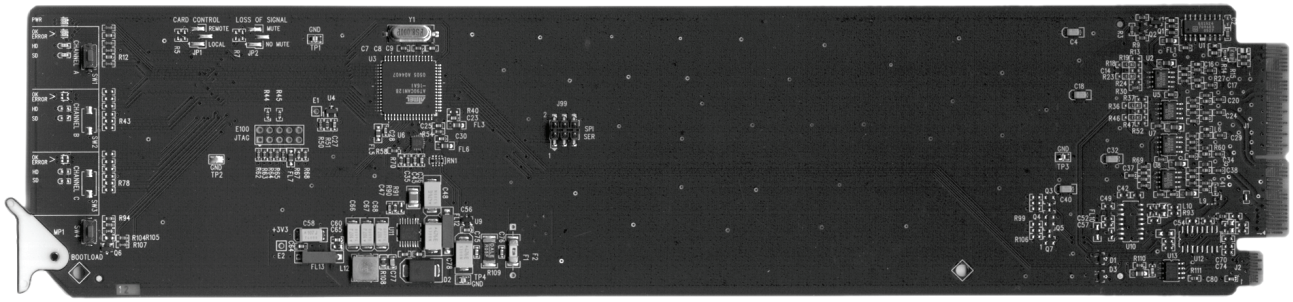
Ross Video Limited

SEA-8203

Serial MD-SDI Equalizing Amplifier

User Manual



Live Production Technology™

openGear

Ross Part Number: 8203DR-004
Issue: 05

SEA-8203 • Serial MD-SDI Equalizing Amplifier User Manual

- Ross Part Number: **8203DR-004**
- Document Issue: **05**
- Printed in Canada.

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Important Regulatory and Safety Notices

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

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.

Notice

The 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

Caution

This product is intended to be a component product of the openGear 8000 series frame. Refer to the openGear 8000 series frame User Manual for important safety instructions regarding the proper installation and safe operation of the frame as well as it's component products.

Warning

Certain parts of this equipment namely the power supply area still present a safety hazard, with the power switch in the OFF position. To avoid electrical shock, disconnect all A/C power cords from the chassis' rear appliance connectors before servicing this area.

Warning

Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after any servicing.

This product contains safety critical parts, which if incorrectly replaced may present a risk of fire or electrical shock. Components contained within the product's power supplies and power supply area, are not intended to be customer serviced and should be returned to the factory for repair.

To reduce the risk of fire, replacement fuses must be the same type and rating.

Only use attachments/accessories specified by the manufacturer.

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.

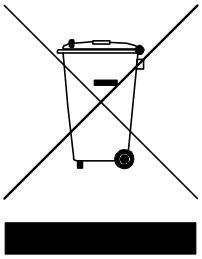
Maintenance/User Serviceable Parts

Routine maintenance to this openGear 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 products are covered by a generous 5-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.

openGear Contents

Introduction

In This Chapter

This chapter contains the following sections:

- A Word of Thanks
- Overview
- Functional Block Diagram
- Features
- Documentation Terms

A Word of Thanks

Congratulations on choosing the openGear **SEA-8203 Serial MD-SDI Equalizing Amplifier**. The SEA-8203 is part of a full line of Digital Products within the openGear Terminal Equipment family of products, backed by Ross Video's experience in engineering and design expertise since 1974.

You will be pleased at how easily your new SEA-8203 fits into your overall working environment. Equally pleasing is the product quality, reliability and functionality. Thank you for joining the group of worldwide satisfied Ross Video customers!

Should you have questions pertaining to the installation or operation of your SEA-8203, contact us at the numbers listed on the back cover of this manual. Our technical support staff are always available for consultation, training, or service.

Overview

The SEA-8203 is a single channel Multi-Definition SDI distribution amplifier, capable of equalizing all common serial digital signals. Support for both standard-definition and high-definition signals makes the SEA-8203 an extremely versatile SDI distribution amplifier.

The SEA-8203 equalizes the incoming SDI signal and produces 8 outputs, compensating for up to 300m of cable at 270Mb/s and over 120m of cable at 1.485Gb/s. Special attention has been taken to ensure the SDI outputs faithfully reproduce the incoming signals, with excellent jitter and return loss specifications.

LED indicators at the front of the card identify the presence of incoming video, simplifying system troubleshooting.

Ten amplifiers can be housed in an openGear DFR-8310 2RU frame.

Functional Block Diagram

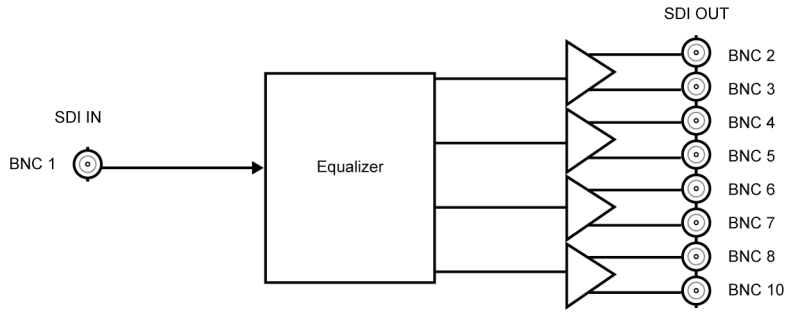


Figure 1. Simplified Block Diagram of SEA-8203 Functions

Features

The following features make the SEA-8203 the best solution for general SDI equalizing and distribution:

- One channel with 8 outputs
- Equalizes all SDI signals from 143 Mb/s to 1.485 Gb/s
- Equalizes up to 300m of Belden 1694A cable at 270 Mb/s, or over 120m of cable at 1.485 Gb/s
- LED indicators for signal presence
- Excellent input and output return loss exceeds SMPTE specifications
- Fits openGear DFR-8300 series frames
- 5 year transferable warranty

Documentation Terms

The following terms are used throughout this guide:

- "**Frame**" refers to the **DFR-8310** frame that houses the **SEA-8203** card.
- All references to the **DFR-8310** also include the **DFR-8310-C** versions with the cooling fan option. See the respective User Manuals for details.
- "**Operator**" and "**User**" both refer to the person who uses the **SEA-8203**.
- "**Board**" and "**Card**" both refer to the **SEA-8203** card itself, including all components and switches.
- "**System**" and "**Video system**" both refer to the mix of interconnected production and terminal equipment in which the **SEA-8203** operates.

Installation and Setup

In This Chapter

This chapter contains the following sections:

- Static Discharge
- Unpacking
- Rear Module Installation (Optional)
- Board Installation
- BNC Labels
- Cable Connections
- LEDs and Buttons

Static Discharge

Whenever handling the SEA-8203 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 SEA-8203 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.

Rear Module Installation (Optional)

If you received a RM-8300-B Rear I/O Module with your SEA-8203, you will need to install it in your DFR-8310 frame before you can connect cables.

If you are installing the SEA-8203 in a DFR-8310-C-BNC or DFR-8310-BNC frame, skip this section.

Use the following procedure to install the RM-8300-B in a DFR-8310 digital distribution frame:

1. Refer to the openGear DFR-8310 frame User Manual, to ensure that the frame is properly installed according to instructions.
2. On the rear of the DFR-8310, locate the card frame slot.
3. As shown in Figure 2, seat the bottom of the RM-8300-B in the seating slot at the base of the frame's back plane.

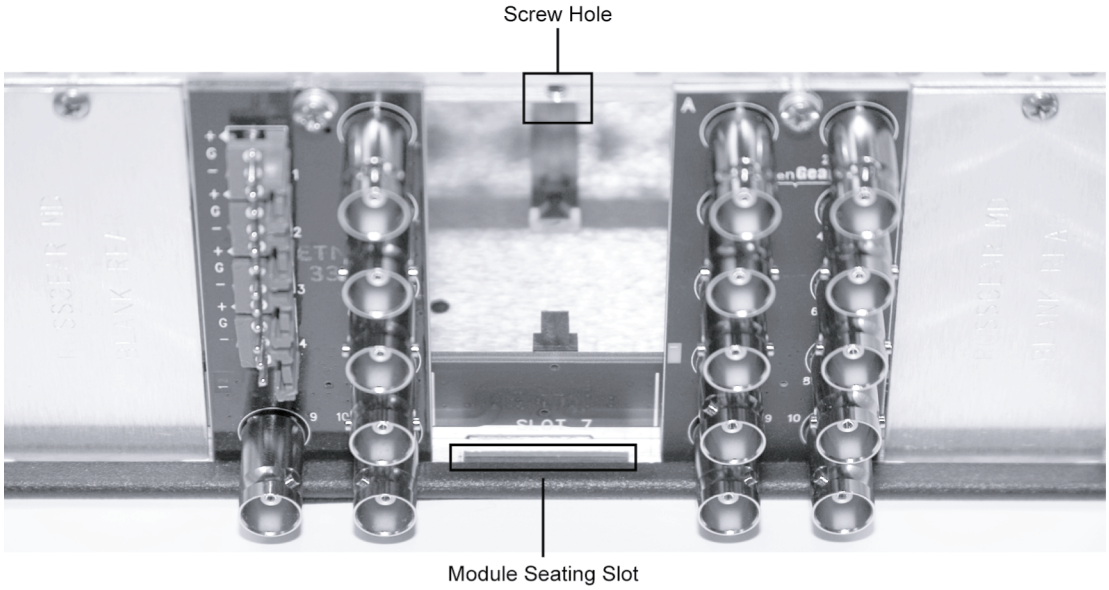


Figure 2. Rear Module Installation

4. Align the top hole of the RM-8300-B with the screw hole on the top edge of the DRF-8310 back plane.
5. Using a Phillips driver and the supplied screw, fasten the RM-8300-B panel to the DFR-8310 back plane. Do not over tighten.

This completes the procedure for installing the RM-8300-B in a DFR-8310 digital distribution frame.

Board Installation

Use the following procedure to install the SEA-8203 in an openGear DFR-8310 digital distribution frame:

1. Refer to the User Manual of the openGear DFR-8310 frame, to ensure that the frame is properly installed according to instructions.

Note

> Heat and power distribution requirements within a frame may dictate specific slot placement of cards. Cards with many heat-producing components should be arranged to avoid areas of excess heat build-up, particularly in frames using convectional cooling.

2. After selecting the desired frame installation slot, hold the SEA-8203 card by the edges and carefully align the card edges with the slots in the frame. Then fully insert the card into the frame until the rear connection plugs are properly seated on the mid plane and back plane.

This completes the procedure for installing the SEA-8203 in an openGear DFR-8310 digital distribution frame.

BNC Labels

Affix the supplied BNC label, as per the included instructions, to the BNC area on the rear of the rack frame.

Cable Connections

This section provides instructions for connecting cables to the installed BNC rear modules on the DFR-8310 series frame backplane. Connect the input and output cables according to the following diagram. The inputs are internally terminated in 75 ohms. It is not necessary to terminate unused outputs.

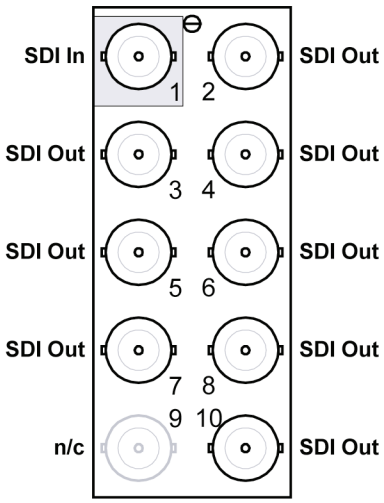


Figure 3. BNC Designations for the SEA-8203 Rear Module

LEDs and Buttons

The SEA-8203 is a single channel distribution amplifier, and will only have components installed into the **CHANNEL A** section of the card. Channels B and C are not applicable to the SEA-8203.

The following sections describe the SEA-8203 LEDs and Channel Rate Selection button.

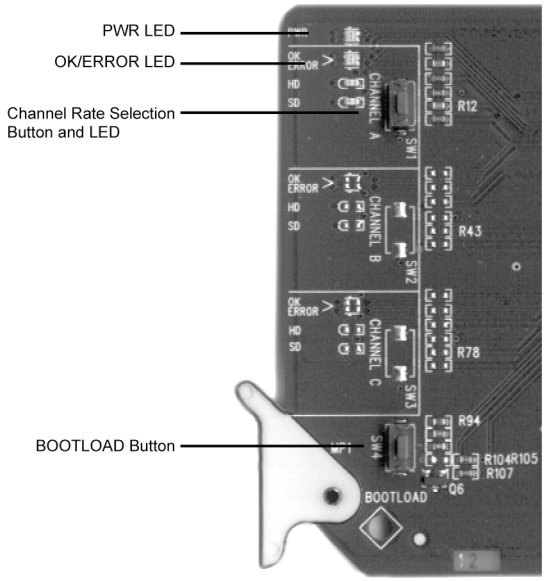


Figure 4. LED and Rate Selection Switch Locations

PWR (Power) LED

The top front edge of the card has a Power LED which indicates card status. The Power LED displays green when the card is operational. If the card is not operational or the LED is not displaying green, refer to the chapter, "**Service Information**", of this manual.

OK/Error LED

Channel A has an OK/ERROR LED. The LED displays the following conditions:

- **Green** — signal is passing through the channel
- **Red** — no input signal

Channel Rate Selection Buttons and LEDs

Channel A has a rate selection button and SD and HD LEDs. Use the rate selection button and LEDs to set the input signal rate type that the channel will process. You can choose between the following signal rate types:

- **HD** — 1.485Gb/s
- **SD** — 143, 177, 270, 360, 540 Mb/s

If a mix of SD and HD signals are passed through the channel, select **HD**. Pressing the button will cycle between HD and SD options.

Bootload Button

This button can be used to reset a channel to factory settings. Refer to the section below for details.

This button is also used for factory service in the unlikely event of a complete card failure. The Bootload process is further described in the chapter, "***Service Information***" of this manual.

Factory Default Values

Any channel can be set back to factory settings, where the data rate is set to **HD** and the alarm is enabled on loss of input. Use the following procedure to reset a channel to factory default values:

1. Press and hold the **Bootload** button on the card.
2. Press the rate selection button for the selected channel.

   The **Signal Status LED** flashes green and red for approximately 2 seconds to confirm the reset values.

Remote Control

In This Chapter

This section provides a detailed explanation on using remote control functions with your SEA-8203. The following topics are discussed:

- DashBoard Control System Software
- SNMP Monitoring and Control

DashBoard Control System Software

The DashBoard Control System enables you to monitor and control openGear frames and controller cards from a computer. The DashBoard software and manual can be downloaded from the Ross Video website.

Using the Menus

You must first install the DashBoard Control System software on your computer. Refer to the ***DashBoard User Manual*** for software installation procedures and using the DashBoard interface.

The Menu System

The following table and sections describe the menus, items, and parameters available from the DashBoard Control System software for the SEA-8203 Equalizing Amplifier.

Note

The **Channel A Rate** in the **Setup** menu affects the **Slew Rate** of the output driver. Ensure that the correct standard for your input is selected.

Table 1. DashBoard Menus

Menu	Item	Parameters	Description
Product (Read-only)	Product	SEA-8203	
	Supplier	Ross Video Ltd.	
	Board Rev	##	
	Serial Number	######-###	
	Software Rev	#.###	
Hardware (Read-only)	Voltage (mV)	#	Supply Voltage
	Current (mA)	#	Current consumption of card
	Rear Module	#	
	CPU Headroom	#	Process power available
	RAM Available (bytes)	#	On-board processing memory available
	EE Bank	#	Storage count
Signal (Read-only)	Signal Status	Green Indicator (OK)	The channel is passing valid signal
		Red Indicator (No Input A)	The channel has no input signal
	Channel A Status	No Signal	No signal present
		Signal Present	The input is present
Setup	Channel A Rate**	High Def*	1.485Gb/s or if a mix of SD and HD signals are passed through the channel, select High Def.
		Std Def	143, 177, 270, 360, 540 Mb/s
	Loss of Input	Ignore	The signal status field ignores the status for the input
		Alarm*	The signal status field displays the status for the input
	Edit Permission	Unlocked*	All configurable menu options are editable
		Locked	All configurable menu options, except this one, are locked and are read-only
	Factory Defaults	Reset	

* = Default Setting.
** = See Note above Table 1

SNMP Monitoring and Control

The MFC-8310-N Network Controller card in the DFR-8310 frame provides optional support for remote monitoring and control of your frame and SEA-8203 using SNMP (Simple Network Management Protocol), which is compatible with many third-party monitoring and control tools.

Refer to your SEA-8203 MIB (Management Information Base) file for a breakdown of SNMP controls on this card.

Refer to your ***DFR-8310 User Manual*** for additional information on SNMP Monitoring and Control.

Specifications

Technical Specifications

Table 2. SEA-8203 - Technical Specifications

Category	Parameter	Specification
Serial Digital Video Inputs	Number Of Inputs	1
	Data Rates Supported	All data rates from 143Mb/s to 1.485 Gb/s
	Impedance	75Ω terminating
	Equalization	Over 120m of Belden 1694A cable @ 1.485Gb/s or up to 300m @ 270Mb/s
	Return Loss	>17dB to 1.485GHz
Serial Digital Video Outputs	Number of Outputs	8
	Impedance	75Ω
	Return Loss	>15dB to 1.485GHz
	Signal Level	800mV ±10%
	DC Offset	0 Volts ±50 mV
	Rise & Fall Time (20-80%)	700ps. Typical (270Mb/s) 120ps. Typical (1.485Gb/s)
	Overshoot	<1%
Other	Total Power Consumption	1.5W
	Warranty	5 year transferable

Specifications are subject to change without notice.

Service Information

In This Chapter

This chapter contains the following sections:

- Troubleshooting Checklist
- Power LED Conditions
- Bootload Button
- Warranty and Repair Policy

Troubleshooting Checklist

Routine maintenance to this openGear product is not required. In the event of problems with your SEA-8203, the following basic troubleshooting checklist may help identify the source of the problem. If the module still does not appear to be working properly after checking all possible causes, please contact your openGear products distributor, or the openGear Technical Support department at the numbers listed under the "Contact Us" section at the end of this manual.

1. **Visual Review —** Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the module, the frame, and any associated peripheral equipment for signs of trouble.
2. **Power Check —** Check the power indicator LED on the distribution frame front panel for the presence of power. If the power LED is not illuminated, verify that the power cable is connected to a power source and that power is available at the power main. Confirm that the power supplies are fully seated in their slots. If the power LED is still not illuminated, replace the power supply with one that is verified to work.
3. **Reseat the Card in the Frame** — Eject the card and reinsert it in the frame.
4. **Check Control Settings —** Refer to the Installation and Operation sections of the manual and verify all user-adjustable component settings.
5. **Input Signal Status —** Verify that source equipment is operating correctly and that a valid signal is being supplied.
6. **Output Signal Path —** Verify that destination equipment is operating correctly and receiving a valid signal.
7. **Module Exchange** — Exchanging a suspect module with a module that is known to be working correctly is an efficient method for localizing problems to individual modules.

Power LED Conditions

The top front edge of the module has a Power LED which indicates card status. The Power LED displays the following conditions:

- **Off** — no power to the card.
- **Amber** — the card is running internal diagnostics while powering up.
- **Green** — normal operation.
- **Flashing Green** — Bootload button pressed, card is receiving a new software load from the frame.
- **Green/Flashing Amber** — signal or configuration problem, check signal status and settings.
- **Red** — solid or flashing means the card is not operational. Reseat card in frame, check the rear I/O module type and connections, or call openGear Technical Support.

Bootload Button

In the unlikely event of a complete card failure, you may be instructed by a Ross Technical Support specialist to perform a complete software reload on the SEA-8203. To perform this task, perform the following steps:

1. Eject the card
2. Press and hold the **Bootload** button, while re-inserting the card into the frame.
3. Release the button.

   The **PWR LED** will flash GREEN while the card is waiting for a new software load.

   If a new software load is not sent to the card within 60 seconds, the card will attempt to restart with it's last operational software load.

Software loads can be sent to the SEA-8203 using the MFC-8310-N Frame Controller with Networking, or via connection to the openBUS on the rear of the frame.

Warranty and Repair Policy

The openGear SEA-8203 is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of FIVE (5) years from the date of shipment from our factory. In the event that your RossGear SEA-8203 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 openGear SEA-8203 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 FIVE (5) 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 openGear SEA-8203 User Manual provides all pertinent information for the safe installation and operation of your RossGear Product. Ross Video policy dictates that all repairs to the openGear SEA-8203 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 openGear SEA-8203, 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 openGear SEA-8203. 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

SEA-8203 and Related Products

Your **SEA-8203 Serial MD-SDI Equalizing Amplifier** is a part of the openGear family of products. Ross Video offers a full line of openGear terminal equipment including distribution, conversion, monitoring, synchronizers, encoders, decoders, keyers, switchers, as well as analog audio and video products**.**

Standard Equipment

- **SEA-8203** Serial MD-SDI Equalizing Amplifier
- **8203DR-004** Serial MD-SDI Equalizing Amplifier User Manual

Optional Equipment

- **8203DR-004** Serial MD-SDI Equalizing Amplifier User Manual (additional User Manual)
- **RM-8300-B** Gear MD Rear Module (10 BNC connector)
- **DFR-8310** Digital Products Frame and Power Supply (2RU, holds 10 cards)
- **DFR-8310-C** Digital Products Frame and Power Supply with Cooling Fans (2RU, holds 10 cards)
- **DFR-8310-BNC** Digital Products Frame and Power Supply with fixed 100-BNC Rear Module. (2RU, holds 10 cards)
- **DFR-8310-C-BNC** Digital Products Frame and Power Supply with fixed 100-BNC Rear Module and Cooling Fans. (2RU, holds 10 cards)
- **DFR-8310-N** Digital Products Frame and Power Supply with cooling fans, and MFC-8310-N card. (2RU, holds 10 cards)
- **DFR-8310-N-BNC** Digital Products Frame and Power Supply with cooling fans, 100-BNC Rear Module, and MFC-8310-N card. (2RU, holds 10 cards)
- **MFC-8310-N** Network Controller Card (Additional)

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
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