ADC-8733A Series

Analog Component to SDI Video Converter

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.)*

ADC-8733A Series · User Manual

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- Release Date: January 25, 2018.

The information contained in this Guide is subject to change without notice or obligation.

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Patents

Patent numbers US 7,034,886; US 7,508,455; US 7,602,446; US 7,802,802 B2; US 7,834,886; US 7,914,332; US 8,307,284; US 8,407,374 B2; US 8,499,019 B2; US 8,519,949 B2; US 8,743,292 B2; GB 2,419,119 B; GB 2,447,380 B; and other patents pending.

Notice

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Safety Notices

Refer to the "**Important Regulatory and Safety Notices**" document that accompanied your product.

Statement of Compliance

This product has been determined to be compliant with the applicable standards, regulations, and directives for the countries where the product is marketed.

Compliance documentation, such as certification or Declaration of Compliance for the product is available upon request by contacting techsupport@rossvideo.com. Please include the product; model number identifiers and serial number and country that compliance information is needed in request.

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 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 Ltd. could void the user's authority to operate this equipment.*

Canada

This Class "A" digital apparatus complies with Canadian ICES-003 and part 15 of the FCC Rules.

Cet appareil numerique de la classe "A" est conforme a la norme NMB-003 du Canada.

European Union

This equipment is in compliance with the essential requirements and other relevant provisions established under regulation (EC) No 765/2008 and Decision No 768/2008/EC referred to as the "New Legislative Framework".

> ⚠ **Warning** — *This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.*

Australia/New Zealand

This equipment is in compliance with the provisions established under the Radiocommunications Act 1992 and Radiocommunications Labeling (Electromagnetic Compatibility) Notice 2008.

Korea

This equipment is in compliance with the provisions established under the Radio Waves Act.

Class A equipment (Broadcasting and communications service for business use)

This device is a business-use (Class A) EMC-compliant device. The seller and user are advised to be aware of this fact. This device is intended for use in areas outside home.

Type of Equipment	User's Guide
A급 기기 (업무용 방송통신기자재)	이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.
Class A Equipment (Industrial Broadcasting & Communication Equipment)	This equipment is and seller or user should take notice of it, and this equipment is to be used in the places except for home.

International

This equipment has been tested under the requirements of CISPR 22:2008 or CISPR 32:2015 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 of this manual. All openGear 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 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 sections:

- Overview
- Features
- Functional Block Diagram
- User Interfaces
- Documentation Terms and Conventions

A Word of Thanks

Congratulations on choosing an openGear ADC-8733A Series Analog Component to SDI Video Converter. 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 card, 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 ADC-8733A is the perfect solution for converting analog component (YUV/RGB) sources such as VTRs, cameras, and character generators for use in the digital realm. The component YUV/RGB video signal, with or without setup, is converted to four SD-SDI (SMPTE-259M) outputs with the highest level of precision. This is achieved because all signal processing and color space conversion is performed in the digital domain. A two times over-sampled 12-bit A-D conversion and high quality digital filtering ensure superb frequency response.

The ADC-8733A is available in the following models:

- **ADC-8733A** — This model includes Proc Amp, Line Delay, and Line Synchronizer modes.
- **ADC-8733A-S** — This model includes Frame Delay and Frame Synchronizer modes, along with all the features available on the ADC-8733A.
- **ADC-8733A-C** — This model includes the AAM-8581 daughter card and features four channels of analog audio embedding along with all the features available on the ADC-8733A.
- **ADC-8733A-SC** — This model includes the features of the ADC-8733A-S model in addition to all the features available on the ADC-8733A-C model.

To simplify configuration, the ADC-8733A offers two methods. Note that changes made using either of the methods are reflected in the other.

- DashBoard Control System — The ADC-8733A is fully compliant with all openGear technical specifications and supports remote monitoring and control via the DashBoard Control System.
- Heads-Up Display — The ADC-8733A includes an on-screen display that enables you to view adjustments made using the card-edge controls.

The ADC-8733A converters are part of a full line of openGear digital distribution products engineered to satisfy the highest quality broadcast standards and the most demanding requirements of your facility.

ADC-8733A-S Overview

The ADC-8733A-S version comes with a full featured frame synchronizer, capable of synchronizing incoming video to house reference. Various timing modes are available to accommodate most situations. New techniques in frame synchronization contribute to the low power requirements and compact design. The complete circuit for the ADC-8733A-S, including color space converter, frame (or line) synchronizer, serializer, tracking delay pulse, three 12-bit A-D converters and a microprocessor are all contained on a single DA-sized card. Additional daughter cards are not required.

ADC-8733A-C Overview

The ADC-8733A-C model includes the ADC-8733A or the ADC-8733A-S, the AAM-8581, and the appropriate Rear Module. The AAM-8581 is a daughter card that plugs onto the top of the ADC-8733A and enables you to add four channels of analog audio conversion and embedding to the SDI video output of the ADC-8733A. The AAM-8581 uses state of the art analog to digital converters that provide 24-bit resolution. The audio gain adjustment is provided in the analog domain through the use of digital potentiometers and has a range of ±10dBu.

Features

The ADC-8733A includes the following standard features:

- YUV input from Betacam, MII and SMPTE/EBU formats
- RGB input from NTSC-related, MII and SMPTE EBU supported
- Four serial digital outputs
- 12-bit analog to digital conversion
- 2x over-sampling for excellent frequency response
- Automatic 525/625-line selection
- Can pass vertical interval signals
- Programmable vertical interval blanking
- Compact design on a single DA-sized card
- Heads-Up Display
- Optional Frame Synchronization (no daughter card required)
- Field-upgrade Frame Synchronization option available
- Extensive Proc Amp controls
- Freeze modes
- Horizontal and vertical timing adjustments
- Setup adjustment
- Black level offset
- Pass or clip Super Black
- Status indicator LEDs on card edge
- Choice of input timing source
- Choice of reference inputs
- Tracking Delay Output for companion audio synchronizer
- Built-in test signals (FF color bars, SDI Checkfield)
- Reports status and configuration remotely via the DashBoard Control System
- Fits openGear frames
- 5-year transferable warranty
- Fully compliant with openGear specifications

ADC-8733A-C Features

In addition to the above features, the ADC-8733A-C also includes:

- 4 channel audio embedding
- 24-bit ADC resolution
- Selectable maximum input level from -10dBu to +10dBu in 0.5dBu increments
- Audio gain in the analog domain via digital potentiometers
- ±0.05dB frequency response 20Hz to 22Hz
- Audio Clip LED on card-edge
- Alarm feature via DashBoard
- Silence alarm with threshold and alarm timeout settings
- Audio Delay up to 5 seconds

Functional Block Diagram

This section provides a functional block diagram that outlines the workflow of the ADC-8733A.
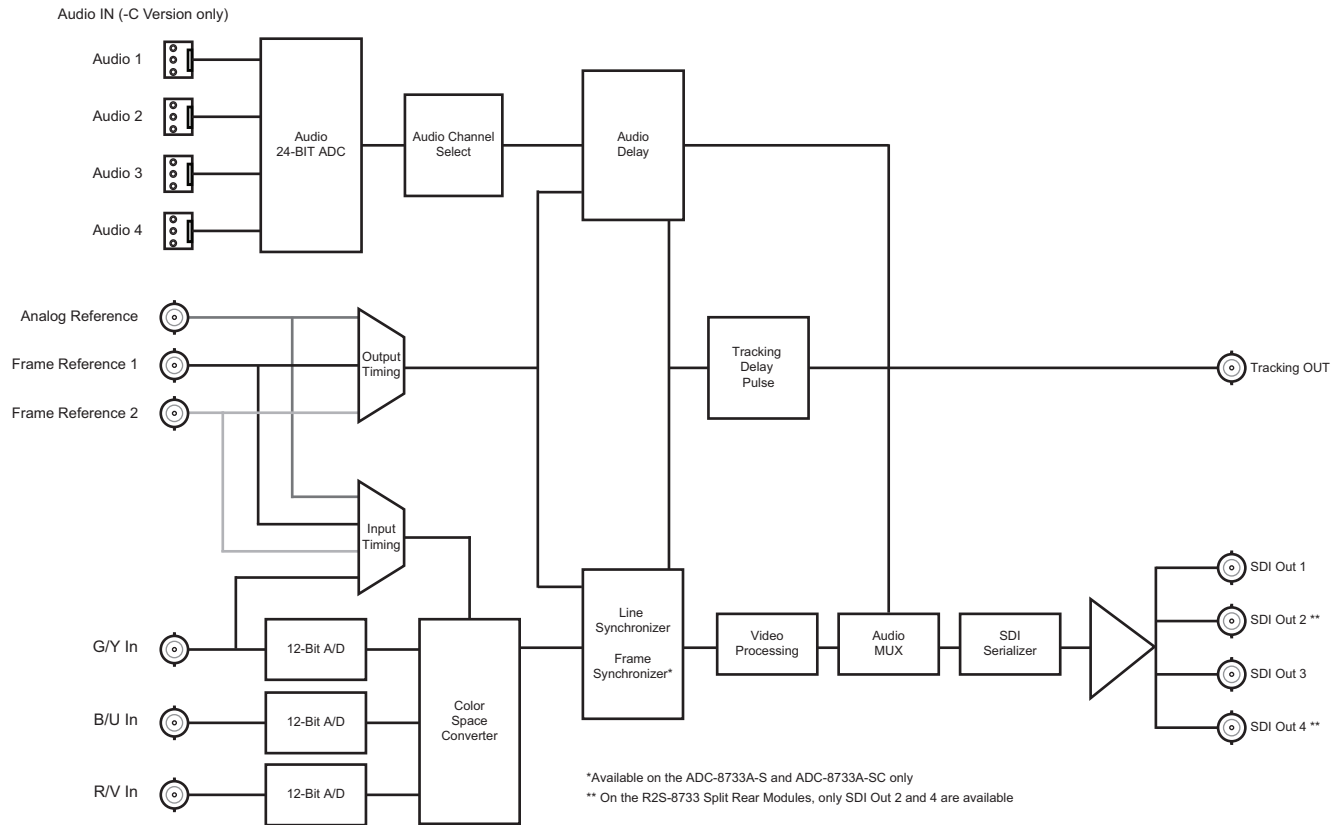
Figure 1.1 *ADC-8733A-A — Simplified Block Diagram*

User Interfaces

The ADC-8733A includes the following user interfaces.

DashBoard Control System

DashBoard enables you to monitor and control openGear frames and cards from a computer. DashBoard communicates with other cards in the frame through the Network Controller Card.

For More Information on...

- the DashBoard menus for your card, refer to the chapter "**DashBoard Menus**" on page 4-1.
- installing and using DashBoard, refer to the *DashBoard User Manual*.
- setting up your Network Controller Card, refer to the *MFC-8300 Series User Manual*.

Card-edge Controls

The ADC-8733A provides jumpers to terminate the signal on the reference input, configure the function of BNC 10, and access the Heads-up Display. LEDs on the card-edge enable you to monitor the communication activity, input signals, reference input, and freeze mode.

For More Information on...

- using the HUD, refer to the chapter "**Heads-up Display Menus**" on page 5-1.
- the card-edge controls, refer to the section "**Card Overview**" on page 3-2.
- the LEDs, refer to the section "**Control and Monitoring Features**" on page 3-3.

SNMP Monitoring and Control

The Network Controller Card in the openGear frame provides optional support for remote monitoring of your frame and the using Simple Network Management Protocol (SNMP), which is compatible with many third-party monitoring and control tools.

For More Information on...

- SNMP controls on for your card, refer to your ADC-8733A Management Information Base (MIB).
- SNMP monitoring and control, refer to the *MFC-8300 Series User Manual*.

Documentation Terms and Conventions

The following terms and conventions are used throughout this manual.

Terms

The following terms are used:

- "**525-line mode**" refers to broadcast situations using **NTSC** or **PAL-M** composite (analog) signal reference inputs.

- "**625-line mode**" refers to broadcast situations using **PAL-B** or **PAL-N** composite (analog) signal reference inputs.

- "**ADC-8733A**" also includes all versions unless otherwise indicated.

- "**Board**", and "**Card**" refer to openGear terminal devices within openGear frames, including all components and switches.

- "**DFR-8300 series frame**" also includes all version of the 10-slot (DFR-8310 series) and 20-slot (DFR-8321 series) frames and any available options unless otherwise noted.

- "**OG3-FR series frame**" refers to all versions of the OG3-FR series frames and any available options unless otherwise noted.

- "**openGear frame**" refers to DFR-8300 series and the OG3-FR series frames that house the ADC-8733A card.

- "**Operator**" and "**User**" refer to the person who uses ADC-8733A.

- "**PAL**" refers to PAL-B, PAL-M, and PAL-N unless otherwise stated.

- "**System**" and "**Video system**" refer to the mix of interconnected production and terminal equipment in your environment.

Conventions

The following conventions are used:

- The "**Operating Tips**" and "**Note**" boxes are used throughout this manual to provide additional user information.

Installation

In This Chapter

This chapter provides instructions for installing the Rear Module(s) for the ADC-8733A, installing the card into the frame, cabling details, and updating the card software.

The following topics are discussed:

- Before You Begin
- Installing the ADC-8733A
- Cabling for the ADC-8733A
- Software Upgrades

Before You Begin

Before proceeding with the instructions in this chapter, ensure that your openGear frame is properly installed according to the instructions in its manual.

Static Discharge

Throughout this chapter, please heed the following cautionary 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 synthetic fiber clothing is worn. Always exercise proper grounding precautions when working on circuit boards and related equipment.*

Unpacking

Unpack each ADC-8733A you received from the shipping container and ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video directly.

Installing the ADC-8733A

This section outlines how to install a Rear Module in an openGear frame. The same procedure applies regardless of the frame or card type. However, the specific Rear Module you need to install depends on the frame you are using.

Supported Rear Modules

This section briefly outlines the required rear modules for the ADC-8733A.

Note — *An error message displays in the DashBoard HW Status field when using the AAM-8581 daughter card with an unsupported Rear Module. The following Rear Modules are not supported by the AAM-8581: 8310AR-030, 8310AR-031, 8320AR-030, 8320AR-031, 8320AR-040, and 8320AR-041.*

Rear Modules for the DFR-8310 Series Frames

The following rear modules are required:

- **ADC-8733A** — The **8310AR-030** Rear Module is required. The ADC-8733A is also compatible with the DFR-8310-BNC frame.

- **ADC-8733A-C** or **ADC-8733A-SC** — The **8310AR-037** Rear Module is required. The ADC-8733A-C and the ADC-8733A-SC are not compatible with the DFR-8310-BNC frame.

Rear Modules for the DFR-8321 Series and OG3-FR Series Frames

The following rear modules are required:

- **ADC-8733A** — The **8320AR-030** Full Rear Module or the **8320AR-031** Split Rear Module can be used. Ensure that the ADC-8733A is installed in an even slot number.

- **ADC-8733A-C** or **ADC-8733A-SC** — The **8320AR-037** Rear Module is required. The ADC-8733A-C and the ADC-8733A-SC are not compatible with the Split Rear Module.

Installing a Rear Module

If you are installing the ADC-8733A in a DFR-8310-BNC frame, or the Rear Module is already installed, proceed to the section "**Installing the ADC-8733A**" on page 2-4.

To install a rear module in your openGear frame

1. Locate the card frame slots on the rear of the frame.

Notice — *Do not install the ADC-8733A-C or the ADC-8733A-SC in slot 10 of the DFR-8310 series frame when using a Network Controller Card. Doing so may damage the Network Controller Card, the AAM-8581, or both.*

2. Remove the Blank Plate from the slot you have chosen for the ADC-8733A installation.

3. Install the bottom of the Rear Module in the **Module Seating Slot** at the base of the frame's back plane. (**Figure 2.1**)

Screw Hole

Module Seating Slots
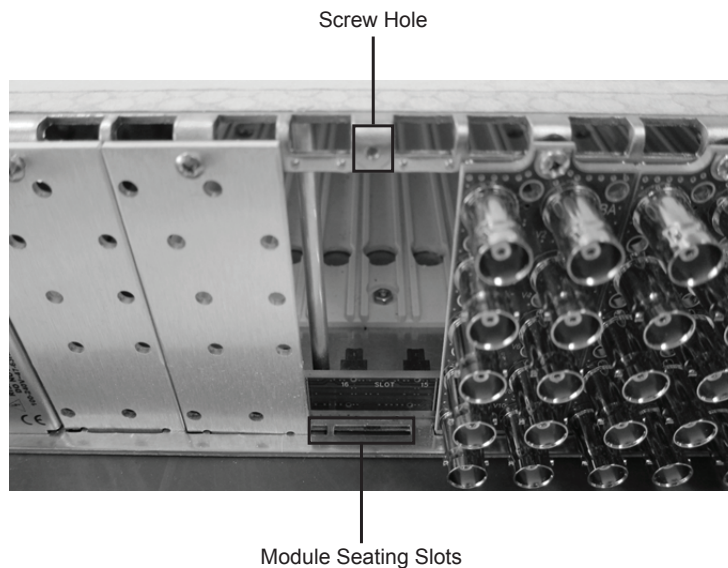
Figure 2.1 Rear Module Installation in an openGear Frame (ADC-8733A not shown)

4. Align the top hole of the Rear Module with the screw on the top-edge of the frame back plane.

5. Using a Phillips screwdriver and the supplied screw, fasten the Rear Module to the back plane of the frame. Do not over tighten.

6. Ensure proper frame cooling and ventilation by having all rear frame slots covered with Rear Modules or Blank Plates.

Installing the ADC-8733A

This section outlines how to install the ADC-8733A in a openGear frame. If the ADC-8733A is to be installed in any compatible frame other than a Ross Video product, refer to the frame manufacturer's manual for specific instructions.

To install the ADC-8733A in an openGear frame

1. Locate the Rear Module you installed in the procedure "**Installing a Rear Module**" on page 2-3.

Notice — *Heat and power distribution requirements within a frame may dictate specific slot placements 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. Hold the ADC-8733A by the edges and carefully align the card-edges with the slots in the frame.

3. Fully insert the card into the frame until the rear connection plus is properly seated in the Rear Module.

4. Affix the supplied Rear Module Label, as per the included instructions, to the BNC area of the Rear Module.

Cabling for the ADC-8733A

This section provides information for connecting cables to the installed Rear Modules on the openGear frames. Connect the input and output cables according to the following sections.

DFR-8310 Series Frame Cabling

The ADC-8733A is used with the following Rear Modules:

- **8310AR-030** Rear Module — Each rear module occupies one slot and accommodates one card. This rear module provides four SD-SDI outputs, one tracking pulse output, and a reference input. (**Figure 2.2**)

- **8310AR-037** Rear Module — Each rear module occupies one slot and accommodates one card. This rear module provides four audio inputs, two SDI outputs, one tracking pulse output, and a reference input. (**Figure 2.3**)
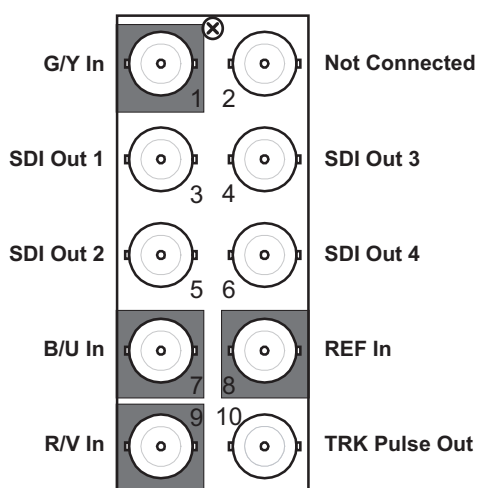
Figure 2.2 Cable Connections for the 8310AR-030 and 8320AR-030 Rear Modules
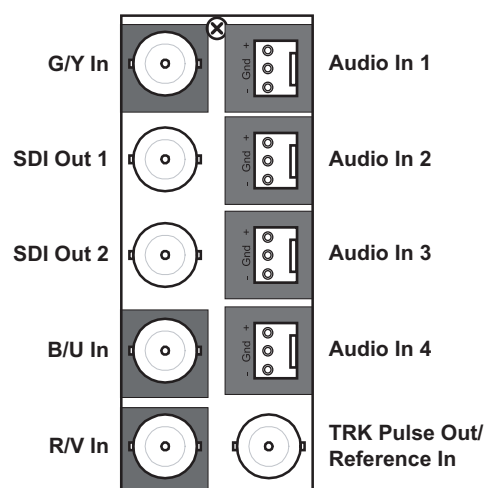
Figure 2.3 Cable Connections for the 8310AR-037 and 8320AR-037 Rear Modules

DFR-8321 Series and OG3-FR Series Frame Cabling

The ADC-8733A is used with the following Rear Modules:

- **8320AR-030** Full Rear Module — Each rear module occupies two slots and accommodates one card. This rear module provides four SD-SDI outputs, one tracking pulse output, and a reference input. (**Figure 2.2**)

- **8320AR-037** Full Rear Module — Each rear module occupies two slots and accommodates one card. This rear module provides four audio inputs, two SDI outputs, one tracking pulse output, and a reference input. (**Figure 2.3**)

- **8320AR-031** Split Rear Module — Each rear module occupies two slots and accommodates two cards. This rear module provides three inputs, and two SD-SDI outputs per card. (**Figure 2.4**)
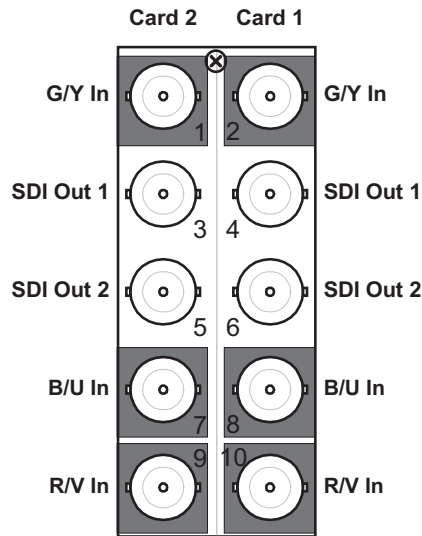
Figure 2.4 *Cable Connections for the 8320AR-031 Split Rear Module*

Video Cabling for the ADC-8733A

Use the following procedure to connect the video signal cables to the ADC-8733A:

1. Connect the input signal as follows:

    •   Full Rear Modules — BNC 1 (G/Y In), BNC 7 (B/U In) and BNC 9 (R/V In).

    •   Split Rear Modules — Connect cables according to **Figure 2.4** and depending on the slot that the ADC-8733A is installed in.

2. Connect your Downstream SD-SDI devices as follows:

    •   Full Rear Modules — Connect cables according to **Figure 2.2** and **Figure 2.3**.

    •   Split Rear Module — Connect cables according to **Figure 2.4** and depending on the slot that the ADC-8733A is installed in.

3. Connect BNC 10 (Track Pulse Out) to any device that needs to track the video delay through the ADC-8733A.

    •   The Tracking Pulse is a positive 5V pulse. Its width tracks the video delay as it passes through the card. The ADC-8733A tracking delay pulse tracks up to 2 video lines.

    •   The Tracking Pulse is not available when using a Split Rear Module.

4. Connect a video reference one of two ways:

    •   Connect to REF In on the Rear Module. If you are using a Split Rear Module, connect to BNC 9 or BNC 10 depending on the slot that the ADC-8733A is installed in.

    •   Connect to **REF1** or **REF2** on the back of the openGear frame.

Audio Cabling for the ADC-8733A

The 8310AR-037 and 8320AR-037 Rear Modules provide four audio terminal blocks with removable connectors for Audio In 1, 2, 3, and 4. **Figure 2.3** Each connector has locations for the positive, negative, and grounded wires of a balanced analog audio cable.

To wire the analog audio for the 8310AR-037 and 8320AR-037

1. Insert an analog audio wire to the designated polarity slot on the connector of the rear module. **Figure 2.5**
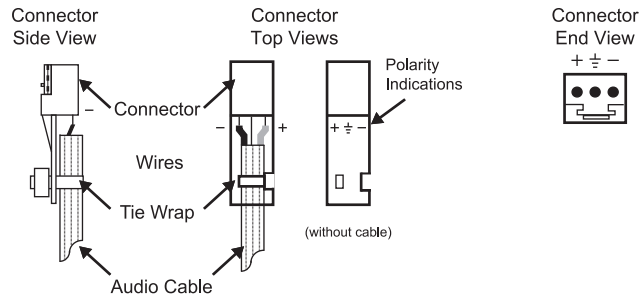
Figure 2.5 Connector Wiring for R1C-8733 and R2C-8733 Input Sockets

2. Use a tweaker screwdriver to tighten the corresponding capture screw.

3. Repeat steps 1 and 2 for each wire on each connector.

4. Once the cables are wired to the connectors, install the connectors on the terminal blocks for the rear module.

Software Upgrades

This section provides instructions for installing a license key and upgrading the software for your ADC-8733A using DashBoard.

Installing a License Key

When installing a license key on the ADC-8733A:

- You must have DashBoard installed and communicating with the openGear frame that houses the card you wish to install the key for.
- Ensure that you are using version 2.0 or higher of DashBoard. This information is available by selecting **Help ⇨ About DashBoard** from the DashBoard main toolbar.
- The DashBoard software and manual are available from the Ross Video website.

To install a License Key

1. Launch DashBoard on your computer.
2. In DashBoard, display the **Device** tab of the ADC-8733A by double-clicking its status indicator in the **Basic Tree View**.
3. Select the **Setup** tab in the **Device View** to display the setup information.
4. Make a note of the **Request Code** in the License Key field.
5. Contact Ross Video Technical Support using the information found in the section "**Contact Us**".
    - When you speak to the Technical Support representative, tell them your name, your facility name, and the **Request Code** from the **Setup** tab.
    - You will be given a License Key that must be entered in the License box of the **Setup** tab.
6. Enter the **License Key** in the **License** box of the **Setup** tab.
7. When the installation is complete, verify that the following has occurred:
    - the **Setup** tab displays "**Licensed**" in the **License** field.
    - the **License** box displays a green background.

Performing Software Upgrades

DashBoard enables you to upload software updates to the ADC-8733A.

To upload software to the ADC-8733A

1. Contact Ross Technical Support for the latest software version file.
2. In DashBoard, display the **Device** tab of the ADC-8733A by double-clicking its status indicator in the **Basic Tree View**.
3. From the **Device** tab, click **Upload** to display the **Select File for upload** dialog box.
4. Click **Browse...** to navigate to the *.bin upload file you wish to upload. DashBoard automatically selects the last directory that you loaded from.
5. Click **Open** to display a confirmation dialog box. This dialog box displays the selected upload file name, type, size, and the file creation date.

6. From the **Confirmation** dialog box, select one of the following:

   • **Cancel** — Select this option to cancel the upload of the file and return to the **Device View**.

   • **Continue** — Select this option to upload the file. While uploading, an **Uploading Progress** dialog box opens.

Important — *Pressing the **Cancel** button while uploading will leave the card in an invalid state. Do not click **Cancel** unless the uploading progress has stopped completely for 60 seconds or more.*

7. Monitor the upgrade progress bar displayed in DashBoard while the software is upgraded on your ADC-8733A.

8. To complete the upgrade process, DashBoard performs an automatic reboot of the card.

Note — *The communications processor of the ADC-8733A requires approximately 30 seconds to re-start and re-establish network communications.*

   • The ADC-8733A automatically saves all your settings before starting the reboot process.

   • The status of all the cards in the frame are grayed out until the reboot process is complete.

User Controls

In This Chapter

This chapter provides a general overview of the user controls available on the ADC-8733A.

The following topics are discussed:

- Card Overview
- Control and Monitoring Features
- Notes on Timing Modes

Card Overview

This section provides a general overview of the ADC-8733A components and how to set up the jumpers on the card. This setup is performed before installing the card in the frame, but may be repeated as required. For information on the LEDs available on the card-edge, refer to the section ""**Control and Monitoring Features**" on page 3-3.
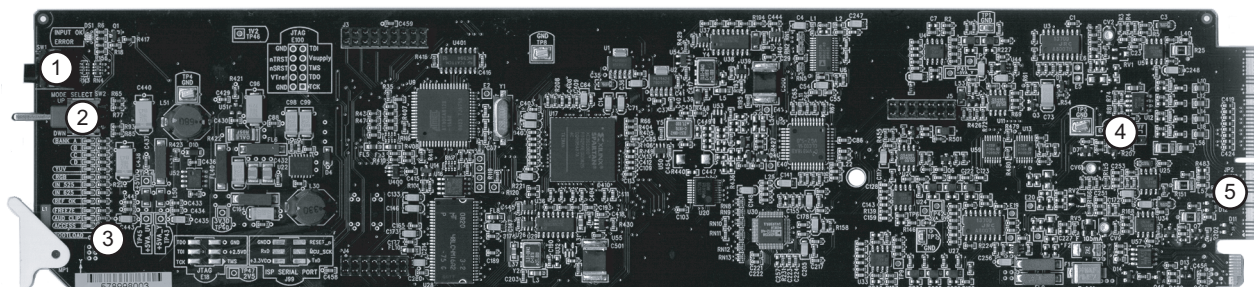
Figure 3.1 ADC-8733A — Components (AAM-8581 not shown)

1) Function Select Switch (**SW1**)	3) Bootload Button (**SW3**)	5) BNC 10 Jumper (**JP2**)
2) Mode Select Switch (**SW2**)	4) EXT TERM Jumper (**JP6**)	

1. Function Select Switch (SW1)

SW1 is a 16-position rotary switch used to select functions such as Proc Amp controls and timing adjustments. The **SW1** switch works in conjunction with the **SW2** toggle switch. You select the function with **SW1**, and then use **SW2** to select modes or configuration settings within that function. Refer to the section "**HUD Overview**" on page 5-2 for details.

2. Mode Select Switch (SW2)

SW2 is a 3-position momentary toggle switch with an automatic spring-return to the center position. Use **SW2** to enable, disable, and select specific ADC-8733A functional modes or configurations within the function menu (selected first using **SW1**).

3. Bootload Button (SW3)

SW3 is used for factory service in the unlikely event of a complete card failure. The Bootload process is further described in the section "**Bootload Button**" on page 7-2.

4. EXT TERM Jumper (JP6)

Use **JP7** to terminate the signal on the Reference In. This can be BNC 8 or BNC 10 depending on the rear module used. Select from the following:

- **ON** — Select this option to terminate the signal.
- **OFF** — Select this option to leave the signal un-terminated.

5. BNC 10 Jumper (JP2)

Use **JP2** to configure BNC 10. Select from the following:

- **REF** — Select this option when using an input external reference on BNC 10.
- **PULSE** — Select this option to output the Tracking Pulse on BNC 10.

Control and Monitoring Features

This section provides information on the jumpers, buttons and LEDs for the ADC-8733A. Refer to **Figure 3.2** for the location of the LEDs.
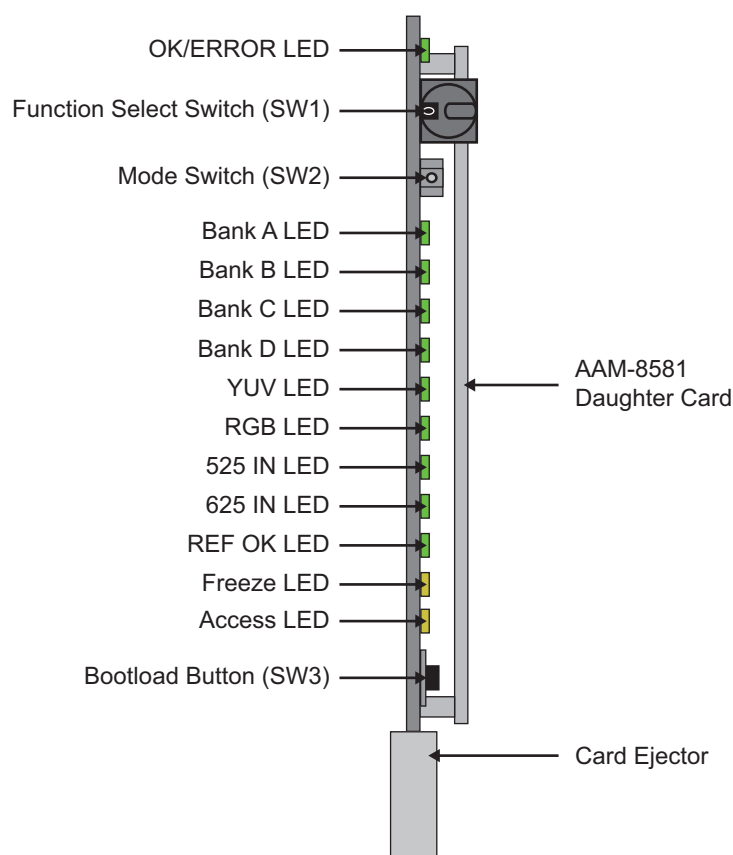
Figure 3.2 ADC-8733A Card-edge Controls

Status and Selection LEDs on the ADC-8733A

The front-edge of the ADC-8733A has LED indicators for the cooling module fan, alarm, and communication activity. Basic LED displays and descriptions are provided in **Table 3.1**.

Table 3.1 LEDs on the ADC-8733A

LED	Color	Display and Description
OK/ERROR	Green	When lit green, this LED indicates that the card is functioning normal and that no anomalies have been detected. The following conditions must be satisfied: • a valid input signal is present • if forcing an input standard, the incoming signal matches • a valid reference signal is present when a reference is required, and that the reference standard matches the input standard.

Table 3.1 LEDs on the ADC-8733A

LED	Color	Display and Description
OK/ERROR	Red	When lit red, this LED indicates one of the following errors: • a valid input signal is not present • the input signal does not match the forced input standard • a valid reference signal is not present • the reference signal does not match the input signal
Bank #	Green	When lit, this LED confirms that the indicated Bank is selected.
YUV	Green	When lit, this LED indicates that the input signal is configured as YUV.
RGB	Green	When lit, this LED indicates that the input signal is configured as RGB.
525 IN	Green	When lit, this LED indicates that the input signal standard is 525-lines.
625 IN	Green	When lit, this LED indicates that the input signal standard is 625-lines.
REF OK	Green	When lit green, this LED indicates a reference signal is present at the Frame REF or reference BNC input, and that the reference is locked. The reference standard matches the input standard.
	Flashing	When flashing, this LED indicates that the reference standard does not match the input standard.
	Off	When not lit, the LED indicates that a reference is not present.
FREEZE	Yellow	When lit, this LED indicates that the output is frozen. This LED is implemented only for the ADC-8733A-S.
ACCESS	Yellow	When lit, this LED indicates that the Switch Access is locked and the ADC-8733A card-edge controls are editable.

Tracking Pulse Output

The ADC-8733A offers a tracking delay output that pulses high in a two frame cycle on BNC 10. The pulse is a positive 5V signal. Its width is a measurement of the video delay through the card. The pulse tracks delay up to two video lines on the ADC-8733A and up to two fields on the ADC-8733A-S.

Notes on Timing Modes

This section briefly summarizes the Timing Modes available on the ADC-8733A.

Line Delay (ADC-8733A and ADC-8733A)

This mode uses the input timing signal to generate the output timing. There is a constant delay between the input and the output. The reference is not used. This is useful in applications where a constant delay through the card is required. The minimum delay through the card is given in the "**Technical Specifications**" on page 6-2. Output timing can be adjusted from this minimum delay up to an additional two lines in half-pixel increments. Refer to the section "**Notes on Adjusting the Horizontal Delay**" on page 5-10 and the section "**Notes on Adjusting the Vertical Delay**" on page 5-10 for details.

Line Sync (ADC-8733A and ADC-8733A-S)

This mode uses the reference to generate the output timing on a line-by-line basis, but uses the input timing signal to decide when a frame begins.

Whenever a signal is received, the output-timing generator waits for the next falling edge of H Sync on the reference signal before outputting the received signal. The advantage of this mode is that as long as all input sources are timed to be on the same line, the output timing stays constant, regardless of which input is selected. This is very useful in that all sources to the ADC-8733A (for example, from a routing switcher) only need to be lined up to the same line.

Up to two extra lines of delay can be added to the output in half-pixel increments in this mode.

> **Note** — *If two input sources are not on the same line, then switching from one source to the other causes a jump in the output timing by an exact number of lines. For example, if the two sources are 2.5 lines apart, the output jumps by either 2 or 3 lines depending on the position of the sources with respect to the reference.*

Threshold Point

A finite amount of time is needed to process an input signal before it can be output. This is called the minimum delay. In Line Sync operation the start of the input line is delayed beyond the minimum delay until the start of the next reference line, then it is output. If the input signal's timing slips enough, the start of its line will not have enough time to get processed and be output in time to be aligned with the start of the reference line. This point is called the threshold point. When the input signal slips to the threshold point the output will be delayed until the next reference line.

The threshold point is measured as the amount of time the input signal's line start must lead the reference's line start. This is 2 lines plus 38µs.

In addition, there is built in hysteresis so that if an input source is near the threshold point, the output timing will be constant and will not jump back and forth by a line if the input signal varies slightly. However, if the input signal is exactly on the threshold point, the output timing may vary from one power up to the next. In other words, the card may power up with different timing than the previous time it was powered-up. To avoid this condition, it is recommended to keep the input signal away from the threshold point. Two microseconds can be considered a safe distance.

> **Note** — *In Line Sync Mode, the falling edge of the incoming video's Sync should be kept away from the threshold point.*

Frame Delay (ADC-8733A-S only)

The Frame Delay mode is identical to the Line Delay mode, except that the output timing can be delayed by up to a full frame of video. By using almost a full frame of delay, it is possible to set apparent negative timing, making it look like the output occurs before the input.

Frame Sync (ADC-8733A-S only)

The Frame Sync mode makes it possible to use asynchronous sources. The output timing is generated entirely based on the reference. Whether a synchronous or an asynchronous source is used, output timing is constant. The delay through the card will be:

- one full frame of buffered video;
- an additional delay of anything from the minimum latency of the ADC-8733A-S (an amount in the order of less than a microsecond) up to an additional full frame of delay (two frames total).

Up to one extra frame of delay can be added to the output in half-pixel increments in this mode.

DashBoard Menus

In This Chapter

This chapter briefly summarizes the menus, items, and parameters available from DashBoard for the ADC-8733A. Note that parameters marked with an asterisk (*) are the factory default values, while those marked with an ^{m} an are values stored in the non-volatile memory.

The following topics are discussed:

- Status Tabs
- Setup Tab
- Timing Tab
- Output Tab
- Framing Tab
- Proc Amp Tab
- Audio Tab
- Alarms Tab

✓ **Operating Tip** — *Wait 30 seconds after the last setting change to ensure all changes are saved to the non-volatile memory of the card.*

Status Tabs

This section summarizes the read-only information displayed in the Status tabs. The fields in the Status tabs vary in severity from green (valid), yellow (caution), to red (alarm). DashBoard reports the most severe alarm for a single field. Alarm colors are noted within the tables as text set in brackets next to the menu parameter name.

Note — *The ADC-8733A defaults with **Edit Permissions** set to **Locked**.*

Product Tab

Table 4.1 summarizes the read-only information displayed in the **Product** tab.

Table 4.1 Product Tab Items

Tab Title	Item	Parameters	Description
Product	Product	ADC-8733A	
	Supplier	Ross Video Ltd.	
	Board Rev	##	Indicates the board revision level
	Serial Number	######	Indicates the card serial number
	Software Rev	##.##	Indicates the software version
	Firmware Rev	#.###	Indicates the firmware version

Hardware Tab

Table 4.2 summarizes the read-only information displayed in the **Hardware** tab.

Table 4.2 Hardware Tab Items

Tab Title	Item	Parameters	Description
Hardware	HW Status	OK (Green)	Normal operation; no hardware errors
		Check I/O Module (Yellow)	Card is connected to a rear module not supported by the AAM-8581[a]
		FPGA load invalid (Red)	The card failed to load the FPGA firmware
		Income I/O Module (Red)	Card is connected to an incompatible rear module
	Voltage (mV)	#	Supply Voltage
	Current (mA)	#	Current consumption of card
	Rear Module	#	Type of rear module in the slot
	CPU Headroom	#	Processing power available
	RAM Available	#/##	On-board processing memory available
	EE Bank	#	Storage count

a. This message displays when the following rear modules are installed when using the AAM-8581: 8310AR-030, 8310AR-031, 8320AR-030, 8320AR-031, 8320AR-040, and 8320AR-041.

Signal Tab

Table 4.3 summarizes the read-only information displayed in the **Signal** tab.

Table 4.3 Signal Tab Items

Tab Title	Item	Parameters	Description
Signal	Signal Status	Green	Indicates that the card is functioning normally and no anomalies are detected. Refer to the section "**Notes on the Signal Status Field**" below.
		Red	The reference does not match the input standard or an error has occurred. Refer to the section "**Notes on the Signal Status Field**" below.
	Input Status	Signal Present	Indicates the presence of an input signal
		No Signal	
	Reference[a]	Reference OK	Indicates the presence of a reference signal
		No Reference	
	Line Standard	525	Indicates that the input signal is 525-line standard
		625	Indicates that the input signal is 625-line standard

a. The ADC-8733A only accepts BLS Reference signals.

Notes on the Signal Status Field

When the **Signal Status** indicator in DashBoard is green, the following conditions are present:

- A valid input timing signal is present and selected.
- A valid reference signal is present when a reference is required and that reference standard matches the input standard. The Line Sync or Frame Sync modes require that a reference signal be present.

When the **Signal Status** indicator in DashBoard is red, one of the following errors have occurred:

- A valid input timing signal is not present or selected.
- A valid reference signal is not present or selected.
- The reference does not match the input standard.

Setup Tab

Table 4.4 summarizes the **Setup** options available in DashBoard.

Note — *For each supported line standard (525 and 625), the ADC-8733A stores the default and user-adjusted video settings independently in non-volatile memory. The selection of settings is determined by the input timing source.*

Table 4.4 Setup Menu Items

Tab Title	Item	Parameters	Description
Setup	Input Standard	RGB SMPTE	Specifies the standard of the input signal
		RGB MII[a]	
		RGB NTSC[a]	
		YUV SMPTE	
		YUV MII[a]	
		YUV BETA	
	Setup[m]	Off	Disables the NTSC setup removal
		On	Enables the NTSC setup removal
	Edit Permission	Unlocked	All menu options are unlocked and can be edited.
		Locked	All menu items, except this one, are locked and read-only.
	Factory Defaults	Reset	Resets all parameters to factory defaults.
	Licensable Features		Indicates if the software key for any licensable features is installed.

a. This option is only available for 525-line standards.

Timing Tab

Table 4.5 summarizes the **Timing** options available in DashBoard.

Table 4.5 Timing Menu Items

Tab Title	Item	Parameters	Description
Timing	Reference[m]	Frame Ref 2	The reference source is the analog reference connected to the frame REF 2 port
		Frame Ref 1	The reference source is the analog reference connected to the frame REF 1 port
		BNC 8	The reference source is the analog reference connected to BNC 8
	Input Timing[m]	Frame Ref 2	The timing source is the analog signal connected to the frame REF 2 port
		Frame Ref 1	The timing source is the analog signal connected to the frame REF 1 port
		BNC 8	The timing source is the analog signal connected to BNC 8
		Y/G	The timing source is the analog signal connected to BNC 1
	Timing Mode[m]	Line Delay	Output timing is based on the input timing
		Line Sync	Output timing is based on the reference
		Frame Delay[a]	Output timing is based on the input timing
		Frame Sync[a]	Output timing is based on the reference
	Horizontal Delay[m]	0 to 1715[b]	Adjusts the horizontal delay
		0 to 1727[c]	
	Vertical Delay[m]	0 to 524[b]	Adjusts the vertical delay
		0 to 624[c]	
	Minimum Delay[m]	Reset	Resets the delay

a.   This option is only available for the ADC-8733A-S.
b.   This value range is available when using a 525-line standard.
c.   This value range is available when using a 625-line standard.

Output Tab

Table 4.6 summarizes the **Output** options available in DashBoard.

Table 4.6 Output Menu Items

Tab Title	Item	Parameters	Description
Output	Input Timing Loss[m]	Black[a]	When the input timing signal is lost or invalid, SD-SDI black is the output
		No Output	When the input timing signal is lost or invalid, there is no output present
		Freeze[a]	When the input signal is lost or invalid, the last valid image is frozen, as determined by the **Freeze Mode** option, and used as the output
	Forced Black	Off	Disables this feature
		On	Forces the output to SD-SDI black
	Forced Monochrome	Off	Disables this feature
		On	Forces the output to SD-SDI monochrome
	Test Pattern	Off	Disables this feature
		SDI Check Field	
		Full Field Color Bars	
	Forced Freeze	Off	Disables this feature
		On	Freezes the output. The frozen output video displayed will be determined by the **Freeze Mode** setting.
	Freeze Mode	Field 1	When a freeze occurs, the last Field 1 is the output
		Field 2	When a freeze occurs, the last Field 2 is the output
		Frame	When a freeze occurs, the last full frame is the output

a.   This option is only available for the ADC-8733A-S.

Framing Tab

Table 4.8 summarizes the **Framing** options available in DashBoard.

Table 4.7 Framing Menu Items

Tab Title	Item	Parameters	Description
Framing	Vertical Interval Blanking[m]	Pass Through	Pass the vertical interval
		Blank	Blank the vertical interval
	Vertical Interval End[m]	19 to 21[a]	Selects the line on which the vertical interval ends
		23[b]	
	Lock V Bit On Line[m][a]	10	Active video starts on line 10
		20	Active video starts on line 20
	Horizontal Crop	Off	Disables this feature
		On	Enables this feature
	Crop Left	0 to 350	Number of pixels to crop from the beginning of the line
	Crop Right	0 to 350	Number of pixels to crop from the end of the line backwards

a.   This value range is available when using a 525-line standard.
b.   This value is fixed at 22 when using a 625-line standard.

Proc Amp Tab

Table 4.8 summarizes the **Proc Amp** options available in DashBoard.

Table 4.8 Proc Amp Menu Items

Tab Title	Item	Parameters	Description
Proc Amp	Video Gain (%)^m	50 to 150	Adjusts the output video gain level
	Chroma Gain (%)^m	50 to 150	Adjusts the output video chroma gain
	CB Gain (%)^m	50 to 150	Adjusts the output C_B gain
	Black Level Offset (IRE)^m	-7.2 to 51.7	Adjusts the output black level of the card
	Super Black	Pass	Enables the input to pass without clipping
		Clip	Clips any value below black
	Proc Amp	Reset	Resets all Proc Amp controls to the factory default values

Audio Tab

Table 4.9 summarizes the **Audio** options available in DashBoard.

Table 4.9 Audio Menu Items

Tab Title	Item	Parameters	Description
Analog Audio Inputs	Audio Input Gain (dB)^m	-10.0 to +10.0	Adjusts the **Audio Gain** for each input of the AAM-8581
	Audio Input Status^m	OK	Indicates that audio is present above the selected **Silence Threshold** value
		Clip	Indicates that the audio input level is too high and is causing distortion
		No Input	Indicates that the input audio level is below the selected **Silence Threshold** value
	Notify Audio Input Alarm	Checkbox selected	An alarm is triggered when the selected audio input is clipping or if it is silent for longer than the selected **Silence Alarm Threshold** value
		Checkbox unselected	Disables this feature
	Silence Threshold^m	-6dBFS (minimum)	Selects the audio threshold for silence measurement and defines the audio silence threshold in 6dBFS increments
		-84dBFS (maximum)	
	Silence Alarm Timeouts^m	0-60	Selects the duration of silence before an alarm is displayed in the **Signal** tab
Embedded Audio	Audio Mux Enable	Checkbox selected	Embeds audio channels into the horizontal interval of the digital video
		Checkbox unselected	Disables this feature.
	Embed to^m	Group 1	Selects which group to embed the audio into
		Group 2	
		Group 3	
		Group 4	
	Audio Delay (ms)^m	0 to 5000	Selects the amount of additional audio delay to add to the input audio before it is embedded
	Channel Source^m	Analog Input #	Assigns the specified Analog Input to the selected embedded channel
	Audio Configuration	Reset	Resets the audio settings to the factory default values

Alarms Tab

Table 4.10 summarizes the **Alarms** options available in DashBoard.

Table 4.10 Alarms Menu Items

Tab Title	Item	Parameters	Description
Alarms	Loss of Input Timing	Ignore	Signal Status parameter in the **Signal** tab ignores loss of reference
		Notify	Signal Status parameter in the **Signal** tab reports loss of reference when they occur
	Loss of Reference	Ignore	Signal Status parameter in the **Signal** tab ignores loss of input condition
		Notify	Signal Status parameter in the **Signal** tab reports loss of input conditions when they occur

Heads-up Display Menus

In This Chapter

This chapter provides a summary of the Heads-up Display (HUD) menus available for the ADC-8733A.

The following topics are discussed:

- HUD Overview
- Bank A Menus
- Bank B Menus
- Bank C Menus
- Bank D Menus

Note — *For each supported line standard (525 and 625), the ADC-8733A stores the default and user-adjusted video settings independently in non-volatile memory. The selection of settings is determined by the input timing source.*

HUD Overview

This section summarizes the Bank Menu system of the Heads-Up Display and how to navigate the menus and options using the **SW1** and **SW2** switches on the ADC-8733A card-edge. A list of the available menus and parameters is provided in the following tables. Note that the tables list the functions in numerical order based on the value selected using **SW1**.

Note — *When the ADC-8733A is powered up or unlocked, it defaults to Bank A and the Heads-Up Display is disabled.*

Menu Organization

The menus are split into Banks: A, B, C and D. Each bank has 16 positions, 0 though F, with position 0 (zero) reserved for the Bank designation. Positions 1 to F may contain menu items.

Naming Conventions

A particular menu is referred to as: **Bank#-Menu#**, for example **A-9**. The ADC-8733A must be unlocked to be able to adjust the parameters.

Parameters

Parameters in the menus can be adjusted without turning on the Heads-Up Display, but using the display gives visual feedback to ensure the parameter is adjusted correctly. The Heads-Up Display is superimposed over all video outputs.

The tables in this chapter list all the menus and the possible parameters.To activate some of these parameters, it may be necessary to toggle **SW2** in either direction, or it may require that **SW2** be held in either direction for a few seconds.

Navigation

This section summarizes how to navigate the menus and options using the **SW1** and **SW2** switches on the ADC-8733A card-edge. A list of the available menus and parameters is provided in the following sections of this chapter. By default, whenever the card is powered up, it is locked

The following rules apply to the tables that are used throughout this chapter:

- The label "**+**" instructs you to toggle the **Mode Switch** (**SW2**) up momentarily.
- The label "**–**" instructs you to toggle the **Mode Switch** (**SW2**) down momentarily.
- The label "**+ (h)**" instructs you to hold the **Mode Switch** (**SW2**) up for one second.
- The label "**– (h)**" instructs you to hold the **Mode Switch** (**SW2**) down for one second.

To navigate the Bank Menus of the ADC-8733A

1. Rotate **SW1** to position **0**.
2. Toggle **SW2** up or down to select the Bank.
3. Rotate **SW1** to the required menu.
4. Toggle **SW2** to select the required parameter.

Ballistics

In those menus where there is a wide adjustment range, a mechanism to help speed up the selection process is provided. If **SW2** is pressed and held in either direction, the values in the menu will change at an increasing faster rate. The rate of change will reach its peak after approximately two seconds. This is called **ballistics**.

Bank A Menus

This section summarizes the menus, parameters, and functions available on Bank A.

Table 5.1 Bank A Menu and Parameters Table

Menu Select	Menu	Parameters		HUD Values		Description
0	Bank Select	–	A B C D	BANK	A B C D	Reserved for the Bank designation
1	Heads-Up Display[a]	+ (h) –	On Off	HEADS UP	ON OFF	The HUD is used to provide visual feedback to the user while altering parameters with the card-edge controls. It is not necessary to have the HUD on while adjusting parameters.
2	Input Standard[m]	+ –	YUV BETA YUV MII[b] YUV SMPTE RGB NTSC[a] RGB MII[a] RGB SMPTE	IN STD	YUV BETA YUV MII YUV SMPTE RGB NTSC RGB MII RGB SMPTE	The Input Standard function allows you to select from five input video standards.
3	Not implemented					
4	Input Timing[m]	+ –	Frame 2 Frame 1 BNC 8 Y/G	IN TIMING	FRM 2 FRM 1 BNC 8 Y/G	Selects where the input signal timing will come from. Normally, the card obtains synchronization from the Y or G channel of the input signal. However, if the input does not contain sync, an external sync source must be used. The timing of any external sync must be co-timed to within $\pm$ 1µs to the normal position of sync on the input signal.
5	Test Pattern	+ –	Full Field Color Bars SDI Check Field[c] Off	TEST PAT	FF BARS PATH OFF	Selects from two test pattern types or disable the test pattern option.
6	Not implemented					
7	Not implemented					
8	Video Gain[m]	+ –	Increase Decrease	VID GAIN	(###.#)%	Adjusts the gain of the output signal. The range is 50% to 150%. This menu uses ballistics.

Table 5.1 Bank A Menu and Parameters Table

Menu Select	Menu	Parameters		HUD Values		Description
9	Black Level Offset[m]	+ –	Increase Decrease	BLK OFF	(##.#) IRE	Configures the black level offset that is not affected by the NTSC Setup function. The range is between -7.2 to 51.7 IRE. This menu uses ballistics. For example, with Black Level Offset at 1 IRE, a setup level of 7.5 IRE on the video input, and Setup off (e.g. The setup on the input video is not removed before converting to SDI output), the black level will be 8.5 IRE.
A	Chroma Gain[m]	+ –	Increase Decrease	CHROMA	(###.#)%	Adjusts the Chroma (CR and CB) portion of the output signal. The range is 50% to 150%. This menu uses ballistics.
B	Not implemented					
C	C_B Gain[m]	+ –	Increase Decrease	CB GAIN	(###.#)%	Adjusts the CB portion of the output signal. The range is 50% to 150%. This menu uses ballistics.
D	Not implemented					
E	Factory Defaults	+ (h) – (h)	Reset All Reset Proc Amp	DEFAULT	ALL RST PROC RST	Returns all controls to their default values except the HUD and Switch Access menu parameters.
F	Switch Access[d]	+ (h) – (h)	Locked Unlocked	ACCESS	LOCKED UNLOCKED	The ADC-8733A can be monitored using DashBoard at any time while it is powered. To be able to adjust its parameters the card has to be unlocked. On power-up the Edit Permission always reverts to its default value of locked. The ACCESS LED lights whenever the card is unlocked. The Switch Access function allows you to lock or unlock user access to all adjustment parameters from the card-edge controls. The "lock" function should be performed after installation to secure all settings, and to prevent accidental setting changes.

a. The display is superimposed over all ADC-8733A video outputs. Do not use this feature with "on-air" signals
b. This value is only available when using a 525-line standard.
c. When using the SD-SDI Check Field test pattern, the HUD must be Off for the test pattern to provide accurate results.
d. Note the following rules: when access is locked, no adjustments can be made and the HUD is automatically turned off. The ACCESS LED is off; when access is unlocked, adjustments can be made. The ACCESS LED is lit. The HUD must be manually turned on again if needed.

Bank B Menus

This section summarizes the menus, parameters, and functions available on Bank B.

Table 5.2 Bank B Menu and Parameters Table

Menu Select	Menu	Parameters		HUD Values		
0	Bank Select	+ − −	A B C D	BANK	A B C D	Reserved for the Bank designation
1	NTSC Setup[a]	+ −	On Off	SETUP	ON OFF	Controls what the card does to the incoming signal with respect to setup as follows: • If the incoming signal has setup on, it set this parameter to ON. The card will remove it before it converts the component signal to SD-SDI. • If the incoming signal does not have setup on, it set this parameter to OFF
2	Not implemented					
3	Vertical Interval Blanking[m]	+ −	Blank Pass Through	VI BLANK	BLANK PASS	Blanks the vertical interval, or allow the signals in the vertical interval to pass through the ADC-8733A.
4	Vertical Interval End[m]	+ −	Increase Decrease	VI END	(##)	The ADC-8733A has a programmable Vertical Interval that allows you to set where the VI ends and the first line of active video begins. Everything up to (but not including) the first line of active video is considered part of the Vertical Interval and will be affected by this function. • In 525-line standard, signals in the vertical interval are passed without setup even if setup is enabled. The Vertical Interval End can be set to line 19, 20, or 21. • In 625-line standard, the Vertical Interval End is not adjustable and is set at 22.
5	SuperBlack[m]	+ −	Clip Pass Through	SUPER BLK	CLIP PASS	Clips SuperBlack values from the input video signal as follows: • Allow the input's active video signal to pass through unaltered • Clip any value below black

Table 5.2 Bank B Menu and Parameters Table

Menu Select	Menu	Parameters		HUD Values		
6	Vertical Bit Lock[m][a]	+ –	Line 20 Line 10	V BIT LOCK	20 10	Some types of equipment require that the transition from vertical interval to active video to be locked to either line 10 or line 20. Use this menu to select the V Bit location. Note that V Bit location can only be moved in the 525-line standards.
7	Not implemented					
8	Not implemented					
9	Not implemented					
A	Horizontal Crop[m]	+ –	On Off	H CROP	ON OFF	The active video portion of an SDI video line is wider than that of an analog component video line. The smaller active analog video is centered on that of the SDI video. Use this card to crop the leading, the trailing, or both video samples on the output SDI video line. This will avoid possible errors downstream if converting back to analog component video.
B	Crop Left[m]	+ –	Increase Decrease	CROP LEFT	(##)	The output SDI video line can be cropped starting at the beginning of the line in increments of one pixel up to 350.
C	Crop Right[m]	+ –	Increase Decrease	CROP RIGHT	(##)	The output SDI video line can be cropped from the end of the line backwards toward the beginning of the line in increments of one pixel up to 350.
D	Not implemented					
E	Not implemented					
F	Not implemented					

a.   When using a 525-line standard.

Bank C Menus

This section summarizes the menus, parameters, and functions available on Bank C.

Table 5.3 Bank C Menu and Parameters Table

Menu Select	Menu	Parameters		HUD Values		Description
0	Bank Select	+ + –	A B C D	BANK	A B C D	Reserved for the Bank designation
1	Timing Mode[m]	+ –	Frame Sync[a] Frame Delay[a] Line Sync Line Delay	TIME MODE	FS FD LS LD	The ADC-8733A has the following timing modes: Line Delay and Line Sync. The ADC-8733A-S has the following timing modes: Line Sync, Frame Delay, and Frame Sync. Refer to the section "**Notes on Timing Modes**" on page 3-5 for more information.
2	Horizontal Delay[m]	+ –	Increase Decrease	H DELAY	(####)	Delay can be added to the output video in half-pixel increments up to a maximum of 1715 in 525-line standard or 1727 in 625-line standard. This menu uses ballistics.
3	Horizontal Reset	+ –	Zero No Action	H RESET	ZERO	Resets the Horizontal Delay to 0.
4	Vertical Delay[m]	+ –	Increase Decrease	V DELAY	(#)	Extra delay can be added to the output video in line increments. Vertical Delay can add up to a maximum of 524 lines in the 525-line standard or 624 lines in the 625-line standard. This menu uses ballistics.
5	Vertical Reset	+ –	Zero No Action	V RESET	ZERO	Resets the Vertical Delay to 0.
6	Minimum Delay	+ –	Zero No Action	MIN DEL	ZERO	Resets both the Horizontal Delay and Vertical Delay values to 0 (zero). Note that this resets the Horizontal and Vertical Delay values across all Timing Modes.
7	Not implemented					
8	Freeze Mode[m]	+ –	Frame Field 2 Field 1	FRZ MODE	FRAME FLD 2 FLD 1	The Freeze Mode function allows you to set what will be the output when a freeze occurs (as set by the Forced Freeze menu). The output is be frozen (ADC-8733A-S only) if any of the following conditions occur: The user freezes the output manually. Refer to the menu, "**9 Forced Freeze**" below. There is a loss of input signal. Refer to the menu, "**A Input Loss Mode** [m]" below.

Table 5.3 Bank C Menu and Parameters Table

Menu Select	Menu	Parameters		HUD Values		Description
9	Forced Freeze	+ −	Freeze[b] Pass Through	FREEZE	ON OFF	The output can be manually frozen (ADC-8733A-S only) using the Forced Freeze menu. When enabled, it will freeze Field 1 only, Field 2 only, or the entire frame as determined by the Freeze Mode function. If Forced Freeze is set to ON, the output is frozen only if the Timing Mode is set to Frame Sync.
A	Input Loss Mode [m]		Freeze[b c] No Output Black[c]	IN LOSS	FREEZE NO OUTPUT BLACK	Selects what type of video appears at the card's outputs when the input signal is lost or invalid. • Black — The output is set to SD-SDI black. The Timing Mode must be set to Frame Sync and the reference must be valid. • No Output —No signal is present on the output. • Freeze — The last valid image is automatically frozen (ADC-8733A-S only). The freeze is determined by the Freeze Mode menu. The Timing Mode must be set to Frame Sync and the reference must be valid.
B	Not implemented					
C	Forced Black	+ (h) − (h)	Off On	FRCD BLK	ON OFF	Forces the output to SD-SDI Black. The output can be forced to SDI Black only if: • in Line/Delay modes the input timing signal is valid; or • in Line/Frame Sync modes the input timing signal or reference is valid.
D	Forced Monochrome	+ (h) − (h)	Off On	FRCD MONO	ON OFF	Turns off the color portion of the output SD-SDI signal.
E	Not implemented					
F	Reference[m]	+ −	BNC 8 Frame 2 Frame 1	REFERENCE	BNC8 FRM2 FRM1	The sync timing modes of the ADC-8733A require a reference. The recommended signal is a stable composite analog black signal. This menu selects where the card will look for that reference.

a. This option is only available for the ADC-8733A-S and the ADC-8733A-SC.
b. When Freeze mode is enabled, the freeze is determined by the section in Bank C-8.
c. Before selecting the Black or Freeze options, first ensure that the Reference is not set to the same value as the Input Tim-ing.

Notes on Adjusting the Horizontal Delay

Note the following points when adjusting the Horizontal Delay:

- If you cross over the maximum Horizontal Delay, the value returns to 0 (zero) and the Vertical Delay value increments by 1.

- Crossing the minimum delay returns the Horizontal Delay value to 1715 (525-line standard) or 1725 (625-line standard) and decrements the Vertical Delay value by 1.

- If at maximum Horizontal Delay and maximum Vertical Delay, incrementing the Horizontal Delay value will cause the Vertical Delay value to wrap from maximum value to the minimum value.

- If at minimum Horizontal Delay and minimum Vertical Delay, decreasing the Horizontal Delay value will cause the Vertical Delay value to wrap from minimum value to the maximum value.

Notes on Adjusting the Vertical Delay

Note the following points when adjusting the Vertical Delay:

- If you cross over the maximum Vertical Delay, the value returns to 0 (zero).

- Crossing the minimum delay returns the Vertical Delay value to 524 (525-line standard), or 624 (625-line standard).

Bank D Menus

This section summarizes the menus, parameters, and functions available on Bank D when using the AAM-8581.

Table 5.4 Bank D Menu and Parameters Table

Menu Select	Menu	Parameters		HUD Values		Description
0	Bank Select	− −	A B C D	BANK	A B C D	Reserved for the Bank designation
1	Audio MUX Enable[m]	+ −	Off On	MUX ENABL	ON OFF	Enables the audio embedding feature on the card. This menu is only available for the ADC-8733A-C and ADC-8733A-SC. • ON — The audio channels are embedded into the horizontal interval of the digital video based on the Embed To, Audio Delay, and Channel Source settings. • OFF — The audio embedding feature is disabled.
2	Embed Group Select[m]	+ −	1 2 3 4	EMBEDDED	1 2 3 4	Specify which group to embed the audio into (Group 1 to 4).
3	Audio Delay[m a]	+ −	Increase Decrease	AUD DELAY	(####) MS	Controls the amount of additional delay to be added to the input audio before it is embedded. The audio delay is entered in milliseconds and has a range of 0-5000ms (5 seconds). Note that the minimum audio delay is based on the Timing Mode, Horizontal Delay, Vertical Delay, and Video settings and is in addition to the Minimum Delay. This menu only applies to the ADC-8733A-C and ADC-8733A-SC. • If the Timing Mode is set to Frame Sync, 1 frame of delay is added to the minimum audio delay. When using NTSC, this is equal to 33mS. When using PAL, this is equal to 40mS. • The Horizontal Delay and Vertical Delay settings are also applied to the minimum audio delay. • If the card is not set to Frame Sync Mode, and the Horizontal and Vertical Delay settings are set to 0, the minimum inherent delay for the audio is 3mS.

Table 5.4 Bank D Menu and Parameters Table

Menu Select	Menu	Parameters		HUD Values		Description
4	Channel 1 Source[m]	+ –	Increase Decrease	CHANNEL 1	MUTE 1 2 3 4	Use these menus to map the analog input channels to the embedded channels within the embedded group. Any input channel can be routed to any, or all, of the embedded channels within the selected group. These menus only apply to the ADC-8733A-C and ADC-8733A-SC.
5	Channel 2 Source[m]	+ –	Increase Decrease	CHANNEL 2	MUTE 1 2 3 4	
6	Channel 3 Source[m]	+ –	Increase Decrease	CHANNEL 3	MUTE 1 2 3 4	
7	Channel 4 Source[m]	+ –	Increase Decrease	CHANNEL 4	MUTE 1 2 3 4	
8	Audio Input 1 Gain[m]	+ –	Increase Decrease	IN 1 GAIN	(#.#)DB	Use these menus to adjust the audio gain for each input of the AAM-8581 over a range of ±10dBu in increments of 0.05dBu. The audio is adjusted on the AAM-8581 in the analog domain before the A-D conversion for maximum signal resolution. These menus only apply to the ADC-8733A-C and ADC-8733A-SC.
9	Audio Input 2 Gain[m]	+ –	Increase Decrease	IN 2 GAIN	(#.#)DB	
A	Audio Input 3 Gain[m]	+ –	Increase Decrease	IN 3 GAIN	(#.#)DB	
B	Audio Input 4 Gain[m]	+ –	Increase Decrease	IN 4 GAIN	(#.#)DB	
C	Silence Threshold[m]	+ –	Increase Decrease	THRESH HL	-(##)DBFS	Selects the audio threshold for silence from a range of -84dBFS to -6dBFS in increments of 6dBFS. The value selected defines silence for the input audio level and influences when the "No Input" error message is displayed in the Audio Input Status field of DashBoard. This menu only applies to the ADC-8732B-C and ADC-8732B-SC.
D	Silence Alarm Timeout	+ –	Increase Decrease	TIMEOUT	(##) SECONDS	
E	Audio Configuration Reset	Hold SW2 up for 3 seconds		AUD RST	0	Enables you to reset the audio settings to the factory default values. This menu only applies to the ADC-8733A-C and ADC-8733A-SC.
F	Not implemented					

a. The minimum Audio Delay is based on the Timing Mode, Horizontal Delay, Vertical Delay, and Video Standard settings.

Specifications

In This Chapter

This chapter provides technical specifications on the ADC-8733A. Note that specifications are subject to change without notice.

The following topics are discussed:

- Technical Specifications

Technical Specifications

This section provides the technical specifications for the ADC-8733A.

Table 6.1 ADC-8733A Technical Specifications

Category	Parameter	Specification
Component Video Input	Signal Standards Accepted	YUV (SMPTE, BETA, and MII)
		RGB (SMPTE, NTSC-Rel, MII)
	Number of Inputs	1
	Component Video	1V p-p nominal
	Impedance	75ohm terminating
	Return Loss	>43.5dB to 6MHz
SDI Output	Signal Standards	SMPTE 259M-C, 270Mbps 525/625-lines, 10 bits
	Number of Outputs	Full Rear Module: 4
	Return Loss	>20.0dB to 270MHz
	Signal Level	800mV ±10%
	DC Offset	<50mV
	Rise and Fall Time	>800pS (20-80%, ±15%)
	Overshoot	<5% typical
Audio Input (8310AR-037 and 8320AR-037 Rear Modules)	Number of Inputs	4
	Connector	3-Pin Plug to BNC
	Impedance	>10Kohm
	Maximum Input Level	+34dBu (input gain set to –10dBu)
	Input Level Range	± 10dBu
	Frequency Response	± 0.05dB 20Hz – 22kHz @ Fs = 48kHz
Audio Performance (8310AR-037 and 8320AR-037 Rear Modules)	Signal to Noise Ratio	100dB
		101dB 'A' weighted
		107dB CCITT weighting
	Total Harmonic Distortion	<100dB
	Phase Linearity	1.2° @ 20kHz
	Amplitude Linearity	0.6dB @ -100dBFS
	Crosstalk	>95dB
	Minimum Audio Delay	3ms
	Maximum Audio Delay	5sec
Analog Reference	Signal Standards Accepted	NTSC, PAL-B, PAL-M, PAL-N
	Number of Inputs	1
	Input Impedance	75ohm
	Return Loss	>46dB to 6.75MHz

Table 6.1 ADC-8733A Technical Specifications

Category	Parameter	Specification
Minimum Delay in Line/Frame Delay Mode	Minimum Delay	525-line standard: 1 Line + 3.3µs 625-line standard: 1 Line + 3.6µs
Tracking Delay Pulse	ADC-8733A	up to 2 video lines
	ADC-8733A-S	up to 2 video frames
Power Consumption	Total without Audio Option	4.5W
	Total with Audio Option	9.5W

Service Information

In This Chapter

This chapter contains the following sections:

- Troubleshooting Checklist
- Warranty and Repair Policy

Troubleshooting Checklist

Routine maintenance to this openGear product is not required. In the event of problems with your ADC-8733A, the following basic troubleshooting checklist may help identify the source of the problem. If the frame still does not appear to be working properly after checking all possible causes, please contact your openGear products distributor, or the Technical Support department at the numbers listed under the "**Contact Us**" section.

1. **Visual Review** — Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the card, 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. **Input Signal Status** — Verify that source equipment is operating correctly and that a valid signal is being supplied.

4. **Output Signal Path** — Verify that destination equipment is operating correctly and receiving a valid signal.

5. **Unit Exchange** — Exchanging a suspect unit with a unit that is known to be working correctly is an efficient method for localizing problems to individual units.

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 ADC-8733A.

To reload the software on a ADC-8733A

1. Eject the card from the frame.

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

3. Release the button.

   • The **OK/ERROR** LED flashes 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 its last operational software load.

   • Software loads can be sent to the ADC-8733A via the connection on the rear of the frame.

Warranty and Repair Policy

The ADC-8733A 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 ADC-8733A 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 ADC-8733A 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 ADC-8733A User Manual provides all pertinent information for the safe installation and operation of your openGear Product. Ross Video policy dictates that all repairs to the ADC-8733A 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 ADC-8733A, 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 ADC-8733A. If required, a temporary replacement frame will be made available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited will be shipped collect.

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

Contact Us

Contact our friendly and professional support representatives for the following:

- Name and address of your local dealer
- Product information and pricing
- Technical support
- Upcoming trade show information

Technical Support		
	Telephone:	+1 613 • 652 • 4886
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