9121

3G/HD/SD-SDI / ASI Redundancy Switch

Product Manual

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Congratulations on choosing the Cobalt® 9121 3G/HD/SD-SDI / ASI Redundancy Switch. The 9121 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 9121, please contact us at the contact information on the front cover.

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Description of product/manual changes:	- Added EMC Compliance information.

Table of Contents

Chapter 1

Introduction

Overview

This manual provides installation and operating instructions for the 9121 3G/HD/SD-SDI / ASI Redundancy Switch card (also referred to herein as the 9121).

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 9121.

- **Chapter 2, "Installation and Setup"** – Provides instructions for installing the 9121 in a frame, and optionally installing a 9121 Rear I/O Module.

- **Chapter 3, "Operating Instructions"** – Provides overviews of operating controls and instructions for using the 9121.

This chapter contains the following information:

- **Manual Conventions (p. 1-3)**
- **Safety Summary (p. 1-4)**
- **9121 Functional Description (p. 1-5)**
- **Warranty and Service Information (p. 1-9)**
- **Contact Cobalt Digital Inc. (p. 1-10)**

9121 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™. 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 9121 itself. Examples are provided below.

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

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

- **9121** refers to the 9121 3G/HD/SD-SDI / ASI Redundancy Switch card.
- **Frame** refers to the HPF-9000, OG3-FR, 8321, or similar 20-slot frame that houses Cobalt® or other cards.
- **Device** and/or **Card** refers to a Compass® or Fusion3G® card.
- **System** and/or **Video System** refers to the mix of interconnected production and terminal equipment in which the 9121 and other Compass® or Fusion3G® cards operate.

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.
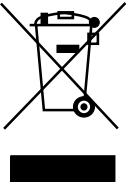
Cautions

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

⚠	Important note regarding product usage. Failure to observe may result in unexpected or incorrect operation.
(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™ frame. Refer to the openGear™ frame Owner's 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.**

CAUTION **If required, make certain Rear I/O Module(s) is installed before installing the 9121 into the frame slot. Damage to card and/or Rear I/O Module can occur if module installation is attempted with card already installed in slot.**

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

EMC Compliance Per Market

Market	Regulatory Standard or Code
United States of America	FCC "Code of Federal Regulations" Title 47 Part15, Subpart B, Class A
Canada	ICES-003
International	CISPR 24:2010 IEC 61000-4-2:2008 IEC 61000-4-3:2006 with A1:2007 and A2:2010 IEC 61000-4-4:2004 IEC 61000-4-6:2008 IEC 61000-6-3:2006 with A1:2010 CISPR 22:2008

9121 Functional Description

Figure 1-1 shows a functional block diagram of the 9121. The 9121 3G/HD/SD-SDI / ASI Redundancy Switch allows GPI changeover control between two SDI or ASI sources to a common SDI or ASI output. Output routing uses a latching relay to retain the selected I/O path even if the card/frame is powered down or card is removed from its slot.

An SDI failover function is provided using a main path preference of **IN A**: If **IN A** goes invalid, then **IN B** is selected. If **IN A** goes valid again, failover automatically reverts to the **IN A** input. Switchover can also be manually selected (in which case the selection is persistent even if the card is removed from its slot).

Note: Automatic failover operation is specified for supported SDI formats only. Failover usage when carrying signals other than SDI should utilize the GPI inputs controlled by suitable external monitoring devices.

The 9121 is very straightforward in operation in that the signal path is via a direct relay path output (alternately, the selected input is available via non-relay coupled 4x cable drivers). The relay signal path is entirely passive, with the entire signal package kept intact with no modification of the signal.

Defeatable reclockers for the four non-relay outputs allow the card to pass digital signals other than SDI and ASI on these DA outputs.
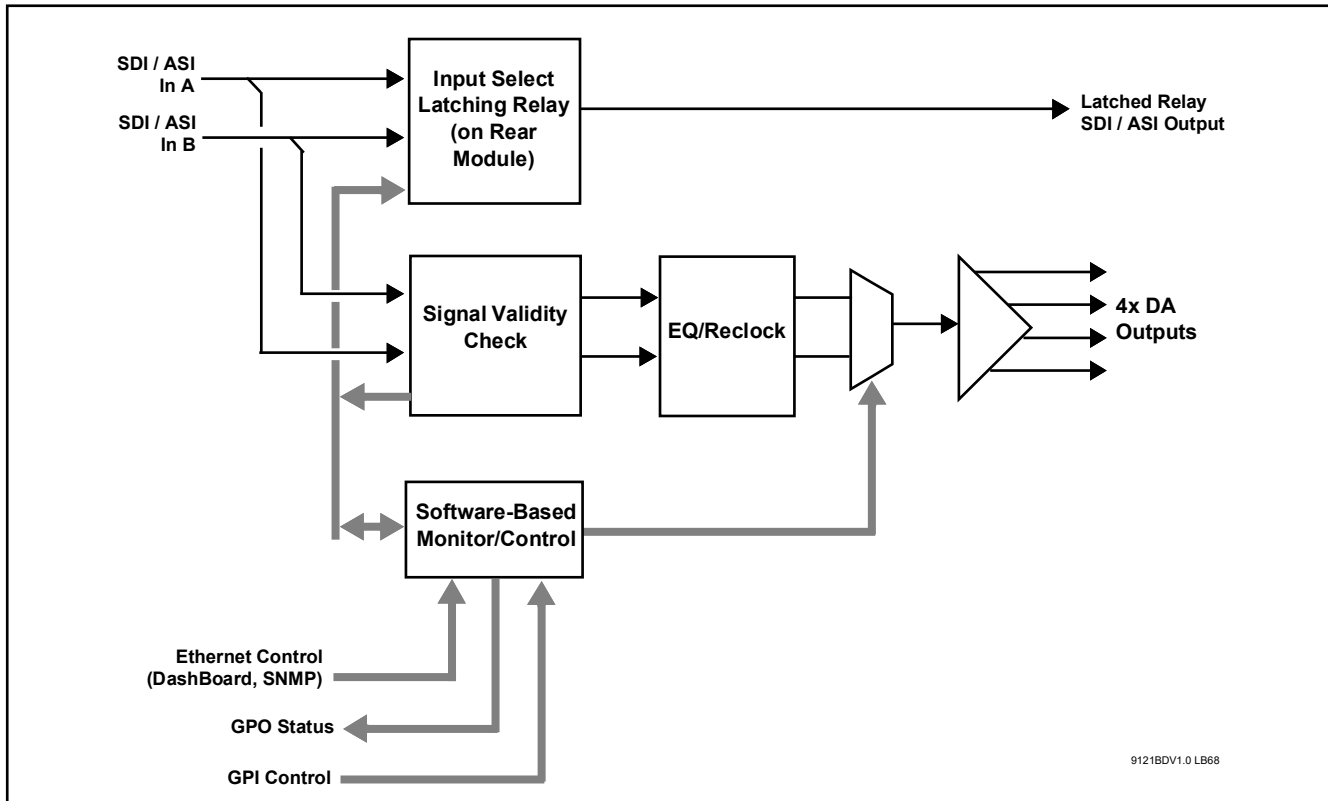
Figure 1-1 9121 Functional Block Diagram

Failover Function and Modes

(See Figure 1-2.) This function allows the card logic assert of input select and routing to the **A/B RLY OUT** card output under normal conditions, while providing latching relays at both the input and output nodes to provide input failover to select an alternate input, and also provides output failover which can passively relay-route the currently selected input directly to the output if the card loses power or is removed from the frame. (All relays are located on the card rear module.)

The **A/B RLY OUT** SDI output retains selected routing regardless of whether a selection was manually invoked or by a unit-detected failover (such as loss of power). For example, prior to a power loss event if a changeover from **IN A** to **IN B** was active at the time, this selection is retained by the latching relays. A **Revertive** failover mode routes the primary-designated input directly to the output upon resumption of valid status on the primary input. A **Non-Revertive** failover mode holds the card to use the failover routing, and only reverts to the primary input when a Return To Primary Input button is pressed. In cases where the primary input might be going in and out of lock, this prevents repeated undesired toggling in and out of primary and failover routing.

Note: The card also provides active (DA-driven) outputs **OUT 1-1** thru **OUT 1-3** and **OUT 2**. These outputs are independent of the relay failover function and will lose signal in the event of a power loss.

Input selected; card and input OK

Input selected; card loses power

Input loss; failover to other input

Failover engaged; card loses power

Revertive failover back to Primary

When Primary comes back ("A" in this example), failover immediately reverts back to A

Non-Revertive failover back to Primary

When Primary comes back ("A" in this example), failover will not commence until Return To Primary Input is manually pressed. Signal status of both inputs are always displayed on the card Control DashBoard page and on card edge indicators.
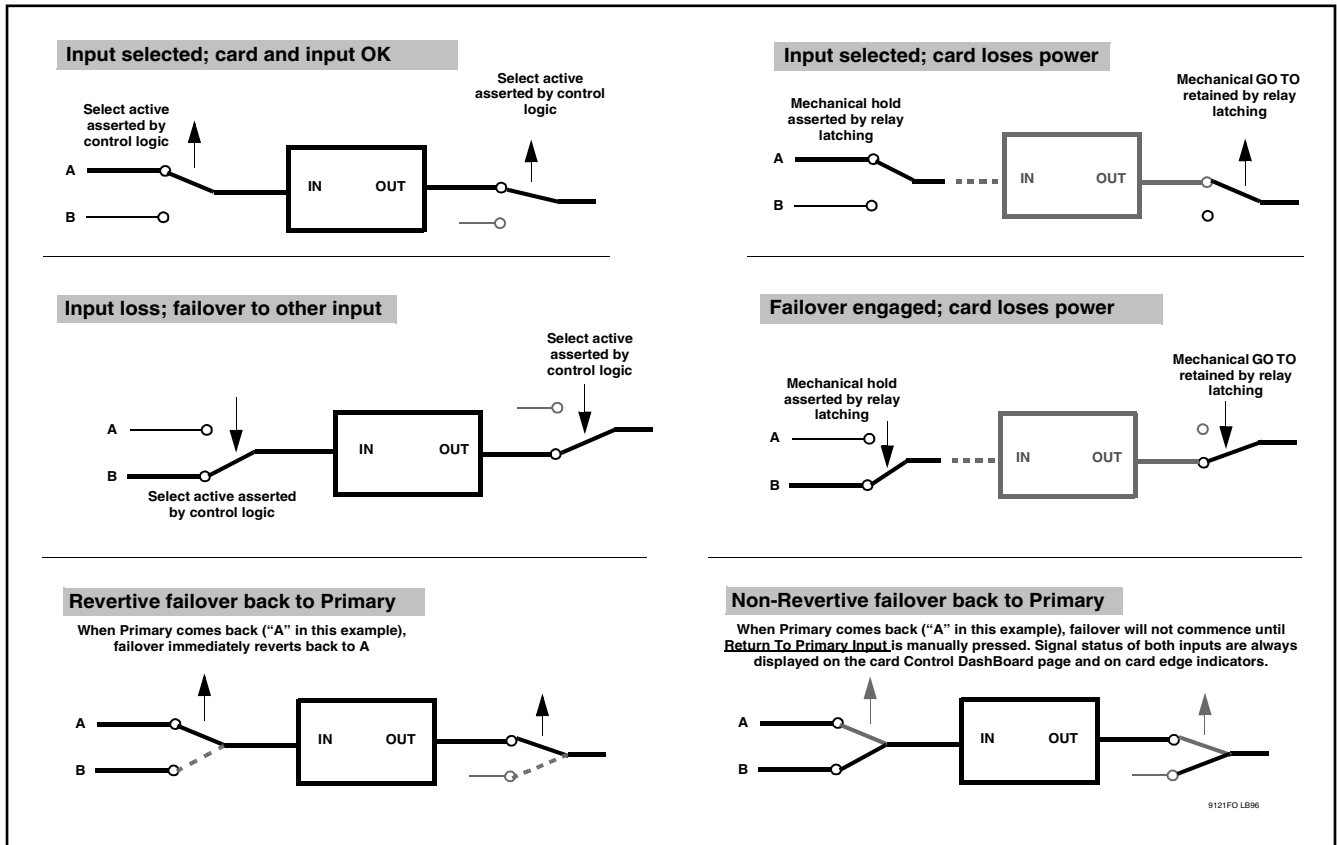
Figure 1-2 Auto-Changeover Function and Signal Flow

User Control Interface

The 9121 uses DashBoard™ as the normal graphical user interface for the card, similar to other Cobalt® Compass® or Fusion3G®cards.

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® 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>Reference Documents** link at www.cobaltdigital.com and then select DashBoard Remote Control Setup Guide as a download, or contact Cobalt® as listed in 11.

9121 Rear I/O Modules

The 9121 physically interfaces to system video connections at the rear of its frame using a Rear I/O Module.

All inputs and outputs shown in the 9121 Functional Block Diagram (Figure 1-1) enter and exit the card via the card edge backplane connector. The Rear I/O Module breaks out the 9121 card edge connections to BNC connectors that interface with other components and systems in the signal chain. See "Installation", Chapter 2 for Rear I/O Module connections.

Technical Specifications

Table 1-1 lists the technical specifications for the 9121 3G/HD/SD-SDI / ASI Redundancy Switch card.

Table 1-1   Technical Specifications

Item	Characteristic
Part number, nomenclature	9121 3G/HD/SD-SDI / ASI Redundancy Switch
Installation/usage environment	Intended for installation and usage in frame meeting openGear™ modular system definition.
Power consumption	< 6 Watts maximum
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.

Table 1-1   Technical Specifications — continued

Item	Characteristic
Switchover Triggering	Selectable automatic failover upon loss of valid SMPTE 424M, 292M, or 259M formatted signal. Manual switchover using DashBoard remote control or GPI.
	Note: Automatic failover operation is specified for supported SDI formats only (see "Video Inputs" below). Failover usage when carrying signals other than SDI should utilize the GPI inputs controlled by suitable external monitoring devices.
Video Inputs	Number of inputs: 2
	Standards:
	3G-SDI (SMPTE 424M) HD-SDI (SMPTE 292M) SD-SDI (SMPTE 259M)
	Impedance: 75Ω
Receive Performance (EQ/Reclock active path)	<u>Reclock ON</u> <u>Reclock OFF</u> SD 370m 370m HD 190m 180m 3G 120m 100m
	Note: Specification applicable only if using specified current-manufacture Rear I/O Module.
Video Outputs	Number of outputs:
	(1) 75Ω BNC latching relay direct from selected input A or B
	(4) 75Ω BNC non-relay DA (reclockable) via mux from selected input A or B (213Mbit/s maximum ASI TS bit-rate per port)
	Note: Relay output must be terminated into 75Ω impedance via connection to downstream equipment or termination for card to properly display input status.
GPI	Two independent inputs that select input A or Input B. Edge-triggering on H/L transition (switch closure or pull-down)
	Response: GPI acknowledge upon falling-edge input triggered by $R \le 10\ k\Omega$ (or $Vin \le 2.0\ V$) "G" (GND) terminal at chassis-ground potential Suitable for use with 3.3V LVCMOS logic
	Maximum Recommended Logic Control Voltage Range: 0 to 5 VDC
	Connector: 3-terminal Phoenix; **GPI-1/GPI-2/COM**
GPO	Two, independent non-referenced (floating) SPST relay closure indicating input path selected (either via manual or failover selection).
	Response: Closure effected for duration of true status condition; closure release upon false status condition
	Maximum Recommended Voltage / Current: 12 VDC @ 100mA max.
	Connector: 4-terminal Phoenix; **GPO1/GPO1C / GPO2/GPO2C**

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

2506 Galen Drive	Office: (217) 344-1243
Champaign, IL 61821 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
Fax:	(217) 344-1245
Web:	www.cobaltdigital.com
General Information:	info@cobaltdigital.com
Technical Support:	support@cobaltdigital.com

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Chapter 2

Installation and Setup

Overview
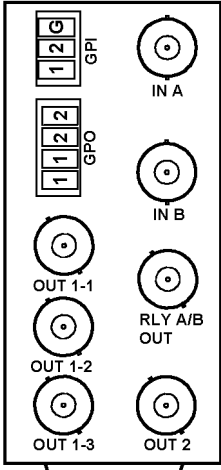
This chapter contains the following information:

- Installing a Rear I/O Module (p. 2-1)
- Connecting To GPI / GPO Phoenix Terminal Connectors (p. 2-3)
- Installing the 9121 Into a Frame Slot (p. 2-5)
- Setting Up 9121 Network Remote Control (p. 2-6)

Installing a Rear I/O Module

9121 Rear I/O Modules

Table 2-1 shows and describes the Rear I/O Modules specifically for use with the 9121.

Table 2-1   9121 Rear I/O Modules

9121 Rear I/O Module	Description

RM20-9121-B
 	
	Provides the following connections:
	 • **IN A** BNC input
	 • **IN B** BNC input
	 • **RLY A/B OUT** passive relay-coupled output. Failover to **IN B** if **IN A** is invalid. Manually selected via user controls or SNMP.
	 Note: Relay output must be terminated into 75Ω impedance via connection to downstream equipment or termination for card to properly display input status.
	 • Four non-relay outputs (**OUT 1-1**, **1-2**, **1-3**, and **OUT 2**) with defeatable reclocking. All four non-relay outputs track with RLY A/B OUT selection.
	 • GPI inputs **GPI1/G** and **GPI2/G** for manual selection of inputs **IN A** or **IN B**.
	  - **GPI 1** invokes **IN A**
	  - **GPI 2** invokes **IN B**
	 • GPI outputs **GPO1** and **GPO2** indicate input channel selection (either invoked manually or via failover).
	  - **GPO 1** pair closed when **IN A** is selected
	  - **GPO 2** pair closed when **IN B** is selected
	 CAUTION
	 GPO controlled circuit must not exceed voltage/ current ratings. See Technical Specifications (p. 1-8) in Chapter 1, Introduction.

Installing a Rear I/O Module

Install a Rear I/O Module as follows:

1. On the frame, determine the slot in which the 9121 is to be installed.

2. In the mounting area corresponding to the slot location, install Rear I/O Module as shown in Figure 2-1.
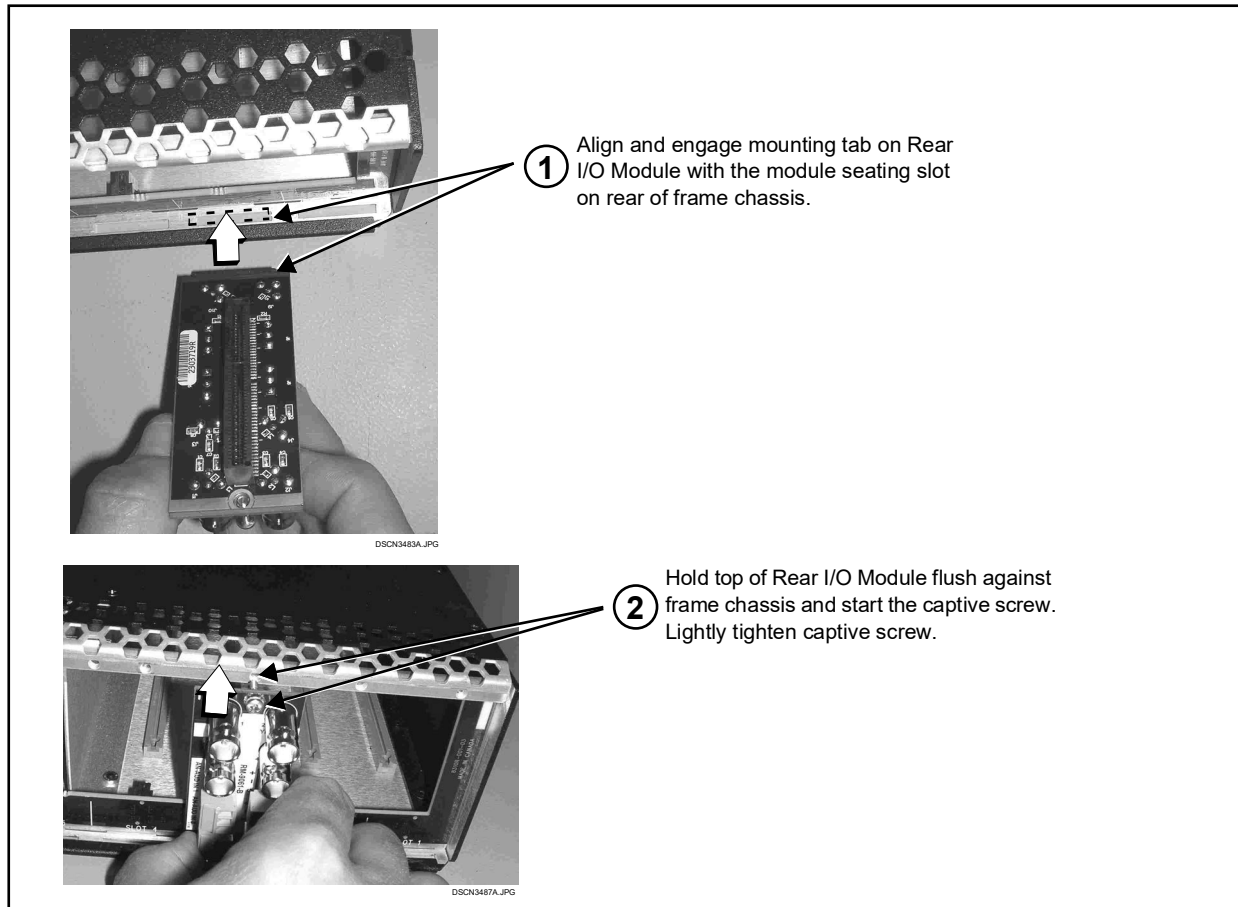
Align and engage mounting tab on Rear
I/O Module with the module seating slot
on rear of frame chassis.

DSCN3483A.JPG

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

DSCN3487A.JPG

Figure 2-1 Rear I/O Module Installation

Connecting To GPI / GPO Phoenix Terminal Connectors

Figure 2-2 shows connections to the card Phoenix™ terminal block GPI and
GPO connectors. 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 con-
nected to Phoenix plug oriented as shown here, the electrical orientation will
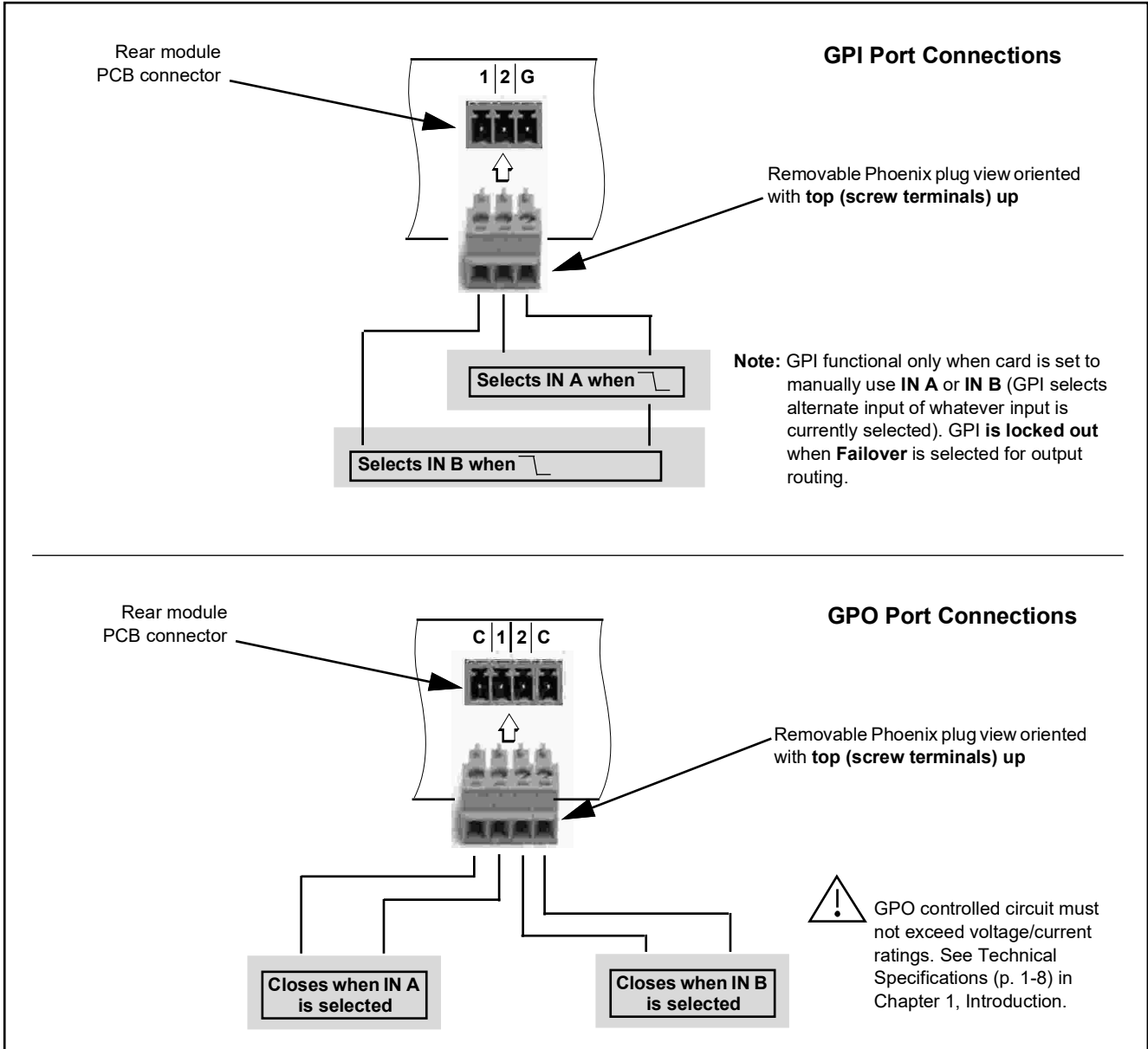be correct regardless of rear module connector orientation.

GPI Port Connections

Rear module
PCB connector

1 | 2 | G

Removable Phoenix plug view oriented
with **top (screw terminals) up**

Selects IN A when ⌐

Selects IN B when ⌐

Note: GPI functional only when card is set to
manually use **IN A** or **IN B** (GPI selects
alternate input of whatever input is
currently selected). GPI **is locked out**
when **Failover** is selected for output
routing.

GPO Port Connections

Rear module
PCB connector

C | 1 | 2 | C

Removable Phoenix plug view oriented
with **top (screw terminals) up**

Closes when IN A
is selected

Closes when IN B
is selected

⚠ GPO controlled circuit must
not exceed voltage/current
ratings. See Technical
Specifications (p. 1-8) in
Chapter 1, Introduction.

Figure 2-2 GPI/GPO Phoenix Terminal Connections

Installing the 9121 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.

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.

Note: A Rear I/O Module is required before cabling can be connected. Refer to Installing a Rear I/O Module (p. 2-1) for rear I/O module installation procedure.

CAUTION

If required, make certain Rear I/O Module(s) is installed before installing the 9121 into the frame slot. Damage to card and/or Rear I/O Module can occur if module installation is attempted with card already installed in slot.

Note: Check the packaging in which the 9121 was shipped for any extra items such as a Rear I/O 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 9121 into a frame slot as follows:

1. Determine the slot in which the 9121 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.

5. 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 I/O module mating connector.

CAUTION

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

6.   Verify that the card is fully engaged in rear I/O module mating connector.

7.   Close the frame front access panel.

8.   Connect the input and output cables as shown in Installing a Rear I/O Module (p. 2-2).

9.   Repeat steps 1 through 8 for other 9121 cards.

Note: To remove a card, press down on the ejector tab to unseat the card from the rear I/O module mating connector. Evenly draw the card from its slot.

10. 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 9121 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.

Setting Up 9121 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>Reference Documents** 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. 1-11).

• 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 or a Cobalt Remote Control Panel to control Cobalt cards, please skip to 9121 Function Menu List and Descriptions (p. 3-2).

This chapter contains the following information:

- Accessing the 9121 Card Using DashBoard™ Remote Control (p. 3-1)
- 9121 Function Menu List and Descriptions (p. 3-2)
- Troubleshooting (p. 3-6)

Accessing the 9121 Card Using DashBoard™ Remote Control

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 9121 card to be accessed (in this example, "MFC-8320-N SN: 00108053").
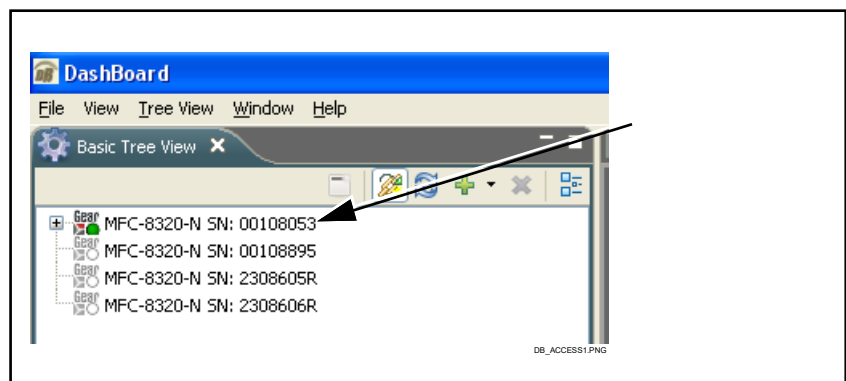
3. As shown below, expand the tree to access the cards within the frame. Click on the card to be accessed (in this example, "Slot 6: CDI-9121").
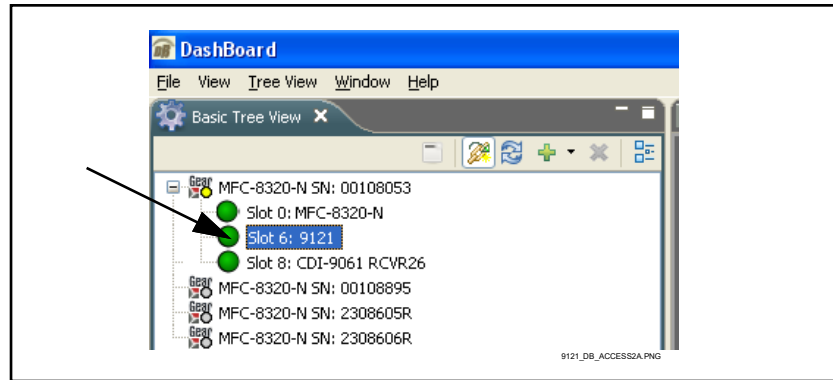
When the card is accessed in DashBoard™ its function menu screen showing tabs for each function is displayed.

9121 Function Menu List and Descriptions

Table 3-1 individually lists and describes each 9121 function menu 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 menus and parameters.

Table 3-1   9121 Function Menu List

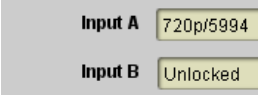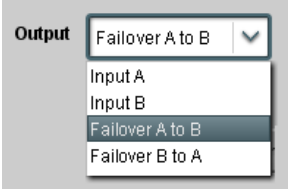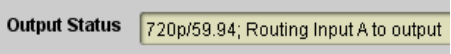|	Provides input status and routing controls for manual or failover routing to the relay output and non-relay reclockable outputs.
• **Card Remote Control / Card Edge Control Select** 	• **Enabled** shows DashBoard remote control and status monitoring for card functions has been enabled. • **Disabled** shows DashBoard remote control has been locked out. In this mode DashBoard only shows status, with control effected using card edge switches. **Note:** Card default settings enable remote control. Refer to 9121 Card Edge Control (p. 3-5) for using card edge control.

Table 3-1   ***9121 Function Menu List — continued***
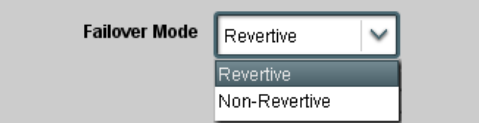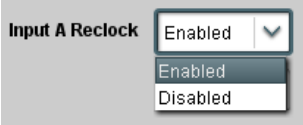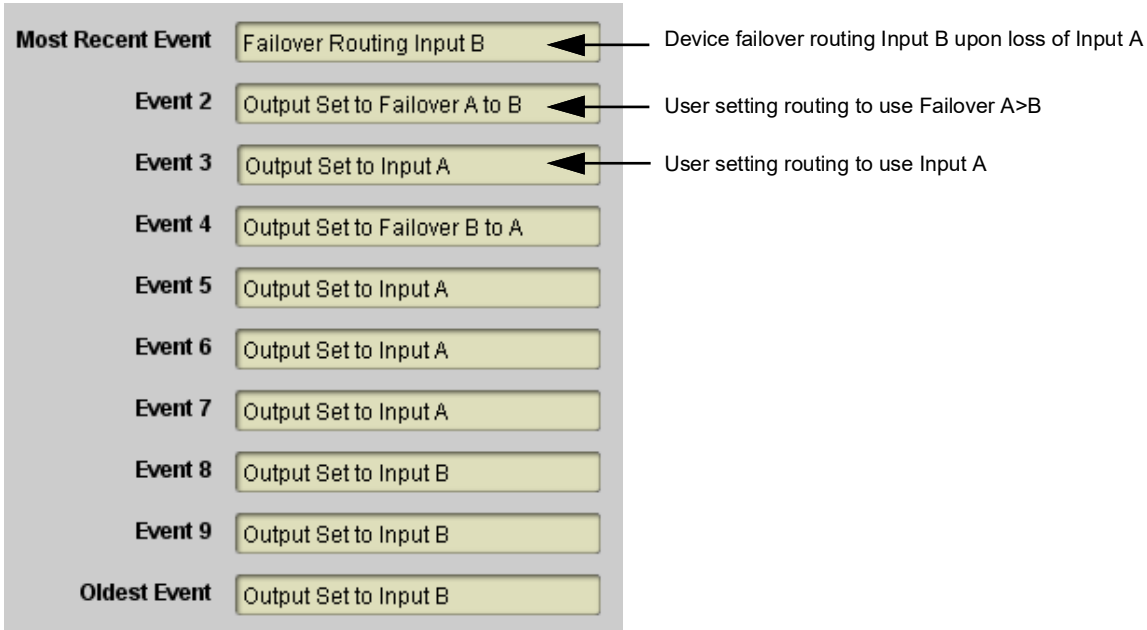
Control	**(continued)**
• Input Status Input A `720p/5994` Input B `Unlocked`	Shows input status of SDI **Input A** and **Input B** as follows: • SDI format (for example, "720p5994" as shown to the left) indicates input recognizes a valid SDI format supported by the card. • **Unlocked** indicates input does not recognizes a valid SDI format supported by the card. This can be from loss of signal presence or a signal format that is not supported SMPTE 424M, SMPTE 292M, or SMPTE 259M signals recognized by the card (such as ASI or AES audio). **Note:** Card relay output **RLY A/B OUT** must be terminated into 75Ω impedance via connection to downstream equipment or termination for card to properly display input status.

• Output Select and Status
 	
Output   `Failover A to B` ▼
Input A
Input B
Failover A to B
Failover B to A
 	
Output Status   `720p/59.94; Routing Input A to output`
 	
Failover Mode   `Revertive` ▼
Revertive
Non-Revertive
 	
Failover Manual Return   `Return To Primary Input`
	Selects (either manually or via failover rules) input-to-output routing of the two inputs to the card RLY A/B OUT port and the four OUT non-relay ports as follows:
	
	• **Input A** or **Input B** selection provides corresponding manual selection of input. In this mode, GPI can select the alternate input when applied.
	
	• **Fail Over** selection provides Primary Input preference of **Input A** or **Input B**. Using an example of Failover A to B, Input A is the primary input. In this case:
	  - If **Input A** goes invalid, then **Input B** is selected.
	  - If **Input A** goes valid again, failover reverts to **Input A**.
	
	Note: If an input is being sourced from a digital signal other than a supported SMPTE 424M, SMPTE 292M, OR SMPTE 259M signal (such as ASI or AES audio), unlocked will be displayed. Failover cannot reliably be used when passing these signals. Input select should only use manual selection. Failover usage when carrying signals other than SDI should utilize the GPI inputs controlled by suitable external monitoring devices.
	
	• **Output Status** shows input routing currently invoked (either by manual/ GPI selection or by failover), as well as signal status.
	
	• **Failover Mode** selects between revertive and non-revertive modes.
	- **Revertive** failover mode routes the primary-designated input directly to the output upon resumption of valid status on the primary input.
	- **Non-Revertive** failover mode holds the card to use the failover routing, and only reverts to the primary input when **Return To Primary Input** button is pressed.
	
	In cases where the primary input might be going in and out of lock, this prevents repeated undesired toggling in and out of primary and failover routing.
	
	⚠ Make certain Revertive/Non-Revertive mode is understood and selected as desired. If Non-Revertive mode is unintentionally selected, automatic reversion to Primary input may not occur as expected.

Table 3-1   9121 Function Menu List — continued

Control	(continued)
• Reclock Enable Select Input A Reclock [Enabled ⌄] [Enabled] [Disabled]	For the four non-relay outputs (**OUT 1-1** thru **OUT 2**), allows reclock enable/disable for outputs sourced from **Input A** or **Input B**. **Note:** If input is not carrying a valid SDI format supported by the card, control should be set to **Disabled**. This allows passage of non-SDI digital signals such as ASI or AES audio.
Card Name	Provides entry field for custom card name/ID.
Card Name [IRD 1A23-24 SW]	Allows up to 15 characters to be entered for card ID (in this example "IRD 1A23-24 SW"). Entered name appears in DashBoard card info header as well as DashBoard frame tree view.
Log	Provides a log of the 10 most-recent events regarding control setting changes and/or manual or failover-invoked signal routing changes.

Log shows most-recent event to earliest event in descending order (events older than 10th are discarded).

Most Recent Event	Failover Routing Input B	Device failover routing Input B upon loss of Input A
Event 2	Output Set to Failover A to B	User setting routing to use Failover A>B
Event 3	Output Set to Input A	User setting routing to use Input A
Event 4	Output Set to Failover B to A	
Event 5	Output Set to Input A	
Event 6	Output Set to Input A	
Event 7	Output Set to Input A	
Event 8	Output Set to Input B	
Event 9	Output Set to Input B	
Oldest Event	Output Set to Input B	

9121 Card Edge Control

Card edge control allows limited use of card without remote control, or can be used where remote control is desired to be locked out.

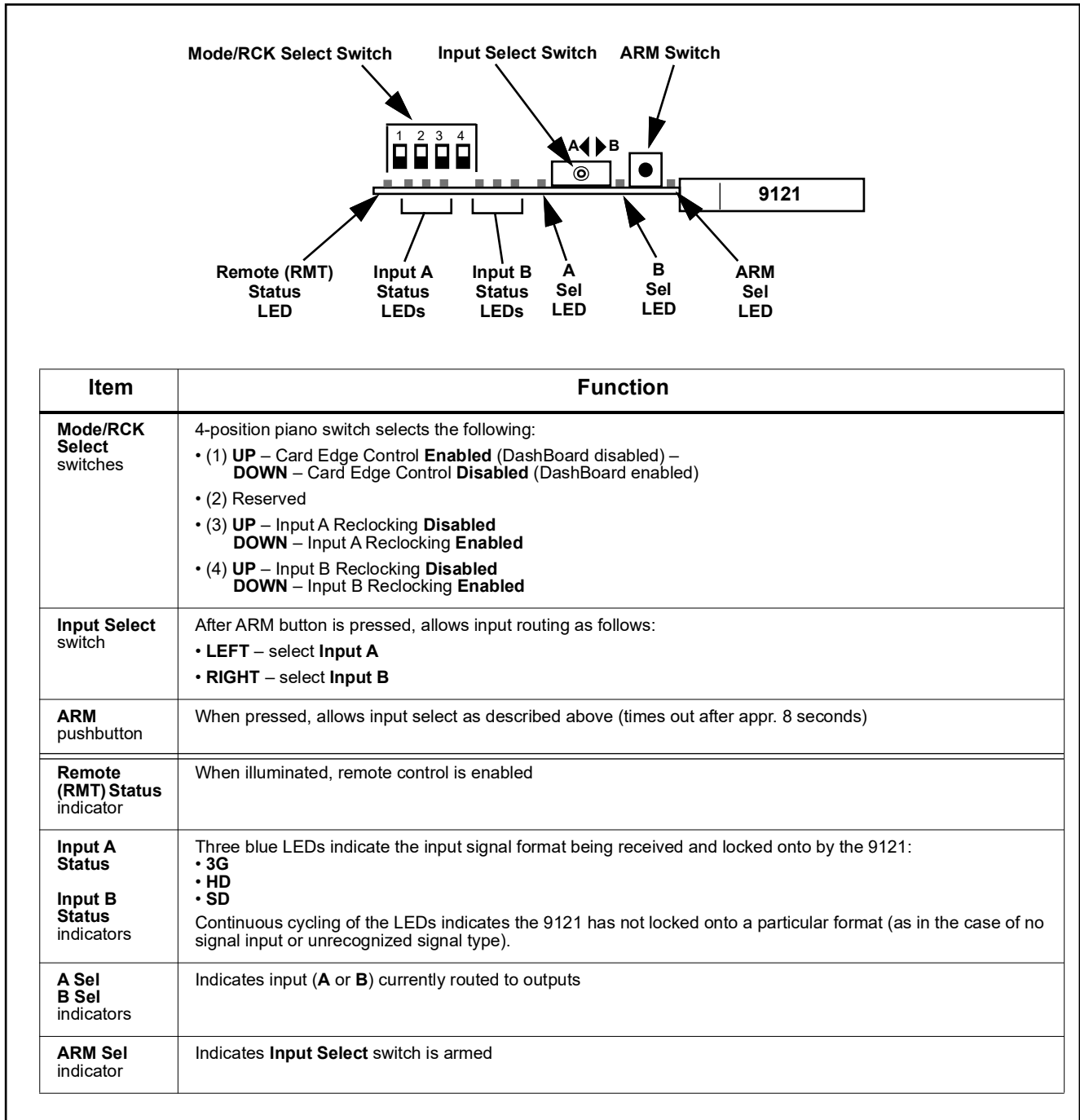Figure 3-1 shows and describes the 9121 card edge controls, indicators, and display.

Item	Function
Mode/RCK Select switches	4-position piano switch selects the following: • (1) **UP** – Card Edge Control **Enabled** (DashBoard disabled) – **DOWN** – Card Edge Control **Disabled** (DashBoard enabled) • (2) Reserved • (3) **UP** – Input A Reclocking **Disabled** **DOWN** – Input A Reclocking **Enabled** • (4) **UP** – Input B Reclocking **Disabled** **DOWN** – Input B Reclocking **Enabled**
Input Select switch	After ARM button is pressed, allows input routing as follows: • **LEFT** – select **Input A** • **RIGHT** – select **Input B**
ARM pushbutton	When pressed, allows input select as described above (times out after appr. 8 seconds)
Remote (RMT) Status indicator	When illuminated, remote control is enabled
Input A Status **Input B Status** indicators	Three blue LEDs indicate the input signal format being received and locked onto by the 9121: • **3G** • **HD** • **SD** Continuous cycling of the LEDs indicates the 9121 has not locked onto a particular format (as in the case of no signal input or unrecognized signal type).
A Sel B Sel indicators	Indicates input (**A** or **B**) currently routed to outputs
ARM Sel indicator	Indicates **Input Select** switch is armed

Figure 3-1 9121 Card Edge Controls and Indicators

Troubleshooting

This section provides general troubleshooting information and specific symptom/corrective action for the 9121 card and its remote control interface. The 9121 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 9121 card itself and its remote control systems all (to varying degrees) provide error and failure indications. Depending on how the 9121 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.

Red indicators in DashBoard typically signify a condition where the card is lacking a required input, or controls are improperly set for the mode(s) selected.

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. Tables 3-2 and 3-3 provide basic system checks that typically locate the source of most general problems.

Troubleshooting Network/Remote Control Errors

Refer to Cobalt® reference guide "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. 1-11) in Chapter 1, "Introduction" for contact information.

Table 3-2   Basic Troubleshooting Checks

Item	Checks
Verify power presence and characteristics	On both the frame Network Controller Card and the 9121, 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 DashBoard™, red indications typically 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.

Table 3-3   Troubleshooting Processing Errors by Symptom

Symptom	Error/Condition	Corrective Action
DashBoard™ remote control does not change card settings.	Remote control disabled on card	Check card edge Mode Select switch and make certain set for Card Edge Control>Disabled (see 9121 Card Edge Control (p. 3-5)). DashBoard™ remote control is locked out if card edge control is enabled.
• **DashBoard™** indicates **Unlocked** for input. • Card edge **Input Format** LEDs show continuous cycling.	• No video input present	• Make certain intended video source is connected to appropriate card video input. Make certain BNC cable connections between frame Rear I/O Module for the card and signal source are OK.
	• Signal is not SMTE 424M, 292M, or 259	• The card can typically pass non-SDI signals, however, status will indicate **Unlocked**.
Failover does not function as expected.	• Signal not supported by card failover validity check	• Only signal formats recognized by the card validity checks should use the failover mode. (See Technical Specifications (p. 1-8))
	• Failover Mode set to Non-Revertive	• Non-Revertive mode requires manual confirmation to revert to primary input when primary input returns as valid. If Non-Revertive mode is unintentionally selected, reversion to Primary input will not automatically occur.
Card non-relay outputs will not pass selected input.	Reclocking enabled for non-SDI signal	Reclocking should be disabled if non-relay outputs are to carry any non-SDI signal. (See Technical Specifications (p. 1-8))
Card Input Status displays show unlocked when receiving a valid SDI signal	Relay output RLY A/B OUT unterminated	Card relay output RLY A/B OUT must be terminated into 75Ω impedance via connection to downstream equipment or termination for card to properly display input status.

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