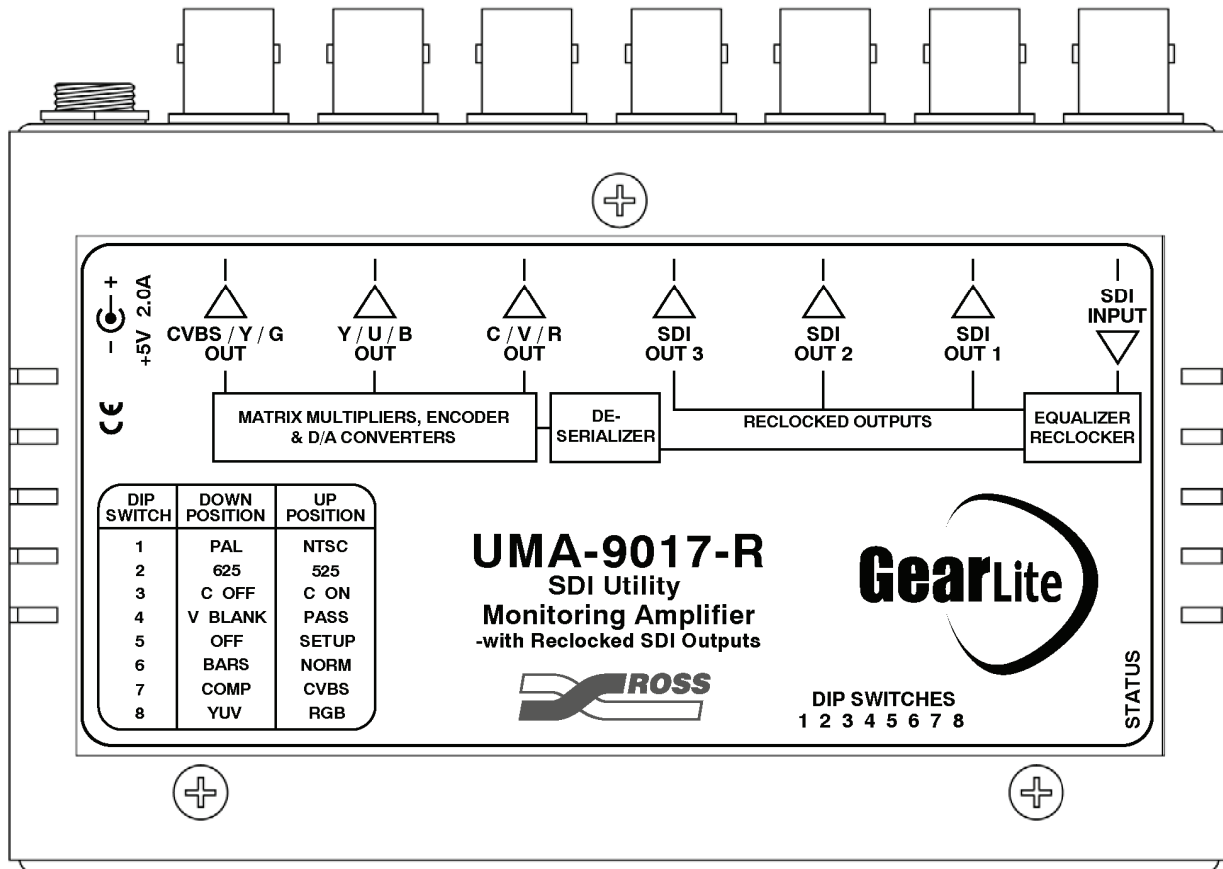




# UMA-9017-R

## SDI Utility Monitoring Amplifier with Reclocked SDI Outputs

### User Manual



Ross Part Number: 9017RDR-004  
Issue: 03C



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# UMA-9017-R • SDI Utility Monitoring Amplifier with Reclocked SDI Outputs User Manual

- Ross Part Number: **9017RDR-004**
- Document Issue: **03C**
- 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 warning.

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**

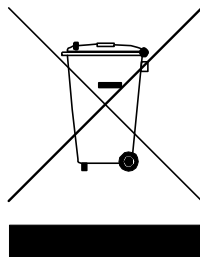
Routine maintenance to this GearLite product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the “Contact Us” section on the last page of this manual. All RossGear GearLite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





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# Introduction

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## In This Chapter

This chapter contains the following sections:

- Overview
- Functional Block Diagrams
- Features

### Overview

The UMA-9017-R SDI Utility Monitoring Amplifier with Reclocked SDI Outputs is a highly flexible monitoring solution for SDI signals, and part of a growing family of GearLite self-contained, small brick-format modules.

The UMA-9017-R addresses high-quality imaging requirements by converting the eight MSBs of an SDI signal to analog composite (CVBS), Y/C, RGB, or component video. A 10-bit DAC and special filtering techniques used in the design achieve a low-artifact video output.

The front panel of the UMA-9017-R chassis provides a power status LED for visual reference. In addition, user-selectable settings are available to place the UMA-9017-R into the proper operating mode. Some of these modes are: monochrome output, 75% color bar pattern, and vertical interval blanking.

The UMA-9017-R provides conversion of 525 and 625 SDI signals (SMPTE 259M-C). RGB, YUV, or composite plus Y/C outputs are available. NTSC, PAL, and PAL-N composite standards are supported. The UMA-9017-R also has three reclocked SDI outputs. Special measures have been taken to ensure excellent return loss at both input and output. This guarantees error-free performance with short cables.

The UMA-9017-R includes a universal power adaptor and line cord suitable for the country of use. Various mounting options are included that allow a wide range of installation choices. The UMA-9017-R provides a flexible broadcast-quality monitoring solution in a small, stand-alone package.

## Functional Block Diagram

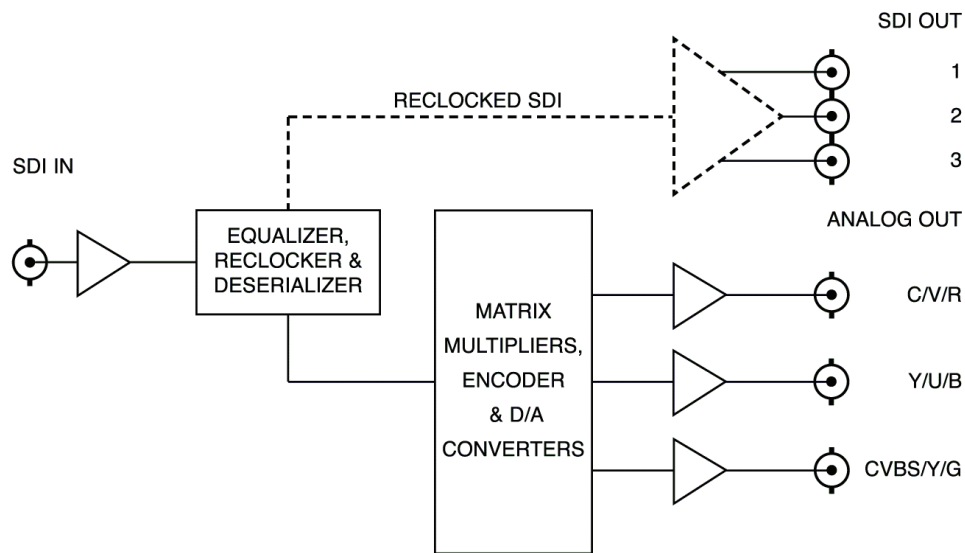


Figure 1. Simplified Block Diagram of UMA-9017-R Functions

## Features

The UMA-9017-R SDI Utility Monitoring Amplifier with Reclocked SDI Outputs has the following features:

- NTSC, PAL, or PAL-N operation
- 10-bit DAC resolution
- 8-bit data processing
- One SDI input
- 3 reclocked outputs
- Reclocking to reduce jitter and noise
- YUV, RGB or CVBS + YC outputs
- Automatic input cable equalization > 250m (> 820 ft.) of Belden 8281
- Color bar test signal with valid SDI input
- Excellent I/O specifications
- Terminating input 75 Ohms
- Visual indicator LED for power status
- Small brick form factor
- 5V universal adapter with locking DC connector
- 3-year warranty

# Installation

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## 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 UMA-9017-R SDI Utility Monitoring Amplifier with Reclocked SDI Outputs 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 UMA-9017-R 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 chassis 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 chassis, 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 chassis as shown in the figure below.

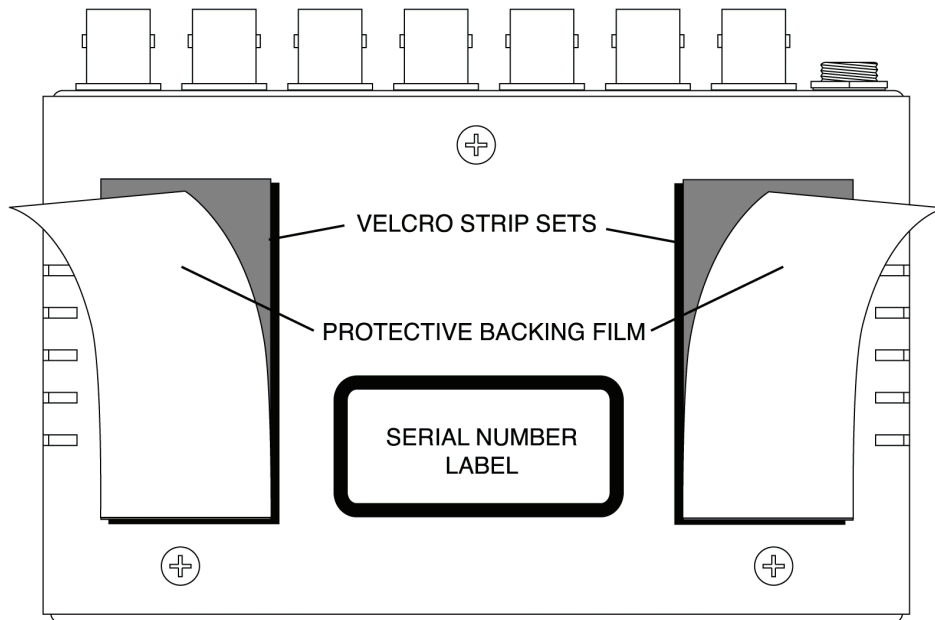


Figure 2. Velcro Installation Option

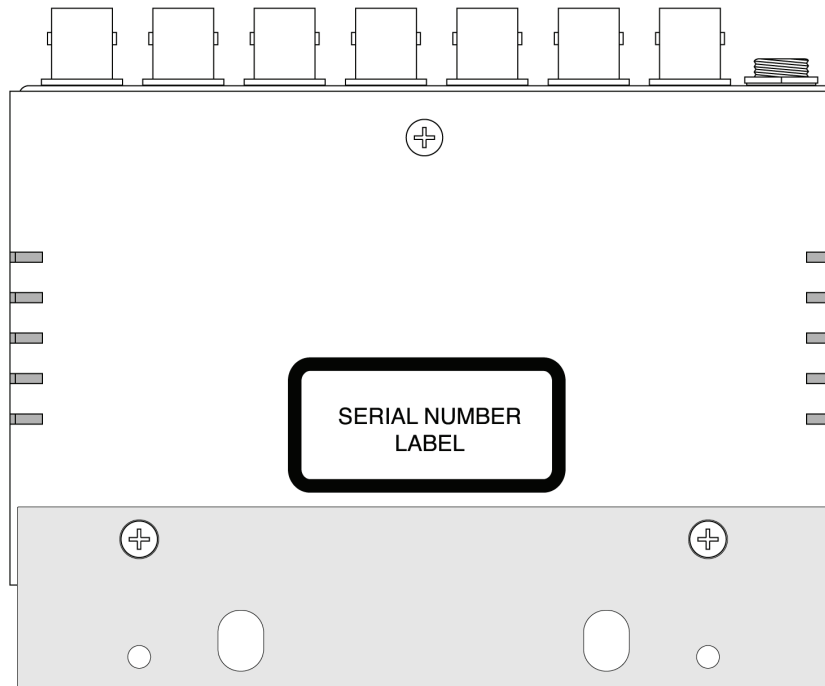
3. To apply the adhesive Velcro to the mounting location, simply remove the protective backing film from the top of the adhesive strips and press the chassis into position on the mounting surface.
4. To mount the power adaptor, apply the remaining mating Velcro strip set, repeating the previous steps.

## 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 chassis using the chassis screws as shown in the figure below:



*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.

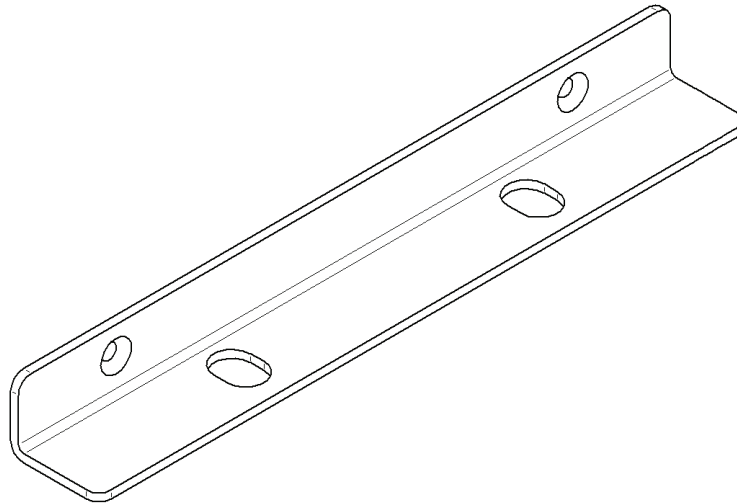


Figure 4. *BMP-9000 90° Mounting Bracket*

### **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.

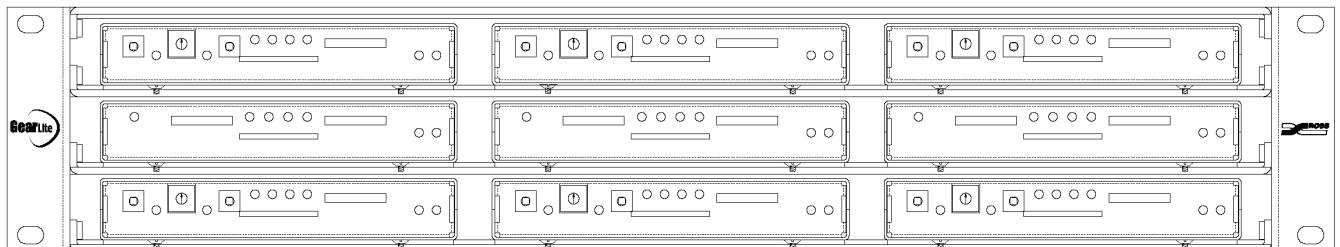


Figure 5. *GRF-9000 with Nine GearLite Modules Installed*

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.

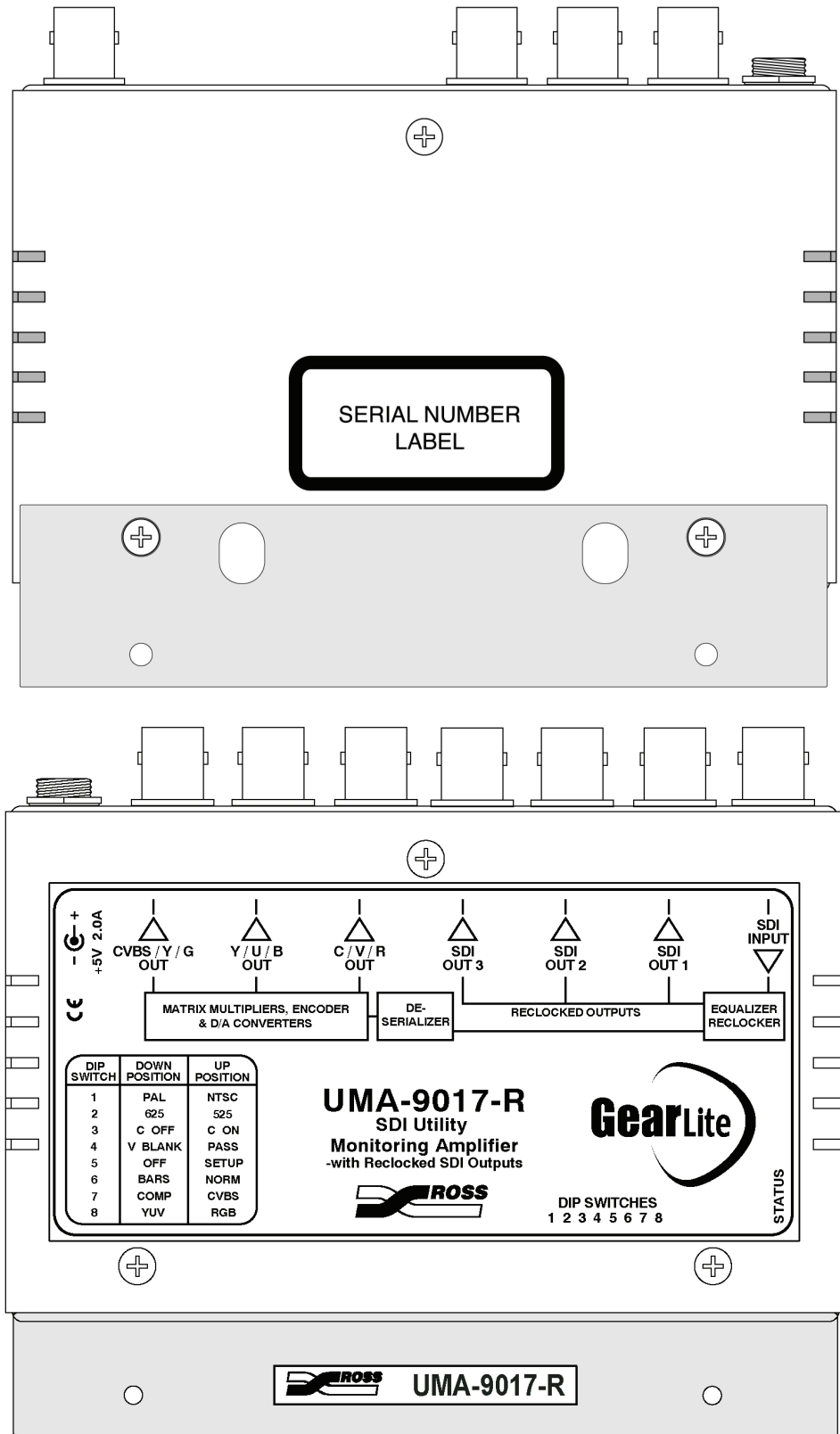


Figure 6. Flat Metal Plate and Label Positions for GRF-9000 Mounting



# Setup and Operation

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## In This Chapter

This section provides details of all operating modes and features.

The following topics are discussed:

- Cable Connections
- User Controls
- DIP Switches
- Status Indicator LED

## Cable Connections

Connect the cables to the UMA-9017-R 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.

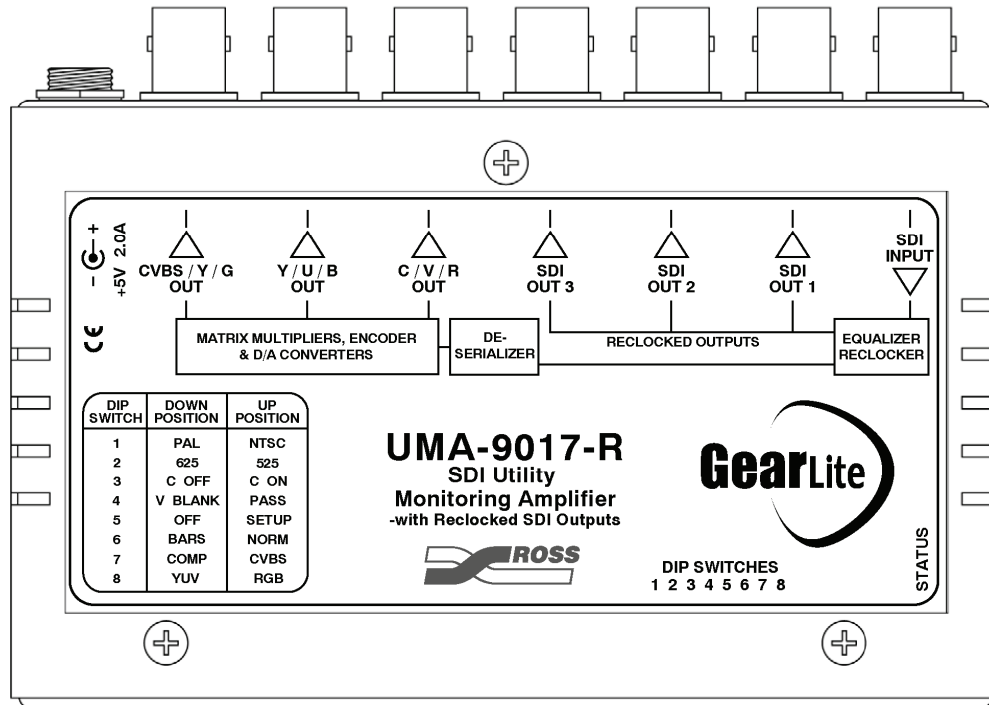


Figure 7. UMA-9017-R Cable Connections Indicator Label

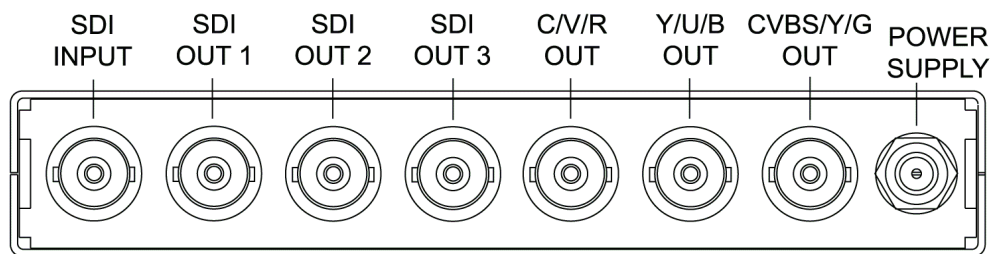


Figure 8. UMA-9017-R Rear Connections Configuration

### Power Adaptor and Supply

Connect the PS-9000 power adaptor to the power supply connector. The PS-9000 provides up to 2A of regulated +5V DC (5%). The DC power cord has a locking connector that securely fastens into the power supply DC jack on the converter. The converter has a standard miniature power jack (center pin positive). See Figure 8.

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 UMA-9017-R is supplied



**Caution**

Use of improper adaptors may damage the UMA-9017-R and will void the warranty.

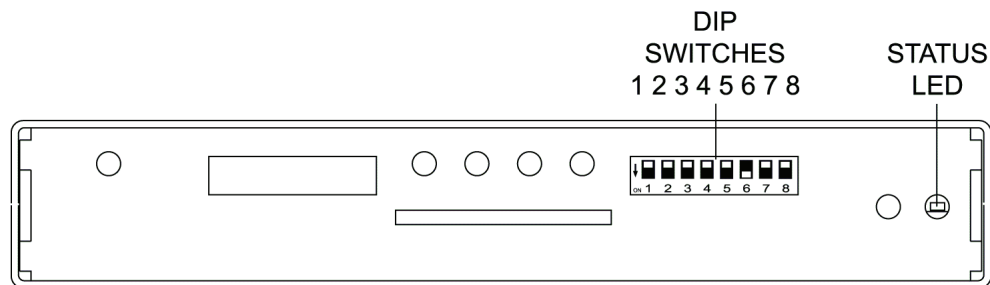
Installations outside of North America using line voltages of 200 – 240 Volts require a plug, certified for the country of use, to be installed on the supplied line cord.

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

## User Controls

The UMA-9017-R has the following front edge user controls:

- DIP Switches
- Status Indicator LED



*Figure 9. User Controls*

## DIP Switches

An 8-position DIP switch allows the user to configure the UMA-9017-R to fit into almost any installation. Settings are as described in the following table:

Table 1. UMA-9017-R DIP Switch Menu

Video Standard		Chroma	Vertical Interval	Setup	Mode	Output	Format	Setting Selections
SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8	
UP	UP							NTSC (525)
UP	DOWN							PAL-N (625)
DOWN	DOWN							PAL-B/G (625)
		UP						Chroma on
		DOWN						Chroma off
			UP					Pass VI
			DOWN					Blank VI
				UP				Setup On
				DOWN				Setup Off
					UP			Normal
					DOWN			Color Bars
						UP		Composite + Y/C
						DOWN		Component
							UP	RGB
							DOWN	YUV

The following diagram shows the DIP switch settings chart included on the chassis label. It is a condensed version of the previous table intended as a quick reference guide.

DIP SWITCH	DOWN POSITION	UP POSITION
1	PAL	NTSC
2	625	525
3	C OFF	C ON
4	V BLANK	PASS
5	OFF	SETUP
6	BARS	NORM
7	COMP	CVBS
8	YUV	RGB

Figure 10. DIP Switch Settings Quick Reference Chart

## Status Indicator LED

The front edge of the module has an LED indicator to show the status of the amplifier. The module is operating correctly when the Status LED is lit.

Table 2. UMA-9017-R LED Status Descriptions

Led	Display	Status Description
Status (Green)	Solid	The unit is powered-up and functioning normally.
	Flashing	Input signal problems or the unit is set to output color bars.
	Off	Loss of power.



# Specifications

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## In This Chapter

This chapter contains the Technical Specifications and Analog Video Levels tables.

### Technical Specifications

Table 3. UMA-9017-R - Technical Specifications

Category	Parameter	Specification
<b>Power</b>	Required Voltage	+5 V DC (5% regulation)
	Current Consumption	>425 mA typical
	Total Power	>2.2 W typical
<b>Other</b>	Warranty	3-year transferable
<b>Serial Digital Video Input</b>	Number of Inputs	1
	Signal Standards Accommodated	SMPTE 259M (conversion at 270Mb/s only)
	Input Impedance	75 $\Omega$ terminating
	Return Loss	>19dB to 270MHz
	Equalization	Automatic, up to 26dB (250m of Belden 8281 cable) @ 270Mb/s

Category	Parameter	Specification	
<b>Serial Video Output</b>	Signal Standards Accommodated	SMPTE 259M	
	Number of Outputs	3	
	Output Impedance	75Ω	
	Output Return Loss	>20dB to 270MHz	
	Signal Level	800mV ± 10%	
	DC Offset	< ± 50mV	
	Rise & Fall Time	>750pS typical (20 - 80%)	
	Overshoot	<7% typical	
	Outputs Short Circuit Protected	Yes	
	Propagation Delay	>14 ns	
	<b>Analog Monitoring Output</b>	Number of Outputs	3
		Video	Composite plus Y/C or RGB or YUV
Output Impedance		75Ω	
Output Return Loss		>45dB to 6MHz	
Output Isolation		>44dB to 6MHz	
Signal Level		See Table 4, Analog Video Levels	
DC Offset for RGB or Composite Video		<± 50mV	
Frequency Response		±0.25dB to 5MHz typically -1dB @ 5.75MHz	
Differential Phase		<1%	
Differential Gain		<1°	
Outputs Short Circuit Protected		Yes	
RMS Noise (unweighted)		-53dB 0 - 5.0MHz	

Specifications are subject to change without notification



## Analog Video Levels

Table 4. UMA-9017-R Analog Video Levels

Composite Video	NTSC	1Vpp	± 5%
	PAL-B/G		
	PAL-N		
RGB (for 100% color bar input signal)	525 SETUP ON	Video Level 714mV	
		Sync level 286mV	
	525 SETUP OFF	Video Level 700mV	
		Sync level 286mV	
	625	Video Level 700mV	
		Sync Level 300mV	
YUV (for 100% color bar input signal)	525 SETUP ON	Y VIDEO 714mV	
		Y SYNC 286mV	
		U/V LEVELS 934mV	
	525 SETUP OFF	Y VIDEO 714mV	
		Y SYNC 286mV	
		U/V LEVELS 934mV	
	625	Y VIDEO 700mV	
		Y SYNC 300mV	
		U/V LEVELS 700mV	

Specifications are subject to change without notification



# Service Information

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## In This Chapter

This chapter contains Warranty and Repair Policy information.

### Warranty and Repair Policy

The RossGear UMA-9017-R 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 UMA-9017-R 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 UMA-9017-R 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 UMA-9017-R SDI Utility Monitoring Amplifier with Reclocked SDI Outputs 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 UMA-9017-R 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 UMA-9017-R, 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 UMA-9017-R. 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

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## In This Chapter

This chapter contains ordering information for the UMA-9017-R and related products.

### ***Standard Equipment***

- **UMA-9017-R**, SDI Utility Monitoring Amplifier with Reclocked SDI Outputs, 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***

- **9017RDR-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 **UMA-9017-R** SDI Utility Monitoring Amplifier with Reclocked SDI Outputs 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, switchers, 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

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

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