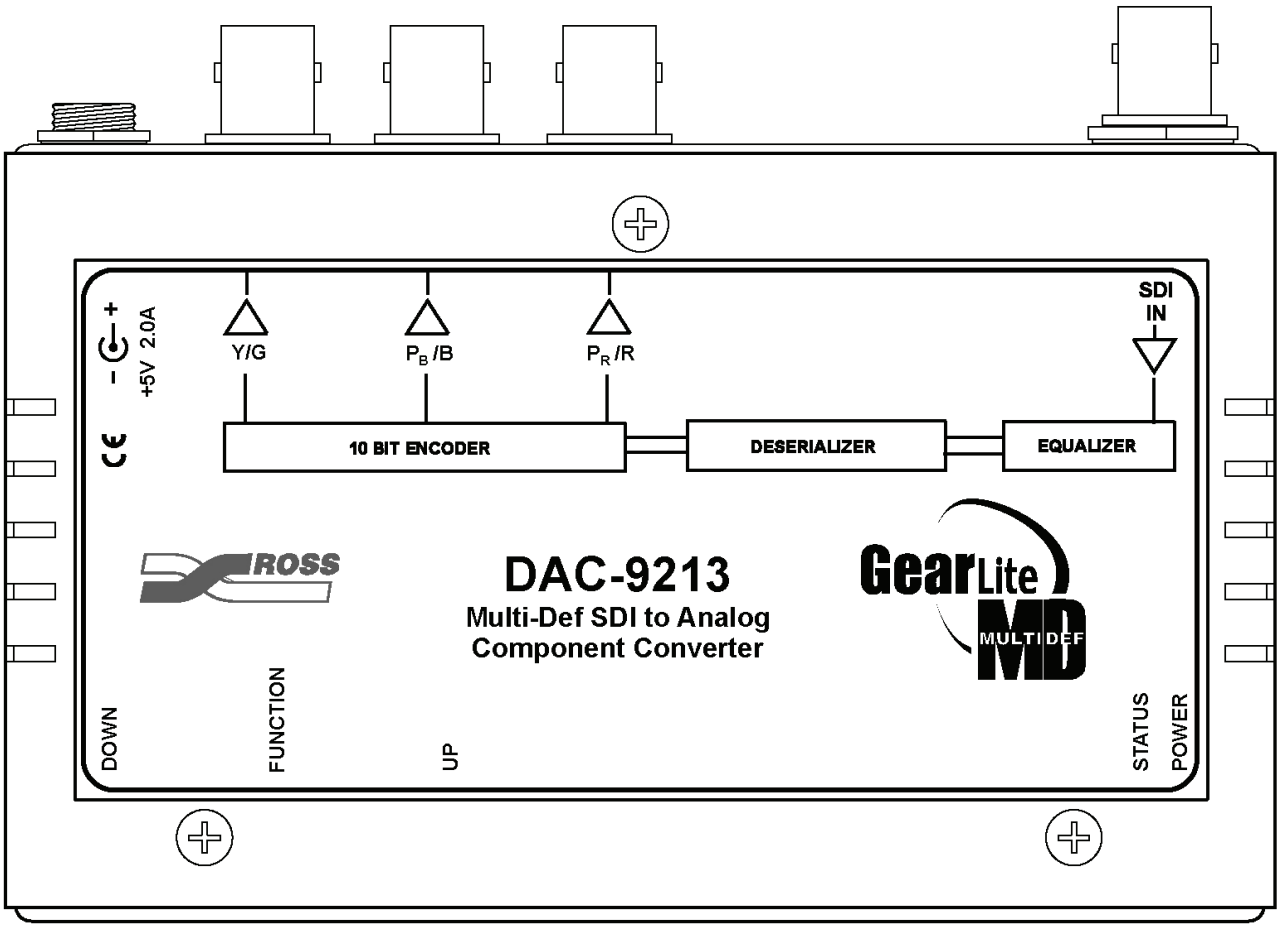
Ross Video Limited

DAC-9213

Multi-Definition SDI to Analog Component Converter

User Manual



Ross Part Number: 9213DR-004

Issue: 02D

Live Production Technology™

DAC-9213 • Multi-Definition SDI to Analog Component Converter User Manual

- Ross Part Number: **9213DR-004**
- Document Issue: **02D**
- Release 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 Susceptibility

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

Important Safety Instructions

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 numerique 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

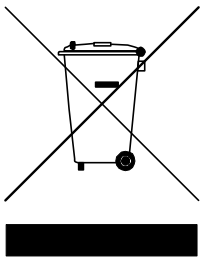
Routine maintenance to this GearLite product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All RossGear GearLite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

In This Chapter

This chapter contains the following sections:

- Overview
- Functional Block Diagrams
- Features

Overview

The DAC-9213 Multi-Definition SDI to Analog Component Converter is a high quality signal conversion solution for High Definition (HD) and Standard Definition (SD) SDI signals and part of a growing family of GearLite Multi-Definition (MD) self-contained, small brick format modules.

The DAC-9213 addresses program stream imaging requirements by converting 10-bit MD-SDI video to analog component video (multiple formats). The DAC-9213 has a full 10-bit data path, with 11-bit data processing.

The front panel of the DAC-9213 chassis provides power and status LEDs for visual reference. In addition, user-selectable switch settings are available to select the preferred mode of operation.

The DAC-9213 provides analog conversion of 525i, 625i, 720p, 1080i, and 1080p SDI signals (SMPTE 259M-C and 292M). Special measures have been taken to ensure excellent return loss at both input and output. This ensures error-free performance with short or long cables.

The DAC-9213 is delivered with a universal power adapter and line cord suitable for the country of use. Various mounting options are included that allow a wide range of installation choices. The DAC-9213 provides a broadcast-quality MD-SDI component monitoring solution in a small, stand-alone package.

Functional Block Diagram

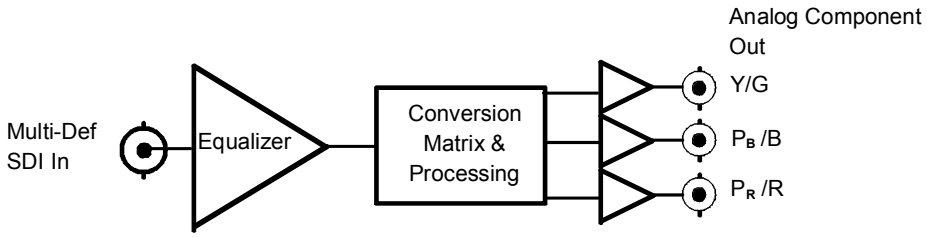


Figure 1. Simplified Block Diagram of DAC-9213 Functions

Features

The DAC-9213 Multi-Definition SDI to Analog Component Converter has the following features:

- High Definition and Standard Definition SDI to analog component conversion
- 10-bit DAC resolution
- 11-bit data processing
- Automatic input cable equalization >300m (>984 ft.) of Belden 1694A at SD-SDI rates (270 Mb/s)
- Automatic input cable equalization >100m (>328 ft.) of Belden 1694A at HD-SDI rates (1.485 Gb/s)
- Analog component outputs can be set for $Y/P_B/P_R$ or RGB
- LEDs for power and status
- 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 DAC-9213 Multi-Definition SDI to Analog Component Converter and other related equipment, please observe all static discharge precautions as described in the following 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 wearing synthetic fiber clothing. Always exercise proper grounding precautions when working on circuit boards and related equipment.

Unpacking

Unpack each DAC-9213 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 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 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. 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.

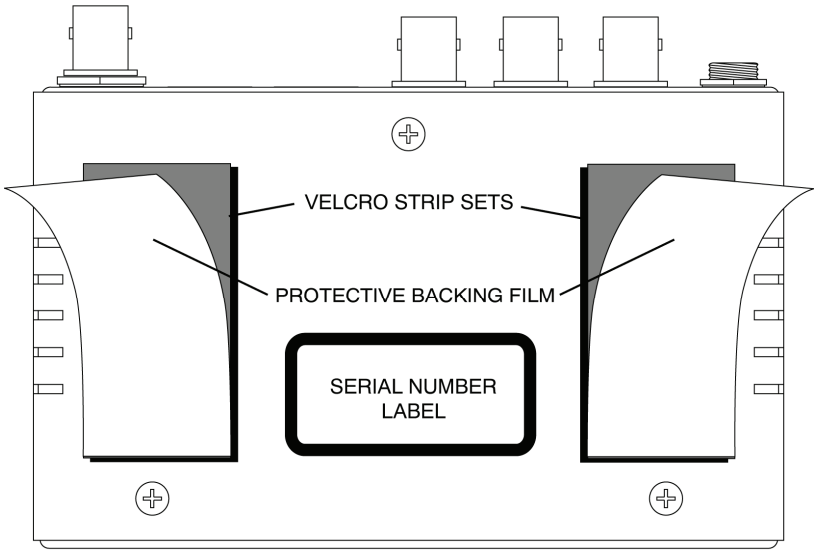


Figure 2. Velcro Installation Option

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

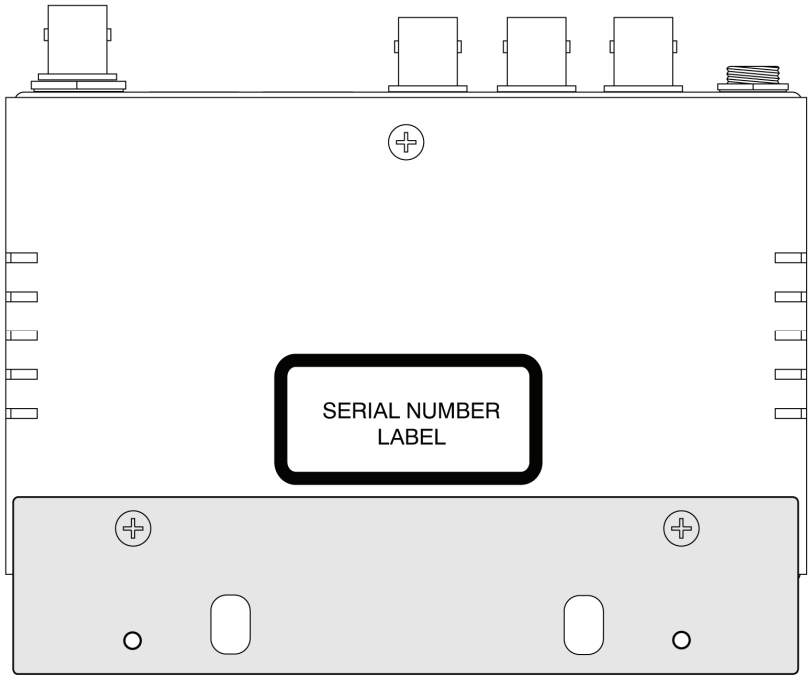


Figure 3. Flat Metal Plate Installation Option

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.

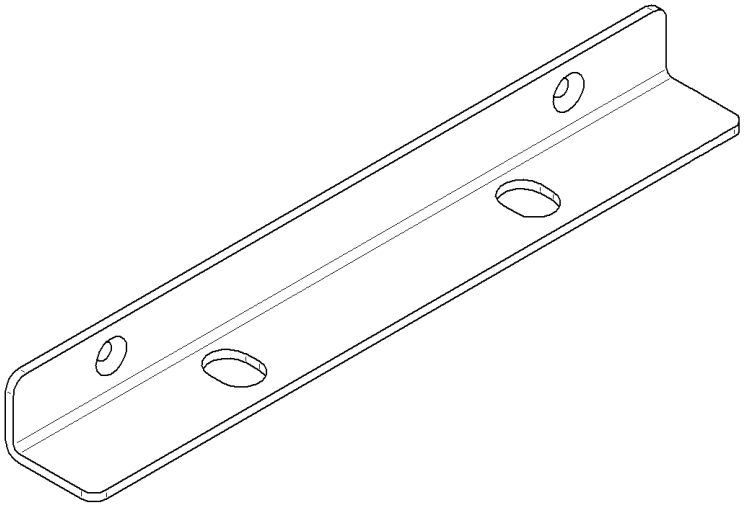


Figure 4. BMP-9000 90° Mounting Bracket

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.

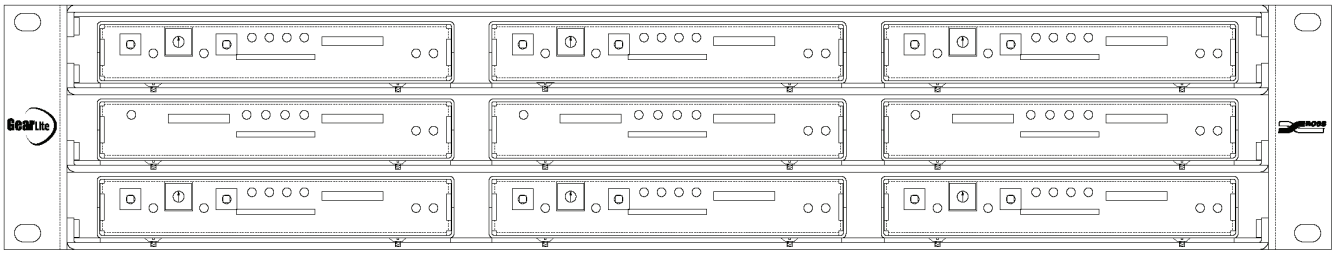


Figure 5. GRF-9000 with Nine GearLite Modules Installed

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.

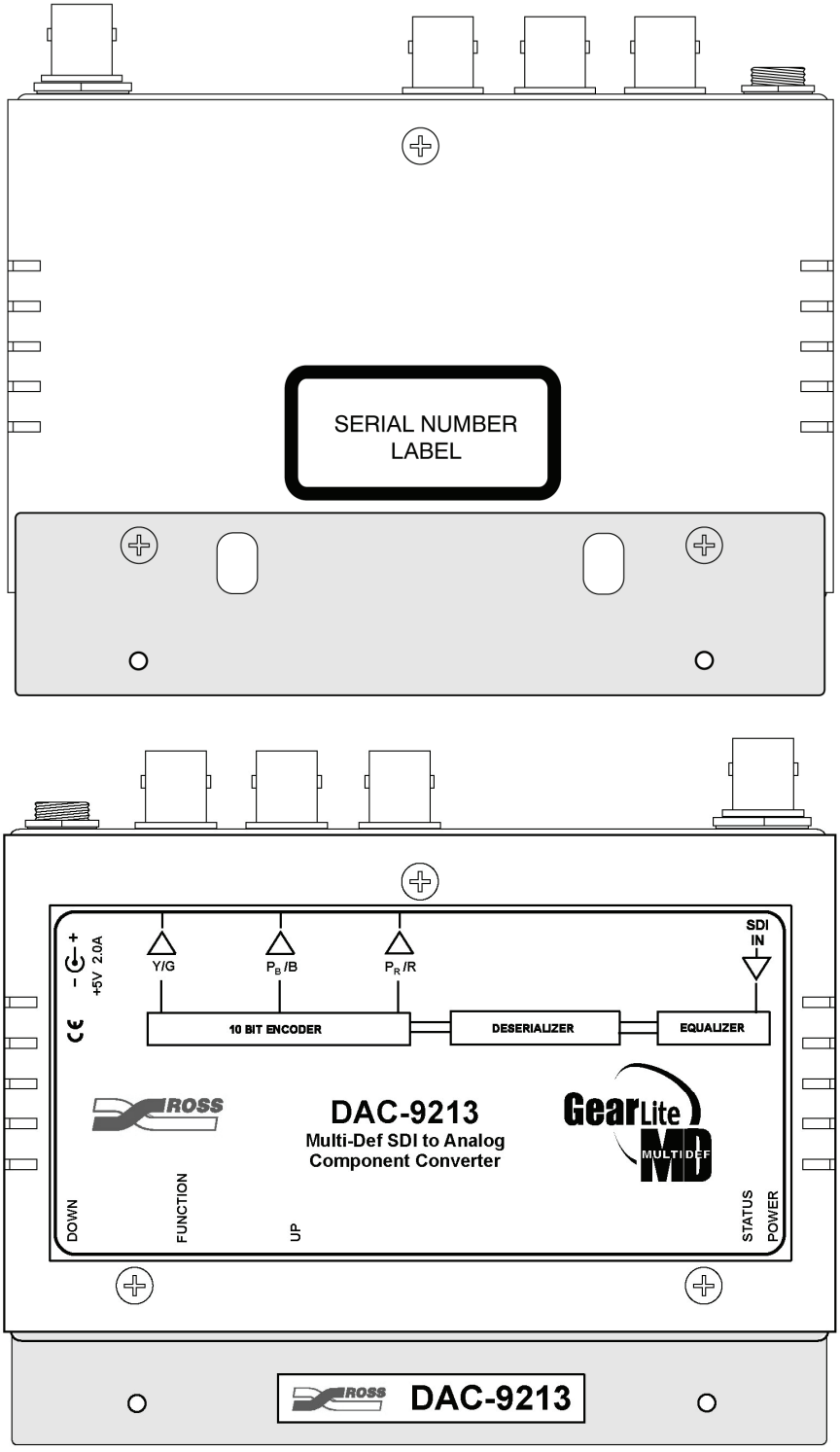


Figure 6. Flat Metal Plate and Label Positions for GRF-9000 Mounting

Setup and Operation

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

Note

Throughout this section, the term SDI is used universally to indicate either SD-SDI or HD-SDI signals.

Cable Connections

Connect the cables to the DAC-9213 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.

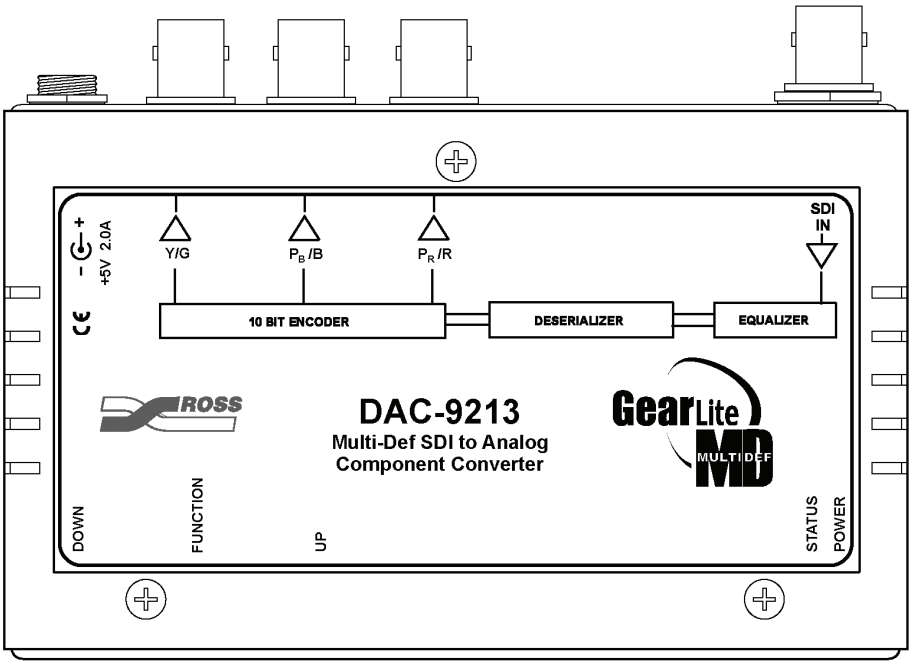


Figure 7. DAC-9213 Cable Connections Indicator Label

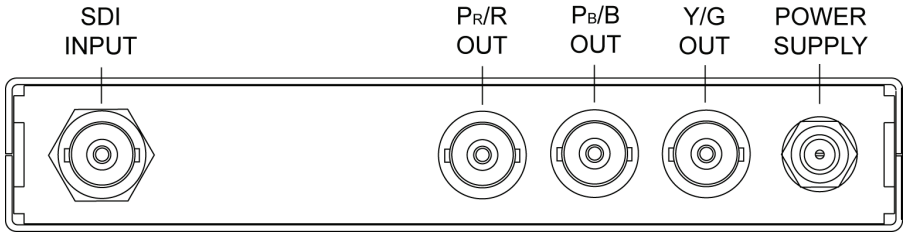


Figure 8. DAC-9213 Rear Connections Configuration

Note

For cabling convenience, a 3-BNC molded analog output cable is available from Ross Video. For monitors with RCA inputs, Ross Video also has available RCA to BNC adapters. See Chapter 6, "**Ordering Information**" for cable ordering details.

Power Adapter and Supply

Connect the PS-9000 power adapter 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 adapter other than the PS-9000, ensure that:

- the polarity is correct
- the voltage is +5V DC regulated to 5%
- sufficient current for the DAC-9213 is supplied

Caution

Use of improper adapters may damage the DAC-9213 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 DAC-9213 has the following front edge user controls:

- Function Select
- Up and Down selector buttons and LEDs
- Status LED
- Power LED

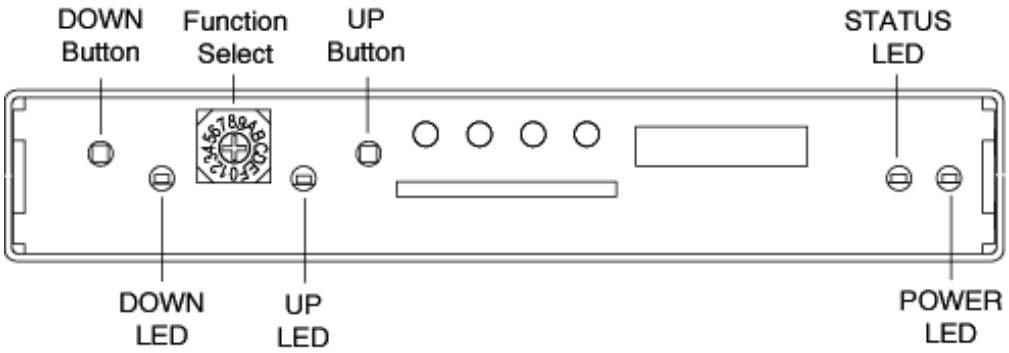


Figure 9. User Controls

Status and Selection LEDs

The front panel of the module has four LEDs (Down, Up, Status, Power) that display the status of the input signal, and indicate menu function and configuration selections. The LED displays are described in the following table:

Table 1. Selection and Status LED Descriptions

LED	Reference	Function
Power (Green)	On	When continuously lit, this LED indicates that the module has power.
	Off	When off, this LED indicates that a loss of power has occurred.
Status (Green)	On	LED will be *continually lit* when a valid* input signal is present and no anomalies have been detected. The unit is functioning normally.
	Flashing	When LED is flashing, there is a problem between the SDI input standard and the selected input standard (menu item 1).
	Off	When off, this LED indicates that a loss of power has occurred.
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.
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.

* A valid signal is defined as any SD or HD SDI signal standard, input into the DAC-9213, which matches the setting of the **Video Standard** that has been selected in the Function Setup and Configuration Menu. In other words, if the converter is set for 525i video, then only a 525i video signal input will cause the STATUS LED to be lit.

Any other analog, SD or HD SDI signal, of a different standard (625i, 1080i, etc.), that is input into the converter will be invalid and the Status LED will be flashing.

Function Selection Switch and Down/Up Buttons

The Function Select switch is a 16-position rotary switch used to select specific functions. 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 DAC-9213 to convert SDI signals to analog component. Settings are described in Table 2.

General Operating Rules

Please note the following important operating rules for the DAC-9213:

- The unit is properly powered.
- The unit always powers-up in the last configuration used.

Function Selection

The factory-set default modes of operation are:

- Input Video Standard = Auto Detect.
- Output Video Format = YP_BP_R, N10 (no setup)

In general only the Output Video Format needs to be set as desired. The default Auto-Detect input setting is extremely versatile. However, fixed mode settings are provided for user convenience.

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
○	Lit LED display
●	Unlit LED display
☼	Flashing LED display

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	**Operation**	Buttons perform no action		•	•
1	**Input Video Standard**	525i	+	•	☼
		625i	+	○	☼
		720p	+	•	○
		1080p/23.98sf, 1080p/24sf	+	○	○
		1080i/50	+	○	•
		1080i/59.94, 1080i/60	+	☼	○
		Auto detect *		☼	•
2	**Output Video Format**	RGB (NTSC Related)	+	•	☼
		RGB (MII)	+	○	☼
		RGB N10 (No Setup)	+	☼	○
		$Y/P_B/P_R$ N10 (No Setup) *		☼	•
3	**Output Video Level**	Max Gain	+ (h)	•	☼
		Gain between Unity and Max	+ (h)	•	○
		Unity *	± (h)	○	○
		Gain between Min and Unity	- (h)	○	•
		Min Gain	- (h)	☼	•
4	**Force Mono** (See Function Menu Notes)	On	+	•	☼
		Off *		☼	•
5	**Setup On** (See Function Menu Notes)	On*		•	☼
		Off	-	☼	•
6	**Sync on All**	On	+	•	☼
		Off *		☼	•
7	**Disable Auto Mute**	On	+	•	☼
		Off *		☼	•
8	**N/A**				
9	**N/A**				
A	**N/A**				

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)
B	**N/A**			
C	**N/A**			
D	**N/A**			
E	**N/A**			
F	**Default Set** (See Function Menu Notes)	Reset All User Settings to Factory Default state (Unity) +(h)	See Notes	

Function Menu Notes

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

Operation

In this menu position, the Down and Up buttons are disabled.

Input Video Standard

Use this menu item to select the video standard that matches the incoming SDI signal's video standard.

In Auto Detect mode, the module will attempt to detect any of the supported incoming High Definition or Standard Definition SDI video standards. See Table 2 for supported standards. When a supported standard is detected, the appropriate analog output format is selected. If the module is unable to determine the input standard, the Status LED will flash and the module will mute the analog outputs.

Note

If Disable Auto Mute = On with an input/output mismatch, the DAC-9213 will output an invalid signal and the Status LED will flash.

Output Video Format

Use this menu to select the output component video format. Please note that not all output formats support all SDI input signal standards. For example, RGB (NTSC Related) is only supported on 525i.

Please see Table 3 for a complete list of supported formats vs. input standards.

Table 3. Supported Formats and Input Standards

Digital Input Standard	Signal	Analog Output Format			
		RGB			YP_BP_R
		SMPTE/ EBU N10	MII	NTSC Related	SMPTE/ EBU N10
525i	Y/G (setup)	0 to 700mV	0 to 700mV (54 to 700mV)	0 to 714mV (54 to 714mV)	0 to 700mV
	P_B/B (setup)	0 to 700mV	0 to 700mV (54 to 700mV)	0 to 714mV (54 to 714mV)	-350mV to +350mV
	P_R/R (setup)	0 to 700mV	0 to 700mV (54 to 700mV)	0 to 714mV (54 to 714mV)	-350mV to +350mV
	Sync	0 to -300mV	0 to -300mV	0 to -286mV	0 to -300mV
625i	Y/G	0 to 700mV			0 to 700mV
	P_BP_R/RB	0 to 700mV			-350mV to +350mV
	Sync	0 to -300mV			0 to -300mV
HD (1080i, 720p)	Y/G	0 to 700mV			0 to 700mV
	P_BP_R/RB	0 to 700mV			-350mV to +350mV
	Sync	-300mV to +300mV			-300mV to +300mV

Output Video Level

Use this menu to adjust the component video output level by up to ± 25%. This setting affects all input standards and output formats. Pressing, or holding, the Up button will increase the output video level on all three analog output signals. Pressing, or holding, the Down button will decrease the output levels. This menu has a 2 button quick default to unity, the default value. Press both Up and Down buttons at the same time and hold for three seconds.

Force Mono

Use this menu to blank the P_B and P_R component output signals. This option has no function in RGB format. Note that if the DAC-9213 is setup in RGB mode, and Force Mono is enabled, then the module is switched to YP_BP_R mode, the P_B and P_R channels will be blanked (i.e. the module "remembers" option settings even though they may not affect the current operating mode).

Setup On

Use this menu to control the blanking level of RGB signals in 525i mode only. Setup is only valid in the 525i RGB (MII) and 525i RGB (NTSC Related) output formats.

Sync On All

Use this menu to enable horizontal synchronization pulses (bi-level sync or tri-level sync), on all three RGB signals (Sync On All = On) or just on the Green channel (Sync On All = Off).

Note

This setting has no effect on $Y/P_B/P_R$ signals.

Disable Auto Mute

Use this menu to disable automatic muting of the analog outputs when a standard mismatch occurs. When automatic muting is enabled (Disable Auto Mute = Off) the DAC-9213 will automatically mute the analog outputs when the input video standard selected by the user differs from the video standard detected at the SDI input.

Note

If Disable Auto Mute = On with an input/output mismatch, the DAC-9213 will output an invalid signal and the Status LED will flash.

Default Set

Use this menu item to reset all user settings to the factory defaults. Holding down the Up button for three seconds will reset the user settings to the default values given in Table 2.

When selecting this option, the state of the Up LED will indicate if any settings are not in their default states. If the Up LED is flashing, it indicates there is at least one user setting that is not in its default state. If the Up LED is lit solid, the user settings are in default state.

Specifications

In This Chapter

This chapter contains the Technical Specifications table.

Table 4. DAC-9213 - Technical Specifications

Category	Parameter	Specification
Serial Digital Video Input	Number of Inputs	1
	Signal Standards Supported	SMPTE 259M-C (270Mb/s) SMPTE 292M (1.4835 Gb/s, 1.485 Gb/s)
	Signal Formats Supported	SD: 525i/59.94, 525i/60, 625i/50 HD: 720p/59.94, 720p/60, 1080p/23.98sf, 1080p/24sf, 1080i/50, 1080i/59.94, 1080i/60
	Input Impedance	75Ω terminating
	Return Loss	>20dB to 270 MHz >15dB to 1.485 GHz
	Equalization	>300m of Belden 1694A cable @ 270 Mb/s >100m of Belden 1694A cable @ 1.485 Gb/s
Analog Component Output	Number of Outputs	3
	Video	Component Analog Video YP_BP_R or RGB
	Supported Video Levels	YP_BP_R: SMPTE, RGB: SMPTE, MII, Beta
	Output Impedance	75Ω
	Output Return Loss	>45 dB to 6MHz >28 dB to 30MHz
	DC Offset for RGB or Component Video	<± 50mV
	Frequency Response	± 0.5 dB to 20 MHz ± 1.0 dB to 30 MHz
	Group Delay	SD: < 20ns to 6 MHz HD: < 6ns to 30 MHz
	Outputs Short Circuit Protected	Yes
	RMS Noise (unweighted)	SD: < -55 dB, 0 - 6.0 MHz
Power	Required Voltage	+5V DC
	Current Consumption	<750mA typical
	Total Power	<3.75W typical
Other	Warranty	3-year transferable
	Thermal Environment	20 – 40ºC (68 – 104ºF) 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 DAC-9213 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 DAC-9213 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 DAC-9213 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 DAC-9213 Multi-Definition SDI to Analog Component 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 DAC-9213 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 DAC-9213, 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 DAC-9213. 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 DAC-9213 and related products.

Standard Equipment

- **DAC-9213**, Multi-Definition SDI to Analog Component Converter, including:
  - one User Manual
  - an installation kit with various mounting hardware
  - one **PS-9000** 5V Universal Power Adapter and line cord (pre-packaged for the country of use)

Optional Equipment

- **9213DR-004,** additional User Manual
- **CBL-3BNC-MM,2M,** 3BNC male to 3BNC male two meter cable
- **CON-BNCF-RCAM,** BNC Female to RCA Male adapter
- **PS-9000,** additional 5V Universal Power Adapter 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 **DAC-9213** Multi-Definition SDI to Analog Component 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, switchers, as well as analog audio and video products**.**

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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