



MUX-9258-A User Guide

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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
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Ross Video Code of Ethics

Any company is the sum total of the people that make things happen. At Ross, our employees are a special group. Our employees truly care about doing a great job and delivering a high quality customer experience every day. This code of ethics hangs on the wall of all Ross Video locations to guide our behavior:

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-9258-A · User Guide

- Ross Part Number: **9258ADR-004-02**
- Release Date: June 19, 2018.

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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

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 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 device complies with Canadian ICES-003 and part 15 of the FCC Rules.

Cet appareil numérique de la classe “A” est conforme à 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 Labelling (Electromagnetic Compatibility) Notice 2008.

Korea

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

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 GearLite 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 GearLite products are covered by a generous 3-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.

Company Address

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Introduction

This guide covers the installation, configuration, and use of the MUX-9258-A. The following chapters are included:

- “**Introduction**” summarizes the guide and provides important terms, and conventions.
- “**Before You Begin**” provides an overview of the features of the MUX-9258-A.
- “**Hardware Overview**” describes the MUX-9258-A hardware features and physical connections.
- “**Physical Installation**” provides instructions for the basic physical installation of the MUX-9258-A in your system.
- “**Cabling**” provides an overview of connecting external devices to the MUX-9258-A.
- “**Setup**” provides information for configuring the MUX-9258-A outputs.
- “**Warranty and Repair**” provides information on the warranty and repair policy for your MUX-9258-A.
- “**Technical Specifications**” provides the technical specifications for your MUX-9258-A.

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 **Edit** dialog, 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

Italic text is used to identify the titles of referenced guides, manuals, or documents. For example:

For more information, refer to the ***DAC-9516 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 select the **File** menu and then select **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 MUX-9258-A.

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 MUX-9258-A, contact us at the numbers listed in the section “**Contacting Technical Support**” on page 7. Our technical staff is always available for consultation, training, or service.

Overview

The MUX-9258-A provides a cost effective miniature solution to multiplex four AES/EBU digital audio signals into a 3G/HD/SD-SDI signal.

The MUX-9258-A accepts one SDI signal and provides one processed SDI output on BNC connectors. The four DIP switch assignable AES/EBU inputs are also provided on BNC connectors.

Five dual color LED indicators provide SDI and AES/EBU signal status information. The SDI LED will be illuminated green when a valid SDI signal is present at the input or illuminated red when no SDI signal is present. The A1, A2, A3, A4 LEDs will be illuminated green when an AES signal is present on inputs 1 through 4 respectively and available to be multiplexed into the SDI signal. These LEDs will remain off if no signal is present on the respective inputs.

Power to the MUX-9258-A is provided by an external AC adapter with locking DC connector supplied with the module.

Block Diagram

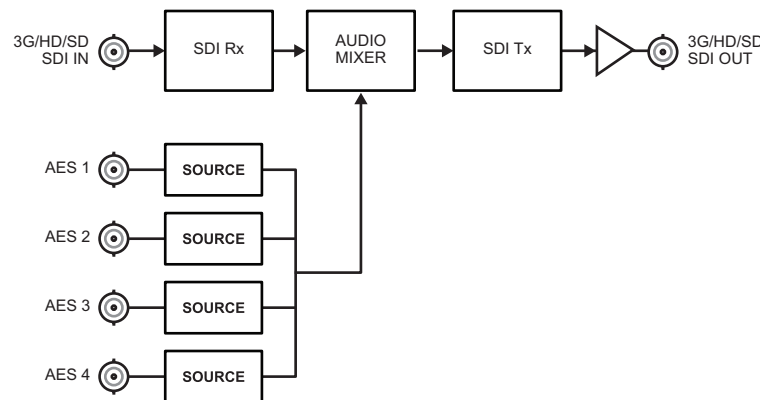


Figure 2.1 Simplified Block Diagram of MUX-9258-A Functions

Features

Some features of the MUX-9258-A include:

- Four BNC connectors for the AES inputs
- One BNC connector for the SDI input
- One BNC connector for the SDI output
- Supports SDI Data Rates of 270Mbps, 1.485Gbps, 2.97Gbps
- Supports AES3-id
- Small brick form factor
- 5V universal adapter with locking DC connector
- 3-year warranty

Hardware Overview

This chapter presents information on the MUX-9258-A hardware components and features.

Chassis Faceplate Overview

The chassis faceplate of the MUX-9258-A provides a silk-screen map of the connections available. **Figure 3.1** illustrates the MUX-9258-A faceplate label.

The chassis of the MUX-9258-A also includes status LEDs that display the status of SDI signal status, and audio status.

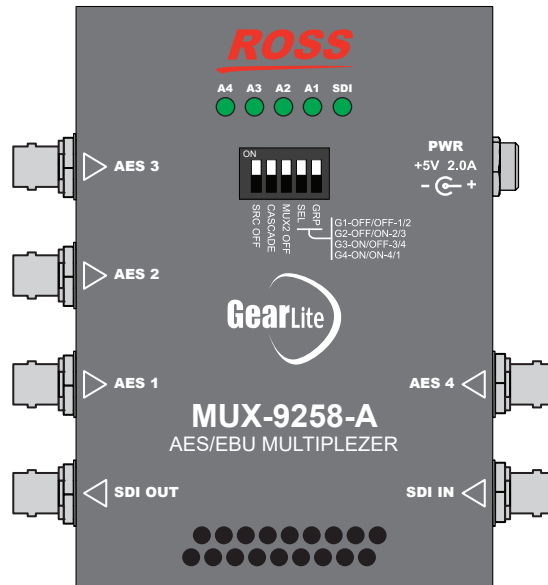


Figure 3.1 MUX-9258-A — Faceplate Label

POWER Connection

The MUX-9258-A has a standard miniature power jack (center pin positive) that connects to the PS-9000 power supply. (**Figure 3.2**)

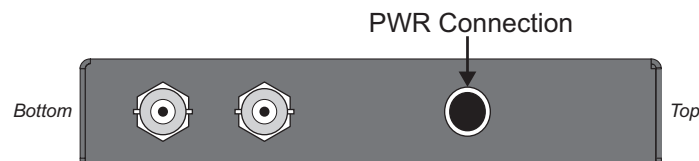


Figure 3.2 MUX-9258-A — PWR Connection

AES Input Connections

The MUX-9258-A provides three BNC connections for AES inputs on the left side of the module, and one AES input on the right side of the module. (**Figure 3.3** and **Figure 3.4**)

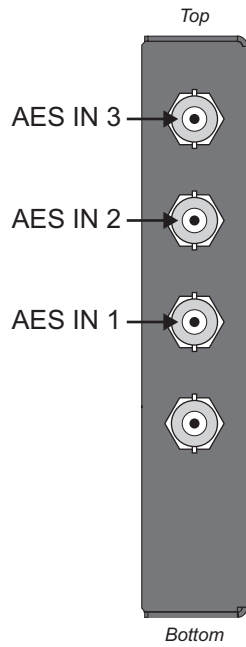


Figure 3.3 Left Side of Module — AES Inputs

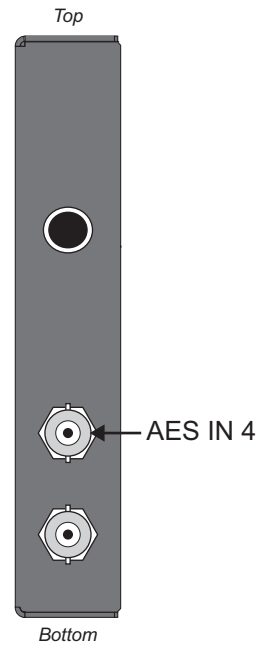


Figure 3.4 Right Side of Module — AES Inputs

SDI Connections

The MUX-9258-A provides a BNC for one SDI output and one SDI input. (**Figure 3.5** and **Figure 3.6**)

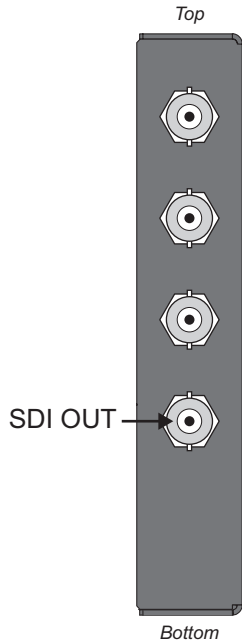


Figure 3.5 Left Side of Module — SDI Output

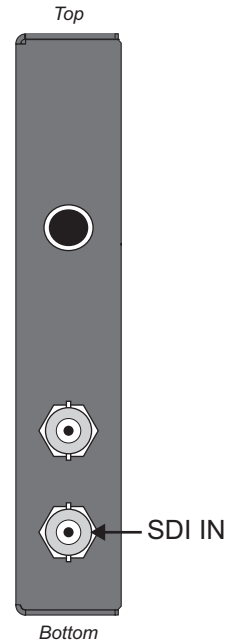


Figure 3.6 Right Side of Module — SDI Input

Signal Status LEDs

The chassis faceplate of the MUX-9258-A includes five LEDs that report the SDI and signal status information and the presence of audio. Refer to **Figure 3.7** for the LED locations.

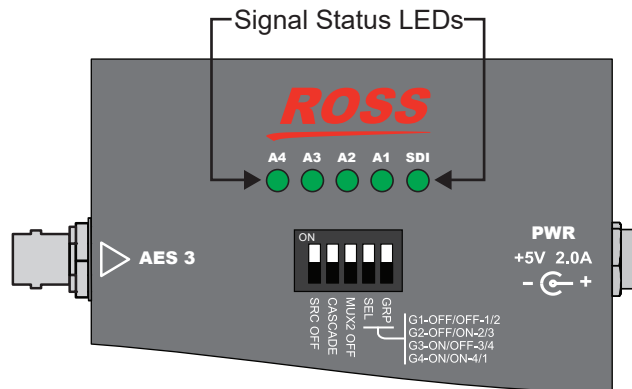


Figure 3.7 MUX-9258-A — Signal Status LEDs

Table 3.1 describes the behavior of the Signal Status LEDs.

Table 3.1 Status LEDs

Status	Description
A4	
Green	When lit green, this LED indicates an AES/EBU signal is present on AES IN 4
Off	When unlit, this LED indicates no AES/EBU signal present on AES IN 4
A3	
Green	When lit green, this LED indicates an AES/EBU signal is present on AES IN 3
Off	When unlit, this LED indicates no AES/EBU signal present on AES IN 3
A2	
Green	When lit green, this LED indicates an AES/EBU signal is present on AES IN 2
Off	When unlit, this LED indicates no AES/EBU signal present on AES IN 2
A1	
Green	When lit green, this LED indicates an AES/EBU signal is present on AES IN 1
Off	When unlit, this LED indicates no AES/EBU signal present on AES IN 1
SDI	
Green	When lit green, this LED indicates the MUX-9258-A is locked to a valid SDI signal
Off	When lit red, this LED indicates the MUX-9258-A is not locked to a valid SDI signal

DIP Switches

The MUX-9258-A provides a block of five DIP switches located on the front panel, near the top. These switches are used to configure the unit for various modes of operation (**Figure 3.8**)

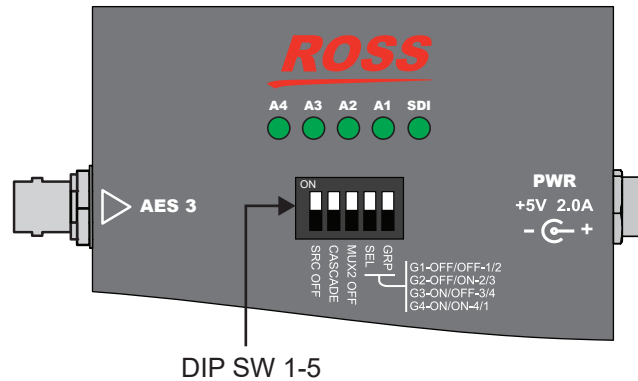


Figure 3.8 MUX-9258-A — DIP Switch Locations

For More Information on...

- setting the DIP Switches, refer to the section “**Using the DIP Switches**” on page 19.

Physical Installation

If you have questions pertaining to the installation of MUX-9258-A, please contact us at the numbers listed in the section “**Contacting Technical Support**” on page 7. Our technical staff is always available for consultation, training, or service.

For More Information on...

- the technical specifications for the MUX-9258-A, refer to the chapter “**Technical Specifications**” on page 23.

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.*

Mounting and Installation

The MUX-9258-A can be mounted in any convenient location. However, to ensure long life for this product, observe the following precautions and operating requirements:

- Maintain an ambient temperature of 20° to 40°C (68°F – 104°F).
- Allow for air circulation around the chassis for convectional cooling.

Many different mounting positions are possible with the included mounting hardware. Some installation options are permanent and require careful consideration of the final positioning before installation.

★ In some mounting locations, the power adapter must be affixed in a similar manner as the chassis.

Other possible options include the use of adhesive magnetic sheets (not included) affixed to the chassis and the power adapter, for removable mounting on metal cabinets etc.

Cable ties may be necessary in some applications to relieve strain on the mounting hardware and the connectors.

Surface Mount Strips

The included VELCRO® brand surface mount strips allow the GearLite module and power supply to be affixed to a permanent location during use and easily removed for adjustments. Carefully consider the installation location before proceeding; the adhesive is very aggressive and is not easily removed. The adhesive will cure fully in 24 hours.

To install the Surface Mount Strips

1. Remove the **Protective Backing Film** from the adhesive on the bottom of the two VELCRO® brand **Surface Mount Strips**.
- ★ A third VELCRO® brand **Surface Mount Strip** is available to mount the power adapter.
2. Adhere the **Surface Mount Strips** to the bottom side of the chassis **Figure 4.1**.

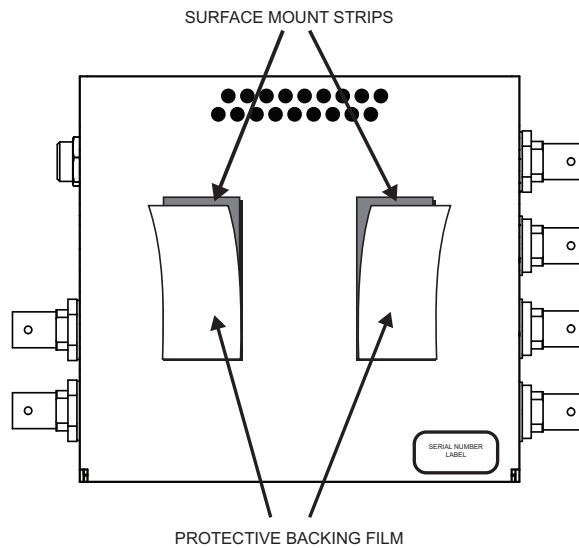


Figure 4.1 Surface Mount Installation Option

3. Remove the **Protective Backing Film** from the other side of the VELCRO® brand **Surface Mount Strips**.
4. Press the chassis into position on the surface you want to mount it to.

Non-Slip Pads

Four non-slip adhesive pads have been supplied for desktop placements. Simply remove the protective backing film from the adhesive and affix one non-slip pad to each of the four corners on the bottom of the chassis.

Cabling

This chapter provides an overview of connecting external devices to the MUX-9258-A.

AES Input Cabling

Refer to **Figure 5.1** for AES input cabling designations.

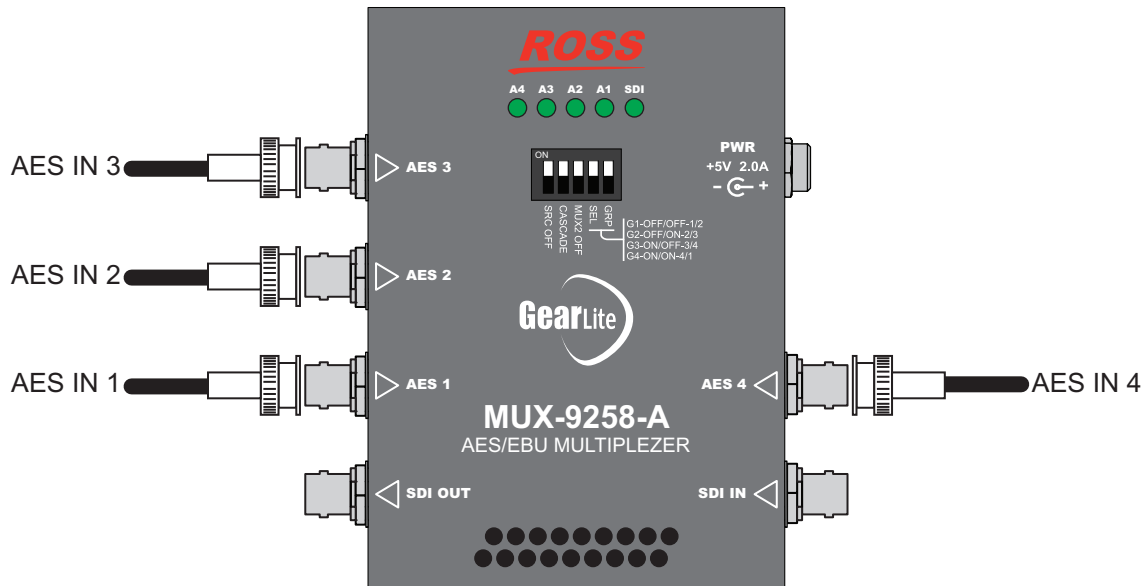


Figure 5.1 MUX-9258-A — AES IN Connections

SDI Cabling

Refer to **Figure 5.2** for SDI cabling designations.

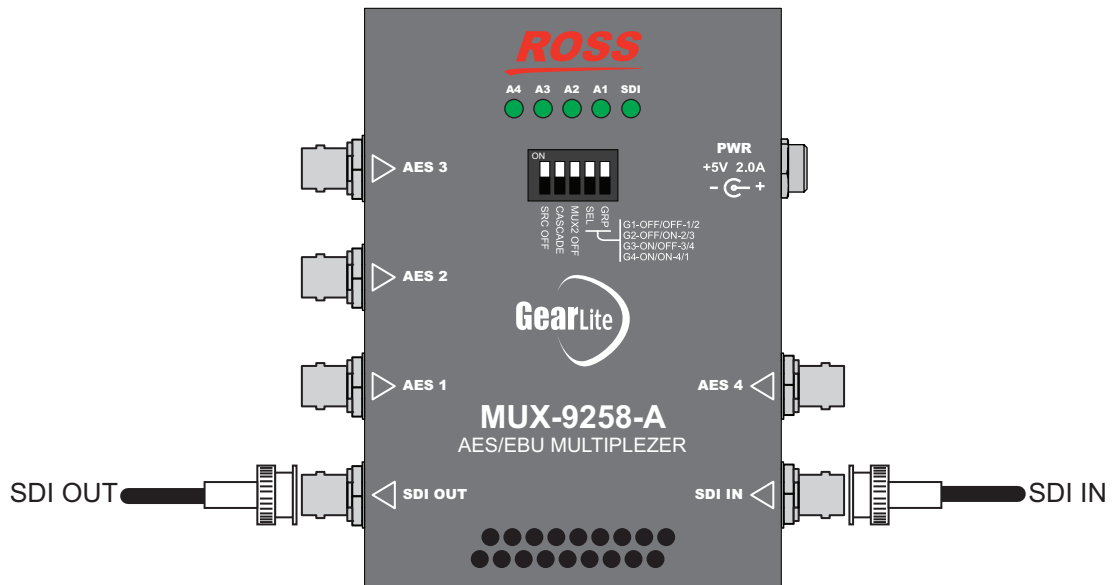


Figure 5.2 MUX-9258-A — SDI Connections

Power Adapter and Supply

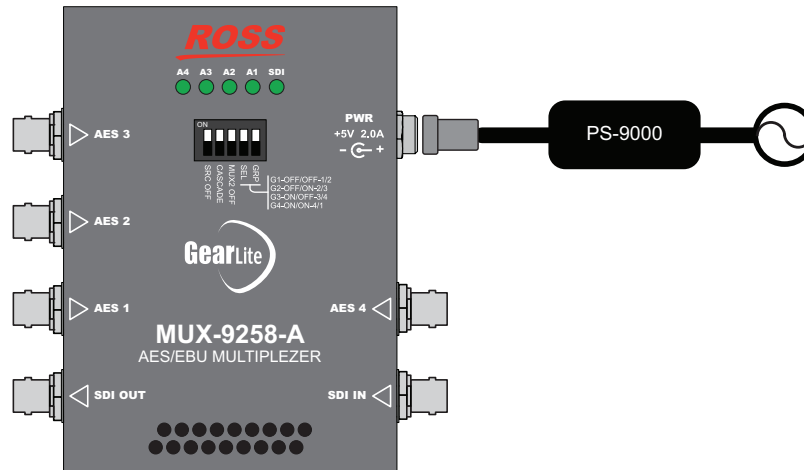
Connect the PS-9000 power adapter to the power supply connector. The PS-9000 provides regulated +5V DC (5%) @ up to 2A. The DC power cord has a locking connector that securely fastens into the power supply DC jack on the MUX-9258-A. The MUX-9258-A has a standard miniature power jack (center pin positive).



Caution — Use of improper adapters may damage the MUX-9258-A and will void the warranty.

To connect the MUX-9258-A to the PS-9000

1. Connect the female end of the PS-9000 cable into the socket marked **POWER** on the MUX-9258-A chassis.



Note: It is recommended that you always connect the PS-9000 to the MUX-9258-A before connecting to Mains Power.

Figure 5.3 MUX-9258-A — Power Connection

2. Connect the PS-9000 to Mains Power.

Setup

The DIP Switches on the bottom of the MUX-9258-A enable you to configure the audio groups, enable Sample rate Conversion, how to embed the audio, and configure the audio multiplexer.

For More Information on...

- the location of the DIP Switches, refer to the section “**DIP Switches**” on page 14.

Using the DIP Switches

Figure 6.1 shows the DIP Switches set in the ON (↑) position.

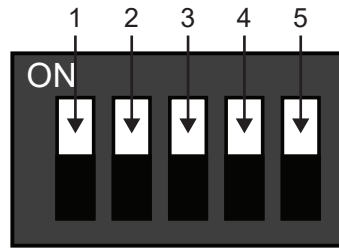


Figure 6.1 MUX-9258-A — DIP Switches

The following conventions are used:

- ↑ Set the DIP switch in the ON position
- ↓ Set the DIP Switch in the OFF position

Configuring the Audio Groups

Table 6.1 outlines how to use SW4 and SW5 in conjunction to assign the AES inputs to the audio groups.

Table 6.1 Audio Group Configuration

SW4	SW5	AES 1 and 2	AES 3 and 4
↓	↓	Group 1	Group 2
↓	↑	Group 2	Group 3
↑	↓	Group 3	Group 4
↑	↑	Group 4	Group 1

Enabling Sample Rate Conversion

Table 6.2 outlines how to configure SW1 to enable the 48kHz Sample Rate Converter (SRC).

Table 6.2 SRC Configuration

SW1	Description
↓	Enables the 48kHz SRC. This is the default.
↑	Disables the SRC on all four AES/EBU inputs. This allows for encoding of Dolby® encoded signals.

Audio Mode

Table 6.3 outlines how to configure **SW2** to specify the audio mode.

Table 6.3 Audio Mode Configuration

SW2	Description
↓	The MUX-9258-A strips all incoming audio from the signal before embedding the AES inputs. This is the default.
↑	The MUX-9258-A embeds the AES inputs as well as passing any audio in other groups.

Disabling MUX Group 2

Table 6.4 outlines how to configure **SW3** to enable or disable the second Group multiplexer.

Table 6.4 MUX2 Setup

SW3	Description
↓	The MUX-9258-A operates as a full two group multiplexer. This is the default.
↑	The MUX-9258-A operates as a single group multiplexer. MUX Group 2 is disabled.

Warranty and Repair

The MUX-9258-A is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of **THREE (3)** years from the date of delivery to the customer. In the event that your RossGear MUX-9258-A 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-9258-A 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 **THREE (3)** 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-9258-A User Manual provides all pertinent information for the safe installation and operation of your RossGear Product. Ross Video policy dictates that all repairs to the MUX-9258-A 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-9258-A, 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-9258-A. If required, a temporary replacement module 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.

Technical Specifications

This chapter provides technical information for MUX-9258-A.

★ Specifications are subject to change without notice.

SDI Input and Output

Table 8.1 Technical Specifications — SDI Input and Output

Item	Specifications
Standards Accommodated	SMPTE 259M
	SMPTE 292M
	SMPTE 424M
Level	800mV p-p +/- 10%
SDI Data Rates	270Mbps
	1.485Gbps
	2.97Gbps
Impedance	75ohm
Input Cable Equalization	>50m Belden 1694A cable to 2.97Gbps
Return Loss	>10dB @ 2.97Gbps

AES/EBU Inputs

Table 8.2 Technical Specifications — AES/EBU Inputs

Item	Specifications
Standards Accommodated	AES3-id
Level	1V p-p nominal
Sample Frequency	32kHz to 96kHz when SRC is enabled
Impedance	75ohm

Power

Table 8.3 Technical Specifications — Power

Item	Specifications
Required Voltage	+5v DC
Power Consumption	>4W

Dimensions

Table 8.4 Technical Specifications — Dimensions

Item	Specifications
Physical Dimensions	3.938" x 2.625" x 0.813" (10cm x 6.70cm x 2.10cm)
Weight	7.8oz (221g)