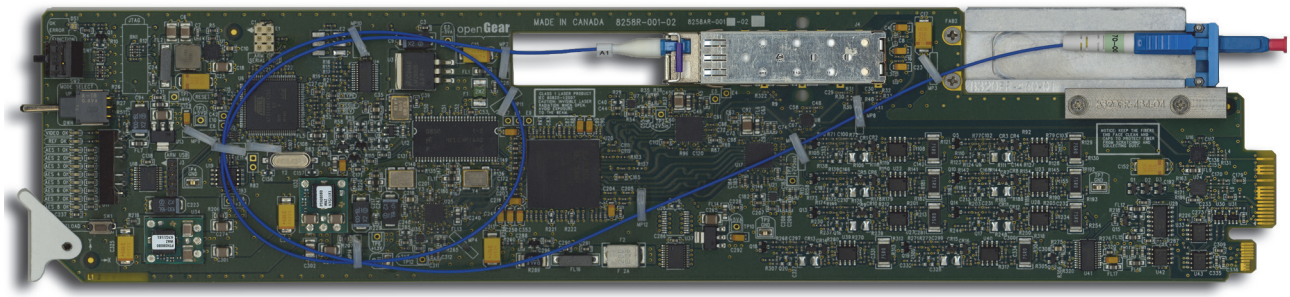
openGear

MUX-6258-A Series

CWDM AES/EBU Audio Multiplexer with Fiber Optic Output

User Manual



ROSS

Video Production Technology

MUX-6258-A Series User Manual

- Ross Part Number: 6258ADR-004-04
- Release Date: February 19, 2013.

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Before using this product and nay associated equipment, refer to the "**Important Safety Instructions**" listed below to avoid personnel injury and to prevent product damage.

Product may require specific equipment, and/or installation procedures to be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these specific requirements.

Symbol Meanings

This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage to persons or equipment.

Warning — *The symbol with the word "**Warning**" within the equipment manual indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.*

Caution — *The symbol with the word "**Caution**" within the equipment manual indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.*

Notice — *The symbol with the word "**Notice**" within the equipment manual indicates a potentially hazardous situation, which, if not avoided, may result in major or minor equipment damage or a situation which could place the equipment in a non-compliant operating state.*

ESD Susceptibility — *This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.*

Important Safety Instructions

Caution — *This product is intended to be a component product of the DFR-8300 series frame. Refer to the DFR-8300 Series Frame User Manual for important safety instructions regarding the proper installation and safe operation of the frame as well as its component products.*

Warning — *Certain parts of this equipment namely the power supply area still present a safety hazard, with the power switch in the OFF position. To avoid electrical shock, disconnect all A/C power cords from the chassis' rear appliance connectors before servicing this area.*

Warning — *Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after any servicing.*

This product contains safety critical parts, which if incorrectly replaced may present a risk of fire or electrical shock. Components contained with the product's power supplies and power supply area, are not intended to be customer serviced and should be returned to the factory for repair. To reduce the risk of fire, replacements fuses must be the same time and rating. Only use attachments/accessories specified by the manufacturer.

EMC Notices

United States of America
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 their own expense.

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

CANADA

This Class "A" digital apparatus complies with Canadian ICES-003.

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

EUROPE

This equipment is in compliance with the essential requirements and other relevant provisions of CE Directive 93/68/EEC.

INTERNATIONAL

This equipment has been tested to **CISPR 22:1997** along with amendments **A1:2000** and **A2:2002**, 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 on the last page 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.

Important Laser Safety Measures and Notices

Before using this product and any associated equipment, refer to the sections below so as to avoid personnel injury and to prevent product damage. For further safety information when using fiber products, consult the following publications:

- ***IEC-60825- 2, Safety of Laser Products - Part 2: Safety of Optical Fiber Communication Systems (OFCS)*** (for use outside of the U.S.A.)
- ***ANSI Z136.2, Safe Use of Optical Fiber Communication Systems Utilizing Laser Diode and LED Sources*** (for use in the U.S.A.)

Products may require specific equipment, and /or installation procedures be carried out to satisfy certain regulatory compliance requirements.

Caution — *Before operating or servicing this product, all personnel should be familiar with laser safety and fiber handling practices.*

Safety Measures for Operation

During normal operation of this product, heed the following safety measures:

- Do not stare at, or into, broken, or damaged, fibers.
- Do not stare at, or into, optical connectors.
- Only properly trained and authorized personnel shall be permitted to perform laser/fiber optic operations.
- Ensure that appropriate labels are displayed in plain view and in close proximity to the optical port on the protective housing/access panel of the terminal equipment.

Safety Measures for Maintenance and Servicing

Warning — *Do not use optical equipment, such as a microscope or an eye loupe, to stare at the energized fiber end. Doing so may damage your eyes.*

During maintenance and servicing of this product, only properly trained and authorized personnel shall be allowed to use optical test or diagnostic equipment.

Laser Information

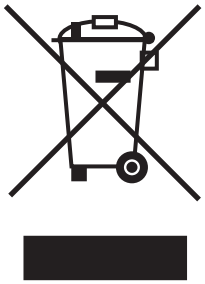
CLASS 1 LASER PRODUCT
IEC 60825-1:2007
Caution — *INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO THE BEAM.*

Environmental Information

The equipment that you purchased required the extraction and use of natural resources for its production. It 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 wheelie bin symbol invites you to use these systems.



If you need more information on the collection, re-use, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performance of our products.

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Contents

Introduction

In This Chapter

This chapter contains the following sections:

- Overview
- Functional Block Diagram
- User Interfaces
- Documentation Terms and Conventions

A Word of Thanks

Congratulations on choosing an openGear MUX-6258-A Series AES/EBU Audio Multiplexer with Fiber Optic Output. Your MUX-6258-A is part of a full line of Digital Products within the openGear Terminal Equipment family of products, backed by Ross Video's experience in engineering and design expertise since 1974.

You will be pleased at how easily your new MUX-6258-A fits into your overall working environment. Equally pleasing is the product quality, reliability and functionality. Thank you for joining the group of worldwide satisfied Ross Video customers!

Should you have a question pertaining to the installation or operation of your MUX-6258-A, please contact us at the numbers listed on the back cover of this manual. Our technical support staff is always available for consultation, training, or service.

Overview

This section provides a brief summary of the features for your MUX-6258-A series card.

MUX-6258-A

The MUX-6258-A is a broadcast quality embedder with one multi-rate SDI input which supports up to 16 channels of embedded audio and eight AES 75ohm unbalanced audio inputs. A single mode fiber interface with an LC/UPC connector provides an SDI output. The output is also available as an SDI output on BNC 2.

The MUX-6258-A can take in up to eight AES inputs and embed them into any of the 16 possible audio channels in an SD or HD-SDI output. If the input is a synchronous 48kHz signal, the audio will be embedded into the SDI signal unaltered. If the input is not a synchronous 48kHz signal, it may be converted using Sample Rate Conversion (SRC) before it is embedded on the SDI output.

MUX-6258-A CWDM Series

The MUX-6258-A CWDM Series include all the features of the MUX-6258-A described above, but are equipped with Coarse Wavelength Division Multiplexing (CWDM) lasers. This enables you to expand your current fiber infrastructure from one wavelength to up to 16 wavelengths on a fiber. These models are identified with a two digit suffix as indicated in **Table 1.1**. The output wavelengths for each model are also indicated.

Table 1.1 Supported Output Wavelengths

Model	Output Wavelength
MUX-6258-A-27	1270nm
MUX-6258-A-29	1290nm
MUX-6258-A-31	1310nm
MUX-6258-A-33	1330nm
MUX-6258-A-35	1350nm
MUX-6258-A-37	1370nm
MUX-6258-A-43	1430nm
MUX-6258-A-45	1450nm
MUX-6258-A-47	1470nm
MUX-6258-A-49	1490nm
MUX-6258-A-51	1510nm
MUX-6258-A-53	1530nm
MUX-6258-A-55	1550nm
MUX-6258-A-57	1570nm
MUX-6258-A-59	1590nm
MUX-6258-A-61	1610nm

Features

The MUX-6258-A Series includes the following features:

- Supports HD-SD SDI SMPTE 292M (1.5Gbps) and SMPTE 259M (270Mbps)
- Supports AES-3id-2001, and EBU tech 3250
- Supports embedding of non-PCM data such as Dolby® Digital and Dolby® E
- Audio embedding for all popular formats 480i, 576i, 720p, and 1080i
- Embeds four audio groups with selection of primary and backup sources
- Eight AES-3id 75ohm unbalanced inputs with SRC on DIN 1.0/2.3 connectors
- *MUX-6258-A CWDM Series only:* Optical output wavelengths from 1270nm to 1610nm, Distributed Feedback (DFB) Laser with 0 to +3dBm optical output power
- One SDI processed output
- Automatic input video format detection
- SNMP support available
- Input buffer with a bypass option
- User defined loss of signal output
- AES input controls such as gain, invert, delay, and sum
- Internally generated test patterns and test tones
- 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 DFR-8321 series frames
- 5-year transferable warranty

Functional Block Diagram

This section provides a functional block diagram that outlines the workflow of the MUX-6258-A series cards.

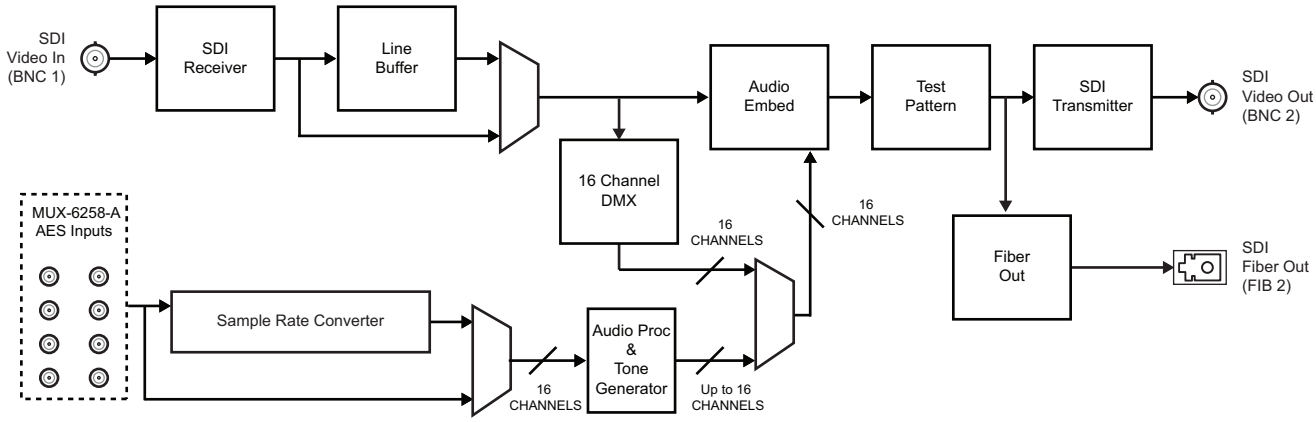

Figure 1.1 *MUX-6258-A — Simplified Block Diagram*

User Interfaces

The MUX-6258-A series cards include the following interfaces.

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 DFR-8321 series frames through the MFC-8300 Series Network Controller Card. The DashBoard Control System software and manual are available for download from our website.

For More Information on...

- installing and using DashBoard, refer to the ***DashBoard User Manual***.
- the MUX-6258-A menus in DashBoard, refer to the chapter "**DashBoard Menus**" on page 4-1.

Card-edge Controls

The front-edge of the MUX-6258-A series cards feature LED indicators for the power, video input status and communication activity. The card-edge also includes the **SW2** and **SW3** switches that are used in conjunction to navigate the card-edge menu system.

For More Information on...

- the card-edge controls and LEDs, refer to the section "**Card Overview**" on page 3-2.
- the card-edge menus, refer to the chapter "**Card-edge Menus**" on page 5-1.

SNMP Monitoring and Control

The MFC-8300 Series Network Controller Card in the DFR-8321 series frames 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...

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

Documentation Terms and Conventions

The following terms and conventions are used throughout this manual.

Terms

The following terms are used:

- "**525-line mode**" refers to broadcast situations using **NTSC** composite (analog) signal reference inputs.
- "**625-line mode**" refers to broadcast situations using **PAL-B** composite (analog) signal reference inputs.
- "**Board**", and "**Card**" refer to openGear terminal devices within openGear frames, including all components and switches.
- "**DFR-8321 series**" includes all versions of the DFR-8321 series frames and any available options unless otherwise noted.
- "**Frame**" refers to the openGear frame that houses the MUX-6258-A series card.
- "**MUX-6258-A**" refers to the card version that does not include CWDM lasers.
- "**MUX-6258-A CWDM Series**" refers to all the card versions that do include CWDM lasers.
- "**MUX-6258-A series**" refers to all versions of the card and any available options unless otherwise indicated.
- "**Operator**" and "**User**" refer to the person who uses MUX-6258-A series card.
- "**PAL**" refers to PAL-B unless otherwise stated.
- "**System**" and "**Video system**" refer to the mix of interconnected production and terminal equipment in your environment.

Conventions

The following conventions are used:

- "**Operating Tips**" and "**Note**" boxes are used to provide additional user information.

Installation

In This Chapter

This chapter provides instructions for installing the rear module(s), installing the card into the frame, cabling details, and updating the card software.

The following topics are discussed:

- Before You Begin
- Installing the MUX-6258-A Series
- Cabling
- Software Upgrades

Before You Begin

Before proceeding with the instructions in this chapter, ensure that your DFR-8321 series frame is properly installed according to the instructions in the ***DFR-8300 Series User 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 card 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.

Working with Fiber Optic Connectors

Keep the following in mind when working with fiber optic connectors:

- Every time you are required to insert a connector into a device or mating sleeve, you must clean the connector. All exposed surfaces of the ceramic ferrule must be clean. Follow your facility practices of cleaning fiber optic connectors.
- Connectors must always be inserted into a device or have a dust cap on. Refer to **Figure 2.1** for dust cap locations.
- A poor optical connection is often similar to a poor electrical connection. Try removing the connector, cleaning, and re-inserting the connector. A bad connection can result in experiencing instability of signal, high loss, or a noisy signal.

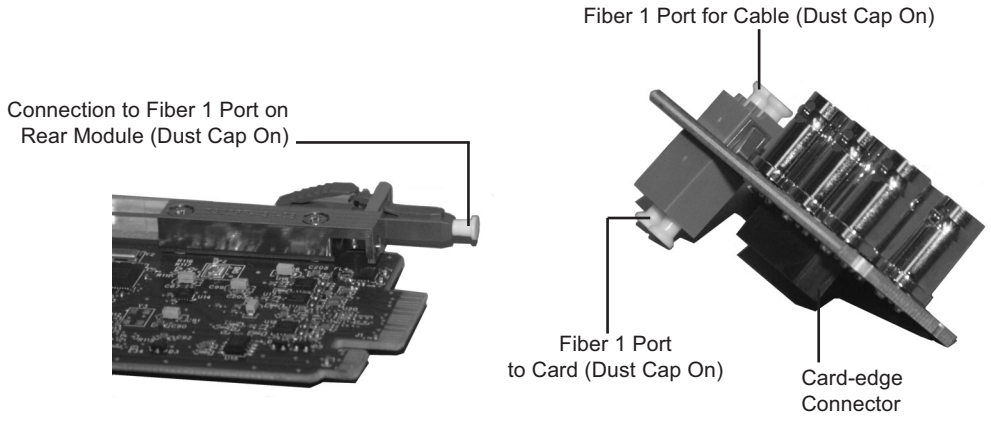

Figure 2.1 *Card Connectors with Dust Caps Installed — MUX-6258-A*

Installing the MUX-6258-A Series

This section outlines how to install a rear module and card in an DFR-8321 series frame. You cannot install the MUX-6258-A series card in a DFR-8310 series or a DFR-8320 series frame.

Caution — *Never attempt to look down the barrel of a connected fiber or device transmitting an optical signal. The transmitted light is not in the visible spectrum and may cause permanent eye damage. Turn off all laser sources before disconnecting devices.*

Supported Rear Modules

This section outlines the rear modules supported by each model of the MUX-6258-A series card.

MUX-6258-A

The **8320AR-048A** Full Rear Module is required when installing the MUX-6258-A.

MUX-6258-A CWDM Series

The **8320AR-048A** Full Rear Module is required when installing the MUX-6258-A CWDM series card.

Installing a Rear Module

If the Rear Module is already installed, proceed to the section "**Installing the Card**" on page 2-4.

To install a Rear Module in your DFR-8321 series frame

1. Locate the card frame slots on the rear of the DFR-8321 series frame.
2. Remove the Blank Plate from the slot you have chosen for the card installation.
3. Remove the dust caps from the Fiber ports on the Rear Module that face the interior of the frame. Refer to **Figure 2.1** and **Figure 2.2** for dust cap locations.

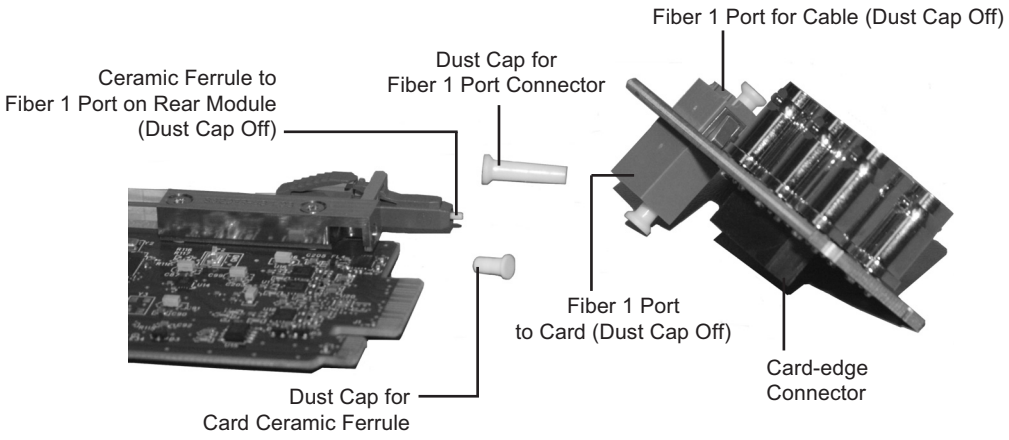

***Figure 2.2** Card Connectors with Dust Caps Removed — MUX-6258-A*

4. Install the bottom of the Rear Module in the **Module Seating Slot** at the base of the frame's back plane.

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

Installing the Card

The MUX-6258-A series uses a single mode, LC/UPC connector to interface with the Rear Modules. The procedure in this section is applicable to all versions of the MUX-6258-A series cards.

To install the card in a DFR-8321 series frame

1. Locate the Rear Module you installed in the procedure "**Installing a Rear Module**" on page 2-3.
2. Ensure the Rear Module is the **8320AR-048A** Full Rear Module.
3. Remove the dust cap from the connector on the card end.
   - Refer to **Figure 2.1** and **Figure 2.2** for dust cap locations.
   - Refer to the section "**Important Laser Safety Measures and Notices**" at the beginning of this manual for safety information when handling fiber optic components.
4. Ensure that the exposed surface of the ceramic ferrule of the connector is clean. Refer to the section "**Working with Fiber Optic Connectors**" on page 2-2.
5. Hold the card by the edges and carefully align the card-edges with the slots in the frame.
6. Fully insert the card into the frame until the rear connection plus is properly seated in the Rear Module. You will feel a click when the card mates onto the rear module.
7. Affix the supplied Rear Module Label to the BNC area of the Rear Module.
8. Remove the dust cap from the **Fiber 1** port (the topmost fiber optic port) on the Rear Module that faces the exterior of the frame.
9. Ensure the ceramic ferrule of the **Fiber 1** port connector is clean.
10. Cable your rear module as outlined in the section "**Cabling**" on page 2-5.

Cabling

This section provides information for connecting cables to the installed Rear Modules on the DFR-8321 series frames. Connect the input and output cables according to the following sections.

Each card accommodates eight synchronous AES 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®.

The optical connector used to mate the card to the rear module is designed for blind mate optical connectors. All fiber interfaces are single mode fibers.

Notice — *Every time you are required to insert a connector into a device or mating sleeve, you must clean the connector. All exposed surfaces of the ceramic ferrule must be clean. Follow your facility practices of cleaning fiber optic connectors.*

Connectors must always be inserted into a device or have a dust cap on.

MUX-6258-A Cabling Overview

In the DFR-8321 series frames, the MUX-6258-A is used with the **8320AR-048A** Full Rear Module. Each rear module occupies two slots and accommodates one card. This rear module provides one SDI input, one SDI output, one fiber output, and eight unbalanced AES inputs. (**Figure 2.3**)

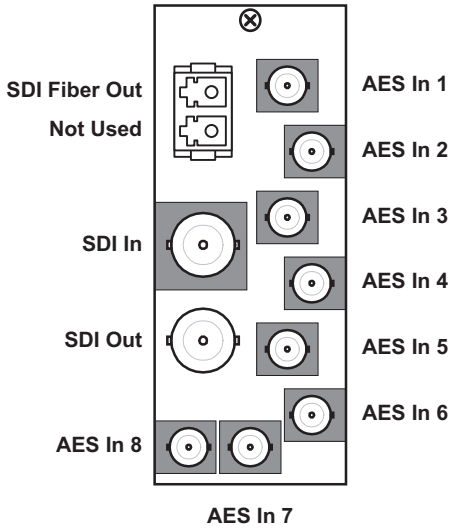

Figure 2.3 *Cable Connections for the 8320AR-048A Rear Module*

MUX-6258-A CWDM Series Cabling Overview

The MUX-6258-A CWDM series use the same rear module as the MUX-6258-A, but require a different cabling scheme. The wavelength of the optical output of your card is dependent on the card model. For the MUX-6258-A CWDM series, the wavelength designation replaces the SD Fiber Out (**Figure 2.3**) designations as specified in **Table 2.1**.

Table 2.1 MUX-6258-A CWDM Series Wavelengths

Model	Output Wavelength
	SDI Fiber Out
MUX-6258-A-27	1270nm OUT
MUX-6258-A-29	1290nm OUT
MUX-6258-A-31	1310nm OUT
MUX-6258-A-33	1330nm OUT
MUX-6258-A-35	1350nm OUT
MUX-6258-A-37	1370nm OUT
MUX-6258-A-43	1430nm OUT
MUX-6258-A-45	1450nm OUT
MUX-6258-A-47	1470nm OUT
MUX-6258-A-49	1490nm OUT
MUX-6258-A-51	1510nm OUT
MUX-6258-A-53	1530nm OUT
MUX-6258-A-55	1550nm OUT
MUX-6258-A-57	1570nm OUT
MUX-6258-A-59	1590nm OUT
MUX-6258-A-61	1610nm OUT

Software Upgrades

This section provides instructions for upgrading the software for your card using the DashBoard Control System™ client software. The DashBoard client enables you to upload software updates to the card.

To upload software to the card

1. Contact Ross Technical Support for the latest software version file.
2. In DashBoard, display the **Device** tab of the card 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 upgrade 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 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 box opens.

Important — *Clicking **Cancel** 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. If upload fails, repeat the upload process from DashBoard. If the upload process fails again, refer to the section "**Bootload Button**" on page 7-2.*

7. Monitor the upgrade progress bar displayed in DashBoard while the software is upgraded on your card.
8. To complete the upgrade process, the card automatically reboots.

Note — *The communications processor of the card requires approximately 30 seconds to re-start and re-establish network communications.*

   - The card 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.

User Controls

In This Chapter

This chapter provides a general overview of the user controls available on the front edge of the card. Additional operation information on reference compatibility, embedding non-PCM signals, and processing HANC or VANC data is also provided.

The following topics are discussed:

- Card Overview
- Control and Monitoring Features
- Reference Compatibility
- Operation Notes

Card Overview

This section provides a general overview of the card components. For information on the LEDs available on the card-edge, refer to the section "**Control and Monitoring Features**" on page 3-3.

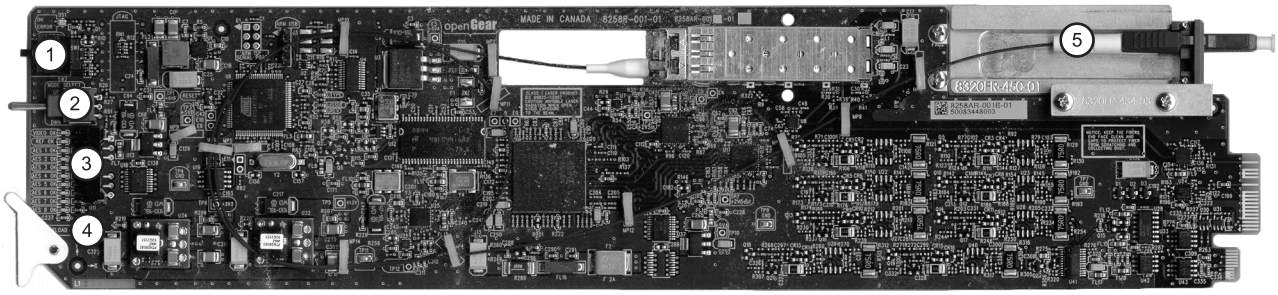

Figure 3.1 *MUX-6258-A — Card-edge Components*

1) Function Select Switch	3) Four Character Display	5) Fiber Optic Connector
2) Mode Select Switch	4) Bootload Button	

1. Function Select Switch

Use this switch to select general operation functions and menu items. This switch works in conjunction with the Mode Select Switch.

2. Mode Select Switch

Use this switch to enable, disable, and select specific configurations within the operational function modes menu (selected first with the Function Select Switch).

3. Four Character Display

This display is located on the card-edge and reports the menu and options selected using the Function Select Switch and the Mode Select Switch.

4. Bootload Button

This button 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.

5. Fiber Optic Connector

The cards use a blind mate, single mode, LC/UPC connector to interface with the Full Rear Module (8320AR-048A). The rear module is passive, which allows for the card to be replaced without the need to remove any connected BNC or fiber optic cables.

The fiber optic connector for the card includes a dust cap. The dust cap must stay on at all times when the card is not installed in a frame. Ensure to keep the fibers end face clean and use the caps to protect the fiber from scratches and collecting dust.

For More Information on...

- using the switches, refer to the section "**Navigating the Card-edge Menus**" on page 5-2.
- the LEDs located on the card-edge, refer to the section "**Status and Selection LEDs**" on page 3-3.
- safety information when handling fiber optic components, refer to the section "**Important Laser Safety Measures and Notices**" at the beginning of this manual.
- fiber optic connectors, refer to the section "**Working with Fiber Optic Connectors**" on page 2-2.

Control and Monitoring Features

This section provides information on the card-edge LEDs for the card. Refer to **Figure 3.2** for the location of the LEDs and controls.

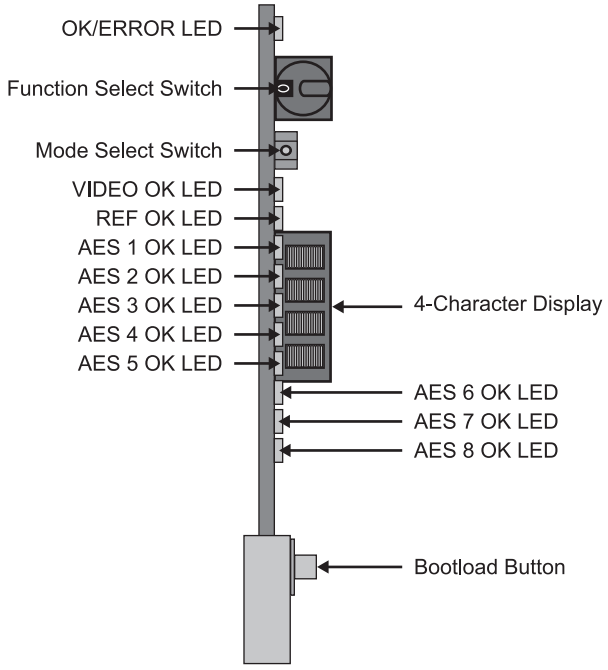

***Figure 3.2** Card-edge Controls*

Status and Selection LEDs

The front-edge of the card has LED indicators for the power, video input status, and communication activity. Basic LED displays and descriptions are provided in **Table 3.1**.

Table 3.1 LEDs on the Card-edge

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 3.1 LEDs on the Card-edge

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, 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	Yellow	When lit, an LED indicates a valid signal is detected on the corresponding AES input.

Reference Compatibility

It is important to remember that if you are using the source connected to either **Frame 1** or **Frame 2** BNCs on the DFR-8321 series frame as the reference, the input video frame rate must match the reference frame rate. Refer to **Table 3.2** for frame rate compatibility.

Table 3.2 Frame Rate Compatible Video Formats

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

Operation Notes

This section provides additional information for operating the card such as audio proc amp controls, the minimum delay, embedding PCM versus Non-PCM signals, and ancillary data processing.

Audio Proc Amp Controls

The card 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.
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 3.3** provides information on the buffer window available depending on how the Minimum Delay option is configured in DashBoard.

Table 3.3 Minimum Delay Option

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

Embedding PCM Signals

The card can embed PCM audio from two sources: the AES input or from the embedded audio of the source video. Processing also includes embedding channel status data as per **Table 6.2**.

Embedding Non-PCM Signals

You can configure the card to embed non-PCM signals, such as Dolby® Digital and Dolby® E, using the options available in DashBoard.

Note — *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 configure the card to embed non-PCM signals

1. Launch DashBoard on your computer.
2. Display the **Device View** for the card you wish to configure.
3. Select the **AES Inputs** tab for the input channel you wish to configure.
4. Set the **Sample Rate Conversion** to **Off**.
5. Clear the **Sum** box to disable channel summing.
6. Set the **Channel Gain** to **0**.
7. Clear the applicable **Ch Invert** check 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 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 3.4** lists the allowable line selections based on format.

Table 3.4 VANC Processing — Line Selection

Format	Field 1 Lines	Field 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 card 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.

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

DashBoard Menus

In This Chapter

This chapter briefly summarizes the menus, items, and parameters available from the DashBoard Control System™ for the MUX-6258-A series cards. Parameters marked with an asterisk (*) are the factory default values.

The following topics are discussed:

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 4.1 summarizes the read-only information displayed in the **Status** tabs.

Table 4.1 Status Tab Items

Tab Title	Item	Parameters	Description
General	Signal Status	OK	Indicates when the card is functioning normally or if errors are detected
		No Input	
		Invalid Format	
		Incompatible	
		Non-Sync Video	
		Group Not Present	
		Group Channel Silent	
	Audio Status	OK	Indicates the status of the audio source
		AES Input Not Present	
		Source Missing	
		Source Async	
		AES Input Silent	
		Group 4 Reduced to 20bit[a]	
		Backup Source Missing	
		Backup Source Async	
	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 • A valid video signal is not present • Card has gone to Free Run Mode

Table 4.1 Status Tab Items

Tab Title	Item	Parameters	Description
General	Reference Status	Invalid Format - Video	Card has detected an invalid[b] reference format and has switched to Video Timing Mode
		Invalid Format - Free Run	The following conditions are occurring: • Card has detected an invalid[b] 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
	Optical Module Status	OK	Indicates the status of the card Optical Module
		Temp High	
		Temp Low	
		Tx Power High	
		Tx Power Low	Indicates the status of the card Optical Module
		Tx Fault	
		Not Detected	
	Optical Tx Power (dBm)	#	Indicates the output power of the Optical Module
	Embedded Audio Status - Group #	PCM	Indicates the presence of input
		No Input	
		PCM-Silent	
		Non-PCM	
		Async	
		Mixed	
Signal - AES Inputs	AES #	PCM	Indicates the presence of input
		No Input	
		PCM-Silent	
		Non-PCM	
		Async	
		Mixed	

a. This parameter indicates that there are more than 3 groups of 24bit SD embedded audio sources.
b. Refer to the section "**Reference Compatibility**" on page 3-5 for a complete list of supported formats.

Product Tab

Table 4.2 summarizes the read-only information displayed in the **Product** tab.

Table 4.2 Product Tab Items

Tab Title	Item	Parameters	Description
Product	Product	MUX-6258-A or MUX-6258-A-xx	
	Supplier	Ross Video Ltd.	
	Board Rev	##	Indicates the board version
	Rear Module	#	Indicates the rear module installed
	Board S/N	######	Indicates the board serial number
	Software Rev	##.##	Indicates the software version
	Firmware Rev	#.###	Indicates the firmware version

Hardware Tab

Table 4.3 summarizes the read-only information displayed in the **Hardware** tab.

Table 4.3 Hardware Tab Items

Tab Title	Item	Parameters	Description
Hardware	HW Status	OK	Indicates the status of the hardware including the SFP module. Some messages displayed are dependent on the settings in the **Alarms Enable** tab.
		FPGA load invalid	
		Incomp I/O module	
		Current out of spec	
		Internal Error	
		SFP Temp Low	
		SFP Temp High	
		SFP Power High	
		SFP Power Low	
		SFP Tx Fault	
		SFP Not Detected	
	Voltage (mV)	#	Supply Voltage
	Current (mA)	#	Current consumption of card
	Optical Module Temperature (C)	#	Indicates the temperature of the Optical Module
	Optical Tx Wavelength (nm)	#	Indicates the wavelength being transmitted
	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 4.4 summarizes the **Setup** options available in DashBoard.

Table 4.4 Setup Menu Items

Menu Title	Item	Parameters	Description
Setup	Reference	Frame 1*	Selects the reference source
		Frame 2	
		Video	
	Minimum Delay	Selected	Provides the shortest video delay through the card. Refer to **Table 3.3** on page 3-6 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	Sets the output to Black in the event of a loss of video input
		Blue	Sets the output to Blue in the event of a loss of video input
		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 Custom video signal.
		Cr slider	Sets the Cr component of the Loss of Input Custom video signal.
		Cb slider	Sets the Cb component of the Loss of Input Custom video signal.
	Test Pattern	None*	Disables the test pattern feature
		100% Bars	Specifies the type of test pattern to output. Note that this setting is not retained on power down.
		Frequency Sweep	
		Black	
		Blue	
		Matrix Pathological	
		Luma Ramp	
		Y/C Ramp	
		75% SMPTE Bars	
	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 4.4 Setup Menu Items

Menu Title	Item	Parameters	Description
Setup	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 4.5 summarizes the **Input Status** options available in DashBoard.

Table 4.5 Input Status Menu Items

Menu Title	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 roll over 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 #	Ch A Status (read-only)	PCM	Displays the status of the Channel A input
		No Input	
		PCM-Silent	
		Non-PCM	
		Async[a]	
		Mixed	
	Ch B Status (read-only)	Same as above	
	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

a. If the SRC is ON, an Aysnc PCM incoming AES signal is processed to be PCM and indicated as such.

AES Inputs 1-8 Tabs

Table 4.6 summarizes the **AES Inputs 1-4** and **AES Inputs 5-8** options available in DashBoard.

Table 4.6 AES Inputs Menu Items

Menu Title	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 A Delay (ms)	0* to 1000	Adjusts the delay of the audio channel
	Ch B Delay (ms)	Same as above	
	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 A Gain (dB)	-18 to +18[a]	Adjusts the gain of the audio channel
	Ch B Gain (dB)	Same as above	
	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 A Invert	Selected	Inverts the audio signal of the channel
		Cleared*	The audio signal is not inverted
	Ch B Invert	Same as above	
	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.

Embedded Outputs Tab

Table 4.7 summarizes the **Embedded Outputs** options available in DashBoard.

Table 4.7 Embedded Outputs Menu Items

Menu Title	Item	Parameters	Description
Group #	Enable	Selected*	Determines if the group is inserted in the output or not
		Cleared	
	Ch # Source	Mute	Configures the Primary Source that is inserted in to the embedded group if present
		Group# Ch#*	
		AES #	
		#Hz Tone	
		#kHz Tone	
	Ch # Backup Source	Mute	Configures the Backup Source that is inserted when the Primary Source is unavailable
		Group# Ch#	
		AES #*	
		#Hz Tone	
		#kHz Tone	
	Presets	Pass	Configures the group source settings with the original group as the Primary Source and original group 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

Alarm Enables Tab

Table 4.8 summarizes the **Alarm Enables** options available in DashBoard.

Table 4.8 Alarms Menu Items

Menu Title	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 displays an alarm when the input video is a format that is not supported
		Cleared	Disables the alarm
	Incompatible Input	Selected*	Input Format field reports when the video 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 loss of input conditions
		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
Optical Module Alarms	Alarm on Abnormal Temperature	Selected*	HW Status field reports when the temperature of the SFP module is not in range (high/low)
		Cleared	Disables the alarm
	Alarm on Abnormal Power	Selected*	HW Status field reports when the power consumption of the SFP module is not in range (high/low)
		Cleared	Disables the alarm
	Alarm on Not Detected	Selected*	HW Status field reports when the optical module is not detected
		Cleared	Disables the alarm

Table 4.8 Alarms Menu Items

Menu Title	Item	Parameters	Description
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 #	Input not present	Selected*	Signal Status field reports when the source for the specified input is not present
		Cleared	Disables the alarm
	Channel # Silent	Selected*	Signal Status field reports when the specified channel is detected as silent
		Cleared	Disables the alarm
Embedded Outputs - Group #	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 selected source is asynchronous to the input video
		Cleared	Disables the alarm
	Backup Source Missing	Selected*	An alarm is displayed when the selected Backup Source is not present or is silent
		Cleared	Disables the alarm
	Backup Source Async	Selected*	An alarm is displayed when the selected Backup Source is not synchronous to the input video
		Cleared	Disables the alarm
	SD 24Bit	Selected*	Audio Status field displays an alarm 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

VANC Processing Tab

Table 4.9 summarizes the **VANC Processing** options available in DashBoard.

Table 4.9 VANC Processing Menu Items

Menu Title	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	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.

Card-edge Menus

In This Chapter

This chapter summarizes the Card-edge Menu system of the card and how to navigate the menus and options using the **SW1** and **SW2** on the card-edge.

The following topics are discussed:

- Navigating the Card-edge Menus
- Card-edge Menus
- Menu Descriptions

Navigating the Card-edge Menus

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

1. Locate **SW1** and **SW2** on the front card-edge. Refer to **Figure 3.1** on page 3-2 for switch locations.
2. Rotate **SW1** to the required menu.
3. Toggle **SW2** to select the required parameter.

Note — *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 5.1 lists all the menus, and menu items available using the card-edge controls. To activate some of these parameters, it may be necessary to toggle **SW2** in either direction, or it may require that **SW2** be held in either direction for a few seconds. Default values are indicated with an asterisk (*). Refer to the section "**Menu Descriptions**" on page 5-5 for a brief summary of the menus available on the card-edge.

Table 5.1 Card-edge Menus and Items

Menu Select	Card-Edge Menu Label	Menu Name	Card-Edge Item Label	Item Name
0	MUX-6258-A slot # or MUX-6258-A-xx 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*	
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	Enabled*	
			Disabled	

Table 5.1 Card-edge Menus and Items

Menu Select	Card-Edge Menu Label	Menu Name	Card-Edge Item Label	Item Name
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
			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	
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
			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 of the card.

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.

To reset the card parameters to factory default values using the card-edge controls:

1. Rotate **SW1** to **1**. The Four Character Display displays "**Fact Def**".
2. Toggle **SW2** down and hold for 3 seconds.
3. Release **SW2**.

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 3-5 for a list of supported reference 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 5.2 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 default values based on the group selected:

Table 5.3 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

Specifications

In This Chapter

This chapter provides technical specification details for the MUX-6258-A series. Note that specifications are subject to change without notice.

The following topics are discussed:

- Technical Specifications
- Channel Status Data Table

Technical Specifications

This section includes the technical specifications for the MUX-6258-A series cards.

Table 6.1 Technical Specifications

Category	Parameter	Specification
SDI Input	Number of Inputs	1
	SDI Data Rates and SMPTE Standards Accommodated	SMPTE 259M, SMPTE 292M
	Impedance	75ohm terminating
	Return Loss	>15dB to 1.485GHz >10dB from 1.485GHz to 2.97GHz
	Cable Length with Equalizer	>300m of Belden 1694A cable @ 270Mbps >120m of Belden 1694A cable @ 1.485Gbps >80m of Belden 1694A cable @ 2.97Gbps
	Connector Type	BNC
Optical Output	Number of Outputs	1
	SMPTE Standards Accommodated	SMPTE 259M, SMPTE 292M
	Nominal Wavelength	MUX-6258-A: 1310nm
		MUX-6258-A-27: 1270nm
		MUX-6258-A-29: 1290nm
		MUX-6258-A-31: 1310nm
		MUX-6258-A-33: 1330nm
		MUX-6258-A-35: 1350nm
		MUX-6258-A-37: 1370nm
		MUX-6258-A-43: 1430nm
		MUX-6258-A-45: 1450nm
		MUX-6258-A-47: 1470nm
		MUX-6258-A-49: 1490nm
		MUX-6258-A-51: 1510nm
		MUX-6258-A-53: 1530nm
		MUX-6258-A-55: 1550nm
		MUX-6258-A-57: 1570nm
		MUX-6258-A-59: 1590nm
		MUX-6258-A-61: 1610nm
	Output Power	MUX-6258-A: -7dBm to -2dBm MUX-6258-A CWDM Series: 0dBm to +3dBm
	Connector Type	Single Mode, LC/UPC

Table 6.1 Technical Specifications

Category	Parameter	Specification
SDI Outputs	Number of Outputs	1
	SDI Data Rates and SMPTE Standards Accommodated	SMPTE 259M, SMPTE 292M
	Impedance	75ohm
	Return Loss	>15dB to 1.485GHz >10dB 1.485GHz to 2.97GHz
	Signal Level	800mV, ±10%
	DC Offset	0V ±50mV
	Rise and Fall Time (20-80%)	• 700ps typical (270Mbps) • 120ps typical (1.485Gbps, 2.97Gbps)
	Overshoot	<10%
	Connector Type	BNC
AES Inputs	Number of Inputs	8 AES-3id inputs
	Impedance	75ohm
	Input Resolution	24bits
	Nominal Signal Level	1V p-p
	Sampling Rate	48kHz compliant with SMPTE 272M or any rate from 20kHz to 96kHz with SRC on
	Connector Type	DIN 1.0/2.3
Environmental	Operating Range	5°C to 40°C ambient
Power	Total Power Consumption	<8W

Channel Status Data Table

The following table shows the channel status bit information that is used for all output audio.

Table 6.2 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)
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-6258-A series card replaces Channel Status Bytes according to **Table 6.2** 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

In This Chapter

This chapter contains the following sections:

- Troubleshooting Checklist
- Warranty and Repair Policy

Troubleshooting Checklist

Routine maintenance to this openGear product is not required. In the event of problems with your MUX-6258-A series card, 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 under the "**Contact Us**" section.

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 card.

To reload the software

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 **STATUS OK** LED will flash 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 restart with its last operational software load.
   - Software loads can be sent to the card via DashBoard.

Warranty and Repair Policy

The MUX-6258-A series card 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-6258-A series card 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-6258-A series card 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 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-6258-A series card 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-6258-A series card, 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 card. 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.

Notes:

Notes:

Contact Us

Contact our friendly and professional support representatives for the following:

- Name and address of your local dealer
- Product information and pricing
- Technical support
- Upcoming trade show information

Technical Support	Telephone:	+1 613 • 652 • 4886
	After Hours Emergency:	+1 613 • 349 • 0006
	Email:	techsupport@rossvideo.com
General Information	Telephone:	+1 613 • 652 • 4886
	Fax:	+1 613 • 652 • 4425
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	Website:	http://www.rossvideo.com

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