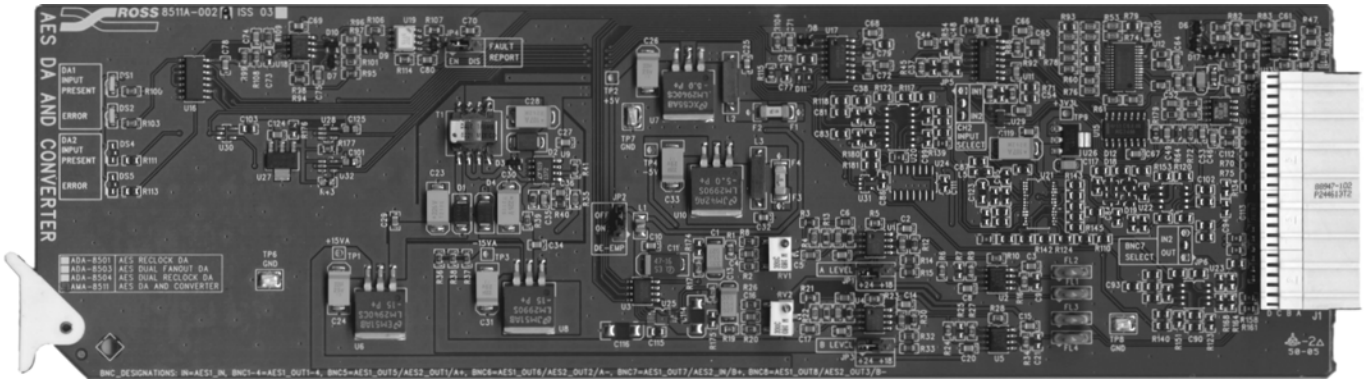
Ross Video Limited

AMA-8511

AES/EBU Distribution Amplifier and Converter

User Manual



Ross Part Number: 8511D-004
Issue: 03

Cool Practical Technology™

AMA-8511 • AES/EBU Distribution Amplifier and Converter User Manual

- Ross Part Number: **8511D-004**
- Document Issue: **03**
- Release Date: December 21, 2005. Printed in Canada.

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Trademarks

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 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

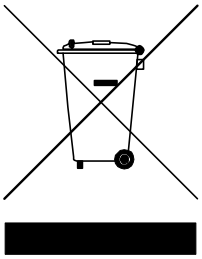
Routine maintenance to this RossGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All RossGear products 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 **AMA-8511 AES/EBU Distribution Amplifier and Converter**. The AMA-8511 is part of a full line of Digital Products within the RossGear 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 AMA-8511 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 a question pertaining to the installation or operation of your AMA-8511, please contact us at the numbers listed on the back cover of this manual. Our technical support staff is always available for consultation, training, or service.

Overview

The RossGear AMA-8511 AES/EBU Distribution Amplifier and Converter is a broadcast quality digital AES/EBU audio reclocking distribution amplifier, as well as a modular product used to convert 20 or 24 bit AES-3id (coaxial) signals to analog audio. The AMA-8511 accepts one 32, 44.1, or 48kHz sample rate AES/EBU audio signal and provides two copies of balanced stereo (A, B) analog audio and four reclocked copies of the input signal. The RossGear AMA-8511 is designed for use in 75-ohm coaxial SMPTE 276M or AES-3id systems.

The AMA-8511 provides automatic cable equalization for lengths up to and beyond 610m (2000 ft.). The D/A converter uses a state of the art 24bit 128X over-sampled Delta Sigma Modulator DAC to convert to analog audio. Following the D/A conversion, the analog audio passes through a very high quality reconstruction filter that assures low distortion and noise. Two identical copies of the analog signal are output via the rear plug-on module, the CON-8516 AES Audio Connector (included with the card).

A coarse level adjustment headroom jumper (18dB or 24dB), and a fine adjustment potentiometer (±6dB) are provided to precisely match to your facility's house reference audio level. The AMA-8511 can accommodate any full-scale digital (FSD) level in the -12 to - 30dBFS range. Automatic detection of AES/EBU 50/15µs de-emphasis is available for all data rates.

The AMA-8511 has been designed with the capability to report a variety of AES signal errors including No Lock, Coding, Parity, CRC, and Validity. These errors are indicated on a card edge LED. In addition, there is a SMPTE 269M fault reporting output to the back of the Ross frame.

The AMA-8511 fits into Ross 8000A series digital frames, the DFR-8110A (2RU) and the DFR-8104A (1RU), and provides system builders with the ability to easily distribute and convert digital audio within a facility.

A reclocking amplifier is the preferred method of distribution for long coaxial runs to reduce jitter in the data stream. The AMA-8511 performs reclocking in a two-stage process that develops an output, which is stable and noise-free.

The AMA-8511 is part of a complete line of RossGear AES solutions that includes distribution, conversion, and monitoring. Designed and manufactured to meet the highest quality broadcast industry standards, the RossGear AMA-8511 is an ideal, flexible, and cost effective solution for your digital audio reclocking distribution and digital to analog conversion requirements.

Functional Block Diagram

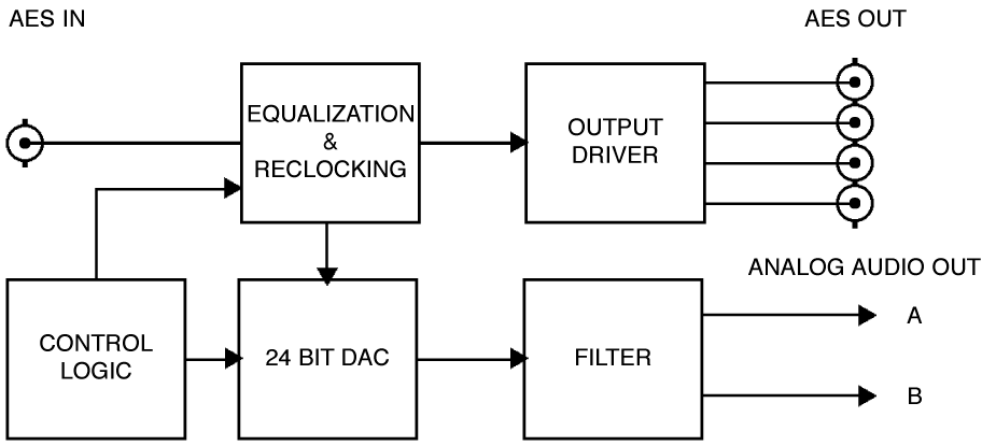

Figure 1. Simplified Block Diagram of AMA-8511 Functions

Features

The following features make the AMA-8511 a great choice for your AES/EBU reclocking distribution and conversion requirements:

- Support for 32, 44.1, and 48kHz sampling rates
- 24-bit DAC resolution
- Reclocking to reduce output jitter and noise
- Conformity to AES 3id 1995
- Adjustable headroom level
- Two stereo audio outputs
- Terminating input 75Ω
- Auto equalization for > 610m (2000 ft.) of Belden 8281 cable
- Ten card capacity in the Ross DFR-8110A (2RU) digital rack frame
- Four card capacity in the Ross DFR-8104A (1RU) digital rack frame
- Visual indication of signal presence
- Visual indication of an error condition
- SMPTE 269M Fault Reporting
- 5-year transferable warranty

Documentation Terms

The following terms are used throughout this guide:

- "**Frame**" refers to the **DFR-8104A** and **DFR-8110A** frames that house the **AMA-8511** 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.
- "**Operator**" and "**User**" both refer to the person who uses the **AMA-8511**.
- "**Board**", "**Card**", and "**Module**" all refer to the **AMA-8511** board itself, including all components and switches.
- "**System**" and "**Video system**" refers to the mix of interconnected production and terminal equipment in which the **AMA-8511** operates.

Installation and Setup

In This Chapter

This chapter contains the following information sections:

- Static Discharge
- Unpacking
- De-Emphasis Jumper Setup
- Coarse Level Jumper Setup
- Fine Level Adjustment
- Fault Report Jumper Setup
- Board Installation
- BNC Labels
- Cable Connections
- Audio Levels
- LEDs

Static Discharge

Whenever handling the AMA-8511 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 AMA-8511 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.

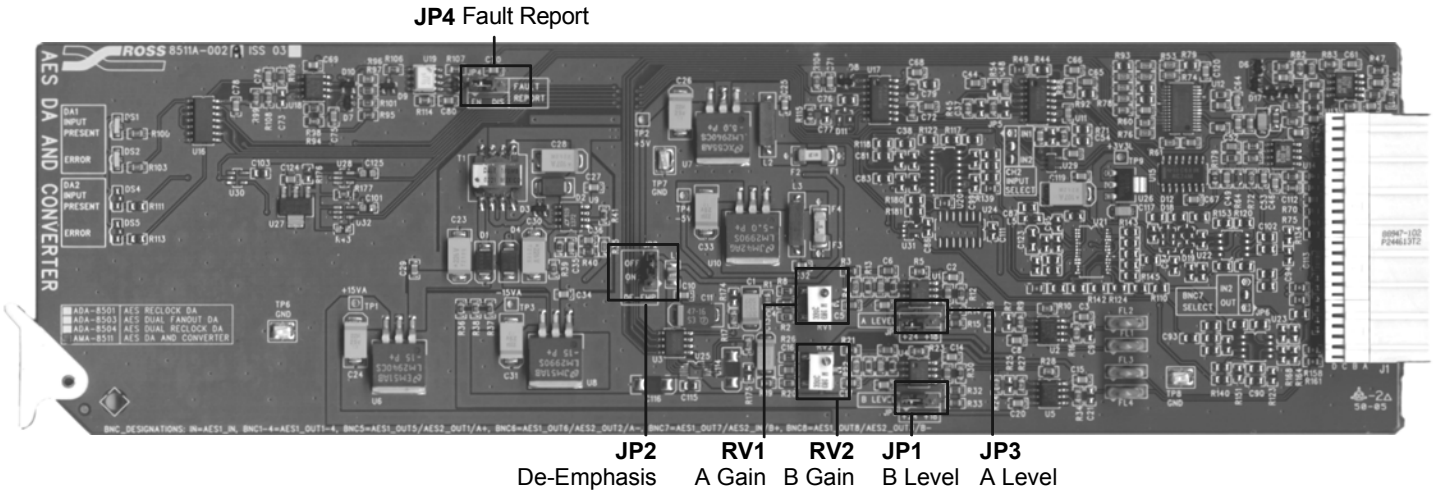

Figure 2. User Control Locations

De-Emphasis Jumper Setup

Jumper **JP2** allows the AMA-8511 to force De-Emphasis according to the current sampling rate. Select one of the following options for **JP2**:

- **On** — AMA-8511 forces de-emphasis (50/15us) according to the current sampling rate.
- **Off** — No de-emphasis filtering (default setting).

Coarse Level Jumper Setup

The following table explains how to make the coarse-level selections that determine the desired analog output signal using the headroom jumpers **JP1** and **JP3**.

Table 1. AMA-8511 Coarse Level Jumper Settings

Jumper	Designation	Mode	Description / Function
JP1	A Level	+24	Sets coarse Headroom level for A channel to +24dBu (default setting)
		+18	Sets coarse Headroom level for A channel to +18dBu
JP3	B Level	+24	Sets coarse Headroom level for B channel to +24dBu (default setting)
		+18	Sets coarse Headroom level for B channel to +18dBu

Fine Level Adjustment

The following table explains making level adjustments (±6dB) for each channel using potentiometers, **RV1** and **RV2**. If necessary, use the **EXT-8100** Extender Board to adjust the potentiometers with the card running in the frame.

Table 2. AMA-8511 Potentiometer Adjustments

Potentiometer	Designation	Description / Function
RV1	A Gain	Used to set fine level adjustment for A channel output gain
RV2	B Gain	Used to set fine level adjustment for B channel output gain

Note

RV1 and **RV2** are factory adjusted for unity gain and should not need adjusting.

An extender card is required (EXT-8100) to adjust potentiometer settings. See the "**Optional Equipment**" section in Chapter 4 for details.

For an AES input of -20dBFS, with **JP1** and **JP3** set to +24dBu, the analog audio output will be +4dBu.

Fault Report Jumper Setup

Select SMPTE 269M Fault Reporting, **EN**ABLED or **DIS**ABLED, via **JP4** The default is **EN**.

See Chapter 3, "**SMPTE 269M Fault Reporting**" for complete details.

Board Installation

Use the following steps to install the AMA-8511 in a RossGear 8000 series digital distribution frame:

1. Refer to the User Manual of the RossGear 8000 series frame, to ensure that the frame is properly installed according to instructions.
2. Please note that 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.
3. After selecting the desired frame installation slot, hold the AMA-8511 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 plug is properly seated.

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 AMA-8511 when mounted in RossGear 8000 series Digital Products Frames.

Connect the input and output cables according to the frame rear panel connections diagram in the following figure and discussions. The inputs are internally terminated in 75 ohms. It is not necessary to terminate unused outputs.

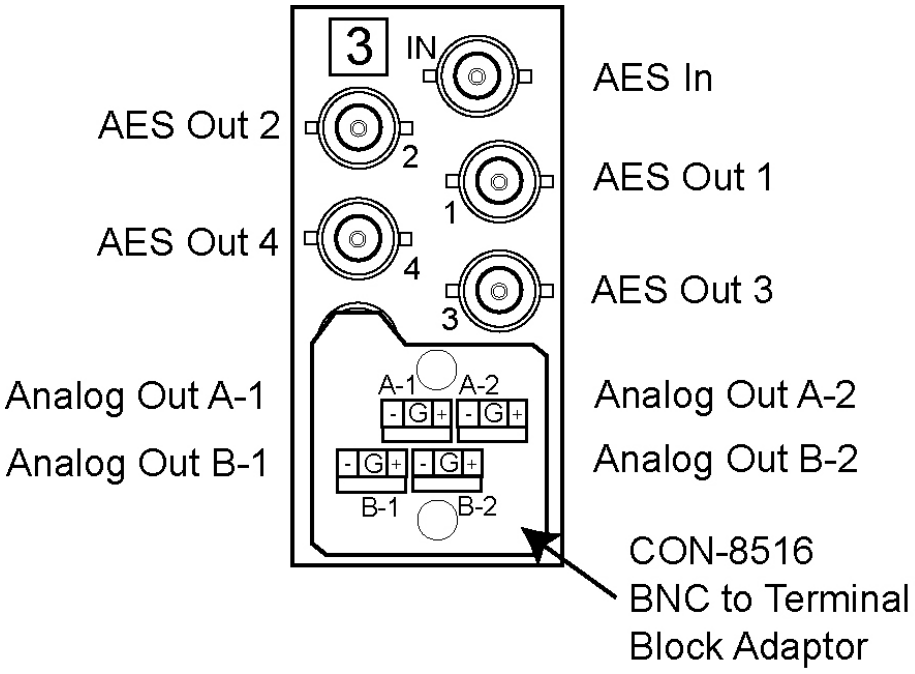

Figure 3. AMA-8511 BNC and Audio Plug Designations for RossGear DFR-8110A (2RU Frame)

AES Input

The AES audio input should be connected to the "IN" BNC on the rear of the frame.

Note

> If the AES input signal is disrupted, the AMA-8511 will generate invalid analog audio output.

AES Output

Four reclocked AES outputs are available on BNC connectors 1, 2, 3, and 4.

Analog Audio Output

The AMA-8511 uses a rear sub-module (CON-8516) to access the balanced audio outputs. The sub-module plugs onto BNCs 5, 6, 7, and 8 on the rear of the Ross DFR-8104A or DFR-8110A frames.

On the CON-8516 module there are removable connectors for OUT-A and OUT-B. Each connector has sockets for the positive, negative, and grounded wires of a balanced analog audio cable.

Two copies of the analog audio signal (OUT A1&A2, OUT B1&B2) are available via plug-on connectors on the CON-8516.

The AMA-8511 can accommodate any full-scale digital level in the -12 to -30dBFS range. To adjust the output level, select the approximate dBFS level (18dB or 24dB) using the headroom jumpers (A Level and B Level) and then turn the potentiometers (RV1 and RV2) to trim (± 6dB) the analog output to match your installation's standard.

Wire the external cables to the plug-able terminal block connectors as outlined in the diagram and procedure below.

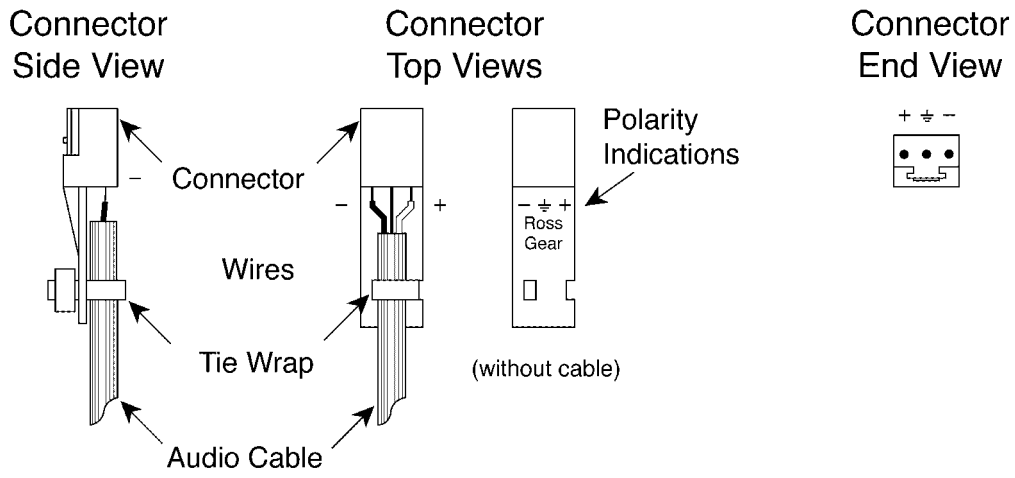

Figure 4. Connector Wiring for CON-8516 Module

1. Insert an analog audio wire to the designated polarity slot on the connector.
2. Use a tweaker screwdriver to tighten the corresponding screw on the underside of the connector.
3. Repeat steps 1 and 2 for each wire on each connector.

Once the cables have been wired to the connectors, install the connectors to the sockets on the CON-8516 module so that the slotted tongue fits in the grooves on the module socket.

Audio Levels

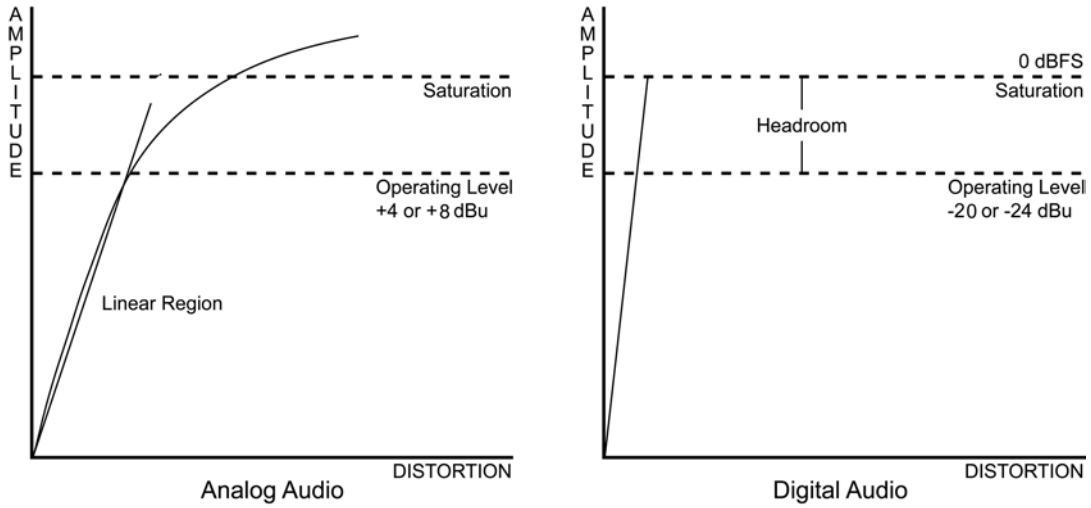

Figure 5. Graphs of Amplitude vs. Distortion

The graphs of amplitude vs. distortion for analog and digital audio equipment show that digital audio does not gradually degrade (become more distorted) as the amplitude increases. Likewise, the digital audio signal does not exist above 0dBFS. For these reasons, the interface between existing analog house reference standards, and digital audio standards are as shown in the following table:

Table 3. Analog House Reference & Digital Audio Interface

Existing House Reference	Desired Headroom	Set AMA-8511 Maximum Output Level to:	Typical Application
0dBu	14dB	+14dBu	AES/EBU for Audio Production
+4dBu	20dB	+24dBu	AES/EBU for Audio Production
+8dBu	20dB	+28dBu	AES/EBU for 525 Video
+4dBu	18dB	+22dBu	AES/EBU for 625 Video
+4dBu	22dB	+26dBu	AES/EBU for 625 Video

LEDs

The front edge of the module has two LED indicators, which show the status of the amplifier. They are described in the following figure and table. The module is operating correctly when the Input Present LED is lit and the Error LED is not lit.

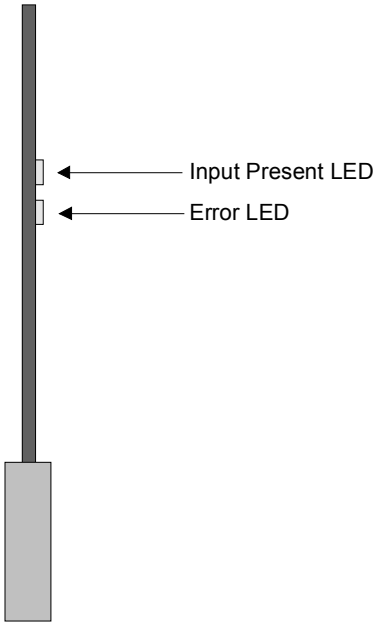

Figure 6. AMA-8511 Status LEDs

Table 4. AMA-8511 Status LED Indicator Descriptions

LED	Reference	Status Description
Input Present	Green	Indicates presence of an input signal.
Error	Red	One or more of the following problems have been encountered: 1. **No Lock** - There was an error with the incoming signal 2. **Coding** - Bi-phase coding violation 3. **Parity** - There was a parity error 4. **CRC** - Error in the CRC calculation 5. **Validity** - The integrity of this sub-frame is in question

SMPTE 269M Fault Reporting

In This Chapter

This chapter contains the following sections:

- Overview
- Jumper Setup
- Frame Connections
- Details

Overview

The SMPTE 269M Fault Reporting system, also known as a SMPTE "alarm", provides indication if one or more frame modules encounter a fault or an abnormal condition. The AMA-8511 module provides a jumper to enable SMPTE-269M fault reporting. The card connects by means of an internal interface circuit to an auxiliary telco connector on RossGear 8000 series frames. When the frame connection is interfaced with a customer-designed system of LEDs or audible alarms, faults can be traced to a specific frame when a card fault occurs within that frame.

The following diagram illustrates a general arrangement for SMPTE 269M alarm reporting:

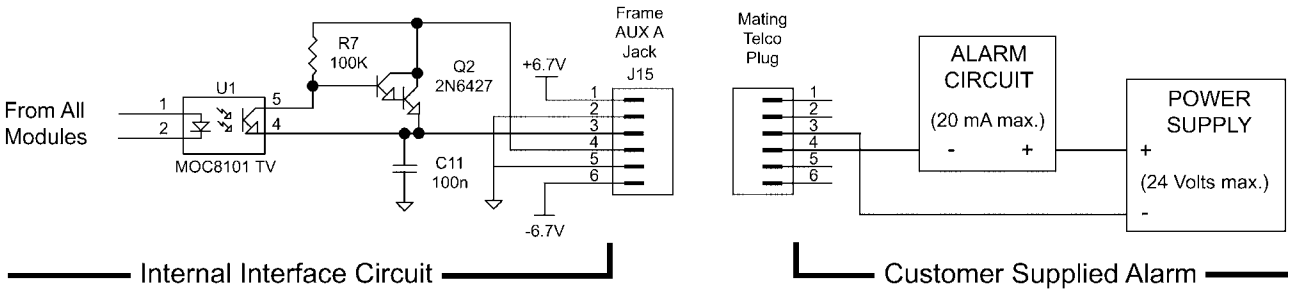

Figure 7. SMPTE 269M Alarm Reporting: Internal interface and typical connections

Jumper Setup

If fault reporting for the AMA-8511 is desired, use jumper **JP4 - 269M FAULT REPORT** to set up the card.

1. To access the jumper, remove the card from the frame by pressing down the white card ejector tab and pulling the card from the frame slot.
2. Observing all static discharge and handling precautions, place the card with the component side facing up on a clean flat surface.
3. To enable SMPTE fault reporting, set jumper **JP4** to **ENABLE** position.
4. To disable SMPTE fault reporting, set jumper **JP4** to **DISABLE** position.

Frame Connections

The SMPTE 269M Fault Reporting connection on RossGear 8000 series frames is provided by the auxiliary telco connector, **AUX A**, for interfacing with a customer-designed alarm system.

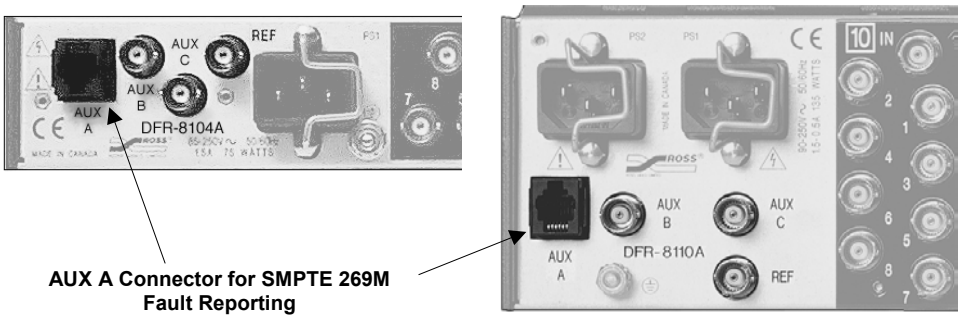

Figure 8. SMPTE 269M Alarm Reporting Frame Connections

Details

The fault report contacts are closed when the card detects an internal failure or a power loss condition. Some internal failures are:

- Failure of the card to initialize
- Failure in the fault reporting circuitry
- Failure to detect a valid input signal to the card

For additional information on alarm system design, refer to the SMPTE document ***ANSI/SMPTE 269M - 1999***.

Specifications

In This Chapter

This chapter contains the following information:

- Technical Specifications
- Channel Status Data

Technical Specifications

Table 5. AMA-8511 - Technical Specifications

Category	Parameter	Specification
AES Input	Number of Inputs	1
	Standards	AES-3id (SMPTE 276M)
	Sampling Rates	32kHz, 44.1kHz, 48kHz
	Input Impedance	75Ω terminating
	Connector	BNC
	Input Return Loss	>40dB to 6MHz
	Equalization	>610m (2000 ft.) of Belden 8281
	Input Level	1V p-p nominal
	Max Common Mode Signal	12Vp-p @ 50/60Hz
AES Output	Number of Outputs	4
	Standards	AES-3id (SMPTE 276M)
	Output Impedance	75Ω
	Output Isolation	48dB
	Signal Level	1.0V p-p ±10%
	Rise and Fall Time	30ns Typical
	Output Jitter	<4ns peak @ 48kHz (<24.5mUI)
	Output Return Loss	>46dB (0.1 - MHz)
	Electrical Path Length	260ns @ 48kHz

Category	Parameter	Specification
Analog Audio Output	Number of Outputs	2 Copies of 1 stereo pair
	Type	Balanced Analog Audio
	Connector	Removable Terminal Block via BNC Adapter Module CON-8516
	Output Impedance	55Ω
Performance	Quantization	20 or 24 bits
	Frequency Response	20Hz - 20kHz ±0.25dB @ 48kHz
	Signal to Noise Ratio	105dB (22Hz - 20kHz AES 17 filter)
	THD	<0.04% -80dB @ -20dBFS
	Reference Levels (Headroom)	Adjustable from -30dBFS to -12dBFS
	Max Output Amplitude	+27dBu
	IMD (SMPTE/DIN 4:1)	< 0.04% -112dB CCIF two-tone test
	Phase Linearity	+8 degrees @ 20kHz
	Crosstalk	<-74dB
	Audio Delay	300µs (AES In to Analog Out)
Environmental	Operating Range	5 °C – 40 °C ambient
Power	Total Consumption	2.5W

Specifications are subject to change without notification.

Channel Status Data

The following table indicates fixed and configurable channel status bit information.

Table 6. Channel Status Data

Byte	Bit	Function	Transmitted
0	0	Professional or Consumer use of Channel Status Block	Professional (1)
	1	Normal Audio or Non-Audio Mode	Normal Audio (0)
	2-4	Emphasis: User selectable	Not Indicated or No Emphasis (000) 50/15us Emphasis (110)
	5	Source Sampling Rate Locked (0)	
	6-7	Sampling Rate: User Selectable	Set according to current sampling rate 32kHz (11) 44.1kHz (10) 48kHz (01)
1	0-3	Channel Mode	2 channel stereo (0001)
	4-7	User Bit Mode	192-bit (0001)
2	0-2	Auxiliary Bit Usage	20-bit audio sample, Aux bits undefined (000) 24-bit audio sample (001)
	3-5	Sample Word Length: User Selectable	20 bits (011) 24 bits (101)
3	0-7	Multichannel Modes (0)	
4	0-7	AES 11 Sync Reference (0)	
5	0-7	Reserved (0)	
6-9		ASCII Source ID (0)	
10-13		ASCII Destination ID (0)	
14-17		Local Sample Address (0)	
18-21		Time of Day Address (0)	
22	0-7	Reliability flags (0)	
23	0-7	CRCC	

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 AMA-8511, 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-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.

Warranty and Repair Policy

The RossGear AMA-8511 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 AMA-8511 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 AMA-8511 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 RossGear AMA-8511 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 RossGear AMA-8511 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 AMA-8511, 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 AMA-8511. If required, a temporary replacement module will be made available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited will be shipped collect.

The Ross Video Technical Support Department will continue to provide advice on any product manufactured by Ross Video Limited, beyond the warranty period without charge, for the life of the equipment.

Ordering Information

In This Chapter

This chapter contains ordering information for the AMA-8511 and related products.

AMA-8511 and Related Products

Standard Equipment

- **AMA-8511** AES/EBU Distribution Amplifier and Converter

Optional Equipment

- **8511D-004** AES/EBU Distribution Amplifier and Converter User Manual (additional 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)
- **EXT-8100** Extender Board (module servicing extension)

Your **AMA-8511 AES/EBU Distribution Amplifier and Converter** is a 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, switches, as well as analog audio and video products**.**

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

PHONE	**General Business Office and Technical Support**	613 • 652 • 4886
	After-hours Support	613 · 349 · 0006
	Fax	613 • 652 • 4425
E-MAIL	**General Information**	solutions@rossvideo.com
	Technical Support	techsupport@rossvideo.com
POSTAL SERVICE	**Ross Video Limited**	8 John Street, Iroquois, Ontario, Canada K0E 1K0
	Ross Video Incorporated	P.O. Box 880, Ogdensburg, New York, USA 13669-0880

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