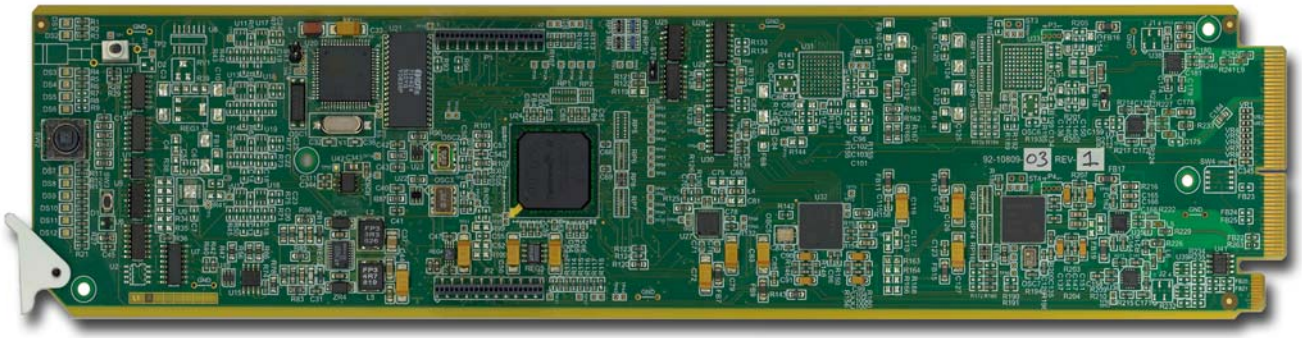
openGear

CEG-100

CDP Error Generator

User Manual



ROSS

Video Production Technology

CEG-100 User Manual

- Ross Part Number: CEG100DR-004-04
- Release Date: May 10, 2012.

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

Product 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 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 potentially hazardous 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 Susceptability — *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 inteded 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 cords from the chassis' rear appliance connectors before servicing this area.*

Warning — *Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after any servicing.*
This product contains safety critical parts, which if incorrectly replaced may present a risk of fire or electrical shock. Components contained 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, pursant 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 their 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

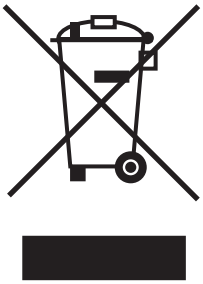
Routine maintenance to this openGear product is not required. This product contains no user servicable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All openGear products 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 diminsh 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 wheelie bin symbol invites you to use these systems.



If you need more information on the collection, resuse, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performance 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 CEG-100 CDP Error Generator. Your CEG-100 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 CEG-100 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 CEG-100, 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 CEG-100 adds CDP captioning data containing errors to an HD-SDI (SMPTE-292) or SD-SDI (SMPTE-259) video signal, in accordance with SMPTE-334, -291 and other related standards. The user can select the types and duration of the errors inserted. The CEG-100 is a tool for testing the response of captioning-aware devices to some of the most common data errors. It may be used alone, or in conjunction with the CDP-100 (CDP Analyzer Card), as a captioning test system.

As a member of the openGear family, the CEG-100 shares a common control interface, known as the DashBoard Control System™, with a broad array of other products.

Features

The following features make the CEG-100 the ideal solution for generating a CDP stream in the VANC space of an SDI signal, with known errors:

- Operates automatically with major HD and SD video formats
- Flexible selection of CDP errors
- SNMP compatible
- Video bypass capability with suitable Ross Video rear modules
- Fits openGear DFR-8300 series frames

Functional Block Diagram

This section provides a functional block diagram that outlines the workflow of the CEG-100.

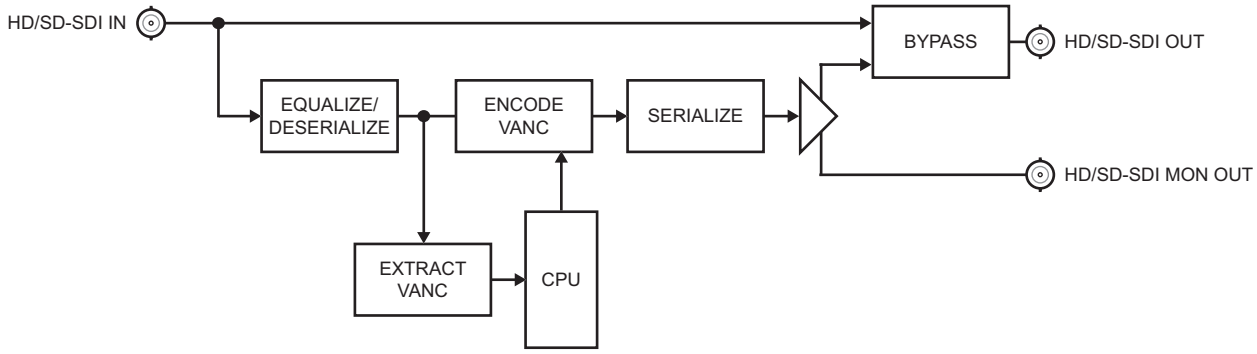

Figure 1.1 *CEG-100 — Simplified Block Diagram*

User Interfaces

The CEG-100 includes the following user interfaces.

DashBoard Control System™

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 Network Controller Card. The DashBoard Control System software and manual are available for download from our website.

For More Information...

- on using DashBoard, refer to the ***DashBoard User Manual***.

SNMP Monitoring and Control

The MFC-8300 Series Network Controller Card in the DFR-8300 series frame provides optional support for remote monitoring of your frame and using Simple Network Management Protocol (SNMP), which is compatible with many third-party monitoring and control tools.

For More Information...

- on the SNMP controls on this card, refer to your CEG-100 Management Information Base (MIB) file.
- on SNMP Monitoring and Control, refer to the ***MFC-8300 Series User Manual***.

Documentation Terms and Conventions

The following terms and conventions are used throughout this manual:

- "**Board**", and "**Card**" refer to openGear terminal devices within openGear frames, including all components and switches.
- "**CDP**" is an abbreviation for Caption Distribution Packet. This format is defined by SMPTE-334-2. It is the caption payload in VANC packets that comply with SMPTE-334-1.
- "**DashBoard**" refers to the DashBoard Control System™.
- "**DFR-8300 series frame**" refers to all versions of the 10-slot (DFR-8310 series frames), 20-slot (DFR-8321 series frames) and any available options unless otherwise noted.
- "**Frame**" refers to DFR-8300 series frame that houses the CEG-100 card, as well as any openGear frames.
- "**Operator**" and "**User**" refer to the person who uses CEG-100.
- "**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.
- "**VANC**" is an abbreviation for Vertical Ancillary. This refers to data packets that are inserted into the active portion of lines in the vertical interval of an SDI signal. The root standard for VANC is SMPTE-291. VANC packets containing captioning data are defined by SMPTE-334, which references SMPTE-291.
- 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 CEG-100, installing the card into the frame, cabling details, and updating the card software.

The following topics are discussed:

- Before You Begin
- Quick Start
- Installing the CEG-100
- Cabling for the CEG-100
- 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 CEG-100 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.

Quick Start

Assuming you have an openGear frame, a CEG-100 card and a suitable rear module, the following steps will get you started with VANC insertion of test captions with user-selected errors:

1. Connect the frame to your LAN. Refer to the ***DFR-8300 Series User Manual*** and the ***MFC-8300 Series User Manual*** for details.
2. Install DashBoard on a computer connected to the LAN. The DashBoard software and user manual are available from the Ross Video website.
3. Install the rear module in the frame as described in the section "**Installing a Rear Module**" on page 2-4.
4. Install the CEG-100 into the rear module as described in the section "**Installing the CEG-100**" on page 2-5.
5. Connect a SMPTE 292 or SMPTE 259 signal to the **SDI IN** (BNC 1) on the rear module as described in the section "**DFR-8321 Series Frames**" on page 2-6.
6. Connect the **SDI OUT** (BNC 3) to an SDI analyzer or VANC monitoring test set. For information on our VANC monitoring tools, visit the Ross Video website.
7. Power the frame on.
8. Launch the DashBoard client on your computer. It should automatically find your frame within a minute or two.
9. Expand the node next to the frame name to display a list of the cards in the frame.
10. Double-click the CEG-100 to display a tab for the card in the **Device View** of DashBoard.
11. On the **Settings** tab of the CEG-100:
    - Rename your card by typing a unique identifier in the **Card ID** field. It is a good idea to name the card so that it can easily be identified within Dashboard especially when there are more than one CEG-100 present.
    - Select **Append** in the **Encode Mode** area.
12. Create CDP data containing errors using the options in the Closed Captions, Setup Encoding, and Generate Errors tabs. Refer to the chapter "**Configuration**" on page 4-1 for details.

Installing the CEG-100

This section outlines how to install a rear module and a card in a DFR-8300 series frame. Refer to the section "**Cabling for the CEG-100**" on page 2-6 for cabling details.

Rear Modules

When installing the CEG-100:

- **DFR-8310 series frames** — The **MDL-R10** Full Rear Module is required. The CEG-100 is not compatible with the DFR-8310-BNC frames.
- **DFR-8321 series frames** — The **MDL-R20** Full Rear Module is required.

Installing a Rear Module

If the rear module is installed, proceed to the section "**Installing the CEG-100**" on page 2-5.

Use the following procedure to install a rear module in your DFR-8300 series frame:

1. Refer to the ***DFR-8300 Series Frames User Manual*** to ensure that the frame is properly installed according to instructions.
2. Locate the card frame slot on the rear of the frame.
3. Remove the Blocker Plate from the rear of the slot you have chosen for the CEG-100 installation. Retain the plate for possible future use.
4. Seat the bottom of the rear module in the seating slot at the base of the frame's back plane. (**Figure 2.1**)

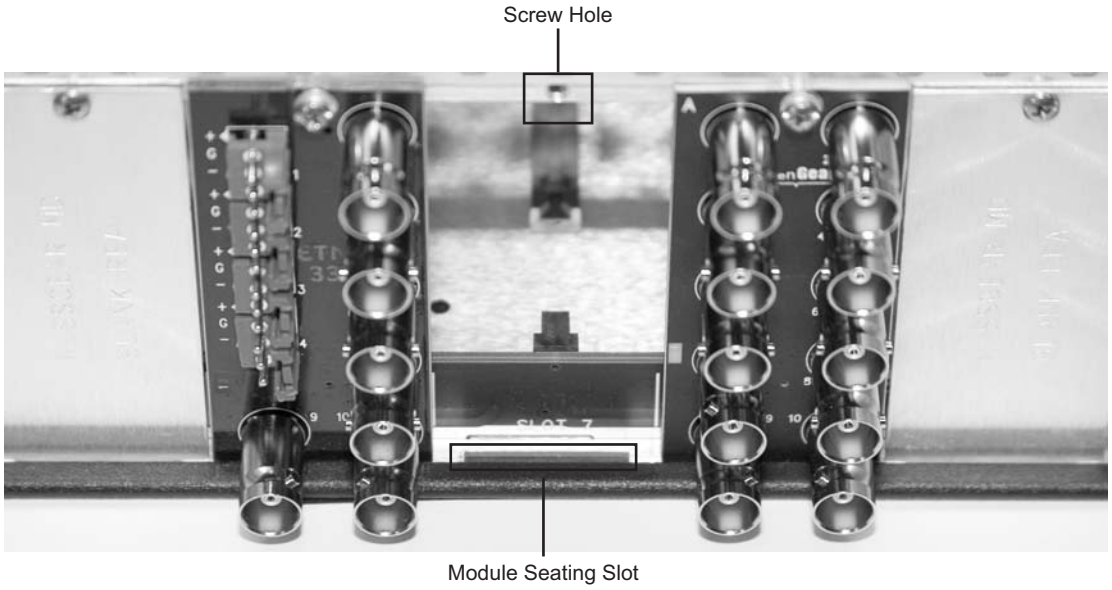

Figure 2.1 *Rear Module Installation (MDL-R20 not shown)*

5. Align the top hole of the rear module with the screw hole on the top edge of the back plane.
6. Using a Phillips screwdriver and the supplied screw, fasten the rear module to the frame's back plane. Do not over tighten.

7. Ensure proper frame cooling and ventilation by having all rear frame slots covered with rear modules or blank metal plates. If you need blanks, contact your openGear sales representative.

Installing the CEG-100

Use the following procedure to install the CEG-100 in a DFR-8300 series frame:

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

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 CEG-100 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 plug 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 affixing the label.
5. Affix the supplied **Rear Module Label** to the BNC area of the Rear Module.

Cabling for the CEG-100

This section provides information for connecting cables to the installed rear module on the DFR-8300 series frames. It is not necessary to terminate unused outputs.

Rear Module Cabling

This section provides cabling diagrams for the rear modules. The type of rear module depends on the frame the card is installed in.

DFR-8310 Series Frames

Each **MDL-R10** accommodates one card and occupies one slot. The MDL-R10 provides one HD/SD-SDI input, one HD/SDI-SDI monitoring output, two HD/SDI-SDI outputs, and GPIO outputs. (**Figure 2.2**)

DFR-8321 Series Frames

Each **MDL-R20** accommodates one card and occupies two slots. The MDL-R20 provides one HD/SD-SDI input, one HD/SDI-SDI monitoring output, two HD/SDI-SDI outputs, and GPIO outputs. (**Figure 2.3**)

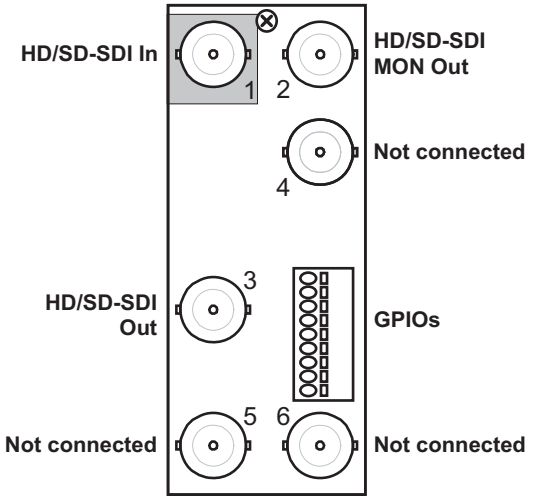

Figure 2.2 *Cabling for the MDL-R10 Rear Module*

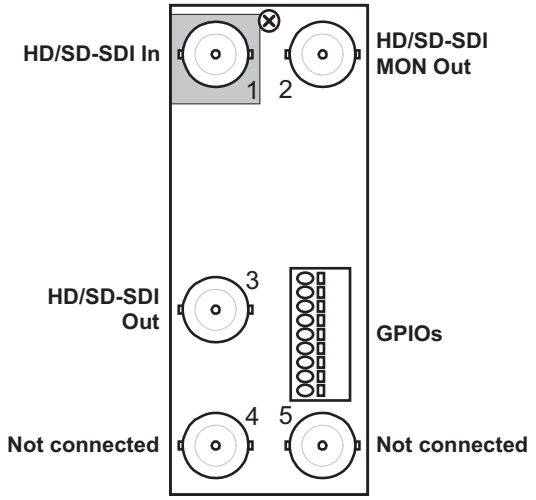

Figure 2.3 *Cabling for the MDL-R20 Rear Module*

Connection Overview

This section briefly outlines the types of connections available on the rear modules.

HD/SD-SDI In — BNC 1

BNC 1 accepts an HD-SDI (SMPTE 292) or SD-SDI (SMPTE 259) video signal. The CEG-100 requires this input in all cases. It inserts VANC packets into this signal and routes the resulting output to **BNC 3**. When using a rear module with bypass capability, the input signal is internally terminated in 75ohm when the CEG-100 is active; when the CEG-100 is in bypass, the termination is provided by the downstream equipment.

HD/SD-SDI MON Out — BNC 2

BNC 2 carries a copy of the signal present on SDI Output (**BNC 3**) which can be useful for test purposes. Note that **BNC 2** does not have any bypass capability: with power off or the CEG-100 removed, there is no output signal on this jack.

HD/SD-SDI Out — BNC 3

BNC 3 carries the main program output from the CEG-100, consisting of the signal applied to **BNC 1**, with VANC data packets inserted. When using a rear module with bypass capability, SDI OUT is connected directly to SDI IN (without passing through the CEG-100), under the following circumstances: power off, CEG-100 card removed, CEG-100 Bypass button (**SW1**) is in the **OUT** position, software selection or certain major error conditions.

GPIO 1-8

Eight bi-directional, logic-level GPIOs are available. Refer to **Figure 2.4** for pinouts on the MDL-R10 and **Figure 2.5** for pinouts on the MDL-R20.

Figure 2.4 *GPIO Pinouts for the MDL-R10*

Figure 2.5 *GPIO Pinouts for the MDL-R20*

Software Upgrades

This section provides instructions for upgrading the software for your CEG-100 using the DashBoard Control System™.

Use the following procedure to upgrade the software on a CEG-100:

1. Contact Ross Technical Support for the latest software version file.
2. Launch the DashBoard client on your computer.
3. Display a tab for the card you wish to upgrade by double-clicking its status indicator in the **Basic Tree View**.
4. From the **Device** tab, click **Upload** to display the **Select File for upload** dialog box.
5. Navigate to the ***.bin** upload file you wish to upload.
6. Click **Open** and follow the on-screen instructions.
7. Click **Finish** to start the upgrade.
8. Monitor the upgrade.
   - A **Upload Status** dialog enables you to monitor the upgrade process.
   - The card reboots automatically once the file is uploaded. The card is temporarily taken offline.
   - The reboot process is complete once the status indicators for the **Card State** and **Connection** return to their previous status.

Operating Tip — *If you are running DashBoard version 2.3.0 or lower, you must click **Reboot** in the **Device** tab to complete the upgrade process.*

This completes the procedure for upgrading the software on a CEG-100.

Troubleshooting

If you encounter problems when upgrading your card software, verify the following:

- Ethernet cable is properly connected if you are uploading the file via a network connection.
- The file you are attempting to load is a ***.bin** file that is for the card you are upgrading.

User Controls

In This Chapter

This chapter provides a general overview of the user controls available on the CEG-100.

The following topics are discussed:

- Card Overview
- Control and Monitoring Features

Card Overview

This section provides a general overview of the CEG-100 card components.

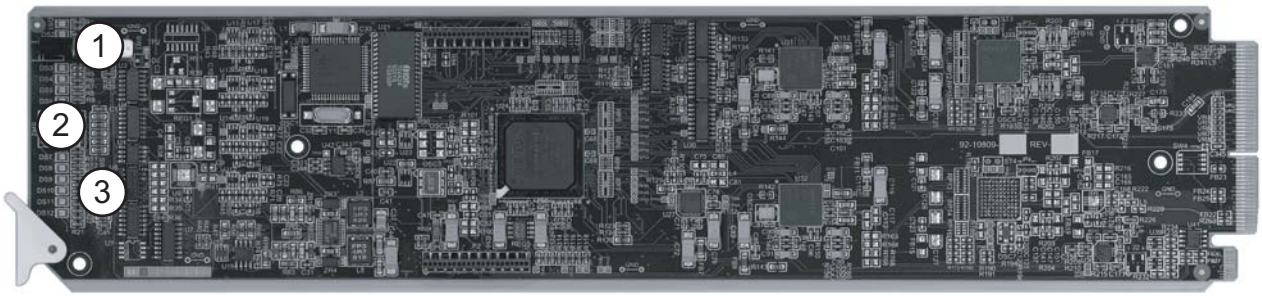

Figure 3.1 *CEG-100 — Components*

1) Bypass Switch (SW1)	2) Menu Switch (SW2)	3) Reset Switch (SW3)

1. Bypass Switch (SW1)

This two-position push-button is used to control the bypass relay.

- When the **SW1** is in the **IN** position, the CEG-100 is in the video signal path.
- Pressing **SW1** once moves the switch to the **OUT** position and bypasses the CEG-100.
- Pressing **SW1** again restores the CEG-100 to its active state.

2. Menu Switch (SW2)

This switch is not implemented on the CEG-100.

3. Reset Switch (SW3)

This button is used for rebooting the card. Refer to the section "**Reset Button**" on page 6-2 for details on using this button.

For More Information...

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

Control and Monitoring Features

This section provides information on the card-edge LEDs for the CEG-100. Refer to **Figure 3.2** for the location of the LEDs.

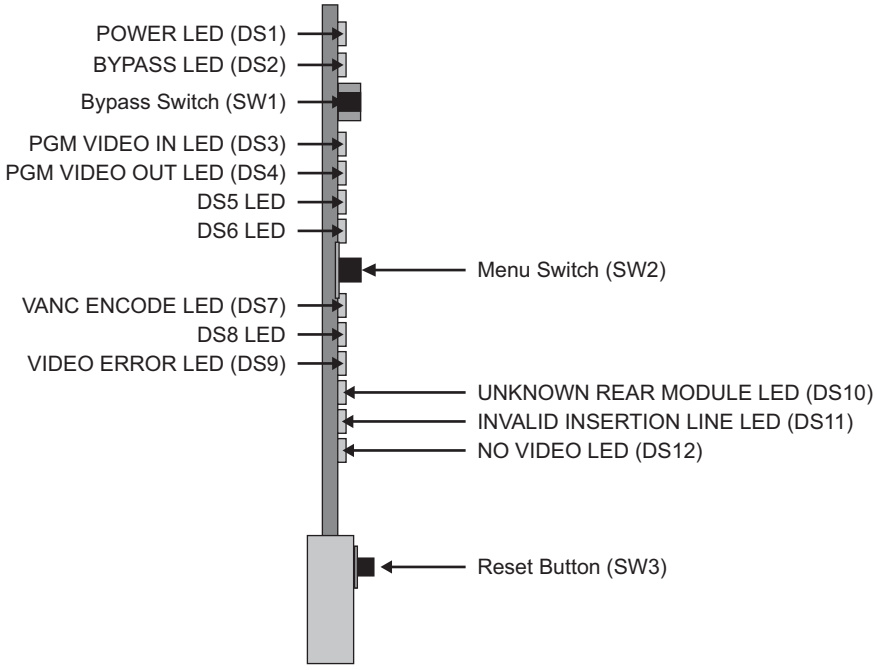

***Figure 3.2** CEG-100 — LED on the Card-edge*

Status and Selection LEDs on the CEG-100

The front-edge of the CEG-100 has LED that report the communication activity. Basic LED displays and descriptions are provided in **Table 3.1**.

Table 3.1 LEDs on the CEG-100

LED	Color	Display and Description
POWER (DS1)	Green	When lit green, this LED indicates the card is operating with a valid input.
	Flashing Green	When flashing green, this LED indicates the bootloader is waiting for a software upload.
	Orange	When lit orange, this LED indicates this is a warning about a signal or configuration error.
	Red	When lit red, this LED indicates that the card is not operational. This will occur if, for example, there is no video input.
	Off	When off, this LED indicates there is no power to the card.
BYPASS (DS2)	Red	When lit red, this LED indicates the card is in bypass mode.
	Off	When off, this LED indicates the card is in the video path and is capable of inserting data.

Table 3.1 LEDs on the CEG-100

LED	Color	Display and Description
PGM VID IN (DS3)	Green	When lit green, this LED indicates the Program Video input is present and valid.
	Red	When lit red, this LED indicates that no valid input is present. Ensure that the input cable is connected properly to the rear module.
PGM VID OUT (DS4)	Green	When lit green, this LED indicates the Program Video output serializer is locked to a valid input.
	Red	When lit red, this LED indicates there is hardware fault on the card.
DS5		This LED is not implemented.
DS6		This LED is not implemented.
VANC ENCODE (DS7)	Green	When lit green, this LED indicates the CEG-100 is inserting VANC data into the video.
	Orange	When lit orange or blinking orange-green, there is too much VANC data to fit in the specified line(s), and some data is being lost.
	Off	When off, there is no insertion.
DS8		This LED is not implemented.
VID ERROR (DS9)	Green	When lit green, this LED indicates that no video errors are occurring.
	Orange	When lit orange, this LED indicates that there is an error condition occurring (e.g. EDH) in the video input stream.
UNKNOWN REAR MODULE (DS10)	Green	When lit green, this LED indicates the card is installed with a valid rear module.
	Orange	When lit orange, this LED indicates that the rear module connected to the card is not one of the types recognized by the software. Operation may not be correct.
Invalid Insertion Line (DS11)	Green	When lit green, this LED indicates correct operation.
	Red	When lit red, this LED indicates that the CEG-100 has been set to insert VANC data into an invalid line, that is a line that is not in the vertical interval for the current video format.
NO VIDEO (DS12)	Green	When lit green, this LED indicates correct operation.
	Red	When lit red, this LED indicates that no video is present at the input.

Configuration

In This Chapter

This chapter explains how to use the user interface to set up the CEG-100. This discussion is based on the use of DashBoard. The order of sections in this chapter follows the workflow required to set up the CEG-100 for operation.

The following topics are discussed:

- General Settings
- Inserting CDP Errors
- Monitoring

General Settings

This section provides a summary of the initial tasks you may wish to perform before configuring your card for generating a CDP stream in the VANC space with known errors. Before proceeding, please ensure that these settings are correct, as they will have an effect on the operation of the other functions.

To configure the general settings

1. Select the **Settings** tab.
2. Type a unique name for your card in the **Card ID** field. This is especially useful if you have more than one CEG-100 in a frame. If this field is blank, the name is just "CEG-100".
3. Set the **Encode Mode** as follows:
   - **Overwrite** — This is the recommended setting. This allows the CEG-100 to overwrite any VANC data services present on the same line(s) of the input signal. This is the preferred mode of operation, since it prevents duplicate data on the same line. Please note that this only affects lines encoded. Other lines will pass untouched.
   - **Prepend** — Select this option to insert your test caption data before any existing data on the same line of the input signal.
   - **Append** — Select this option if you want to retain incoming VANC services and add your test caption data to them.
4. You can save the **Configuration** of the card to a file on a PC by clicking **Save**.
5. The **Factory Defaults Reset** button clears all configuration settings and restores the settings to the values they had when shipped from the factory.

Inserting CDP Errors

The **Generate Errors** tab allows the user to add errors into CDPs generated by the CEG-100. Each error option typically has two insertion methods: a box that will insert the error as long as the box is selected; and a button that inserts a single instance of the error. The CEG-100 has a number of errors it can generate, and the errors have been divided into sub-tabs based on the area of the CDP they affect.

Creating a Captioning Test Sequence

The CEG-100 can insert the caption data into both the 608 and DTVCC sections of the SMPTE-334 / CEA-708 caption packet. The **Closed Captions** tab is used to create a captioning test sequence.

To create a captioning test sequence

1. Select the **Closed Captions** tab.
2. Use the **Interval** slider to specify the number of seconds between transmissions of the lines of caption text.
3. Select the **Sequence** box to cause the software to prepend a counter to the start of each line of caption text. Each of the four text fields contains the text for a single line of captioning. Each line can be 0 to 32 characters long and may only contain printable characters.
4. Click **Save** to store the captions.

Customizing the Location of the CDP Data

The **Setup Encoding** tab enables you to specify the line number and the channel to insert the CDP packets into.

To customize the location of the CDP data

1. Select the **Setup Encoding** tab.
2. Use the **Encode Line** field to specify the line number to insert the CDP packets into.
3. Use the **Encode Channel** field to specify the channel to insert the CDP packets into.
4. Click **Save** to make the changes to the **Encode Line** and **Encode Channel** take effect.

Generating General CDP Errors

The **General CDP Errors** tab allows the user to add errors into CDPs generated by the CEG-100. Each error option typically has two insertion methods: a check box that will insert the error as long as the box is selected; and a button that inserts a single instance of the error. The CEG-100 has a number of errors it can generate, and the errors have been divided into sub-tabs based on the area of the CDP they affect.

To generate general CDP errors

1. Select the **Generate Errors** tab. The **General CDP Errors** sub-tab is automatically selected.
2. Select the **Invalid CDP Length** box to add errors where the length at the start of the CDP packet is shorter than the length of the actual CDP packet.
3. Select the **Missing Packets** box to add errors where the CDP packet(s) are missing from Field 1 of an interlaced signal or any progressive frame.
4. Select the **CDPs in Field 2** box to add errors where the CDP packets are inserted into Field 2 as well as Field 1 of an interlaced signal. This has no effect with progressive video input.
5. Select the **Multiple CDPs in Field 1** box to add errors where the same CDP packets are inserted twice in the same interlaced Field 1, or progressive frame.

Generating Header Errors

The **Header** tab contains errors that deal with contents of the header. Note that selecting the box inserts the error as long as the box is selected, while clicking the associate **Single Error** button inserts a single instance of that error.

To generate header errors

1. Select the **General CDP Errors** tab.
2. Select the **Header** tab located at the bottom of the **General CDP Errors** tab.
3. Select the **Header Sequence Not Counting** box to add errors where the sequence number in the CDP header normally increments by 1 each frame. Using the controls, the user can induce several different error conditions:
   - **Header Sequence Skip One Count** — The sequence number skips one number between packets. For example, the sequence 100, 101, 103, 104, etc. where 102 is skipped.
   - **Header Sequence Count Jumps** — The sequence number skips more than one number between packets. For example, the sequence 100, 101, 2000, 2001, etc.
   - **Header Sequence Does Not Count** — The sequence number is repeated in two packets. For example, the sequence 100, 101, 101, 102 etc.
4. Select the **Header Reserved Bits Set Incorrectly** box to add errors where the reserved bits in the header are set incorrectly.
5. Use the **Frame Rate** field to override the frame rate with any of the 16 values contained in the combo box. Normally the CEG-100 places the correct frame rate for the incoming video in the header.

Generating Captions Errors

The **Captions** tab contains errors that deal with the caption data contained in the CDPs. Note that selecting the box inserts the error as long as the box is selected, while clicking the associate **Single Error** button inserts a single instance of that error.

To generate captions errors

1. Select the **General CDP Errors** tab.
2. Select the **Captions** tab located at the bottom of the **General CDP Errors** tab.

3. Select the **708 Sequence Error** box to add errors where the 708 sequence counter is locked and does not count.
4. Select the **708 Extra Triplet** box to add errors where an extra triplet is added to the CDP
5. Select the **708 Missing Triplet** box to add errors where a triplet is removed from the CDP.
6. Select the **Incorrect Triplet Count** box to add errors where the triplet count is altered so it does not match the real count.
7. Select the **No 608 Captions** box to add errors where the 608 captions are not present in the CDPs.
8. Select the **Caption Reserve Bits** box to add errors where the caption reserve bits are set incorrectly.
9. Select the **No Field 2 608 Packets** box to add errors where the Field 2 608 data is not present.
10. Select the **Cadence Error** box to add errors where the Cadence is incorrect for the 608 data.
11. Select the **No 708 Captions** box to add errors where the 708 Captions are not present in the CDPs.

Generating Service Errors

The **Service** tab contains errors that deal with the service information contained in the CDPs. Note that selecting the box inserts the error as long as the box is selected, while clicking the associate **Single Error** button inserts a single instance of that error.

To generate service errors

1. Select the **General CDP Errors** tab.
2. Select the **Service** tab located at the bottom of the **General CDP Errors** tab.
3. Select the **Service Start Flag** box to add errors where the Service Start Flag does not match the same flag in the header.
4. Select the **Service Complete Flag** box to add errors where the Service Complete Flag does not match the same flag in the header.
5. Select the **Service Change Flag** box to add errors where the Service Change Flag does not match the same flag in the header.
6. Select the **Service Reserved Bits** box to add errors where the Service Reserved Bits are set incorrectly.
7. Select the **Service Reserved Index 0** box to add errors where the Service Reserved Bits are set incorrectly in service 0.
8. Select the **Service Reserved Index 1** box to add errors where the Service Reserved Bits are set incorrectly in service 1.

Generating Footer Errors

The **Footer** tab contains errors related to the CDP footer. Note that selecting the box inserts the error as long as the box is selected, while clicking the associate **Single Error** button inserts a single instance of that error.

To generate footer errors

1. Select the **General CDP Errors** tab.
2. Select the **Footer** tab located at the bottom of the **General CDP Errors** tab.
3. Select the **Header Footer Sequence Different From Header** box to add errors where the sequence number in the header and the footer do not match.
4. Select the **Checksum Error** box to add errors where the Checksum contained in the footer is incorrect.

Monitoring

This section provides a detailed explanation of the status tabs available when using DashBoard to monitor the CEG-100.

Product Tab

The **Product** tab summarizes the read-only information, such as board revision, serial number, and rear module type. This information is useful in discussing the operation of the card with Ross Technical Support.

Alarms Tab

The **Alarms** tab provides the following information:

- The **Card Status** field reports if the card is operating correctly or if there are underlying error conditions occurring.
- The **Incoming Video** field reports the video format of the input signal.
- The **Upstream Encoding** field reports if there was an attempt to add more data than could fit in the specified line(s) or if the total of existing plus added data does not fit in the line(s).
- The **Local Encoding** field reports if there was an attempt to insert more data than could fit in the specified line(s) or if the total of the added data services overflows the capacity of the line(s).
- The **Rear Module** field reports if the card is installed in a rear module that it does not recognize. This could have an effect on the video output, since the types and locations of jacks are unknown.
- The **Encoding Line** field reports if there was an attempt to insert VANC data in a line that is not part of the vertical interval. For example, line > 20 for 1080i 59.94.
- The **Video Presence** field reports a loss of the input signal.
- The **Video Status** field reports a detectable video error, such as an EDH or CRC error, has occurred in the input video.
- The **Bypass Switch** field reports when the video is bypassed from the card directly to the output (Bypass), or whether the video is routed through the card and then to the output (Active).

Specifications

In This Chapter

This chapter provides the technical specification information for the CEG-100. Note that technical specifications are subject to change without notice.

The following topics are discussed:

- Technical Specifications

Technical Specifications

This section provides technical specifications for the CEG-100.

Category	Parameter	Specifications
Serial Digital Video Inputs	Number of Inputs	1 Program input (bypass-protected)
	Data Rates and SMPTE Standards Accommodated	480i 59.94 (SMPTE 259M)
		576i 50 (SMPTE 259M)
		1080i 50, 59.94, 60 (SMPTE 292M)
		720p 50, 59.94, 60 (SMPTE 292M)
		1080p 23.98, 24 (SMPTE 292M)
		1080sf 23.98, 24 (SMPTE 292M)
	Impedance	Active mode: 75ohm terminating
		Bypass mode: Loop-through to SDI Output
	Equalization	>100m of Belden 1694A cable @ 1.485Gbps
		> 400m of Belden 1694A cable @ 270Mbps
	Return Loss	>13dB to 1.485GHz
Serial Digital Video Outputs	Number of Outputs	1 Program output
		1 output monitor
	Impedance	75ohm
	Return Loss	10dB to 1.485GHz
	Signal Level	800mV ±10%
	DC Offset	0 Volts ±50 mV
	Rise & Fall Time (20-80%)	700ps typical (270Mbps)
		120ps typical (1.485Gbps)
	Overshoot	<8%
GPIO Outputs	Number and type of outputs	8 logic outputs (3.3v)
Power	Max. Power Consumption	5W

Service Information

In This Chapter

This chapter contains the following sections:

- Troubleshooting Checklist
- Warranty and Repair Policy

Troubleshooting Checklist

Routine maintenance to this openGear product is not required. In the event of problems with your CEG-100, 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. **Re-seat the Card in the Frame** — Eject the card and re-insert it into the frame.
4. **Check Control Settings** — Refer to the Installation and User Controls sections of this manual to verify all user-adjustable component settings
5. **Input Signal Status** — Verify that source equipment is operating correctly and that a valid signal is being supplied.
6. **Output Signal Path** — Verify that destination equipment is operating correctly and receiving a valid signal.
7. **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.

Reset 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 CEG-100.

Use the following procedure to reload the software on a CEG-100:

1. Press and hold the **Menu** switch.
2. While holding the **Menu** switch, press the **Reset** button in.
3. Release the **Reset** button and then the **Menu** switch.
    - The **POWER** LED (DS1) will flash 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 CEG-100 from DashBoard, using the MFC-8300 series Network Controller card.

Warranty and Repair Policy

The CEG-100 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 CEG-100 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 CEG-100 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 CEG-100 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 CEG-100 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 CEG-100, 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 CEG-100. 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
General Information	Telephone:	+1 613 • 652 • 4886
	Fax:	+1 613 • 652 • 4425
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	Website:	http://www.rossvideo.com

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