HDCC-708MON-OG1
(CEA-608/CEA-708 Closed Caption/Subtitle Card)

- **HDCC-708MON-OG1   (openGear Platform)**

Multi-Purpose, HD/SD-SDI Closed Caption Card: Decoder and Monitor

Configuration Guide
Firmware Version: V2.47
Software Version: V0.77

Part Number 821161, Revision A

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Table of Contents

Chapter 5. Terminal. 43

Appendix A. Register Set. 51

CHAPTER 1
Getting Started

Introduction

Overview

This chapter describes the basic captioning functions that you can perform using your Wohler HDCC-708MON-OG1 (for the Ross DFR-8321 frame).

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-708MON is a versatile card for decoding and monitoring captions on HD/SD-SDI video streams in real time.

You operate the HDCC-708MON-OG1 in a Ross® openGear® DFR-8321 frame. Refer to Chapter 2: Hardware Installation on page 9 for installation instructions.

When operated in the Ross frame, the card is configured and controlled through DashBoard® software. Refer to Using DashBoard on page 33 for instructions.

The HDCC-708MON-OG1 is a one-channel card; It allows a single HD/SD-SDI stream to pass through. Caption data is output through several available serial connections: RS-232, USB, and Ethernet (via a virtual serial port).
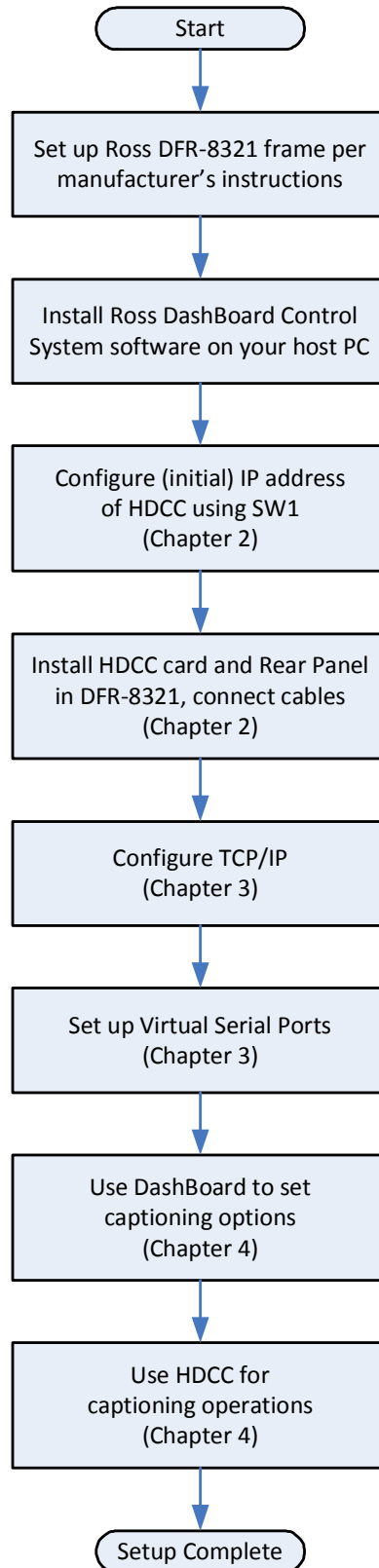
Figure 1–1   HDCC Card

Quick Start Guides

Figure 1–2 on page 3 illustrates the installation and configuration process for the Ross DFR-8321 frame.

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

```
                    ( Start )
                       │
                       ▼
        ┌──────────────────────────────┐
        │ Set up Ross DFR-8321 frame per │
        │   manufacturer's instructions  │
        └──────────────────────────────┘
                       │
                       ▼
        ┌──────────────────────────────┐
        │  Install Ross DashBoard Control │
        │  System software on your host PC │
        └──────────────────────────────┘
                       │
                       ▼
        ┌──────────────────────────────┐
        │   Configure (initial) IP address │
        │       of HDCC using SW1         │
        │         (Chapter 2)            │
        └──────────────────────────────┘
                       │
                       ▼
        ┌──────────────────────────────┐
        │ Install HDCC card and Rear Panel │
        │   in DFR-8321, connect cables   │
        │         (Chapter 2)            │
        └──────────────────────────────┘
                       │
                       ▼
        ┌──────────────────────────────┐
        │        Configure TCP/IP        │
        │         (Chapter 3)            │
        └──────────────────────────────┘
                       │
                       ▼
        ┌──────────────────────────────┐
        │    Set up Virtual Serial Ports │
        │         (Chapter 3)            │
        └──────────────────────────────┘
                       │
                       ▼
        ┌──────────────────────────────┐
        │     Use DashBoard to set       │
        │      captioning options        │
        │         (Chapter 4)            │
        └──────────────────────────────┘
                       │
                       ▼
        ┌──────────────────────────────┐
        │        Use HDCC for            │
        │     captioning operations      │
        │         (Chapter 4)            │
        └──────────────────────────────┘
                       │
                       ▼
                ( Setup Complete )
```
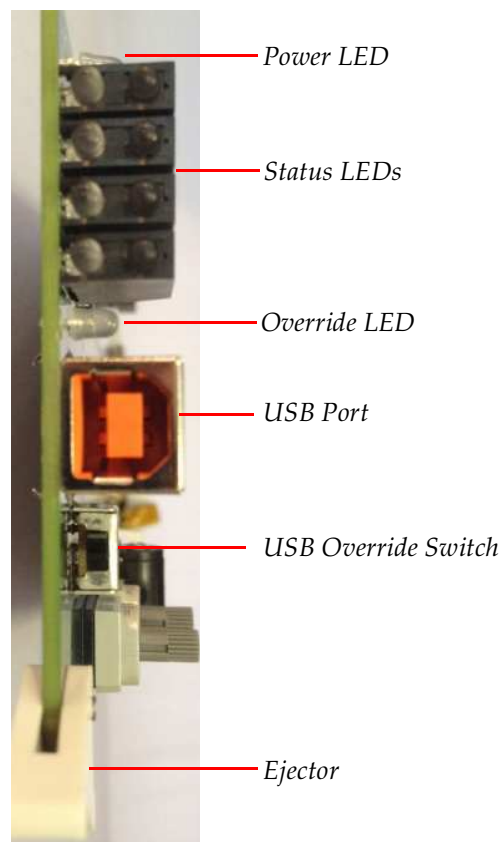
3

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. There are also status LEDs and an override LED.

Figure 1–3   HDCC Front Edge

Power LED

Status LEDs

Override LED

USB Port

*USB Override Switch*

Ejector

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 1–4 shows the input and output connectors of the Rear Panel supplied with the 1 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.
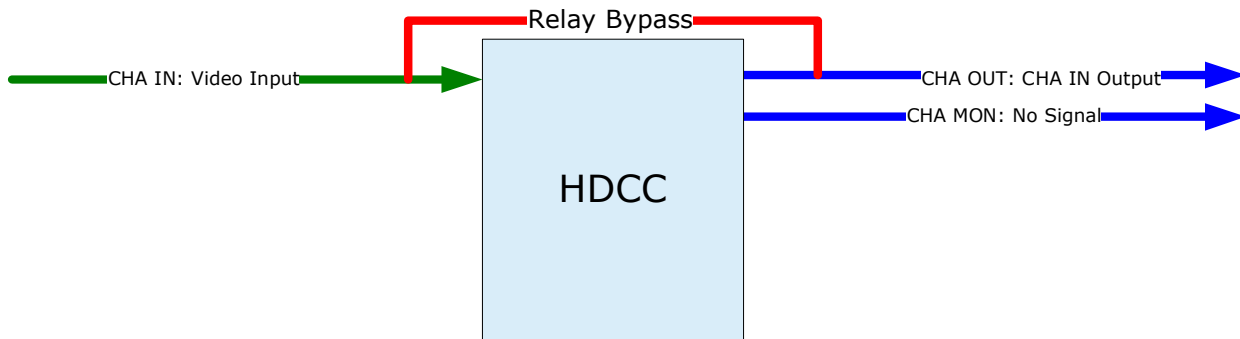
Figure 1–4   **OG1 Rear Panel**
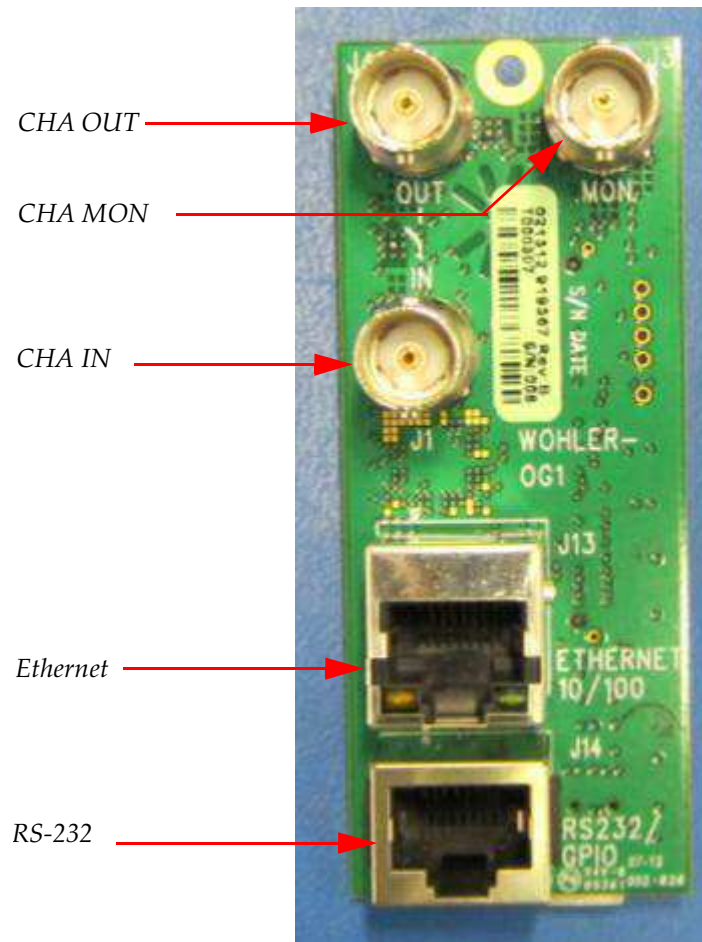
Relay Bypass

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

**Figure 1–5   Relay Bypass - No Power Condition**

Functions

Decoding

Decoding is the process of extracting closed caption text data from an SDI video stream, interpreting it, and making it available in human-readable form. For example, if a video/audio stream with embedded caption data is supplied to **CHA IN**, the caption text is decoded and supplied through a serial and/or Ethernet and/or USB connection to a host PC for display. Note that the closed captioned text is not removed from the input video stream. A signal comes in on **CHA IN** and goes out on **CHA OUT**. See Figure 1–6 on page 7 below.

Figure 1–6   Decoding Setup
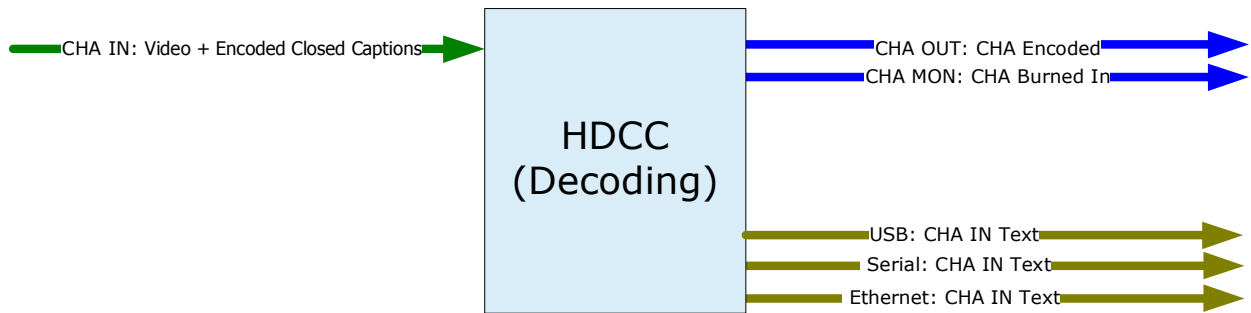
Example: The caption data supplied on **CHA IN** is output to either of the **Ethernet, USB,** or **RS-232** output ports.

Connections	
Port	**Data**
CHA IN	SMPTE HD/SD-SDI video stream with captions present.
CHA OUT	SMPTE HD/SD-SDI video stream with closed captions present (same as **CHA IN**).
CHA MON	SMPTE HD/SD-SDID video stream with burned-in captions to monitor.
RS-232	**Input**: None. **Output**: Captions from **CHA IN**.
Ethernet	**Input**: None. **Output**: Captions from **CHA IN**.

Monitoring

The monitoring function allows you to verify the presence of captions on the **SDI** output by showing the captions on the video signal. Connect the **CHA MON** output to an SDI monitor to view the video with captions displayed. Refer to Figure 1–7 on page 8.

Figure 1–7   Monitoring Setup
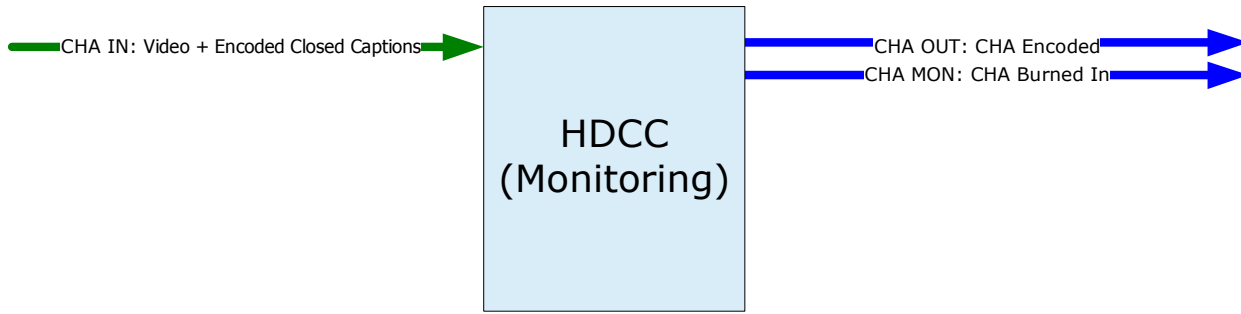
Example:	The caption data supplied on **CHA IN** is burned into the video stream and displayed on **CHA MON**.

Connections	
Port	**Data**
CHA IN	SMPTE HD/SD-SDI video stream with captions present.
CHA OUT	SMPTE HD/SD-SDI video stream with closed captions present (same as **CHA IN**).
CHA MON	SMPTE HD/SD-SDID video stream with burned-in captions to monitor.

Note: By default, **CHA OUT** is "clean" (no burned-in captions displayed) and **CHA MON** shows the captions "burned" into the video. The HDCC-708MON-OG1 can be configured to have both outputs burned-in or both clean, as well.

Hardware Installation

Introduction

Overview

This chapter explains how to install your HDCC card in the Ross DFR-8321 frame.

Goals for This Chapter

> ✓   Install your HDCC card in a Ross DFR-8321.
>
> ✓   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.

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 (single channel)

- 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 hole of the rear panel. Refer to Figure 2–1.

Figure 2–1   OG1 Rear Panel

Insert screw here.

4. After you have inserted the screw into the OG Rear Panel, place the O-ring on the screw. The O-ring will keep the screw from falling out during installation..

Important: The HDCC's IP address is determined by dip switch **SW1** on the inner surface of the 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 14, then come back here to finish the installation.

5. With the rear of the frame facing you, insert the rear panel into the base slot and tighten the top screw. Refer to Figure 2–2.

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 14) and then close the front panel.

   Note: You can install the HDCC-OG1 card into any odd numbered slot. Again refer to Figure 2–3 on page 14.

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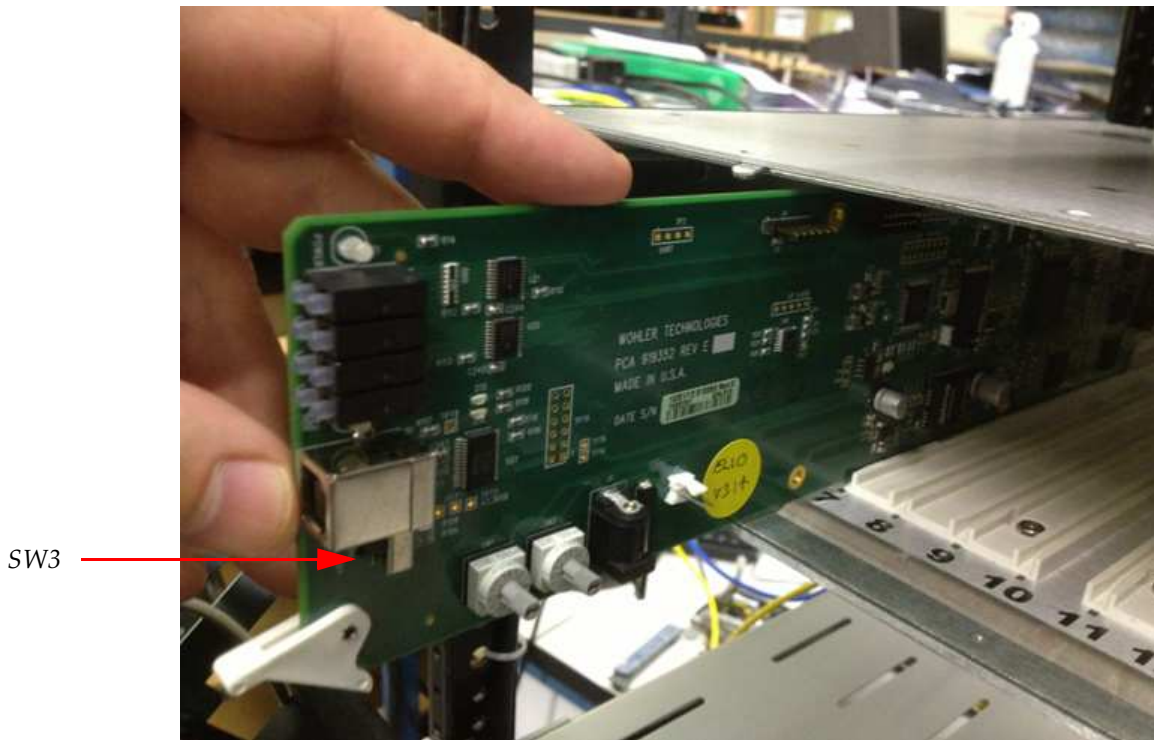
Note: Ensure that **SW3** is in the **Off** position.

Rear Panel DIP Switch

The Rear Panel has a miniature DIP switch, SW1, that sets the IP address of the card. SW1 is a slider-type DIP switch and is on the inside surface of the board.

Position 1 is set to **Off** 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 **On**, 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	Static IP= 10.2.1.**4**	Static IP= 192.168.2.**4**	**Off**
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 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 17.

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 rear panel) 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.
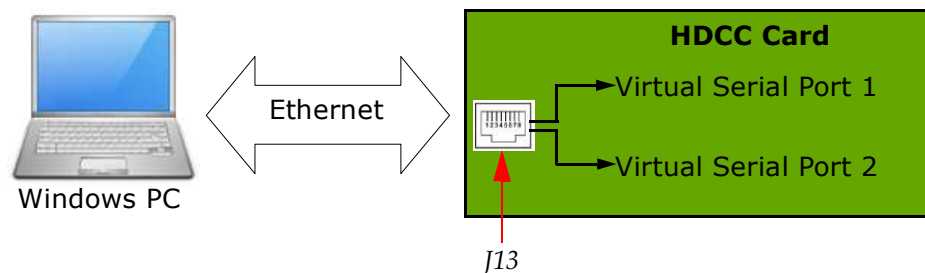
Figure 3–1   HDCC to PC Connectivity

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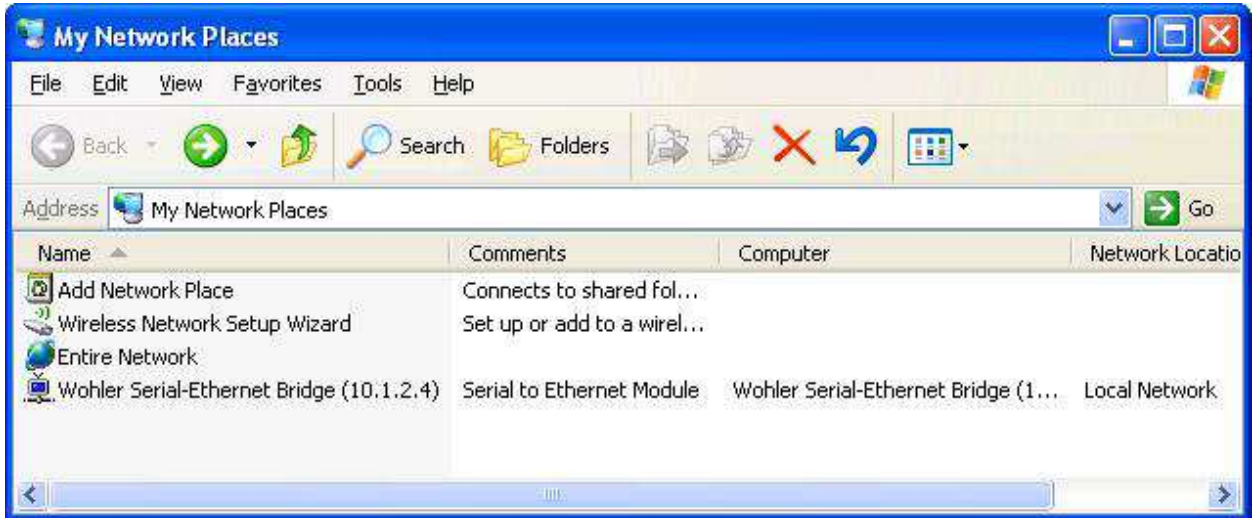
**Note:** The default IP address can be set by SW1. See the previous chapter

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 on page 20.

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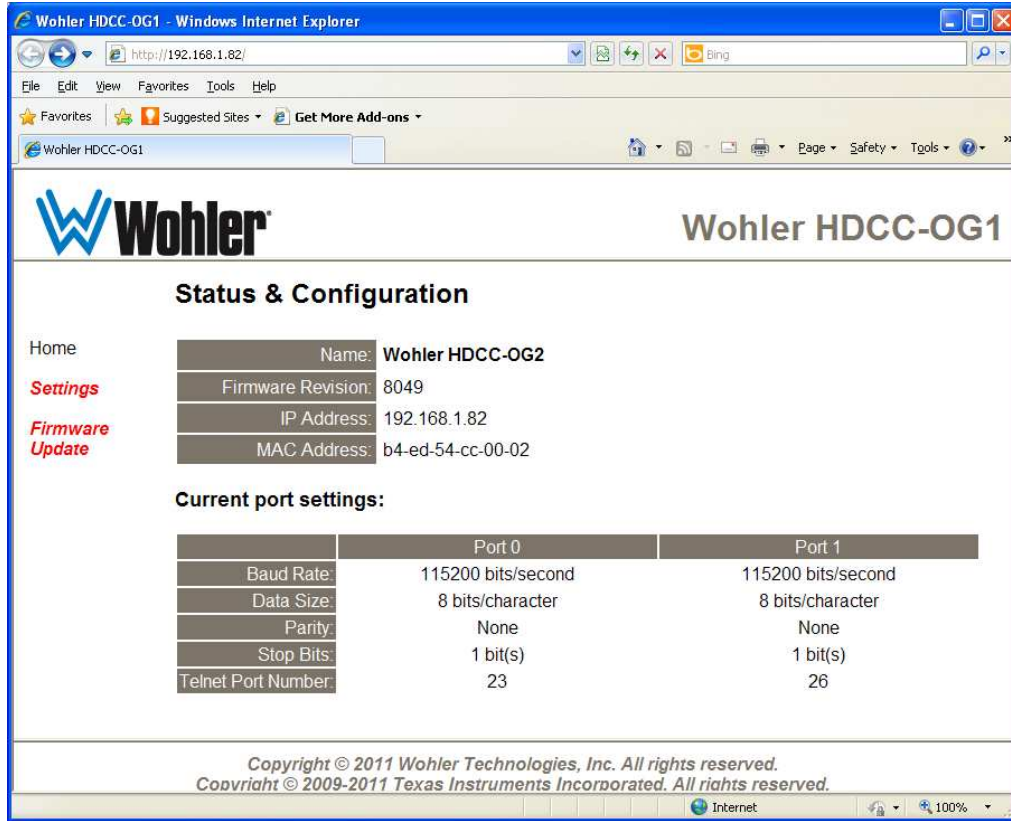
1.   Click **Settings** on the left hand side of the screen (Figure 3–3 above).

2.   When the **Settings** screen appears (Figure 3–4 on page 21) 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 21).

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

Figure 3–4   Settings Menu
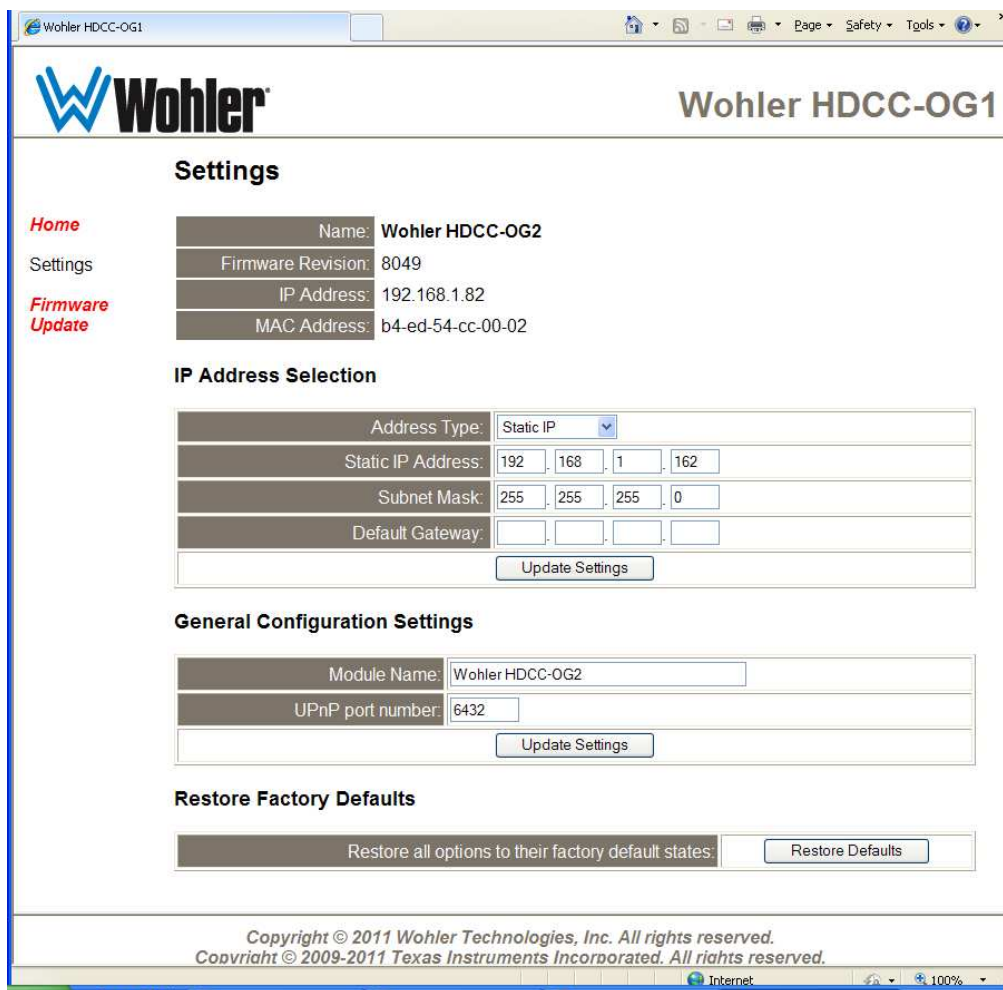
WARNING!   Verify that all information is correct for your network. The HDCC card will become unreachable on your network if the wrong information is set.

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 14 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
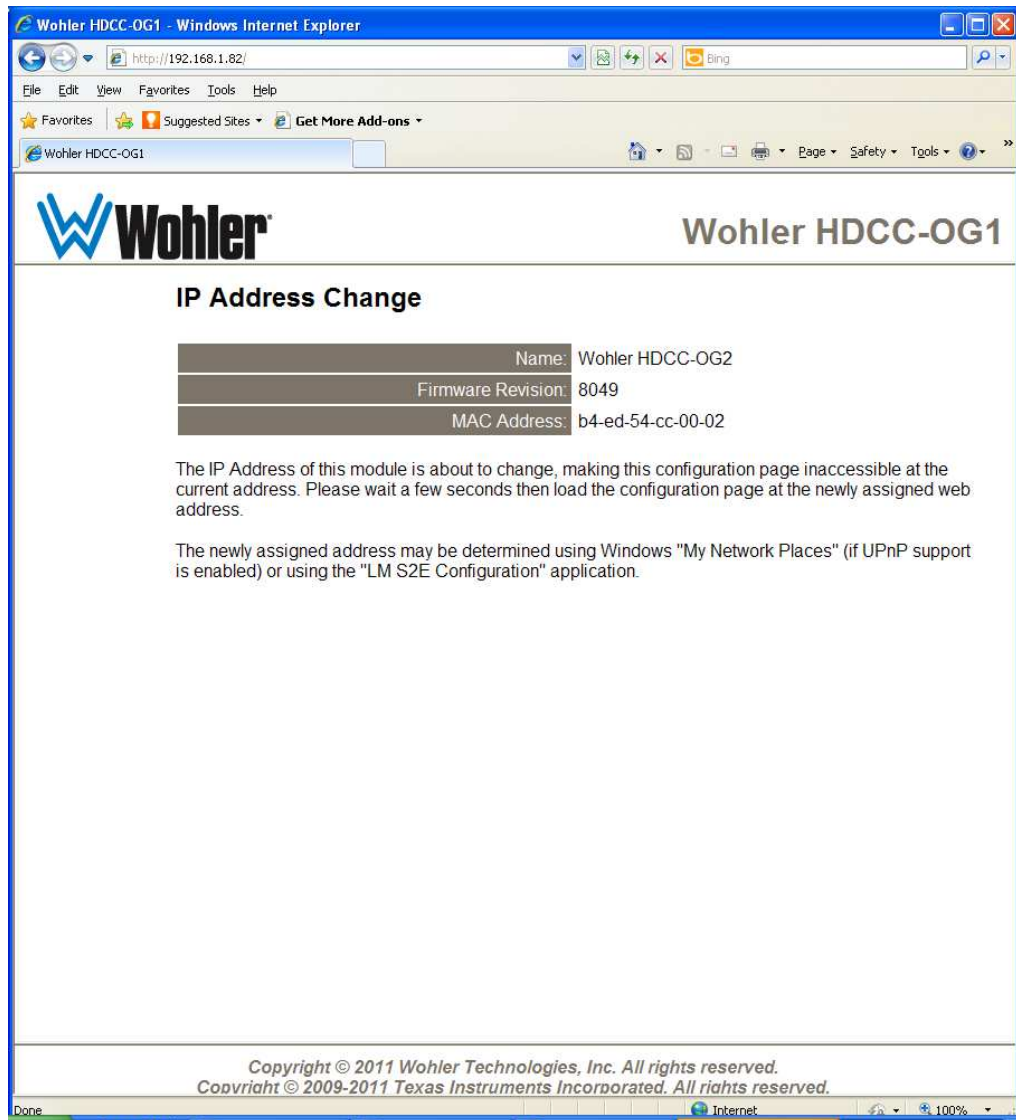
7.   Close this window (Figure 3–5 above).

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.

Important: If you are using Microsoft Windows 7 or 8, this software will not work for you. Instead, refer to Creating VSPs with later versions of Windows.

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

If you need to control hardware handshaking lines directly on an MSS, ETS or SCSx00 product, the original Redirector is still available at the links below. These products use a proprietary protocol to control HW handshaking signals instead of TruPort Technology (RFC2217). Click one of the links below to download the **v3.1.0.4** Redirector:

|	Download via FTP	Download via HTTP	Comment
Redirector	ftp	http	
Release Notes	ftp	http	Right-click and choose "Save Target As..."

Download the Redirector.

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

Figure 3–7   Open File - Security Warning
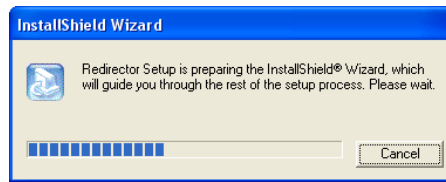

4.   When the initial installation screen displays (Figure 3–7 above) click **Run**.

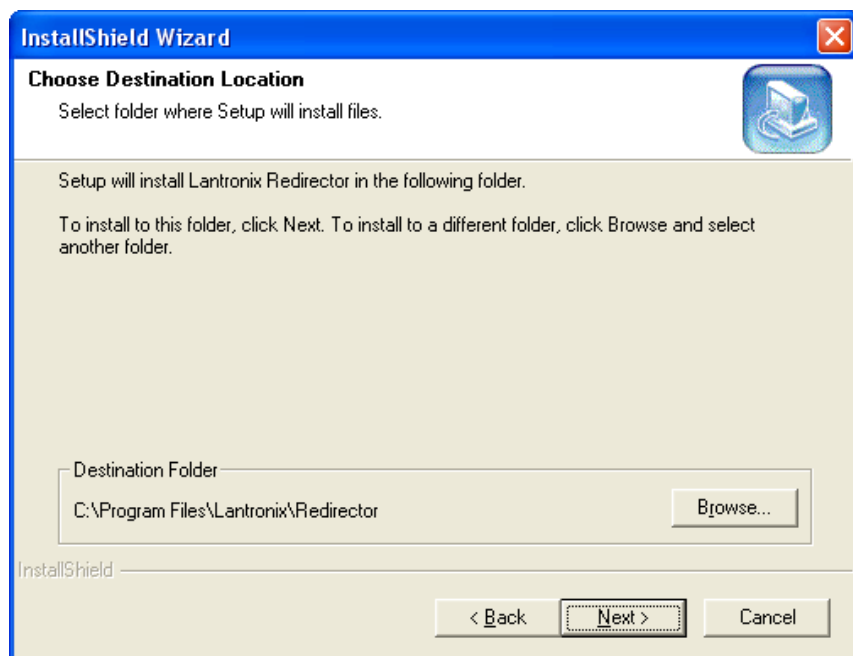**Figure 3–8   Lantronix Welcome Screen**
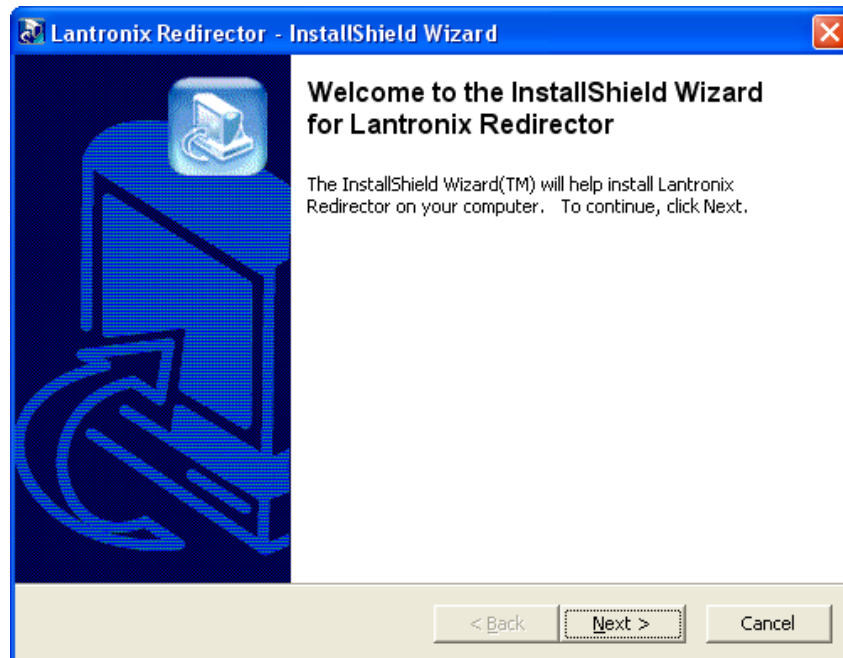
5.   When the **Welcome** screen displays (Figure 3–8 above) click **Next**.

Figure 3–9   InstallShield

6.   The **InstallShield** screen will quickly display and then return
     you to the Welcome screen. Click **Next** again.
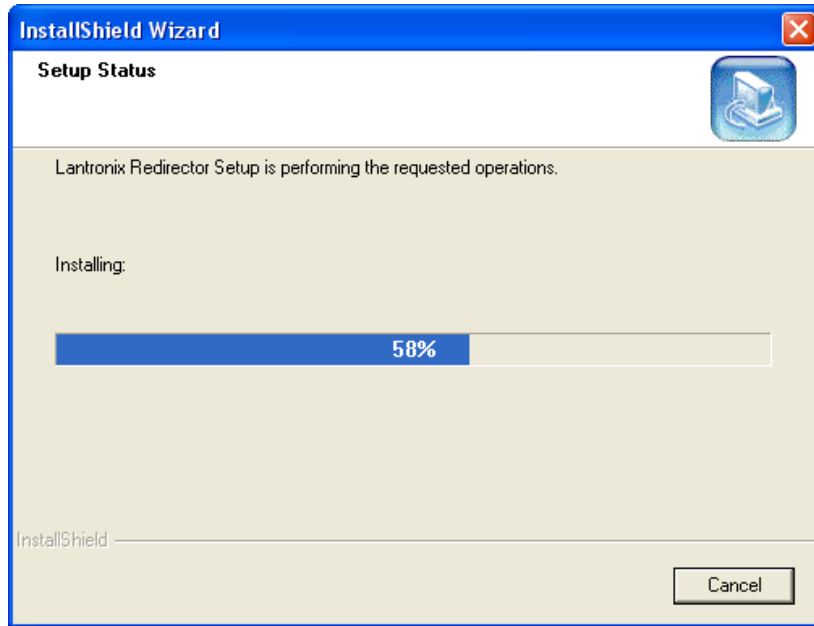
Figure 3–10   Choose Destination Location

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

     The **Setup Status** screen (Figure 3–11 on page 26) 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
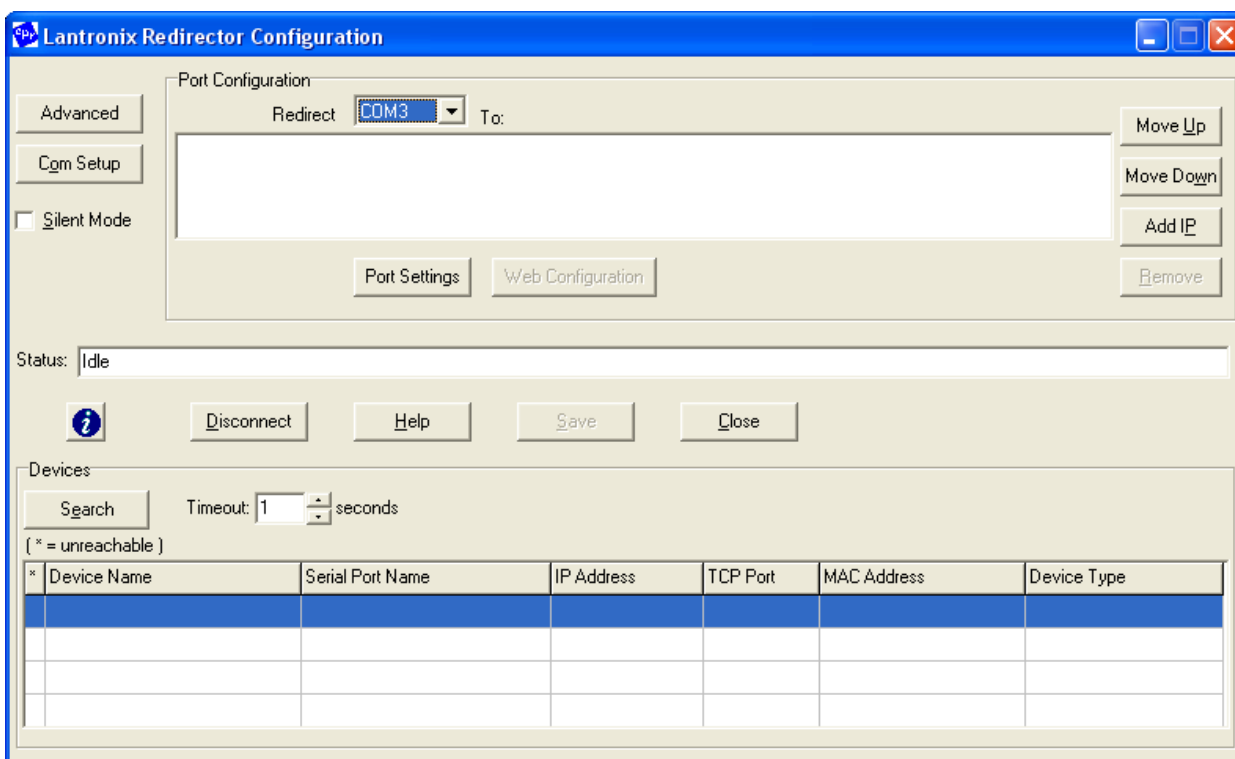
Important: Each HDCC has provision for two virtual serial ports; each MC-1RU frame therefore has provision for four virtual serial ports (two HDCC cards times two VSPs per card). For each HDCC card, you will perform Steps 2 through 12 twice: once for VSP#1 and again for VSP#2.
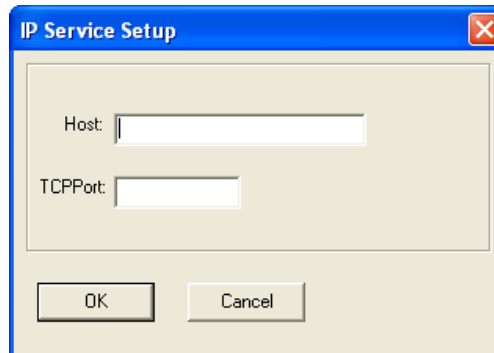
2. Click **Com Setup** on the left side of the screen.

Figure 3–14   Com Setup
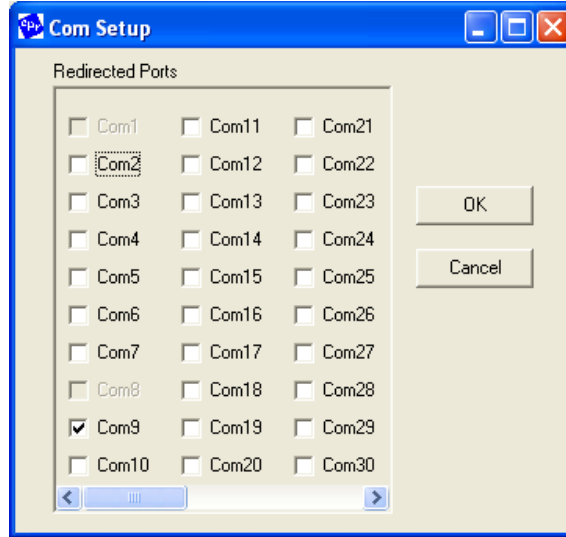
3.   Assign an available **Com** port (in our example Com9 is selected) and click **OK**.

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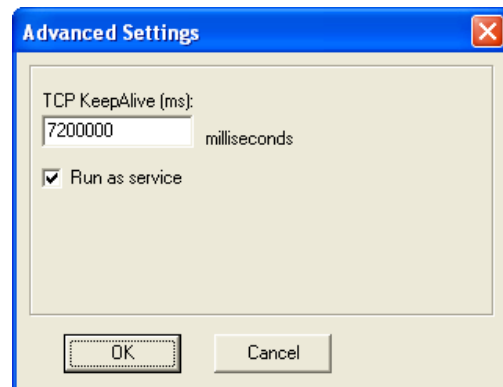
Figure 3–16   Port Settings
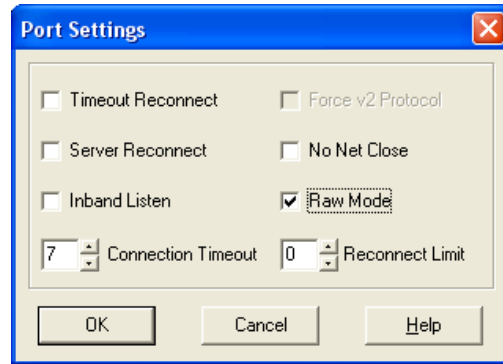
9.   Check **Raw Mode** (Figure 3–16 above) and click **OK**.

Important: The virtual serial port will not function unless Raw Mode is enabled

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**.

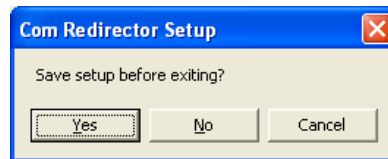**Figure 3–18   Service Installation**

12.   When the **Service Installation** (Figure 3–18 above) dialog appears, click **OK**.
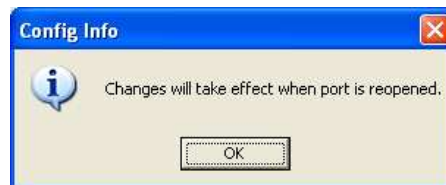
Figure 3–19   Config Info

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.

Creating VSPs with the Later Versions of Windows

Windows 7 or 8 users need to install an alternative COM port redirector. There are many freeware/shareware possibilities, but Tactical Software's Serial/IP COM Port Redirector has been used successfully with both Windows 7 and 8.

The product description can be found at: http://www.tacticalsoftware.com/products/serialip/index.html.

The software is not free (a two port license costs $150.00), but Tactical Software offers a free downloadable 30-day trial

Figure 3–22   Tactical Serial/IP Control Panel
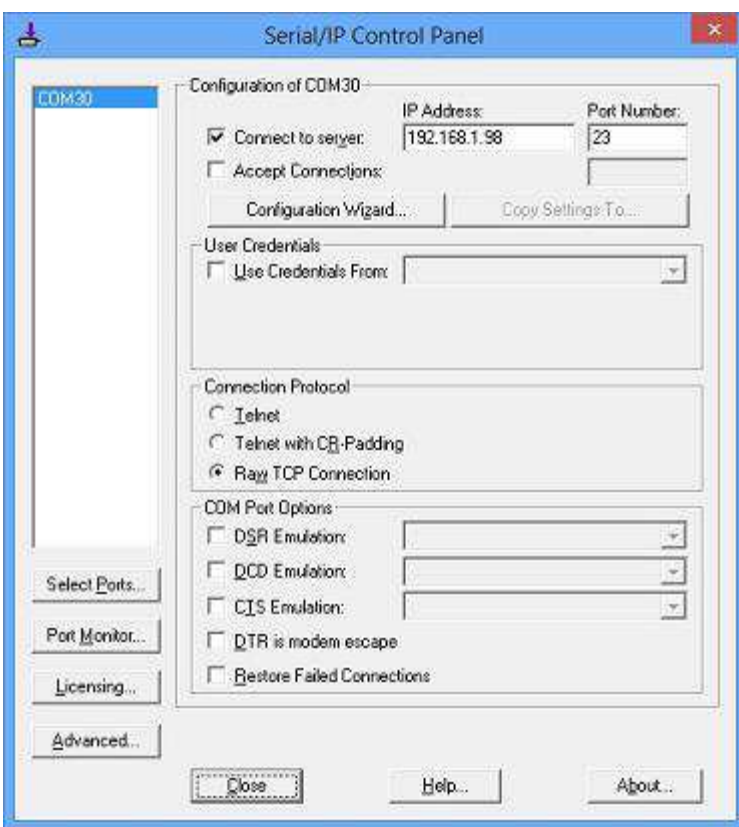
With the software, you can configure two virtual COM ports. Both muse use the IP address of the card, port 23 should be used for Eth1, and port 26 for Eth2.

Important: Raw TCP connection must be selected or the VSP will not operate.

Next Steps

If you are using the Ross DFR-8321 frame, proceed to the next chapter, Using DashBoard on page 33.

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.

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.
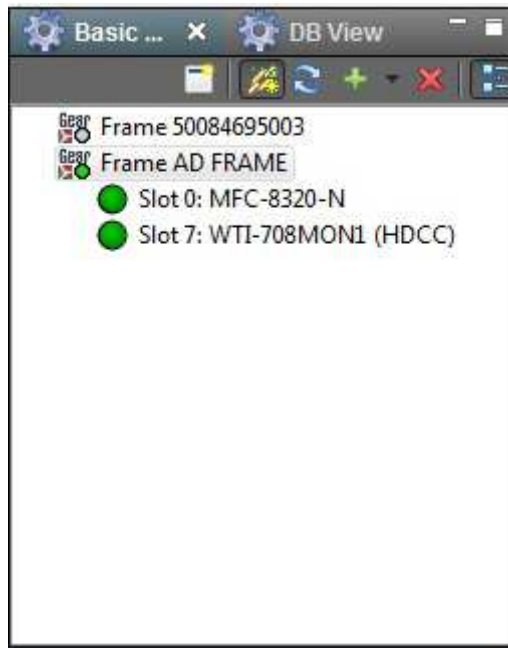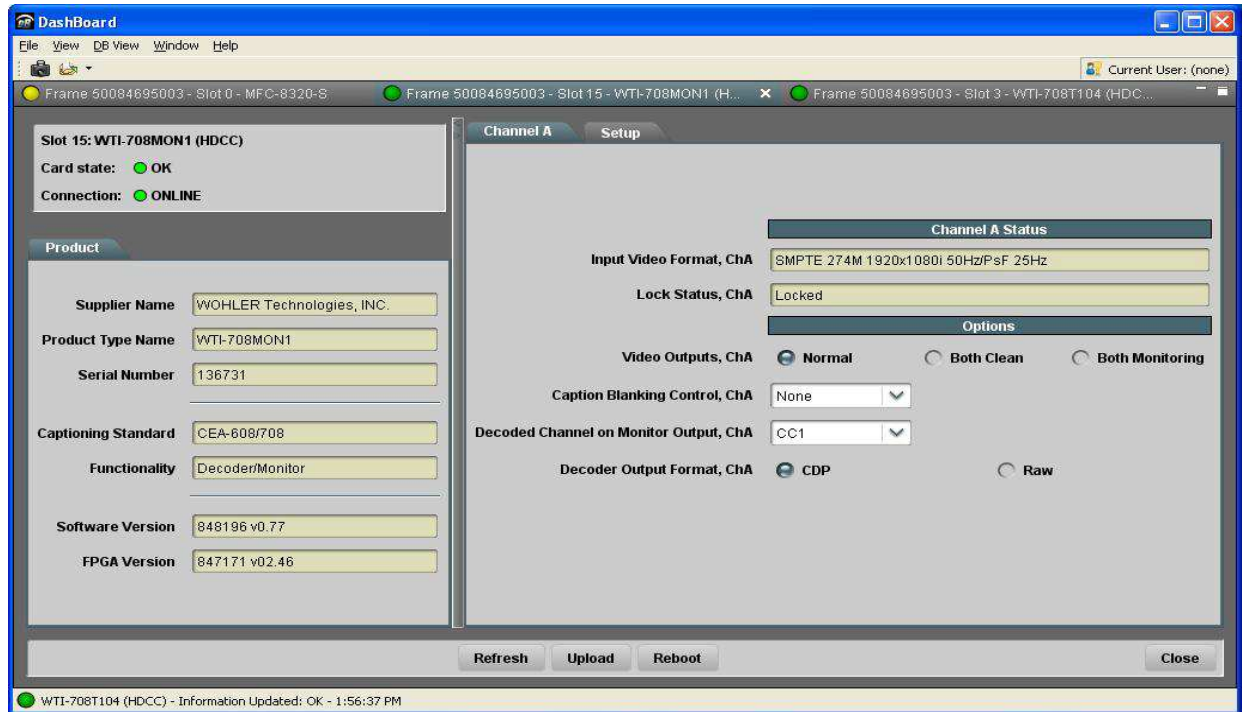
Figure 4–1   DashBoard Tree

Figure 4–2 DashBoard Main Screen (Top)

Note: The Wohler HDCC card will appear as **WTI-708MON (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 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
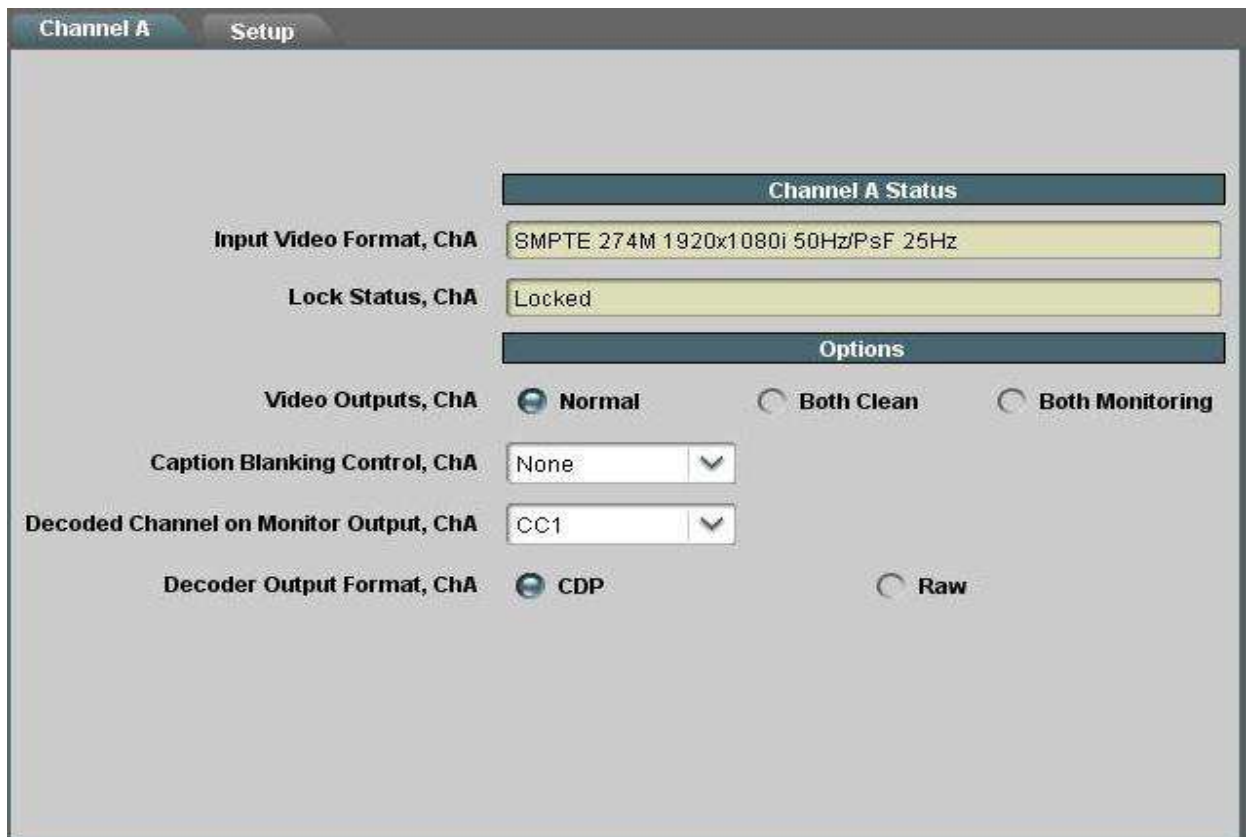
Channel A Status

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

Options

Video Outputs

- Normal: **CHA OUT** output is clean and **CHA MON** output has burned-in captions.

- Both clean

- Both monitoring (burned-in)

708 Features

- **Decoded Channel on Monitor Output**: Selects which Caption channel (CC1 or CC2) is decoded and displayed on the monitor output.

- **Caption Blanking Control:** Selects which (if any) general purpose (GPI) input blanks burned-in captions on the monitoring output.

The Setup Tab

The **Setup** tab allows you to set the Com port speed for both channels and reload the factory default settings.

Figure 4–5   **System Setup**
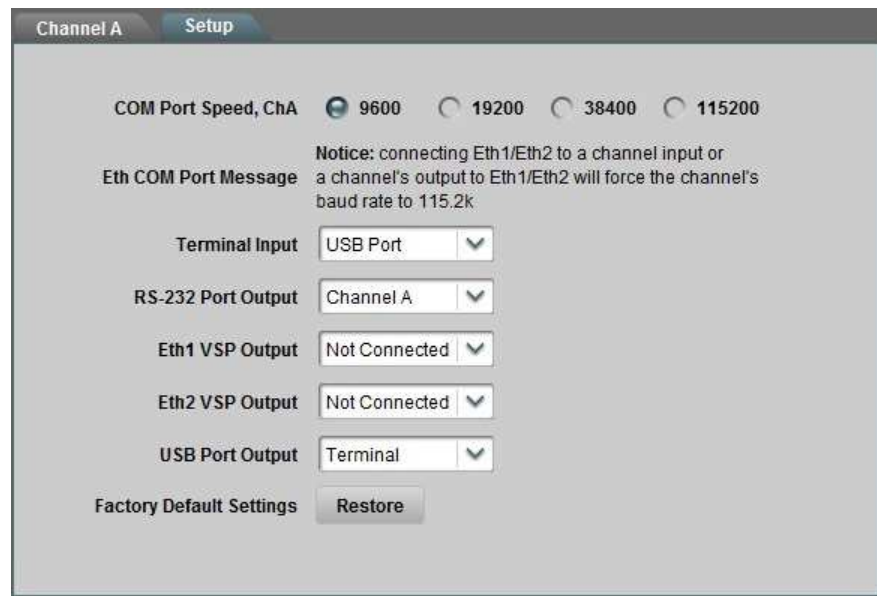
- **Com Port Speed, Ch A/B**: Click either 9600, 19200, 38400, or 115200.

Important: If a virtual serial port is connected for decoding, the baud rate **must** be 115200. However, the baud rate of the redirected COM port on the PC can be set to any desired baud rate.

- **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.

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 decode captions on Channel A and output the data on the RS-232 port?

Situation

You have an incoming video stream on Channel A and want to decode the captions on it and output the data through the RS-232 port.

Preparation

Make sure an SDI cable with a valid captioned video stream is connected to input **CHA IN**, the card/frame is powered and operational, and a serial cable is connected to the **RS-232** port, hooked to a PC with a terminal/decoding program.

Process

1. In the **Setup** menu, set the **RS-232 Port Output** to "Channel A" and the **COM Port Speed, ChA** to the baud rate used by your terminal program. No other output should be set to "RS-232."

2. Select **Decoder Output Format, ChA**: **CDP** for SMPTE 334-2 Caption Data Packets or **Raw** for SMPTE 333 closed caption packets

Decoded caption data should be output from the **RS-232** port.

How do I decode captions on Channel A and output the data on the Ethernet virtual serial port Eth1 VSP (port 23)?

Situation

You have an incoming video stream on Channel A and want to decode the captions on it and output the data through virtual serial port **Eth1 VSP**.

Preparation

Make sure an SDI cable with a valid captioned 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 (refer to the previou chapter).

Process

1. In the **Setup** menu, set the **Eth1 VSP Output** to "Channel A" and the **Channel A 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 PC's terminal emulator can still set the baud rate to any desired setting in the range 9,600 to 115.2k. No other output should be set to "Eth1 VSP."

2. Select **Decoder Output Format, ChA**: **CDP** for SMPTE 334-2 Caption Data Packets or **Raw** for SMPTE 333 closed caption packets

Decoded caption data should be output from the **Eth1 VSP** port.

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 when you use the DashBoard.

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 5–1   Terminal Main Menu
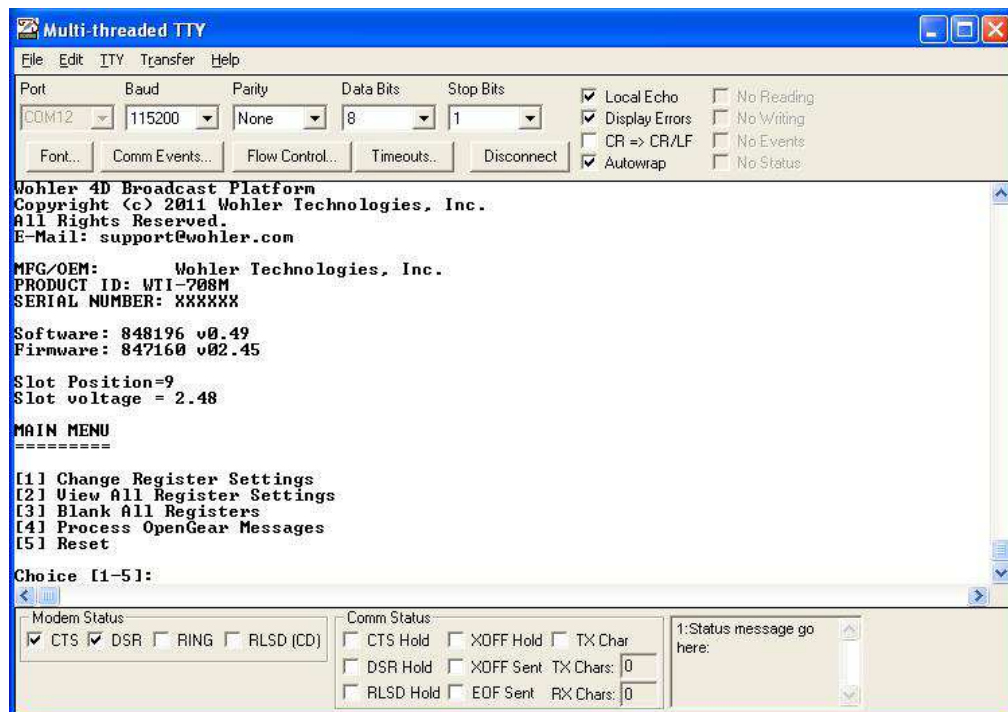
Access to the Terminal is controlled by the **BOOTOPT** jumper on the card as shown in Figure 5–2 on page 46. The sections below describe how it is used.

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.
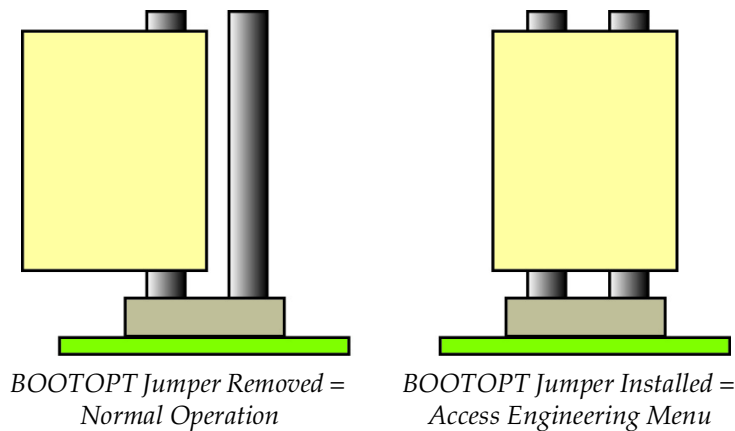
Accessing the Terminal via the RS-232 Port

1.   In DashBoard's **Setup Menu**, set the Terminal input to **RS-232** and the RS-232 output to **Terminal**.

2.   Power down the card, install the **BOOTOPT** jumper (see Figure 5–2 on page 46).

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

4.   Connect a serial cable from your PC to the RS-232 connector on the rear panel.

5.   Re-power the card.

6.   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.

7.   Press the Enter key to display the Engineering Menu as shown in Figure 5–1 on page 44.

8.   Power off the card, remove the **BOOTOPT** jumper, and re-power the card to restore normal operation. (See Figure 5–2 on page 46 for details.)

BOOTOPT Jumper

| *BOOTOPT Jumper Removed =* | *BOOTOPT Jumper Installed =* |
| *Normal Operation* | *Access Engineering Menu* |
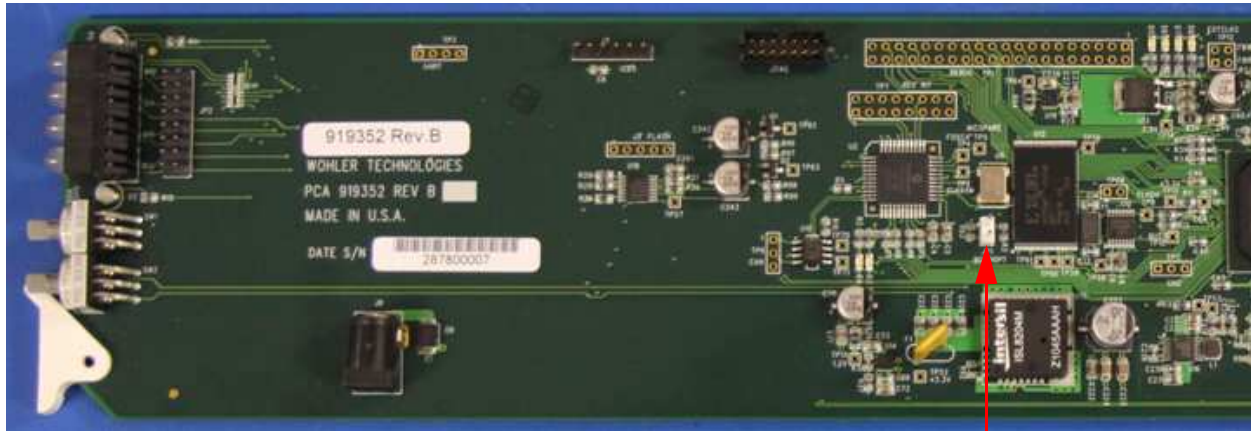
9.   Go to the Engineering Menu functions below.

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 5–2 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 5–1 on page 44).

8. Power off the card, remove the **BOOTOPT** jumper, and re-power the card to restore normal operation. (See Figure 5–2 on page 46 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 5–2 on page 46), 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 5–1 on page 44).

8.   Power off the card, remove the **BOOTOPT** jumper, and re-power the card to restore normal operation. (see Figure 5–2 on page 46)

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 5–2 on page 46 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 5–1 on page 44).

5.   Power off the card, remove the **BOOTOPT** jumper, set SW3 to OFF (Refer to Figure 2–3 on page 14.), and re-power the card to restore normal operation. (See Figure 5–2 on page 46 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 5–3 on page 49 and the following descriptions of each menu option for details.

Figure 5–3 **Main Menu**

Software and Firmware Part Numbers and Versions

Engineering Menu
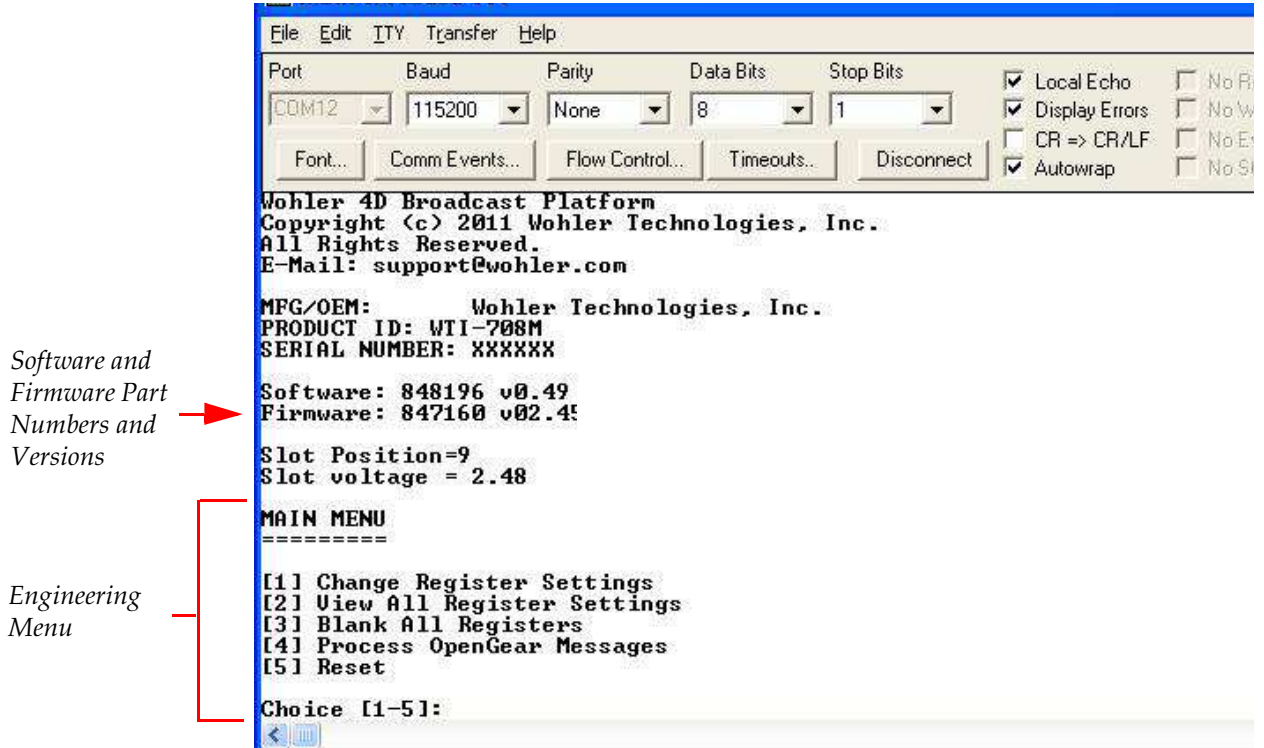
Important: Refer to Appendix A for a detailed list of registers.

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.

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

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

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 43.

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

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
00f	Not Used
01h	Not Used
02h	Not Used
03f	Not Used
04h	Not Used
05h	Not Used
06h	Not Used
07h	Not Used
08h	Transmission Features
09h	Not Used
0Ah	Not Used
0Bh	Not Used
0Ch	Not Used
0Dh	Not Used
0Eh	Not Used
0Fh	Not Used
10h	Special Features 2
11h	Not Used
12h	Not Used
13h	Not Used
14h	Not Used
15h	Not Used

Table A–1   Register Table Summary

Channel A	Description
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 Monitoring Output (0=CC1, 1=CC2, ...)
1Eh	Not Used
1Fh	Not Used
4Dh	Timing Offset—Do Not Change
4Eh	Not Used
4Fh	Not Used

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

CHA Reg #	Description	Default
00h	Not Used	09h
01h	Not Used	13h
02h	Not Used	15h
03h	Not Used	00h
04h	Not Used	81h
05h	Not Used	"e" 65h
06h	Not Used	"n" 6Eh
07h	Not Used	"g" 67h

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

CHA Reg #	Description	Default
08h	**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 = CDP 1 = Raw</td></tr><tr><td>3</td><td>Not Used</td></tr><tr><td>2</td><td>Not Used</td></tr><tr><td>1</td><td>Not Used</td></tr><tr><td>0</td><td>Not Used</td></tr></table>	00h
09h	Reserved—Do Not Change	—
0Ah	Not Used	0Dh
0Bh	Not Used	0Dh
0Ch	Not Used	—
0Dh	Not Used	—
0Eh	Not Used	—
0Fh	Not Used	00h

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

CHA Reg #	Description	Default
10h	**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>Not Used</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	00h
11h	**Regen / Blank Control** <table><tr><th>Bit(s)</th><th>Function</th></tr><tr><td>7:4</td><td>Not Used</td></tr><tr><td>3:0</td><td>Blank Control: 0000 = No Blank 0101 = Blank with GPI 1 0110 = Blank with GPI 2 0111 = Blank with GPI 3 1000 = Blank with GPI 4 Other = Invalid</td></tr></table>	00h
12h	Not Used	12h
13h	Not Used	E4h
14h	Not Used	—
15h	Not Used	—
16h	Not Used	—

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

CHA Reg #	Description	Default
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	00h
1Eh	Not Used	—
1Fh	Not Used	—
4Dh	Not Used	06h
4Eh	Not Used	10h
4Fh	Not Used	00h

Specifications and Pin-Outs

Introduction

Overview

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

Topics

Topics	Page
Introduction	57
Specifications	58
Connector Pin Assignments	59
Technical Functional Overview	59

Specifications

Table B–1   Physical Specifications

| Specification	OG
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: 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 (OG only)
Power Requirements	Receives power from frame
Power Consumption	Approximately 10 W

Table B–2   Technical Specifications

Specification	1 Channel
Video Inputs	1 SD/HD-SDI autosensing on BNC
Video Outputs	1 HD/SD-SDI Closed Captioned (BNC)
	1 HD/SD-SDI Open Captioned (BNC)
Caption Inputs/Outputs	1 Ethernet (RJ-45) 10/100 BaseTX
	1 RS-232 (DB-9)
	1 USB
Frame compatibility	• Ross DFR-8321
Available functions	• Closed Caption OSD Monitoring
	• HD/SD Closed Caption Decoding/ Analyzing
Supported closed caption specifications	CEA-608, CEA-708 both encapsulated 608 and native 708

Connector Pin Assignments

Table B–3   RS-232 / GPIO Pin-Out Assignments

Pin	Label	Function
1	Rx0	Open Collector
2	NC	Not Connected
3	Tx0	Active Low
4	GND	Signal Ground
5	TX	RS-232 Tx Data (Out)
6	RX	RS-232 Rx Data (In)
7	Rx1	Open Collector
8	Tx1	Active Low

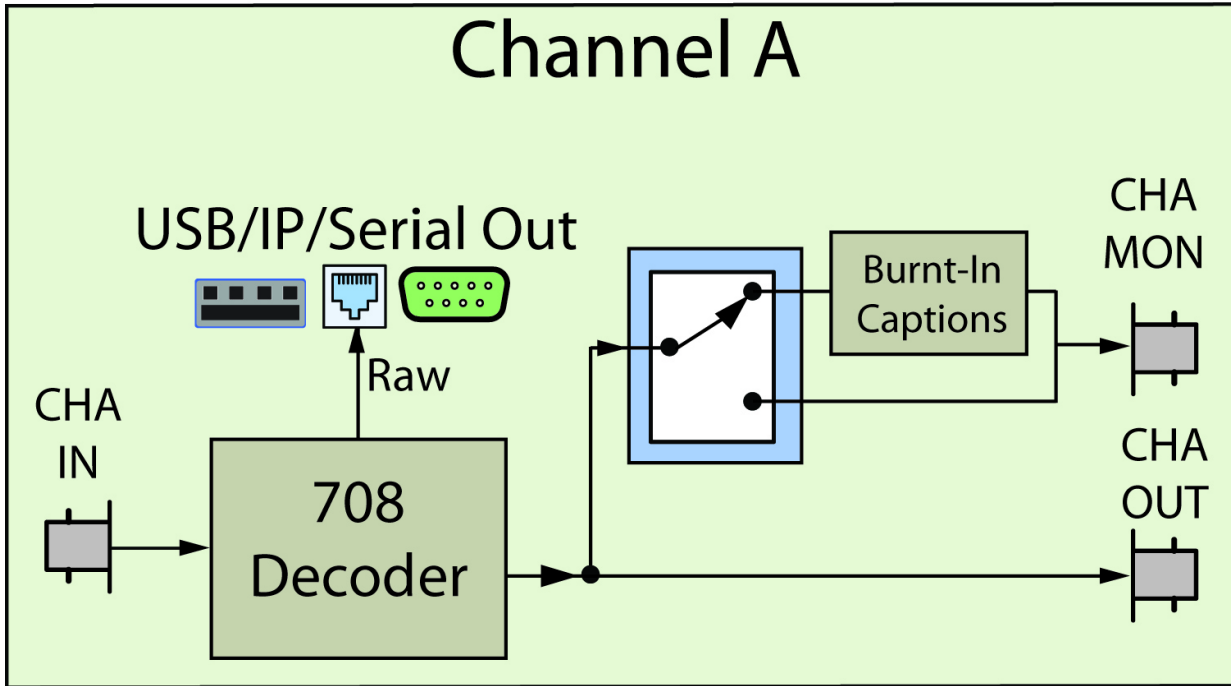**Figure B–1   RS-232 / GPIO RJ-45 Pin-Out**
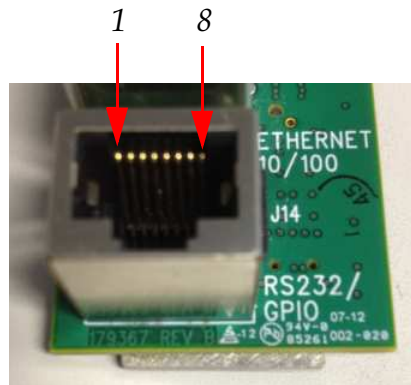
WARNING!   RS-232 voltage levels are present on pins 5 and 6. These voltages can damage some digital components. Be sure not to connect these pins to any equipment that may be damaged by these voltage levels.

Technical Functional Overview

illustrates the design of the HDCC.

Figure B–2 **HDCC Block Diagram**

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.

Network

Table C–2   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.

Decoding

Table C–3   Common Decoding Problems and Solutions

Symptom	Possible Cause	Solution
Incoming video stream with captions is not decoding.	Serial output connection not valid.	Verify output serial connection is valid. If video output is set to **Normal**, burned in captions will be visible on the channel's **MON** output.
	If using VSP, settings are wrong.	VSP settings must be 115.2k, 8, 1, n for decoded output.
	Channel connection incorrect.	Verify the signal is provided to the input for decoding.

VSPs

Table C–4   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.