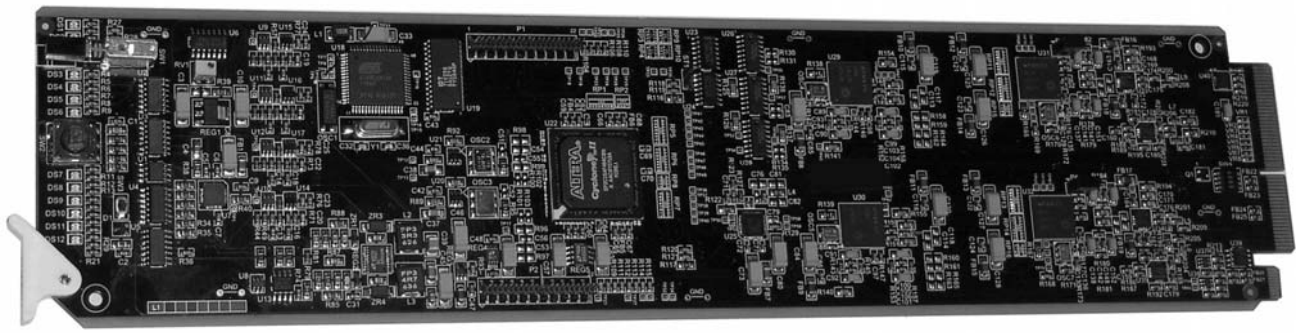
Ross Video Limited

CDP-100

Caption Distribution Pack Analyzer

User Manual



Live Production Technology

openGear

CDP-100 • Caption Distribution Pack Analyzer User Manual

- Ross Part Number: **CDP100DR-004-02**
- Release Date: September 23, 2010. Printed in Canada.

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Trademarks

Important Regulatory and Safety Notices

Before using this product and any associated equipment, refer to the “Important Safety Instructions” listed below so as to avoid personnel injury and to prevent product damage.

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

Symbol Meanings

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

Warning

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

Caution

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

Notice

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

ESD Susceptibility

This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from electrostatic discharge.

Important Safety Instructions

Caution

This product is intended to be a component product of the openGear 8000 series frame. Refer to the openGear 8000 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 within the product’s power supplies and power supply area, are not intended to be customer serviced and should be returned to the factory for repair.

To reduce the risk of fire, replacement fuses must be the same type and rating.

Only use attachments/accessories specified by the manufacturer.

EMC Notices

US FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

Notice

Changes or modifications to this equipment not expressly approved by Ross Video Limited could void the user's authority to operate this equipment.

CANADA

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

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

EUROPE

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

INTERNATIONAL

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

Notice

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

Maintenance/User Serviceable Parts

Routine maintenance to this 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.

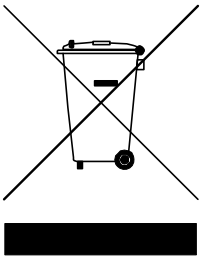
Environmental Information

The CDP-100 complies with the European Union's RoHS Directive. This stands for "the restriction of the use of certain hazardous substances in electrical and electronic equipment". This Directive bans the placing on the EU market of new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants.

The equipment that you purchased required the extraction and use of natural resources for its production. Despite compliance with the RoHS directive, it may nevertheless 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, we encourage 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.

Contents

Introduction

In This Chapter

This chapter contains the following sections:

- Overview
- Functional Block Diagram
- Features
- Documentation Terms

A Word of Thanks

Congratulations on choosing the openGear CDP-100 Caption Distribution Pack. The CDP-100 is part of a full line of Digital Products within the openGear Terminal Equipment family of products.

You will be pleased at how easily your new CDP-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 CDP-100, please contact us at the numbers listed on the back cover of this manual. Our technical support staff is available for consultation or service.

Overview

The CDP-100 extracts and analyses the CDP caption content of a video signal . It is designed to find all the errors which might cause problems with captions passing through the broadcast chain to television receivers. The errors are clearly explained with the explanation overlaid on the video and logged to a file. Time stamps are used to determine when an error occurred and counters indicate how often the error occurred. Logged information may be viewed or uploaded to a PC for manipulation in a database or spreadsheet. For deeper analysis, errors may be captured in a binary file of CDPs, uploaded to the PC and viewed with a CDP File Analyzer program.

As a member of the openGear family:

- The CDP-100 shares a common control interface, known as DashBoard, with a broad array of other products.
- The CDP-100 is housed in the openGear DFR-8300 series frames. It is compatible with both 10-slot and 20-slot frames.

Features

The following features make the CDP-100 ideal solution for detecting and identifying errors in the captioning of a video source:

- CDP Errors are overlaid on the source video with easy to read text descriptions.
- Caption channel text may be overlaid for a visual inspection.
- Raw data capture with packet by packet analysis available via *CDP Analyze* .
- Downloadable error log with easy to read, time stamped error descriptions.
- Errors can drive GPIOs to trigger external devices, within one video frame time.
- Individual errors can be set for severity and whether they should trigger errors or warnings.
- Video bypass capability with ONG-MDL-R01, R21 or R23 rear module.
- Fits openGear DFR-8300 series frames.
- the CDP-100 is compatible with the openGear frame's SNMP option, allowing monitoring with third-party SNMP software systems. For more information and to obtain MIBs, contact Ross Technical Support.

Functional Block Diagram

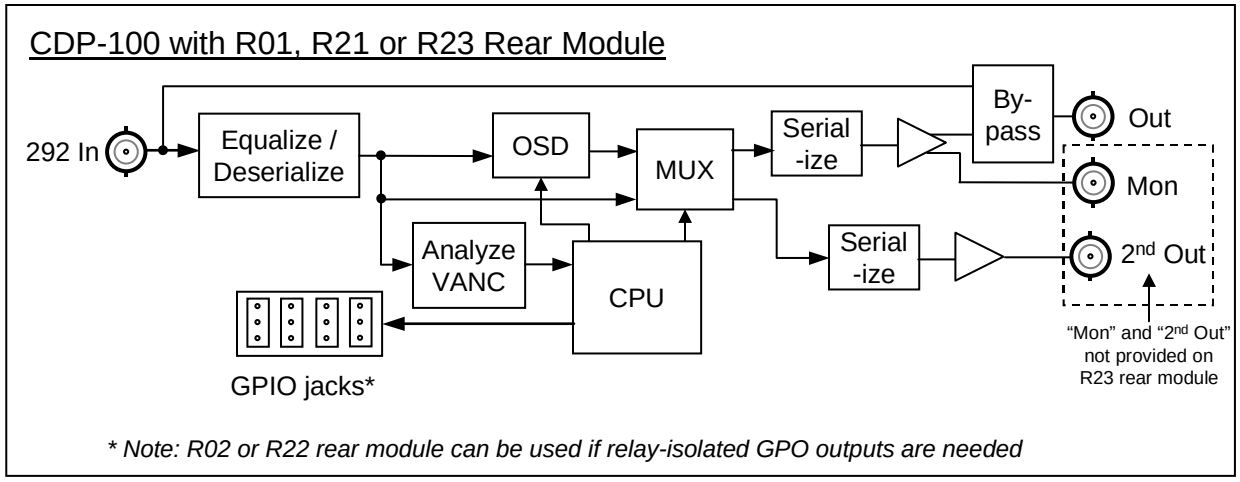


Figure 1. Simplified Block Diagram of CDP-100 Functions

Documentation Terms

The following terms are used throughout this guide:

- "**Frame**" refers to the frame that houses the CDP-100 card.
- "**Operator**" and "**User**" refer to the person who uses the CDP-100.
- "**Board**" and "**Card**" refer to the CDP-100 card itself, including all components and switches.
- "**System**" and "**Video system**" refer to the mix of interconnected production and terminal equipment in which the CDP-100 operates.
- "**Rear Module**" refers to the connector module at the rear of the frame, into which the CDP-100 is inserted.
- "**GPIO**" means General Purpose Input-Output. This term is commonly used in the broadcast industry to refer to DC signals used by one device to control another.

Frame and Rear Module Compatibility

The CDP-100 can operate with the following combinations of frames and rear modules.

Table 1.Combinations of CDP-100, Frame and Rear Module models

Rear Module	Frame	Bi-Directional GPIOs	Isolated GPIO	Program 2 Out	Bypass Relay
ONG-MDL-R01	DFR-8310-N	Yes	No	Yes	Y
ONG-MDL-R02	DFR-8310-N	No	Yes	No	N
ONG-MDL-R21	DFR-8321-C or –CN or -CNS	Yes	No	Yes	Y
ONG-MDL-R22	DFR-8321-C or –CN or -CNS	No	Yes	No	N
ONG-MDL-R23	DFR-8321-C or –CN or -CNS	Yes	No	No	Y

Quick Start

Assuming you have a openGear frame, an **ONG-CDP-100** card and a suitable rear module, the following steps will allow you to start analyzing VANC captioning compliance with SMPTE 334-1 and 334-2:

1. Connect the frame to your LAN. Refer to the ***DFR-8300 Series Frames User Manual*** for details.
2. Install DashBoard on a computer connected to the LAN. The DashBoard Control System™ software and user manual is also available at the same address.
3. Install a rear modules in the frame, as described in the section "**Rear Module Installation**" of this manual.
4. Install a CDP-100 into the rear modules, as described in the section "**Board Installation**" of this manual.
5. Connect a video signal to the SDI input jack on the rear module of the CDP-100 as described in the section "**Cable Connections"** of this manual.
6. Start DashBoard on your computer. It should automatically find your frame within a minute or two. Click the "+" next to the frame name to show the cards in the frame, then double-click the CDP-100 to be used for monitoring.
7. Click the **Caption Display** tab select any caption types you want to have overlaid on the video.

The following in an example of what the overlay will look like the following:

Example — CDP-100 Overlay

At the top of the screen there is a status bar.

The video type is the leftmost item. In this example 720P 59.94.

Caption Present indicates if the caption DID and SDID (61/01) is present in the incoming signal and will be green for present or red for missing.

Caption Status indicates the quality of the CDP packets. In this case several errors are present causing the status indicator to display red.

On the far right of the status bar is CDP capture indicator. A green **Cont** indicates the CDP-100 is currently capturing packets. A red **Stop** indicates the CDP-100 is not currently capturing packets.

Directly underneath the status bar is a list of errors currently detected by CDP-100 in the incoming video. If the error is persistent (present in every CDP) then the error message will stay on the screen. Otherwise it will stay on the screen for five seconds and then be removed.

If caption display 1 and/or 2 have been selected they will appear in the lower part of the screen beneath the error conditions.

Installation and Setup

In This Chapter

This chapter contains the following sections:

- Static Discharge
- Unpacking
- Rear Module Installation
- Board Installation
- BNC Labels
- Cable Connections

Static Discharge

Whenever handling the CDP-100 and other related equipment, please observe all static discharge precautions as described in the following note:

ESD Susceptibility — *Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas, and when wearing synthetic fiber clothing. Always exercise proper grounding precautions when working on circuit boards and related equipment.*

Unpacking

Unpack each CDP-100 you received from the shipping container, and check the contents against the packing list to ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video Limited directly.

Rear Module Installation

The CDP-100 requires a Ross Video Rear I/O Module with GPIO jacks. You will need to install the I/O module in your openGear frame before you can install the CDP-100 in the frame, or connect cables to the slot you have chosen for the CDP-100.

Use the following procedure to install the rear module in an openGear digital distribution frame:

1. Refer to the ***DFR-8300 Series Frames User Manual***, to ensure that the frame is properly installed according to instructions.
2. On the rear of the frame, locate the card frame slot.
3. Remove the Blocker Plate (if any) from the rear of the slot you have chosen for the CDP-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.

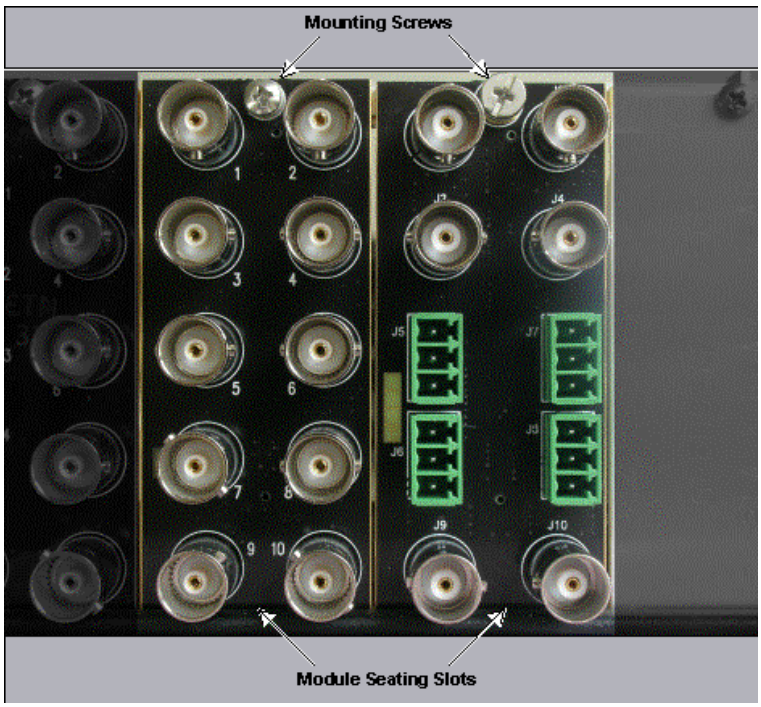


Figure 2. Rear Module Installation, showing RM-8300-B (left) and ONG-MDL-R01 (right) modules

5. Align the top hole of the rear module with the screw hole on the top edge of the frame's back plane.
6. Using a Phillips screwdriver and the supplied screw, fasten the rear module to the back plane. Do not over tighten.
7. Ensure proper frame cooling and ventilation by having all rear frame slots covered with rear I/O modules or blank metal plates. If you need blanks, contact your openGear sales representative.

This completes the procedure for installing the Rear I/O Module in an openGear digital distribution frame.

About Rear Modules

Video bypass is available with the ONG-MDL-R01,R21 and R23 rear modules. A monitor output is available with the ONG-MDL-R02 and R22 modules.

Rear modules ONG-MDL-R02 and R22 have isolated GPIO outputs and ONG-MDL-R01,R21 and R23 produce 0-3.3V logic levels.

Board Installation

Use the following procedure to install the CDP-100 an openGear distribution frame:

Notice — *It is recommended to use a frame with the cooling fan option in all cases, in order to allow all slots to be used without exceeding heat dissipation limits.*

1. Refer to the ***DFR-8300 Series Frames User Manual*** to ensure that the frame is properly installed according to instructions.
2. After selecting the desired frame installation slot, hold the CDP-100 card by the edges and carefully align the card edges with the slots in the frame.
3. Fully insert the card into the frame until the rear connection plugs are properly seated on the midplane and rear modules.

This completes the procedure for installing the CDP-100 in an openGear distribution frame.

BNC Labels

Affix a connector label (if supplied) to the rear of the rack frame at the position occupied by the CDP-100. Some rear modules do not require a label, as the connector names are silkscreened directly onto the rear module itself.

Cable Connections

This section provides information for connecting cables to the rear modules on the frame backplane. Connect the input and output cables according to the following diagram and the descriptions that follow. It is not necessary to terminate unused outputs. Figure 3 shows the rear modules that are most commonly used with the CDP-100. For information on using other modules, please contact our technical support group, using the contact information on the rear cover of this manual. In the following discussion, the five BNC jack positions in the left-hand column are numbered 1, 3, 5, 7 and 9, from top to bottom; the five in the right column are 2, 4, 6, 8 and 10.

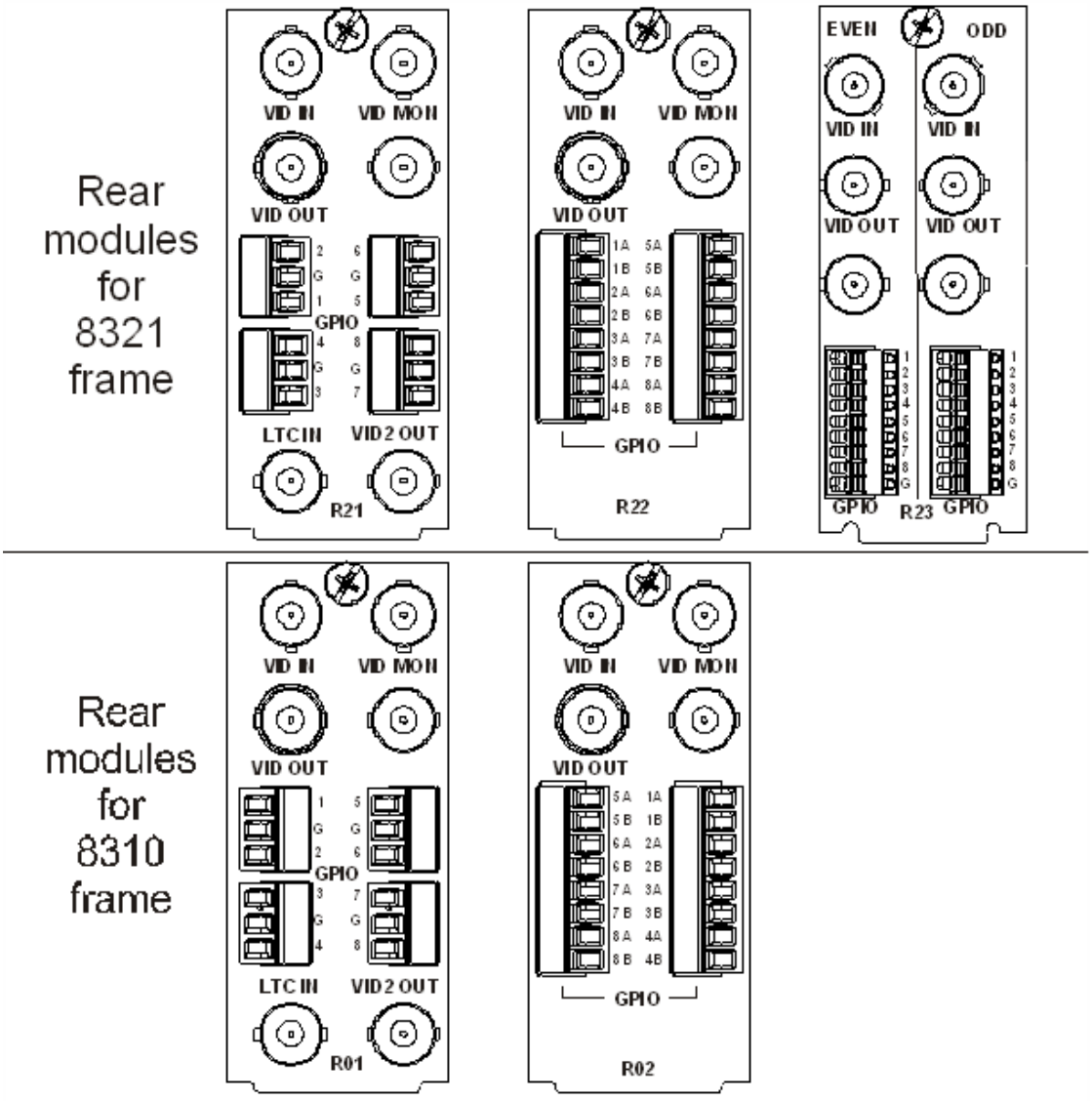


***Figure 3*. Jack Designations for the CDP-100 with Suitable Rear Modules**

VIDEO Input (May be labelled "VID IN" or "SDI IN")

This jack accepts a 292M serial digital video signal. The CDP-100 requires this input in all cases. The input signal is internally terminated in 75 ohms when the CDP-100 is installed.

VIDEO Output (May be labelled "VID OUT" or "SDI OUT")

This jack carries the output of the CDP-100, with caption status displayed on-screen. When the CDP-100 card is removed from its slot or the bypass switch is activated, the **ONG-MDL-R01, R21 or R23** rear module bypasses Video Input to Video Output directly.

VIDEO Monitor Output

This jack carries an unswitched copy of the same signal that is output on BNC3. When the CDP-100 card is removed from its slot or the card is in bypass, this output is not driven.

LTC Input

This jack accepts an LTC time source which the CDP-100 can use as a time source.

Program Output 2 (May be Labelled "VID2 OUT")

This jack carries a second output from the CDP-100. The overlay ability on BNC 3 and 10 is programmable under the **Settings** tab. CDP-100 cards with serial numbers less than 107469 do not have this output.

Rear Module Styles

In the DFR-8310 series frame, each rear module is connected to one circuit card and occupies one-tenth of the space on the rear of the frame.

The DFR-8321 series frame has twenty slots in the same space as the ten slots of the DFR-8310 series frame. Each rear module corresponds to two slots of the frame. Rear modules that can accommodate one card are called "full"; a DFR-8321 series frame with ten "full" rear modules can hold ten cards.

There are also "split" rear modules that can accommodate two cards. Each card is connected to half of the connectors on the rear module. A DFR-8321 series frame with ten "split" rear modules can hold twenty cards.

The ONG-MDL-R01 and R02 are full rear modules for the DFR-8310 series frame; each can accommodate one CDP-100 card.

The ONG-MDL-R21 and R22 are full rear modules for the DFR-8321 series frame with the same functionality as the R01 and R02; each can accommodate one CDP-100 card which must be in an even-numbered slot (2, 4, 6 etc).

The ONG-MDL-R23 is a split rear module for the DFR-8321 series frame that can accommodate two CDP-100 cards. Its two columns of jacks are labelled ODD and EVEN to indicate which slot they are connected to. For example, assume that an R23 rear module is installed in the position corresponding to slots 1 and 2 of the frame. The jacks labelled ODD will be connected to the card in slot 1, and those labelled EVEN will be connected to the card in slot 2. If it were installed at slots 7 and 8, ODD would connect to 7 and EVEN would connect to 8.

User Controls

In This Chapter

This chapter contains a description of the user controls:

- Switches
- LEDs

User Controls

Figure 4 shows the front edge of the CDP-100. Following the illustration are descriptions of the controls and indicators identified here.

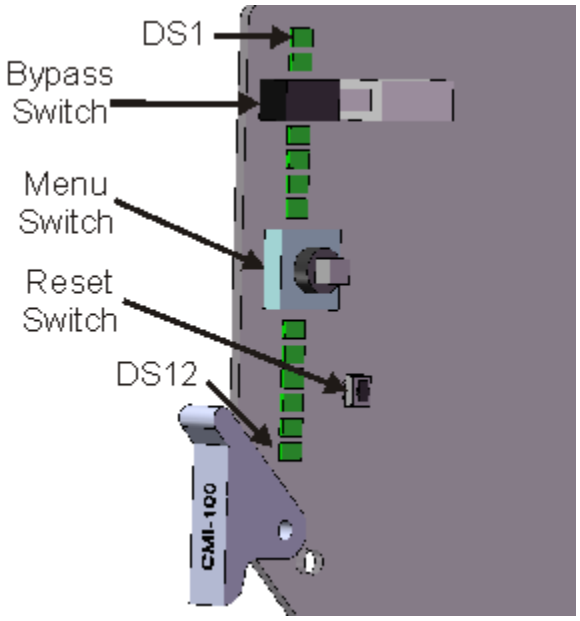


Figure 4. Card-edge User Controls

Bypass Switch

If the CDP-100is installed in an ONG-MDL-R01, R21 or R23 rear module that has a bypass relay, this two-position pushbutton can be used to control the relay. When the pushbutton is in the "IN" position, the CDP-100 is in the video signal path. Pressing it once moves the switch to the "OUT" position and bypasses the CDP-100. Pressing it again restores it to its active state. This switch provides a quick way of disabling all CDP-100 operation, since it disconnects the video input and output from the card.

If the CDP-100 is installed in a rear module that does not provide bypass, this switch has no function and should be left in the "IN" position.

Menu Switch

This switch is not used by the CDP-100.

Reset Switch

This button is used for rebooting the card.

LEDs

The front-edge of the card features LEDs that display the status of the input signals. Descriptions are provided in the following table:

Table 3. Selection and Status LED Descriptions

LED	Color	Location	Display and Description
Power	Red/ Green/ Orange	DS1	When off, there is no power. When lit and green the card is running with valid input. When flashing green, the boot loader is waiting for software upload. When lit orange, this is a warning about a signal or configuration error. When lit red, the card is not operational. This will occur if, for example, there is no video input.
Bypass	Red	DS2	When off, CDP-100 is in the video path. When lit red, the CDP-100's video is bypassed.
Video In	Red/ Green	DS3	When lit green, the video input is present and valid. When lit red, no valid input is present. This typically means that the input cable is disconnected.
Video Out	Red/ Green	DS4	When lit green, the video output serializer is locked to a valid input. When lit red, there is a hardware fault on the card.
Not used		DS5	
Video 2 SDI Out	Red/ Green	DS6	When lit green, the video 2 output serializer is locked to a valid input. When lit red, there is a hardware fault on the card.
Video In	Red/ Green	DS7	Normally lit green. When lit red, this indicates that the video input is missing.
Captioning	Red/ Green	DS8	Normally lit green. When lit red, this indicates that the VANC captioning data is missing.
Not Used		DS9	
Not Used		DS10	
Not Used		DS11	
Not Used		DS12	

DashBoard and CDP-100 Status

In This Chapter

This chapter provides a detailed explanation of the functions available when using DashBoard to monitor and control the CDP-100. The software is available for download at the Ross Video website.

The following topics are discussed in this chapter:

- Layout and Navigation
- Selecting a CDP-100 Card
- Screen layout
- Status and Setup menus.

Layout and Navigation

This section focuses on the use of the DashBoard program to control and monitor a CDP-100. For a more complete description of DashBoard and its capabilities, refer to the ***DashBoard Control System User Manual***.

Selecting a CDP-100 Card

Figure 5 shows a typical DashBoard screen. After it has established its connection to the frame containing the CDP-100, a list of cards is displayed at the left side. Clicking on a frame and then on a CDP-100 causes a window for that card to be opened, resulting in the display shown here. In this simple example, there is only one device, the CDP-100 open. DashBoard provides the ability to view multiple devices in this window. For details, see the ***DashBoard Control System User Manual***.

Screen Layout

The CDP-100 window is divided into four sections as shown:

- The upper left side is the **Product Status** area, and displays a summary of the present module status.
- The lower left side is the **Status** area and provides tabs to select more detailed status.
- The right side, the **Settings** area, provides tabs to allow control of the various functions of the module.
- The bottom band contains buttons for functions that are used relatively infrequently.

Product Status

The left side of this figure shows product information that is useful in discussing the operation of the card with Ross Video's Technical Support staff.

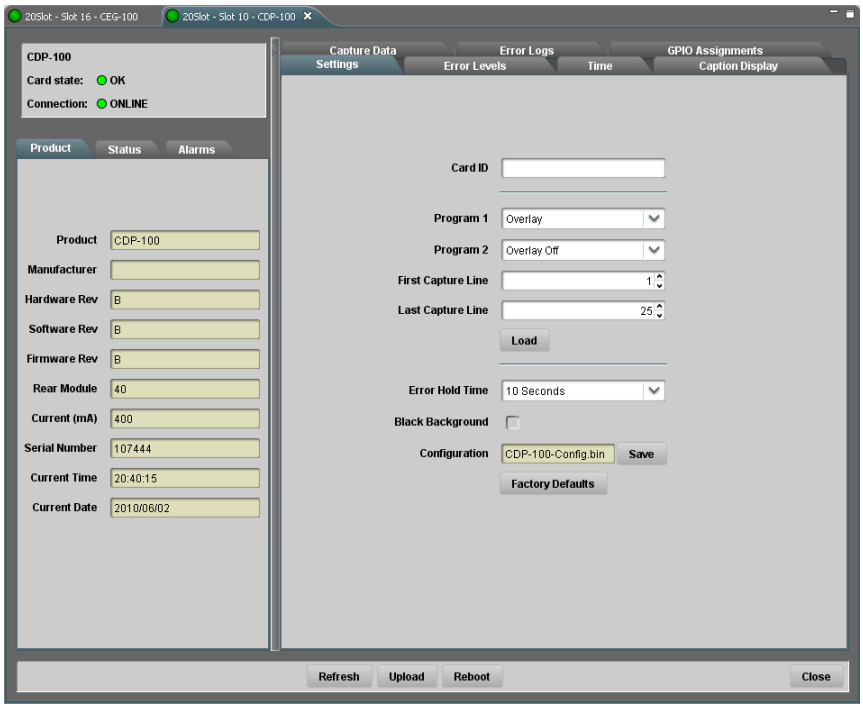


Figure 5. Main CDP-100 DashBoard Screen, showing Product Status and Settings

GPIO Status

Figure 6 shows the current status of the GPIOs of the CDP-100. The CDP-100 can control up to 8 GPIO outputs. These GPIOs can be assigned to any individual CDP error condition or so that any CDP error assigned to a GPIO causes the GPIO to trigger. Errors are assigned on the **GPIO Assignments** tab described later in this manual. Once a CDP error is assigned to a GPIO its short form name will be used on this screen rather than **GPIO*n*.**

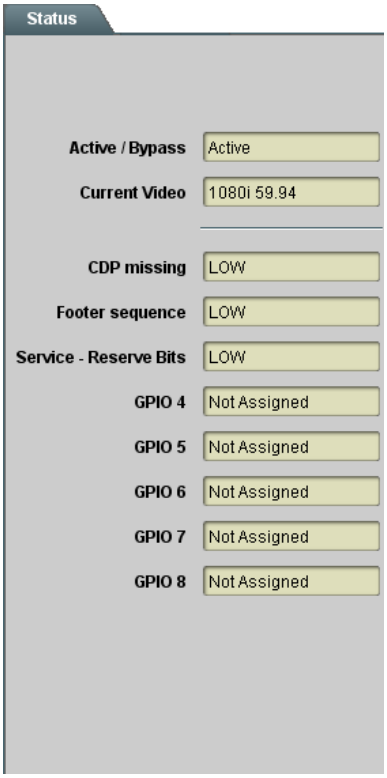


Figure 6. Status screen

Alarms

Figure 7 shows the status of the CDP-100 Alarms. The **Card Status** is the sum of all the possible error states of the card. This includes all the CDP errors. The **Caption Present** indicates whether or not the DID/SDID that carries captioning CDPs is present. The **LTC** indicates whether or not an LTC time source is connected to the card. This indicator only applies when LTC has been selected as the time source. When not selected as the time source this indicator will be green.

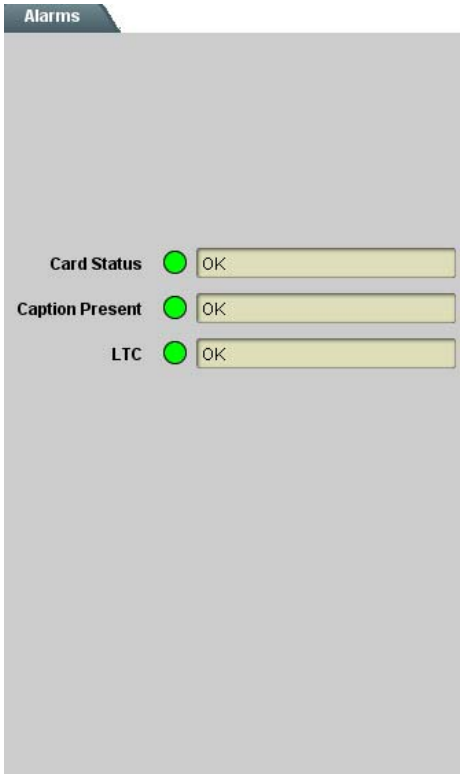


Figure 7. Alarms

Setting Up the CDP-100

In This Chapter

This chapter explains how to use the user interface to set up the CDP-100. This discussion is based on the use of DashBoard through a network connection.

The following topics are discussed:

- General Settings
- Capture Data – Control over capturing errors and uploading the PC
- Caption Display – Which caption stream text to display on the overlay
- GPIO Assignments – Which CDP errors should drive the GPIOs
- Error Levels – How to set whether an error should be considered a failure
- Error Logs – Viewing error statistics and uploading the log to the PC
- Time – Setting the time used for time stamping the log

Settings

Figure 8 shows the screen that is displayed by clicking the **Settings** tab.

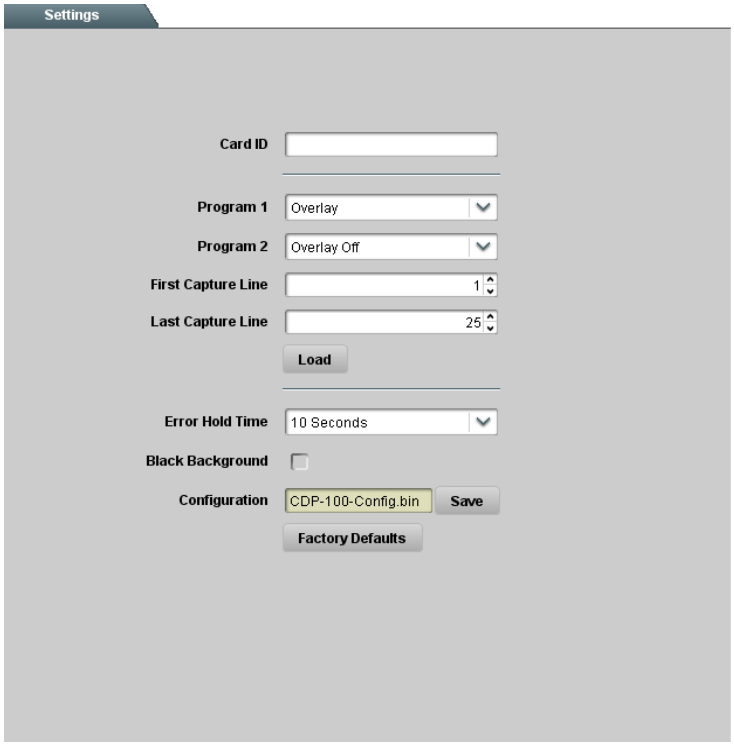


Figure 8. Settings Menu

The **Card ID** field allows you to assign a unique name to a CDP-100 card. This is especially useful if you have more than one CDP-100 in a frame. If this field is blank, the name is just "CDP-100".

Program 1 and **Program 2** control the overlay of the CDP errors on the two outputs of the card. Program 1 refers to BNC 3 and program 2 refers to BNC 10. If overlay is selected the CDP-100 overlays data onto the output video; overlay off lets the video pass unaltered. Note: some rear modules will not have a BNC 10. In this case the program 2 control will not be present. Also, CDP-100 cards with serial numbers less than 107469 do not have a program 2.

The **First Capture Line** and the **Last Capture Line** select the range of lines that the card processes when looking for VANC caption data. Normally, you can leave these set to include the complete range of VANC lines (1-20 for 1080i and 1-25 for 720p). However, you may wish to reduce the range to focus on the data in one specific line.

Error Hold Time specifies the length of time an error will be displayed on the overlay before it times out.

Black Background selects between black background and transparent background for the overlay.

The **Configuration** of the card may be saved to a file on a PC by clicking on the **Save** button. This brings up a dialog box which allows you to name the file and then, by selecting **Save,** to save it to a PC. Configuration files are a fast way to return to a configuration or to clone a configuration to another CDP-100. Use the Upload button on the bottom of the Dashboard screen to restore a configuration. This brings up a dialog screen which allows you to select one of your saved configurations. This is the same button used to upload new firmware to the card. Dashboard automatically determines the difference between a configuration and a firmware file.

The **Factory Defaults Reset** button clears all configuration settings and restores the settings to the values they had when shipped from the factory.

Capture Data

Figure 9 shows the screen that is displayed by clicking the **Capture Data** tab.

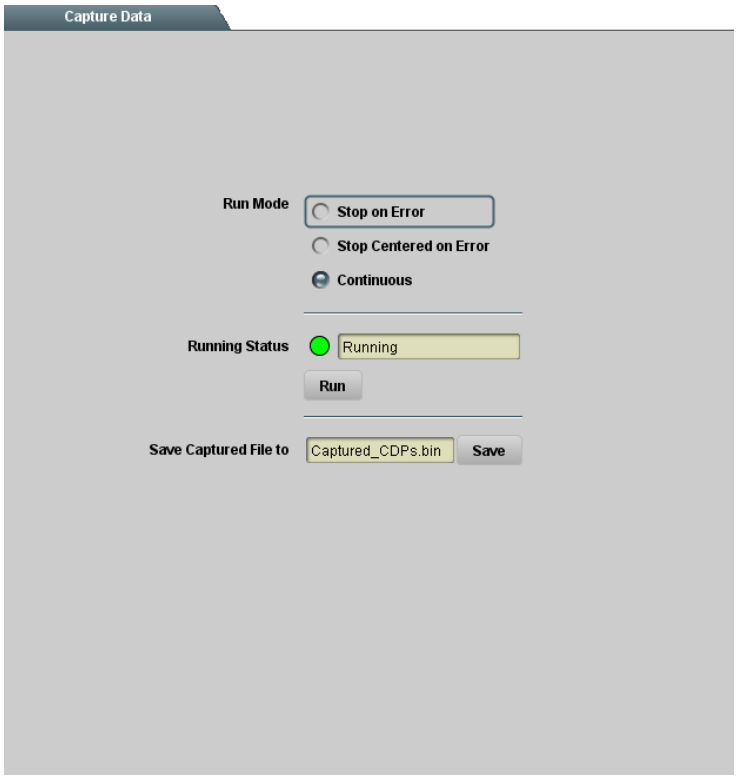


Figure 9. Capture Data

The **Run Mode** indicates the CDP-100s data collection method.

- **Stop on Error:** When an error is located in the incoming CDPs the card immediately stops collecting data.
- **Stop Centered on Error:** When an error is located in the incoming CDPs the card continues to collect data, and centers the error in the capture buffer.
- **Continuous:** The card ignores errors and continually captures data.

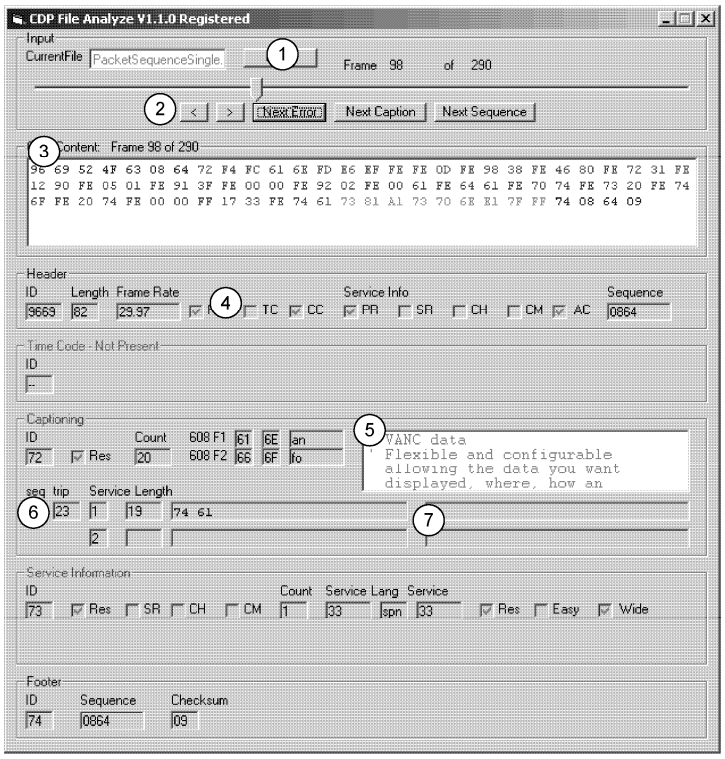
The **Running Status** is an indicator of the CDP-100 current capture state. It can either be "Running" indicating the card is currently capturing data, or "Stopped" indicating the card has stopped capturing data.

The **Run** button allows the user to start data capture if the running status is currently stopped.

The **Save Captured File** control saves the currently stored CDP data to a file. If the CDP-100 is currently running, saving the data will cause the CDP-100's Running Status to stop so the data can be transferred. This data is suitable for detailed analysis by the CDP File Analyzer program which runs on a PC. This is an easy method to know the exact bits and bytes of the CDPs when an error occurs.

The **CDP File Analyzer** program is supplied on an install CDROM. Once installed it will ask for a key which applies to the PC on which it is installed. Contact Ross Technical Support and provide the information given by the program and Ross Video will provide you with this key.

The program will look like the following:



1. **Open Button**
   Use this button to open the file to be analayzed. It must be in the data folder of the CDPfileAnalyze program.
2. **Controls**
   Use these controls to move through the CDPs.
3. **Current CDP Content**
   This area shows the current CDP as hex bytes. It is color coded to show the different sections of the CDP.
4. **Parameters**
   Some parameters are shown as short forms. The parameters full name will appear when the cursor hovers over the short form.
5. **Captioning Information**
   This field shows the last few lines of embedded 608 text as a reference as to your position in the file.
6. **Errors**
   Errors, like this 708 Packet Sequence error, are highlighted in red.
7. **708 Data Stream Information**
   These fields show the 708 data streams in both hex and as text.

Upload CDP files from the CDP-100 to the data folder of the CDPfileAnalyzer to make them available to the program.

Caption Display

Figure 10 shows the screen that is displayed by clicking the **Caption Display** tab.

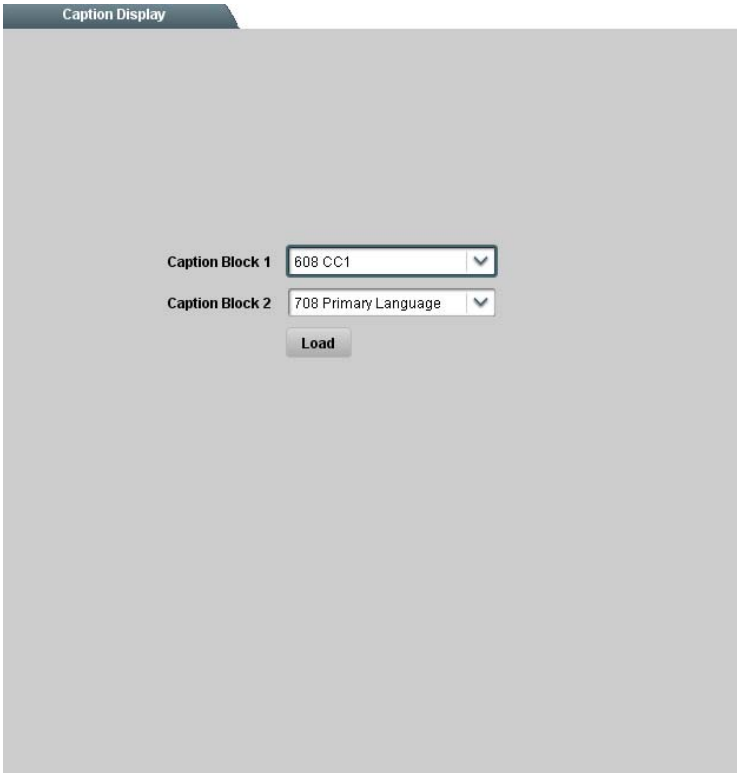


Figure 10. Alarm Setup

The **Caption Display 1** and **Caption Display 2** controls control which caption channel text get displayed on the overlay.

The displayed of captions will reduce the number of unique error types that can be displayed simultaneously on the overlay screen but has no other effect on error logging.

GPIO Assignments

Figure 11 shows the screen that is displayed by clicking the **GPIO Assignments** tab.

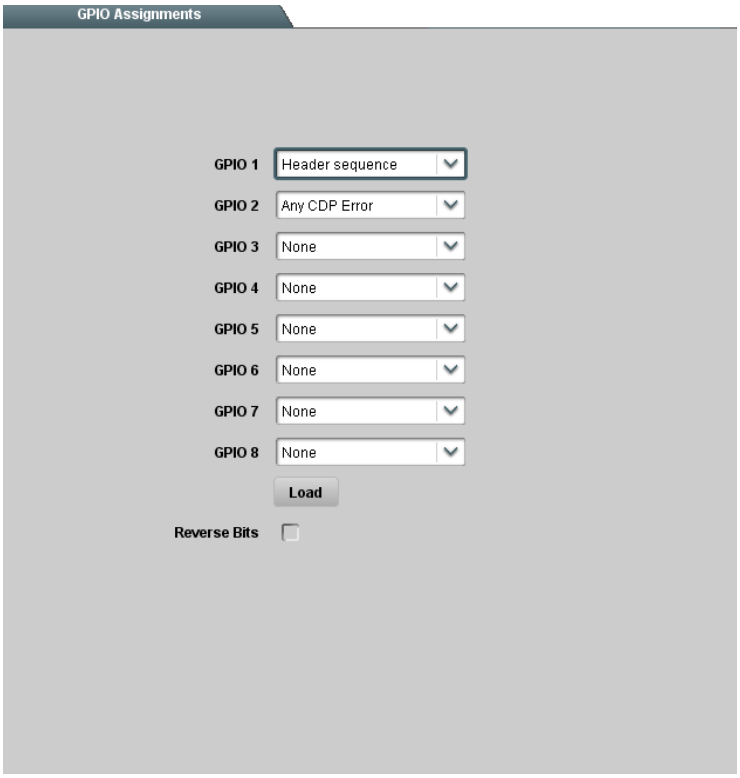


Figure 11. GPIO Assignments

GPIO 1 through **GPIO 8** can be assigned to individual CDP error conditions.

A special **Any CDP Error** is listed in each of the controls. If this option is selected the GPIO will trigger if any CDP error occurs. When used in conjunction with the error levels to mask off unwanted errors, it is possible to build a subset of errors that will trigger a GPIO.

Reverse Bits sets the GPIOs active low instead of the default, active high.

Error Levels

Figure 12 shows the screen that is displayed by clicking the **Error Levels** tab.

Figure 12. Error Levels

Each type of CDP-100 error is maskable using the error levels tab.

The options are:

- **Error** – Error is displayed, registered in the error logs and causes the CDP-100 to stop capturing in *Stop on error* and *Stop centered on error* modes.
- **Warning** - Error is displayed, registered in the error logs but doesn't cause the CDP-100 to stop capturing in *Stop on error* and *Stop centered on error* modes.
- **Ignore** - Error is ignored and is not displayed or registered in the error logs.

Error Logs

Figure 13 shows the screen that is displayed by clicking the **Error Logs** tab.

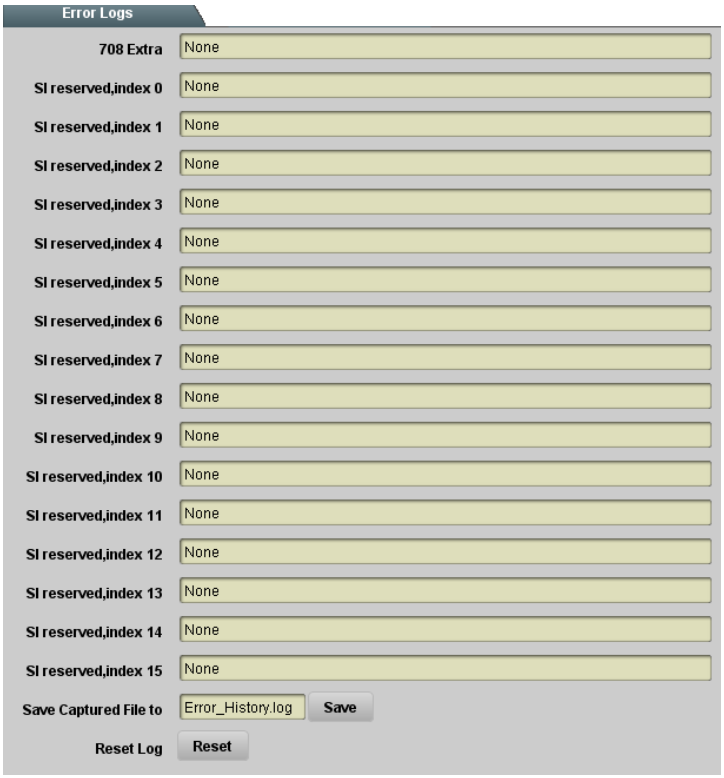


Figure 13. Error Logs

Each error type is listed and indicates the time the error last occurred. Possible log messages are “None”, a start time only indicating the error is currently taking place, or a start time and an end time indicating the error occurred sometime in the past.

The complete log history can be downloaded to the DashBoard PC using the **Save Captured File** option.

The **Reset Log** button clears the log history.

Time

The CDP-100 requires a time source to time stamp errors in the log. Figure 14 shows the screen used to select the time source.

Time can be set accurately and automatically by using **LTC** time or **Network Time**. LTC requires connection of linear time code source to the card and network time requires an NTP server on the same LAN as the openGear frame. To enable network time:

- Select **Network Time** on this menu.
- Specify your time offset from Universal Time (UTC), as a positive or negative number of hours and minutes. For example, the area of North America where Pacific time is observed is 8 hours west of longitude 0; the settings would be **UTC Offset** : **HH = -8, and MM = 0**. Note that UTC is also known as GMT (Greenwich Mean Time).
- Enable or disable **DST** (Daylight Savings Time) as appropriate, and click **Accept**.

To obtain a time reference from a linear timecode input (LTC):

- Select **LTC** on this menu.
- Click **Accept**

If neither network time or LTC are available:

- Select **Manual** on this menu.
- Fill in the manual date and time fields
- Click **Accept**

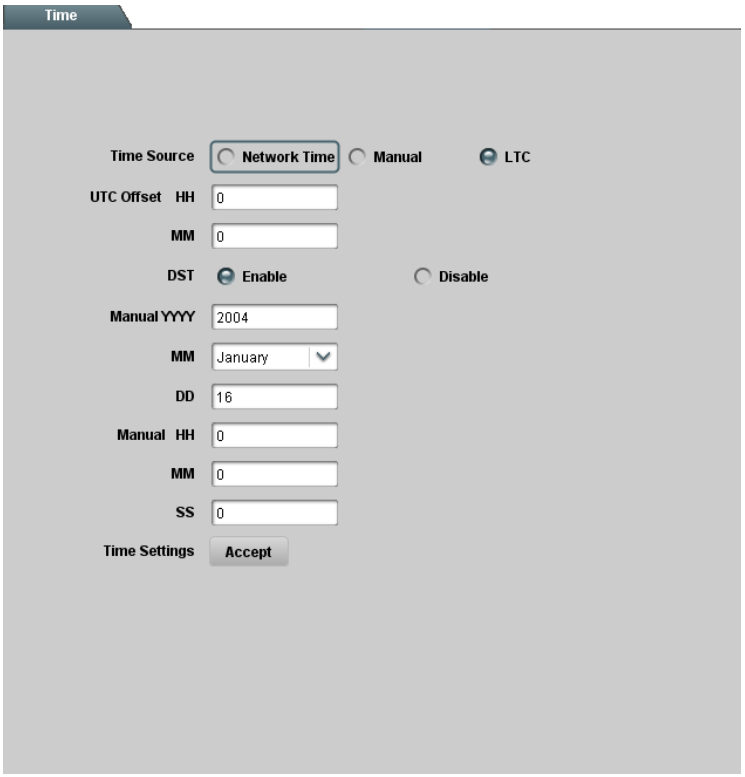


Figure 14. Time

In order to use network time, you also need to ensure that the network card in the openGear frame has been configured to acquire time from an NTP server. To do this, double-click the network card in slot 0 of the frame and then click the **Network** settings tab. In the menu shown below, enter the IP address of the NTP server and then click Apply.

If you do not have access to an NTP server, you can enter the time and date directly on the **Time** settings menu, select **Manual** and click **Accept**.

Understanding CDP Errors

In This Chapter

The CDP-100 detects most coding errors in the CDP. This chapter attempts to describe each error, what problems it might cause and how severe it may be. It should be noted that each device acts differently when presented with each error type. It is therefore impossible to say with certainty whether an error will cause a loss of captioning. It is best practice to insure that no errors are present in the CDP to give the best chance that all captioning will pass through to the TV sets correctly.

The user should also be aware that not all monitoring equipment will show all problems with the captioning stream. For example, decoding the captions and viewing them on a monitor does not guarantee that all required information is present. Many decoders will decode either the CEA 608 or CEA 708 captions and not warn you that one of the two is missing. Any equipment which manipulates CDPs may also make a small CDP error worse so captions which look fine at one point of the broadcast chain may not be usable later in the chain.

CDP Missing, A field 1 was found without a CDP

Explanation:

SMPTE 334-1 states that a single CDP should appear in each field 1 of an interlaced video frame and each progressive frame. This error is generated any time the CDP-100 detects an interlaced field 1 or a progressive frame which does not contain a CDP (no 61/01 VANC packet)

Severity:

This error does not usually cause problems. Sometimes it indicates that there are no captions present. In this case the error is constant. If it happens on a single frame over a long time period (typically hours) it indicates a loss of single packet which may cause the loss of some onscreen data. Most equipment is not affected by this error.

Extra, A field 1 was found with more than one CDP

Explanation:

There should be one and only one CDP in field 1 of every interlaced video frame and every progressive frame. This error is generated any time two or more 61/01 VANC packets are found in field 1. There are several possible causes including two devices both providing captions. The error may also occur if equipment falls behind and tries to catch up by inserting two packets.

Severity:

This error normally has severe consequences. Some equipment will only process one of the two CDPs. If there are two complete caption streams, only one will be passed and it may not be the correct one. If equipment does pass both CDPs then you may end up with a mix of two caption streams which will produce no captioning at output. If it is just a single frame with two CDPs in field 1, it will cause a loss of captions at the error point but normal captioning will resume after the error.

Field 2, A CDP was found in field 2

Explanation:

SMPTE 334-1 states that CDPs shall only be carried in field 1 of interlaced video. This error occurs when a CDP is detected in field 2. On occasion there may be data constantly in field 2 caused by equipment that either mistakenly inserts it there or by equipment that has inadvertently moved it there from field 1. There may also be cases where a single frame has the CDP in field 2 rather than in field 1.

Severity:

It is a severe problem if a signal constantly has CDPs in field 2. Most equipment will ignore this data causing a complete loss of captioning. If the occasional frame has the CDP in field 2 then there may be a loss of caption text when the error occurs but normal captioning will return after the error.

CDP Header, Frame rate does not match current video

Explanation:

The CDP header contains a frame rate for which the CDP was constructed. This is important because the amount of data carried in the caption portion of the CDP varies with frame rate. This error is signaled when the frame rate of the actual video does not match the frame rate specified in the CDP header.

Severity:

This error may cause severe captioning issues. If an incorrect amount of caption stream data is carried in the CDP for the actual video frame rate it may cause data to be lost.

CDP Header, Sequence counter did not count by one

Explanation:

Each CDP in the 61/01 VANC packet has an identifier, indication of CDP size and content, plus a sequence counter. The sequence counter is designed to count by one for each new CDP. Devices use the sequence counter to determine if the stream of CDPs has been interrupted. When an interruption is detected the device may try to resync to the captioning stream. It is normal to see this error when there is a switch from one captioned video source to another.

Severity:

If the header sequence counter error is caused by an appropriate switch between two video sources then it will cause no problems in the captioning. The new source will have all the appropriate information to allow any device to sync to the new caption stream. It is a low severity error if there are occasionally CDPs with the incorrect sequence count because this will cause some equipment to lose parts of captions. It is a severe error if the sequence counter is not counting at all or count continuously does not increment correctly. Some devices will remove the captions under these circumstances.

CDP Footer, Sequence counter does not match header sequence

Explanation:

Each CDP ends with a footer which contains an identifier a checksum for the CDP and a repeat of the sequence number contained in the header. This error occurs if the sequence number from the footer does not match the one in the header. This may be caused by the CDP not being constructed correctly.

Severity:

This is a severe problem. Many devices will throw away CDPs where the footer sequence does not match the header. If this is a non-continuous error then it will only cause a disruption in captioning when the error occurs.

CDP Footer Calculated checksum does not match footer checksum

Explanation:

Each CDP is protected by a checksum which is carried in the footer of the CDP. This error occurs when the checksum carried in the footer does not match the checksum calculated for the CDP.

Severity:

This is normally a severe problem. Many devices will throw away any CDP where the checksum is incorrect, causing a total loss of captioning.

CDP Header, Reserved bits are not set correctly

Explanation:

The CDP header has bits which convey no information at this time but are reserved for future standardization. The SMPTE 334-2 standard defines how these bits should be set. This error is generated any time a reserved header bit is not set according to the standard.

Severity:

The severity of this error varies greatly depending on equipment. Some equipment completely ignores reserved bits and does not care how they are set. Other equipment will completely reject the CDP causing a complete loss of caption data.

CDP Header, CDP Length not a legal value

Explanation:

The header of the CDP contains the length of the CDP. This error occurs if the length in the header is less than the minimum possible length or greater than the maximum possible length.

Severity:

This is a severe error because it likely makes the CDP not decodable.

CDP Header, CDP Length does not match footer position

Explanation:

The CDP header has a count of the number of bytes in the CDP. The footer is of a fixed size so its identifier should be found through calculations based on length. An error is generated if the footer identifier is not found where expected. This indicates an improperly constructed CDP.

Severity:

This is normally a severe error and usually causes a total loss of the captioning stream. Some devices do not use the length and may still be able to process the CDP.

CDP Caption, Caption triplet count incorrect for frame rate

Explanation:

The CEA 708 specification specifies a constant bit rate for caption data. This creates an absolute relationship between the video frame rate and the bytes of caption data which are carried in triplets. This error occurs when the frame rate from the header does not indicate the same number of triplets as carried in the caption portion of the CDP.

Severity:

This can be a severe problem. Some gear will see this error and ignore all the caption data. Other gear may attempt to fix the problem and possibly lose some caption data.

CDP Caption, Reserve bits are not set correctly

Explanation:

The CDP caption information area has bits which convey no information at this time but are reserved for future standardization. The SMPTE 334-2 standard defines how these bits should be set. This error is generated any time a reserved caption information bit is not set according to the standard.

Severity:

Most devices do not check reserved bits, so normally this error does not cause a problem. Caution should be taken because it is unknown what a device that does check these bits might do if an error is detected.

CDP Caption, No 608 data present

Explanation:

This is one of the least understood errors. SMPTE 334-2 makes the carriage of captioning optional through a CC data present bit in the header. If this bit is not set then the caption portion of the CDP will not be present. However, if this bit is set it must carry all the captioning information required by CEA 708 as determined by

the current video frame rate. This means that the caption information section must carry CEA 608 embedded data. An error is generated if no CEA 608 embedded data is present.

Severity:

This error may lead to subtle but severe captioning problems which can be hard to detect by monitoring equipment. It may indicate that the embedded CEA 608 data is not being carried at all and this will lead to a non-compliant broadcast signal (embedded 608 is a “must carry”). It may cause downstream equipment problems because they expect this data and may not be able to create a correct output without it. The problem is difficult to detect because some monitoring systems do not assume this to be an error. Equipment which displays the text of the captioning may only show the CEA 708 captions or may automatically show CEA 708 if CEA 608 is not present.

CDP Service, Start flag does not match header

Explanation:

The CDP service information may be too large to place in a single CDP so may be broken into pieces and spread over more than one CDP. To allow for decoding of the service information there are flags to indicate the start and end of the service information and when the service information has changed. These flags reside in both the header of the CDP and in the service information section. An error is generated when the start of service information flag in the header does not match the same flag in the service information section.

Severity:

This is not normally a severe error because much equipment ignores the service information. It may cause service information to be removed as it passes through a device but this data is not typically used and will not cause any loss of data in the caption streams. However, as with any error, there may be some gear where this error will cause the loss of the CDP which includes the captioning stream.

CDP Service, Change flag does not match header

Explanation:

The CDP service information may be too large to place in a single CDP so may be broken into pieces and spread over more than one CDP. To allow for decoding of the service information there are flags to indicate the start and end of the service information and when the service information has changed. These flags reside in both the header of the CDP and in the service information section. An error is generated when the change of service information flag in the header does not match the same flag in the service information section.

Severity:

This is not normally a severe error because much equipment ignores the service information. It may cause service information to be removed as it passes through a device but this data is not typically used and will not cause any loss of data in the caption streams. However, as with any error, there may be some gear where this error will cause the loss of the CDP which includes the captioning stream.

CDP Service, Complete flag does not match header

Explanation:

The CDP service information may be too large to place in a single CDP so may be broken into pieces and spread over more than one CDP. To allow for decoding of the service information there are flags to indicate the start and end of the service information and when the service information has changed. These flags reside in both the header of the CDP and in the service information section. An error is generated when the completion of service information flag in the header does not match the same flag in the service information section.

Severity:

This is not normally a severe error because much equipment ignores the service information. It may cause service information to be removed as it passes through a device but this data is not typically used and will not cause any loss of data in the caption streams. However, as with any error, there may be some gear where this error will cause the loss of the CDP which includes the captioning stream.

CDP Service, Reserve Bits set incorrectly

Explanation:

The CDP service information area has bits at the beginning of the area that are always present which convey no information at this time but are reserved for future standardization. The SMPTE 334-2 standard defines how these bits should be set. This error is generated any time a reserved service information bit is not set according to the standard.

Severity:

Most devices do not check reserved bits so normally this error does not cause a problem. It may cause service information to be removed as it passes through a device but this data is not typically used and will not cause any loss of data in the caption streams. However, as with any error, there may be some gear where this error will cause the loss of the CDP which includes the captioning stream..

CDP Caption, 708 caption block sequencing error

Explanation:

The CEA 708 native captioning stream(s) are carried in triplets in the same fashion as the embedded CEA 608 captions streams. The first byte of the triplet identifies the type of data carried in the triplet and the other two bytes are the data. For 708 data, the first byte will define it as 708 data and whether this triplet starts a set of captioning service blocks. A start of the captioning service blocks start with a packet header which includes a size of the packet and a sequence counter. The sequence counter should count by one each time a new packet is received. An error is generated any time the count is not properly incremented.

Severity:

This is a very subtle error. The sequence number is used to keep the underlying caption streams synchronized and may cause some equipment to resync with the stream. In doing so, portions of CEA 708 captioning text may be lost. The effect on captioning is that CEA 608 data will be correct but characters or words will be missing from the CEA 708 captions.

CDP Caption, 708 Triplet count does not match caption count

Explanation:

The triplet count at the start of the caption section of the CDP indicates how may caption triplets there are in the caption section. This should match the number of triplets that must be carried for a given video frame rate. An error is generated if these two values do not match.

Severity:

The effect on downstream devices is unpredictable when this error is present. It means that there is either too much or too little caption data being delivered to the ATSC encoder for the given frame rate. Some gear may correct this problem without affecting the caption stream. Others may cause some caption data to be lost and still others may pass no captions at all.

CDP Caption, 708 Extra triplets in caption block

Explanation:

The size of the CEA 708 captioning packet is part of the header. This starts the processing of caption stream blocks until the last block is processed as indicated by a caption stream block with a null header. An error is generated if the size of the packet does not match the number of bytes processed to reach the end of the packet.

Severity:

This is a severe error and in most cases will cause a loss or corruption of caption streams.

CDP Service, Reserved bits incorrect, service index 0 to 15

Explanation:

This is actually a collection of 16 possible errors where the index will be 0 to 15. The service information has two parts. The first part is fixed and contains the service information flags and a count of the service information to follow. Count blocks of service information follows and the index will indicate which one contains the error. Each block has the service number, the language code, an aspect ratio flag and an easy reading flag. Each block has bits which convey no information at this time but are reserved for future standardization. The SMPTE 334-2 standard defines how these bits should be set. This error is generated any time a reserved bit is not set according to the standard.

Specifications

In This Chapter

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

Category	Parameter	Specification
Serial Digital Video Inputs	Number Of Inputs	One input
	Input Signal Standard Accommodated	SMPTE 292M
	Impedance	75Ω terminating in Active mode Loop-through to Video Output in Bypass mode, via the ONG-MDL-R01, R21 or R23 rear module.
	Equalization	Over 100 m of Belden 1694A cable
	Return Loss	>10dB to 1485 MHz
Serial Digital Video Outputs	Number of Outputs	Three SMPTE 292M outputs, in the same format as the input.
	Impedance	75Ω
	Return Loss	>10dB to 1485 MHz
	Signal Level	800mV ±10%
	DC Offset	0 Volts ±50 mV
	Overshoot	<8%
GPIO Outputs	Number and type of outputs	With ONG-MDL-R02 or R22 rear module: 8 pairs of isolated contacts. (Max 0.1A)
		With ONG-MDL-R01, R21 or R23 rear module: 8 logic outputs (3.3v) and 2 or 4 ground connections.
Other	Maximum Power Consumption	5W
	Warranty	1 year return to factory

Service Information

In This Chapter

This chapter contains the following sections:

- Troubleshooting Checklist
- Power LED Conditions
- Bootload Sequence
- Warranty and Repair Policy

Troubleshooting Checklist

Routine maintenance to this openGear product is not required. In the event of problems with your CDP-100, the following basic troubleshooting checklist may help identify the source of the problem. If the module still does not appear to be working properly after checking all possible causes, please contact your openGear products distributor, or the openGear Technical Support department at the numbers listed under the "**Contact Us**" section at the end of this manual.

1. **Visual Review –** Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the module, the frame, and any associated peripheral equipment for signs of trouble.
2. **Power Check –** Check the power indicator LED on the distribution frame front panel for the presence of power. If the power LED is not illuminated, verify that the power cable is connected to a power source and that power is available at the power main. Confirm that the power supplies are fully seated in their slots. If the power LED is still not illuminated, replace the power supply with one that is verified to work.
3. **Reseat the Card in the Frame** – Eject the card and reinsert it in the frame.
4. **Check Control Settings –** Refer to the Installation and Operation sections of the manual and verify all user-adjustable component settings.
5. **Input Signal Status –** Verify that source equipment is operating correctly and that a valid signal is being supplied.
6. **Output Signal Path –** Verify that destination equipment is operating correctly and receiving a valid signal.
7. **Module Exchange** – Exchanging a suspect module with a module that is known to be working correctly is an efficient method for localizing problems to individual modules.

Power LED Conditions

The top front edge of the module has a Power LED which indicates card status. The Power LED displays the following conditions:

- **Off** - there is no power.
- **Green** - the card is running with valid input.
- **Flashing green** - the boot loader is waiting for, or receiving, a software upload.
- **Orang**e – there is a signal or configuration error. Check the inputs and menus.
- **Red** - the card is not operational. This will occur if, for example, there is no video input. Check the inputs, reseat the card, press the Reset button, or call Technical Support.

Bootload Sequence

In the unlikely event of a complete card failure, you may be instructed by a Ross Video Technical Support specialist to perform a complete software reload on the CDP-100. To perform this task, follow these steps:

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 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 the last operational software load.

Software loads can be sent to the CDP-100 from DashBoard, using the MFC-8300 Series Network Controller card.

Warranty and Repair Policy

The CDP-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 CDP-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 CDP-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 User Manual provides all pertinent information for the safe installation and operation of your CDP-100. Ross Video policy dictates that all repairs to the CDP-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 CDP-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 CDP-100. If required, a temporary replacement module will be made available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited will be shipped collect.

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

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**	9 John Street, Iroquois, Ontario, Canada K0E 1K0
	Ross Video Incorporated	P.O. Box 880, Ogdensburg, New York, USA 13669-0880

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Ross Part Number: CDP100DR-004-02