HDCC-708TX

(CEA-608/CEA-708 Closed Caption/Subtitle Card)

- **HDCC-708TX-OG1 (openGear Platform)**
- **HDCC-708TX-1CH (MC-1RU Platform)**

Multi-Purpose, HD/SD-SDI Closed Caption Inserter Card

Configuration Guide

Firmware Version: V2.46
Software Version: V0.68

Part Number 821190, Revision C

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CHAPTER 1
Getting Started

Introduction

Overview

This chapter describes the basic captioning functions that you can perform using your Wohler HDCC-708TX-OG1 (for the Ross DFR-8321 frame) and HDDC-708TX-1CH (for the Wohler MC-1RU frame) products (collectively called HDCC).

Goals for This Chapter

- ✓ Provide a Quick Start process that gives an overview of the installation.
- ✓ Identify the HDCC card's connectors.
- ✓ Understand the captioning functions the HDCC card performs.

Topics

Product Description

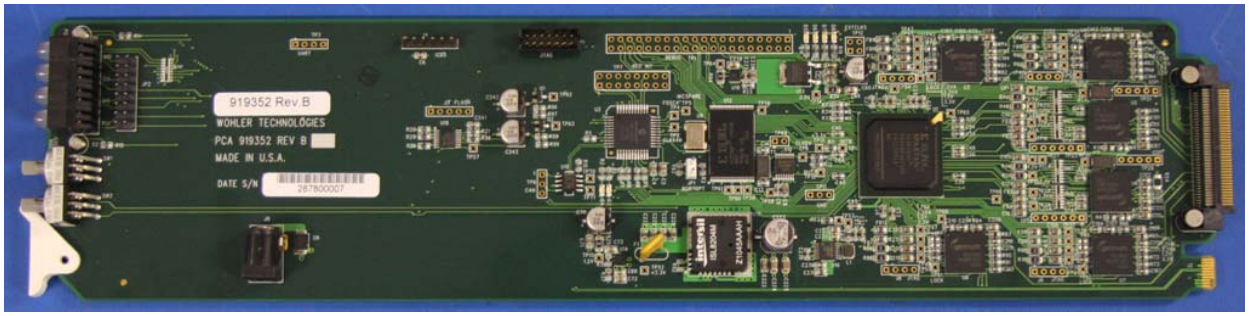
The HDCC is a card for encoding captions on HD/SD-SDI video streams in real time.

You can operate the HDCC in either a Ross® openGear® DFR-8321 frame or in Wohler's MC-1RU frame. (See Chapter 2: Hardware Installation on page 11 for installation instructions.)

When operated in the Ross frame, the card is configured and controlled through DashBoard® software. In the Wohler MC-1RU frame the card is configured and controlled through HDCCRegEdit. (Refer to Using DashBoard on page 35 or Using HDCCRegEdit on page 51 for instructions.)

The HDCC is a one-channel card that allows a single HD/SD-SDI stream to pass through. Caption data goes to and from the card through several available serial connections: RS-232, USB, and Ethernet (via a virtual serial port).

Figure 1–1 HDCC Card



Quick Start Guides

Figure 1–2 on page 3 and Figure 1–3 on page 4 illustrate the installation and configuration processes for the Ross DFR-8321 frame and the Wohler MC-1RU frame respectively.

Figure 1–2 Quick Start, Ross DFR-8321 Frame

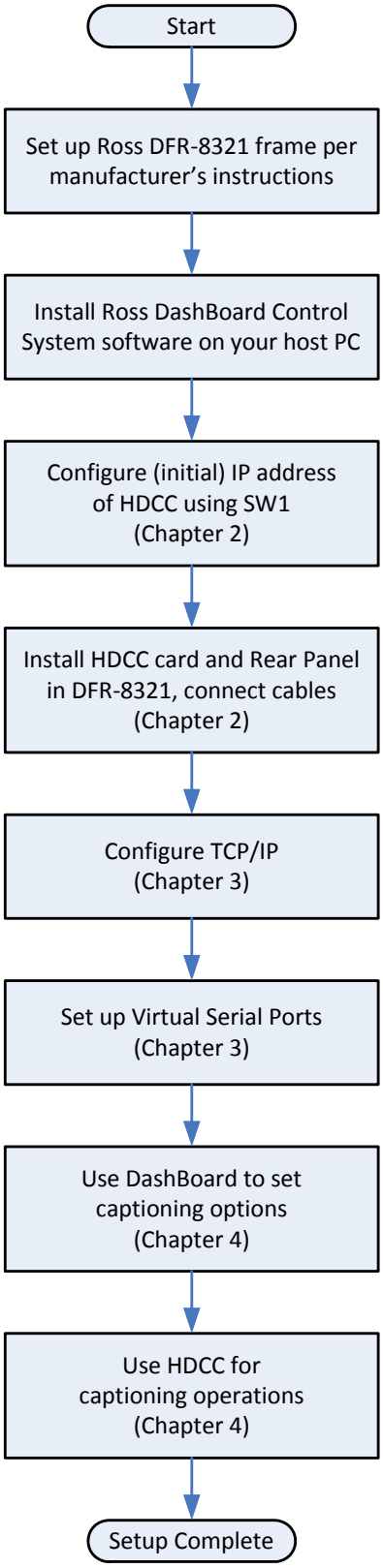
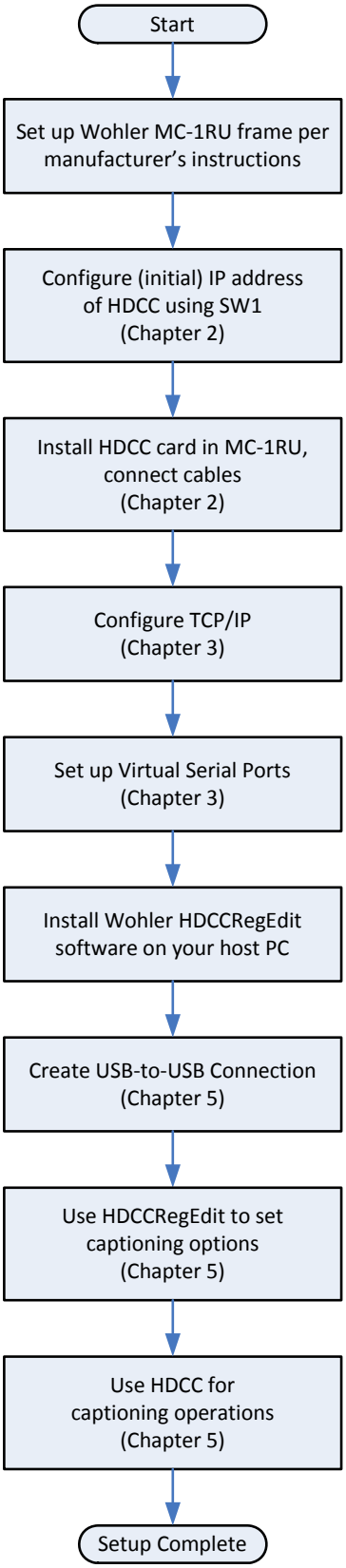


Figure 1–3 Quick Start Wohler MC-1RU Frame

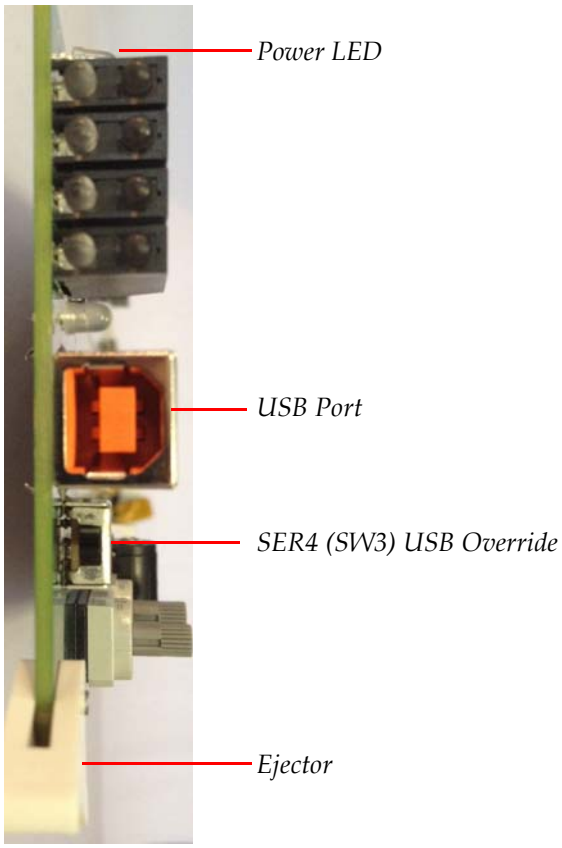


I/O Connections

Front Edge

The HDCC card's front edge has a power LED (lit when power is applied), a USB port, and a USB override switch. The USB port is useful during the initial setup.

Figure 1–4 HDCC Front Edge

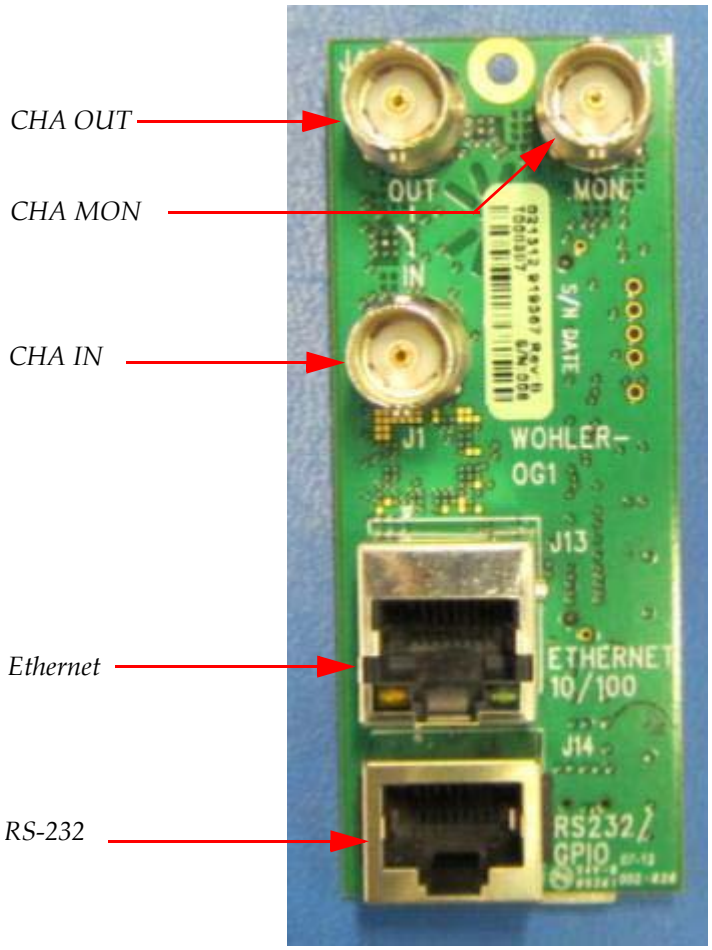


HDCC in Ross DFR-8321 Frame

The HDCC-OG1 consists of two main parts: the HDCC board which goes into a DFR-8321 slot, and the OG1 Rear Panel which is attached to the rear of the frame.

Figure 1–5 shows the input and output connectors of the Rear Panel supplied with the HDCC card. The input is **CHA IN** and the output is **CHA OUT**. The monitoring output **CHA MON** provides a duplicate of the regular output to be sent to a monitor for display with burned-in captions.

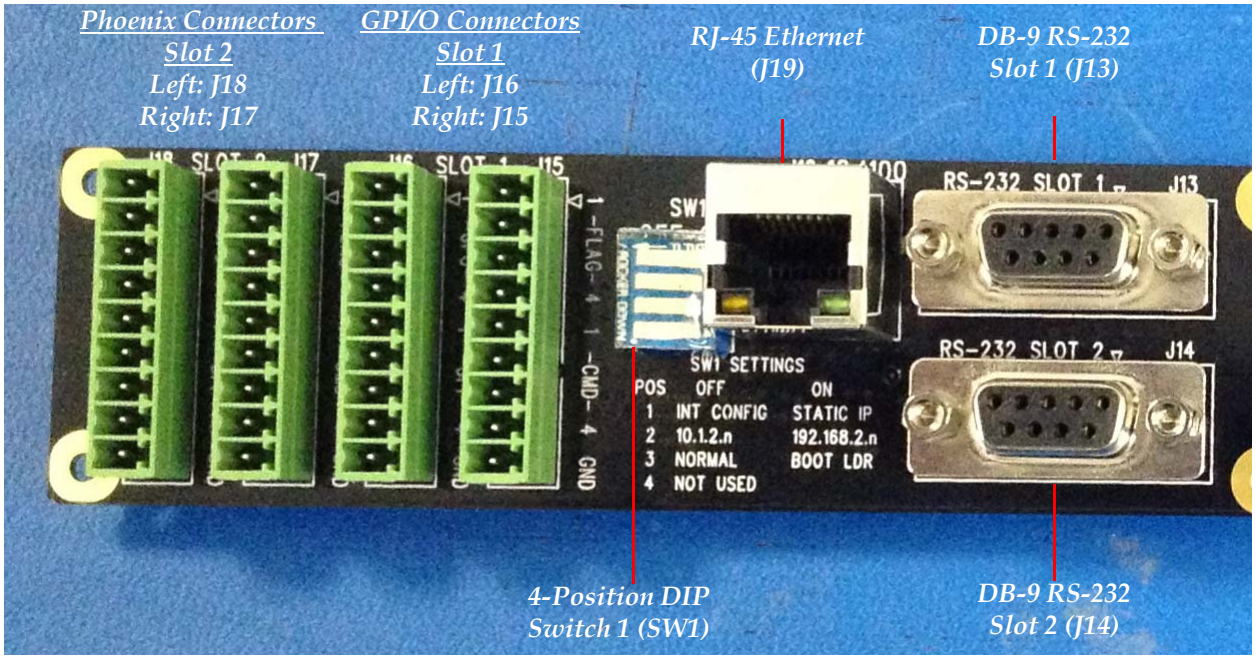
Figure 1–5 OG1 Rear Panel



HDCC in Wohler MC-1RU Frame

The HDCC-1CH is designed to be used in a Wohler MC-1RU frame. The MC-1RU Rear Panel provides all of the I/O connections.

Figure 1–6 MC-1RU Rear Panel - Left Side



Note: Refer to Appendix B: Connector Pin Assignments on page 77 for detailed pin-out descriptions for each connector.

Figure 1–6 above and Figure 1–7 below show the input and output connectors of the MC-1RU Rear Panel.

Figure 1–7 MC-1RU Rear Panel - Right Side

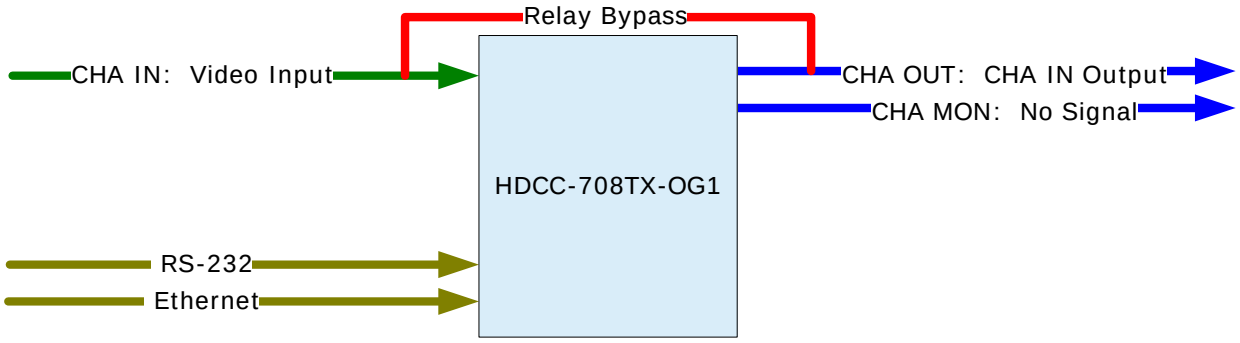
The input is **CHA IN** and the output is **CHA OUT**. The monitoring output (**CHA MON**) allows a duplicate of the regular output to be sent to a monitor for display with burned-in captions.

Important: Channel B connections (**CHB IN**, **CHB OUT**, and **CHB MON**) are not functional with the 708TX-OG1 applications.

Relay Bypass

To prevent the loss of the broadcast signal in the event of power failure, each input is bypassed via a relay to its respective output, ensuring the signal will always pass through the card.

Figure 1–8 Relay Bypass - No Power Condition

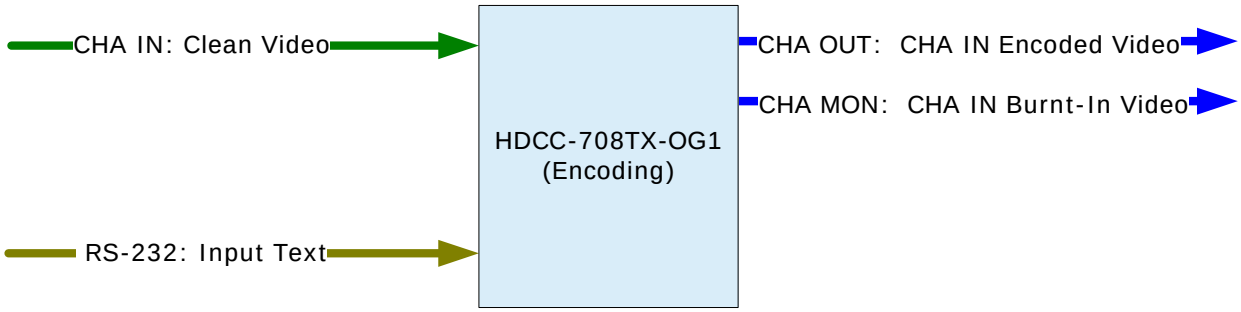


Encoding

The HDCC can receive caption data from either the RS-232 port, the USB port, or one of two available Ethernet virtual serial ports, and embed it into the input video stream. The monitoring output channel allows the encoding to be visually confirmed by displaying the video with captions overlaid. Moreover, you can simultaneously encode Channels A and B from either the same source or a different one.

The following example shows the connections necessary to encode user-supplied caption data onto the video stream using the RS-232 port. See Figure 1–9 on page 9.

Figure 1–9 Encoding Setup



Example: The caption data supplied on RS-232 is encoded onto the video stream supplied at **CHA IN** and output to **CHA OUT** and **CHA MON**.

Connections	
Port	**Data**
CHA IN	SMPTE HD/SD-SDI video stream with no captions present.
CHA OUT	SMPTE HD/SD-SDI video stream with user-supplied captions encoded.
CHA MON	SMPTE HD/SD-SDID video stream with burned-in captions to monitor.
RS-232	**Input**: Closed caption input data, Grand Alliance/ SMPTE333/CDP format. **Output**: None.

CHAPTER 2
Hardware Installation

Introduction

Overview

This chapter explains how to install your HDCC card in the Ross DFR-8321 frame or in the Wohler MC-1RU frame.

Goals for This Chapter

- ✓ Install your HDCC card in a Ross DFR-8321 or Wohler MC-1RU chassis.
- ✓ Set **SW1** to configure a static IP address or DHCP for your HDCC card.

Topics

Safety Instructions

1. Read, keep, and follow all of these instructions; heed all warnings.
2. Do not use this equipment near water or expose the equipment to rain or moisture.
3. Use only the adaptors specified by the manufacturer.
4. Unplug the equipment during lightning storms or when unused for long periods of time.
5. Refer all servicing to qualified service personnel. Servicing will be required under all of the following conditions:
   - The equipment has been damaged in any way.
   - Liquid had been spilled or objects have fallen onto the equipment.
   - The equipment has been exposed to rain or moisture.
   - The equipment does not operate normally.
   - The equipment has been dropped.

Unpacking

CAUTION! Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling the circuit boards in high static environments such as carpeted areas, and when synthetic or wool fiber clothing is worn. Always exercise proper grounding precautions when handling circuit boards.

Unpack each HDCC that you have received from its shipping container and check the contents against the packing list to ensure that all items are included. If any items are missing or damaged, please contact your Wohler sales representative immediately.

Decision Point:

If you will be installing your HDCC card into a Wohler MC-1RU, skip down to Installing the HDCC in the Wohler MC-1RU on page 16.

Otherwise, if you will be installing your HDCC card into a Ross DFR-8321 frame, continue on to Installing the HDCC in the Ross DFR-8321 immediately below.

Installing the HDCC in the Ross DFR-8321

Requirements

Tools

To install and use the HDCC, you will need a small Phillips screwdriver for attaching the rear panel adaptor to the frame.

Chassis

Ross DFR-8321 openGear frame

Hardware

- HDCC card
- OG1 Rear Panel
- Screw
- O-Ring

Installation

To install the HDCC board and OG1 Rear Panel in the frame, follow the steps below:

1. Ensure that the Ross DFR-8321 frame is properly installed.
2. Power down the frame.

Important: The OG1 requires two slots of the Ross DFR-8321 chassis.

3. Insert the screw into the two corner holes of the rear panel. Refer to Figure 2–1 below.

Figure 2–1 The OG1 Rear Panel

4. After you have inserted the screw into the OG1 Rear Panel, place the O-ring on the screw. .

Important: The HDCC's IP address is determined by dip switch **SW1** on the inner surface of the OG1 rear panel. You may want to set the switch positions on **SW1** before installing the adapter in the frame. If so, skip ahead to Rear Panel DIP Switch on page 17, then come back here to finish the installation.

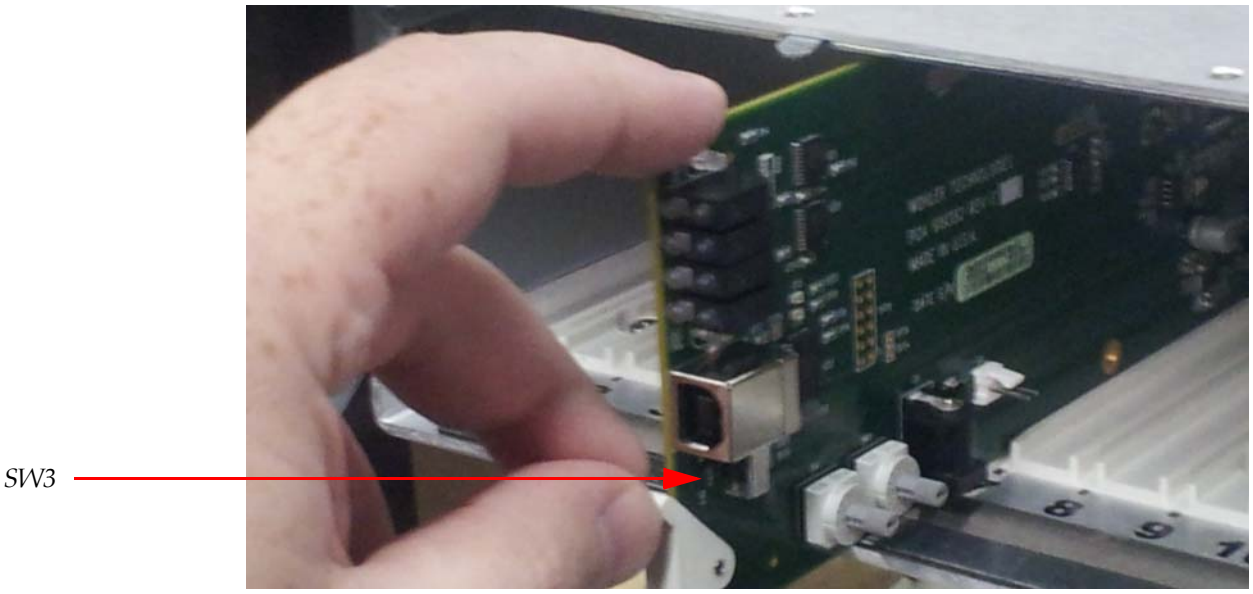
5. With the rear of the frame facing you, sit the rear panel into the base slot and tighten the top screw(s).

Figure 2–2 Rear Panel Installed

6. With the front of the frame facing you, press inward on both tabs to disengage the front panel from the chassis and pull the front panel towards you and then down.

7. Insert the card so that the ejector is at the bottom (Figure 2–3 on page 15) and then close the front panel.

Figure 2–3 Open DFR-8321 Frame



Note: Ensure that **SW3** is in the **Off** position.

8. When complete, skip ahead to Rear Panel DIP Switch on page 17.

Installing the HDCC in the Wohler MC-1RU

Requirements

Tools

None

Chassis

Wohler MC-1RU frame

Hardware

HDCC card

Installation

To install the HDCC , follow the steps below

1. Ensure that the Wohler MC-1RU frame is properly installed. Refer to the *MC-1RU Installation Guide* (part number 821084).
2. Remove the power cord from the MC-1RU to power it down.
3. Remove the MC-1RU's front panel by loosening the two captive screws.
4. With the components facing up and the ejector to the right, slide the HDCC-xCH board into either Slot 1 or 2. The connectors will positively engage and the ejector will bottom out when the board is fully seated.
5. Re-install the MC-1RU's front panel.

Rear Panel DIP Switch

Both the MC-1RU and OG1 Rear Panel have a miniature DIP switch, SW1, that sets the IP address of the card. On the MC-1RU, SW1 is a rocker-type DIP switch next to the Ethernet port on the rear panel. On the OG1, SW1 is a slider-type DIP switch and is on the inside surface of the board.

Position 1 is set to **On** at the factory so that the card's IP address will be based on the previously stored configuration (by default, to use DHCP network settings). If Position 1 is **Off**, the static IP address set by Position 2 will apply.

Table 2–1 Rear Panel DIP Switch Position Functionality

Position	Off	On	Default
1	Use internal settings for IP address.	Use static IP address determined by position 2.	**Off**
2 (DFR-8321 and MC-1RU Slot 1)	Static IP= 10.2.1.4	Static IP= 192.168.2.4	**Off**
2 (MC-1RU Slot 2)	Static IP= 10.2.1.5	Static IP= 192.168.2.5	
3	Normal boot.	Execute boot loader.	**Off**
4	Not Used.		

Important: Position 3 should always be **Off**.

Important: If you're using the default static IP address, be aware that because the static IP addresses defined by the switch are *always* the same, no more than one HDCC card (or one MC-1RU frame) can be connected to the network **until** you change the card's (or frame's) TCP/IP settings (see next chapter).

Important: If you are setting up more than one HDCC card, you may need to clear your computer's ARP cache (that identifies which Ethernet MAC addresses are associated with which IP addresses) after you connect each HDCC card. Othewise, you may be unable to connect because your cache contains outdated information.

To clear the cache, open a Windows command prompt and type:
`arp -d *`

Next Steps

1. Connect the SDI, serial, and Ethernet cables as needed.
2. Set up virtual serial ports (VSPs) if needed. Refer to next chapter.

Important: This concludes the procedure for installing the HDCC card and its rear panel.

If you want to configure your Ethernet port to support serial communications, continue on to Chapter 3: TCP/IP Configuration and Virtual Serial Ports (VSPs) on page 19.

CHAPTER 3
TCP/IP Configuration and Virtual Serial Ports (VSPs)

Introduction

Overview

This chapter describes how to configure your HDCC card for use on a TCP/IP network and how to install virtual serial ports (VSPs) to communicate with you HDCC card.

Goals for This Chapter

- ✓ Configure your HDCC card's TCP/IP settings.
- ✓ Create Virtual Serial Ports (VSPs) to provide serial port-like access to your HDCC card.

Topics

Functional Overview

Virtual Serial Ports (VSPs) on the HDCC

Caption data is supplied to and received from the HDCC via serial ports. In addition to the RS-232 port (J14 on the OG2 rear panel, or J13 and J14 on the rear panel of the MC-1RU) serial data is also accessible over the Ethernet port using virtual serial ports. The HDCC provides two virtual serial ports as shown in Figure 3–1 below.

Figure 3–1 HDCC to PC Connectivity

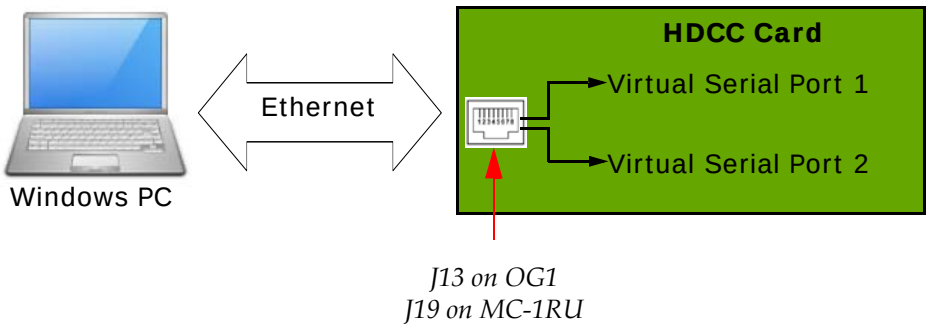


Figure 3–1 above provides a functional overview of the virtual serial port configuration. You can use third party software (link provided below) to create a virtual serial port which will transfer serial data to and from the HDCC over Ethernet. From the PC user's perspective, the virtual serial ports are indistinguishable from the hardware serial ports.

Once the virtual serial ports are operational, you can change the HDCC settings through DashBoard or HDCCRegEdit to control how these serial ports are routed to the captioning system.

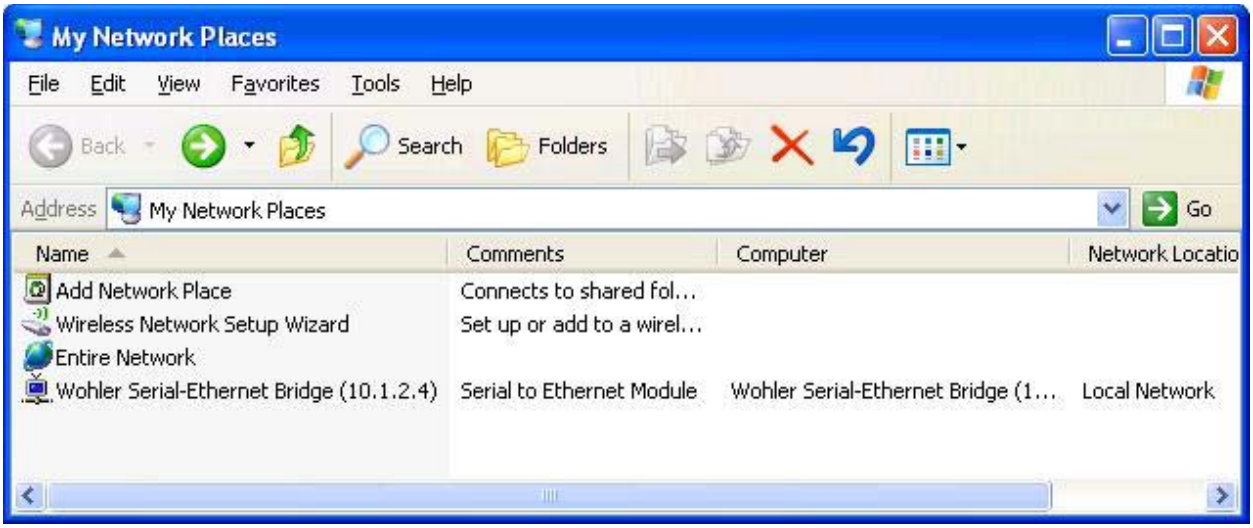
Required Information

To set up a virtual serial port (VSP) you must know the HDCC card's IP address and telnet port numbers. Once you have this information, the serial port redirector software can be configured.

Finding the HDCC on the Network

The HDCC card is factory set for **DHCP/AutoIP**. If you connect the HDCC card to a network with a DHCP server, the HDCC card's IP address will be assigned automatically. If you are using a Windows-based computer you will be able to see the card in **My Network Places** as shown in Figure 3–2 below.

Figure 3–2 HDCC Shown in My Network Places



Note: If you are using a Wohler MC-1RU chassis, two Wohler serial-Ethernet bridges will appear: each slot has its own IP address.

Note: The default IP address can be set by SW1. See the previous chapter

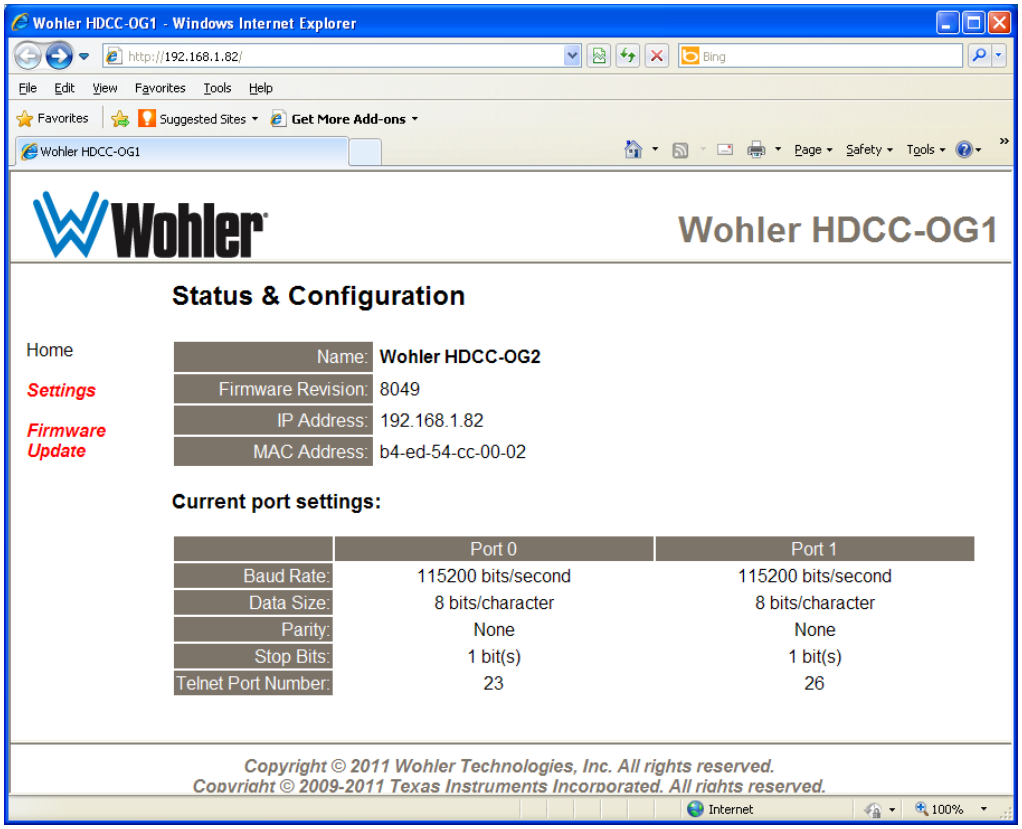
Assigning a Static IP Address/Enabling DHCP

Double-clicking on the Wohler Serial-Ethernet Bridge (see Figure 3–2 above) will open a web browser and take you the card's configuration page where you can set a static IP address, if desired.

You can also reach the HDCC card configuration screen through a web browser by entering the IP address in the address bar. Refer to Figure 3–3 below.

Important: The HDCC uses telnet ports 23 and 26 for Eth VSP1 and VSP2 respectively. We **highly** recommend that you do not change these port numbers. All subsequent instructions depend on these port values.

Figure 3–3 HDCC Configuration Page



1. Click **Settings** on the left hand side of the screen (Figure 3–3 above).

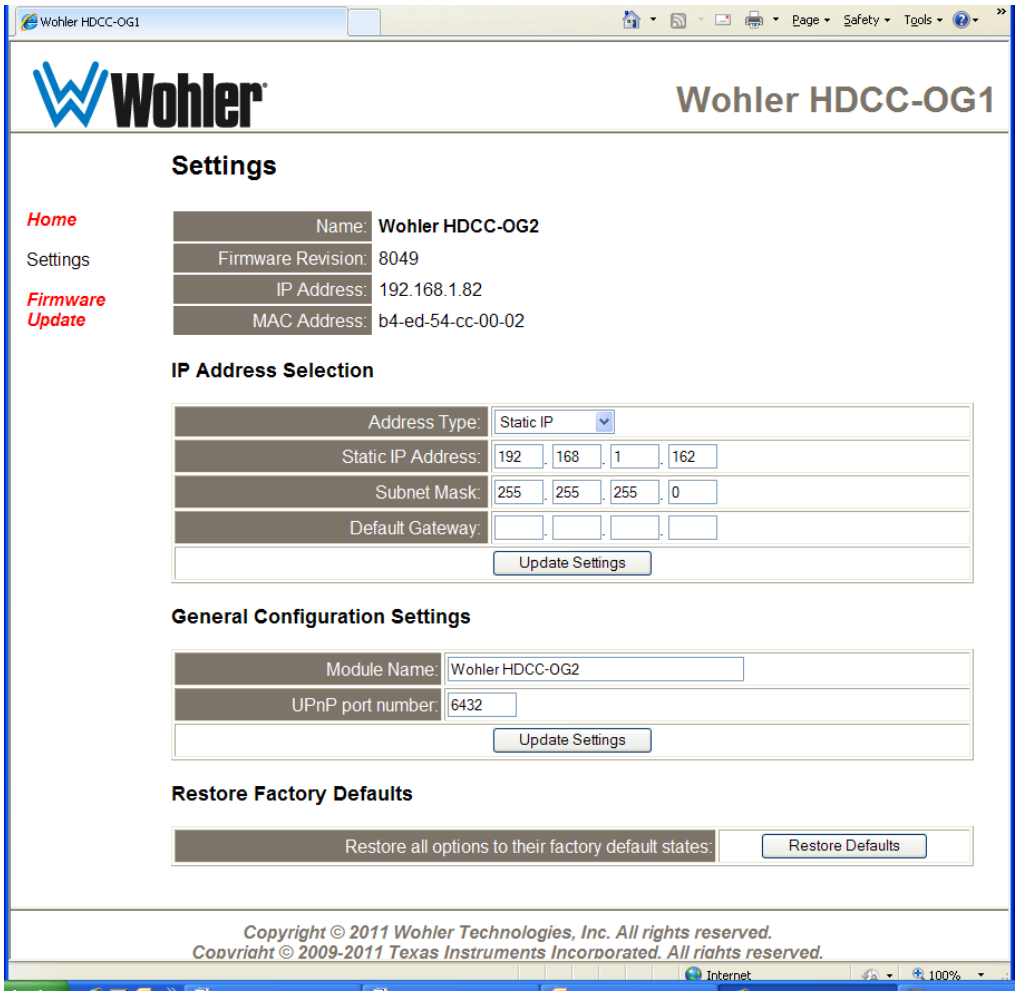
2. When the **Settings** screen appears (Figure 3–4 on page 23) click the drop down in **Address Type** to change it to **Static IP** or **DHCP/AutoIP**. If you're using DHCP, skip to Set 6. Othewise, continue to Step 3.

3. Enter the new **Static IP Address** for your network provided by your network administrator.

4. If needed, enter a different **Subnet Mask** (Figure 3–4 on page 23).

5. If your network administrator provides you with a **Default Gateway**, enter that, too.

Figure 3–4 Settings Menu

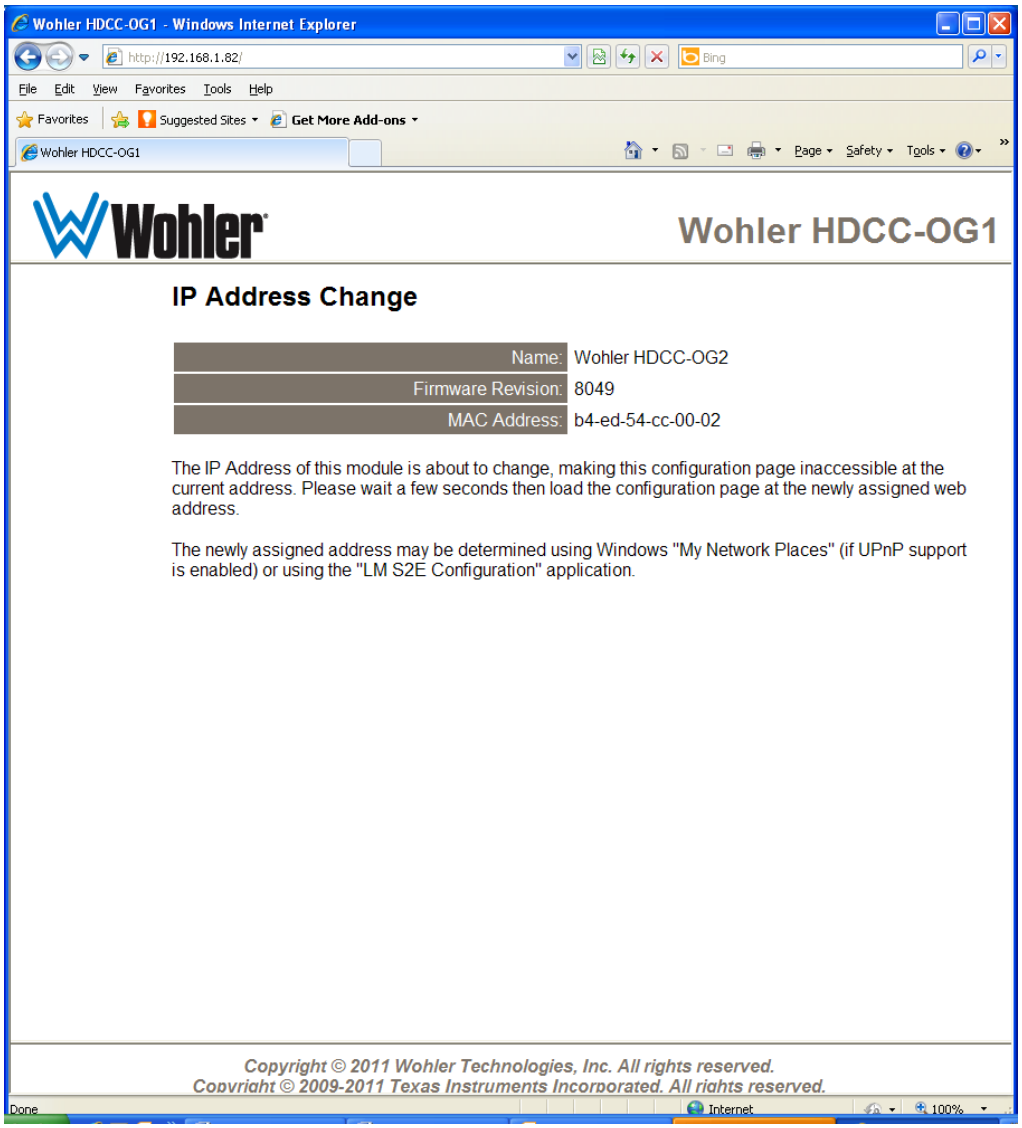


WARNING! Verify that all information is correct for your network. The HDCC card will become unreachable on your network if the wrong information is set.

If this occurs consult your IT department for assistance. You can set the card to a known static IP address using the DIP switch on the rear panel.. See Rear Panel DIP Switch on page 17 for details.

6. Once the information is accurate, click on the **Update Settings** button in the **IP Address Selection** section.

Figure 3–5 IP Address Change



7. Close this window (Figure 3–5 above).

8. Set **SW1** Position 1 so that the card will use the TCP/IP configuration you just set.

9. Power cycle the card.

Important: If SW1 Position 1 is set to **On**, the card will continue to use its default static IP address.

Creating VSPs with the Lantronix Redirector

The Lantronix Redirector software allows you to create VSPs quickly and easily.

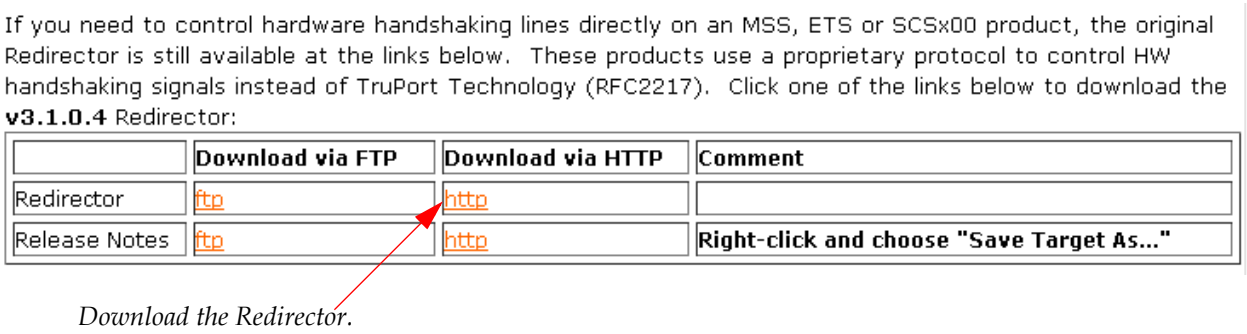
Software Installation

1. Launch your web browser and navigate to http://ltxfaq.custhelp.com/app/answers/detail/a_id/928.

Important: Download only the legacy version 3.1.0.4. Do not use a more recent version. None of them will connect to the card's Ethernet interface.

2. Scroll to the bottom of the page and click on the **http** link for the **Redirector**.

Figure 3–6 Redirector Download Location



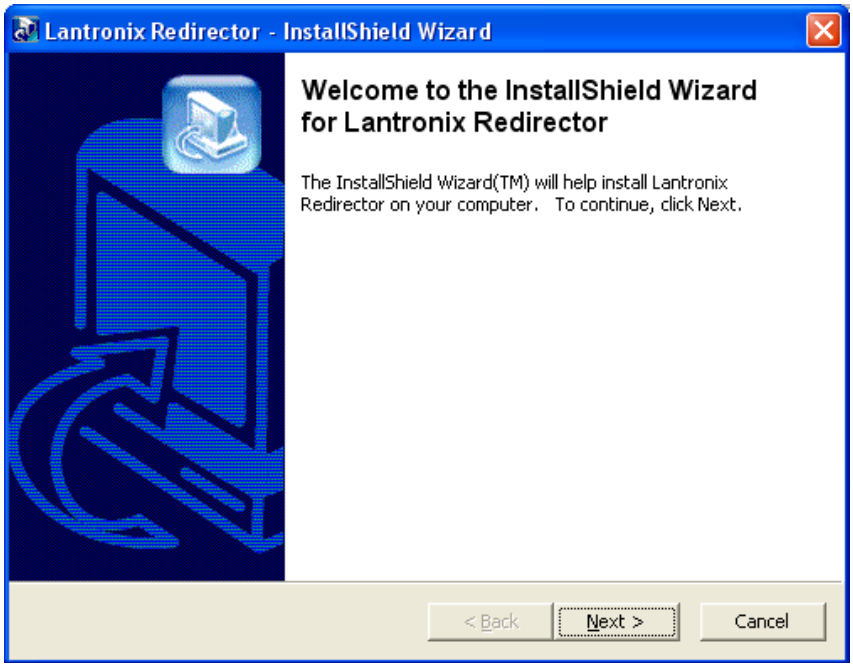
Download the Redirector.

3. Once the file is downloaded, double-click **red32.bit.exe** to install.

Figure 3–7 Open File - Security Warning

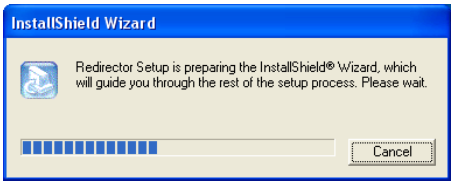
4. When the initial installation screen displays (Figure 3–7 above) click **Run**.

Figure 3–8 Lantronix Welcome Screen



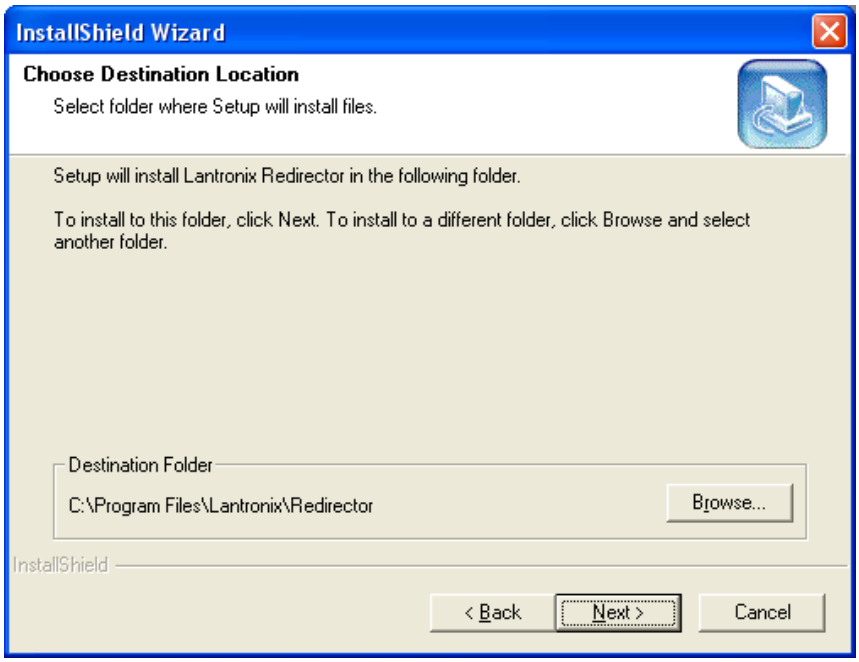
5. When the **Welcome** screen displays (Figure 3–8 above) click **Next**.

Figure 3–9 InstallShield



6. The **InstallShield** screen will quickly display and then return you to the Welcome screen. Click **Next** again.

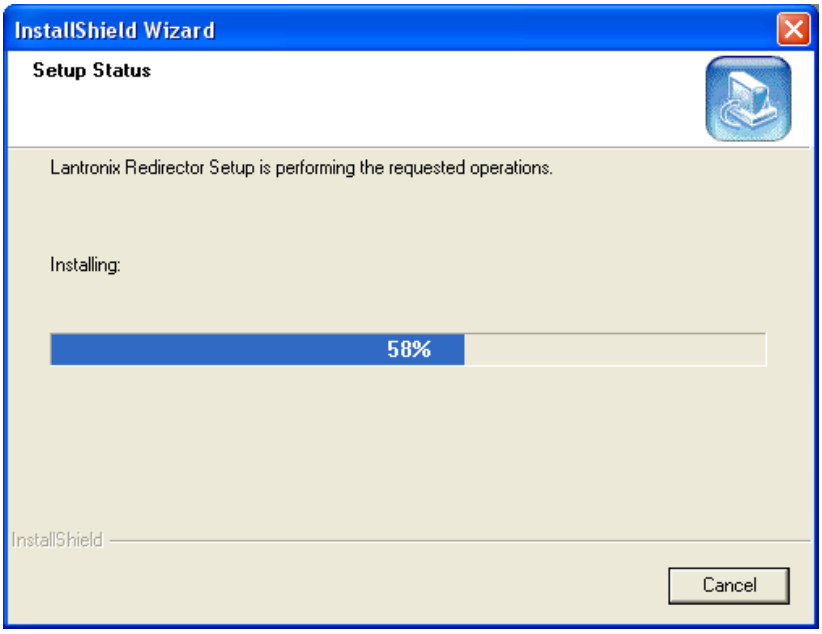
Figure 3–10 Choose Destination Location



7. When the **Choose Destination Location** screen displays, accept the default and click **Next**.

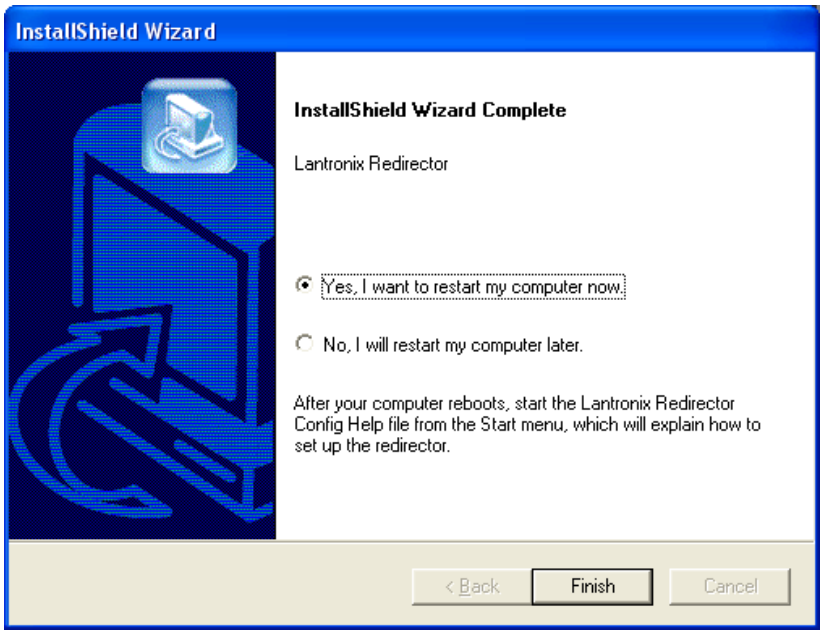
   The **Setup Status** screen (Figure 3–11 on page 28) will display and quickly complete the file installation.

Figure 3–11 Setup Status



8. Before the wizard completes, take a moment to close all other applications on your PC before the system restarts your computer.

Figure 3–12 Wizard Complete



9. When the **InstallShield Wizard Complete** screen displays, verify that **Yes,...** is selected, and click **Finish**. The system will restart.

VSP Configuration

Now that the software is installed, you can set up VSPs.

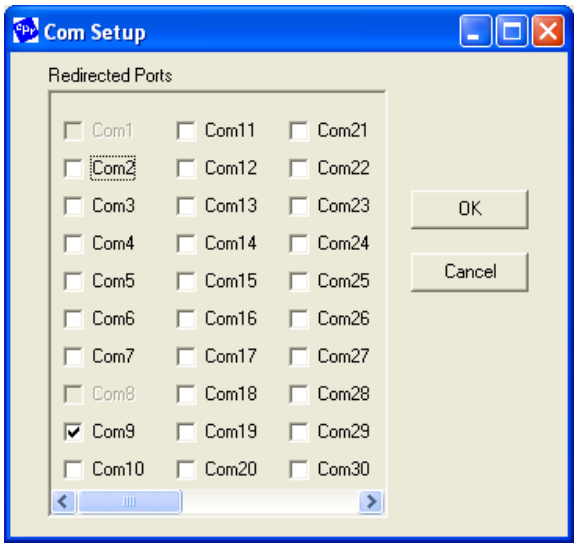
1. After your computer reboots, launch the Lantronix Redirector by clicking the **Start** menu ⇨ **Programs** ⇨ **Lantronix** ⇨ **Redirector** ⇨ **Configuration**.

Figure 3–13 Lantronix Redirector Configuration

Important: Each HDCC has provision for two virtual serial ports; each MC-1RU frame therefore has provision for four virtual serial ports (two HDCC cards times two VSPs per card). For each HDCC card, you will perform Steps 2 through 12 twice: once for VSP#1 and again for VSP#2.

2. Click **Com Setup** on the left side of the screen.

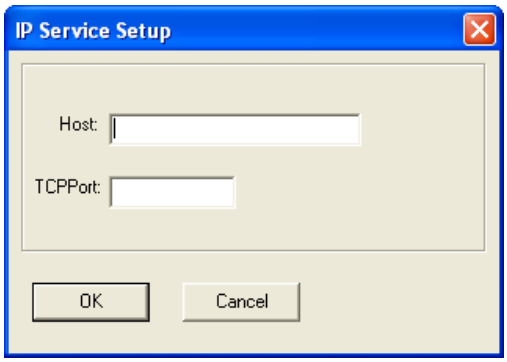
Figure 3–14 Com Setup



3. Assign an available **Com** port (in our example Com9 is selected) and click **OK**.

4. Click **Add IP** on the right side of the screen.

Figure 3–15 Wizard Complete



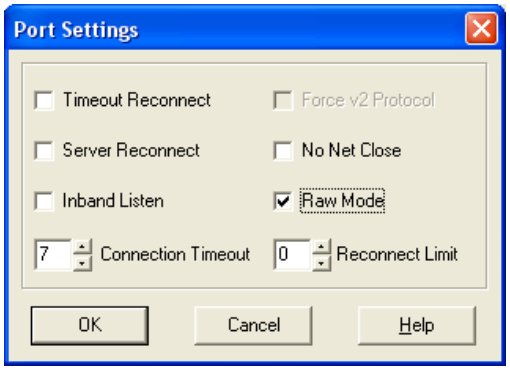
5. In the **Host** field (Figure 3–15 above) enter the IP address of your HDCC card. (Use **My Network Places** to rediscover it if necessary.)

6. In the **TCPPort** field (Figure 3–15 above) enter the telnet port number and click **OK**.

7. For VSP#1, this will be 23. For VSP#2 this will be 26.

8. Click **Port Settings**.

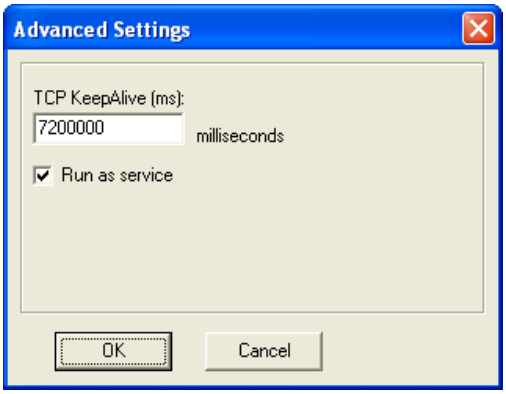
Figure 3–16 Port Settings



9. Check **Raw Mode** (Figure 3–16 above) and click **OK**.

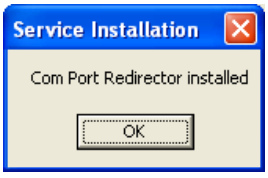
10. Click **Advanced** at the top left corner of the application window.

Figure 3–17 Advanced Settings



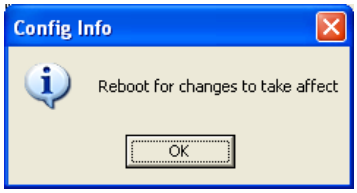
11. When the Advanced Settings dialog appears (Figure 3–17 above) check the **Run as service** box and click **OK**.

Figure 3–18 Service Installation



12. When the **Service Installation** (Figure 3–18 above) dialog appears, click **OK**.

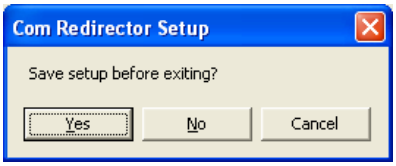
Figure 3–19 Config Info



13. When the **Config Info** dialog displays (Figure 3–19 above) click **OK**.

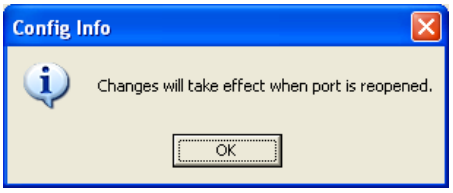
14. When the application window reappears, click **Close** near the center of the screen.

Figure 3–20 Com Redirector Setup



15. When the **Com Redirector Setup** dialog appears (Figure 3–20) click **Yes**.

Figure 3–21 Config Info



16. When the **Config Info** dialog displays (Figure 3–21 above) click **OK**.

17. Reboot the computer to enable the VSPs. You shoulld now have two available COM ports that will serve as serial connections to the HDCC card.

Next Steps

If you are using the Ross DFR-8321 frame, proceed to the next chapter, Using DashBoard on page 35.

If you are using the Wohler MC-1RU, proceed to Chapter 4: Using HDCCRegEdit on page 51.

CHAPTER 4
Using DashBoard

Introduction

Overview

This chapter explains how to use the HDCC card in a Ross DFR-8321 frame with the DashBoard Control System™ (the PC graphic user interface, from here on referred to as *DashBoard*) to configure your HDCC card.

Important: If you are using the HDCC card in a MC-1RU frame, skip this chapter and continue on to Using HDCCRegEdit on page 51.

Goals for This Chapter

- ✓ Use Ross's DashBoard Control System to operate your HDCC card.
- ✓ Learn the steps required for common captioning tasks.

Topics

Starting DashBoard

The operations of the HDCC card are controlled by the settings of internal registers, which are easily and intuitively configured with DashBoard.

1. Make sure your openGear™ DFR-8321 frame is installed, the HDCC card is installed within it, and DashBoard has been installed on a PC that is networked to the frame.

2. Power up the frame.

3. Open the DashBoard application by double-clicking the desktop icon or selecting it from the Start menu.

4. When the application opens, it will discover any openGear frames on the network and display them in the left side window of the main screen (Figure 4–1 below) the DashBoard tree. Clicking on the frame's entry in this window will show cards that are installed within it.

   Note: Depending on the frame contents, the card may take several minutes to appear in the list.

Figure 4–1 DashBoard Tree

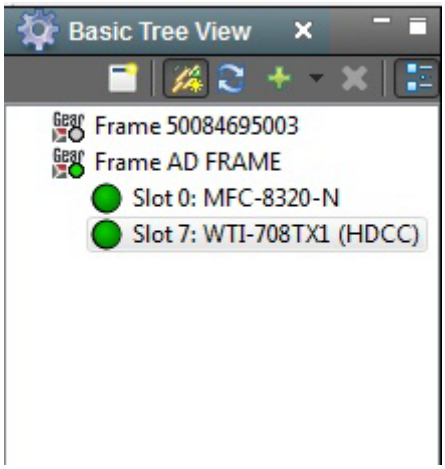
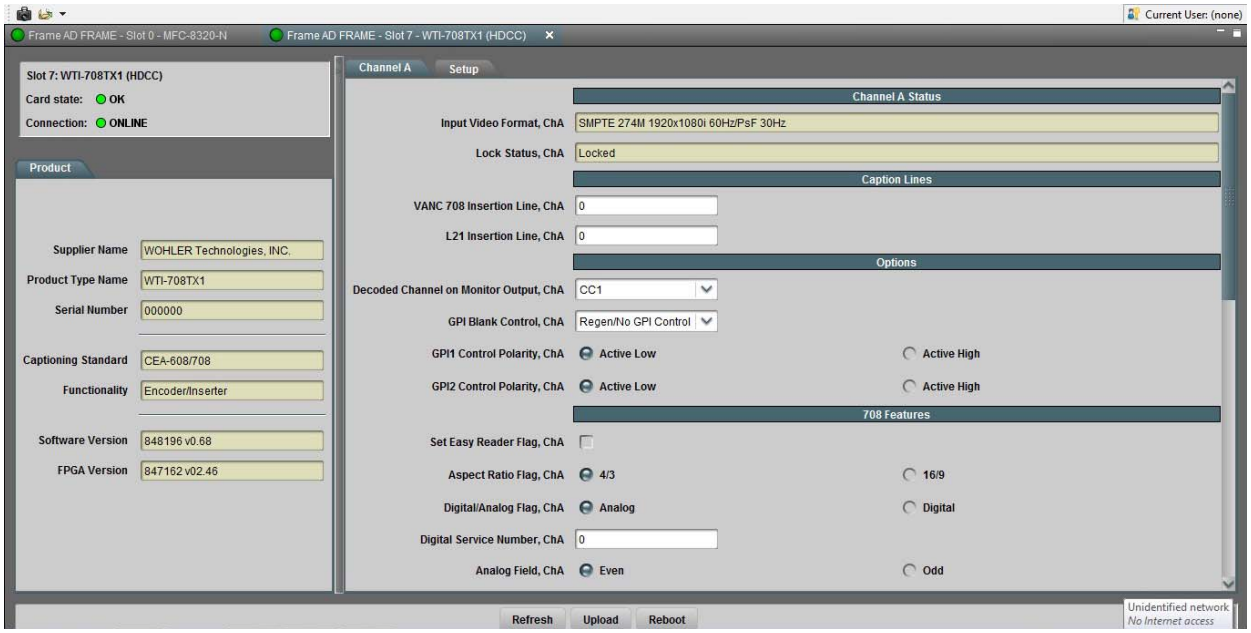


Figure 4–2 DashBoard Main Screen (Top)



Note: The Wohler HDCC-708TX-OGx card will appear as **WTI-708TX1 (HDCC)** in the list of cards installed in the frame.

5. Double-click on the HDCC card in the list of cards and the user interface will appear in the main screen.

6. If everything is in order, the **Card state** and **Connection** indicators in the left frame of the window will be green and product information will appear in the Product submenu (see Figure 4–3 below).

Figure 4–3 Product Information Pane

Figure 4–3 on page 37 shows some product details about the HDCC that may be helpful at a future date, including the software and FPGA firmware part numbers and revisions.

Common Controls

At the bottom of the screen (no matter which tab is selected) you can perform two systemic functions.

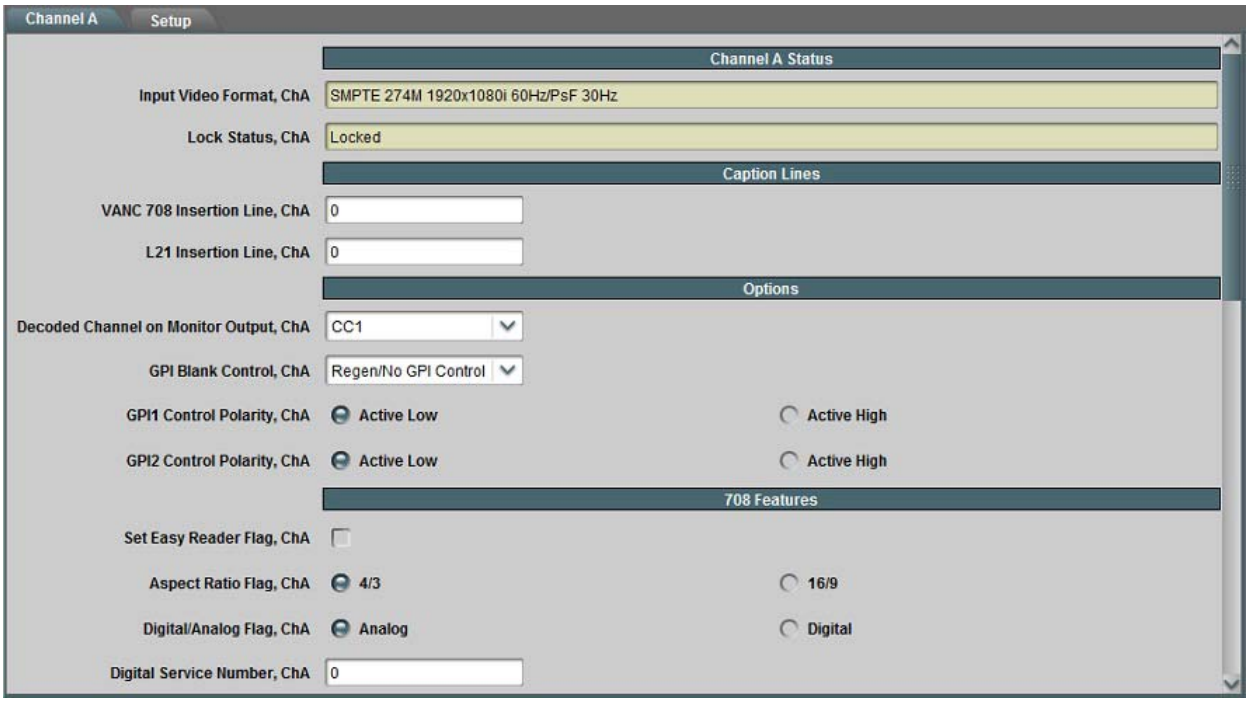
- **Upload**: Not currently used.
- **Refresh**: Clicking this button causes the HDCC card to re-query all the settings. A screen indicating that the card is busy will appear while the system is refreshing.
- **Reboot**: Clicking this button causes the HDCC card to reboot. A screen indicating that the card is busy will appear while the system is rebooting.

Channel A Tab

Click the Channel A tab in DashBoard and change the settings (see Figure 4–4 below) to customize your configuration.

Notice that the Channel A menu is divided into sections, each with a heading that describes the features below. We'll cover each of the options of each section below.

Figure 4–4 Channel A (Top)



Channel A Status

None of these fields are user-editable; they reflect the state of the input video channel as it is measured.

- **Input Video Format**: The video format (resolution, frame rate) of the incoming signal
- **Lock Status**: Whether the hardware has locked onto an incoming video signal

Caption Lines

- **VANC 708 Insertion Line**: The video line for HD video formats on which CEA-708 captions are present or will be placed.
- **L21 Insertion Line**: The video line for SD video formats on which CEA-608 captions are present or will be placed.

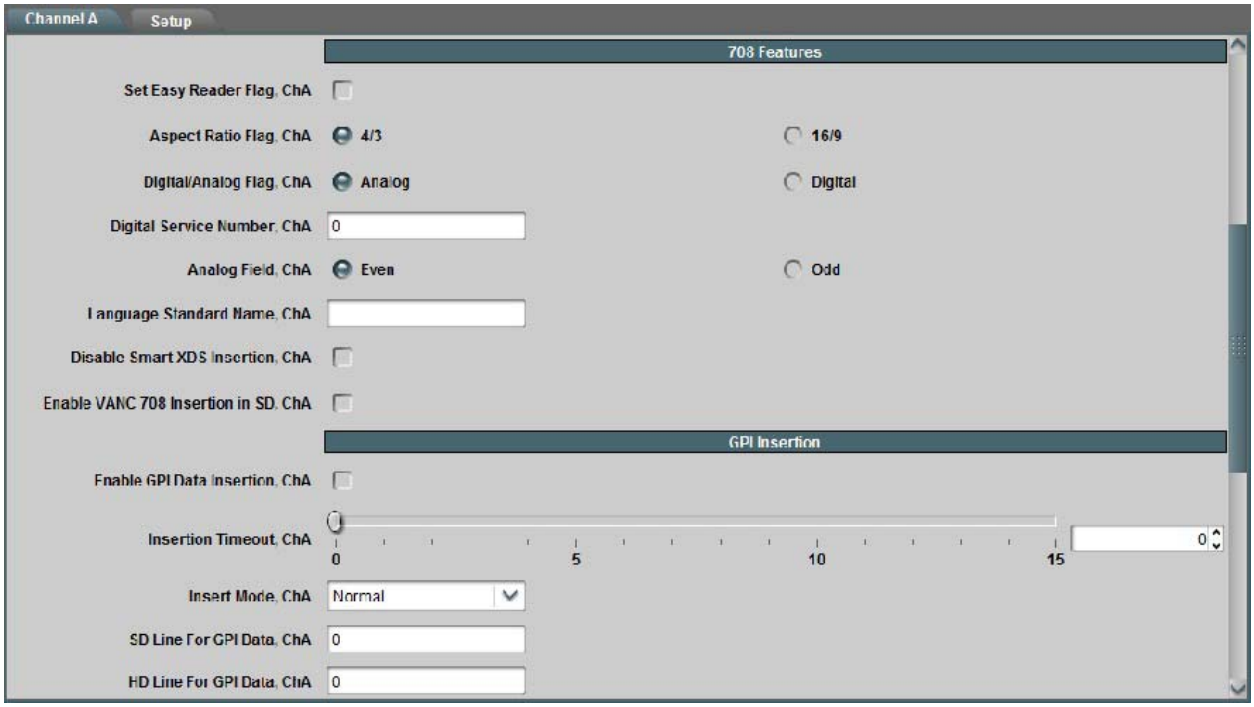
Options

- **Video Outputs**
  - Normal: **CHA OUT** output is clean and **CHA MON** output has burned-in captions.
  - Both clean
  - Both monitoring (burned-in)
- **GPI Blank Control**: Specifies how GPI control of caption blanking works:
  - No GPI Control: No GPI stimulus will blank captions.
  - GP1..GP4: Determines which GPI blanks captions.
- **GPI Tx Control Polarities (1..4)**: Controls how GPI inputs are interpreted:
  - Active Low: External switch closure to ground activates.
  - Active High: External switch open activates.

708 Features

- **Set Easy Reader Flag**: Sets flag indicating if caption data is at language appropriate for language learners.
- **Aspect Ratio**: Sets flag denoting either 4:3 or 16:9 content.
- **Digital/Analog**: Sets a flag indicating whether captions are older analog type or newer digital type.
- **Digital Service Number**: Sets the service number of the captioning service. Enter a number from 1 to 63 inclusive.
- **Analog Field**: Click either **Even** (for Field 1) or **Odd** (for Field 2).
- **Language Standard Name**: Sets the language code for the captions, usually "eng."

Figure 4–5 Channel A (Part 2)



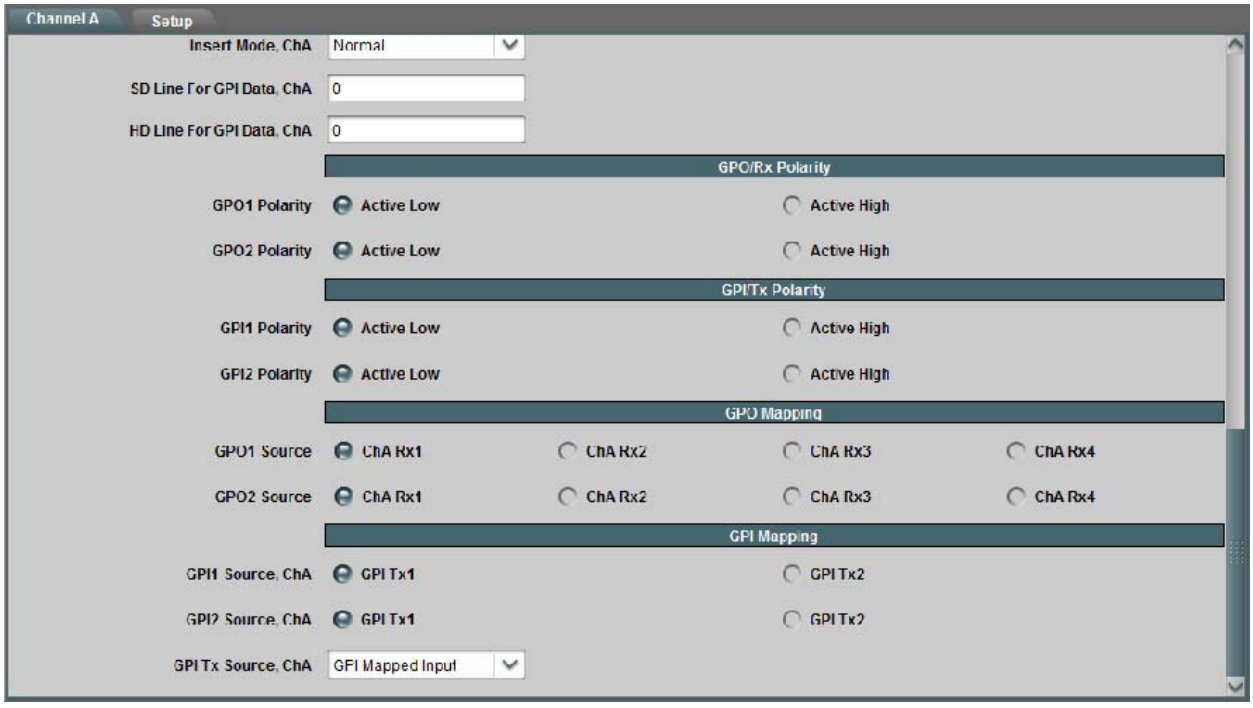
- **Disable VANC 608/708 Insertion Without CDP**: Disables the insertion of captions when no caption data packets are being received.
- **Disable Smart XDS Insertion**: Disables Smart XDS insertion.
- **Enable VANC 708 Insertion in SD**: Enables VANC 608/708 insertion.
- **Decoded Data Output Format**: Controls the format of decoder caption data packets. Select either **Normal/Grand Alliance** or **Raw Data**.
- **Omit 708 Packets from Decoder Output** (B37 only): Check this box to omit 708 packets from the decoder output.

GPI Insertion

- **Enable GPI Data Insertion**: Controls whether data provided on the GPI inputs of the card will be encoded on the video signal.
- **Insertion Timeout**: Click and drag the slider to select the number of seconds for the timeout.

- **Insertion Mode**: Controls whether captions are permanently inserted in the absence of new encoding data, or whether the card falls back to regen mode according to the timeout specified in Insertion Timeout.
- **SD Line for GPI Data**: Specifies the line on which the GPI data will be encoded when the signal is SD.
- **HD Line for GPI Data**: Specifies on which line the GPI data will be encoded when the signal is HD.

Figure 4–6 Channel A (Part 3)



GPO/Rx Polarity

GPO Rx Polarities: Specifies how GPO output of received data will be presented:

- **Active High**: The output voltage is high if the bit is set.
- **Active Low**: The output voltage is low if the bit is set.

GPI/Tx Polarity

GPI Tx Polarities: Specifies how GPI input of received data will be interpreted:

- **Active High**: The output voltage is high if the bit is set.
- **Active Low**: The output voltage is low if the bit is set.

GPO Mapping

GPO Rx (1..4) Sources: These control how data bits that are encoded on an incoming video stream of Channel A or B are routed to the Rx1..4 pins on the GPI/O connector.

GPI Mapping

GPI Tx (1..4) Sources: These control how inputs on the Tx1..4 pins of the GPI/O connector are encoded on an output video stream of either Channel A or B.

The Setup Tab

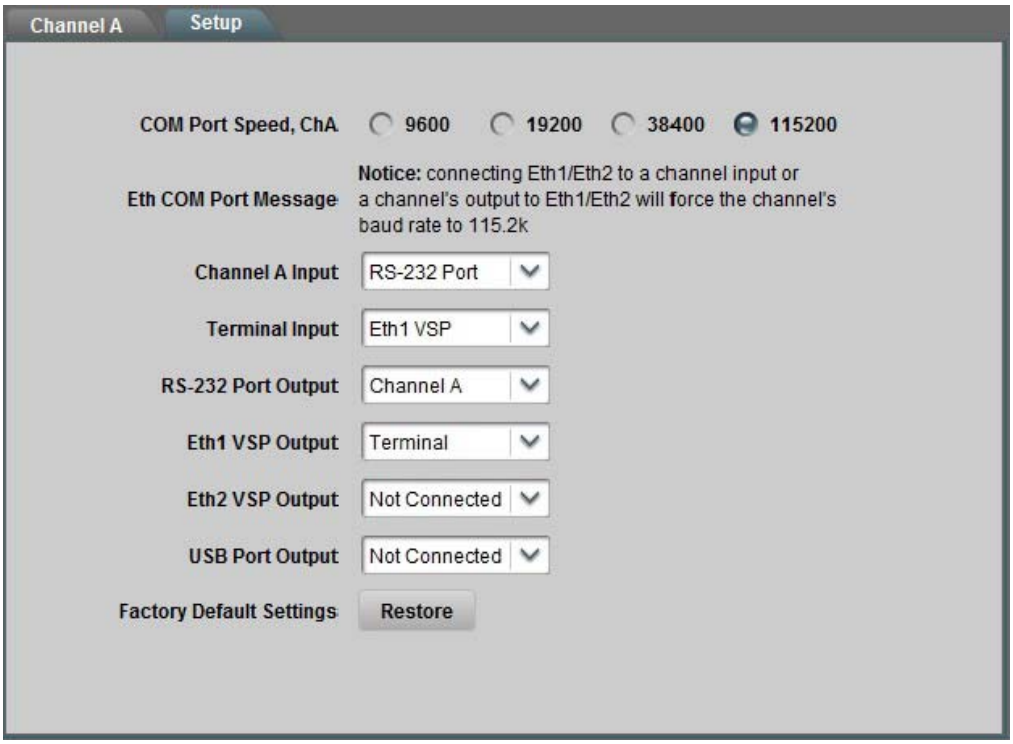
The **Setup** tab (Figure 4–7 on page 44) allows you to set the Com port speed for both channels and reload the factory default settings.

- **Com Port Speed, Ch A**: Click either 9600, 19200, 38400, or 115200.

Important: If a virtual serial port is connected (for encoding or decoding) the baud rate **must** be 115200.

- **Factory Default Settings**: Clicking the **Restore** button displays a confirmation dialog and then allows you to reload all the factory default settings of the card.

Figure 4–7 System Setup



How Do I...?

In this section we provide a list of questions and answers to help you set up and use your new HDCC product as efficiently as possible.

How do I encode captions on Channel A using the RS-232 port?

Situation: You have an incoming video stream on Channel A and you want to encode captions on it using data supplied by **RS-232**.

Preparation: Make sure a cable with a video stream is connected to **CHA IN** input, the card/frame is powered and operational, and a serial cable is connected from your caption generator to the card's **RS-232** port.

Process:

1. In the **Setup** menu, set the **Channel A** input to "RS-232" and the **COM Port Speed, ChA** to the baud rate used by your captioning system.

2. In the **Channel A** menu, in the **Caption Lines** section, set the **VANC 708 Insertion Line, ChA** (if signal is HD), **L21 Insertion Line, ChA** (if SD), or **HD Line for B37 Insertion, ChA** (if B37) to the video line to which you want the captions encoded.

Caption data supplied on **RS-232** will be encoded on the video stream coming out of **CHA OUT**.

How do I encode captions on Channel A using a Virtual Serial port?

Situation: You have an incoming video stream on Channel A and you want to encode captions on it using data supplied by virtual serial port **Eth1 VSP**.

Preparations: Make sure a cable with a video stream is connected to **CHA IN** input, the card/frame is powered and operational, an Ethernet cable connects the HDCC card to your network, and that you have established an Ethernet virtual serial port (see the Installation Guide for instructions on doing this).

Process:

1. In the **Setup** menu, set the **Channel A** input to "Eth1 VSP" and the **COM Port Speed, ChA** to 115.2k. The baud rate for a channel must always be set to 115.2k when an Ethernet virtual serial port is connected to it; however, your captioning system can still set the baud rate to any desired setting in the range 9,600 to 115.2k.

2. In the **Channel A** menu, in the **Caption Lines** section, set the **VANC 708 Insertion Line, ChA** (if signal is HD), **L21 Insertion Line, ChA** (if SD), or **HD Line for B37 Insertion, ChA** (if B37) to the video line to which you want the captions encoded.

Caption data supplied on **Eth1 VSP** will be encoded on the video stream coming out of **CHA OUT**.

How do I set general purpose transmission bits on Channel A?

Situation: You want to set general purpose transmission bits on a video stream to cue downstream equipment, etc.

Preparation: Connect a switch-closing circuit for the **TXIN1-4** pins on connector **J18**. Provide a video input on **CHA IN** and a video output on **CHA OUT**.

Process:

1. Check the **Enable GPI Data Insertion, ChA** check box on the **Channel A** menu.

2. If you want encoding to time out (and revert to passing received data), select an interval using the **Insertion Timeout ChA** slider in the **Channel A** menu.

3. Select the insertion mode using the **Insert Mode, ChA** drop-down list:

   - "Normal" means encoding will time out after the interval selected in step 2.
   - "Permanent, Field 0" will keep the input data present on the odd.
   - "Permanent, Field 1" will keep the input data present on the even field.
   - "Permanent, Both" will keep the input data present on both fields.

4. Enter a video line for the data in **SD Line for GPI Data, ChA** text box (for SD video signals) and in **HD Line for GPI Data, ChA** text box (for HD video signals).

5. The polarity of the input-active high—(a high input means "1") or active low (a low input means "1")—can be set for each of the TXIN1-4 inputs with the controls in the GPI/Tx Polarity section. For example, if GPI Tx1 Polarity is set to "Active Low," then a low input (switch closed) on the TXIN1 pin will correspond to a set ("1") bit in the transmission stream.

6. The mapping of the TXIN1-4 bits to the transmitted bits can be set with the controls in the **GPI Mapping** section.

7. If **GPI Tx Source, ChA** is set to "GPI Mapped Input," the transmitted bits will be as assigned by the **TXIN1-4** inputs. If pass-through of existing data bits is desired, select "GPI Input OR GPI Rx."

Transmitted bits will now be encoded on Channel A according to the inputs you provide and the settings you've chosen.

How do I receive general purpose transmission bits on Channel A?

Situation: You are receiving a video stream with transmission bits encoded upon it and you want to drive the outputs on the GPIO connector based on their values.

Preparation: Connect your video input to **CHA IN**. Sense (or provide output circuit for) RXOUT1-4 outputs on **J18** connector.

Process:

1. Enter a video line for the data in **SD Line for GPI Data, ChA** text box (for SD video signals) and in **HD Line for GPI Data, ChA** text box (for HD video signals).

2. The polarity of the output-active high—(a high output means a "1" in the transmission stream) or active low (a low output means "1")—can be set for each of the RXOUT1-4 outputs with the controls in the GPO/Rx Polarity section. For example, if GPO Rx1 Polarity is set to "Active Low," then a high transmission bit will correspond to a low output on the RXOUT1 pin.

3. The mapping of the RXOUT1-4 pins to the received bits can be set with the controls in the GPO Mapping section.

   Note: Received bits from either/both video channels can be used to drive the RXOUT1-4 outputs.

Received bits will now be represented on the RXOUT1-4 pins of **J18** according to the received data bits and the settings you've chosen.

CHAPTER 5
Using HDCCRegEdit

Introduction

Overview

HDCCRegEdit is a Windows application that enables a user to configure and operate cards installed in the MC-1RU. This chapter describes how to install the HDCCRegEdit application.

Goals for This Chapter

- ✓ Perform the initial setup with a USB-to-USB connection.
- ✓ Control your HDCC card with any available serial connection.
- ✓ Use HDCCRegEdit to operate your HDCC card.
- ✓ Learn the steps required for common captioning tasks.

Topics

Setup

To install HDCCRegEdit, copy the executable file from the CD-ROM included with your card to the desktop (or a convenient folder) on your Windows-based PC. It can be executed from there by double-clicking its icon.

Note: HDCCRegEdit is written in Java and requires a Java VM in order to run. If you do not already have the Java VM installed, you will be prompted to do so when you execute HDCCRegEdit.

Each running instance of HDCCRegEdit communicates with one of the cards installed in the MC-1RU. To communicate with both cards simultaneously, simply open another instance of HDCCRegEdit.

Connection Methods

HDCCRegEdit communicates with each card via a serial connection. Each card installed in the MC-1RU can connect to the outside world through four serial ports:

- One port via an RS-232 connector on the rear panel,
- Two ports via the Ethernet connector on the rear panel, and
- One port via the USB connector on the card (accessible when the MC-1RU's front panel is removed).

However, for the *initial* setup (the first time you configure the card) you can only use USB-to-USB Connection.

USB-to-USB Connection

This method entails connecting the host computer to the card with a USB cable. USB-to-USB is **always** available no matter how the card is configured. Follow the instructions below.

1. Remove the power cord from the the MC-1RU to power it down.

2. Open the front panel of the MC-1RU by loosening the captive screws.

3. Identify which card you wish to configure.

4. Move the **SW3** switch (between the card's USB connector and the ejector) to **On**.

5. Connect a USB cable (Type A male to Type B male) from a USB port on the machine running HDCCRegEdit to the USB port on the card you are configuring.

Important: The HDCC's USB interface is not hot-pluggable. Either connect it with the power off, or power cycle after connecting the cable.

6. Replace the MC-1RU's power cord to power up the chassis.

7. Install FTDI USB-serial virtual COM port drivers if necessary (visit FTDI's web site at `http://www.ftdichip.com/Drivers/VCP.htm` to download).

8. Run HDCCRegEdit by following the instructions below using the COM port created in Step 7.

Important: If you subsequently choose to control the card through a different means (RS-232, Ethernet as below), remember to set the **SW3** switch on the card back to **Off**.

Important: Although the card can be controlled by any of the serial connection methods, you MUST connect with the USB-to-USB connection method described above if you want to change the serial method that controls the card.

RS-232 Serial Connection

This method is very easy but will only work after your card is configured to be controlled this way. Follow the instructions below.

Important: You cannot use this method for the initial setup.

1. Connect a serial cable from the host computer's serial port (or from a USB serial dongle installed in your computer's USB port) to the 9-pin **RS-232** port on the back of the MC-1RU. Make sure to connect to the connector for the particular slot your board is in. The RS-232 connectors are identified **Slot 1** and **Slot 2**.

2. Set up the USB-to-USB connection as described in the section entitled USB-to-USB Connection on page 52.

   A. Launch HDCCRegEdit.

   B. Change the **Inbound data routing** to **Serial** and **To Serial** to **Registers**.

   C. Save the changes by clicking on **Apply to both channels**.

   D. Click on the **Connection** tab then click on the **Disconnect** button.

   E. Power off the HDCC card.

   F. Set the **SW3** switch to **Off**.

   G. Power on the HDCC card.

3. Run HDCCRegEdit using the COM port that corresponds to your RS-232 connection.

A third connection method is available, but it can only be selected when HDCCRegEdit is up and running with the USB-to-USB connection.

Ethernet Virtual Serial Port Connection

This method is more complicated and will only work if your card is configured to be controlled this way; that is, you can only set this method once you have HDCCRegEdit connected via USB-to-USB or RS-232. Follow the instructions below.

Important: You cannot use this method for the initial setup.

1. Make sure your MC-1RU has network connectivity and is accessible to the computer running HDCCRegEdit (see Chapter 3: TCP/IP Configuration and Virtual Serial Ports (VSPs) on page 19).

2. Make sure the Virtual Serial Port (VSP) software is installed. This will give you two serial ports that can be used to connect with HDCCRegEdit. See Chapter 3: TCP/IP Configuration and Virtual Serial Ports (VSPs) on page 19 for detailed instructions to install a VSP.

3. Connecting with the USB-to-USB Connection on page 52,

   A. Launch HDCCRegEdit.

   B. Change the **Inbound data routing** to **Ethernet 1 or Ethernet 2** and change **To Ethernet 1** or **To Ethernet 2** to **Registers**.

   C. Save the changes by clicking on **Apply to both channels**.

   D. Click on the **Connection** tab then click on the **Disconnect** button.

   E. Power off the HDCC card.

   F. Set the **SW3** switch to **Off**.

   G. Power on the HDCC card.

4. Run HDCCRegEdit per below using either of the COM ports created in Step 2 on page 54.

Establishing Communications from the PC to the HDCC

1. On the PC, launch **HDCCRegEdit**.

   Note: The HDCCRegEdit application runs on Microsoft© Windows XP, Windows Vista, and Windows 7.

2. When the application window displays (Figure 5–1 below) click **Scan** to display the available COM ports.

Figure 5–1 HDCC Registry Editor

3. On the **Connection** tab, open the drop down list for the **Serial port** and select the serial port that corresponds to your USB port.

4. In the **Port settings** section, do not change the port settings. Use the settings shown in Figure 5–2 below.

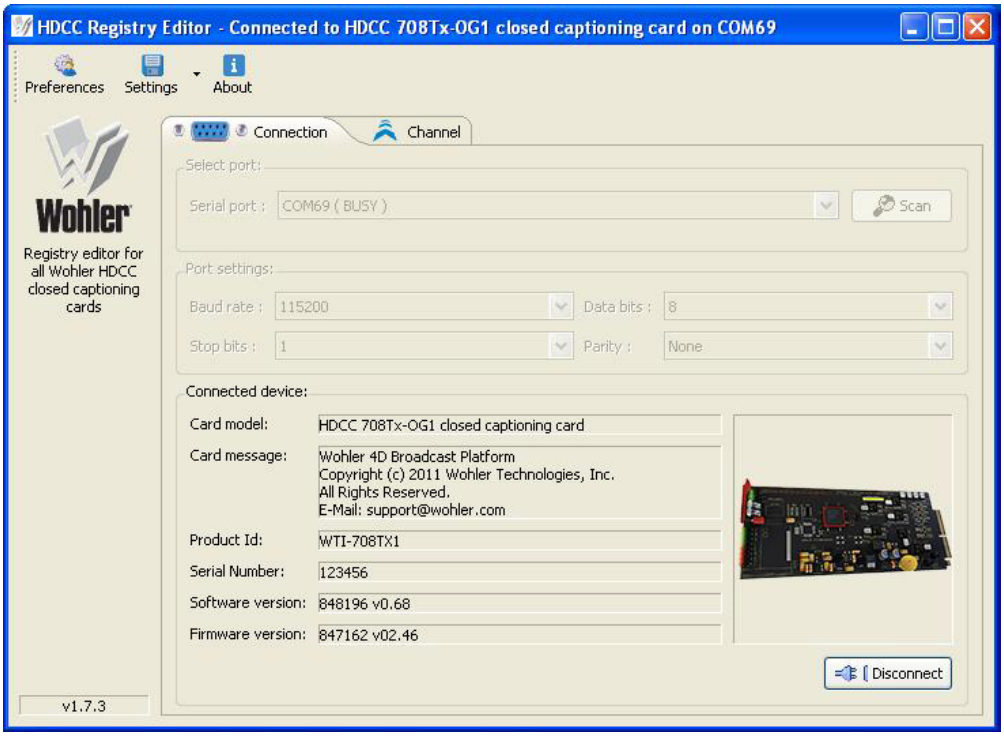
Important: Port settings should remain at 115.2k, 8 data bits, no parity, 1 stop bit in the **Connection** tab for the current HDCC hardware platform. Only these settings will permit connection to the card.

5. Click **Connect**.

Figure 5–2 Setting the Port Settings

When the PC has established communications with the HDCC card, the **HDCCRegEdit** application window will display the Wohler copyright and the software part number and version (Figure 5–3 below).

Figure 5–3 Connected to the HDCC Card



Common Controls

At the bottom of the screen (no matter which tab is selected) you can perform several systemic functions.

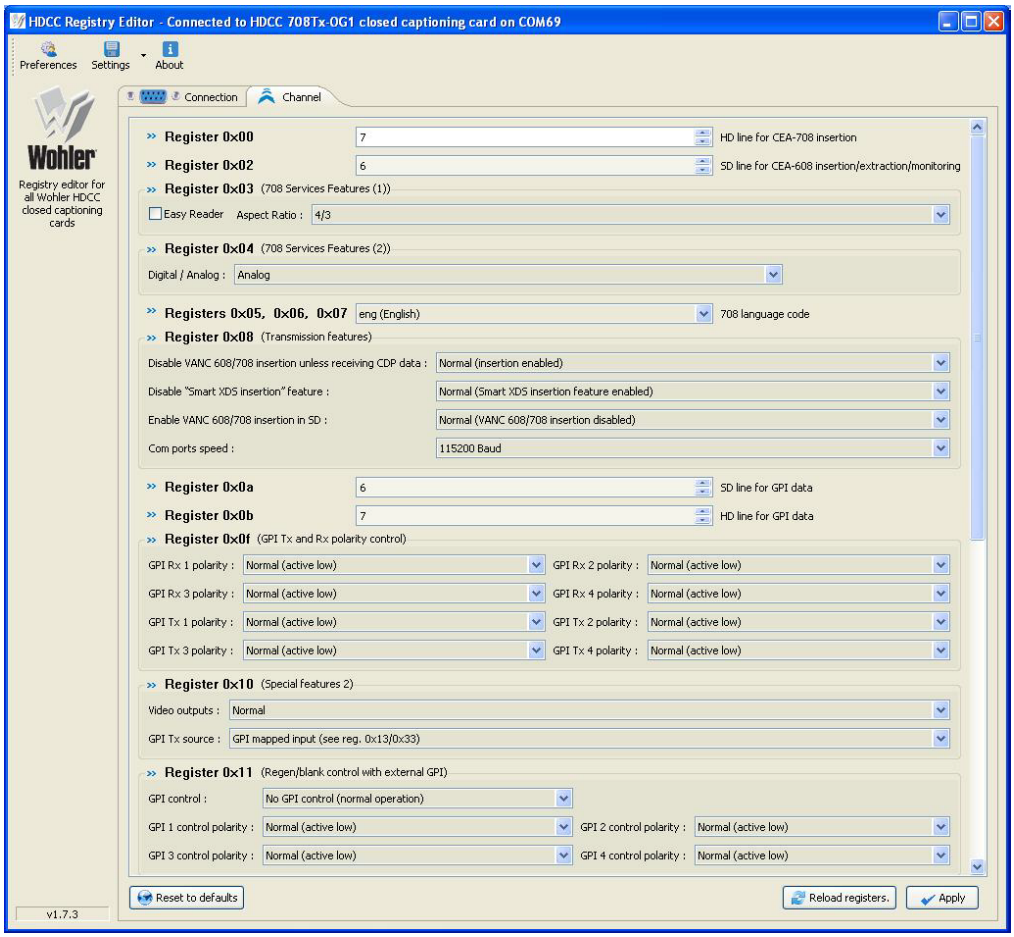
- **Reset to Defaults**: Click this button if you want to start over and reload the factory defaults.
- **Reload ch. A reg.**: Click this button to restore the register values that the card had before your changes.
- **Apply to both channels**: Click this button after modifying values for registers that affect both channels.
- **Apply to ch A**: Thes buttons act like the **Save** function. After modifying the register values (by using either the drop-down lists, or by typing in the register values) clicking these buttons saves your new settings to the card.

Channel A Tab

Click the Channel A tab in HDCCRegEdit and change the settings (see Figure 5–4 on page 59 and Figure 5–5 on page 60) to customize your configuration.

- **HD line for CEA-708 insertion**: The video line for HD video formats on which CEA-708 captions are present or will be placed.
- **SD line for CEA-608 insertion / extraction / monitoring**: The video line for SD video formats on which CEA-608 captions are present or will be placed
- **Easy Reader**: Sets flag indicating if caption data is at language appropriate for language learners.
- **Aspect Ratio**: Sets flag denoting either 4:3 or 16:9 content.
- **Digital / Analog**: Sets a flag indicating whether captions are older analog type or newer digital type.

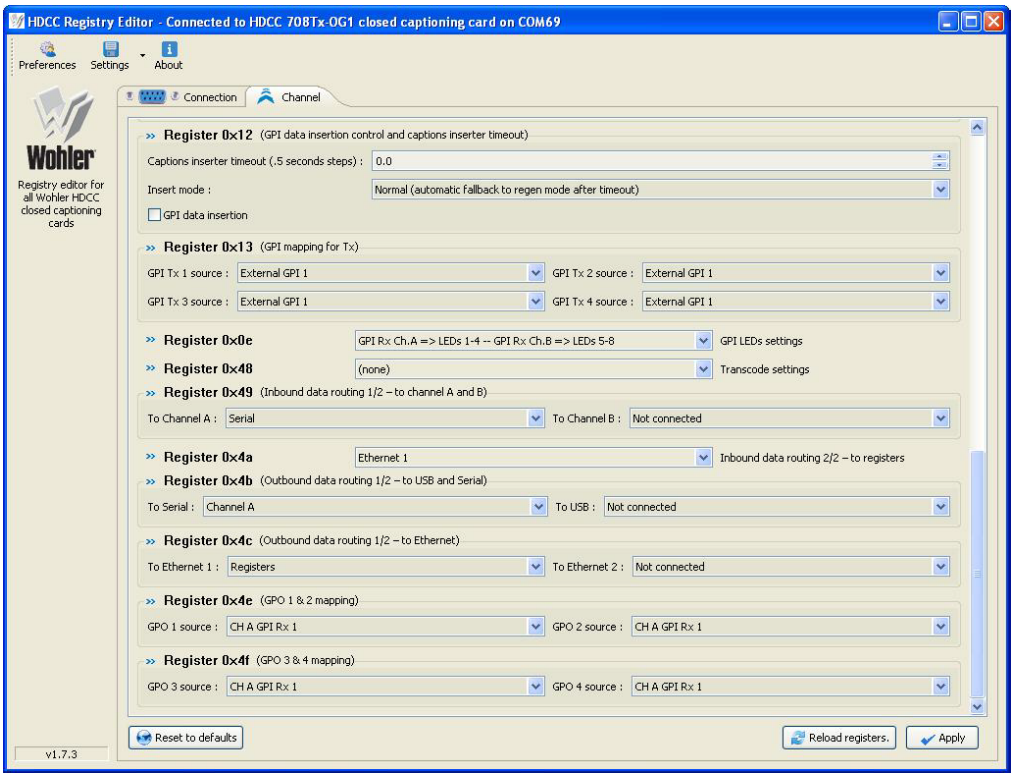
Figure 5–4 Channel A Settings (Top)



- **Service number**: Sets the service number of the captioning service. Enter a number from 1 to 63 inclusive.
- **708 language code**: Sets the language code for the captions.
- **Disable VANC 608/708 insertion unless receiving CDP data**: Disables the insertion of captions when no caption data packets are being received.
- **Disable "Smart XDS insertion" feature**: Disables Smart XDS insertion.
- **Enable VANC 608/708 insertion in SD**: Enables VANC 608/708 insertion in video streams.
- **Select decoded data output format**: Controls the format of decoder caption data packets. Select either **Normal/Grand Alliance** or **Raw Data**.

Scroll down to see the rest of the register values (shown in Figure 5–5 below).

Figure 5–5 Channel A Settings (Bottom)



- **Com ports speed**: Sets the speed of the serial communications with either channel's caption encoder/decoder.
- **SD line for GPI data**: Specifies on which SD video line general purpose transmission bits will be received/transmitted.
- **HD line for GPI data**: Specifies on which HD video line general purpose transmission bits will be received/transmitted.
- **GPI Rx 1-4 polarity**: Controls the polarity of the output that represents the value of a received general purpose transmission bit.
- **GPI Tx 1-4 polarity**: Controls the polarity of the input used to provide the value for a transmitted general purpose transmission bit.
- **Video outputs**: Controls whether captions are burned-in on the channel's output and monitor output.

- **GPI Tx source**: Controls whether the general purpose transmission bits are taken solely from the mapped input from the connector or whether the mapped input is logically OR'd with a received transmission bit (the latter enables transmission bit pass through when the connector input is not asserted).
- **GPI control**: Controls whether an external GPI can cause caption blanking.
- **GPI 1-4 control polarity**: Controls how high or low voltages at the GPIO connector input will be interpreted for GPI control.
- **Caption inserter timeout**: Sets the duration for insertion timeout to occur.
- **Insert mode**: Controls whether captions are permanently inserted in the absence of new encoding data, or whether the card falls back to regen mode according to the timeout specified in Caption insert timeout.
- **GPI data insertion**: Enables general purpose transmission bit encoding.
- **GPI Tx 1-4 source**: Maps bits transmitted on the video stream to inputs on the GPIO connector.
- **Decoded channel on mon. output**: Specifies which CC channel is decoded on the monitor output.
- **GPI LED settings**: Not currently used.
- **Transcode settings**: ontrols how captions are bridged/ transcoded between video controls.
- **To Channel A**: Controls which serial port is connected as INPUT (e.g., for encoding) to Channel A.
- **Inbound data touring 2/2 - to registers**: Controls which serial port is connected as INPUT for the terminal.
- **To Serial**: Controls which OUTPUT is connected to the RS-232 port.
- **To USB**: Controls which OUTPUT is connected to the USB port.

- **To Ethernet 1**: Controls which OUTPUT is connected to Ethernet VSP 1.
- **To Ethernet 2**: Controls which OUTPUT is connected to Ethernet VSP 2.
- **GPO 1-4 source**: Controls how the outputs on the connector are mapped to received general purpose transmission bits.

How Do I...?

In this section we provide a list of questions and answers to help you set up and use your new HDCC product as efficiently as possible.

How do I encode captions on Channel A using the RS-232 port?

Situations: You have an incoming video stream on Channel A and want to encode captions on it and using data supplied by the **RS-232** port.

Preparation: Make sure an SDI cable with a valid video stream is connected to input **CHA IN**, the card/frame is powered and operational, and a serial cable is connected from your caption generator to the card's **RS-232** port.

Process:

1. On the **Channel A** page, set **To Channel A** to **Serial** and set **To Serial** to **Not connected**. Set **COM ports speed** to the desired baud rate.
2. On the **Channel A** page, enter the video line for the captions on the **HD line for CEA-708 insertion** if the signal is HD, or **SD line for CEA-608 insertion** if the signal is SD.
3. Click **Apply to ch. A**.

Caption data supplied on **RS-232** will be encoded on the video stream coming out of **CHA OUT**.

How do I encode captions on Channel A using the Ethernet 2 Virtual Serial Port?

Situations: You have an incoming video stream on Channel A and want to encode captions on it and using data supplied by the Ethernet 1 Virtual Serial Port.

Preparation: Make sure an SDI cable with a valid video stream is connected to input **CHA IN**, the card/frame is powered and operational, an Ethernet cable connects the HDCC card to your computer network, and that you have established an Ethernet Virtual Serial Port that can be used by your caption generator.

Process:

1. On the **Channel A** page, set **To Channel A** to **Ethernet 2** and set **To Ethernet 2** to **Not connected**. Set **COM ports speed** to the 115.2k.

Important: Ethernet 1 and Ethernet 2 can be operated ONLY at 115.2k. If **COM ports speed** is not set to 115.2k, communication with the HDCC card will fail. If a different baud rate is needed, the RS-322 and USB ports can be run at other speeds.

2. On the **Channel A** page, enter the video line for the captions on the **HD line for CEA-708 insertion** if the signal is HD, or **SD line for CEA-608 insertion** if the signal is SD.

3. Click **Apply to ch. A**.

Caption data supplied on **Ethernet 2** will be encoded on the video stream coming out of **CHA OUT**.

How do I set general purpose transmission bits on Channel A?

Situation: You want to set general purpose transmission bits on Channel A's video stream (e.g., to cue downstream equipment).

Preparation: Connect a switch-closing circuit to the **TXIN1-4** pins on connector **J18**. (If using an MC-1RU chassis, **J16** is for **Slot 1**, **J18** is for **Slot 2**.)

Process:

1. On the **Channel A** page, check the **GPI data insertion** check box.

2. If you want the card to let GPI encoding time out (and revert to passing data in the received video stream), select an interval using the **Captions Inserter Timeout** control.

3. Using the **Insert** mode drop down control, select how you want the data to persist on the output video stream:

   - **Normal**
   - **Permanent insert mode in field 0**
   - **Permanent insert mode in field 1**
   - **Permanent insert mode in both fields**

4. Enter a video line for the data in SD line for GPI data (if the input video signal is SD) or in **HD line for GPI data** (if the signal is HD).

5. Set the preferred signaling polarity of the switch-closure with the **GPI Tx 1-4 polarity** controls: **active low** means switching the connector's input low will result in a transmitted 1; **active high** means switching the connector's input low will result in a transmitted 0.

6. The pins on the connector can be individually mapped to bits in the video stream with the **GPI mapping for Tx** controls.

7. If **GPI Tx source** is set to **GPI Mapped Input**, the transmitted bits will be as provided at the connector (with polarity taken into

account). If pass-through of existing data on the input video stream is desired, select **GPI input OR GPI Rx**, which will logically OR the incoming bits with the input bits.

8. Click **Apply to ch. A**.

Transmitted bits will now be encoded on Channel A according to the inputs you provide and the settings you've chosen.

How do I receive general purpose transmission bits on Channel A?

Situation: You are receiving a video stream on Channel A that has transmission bits encoded upon it and want to drive the GPIO connector based on their values.

Preparation: Sense (or connect an output circuit to) the **RXOUT1-4** pins on connector **J18**. (If using an MC-1RU chassis, **J16** is for **Slot 1**, **J18** is for **Slot 2**.)

Process:

1. Enter a video line for the data in the **SD line for GPI data** text box (for SD signals) and/or a video line in the **HD line for GPI data** text box (for HD signals).

2. For a received bit, the output signal can be either polarity: **active high** or **active low**. If the received bit's polarity is set to **active low**, it will output a low voltage when a 1 is received; if the polarity is set to **active high**, it will output a high voltage when a 1 is received. The polarity can be set with the **GPI Rx 1-4 polarity** controls.

3. The received bits can be mapped in any order to the output pins. Use the **GPO Mapping** controls to switch the received bits to the desired connector pins.

Note: Received bits from either/both video channels can be used to drive the **RXOUT1-4** outputs on the connector.

The **RXOUT1-4** pins of the connector will now show the show the received bits in the polarity and ordering that you've selected.

CHAPTER 6
Using the General Purpose Inputs/Outputs

Introduction

Overview

This chapter describes the functionality of the GPI/O connectors on the adaptors.

Goals for This Chapter

- ✓ Understand what General Purpose I/Os are.
- ✓ Identify GPI/O connector pin-outs.
- ✓ Understand how to assert a GP input.
- ✓ Understand how to connect a GP output.

Topics

Functionality

The GPI interface allows the user to encode contact closure triggers into a HD or SD video stream frame accurately. The encoded data uses a proprietary algorithm designed to withstand severe degradation and prevent false triggering or releasing of GPIs. Error checking information is embedded within the GPI data stream which accomplishes this task and is far more advanced than simple CRC.

Typical triggers that users can encode from automation include (but are not limited to:

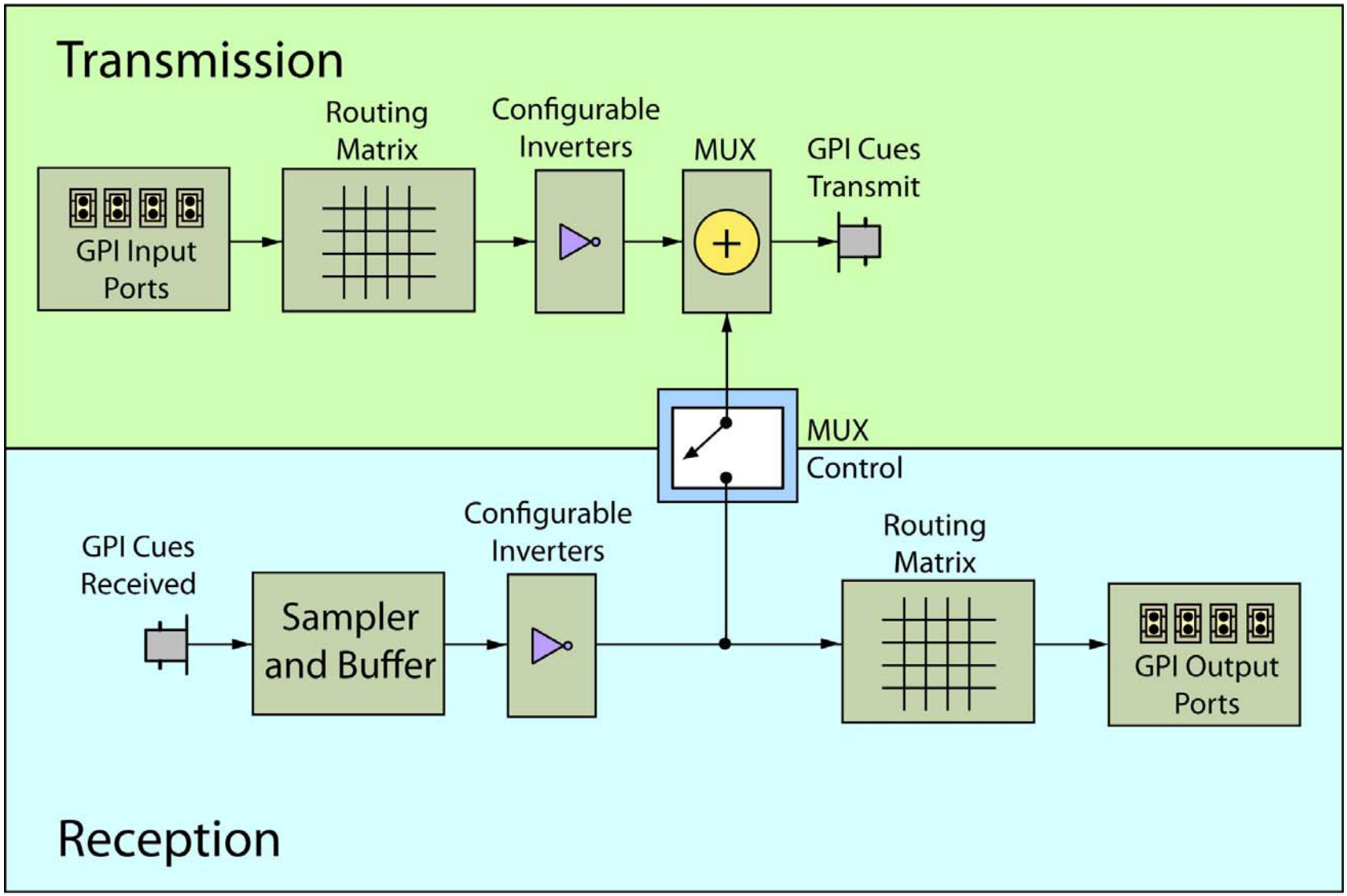
- ARC switching
- Commercial cue triggers (more accurate than the antiquated cue tone system)
- Machine control
- Regional commercial insertion cards

Typically the GPI data is encoded on Line 13 for both the HD-SDI signals and the SD-SDI signals. However, the HDCC is flexible enough to allow you to assign the lines on which you want the GPI data. See Register Reference on page 82 for details.

You can also use the GPI interface to control other operational aspects of the card.

Figure 6–1 on page 69 illustrates the GPI/O signal flow through the HDCC. For our purposes, a GPI is an input signal to the HDCC card supplied by the user through the physical GPI/O port that can activate certain modes in the HDCC card, and/or can be encoded onto the outgoing SDI video stream to notify downstream equipment of some condition, event, or command. A GPO is a signal the HDCC card receives on the incoming SDI video stream that is output to the physical GPI/O port to signify some condition, event, or command generated by upstream equipment.

Figure 6–1 GPI/O Functional Diagram



GPI/O Connector

Connector **J14** (-OG1) /Connectors **J16** and **J18** (-1CH, Slot 1 and 2, respectively) on the Rear Panel provides general purpose input and output.

Figure 6–2 GPI/O Connector Diagram (OG1)

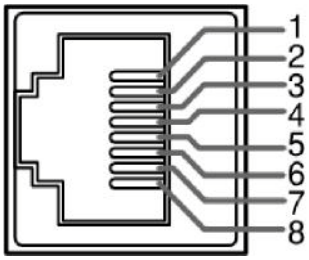
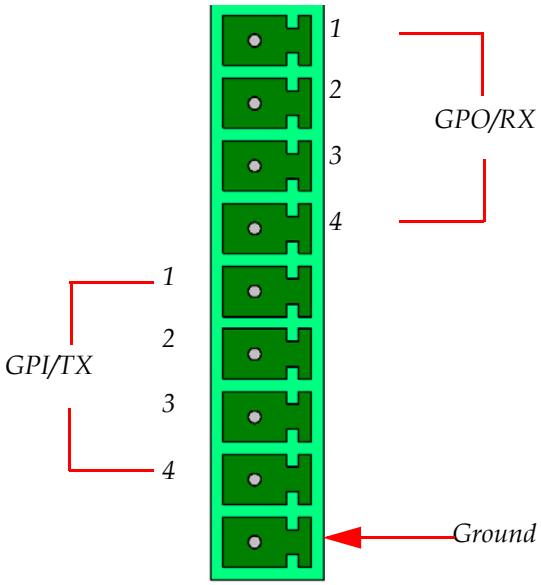


Table 6–1 GPI/O Pin-Out

Pin	Description
1	GPO/Rx0
2	N/C
3	GPI/Tx0
4	Ground
5	RS-232 Tx (Out)
6	RS-232 Rx (In)
7	GPO/Rx1
8	GPI/Tx1

Figure 6–3 GPI/O Connector Diagram (-1CH)

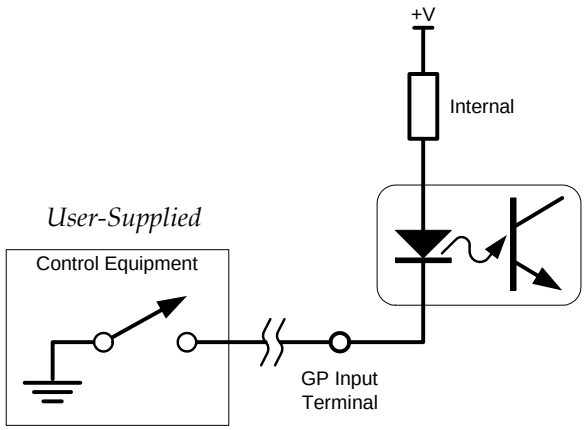


821190: HDCC-708TX Configuration Guide

GPIs

The GP inputs are designed to be asserted by switching the closures to ground. Asserting a GP input will result in that input state being encoded on the appropriate line of the video signal or the required function being activated.

Figure 6–4 Input Diagram



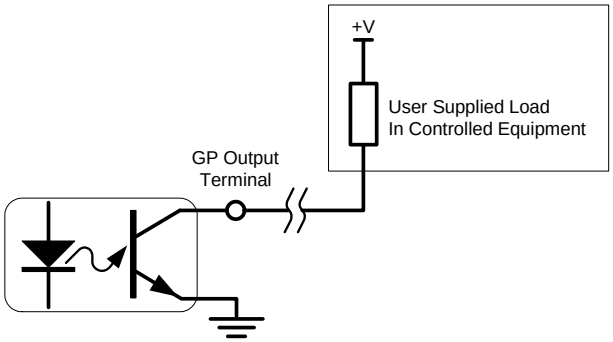
GPOs

If the incoming SDI data stream contains GP data on the appropriate line of the video signal, the corresponding GP output on the card can be activated. The GP output is asserted when its voltage is high.

Important: The GP outputs are optically isolated and "open collector" so the user must provide the appropriate pull-up resistor for each GP output. See Figure 6–4 below.

The HDCC provides four GPOs. (See Connector Pin Assignments on page 95 in Chapter 4 for connectivity.)

Figure 6–5 Output Diagram



CHAPTER 7
Terminal

Introduction

Overview

This chapter describes how to access the Terminal to change the HDCC card's registers directly.

Goals for This Chapter

- ✓ Explain the purpose and operation of the Terminal.
- ✓ Explain how to access the Terminal with any serial connection.

Topics

Background

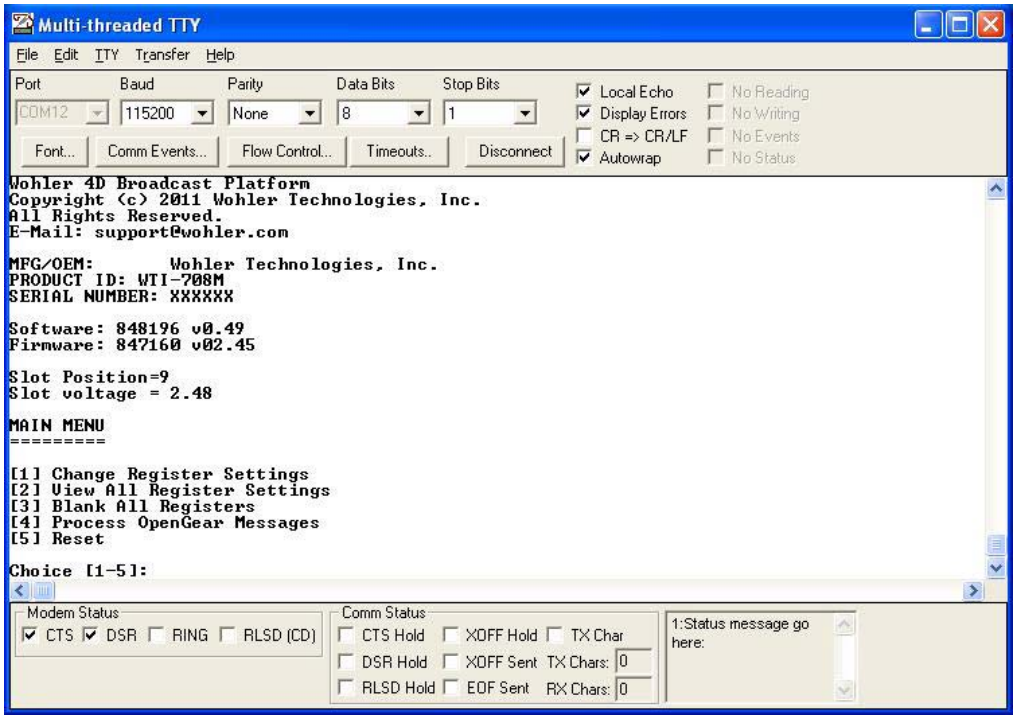
The HDCC card's operation is governed by several registers. These registers are modified automatically if you use either the DashBoard or HDCCRegEdit user interface.

However, more advanced users may prefer to configure these registers manually. You can do so by accessing the Terminal via a number of ports: RS-232, Ethernet Virtual Serial Ports, and the USB port.

The sections below describe how to connect to the Terminal with each method.

Configuring the HDCC Card for Terminal Access

Figure 7–1 Terminal Main Menu



Access to the Terminal is controlled by the **BOOTOPT** jumper on the card as shown in Figure 7–2 below. The sections below describe how it is used.

Note: If you're using the DFR-8321 frame, be aware that while the card is configured for Engineering Menu access, it will not be controllable from DashBoard. To restore DashBoard operation, power down the card, remove the jumper, and re-power the card.

Note: If you're using the Wohler MC-1RU frame, you can access the Terminal with the same serial port you use to connect to the HDCCRegEdit. (HDCCRegEdit is really a user interface that uses the Terminal.)

WARNING! Use caution when modifying the HDCC card's register values. Incorrect values may cause the card to behave unpredictably.

Accessing the Terminal via the RS-232 Port

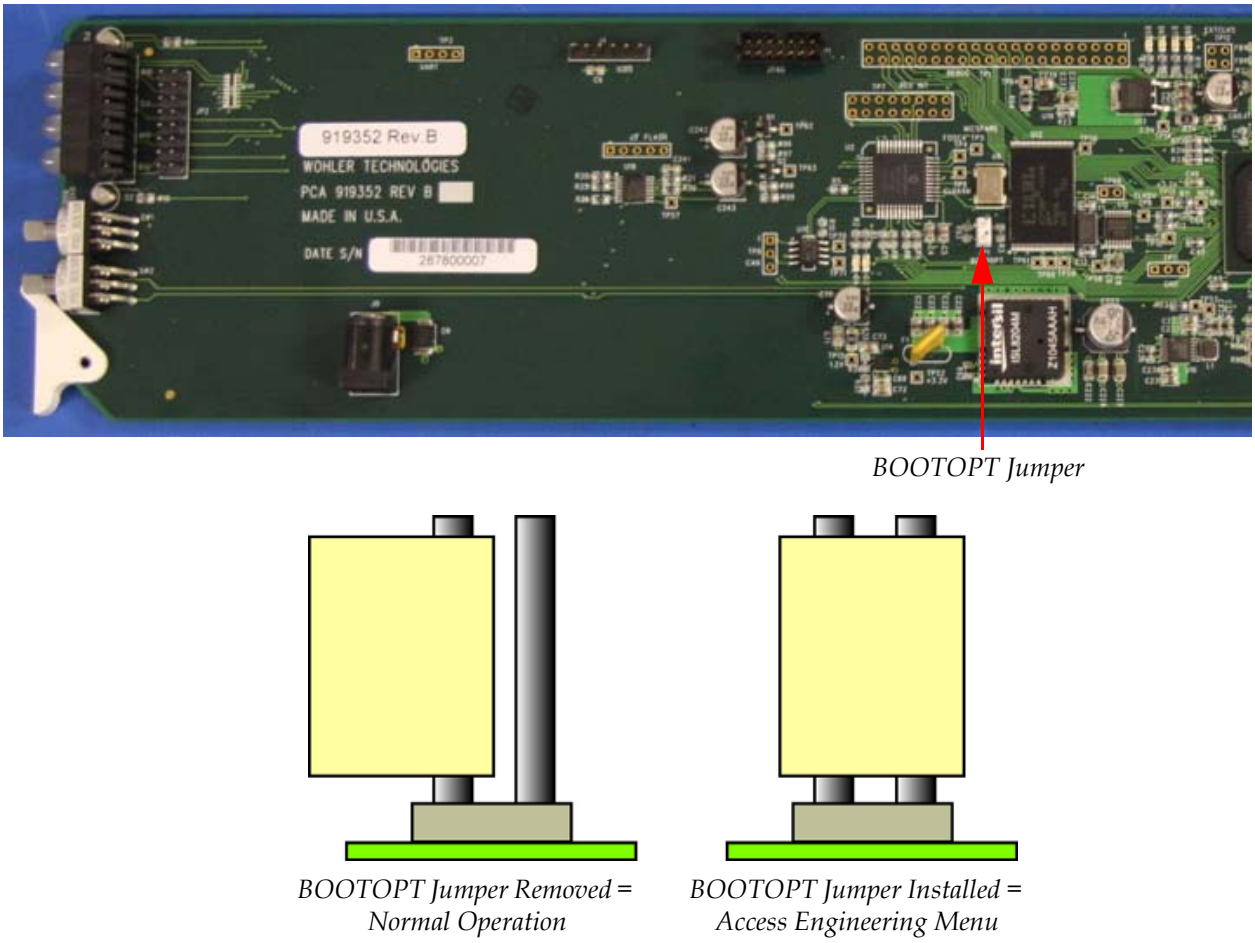
1. In DashBoard's **Setup Menu**, set the Terminal input to **RS-232** and the RS-232 output to **Terminal**.
2. In HDCCRegEdit's **Channel A** page, set **To RS-232** to **Registers** and set the **To Registers** to **RS-232**. Click **Apply**.
3. Power down the card, install the **BOOTOPT** jumper (see Figure 7–2 on page 76).

   Note: For MC-1RU users, the jumper should already be installed.
4. Verify the SW3 is set to **OFF**.
5. Connect a serial cable from your PC to the RS-232 connector on the rear panel.
6. Re-power the card.
7. Open a terminal emulator (e.g., HyperTerminal, PuTTY, etc.) with the serial COM port set to 115.2k, 8 data bits, 1 stop bit, no parity, and no handshaking.
8. Press the Enter key to display the Engineering Menu as shown in Figure 7–1 on page 74.

9. Power off the card, remove the **BOOTOPT** jumper, and re-power the card to restore normal operation. (See Figure 7–2 on page 76 for details.)

   Note: MC-1RU users should not remove the **BOOTOPT** jumper.

Figure 7–2 BOOTOPT Jumper Location



10. Go to the Engineering Menu functions below.

Accessing the Terminal via the Virtual Serial Ports

There are two virtual serial ports, Eth1 and Eth2. The instructions below are for Eth1 but are easily applied to Eth2.

1. In DashBoard's **Setup Menu**, set the Terminal input to **Eth1** and the Eth1 output to **Terminal**.

2. Power down the card, install the **BOOTOPT** jumper (see Figure 7–2 above) and re-power the card.

3. Verify the SW3 is set to **OFF**.

4. Verify that Eth1 is installed per Chapter 2 of this document.

5. Connect an Ethernet cable from your network to the Ethernet connector on the rear panel.

6. Open a terminal emulator (e.g., HyperTerminal, PuTTY, etc.) with Eth1's COM port set to 115.2k, 8 data bits, 1 stop bit, no parity, and no handshaking.

7. Press the Enter key to display the Main Menu. (See Figure 7–1 on page 74).

8. Power off the card, remove the **BOOTOPT** jumper, and re-power the card to restore normal operation. (See Figure 7–2 on page 76 for details.)

Accessing the Terminal via the USB Port (Front of Card)

There are two methods of accessing the Terminal via USB: the first requires configuration via DashBoard; the second uses SW3 on the card's front edge to override any software settings.

The following instructions are configuration via DashBoard.

1. In DashBoard's **Setup Menu**, set the Terminal input to **USB** and the USB output to **Terminal**.

2. Power down the card, install the **BOOTOPT** jumper (see Figure 7–2 on page 76), connect a USB cable between the host computer and the HDCC's USB connector, and re-power the card.

3. Verify the SW3 is set to **off**.

4. Connect a USB cable from your network to the USB connector on the front edge of the HDCC card.

5. Install the USB-Serial interface software as prompted.

6. Open a terminal emulator (e.g., HyperTerminal, PuTTY, etc.) with USB serial port set to 115.2k, 8 data bits, 1 stop bit, no parity, and no handshaking.

7. Press the Enter key to display the Main Menu. (See Figure 7–1 on page 74).

8. Power off the card, remove the **BOOTOPT** jumper, and re-power the card to restore normal operation. (see Figure 7–2 on page 76)

The following instructions show how to access the terminal without DashBoard configuration.

1. Power down the card, set **SW3** to **On**, install **BOOTOPT** jumper, connect a USB cable from your host computer to the USB connector on the front edge of the HDCC card, and re-power the card. (See Figure 7–2 on page 76 for details.)

2. Install the USB-Serial interface software as prompted.

3. Open a terminal emulator (e.g., HyperTerminal, PuTTY, etc.) with USB serial port set to 115.2k, 8 data bits, 1 stop bit, no parity, and no handshaking.

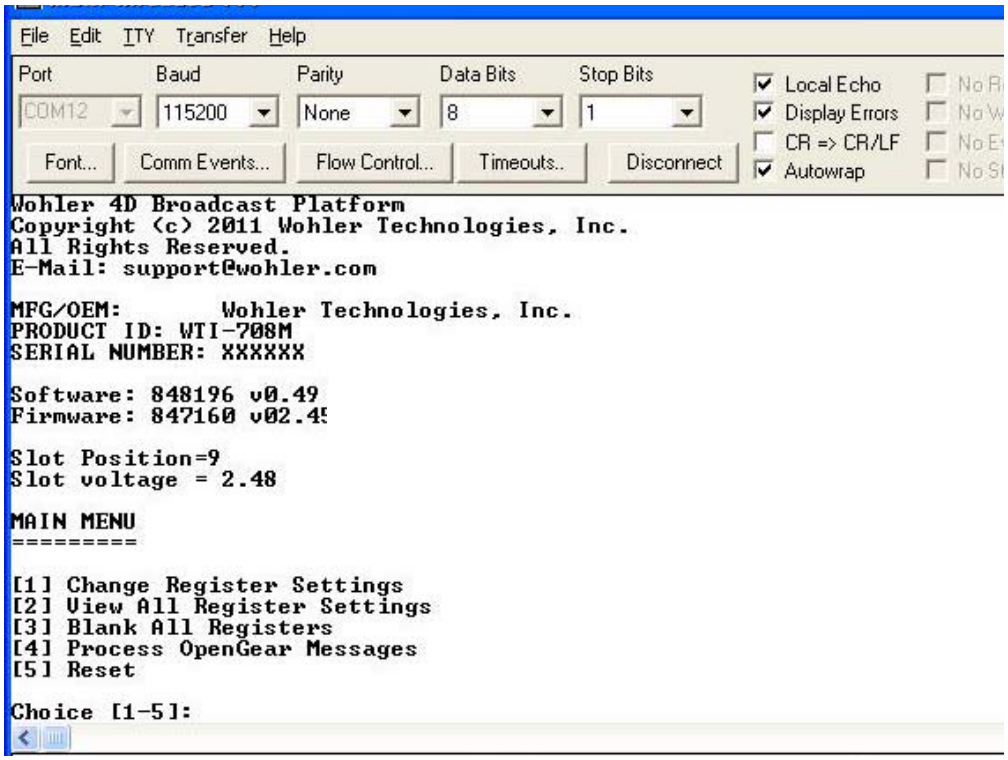
4. Press the Enter key to display the Main Menu. (See Figure 7–1 on page 74).

5. Power off the card, remove the **BOOTOPT** jumper, and re-power the card to restore normal operation. (See Figure 7–2 on page 76 for details.)

Main Menu

The Main Menu provides several functions for quick and easy modifications. You can also find software and firmware version listed above the menu. Refer to Figure 7–3 on page 79 and the following descriptions of each menu option for details.

Figure 7–3 Main Menu



Software and Firmware Part Numbers and Versions

Engineering Menu

Important: Refer to the configuration guide for your product for a detailed list of registers.

1. **Change Register Settings**: Allows you to modify any available register value.

2. **View All Register Settings**: Shows you the register list and all of the current values for each.

3. **Blank All Registers**: Sets all registers to zero.

WARNING! Without further register modifications, the card will be unusable after the registers are erased. Use only with extreme caution/discretion.

Note: Some registers are READ ONLY and will display a value even after you select option **[3] Blank All Registers**.

4. **Process OpenGear Messages**: Disables the Main Menu and returns control of the HDCC card to DashBoard to start processing openGear messages.

Note: If you're using a Wohler MC-1RU frame, you should never use this function.

5. **Reset**: Reboots the hardware.

Note: If the **BOOTOPT** jumper is not removed, the card will boot back to the Main Menu.

APPENDIX A
Register Set

Introduction

Overview

This appendix summarizes the registers that control the operation of your HDCC card.

Topics

Changing the Registers

You can modify the registers directly using the Terminal. Refer to Chapter 7: Terminal on page 73.

Important: We highly recommend that you only modify the registers using either DashBoard or HDCCRegEdit. Please do not modify the register table directly unless absolutely necessary.

Note: Channel B registers have effect only with two-channel products.

Register Reference

WARNING! If a register is not listed in Table A–1 below, do not modify it. Doing so will cause unpredictable results.

Table A–1 Register Table Summary

Channel A	Description
00h	HD Line for CEA-708 Insertion, Extraction, and Monitoring
01h	Not Used
02h	SD Line for CEA-608 Insertion, Extraction, and Monitoring
03f	708 Features (1)
04h	708 Features (2)
05h	708 Language Code (1st Letter)
06h	708 Language Code (2nd Letter)
07h	708 Language Code (3rd Letter)
08h	Transmission Features
09h	Horizontal Timing Offset for GPI SD Insertion Line (Reserved)
0Ah	SD Line for GPI Data Insertion and Decoding
0Bh	HD Line for GPI Data Insertion and Decoding
0Ch	Not Used
0Dh	Not Used
0Eh	Not Used
0Fh	GPI Rx/Tx Polarity Control
10h	Special Features 2
11h	Regen/Blank Control With External GPI
12h	GPI Data Insertion Control and Encoder Timeout

Table A–1 Register Table Summary

Channel A	Description
13h	GPI Mapping for Tx
14h	GPI Mapping for Per-Field Blank Control (Reserved)
15h	Not Used
16h	Not Used
17h	Not Used
18h	Not Used
19h	Not Used
1Ah	Not Used
1Bh	Not Used
1Ch	Not Used
1Dh	Decoded Channel on Monitor Output (CC1, CC2, etc.)
1Eh	Not Used
1Fh	Not Used
4Dh	Timing Offset—Do Not Change
4Eh	GPO 1 and 2 Mapping
4Fh	GPO 3 and 4 Mapping

Table A–2 Register Settings with Descriptions, Domains, and Defaults

CHA Reg #	Description	Default
00h	**HD Line for CEA-708 Insertion, Extraction, and Monitoring** *Min: 07 – Max: 19*	09h
01h	**Not Used**	13h
02h	**SD Line for CEA-608 Insertion, Extraction, and Monitoring** *Min: 06 – Max: 16*	15h

Table A–2 Register Settings with Descriptions, Domains, and Defaults (Continued)

<table>
<tr><th>CHA Reg #</th><th>Description</th><th>Default</th></tr>
<tr><td>03h</td><td>708 Services Features (1)
Min: N/A – Max: N/A
<table><tr><th>Bit(s)</th><th>Function</th></tr><tr><td>7</td><td>Aspect Ratio Flag
0 = 4:3
1 = 16:9</td></tr><tr><td>6</td><td>Easy Reader Flag
0 = Easy reader flag not set
1 = Easy reader flag set</td></tr><tr><td>5:0</td><td>Not Used</td></tr></table></td><td>00h</td></tr>
<tr><td>04h</td><td>708 Service Features (2)
Min: N/A – Max: N/A
<table><tr><th>Bit(s)</th><th>Function</th></tr><tr><td>7</td><td>Digital/Analog Flag
0 = Analog
1 = Digital</td></tr><tr><td>6:1</td><td>Service Number (if Bit 7=1):
000 0001
.
.
.
111 1111</td></tr><tr><td>0</td><td>Field Number (if Bit 7=0):
0 = Field 1
1 = Field 2</td></tr></table></td><td>81h</td></tr>
<tr><td>05h</td><td>708 Language Code (1st Letter)
Min: “a” 61h – Max: “z” 7Ah</td><td>“e” 65h</td></tr>
<tr><td>06h</td><td>708 Language Code (2nd Letter)
Min: “a” 61h – Max: “z” 7Ah</td><td>“n” 6Eh</td></tr>
<tr><td>07h</td><td>708 Language Code (3rd Letter)
Min: “a” 61h – Max: “z” 7Ah</td><td>“g” 67h</td></tr>
</table>

Table A–2 Register Settings with Descriptions, Domains, and Defaults (Continued)

<table>
<tr><th>CHA Reg #</th><th>Description</th><th>Default</th></tr>
<tr><td>08h</td><td>Transmission Features
Min: N/A – Max: N/A
<table>
<tr><th>Bit(s)</th><th>Function</th></tr>
<tr><td>7</td><td>Enable SMPTE 333 Protocol
(Not Yet Used)
0 = Disabled
1 = Enabled</td></tr>
<tr><td>6:5</td><td>Com Port Speed
00 = 9600 baud
01 = 19200 baud
10 = 38400 baud
11 = 115200 baud</td></tr>
<tr><td>4</td><td>Decoded Data Output Format
0 = Normal; Grand Alliance (^A)
1 = Raw</td></tr>
<tr><td>3</td><td>Not Used</td></tr>
<tr><td>2</td><td>Enable VANC 608/708 Insertion in SD
0 = Normal
1 = Insert</td></tr>
<tr><td>1</td><td>Enable “Smart XDS” Insertion Feature
0 = Normal: Smart XDS Insertion Feature Enabled
1 = Smart XDS Feature Disabled</td></tr>
<tr><td>0</td><td>Disable VANC 608/708 Insertion in HD
0 = Normal: Insertion Enabled
1 = Insertion Disabled</td></tr>
</table></td><td>00h</td></tr>
<tr><td>09h</td><td>Reserved—Do Not Change</td><td>—</td></tr>
<tr><td>0Ah</td><td>SD Line for GPI Data
Min: 06h – Max: 16h</td><td>0Dh</td></tr>
</table>

Table A–2 Register Settings with Descriptions, Domains, and Defaults (Continued)

<table>
<tr><th>CHA Reg #</th><th>Description</th><th>Default</th></tr>
<tr><td>0Bh</td><td>HD Line for GPI Data
Min: 07h – Max: 19h</td><td>0Dh</td></tr>
<tr><td>0Ch</td><td>Not Used</td><td>–</td></tr>
<tr><td>0Dh</td><td>Not Used</td><td>–</td></tr>
<tr><td>0Eh</td><td>Not Used</td><td>–</td></tr>
<tr><td>0Fh</td><td>GPI Tx/Rx Polarity
Min: N/A – Max: N/A
<table>
<tr><th>Bit(s)</th><th>Type</th><th>Function</th></tr>
<tr><td>0</td><td>GPI Rx 1</td><td rowspan="8">0 = Normal (Active Low)
1 = Inverted (Active High)</td></tr>
<tr><td>1</td><td>GPI Rx 2</td></tr>
<tr><td>2</td><td>GPI Rx 3</td></tr>
<tr><td>3</td><td>GPI Rx 4</td></tr>
<tr><td>4</td><td>GPI Tx 1</td></tr>
<tr><td>5</td><td>GPI Tx 2</td></tr>
<tr><td>6</td><td>GPI Tx 3</td></tr>
<tr><td>7</td><td>GPI Tx 4</td></tr>
</table></td><td>00h</td></tr>
</table>

Table A–2 Register Settings with Descriptions, Domains, and Defaults (Continued)

<table>
<tr><th>CHA Reg #</th><th>Description</th><th>Default</th></tr>
<tr><td>10h</td><td>
Special Features—2
Min: N/A – Max: N/A

This register controls miscellaneous functions on the card including the video outputs.
<table>
<tr><th>Bit(s)</th><th>Function</th></tr>
<tr><td>7:6</td><td>Not Used</td></tr>
<tr><td>5</td><td>GPI Tx Source:
0 = GPI mapped input (See Registers 13h and 33h.)
1 = GPI mapped input ORed with GPI Rx</td></tr>
<tr><td>4[a]:3</td><td>Video Output Mode:
00 = Normal
01 = Both outputs set to monitoring
10 = Both outputs are clean
11 = Not Used</td></tr>
<tr><td>2:0</td><td>Not Used</td></tr>
</table>
a Normal (default) = Monitoring O/Ps are 3 and 4; Clean O/Ps are 1 and 2
Monitoring = Burned-in captions on all O/Ps
Clean = No burned-in captions on any O/Ps
</td><td>00h</td></tr>
</table>

Table A–2 Register Settings with Descriptions, Domains, and Defaults (Continued)

<table>
<tr><th>CHA Reg #</th><th>Description</th><th>Default</th></tr>
<tr><td>11h</td><td>
Regen/Blank Control with External GPI
Min: N/A – Max: N/A

<table>
<tr><th>Bit(s)</th><th>Polarity Control</th><th>Function</th></tr>
<tr><td>7</td><td>GPI 4</td><td rowspan="4">0 = Normal (Active Low)
1 = Inverted (Active High)</td></tr>
<tr><td>6</td><td>GPI 3</td></tr>
<tr><td>5</td><td>GPI 2</td></tr>
<tr><td>4</td><td>GPI 1</td></tr>
</table>
<table>
<tr><th>Bit(s)</th><th>Value</th><th>Blank Controlled by...</th></tr>
<tr><td rowspan="5">3:0</td><td>0000</td><td>GPI Control (Regen Operation)</td></tr>
<tr><td>0001</td><td>External GPI 1</td></tr>
<tr><td>0010</td><td>External GPI 2</td></tr>
<tr><td>0011</td><td>External GPI 3</td></tr>
<tr><td>0100</td><td>External GPI 4</td></tr>
</table>
</td><td>00h</td></tr>
</table>

Table A–2 Register Settings with Descriptions, Domains, and Defaults (Continued)

<table>
<tr><th>CHA Reg #</th><th>Description</th><th>Default</th></tr>
<tr><td>12h</td><td>GPI Insertion Control and Insert Mode Timeout
Min: N/A – Max: N/A
<table>
<tr><th>Bit(s)</th><th>Function</th></tr>
<tr><td>7</td><td>GPI Data Insertion
0 = Off
1 = On</td></tr>
<tr><td>6</td><td>Not Used</td></tr>
<tr><td>5:4</td><td>Insert Mode
00 = Normal (Automatic Fall Back to Regen Mode After Timeout)
01 = Permanent Insert Mode in Field 0
10 = Permanent Insert Mode in Field 1
11 = Permanent Insert Mode in Both Fields</td></tr>
<tr><td>3:0</td><td>Insert Mode Time Out
(0.5 second intervals):
0000 = 0 seconds
0001 = 0.5 seconds
0010 = 1.0 seconds
.
.
.
1111 = 7.5 seconds</td></tr>
</table></td><td>12h</td></tr>
<tr><td>13h</td><td>GPI Mapping for Tx
Min: N/A – Max: N/A
<table>
<tr><th>Bit(s)</th><th>GPI Tx Source</th><th>Function</th></tr>
<tr><td>7:6</td><td>4</td><td rowspan="5">External GPIs:
00 = GPI 1
01 = GPI 2
10 = GPI 3
11 = GPI 4</td></tr>
<tr><td>5:4</td><td>3</td></tr>
<tr><td>3:2</td><td>2</td></tr>
<tr><td rowspan="2">1:0</td><td rowspan="2">1</td></tr>
</table></td><td>E4h</td></tr>
</table>

Table A–2 Register Settings with Descriptions, Domains, and Defaults (Continued)

CHA Reg #	Description	Default
14h	Not Used	–
15h	Not Used	–
16h	Not Used	–
17h	Not Used	–
18h	Not Used	–
19h	Not Used	–
1Ah	Not Used	–
1Bh	Not Used	–
1Ch	Not Used	–
1Dh	**Decoded Channel on Monitor Output** *Min: 00h – Max: 03h* 0 = CC1 1 = CC2 2 = CC3 3 = CC4	00h
1Eh	Not Used	–
1Fh	Not Used	–
4Dh	**Timing Offset** – Do Not Change *Min: N/A – Max: N/A*	06h

Table A–2 Register Settings with Descriptions, Domains, and Defaults (Continued)

<table>
<tr><th>CHA Reg #</th><th>Description</th><th>Default</th></tr>
<tr><td>4Eh</td><td>
GPO 1 and 2 Source
Min: N/A – Max: N/A
<table>
<tr><th>Bit(s)</th><th>Function</th></tr>
<tr><td>7:4</td><td>GPO 2 Source
0000 = Ch 1 GPI Rx 1
0001 = Ch 1 GPI Rx 2
0010 = Ch 1 GPI Rx 3
0011 = Ch 1 GPI Rx 4
0100 = Ch 2 GPI Rx 1
0101 = Ch 2 GPI Rx 2
0110 = Ch 2 GPI Rx 3
0111 = Ch 2 GPI Rx 4</td></tr>
<tr><td>3:0</td><td>GPO 1 Source
0000 = Ch 1 GPI Rx 1
0001 = Ch 1 GPI Rx 2
0010 = Ch 1 GPI Rx 3
0011 = Ch 1 GPI Rx 4
0100 = Ch 2 GPI Rx 1
0101 = Ch 2 GPI Rx 2
0110 = Ch 2 GPI Rx 3
0111 = Ch 2 GPI Rx 4</td></tr>
</table>
</td><td>10h</td></tr>
</table>

Table A–2 Register Settings with Descriptions, Domains, and Defaults (Continued)

<table>
<tr><th>CHA Reg #</th><th>Description</th><th>Default</th></tr>
<tr><td>4Fh</td><td>GPO 3 and 4 Source
Min: N/A – Max: N/A
<table>
<tr><th>Bit(s)</th><th>Function</th></tr>
<tr><td>7:4</td><td>GPO 4 Source
0000 = Ch 1 GPI Rx 1
0001 = Ch 1 GPI Rx 2
0010 = Ch 1 GPI Rx 3
0011 = Ch 1 GPI Rx 4
0100 = Ch 2 GPI Rx 1
0101 = Ch 2 GPI Rx 2
0110 = Ch 2 GPI Rx 3
0111 = Ch 2 GPI Rx 4</td></tr>
<tr><td>3:0</td><td>GPO 3 Source
0000 = Ch 1 GPI Rx 1
0001 = Ch 1 GPI Rx 2
0010 = Ch 1 GPI Rx 3
0011 = Ch 1 GPI Rx 4
0100 = Ch 2 GPI Rx 1
0101 = Ch 2 GPI Rx 2
0110 = Ch 2 GPI Rx 3
0111 = Ch 2 GPI Rx 4</td></tr>
</table></td><td>00h</td></tr>
</table>

APPENDIX B
Specifications and Pin-Outs

Introduction

Overview

This chapter lists the specifications of the HDCC-708MULTI-OG2 and provides the pin-outs for its connectors.

Topics

Specifications

Table B–1 Physical Specifications

Specification	Value
Dimensions (H x W x D)	Card: 3″ x 12.75″x 0.5″ (76.2 mm x 323.85 mm x 12.7 mm)
	Rear Panel (for OG1 Only): 2.5″ (W) x 3.5″ (H) x 1.5″ (D) (63.5 mm x 88.9 mm x 38.1 mm)
Shipping Weight (combined)	1 lbs (.45 kg)
Supplied Accessories	Rear panel adaptor (-OG1 only)
Power Requirements	Receives power from frame
Power Consumption	Approximately 10 W

Table B–2 Technical Specifications

Specification	Value
Inputs	1 SD/HD-SDI autosensing on BNC 4 GPI (Phoenix - 1CH Version) 2 GPI (RJ45 - OG1 Version)
Outputs	1 HD/SD-SDI Closed Captioned (BNC) 1 HD/SD-SDI Open Captioned (BNC) 4 GPO (Phoenix - 1CH Version) 2 GPO (RJ45 - OG1 Version)
Inputs/Outputs	1 Ethernet (RJ-45) 10/100 BaseTX 1 RS-232 (DB-9 - 1CH Version) 1 RS-232 (RJ45 - OG1 Version)
Frame compatibility	• Ross DFR-8321 • Wohler MC-1RU
Available functions	• Closed Caption OSD Monitoring • HD/SD Closed Caption Encoding/Inserting • GPI Encoding and Decoding

Table B–2 Technical Specifications (Continued)

Specification	Value
Available communication protocols	• GrandAlliance • SMPTE333 • CDP
Supported closed caption specifications	CEA-608, CEA-708 both encapsulated 608 and native 708

Connector Pin Assignments

Figure B–1 J14 GPI/O Connector Diagram (OG1)

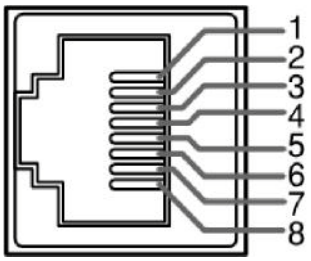


Table B–3 GPI/O Pin-Out

Pin	Description
1	GPO/Rx0
2	N/C
3	GPI/Tx0
4	Ground
5	RS-232 Tx (Out)
6	RS-232 Rx (In)
7	GPO/Rx1
8	GPI/Tx1

Table B–4 J16/J18 GPI/O Pin-Out Assignments

Pin	Label	Interface
1	Ground	
2	TX4 (GPI-4)	Open Collector (Emitter to Ground)
3	TX3 (GPI-3)	
4	TX2 (GPI-2)	
5	TX1 (GPI-1)	

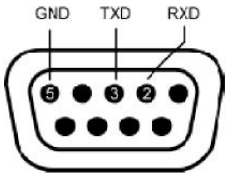
Table B–4 J16/J18 GPI/O Pin-Out Assignments

Pin	Label	Interface
6	RX4 (GPO-4)	Active Low
7	RX3 (GPO-3)	
8	RX2 (GPO-2)	
9	RX1 (GPO-1)	

Table B–5 RS-232 DE-9 Pin-Out Assignments

Pin	Label	Function
2	TXD	RS-232 Tx Data
3	RXD	RS-232 Rx Data
5	Common GND	GND

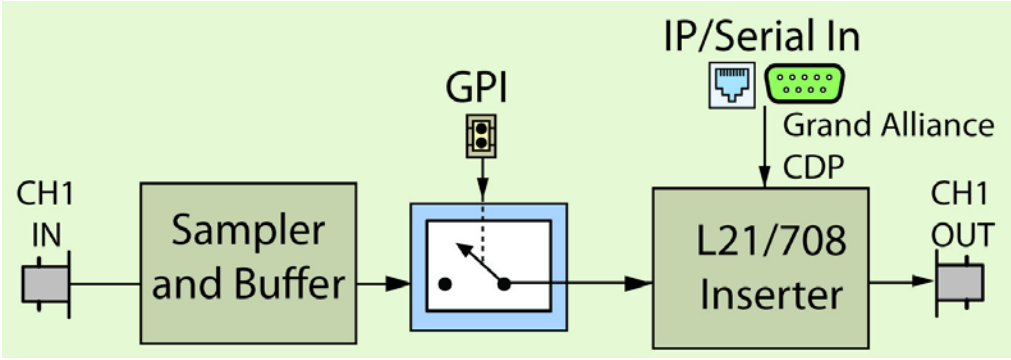
Figure B–2 RS-232 DE-9 Pin-Out



Technical Functional Overview

Figure B–2 on page 96 illustrates the design of the HDCC.

Figure B–3 HDCC Block Diagram



APPENDIX C
Troubleshooting

Introduction

Overview

This appendix provides instructions for correcting the most common problems.

Topics

DashBoard

Table C–1 Common DashBoard Problems and Solutions

Symptom	Possible Cause	Solution
Frame does not appear in DashBoard.	Frame not power up.	Apply power to frame.
	No network connectivity.	Verify Ethernet/IP connectivity between host PC and frame is established.
HDCC card does not appear in DashBoard.	**BOOTOPT** jumper is in place.	Remove **BOOTOPT** jumpter, then power cycle the frame.

HDCCRegEdit

Table C–2 Common HDCCRegEdit Problems and Solutions

Symptom	Possible Cause	Solution
HDCCRegEdit cannot connect to the HDCC card.	**BOOTOPT** jumper is not installed.	Install BOOTOPT jumper, then power cycle the frame.

Network

Table C–3 Common Network Problems and Solutions

Symptom	Possible Cause	Solution
Cannot locate HDCC card in **My Network Places**.	No network connectivity to card.	Check network connectivity.

Encoding

Table C–4 Common Encoding Problems and Solutions

Symptom	Possible Cause	Solution
Encoding not working.	Channel setup is incorrect.	Check HD/SD video line for captions set correctly.
	Serial input connection not valid.	Verify the input line for captions is set correctly.
	caption source inoperative.	Verify caption system source is providing data.
	If using VSP, settings are wrong.	User settings must be 115.2k, 8, 1, n for encoding.

GPI/O

Table C–5 Common GPI/O Problems and Solutions

Symptom	Possible Cause	Solution
Asserted input on GPI/O connector not encoded on video stream.	Wrong pin stimulated.	Verify that the correct GPI pin is being stimulated.
	Data insertion not enabled.	Enable GPI data insertion.
	Input polarity is wrong.	Set GPI Tx polarity.
	Input mapping is wrong.	Set GPI Tx source.
Output on GPI/O connector not reflecting recieved bit in input video stream.	Output circuit incorrect.	GPO requires external pull-up resistor.
	Output is wrong polarity.	Set GPI Rx polarity.

VSPs

Table C–6 Common VSPs Problems and Solutions

Symptom	Possible Cause	Solution
VSP input/output is not working.	VSP software settings are incorrect.	Set each VSP's IP address and port number correctly. Verify that **Raw** mode is selected.
VSP encoder input not working.	VSP settings are incorrect.	VSP must be operated at 115.2k, 8, 1, n for encoding.
VSP decoder output not working.	VSP settings are incorrect.	VSP must be operated at 115.2k, 8, 1, n for decoding.