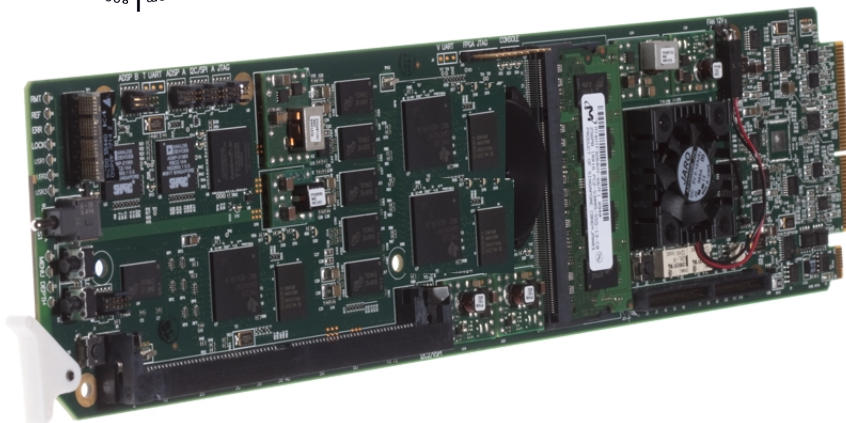# 9392-TCB

3G/HD/SD-SDI Dual-Channel Timecode Burn-In Inserter

Product Manual

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Congratulations on choosing the Cobalt® 9392-TCB 3G/HD/SD-SDI Dual-Channel Timecode Burn-In Inserter. The 9392 is part of a full line of modular processing and conversion gear for broadcast TV environments. The Cobalt Digital Inc. line includes video decoders and encoders, audio embedders and de-embedders, distribution amplifiers, format converters, remote control systems and much more. Should you have questions pertaining to the installation or operation of your 9392, please contact us at the contact information on the front cover.

Manual No.:	9392-TCB-OM
Document Version:	V1.3
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Applicable for card firmware version: (or greater)	13
Description of product/manual changes:	- Revise manual to reflect product functional changes of latest firmware release (including full SMPTE embedded timecode insertion/burn-in controls). Refer to **Support > Firmware Downloads** link at www.cobaltdigital.com for latest firmware and corresponding functional description changes and additions.

Table of Contents

Chapter 1

Introduction

Overview

This manual provides installation and operating instructions for the 9392-TCB 3G/HD/SD-SDI Dual-Channel Timecode Burn-In Inserter card (also referred to herein as the 9392).

This manual consists of the following chapters:

- **Chapter 1, "Introduction"** – Provides information about this manual and what is covered. Also provides general information regarding the 9392.
- **Chapter "Installation and Setup"** – Provides instructions for installing the 9392 in a frame, and optionally installing 9392 Rear Modules.
- **Chapter "Operating Instructions"** – Provides overviews of operating controls and instructions for using the 9392.

This chapter contains the following information:

- **9392 Card Software Versions and this Manual (p. 1-2)**
- **Manual Conventions (p. 1-3)**
- **Safety Summary (p. 1-4)**
- **9392 Functional Description (p. 1-5)**
- **Technical Specifications (p. 1-11)**
- **Warranty and Service Information (p. 1-13)**
- **Contact Cobalt Digital Inc. (p. 1-14)**

9392 Card Software Versions and this Manual

When applicable, Cobalt Digital Inc. provides for continual product enhancements through software updates. As such, functions described in this manual may pertain specifically to cards loaded with a particular software build.

The Software Version of your card can be checked by viewing the **Card Info** menu in DashBoard™. See Checking Card Information (p. 3-7) in Chapter 3, "Operating Instructions" for more information. You can then check our website for the latest software version currently released for the card as described below.

Check our website and proceed as follows if your card's software does not match the latest version:

Card Software **earlier** than latest version	Card is not loaded with the latest software. Not all functions and/or specified performance described in this manual may be available.
	You can update your card with new Update software by going to the **Support>Firmware Downloads** link at www.cobaltdigital.com. Download "Firmware Update Guide", which provides simple instructions for downloading the latest firmware for your card onto your computer, and then uploading it to your card through DashBoard™.
	Software updates are field-installed without any need to remove the card from its frame.
Card Software **newer** than version in manual	A new manual is expediently released whenever a card's software is updated **and specifications and/or functionality have changed** as compared to an earlier version (a new manual is not necessarily released if specifications and/or functionality have not changed). A manual earlier than a card's software version may not completely or accurately describe all functions available for your card.
	If your card shows features not described in this manual, you can check for the latest manual (if applicable) and download it by going to the card's web page on www.cobaltdigital.com.

Cobalt Reference Guides

From the Cobalt® web home page, go to **Support>Reference Documents** for easy to use guides covering network remote control, card firmware updates, example card processing UI setups and other topics.

Manual Conventions

In this manual, display messages and connectors are shown using the exact name shown on the 9392 itself. Examples are provided below.

- Connector names are shown like this: **SDI IN A**

In this manual, the terms below are applicable as follows:

- **9392** refers to the 9392-TCB 3G/HD/SD-SDI Dual-Channel Timecode Burn-In Inserter card.

- **Frame** refers to the HPF-9000 (or similar) 20-slot frame that houses the Cobalt® COMPASS® and/or FUSION3G® cards.

- **Device** and/or **Card** refers to a COMPASS® and/or FUSION3G® card.

- **System** and/or **Video System** refers to the mix of interconnected production and terminal equipment in which the 9392 and other COMPASS® and/or FUSION3G® cards operate.

- Functions and/or features that are available only as an option are denoted in this manual like this:

    Option ☞

    Not all options are covered in this manual. In these cases, Manual Supplement(s) for the option(s) ordered have been included in the binder containing this manual.

Warnings, Cautions, and Notes

Certain items in this manual are highlighted by special messages. The definitions are provided below.

Warnings

Warning messages indicate a possible hazard which, if not avoided, could result in personal injury or death.

Cautions

Caution messages indicate a problem or incorrect practice which, if not avoided, could result in improper operation or damage to the product.

Notes

Notes provide supplemental information to the accompanying text. Notes typically precede the text to which they apply.

Labeling Symbol Definitions

⚠	Attention, consult accompanying documents.
(ESD symbol)	Electronic device or assembly is susceptible to damage from an ESD event. Handle only using appropriate ESD prevention practices. If ESD wrist strap is not available, handle card only by edges and avoid contact with any connectors or components.
(WEEE symbol)	Symbol (WEEE 2002/96/EC) For product disposal, ensure the following: • Do not dispose of this product as unsorted municipal waste. • Collect this product separately. • Use collection and return systems available to you.

Safety Summary

Warnings

! WARNING ! **To reduce risk of electric shock do not remove line voltage service barrier cover on frame equipment containing an AC power supply. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

Cautions

CAUTION **This device is intended for environmentally controlled use only in appropriate video terminal equipment operating environments.**

CAUTION **This product is intended to be a component product of an openGear®compatible frame. Refer to the frame Product Manual for important safety instructions regarding the proper installation and safe operation of the frame as well as its component products.**

CAUTION **Heat and power distribution requirements within a frame may dictate specific slot placement of cards. Cards with many heat-producing components should be arranged to avoid areas of excess heat build-up, particularly in frames using only convection cooling. The 9392 has a high power dissipation (<25 W max.). As such, avoiding placing the card adjacent to other cards with similar dissipation values if possible.**

CAUTION **If required, make certain Rear Module(s) is installed before installing the 9392 into the frame slot. Damage to card and/or Rear Module can occur if module installation is attempted with card already installed in slot.**

CAUTION **If card resists fully engaging in Rear Module mating connector, check for alignment and proper insertion in slot tracks. Damage to card and/or Rear Module may occur if improper card insertion is attempted.**

9392 Functional Description

(See Figure 1-1.) The 9392 allows LTC timecode (received either as SMPTE embedded timecode or on an RS-485 LTC input) to be burned onto the active video area and outputted over output SDI. The card can also burn up to 16 characters of static text onto the program video path.

Note: "Video channel" or "video path" in descriptions in this manual and on card GUI controls refers to either of the two independent video paths accommodating the two SDI inputs on the card. Each of these independent video channels have independent timecode, text, and flat-field controls as described in this manual. The two video channels are eventually outputted from the card via the output crosspoint.

Independent, per-channel failover/manual select function provides for a user-selectable flat-field to replace program video either as a manual selection or upon loss of input video. The generated flat field can be timed to input video, or to a frame reference signal. Timecode burn-in and text can be sized and positioned anywhere in the active video area using easy-to-use positioning controls.

The 9392 also includes a 3x4 SDI output crosspoint, with **SDI OUT A** (channel A), **SDI OUT B** (channel B), or reclocked **SDI IN A** routable to up to four SDI outputs.

Two independent RS-485 LTC inputs **RS-485 LTC IN (SDI A)** and **RS-485 LTC IN (SDI B)** are received by the card for each SDI channel. (The LTC inputs received by the card must have the customary zero-crossing associated with RS-485. If the LTC source is offset above or below ground (0 V), the sources must be capacitively coupled or passed through an analog audio DA that can restore zero-crossing.)

Reference Function

The 9392 uses a common reference for both SDI video channels, with the reference being selectable from **Input Video A**, **Input Video B**, **REF 1**, or **REF 2** obtained from the frame references. This provides for proper rendering and switchover transitions from program video to the flat-field generators as well as stable output video.

Note: Both program video inputs must be of the same refresh rate (e.g., 59.94 or 50, or co-related (29.97 or 25), and co-synchronous using frame sync or similar means. In practical application, both inputs should be frame-synchronized using a common frame reference, with the same reference also to be used by this card.
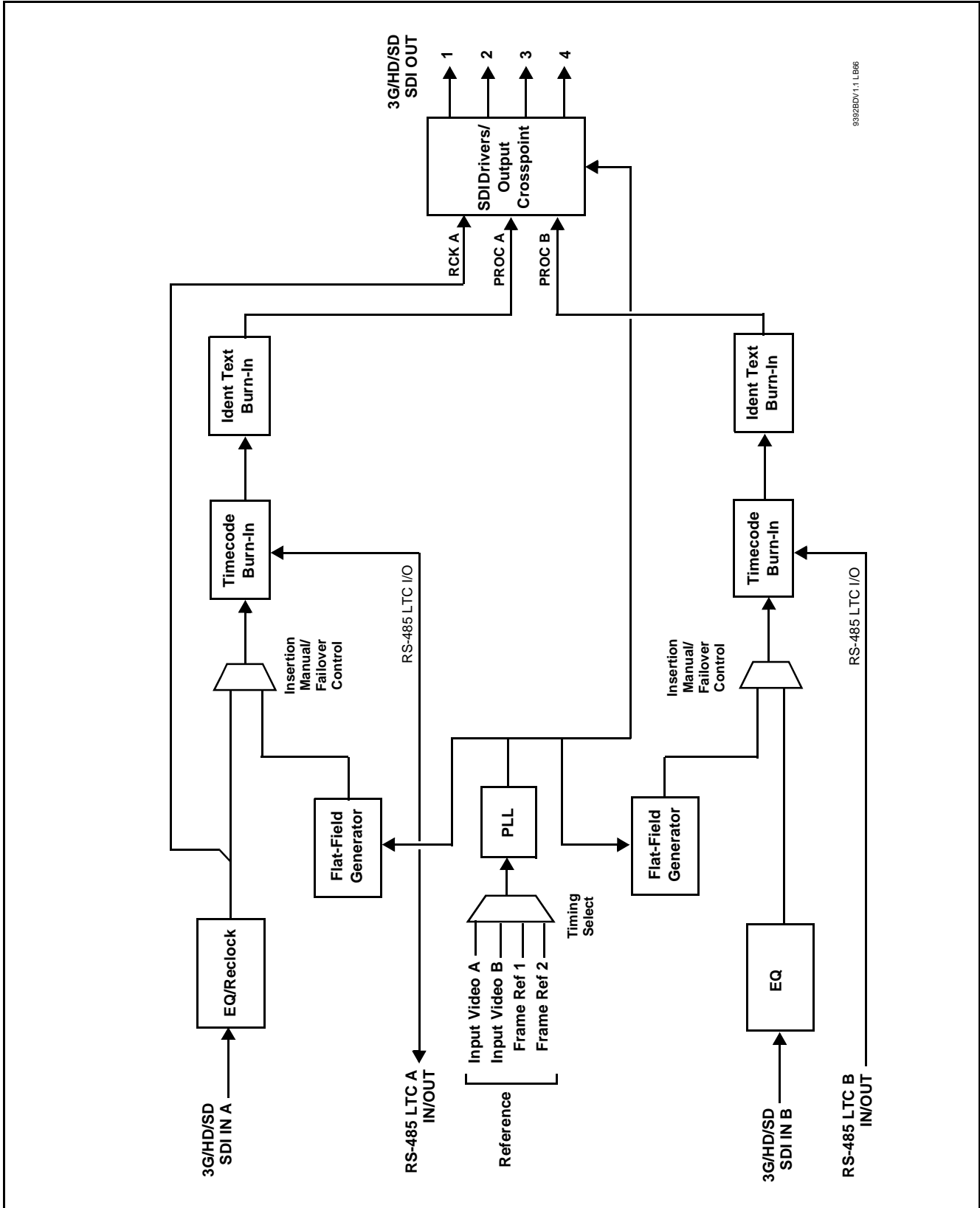
Figure 1-1 9392 Functional Block Diagram

Timecode Burn-In and SDI Output Insertion

(See Figure 1-2.) This function provides for extraction of timecode data from the input video, and in turn re-insertion of timecode data into the output SDI.

Note: Two independent timecode processors (one for each video path) are provided as described here.

The function can monitor the SDI video inputs of the card for supported timecode formats and convert the timecode to either or both ATC_LTC or ATC_VITC for HD, and ATC_VITC or VITC waveform (with selectable odd/even field line number control) for SD inputs. VITC waveform received on the frame reference can be used as a source for all supported video formats. Priority can be set to choose a particular received timecode format among any received.

The card can also can receive LTC timecode from either of two RS-485 ports for insertion as SMPTE embedded timecode formats onto the output video as described above. A free-run generator selection provides a self-generated timecode that can also be set as a count-down timecode, with selectable wrap or halt upon reaching zero.

The timecode burn-in function allows input video SMPTE embedded or RS-485 LTC as burn-in timecode in any of the following formats:

- seconds
- seconds : frame
- seconds : frame : field

Note: In the above selections, hours : minutes are always present.

The vertical/horizontal positioning and size of the timecode burn-in can be user-configured.
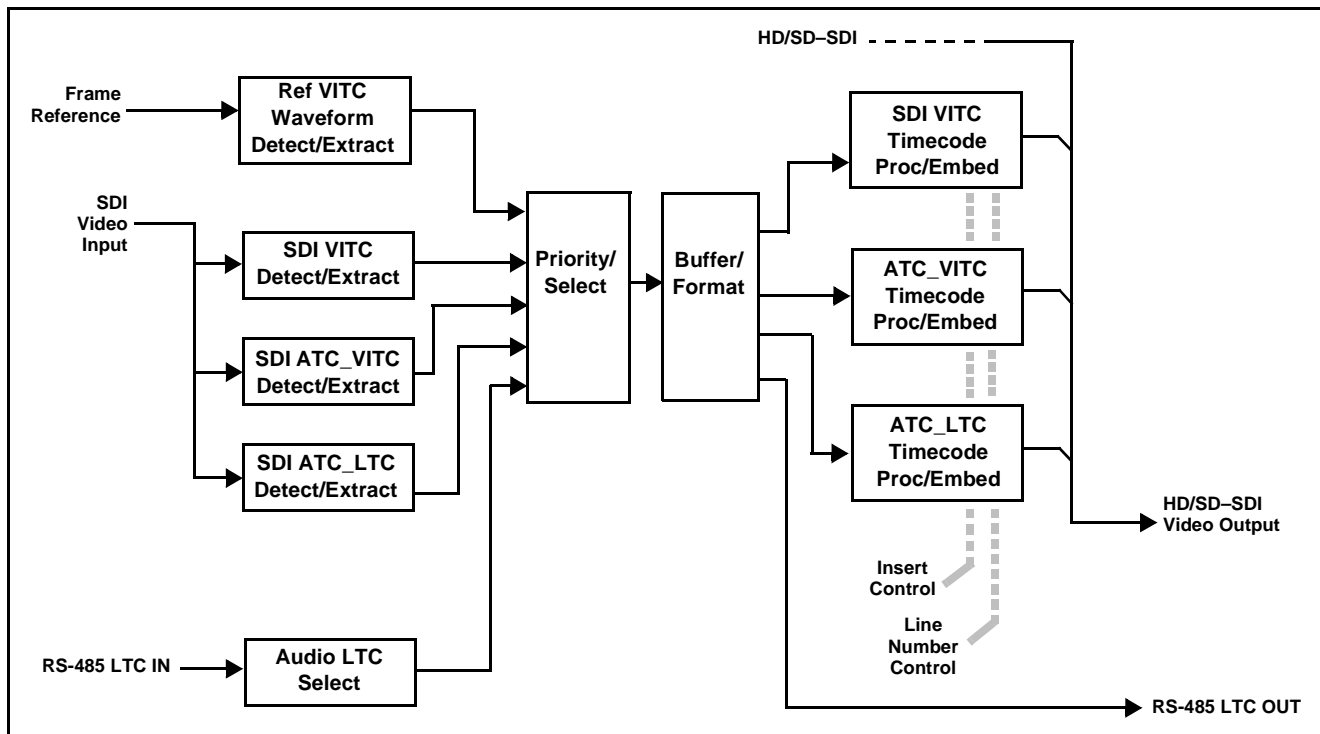
Figure 1-2 Timecode Processor (One of Two Video Paths Shown)

Identification Text Burn-In

Two independent text burn-in functions allow up to 16 ASCII-character text to be burned onto the output video. Insertion is manually and independently available for each SDI channel. The text burn function, when enabled, burns the entered text whether the card channel is passing input video or an internally generated flat field.

Flat-Field Generators

Independent flat-field generators are provided for each SDI channel. Either manually selected or via failover on loss of SDI input, the generators are individually configurable to output a flat field, with nine choices of color being user selectable.

Video Output Crosspoint

A 3x4 video output crosspoint allows processed SDI Channel A, processed SDI Channel B, or reclocked input channel SDI A to be outputted to any of four SDI output BNC connectors.

User Control Interface

Figure 1-3 shows the user control interface options for the 9392. These interfaces are individually described below.

Note: All user control interfaces described here are cross-compatible and can operate together as desired. Where applicable, any control setting change made using a particular user interface is reflected on any other connected interface.
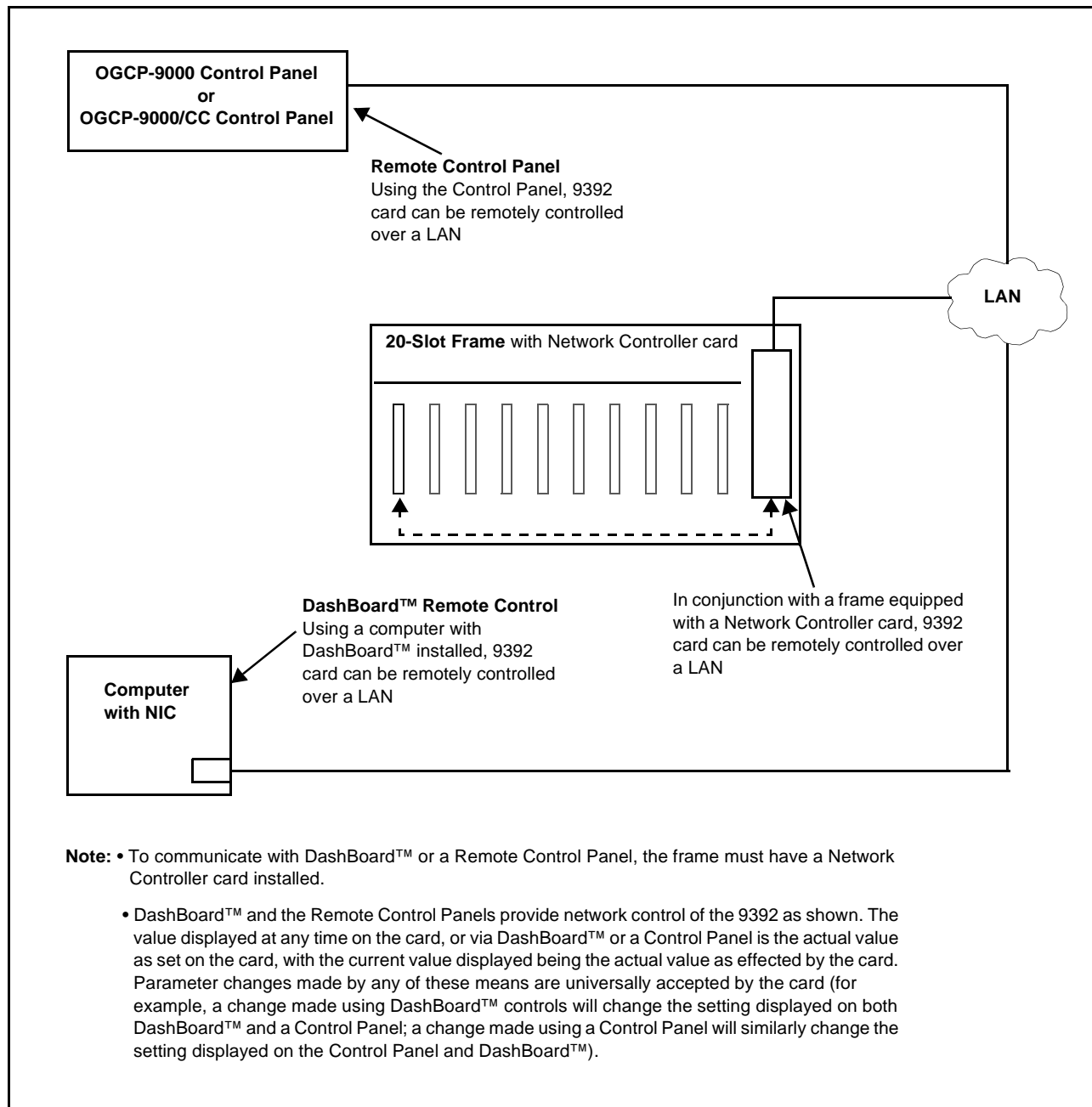

OGCP-9000 Control Panel
or
OGCP-9000/CC Control Panel

Remote Control Panel
Using the Control Panel, 9392 card can be remotely controlled over a LAN

LAN

20-Slot Frame with Network Controller card

In conjunction with a frame equipped with a Network Controller card, 9392 card can be remotely controlled over a LAN

DashBoard™ Remote Control
Using a computer with DashBoard™ installed, 9392 card can be remotely controlled over a LAN

Computer with NIC

Note: • To communicate with DashBoard™ or a Remote Control Panel, the frame must have a Network Controller card installed.

• DashBoard™ and the Remote Control Panels provide network control of the 9392 as shown. The value displayed at any time on the card, or via DashBoard™ or a Control Panel is the actual value as set on the card, with the current value displayed being the actual value as effected by the card. Parameter changes made by any of these means are universally accepted by the card (for example, a change made using DashBoard™ controls will change the setting displayed on both DashBoard™ and a Control Panel; a change made using a Control Panel will similarly change the setting displayed on the Control Panel and DashBoard™).

Figure 1-3 9392 User Control Interface

- **DashBoard™ User Interface** – Using DashBoard™, the 9392 and other cards installed in openGear®[1] frames such as the Cobalt® HPF-9000 or 8321 Frame can be controlled from a computer and monitor.

  DashBoard™ allows users to view all frames on a network with control and monitoring for all populated slots inside a frame. This simplifies the setup and use of numerous modules in a large installation and offers the ability to centralize monitoring. Cards define their controllable parameters to DashBoard™, so the control interface is always up to date.

  The DashBoard™ software can be downloaded from the Cobalt Digital Inc. website: www.cobaltdigital.com (enter "DashBoard" in the search window). The DashBoard™ user interface is described in Chapter 3,"Operating Instructions".

Note: If network remote control is to be used for the frame and the frame has not yet been set up for remote control, Cobalt® reference guide **Remote Control User Guide (PN 9000RCS-RM)** provides thorough information and step-by-step instructions for setting up network remote control of COMPASS® and FUSION3G® cards using DashBoard™. (Cobalt® OGCP-9000 and OGCP-9000/CC Remote Control Panel product manuals have complete instructions for setting up remote control using a Remote Control Panel.)

Download a copy of this guide by clicking on the **Support>Documents> Reference Guides** link at www.cobaltdigital.com and then select DashBoard Remote Control Setup Guide as a download, or contact Cobalt® as listed in Contact Cobalt Digital Inc. (p. 1-14).

- **Cobalt® OGCP-9000, OGCP-9000/CC and WinOGCP Remote Control Panels** – The OGCP-9000, OGCP-9000/CC, and WinOGCP Remote Control Panels conveniently and intuitively provide parameter monitor and control of the cards within the 20-slot frame.

  The remote control panels allow quick and intuitive access to hundreds of cards in a facility, and can monitor and allow adjustment of multiple parameters at one time.

  The remote control panels are totally compatible with the openGear® control software DashBoard™; any changes made with either system are reflected on the other.

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1. openGear® is a registered trademark of Ross Video Limited. DashBoard™ is a trademark of Ross Video Limited.

9392 Rear Modules

The 9392 physically interfaces to system video and audio connections using a Rear Module.

All inputs and outputs shown in the block diagram (Figure 1-1) enter and exit the card via the card edge backplane connector. The Rear Module breaks out the 9392 card edge connections to industry standard connections that interface with other components and systems in the signal chain.

9392 Rear Modules are shown and described in Chapter 2, "Installation and Setup".

Technical Specifications

Table 1-1 lists the technical specifications for the 9392-TCB 3G/HD/SD-SDI Dual-Channel Timecode Burn-In Inserter card.

Table 1-1   Technical Specifications

Item	Characteristic
Part number, nomenclature	9392-TCB 3G/HD/SD-SDI Dual-Channel Timecode Burn-In Inserter
Installation/usage environment	Intended for installation and usage in frame meeting openGear® modular system definition.
Power consumption	< 25 Watts

Environmental:
  Operating temperature:
  Relative humidity (operating or storage):
	32° – 104° F (0° – 40° C)
	< 95%, non-condensing

Frame communication	10/100 Mbps Ethernet with Auto-MDIX.

Standards supported	3G: SMPTE 425 level A and B
	    1080p60, 1080p59.94, 1080p50
	
	HD: 1080i60, 1080i59.94, 1080i50, 1080p29.97, 1080p25, 1080p24;
	    1080p23.98
	    720p60, 720p59.94, 720p50, 720p29.97, 720p25, 720p24,
	    720p23.98
	
	SD: 486i59094, 576i50

Internally generated flat-field formats **Note:** Flat-field format is user-selectable using GUI controls and independent of received (input video) format	3G: 1080p59.94, 1080p50 HD: 1080i59.94, 1080i50, 1080psf23.98 720p59.94, 720p50 SD: 525i59.94, 625i50

Table 1-1   Technical Specifications — continued

Item	Characteristic
BNC SDI Video Inputs/Outputs	Input/Output Complement: • SDI inputs: (2) 75Ω BNC • SDI outputs: (4) 75Ω BNC via 3x4 crosspoint Data Rates Supported: SMPTE 425 level A: 3 Gbps SMPTE 292 HD-SDI: 1.485 Gbps or 1.485/1.001 Gbps SMPTE 259M-C SD-SDI: 270 Mbps BNC Connector Input/Output Impedance: 75 Ω terminating Cable Equalization (3G): 394 ft (120 m) Belden 1694A Cable Equalization (HD): 591 ft (180 m) Belden 1694A Cable Equalization (SD): 1050 ft (320 m) Belden 1694A Return Loss: > 15 dB up to 1.485 GHz > 10 dB up to 2.970 GHz Jitter; Alignment (3G / HD / SD): < 0.3 UI / 0.2 UI / 0.2 UI Jitter; Timing (3G / HD / SD): < 2.0 UI / 1.0 UI / 0.2 UI
Processing delay	Less than 25 samples
Frame reference inputs	Standards Supported: SMPTE 170M/318M ("black burst") SMPTE 274M/296M ("tri-color") Return Loss: > 35 dB up to 5.75 MHz
RS-485 Ports	Two ports, each 3-wire RS-485 using Phoenix connectors with removable screw terminal blocks (Phoenix PN 1803581; Cobalt PN 5000-0013-000R)

Warranty and Service Information

Cobalt Digital Inc. Limited Warranty

This product is warranted to be free from defects in material and workmanship for a period of five (5) years from the date of shipment to the original purchaser, except that 4000, 5000, 6000, 8000 series power supplies, and Dolby® modules (where applicable) are warranted to be free from defects in material and workmanship for a period of one (1) year.

Cobalt Digital Inc.'s ("Cobalt") sole obligation under this warranty shall be limited to, at its option, (i) the repair or (ii) replacement of the product, and the determination of whether a defect is covered under this limited warranty shall be made at the sole discretion of Cobalt.

This limited warranty applies only to the original end-purchaser of the product, and is not assignable or transferrable therefrom. This warranty is limited to defects in material and workmanship, and shall not apply to acts of God, accidents, or negligence on behalf of the purchaser, and shall be voided upon the misuse, abuse, alteration, or modification of the product. Only Cobalt authorized factory representatives are authorized to make repairs to the product, and any unauthorized attempt to repair this product shall immediately void the warranty. Please contact Cobalt Technical Support for more information.

To facilitate the resolution of warranty related issues, Cobalt recommends registering the product by completing and returning a product registration form. In the event of a warrantable defect, the purchaser shall notify Cobalt with a description of the problem, and Cobalt shall provide the purchaser with a Return Material Authorization ("RMA"). For return, defective products should be double boxed, and sufficiently protected, in the original packaging, or equivalent, and shipped to the Cobalt Factory Service Center, postage prepaid and insured for the purchase price. The purchaser should include the RMA number, description of the problem encountered, date purchased, name of dealer purchased from, and serial number with the shipment.

Cobalt Digital Inc. Factory Service Center

2406 E. University Avenue	Office:	(217) 344-1243
Urbana, IL 61802 USA	Fax:	(217) 344-1245
www.cobaltdigital.com	Email: info@cobaltdigital.com	

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Contact Cobalt Digital Inc.

Feel free to contact our thorough and professional support representatives for any of the following:

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

Phone:	(217) 344-1243
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Web:	www.cobaltdigital.com
General Information:	info@cobaltdigital.com
Technical Support:	support@cobaltdigital.com

Chapter 2

Installation and Setup

Overview

This chapter contains the following information:

- Installing the 9392 Into a Frame Slot (p. 2-1)
- Installing a Rear Module (p. 2-3)
- Connecting To 3-Wire Phoenix Terminal Connectors (p. 2-5)
- Setting Up 9392 Network Remote Control (p. 2-6)

Note: The 9392 is suitable for installation only in a 20-slot frame (Cobalt® PN HPF-9000, OG3-FR, or 8321).

Installing the 9392 Into a Frame Slot

CAUTION

Heat and power distribution requirements within a frame may dictate specific slot placement of cards. Cards with many heat-producing components should be arranged to avoid areas of excess heat build-up, particularly in frames using only convection cooling. The 9392 has a high power dissipation (<25 W max.). As such, avoiding placing the card adjacent to other cards with similar dissipation values if possible.

CAUTION

This device contains semiconductor devices which are susceptible to serious damage from Electrostatic Discharge (ESD). ESD damage may not be immediately apparent and can affect the long-term reliability of the device.

Avoid handling circuit boards in high static environments such as carpeted areas, and when wearing synthetic fiber clothing. Always use proper ESD handling precautions and equipment when working on circuit boards and related equipment.

CAUTION

If required, make certain Rear Module(s) is installed before installing the 9392 into the frame slot. Damage to card and/or Rear Module can occur if module installation is attempted with card already installed in slot.

Note: Check the packaging in which the 9392 was shipped for any extra items such as a Rear Module connection label. In some cases, this label is shipped with the card and to be installed on the Rear I/O connector bank corresponding to the slot location of the card.

Install the 9392 into a frame slot as follows:

1. Determine the slot in which the 9392 is to be installed.

2. Open the frame front access panel.

3. While holding the card by the card edges, align the card such that the plastic ejector tab is on the bottom.

4. Align the card with the top and bottom guides of the slot in which the card is being installed. Gradually slide the card into the slot. When resistance is noticed, gently continue pushing the card until its rear printed circuit edge terminals engage fully into the Rear Module mating connector.

CAUTION

If card resists fully engaging in Rear Module mating connector, check for alignment and proper insertion in slot tracks. Damage to card and/or Rear Module may occur if improper card insertion is attempted.

5. Verify that the card is fully engaged in Rear Module mating connector.

6. Close the frame front access panel.

7. Connect cabling in accordance with the appropriate diagram shown in Table 2-1, "9392 Rear Modules" (p. 2-4).

8. Repeat steps 1 through 7 for other 9392 cards.

Notes: • The 9392 BNC inputs are internally 75-ohm terminated. It is not necessary to terminate unused BNC inputs or outputs.

• External frame sync reference signals are received by the card over a reference buses on the card frame, and not on any card rear I/O module connectors. The frame has a BNC connectors labeled **REF 1** and **REF 2** which receive reference signals from an external source such as a house distribution.

9. If network remote control is to be used for the frame and the frame has not yet been set up for remote control, perform setup in accordance with Setting Up 9392 Network Remote Control (p. 2-6).

> **Note:** If installing a card in a frame already equipped for, and connected to DashBoard™, no network setup is required for the card. The card will be discovered by DashBoard™ and be ready for use.

Installing a Rear Module

> **Notes:** • This procedure is applicable **only if a Rear Module is not currently installed** in the slot where the 9392 is to be installed.
>
> • Note that some Rear Modules and labels have several ventilation holes. To allow maximum ventilation, it is recommended to place the label fully over connectors such that label is flush with rear module and holes are not obscured. Also, when a card is not installed in a slot, it is recommended that the supplied blank cover be used to preserve proper forced ventilation flow-through.

9392 Rear Modules are shown and described in 9392 Rear Modules (p. 2-4). Install a Rear Module as follows:

1. On the frame, determine the slot in which the 9392 is to be installed.

2. In the mounting area corresponding to the slot location, install Rear Module as shown in Figure 2-1.

① Align and engage mounting tab on Rear I/O Module with the module seating slot on rear of frame chassis.

DSCN3483A.JPG

② Hold top of Rear Module flush against frame chassis and start the captive screw. Lightly tighten captive screw.

DSCN3487A.JPG
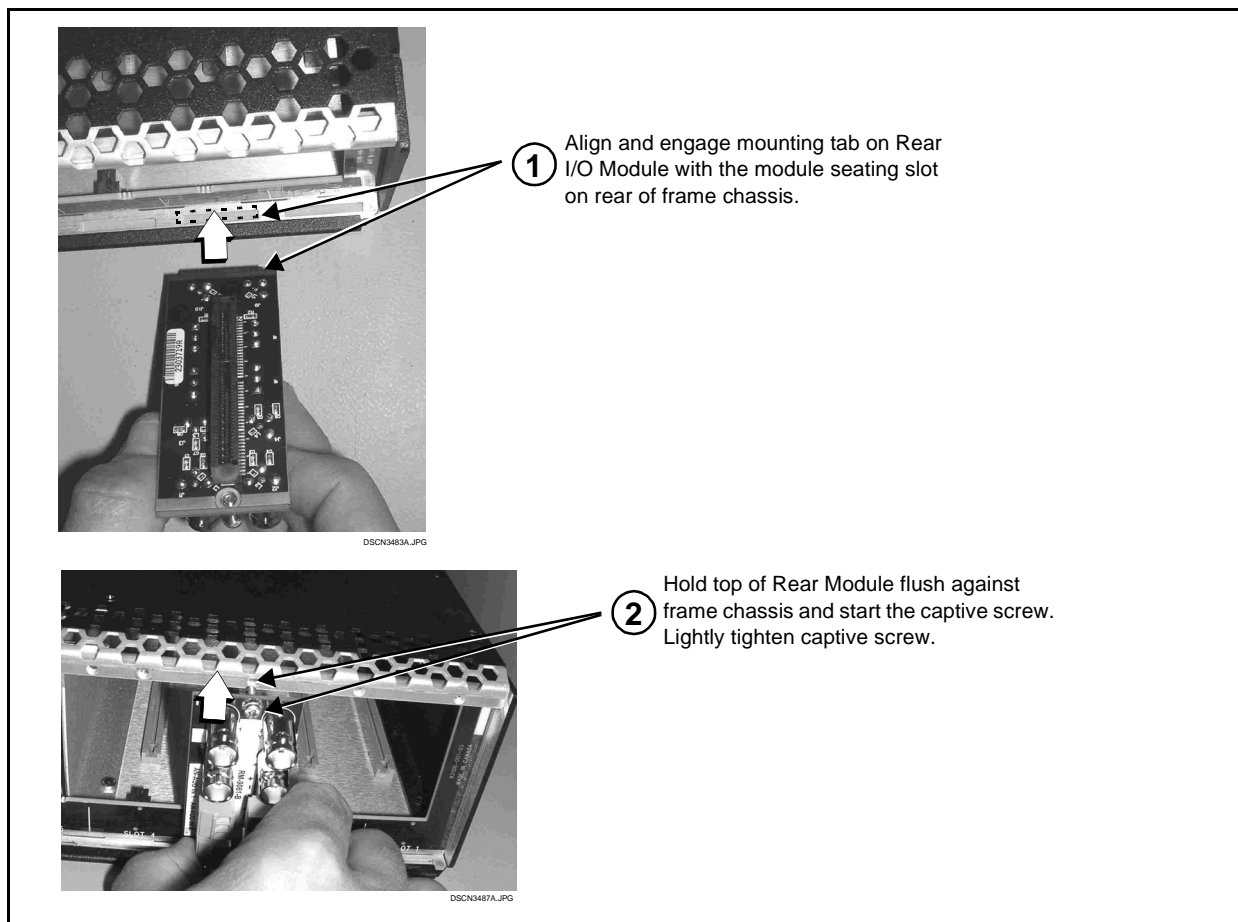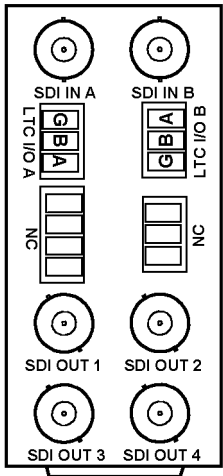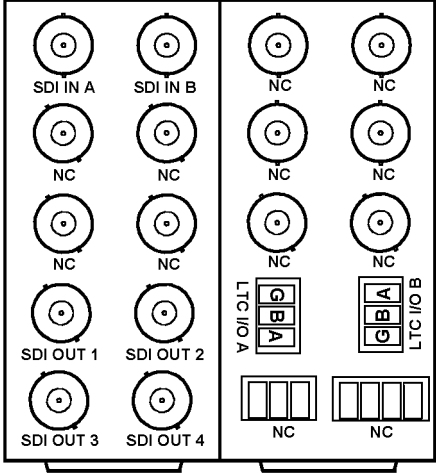
Figure 2-1 Rear Module Installation

9392 Rear Modules

Table 2-1 shows and describes the full assortment of Rear Modules specifically for use with the 9392.

Notes: • Rear Modules equipped with 3-wire Phoenix connectors are supplied with removable screw terminal block adapters. For clarity, the adapters are omitted in the drawings below. Refer to Connecting To 3-Wire Phoenix Terminal Connectors (p. 2-5) for connector polarity orientation details.

• The Rear Modules shown here are standard production items. Other signal combinations may be available as custom items. Consult Product Support with requests. Also, please check our web site pages for this product; new Rear Modules may be available that are not listed here.

Table 2-1   9392 Rear Modules

9392 Rear Module	Description
RM20-9392-D Rear Module 	Provides the following connections: • Two 3G/HD/SD-SDI video input BNCs (**SDI IN A** and **SDI IN B**) • Two RS-485 LTC input/outputs **LTC I/O A** and **LTC I/O B**. LTS ports can be correlated to either SDI video path. • Four 3G/HD/SD-SDI video output BNCs (**SDI OUT 1** thru **SDI OUT 4**). Output routing assignments per card SDI Output Map GUI routing. **Note:** Some rear module labels may label **SDI OUT 1** thru **SDI OUT 4** as **SDI OUT A** thru **SDI OUT D**, respectively.
RM20-9392-E Rear Module 	

Connecting To 3-Wire Phoenix Terminal Connectors

Figure 2-2 shows connections to the card 3-wire Phoenix™ terminal block connectors. These connectors are used for card RS-485 LTC input/output connections. These terminal blocks use a removable screw terminal binding post block which allows easier access to the screw terminals.

Note: It is preferable to wire connections to Phoenix plugs oriented as shown in Figure 2-2 rather than assessing polarity on rear module connectors. Note that the orientation of rear module connectors is not necessarily consistent within a rear module, or between different rear modules. If wiring is first connected to Phoenix plug oriented as shown here, the electrical orientation will be correct regardless of rear module connector orientation.

Note: An RS-485 input received by the card must have the customary zero-crossing associated with RS-485. If the LTC source is offset above or below ground (0 V), the sources must be capacitively coupled or passed through an analog audio DA that can restore zero-crossing.
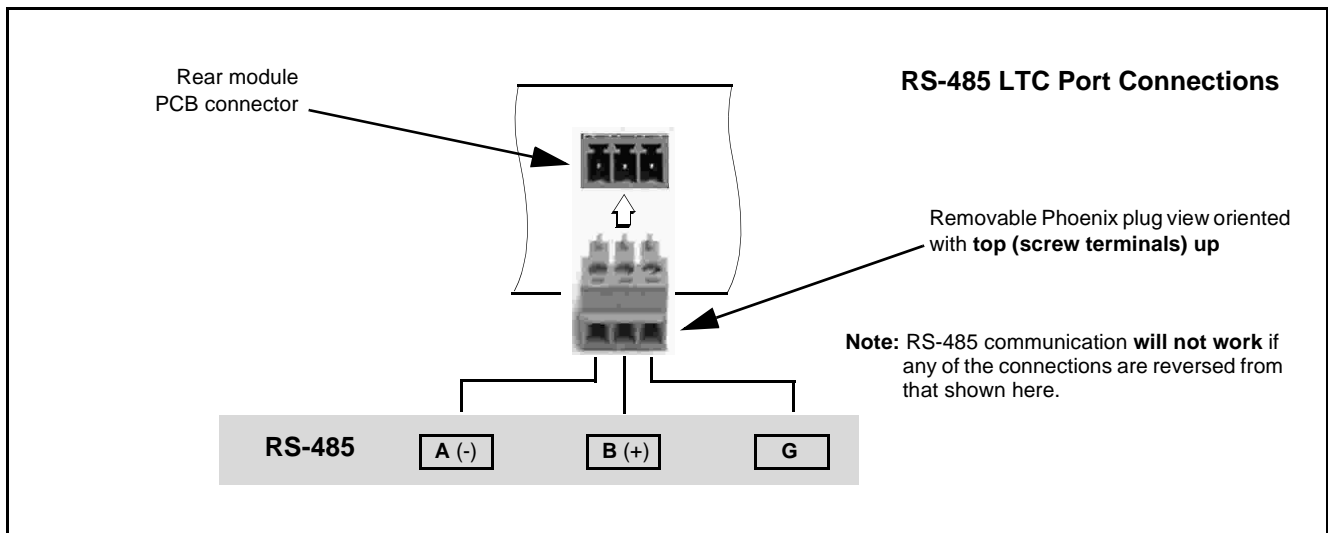
Figure 2-2 3-Wire Phoenix Terminal Connections

Setting Up 9392 Network Remote Control

Perform remote control setup in accordance with Cobalt® reference guide "Remote Control User Guide" (PN 9000RCS-RM).

Note: • If network remote control is to be used for the frame and the frame has not yet been set up for remote control, Cobalt® reference guide **Remote Control User Guide (PN 9000RCS-RM)** provides thorough information and step-by-step instructions for setting up network remote control of COMPASS™ cards using DashBoard™. (Cobalt® OGCP-9000 and OGCP-9000/CC Remote Control Panel product manuals have complete instructions for setting up remote control using a Remote Control Panel.)

Download a copy of this guide by clicking on the **Support>Documents>Reference Guides** link at www.cobaltdigital.com and then select DashBoard Remote Control Setup Guide as a download, or contact Cobalt® as listed in Contact Cobalt Digital Inc. (p. 1-14).

• If installing a card in a frame already equipped for, and connected to DashBoard™, no network setup is required for the card. The card will be discovered by DashBoard™ and be ready for use.

Operating Instructions

Overview

If you are already familiar with using DashBoard to control Cobalt cards, please skip to 9392 Function Submenu List and Descriptions (p. 3-8).

This chapter contains the following information:

- Control and Display Descriptions (p. 3-1)
- Accessing the 9392 Card via Remote Control (p. 3-5)
- Checking Card Information (p. 3-7)
- 9392 Function Submenu List and Descriptions (p. 3-8)
- Troubleshooting (p. 3-18)

Control and Display Descriptions

This section describes the user interface controls, indicators, and displays for using the 9392 card. The 9392 functions can be accessed and controlled using any of the user interfaces described here.

The format in which the 9392 functional controls, indicators, and displays appear and are used varies depending on the user interface being used. Regardless of the user interface being used, access to the 9392 functions (and the controls, indicators, and displays related to a particular function) follows a general arrangement of Function Submenus under which related controls can be accessed (as described in Function Submenu/Parameter Submenu Overview below).

After familiarizing yourself with the arrangement described in Function Submenu/Parameter Submenu Overview, proceed to DashBoard™ User Interface (p. 3-4).

Note: When a setting is changed, settings displayed on DashBoard™ are the settings as effected by the 9392 card itself and reported back to the remote control; the value displayed at any time is the actual value as set on the card.

Function Submenu/Parameter Submenu Overview

The functions and related parameters available on the 9392 card are organized into function **submenus**, which consist of parameter groups as shown below.

Figure 3-1 shows how the 9392 card and its submenus are organized, and also provides an overview of how navigation is performed between cards, function submenus, and parameters.
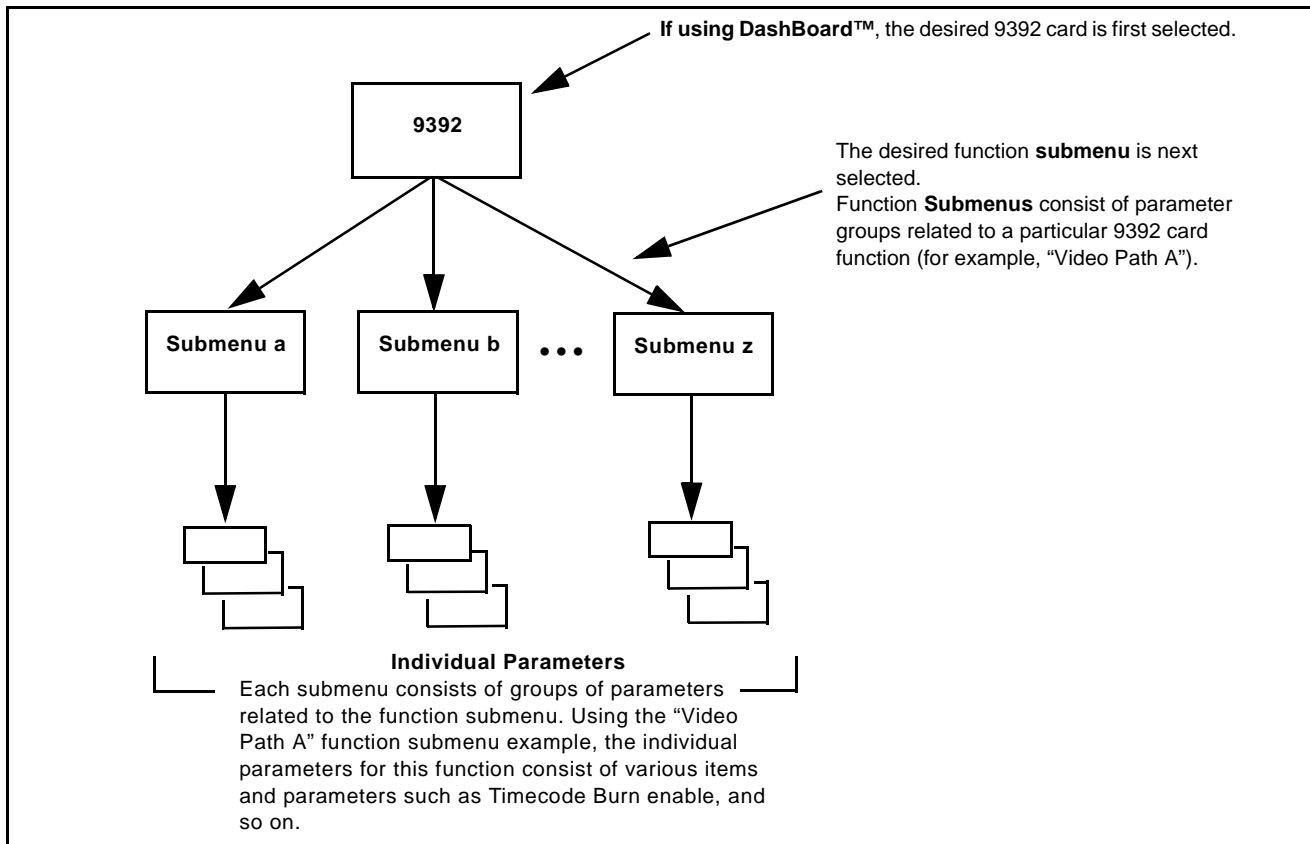
Figure 3-1 Function Submenu/Parameter Submenu Overview

9392 Card Edge Controls, Indicators, and Display

Figure 3-2 shows and describes the 9392 card edge controls, indicators, and display.

Item	Function
Display	Displays 4-digit abbreviated code showing menu and submenu selections. When in a menu displaying a parameter setting, the display shows parametric scalar value (and +/- sign where applicable).
Card Edge Manual Controls	This function is currently reserved.
Input Format Indicators	Three blue LEDs indicate the input signal format being received and locked onto by the 9392: • **3G** • **HD** • **SD** Continuous cycling of the LEDs indicates the 9392 has not locked onto a particular format (as in the case of no signal input).
Menu Depth Indicators	This function is currently reserved.
RMT LED	Blue LED flashes when 9392 is receiving control message from remote network control
REF LED	Blue LED illuminates when 9392 is receiving valid framesync when set up for framesync reference.
LOCK LED	Blue LED illuminates when 9392 unable to lock to framesync, or unable to lock to input standard.
ERR LED	This function is currently reserved.

Figure 3-2 9392 Card Edge Controls, Indicators, and Display

DashBoard™ User Interface

(See Figure 3-3.) The 9392 function submenus are organized in DashBoard™ using tabs (for example, "Video Path A" in Figure 3-3). When a tab is selected, each parametric control or selection list item associated with the function is displayed. Scalar (numeric) parametric values can then be adjusted as desired using the GUI slider controls. Items in a list can then be selected using GUI drop-down lists.

In this example, the **Video Path A** tab is selected to disable flat-field insertion, and enable timecode burn of hr:min:sec:frame:field for the video path A SDI input.
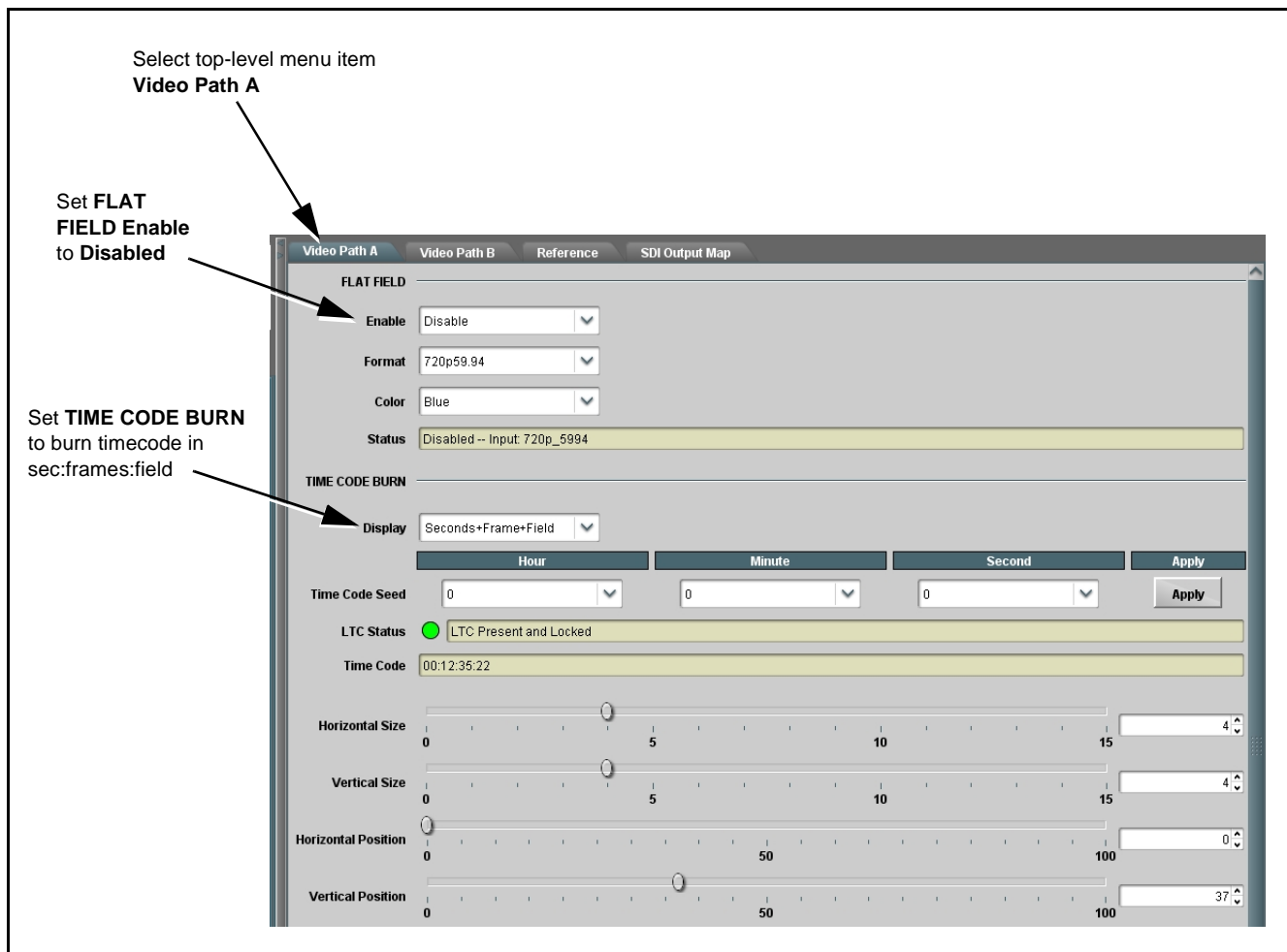
Figure 3-3 DashBoard™ Setup of Example Video Path A Setup

Accessing the 9392 Card via Remote Control

Access the 9392 card using DashBoard™ as described below.

Accessing the 9392 Card Using DashBoard™

1. On the computer connected to the frame LAN, open DashBoard™.

2. As shown below (in the left side Basic View Tree) locate the Network Controller Card associated with the frame containing the 9392 card to be accessed (in this example, "MFC-8320-N SN: 00108053").
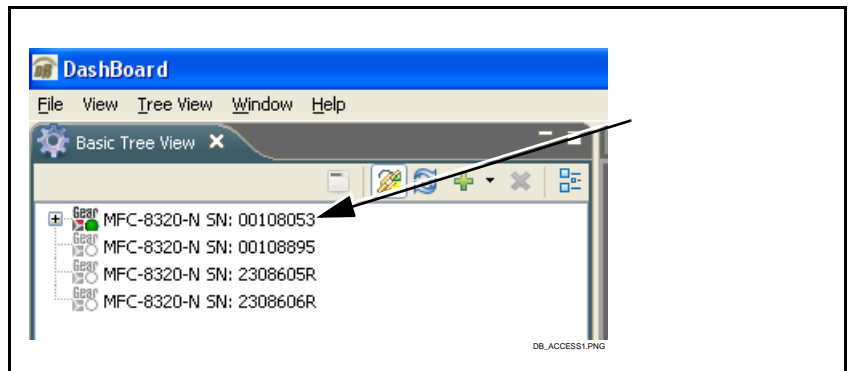
3. As shown below, expand the tree to access the cards within the frame. Click on the card to be accessed (in this example, "Slot 6: 9392").
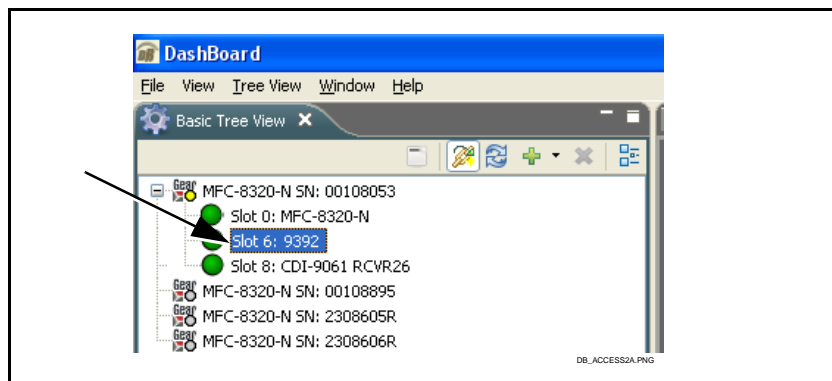
As shown on the next page, when the card is accessed in DashBoard™ its function submenu screen showing tabs for each function is displayed. (The particular submenu screen displayed is the previously displayed screen from the last time the card was accessed by DashBoard™).

Card Access/Navigation   Card Info   Card Function Submenu
      Tree Pane   Pane   and Controls Pane
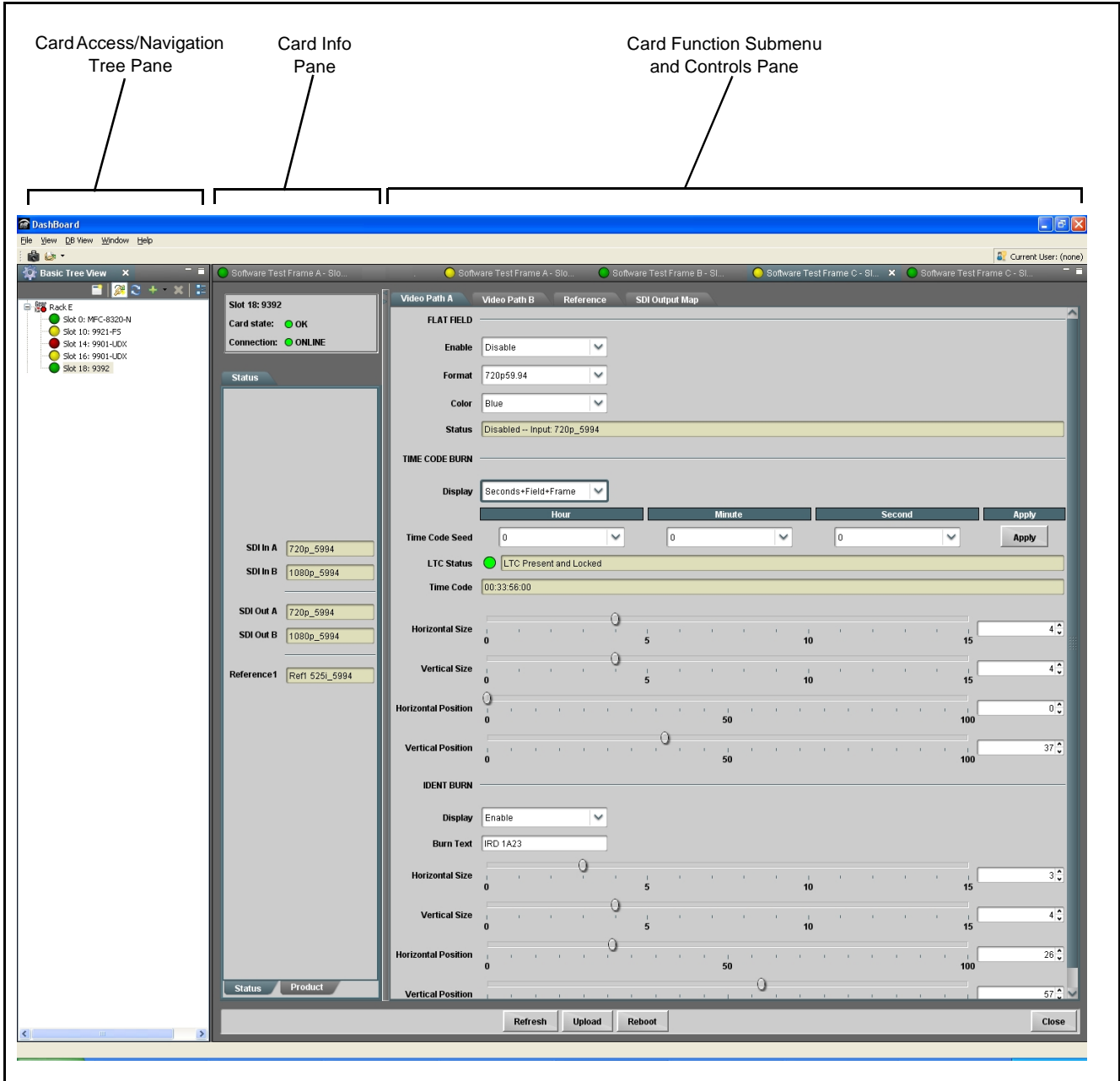
Checking Card Information

The operating status and software version the 9392 card can be checked using DashBoard™. Figure 3-4 shows and describes the 9392 card information screen using DashBoard™.

Note: Proper operating status in DashBoard™ is denoted by green icons for the status indicators shown in Figure 3-4. Yellow or red icons respectively indicate an alert or failure condition. Refer to Troubleshooting (p. 3-18) for corrective action.

The **Tree View** shows the cards seen by DashBoard™. In this example, Network Controller Card MFC-8320-N (serial number ...8053) is hosting a 9392 card in slot 18.

Status Displays
Clicking the **Status** sub-tab shows the status the signal being received by the 9392, and other card conditions. Green Settings icon shows that any changes made on DashBoard™ are sucessfully saved on the card's memory.
Clicking the **Product** sub-tab shows product information such as card model, options installed, and firmware versions. Use this information when communicating to Cobalt® regarding the card.

Figure 3-4 9392 Card Info Utility

9392 Function Submenu List and Descriptions

Table 3-1 individually lists and describes each 9392 function submenu ("tab") and its related list selections, controls, and parameters. Where helpful, examples showing usage of a function are also provided. Table 3-1 is primarily based upon using DashBoard™ to access each function and its corresponding submenus and parameters.

Note: All numeric (scalar) parameters displayed on DashBoard™ can be changed using the slider controls, ⬍ arrows, or by numeric keypad entry in the corresponding numeric field. (When using numeric keypad entry, add a return after the entry to commit the entry.)

On DashBoard™ itself and in Table 3-1, the function submenu items are organized using tabs as shown below.

Some functions use **sub-tabs** to help maintain clarity and organization. In these instances, Table 3-1 shows the ordinate tab along with its sub-tabs. Highlighted sub-tabs indicate that controls described are found by selecting this sub-tab (in this example, the **Master Controls** sub-tab on the **Video Path A** page).
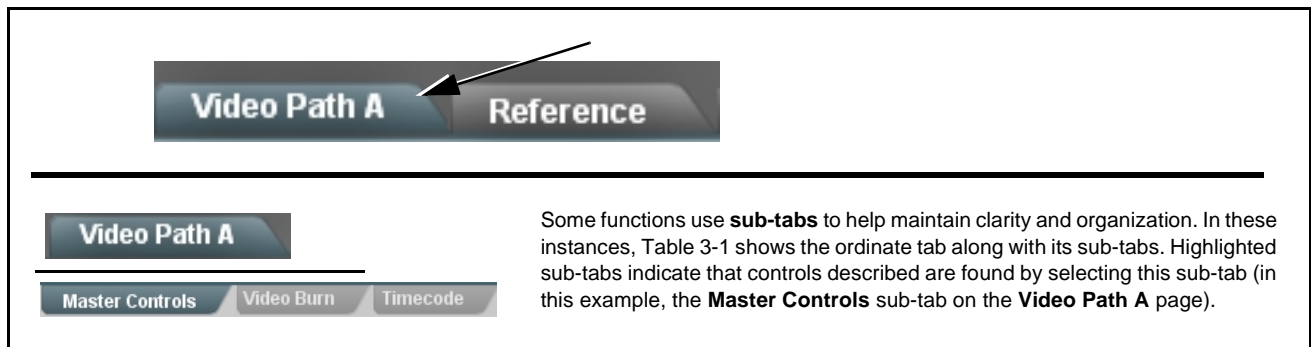
The table below provides a quick-reference to the page numbers where each function submenu item can be found.

Function Submenu Item	Page
Video Path Controls	3-9
Reference Select Control	3-16
LTC Port Configuration Controls	3-17
Video Output Crosspoint Control	3-17

Table 3-1   9392 Function Submenu List
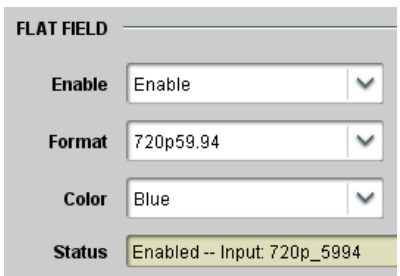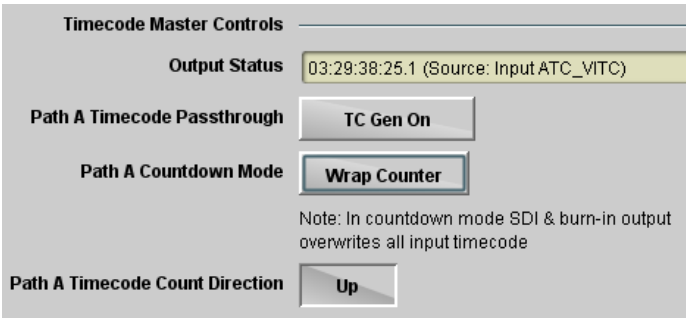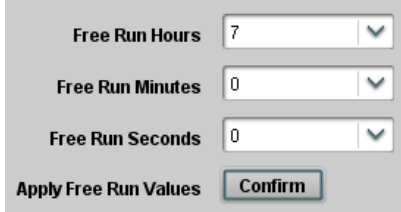
Accesses the flat field generator, timecode burn-in, text burn-in, and timecode generator (self-generate) controls for Video Path A card input.

Note: Video Path B has controls identical to the controls described here for Video Path A. Therefore, only the Video Path A controls are shown here.

• **Flat Field Insertion Controls**

Controls flat field insertion, failover insertion, and format as follows:

• **Enable:**
  • **Disable** never replaces input video with flat field.
  • **Enable** manually replaces input video with flat field (regardless or not if input video is present).
  • **Enable on Loss of Video** allows valid input video to pass, but fails over to flat field upon loss of input video.
    Note: Failover occurs when receiver module does not detect stable lock for known formats supported by the card.

• **Format** selects the flat-field format when flat field is inserted onto video. Choices are typical TV and film SD, HD, and 3G formats (refer to Specifications in Chapter 1. Introduction for more information).
    Note: When flat field is inserted (either manually or by failover), format of flat field is always as set per this drop-down, and does not automatically track with input video.

• **Color** allows flat field color selection of nine common colors.

• **Status** shows flat field insertion status, as well as status of input SDI on the video path.

• **Timecode Master Controls**

Provides controls for using either video or other external timecode source, or using the card TC Generator self-generated timecode.

• **Free Run Timecode Controls**

Allows an initial (starting) count to be applied to output video timecode when Free Run (TC Gen) insertion is enabled.

Note: • Initialization can only be applied when card is outputting Free Run timecode (as shown by Output Status displaying "Free Run").

• If failover to Free Run occurs due to loss of external timecode(s), the Free Run count assumes its initial count from the last valid externally supplied count.

Table 3-1   9392 Function Submenu List — continued
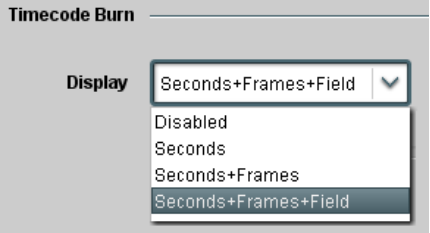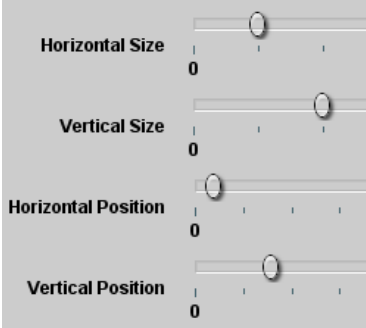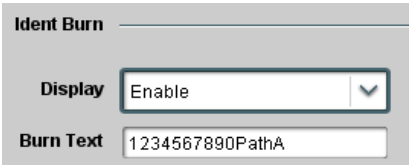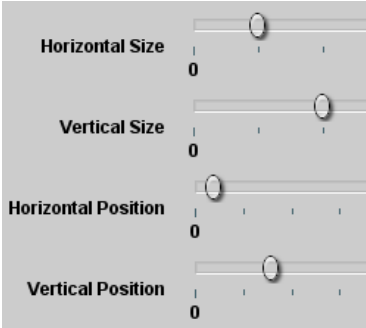
Video Path A	Provides controls to enable/disable timecode and text burn-in, and also size and position the burn-ins.
Master Controls **Video Burn** Timecode	

• Timecode Burn-In Enable/Format Select
 	
Timecode Burn
 	
Display [Seconds+Frames+Field ▼]
 	
Disabled
Seconds
Seconds+Frames
Seconds+Frames+Field
	Display control selects from the following modes:
	
	• **Disabled** never inserts timecode burn-in on video.
	• **Seconds** inserts burn-in timecode in **hr:min:sec** format.
	• **Seconds+Frame** inserts burn-in timecode in **hr:min:sec:frame** format.
	• **Seconds+Frame+Field** inserts burn-in timecode in **hr:min:sec:frame:field** format.
	
	Note: • Timecode insertion control burns-in timecode as set here on received SDI video or manual/failover flat field.
	        • On progressive video where frame count exceeding 30 fps, the field counter is utilized to show extended frame count as follows:
	              0.0 Frame 0
	              0.1 Frame 1
	              1.0 Frame 2
	              1.1 Frame 3
	              …
	              29.1 Frame 59

• Timecode Size/Position Controls Horizontal Size 0 Vertical Size 0 Horizontal Position 0 Vertical Position 0	Allows timecode burn-in size/position attributes control as follows: • **Horizontal Size** sets horizontal size (in units of 11 lines x control setting; e.g., control set for "4" results in horizontal size of 4 x 11 = 44). (Range is 0 thru 15) • **Vertical Size** sets vertical size (in units of 11 lines x control setting; e.g., control set for "4" results in horizontal size of 4 x 11 = 44). (Range is 0 thru 15) • **Horizontal Position** sets horizontal position (in percentage of offset from left of image area, left justified). (Range is 0 thru 100) • **Vertical Position** sets vertical position (in percentage of offset from top of image area, top justified). (Range is 0 thru 100)
• Identification Text Burn-In Insertion **Ident Burn** Display [Enable ▼] Burn Text [1234567890PathA]	Controls identification text insertion as follows: • **Display** enables or disables text burn-in insertion. • **Burn Text** dialog entry allows up to 16 ASCII characters to be entered as a burn-in text string. Upper and lower case characters, as well as numeric characters, can be entered. **Note:** Ident Burn insertion control burns-in text as set here on received SDI video or manual/failover flat field.
• Identification Text Size/Position Controls Horizontal Size 0 Vertical Size 0 Horizontal Position 0 Vertical Position 0	Allows text burn-in size/position attributes control as follows: • **Horizontal Size** sets horizontal size (in units of 11 lines x control setting; e.g., control set for "4" results in horizontal size of 4 x 11 = 44). (Range is 0 thru 15) • **Vertical Size** sets vertical size (in units of 11 lines x control setting; e.g., control set for "4" results in horizontal size of 4 x 11 = 44). (Range is 0 thru 15) • **Horizontal Position** sets horizontal position (in percentage of offset from left of image area, left justified). (Range is 0 thru 100) • **Vertical Position** sets vertical position (in percentage of offset from top of image area, top justified). (Range is 0 thru 100)

Table 3-1   9392 Function Submenu List — continued

Video Path A

Master Controls Video Burn **Timecode**

Provides timecode data extraction from various sources, and provides formatting and re-insertion controls for inserting the timecode into the output video and burn-in.

Shown below is an example in which received SDI video with SDI VITC waveform timecode is to be converted to SDI ATC_VITC timecode data. Each Timecode control is fully described on the pages that follow. **Timecode settings performed here output selected timecode on output video and timecode burn-in. Video Path A and B have identical independent controls.**

525i 5994 w/ VITC Waveform → **9392** → **525i 5994 w/ ATC_VITC**	Reference VITC Status `06:09:15:06.0` Input VITC Status `06:09:15:05.0` Input ATC_LTC Status `Not Present` Input ATC_VITC Status `Not Present` Input LTC Status `Not Present`

(A) Noting that the incoming video contains VITC waveform timecode data (as shown in the status display), set the Source Priority drop-down lists to include VITC Waveform timecode data (**SDI VITC**) as a choice. This extracts VITC Waveform timecode data from the incoming video.

Source Priority 1 `Input VITC`
Source Priority 2 `Input ATC_VITC`
Source Priority 3 `Reference VITC`
Source Priority 4 `Free Run`

(B) In this example, it is desired to provide SD ATC_VITC timecode data in the output video. As such, set **SD ATC VITC Insertion** to **Enabled**.

In the example here, the line numbers are set to the default SMPTE 12M-2-2008 recommended value.

SD ATC_VITC Insertion **Enabled**
SD ATC Insertion Line `13 - SMPTE 12M-2-2008 Recommended`

Table 3-1　　9392 Function Submenu List — continued

Video Path A / Master Controls / Video Burn / **Timecode**	**(continued)**
• **Timecode Source Status Displays** Reference VITC Status `06:09:15:06.0` Input VITC Status `06:09:15:05.0` Input ATC_LTC Status `Not Present` Input ATC_VITC Status `Not Present` Input LTC Status `Not Present`	Displays the current status and contents of the supported external timecode formats shown to the left. • If a format is receiving timecode data, the current content (timecode running count and line number) is displayed. • If a format is not receiving timecode data, Not Present is displayed.

• **LTC Input Control**
 	
Input LTC `LTC A`　▼
　　　　　`LTC A`
　　　　　`LTC B`
	Selects source (RS-485 port **LTC A** or **LTC B**) to be used by card to **receive** LTC.
	
	Note: • **Input LTC** must be appropriately set for card to receive and process received LTC.
	　• **LTC Port Configuration** controls must be set to use port selected here as an input to receive RS-485 LTC. See LTC Port Configuration Controls (p. 3-17).
	　• Card LTC inputs will not center inputs with DC offset. If input has DC offset, the source may need to be capacitively coupled to remove the offset.

• **Mute LTC Control** Mute LTC Audio on input loss `Enabled`	Allows RS-485 LTC output to mute upon loss of selected timecode inputs. • When set to **Enabled** and input timecode is lost, RS-485 LTC output goes to frozen state. • When set to **Disabled** and input timecode is lost RS-485 LTC output keeps counting, with count value being free-run count. Note: If muting upon loss of a particular input format is desired, set all **Source Priority 1** thru **4** to that particular input format. If this is not done, the card failover timecode selection may substitute another format choice for the format not being received.
• **Incoming ATC Packet Removal Control** Incoming ATC Packet Removal `Disabled`	Enables or disables removal of existing input video ATC timecode packets from the output. This allows removal of undesired existing timecodes from the output, resulting in a "clean slate" where only desired timecodes are then re-inserted into the output. (For example, if both SDI ATC_VITC and ATC_LTC are present on the input video, and only ATC_LTC is desired, using the Removal control will remove both timecodes from the output. The ATC_LTC timecode by itself can then be re-inserted on the output using the other controls discussed here.)

Table 3-1 9392 Function Submenu List — continued

(continued)

• Source Priority

Selects the priority assigned to each supported external formats, and internal Free Run in the event the preferred source is unavailable.

Source Priority 1 thru **Source Priority 4** select the preferred format to be used in descending order (i.e., Source Priority 2 selects the second-most preferred format, and so on. See example below.)

In this example, **Input VITC** 1st priority selection selects SDI VITC (received on SDI input) over reference VITC (received on frame reference) regardless of video input material source to be processed by the card.

The selected timecode source is embedded on the SDI video output (in this example, 720p) using the selected line number. In this example, if the SDI VITC on the SDI input becomes unavailable, the card then uses the reference VITC data received on the frame reference.

Note: Reference VITC selection uses reference source as selected on the **Reference** tab (see Reference Select Control (p. 3-16)).

Note: Disable Output setting should be used with care. If Disable Output is selected with alternate intended format(s) set as a lower priority, the card will indeed disable **all** timecode output should the ordinate preferred format(s) become unavailable.

Typically, choices other than Disable should be used if a timecode output is always desired, with Disable only being used to remove all timecode data.

In this example, even though and ATC_LTC could be available to substitute for ATC_VITC not being present, the card will revert to no timecode output since the choice of Disable Output "out-prioritizes" ATC_LTC with these settings.

The choices shown here will allow ATC_LTC to "out-prioritize" Disable Output if ATC_VITC is not available.

• Offset Controls

Allows the current timecode count to be advanced or delayed on the output video.

- **Offset Advance** or **Delay** selects offset advance or delay.
- **Offset Field** delays or advances or delays timecode by one field.
- **Offset Frame** delays or advances or delays timecode by up to 5 frames.

Note: Default settings are null, with both controls set at zero as shown.

Table 3-1   ***9392 Function Submenu List — continued***

Video Path A (Master Controls / Video Burn / Timecode)	**(continued)**

• **Output Status Display**
 	
Output Status   00:04:46:06.1 (Source: SDI VITC)
	Displays the current content and source being used for the timecode data as follows:
	
	Output Status 00:04:46:06.1 (Source: SDI VITC)
	
	• Output status OK (in this example, SDI VITC timecode received and outputted).
	
	Output Status Insertion Disabled
	
	• **Timecode Insertion** button set to **Disabled**; output insertion disabled.
	
	Note: • If timecode is not available from Source Priority selections performed, timecode on output reverts to Free Run (internal count) mode.
	       • Because the 1's digit of the display Frames counter goes from 0 to 29, the fractional digit (along with the 1's digit) indicates frame count as follows:
	           0.0 Frame 0
	           0.1 Frame 1
	           1.0 Frame 2
	           1.1 Frame 3
	           •
	           •
	           •
	          29.1 Frame 59

• **SD VITC Waveform Insertion Controls** SD VITC Waveform Output 1 Line Number 14 SD VITC Waveform Output 2 Line Number 16 SD VITC Waveform Insertion Enabled	For SD output, enables or disables SD VITC waveform timecode insertion into the output video, and selects the VITC1 and VITC2 line numbers (6 thru 22) where the VITC waveform is inserted. **Note:** • If only one output line is to be used, set both controls for the same line number. • **SD VITC Waveform Insertion** control only affects VITC waveforms inserted (or copied to a new line number) by this function. An existing VITC waveform on an unscaled SD SDI stream is not affected by this control and is passed on an SDI output.
• **SD ATC Insertion Control** SD ATC_VITC Insertion Enabled SD ATC Insertion Line 13 - SMPTE 12M-2-2008 Recommended	For SD output, enables or disables SD ATC_VITC timecode insertion into the output video, and selects the line number for ATC_VITC.

Table 3-1   9392 Function Submenu List — continued

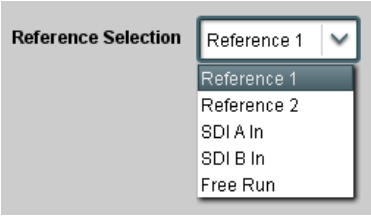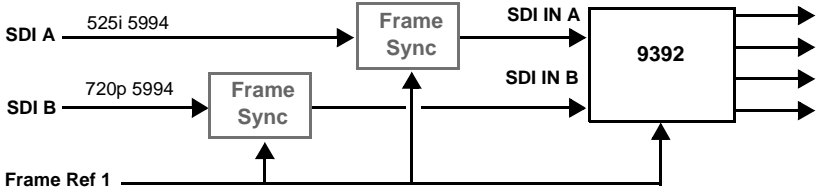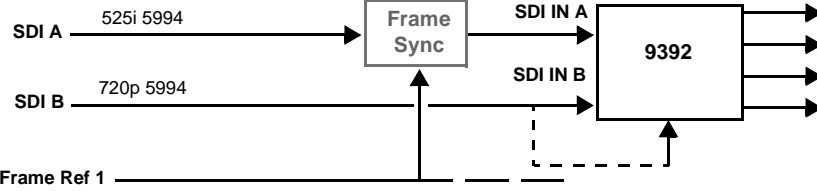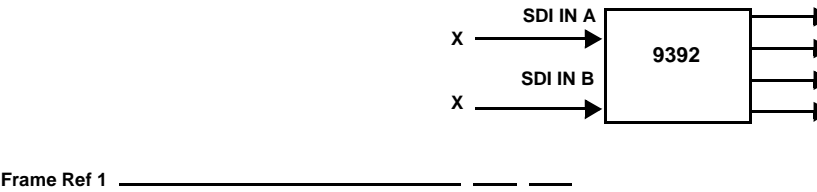|	
Video Path A Master Controls Video Burn **Timecode**	**(continued)**
• HD ATC_LTC Insertion Control HD ATC_LTC Insertion **Enabled** HD ATC_LTC Insertion Line 10 - SMPTE 12M-2-2008 Recommended ⌄	For HD output, enables or disables ATC_LTC timecode insertion into the output video, and selects the line number for ATC_LTC timecode data.
• HD ATC_VITC Insertion Control HD ATC_VITC Insertion **Enabled** HD ATC_VITC Insertion Line Field 1 9 - SMPTE 12M-2-2008 Recommended ⌄ HD ATC_VITC Insertion Line Field 2 8 (571) - SMPTE 12M-2-2008 Recommended ⌄	For HD output, enables or disables ATC_VITC timecode insertion into the output video, and selects the line number for ATC_VITC1 and ATC_VITC2. **Note:** If only one output line is to be used, set both controls for the same line number.
• ATC_VITC Legacy Support Control ATC VITC Legacy Support **Disabled**	When enabled, accommodates equipment requiring ATC_VITC packet in both fields as a "field 1" packet (non-toggling). **Note:** Non-toggling VITC1 and VITC2 packets do not conform to SMPTE 12M-2-2008 preferences. As such, ATC_VITC Legacy Support should be enabled only if required by downstream equipment.

Table 3-1 9392 Function Submenu List — continued

Reference	Provides a master reference selection for both SDI video channels.
• **Reference Select Control** Reference Selection: Reference 1 ⌄ Reference 1 Reference 2 SDI A In SDI B In Free Run	Selects a master reference source for both video paths as shown. **Note:** • Both program video inputs must be of the same refresh rate (e.g., 59.94 or 50, or co-related (29.97 or 25), and co-synchronous using frame sync or similar means. In practical application, both inputs should be frame-synchronized using a common frame reference, with the same reference also to be used by this card. • Reference Selection control must be appropriately set to match upstream video signal timing: - If input video **is not locked** to a frame reference, the 9392 should be set to lock to the respective input choice (SDI A or SDI B). - If the video input **is locked** to a frame reference, the 9392 should be set to same reference. • **Free Run** selection should **only** be used when no SDI inputs are to be used. This selection is valid only for internally generated flat field outputs. • A DashBoard **Reference Status** indication is provided that alerts to a missing reference where a reference has been selected. However, the status indication will not detect improper reference usage violating the conditions specified above.

Shown below are appropriate selections of this control for various examples.

In this example, because **both** inputs are upstream frame synced to frame Reference 1, 9392 can be set for ref from either SDI input or Reference 1 (however, in this case safest operation is to use Reference 1).

Note: 9392 Ref 1 or Ref 2 selection should **only** be used when upstream video is also locked to the same reference.

In this example, because SDI IN B is **not** frame synced to frame Reference 1, when SDI IN B is used the 9392 should be set to ref from the SDI IN B input video.

In this example, the 9392 is generating an internal flat field. Since no external timing need be associated with the flat field, the Free Run (internal) setting can be used.
However, if an external frame reference is available, it is safest to use the external Ref 1 or Ref 2 setting as appropriate.

Table 3-1   9392 Function Submenu List — continued

LTC Port Configuration	Provides controls for setting RS-485 ports for LTC in or out functions.
• **LTC Port Direction Controls** Serial Port Controls LTC A Out - LTC A Encoder Out - LTC A Encoder Out - LTC B Encoder Input LTC B Input	Sets RS-485 LTC port functions to either receive LTC over the port (**Input**), or send RS-485 LTC over the port (**Out**). Note: LTC A and LTC B (as inputs) are independent of either video path, with either port being used to receieve RS-485 LTC as desired. As an output, **LTC A Encoder** and **LTC B Encoder** correspond to Video Path A and Video Path B, respectively.
SDI Output Map	Provides a 3 x 4 output video crosspoint between the two video paths (and reclocked **SDI In A** input) to up to four SDI output ports.
• **Output Video Crosspoint**	As shown below, each independent card SDI output **SDI 1 Out** thru **SDI 4 Out** can receive as sources: • **Processed A** (video path A with processing as described in Video Path Controls (p. 3-9). • **Processed B** (video path B with processing as described in Video Path Controls (p. 3-9). • **Input A Reclock** Note: Crosspoint is fully flexible, with duplicated choices (DA function) across several outputs from the same or different sources.

SDI 1 OUT	SDI 2 OUT	SDI 3 OUT	SDI 4 OUT
◉ Processed A	◉ Processed A	○ Processed A	○ Processed A
○ Processed B	○ Processed B	○ Processed B	◉ Processed B
○ Input A Reclock	○ Input A Reclock	◉ Input A Reclock	○ Input A Reclock

In this example:
• **Processed A** (video path from input **SDI In A**) is DA'ed to outputs **SDI 1 Out** and **SDI 2 Out**.
• **Input A Reclock** is outputted on **SDI 3 Out**.
• **Processed B** (video path from input **SDI In B**) is outputted to **SDI 4 Out**.

Troubleshooting

This section provides general troubleshooting information and specific symptom/corrective action for the 9392 card and its remote control interface. The 9392 card requires no periodic maintenance in its normal operation; if any error indication (as described in this section) occurs, use this section to correct the condition.

Error and Failure Indicator Overview

The 9392 card itself and its remote control systems all (to varying degrees) provide error and failure indications. Depending on how the 9392 card is being used (i.e, standalone or network controlled through DashBoard™, check all available indications in the event of an error or failure condition. The various 9392 card and remote control error and failure indicators are individually described below.

Note: The descriptions below provide general information for the various status and error indicators. For specific failures, also use the appropriate subsection listed below.

9392 Card Edge Status/Error Indicators and Display

Figure 3-5 shows and describes the 9392 card edge status indicators and display. These indicators and the display show status and error conditions relating to the card itself and remote (network) communications (where applicable). Because these indicators are part of the card itself and require no external interface, the indicators are particularly useful in the event of communications problems with external devices such as network remote control devices.

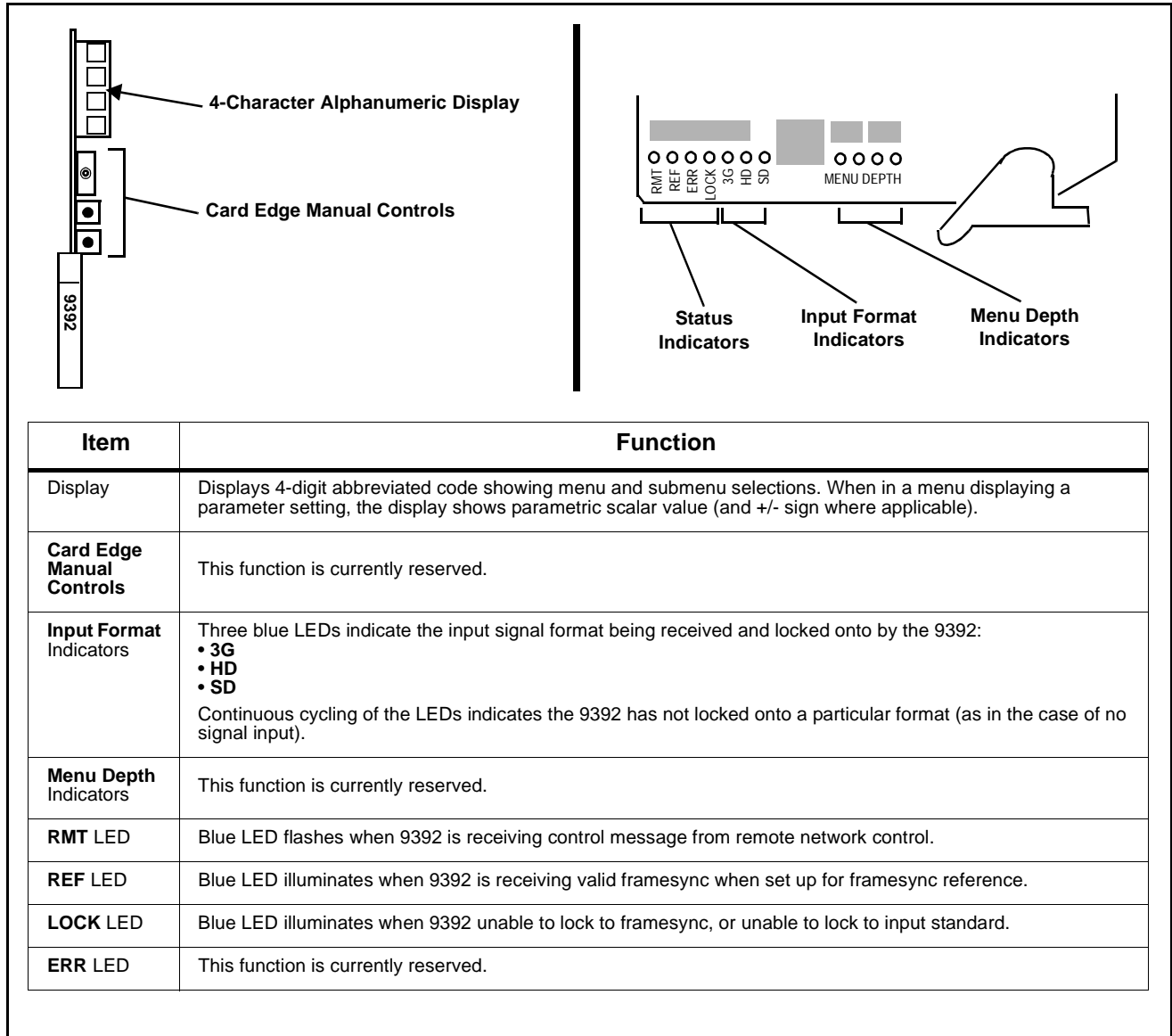| Item	Function
Display	Displays 4-digit abbreviated code showing menu and submenu selections. When in a menu displaying a parameter setting, the display shows parametric scalar value (and +/- sign where applicable).
Card Edge Manual Controls	This function is currently reserved.
Input Format Indicators	Three blue LEDs indicate the input signal format being received and locked onto by the 9392: • **3G** • **HD** • **SD** Continuous cycling of the LEDs indicates the 9392 has not locked onto a particular format (as in the case of no signal input).
Menu Depth Indicators	This function is currently reserved.
RMT LED	Blue LED flashes when 9392 is receiving control message from remote network control.
REF LED	Blue LED illuminates when 9392 is receiving valid framesync when set up for framesync reference.
LOCK LED	Blue LED illuminates when 9392 unable to lock to framesync, or unable to lock to input standard.
ERR LED	This function is currently reserved.

Figure 3-5 9392 Card Edge Status Indicators and Display

DashBoard™ Status/Error Indicators and Displays

Figure 3-6 shows and describes the DashBoard™ status indicators and displays. These indicator icons and displays show status and error conditions relating to the 9392 card itself and remote (network) communications.
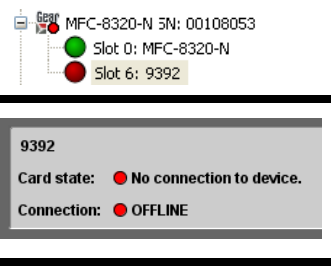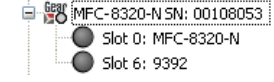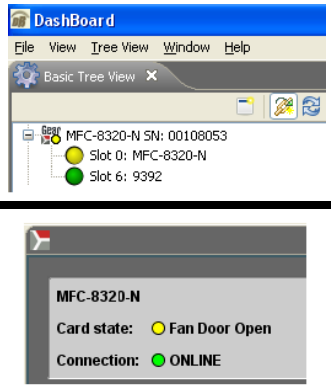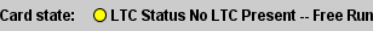
Indicator Icon or Display	Error Description
MFC-8320-N SN: 00108053 Slot 0: MFC-8320-N Slot 6: 9392 9392 Card state: ● No connection to device. Connection: ● OFFLINE	Red indicator icon in Card Access/Navigation Tree pane shows card with Error condition (in this example, the Card Access/Navigation Tree pane shows a general error issued by the 9392 card in slot 6). Specific errors are displayed in the Card Info pane (in this example "No connection to device" indicating 9392 card is not connecting to frame/LAN). If the 9392 card is not connecting to the frame or LAN, all controls are grayed-out.
MFC-8320-N SN: 00108053 Slot 0: MFC-8320-N Slot 6: 9392	Gray indicator icon in Card Access/Navigation Tree pane shows card(s) are not being seen by DashBoard™ due to lack of connection to frame LAN (in this example, both a 9392 card in slot 6 and the MFC-8320-N Network Controller Card for its frame in slot 0 are not being seen).
DashBoard File View Tree View Window Help Basic Tree View ✕ MFC-8320-N SN: 00108053 Slot 0: MFC-8320-N Slot 6: 9392 MFC-8320-N Card state: ○ Fan Door Open Connection: ● ONLINE	Yellow indicator icon in Card Access/Navigation Tree pane shows card with Alert condition (in this example, the Card Access/Navigation Tree pane shows a general alert issued by the MFC-8320-N Network Controller Card). Clicking the card slot position in the Card Access/Navigation Tree (in this example Network Controller Card "Slot 0: MFC-8320-N") opens the Card Info pane for the selected card. In this example, a "Fan Door Open" specific error is displayed.
Card state: ○ LTC Status No LTC Present -- Free Run	Yellow indicator icon in 9392 Card Info pane shows error alert, along with cause for alert (in this example, the 9392 is not receiving external LTC for the respective video channel, and has reverted to free-run timecode burn-in.

Figure 3-6 DashBoard™ Status Indicator Icons and Displays

Access the Card Info pane for a specific card by clicking the card slot position in the Card Access/Navigation Tree pane (as shown in the example in Figure 3-7).

By clicking on "Slot 0: MFC-8320-N" in this example, Card Info is displayed for frame Network Controller Card

Status for selected card is shown here (in this example, connection OK and "Fan Door Open" alert)

Card general information is displayed in lower portion of Card Info pane

By clicking on "Slot 18: 9392" in this example, Card Info is shown for 9392 card in slot 18

Status for selected card is shown here

Where applicable, additional status is displayed (as shown in this example)
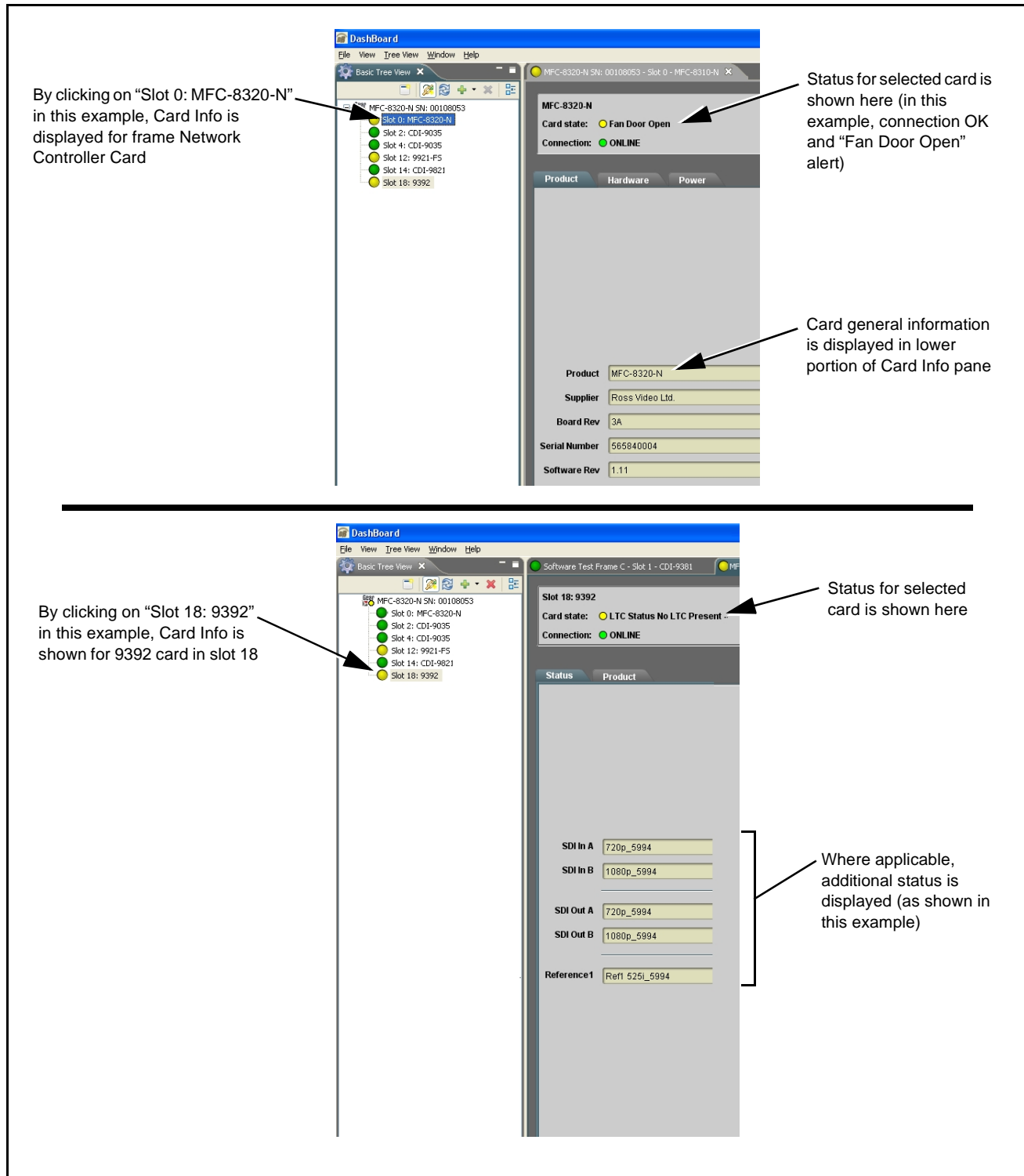
Figure 3-7 Selecting Specific Cards for Card Info Status Display

Basic Troubleshooting Checks

Failures of a general nature (affecting many cards and/or functions simultaneously), or gross inoperability errors are best addressed first by performing basic checks before proceeding further. Table 3-2 provides basic system checks that typically locate the source of most general problems. If required and applicable, perform further troubleshooting in accordance with the other troubleshooting tables in this section.

Table 3-2   Basic Troubleshooting Checks

Item	Checks
Verify for power presence	On both the frame Network Controller Card and the 9392, in all cases when power is being properly supplied there is always at least one indicator illuminated. Any card showing no illuminated indicators should be cause for concern.
Check Cable connection secureness and connecting points	Make certain all cable connections are fully secure (including coaxial cable attachment to cable ferrules on BNC connectors). Also, make certain all connecting points are as intended. Make certain the selected connecting points correlate to the intended card inputs and/or outputs. Cabling mistakes are especially easy to make when working with large I/O modules.
Card seating within slots	Make certain all cards are properly seated within its frame slot. (It is best to assure proper seating by ejecting the card and reseating it again.)
Check status indicators and displays	On both DashBoard™ and the 9392 card edge indicators, red indications signify an error condition. If a status indicator signifies an error, proceed to the following tables in this section for further action.
Troubleshoot by substitution	All cards within the frame can be hot-swapped, replacing a suspect card or module with a known-good item.

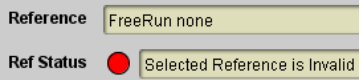## 9392 Processing Error Troubleshooting

Table 3-3 provides 9392 processing troubleshooting information. If the 9392 card exhibits any of the symptoms listed in Table 3-3, follow the troubleshooting instructions provided.

In the majority of cases, most errors are caused by simple errors where the 9392 is not appropriately set for the type of signal being received by the card.

Note: The error indications shown below are typical for the corresponding error conditions listed. Other error indications not specified here may also be displayed on DashBoard™ and/or the 9392 card edge status indicators.

Note: Where errors are displayed on both the 9392 card and network remote controls, the respective indicators and displays are individually described in this section.

Table 3-3   Troubleshooting Processing Errors by Symptom

Symptom	Error/Condition	Corrective Action
• **DashBoard™** shows **Video** yellow icon and Input Invalid message in 9392 Card Info pane. Video ◯ Input Invalid • Card edge **Input Format** LEDs show continuous cycling.	No video input present	Make certain intended video source is connected to appropriate 9392 card video input. Make certain BNC cable connections between frame Rear I/O Module for the card and signal source are OK.
• **DashBoard™** shows **invalid** in Ref Status message in 9392 Card Info pane. Reference FreeRun none Ref Status ⬤ Selected Reference is Invalid	Reference not properly selected or not being received (card has reverted to free-run failover)	If external reference is not intended to be used, make certain the Reference selection list is set to appropriate alternate selection as desired.
Transient video or audio errors (CRC, etc.) noted in viewing or on logging waveform monitor.	Card reference cannot sync with received video input.	**Reference Selection** control must be appropriately set to match upstream video signal timing: • If input video is **not locked** to a frame reference, the 9392 should be set to lock to the respective input choice (**SDI A** or **SDI B**). • If the video input is locked to a frame reference, the 9392 should be set to lock to the same reference (**Reference 1** or **Reference 2**). **Note:** Both program video inputs must be of the same refresh rate (e.g., 59.94 or 50, or co-related (29.97 or 25), and co-synchronous using frame sync or similar means. In practical application, both inputs should be frame-synchronized using a common frame reference, with the same reference also to be used by this card.
RS-485 LTC not being locked on to by card (yellow status indicator)	• LTC RS-485 polarity incorrect • LTC RS-485 does not have zero-crossing per RS-485 convention.	• Make certain RS-485 LTC connections are as described in Connecting To 3-Wire Phoenix Terminal Connectors (p. 2-5) in Chapter 2, Installation and Setup. • The RS-485 inputs received by the card must have the customary zero-crossing associated with RS-485. If the LTC source is offset above or below ground (0 V), the sources must be capacitively coupled or passed through an analog audio DA that can restore zero-crossing.
ERROR displayed on Timecode Output Status.	Free-run selected as prioritized manual selection, but timecode generator is set to bypass	If free-run timecode is set as first prioritized selection (i.e., free-run over any other choice), **Timecode Passthrough** on Video Path > Master Controls must be set to **TC Gen On**.

Troubleshooting Network/Remote Control Errors

Refer to Cobalt® reference guide "COMPASS™ Remote Control User Guide" (PN 9000RCS-RM) for network/remote control troubleshooting information.

In Case of Problems

Should any problem arise with this product that was not solved by the information in this section, please contact the Cobalt Digital Inc. Technical Support Department.

If required, a Return Material Authorization number (RMA) will be issued to you, as well as specific shipping instructions. If required, a temporary replacement item will be made available at a nominal charge. Any shipping costs incurred are the customer's responsibility. All products shipped to you from Cobalt Digital Inc. will be shipped collect.

The Cobalt Digital Inc. Technical Support Department will continue to provide advice on any product manufactured by Cobalt Digital Inc., beyond the warranty period without charge, for the life of the product.

See Contact Cobalt Digital Inc. (p. 1-14) in Chapter 1, "Introduction" for contact information.