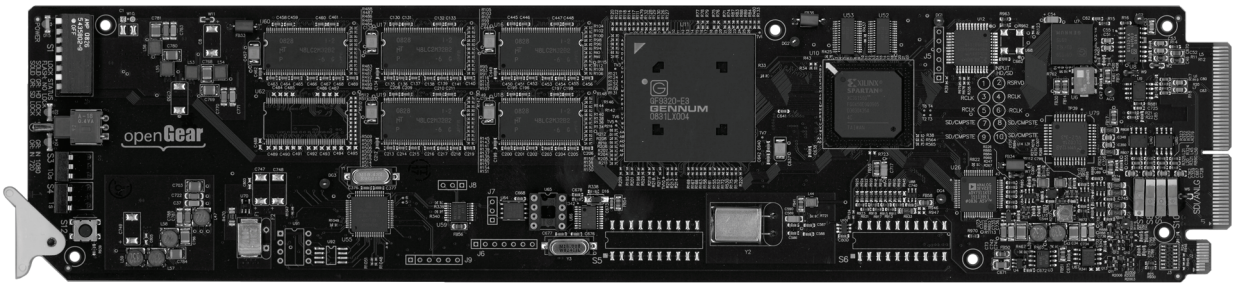
Ross Video Limited

HDC-8222A
HD-Down Converter and Distribution Amplifier
User Manual



ROSS
Live Production Technology

openGear

HDC-8222A • HD-Down Converter and Distribution Amplifier User Manual

- Ross Part Number: **8222ADR-004-02**
- Release Date: February 1, 2012.

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Patents

This product is protected by the following US Patents: 4,205,346; 5,115,314; 5,280,346; 5,561,404; 7,034,886; 7,508,455; 7,602,446; 7,834,886; 7,914,332. This product is protected by the following Canadian Patents: 2039277; 1237518; 1127289. Other patents pending.

Notice

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Trademarks

Important Regulatory and Safety Notices

Before using this product and any associated equipment, refer to the "**Important Safety Instructions**" listed below to avoid personnel injury and to prevent product damage.

Products may require specific equipment, and/or installation procedures to be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these specific requirements.

Symbol Meanings

This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage or injury to persons or equipment.

Warning — *The symbol with the word "**Warning**" within the equipment manual indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.*

Caution — *The symbol with the word "**Caution**" within the equipment manual indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.*

Notice — *The symbol with the word "**Notice**" within the equipment manual indicates a situation, which if not avoided, may result in major or minor equipment damage or a situation which could place the equipment in a non-compliant operating state.*

ESD Susceptibility — *This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.*

Important Safety Instructions

Caution — *This product is intended to be a component product of the DFR-8300 series frame. Refer to the DFR-8300 series frame User Manual for important safety instructions regarding the proper installation and safe operation of the frame as well as its component products.*

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

Warning — *Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after any servicing.*
This product contains safety critical parts, which if incorrectly replaced may present a risk of fire or electrical shock. Components contained with the product's power supplies and power supply area, are not intended to be customer serviced and should be returned to the factory for repair. To reduce the risk of fire, replacement fuses must be the same time and rating. Only use attachments/accessories specified by the manufacturer.

EMC Notices

United States of America
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 Limited could void the user's authority to operate this equipment.*

CANADA

This Class "A" digital apparatus complies with Canadian ICES-003.

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

EUROPE

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

INTERNATIONAL

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

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

Maintenance/User Serviceable Parts

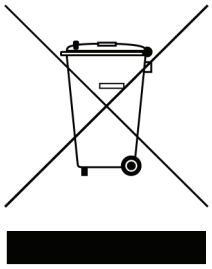
Routine maintenance to this openGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All openGear products 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 that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.



If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration. You can also contact Ross Video for more information on the environmental performances of our products.

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Contents

Introduction

In This Chapter

This chapter contains the following sections:

- Overview
- Functional Block Diagrams
- Documentation Terms and Conventions

A Word of Thanks

Congratulations on choosing an openGear HDC-8222A HD-Down Converter and Distribution Amplifier. Your HDC-8222A is part of a full line of Digital Products within the openGear Terminal Equipment family of products, backed by Ross Video's experience in engineering and design expertise since 1974.

You will be pleased at how easily your new HDC-8222A fits into your overall working environment. Equally pleasing is the product quality, reliability and functionality. Thank you for joining the group of worldwide satisfied Ross Video customers!

Should you have a question pertaining to the installation or operation of your HDC-8222A, 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 HDC-8222A is a high quality 10-bit, HD-Down Converter with Serial Digital pass-through and individual Aspect Ratio Controls for HD and SD inputs. The HDC-8222A bridges SMPTE 292 high definition (HD) and 259M-C standard definition (SD) signal formats; allowing high density and low power conversion of HD signals.

The HDC-8222A will down-convert HD to SD serial component digital and analog composite video. This unit can re-aspect the image with separate rules for HD and SD inputs, and adds 3:2 pull-down to 23.98 progressive segmented frame (pSF) or interlaced (i) inputs. In addition, reticule overlays, for full aperture and safe area, in both 16x9 and 4x3 can be enabled, as well as a center cross-hairs. Reticules can be separately enabled on the SD-SDI and composite outputs.

The image processing is full 10-bit using a 24-tap spatial filter. Down-conversions of HD to SD signals are de-jittered to reduce the chroma phase jitter of the SD composite outputs.

The HDC-8222A also preserves several key non-video signals across a down-conversion or ARC. Embedded audio is de-embedded at the input, delayed appropriately, and then embedded at the output in the new format. Timecode signals (as VITC or as in SMPTE RP-188) are extracted, delayed the appropriate amount, and then embedded in the output video. Standard definition closed captioning data (NTSC Line 21) is decoded, delayed, and embedded in the output video, regardless of aspect ratio correction.

With the 8320AR-1821 Full Rear Module, the HDC-8222A also supports audio de-embedding with four analog audio outputs.

This product also provides full color proc control of the output video, with separate controls for Gain, Lift, Saturation and Color Phase.

Features

The HDC-8222A also includes the following features:

- Preserves several non-video signals across a down-conversion or aspect ratio conversion
- Embedded audio is de-embedded at the input, delayed appropriately, and then embedded at the output, in the new format
- Timecode signals, as D-VITC (SMPTE 266M) or as ATC (RP188), are extracted, delayed the appropriate amount, and then embedded in the output video
- Closed captioning support: CEA-608 Line 21 style closed captioning or CEA-608 within a CEA-708 packet, extracted and inserted into the output video
- Provides full color proc-amp control of the output video, with separate controls for Gain, Lift, Saturation, and Color Phase
- Provides one dual-rate HD/SD-SDI input
- Optional four-channel analog audio de-embedding available with the 8320AR-1821 Full Rear Module
- Depending the rear module used, the following outputs are provided:
  - 8310AR-030 and 8320AR-030 Full Rear Modules — four re-clocked HD/SD-SDI copies of the input, and four user selectable (SD-SDI or Composite) down-converted HD or SD ARC outputs.
  - 8320AR-1821 Full Rear Module — two re-clocked HD/SD-SDI copies of the input, two user selectable (SD-SDI or Composite) down-converted HD or SD ARC outputs, and four analog audio outputs.

Available Format Conversions

The HDC-8222A has extensive re-format and down conversion capabilities. It can act as a down-converter, Aspect Ratio Converter (ARC), and frame rate converter. The format conversions are listed in **Table 1.1**.

Table 1.1 Supported Format Conversions

From HD to SD	
1080pSF 23.98Hz	480i 59.94Hz
1080p 29.97Hz	480i 59.94Hz
1080p 50Hz	576i 50Hz
1080p 23.98Hz	480i 59.94Hz
1080i 59.94Hz	480i 59.94Hz
1080i 25Hz	576i 50Hz
720p 25Hz	576i 50Hz
720p 29.97Hz	480i 59.94Hz
720p 50Hz	576i 50Hz
720p 59.94Hz	480i 59.94Hzz
480i 59.94Hz	480i 59.94Hz
576i 50Hz	576i 50Hz

Notes:

Note the following when calculating format conversions:

- An interlaced video format (i) contains two fields per frame, but the frame rate designation for that video format is actually the field rate. For example;
  - › 1080i 59.94Hz is 29.97 frames per second. There are two fields per frame, thus the interlaced frame rate is 59.94Hz.
  - › 1080p 29.97Hz is 29.97 frames per second.
- SD active line rates are PAL (575) and NTSC (486).
- The HDC-8222A cannot accept native 720p 23.98Hz or 720pSF 23.98Hz; however it can convert those signals if they are delivered inside a 720p 59.94Hz transportation wrapper (as typically done with this format) and processed as 720p 59.94Hz.

Functional Block Diagrams

This section provides functional block diagrams that outline the workflow of the HDC-8222A.

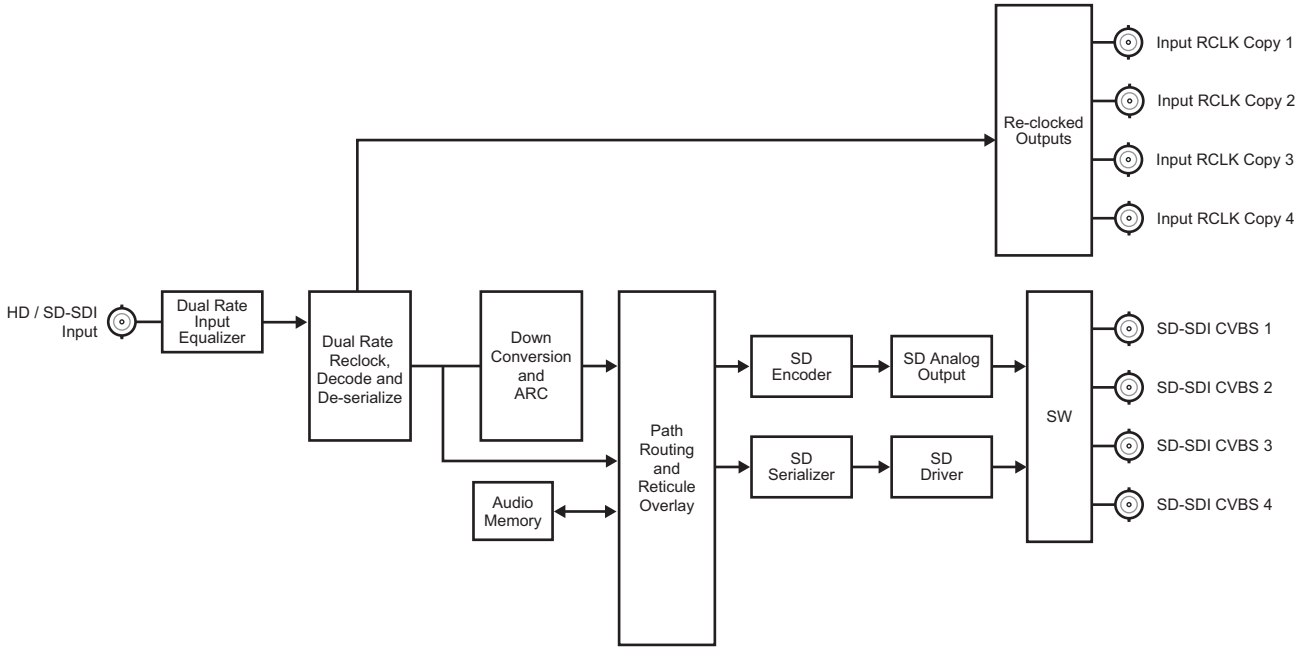

Figure 1.1 *HDC-8222A — Simplified Block Diagram (8310AR-030 and 8320AR-030 Rear Modules)*

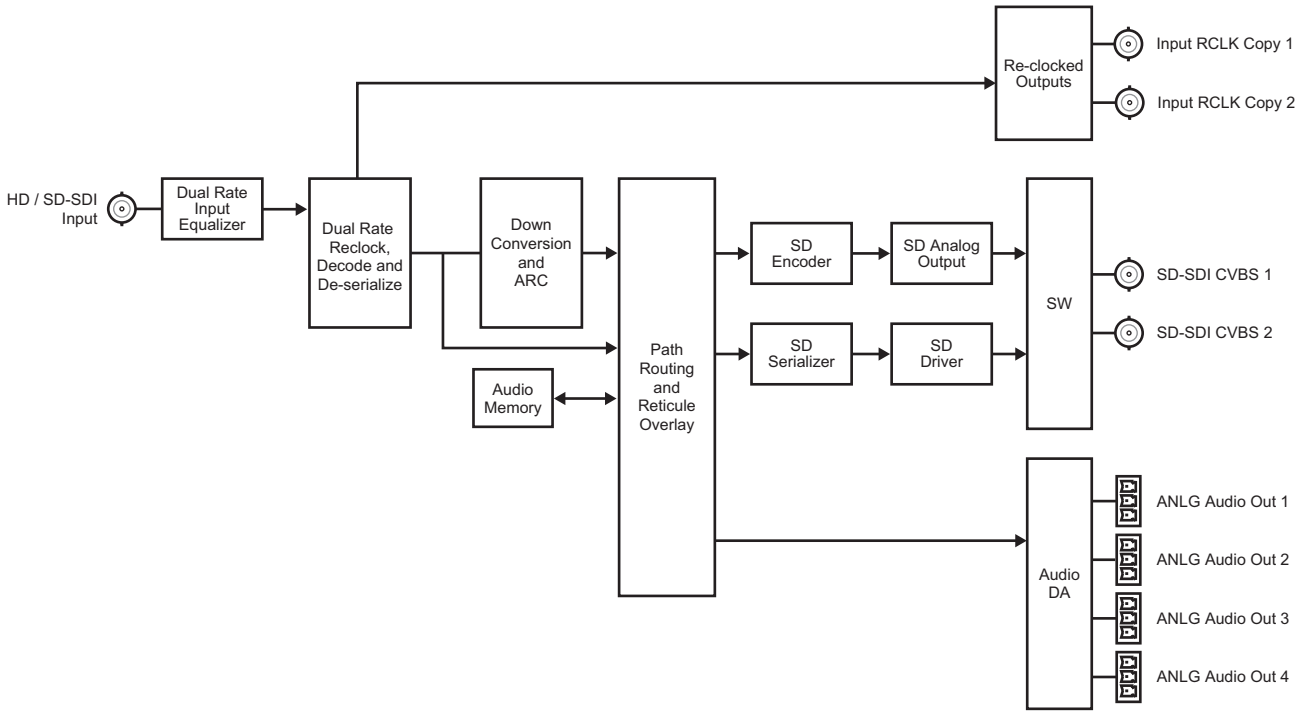

Figure 1.2 *HDC-8222A — Simplified Block Diagram (8320AR-1821 Rear Module)*

Overview

Starting in the upper left of the block diagrams, the dual-rate (HD/SD) serial digital signal is equalized, re-clocked and then de-serialized. A re-clocked copy of the input is driven out of up to four BNCs (number of BNCs is dependent on the rear module you are using). Once de-serialized, the video standard and frame rate is determined.

Coming out of the de-serializer, the parallel video data path goes to the image scalar circuitry, where it is down, aspect and/or frame rate converted depending on the signal input and user settings. After conversion audio, timecode, and closed captioning signals are embedded. Finally the reticule overlays (if any) are applied, and the signal passes through circuitry to reduce output clock jitter.

Up to four copies of SD analog composite and SD-SDI are generated and sent to four, 2x1 switches (**S7**, **S8**, **S9**, and **S10**) that allow you to select analog composite or SDI for the outputs.

The HDC-8222A also has a special feature called **Field Lock** for 720p down-converts. The 720p signals do not carry information indicating which frame should become a down-converted even field and which should be a down-converted odd field. When Field Lock is enabled, the card uses the frame reference as a guide to ensure that the down-converted odd/even sequence matches the odd/even sequence of the reference.

Documentation Terms and Conventions

The following terms and conventions are used throughout this manual:

- "**ARC**" refers to Aspect Ratio Converter.
- "**Board**", and "**Card**" refer to openGear terminal devices within openGear frames, including all components and switches.
- "**DashBoard**" refers to the DashBoard Control System™.
- "**DFR-8300 series frame**" refers to all versions of the 10-slot (DFR-8310 series) and 20-slot (DFR-8321 series) frames and any available options unless otherwise noted.
- "**Dual Rate**" refers to multi-definition.
- "**Frame**" refers to DFR-8300 series frame that houses the HDC-8222A card, as well as any openGear frames.
- "**Lift**" refers to black offset.
- "**Operator**" and "**User**" refer to the person who uses HDC-8222A.
- "**PAL**" refers to PAL-B unless otherwise stated.
- "**System**" and "**Video system**" refer to the mix of interconnected production and terminal equipment in your environment.
- "**525-line mode**" refers to broadcast situations using **NTSC** composite (analog) signal reference inputs.
- "**625-line mode**" refers to broadcast situations using **PAL-B** composite (analog) signal reference inputs.
- 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 HDC-8222A, installing the card into the frame, cabling details, and updating the card software.

The following topics are discussed:

- Before You Begin
- Installing the HDC-8222A
- Cabling for the HDC-8222A
- Software Upgrades

Before You Begin

Before proceeding with the instructions in this chapter, ensure that your DFR-8300 series frame is properly installed according to the instructions in the ***DFR-8300 Series User 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 HDC-8222A 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 HDC-8222A

This section outlines how to install a Rear Module in a DFR-8300 series 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.

Rear Modules for the HDC-8222A

The Rear Module for the HDC-8222A depends on the openGear frame you are installing the card into.

- **DFR-8310 series frame** — When installing the HDC-8222A in the DFR-8310 series frames, the **8310AR-030** Rear Module is required. The HDC-8222A is also compatible with the DFR-8310-BNC frame.
- **DFR-8321** — When installing the HDC-8222A in the DFR-8321 series frames, the **8320AR-030** Full Rear Module or the **8320AR-1821** Full Rear Module can be used.

Installing a Rear Module

If you are installing the HDC-8222A in a DFR-8310-BNC frame, or the Rear Module is already installed, proceed to the section "**Installing the HDC-8222A**" on page 2-4.

To install a Rear Module in your DFR-8300 series frame

1. Locate the card frame slots on the rear of the frame.
2. Remove the Blank Plate from the slot you have chosen for the HDC-8222A installation. If there is no Blank Plate installed, proceed to the next step.
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**)

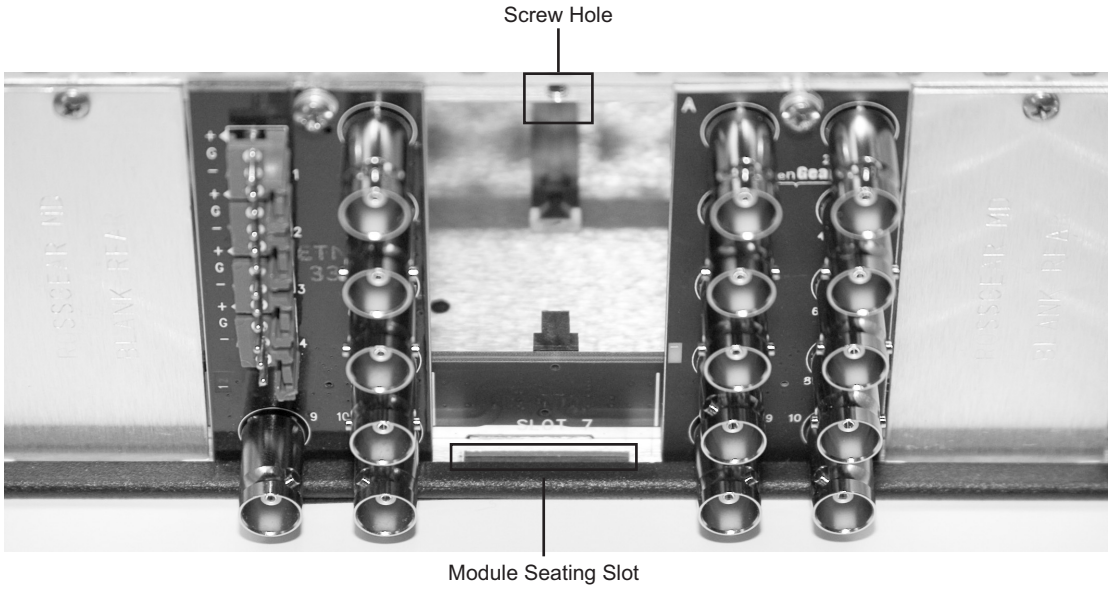

Figure 2.1 *Rear Module Installation in a DFR-8300 Series Frame (HDC-8222A not shown)*

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 HDC-8222A

This section outlines how to install the HDC-8222A in a DFR-8300 series frame. If the HDC-8222A 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 HDC-8222A in a DFR-8300 series 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 HDC-8222A 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. Verify whether your label is self-adhesive by checking the back of the label for a thin, wax sheet. You must remove this wax sheet before applying the label to the rear module surface.
5. Affix the supplied **Rear Module Label** to the BNC area of the Rear Module.

Cabling for the HDC-8222A

This section provides information for connecting cables to the installed Rear Modules on the DFR-8300 series frames. Connect the input and output cables according to the following sections. The input is internally terminated with 75ohms. It is not necessary to terminate unused outputs. Note that the number and type of outputs is dependent on the rear module you are using.

DFR-8310 Series Frame Cabling Overview

In the DFR-8310 series frames, the HDC-8222A is used with the following Rear Modules:

- **8310AR-030** Rear Module — Each card occupies one slot and provides one HD/SD-SDI input, four output copies of the re-clocked input, and four SD-SDI/CVBS outputs. (**Figure 2.2**).

DFR-8321 Series Frame Cabling Overview

In the DFR-8321 series frames, the HDC-8222A is used with the following Rear Modules:

- **8320AR-030** Full Rear Module — Each card occupies two slots and provides one HD/SD-SDI input, four output copies of the re-clocked input, and four SD-SDI/CVBS outputs. (**Figure 2.2**)
- **8320AR-1821** Full Rear Module — Each card occupies two slots and provides one SDI input, two output copies of the re-clocked input, two SDI-Composite outputs, and four analog audio outputs. (**Figure 2.3**)

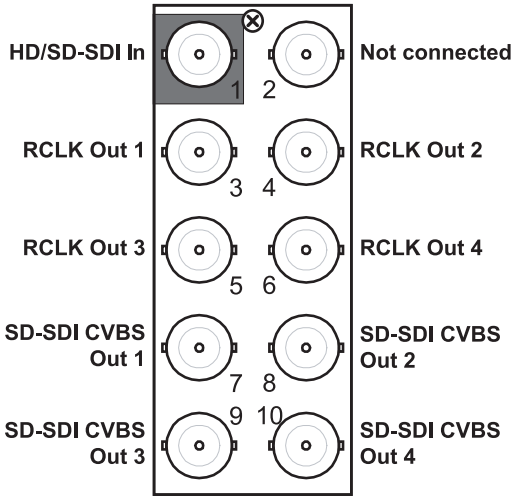

Figure 2.2 *Cable Connections for the 8310AR-030 and 8320AR-030 Rear Modules*

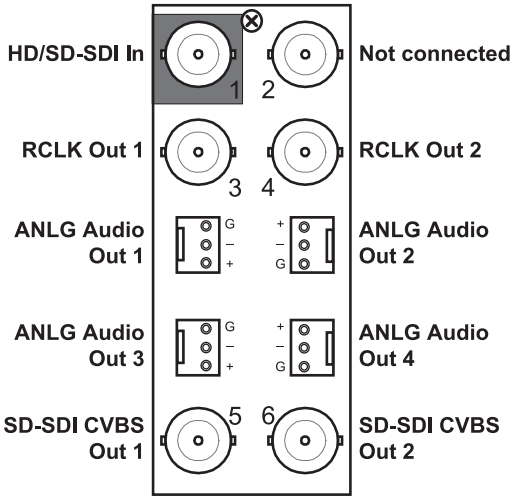

Figure 2.3 *Cable Connections for the 8320AR-1821 Rear Module*

Software Upgrades

The card can be upgraded in the field via the MFC-8300 series Network Controller card in your frame.

Note — *DashBoard version 3.0.0 or higher is required for this procedure.*

To upgrade the software on a card

1. Contact Ross Technical Support for the latest software version file.
2. Display the **Device View** of the card by double-clicking its status indicator in the **Basic Tree View**.
3. From the **Device View**, click **Upload** to display the **Select file for upload** dialog.
4. Navigate to the ***.bin** upload file you wish to upload.
5. Click **Open**.
6. If you are upgrading a single card, click **Finish** to display the **Uploading to Selected Devices** dialog. Proceed to step 8.
7. If you are upgrading multiple cards:
   - Click **Next >** to display the **Select Destination** menu. This menu provides a list of the compatible cards based on the card selected in step 2.
   - Specify the card(s) to upload the file to by selecting the check box(es) for the cards you wish to upload the file to.
   - Verify that the card(s) you wish to upload the file to. The **Error/Warning** fields indicate any errors, such as incompatible software or card type mismatch.
   - Click **Finish** to display the **Uploading to Selected Devices** dialog.
8. Monitor the upgrade.
   - The **Uploading to Selected Devices** dialog enables you to monitor the upgrade process.
   - Notice that each card is listed in the dialog with a button. This button is replaced with a **Reboot** button once the software file is loaded to that card.

Important — *Avoid clicking the individual **Reboot** buttons until all cards have successfully completed the file upload process and the **OK** button, located in the bottom right corner of the dialog, is enabled.*

   - Click **OK** to re-boot all the cards listed in the **Uploading to Selected Devices** dialog.
   - The **Reboot Confirm** dialog displays, indicating the number of cards that will re-boot. Click **Yes** to continue the upgrade process. Note that clicking **Cancel** or **No** returns you to the **Uploading to Selected Devices** dialog without rebooting the card(s).
   - The card(s) are temporarily taken offline during the re-boot process. The process is complete once the status indicators for the **Card State** and **Connection** fields return to their previous status.

User Controls

In This Chapter

There are two methods for monitoring the HDC-8222A: via DashBoard™, or using the LEDs and switches on the card-edge. This chapter provides a general overview of the controls available on the card-edge of the HDC-8222A.

The following topics are discussed:

- Card Overview
- Configuring the DIP Switches
- Control and Monitoring Features

Card Overview

This section provides a general overview of the HDC-8222A components.

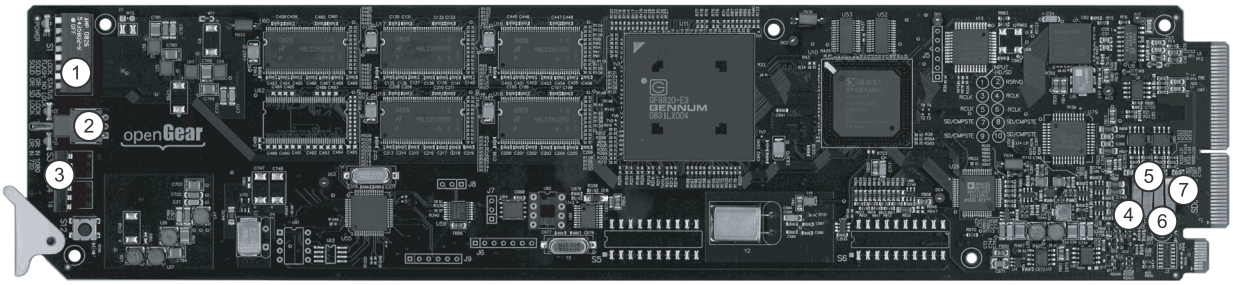

***Figure 3.1** HDC-8222A — Components*

1) Control Settings Switch (**S1**)	4) BNC 7 Output Select (**S7**)	7) BNC 10 Output Select (**S10**)
2) Menu Select Switch (**S2**)	5) BNC 8 Output Select (**S8**)	
3) Function Select Switches (**S3** and **S4**)	6) BNC 9 Output Select (**S9**)	

1. Control Settings Switch (S1)

S1 is a series of eight DIP Switches that are used to access and configure the features of the HDC-8222A. Refer to the section "**Configuring the DIP Switches**" on page 3-3 for details.

2. Menu Select Switch (S2)

Use **S2**, in conjunction with **S3** and **S4**, to enable, disable, and select specific HDC-8222A configurations. **S2** is a 3-position momentary toggle switch with an automatic spring-return to the center (null or unity) position. Refer to the section "**Card-edge Menu System**" on page 4-10 for information on the card-edge menus. Selection is made according to two basic menu design types:

- Menu selection utilizing a scrolling wrap-around style of selection (from last menu item directly back to the first menu item).
- Menu selection utilizing a bi-directional upper and lower range limit.

3. Function Select Switches (S3 and S4)

Use **S3** and **S4** in conjunction with **S2**, to select parameters to configure for the HDC-8222A. The parameter number (00-99) is selected with the rotary switches as follows:

- Use **S3** to select the 10s digit.
- Use **S4** to select the 1s digit.
- For parameters that have only an ON/OFF state, the **INPUT STANDARD** LED will turn on for "ON" and off for "OFF".

For example, setting **S3** to **3** and **S4** to **1** selects parameter **31** (**Y Channel Lift**). Use **S2** to increase or decrease the value of the parameter. Refer to **Table 3.1** for a list of available options.

4. BNC 7 - BNC 10 Output Select (S7-S10)

Use **S7-S10** to specify the type of output on **BNC 7 - BNC 10** respectively. For example, use **S8** to set the output for **BNC 8**. Position the switches as follows:

- **UP** — If a switch is in this position, the output of the corresponding BNC is set to SD Analog.
- **DOWN** — If a switch is in this position, the output of the corresponding BNC is set to SD-SDI.

Configuring the DIP Switches

This section outlines the **Control Settings** (**S1**) which enables you to control the primary functions of the HDC-8222A from the card-edge. There are eight DIP Switches numbered **S1.1** to **S1.8**. Use these DIP Switches, sometimes in conjunction, to access and configure various features of the HDC-8222A.

- **ON** — is defined as the DIP Switch in the up position (set away from the card).
- **OFF** — is defined as the DIP Switch in the down position (set towards the card). **Figure 3.2** illustrates all the DIP Switches in the **OFF** position.

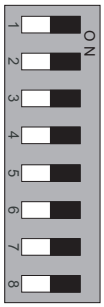

***Figure 3.2** S1 DIP Switches — OFF Position*

Table 3.1 provides a summary of the **S1** settings.

Table 3.1 S1 Settings on Card-edge

Settings		S1.1	S1.2	S1.3	S1.4	S1.5	S1.6	S1.7	S1.8
Remote Software Control Enable		ON							
Remote Software Control Disabled		OFF							
SD-SDI Video Input	SD to SD Video Input[a]		ON	ON					
	SD to SD 0.75 Vertical Reduction (letter box)[a]		ON	OFF					
	SD to SD 1.33 Horizontal Expansion (center cut)[a]		OFF	ON					
	SD to SD No Aspect Change[a]		OFF	OFF					
HD-SDI Video Input	HD to SD User Settings[b]				ON	ON			
	HD to SD 0.75 Vertical Reduction (letter box)[b]				ON	OFF			
	HD to SD 1.33 Horizontal Expansion (center cut)[b]				OFF	ON			
	HD to SD No Aspect Change[b]				OFF	OFF			
Underscan ON (10% overall)							ON		
Underscan OFF (10% overall)							OFF		
SD Analog Color ON								ON	
SD Analog Color OFF (black and white)								OFF	
Enable Field Locking (for 720p down-convert)									ON
Disable Field Locking (for 720p down-convert)									OFF

a. An SD video input validates the SD to SD ARC card control that is set to this setting.
b. An HD video input validates the HD to SD ARC card control that is set to this setting.

Remote Control Enable (S1.1)

This switch enables the remote control interface as follows:

- **ON** — Select this setting to control the HDC-8222A using the DashBoard Control System. This also disables switches **S1.2** through **S1.8**. Control can be either from the remote control (such as DashBoard), or these card-edge switches, but not both.

Note — *With DashBoard connected, and to avoid user setting override when switching from **Local** to **Remote** control, it is recommended to save your card settings, set **S1.1** to **ON**, and then reload the card settings from DashBoard.*

- **OFF** — Select this setting the remote control cannot set any card parameters, but can still monitor the status of the card.

Note — *When switching from **Remote** to **Local** control, switches **S1.2** to **S1.8** will override some user settings made in DashBoard.*

Aspect Ratio Control (S1.2 to S1.5)

These switches control aspect ratio for both HD and SD inputs separately. Refer to **Table 3.1** for the positions to select various preset or user defined aspect ratios.

Underscan (S1.6)

This switch activates an underscan feature, further reducing a selected aspect ratio by 10%.

Analog Composite Color (S1.7)

This switch enables or disables color on the SD analog output.

Field Lock (S1.8)

This switch enables or disables the Field Lock feature on the HDC-8222A. The Field Lock feature is used to ensure that the output SD signals have the correct field polarity when 720p 59.94Hz and 720p 50Hz signals are used as the input.

- There is no information in the 720p signal that indicates which frames should be made into even fields and which should be made into odd fields.
- The Field Lock feature looks at the frame reference bus and makes sure that the output field polarity matches that of the reference bus.
- If the aspect ratio has been adjusted off of the default setting, do a factory restore to correct it.

Control and Monitoring Features

The front-edge of the HDC-8222A has LED indicators for communication activity. This section provides information on the LEDs located on the card-edge of the HDC-8222A. Refer to **Figure 3.3** for the location of the LEDs.

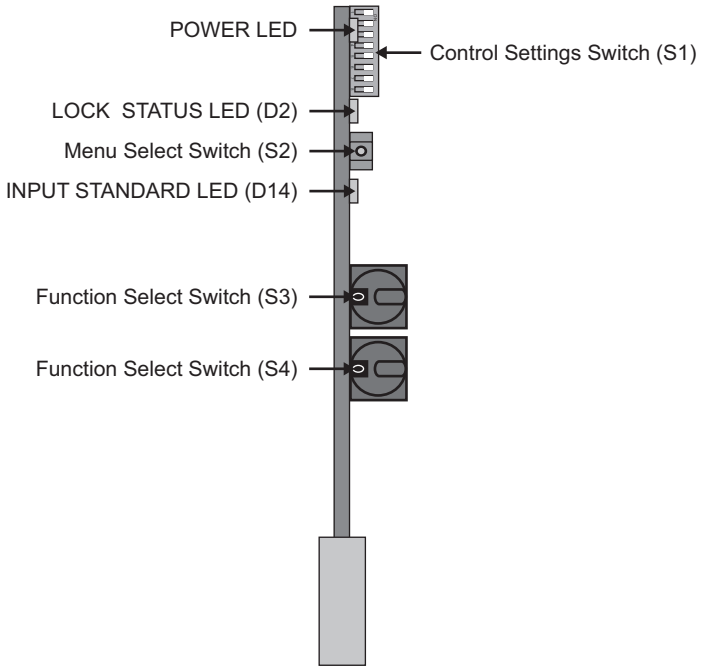

***Figure 3.3** HDC-8222A Card-edge Controls*

Status LEDs

The front-edge of the HDC-8222A has LED indicators for the power, video input status and communication activity. Basic LED displays and descriptions are provided in **Table 3.2**.

Table 3.2 LEDs on the HDC-8222A

LED	Color	Display and Description
POWER	Green	When lit green, this LED indicates that the card is functioning correctly and that no anomalies have been detected. The following conditions must be satisfied: • a valid input signal is present • a valid reference signal is present when a reference is required, and that the reference standard matches the input standard.
	Flashing Green and Orange	When lit green with flashing orange, this LED indicates that the card is running the bootloader.
	Orange	When lit orange, this LED indicates the card is powering on, but no software is running on the card.
	Off	When unlit, this LED indicates there is no power to the card.

Table 3.2 LEDs on the HDC-8222A

LED	Color	Display and Description
LOCK STATUS[a]	Green	When lit green, this LED indicates an HD lock.
	Flashing	When flashing, this LED indicates that there is no signal present.
	Orange	When lit orange, this LED indicates an SD lock.
INPUT STANDARD[a]	Green	When lit green, this LED indicates an input standard of 1080.
	Yellow	When lit yellow, this LED indicates an input standard of 720.
	Off	When unlit, this LED indicates the presence of an SD signal.

a. When the card is operating in Normal mode (**S3** and **S4** are set to **00**).

Adjusting Menu Parameters on the Card-edge

When adjusting the parameters with the rotary switches **S3** and **S4**, the three LEDs on the front card-edge report the value of the setting. While viewing the card in its vertical position in the frame:

- at the start of a numerical report, all the LEDs blink simultaneously
- the **POWER** (top) LED blinks the number of 100s
- the **LOCK STATUS** (middle) LED blinks the number of 10s
- the **INPUT STANDARD** (bottom) LED blinks the number of 1s. Note that for parameters that have only an ON/OFF state, the **INPUT STANDARD** LED blinks accordingly.

For example, the card is reporting a value of **275**. The sequence is as follows:

1. A blink of all LEDs
2. Two blinks of the **POWER** LED
3. Seven blinks of the **LOCK STATUS** LED
4. Five blinks of the **INPUT STANDARD** LED
5. Repeat

Menus

In This Chapter

This chapter provides a summary of the menus available for the HDC-8222A.

The following topics are discussed:

- DashBoard Menus for the HDC-8222A
- Card-edge Menu System
- Managing Card Settings
- Loading the Factory Defaults

DashBoard Menus for the HDC-8222A

This section briefly summarizes the menus, items, and parameters available from the DashBoard Control System™ for the HDC-8222A. Parameters marked with an asterisk (*) are the factory default values. The DashBoard Control System™ enables you to monitor and control openGear frames and cards from a computer. DashBoard communicates with other cards in the DFR-8300 series frame through the MFC-8300 Series Network Controller Card.

Card Info Tab

The **Card Info** tab provides read-only information such as software revision issue, signal status, and power consumption of the HDC-8222A. **Table 4.1** summarizes the read-only information displayed in the **Card Info** tab.

Table 4.1 Card Info Tab Items

Tab Title	Item	Parameters	Description
Card Info (Read-only)	Product	HDC-8222A	
	Manufacturer	Ross Video Ltd.	
	Input Format	#	Reports the current input format
	Equalizer	#	Reports any detected bit errors
	Temperature	##.##°C / ###.#°F	Current temperature of card at scalar IC
	+12 Rail Current	### mA	Supply current
	Power	#.# W	Current power consumption of card
	Software Release Number	#	Indicates the software release version currently installed on the card
	Software Build Number	#	Indicates the build number currently installed on the card
	S3 and S4	Rotary Edge Switch	Reports which parameter is selected by the **S3** and **S4** rotary switches
	Remote Software	Switch S1-1	Reports if remote software is enabled or disabled (how **S1-1** is set). When enabled remote software can modify card parameters. (**S1-1** is set to **ON**). When disabled, card parameters can only be changed through the card-edge switches. (**S1-1** is set to **OFF**).

Scalar Tab

Table 4.2 summarizes the **Scalar** options available in DashBoard.

Table 4.2 Scalar Tab Items

Tab Title	Item	Parameters	Description
Scalar	HD to SD ARC[a]	No Aspect Change	Vertical and horizontal zoom set to 100%
		0.75 V Letter Box	Vertical zoom set to 75%
		1.33 V	Vertical zoom set to 133%
		0.75 H Pillar Box	Horizontal zoom set to 75%
		1.33 H Center Cut*	Horizontal zoom set to 133%
		User Setting	Adjustment of the horizontal or vertical zoom or pan settings will automatically change HD to SD ARC to User Settings
	SD to SD ARC[b]	No Aspect Change*	Vertical and horizontal zoom set to 100%
		0.75 V Letter Box	Vertical zoom set to 75%
		1.33 V	Vertical zoom set to 133%
		0.75 H Pillar Box	Horizontal zoom set to 75%
		1.33 H Center Cut	Horizontal zoom set to 133%
		User Setting	Adjustment of the horizontal or vertical zoom or pan settings will automatically change SD to SD ARC to User Settings
	Underscan	Enable	10% horizontal and vertical reduction
		Disable*	Disables this feature
	H Zoom Percent	Range 20-1000%[c]	Horizontal zooming
	V Zoom Percent	Range 20-1000%[c]	Vertical zooming
	H Pan	Range 0-100[d]	Horizontal panning
	V Pan	Range 0-100[d]	Vertical panning
	Filter Type	Better frequency response*	
		Better edge response	
		Disable filter	
	Filter Aggressiveness	Range 0-20[e]	Higher value filters more of the signal
	HD to SD color matrix	Enable*	10% horizontal and vertical reduction
		Disable	Disables this feature

a. Auto input format detection, a HD-SDI input validates the parameter selected for this item.
b. Auto input format detection, a SD-SDI input validates the parameter selected for this item.
c. The default setting for this menu item is dependant on the **HD to SD ARC** setting. Refer to the section "**H Zoom and V Zoom Default Values**" below.
d. The default setting is 50.
e. The default setting is 10.

H Zoom and V Zoom Default Values

The default values of the H Zoom Percent and V Zoom Percent menu items are dependent on how the **HD to SD ARC** menu item is set.

- If **HD to SD ARC** is set to **No Aspect Change** — The H Zoom Percent and V Zoom Percent values both default to 100.
- If **HD to SD ARC** is set to **0.75 Letter Box** — The H Zoom Percent defaults to 100 and the V Zoom Percent defaults to 75.
- If **HD to SD ARC** is set to **1.33V** — The H Zoom Percent defaults to 100 and the V Zoom Percent defaults to 133.
- If **HD to SD ARC** is set to **0.75H Pillar Box** — The H Zoom Percent defaults to 75 and the V Zoom Percent defaults to 100.
- If **HD to SD ARC** is set to **1.33H Center Cut** — The H Zoom Percent defaults to 133 and the V Zoom Percent defaults to 100.
- If **HD to SD ARC** is set to **User Setting** — The H Zoom Percent defaults to 20 -1000 and the V Zoom Percent defaults to 20 -1000.

Ancillary Data Tab

Table 4.3 summarizes the **Ancillary Data** options in DashBoard.

Table 4.3 Ancillary Data Menu Items

Tab Title	Item	Parameters	Description
Ancillary Data	24-Bit Audio Processing	Enable*	SD embedded audio will be 24bits deep, with extended data packets
		Disable	SD embedded audio will be 20bits deep, with no extended data packets
	Group #	Enable*	Enables the specified Audio Group
		Disable	Disables the specified Audio Group
	Video Audio Delay	Range 0*-2700ms	Amount of audio delay from input to output. If the slider is set to 0, the Audio Delay matches the Video Delay.
	Current Output Audio Delay (read-only)	# ms / # Frames / # lines	
	Closed Caption	Enable*	Enables the insertion of VBI analog closed caption compliant CEA-608 to the processed output
		Disable	Disables this feature
	Time Code	Enable *	Enables the insertion of timecode information. Auto searches for first line with timecode. If more than one timecode signal, only the first timecode line detected will be used.
		Disable	Disables this feature
	Time Code Output Line	Range 6-22[a]	Specifies the output line to embed D-VITC on

a. When using NTSC formats, you must select a line between 12-22. The default value is 14.

Proc Control Tab

Table 4.4 summarizes the **Proc Control** options available in DashBoard.

Table 4.4 Proc Control Menu Items

Tab Title	Item	Parameters	Description
Proc Control	Gain	0-200 (%)[a]	Adjusts the output video gain level
	Lift	0-200 (%)[a]	Adjusts the output lift level
	Saturation	0-200 (%)[a]	Adjusts the output video saturation level
	Phase	0*-200 (%)	Adjusts the output video phase
	Background Color Hue	0*-360 (°)	Adjusts the background hue when the scaled image size is less than the active video size
	Background Color Saturation	0*-100	Adjusts the background color when the scaled image size is less than the active video size
	Background Color Value	0-255[b]	Adjusts the background color value when the scaled image is less than the active video size

a. The default setting is 100.
b. The default setting is 16.

Reticules (Overlay) Tab

Table 4.5 summarizes the **Reticules (Overlay)** options in DashBoard.

Table 4.5 Reticules (Overlay) Menu Items

Tab Title	Item	Parameters	Description
Reticules (Overlay)	SDI Reticule	Enable	Enables the reticules on the SDI output
		Disable*	Disables this feature
	Analog Reticule	Enable	Enables the reticules on the analog/composite output
		Disable*	Disables this feature
	4x3 Safe Area	Enable	
		Disable*	
	4x3 Full Aperture	Enable	
		Disable*	
	16x9 Safe Area	Enable	
		Disable*	
	Center Cross	Enable	
		Disable*	

Table 4.5 Reticules (Overlay) Menu Items

Tab Title	Item	Parameters	Description
Reticules (Overlay)	Reticules Follow Arc	Enable	Reticules scale with the video when scaled image size is less than the active video size
		Disable*	Disables this feature
	Reticule Color	White*	Specifies the color of the reticules
		Black	
		Blue	
		Red	
	Modify	4x3 Safe Area*	Sets which reticule the following items effect: Horizontal Size, Vertical Size, Horizontal Thickness, and Vertical Thickness
		4x3 Full Aperture	
		16x9 Safe Area	
		Center Cross	
	Horizontal Size[a]	Range 0-100	
	Vertical Size[a]	Range 0-100	
	Horizontal Thickness[a]	Range 0-100	
	Vertical Thickness[a]	Range 0-100	
	Shadow	Enable	Enables shadowing outside of the reticule boxes
		Disable*	Disables this feature
	Shadow Luma	Range 0-100[b]	Specifies the percentage of the signal to pass
	Shadow Chroma	Range 0-100[c]	Specifies the percentage of the signal to pass

a. The default setting for this menu item is dependent on the **Modify** setting. Refer to the section "**Horizontal and Vertical Default Values**" for details.
b. The default setting is 25.01.
c. The default setting is 50.01.

Horizontal and Vertical Default Values

The default values of the Horizontal Size, Vertical Size, Horizontal Thickness, and Vertical Thickness menu items are dependent on how the **Modify** menu item is set.

- If **Modify** is set to **4x3 Safe Area** — The Horizontal Size defaults to 72, the Vertical Size defaults to 90, Horizontal Thickness defaults to 1, and Vertical Thickness defaults to 1.
- If **Modify** is set to **4x3 Full Aperture** — The Horizontal Size defaults to 80, the Vertical Size defaults to 100, Horizontal Thickness defaults to 1, and Vertical Thickness defaults to 0.
- If **Modify** is set to **16x9 Safe Area** — The Horizontal Size defaults to 90, the Vertical Size defaults to 68, Horizontal Thickness defaults to 1, and Vertical Thickness defaults to 1.
- If **Modify** is set to **Center Cross** — The Horizontal Size defaults to 9, the Vertical Size defaults to 15, Horizontal Thickness defaults to 1, and Vertical Thickness defaults to 1.

Analog Output Tab

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

Table 4.6 Analog Output Menu Items

Tab Title	Item	Parameters	Description
Video Controls	Oversampling	On*	Enables the encoder oversampling of the composite output video
		Off	Disables this feature
	Color	On*	Enables the color on the analog/composite output channels
		Off	Disables this feature
	Color Bars	On	Enables the color bars on the analog/composite output channels
		Off*	Disables this feature
Audio Controls	Group De-embed	Group #	Specifies the group to be de-embedded onto ANLG AUDIO OUT 1 to 4 on the 8320AR-1821 rear module
	Trim	0-20.0	Provides master attenuation for the four analog audio outputs; measured in dB

Miscellaneous Tab

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

Table 4.7 Miscellaneous Items

Tab Title	Item	Parameters	Description
Miscellaneous	Reference[a]	Off*	No reference is specified
		Ref. 1	Selects Ref 1 to use for field locking with 720p input signals
		Ref. 2	Selects Ref 2 to use for field locking with 720p input signals
	Reference Alignment Percent (read-only)	Input signal and reference signal	Reports the alignment percentage of the input video and reference input. Note that an Invalid Reference occurs if the input source is not 720p or frequency mismatch between the reference and the input source
	SD V Bit correction[b]	Enable*	V-bit will always be enabled on Line 20 for the output
		Disable	Disables this feature
	Card Settings[c]	Save	Saves the current configuration
		Load	Loads the previously saved configuration
	Factory Defaults[c]		Loads the factory default settings; replaces any saved settings with the factory defaults.

a. Refer to the section "**Card-edge Menu System**" on page 4-10 for details on reporting the status of **SW1**, position **8**.
b. This feature is not fully implemented at this time. Adjusting this feature may produce undesired results.
c. The buttons are disabled when **S1.1** is set for (local) card-edge control.

Downmixer Tab

Table 4.8 summarizes the **Downmixer** options available in DashBoard. The controls in the Downmixer tab provide basic audio channel assignments to serve as inputs (downmixed or pass-through) for the card analog audio outputs.

Table 4.8 Downmixer Menu Items

Tab Title	Item	Parameters	Description
Downmixer	Downmixer Enable	Enable	Enables the downmixed output
		Disable*	Disables the downmixed output
	Left Channel Input	Emb Ch #	When the Downmixer is enabled, assigns 5.1 inputs to downmixer. For example, when Emb Ch 1 is selected, Emb Ch 1 is the L source, with the next consecutive embedded channels 2-6 being assigned as R, C, LFE, Ls, and Rs sources.
	Downmix Left Channel Output	Emb Ch#	Assigns, as destination embedded channels, the L and R channels. For example, when Emb Ch 1 is selected, downmix L is routed to output Emb Ch 1 and downmix right is routed to the next embedded channel (Emb Ch 2).
	Center Mix Ratio	-10 to 0	Adjusts the attenuation ratio of center-channel content from 5-channel source that is re-applied as Lt and Rt content to the DM-L and DM-R stereo mix
	Surround Mix Ratio	-10 to 0	Adjusts the attenuation ratio of surround-channel content from 5-channel source that is re-applied as Lo and Ro content to the DM-L and DM-R stereo mix
	Left	Muted	Mutes the channel within a selected 5.1 complement from being applied to the downmixer
	Right		
	Center		
	LFE	Unmuted*	Does not mute the channel
	Left Surround		
	Right Surround		
	Analog Audio Downmix Select[a]	Pass Through	Routes the four embedded channels (non-downmix) as selected using the Group Deembed setting (configured in the Analog Output tab)
		Ch 1/2	Routes downmix L and R to analog audio outputs Channel 1 and Channel 2

Table 4.8 Downmixer Menu Items

Tab Title	Item	Parameters	Description
Downmixer	Analog Audio Downmix Select[a]	Ch 3/4	Routes downmix L and R to analog audio outputs Channel 3 and Channel 4
		Both Pairs	Routes downmix L and R to analog outputs Channel 1 and Channel 2, and a copy to analog audio outputs Channel 3 and Channel 4

a. Embedded audio channels not selected for downmixing or de-embedding are not affected by these controls. Other groups are passed unaffected as embedded audio on the card SDI output.

Card-edge Menu System

This section summarizes the Card-edge Menu system of the HDC-8222A.

Navigation

The HDC-8222A has additional parameters which will need to be accessed less frequently. These are controlled via the rotary switches (**S3** and **S4**) and the up/down thumb switch (**S2**) located on the card-edge. The parameter number (00 through 99) is selected with the rotary switches where **S3** selects the“10s” digit, and **S4** selects the “1s” digit.

For example, setting **S3** equal to **3** and **S4** equal to **1** selects parameter 31 (Y channel lift). The thumb switch **S2** will increase or decrease the value of the parameter when pressed up or down. Some parameters have only a binary state. Press **S2** up to turn them on, and down to turn them off.

When adjusting the parameters, the three LEDs on the front card-edge will report to the user the value of the setting. While viewing the card in its vertical position in the frame the top (**POWER**) LED will flash the number of 100s, the middle (**LOCK STATUS**) LED will flash the number of 10s, and the bottom (**INPUT STANDARD**) LED will flash the number of 1s. At the start of a numerical report all the LEDs will blink simultaneously.

For example, the card is reporting a value of 275. The sequence is this: a blink of all LEDs->2 blinks of the100s LED->7 blinks of the 10s LED->5 blinks of the 1s LED->repeat.For parameters that have only a binary state the “1s” LED (D14) will turn on for enabled and off for disabled.

Note — *Do not power down the card before ensuring that all edited parameters are saved. Saving edited parameters can take up to 10 seconds.*

Card-edge Menus

Table 4.9 lists all the menus and the default values available using the card-edge controls.

Table 4.9 Card-edge Menus and Items

S3	S4	Parameter Description
0	**0**	Report Signal Lock Status; restore to 00 prior to device use
Composite Output		
0	**1**	Composite output over-sampling
	2	Composite output color bars
Software Information		
0	**8**	Software release number
	9	Software build number
Ancillary Data		
1	**0**	24-bit audio processing
	1	Audio Group 1 enable
	2	Audio Group 2 enable
	3	Audio Group 3 enable
	4	Audio Group 4 enable
	6	Video Audio delay Offset — Delay is reported in 10 x milliseconds

Table 4.9 Card-edge Menus and Items

S3	S4	Parameter Description
1	7	Closed caption preservation enable
	8	Timecode preservation enable
	9	Timecode output line
Audio De-embed to Analog Audio Output		
2	0	Select Group (1-4) to de-embed the Analog Outputs 1-4. For example, Group 1 setting de-embeds PCM channels 1-4 to ANLG AUDIO OUT 1 to ANLG AUDIO OUT 4.
	1	Select level trim
Proc Control		
3	0	Gain
	1	Lift
	2	Saturation
	3	Phase
	4	Background color hue
	5	Background color saturation
	6	Background color value
Scalar		
4	0	Horizontal and Vertical Aspect Zoom
	1	Horizontal Aspect Zoom
	2	Vertical Aspect Zoom
	3	Horizontal Aspect Pan
	4	Vertical Aspect Pan
	5	Prefilter type: 1 — Better Edge Response 2 — Better Frequency Response 3 — Disable Prefilter
	6	Prefilter Aggressiveness: UP — Attenuate more high frequency components DOWN — Attenuate less frequency components
	7	HD to SD Color Matrix: UP — Enable DOWN — Disable
Downmixer		
4	8	Downmix Enable: UP — Enable DOWN — Disable (default)
	9	Input Channel Select: UP — Increment channel select DOWN — Decrement channel select (default is chnl 1)

Table 4.9 Card-edge Menus and Items

S3	S4	Parameter Description
5	0	Output Channel Select: UP — Increment channel select DOWN — Decrement channel select (default is chnl 1)
	1	Center Mix Ratio: UP — Increment by +1dB DOWN — Decrement (default is max setting)
5	2	Surround Mix Ratio: UP — Increment by +1dB DOWN — Decrement (default is max setting)
	3	Downmix L Channel Mute: UP — Mute DOWN — Unmute (default)
	4	Downmix R Channel Mute: UP — Mute DOWN — Unmute (default)
	5	Downmix C Channel Mute: UP — Mute DOWN — Unmute (default)
	6	Downmix LFE Mute: UP — Mute DOWN — Unmute (default)
	7	Downmix Ls Channel Mute: UP — Mute DOWN — Unmute (default)
	8	Downmix Rs Channel Mute: UP — Mute DOWN — Unmute (default)
	9	Analog Audio Downmix Select: UP — Cycle up through the choices DOWN — Cycle down through the choices
Reticules (Overlays)		
6	0	SDI Reticule Output Enable
	1	Analog Reticule Output Enable
	2	4x3 Full Aperture (Vertical Bars)
	3	4x3 Full Aperture (Vertical Bars) size
	4	4x3 Full Aperture (Vertical Bars) thickness
	5	4x3 Save Area Enable
	6	4x3 Safe Area Horizontal Size
	7	4x3 Safe Area Vertical Size
	8	4x3 Safe Area Horizontal Thickness

Table 4.9 Card-edge Menus and Items

S3	S4	Parameter Description
6	**9**	4x3 Safe Area Vertical Thickness
7	**0**	16x9 Safe Area Enable
	1	16x9 Safe Area Horizontal Size
	2	16x9 Safe Area Vertical Size
	3	16x9 Safe Area Horizontal Thickness
	4	16x9 Safe Area Vertical Thickness
	5	Center Cross Enable
	6	Center Cross Horizontal Size
	7	Venter Cross Vertical Size
	8	Center Cross Horizontal Thickness
	9	Center Cross Vertical Thickness
8	**0**	Reticule(s) follow ARC
	1	Reticule Color: 1 — White 2 — Black 3 — Blue 4 — Red
	2	Diagnostic setting
	3	Shadow Luma
	4	Shadow Chroma
Miscellaneous		
9	**2**	Reference Input Select:[a] DOWN — Reference 1 UP — Reference 2
	3	Vbit Correction[b]
	5	Equalizer Status Error (if lit, there is a bit error detected)
Save/Load		
9	**7**	Load Factory Defaults. Note that loading factory defaults will replace current saved settings.
	8	Load saved settings
	9	Save current settings

a. Ensure that **S1.8** is set to **On** in order to validate the selection for this item.
b. The Vbit Correction feature is not fully implemented at this time. Adjusting this feature may produce undesirable results.

Managing Card Settings

There are two methods for loading and saving the settings for your HDC-8222A. However, the method for managing the card settings is dependent on how **S1.1** is configured as this switch determines whether the card can be controlled by the card-edge controls (set to **Off**) or via DashBoard (set to **On**). Both methods are described in this section.

Using DataSafe™

DataSafe enables you to load and store card parameters automatically, or you can load from and store to a single file in DashBoard. The DataSafe feature is only available for openGear frames using the MFC-8320-N Network Controller Cards. For details on using the DataSafe feature, refer to the ***MFC-8300 Series User Manual*** and the ***DashBoard User Manual***.

The HDC-8222A user settings must be saved or changes to settings will automatically be lost if the card is removed or returned to a DFR-8300 series frame without DataSafe enabled. You also have the option to revert back to the saved configuration settings or to factory defaults.

Saving and Loading via the Card-edge Controls

This section outlines how to save and load the settings for your HDC-8222A using the card-edge controls or the options in DashBoard.

To use the card-edge controls:

1. Set **S1.1** to **OFF**.
2. Set **S3** to position **9**.
3. To save the current card settings, set **S4** to position **9**.
4. To load the last saved card settings, set **S4** to position **8**.
5. Toggle the **Menu Select Switch** (**S2**) up. All LEDs will flash when the operation is complete.

Saving and Loading via DashBoard

This section outlines how to save and load the settings for your HDC-8222A using the options in DashBoard.

To use DashBoard:

1. Ensure that **S1.1** is set to **ON**.
2. In DashBoard, display the **Device View** of the card by double-clicking its status indicator in the **Basic Tree View**.
3. From the **Device View**, select the **Miscellaneous** tab.
4. From the **Card Setting** area:
   - Click **Save** to save the current settings.
   - Click **Load** to load the settings that were last saved to the card.
5. Follow the on-screen instructions in the **Confirm** dialog.

Loading the Factory Defaults

The HDC-8222A can be set to the default factory setting locally using the card-edge controls or remotely through DashBoard. The method is determined by how **S1.1** is configured.

To reset to the default settings using the card-edge controls:

Locally the HDC-8222A can be set to the factory defaults by

1. Set **S1.1** to **OFF** on the card-edge. This enables the HDC-8222A to be configured locally using the controls available on the card-edge.
2. Set **S3** to position **9**.
3. Set **S4** to position **7**.
4. Toggle the **Menu Select Switch** (**S2**) up. The three LEDs will flash.

To reset to the default settings using DashBoard:

1. Ensure that **S1.1** is set to **ON** on the card-edge. This enables the HDC-8222A to be controlled remotely via DashBoard.
2. In DashBoard, display the **Device View** of the card by double-clicking its status indicator in the **Basic Tree View**.
3. From the **Device View**, select the **Miscellaneous** tab.
4. From the **Factory Defaults** area, click **Load** to display the **Confirm** dialog.
5. Click **Yes** to load the factory default values for all menu parameters, or **No** to cancel the load and close the dialog.

Specifications

In This Chapter

This chapter provides the technical specification information for the HDC-8222A. Note that specifications are subject to change without notice.

The following topics are discussed:

- Technical Specifications

Technical Specifications

This section includes the technical specifications for the HDC-8222A.

Table 5.1 HDC-8222A Technical Specifications

Category	Parameter	Specification
Serial Digital Video Inputs	Number of Inputs	1
	Data Rates Supported	SMPTE-292 HD-SDI: 1.485Gpbs or 1.485/M Gbps SMPTE 259M-C SD-SDI: 270Mbps
	Frames Rates Supported - HD	720p 25Hz 720p 29.97Hz 720p 50Hz 720p 59.94Hz 1080i 25Hz 1080i 59.94Hz 1080p 23.98Hz 1080p 25Hz 1080p 29.97Hz 1080pSF 23.98Hz
	Frames Rates Supported - SD	480i 59.94Hz 576i 50Hz
	Impedance	75ohm terminating
	Equalization	>75m of Belden 1505A cable @ 1.485Gbps <300m of Belden 1505A cable @ 270Mbps
	Return Loss	>10dB @1.485GHz
Serial Digital Video Outputs	Number of Outputs	8 outputs: • 4 SDI re-clocked copies of the input signal • 4 user configurative SDI/Analog composite signals
	Impedance	75ohm
	Return Loss (reclocked DA output)	HD: >12dB SD: >15dB
	Return Loss (SDI output)	>8dB @ 1.485Ghz
	Signal Level	800mV±10%
	DC Offset	0V ±50mV
Analog Video Outputs	Number of Outputs	4 shared with user configurable above
	Impedance	75ohm
	Return Loss	>30dB
	Signal Type	Analog Composite (NTSC/PAL tracking input rate)
	Quantization	12-bit

Table 5.1 HDC-8222A Technical Specifications

Category	Parameter	Specification
Analog Video Outputs	Differential Gain	<0.6%
	Differential Phase	<0.6°
	Signal Level	1V p-p
	DC Offset	NTSC: -220mV PAL: -350mV
Analog Audio Outputs	Number of Outputs	4 balanced
Power	Power Consumption	8W

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 HDC-8222A, 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. **Card Exchange** — Exchanging a suspect card with a card that is known to be working correctly is an efficient method for localizing problems to individual cards.

Warranty and Repair Policy

The HDC-8222A 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 HDC-8222A 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 HDC-8222A 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 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 HDC-8222A 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 problems arise with your HDC-8222A, 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 HDC-8222A. 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.

Notes:

Notes:

Contact Us

Contact our friendly and professional support representatives for the following:

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

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

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