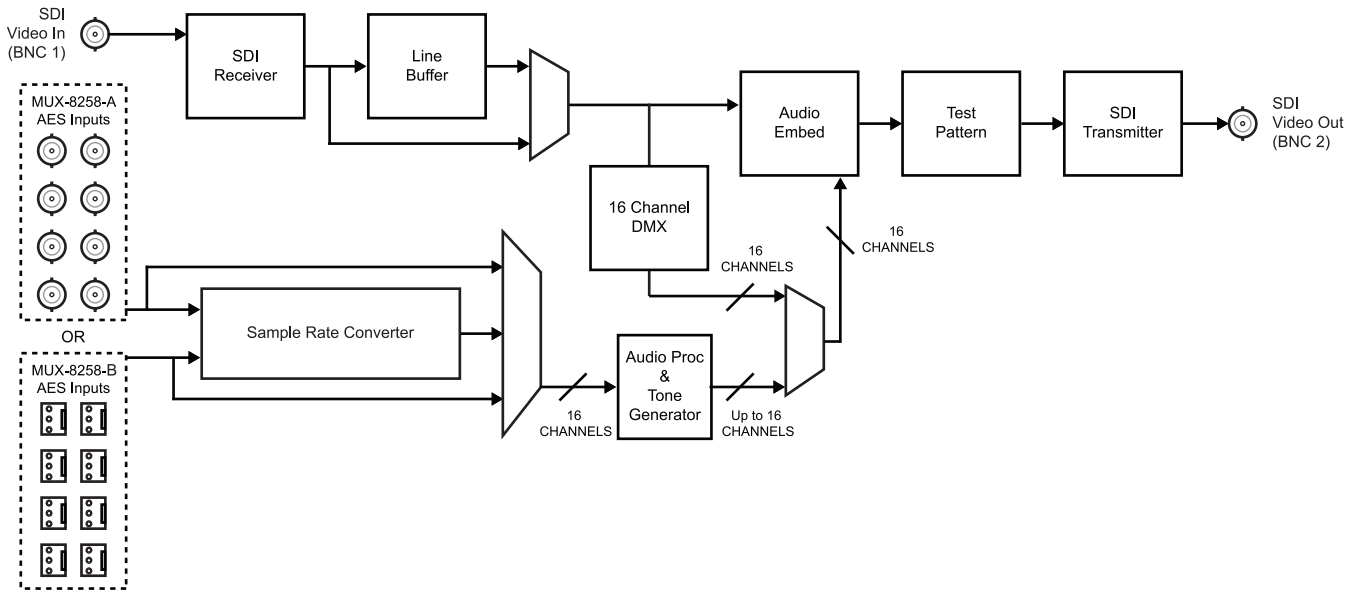


Figure 1.1 MUX-8258-A and MUX-8258-B — Simplified Block Diagram

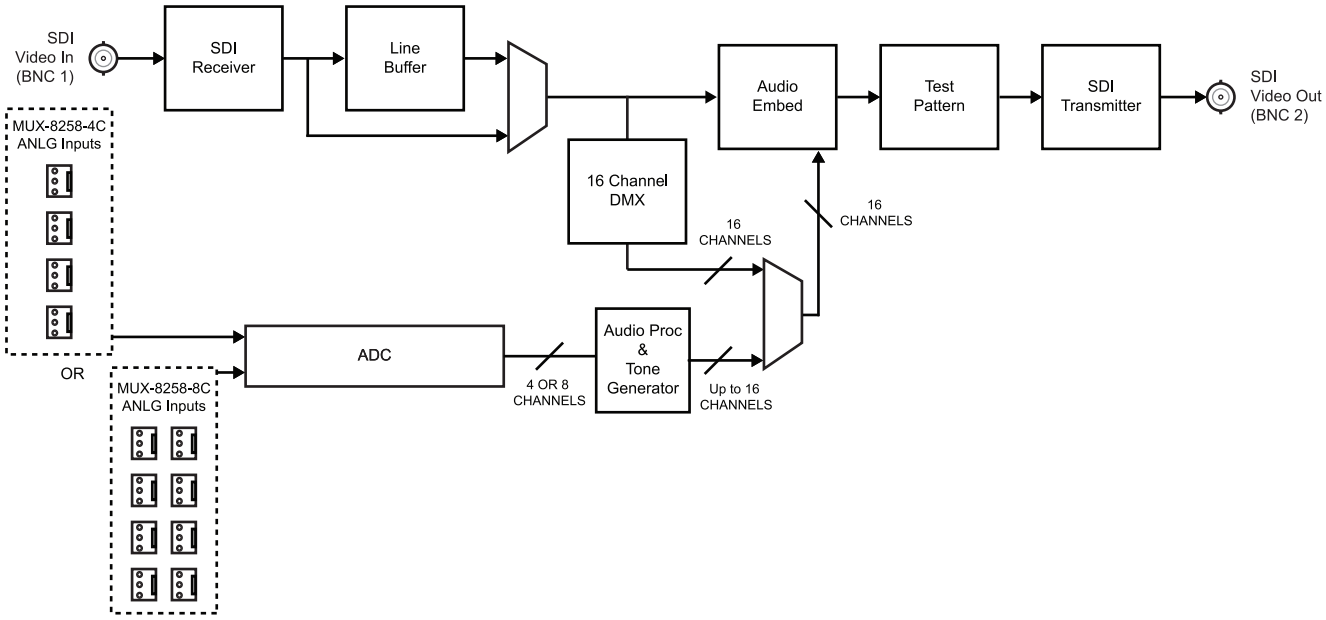


Figure 1.2 MUX-8258-C — Simplified Block Diagram

User Interfaces

The MUX-8258 includes three interfaces for control and monitoring for your card.

DashBoard Control System

The DashBoard Control System enables you to monitor and control openGear frames and cards from a computer. DashBoard communicates with other cards in the openGear frame through the Network Controller Card. The DashBoard Control System software and manual are available for download from our website.

For More Information on...

- on the MUX-8258 menus in DashBoard, refer to the chapter "**DashBoard Menus**" on page 31.
- on using DashBoard, refer to the ***DashBoard User Manual*** available from our website.

Card-edge Controls

The front-edge of the MUX-8258 features LED indicators for the power, video input status and communication activity.

For More Information on...

- on the card-edge controls and LEDs, refer to the section "**Hardware Overview**" on page 15.

SNMP Monitoring and Control

The Network Controller Card in the openGear frame can provide optional support for remote monitoring of your frame and using Simple Network Management Protocol (SNMP), which is compatible with many third-party monitoring and control tools.

For More Information on...

- on enabling SNMP Monitoring and Control for your frame, refer to the ***MFC-8300 Series User Manual***.
- on SNMP controls for the MUX-8258, refer to your MUX-8258 Management Information Base (MIB).

Hardware Overview

This chapter provides a general overview of the MUX-8258 components, supported rear modules, and cabling designations.

Card Overview

Figure 1.1 is an example of a MUX-8258 card.

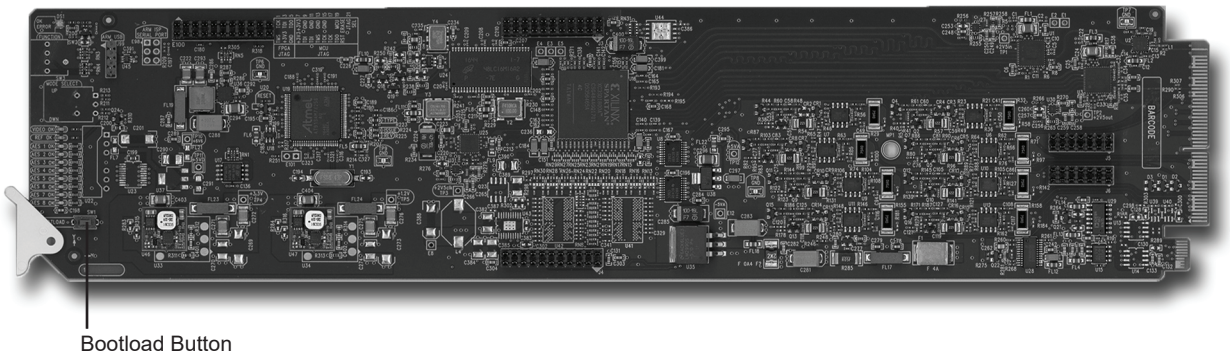


Figure 1.1 MUX-8258 — Card-edge Components

Bootload Button (SW1)

SW1 is used for factory service in the unlikely event of a complete card failure. Do not press this button unless instructed to do so by Ross Technical Support personnel.

Function Selection Switch (SW2), not shown

On legacy MUX-8258 series cards, **SW2** works in conjunction with the Mode Select Switch (**SW3**) to select general functions and menu items. Refer to the chapter "**Card-edge Menus**" on page 41 for details.

Mode Select Switch (SW3), not shown

On legacy MUX-8258 series cards, **SW3** is used to enable, disable, and select specific configuration within the operational function mode menus. Refer to the chapter "**Card-edge Menus**" on page 41 for details.

Control and Monitoring Features

This section provides information on the card-edge LEDs for the MUX-8258. Refer to **Figure 1.2** for the location of the LEDs and controls.

✶ Legacy MUX-8258 series cards will include a card-edge 4-character display and the **SW2** and **SW3** switches. Refer to the chapter "**Card-edge Menus**" on page 41 for details on this card-edge menu system.

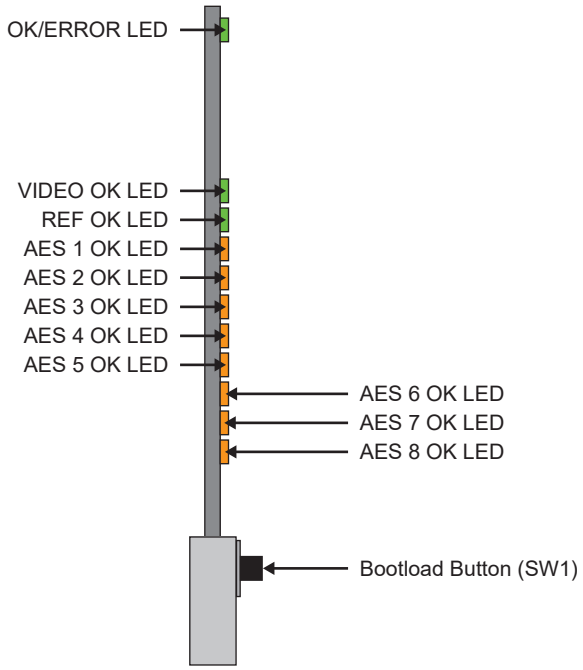


Figure 1.2 MUX-8258 Card-edge Controls

Status and Selection LEDs on the MUX-8258

Basic LED displays and descriptions are provided in **Table 1.1**.

Table 1.1 LEDs on the MUX-8258

LED	Color	Display and Description
OK/ERROR	Green	When lit green, this LED indicates that the card is functioning normal and that no anomalies have been detected. The following conditions must be satisfied: • a valid input signal is present • a valid reference signal is present when a reference is required, and that the reference standard matches the input standard.
	Flashing Green	When flashing green, this LED indicates the bootloader is waiting for a software upload.
	Flashing Green and Orange	When lit green with flashing orange, this LED indicates there is a signal error such as a missing or invalid input or reference.
	Orange	When lit orange, this LED indicates the card is powering on.
	Red	When lit red, this LED indicates the card is not operational.
	Off	When off, this LED indicates there is no power to the card.

Table 1.1 LEDs on the MUX-8258

LED	Color	Display and Description
VIDEO OK	Green	When lit, this LED indicates that the video input is valid.
	Flashing Green	When flashing, this LED indicates that video is present, but the input format is unsupported.
	Off	When unlit, this LED indicates the absence of an input signal.
REF OK	Green	When lit green, this LED indicates a valid reference signal.
	Flashing Green	When flashing, this LED indicates that the reference signal is present but the format is invalid.
	Off	When unlit, this LED indicates that a reference signal is not present, or is not supported.
AES # OK	Orange	MUX-8258-A or MUX-8258-B — When lit, an LED indicates a valid signal is detected on the corresponding AES input. MUX-8258-C — When lit, an LED indicates that the analog audio is present.

Cabling for the MUX-8258-A

The MUX-8258-A accommodates eight synchronous AES audio input streams at 48kHz or any asynchronous AES streams from 32kHz to 96kHz with SRC enabled. Note that SRC should only be used with Pulse Code Modulation (PCM) digital audio and not any form of compressed signal, such as Dolby®.

When installing the MUX-8258-A:

- **DFR-8310 series frame** — The **8310AR-030** Rear Module is required. The MUX-8258-A is also compatible with the DFR-8310-BNC frame (with the cooling fan option installed). Each rear module occupies one slot and accommodates one card. This rear module provides one SDI input, one SDI output and eight unbalanced AES inputs. (**Figure 1.3**)
- **DFR-8320**, **OG3-FR.** and **OGX-FR series frame**s — The **8320AR-041** Full Rear Module is required. Each card occupies two slots and accommodates one card. This rear module provides one SDI input, one SDI output, and eight unbalanced AES inputs. (**Figure 1.3**)

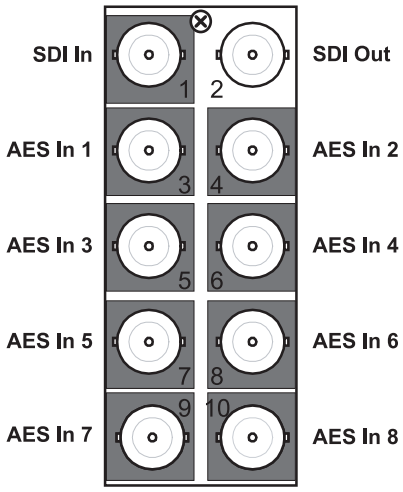


Figure 1.3 Cable Connections for the MUX-8258-A

Cabling for the MUX-8258-B

The MUX-8258-B accommodates eight synchronous AES audio input streams at 48kHz or any asynchronous AES streams from 32kHz to 96kHz with SRC enabled. Note that SRC should only be used with Pulse Code Modulation (PCM) digital audio and not any form of compressed signal, such as Dolby®.

When installing the MUX-8258-B:

- **DFR-8310 series frame** — The **8310AR-034** Rear Module is required. Each rear module occupies one slot and accommodates one card. This rear module provides one SDI input, one SDI output and eight balanced AES inputs. (**Figure 1.4**)

✶ The MUX-8258-B is not compatible with the DFR-8310-BNC frames.

- **DFR-8320**, **OG3-FR.** and **OGX-FR series frame**s — The **8320AR-034** Full Rear Module is required.Each rear module occupies two slots and accommodates one card. This rear module provides one SDI input, one SDI output, and eight balanced AES inputs. (**Figure 1.4**)

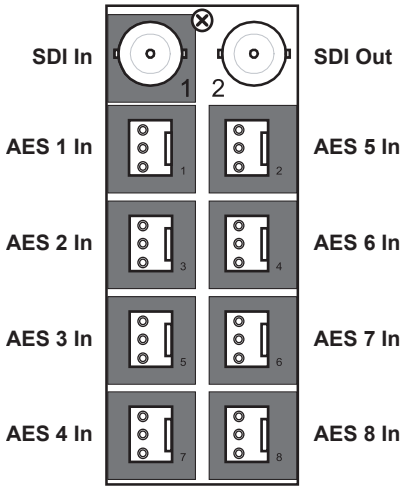


Figure 1.4 Cable Connections for the MUX-8258-B

Cabling for the MUX-8258-4C

When installing the MUX-8258-4C:

- **DFR-8310 series frame** — The **8310AR-034** Rear Module is required. Each rear module occupies one slot and accommodates one card. This rear module provides one SDI input, one SDI output and four analog inputs. (**Figure 1.5**)

✶ The MUX-8258-4C is not compatible with the DFR-8310-BNC frames.

- **DFR-8320**, **OG3-FR.** and **OGX-FR series frame**s — The **8320AR-034** Full Rear Module is required. Each rear module occupies two slots and accommodates one card. This rear module provides one SDI input, one SDI output, and four analog inputs. (**Figure 1.5**)

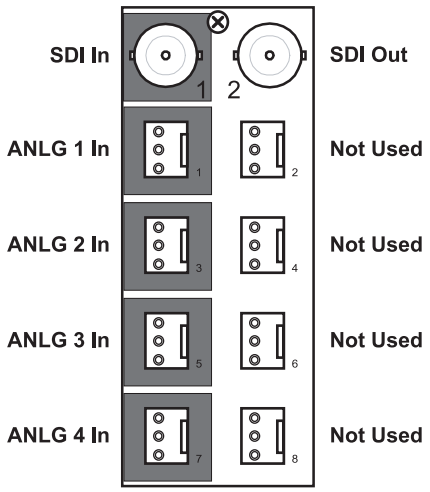


Figure 1.5 Cable Connections for the MUX-8258-4C

Cabling for the MUX-8258-8C

When installing the MUX-8258-8C:

- **DFR-8310 series frame** — The **8310AR-034** Rear Module is required. Note that the MUX-8258-8C is not compatible with the DFR-8310-BNC frames. Each rear module occupies one slot and accommodates one card. This rear module provides one SDI input, one SDI output, and eight analog inputs. (**Figure 1.6**)
- **DFR-8320**, **OG3-FR.** and **OGX-FR series frame**s — The **8320AR-034** Full Rear Module is required. Each rear module occupies two slots and accommodates one card. This rear module provides one SDI input, one SDI output, and eight analog inputs. (**Figure 1.6**)

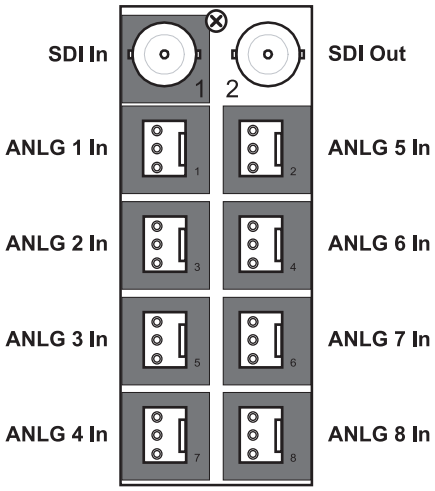


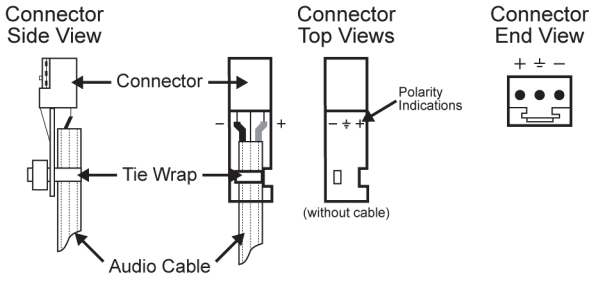
Figure 1.6 Cable Connections for the MUX-8258-8C

Audio Cabling for the MUX-8258-B and MUX-8258-C

The 8310AR-034 and 8320AR-034 rear modules provide 3-pin audio terminal blocks with removable connectors. Each connector has locations for the positive, negative, and grounded wires of a balanced audio cable.

To cable the analog audio connections

1. Insert an analog audio wire to the designated polarity slot on the connector of the rear module.



2. Use a tweaker screwdriver to tighten the corresponding capture screw.
3. Repeat steps 1 and 2 for each wire on each connector.
4. Once the cables are wired to the connectors, install the connectors on the terminal blocks for the rear module.

Physical Installation

This chapter outlines how to install the MUX-8258 card and rear module in an openGear frame. The same procedure applies regardless of the frame or card type. However, the specific rear module you need to install depends on your application and the openGear frame you are using.

Before You Begin

Before proceeding with the instructions in this chapter, ensure that your openGear frame is properly installed according to the instructions in its manual.

Static Discharge

Throughout this chapter, please heed the following cautionary note:

ESD Susceptibility — *Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Always exercise proper grounding precautions when working on circuit boards and related equipment.*

Unpacking

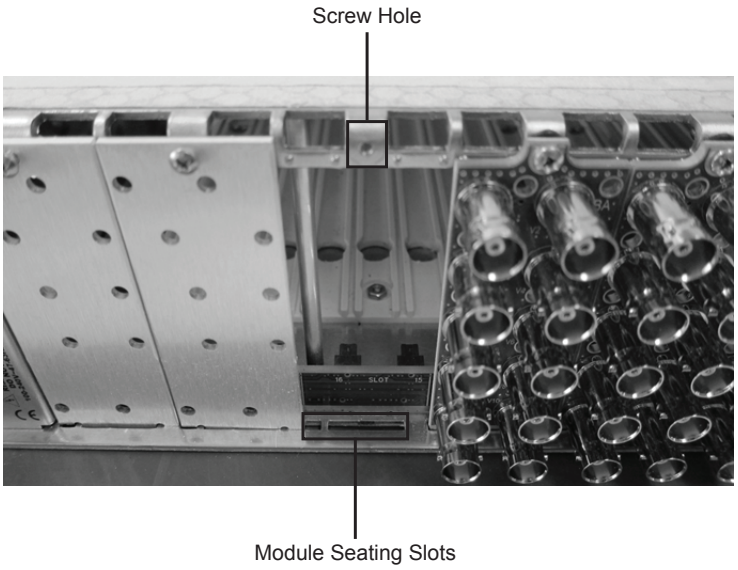
Unpack each MUX-8258 you received from the shipping container and ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video directly.

Installing a Rear Module

If the Rear Module is already installed, proceed to the section "**Installing the MUX-8258 Card into the openGear Frame**" on page 22.

To install a Rear Module in your openGear frame

1. Locate the card frame slots on the rear of the frame.
2. Remove the Blank Plate from the slot you have chosen for the MUX-8258 installation.
3. Install the bottom of the Rear Module in the **Module Seating Slot** at the base of the frame's back plane.



4. Align the top hole of the Rear Module with the screw on the top-edge of the frame back plane.
5. Using a Phillips screwdriver and the supplied screw, fasten the Rear Module to the back plane of the frame. Do not over tighten.
6. Ensure proper frame cooling and ventilation by having all rear frame slots covered with Rear Modules or Blank Plates.

Installing the MUX-8258 Card into the openGear Frame

This section outlines how to install the MUX-8258 in an openGear frame. If the MUX-8258 is to be installed in any compatible frame other than a Ross Video product, refer to the frame manufacturer's manual for specific instructions.

Caution — *Do not populate Slot 10 in the DFR-8310 series frame with an MUX-8258-C. Attempting to populate Slot 10 may damage the MFC-8300 series Controller Card, the MUX-8258-C, or both.*

✶ 1080p (Level A) support is not available when using the cards in a DFR-8310 series frame.

To install the MUX-8258 in a openGear frame

1. Locate the Rear Module you installed in the procedure Refer to the section "**Installing a Rear Module**" on page 21.
2. Hold the MUX-8258 by the edges and carefully align the card-edges with the slots in the frame.
3. Fully insert the card into the frame until the rear connection plus is properly seated in the Rear Module.
4. Verify whether your Rear Module Label is self-adhesive by checking the back of the label for a thin wax sheet. You must remove the wax sheet before affixing the label.
5. Affix the supplied Rear Module Label to the BNC area of the Rear Module.

Configuration

This chapter provides a general overview of the user controls available on the MUX-8258.

Reference Compatibility

It is important to remember that if you are using **Frame 1** or **Frame 2** as the reference, the input video frame rate must match the reference frame rate.

Frame Rate Compatibility

Refer to **Table 3.1** for frame rate compatibility.

Table 3.1 Output/Reference Compatibility

Reference	Output							
	480i 59.94Hz	720p 59.94Hz	1080i 59.94Hz	1080p 59.94Hz	576i 50Hz	720p 50Hz	1080i 50Hz	1080p 50Hz
480i 59.94Hz	✓	✓	✓	✓				
720p 59.94Hz		✓		✓				
1080i 59.94Hz	✓	✓	✓	✓				
576i 50Hz					✓	✓	✓	✓
720p 50Hz						✓		✓
1080i 50Hz					✓	✓	✓	✓

Using DashBoard

Before proceeding, ensure that the DashBoard client software is installed on a computer connected to your facility network. The DashBoard software and user manual area available from the Ross Video website.

For More Information on...

- installing DashBoard, refer to the ***DashBoard User Manual***.

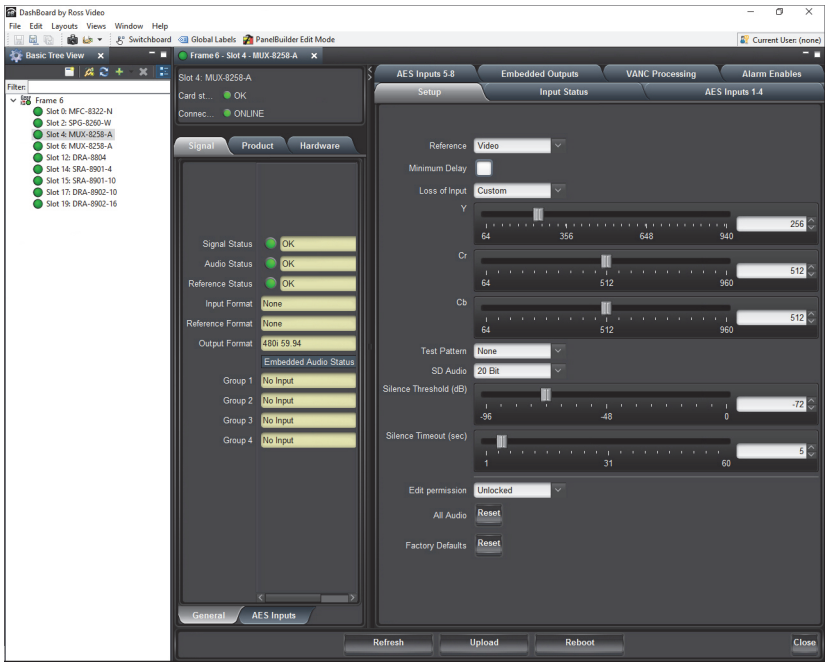
To launch DashBoard

1. Ensure that you are running DashBoard software version 8.2.0 or higher.
2. Launch DashBoard by double-clicking its icon on your desktop.
3. Ensure that the openGear frame with your MUX-8258 card(s) is displayed in the Tree View located on the left-side of the DashBoard window.

   It may take 30 seconds or more to update the Tree View. Consult the ***MFC-8300 Series*** or ***MFC-OG3 Series User Manual*** and ***DashBoard User Manual*** should the Tree View not display the card.

To access a card in DashBoard

1. From the **Tree View**, expand the node for the openGear frame your cards are installed in. A list of cards installed in the frame is now displayed. In the example below, a MUX-8258 is installed in slot 4 in Frame 6.
2. Double-click the node for a card to display its menus in the **Device View** of DashBoard (right-side of the DashBoard window).



Operation Notes

This section provides brief notes when operating the MUX-8258.

Audio Proc Amp Controls

The MUX-8258 includes Processing Amplifiers (Proc Amps) for the audio inputs on the card. Note that these features are not available when using the card-edge controls.

Proc Amp adjustments are applied in the following order:

1. **Sum** — This option enables both channels to carry the average of the two input channels (A+B/2). When the input is summed, the original signals are no longer available for output. This option only operates with AES input pairs.
2. **Delay** — This option enables you to adjust the delay of the audio channel. If you have enabled the Delay Lock feature, changing the delay value for one channel automatically changes the value for the other channel.
3. **Gain** — This option provides a +/- 20dB gain range in 1dB increments. If you have enabled the Gain Lock feature, changing the gain value for one channel automatically changes the value for the other channel. When using the MUX-8258-C, the gain range is +/- 10dB.
4. **Invert** — This option enables you to invert the polarity of the audio signal for the selected channel.

Minimum Delay Overview

The line buffer stores incoming video in relation to the incoming video clock timing. The video data is then read out in relation to the reference timing. This allows the input video to be switched between sources that may not be perfectly timed without timing glitches. Video source timing must remain within the buffer window to properly switch between sources. **Table 3.2** provides information on the buffer window available depending on how the Minimum Delay feature is configured in DashBoard.

Table 3.2 Minimum Delay

If the option is...	Format	Minimum Delay	Maximum Delay
Disabled	SD	1/4 line	1/2 line
	HD	1/4 line	1/2 line
	3G	1/4 line	1/2 line
Enabled	SD	1/8 line	1/4 line
	HD	1/16 line	1/8 line
	3G	1/16 line	1/8 line

Embedding PCM Signals

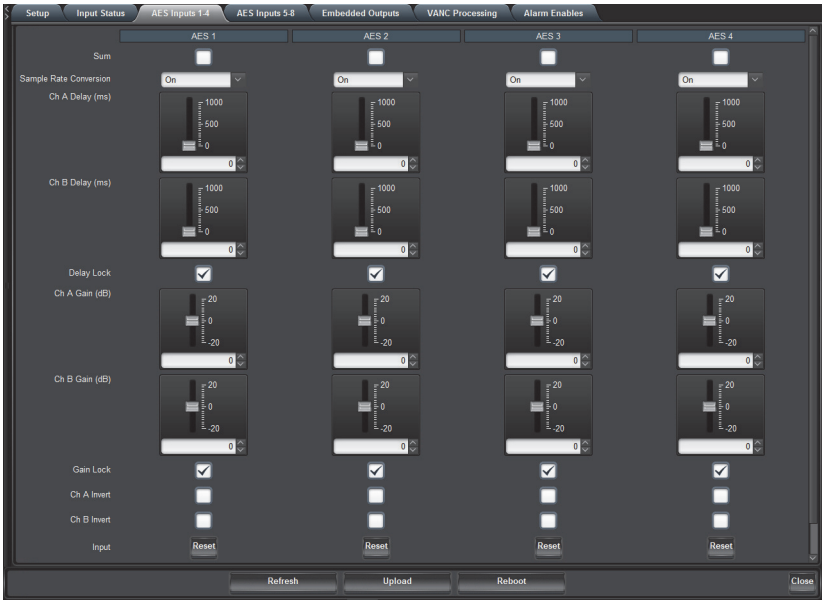
The MUX-8258-A and MUX-8258-B can embed PCM audio from two sources: the AES input or from the embedded audio of the source video. The MUX-8258-C can embed from two sources: the analog input or from the embedded audio of the source video. Processing also includes embedding channel status data as per **Table 3.4**.

Embedding Non-PCM Signals

You can configure the MUX-8258-A or MUX-8258-B to embed non-PCM signals, such as Dolby® Digital and Dolby® E, using the options available in DashBoard. However, when embedding the non-PCM signal, the A and B channels of the input signal must be embedded on Channels 1 and 2, or Channels 3 and 4 of a given group. For example, you would embed AES1A in G1Ch1, and AES1B in G1Ch2.

To embed non-PCM signals

1. Display the **Device View** in DashBoard for the card you wish to configure.
2. Select the **AES Inputs** tab for the input channel you wish to configure.



3. Set the **Sample Rate Conversion** to **Off**.
4. Clear the **Sum** box to disable channel summing.
5. Set the **Channel Gain** to **0**.
6. Clear the applicable **Ch Invert** box to disable inverting on the channel.

HANC Processing

SMPTE 291M formatted ancillary packets, such as SMPTE 12M-2 (timecode), that are found in the Luma portion (Y stream) of the HANC in an HD video signal (other than audio related packets) will be passed from input to output.

VANC Processing

The **VANC Processing** tab in DashBoard provides options for replacing the full active portion of selected lines of video with black.

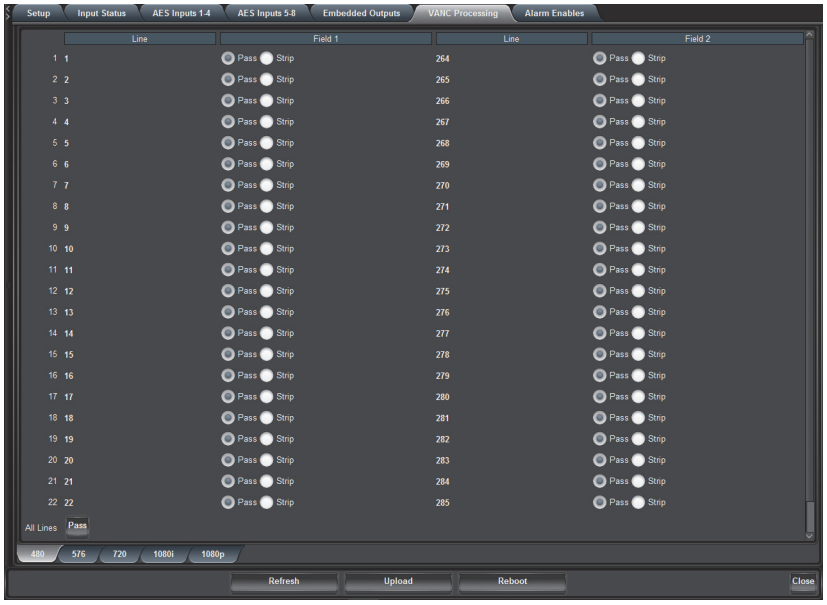
The **VANC Processing** tab is divided into separate sub-tabs for each format (1080p, 1080i, 720p, 576i, and 480i) to provide selection of the lines. This enables you to individually select any combination of lines, from line 1 up to the third line after the VI for the current video format. For interlaced formats, the lines in the two fields are separately configured. **Table 3.3** lists the allowable line selections based on format.

Table 3.3 VANC Processing — Line Selection

Format	Field 1 Lines	Fields 2 Lines
1080p	1-44	-
1080i	1-23	562-586
720p	1-28	-
576i	1-25	313-338
480i	1-23	264-285

To delete the VANC components in a line

1. Display the **Device View** in DashBoard for the MUX-8258 you wish to configure.
2. Select the **VANC Processing** tab.



3. Select the sub-tab, located at the bottom of the **VANC Processing** tab, for the applicable video format.
4. In the **Line** column, locate the line you wish to delete the VANC components for. Notice for interlaced formats that the **Line** column on the left lists the lines in **Field 1**, and the **Line** column on the right lists the lines in **Field 2**.

5. To delete the VANC components:
   - **for a specific line** — select **Strip** for that line. The default for each line is **Pass**.
   - **for all lines of a video format** — click the **Strip** button located near the bottom of the applicable sub-tab.

✶ To pass the VANC components without modification for all lines in a specific video format, click the **Pass** button located near the bottom of the sub-tab.

Software Upgrades

This chapter provides instructions for upgrading the software for your MUX-8258 using the DashBoard Control System.

To upload software to the MUX-8258

1. Contact Ross Technical Support for the latest software version file.
2. In DashBoard, display the **Device** tab of the MUX-8258 by double-clicking its status indicator in the **Basic Tree View**.
3. From the **Device** tab, click **Upload** to display the **Select File for upload** dialog box.
4. Navigate to the *.bin upload file you wish to upload. DashBoard automatically selects the last directory that you loaded from.
5. Click **Open** to display a confirmation dialog box. This dialog box displays the selected upload file name, type, size, and the file creation date.
6. From the **Confirmation** dialog box, select one of the following:
   - **Cancel** — Select this option to cancel the upload of the file and return to the **Device View**.
   - **Continue** — Select this option to upload the file. While uploading, an **Uploading Progress** dialog opens.

   Notice — *Clicking the **Cancel** button while uploading will leave the card in an invalid state. Do not click **Cancel** unless the uploading progress has stopped completely for 60 seconds or more.*
7. Monitor the upgrade progress bar displayed in DashBoard while the software is upgraded on your MUX-8258.
8. To complete the upgrade process, you must reboot the card as follows:
   - From the **Device** tab, click **Reboot** to reboot MUX-8258. The reboot process takes up to 30 seconds.

✶ The communications processor of the MUX-8258 requires approximately 30 seconds to re-start and re-establish network communications.

- The MUX-8258 automatically saves all your settings before starting the reboot process.
- The status of all the cards in the frame are grayed out until the reboot process is complete.

DashBoard Menus

This chapter briefly summarize the menus, items, and parameters available from the DashBoard Control System for the MUX-8258. Parameters marked with an asterisk (*) are the factory default values.

✶ Wait 30 seconds after the last setting change to ensure all changes are saved to the non-volatile memory of the card.

Status Tabs

This section summarizes the read-only information displayed in the Status tabs. The fields in the **Status** tabs vary in severity from green (valid), yellow (caution), to red (alarm). DashBoard reports the most severe alarm for a single field.

Signal Tab

Table 1.1 summarizes the read-only information displayed in the **Signal** tab.

Table 1.1 Signal Tab Items

Item	Parameters	Description
General		
Signal Status	OK	Indicates when the card is functioning normally or if anomalies are detected
	Invalid Format	
	Incompatible	
	Non-Sync Video	Indicates when the card is functioning normally or if anomalies are detected
	Group Not Present	
	Group Channel Silent	
	AES Input Not Present	
Audio Status	OK	Indicates the status of the audio source
	Source Missing	
	Source Async[a]	
	AES Input Silent	
	Analog Input Silent	
	Group 4 Reduced to 20bit[b]	
	Backup Source Missing	
	Backup Source Async	

Table 1.1 Signal Tab Items

Item	Parameters	Description
Reference Status	OK	Indicates that a valid reference source is present
	No Ref - Video	The following conditions are occurring: • Card reference is set to Frame 1 or Frame 2 • A valid reference signal is not present • Card has gone to Video Timing Mode
	No Ref - Free Run	The following conditions are occurring: • Card reference is set to Frame 1 or Frame 2 • A valid reference signal is not present • Card has gone to Free Run Mode
	Invalid Format - Video	Card has detected an invalid[c] reference format and has switched to Video Timing Mode
	Invalid Format - Free Run	The following conditions are occurring: • Card has detected an invalid[c] reference format • Input video is missing or invalid • Card has switched to Free Run Mode
Input Format	#	Indicates the input video format
Reference Format	#	Indicates the reference video format
Output Format	#	Indicates the output video format
Embedded Audio Status - Group #	PCM	Indicates the presence of input
	No Input	
	PCM-Silent	
	Non-PCM	
	Async	
	Mixed	
AES Inputs		
AES #	PCM	Indicates the presence of input. This tab is only available for the MUX-8258-A.
	No Input	
	PCM-Silent	
	Non-PCM	
	Async	
	Mixed	

a. The card will detect and indicate async for any audio input that is an asynchronous audio input, or has a sample rate other than 48kHz.
b. This parameter indicates that there are more than 3 groups of 24bit SD embedded audio sources.
c. Refer to the section "**Reference Compatibility**" on page 23 for a complete list of supported formats.

Product Tab

Table 1.2 summarizes the read-only information displayed in the **Product** tab.

Table 1.2 Product Tab Items

Item	Parameters	Description
Product	MUX-8258-#	Indicates the product name
Supplier	Ross Video Ltd.	
Board Rev	##	Indicates the board version of your card
Rear Module	#	Type of rear module in the slot
Board S/N	######	Indicates the board serial number
Software Rev	##.##	Indicates the software version
Firmware Rev	#.###	Indicates the firmware version
Daughter Card Type[a]	##	Indicates if a daughter card is installed.

a. This field is not available when using a MUX-8258-A.

Hardware Tab

Table 1.3 summarizes the read-only information displayed in the **Hardware** tab.

Table 1.3 Hardware Tab Items

Item	Parameters	Description
HW Status	OK	Indicates any problems with the card hardware components
	FPGA load invalid	
	Incomp I/O module	
	Current out of spec	
	Internal Error	
Voltage (mV)	#	Supply Voltage
Current (mA)	#	Current consumption of card
CPU Headroom	#	Processing power available
RAM Available	#/##	On-board processing memory available
Uptime (h)	#	Displays the number of hours since the last reboot of the card
Configuration Bank	#	Storage count

Setup Tab

Table 1.4 summarizes the **Setup** options available in DashBoard for the MUX-8258.

Table 1.4 Setup Menu Items

Item	Parameters	Description
Reference	Frame 1*	Selects the reference source
	Frame 2	
	Video	
Minimum Delay	Selected	Provides the shortest video delay through the card. Refer to Table 3.2 on page 25 for delay specifications.
	Cleared*	The total video delay through the card will be the values above plus half a video line
Loss of Input	Black	Configures the output in the event of a loss of video input
	Blue	
	Custom*	Sets the output to a custom color in the event of a loss of video input. Use the Y, Cr, and Cb sliders to configure the color.
Y slider		Sets the luminance component of the Loss of Input and/or Test Pattern Custom signal
Cr slider		Sets the Cr component of the Loss of Input and/or Test Pattern Custom signal
Cb slider		Sets the Cb component of the Loss of Input and/or Test Pattern Custom signal
Test Pattern	None*	Disables the test pattern feature
	Black	Specifies the type of test pattern to output. This setting is not retained on power down. Note that the test pattern replaces all of output picture but not the HANC, while the VANC is blanked.
	Blue	
	Custom Color	
	75% Color Bars	
	100% Color Bars	
	75% SMPTE Bars	
	Matrix Pathological	
	Luma Ramp	
	Y/C Ramp	
SD Audio	20 Bit*	Embeds 20bits
	24 Bit	Embeds 24bits
	Auto	Embeds 20-24bit depending on the audio source and the number of bits
Silence Threshold (dB)	-96 to 0	Audio below the specified threshold value is considered silent

Table 1.4 Setup Menu Items

Item	Parameters	Description
Silence Timeout (sec)	1 to 60	Audio silent for longer than the specified value raises an alarm
Edit Permission	Unlocked*	All menu options are unlocked and can be edited
	Locked	All menu items, except this one, are locked and read-only
All Audio	Reset	Resets the parameters in the Audio Inputs and Embedded Audio Outputs tabs to factory defaults
Factory Defaults	Reset	Resets all parameters to factory defaults

Input Status Tab

Table 1.5 summarizes the **Input Status** options available in DashBoard.

Table 1.5 Input Status Menu Items

Item	Parameters	Description
Video Input & Embed		
Input Format (read-only)	#	Displays the format of the video input
CRC Errors (read-only)	#	Displays the count of the CRC errors on the video input. This 14bit counter is reset on loss of video, or by user request. The counter is non-latching, and will rollover from maximum count to zero. • For SD formats, it displays both active picture and full frame errors. • For HD formats, it displays the total count of errors.
Error Count	Reset	Resets the CRC Errors field
Embedded Audio Group # Channel # (read-only)	PCM	Displays the status of each group and channel of embedded audio
	No Input	
	PCM-Silent	
	Non-PCM	
	Async	
	Mixed	
Word Length (read-only)	#bit	Displays the word length of the audio in number of bits
Audio - AES # (MUX-8258-A, MUX-8258-B)		
Ch A Status (read-only)	No Input	Displays the status of the Channel A input
	PCM	
	PCM-silent	
	Non-PCM	
	Async[a]	
Ch B Status	Same as above	

Table 1.5 Input Status Menu Items

Item	Parameters	Description
Word Length (read-only)	#bit	Displays the number of bits of audio
Emphasis (read-only)	Present	The incoming AES signal is indicating 50/15 or CCiTT J.17 emphasis
	Not Present	The incoming AES signal is indicating no emphasis or the emphasis is not indicated
Sample Rate (read-only)	#	Displays the sample rate of the AES input
Audio - Input # (MUX-8258-C)		
Status (read-only)	OK	Displays the status of the input
	Silent	
	Clipped[b]	

a. If the SRC is ON, an Async AES signal is processed to be PCM and indicated as such.
b. Indicates that the audio levels are too high.

AES Inputs 1-8 Tabs

Table 1.6 summarizes the **AES Inputs 1-4** and **AES Inputs 5-8** options available in DashBoard for the MUX-8258-A and MUX-8258-B.

Table 1.6 AES Inputs Menu Items

Item	Parameters	Description
AES#		
Sum	Selected	Both channels will carry the average of the two input channels (A+B/2). When the input is summed, the original signals are no longer available for output.
	Cleared*	Disables this feature
Sample Rate Conversion	Off	SRC is not used on an input. Select this option when using non-PCM audio data
	On*	SRC is used on an input
Ch # Delay (ms)	0* to 1000	Adjusts the delay of the specified audio channel
Delay Lock	Selected*	Locks the Delay slider of both channels together. If the values for the two channels are different, that change is maintained when the channels are locked.
	Cleared	The Delay slider is unlocked
Ch # Gain (dB)	-20 to +20[a]	Adjusts the gain of the specified audio channel

Table 1.6 AES Inputs Menu Items

Item	Parameters	Description
Gain Lock	Selected*	Locks the Gain slider of both channels together. If the values for the two channels are different, that change is maintained when the channels are locked.
	Cleared	The Gain slider is unlocked
Ch # Invert	Selected	Inverts the audio signal of the specified channel
	Cleared*	The audio signal is not inverted
Input	Reset	Resets the parameters for the selected input to the default values
Inputs #-#	Reset	Resets the indicated input parameters to the default values

a. The default value is 0.

Analog Inputs Tab

Table 1.7 summarizes the **Analog Inputs 1-4** and **Analog Inputs 5-8** options available in DashBoard for the MUX-8258-4C and MUX-8258-8C.

Table 1.7 Analog Inputs Menu Items

Item	Parameters	Description
Input #		
Delay (ms)	0* to 1000	Adjusts the audio delay for the specified input
Gain (dB)	-10 to +10[a]	Adjusts the audio gain for the specified input
Invert	Selected	Inverts the audio signal of the channel
	Cleared*	The audio signal is not inverted
Input	Reset	Resets the parameters for the selected input to the default values

a. The default value is 0.

Embedded Outputs Tab

Table 1.8 summarizes the **Embedded Outputs** options available in DashBoard.

Table 1.8 Embedded Outputs Menu Items

Item	Parameters	Description
Group #		
Enable	Selected*	Determines if the group is inserted in the output or not
	Cleared	

Table 1.8 Embedded Outputs Menu Items

Item	Parameters	Description
Ch # Source	Mute	Configures the Primary Source that is inserted in to the embedded group if present
	Group# Ch#*	
	AES #[a]	
	Analog 1 to #[b]	
	#Hz Tone	
	#kHz Tone	
Ch # Backup Source	Mute	Configures the Backup Source that is inserted when the Primary Source is unavailable
	Group# Ch#	
	AES #[a*]	
	Analog 1 to #[b*]	
	#Hz Tone	
	#kHz Tone	
Presets	Pass	Configures the group source settings with the original group as the Primary Source and mute as the Backup Source
	Insert*	Configures the group source settings with the original group as the Primary Source, and AES inputs as the Backup Source
	Overwrite	Configures the group source settings with AES inputs as the Primary Source, and embed as the Backup Source

a. These values are only available when using an MUX-8258-A or MUX-8258-B.
b. The values are dependent on the card. If you are using an MUX-8258-4C, you can choose from Analog 1 to 4. If you are using an MUX-8258-8C, you can choose from Analog 1 to 8.

VANC Processing Tab

Table 1.9 summarizes the **VANC Processing** options available in DashBoard.

Table 1.9 VANC Processing Menu Items

Item	Parameters	Description
480i, 576i, 1080i		
Line	#[a]	Indicates the specific line the VANC components will be deleted from
Field #	Pass*	VANC components are passed unmodified to the card output
	Strip	VANC components are deleted from the card output
720p, 1080p		

Table 1.9 VANC Processing Menu Items

Item	Parameters	Description
Line	#[a]	Indicates the specific line the VANC components will be deleted from
Option	Pass*	VANC components are passed unmodified to the card output
	Strip	VANC components are deleted from the card output
All Lines	Pass	All VANC components are passed unmodified to the card output
	Strip	All VANC components are deleted from the card output

a. The range is dependent on the format.

Alarm Enables Tab

Table 1.10 summarizes the **Alarm Enables** options available in DashBoard.

Table 1.10 Alarms Menu Items

Item	Parameters	Description
Video Input & Reference Alarm		
No Input	Selected*	Signal Status field reports a loss of input
	Cleared	Disables the alarm
Invalid Input	Selected*	Input Format field reports when the input video is a format that is not accepted
	Cleared	Disables the alarm
Incompatible Input	Selected*	Input Format field reports when the frame rate is not the same as the reference input
	Cleared	Disables the alarm
Non-Sync Video	Selected*	Signal Status field reports if the video input is asynchronous to the reference
	Cleared	Disables the alarm
No Reference	Selected*	Reference Status field reports a loss of input conditions when they occur
	Cleared	Disables the alarm
Invalid Reference	Selected*	Reference Format field reports when the reference is a format that is not supported
	Cleared	Disables the alarm
Hardware		
Incompat Rear Module	Selected*	HW Status field reports when a rear module is not compatible with the card
	Cleared	Disables the alarm
Incompat Daughter Card	Selected*	HW Status field reports when using an incompatible daughter card on the MUX-8258-C

Table 1.10 Alarms Menu Items

Item	Parameters	Description
Incompat Daughter Card	Cleared	Disables the alarm
Embedded Input Audio - Group #		
Group not present	Selected*	Signal Status field reports when a group is not present on the input
	Cleared	Disables the alarm
Channel # Silent	Selected*	Signal Status field reports when the specified channel is detected as silent
	Cleared	Disables the alarm
AES Inputs - AES # (MUX-8258-A, MUX-8258-B)		
Input not present	Selected*	Signal Status field reports when the AES input is not detected
	Cleared	Disables the alarm
Channel # Silent	Selected*	Signal Status field reports when the AES channel is detected as silent
	Cleared	Disables the alarm
Analog Inputs - ANLG # (MUX-8258-C)		
Silent	Selected*	Signal Status field reports when the analog input is detected as silent.
	Cleared	Disables the alarm
Source Missing	Selected*	Embedded Audio Status field reports when the selected source is not present or is silent
	Cleared	Disables the alarm
Source Async	Selected*	Embedded Audio Status field reports when the source is asynchronous to the input video, or not a 48kHz rate
	Cleared	Disables the alarm
Backup Source Missing	Selected*	Embedded Audio Status field reports when the selected Backup Source is not present or is silent
	Cleared	Disables the alarm
Backup Source Async	Selected*	Embedded Audio Status field reports when the selected Backup Source is not synchronous to the input video, or not a 48kHz sample rate
	Cleared	Disables the alarm
SD 24Bit[a]	Selected*	Audio Status field reports when the selected configuration would embed 4 groups of 24bit audio in an SD output. Group 4 is down-sampled to 20bit audio
	Cleared	Disables the alarm
All Alarms	Set	Enables all alarms
All Alarms	Clear	Disables all alarms

a. When performing an analog to digital conversion of audio, the card produces 24bit resolution by default. When converting, ensure that you set the **SD Audio** option in the **Setup** tab to **20bit**. Otherwise, the card will output 24bit and an alarm is reported in the **Audio Status** field.

Card-edge Menus

This chapter summarizes the Card-edge Menu system of the MUX-8258 and how to navigate the menus and options using the **SW2** and **SW3** switches on the MUX-8258 card-edge.

✶ This chapter only applies to legacy MUX-8258 series cards with the card-edge 4-character display and the **SW2** and **SW3** switches.

Navigating the Card-edge Menus

Use the following procedure to navigate the card-edge menus of the MUX-8258:

1. Locate **SW2** and **SW3** switches on the MUX-8258 card-edge. Refer to "**Card Overview**" on page 15 for locations.
2. Rotate **SW2** to the required menu.
3. Toggle **SW3** to select the required parameter.

✶ Do not power down the card before ensuring that all edited parameters are saved. Saving edited parameters can take up to 10 seconds.

Card-edge Menus

Table 2.1 lists all the menus and the default values available using the card-edge controls. To activate some of these parameters, it may be necessary to toggle **SW3** in either direction, or it may require that **SW3** be held in either direction for a few seconds. Note that values noted with an asterisk (*) are the factory default values.

Table 2.1 Card-edge Menus and Items

Menu Select	Card-Edge Menu Label	Menu Name	Card-Edge Item Label	Item Name
0	MUX-8258-# slot #	Home		
1	Fact Def	Factory Default	n/a	Factory Default
2	Ref Src	Reference Source	Fr 1*	Frame 1 Reference
			Fr 2	Frame 2 Reference
			Vid	Video
3	LOI	Loss of Input	Black	
			Blue	
			Custom*	

Table 2.1 Card-edge Menus and Items

Menu Select	Card-Edge Menu Label	Menu Name	Card-Edge Item Label	Item Name
4	Test Patt	Test Pattern	None*	
			75%	SMPTE Bars
			YC Ramp	Y/C Ramp
			L Ramp	Luma Ramp
			Matr Path	Matrix Pathological
			Blue	Flat Field Blue
			Black	Flat Field Black
			Frq Swp	Frequency Sweep
			100%	100% Full Field Bars
5	Grp Sel	Group Select	Grp 1*	Group 1
			Grp 2	Group 2
			Grp 3	Group 3
			Grp 4	Group 4
6	Grp Enbl	Group Enable	Grp Enbl*	Group Enabled
			Grp Dsbl	Group Disabled
7	Ch1 Src	Channel 1 Source	Mute	
			T4k	4kHz Tone
			T2k	2kHz Tone
			T1k	1kHz Tone
			T.5k	500Hz Tone
			A1A* - A8B	AES 1A to AES 8B (MUX-8258-A, MUX-8258-B)
			Alg1 - Alg4	Analog 1 to Analog 4 (MUX-8258-4C)
			Alg1 - Alg8	Analog 1 to Analog 8 (MUX-8258-8C)
			G1C1-G4C4	Group 1, Channel 1 to Group 4, Channel 4
8	Ch2 Src	Channel 2 Source	Same as above	
9	Ch3 Src	Channel 3 Source	Same as above	
A	Ch4 Src	Channel 4 Source	Same as above	

Table 2.1 Card-edge Menus and Items

Menu Select	Card-Edge Menu Label	Menu Name	Card-Edge Item Label	Item Name
B	Ch1 Bkp	Channel 1 Backup Source	Mute	
			T4k	4kHz Tone
			T2k	2kHz Tone
			T1k	1kHz Tone
			T.5k	500Hz Tone
			A1A - A8B	AES 1A to AES 8B (MUX-8258-A, MUX-8258-B)
			Alg1 - Alg4	Analog 1 to Analog 4 (MUX-8258-4C)
			Alg1 - Alg8	Analog 1 to Analog 8 (MUX-8258-8C)
			G1C1-G4C4	Group 1, Channel 1 to Group 4, Channel 4
C	Ch2 Bkp	Channel 2 Backup Source	Same as above	
D	Ch3 Bkp	Channel 3 Backup Source	Same as above	
E	Ch4 Bkp	Channel 4 Backup Source	Same as above	

Menu Descriptions

This section briefly summarizes the menu parameters available in the card-edge display.

0 — Home

This read-only menu displays the product name and the slot the card is installed in the frame.

1 — Factory Defaults

This function enables you to return all controls to their factory default values. Use the following procedure to reset the card parameters to factory default values using the card-edge controls:

1. Rotate **SW2** to **1**. The Four Character Display displays "**Fact Def**".
2. Toggle **SW3** down and hold for 3 seconds.
3. Release **SW3**.

2 — Reference Source

This menu enables you to select where the card will look for a reference. The choices are Frame Reference 1 (**Fr 1**), Frame Reference 2 (**Fr 2**), and Video (**Vid**). Refer to the section "**Reference Compatibility**" on page 23 for a list of supported formats.

3 — Loss of Input

Use this menu to select what type of video displays at the system's outputs when the input video signal is lost or invalid.

4 — Test Pattern

This menu enables you to specify the type of test pattern to output. Note that this setting is not retained on power down.

5 — Group Select

This menu enables you to select the embedded group before enabling the group, assigning sources to the channels, and backup sources. This menu is used in conjunction with Menus 6 to E.

6 — Group Enable

Use this menu to determine if the selected group is embedded in the output or not.

7, 8, 9, A — Channel # Source

Use Menus 7 to A to configure the Primary Source that is inserted into the embedded group if present. These menus are used in conjunction with Menu 5 (Group Select). The following are the default values based on the group selected:

Table 2.2 Primary Source Default Values

SW1-5	SW1-7	SW1-8	SW1-9	SW1-A
G1	G1C1	G1C2	G1C3	G1C4
G2	G2C1	G2C2	G2C3	G2C4
G3	G3C1	G3C2	G3C3	G3C4
G4	G4C1	G4C2	G4C3	G4C4

B, C, D, E — Channel # Backup Source

Use Menus B to E to configure the Backup Source that is inserted when the Primary Source is unavailable. This menu is used in conjunction with Menu 5 (Group Select).

The following are the MUX-8258-A and MUX-8258-B default values based on the group selected:

Table 2.3 MUX-8258-A, MUX-8258-B Backup Source Default Values

SW1-5	SW1-B	SW1-C	SW1-D	SW1-E
G1	A1A	A1B	A2A	A2B
G2	A3A	A3B	A4A	A4B
G3	A5A	A5B	A6A	A6B
G4	A7A	A7B	A8A	A8B

The following are the MUX-8258-4C default values based on the group selected:

Table 2.4 MUX-8258-4C Backup Source Default Values

SW1-5	SW1-B	SW1-C	SW1-D	SW1-E
G1	Alg1	Alg2	Alg3	Alg4
G2	Alg1	Alg2	Alg3	Alg4
G3	Alg1	Alg2	Alg3	Alg4
G4	Alg1	Alg2	Alg3	Alg4

The following are the MUX-8258-8C default values based on the group selected:

Table 2.5 MUX-8258-8C Backup Source Default Values

SW1-5	SW1-B	SW1-C	SW1-D	SW1-E
G1	Alg1	Alg2	Alg3	Alg4
G2	Alg5	Alg6	Alg7	Alg8
G3	Alg1	Alg2	Alg3	Alg4
G4	Alg5	Alg6	Alg7	Alg8

Specifications

This chapter provides technical specification details on the MUX-8258. Note that specifications are subject to change without notice.

MUX-8258-A Technical Specifications

This section includes the technical specifications for the MUX-8258-A.

Table 3.1 MUX-8258-A Technical Specifications

Category	Parameter	Specification
SDI Input	Number of Inputs	1 HD-SDI
	SDI Data Rates and SMPTE Standards Accommodated	SMPTE 292M, SMPTE 259M, SMPTE 424M[a]
	Impedance	75ohm
	Return Loss	>15dB to 1.5GHz >15dB to 3.00GHz
	Equalization (Belden 1694A cable)	SD: < 450m (1476ft) HD: < 170m (558ft) 3G: < 100m (328ft)
	Connector Type	BNC
SDI Output	Number of Outputs	1
	SDI Data Rates and SMPTE Standards Accommodated	SMPTE 292M, SMPTE 259M, SMPTE 424M[a]
	Impedance	75ohm
	Return Loss	>15dB to 1.5GHz >8dB to 3.00GHz
	Signal Level	800mV, +/- 10%
	DC Offset	<50mV
	Rise and Fall Time (20-80%)	SD: 600ps typical HD: 120ps typical 3G: 130ps typical
	Overshoot	<10%
	Minimum Video Delay	SD: 7us HD: 2.2us 3G: 1.1us
	Connector Type	BNC

Table 3.1 MUX-8258-A Technical Specifications

Category	Parameter	Specification
AES Inputs	Number of Inputs	8
	AES Standards Accommodated	AES-3id-2001
	Impedance	75ohm
	Minimum Input	50mV p-p
	Maximum Input	2.5V p-p @ 48kHz 1.5V p-p @ 96kHz
	Minimum Audio Delay	SRC on: 1.35mS SRC off: 0.37mS
AES Inputs	Sampling Rate	48kHz compliant with AES-3id or any rate from 32kHz to 96kHz with SRC on
	Equalization	up to 800m (2,400ft) @ 48kHz up to 500m (1,500ft) @ 96kHz
	Connector Type	BNC
Environmental	Operating Range	5°C to 40°C ambient
Power	Total Power Consumption	8.5W

a. Not supported when using the DFR-8310 series frames.

MUX-8258-B Technical Specifications

This section includes the technical specifications for the MUX-8258-B.

Table 3.2 MUX-8258-B Technical Specifications

Category	Parameter	Specification
SDI Input	Number of Inputs	1
	SDI Data Rates and SMPTE Standards Accommodated	SMPTE 292M, SMPTE 259M, SMPTE 424M[a]
	Impedance	75ohm
	Return Loss	>15dB to 1.5GHz >10dB to 3GHz
	Equalization (Belden 1694A cable)	SD: < 450m (1476ft) HD: < 170m (558ft) 3G: < 100m (328ft)
	Connector Type	BNC

Table 3.2 MUX-8258-B Technical Specifications

Category	Parameter	Specification
SDI Output	Number of Outputs	1 HD-SDI
	SDI Data Rates and SMPTE Standards Accommodated	SMPTE 292M, SMPTE 259M, SMPTE 424M[a]
	Impedance	75ohm
	Return Loss	>15dB to 1.5GHz >10dB to 3GHz
	Signal Level	800mV, +/- 10%
	DC Offset	<50mV
	Rise and Fall Time (20-80%)	SD: 600ps typical HD: 120ps typical 3G: 130ps typical
	Overshoot	<10%
	Minimum Video Delay	SD: 7us HD: 2.2us 3G: 1.1us
	Connector Type	BNC
AES Inputs	Number of Inputs	8 connections
	SDI Data Rates and SMPTE Standards Accommodated	AES-3id-2001
	Impedance	110ohm
	Minimum Input	100mV
	Maximum Input	10Vp-p
	Minimum Audio Delay	2.3ms (SRC enabled)
AES Inputs	Sampling Rate	up to 96KHz
	Equalization	>450m of Belden 1492 cable
	Return Loss	>26dB 100KHz to 6MHz
	Output Amplitude	4Vp-p
	Rise and Fall Times	30ns
	Jitter	4.5mUI
	Connector Type	WECO™
Environmental	Operating Range	5°C to 40°C ambient
Power	Total Power Consumption	11W

a. Not supported when using the DFR-8310 series frames.

MUX-8258-C Technical Specifications

This section includes the technical specifications for the MUX-8258-4C and MUX-8258-8C.

Table 3.3 MUX-8258-4C and MUX-8258-8C Technical Specifications

Category	Parameter	Specification
SDI Input	Number of Inputs	1
	SDI Data Rates and SMPTE Standards Accommodated	SMPTE 292M, SMPTE 259M, SMPTE 424M[a]
	Impedance	75ohm
	Return Loss	>15dB to 1.5GHz >10dB to 3GHz
	Equalization (Belden 1694A cable)	SD: < 450m (1476ft) HD: < 170m (558ft) 3G: < 100m (328ft)
	Connector Type	BNC
SDI Output	Number of Outputs	1
	SDI Data Rates and SMPTE Standards Accommodated	SMPTE 292M, SMPTE 259M, SMPTE 424M[a]
	Impedance	75ohm
	Return Loss	>15dB to 1.5GHz >10dB to 3GHz
	Signal Level	800mV, +/- 10%
	DC Offset	<50mV
	Rise and Fall Time (20-80%)	SD: 600ps typical HD: 120ps typical 3G: 130ps typical
	Overshoot	<10%
	Minimum Video Delay	SD: 7us HD: 2.2us 3G: 1.1us
	Connector Type	BNC
Analog Audio Inputs	Number of Inputs	MUX-8258-4C: 4 inputs MUX-8258-8C: 8 inputs
	Input Impedance	> 12KΩ
	Maximum Input Level	+ 24dBu
	Input Level Adjustment	± 10dBu
	Frequency Response	± 0.07dB 20Hz to 20kHz @ Fs = 48kHz

Table 3.3 MUX-8258-4C and MUX-8258-8C Technical Specifications

Category	Parameter	Specification
Analog Audio Inputs	Signal to Noise Ratio	-96dB -98dB 'A' weighted -104dB CCITT weighting
	THD	> -97dB or < 0.002%
	Phase Linearity	< 1°
	Amplitude Linearity	< 0.6dB @ -100dBFS
	Crosstalk	-95dB
Environmental	Operating Range	5°C to 40°C ambient
Power	Total Power Consumption	MUX-8258-4C: 9.5W MUX-8258-8C: 11W

a. Not supported when using the DFR-8310 series frames.

Channel Status Data Table

Table 3.4 shows the channel status bit information that is used for all output audio.

Table 3.4 Channel Status Data

Byte	Bit	Function	Transmitted
0	0	Professional or Consumer use of Channel Status Block	Professional (1)
	1	Normal Audio or Non-Audio Mode	Normal Audio (0)
	2-4	Emphasis	No Emphasis (100)
	5	Lock Indication	Locked (0)
	6-7	Sampling Rate	48kHz (01)
1	0-3	Channel Mode	2 channel stereo (0001)
	4-7	User Bit Mode	192-bit (0001)
2	0-2	Auxiliary Bit Usage	20-bit audio sample, Aux bits undefined (000)
	3-5	Sample Word Length	20- or 24-bits (101)
	6-7	Alignment Level	Not Indicated (00)
3	0-7	Multi-channel Modes	Undefined (0)
4	0-1	Digital Audio Reference Signal	Not a Reference (0)
	2	Reserved	0
	3-6	Sampling Frequency	Not Indicated (0000)
	7	Sampling Frequency Scaling Flag	No Scaling (0)
5	0-7	Reserved	Unused (0)
6-9		ASCII Source ID	Unused (0)

Table 3.4 Channel Status Data

Byte	Bit	Function	Transmitted
10-13		ASCII Destination ID	Unused (0)
14-17		Local Sample Address	Unused (0)
18-21		Time of Day	Unused (0)
22	0-7	C Data Reliability	Only the first 5 Status Bytes are marked as Reliable All other Status Bytes are marked as Unreliable
23	0-7	CRC	Calculated CRC

Passing the Status Bytes

The MUX-8258 replaces Channel Status Bytes according to **Table 3.4** or passes Status Bytes through from input to output. The following conditions must be met for Status Bytes to pass:

- AES inputs must be 48kHz synchronous
- SRC is set to OFF
- Data Word Length in the Channel Status Bytes must match what is embedded

Service Information

Troubleshooting Checklist

Routine maintenance to this openGear product is not required. In the event of problems with your MUX-8258, the following basic troubleshooting checklist may help identify the source of the problem. If the frame still does not appear to be working properly after checking all possible causes, please contact your openGear products distributor, or the Technical Support department at the numbers listed in "**Contacting Technical Support**" on page 14.

1. **Visual Review** — Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the card, the frame, and any associated peripheral equipment for signs of trouble.
2. **Power Check —** Check the power indicator LED on the distribution frame front panel for the presence of power. If the power LED is not illuminated, verify that the power cable is connected to a power source and that power is available at the power main. Confirm that the power supplies are fully seated in their slots. If the power LED is still not illuminated, replace the power supply with one that is verified to work.
3. **Input Signal Status** — Verify that source equipment is operating correctly and that a valid signal is being supplied.
4. **Output Signal Path** — Verify that destination equipment is operating correctly and receiving a valid signal.
5. **Unit Exchange** — Exchanging a suspect unit with a unit that is known to be working correctly is an efficient method for localizing problems to individual units.

Bootload Button

In the unlikely event of a complete card failure, you may be instructed by a Ross Technical Support specialist to perform a complete software reload on the MUX-8258.

To reload the software on a MUX-8258

1. Eject the card from the frame.
2. Press and hold the **Bootload** button, while re-inserting the card into the frame.
3. Release the button.
   - The **OK/ERROR** LED flashes green while the card is waiting for a new software load.
   - If a new software load is not sent to the card within 60 seconds, the card will attempt to re-start with its last operational software load.
   - Software loads can be sent to the MUX-8258 via the connection on the rear of the frame.

Warranty and Repair Policy

The MUX-8258 is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of FIVE (5) years from the date of shipment from our factory. In the event that your MUX-8258 proves to be defective in any way during this warranty period, Ross Video Limited reserves the right to repair or replace this piece of equipment with a unit of equal or superior performance characteristics.

Should you find that this MUX-8258 has failed after your warranty period has expired, we will repair your defective product should suitable replacement components be available. You, the owner, will bear any labor and/or part costs incurred in the repair or refurbishment of said equipment beyond the FIVE (5) year warranty period.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profits) incurred by the use of this product. Implied warranties are expressly limited to the duration of this warranty.

This MUX-8258 User Manual provides all pertinent information for the safe installation and operation of your openGear Product. Ross Video policy dictates that all repairs to the MUX-8258 are to be conducted only by an authorized Ross Video Limited factory representative. Therefore, any unauthorized attempt to repair this product, by anyone other than an authorized Ross Video Limited factory representative, will automatically void the warranty. Please contact Ross Video Technical Support for more information.

In Case of Problems

Should any problem arise with your MUX-8258, please contact the Ross Video Technical Support Department. (Contact information is supplied at the end of this publication.)

A Return Material Authorization number (RMA) will be issued to you, as well as specific shipping instructions, should you wish our factory to repair your MUX-8258. If required, a temporary replacement frame will be made available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited will be shipped collect.

The Ross Video Technical Support Department will continue to provide advice on any product manufactured by Ross Video Limited, beyond the warranty period without charge, for the life of the equipment.

Glossary

The following terms are used throughout this guide:

Active image — the portion of the video picture area (production aperture) that is being utilized for output content. Active image excludes letterbox bars and pillar-box bars.

Auto Select Key — a key in which two video signals are required to insert the key. The Key Alpha is used to cut the hole in the video, and the Key Video is used to fill that hole.

Card — refers to all MUX-8258 models unless otherwise noted.

DashBoard — the DashBoard Control System.

MUX-8258 series — refers to all models unless otherwise noted.

DTVCC captions — CEA-708 captions.

Frame — the openGear frame that houses the MUX-8258 unless otherwise noted.

MIB — management information base.

Network Controller Card — the MFC-OG3-N and any available options unless otherwise noted.

NTSC captions — the CEA-608-D: Line 21 Data Services captions.

openGear Frame — refers to the OG3-FR series and OGX-FR series frames unless otherwise noted.

PAL — PAL-B and PAL-G unless otherwise noted.

Production aperture — the image lattice that represents the maximum possible image extent in a given standard (e.g. the full size of all active pixels and active lines). For example, the 1080i production aperture would be 1920x1080.

System— the mix of interconnected production and terminal equipment in your environment.

UDP — User Datagram Protocol.

User — the person who uses the MUX-8258.