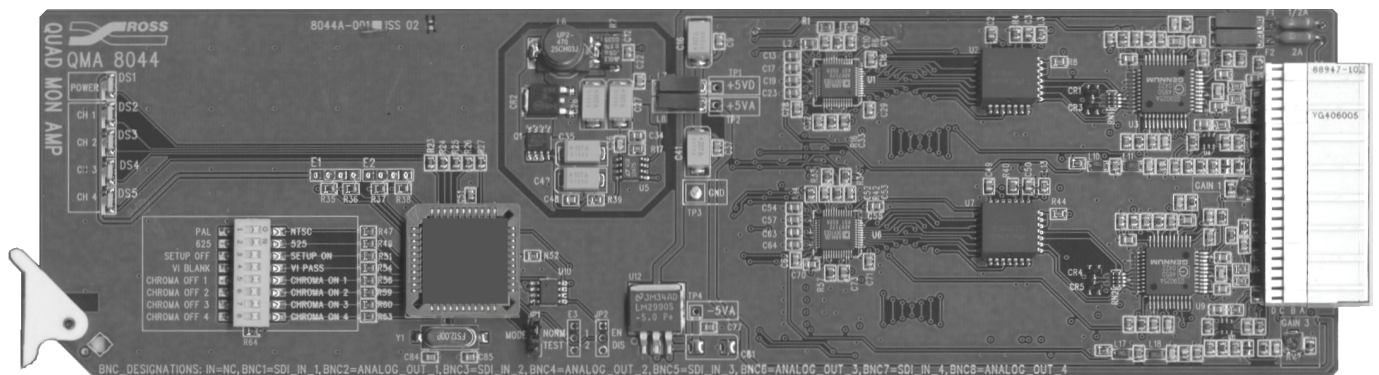


QMA-8044

Quad Monitoring Amplifier User Manual



Ross Part Number: 8044DR-004

Issue: 02C

QMA-8044 • Quad Monitoring Amplifier User Manual

- Ross Part Number: **8044DR-004**
- Document Issue: **02C**
- 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 RossGear 8000 series frame. Refer to the RossGear 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 numérique de classe "A" est conforme à la norme NMB-003 du Canada.

EUROPE

This equipment is in compliance with the essential requirements and other relevant provisions of **CE Directive 93/68/EEC**.

INTERNATIONAL

This equipment has been tested to **CISPR 22:1997** along with amendments **A1:2000** and **A2:2002** and found to comply with the limits for a Class A Digital device.



Notice

This is a Class A product. In domestic environments this product may cause radio interference in which case the user may have to take adequate measures.

Maintenance/User Serviceable Parts

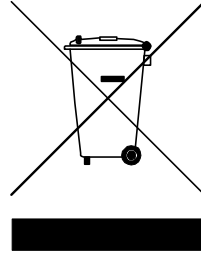
Routine maintenance to this RossGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All RossGear products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



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Introduction

In This Chapter

This chapter contains the following information sections:

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

A Word of Thanks

Congratulations on choosing the Ross Video QMA-8044 Quad Monitoring Amplifier. The QMA-8044 is part of a full line of products within the RossGear Terminal Equipment family of analog and digital products, backed by Ross Video's experience in engineering and design expertise since 1974.

You will be pleased at how easily your new QMA-8044 fits into your overall working environment. Equally pleasing is the product quality, reliability and functionality. Thank you for joining the worldwide group of satisfied Ross Video customers!

Should you have a question pertaining to the installation and operation of your QMA-8044, please contact us at the numbers listed on the last page of this publication. Our technical support staff is always available for consultation, training, or service.

Overview

The QMA-8044 Quad Monitoring Amplifier provides a convenient and cost effective solution for multi-channel picture monitoring requirements in SDI systems. The complete unit occupies only a single card slot in a standard RossGear 8000 series digital products rack frame, and provides four channels of video encoding. The RossGear DFR-8104A can hold 16 channels (4 cards) and the DFR-8110A can hold 40 channels (10 cards). Please refer to the frame User Manual for specific ventilation and cooling instructions to maintain optimum operating conditions. This card also fits into Leitch* FR-6800 series frames to provide you with greater installation versatility.

The QMA-8044 addresses high quality imaging requirements by converting the 8 MSb's of the SDI signal to analog composite video. It uses a 10-bit DAC with 10MHz bandwidth on each channel, thereby achieving a low-artifact video output.

Each QMA-8044 provides four identical composite analog monitoring outputs and can work in NTSC, PAL-B/G, or PAL-N environments. The SDI input has a precision cable equalizer that will give error-free performance with up to 200 meters (656 ft.) of Belden 8281 cable.

Several user-selectable settings are available to place the QMA-8044 into the proper operating mode. Some of these modes are; monochrome output, color bar pattern, and vertical interval blanking.

The QMA-8044 has card-edge LED indicators to confirm the presence of a valid SDI input signal.

Functional Block Diagram

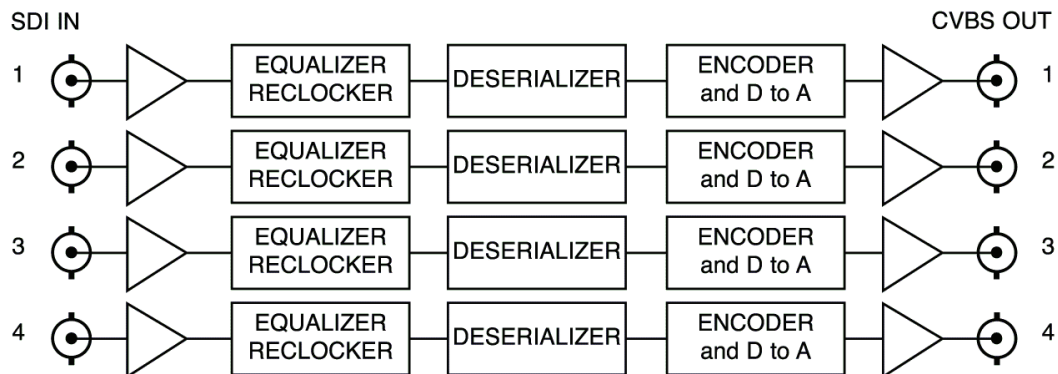


Figure 1. Simplified Block Diagram of QMA-8044 Functions

* Leitch is a trademark of Leitch Technology Corporation.

Features

The following features make the QMA-8044 the best solution for multi-channel monitoring of SDI signals:

- Four channels of conversion on one card
- Reclocking of SDI input
- Input equalization for up to 200 meters (656 ft.) of cable
- Input indicator LEDs
- Four NTSC, PAL-B/G, or PAL-N analog monitoring outputs
- Excellent chroma modulation accuracy
- Fits Ross Video 8000 series digital products frames and Leitch 6800 series frames
- 5-year transferable warranty

Documentation Terms

The following terms may be used throughout this manual:

- “**Frame**” refers to the **DFR-8104A** or **DFR-8110A** frames that house the **QMA-8044** card.
- All references to the **DFR-8104A** and **DFR-8110A** also include the **DFR-8104A-C** and **DFR-8110A-C** versions with the cooling fan option. See the respective User Manuals for details.
- “**Board**”, “**Card**”, “**Module**”, and “**Unit**” all refer to the **QMA-8044** card itself, including all components and switches.
- “**System**” and “**Video system**” refers to the mix of interconnected digital and analog production and terminal equipment in which the **QMA-8044** operates.
- “**525-line mode**” refers to broadcast situations using **NTSC** composite (analog) signal reference inputs.
- “**625-line mode**” refers to broadcast situations using **PAL**, **PAL B/G**, and/or **PAL-N** composite (analog) signal reference inputs.

Installation and Setup

In This Chapter

This chapter contains the following information sections:

- Static Discharge
- Unpacking
- Jumper Locations
- Output Mode Selection
- Analog Output Switch Selection
- Board Installation
- BNC Labels
- Cable Connections
- LEDs

Static Discharge

Whenever handling the QMA-8044 cards and other related equipment, please observe all static discharge precautions as described in the following note:



Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas, and when wearing synthetic fiber clothing. Always exercise proper grounding precautions when working on circuit boards and related equipment.

Unpacking

Unpack each QMA-8044 card 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.

Jumper Locations

Use the following discussions, the card labeling, and Figure 2 to set up QMA-8044 jumpers. These settings are performed *before* installing the unit in the frame, but may be repeated as required.

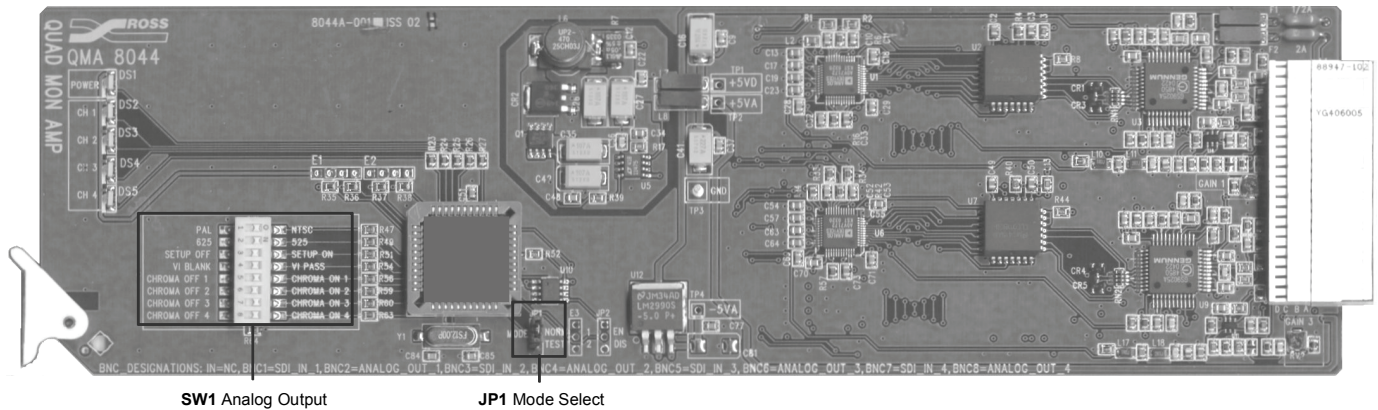


Figure 2. User Control Locations

Output Mode Jumper Selection

The mode selection jumper, **JP1**, provides the operator with two choices of output modes to be selected before making any switch (**SW1**) settings:

- **NORM** — In this position, all SDI input signals are converted to analog composite video for each output channel. This is the normal operating mode. (Default setting)
- **TEST** — In this position, a full-field color bar signal is provided on each output channel.

Note

In both modes, the analog outputs will mute in the absence of a valid SDI input signal.

Analog Output Switch Selection

Adjust the switch settings of **SW1** to determine the nature of the analog output signals according to Table 1.

Table 1. QMA-8044 Analog Output Switch Settings

SW1-1 NTSC/PAL	SW1-2 525/625	SW1-3 SETUP	SW1-4 VI BLANK	SW1-5 CHROMA 1	SW1-6 CHROMA 2	SW1-7 CHROMA 3	SW1-8 CHROMA 4	SELECTION NOTES
ON	ON							NTSC (525)
ON	OFF							PAL-N (625)
OFF	OFF							PAL-B/G (625)
		ON						SETUP ON
		OFF						SETUP OFF
			ON					PASS VI
			OFF					BLANK VI
				ON				CH1 CHROMA ON
				OFF				CH1 CHROMA OFF
					ON			CH2 CHROMA ON
					OFF			CH2 CHROMA OFF
						ON		CH3 CHROMA ON
						OFF		CH3 CHROMA OFF
							ON	CH4 CHROMA ON
							OFF	CH4 CHROMA OFF

Board Installation

Use the following procedure to install the QMA-8044 cards in a RossGear DFR-8104A or DFR-8110A digital frame:

1. Refer to the User Manual of the RossGear frame to ensure that the frame is properly installed according to instructions. If this module is to be installed in any compatible frame other than a Ross Video product, refer to the frame manufacturer's manual for specific 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 QMA-8044 card by the edges and carefully align the card edges with the slots in the frame.
3. Insert the card into the frame until the rear connection plug is properly seated.

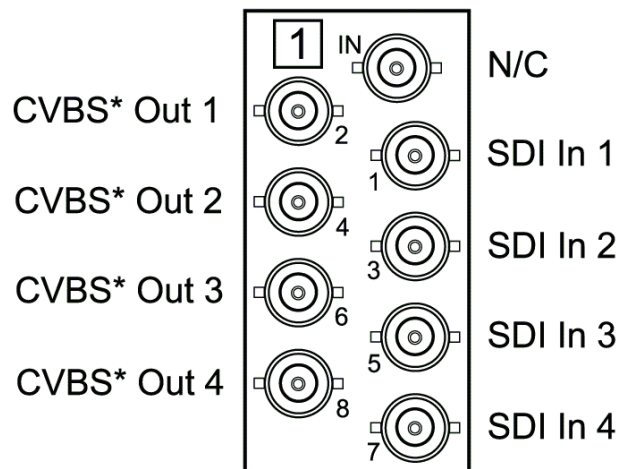
This completes the procedure to install the QMA-8044 cards in a RossGear DFR-8104A or a DFR-8110A digital frame.

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

The following diagram indicates the input and output connections for coax cables to the QMA-8044 when mounted in RossGear 8000 series digital frames. It is not necessary to terminate unused outputs.



*CVBS = Analog Composite NTSC/PAL

Figure 3. Cabling Designations for RossGear 8000 Series Frames

LEDs

The card-edge of the module has several LED indicators, which show the status of the amplifier.

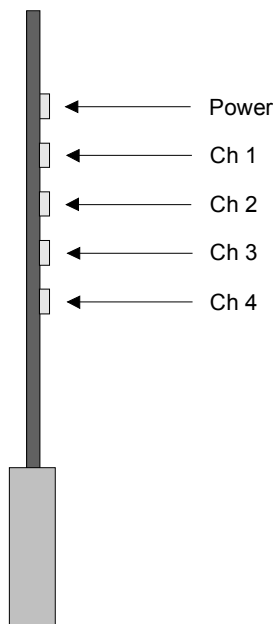


Figure 4. Card-edge LEDs

The meanings of the LED indicators when lit are as follows:

Table 2. QMA-8044 LED Status Indicators

LED	Condition	Status Description
Power (Green)	Lit	The unit is powered and functioning normally.
	Flashing	The unit is in TEST mode. (set to output color bars)
	Off	There is no power to the card.
Ch 1 (Green)	Lit	There is a signal present at Input 1.
	Flashing	Input 1 has no input, or the input is invalid.
Ch 2 (Green)	Lit	There is a signal present at Input 2.
	Flashing	Input 2 has no input, or the input is invalid.
Ch 3 (Green)	Lit	There is a signal present at Input 3.
	Flashing	Input 3 has no input, or the input is invalid.
Ch 4 (Green)	Lit	There is a signal present at Input 4.
	Flashing	Input 4 has no input, or the input is invalid.

Specifications

In This Chapter

This chapter contains the QMA-8044 Technical Specifications table.

Technical Specifications

Table 3. Specifications

Category	Parameter	Specification
SDI Input	Number of Inputs	4 (1 per channel)
	Signal Standards Accommodated	SMPTE 259M (270Mb/s only)
	Input Impedance	75 Ω terminating
	Return Loss	>17dB to 270MHz
	Equalization	Automatic, up to 21dB (200m of Belden 8281 cable @ 270Mb/s)
Analog Monitoring Outputs	Number of Outputs	4 (1 per channel)
	Output Impedance	75 Ω
	Output Return Loss	> 40dB to 6MHz
	Output Isolation	> 42dB to 6MHz
	Signal Level	1V p-p $\pm$ 5%
	DC Offset	0V $\pm$ 50mV
	Frequency Response	$\pm$ 0.2dB to 5MHz, typically -0.6dB @ 5.5MHz
	Differential Phase	< 1°
	Differential Gain	< 1%
	Group Delay	< 20ns to 4.2MHz
	RMS Noise (unweighted)	-56dB, 0 - 5.0MHz

Category	Parameter	Specification
Power Consumption	Positive Rail	980mA
	Negative Rail	45mA
	Total	< 7W typical

Specifications are subject to change without notification.

Service Information

In This Chapter

This chapter contains the following sections:

- Troubleshooting Checklist
- Warranty and Repair Policy

Troubleshooting Checklist

Routine maintenance to this RossGear product is not required. In the event of problems with your QMA-8044, 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 Ross Video products distributor, or the Ross Video 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-components.
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.

Warranty and Repair Policy

The RossGear QMA-8044 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 QMA-8044 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 QMA-8044 has failed after your warranty period has expired, we will repair your defective product for as long as suitable replacement components are available. You, the owner, will bear any labor and/or component 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 RossGear QMA-8044 Quad Monitoring Amplifier User Manual of our Analog Video 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 QMA-8044 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 QMA-8044, 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 QMA-8044. A temporary replacement module, if required, 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 this equipment.

Ordering Information

QMA-8044 and Related Products

Your **QMA-8044 Quad Monitoring Amplifier** is part of the RossGear family of products. Ross Video offers a full line of RossGear terminal equipment including distribution, conversion, monitoring, synchronizers, encoders, decoders, keyers, switchers, as well as analog audio and video products.

Standard Equipment

- **QMA-8044** Quad Monitoring Amplifier
- **8044DR-004** Quad Monitoring Amplifier User Manual

Optional Equipment

- **8044DR-004** additional Quad Monitoring Amplifier User Manual
- **DFR-8104A** Digital Products Frame and Power Supply (PS-8102) (1RU, holds 4 modules, includes 1 power supply)
- **DFR-8104A-C** Digital Products Frame with Cooling Fan Module and Power Supply (PS-8102) (1RU, holds 4 modules, includes 1 power supply)
- **DFR-8110A** Digital Products Frame and Power Supply (PS-8102) (2RU, holds 10 modules, includes 1 power supply)
- **DFR-8110A-C** Digital Products Frame with Cooling Fan Module and Power Supply (PS-8102) (2RU, holds 10 modules, includes 1 power supply)

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
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	Ross Video Incorporated	P.O. Box 880, Ogdensburg, New York, USA 13669-0880

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