



SHC-9642 User Guide

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 - 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
dross@rossvideo.com

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.)*

SHC-9642 · User Guide

- Ross Part Number: **9642DR-004-06**
- Release Date: May 14, 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.

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.

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Introduction

This guide covers the installation, configuration, and use of the SHC-9642. The following chapters are included:

- “**Introduction**” summarizes the guide and provides important terms, and conventions.
- “**Before You Begin**” provides an overview of the SHC-9642 features.
- “**Hardware Overview**” describes the SHC-9642 hardware and physical connections.
- “**Physical Installation**” provides instructions for the basic physical installation of the SHC-9642 in your system.
- “**Cabling**” provides an overview of connecting external devices to the SHC-9642.
- “**Configuration**” provides information on the setup requirements for the SHC-9642.
- “**Warranty and Repair**” provides information on the warranty and repair policy for your SHC-9642.
- “**Technical Specifications**” provides the technical specifications for your SHC-9642.
- “**Software Licenses**” provides third-party software license information for your SHC-9642.

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 SHC-9642.

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 SHC-9642, 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 SHC-9642 SDI to HDMI Converter is a high-quality signal conversion solution within the family of GearLite compact, self-contained modular products. The SHC-9642 is the ideal solution for converting an SDI input signal to output an HDMI Type A signal to another device.

A universal power adapter and line cord, suitable for the country of use, is supplied with each module. Various mounting options are included that enable a wide range of installation choices.

Block Diagram

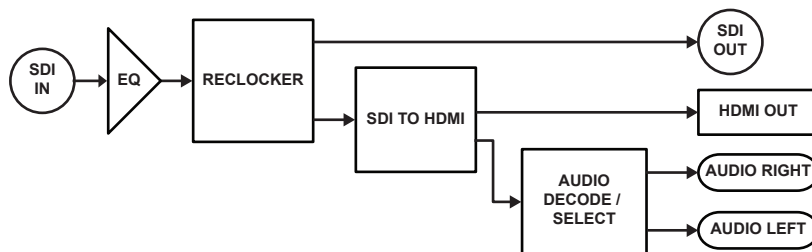


Figure 2.1 Simplified Block Diagram of SHC-9642 Functions

Features

Some features of the SHC-9642 include:

- One HDMI Type A connector
- One BNC connector for an SDI input
- One BNC connector for a reclocked SDI output
- One USB port for upgrades
- Two RCA connectors for analog audio output
- Supports major SDI formats up to 1080p 60Hz
- Automatically applies correct color spaces for SD, HD, and 3G video formats
- User-selectable RGB and YCbCr output
- User-selectable HDMI or DVI formatting, allowing use with a wide variety of monitors
- Power and SDI Input Status indicator LEDs
- Small brick form factor
- 5V universal adapter with locking DC connector
- 3-year warranty

Hardware Overview

This chapter presents information on the SHC-9642 hardware components and features.

Chassis Faceplate Overview

The chassis faceplate of the SHC-9642 provides a silk-screen map of the connections available. **Figure 3.1** illustrates the SHC-9642 faceplate label.

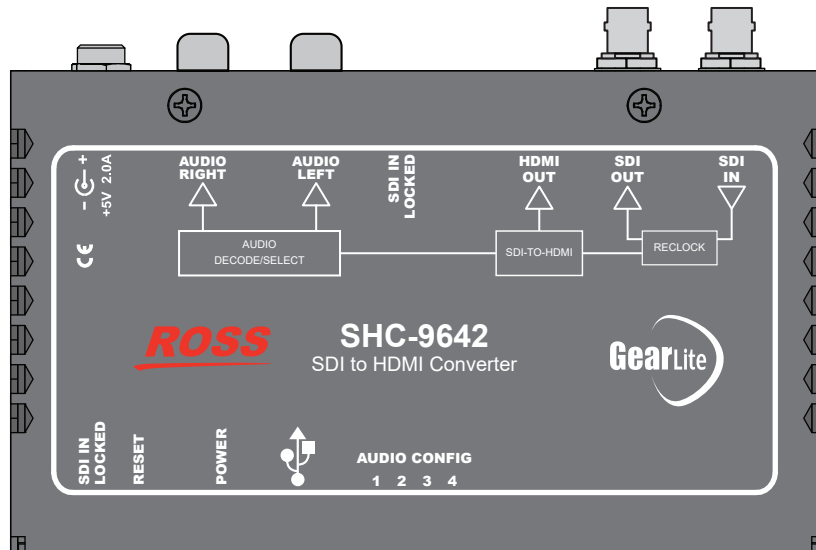


Figure 3.1 SHC-9642 — Faceplate Label

POWER Connection

The SHC-9642 has a standard miniature power jack (center pin positive) that connects to the PS-9000 power supply. (**Figure 3.2**)

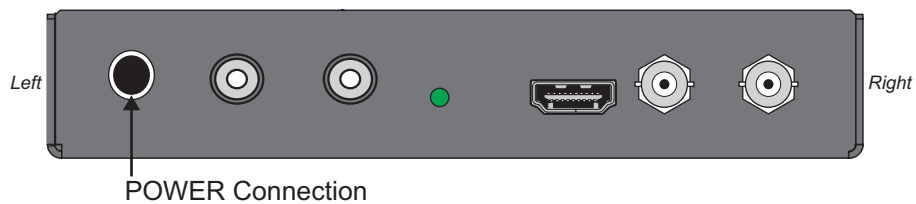


Figure 3.2 SHC-9642 (Top) — POWER Connection

For More Information on...

- connecting to the PS-9000, refer to the section “**Power Adapter and Supply**” on page 20.

Power Status LED

Refer to **Figure 3.3** for the location of the POWER status LED.

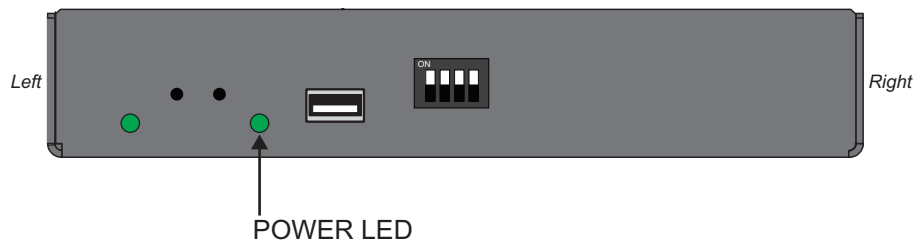


Figure 3.3 SHC-9642 (Bottom) — POWER LED

Table 3.1 describes the behavior the POWER LED.

Table 3.1 POWER Status LED

Status	Description
Green	When this LED is continually lit, power is supplied to the SHC-9642 and the module is operating correctly.
Red	When this LED is lit red: <ul style="list-style-type: none"> • an error is occurring or, • the SHC-9642 is currently in Upgrade Software mode
Off	If this LED is unlit, power is not supplied to the SHC-9642. Verify the cable.

ANALOG Audio Connections

The SHC-9642 provides two analog audio RCA outputs that can be connected to a line-level amplifier or receiver input. (Figure 3.4)

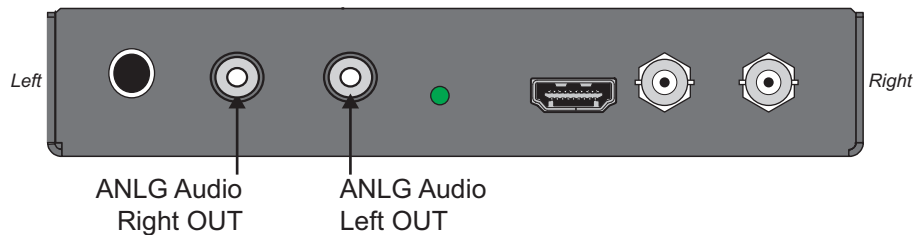


Figure 3.4 SHC-9642 (Top) — Analog Audio Output Connections

HDMI Output Connection

The SHC-9642 provides a single HDMI Type A output connector. (Figure 3.5)

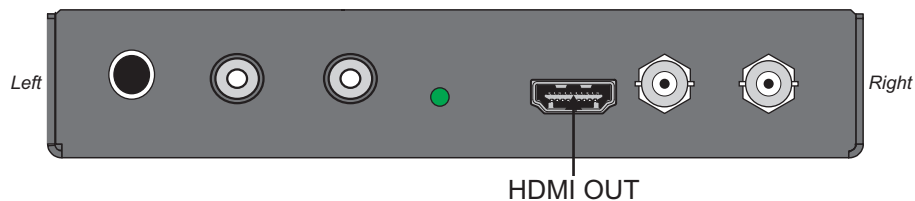


Figure 3.5 SHC-9642 (Top) — HDMI Connection

SDI Connections

The SHC-9642 provides a one SDI input connector and one SDI output connection. (Figure 3.6)

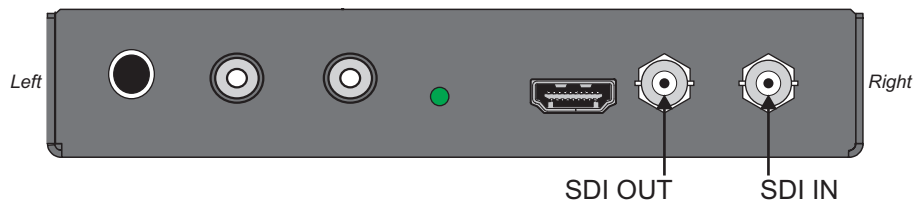


Figure 3.6 SHC-9642 (Top) — SDI Connections

SDI IN LOCKED LED

Refer to **Figure 3.7** for the location of the SDI IN LOCKED status LED on the bottom of the module.

★ The SDI IN LOCKED LED located on the top of the module reports the same information as described in **Table 3.1**.

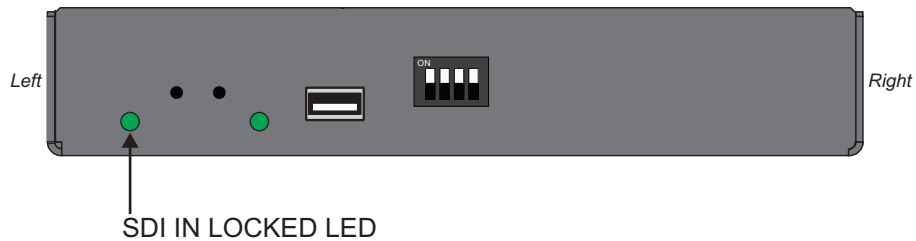


Figure 3.7 SHC-9642 (Bottom) — SDI IN LOCKED LED

Table 3.1 describes the behavior the SDI IN LOCKED LED.

Table 3.2 SDI IN LOCKED Status LED

Status	Description
Green	When this LED is continually lit, the SHC-9642 determines that there is a valid SDI signal on the input.

USB Port

The SHC-9642 provides a one USB port that is used to upgrade the SHC-9642 software. (**Figure 3.5**)

★ Contact Ross Video Technical Support for upgrade instructions.

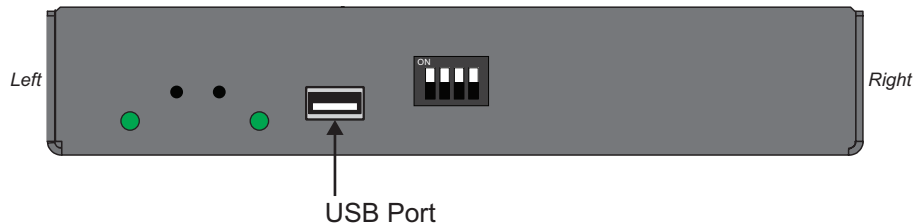


Figure 3.8 SHC-9642 (Bottom) — USB Port

DIP Switches

The SHC-9642 provides a block of four DIP Switches that are used to configuring the HDMI output audio channels and specify the HDMI output mode. (**Figure 3.9**)

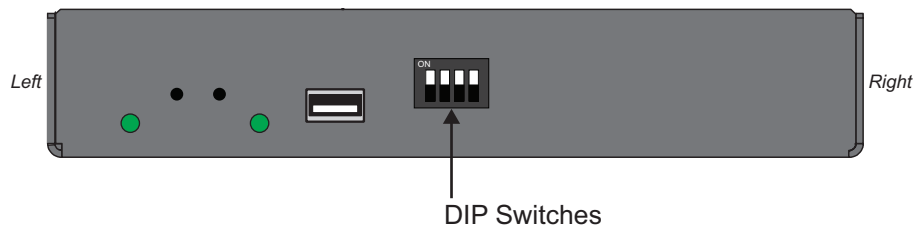


Figure 3.9 SHC-9642 (Bottom) — DIP Switches

Reset Button

The SHC-9642 provides a **Reset** button that is used to reboot the internal microprocessor in the SHC-9642. This should not be necessary under normal circumstances, but is available if the SHC-9642 no longer responds to changing DIP Switch settings or input changes. Similar results can also be achieved by cycling power to the SHC-9642.

Refer to **Figure 3.10** for the **Reset** button location.

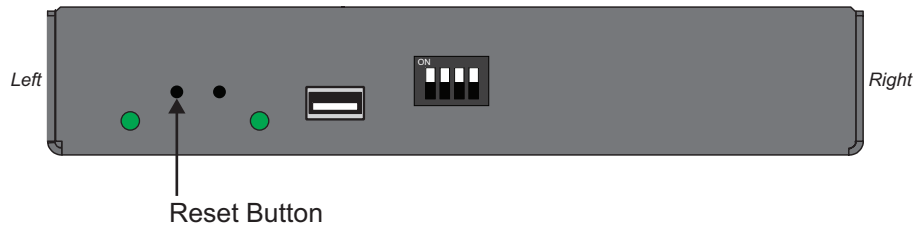


Figure 3.10 SHC-9642 (Bottom) — Reset Button

Physical Installation

If you have questions pertaining to the installation of SHC-9642, 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 SHC-9642, refer to the chapter “**Technical Specifications**” on page 27.

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 SHC-9642 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**.

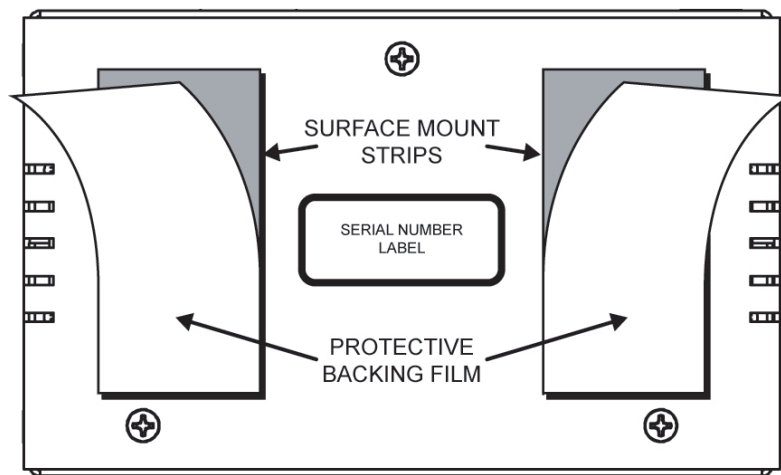


Figure 4.1 Surface Mount Installation Option

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.

Flat Metal Plate

Use the flat metal plate for permanent mounting to a rack, a desk, or any other location where bolts or screws can be applied. Be sure to position the module to allow for operator adjustments, if required.

★ Mounting screws are not provided by Ross Video.

To install the Flat Metal Plate

1. Remove the **2** screws from the bottom of the chassis.
2. Install the **Flat Metal Plate** onto the bottom of the chassis **Figure 4.2** using the screws removed in **Step 1**.

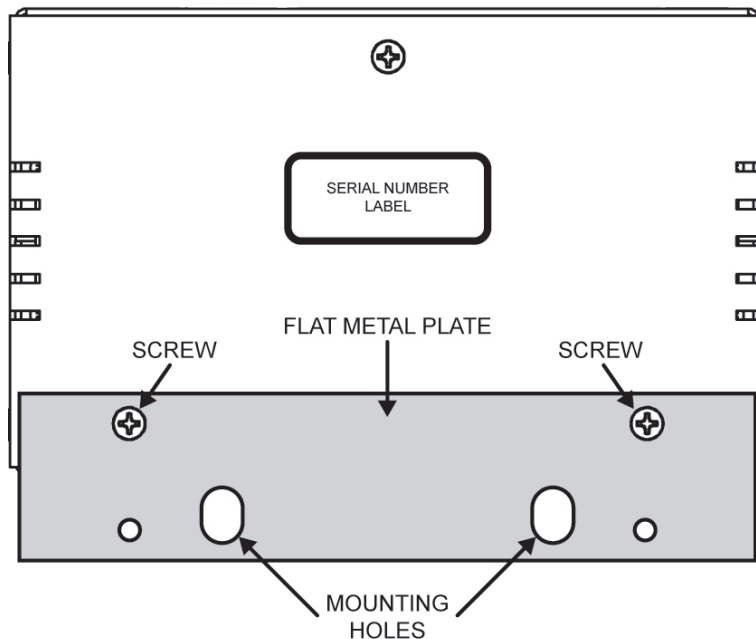


Figure 4.2 Flat Metal Plate Installation Option

3. Install the chassis in the desired location using the **Mounting Holes** on the **Flat Metal Plate**.

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.

Optional Mounting Accessories

Ross Video is committed to providing practical solutions for the needs of your high-quality broadcast facility. The following products may be ordered separately to expand your installation options.

BPM-9000

The BPM-9000 Angle Mounting Bracket (**Figure 4.3**) allows a single GearLite module to be installed in positions not possible with the flat metal plate. The bracket has a 90° angle.

★ Mounting screws are not provided by Ross Video.

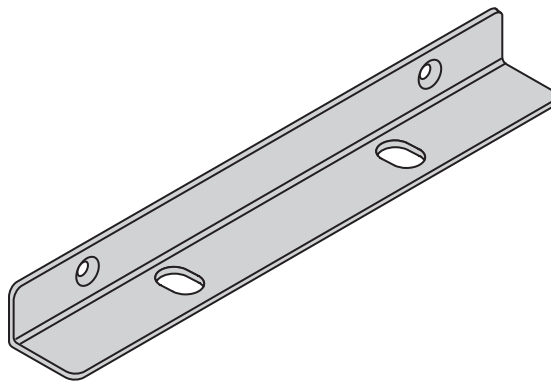


Figure 4.3 BPM-9000 90° Mounting Bracket

Cabling

This chapter provides information on connecting the SHC-9642 to external devices.

There are five connections to the SHC-9642:

- An HDMI Type A output
 - A BNC jack for the SDI input
 - A BNC jack for the SDI output
 - Two RCA connections for Analog Audio output
 - A power supply connection to the GearLite PS-9000 power adapter
- ★ It is not necessary to terminate unused outputs.

Connecting to an HDMI Monitor

Connect the HDMI output cable to the SHC-9642 according to the designations indicated on the chassis label and **Figure 5.1**.

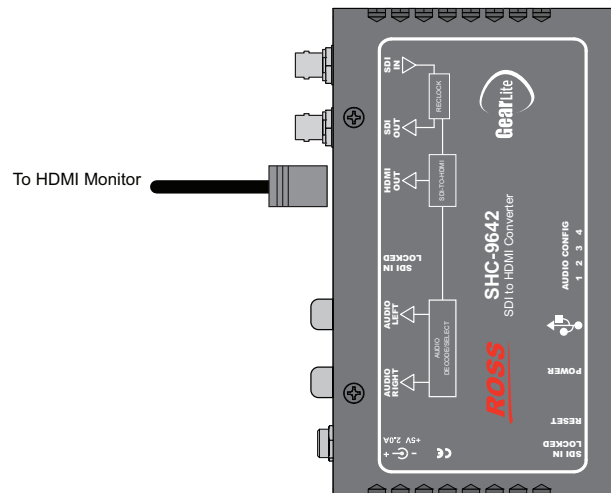


Figure 5.1 Cabling — HDMI Output

Proceed to the section “**Specifying the HDMI Output Mode**” on page 23 to specify the HDMI output mode.

Cabling the SDI Signals

Connect the SDI source to the SDI IN BNC. Once the input source is successfully detected, the SDI IN LOCKED LED will light solid green. If required, connect the SDI OUT BNC to the downstream SDI external device. (**Figure 5.2**)

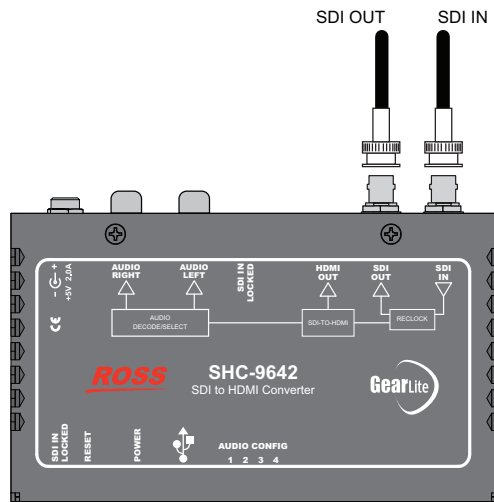


Figure 5.2 Cabling — SDI Connections

Cabling the Analog Audio Outputs

Optionally, connect the two analog audio RCA outputs to a line-level amplifier or receiver input. (Figure 5.3)

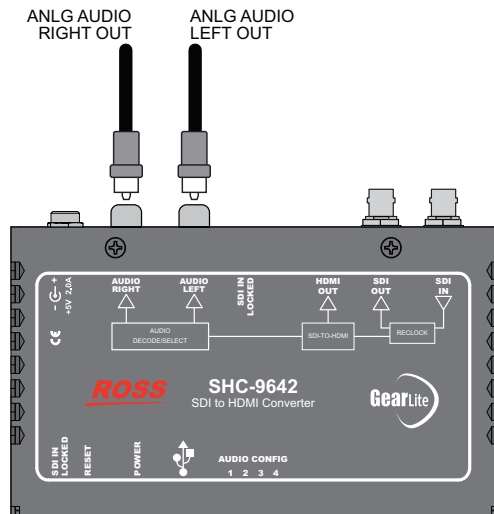


Figure 5.3 Cabling — Analog Audio Outputs

Proceed to the section “Configuring the HDMI Audio Channels” on page 23 to specify the audio output mode.

Power Adapter and Supply

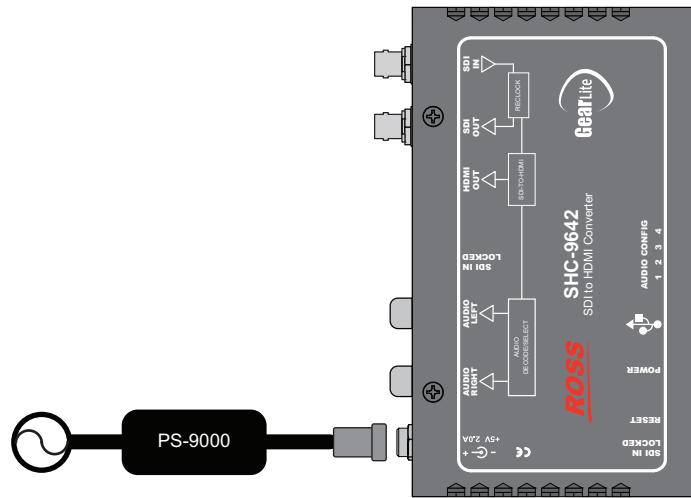
Connect the PS-9000 power adapter to the power supply connector. The PS-9000 provides regulated +5V DC (5%) @ up to 2A. The DC power cord has a locking connector that securely fastens into the power supply DC jack on the SHC-9642. The SHC-9642 has a standard miniature power jack (center pin positive).



Caution — Use of improper adapters may damage the SHC-9642 and will void the warranty.

To connect the SHC-9642 to the PS-9000

1. Connect the female end of the provided PS-9000 cable into the socket marked **POWER** on the SHC-9642 chassis.



Note: It is recommended that you always connect the PS-9000 to the SHC-9642 before connecting to Mains Power.

Figure 5.4 SHC-9642 — Power Connection

2. Connect the PS-9000 to Mains Power.

Configuration

The SHC-9642 includes four DIP Switches located on the bottom of the module. These switches are used to configure the SHC-9642 as outlined in this chapter.

Before You Begin

SW1 to **SW4** are set in the UP (↑) position by default as illustrated in “**DIP Switches**” on page 13. This configures the SHC-9642 as follows:

- Specifies the HDMI output as RGB 4:4:4, with HDMI formatting
- Analog audio Channels 1-2 are routed to the outputs

Configuring the HDMI Audio Channels

Table 6.1 outlines how to set **SW1** and **SW2** for audio output and the following conventions are used:

- ↑ Set the DIP switch in the UP position
- ↓ Set the DIP Switch in the DOWN position

Table 6.1 Audio Config — DIP Switch Positions

HDMI Audio	SW1	SW2	Analog Audio Out
CH 1-8	↑*	↑*	CH 1, 2
	↑	↓	CH 3, 4
	↓	↑	CH 5, 6
	↓	↓	CH 7, 8

*= Default setting

Specifying the HDMI Output Mode

Table 6.2 outlines how to set **SW3** and **SW4** to specify the HDMI output mode.

★ DVI settings require a passive HDMI-DVI adapter.

Table 6.2 HDMI Output Configuration

SW3	SW4	HDMI Output
↑*	↑*	RGB 4:4:4 HDMI format / 8-channel audio
↑	↓	YCbCr 4:4:4 HDMI format / 8-channel audio
↓	↑	RGB 4:4:4 DVI format
↓	↓	RGB 4:4:4 HDMI / 2-channel audio ^a

*= Default setting

a. While this format only supports two digital audio channels, all the audio channels are available on the analog audio output.

HDMI Operation Notes

This section provides additional information when using the HDMI output of the SHC-9642.

Video Formats

The SHC-9642 produces the same video format at its HDMI output as you apply to the SDI input. It performs no scaling or other modification of the image. If there is no image displayed on your HDMI monitor, or the image is unstable, the most likely cause is that the monitor is incapable of displaying the video format that is present in your SDI signal. The display may also have an unexpected appearance, or no image at all, if the SHC-9642 is set for YCbCr and the monitor does not support this mode.

For More Information on...

- the formats that the SHC-9642 can convert, refer to the chapter “**Technical Specifications**” on page 27.

Closed Captioning

The HDMI interface does not transport closed captioning data. If you wish to review open captions in the HDMI output of the SHC-9642, you need to install an SDI VANC caption decoder in the SDI path leading to the SHC-9642. The SHC-9642 will display the captions that are already keyed into the video by the decoder.

Warranty and Repair

The SHC-9642 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 SHC-9642 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 SHC-9642 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 SHC-9642 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 SHC-9642 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 SHC-9642, 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 SHC-9642. 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 SHC-9642.

★ Specifications are subject to change without notice.

SDI Input and Output

Table 8.1 Technical Specifications — SDI Input and Output

Item	Specifications
Transmission Standards	SMPTE 259M
	SMPTE 292M
	SMPTE 424M
Input Voltage	800mV p-p (typical)
	950mV maximum
SDI Data Rate	270MHz/1.485GHz/2.97GHz (auto-selecting)
Impedance	75ohm (input terminating)
Input Cable Equalization	>80m of Belden 1694A cable to 2.97GHz
Return Loss	>15dB to 1.48GHz
	>10dB to 2.97GHz

HDMI Output

★ Standard set by SDI output.

Table 8.2 Technical Specifications — HDMI Output

Item	Specifications
SD Standards Accommodated	525i, 625i
HD Standards Accommodated	720p (50/59.94/60)
	1080i (50/59.94/60)
	1080p (23.98/24/30)
3G Standards Accommodated	1080p (50/59.94/60)
Output Color Space	RGB 4:4:4 or YCbCr 4:4:4

Analog Audio Outputs

Table 8.3 Technical Specifications — Analog Audio Outputs

Item	Specifications
Output Level	-10dBV, unbalanced
Sampling Rate	48KHz

USB Port

Table 8.4 Technical Specifications — USB Port

Item	Specifications
Connector Type	Mini-B, receptacle

Power

Table 8.5 Technical Specifications — Power

Item	Specifications
Required Voltage	+5V DC (5% regulation)
Current Consumption	500mA typical
Total Power	2.5W typical

Environment

Table 8.6 Technical Specifications — Environment

Item	Specifications
Thermal Environment	0°C – 40°C (32°F – 104°F) ambient, non-condensing

Dimensions

Table 8.7 Technical Specifications — Dimensions

Item	Specifications
Physical Dimensions	4.0" x 5.65" x 1.25" (10.16cm x 14.35cm x 3.18cm)
Weight	15oz (425g)

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