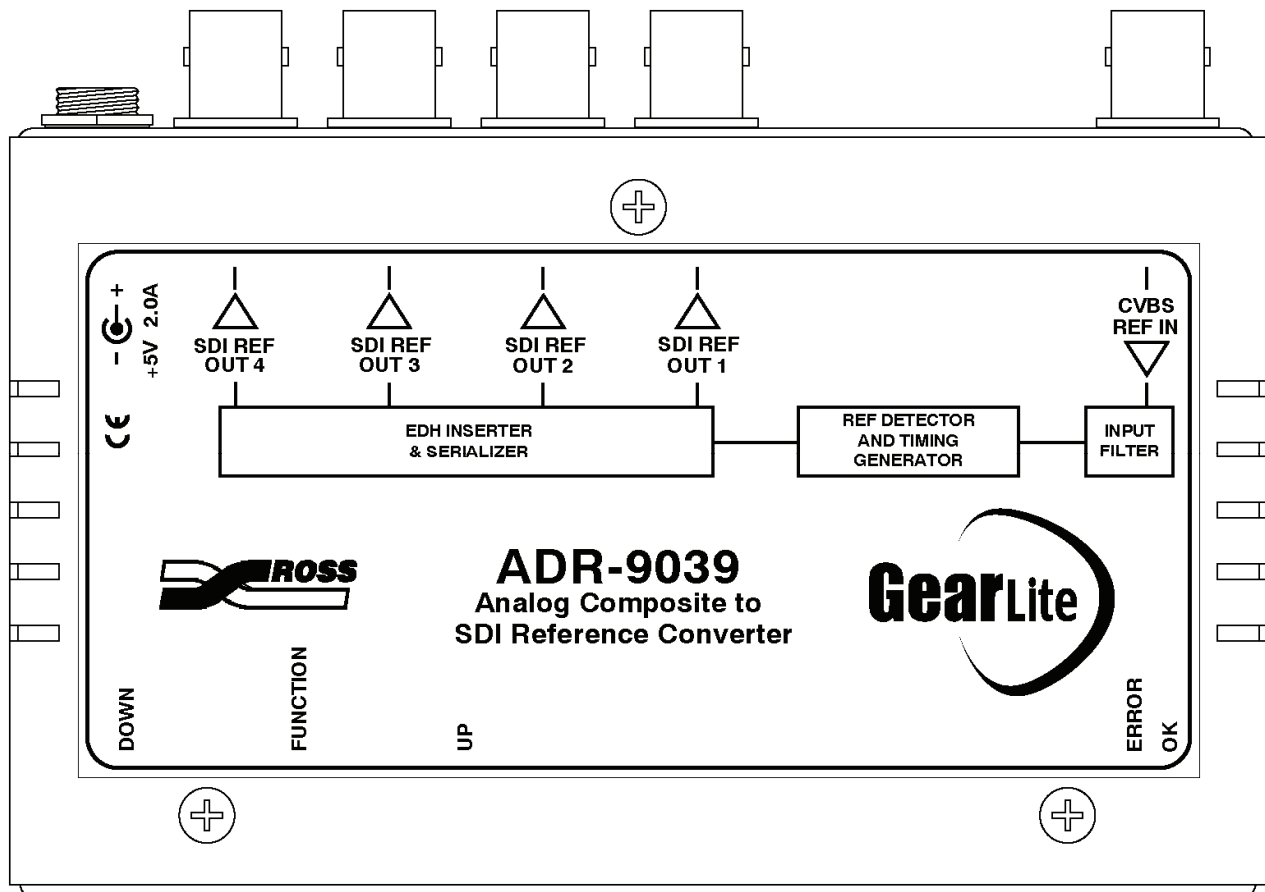




ADR-9039

Analog Composite to SDI Reference Converter

User Manual



Ross Part Number: 9039DR-004

Issue: 04B

ROSS
Live Production Technology™

ADR-9039 • Analog Composite to SDI Reference Converter User Manual

- Ross Part Number: **9039DR-004**
- Document Issue: **04B**
- Printing Date: January 28, 2009. Printed in Canada.

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Important Regulatory and Safety Notices to Service Personnel

Before using this product and any associated equipment, refer to the “Important Safety Instructions” listed below so as to avoid personnel injury and to prevent product damage.

Products may require specific equipment, and /or installation procedures 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



Warning

This 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.



Notice

This symbol with the word “**Notice**” within the equipment manual indicates a 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
Suscep-
tibility**

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



Warning

Read these instructions.

Keep these instructions.

Heed all warnings.

Follow all instructions.

The safe operation of this product requires that a protective earth connection be provided. A grounding conductor in the equipment's supply cord provides this protective earth. To reduce the risk of electrical shock to the operator and service personnel, this ground conductor must be connected to an earthed ground.

Do not defeat the safety purpose of the grounding-type plug. A grounding type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit in to your outlet, consult an electrician for replacement of the obsolete outlet. Protect the power cord from being walked on or pinching particularly at plugs, convenience receptacles, and point where they exit from the apparatus.

Use only power cords specified for this product and certified for the country of use. Refer to the Product Power Cord Requirement Section that follows.

Indoor Use: “WARNING – TO REDUCE THE RISK OF FIRE OR

ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE”

Do not block ventilation openings. Install in accordance with manufacturer’s instructions.

Do not install near heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

Do not use this apparatus near water.

Only use attachments/accessories specified by the manufacturer.

Unplug this apparatus during lightning storms or when unused for long periods of time.

Clean only with a dry cloth.

To avoid electrical shock, disconnect the A/C power cord before any servicing.

Refer all servicing to qualified personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug damage, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

EMC Notices

US FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.



Notice

Changes or modifications to this equipment not expressly approved by Ross Video Ltd. could void the user’s authority to operate this equipment.

CANADA

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

Cet appareil numérique de classe “A” est conforme à 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

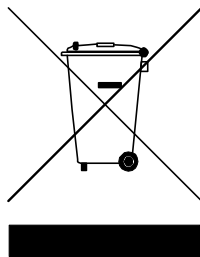
Routine maintenance to this GearLite product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the “Contact Us” section on the last page of this manual. All RossGear GearLite 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 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 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.



Contents

Introduction	1-1
In This Chapter.....	1-1
Overview.....	1-1
Functional Block Diagram.....	1-2
Features.....	1-2
Installation	2-1
In This Chapter.....	2-1
Static Discharge.....	2-1
Unpacking.....	2-1
Mounting and Installation.....	2-2
Velcro Strips.....	2-2
Flat Metal Plate.....	2-4
Non-Slip Pads.....	2-4
Optional Mounting Accessories.....	2-5
Setup and Operation	3-1
In This Chapter.....	3-1
Cable Connections.....	3-1
Power Adaptor and Supply.....	3-2
User Controls.....	3-3
Setup and Configuration.....	3-5
Function Setup and Configuration Menu Table.....	3-6
Function Menu Notes.....	3-8
Specifications	4-1
In This Chapter.....	4-1
Technical Specifications.....	4-2
Service Information	5-1
In This Chapter.....	5-1
Warranty and Repair Policy.....	5-1
Ordering Information	6-1
In This Chapter.....	6-1

Introduction

In This Chapter

This chapter contains the following sections:

- Overview
- Functional Block Diagrams
- Features

Overview

The **ADR-9039 Analog Composite to SDI Reference Converter** is a high-quality reference conversion solution within the growing family of GearLite compact, self-contained modular products. Supporting 525 and 625 analog composite video reference, the ADR-9039 is the ideal analog to SDI reference converter for virtually all composite reference to digital reference conversion requirements.

The ADR-9039 provides high-quality digital black reference into four separate 270Mb/s SDI coaxial outputs. Timing adjustment controls on the front edge enable output timing to be adjusted over one full frame. The chassis front edge also provides power, error, and function LEDs for visual reference.

A universal power adaptor 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.

The GearLite ADR-9039 is a high-quality analog to SDI reference converter making it a perfect solution for existing analog facilities in a growing SDI world.

Functional Block Diagram

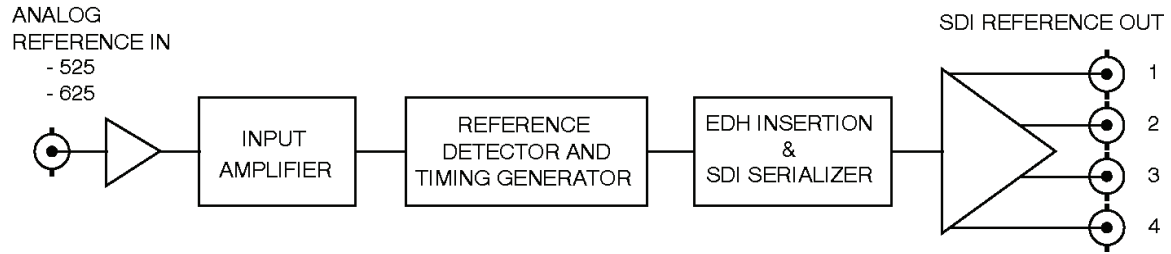


Figure 1. Simplified Block Diagram of ADR-9039 Functions

Features

The ADR-9039 Analog Composite to SDI Reference Converter has the following features:

- Supports 525 and 625 composite analog video input signals
- Output timing adjustable from 0 to 1 frame
- Horizontal and Vertical timing adjustable
- 4 SDI outputs
- Low jitter
- Input and Error status indicator LEDs
- Small brick form factor
- 5V universal adapter with locking DC connector
- 3-year warranty

Installation

In This Chapter

This chapter contains the following sections:

- Static Discharge
- Unpacking
- Mounting and Installation
- Velcro Strips
- Flat Metal Plate
- Non-Slip Pads
- Optional Mounting Accessories

Static Discharge

Whenever handling the ADR-9039 Analog Composite to SDI Reference Converter and other related equipment, please observe all static discharge precautions as described in the following note:



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

Unpacking

Unpack each ADR-9039 module you received from the shipping container and check the contents against the packing list to ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video directly.

Mounting and Installation

The GearLite 9000 series self-contained modules can be mounted in any convenient location. However, to ensure long life for these products, observe the following precautions and operating requirements:

- Maintain an ambient temperature of 20° to 40°C.
- 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. Please note that in some mounting locations, the power adaptor 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 adaptor, for removable mounting on metal cabinets etc.

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

Velcro Strips

The included Velcro 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.

Installing Velcro Strips

1. To mount the module, remove the protective backing film from the adhesive on the bottom of the two mating Velcro strip sets.
2. Adhere the strip sets to the bottom side of the module as shown in Figure 2.

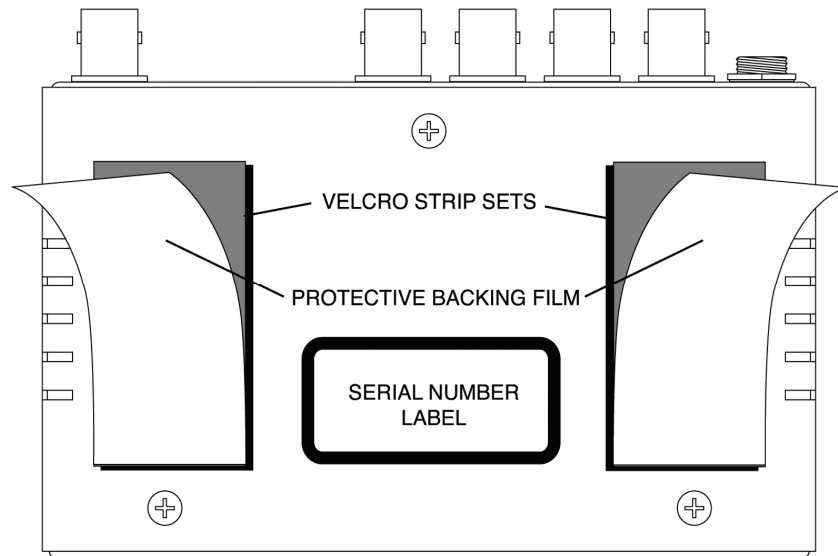


Figure 2. Velcro Installation Option

3. To apply the adhesive Velcro to the mounting location:
 - remove the protective backing film from the top of the adhesive strips
 - press the module into position on the mounting surface
4. To mount the power adaptor, apply the remaining mating Velcro strip set, repeating the previous steps.

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.

Installing the Flat Metal Plate

1. Affix the flat metal plate to the bottom of the module using the chassis screws as shown in Figure 3.

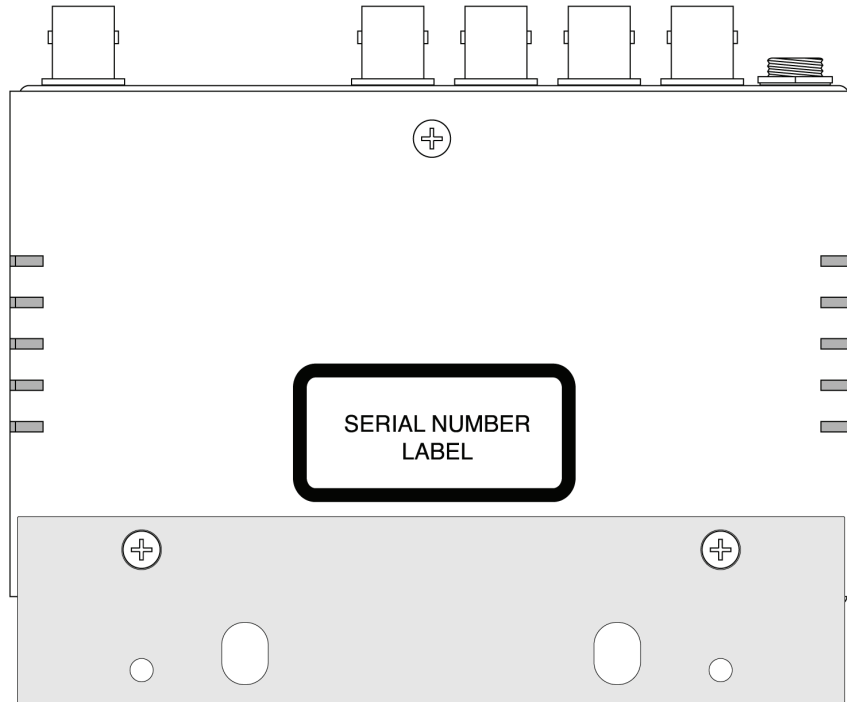


Figure 3. Flat Metal Plate Installation Option

2. Affix the metal plate by the two extended holes to the desired location with customer supplied bolts or screws according to the installation requirements.

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. Two pads can be used at the rear of the module to help support it when mounted in the GRF-9000 GearLite Rack Frame (see Optional Mounting Accessories).

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. Refer to Chapter 6, “**Ordering Information**” for details.

BPM-9000

The BPM-9000 Angle Mounting Bracket enables a single GearLite module to be installed in positions not possible with the flat metal plate. The installer must provide screws or bolts for installing in the desired location. The bracket has a 90° angle.

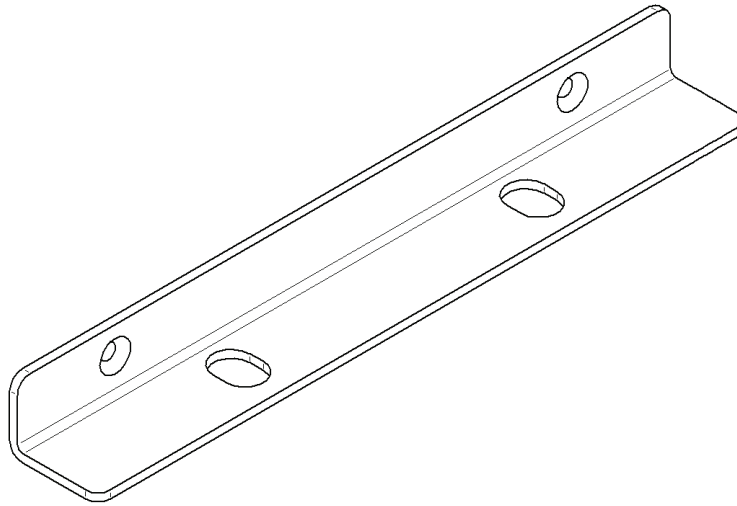


Figure 4. BPM-9000 90° Mounting Bracket

GRF-9000

The GRF-9000 GearLite Rack Frame is a rack mounting frame system for GearLite modules. The mounting system provides convenient organization for up to nine GearLite modules in only a 2RU space.

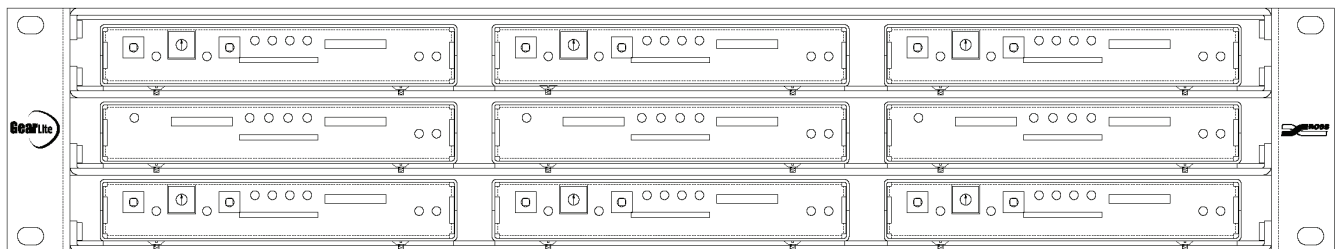


Figure 5. GRF-9000 with Nine GearLite Modules Installed

The flat metal plate and small plastic label (see Figure 6) included with every GearLite module are used to mount a module into the GRF-9000. Complete instructions are included in the GRF-9000 User Manual.

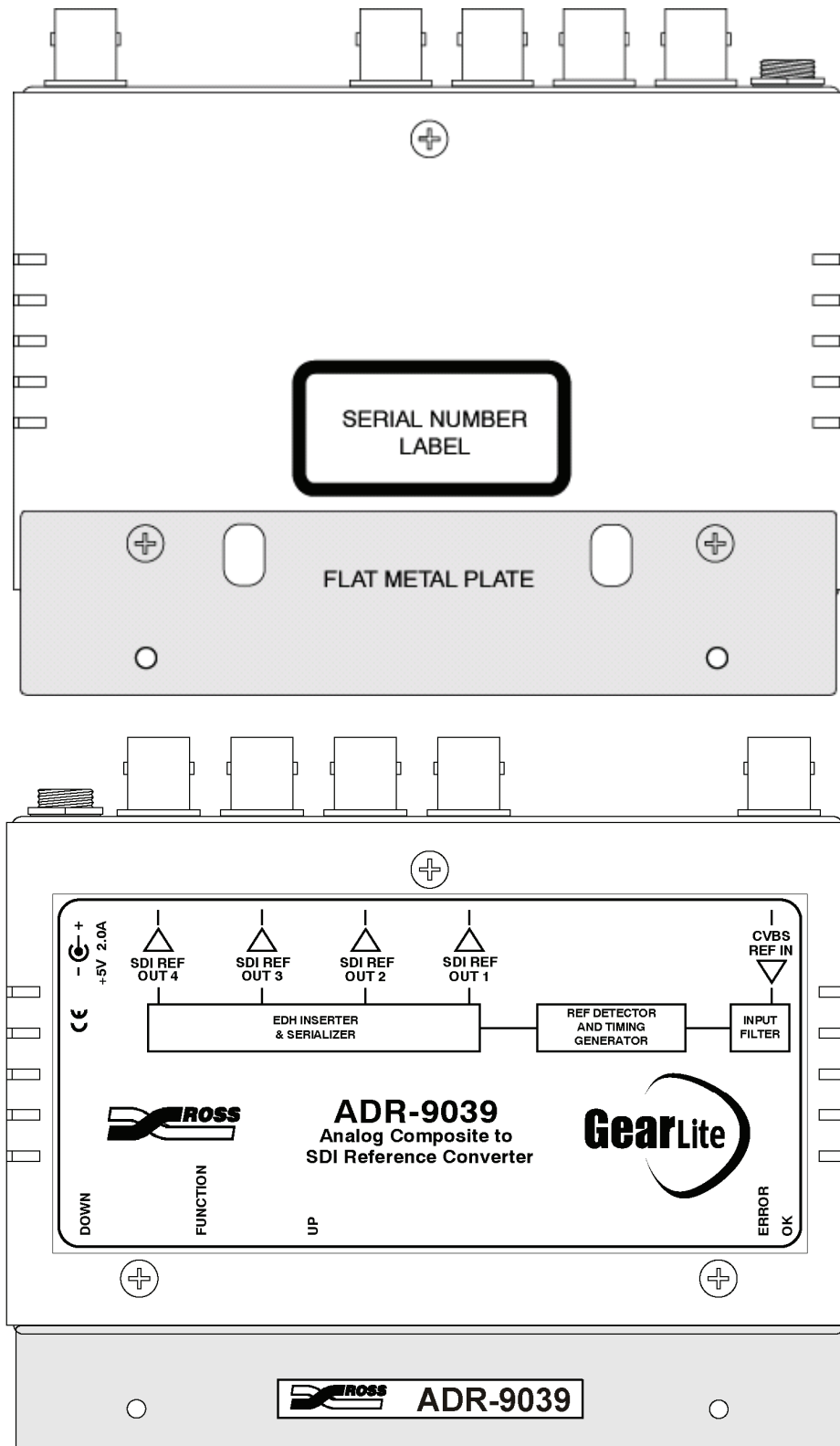


Figure 6. Flat Metal Plate and Label Positions for GRF-9000 Mounting

Setup and Operation

In This Chapter

This section provides details of all operating modes and features.

The following topics are discussed:

- Cable Connections
- User Controls
- Setup and Configuration
- Function Setup and Configuration Menu Table
- Function Menu Notes

Cable Connections

Connect the analog input and SDI output cables to the ADR-9039 according to the designations indicated on the chassis label. The input is internally terminated at 75 Ohms. It is not necessary to terminate unused outputs.

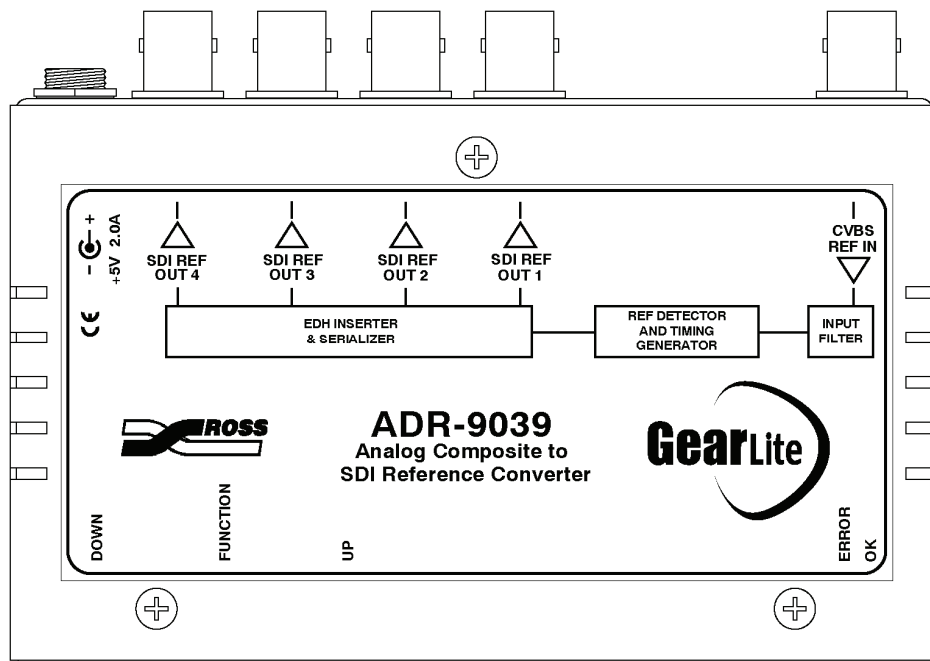


Figure 7. ADR-9039 Cable Connections Indicator Label

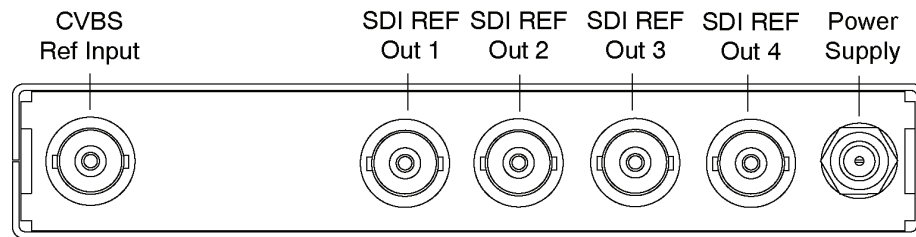


Figure 8. ADR-9039 Rear Connections Configuration

Power Adaptor and Supply

Connect the PS-9000 power adaptor 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 ADR-9039. The ADR-9039 has a standard miniature power jack (center pin positive). If using an adaptor other than the PS-9000, ensure that the polarity is correct and that the voltage is +5V DC regulated to 5% and it can supply sufficient current for the ADR-9039. Use of improper adaptors may damage the ADR-9039 and will void the warranty.

Installations outside of North America using line voltages of 200 – 240 Volts require a plug, certified for the country of use, to be installed on the supplied line cord.

See the **Important Regulatory and Safety Notices** section at the front of this manual for details.

If using an adaptor other than the PS-9000, ensure that:

- the polarity is correct
- the voltage is +5V DC regulated to 5%
- sufficient current for the ADR-9039 is supplied



Notice

Use of improper adaptors may damage the ADR-9039 and will void the warranty.

Installations outside of North America using line voltages of 200 – 240 Volts require a plug, certified for the country of use, to be installed on the supplied line cord.

See the “**Important Regulatory and Safety Notices**” section at the beginning of this manual for details.

User Controls

The following are general descriptions of the user controls identified in Figure 9, presented in normal operating sequence.

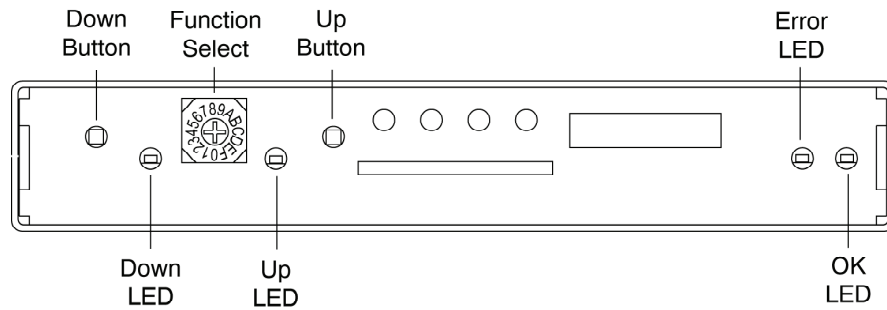


Figure 9. ADR-9039 Front Edge Operational Components

Status and Selection LEDs

The front panel of the module has four LEDs (Down, Up, Error, and OK) that display the status of the input signals, and indicate menu function and configuration selections. The LED displays are described in Table 1.

Table 1. Selection and Status LED Descriptions

LED	Reference	Function
OK (Green)	Input Signal	When continually lit, a valid reference signal is present at the input. The card is functioning normally.
Error (Red)	Input Signal	When continually lit, one of the following conditions has occurred: • The input signal is not valid. • The input is not present on the input. The SDI output is muted in this case. When flashing, the input video standard is not the same as the standard selected in the system menu.
Down (Yellow)	Function Menu	For menu items that have multiple selections, the LED will be in a state as indicated in the Function Setup and Configuration Menu. For menu items that have a range: • LED will be <i>flashing</i> when the selected menu item is adjusted to the lower limit. • LED will be <i>continually lit</i> when less than or equal to the mid point. • LED will be <i>unlit</i> when the selected menu item is adjusted above the mid point.
Up (Yellow)	Function Menu	For menu items that have multiple selections, the LED will be in a state as indicated in the Function Setup and Configuration Menu. For menu items that have a range: • LED will be <i>flashing</i> when the selected menu item is adjusted to the upper limit. • LED will be <i>continually lit</i> when greater than or equal to the mid point. • LED will be <i>unlit</i> when the selected menu item is adjusted below the mid point.

Function Selection Switch and Down/Up Buttons

The Function Select switch is a 16-position rotary switch used to select specific functions and their options. The Function Select switch works in conjunction with the Down and Up buttons.

First, the function category is selected with the rotary switch, and then the Down and Up buttons are used to select modes or level settings within that function category. The following **Setup and Configuration** section provides complete details on the available functions and their options.

Setup and Configuration

Use the Function Select switch and the Down and Up buttons to configure the ADR-9039 to convert analog video signals to SDI. Settings are described in Table 2.

General Operating Rules

Please note the following important operating rules for the ADR-9039:

- For each of the supported **Reference Standard** (525/625) the card stores the timing settings independently in non-volatile memory.
- The module always powers-up in the last configuration used.
- Always check to see that the input OK LED is lit. If not, check that the input is valid and the correct **Reference Standard** has been selected from the Function Menu.

Example Configuration:

- To configure the **Reference Standard** function, turn Function Select switch to Position 6. The default configuration is Auto Select. Both LEDs are lit, to indicate this configuration selection.
- To change **Reference Standard** configuration to PAL (625), keep Function Select in Position 6 and then press the Up button twice. The Down LED will be unlit and the Up LED will be lit, to indicate PAL (625) configuration selection.

Function Setup and Configuration Menu Table

A single press of the Down and Up buttons is a “momentary” click of the button unless indicated by “(h)”.

Table Legend

- + Press Up button from default position
- Press Down button from default position
- (h) Hold Up or Down button for 2 - 3 seconds for faster adjustment or special function
- * Factory Default state
- ^m Stored in non-volatile memory
- Lit LED display
- Unlit LED display
- ☀ Flashing LED display

Note

Functions listed in the Function column as being stored in memory (^m), always power up in the last known state.

Table 2. Function Setup and Configuration Menu

Function Selection Switch Position	Function Menu	Up/Down Buttons Mode Selection Menu See Table Legend for symbol meanings	LED Display See Table Legend for symbol meanings	
			Down (yellow)	Up (yellow)
0	Format Display	625 (PAL)	●	○
		525 (NTSC)	○	●
1	H Delay^m	Max Delay + (h)	●	☀
		Delay between Mid and Max + (h)	●	○
		Mid	○	○
		Delay between Min and Mid - (h)	○	●
		Min Delay * - (h)	☀	●
2	H Reset	Reset +	☀	●
		Not Reset	○	●
3	V Delay^m	Max Delay + (h)	●	☀
		Delay between Mid and Max + (h)	●	○
		Mid	○	○
		Delay between Min and Mid - (h)	○	●
		Min Delay * - (h)	☀	●
4	V Reset	Reset +	☀	●
		Not Reset	○	●
5	Set Min Delay	Reset +	☀	●
		Not Reset	○	●
6	Reference Standard^m	625 (PAL) +	●	○
		525 (NTSC) +	○	●
		Auto Select * -	○	○
7	N/A			
8	N/A			
9	N/A			
A	N/A			
B	N/A			
C	N/A			
D	N/A			
E	N/A			
F	Default	Default - (h)	●	●

Function Menu Notes

Some of the menu items in the Function Setup and Configuration Table are explained here in further detail as follows:

Format Display

This read-only menu indicates the reference system standard currently in operation.

H Delay

Use this menu to adjust the output horizontal delay from 0 (zero) to one full line, one pixel clock at a time. Please note the following important points regarding H Delay:

- If you cross over the maximum H Delay for 1 line, the value returns to 0 (zero) and the V Delay value increments by 1.
- Crossing the minimum delay returns the H Delay value to 1715 (525) or 1727 (625) and decrements the V Delay value by 1.

H Reset

Use this menu to reset just the horizontal delay value to 0 (zero). This function is particularly useful if your adjustment range is far off the mark, or if you simply want to quickly return to zero.

V Delay

Use this menu to adjust the output vertical delay in one line steps.

V Reset

Use this menu to reset just the vertical delay value to 0 (zero).

Set Minimum Delay

Use this menu to reset both the H Delay and V Delay values to 0 (zero).

Reference Standard

Use this menu to select the input reference signal standard. You can set the ADR-9039 to lock to 525 only, 625 only, or automatically detect either format from the input signal.

Default

Use this menu to reset all settings to factory defaults. When the card is restored to the default settings, both the UP and DOWN LEDs are unlit.

Specifications

In This Chapter

This chapter contains the Technical Specifications table.

Technical Specifications

Table 3. ADR-9039 - Technical Specifications

Category	Parameter	Specification
Analog Video Input	Number of Inputs	1
	Signal Standards	Composite Black (NTSC or PAL (B/G))
	Input Impedance	75Ω terminating
	Return Loss	>41dB to 5MHz
Serial Digital Video Output	Number of Outputs	4
	Standard	SMPTE 259M-C (270Mb/s, 525/625 lines)
	Output Impedance	75Ω
	Output Return Loss	>18dB to 270MHz
	Signal Level	800mV ±10%
	DC Offset	<50mV
	Rise and Fall Time	800pS (20 – 80%)
	Overshoot	< 9%
	Jitter	<700pS
	Output Delay	0-1 frame, in 37 nS steps
	Thermal Drift	2.5 nS /10 °C
	Short Circuit Protected	Yes
Power	Required Voltage	+5V DC (5% regulation)
	Current Consumption	<250mA typical
	Total Power	1.25W typical
Other	Warranty	3-year transferable
	Thermal Environment	20 – 40 °C (68 – 104 °F) ambient, non-condensing

Specifications are subject to change without notification

Service Information

In This Chapter

This chapter contains Warranty and Repair Policy information.

Warranty and Repair Policy

The RossGear ADR-9039 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 ADR-9039 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 RossGear ADR-9039 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 RossGear ADR-9039 Analog Composite to SDI Reference Converter User Manual of our Digital Products line provides all pertinent information for the safe installation and operation of your RossGear Product. Ross Video policy dictates that all repairs to the RossGear ADR-9039 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 RossGear ADR-9039, 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 RossGear ADR-9039. 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.

Ordering Information

In This Chapter

This chapter contains ordering information for the ADR-9039 and related products.

Standard Equipment

- **ADR-9039**, Analog Composite to SDI Reference Converter, including:
 - one User Manual
 - an installation kit with various mounting hardware
 - one **PS-9000** 5V Universal Power Adaptor and line cord (pre-packaged for the country of use)

Optional Equipment

- **9039DR-004**, additional User Manual
- **PS-9000**, additional 5V Universal Power Adaptor and line cord (pre-packaged for the country of use)
- **BPM-9000**, 90° Angle Mounting Bracket
(90° angle metal mounting bracket for rack and desk installation)
- **GRF-9000**, GearLite Rack Frame (Front)
(Front of rack frame for mounting up to nine GearLite modules in 2RU space)

Your **ADR-9039** Analog Composite to SDI Reference Converter is part of the GearLite line of the RossGEAR family of products. Ross Video Limited offers a full line of RossGEAR digital terminal equipment including distribution, conversion, monitoring, synchronizers, encoders, decoders, amplifiers, keyers, switches, as well as analog audio and video products.

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

PHONE	General Business Office and Technical Support	613 • 652 • 4886
	After Hours Emergency	613 • 349 • 0006
	Fax	613 • 652 • 4425
E-MAIL	General Information	solutions@rossvideo.com
	Technical Support	techsupport@rossvideo.com
POSTAL SERVICE	Ross Video Limited	8 John Street, Iroquois, Ontario, Canada K0E 1K0
	Ross Video Incorporated	P.O. Box 880, Ogdensburg, New York, USA 13669-0880

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