

ADR-9039

Analog Composite to SDI Reference Converter

User Manual



ADR-9039 User Manual

- Ross Part Number: **9039DR-004-05**
- Release Date: October 11, 2012.

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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 to avoid personnel injury and to prevent product damage.

Product may require specific equipment, and/or installation procedures to 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



Protective Earth — *This symbol identifies a Protective Earth (PE) terminal, which is provided for connection of the supply system’s protective earth (green or green/yellow) conductor.*



This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage or injury to persons or equipment.



Warning — *The 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.*



Caution — *The symbol with the word “**Caution**” within the equipment manual indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.*



Warning Hazardous Voltages — *This symbol is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product enclosure that may be of sufficient magnitude to constitute a risk of shock to persons.*



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



1. **Warning** – Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. 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.
6. 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.



7. **Warning – Indoor Use: WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
8. Do not block ventilation openings. Install in accordance with manufacturer's instructions.
9. Do not install near heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
10. Do not use this apparatus near water.
11. Only use attachments/accessories specified by the manufacturer.
12. Unplug this apparatus during lightning storms or when unused for long periods of time.
13. Clean only with a dry cloth.
14. To avoid electrical shock, disconnect the A/C power cord before any servicing.
15. 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

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 Limited 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 la classe “A” est conforme a 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

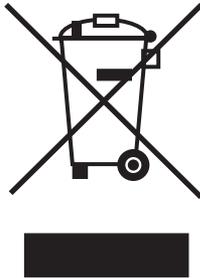
“Contact Us” section on the last page of this manual. All GearLite products are covered by a generous 3-year warranty and will be repaired without charge for materials or labor within this period. See the “Warranty and Repair Policy” section in this manual for details.

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.

Introduction

Overview

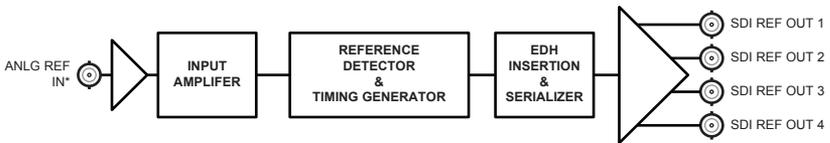
The ADR-9039 Analog Composite to SDI Reference Converter is a high-quality reference conversion solution within the growing family of GearLite compact, self-contained modular products. Supporting 525 and 625 analog composite video reference, the ADR-9039 is the ideal analog to SDI reference converter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

The ADR-9039 provides high-quality digital black reference into four separate 270Mbps 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 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.

Simplified Block Diagram



*525 OR 625

Figure 1 Simplified Block Diagram of ADR-9039 Functions

Features

The ADR-9039 includes 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

Static Discharge

Whenever handling the ADR-9039 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 ADR-9039 module you received from the shipping container and check the contents 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 ADR-9039 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°C 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 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**.
2. Adhere the **Surface Mount Strips** to the bottom side of the chassis. (**Figure 2**)

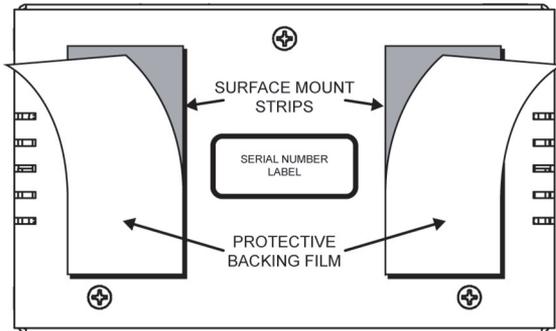


Figure 2 Surface Mount Installation Option

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.



Operating Tip — An additional VELCRO® brand **Surface Mount Strip** is available to mount the power adapter.

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.

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.

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 3**) using the screws provided in the Mounting Kit. Do not use the screws removed during **Step 1**.

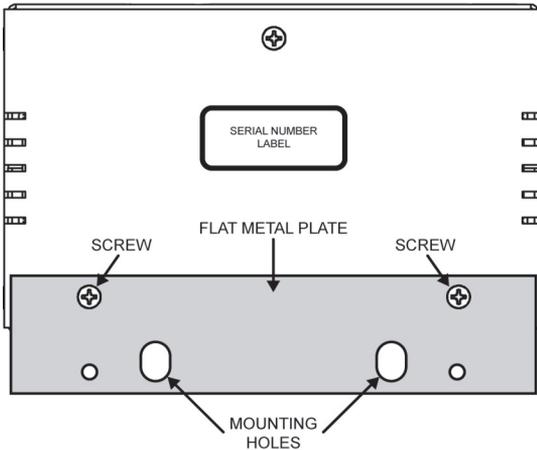


Figure 3 Flat Metal Plate Installation Option

3. Install the chassis in the desired location using the **Mounting Holes** on the **Flat Metal Plate**. Mounting screws are not provided by Ross Video.

Angle Mounting Bracket

The Angle Mounting Bracket (**Figure 4**) 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.

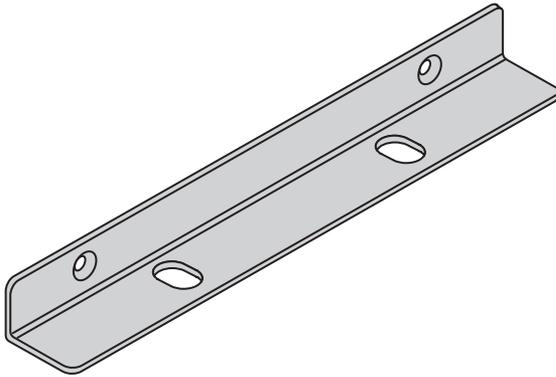


Figure 4 *Angle Mounting Bracket*

Setup

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



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

Installations outside of North America using line voltages of 200-240V require a plug, certified for the country of use, to be installed on the supplied line cord. Refer to the section “**Important Regulatory and Safety Notices to Service Personnel**” at the front of this manual for details.

Cable Connections Overview

Connect the analog input and SDI output cables to the ADR-9039 according to the designations indicated on the chassis label and **Figure 5**. The input is internally terminated at 75ohm. It is not necessary to terminate unused outputs.

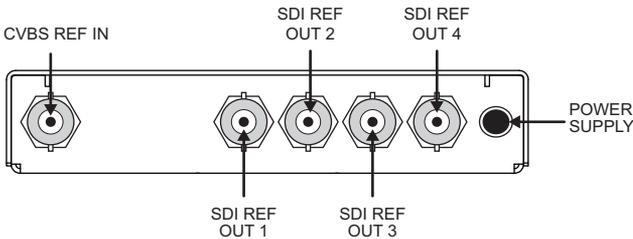


Figure 5 ADR-9039 Connections

Status LEDs

The front edge of the ADR-9039 has four LED indicators that display the status of the input signals, and indicate menu function and configuration selections. (Figure 6)

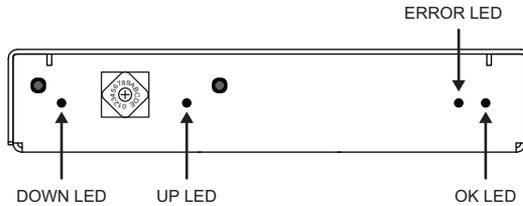


Figure 6 ADR-9039 Front Edge Status Indicator LEDs

Table 1 describes the status LEDs available on the ADR-9039.

Table 1 Status LED Descriptions

LED	Color	Function
OK	Green	When lit, this LED indicates that a valid reference signal is present and no anomalies have been detected. The ADR-9039 is functioning correctly.
ERROR	Flashing Red	When this flashing, this LED indicates that the input video standard is not the same as the standard selected in the system menu.
	Red	When lit, this LED indicates that one of the following conditions has occurred: <ul style="list-style-type: none"> the input signal is not valid the input is not present The SDI output is muted.
DOWN ^a	Flashing Yellow	When flashing, this LED indicates the selected menu item is adjusted to the lower limit.
	Yellow	When lit, this LED indicates that the selected menu item is less than or equal to the mid-point.
	Off	When unlit, this LED indicates the selected menu item is adjusted above the mid-point.
UP ^b	Flashing Yellow	When flashing, this LED indicates that the selected menu item is adjusted to the upper limit.
	Yellow	When lit, this LED indicates that the selected menu item range is greater than or equal to the mid-point.
	Off	When unlit, this LED indicates that the selected menu item is adjusted below the mid-point.

^aFor 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, refer to the section “Function Setup and Configuration Menu” on page 14.

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 the section “**Function Setup and Configuration Menus**” on page 14. Refer to **Figure 7** for switch and button locations.

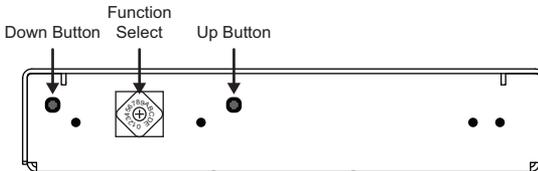


Figure 7 ADR-9039 Switch and Button Locations

General Operating Rules

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

- For each of the supported Reference Standard (525/625), the ADR-9039 stores the timing settings independently in non-volatile memory.
- The ADR-9039 always powers up in the last configuration used.
- Always check to see that the **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

1. To configure the Reference Standard function:
 - Turn the **Function Select** switch to Position **6**. The default configuration is Auto Select.
 - Both LEDs are now lit, to indicate this configuration selection.
2. To change Reference Standard configuration to PAL (625):
 - Keep the **Function Select** in Position **6**.
 - 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 Menus

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

Table Legend

- + Press the **Up** button from the default position
- Press the **Down** button from the default position
- (h) Hold **Up** or **Down** button for 2-3 seconds for faster adjustment or special function
- * Factory default state
- m Stored in memory and this setting will be applied upon power-up in the last known 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	LED Display	
			DOWN	UP
0	Format Display	625 (PAL)	●	○
		525 (NTSC) –	○	●
1	H Delay ^m	Max. Delay +(h)	●	☼
		Delay between Mid-point and Max. +(h)	●	○
		Mid-point	○	○
		Delay between Min-point and Mid. –(h)	○	●
		Min. Delay* –(h)	☼	●
2	H Reset	Reset +	☼	●
		Not Reset	○	●

Table 2 Function Setup and Configuration Menu

Function Selection Switch Position	Function Menu	Up/Down Buttons Mode Selection Menu	LED Display	
			DOWN	UP
3	V Delay ^m	Max. Delay + (h)	●	☀
		Delay between Mid-point and Max. + (h)	●	○
		Mid-point	○	○
		Delay between Min. and Mid-point - (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	Not implemented			
8	Not implemented			
9	Not implemented			
A	Not implemented			
B	Not implemented			
C	Not implemented			
D	Not implemented			
E	Not implemented			
F	Default	Default - (h)	●	●

Function Menu Notes

Some of the menu items in **Table 2** 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. 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 ADR-9039 is restored to the default settings, both the **UP** and **DOWN** LEDs are unlit.

Specifications

Specifications are subject to change without notification.

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	75ohm terminating
	Return Loss	>41dB to 5MHz
SDI Video Output	Number of Outputs	4
	Standard	SMPTE 259M (270Mbps, 525/625 lines)
	Impedance	75ohm
	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 37nS steps
	Thermal Drift	2.5nS/10°C
	Short Circuit Protected	Yes
Power	Require Voltage	+5V DC (5% regulation)
	Current Consumption	<250mA typical
	Total Power	1.25W typical
Other	Thermal Environment	20°C to 40°C (68°F to 104°F), ambient, non-condensing
	Dimensions (approx.)	13cm x 9cm x 2.5cm (5" x 3.5" x 1")
	Weight (approx.)	312g (11oz)

Service Information

Warranty and Repair Policy

The GearLite 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 GearLite 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 GearLite 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 GearLite ADR-9039 User Manual provides all pertinent information for the safe installation and operation of your GearLite Product. Ross Video policy dictates that all repairs to the GearLite 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 GearLite 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 GearLite 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.



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

Technical Support

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