CMA-9011
SDI Component Monitoring Amplifier
User Manual
Thank you for choosing Ross

You've made a great choice. We expect you will be very happy with your purchase of Ross Technology.

Our mission is to:
1. Provide a Superior Customer Experience
   • offer the best product quality and support
2. Make Cool Practical Technology
   • develop great products that customers love

Ross has become well known for the Ross Video Code of Ethics. It guides our interactions and empowers our employees. I hope you enjoy reading it below.

If anything at all with your Ross experience does not live up to your expectations be sure to reach out to us at solutions@rossvideo.com.

David Ross
CEO, Ross Video
dross@rossvideo.com

Ross Video Code of Ethics

Any company is the sum total of the people that make things happen. At Ross, our employees are a special group. Our employees truly care about doing a great job and delivering a high quality customer experience every day. This code of ethics hangs on the wall of all Ross Video locations to guide our behavior:

1. We will always act in our customers’ best interest.
2. We will do our best to understand our customers’ requirements.
3. We will not ship crap.
4. We will be great to work with.
5. We will do something extra for our customers, as an apology, when something big goes wrong and it’s our fault.
6. We will keep our promises.
7. We will treat the competition with respect.
8. We will cooperate with and help other friendly companies.
9. We will go above and beyond in times of crisis. If there's no one to authorize the required action in times of company or customer crisis - do what you know in your heart is right. (You may rent helicopters if necessary.)
CMA-9011 User Manual

- Ross Part Number: 9011DR-004-05
- Release Date: October 3, 2014.

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Patents

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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Protective Earth" /></td>
<td><strong>Protective Earth</strong> — 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.</td>
</tr>
<tr>
<td><img src="image" alt="Warning" /></td>
<td><strong>Warning</strong> — 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.</td>
</tr>
<tr>
<td><img src="image" alt="Caution" /></td>
<td><strong>Caution</strong> — 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.</td>
</tr>
<tr>
<td><img src="image" alt="Warning Hazardous Voltages" /></td>
<td><strong>Warning Hazardous Voltages</strong> — 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.</td>
</tr>
<tr>
<td><img src="image" alt="ESD Susceptibility" /></td>
<td><strong>ESD Susceptibility</strong> — This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.</td>
</tr>
</tbody>
</table>
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 CMA-9011 SDI Component Monitoring Amplifier is a high quality monitoring solution for SDI signals and part of a growing family of GearLite self-contained, small brick-format modules.

The CMA-9011 addresses high quality imaging requirements by converting the eight MSBs of an SDI Signal to Analog Composite Video (CVBS). A 10bit DAC and special filtering techniques used in the design achieve a low-artifact video output.

The front panel of the CMA-9011 chassis provides a power status LED for visual reference. In addition, user-selectable settings are available to place the CMA-9011 into the proper operating mode. Some of these modes are: monochrome output, 75% color bar pattern, and vertical interval blanking.

The CMA-9011 provides conversion of 525 and 625 SDI signals (SMPTE 259M). NTSC, PAL, and PAL-N standards are supported. Special measures have been taken to ensure excellent return loss at both input and output. This guarantees error-free performance with short cables.

The CMA-9011 is delivered with 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 CMA-9011 provides a broadcast-quality SDI component monitoring solution in a small, stand-alone package.

Simplified Block Diagram

Figure 1 Simplified Block Diagram of CMA-9011 Functions

Features
The CMA-9011 includes the following features:

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

Static Discharge
Whenever handling the CMA-9011 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 CMA-9011 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 CMA-9011 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)

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.

![Figure 2 Surface Mount Installation Option](image)

**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](image)

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 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 CMA-9011. The CMA-9011 has a standard miniature power jack (center pin positive).

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 CMA-9011 is supplied

**Caution** — Use of improper adapters may damage the CMA-9011 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 cables to the CMA-9011 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.

![CMA-9011 Connections](Figure 5 CMA-9011 Connections)

**DIP Switch Setup**

An 8-position DIP switch allows you to configure the CMA-9011 to fit into almost any installation. (**Figure 6**) Settings are described in **Table 1**.
Figure 6 shows all switches in the default UP (↑) position. The DIP switches are numbered 1-8 starting at the left of the block. The top of the CMA-9011 chassis includes a label that provides a condensed DIP switch settings chart. This chart is intended as a quick reference guide.

Note — SW1-7 and SW1-8 are not implemented and should be left in their default UP (↑) position.

Table 1 outlines how to set SW1-1 to SW1-6. The following conventions are used:

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

Table 1 DIP Switch Positions

<table>
<thead>
<tr>
<th>Video Standard</th>
<th>Chroma</th>
<th>VI</th>
<th>Setup</th>
<th>Mode</th>
<th>Setting Selections</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW1-1</td>
<td>SW1-2</td>
<td>SW1-3</td>
<td>SW1-4</td>
<td>SW1-5</td>
<td>SW1-6</td>
</tr>
<tr>
<td>↑</td>
<td>↑</td>
<td></td>
<td></td>
<td></td>
<td>NTSC (525)</td>
</tr>
<tr>
<td>↑</td>
<td>↓</td>
<td></td>
<td></td>
<td></td>
<td>PAL-N (625)</td>
</tr>
<tr>
<td>↓</td>
<td>↓</td>
<td></td>
<td></td>
<td></td>
<td>PAL-B/G (625)</td>
</tr>
<tr>
<td></td>
<td>↑</td>
<td></td>
<td></td>
<td></td>
<td>Chroma On</td>
</tr>
<tr>
<td></td>
<td>↓</td>
<td></td>
<td></td>
<td></td>
<td>Chroma Off</td>
</tr>
<tr>
<td></td>
<td>↑</td>
<td></td>
<td></td>
<td></td>
<td>Pass VI</td>
</tr>
<tr>
<td></td>
<td>↓</td>
<td></td>
<td></td>
<td></td>
<td>Blank VI</td>
</tr>
<tr>
<td></td>
<td>↑</td>
<td></td>
<td></td>
<td></td>
<td>Setup On</td>
</tr>
<tr>
<td></td>
<td>↓</td>
<td></td>
<td></td>
<td></td>
<td>Setup Off</td>
</tr>
<tr>
<td></td>
<td>↑</td>
<td></td>
<td></td>
<td></td>
<td>Normal Mode</td>
</tr>
<tr>
<td></td>
<td>↓</td>
<td></td>
<td></td>
<td></td>
<td>Color Bars</td>
</tr>
</tbody>
</table>
Status LEDs

The front panel of the module has an LED that displays the status of the amplifier. Figure 7 indicates the location of the LED and Table 2 describes the function of the LED.

![Status LED](image)

**Figure 7 CMA-9011 Status Indicator LEDs**

**Table 2 Status LED Descriptions**

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATUS</td>
<td>Green</td>
<td>When lit green, this LED indicates that the CMA-9011 is powered on and functioning correctly.</td>
</tr>
<tr>
<td></td>
<td>Flashing Green</td>
<td>When flashing green, this LED indicates that there is a problem with the input signal or the CMA-9011 is set to output Color Bars.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>When unlit, this LED indicates a loss of power to the CMA-9011.</td>
</tr>
</tbody>
</table>
## Specifications

### Technical Specifications

Specifications are subject to change without notification.

<table>
<thead>
<tr>
<th>Table 3  CMA-9011 — Technical Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category</strong></td>
</tr>
<tr>
<td>Serial Digital Video Input</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Analog Monitoring Output</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
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<tr>
<td></td>
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<td></td>
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</tbody>
</table>
### Table 3  CMA-9011 — Technical Specifications

<table>
<thead>
<tr>
<th>Category</th>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power</strong></td>
<td>Required Voltage</td>
<td>+5V DC (5% regulation)</td>
</tr>
<tr>
<td></td>
<td>Current Consumption</td>
<td>&gt;425mA typical</td>
</tr>
<tr>
<td></td>
<td>Total Power</td>
<td>&gt;2.2W typical</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Operating Range</td>
<td>20°C to 40°C ambient</td>
</tr>
<tr>
<td></td>
<td>Dimensions (approx.)</td>
<td>13cm x 9cm x 2.5cm (5” x 3.5” x 1”)</td>
</tr>
<tr>
<td></td>
<td>Weight (approx.)</td>
<td>312g (11oz)</td>
</tr>
</tbody>
</table>
Service Information

Warranty and Repair Policy

The GearLite CMA-9011 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 CMA-9011 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 CMA-9011 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 SDI Component Monitoring Amplifier User Manual of our Digital Products line provides all pertinent information for the safe installation and operation of your GearLite Product. Ross Video policy dictates that all repairs to the GearLite CMA-9011 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 CMA-9011, 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 CMA-9011. 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.
Notes:
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

<table>
<thead>
<tr>
<th>Technical Support</th>
<th>Telephone: +1 613 • 652 • 4886</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>After Hours Emergency: +1 613 • 349 • 0006</td>
</tr>
<tr>
<td></td>
<td>Email: <a href="mailto:techsupport@rossvideo.com">techsupport@rossvideo.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General Information</th>
<th>Telephone: +1 613 • 652 • 4886</th>
</tr>
</thead>
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<tr>
<td></td>
<td>Fax: +1 613 • 652 • 4425</td>
</tr>
<tr>
<td></td>
<td>Email: <a href="mailto:solutions@rossvideo.com">solutions@rossvideo.com</a></td>
</tr>
<tr>
<td></td>
<td>Website: <a href="http://www.rossvideo.com">http://www.rossvideo.com</a></td>
</tr>
</tbody>
</table>

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