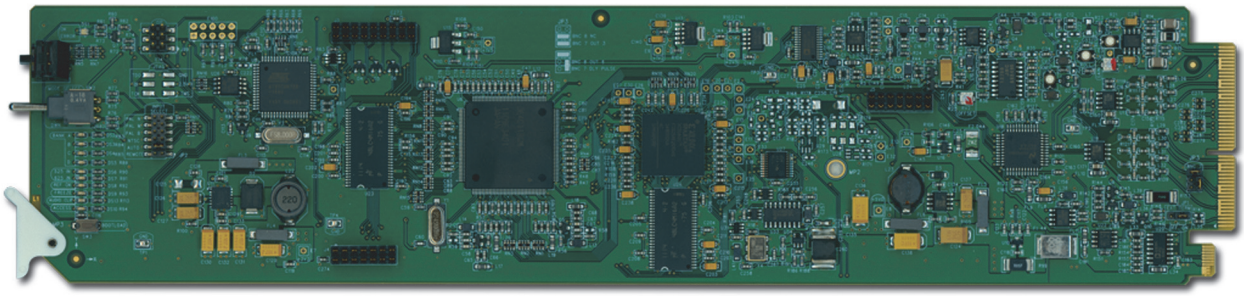
openGear

ADC-8732B Series

Analog Composite to SD-SDI Video Decoder

User Manual



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    - offer the best product quality and support
2. Make Cool Practical Technology
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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*.

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3. We will not ship crap.
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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-8732B Series · User Manual

- Ross Part Number: 8732BDR-004-04
- Release Date: January 22, 2018.

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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.

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The material in this manual is furnished for informational use only. It is subject to change without notice and should not be construed as commitment by Ross Video Limited. Ross Video Limited assumes no responsibility or liability for errors or inaccuracies that may appear in this manual.

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 **Industrial (Class A) electromagnetic wave suitability equipment** 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
- Functional Block Diagram
- User Interfaces
- Documentation Terms and Conventions

A Word of Thanks

Congratulations on choosing an openGear ADC-8732B Analog Composite to SD-SDI Video Decoder. 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 ADC-8732B, 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-8732B series is a 10bit broadcast quality video decoder with a 12bit analog to digital converter. It is specifically designed for broadcast or production situations in which an analog PAL-B, PAL-M, PAL-N, or NTSC composite signal must be converted to a component SD-SDI signal. Seven SD-SDI outputs are provided.

The ADC-8732B series fits into the openGear frames. Refer to the ***DFR-8300 Series*** or ***OG3-FR Series Frames User Manual*** for specific ventilation and cooling instructions to maintain optimum operating conditions.

The ADC-8732B series is available in the following models:

- **ADC-8732B** — The base model decoder includes Proc Amps, Line Delay, and Line Synchronizer modes.
- **ADC-8732B-S** — This model includes a Frame Synchronizer, along with all the features available on the ADC-8732B.
- **ADC-8732B-C** — This model includes the AAM-8581 daughter card and includes four channels of analog audio embedding along with all the features available on the ADC-8732B.
- **ADC-8732B-SC** — This model includes a Frame Synchronizer in addition to all the features available on the ADC-8732B-C and the ADC-8732B.

The complete circuit for the ADC-8732B, including a 12bit A-D converter, decoder, Line (or frame) synchronizer, serializer, tracking delay pulse, and microprocessor is contained on a single DA-sized card. Additional daughter cards are required for audio embedding.

A 10bit decoding process provides excellent performance with all types of picture sources. The decoder uses 3-line, 5-line, and adaptive 3D filters with advanced control algorithms.

To simplify configuration, the ADC-8732B series offers two methods:

- DashBoard Control System — The ADC-8732B series is fully compliant with all openGear technical specifications and supports remote monitoring and control via the DashBoard Control System.
- Heads-up Display (HUD) — The ADC-8732B series includes an on-screen display that enables you to view adjustments made using the card-edge controls.
- Changes made using either of the above methods are reflected in the other.

ADC-8732B-S Overview

The ADC-8732B-S models comes with a full featured frame sychronizer, capable of synchronizing incoming video to house reference. Various timing modes are available to accommodate most situations.

ADC-8732B-C Overview

The ADC-8732B-C models includes the ADC-8732B or the ADC-8732B-S, the AAM-8581, and the appropriate rear module. The AAM-8581 is a daughter card that plugs onto the top of the ADC-8732B board and enables you to add four channels of analog audio conversion and embedding to the SDI video output of the ADC-8732B series card. The AAM-8581 uses state of the art analog to digital converters that provide 24bit 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 following features make the ADC-8732B series the most flexible, high-quality decoding card for your analog to digital conversion requirements:

- 12bit analog to digital conversion
- 10bit decoding with 3-line/5-line/3D adaptive comb filters
- Optional Frame Synchronization (no daughter card required)
- Freeze modes
- Horizontal and vertical timing adjustments
- Programmable vertical interval blanking
- Setup adjustment
- Black level offset
- Passes Super Black
- Status indicator LEDs on card-edge
- Choice of reference inputs (composite sync only)
- Tracking Delay output for companion audio synchronizer
- Built-in test signals
- Reports status and configuration remotely via the DashBoard Control System
- Fits openGear frames
- Fully compliant with openGear specifications
- 5-year transferable warranty

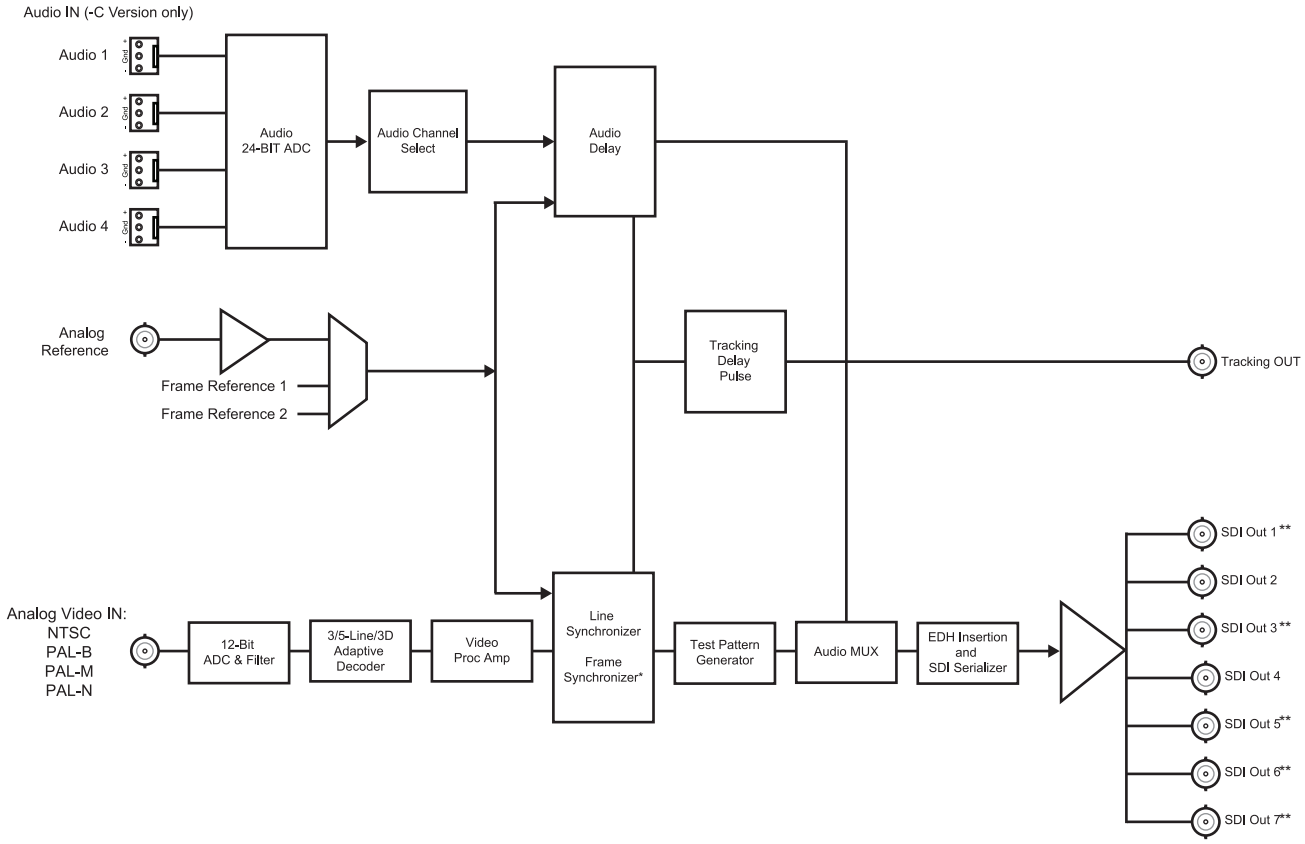
ADC-8732B-C Features

The following features are also available for the ADC-8732B-C:

- 4 channel audio embedding
- 24bit ADC resolution
- Selectable maximum input level from -10dBu to +10dBu in 0.5dBu increments
- +/- 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-8732B series card.



* Available on the ADC-8732B-S and ADC-8732B-SC only

** Not available when using a Split Rear Module

Figure 1.1 *ADC-8732B — Simplified Block Diagram*

User Interfaces

The following interfaces are available for control and monitoring of your card.

DashBoard Control System

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

For More Information on...

- the menus in DashBoard, refer to the section "**DashBoard Menus**" on page 4-1.
- installing and using DashBoard, refer to the ***DashBoard User Manual***.

Card-edge Monitoring

The card-edge includes jumpers for selecting the input video standard, navigating the HUD menus, configuring the Tracking Pulse output, and terminating the reference signal on the rear module. LEDs are available for monitoring the status of the signals.

For More Information on...

- the jumpers available on the card-edge, refer to the section "**Card Overview**" on page 3-2.
- the card-edge LEDs, refer to the section "**Control and Monitoring Features**" on page 3-4.

SNMP Monitoring and Control

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

For More Information on...

- SNMP controls on your card, refer to your ADC-8732B Management Information Base (MIB) file.
- SNMP Monitoring and Control, refer to your ***MFC-8300 Series*** or ***MFC-OG3 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-8732B series**" refers to all versions of the card unless otherwise indicated.
- "**Board**", and "**Card**" refer to the ADC-8732B series within openGear frames, including all components and switches.
- "**Frame**" refers to openGear frame that houses the ADC-8732B series card.
- "**HUD**" refers to the Heads-up Display feature of the card.
- "**openGear frame**" also includes all version of the DFR-8300 and OG3-FR series frames and any available options unless otherwise noted.
- "**Operator**" and "**User**" refer to the person who uses ADC-8732B series card
- "**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-8732B series installing the card into the frame, cabling details, and upgrading the card software.

The following topics are discussed:

- Before You Begin
- Installing the ADC-8732B Series
- Cabling Overview
- 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 card 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-8732B Series

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 card model and frame you are using.

Note — *An error message displays in the DashBoard **Hardware 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.*

Supported Rear Modules

This section outlines the supported rear modules for each card model.

Rear Modules for the ADC-8732B

The ADC-8732B supports the following rear modules:

- **DFR-8310 series frames** — The **8310AR-030** Rear Module is required. The ADC-8732B is also compatible with the DFR-8310-BNC frame.
- **DFR-8321 series and OG3-FR series frames** — The **8320AR-030** Full Rear Module or the **8320AR-031** Split Rear Module can be used.

Rear Modules for the ADC-8732B-S

The ADC-8732B-S supports the following rear modules:

- **DFR-8310 series frames** — The **8310AR-030** Rear Module is required. The ADC-8732B is also compatible with the DFR-8310-BNC frame.
- **DFR-8321 series and OG3-FR series frames** — The **8320AR-030** Full Rear Module or the **8320AR-031** Split Rear Module can be used.

Rear Modules for the ADC-8732B-C

The ADC-8732B-C supports the following rear modules:

- **DFR-8310 series frames** — The **8310AR-037** Rear Module is required. The ADC-8732B-C is not compatible with the DFR-8310-BNC frame.
- **DFR-8321 series and OG3-FR series frames** — The **8320AR-037** Full Rear Module is required.

Rear Modules for the ADC-8732B-SC

The ADC-8732B-SC supports the following rear modules:

- **DFR-8310 series frames** — The **8310AR-037** Rear Module is required. The ADC-8732B-SC is not compatible with the DFR-8310-BNC frame.
- **DFR-8321 series and OG3-FR series frames** — The **8320AR-037** Full Rear Module is required.

Installing a Rear Module

If you are installing the card in a DFR-8310-BNC frame, or the Rear Module is already installed, proceed to the section "**Installing the Card**" on page 2-5.

Note — *Do not install the ADC-8732B-C or the ADC-8732B-SC in slot 10 of your DFR-8310 series frame when using an MFC-8310-N series Network Controller Card. Doing so may damage the Network Controller Card, the AAM-8581, or both.*

To install a rear module in your openGear frame

1. Refer to the ***DFR-8300 and OG3-FR Series User Manual*** to ensure that the frame is properly installed.
2. On the rear of the frame, locate the card frame slot.
3. Remove the Blank Plate from the rear of the slot you have chosen for card installation.
4. As shown in **Figure 2.1**, seat the bottom of the rear module in the seating slot at the base of the frame's back plane.

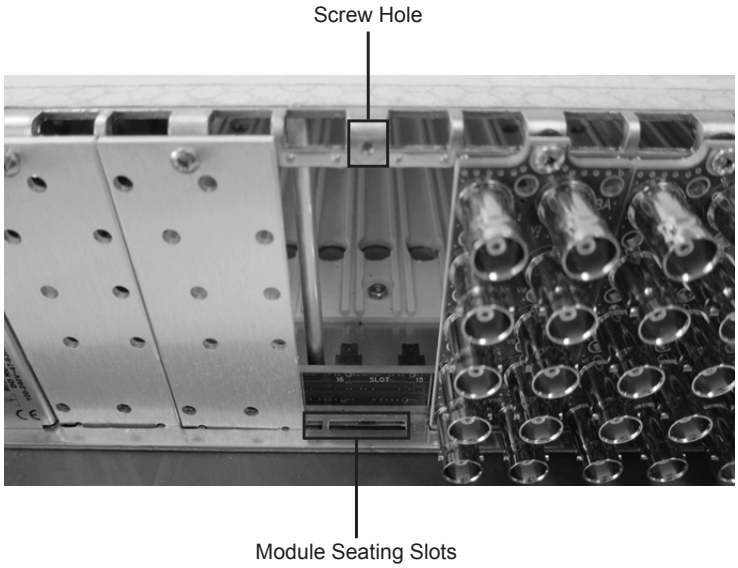


Figure 2.1 *Rear Module Installation in an openGear Frame (Card not shown)*

5. Align the top hole of the rear module with the screw hole on the top edge of the frame back plane.
6. Using a Phillips screwdriver and the supplied screw, fasten the rear module to the back plane. Do not over-tighten.
7. Verify whether your Rear Module Label is self-adhesive by checking the back of the label for a thin wax sheet. You must remove the wax sheet before affixing the label.
8. Affix the supplied Rear Module Label to the BNC area of the Rear Module.
9. Ensure proper frame cooling and ventilation by having all rear frame slots covered with rear modules or blank metal plates.

Installing the Card

If the card is to be installed in any compatible frame other than a Ross Video product, refer to the frame manufacturer's manual for specific instructions.

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.*

To install the card in the openGear frame

1. Locate the Rear Module you installed in the procedure "**Installing a Rear Module**" on page 2-4.
2. Hold the card 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.

Cabling Overview

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.

Cabling for the ADC-8732B and ADC-8732B-S

The ADC-8732B and ADC-8732B-S are used with the following Rear Modules:

- **8310AR-030** Rear Module — Each rear module occupies one slot and accommodates one card. This rear module provides seven SD-SDI outputs, one tracking pulse output, and a reference input. (**Figure 2.2**)
- **8320AR-030** Full Rear Module — Each rear module occupies two slots and accommodates one card. This rear module provides seven SD-SDI outputs, one tracking pulse output, and a reference input. (**Figure 2.2**)
- **8320AR-031** Split Rear Module — Each rear module occupies two slots and accommodates two cards. This rear module provides two or three outputs per card. (**Figure 2.3**)

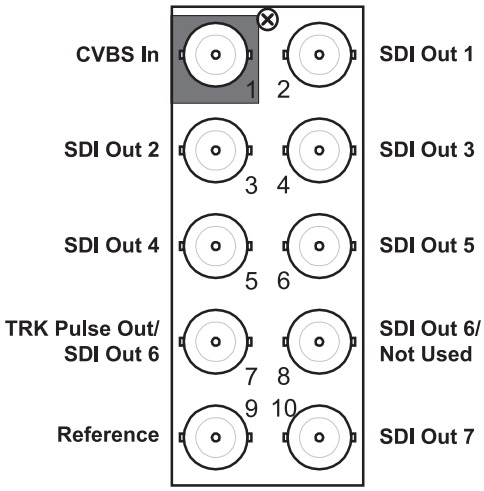


***Figure 2.2** Cable Connections for the 8310AR-030 and 8320AR-030*

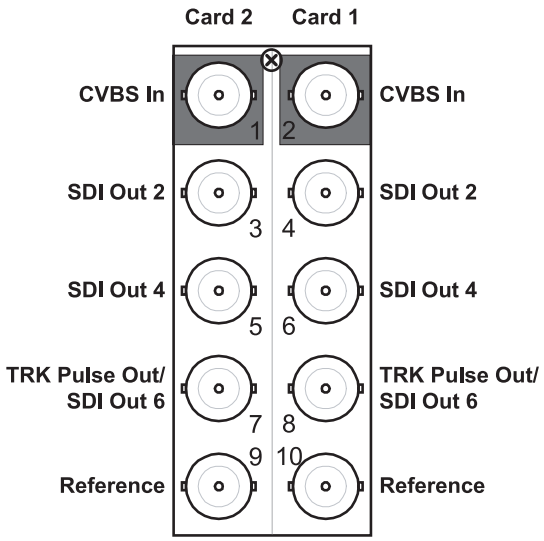


***Figure 2.3** Cable Connections for the 8320AR-031*

Cabling for the ADC-8732B-C and ADC-8732B-SC

The ADC-8732B-C and ADC-8732B-SC are used with the following Rear Modules:

- **8310AR-037** Rear Module — Each rear module occupies one slot and accommodates one card. This rear module provides four audio inputs, three SDI outputs, one tracking pulse output, and a reference output. (**Figure 2.4**)
- **8320AR-037** Full Rear Module — Each rear module occupies two slots and accommodates one card. This rear module provides four audio inputs, three SDI outputs, one tracking pulse output, and a reference output. (**Figure 2.4**)

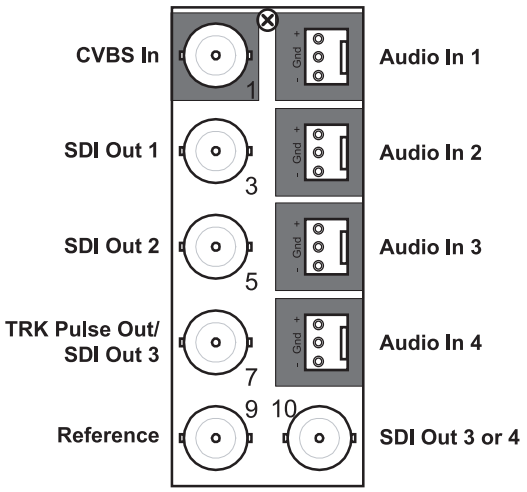


Figure 2.4 *Cable Connections for the 8310AR-037 and 8320AR-037*

Video Cabling

Use the following procedure to cable the card:

1. Connect the input composite signal to BNC 1 (CVBS In). If you are using the 8320AR-031 Split Rear Module, BNC 1 or BNC 2 can be used, depending on the positioning of the card in the frame.
2. Connect downstream SD-SDI devices to BNCs 2 through 6, 8, and 10 (SD-SDI Out). If you are using the 8320AR-031 Split Rear Module, connect to the required BNCs as indicated in **Figure 2.3**.
3. Connect BNC 7 (TRK Pulse Out) to any device that needs to track the video delay through the ADC-8732B or ADC-8732B-S.
   - The Tracking Pulse is a positive 5V pulse. Its width tracks the video delay as it passes through the card. The ADC-8732B tracking delay pulse tracks up to two video lines, the ADC-8732B-S up to two fields.
   - If you are using the 8320AR-031 Split Rear Module, connect to BNC 8 to **JP3** is set to the default.
4. Connect a video reference in one of two ways:
   - Connect to BNC 9 (Reference) on the Rear Module. If you are using the 8320AR-031 Split Rear Module, connect to BNC 9 or BNC 10, depending on the positioning of the card in the frame; or
   - Connect to **REF1** or **REF2** on the back of the frame.
5. Specify the reference source using DashBoard or the Heads-Up Display.

Audio Cabling

The 8310AR-037 and 8320AR-037 Rear Modules provide four audio terminal blocks with removable connectors for Audio In 1, 2, 3, and 4 (refer to **Figure 2.4** for cable designations). Note that each connector has locations for the positive, negative, and grounded wires of a balanced analog audio cable.

To wire the analog audio

1. Insert an analog audio wire to the designated polarity slot on the connector of the rear module. **Figure 2.5**

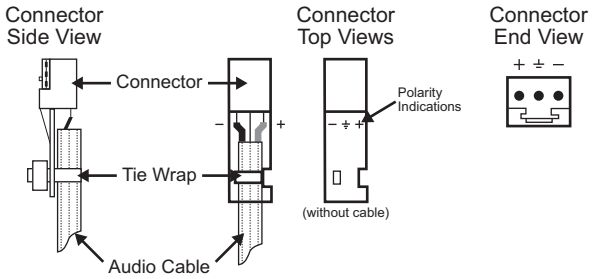


Figure 2.5 *Connector Wiring for 8310AR-037 and 8320AR-037 Input Sockets*

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 card using DashBoard.

Installing a License Key

When installing a license key on the card:

- You must have DashBoard installed and communicating with the openGear frame that houses the card you wish to install the key for. The DashBoard software and manual are available from the Ross Video website.
- 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.

To install a license key

1. Launch the DashBoard client on your computer.
2. In DashBoard, display the **Device** tab of the card 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 from step 4.
   - You will be given a License Key that must be entered in the **License** field 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 **Frame Sync** field.
   - the **Frame Sync** field displays a green background.

Performing Software Upgrades

DashBoard enables you to upload software updates to the card.

To upgrade the software

1. Contact Ross Technical Support for the latest software version file.
2. In DashBoard, display the **Device** tab of the card 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 file you wish to upload. DashBoard automatically selects the last directory that you loaded from.
5. Click **Open** to display a confirmation dialog. This dialog displays the selected upload file name, type, size, and the file creation date.

6. From the **Confirmation** dialog, 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 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 card.
8. To complete the upgrade process, DashBoard performs an automatic reboot of the card.

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

   - The card 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-8732B series cards.

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 card components. The configurations outlined in this section should be performed before installing the card in the frame, but may be repeated as required.

Note — *The ADC-8732B series defaults with **Edit Permissions** set to **Locked**. To unlock the card, refer to **Table 4.4** on page 4-4.*

For More Information on...

- the LEDs available on the card-edge, refer to the section ""**Control and Monitoring Features**" on page 3-4.
- using the HUD menus, refer to the chapter "**HUD Overview**" on page 5-2.

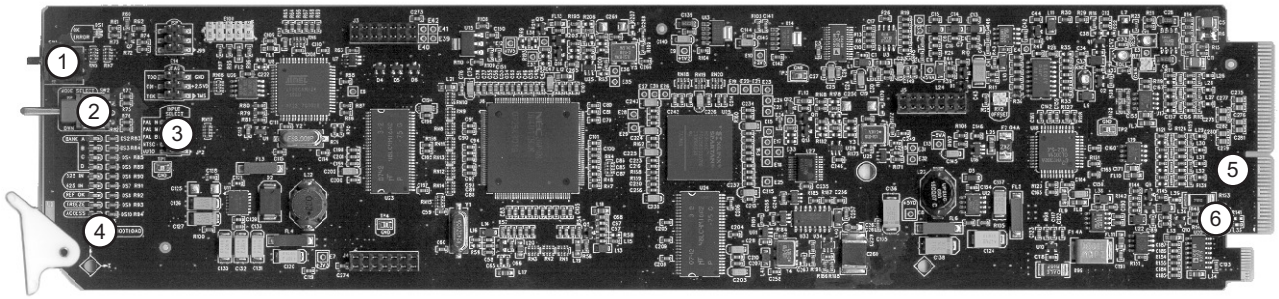


***Figure 3.1** Card Components*

1) Function Select (SW1)	3) Input Select (JP2)	5) BNC 7 (JP3)
2) Mode Select (SW2)	4) Bootload Button (SW3)	6) EXT TERM (JP1)

1. Function Select (SW1)

SW1 is a 16-position rotary switch used to select functions such as Proc Amp controls and timing adjustment menu items. 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.

2. Mode Select (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 card functional modes or configurations within the function menu (selected first using **SW1**).

3. Input Select (JP2)

Use **JP2** to specify the input video standard. Choose from the following:

- **PAL-N** — Selecting this option forces PAL-N decoding.
- **PAL-M** — Selecting this option forces PAL-M decoding.
- **PAL-B** — Selecting this option forces PAL-B decoding.
- **NTSC** — Selecting this option forces NTSC decoding.
- **AUTO** — Selecting this option enables the card to automatically detect the video input standard. This is the default setting.
- **REMOTE** — The input video standard is set remotely in DashBoard.

4. **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.

5. **BNC 7 (JP3)**

   Use **JP3** to configure the Tracking Pulse Output of the card. This is useful in the openGear frames when using the 8320AR-031 Split Rear Module to take advantage of the extra SD-SDI Out. Select from the following:

   - **Default** — Select this position to use BNC 7 as Track Pulse Out and BNC 8 as SD-SDI Out 6. Refer to **Figure 3.2** for jumper positions.
   - **Extra SDI Out** — Select this position to use BNC 7 as SDI Out 6 and when BNC 8 is not connected. This position is advised when using the 8320AR-031 Split Rear Module. Refer to **Figure 3.3** for jumper positions.

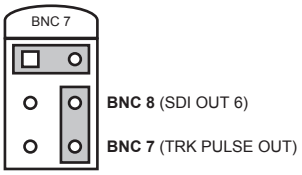


***Figure 3.2** JP3 — Default Setting*

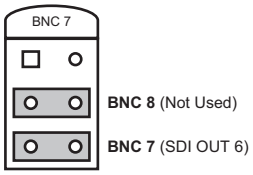


***Figure 3.3** JP3 — Extra SD-SDI Out Setting*

6. **EXT TERM (JP1)**

   Use **JP1** to terminate the signal on the Reference BNC of your rear module. Choose from the following:

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

Tracking Pulse Output

The ADC-8732B and ADC-8732B-S offer a tracking delay output that pulses high in a two frame cycle on BNC 7. 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-8732B and up to two fields on the ADC-8732B-S.

Control and Monitoring Features

This section provides information on the card-edge monitoring features of the card. These features can be used in conjunction with the Heads-Up Display (HUD). Refer to **Figure 3.4** for the location of the LEDs and controls for fan, alarm, and communications.

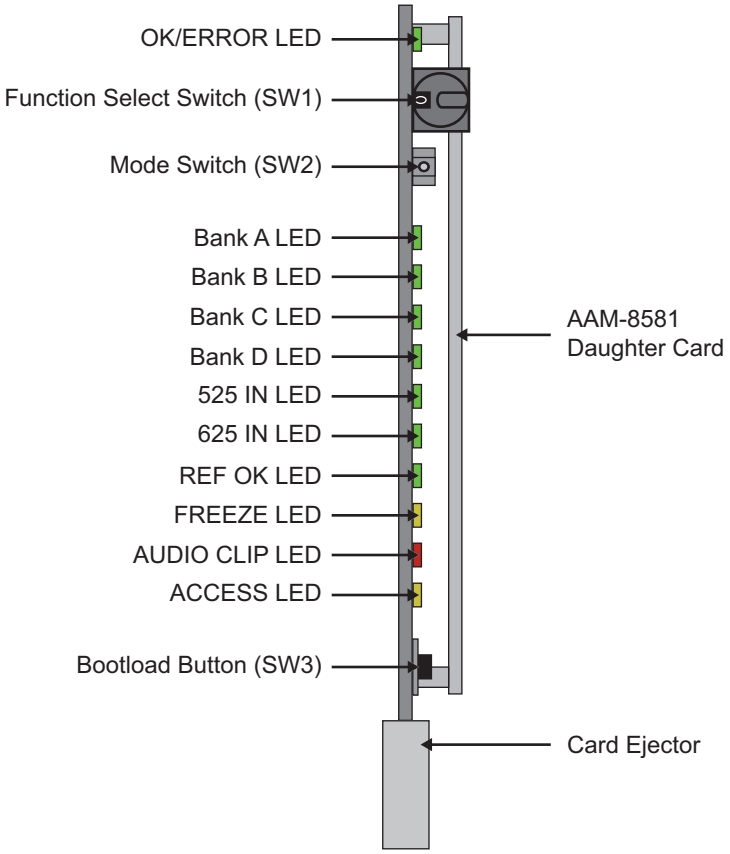


Figure 3.4 *ADC-8732B-SC Card-edge Controls*

Status and Selection LEDs

The front-edge of the card includes LED indicators that display the status of the input signals, and indicate menu function and configuration selections. Refer to **Figure 3.4** for LED locations. Basic LED displays and descriptions are provided in **Table 3.1** on page 3-5.

Table 3.1 LEDs Descriptions

LED	Color	Display and Description
OK/ERROR	Green	When lit, 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. Selecting Line Sync or Frame Sync modes require that a reference signal be present.
	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 corresponding Bank is selected.
525 IN	Green	When lit, this LED indicates that the input signal is 525-lines (NTSC or PAL-M).
625 IN	Green	When lit, this LED indicates that the input signal is 625-lines (PAL-B or PAL-N).
REF OK	Green	When lit green, this LED indicates a reference signal is present at the openGear frame reference or the reference BNC input on the card's rear module, and that the reference is locked. The reference signal matches the input standard.
	Flashing	When flashing green, this LED indicates that the reference standard does not match the input standard.
	Off	When unlit, this LED indicates that a reference is not present.
FREEZE	Yellow	When lit, this LED indicates that the output is frozen. (Frame Sync versions only)
AUDIO CLIP	Red	When lit, this LED indicates that one or more of the audio input levels is too high and is causing distortion at the input to the A-D converter. This LED is implemented only for the ADC-8732B-C and ADC-8732B-SC.
ACCESS	Yellow	When lit, this LED indicates that Switch Access is unlocked. The ADC-8732B card-edge controls are accessible.

Notes on Timing Modes

This section provides additional information on selecting Timing Modes for your card.

Line Delay Mode

This mode uses the input 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 section "**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 "**2 – Horizontal Delay**" on page 5-9 and the section "**4 – Vertical Interval End**" on page 5-7.

Line Sync Mode

This mode uses the reference to generate the output timing on a line-by-line basis, but uses the input signal timing 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-8732B (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 Sync should be kept away from the threshold point.*

Frame Delay Mode

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 Mode

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-8732B-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 your card. Default parameters are noted with an asterisk (*). Parameters marked with an “m” 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 **Signal** tab 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.

Product Tab

Table 4.1 summarizes the **Product** tab parameters available in DashBoard.

Table 4.1 Product Tab Items

Tab Title	Item	Parameters	Description
Product	Product	ADC-8732B-x	
	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 **Hardware** tab parameters available in DashBoard.

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 model not supported by the AAM-8581[a]
		FPGA load invalid (Red)	The card failed to load the FPGA firmware
		Incomp 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 (bytes)	#/##	On-board processing memory available
	EE Bank	#	Storage count

a. This message will display 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 **Signal** tab parameters available in DashBoard.

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
		Yellow	The reference does not match the input standard
		Red	An error has occurred
	Input Status	Signal Present	Indicates the presence of an input signal
		No Signal	
	Input Standard	If you have the card configured for a fixed standard, this field displays that input standard.	
		If the card is configured for Auto Detect, this field tracks the input signal. On loss of input, the input standard shows the last input standard used.	
	Reference	Reference OK	Indicates the presence of a reference signal
		No Reference	

Notes on the Signal Status

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

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

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

- A valid input signal is not present
- The input signal does not match the forced input standard
- A valid reference signal is not present

Setup Tab

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

Note — *The ADC-8732B defaults with **Edit Permissions** set to **Locked**.*

Note — *For each supported line standard (525 and 625), the ADC-8732B 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

Menu Title	Item	Parameters	Description
Setup	Input Control	AUTO	When **JP2** is set to **REMOTE**, you can specify the input video standard.
		NTSC	
		PAL-B	
		PAL-M	
		PAL-N	
	NTSC Setup[m]	Off	Disables the setup
		On	Enables the setup
	Input Mode[m]	Standard	Select if using a standard video input
		VTR	Select if using input signals that do not have a stable time base
	Decode Mode[m] (NTSC options)	3D Adaptive	Selects 3D Adaptive Decode Mode
		3 Line	Selects 3-line Decode Mode
	Decode Mode[m] (PAL options)	5 Line	Selects 5-line Decode Mode when in PAL
	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.

Timing Tab

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

Table 4.5 Timing Menu Items

Menu Title	Item	Parameters	Description
Timing	Reference	Frame Reference 1	The reference source is the analog reference connected to the frame REF 1 port
		Frame Reference 2	The reference source is the analog reference connected to the frame REF 2 port
		BNC 9	The reference source is the analog reference connected to BNC 9
	Timing Mode[m]	Line Delay	Output timing is based on input timing
		Line Sync	Output timing is based on the reference
		Frame Delay[a]	Output timing is based on input timing
		Frame Sync[a]	Output timing is based on the reference
	Horizontal Delay[m] (half pixels)	0-1715[b]	Adjusts the horizontal delay
		0-1727[c]	
	Vertical Delay[m](lines)	0-524[b]	Adjusts the vertical delay
		0-624[c]	
	Minimum Delay	Reset	Resets the Delay

a. This option is only available for the ADC-8732B-S.
b. When in 525-line mode (NTSC/PAL-M).
c. When in 625-line mode (PAL-B/PAL-N).

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 Video Loss Mode[m]	Black	When the input signal is lost or invalid, SD-SDI black is the output
		No Output	When the input signal is lost or invalid, there is no output present
		Freeze	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 black
	Test Pattern	Off	Disables this feature
		SDI Check Field	Specifies the type of test pattern to output.
		Full Field Color Bars	
	Forced Freeze	Off	Disables this feature.
		On	Enables a forced freeze of 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.

Framing Tab

Table 4.7 summarizes the **Framing** options available in DashBoard.

Table 4.7 Framing Menu Items

Menu Title	Item	Parameters	Description
Framing	Vertical Interval Blanking[m]	Pass	Pass the vertical interval
		Blank	Blank the vertical interval
	Vertical Interval End[m]	19-21[a]	Selects the line on which the vertical interval ends
		22[b]	
	Lock V Bit On Line[mb]	10	Sets the V-Bit to line 10
		20	Sets the V-Bit to line 20

a. When in 525-line mode (NTSC/PAL-M).
b. When in 625-line mode (PAL-B/PAL-N), the Vertical Interval End is fixed at 22.

Proc Amp Tab

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

Table 4.8 Proc Amp Menu Items

Menu 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 chroma gain.
	CB Gain (%)[m]	50 to 150	Adjusts the output C_B gain.
	Hue (DEG)[m]	-43° to 44.8°	Adjusts the hue phase (in degrees).
	Black Level Offset (IRE)[m]	-7.2 to 51.7	Adjusts the output black level of the card.
	Super Black[m]	Pass	Enables the input to pass without clipping.
		Clip	Clips any value below black.
	Automatic Gain Control[m]	Off	Disables the Automatic Gain Control Mode (AGC).
		Chroma	Chroma values in the output are adjusted based on the input signal.
		Luma	Luminance values in the output are adjusted based on the input signal.
		Both	Chroma and luminance values in the output are adjusted based on the input signal.
	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

Menu Title	Item	Parameters	Description
Analog Audio Inputs	Audio Input Gain (dB)[m]	-10.0 to +10.0	Adjusts the **Audio Gain** for each input
	Audio Input Status[m]	OK	Indicates that audio is present and 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	Selected	An alarm is triggered when the selected audio input is clipping or if it is silent for longer than the selected S**ilence Alarm Threshold** value.
		Cleared	Disables this feature.
	Silence Threshold[m]	-6dBFS to -84dBFS	Selects the audio threshold for silence measurement and defines the audio silence threshold (-6dBFS increments)
	Silence Alarm Timeouts[m]	0 to 60	Selects the duration of silence before an alarm is displayed in the **Signal** tab.
Embedded Audio	Audio Mux Enable	Selected	Embeds audio channels into the horizontal interval of the digital video.
		Cleared	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	Analog Input #	Assigns 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

Menu Title	Item	Parameters	Description
Alarms	Loss of Input	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 conditions.
		Notify	Signal Status parameter in the **Signal** tab reports loss of input conditions when they occur.

Heads-up Display

In This Chapter

This chapter summarizes the menu system of the Heads-Up Display (HUD) and how to navigate the menus and options using the **SW1** and **SW2** switches on the ADC-8732B series card-edge.

The following topics are discussed:

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

HUD Overview

The HUD feature is displayed on all four SDI outputs. When activated, the card status and parameters can be viewed and adjusted using the card-mounted menu switch and an easy to use menu system. A list of the available menus and parameters is also provided in this section.

A particular menu is referred to as: **Bank**-**Menu**, for example **A-9**. The card must be unlocked to be able to adjust the parameters. By default, whenever the card is powered up, it is locked.

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

Note — *When the card is powered up or unlocked, it defaults to Bank A and the HUD is disabled.*

Navigation

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.

To navigate the Bank Menus

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.

The following sections 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.

Conventions

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

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

Table 5.1 summarizes the functions available on Bank A.

Table 5.1 Bank A Menu and Parameters Table

Menu Select	Menu	Parameters		HUD Values	
0	Bank Select	 – – –	A B C D	BANK	A B C D
1	Heads-Up Display	+ (h) –	On Off	HEADS UP	ON OFF
2	--				
3	--				
4	Decode Mode (NTSC)[m]	+ –	3 Line 3D Adaptive	DECODE	3 LINE 3D ADAPT
	Decode Mode (PAL) [m]		5 Line	DECODE	5 LINE
5	Test Pattern	+ –	Full Field Color Bars SDI Check Field Off	TEST PAT	FF BARS PATH OFF
6	--				
7	--				
8	Video Gain[m]	+ –	Increase Decrease	VID GAIN	(###.#)%
9	Black Level Offset[m]	+ –	Increase Decrease	BLK OFF	(##.#) IRE
A	Chroma Gain[m]	+ –	Increase Decrease	CHROMA	(###.#)%
B	Hue[m]	+ –	Increase Decrease	HUE	(##.##) DEG
C	C_B Gain[m]	+ –	Increase Decrease	CB GAIN	(###.#)%
D	AGC	+ –	Both Luma Chroma Off	AGC	BOTH LUMA CHROMA OFF
E	Factory Defaults	+ (h) – (h)	Reset All Reset Proc Amp	DEFAULT	ALL RST PROC RST
F	Switch Access	+ (h) – (h)	Locked Unlocked	ACCESS	LOCKED UNLOCKED

Bank A Menu Parameters

The following section provides a brief overview of the parameters available in Bank A.

1 – Heads-Up Display

The Heads-Up Display (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.

Note — *The display is superimposed over all card video outputs. Do not use this feature with on-air signals.*

4 – Decode Mode

The Decode Mode function allows you to select 3-line or 3D Adaptive decoding for NTSC input signals. In PAL-B, PAL-M, and PAL-N, the decoder uses a 5-line aperture. The menu parameters will differ depending on the input signal format.

5 – Test Pattern

Use this menu to select a test pattern type, or to disable the test pattern option.

Note — *When using the SD-SDI Check Field test pattern, the HUD must be set to OFF for the test pattern to provide accurate results.*

8 – Video Gain

Use this menu to adjust the gain of the output signal. The range is 50% to 150%. This menu uses ballistics.

9 – Black Level Offset

This menu configures the black level offset that is not affected by the NTSC Setup function. The range is -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 NTSC Setup off, the black level will be 8.5 IRE.

A — Chroma Gain

This menu allows you to adjust the Chroma portion of the output signal. The rang is 50% to 150%. This menu uses ballistics.

B – Hue

Use this menu to adjust the hue of the output signal. The range is -43.0° to 44.8°. This menu uses ballistics.

C – C_B Gain

Use this menu to adjust the C_B portion of the output signal. The range is 50% to 150%. This menu uses ballistics.

D – AGC (Automatic Gain Control)

Use this menu to enable or disable the Automatic Gain Control (AGC) for Chrominance, Luminance, or both. The Proc Amp menu controls will still affect the output video with AGC enabled.

E – Factory Defaults

This function allows you to return all controls to their default values except the **HUD** and **Edit Permission** menu settings.

F – Switch Access

The card can be monitored using DashBoard at any time while it is powered. The card must be unlocked to adjust parameters. On power-up, the **Edit Permission** always reverts to its default value if 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 anyone from accidentally changing the settings.

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

Table 5.2 summarizes the 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
1	Setup[m a]	+ On – Off	SETUP ON OFF
2	--		
3	Vertical Interval Blanking[m]	+ Blank – Pass Through	VI BLANK BLANK PASS
4	Vertical Interval End[m]	+ Increase – Decrease	VI END (##)
5	SuperBlack[m]	+ Pass Through – Clip	SUPER BLK PASS CLIP
6	V Bit Lock[m a]	+ Line 20 – Line 10	V BIT LOC 20 10
7	--		
8	--		
9	--		
A	--		
B	--		
C	--		
D	--		
E	--		
F	--		

a. When in 525-line mode (NTSC/PAL-M).

Bank B Menu Parameters

The following section provides a brief overview of the parameters available in Bank B.

1 – Setup

Use this menu to determine how the card controls the incoming signal with respect to NTSC setup. Select from the following:

- **ON** — Select this option if the incoming signal has setup on it. The card will remove it before it converts the composite signal to SD-SDI.
- **OFF** — Select this option if the incoming signal does not have setup on it.

3 – Vertical Interval Blanking

Use this menu to blank the vertical interval or allow the signals in the vertical interval to pass through the card.

4 – Vertical Interval End

The card 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 NTSC or PAL-M, 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 PAL-B and PAL-N, the Vertical Interval End is not adjustable and is set to 22.

5 – SuperBlack

Use this menu to clip 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

6 – V Bit Lock

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 — *V Bit location can only be moved in the NTSC/PAL-M input standards.*

Bank C Menus

Table 5.3 summarizes the functions available on Bank C.

Table 5.3 Bank C Menu and Parameters Table

Menu Select	Menu	Parameters		HUD Values	
0	Bank Select	+ –	A B C D	BANK	A B C D
1	Timing Mode[m]	+ –	Frame Sync[a] Frame Delay[a] Line Sync Line Delay	TIME MODE	FS FD LS LD
2	Horizontal Delay[m]	+ –	Increase Decrease	H DELAY	(####)
3	Horizontal Reset	+ –	Zero No action	H RESET	ZERO
4	Vertical Delay[m]	+ –	Increase Decrease	V DELAY	(#)
5	Vertical Reset	+ –	Zero No action	V RESET	ZERO
6	Minimum Delay	+ –	Zero No action	MIN DEL	ZERO
7	Input Mode[m]	+ –	VTR Input Standard Input	IN MODE	VTR STAND
8	Freeze Mode[m]	+ –	Frame Field 2 Field 1	FRZ MODE	FRAME FLD 2 FLD 1
9	Forced Freeze	+ –	Freeze[b] Pass Through	FREEZE	FORCE PASS
A	Input Loss Mode[m]	+ –	Freeze[b] No Output Black	IN LOSS	FREEZE NO OUTPUT BLACK
B	--				
C	Forced Black	+ (h) – (h)	On Off	FRCD BLK	ON OFF
D	Forced Monochrome	+ (h) – (h)	On Off	FRCD MONO	ON OFF
E	--				

Table 5.3 Bank C Menu and Parameters Table

Menu Select	Menu	Parameters	HUD Values
F	Reference[m]	+ BNC 9 Frame 1 – Frame 2	BNC9 REFERENCE FRM2 FRM1

a. Only available on the ADC-8732B-S.
b. When Freeze mode is enabled, the freeze is determined by the setting in Menu C-8.

Bank C Menu Parameters

The following section provides a brief overview of the parameters available in Bank C.

1 – Timing Modes

The ADC-8732B features the Line Delay and Line Sync Timing Modes. The ADC-8732B-S features the Line Delay, Line Sync, Frame Delay, and Frame Sync Timing Modes. Refer to the section "**Notes on Timing Modes**" on page 3-6 for details.

2 – Horizontal Delay

Delay can be added to the output video in half-pixel increments up to a maximum of 1715 in NTSC/PAL-M or 1727 in PAL-B/PAL-N. This menu uses ballistics.

- If you cross over the maximum Horizontal Delay, the value returns to 0 and the Vertical Delay value increments by 1.
- Crossing the minimum delay returns the Horizontal Delay value to 1715 (NTSC or PAL-M), or 1725 (PAL-B or PAL-N) and decreases 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.

3 – Horizontal Reset

This menu resets the Horizontal Delay value to 0.

4 – Vertical 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 NTSC/PAL-M or 624 lines in PAL-B/PAL-N. This menu uses ballistics.

Note the following points when adjusting the Vertical Delay:

- If you cross over the maximum Vertical Delay, the value returns to 0.
- Crossing the minimum delay returns the Vertical Delay value to 524 (NTSC or PAL-M), or 624 (PAL-B or PAL-N).

5 – Vertical Reset

Use this menu to reset the Vertical Delay value to 0.

6 – Minimum Delay

Use this menu to reset the Horizontal Delay and Vertical Delay values to 0. Note that this resets the Horizontal Delay and Vertical Delay values across all Timing Modes.

7 – Input Mode

Use this menu to select what type of video is the input. Select from the following:

- **Standard** — Select this option when using input signals with a stable time base.
- **VTR** — Select this option when using input signals that do not have a stable time base, such as VTRs. A reference should be used to reclock the output signal to the house reference. This requires that one of the **Sync Timing Modes** be enabled. Refer to the section "**1 – Timing Modes**" on page 5-9 for details.

8 – Freeze Mode

Use this menu to set what will be the output when a freeze occurs (as set by the Forced Freeze menu). This menu is only applicable for the ADC-8732B-C and ADC-8732B-SC. The output is frozen if any of the following conditions occur:

- The user freezes the output manual. Refer to the section "**9 – Forced Freeze**" above.
- There is a loss of input signal. Refer to the section "**A – Input Loss Mode**" below.

9 – Forced Freeze

The output can be manually frozen (ADC-8732B-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** setting. 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

Use this menu to select what type of video appears at the system's outputs when the input video signal is lost or invalid. Select from the following:

- **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-8732B-S only). The freeze is determined by the **Freeze Mode** setting. The **Timing Mode** must be set to **Frame Sync** and the reference must be valid.

C – Forced Black

This menu forces the output to SD-SDI Black. The output can be forced to SDI Black only when Line/Delay modes and the input signal is valid; or when in Line/Frame Sync modes and the input or reference is valid.

D – Forced Monochrome

This menu turns off the color portion of the output SD-SDI signal.

F – Reference

The Sync Timing Modes of the ADC-8732B require a reference. The recommended signal is a stable composite analog black signal. This menu selects where the card will look for that reference. The choices are BNC 9 (or BNC 10 when using the 8320AR-031 Split Rear Module), Frame Reference 1, and Frame Reference 2 (on the openGear frame).

Bank D Menus

Table 5.4 summarizes the functions available on Bank D.

Table 5.4 Bank D Menu and Parameters Table

Menu Select	Menu	Parameters		HUD Values	
0	Bank Select		A B C D	BANK	A B C D
1	Audio MUX Enable[m]	+ –	Increase Decrease	MUX ENABL	ON OFF
2	Embed Group Select[m]	+ –	1 2 3 4	EMBEDDED	1 2 3 4
3	Audio Delay[m a]	+ –	Increase Decrease	AUD DELAY	(####)MS
4	Channel Source[m]	+ –	Increase Decrease	CHANNEL 1	MUTE 1 2 3 4
5	Channel Source[m]	+ –	Increase Decrease	CHANNEL 2	MUTE 1 2 3 4
6	Channel Source[m]	+ –	Increase Decrease	CHANNEL 3	MUTE 1 2 3 4
7	Channel Source[m]	+ –	Increase Decrease	CHANNEL 4	MUTE 1 2 3 4
8	Audio Input Gain[m]	+ –	Increase Decrease	IN 1 GAIN	(#.#)DB
9	Audio Input Gain[m]	+ –	Increase Decrease	IN 2 GAIN	(#.#)DB

Table 5.4 Bank D Menu and Parameters Table

Menu Select	Menu	Parameters	HUD Values
A	Audio Input Gain[m]	+ Increase – Decrease	IN 3 GAIN (#.#)DB
B	Audio Input Gain[m]	+ Increase – Decrease	IN 4 GAIN (#.#)DB
C	Silence Threshold[m]	+ Increase – Decrease	THRESH HL -(##)DBFS
D	Audio Configuration Reset	Hold **SW2** up for 3 seconds	AUD RST 0
E	--		
F	--		

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

Bank D Menu Parameters

The following section provides a brief overview of the parameters available in Bank D.

1 – Audio MUX Enable

This menu allows you to enable the audio embedding feature on the ADC-8732B-C or ADC-8732B-SC. Select from the following:

- **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.

3 – Audio Delay

This menu 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. This menu is used in conjunction with the Minimum Delay. This menu is only applicable for the ADC-8732B-C and ADC-8732B-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.

4, 5, 6, 7 – Channel Source

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. This menu is only applicable for the ADC-8732B-C and ADC-8732B-SC.

8, 9, A, B – Audio Input Gain

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. This menu is only applicable for the ADC-8732B-C and ADC-8732B-SC.

C – Silence Threshold

This menu 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 is only applicable for the ADC-8732B-C and ADC-8732B-SC.

D – Audio Configuration Reset

This feature enables you to reset the audio settings to the factory default values. This menu is only applicable for the ADC-8732B-C and ADC-8732B-SC.

Specifications

In This Chapter

This chapter provides technical information on the ADC-8732B series. 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-8732B series.

Table 6.1 ADC-8732B Technical Specifications

Category	Parameter	Specification
Composite Video Input	Signal Standards Accepted	NTSC, PAL-B, PAL-M, PAL-N
	Number of Inputs	1
	Composite Video	1V p-p nominal
	Input Impedance	75ohm terminating
	Return Loss	>50dB to 6.75MHz
	Common Mode Rejection	>58dB @ 50/60Hz
Component SDI Output	Signal Standards	SMPTE 259M, 270Mbps 525/625 lines, 10 bits
	Number of Outputs	Full Rear Modules: 7 Split Rear Module: 3
	Output Return Loss	>20dB to 270MHz
	Signal Level	800mV ±10%
	DC Offset	<75mV
	Rise and Fall Time	>800pS (20 to 80%, ±15%)
	Overshoot	<10% typical
Audio Input[a]	Number of Inputs	4
	Connector	3-pin plug to BNC
	Input Impedance	>10Kohm
	Maximum Input Level	+34dBu (input gain set to -10dBu)
	Input Level Range	±10dBu
	Frequency Response	± 0.05dB 20Hz to 22kHz @ Fs = 48kHz
Audio Performance[a]	Signal to Noise Ratio	100dB 101dB ‘A’ weighted 107dB CCITT weighting
	Total Harmonic Distortion	<100dB
	Inter-Modular Distortion	<0.003% (-90dB) @ -20dBFS SMPTE/DIN two-tone test
	Phase Linearity	1.2° @ 20kHz
	Amplitude Linearity	0.6dB @ -100dBFS
	Crosstalk	>98dB
	Minimum Audio Delay	3ms
	Maximum Audio Delay	5sec
	Operating Range	5°C to 40°C ambient (40°F to 104°F)

Table 6.1 ADC-8732B Technical Specifications

Category	Parameter	Specification
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
Minimum Delay in Line/Frame Delay Mode	Minimum Delay	NTSC: 2 Lines + 38µs PAL: 3 Lines +38µs
Tracking Delay Pulse	ADC-8732B	up to 2 video lines
	ADC-8732B-S, ADC-8732B-SC	up to 2 video frames
Power Consumption	Total without AAM-8581	4.0W
	Total with AAM-8581	7.8W

a. With the 8310AR-037 and 8320AR-037 rear modules only.

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 card, 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 card.

To reload the software

1. Eject the card from the frame.
2. Press and hold the **Alarm Mute/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 card via the connection on the rear of the frame.

Warranty and Repair Policy

The ADC-8732B series card 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-8732B series card 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-8732B series card 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-8732B Series 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-8732B series card 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-8732B series card, 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-8732B series card. 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
	After Hours Emergency:	+1 613 • 349 • 0006
	Email:	techsupport@rossvideo.com
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