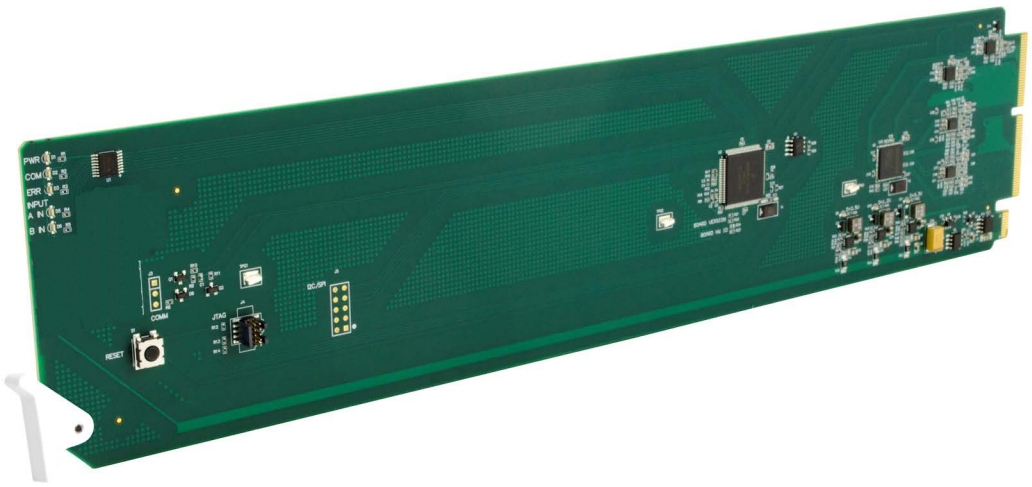
9911DA-8-BPX



Dual-Input 3G/HD/SD-SDI / ASI 1x8 Distribution Amplifier and Bypass Switch

with Passive Relay Protected Output

Product Manual

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9911DA-8-BPX-OM (V1.2)

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

Congratulations on choosing the Cobalt® 9911DA-8-BPX Dual-Input 3G/HD/SD-SDI / ASI 1x8 Distribution Amplifier and Bypass Switch with Passive Relay Protected Output. The 9911DA-8-BPX 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 card, please contact us at the contact information on the front cover.

Manual No.:	9911DA-8-BPX-OM
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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 9911DA-8-BPX Dual-Input 3G/HD/SD-SDI / ASI 1x8 Distribution Amplifier and Bypass Switch with Passive Relay Protected Output card (also referred to herein as the 9911DA-8-BPX).

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 9501.
- **Chapter 2, "Installation and Setup"** – Provides instructions for installing the 9501 in a frame, and optionally installing a 9911DA-8-BPX Rear I/O Module.
- **Chapter 3, "Operating Instructions"** – Provides overviews of operating controls and instructions for using the 9911DA-8-BPX.

This chapter contains the following information:

Manual Conventions

In this manual, display messages and connectors are shown using the exact name shown on the 9911DA-8-BPX itself (for example, connector names are shown like this: **ANLG IN**).

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

- **9911DA-8-BPX** refers to the 9911DA-8-BPX Dual-Input 3G/HD/SD-SDI / ASI 1x8 Distribution Amplifier and Bypass Switch with Passive Relay Protected Output 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 Cobalt® or other card.
- **System** and/or **Video System** refers to the mix of interconnected production and terminal equipment in which the 9911DA-8-BPX and other 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.

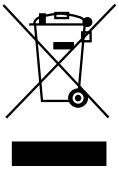
Cautions

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.
	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.
	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 and Regulatory 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® or equivalent 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 **If required, make certain Rear I/O Module(s) is installed before installing the 9911DA-8-BPX 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.**

PRI-to-BKUP Failover Selection

The **Lock Detect** (and in turn active failover) from **PRI** to the **BKUP** source can be set to be invoked as follows:

- **Signal Presence**– this mode uses simple signal presence based on energy present above an acceptable threshold. This mode can be used for any signal format handled by the card.

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

9911DA-8-PBX Functional Description

Figure 1-1 shows a functional block diagram of the 9911DA-8-BPX. The 9911DA-8-BPX can provide up to eight DA input copies with EQ and reclocking, and automatically choose from primary (PRI) and secondary backup (BKUP) inputs. A relay-bypass path (with relay located on the Rear I/O Module) provides a passive bypass signal path if card power is lost or the card is removed from its slot.

9911DA-8-BPX Input/Outputs

The 9911DA-8-BPX provides the following inputs and outputs:

- **Inputs:**
  - **Primary (PRI) IN** – coaxial 3G/HD/SD-SDI / ASI primary input
  - **Secondary Backup (BKUP) IN** – coaxial 3G/HD/SD-SDI / ASI secondary backup input (automatic routing to DAs if PRI is lost)
- **Outputs:**
  - **DA OUT (1-8)** – eight active EQ/reclocked DA coaxial outputs
  - **PRI RLY BYP** – passive relay path provides a failover output from **PRI** input to **PRI RLY BYP** port in case of loss of power

Reclock Select

Reclocking can be individually enabled or disabled for either the **PRI** input or the **BKUP** input. Reclocking, when enabled, automatically adapts to all supported input formats.

- **SDI Video Format** – this mode uses valid SDI format detection (SMPTE 424M, SMPTE 292M, or SMPTE 259M formats) as the lock criteria. Presence of no signal or a signal not complying with SDI format is rejected, and failover reverts to routing the **BKUP** input to the card DA's.

When the **PRI** input is validated, the PRI signal passes through the Lock Detect mux and onto the eight DA outputs. When instead the **BKUP** input is validated upon loss of **PRI**, the **BKUP** signal passes through the Lock Detect mux and onto the eight DA outputs.

Relay (RLY) Failover Selection

When the card is energized and functional, the **RLY BYP** relay is held in the normal position, with **OUT 2** receiving its signal from the associated DA. With no card power or valid card state undetected, the **RLY BYP** relay reverts to the failover position, with the **PRI** input being directly passive-routed to **OUT 2 / PRI RLY BYP**. Upon resumption of power, **RLY BYP** reverts automatically to the normal position.

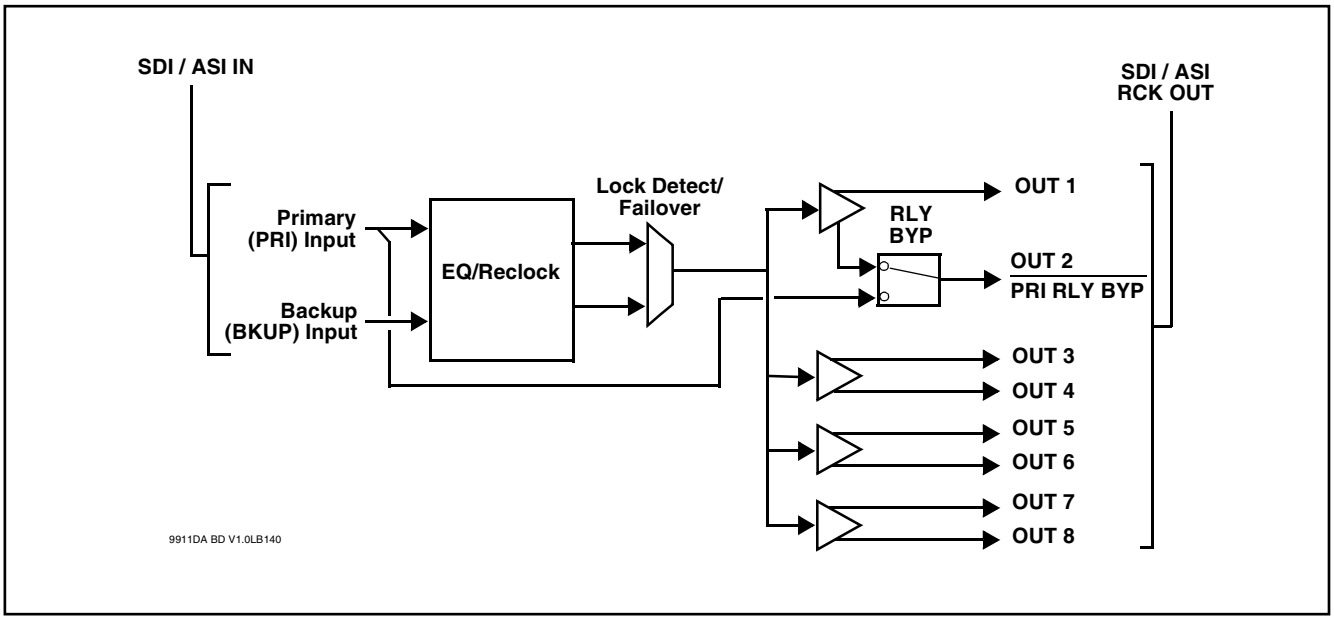


Figure 1-1 9911DA-8-BPX Functional Block Diagram

9911DA-8-BPX Rear I/O Modules

The 9911DA-8-BPX physically interfaces to system video connections at the rear of its frame using a Rear I/O Module. The full assortment of 9911DA-8-BPX Rear I/O Modules is shown and described in 9911DA-8-BPX Rear I/O Modules (p. 2-4) in Chapter 2, “Installation and Setup”.

Technical Specifications

Table 1-1 lists the technical specifications for the 9911DA-8-BPX 9911DA-8-BPX Dual-Input 3G/HD/SD-SDI / ASI 1x8 Distribution Amplifier and Bypass Switch with Passive Relay Protected Output card.

Table 1-1 Technical Specifications

Item	Characteristic
Part number, nomenclature	9911DA-8-BPX-3G Dual-Input 3G/HD/SD-SDI / ASI 1x8 Distribution Amplifier and Bypass Switch with Passive Relay Protected Output
Installation/usage environment	Intended for installation and usage in frame meeting openGear™ modular system definition
Power consumption	< 6 Watts maximum
Installation Density	Up to 10 cards per 20-slot frame
Environmental: Operating temperature: Relative humidity (operating or storage):	 32° – 104° F (0° – 40° C) < 95%, non-condensing
Frame communication	10/100/1000 Mbps Ethernet with Auto-MDIX
3G/HD/SD-SDI / ASI Inputs	Number of inputs: 2 Impedance: 75Ω SDI Return Loss: >15 dB up to 1.485 GHz; >10 dB up to 2.970 GHz
Receive Performance (Cable Length; Belden 1694A)	3 Gbps: 120m 1.485 Gbps: 160m 143-360 Mbps: 400m
3G/HD/SD-SDI / ASI Outputs	Number of DA outputs: 8 213Mbit/s maximum ASI TS bit-rate per port Impedance: 75Ω

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.

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Chapter 2

Installation and Setup

Overview

This chapter contains the following information:

Installing the 9911DA-8-BPX Into a Frame Slot

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: **If installing the 9911DA-8-BPX in a slot with no rear I/O module, a Rear I/O Module is required** before cabling can be connected. Refer to Installing a Rear I/O Module (p. 2-3) for rear I/O module installation procedure.

CAUTION

If required, make certain Rear I/O Module(s) is installed before installing the 9911DA-8-BPX 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 9911DA-8-BPX 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 9911DA-8-BPX into a frame slot as follows:

1. Determine the slot in which the 9911DA-8-BPX 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 9911DA-8-BPX Rear I/O Modules (p. 2-4).
9. Repeat steps 1 through 8 for other 9911DA-8-BPX 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.

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 I/O Module

Note: This procedure is applicable **only if a Rear I/O Module is not currently installed** in the slot where the 9911DA-8-BPX is to be installed.

If installing the 9911DA-8-BPX in a slot already equipped with a suitable I/O module, omit this procedure.

Install a Rear I/O Module as follows:

1. On the frame, determine the slot in which the 9911DA-8-BPX 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.

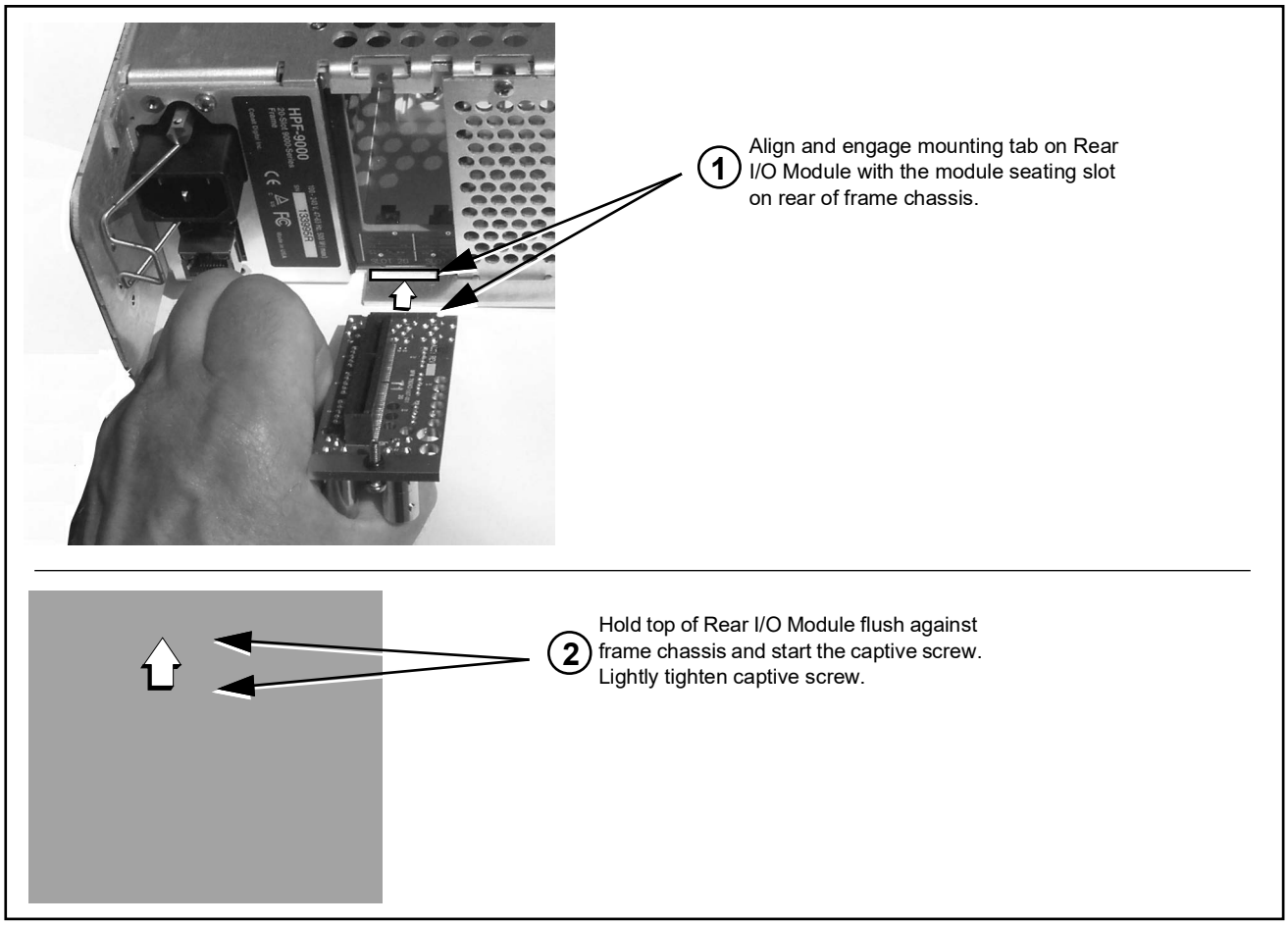
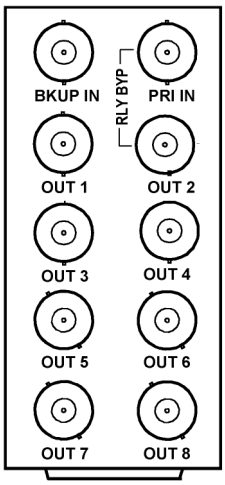


Figure 2-1 Rear I/O Module Installation

9911DA-8-BPX Rear I/O Modules

Table 2-1 shows and describes the full assortment of Rear I/O Modules specifically for use with the 9911DA-8-BPX.

Table 2-1 9911DA-8-BPX Rear I/O Modules

9911DA-8-BPX Rear I/O Module	Description
RM20-9911DA-A  **PRI IN** is DA Primary input, and is card loss-of-power relay protected. **BKUP IN** is DA Backup (secondary) input, and can be source to DA inputs upon signal loss on PRI IN input.	Provides the following connections: • SDI/ASI Primary input BNC (**PRI IN**) (This input is relay-protected and routes to OUT 2 upon power or card loss.) • SDI/ASI Backup input BNC (**BKUP IN**) (This input is actively routed to the card active DA bank upon loss of PRI input. This input is **not** relay-protected.) • Eight DA output BNCs (**OUT 1** thru **OUT 8**)

Chapter 3

Operating Instructions

Overview

If you are already familiar with using DashBoard or a Cobalt Remote Control Panel to control Cobalt cards, please skip to 9911DA-8-BPX Function Menu List and Descriptions (p. 3-3).

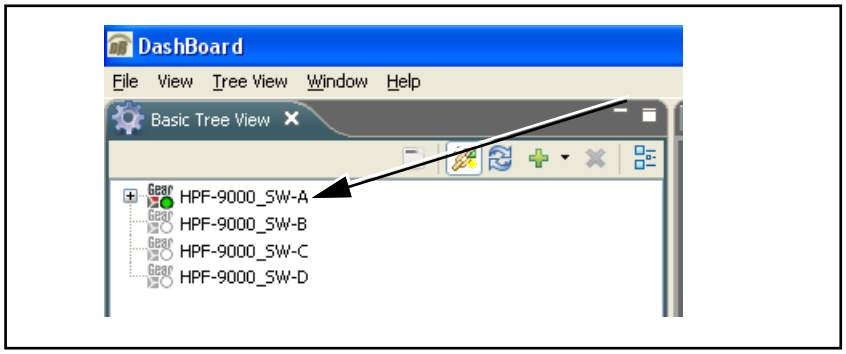
This chapter contains the following information:

Accessing the 9911DA-8-BPX Card via Remote Control

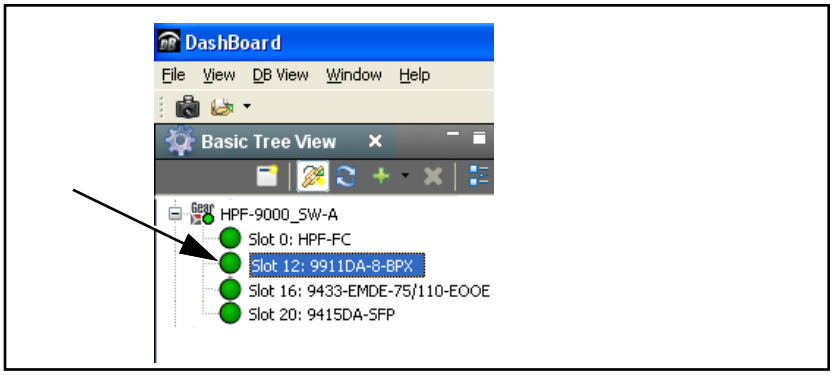
The 9911DA-8-BPX card can be remote monitored via DashBoard™ or Cobalt® Remote Control Panel. Access the 9911DA-8-BPX card using DashBoard™ or Cobalt® Remote Control Panel as described below.

Accessing the 9911DA-8-BPX 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 9911DA-8-BPX card to be accessed (in this example, “HPF-9000_SW-A”).



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 12: 9911DA-8-BPX”).



Checking 9911DA-8-BPX Card Information and Input Status

The operating status of the 9911DA-8-BPX card can be checked using DashBoard™. Figure 3-1 shows and describes the 9911DA-8-BPX card information screen using DashBoard™.

The **Tree View** shows the cards seen by DashBoard™. In this example, Network Controller Card is hosting a 9911DA-8-BPX card in slot 12.

Card Info Display
This displays shows the 9911DA-8-BPX card product details and operating status (including card power/temperature status)

Input Status Display
This displays shows presence and format of inputs being received

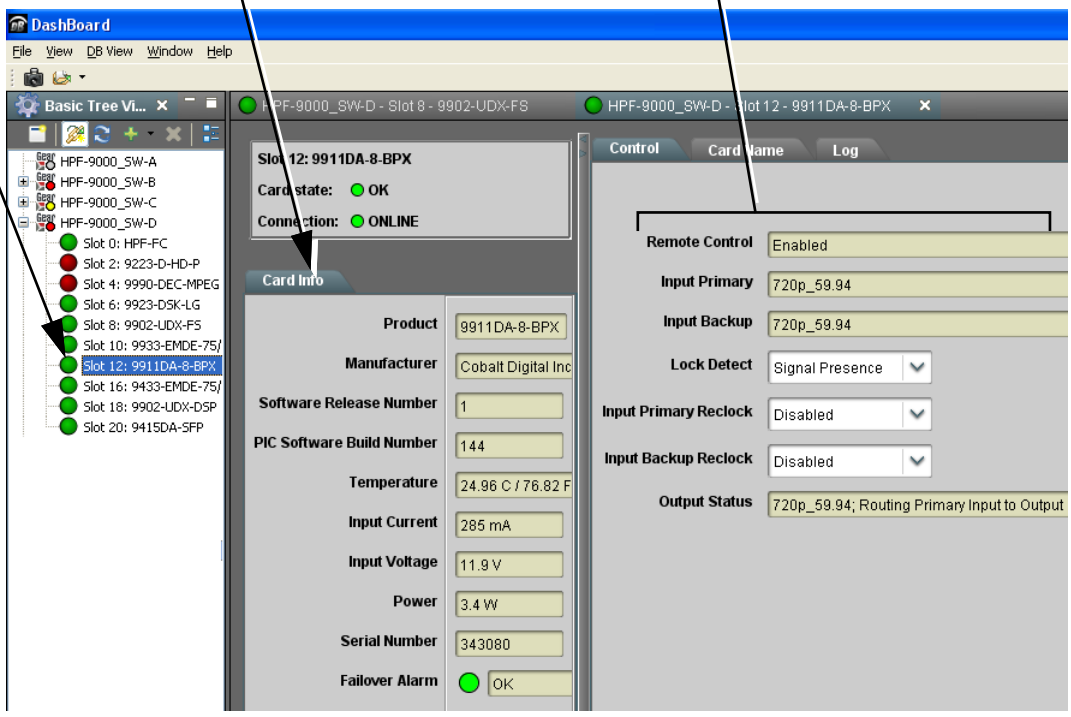


Figure 3-1 9911DA-8-BPX Card Info/Status Utility

9911DA-8-BPX Function Menu List and Descriptions

Table 3-1 individually lists and describes each 9911DA-8-BPX 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.

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

The table below provides a quick-reference to the page numbers where each function menu item can be found.

Table 3-1 9911DA-8-BPX Function Menu List

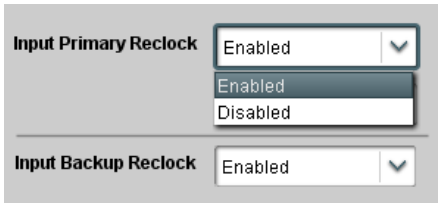
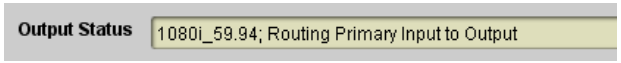
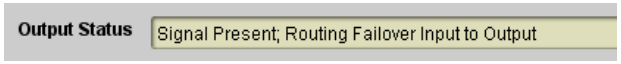
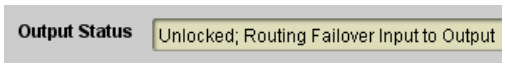
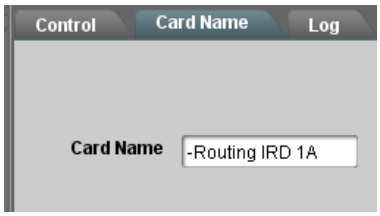
Control	Provides Primary (PRI) and Backup (BKUP) input status monitors. Also provides lock detect (type) setup and reclock enable/disable.
•Input Status Displays 	Displays the current status/signal presence for the PRI and BKUP coaxial video inputs. • Recognized **SDI format presence** is shown as format and rate (example: "720p_5994" as shown here). • **ASI or other format non-specific presence** is shown as **Signal Present** (as shown in example here). • No input is shown as **Unlocked**. **Note: Signal Present** is the display form used when **Lock Detect** is set to Signal Presence and valid signal energy is detected (see below).
•Lock Detect Mode Select 	Sets the type of lock detect to be used for both the PRI and BKUP coaxial inputs. • **Signal Presence** sets detect as simple energy presence detect. This mode should be used when any signal meeting basic electrical compliance of the coaxial input should be considered valid (such as ASI). • **SDI Video Format** sets detect to only consider valid signals meeting specific SMPTE 424M, SMPTE 292M, or SMPTE 259M SDI formats. This mode should be used if the card is only to handle recognized SDI formats. If **Lock Detect** is set to **SDI Video Format** and ASI is present and intended to be passed, this setting will **reject** the ASI received input, and mark the received input as Unlocked (with the signal not being passed to the DA outputs). Make certain control is set to **Signal Presence** if ASI is to be passed.
•Reclock Select 	Individually selects automatic reclocking (enabled) or no reclocking (disabled) for the PRI and BKUP coaxial inputs.
• Output Status Display	Displays the current input-to-output routing (PRI or BKUP to DA outputs, and signal format as shown in the examples below.
	Status display shows PRI input (SDI format) being routed to DA outputs.
	Status display shows failover (BKUP input being routed to DA outputs. (In this example, Signal Presence lock detection has been set as validity check.)
	If neither input (PRI or BKUP) signal is being routed to DA outputs, **Unlocked** is diplayed. Under this condition, the Card Info Failover Alarm will display **Both inputs unlocked**.

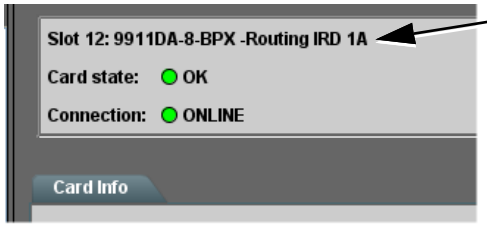
Table 3-1 9911DA-8-BPX Function Menu List — continued

Provides a user entry area for custom naming/tagging to augment the basic DashBoard card name.

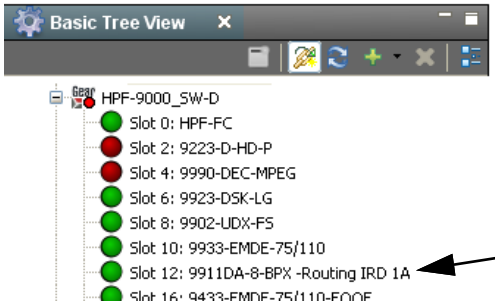


The **Card Name** entry field allows applying a custom name to augment the card name displayed on the card's DashBoard page as well in the DashBoard Basic Tree View. (Note that the custom name augments the basic device name of "9911DA-8-BPX". The custom name is most useful for modifying the name to display a custom card function or place within a processing chain, as in this example here of "Routing IRD 1A".)

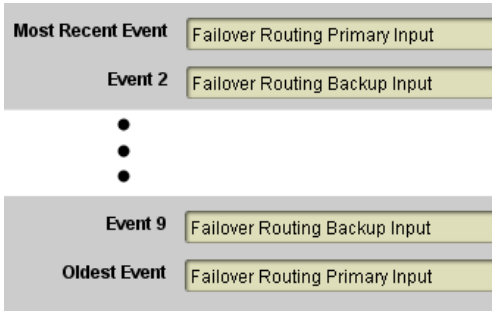
To commit the name, press Enter on keyboard after entering. The name can be cleared or changed similarly.



When card name is augmented with custom tag, the augmentation appears on the card's DashBoard header and in the DashBoard Basic Tree view (as shown in this example).



Provides a log of card signal status and control setting events.



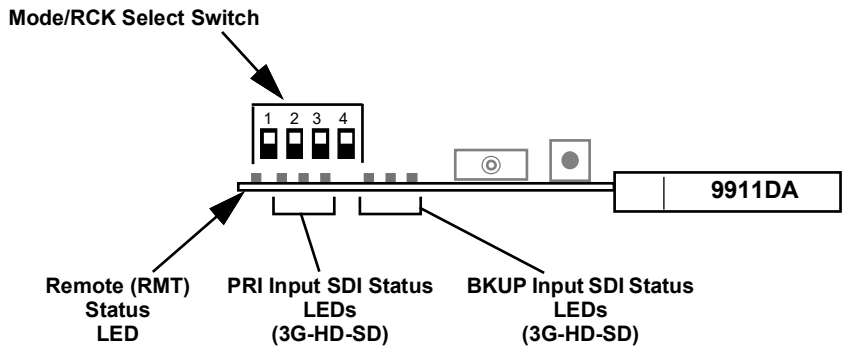
In the example here, card log shows automatic change (due to input loss on PRI input, switching to failover BKUP input).

The event log displays the current nine of the most recent events, along with the historical oldest event.

Note: Log is persistent and cumulative only while card is powered-up. A card power-down or reboot clears the log.

Card Edge Indicators

Figure 3-2 shows and describes the 9911DA-8-BPX card edge indicators.



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** — **BKUP** Input Reclocking **Disabled** **DOWN** — **BKUP** Input Reclocking **Enabled** • (4) **UP** — **PRI** Input Reclocking **Disabled** **DOWN** — **PRI** Input Reclocking **Enabled**
Remote (RMT) Status indicator	When illuminated, remote control is enabled
PRI Input SDI Status **BKUP Input SDI Status**	Three blue LEDs indicate the input signal format being received and locked onto by the card: • **3G** • **HD** • **SD** Continuous cycling of the LEDs indicates the card has not locked onto a particular SMPTE SDI format (as in the case of no signal input or ASI signal type).
Note: Any switches or other indicators present and not described here are not functional on this model.	

Figure 3-2 9911DA-8-BPX Card Edge Indicators

Troubleshooting

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. Table 3-3 provides specific checks related to card settings and usage. If required and applicable, perform further troubleshooting in accordance with the troubleshooting tables in this section.

Table 3-2 Basic Troubleshooting Checks

Item	Checks

Verify power presence and characteristics	• On both the frame Network Controller Card and the 9911DA-8-BPX, 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 the Power Consumed indication for the 9911DA-8-BPX card. This can be observed using the DashBoard™ Card Info pane.
	  • If display shows **no** power being consumed, either the frame power supply, connections, or the 9911DA-8-BPX card itself is defective.
	  • If display shows **excessive** power being consumed (see Technical Specifications (p. 1-6) in Chapter 1, “Introduction”), the 9911DA-8-BPX card may be defective.

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 9911DA-8-BPX 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.

Table 3-3 Troubleshooting Processing Errors by Symptom

Symptom	Error/Condition	Corrective Action
• **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.
	• Card not set for ASI when ASI is to be received (PRI or BKUP)	• The card can pass non-SDI signals (such as ASI), however, Lock Detect **must** be set for Signal Presence to accept ASI is a valid input.
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))
	• Card not set for ASI when ASI is to be received (PRI or BKUP)	• If Lock Detect is set to SDI Video Format and ASI is present and intended to be passed, this setting will reject the ASI received input, and mark the received PRI and/or BKUP input as Unlocked (with the signal not being passed to the DA outputs). Make certain control is set to Signal Presence if ASI is to be passed

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. 1-8) in Chapter 1, “Introduction“ for contact information.

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