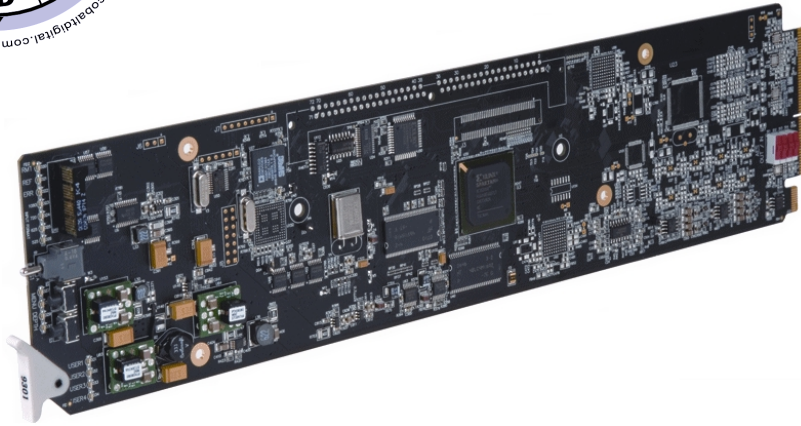


# 9341



## 8-Channel Analog Audio to AES Converter

# *Product Manual*

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Congratulations on choosing the Cobalt<sup>®</sup> 9341 8-channel Analog Audio to AES Converter. The 9341 is part of a full line of processing and modular 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 9341, please contact us at the contact information on the front cover.

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# Introduction

## Overview

This manual provides installation and operating instructions for the 9341 8-Channel Analog Audio to AES Converter card (also referred to herein as the 9341).

**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 9341.
- **Chapter 2, “Installation and Setup”** – Provides instructions for installing the 9341 in a frame, and optionally installing a Rear I/O Module.
- **Chapter 3, “Operating Instructions”** – Provides overviews of operating controls and instructions for using the 9341.

**This chapter** contains the following information:

- **9341 Card Software Versions and this Manual (p. 1-2)**
- **Manual Conventions (p. 1-3)**
- **Safety Summary (p. 1-4)**
- **9341 Functional Description (p. 1-5)**
- **Technical Specifications (p. 1-13)**
- **Warranty and Service Information (p. 1-16)**
- **Contact Cobalt Digital Inc. (p. 1-17)**

## 9341 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 9341 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:

<p>Card Software <b>earlier</b> than latest version</p>	<p>Card is not loaded with the latest software. Not all functions and/or specified performance described in this manual may be available.</p> <p>You can update your card with new Update software by going to the <b>Support&gt;Firmware Downloads</b> link at <a href="http://www.cobaltdigital.com">www.cobaltdigital.com</a>. 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™.</p> <p><b>Software updates are field-installed without any need to remove the card from its frame.</b></p>
<p>Card Software <b>newer</b> than version in manual</p>	<p>A new manual is expediently released whenever a card’s software is updated <b>and specifications and/or functionality have changed</b> 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.</p> <p>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 <b>Support&gt;Documents&gt;Product Information and Manuals</b> link at <a href="http://www.cobaltdigital.com">www.cobaltdigital.com</a>.</p>

## Cobalt Reference Guides

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

---

## Manual Conventions

In this manual, display messages and connectors are shown using the exact name shown on the 9341 itself. Examples are provided below.

- Card-edge display messages are shown like this:



- Connector names are shown like this: **AES OUT 4**

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

- **9341** refers to the 9341 8-Channel Analog Audio to AES Converter card.
- **Frame** refers to the 20-slot frame that houses the Cobalt® Compass® and/or Fusion3G® cards.
- **Device** and/or **Card** refers to a Compass® card.
- **System** and/or **Video System** refers to the mix of interconnected production and terminal equipment in which the 9341 and other Compass® cards operate.
- Functions and/or features that are available only as an option are denoted in this manual like this:



## 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.
	<p>Electronic device or assembly is susceptible to damage from an ESD event. Handle only using appropriate ESD prevention practices.</p> <p>If ESD wrist strap is not available, handle card only by edges and avoid contact with any connectors or components.</p>
	<p>Symbol (WEEE 2002/96/EC)</p> <p>For product disposal, ensure the following:</p> <ul style="list-style-type: none"> <li>• Do not dispose of this product as unsorted municipal waste.</li> <li>• Collect this product separately.</li> <li>• Use collection and return systems available to you.</li> </ul>

## 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. The 9341 has a moderate power dissipation (11 W max.). As such, avoiding placing the card adjacent to other cards with similar dissipation values if possible.

#### **CAUTION**

If required, make certain Rear I/O Module(s) are installed before installing the 9341 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.



## 9341 Functional Description

Figure 1-1 shows a functional block diagram of the 9341. The 9341 receives up to eight balanced audio inputs and converts these into up to four AES-3id output pairs. The output timing can be locked to a DARS input timing, black burst or tri-level video reference signal, or the card's internal clock.

The 9341 also provides audio routing that acts as a full audio cross point. Each of the eight AES output channels can receive signal from any card input source. Unused output channels can be mapped to a "Silence" source. Each output also provides gain adjustment and selectable polarity inversion.

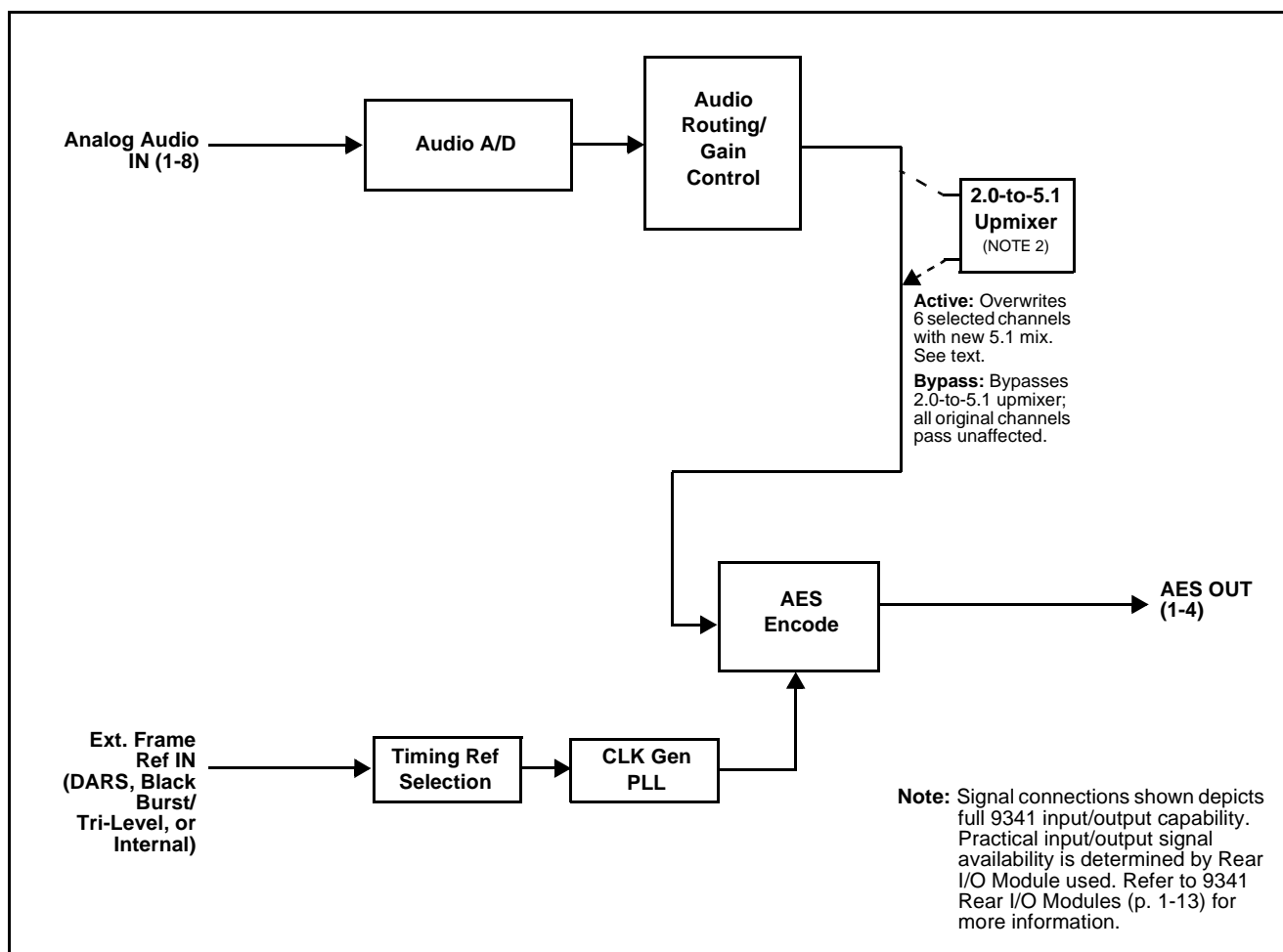


Figure 1-1 9341 Functional Block Diagram

### AES Audio Output Format

The 9341 provides up to 8 channels (4 pairs) of discrete AES audio on 75-ohm BNC connections per AES-3id/SMPTE276M. The output clock rate of each pair is precisely locked to input DARS timing, frame reference timing, or the card's internal independent timing.

---

## Audio Timing Function

Audio data blocks are sequentially buffered and released per the user-selected timing reference source.

The 9341 allows selection from the following reference timing sources:

- **DARS Input** – All outputs can be slaved to a DARS reference when DARS is selected. In this manner, all other inputs will be re-sampled to sync with the DARS channel.
- **Reference 1 and Reference 2 Frame References** – Timing is derived from an external frame sync reference signals distributed with the card frame (**Ext. Frame Ref IN** in Figure 1-1), thereby allowing the audio to be synchronized to a black burst or tri-level video reference.
- **Local** – Timing is derived from the card's internal clock with no association to external signal timing.

## Audio Routing Description

The audio processor operates as an internal audio router. The router function chooses from the following inputs:

- 8 channels of balanced analog audio inputs
- Four independent internal tone generators (described below)
- Downmix and mono mixers
- Digital silence (mute) setting

The router function in turn provides 8 channels of discrete AES output on four AES pairs.

The router acts as a full audio cross point. Each of the 8 AES output channels can receive signal from any one of the card input sources. Unused output channels can be mapped to a "Silence" source. Each output also provides gain adjustment and selectable polarity inversion.

Output audio rates are always 48 kHz locked to the selected reference. Output AES is always precisely synchronized with the selected reference.

As set with the default settings, the routing between analog input channels and AES output channels is basic 1-to-1 (**AN-AUD Ch 1** input is routed to **AES Ch 1** output, and so on). Other sources and/or destinations for each channel are selected (from the choices listed above) using the card edge controls or a remote control system.

### Audio Down Mixer and Mono Mixer Function

(See Figure 1-2.) The Audio Down Mixer function provides for the selection of any five analog audio channel sources serving as Left (L), Right (R), Center (C), Left Surround (Ls), and Right Surround (Rs) individual signals to be multiplexed into a stereo pair (Down Mix Left (DM-L) and Down Mix Right (DM-R)). The resulting stereo pair DM-L and DM-R can in turn be routed and processed just like any of the other audio sources described earlier.

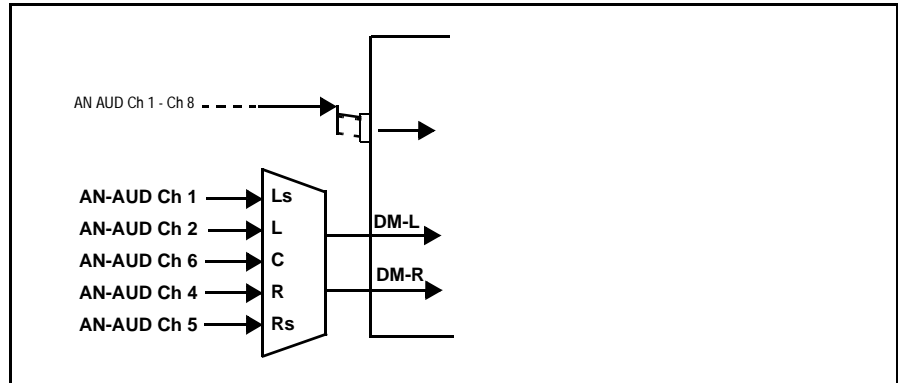


Figure 1-2 Audio Mixing Functional Block Diagram with Example Sources

The Mono Mixer function (Figure 1-3) generates an additional mono-mixed channel from two selected analog input channels serving as left and right inputs. The resulting mono mix channel **MONO** can in turn be routed and processed just like any of the other audio sources described earlier.

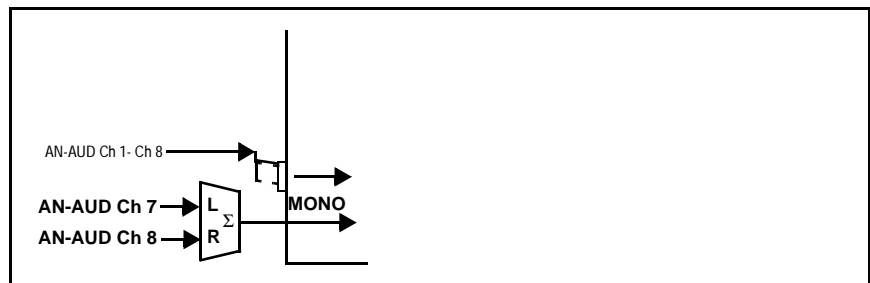


Figure 1-3 Audio Mono Mix Functional Block Diagram with Example Sources

## 2.0-to-5.1 Upmix Function **Option**

**Note:** Upmix function is an optional licensable feature. This function and its controls appear only when a license key is entered and activated. (This option (identified in Cobalt® price lists as **+UM**) can be purchased upon initial order, or field-activated using a key string which is sent to you when this option is purchased.)

The 2.0-to-5.1 upmixer function receives a normal PCM stereo pair from the Audio Routing/Gain Control function and upmixes the pair to provide 5.1 channels (Left (**L**), Right (**R**), Center (**C**), Low Frequency Effects (**LFE**), Left Surround (**Ls**), and Right Surround (**Rs**)). Whenever the upmixer is active, it overwrites the six selected output channels with the new 5.1 upmix signals (including replacing the original source stereo **L** and **R** inputs with new **L** and **R** signals).

The 2.0-to-5.1 upmixer can be set to up mix in any of three modes: Always upmix, Bypass upmix, or Auto enable/bypass upmixing. The Auto upmixing mode looks at the signal levels on the selected channels and compares them to a selectable level threshold. It then determines whether or not to generate 5.1 upmixing from the stereo pair as follows:

- If the upmixer detects signal level **below** a selected threshold on **all four** of the selected channels designated as **C**, **LFE**, **Ls**, and **Rs**, this indicates to the upmixer that these channels are not carrying 5.1. In this case, the upmixer overwrites all six selected channels with the new 5.1 content.
- If the upmixer detects signal level **above** a selected threshold on **any** of the four selected channels designated as **C**, **LFE**, **Ls**, and **Rs**, this indicates to the upmixer that the channel(s) are already carrying viable 5.1 content. In this case, the upmixer is bypassed, allowing the original channels to pass unaffected.

The examples in Figure 1-4 show the automatic enable/disable up-mixing function applied to example selected channels **AES Ch 1** thru **AES Ch 6**. As shown and described, the processing is contingent upon the signal levels of the channels selected to carry the new 5.1 upmix relative to the selected threshold (in this example, -60 dBFS). Note also that this function is applied **after** the Audio Routing/Gain Control function.

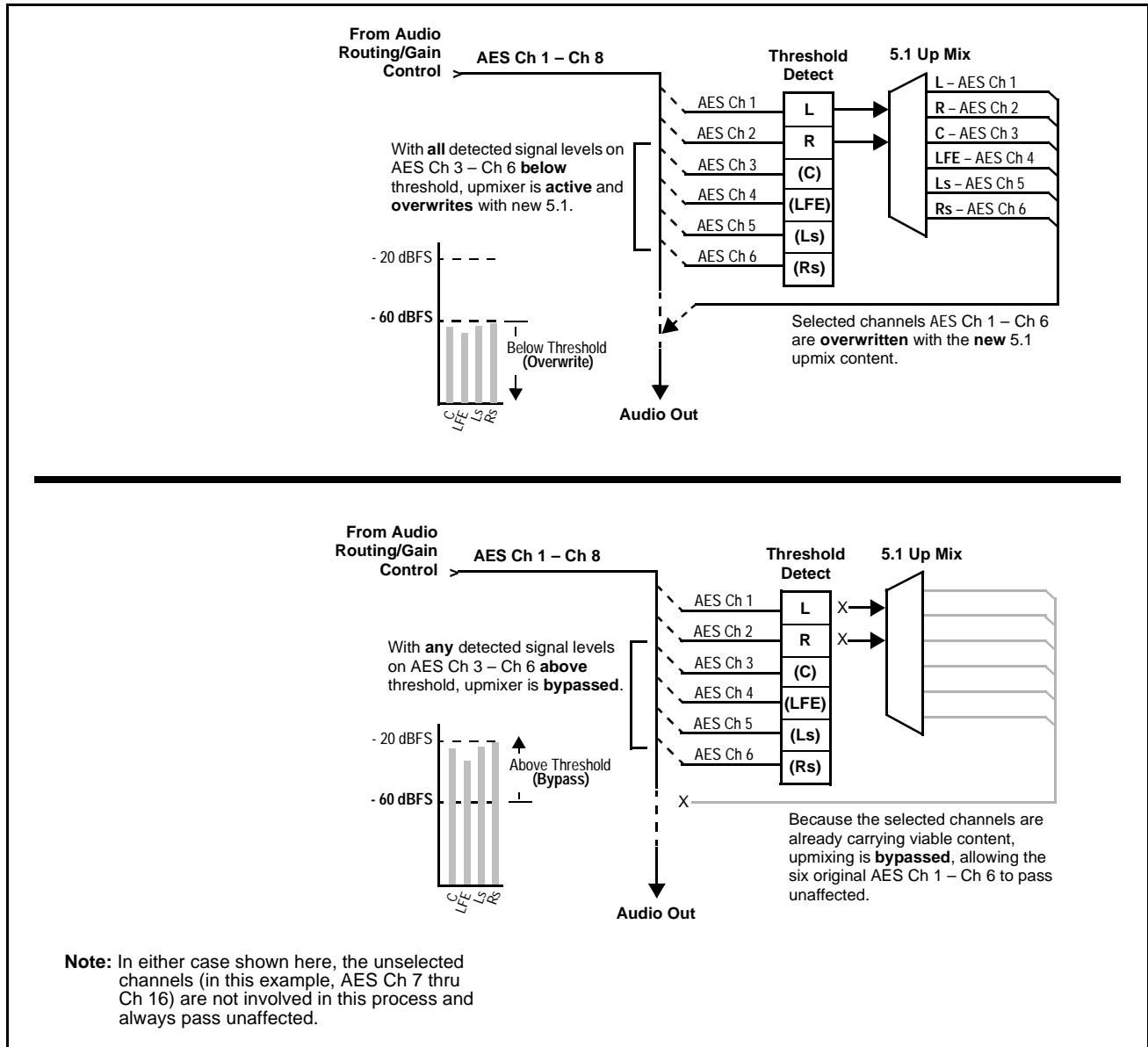


Figure 1-4 Up Mix Auto Enable/Bypass with Example Sources

## Loudness Processor (Option +LP) **Option**

**Note:** Loudness processor function is an optional licensable feature. This function and its controls appear only when a license key is entered and activated. (This option (identified in Cobalt® price lists as **+LP**) can be purchased upon initial order, or field-activated using a key string which is sent to you when this option is purchased.)

If your card was purchased with option **+LP**, loudness processor manual supplement “5.1 and Stereo Loudness Processing Options for Compass® Cards (+LP51, +LP20) Manual Supplement” (OPT-SW-LP-MS) is included in your documentation package. Supplement OPT-SW-LP-MS can be downloaded from our website or requested using the Cobalt contact information in this manual.

## Tone Generator Function

The 9341 contains four built-in tone generators (Tone Generator 1 thru Tone Generator 4). Each of the four tone generators can be set to a different frequency, and are available as audio sources for each AES audio output.

18 discrete sine wave frequencies are available, ranging from 50 Hz to 16 kHz (default frequency is 1.0 kHz).

User Control Interface

Figure 1-5 shows the user control interface options for the 9341. These options 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.

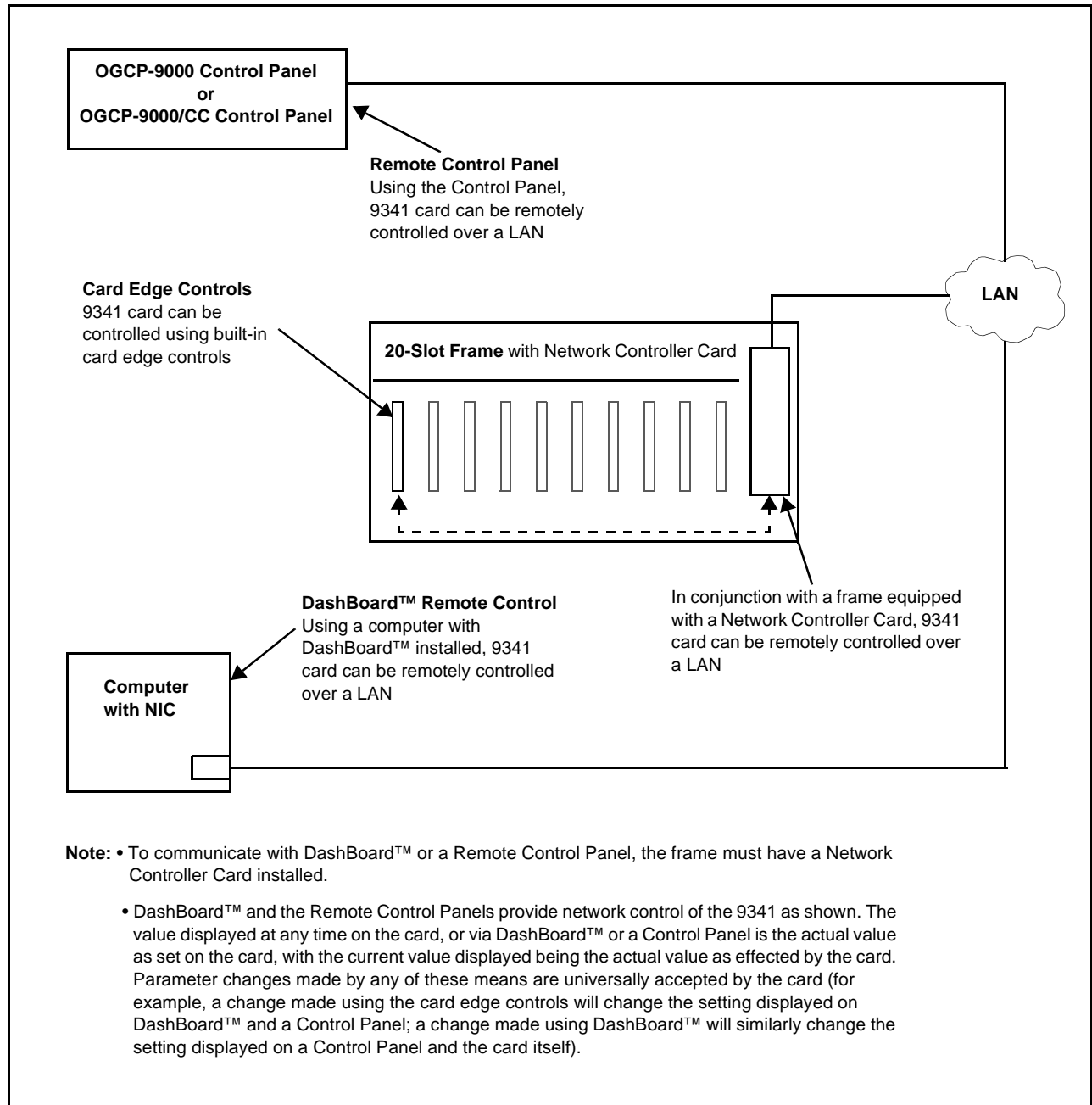


Figure 1-5 9341 User Control Interface

- **Built-in Card Edge User Interface** – Using the built-in card edge controls and display, card control settings can be set using a front panel menu which is described in Chapter 3, “Operating Instructions”.

**Note:** Some of the 9341 functions described in this manual are available only when using the DashBoard™, or Cobalt® OGCP-9000 or OGCP-9000/CC Control Panels user interfaces.

- **DashBoard™ User Interface** – Using DashBoard™, the 9341 and other cards installed in openGear®<sup>1</sup> 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](http://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 “Compass® 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™.

Download a copy of this guide by clicking on the **DashBoard Control and Monitoring** link at [www.cobaltdigital.com](http://www.cobaltdigital.com) and then select DashBoard Remote Control Manual as a download, or contact Cobalt® as listed in Contact Cobalt Digital Inc. (p. 1-17).

- **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.

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



## 9341 Rear I/O Modules

The 9341 physically interfaces to audio connections at the rear of its frame using a Rear I/O Module.

All inputs and outputs shown in the 9341 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 9341 card edge connections to BNC connectors that interface with other components and systems in the signal chain.

These required BNC connections are provided by using an optional 9341 Rear I/O Module. The 9341 Rear I/O Modules are shown and described in 9341 Rear I/O Modules (p. 2-5) in Chapter 2, “Installation and Setup”.

## Technical Specifications

Table 1-1 lists the technical specifications for the 9341 8-Channel Analog Audio to AES Converter card.

**Table 1-1 Technical Specifications**

Item	Characteristic
Part number, nomenclature	9341 8-Channel Analog Audio to AES Converter
Installation/usage environment	Intended for installation and usage in frame meeting openGear® modular system definition.
Power consumption	11 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.
Indicators	Card edge display and indicators as follows: <ul style="list-style-type: none"> <li>• 4-character alphanumeric display</li> <li>• Input Channel LED indicators</li> </ul>
Controls	Card edge switches as follows: <ul style="list-style-type: none"> <li>• Menu Enter pushbutton switch</li> <li>• Menu exit pushbutton switch</li> <li>• Up/down selection toggle switch</li> </ul>
Internal Tone Generators	Four built-in tone generators, each configurable for 18 discrete sine wave frequencies ranging from 50 Hz to 16 kHz.  Generator source signal level is equivalent to -20 dBu.

Table 1-1 Technical Specifications — continued

Item	Characteristic
Analog Audio Input	Number of Inputs (maximum): Eight, 3-wire balanced analog audio using Phoenix connectors with removable screw terminal blocks (Phoenix PN 1803581; Cobalt PN 5000-0013-000R) Sampling Rate: 48 kHz Signal Level: +24 dBu => 0 dBFS A/D Frequency Response: 20 – 20 kHz ± 0.25 dB
AES Audio Output	Standard: SMPTE 276M Number of Outputs (maximum): 4 unbalanced AES-3id pairs Output Impedance: 75 Ω Return Loss: > 30 dB 100 kHz to 6 MHz Resolution: Up to 24-bit Sample Rate: 48 kHz

Table 1-1 Technical Specifications — continued

Item	Characteristic
Reference Video Input	<p>Number of Inputs: Two non-terminating (looping) Frame Reference inputs</p> <p>Standards Supported (HD): 720p 24; 25; 29.97; 30; 50; 59.94 1080i 25; 29.97 1080p 23.98; 24; 25; 29.97; 30 1080p/sF 23.98; 24</p> <p>Standards Supported (SD): 486i 29.97 (NTSC) 575i 25 (PAL)</p> <p>Signal Level: 1 Vp-p nominal</p> <p>Signal Type: Analog video sync (black burst or tri-level)</p> <p>Impedance: 75 <math>\Omega</math></p> <p>Return Loss: &gt; 30 dB to 30 MHz</p> <p>Allowable Maximum DC on Ref Input: <math>\pm 1.0</math> V</p>

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## 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**

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Urbana, IL 61802 USA  
www.cobaltdigital.com

Office: (217) 344-1243  
Fax: (217) 344-1245  
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

<b>Phone:</b>	(217) 344-1243
<b>Fax:</b>	(217) 344-1245
<b>Web:</b>	<a href="http://www.cobaltdigital.com">www.cobaltdigital.com</a>
<b>General Information:</b>	info@cobaltdigital.com
<b>Technical Support:</b>	support@cobaltdigital.com

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# Installation and Setup

## Overview

This chapter contains the following information:

- Installing the 9341 Into a Frame Slot (p. 2-1)
- Installing a Rear I/O Module (p. 2-4)
- Setting Up 9341 Network Remote Control (p. 2-6)

## Installing the 9341 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 9341 has a moderate power dissipation (11 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.

**Note:** If installing the 9341 in a slot with no rear I/O module, an optional Rear I/O Module is required before cabling can be connected. Install the Rear I/O Module as described in Installing a Rear I/O Module (p. 2-4).

### CAUTION

If required, make certain Rear I/O Module(s) are installed before installing the 9341 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 9341 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 9341 into a frame slot as follows:

1. Determine the slot in which the 9341 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 follows:
  - If the 9341 is being installed in a frame with a rear I/O module already in place, refer to the label on the connector bank corresponding to the card's slot location for connector designations.
  - If the 9341 is being installed in a frame using an optional 9341 Rear I/O Module, connect cabling in accordance with the appropriate diagram shown in Table 2-1, "9341 Rear I/O Modules" (p. 2-5).
9. Repeat steps 1 through 8 for other 9341 cards.



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

**Note:** The 9341 BNC inputs are internally 75-ohm terminated. It is not necessary to terminate unused BNC inputs or outputs.

**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 9341 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.

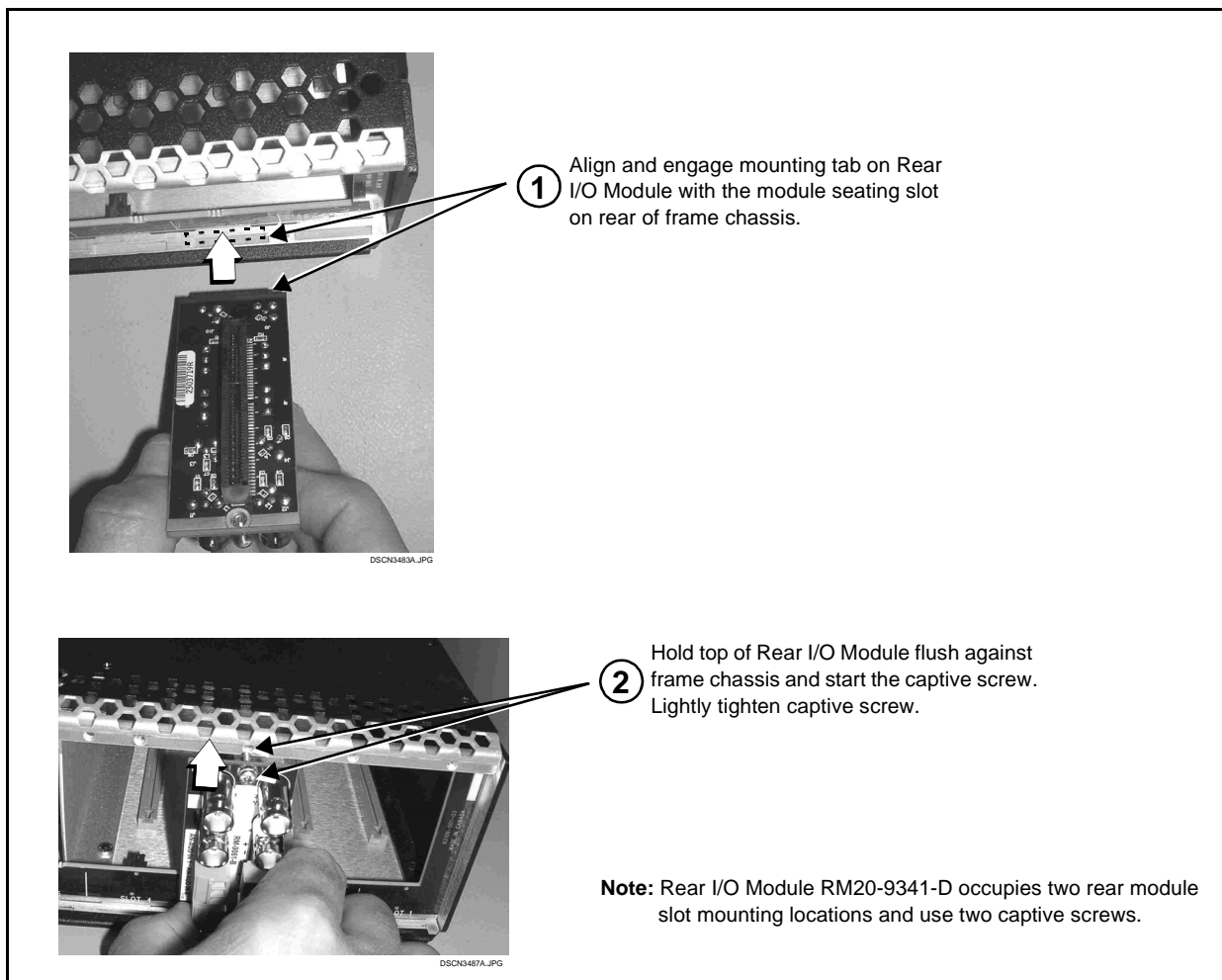
## Installing a Rear I/O Module

**Note:** This procedure is applicable **only if a Rear I/O Module is not currently installed** in the slot where the 9341 is to be installed.

If installing the 9341 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 9341 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.

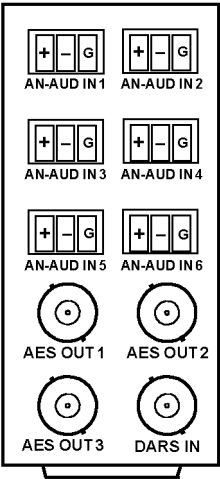
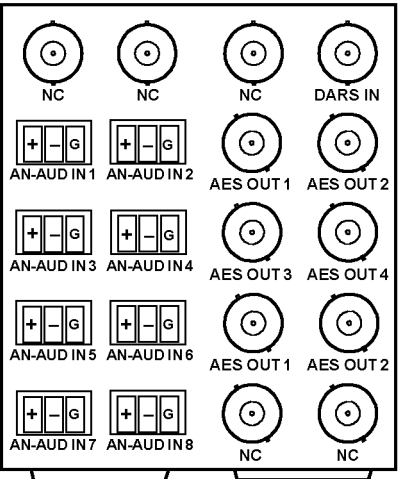


**Figure 2-1 Rear I/O Module Installation**

### 9341 Rear I/O Modules

Table 2-1 shows and describes the full assortment of Rear I/O Modules specifically for use with the 9341.

**Table 2-1 9341 Rear I/O Modules**

9341 Rear I/O Module	Description
<p><b>RM20-9341-B</b></p>  <p>The diagram shows a rear panel with six balanced audio inputs arranged in three rows of two. Each input is represented by a box with a '+' sign on the left and a '-' sign on the right, with a 'G' (ground) symbol on the right side. The inputs are labeled AN-AUD IN 1 through AN-AUD IN 6. Below the audio inputs are three AES BNC outputs, labeled AES OUT 1, AES OUT 2, and AES OUT 3, each represented by a circle with a central dot. To the right of the AES outputs is a DARS timing input, labeled DARS IN, represented by a circle with a central dot.</p>	<p>Provides the following connections:</p> <ul style="list-style-type: none"> <li>• Six analog balanced audio inputs (<b>AN-AUD IN 1</b> thru <b>AN-AUD IN 6</b>)</li> <li>• DARS timing input (<b>DARS IN</b>)</li> <li>• Three AES BNC outputs (<b>AES OUT 1</b> thru <b>AES OUT 3</b>)</li> </ul>
<p><b>RM20-9341-C</b></p>  <p>The diagram shows a rear panel with eight balanced audio inputs arranged in four rows of two. Each input is represented by a box with a '+' sign on the left and a '-' sign on the right, with a 'G' (ground) symbol on the right side. The inputs are labeled AN-AUD IN 1 through AN-AUD IN 8. The top row also includes two 'NC' (Not Connected) ports. Below the audio inputs are four AES BNC outputs, labeled AES OUT 1, AES OUT 2, AES OUT 3, and AES OUT 4, each represented by a circle with a central dot. To the right of the AES outputs is a DARS timing input, labeled DARS IN, represented by a circle with a central dot.</p>	<p>Provides the following connections:</p> <ul style="list-style-type: none"> <li>• Eight analog balanced audio inputs (<b>AN-AUD IN 1</b> thru <b>AN-AUD IN 8</b>)</li> <li>• DARS timing input (<b>DARS IN</b>)</li> <li>• Four AES BNC outputs (<b>AES OUT 1</b> thru <b>AES OUT 4</b>)</li> <li>• Two AES BNC output copies (<b>AES OUT 1</b> and <b>AES OUT 2</b>)</li> </ul>

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## Setting Up 9341 Network Remote Control

Perform remote control setup in accordance with Cobalt® reference guide “COMPASS™ 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 “COMPASS™ 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/CC and OGCP-9000 Remote Control Panel product manuals have complete instructions for setting up remote control using a Remote Control Panel.)

Download a copy of this manual by clicking on the **DashBoard Control and Monitoring** link at [www.cobaltdigital.com](http://www.cobaltdigital.com) and then select DashBoard Remote Control Manual as a download, or contact Cobalt® as listed in Contact Cobalt Digital Inc. (p. 1-17).

- 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.

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# Operating Instructions

## Overview

If you are already familiar with using DashBoard or a Cobalt Remote Control Panel to control Cobalt cards, please skip to 9341 Function Submenu List and Descriptions (p. 3-8).

This chapter contains the following information:

- Control and Display Descriptions (p. 3-1)
- Accessing the 9341 Card via Remote Control (p. 3-5)
- Checking 9341 Card Information (p. 3-7)
- 9341 Function Submenu List and Descriptions (p. 3-8)
- Troubleshooting (p. 3-20)

## Control and Display Descriptions

This section describes the user interface controls, indicators, and displays for using the 9341 card. The 9341 functions can be accessed and controlled using any of the user interfaces described here.

The format in which the 9341 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 9341 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).

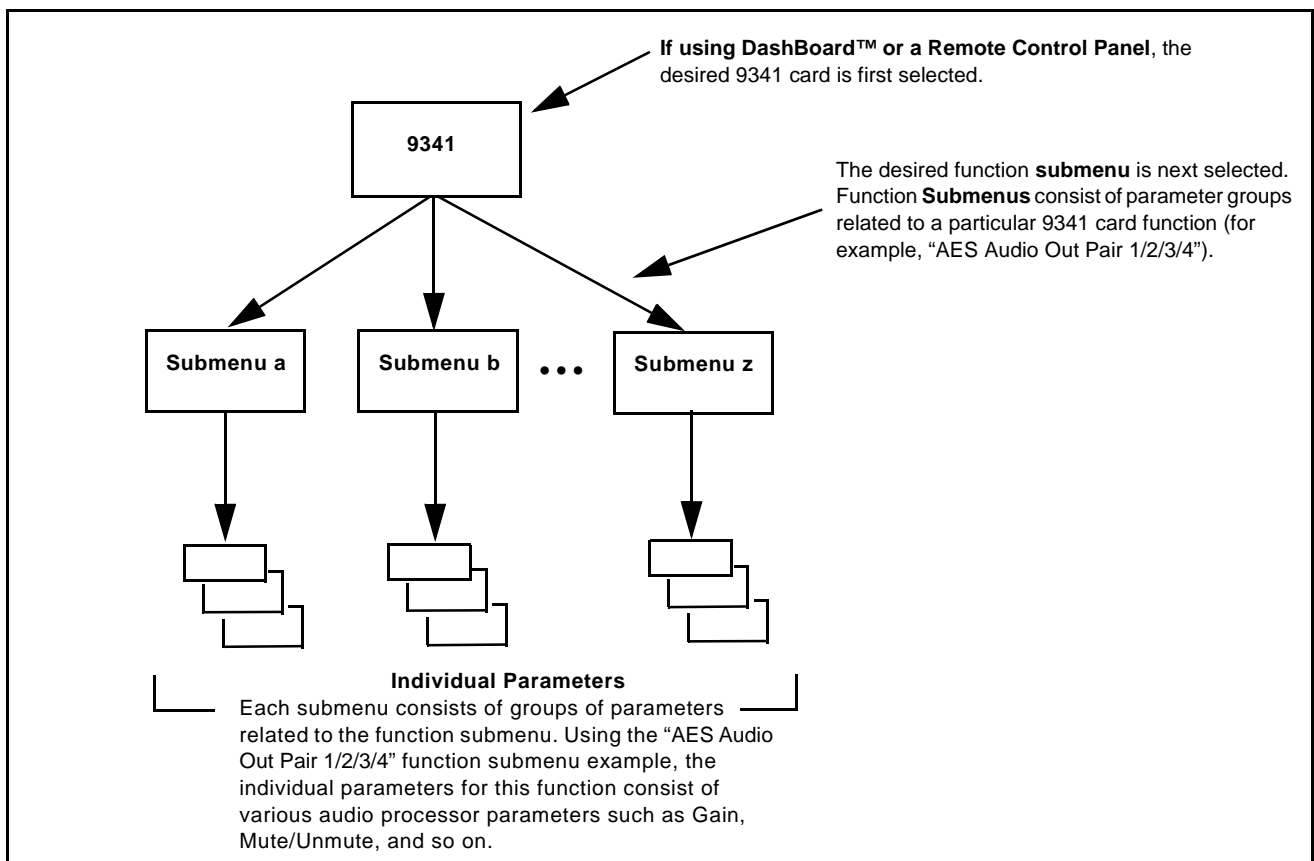
**Note:** DashBoard™ and the Remote Control Panel provide greatly simplified user interfaces as compared to using the card edge controls. For this reason, **it is strongly recommended** that DashBoard™ or a Remote Control Panel be used for all card applications other than the most basic cases. Card edge control codes are not included in this manual. If card-edge control is to be used, obtain a copy of “Manual Supplement – Card-Edge Control Reference Master List and Instructions for Using Compass® Card-edge (Local) Control Codes” (989CEC-MS.pdf) at [www.cobaltdigital.com](http://www.cobaltdigital.com)>Support>Documents>Reference Guides.

**Note:** When a setting is changed, settings displayed on DashBoard™ (or a Remote Control Panel) are the settings as effected by the 9341 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 9341 card are organized into function **submenus**, which consist of parameter groups as shown below.

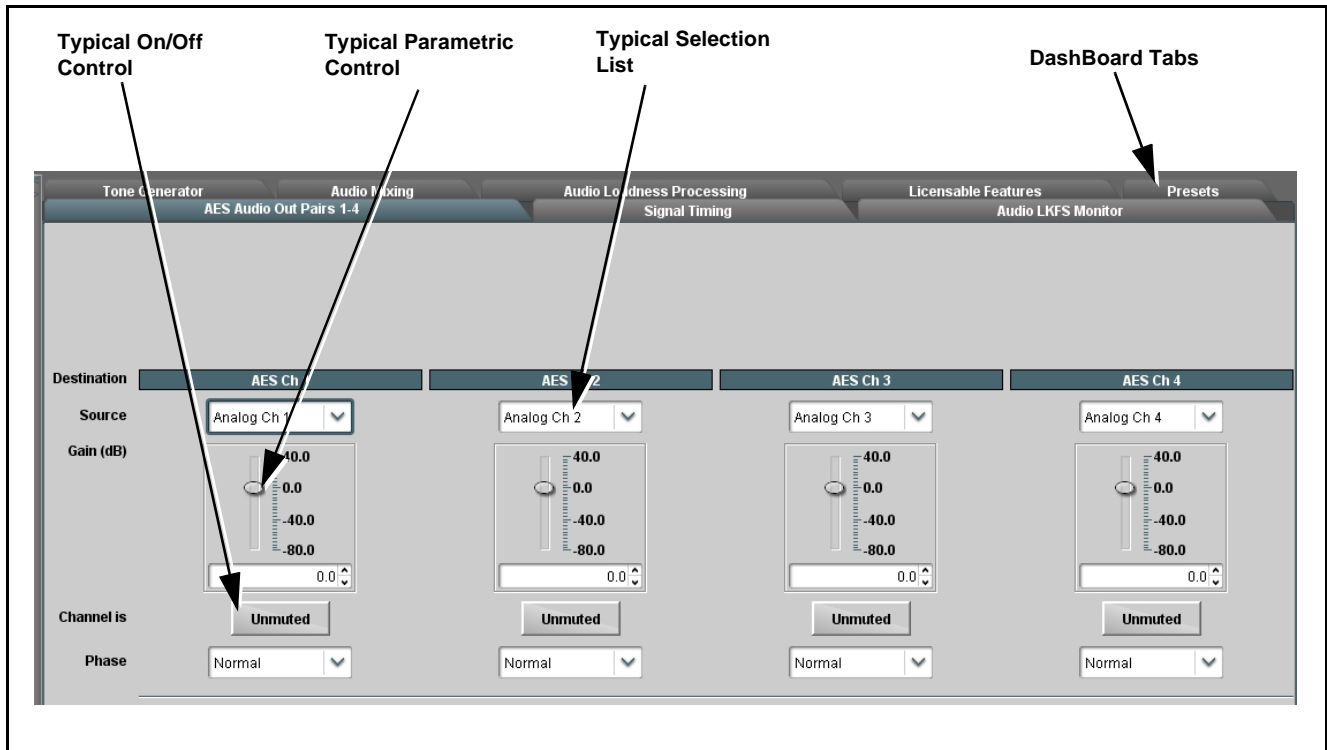
Figure 3-1 shows how the 9341 card and its submenus are organized, and also provides an overview of how navigation is performed between cards, function submenus, and parameters.



**Figure 3-1 Function Submenu/Parameter Submenu Overview**

## DashBoard™ User Interface

(See Figure 3-2.) The 9341 function submenus are organized in DashBoard™ using tabs. 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 manner, the setting effected using controls and selection lists displayed in DashBoard™ are comparable to the submenu items accessed and committed using the 9341 card edge controls.)



**Figure 3-2 Typical DashBoard Tabs and Controls**

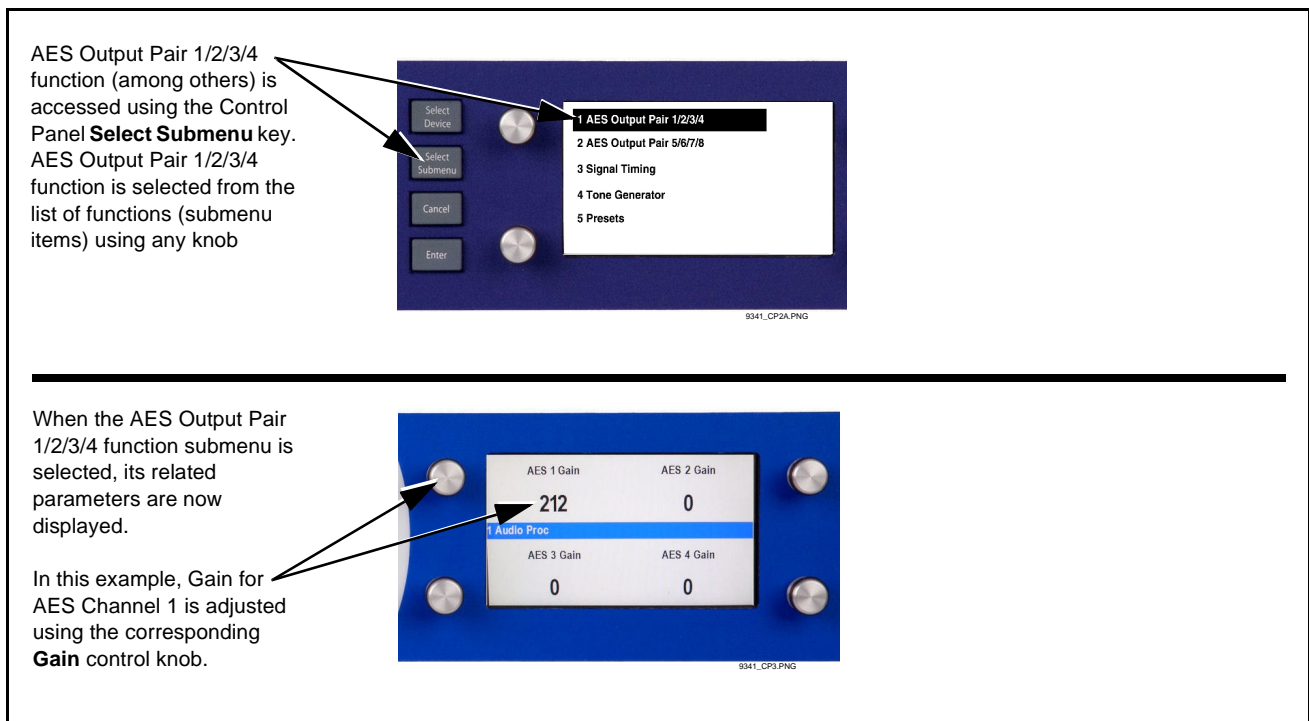
## Cobalt® Remote Control Panel User Interface

(See Figure 3-3.) Similar to the function submenu tabs using DashBoard™, the OGCP-9000 (and OGCP-9000/CC) Remote Control Panels have a Select Submenu key that is used to display a list of function submenus. From this list, a control knob on the Control Panel is used to select a function from the list of displayed function submenu items.

When the desired function submenu 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 control knobs, which acts like a potentiometer. Items in a list can then be selected using the control knobs which correspondingly acts like a rotary switch.

Figure 3-3 shows accessing a function submenu and its parameters (in this example, “AES Output Pair 1/2/3/4”) using the Control Panel as compared to using the card edge controls.

**Note:** Refer to “OGCP-9000 Remote Control Panel User Manual” (PN OGCP-9000-OM) or “OGCP-9000/CC Remote Control Panel User Manual” (PN OGCP-9000/CC-OM) for complete instructions on using the Control Panels.



**Figure 3-3 Control Panel Setup of Example Audio Control Function**

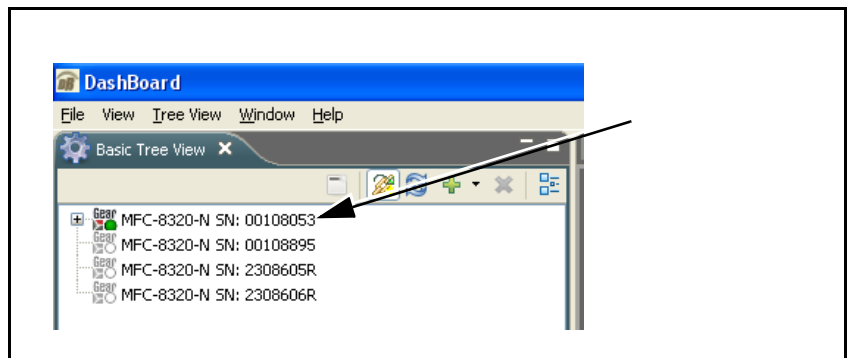


## Accessing the 9341 Card via Remote Control

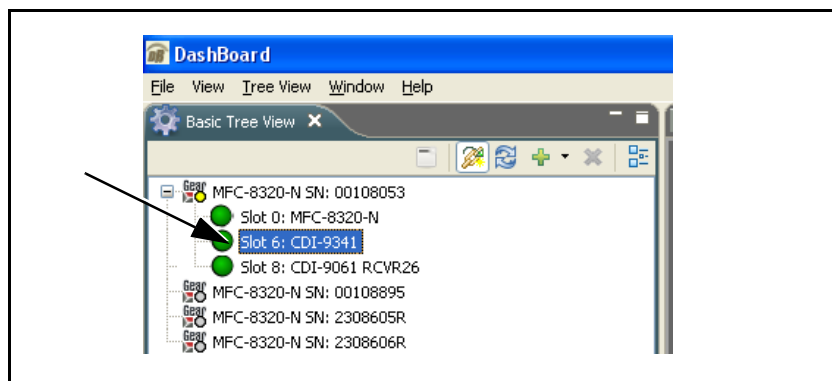
Access the 9341 card using DashBoard™ or a Cobalt® Remote Control Panel as described below.

### Accessing the 9341 Card Using DashBoard™

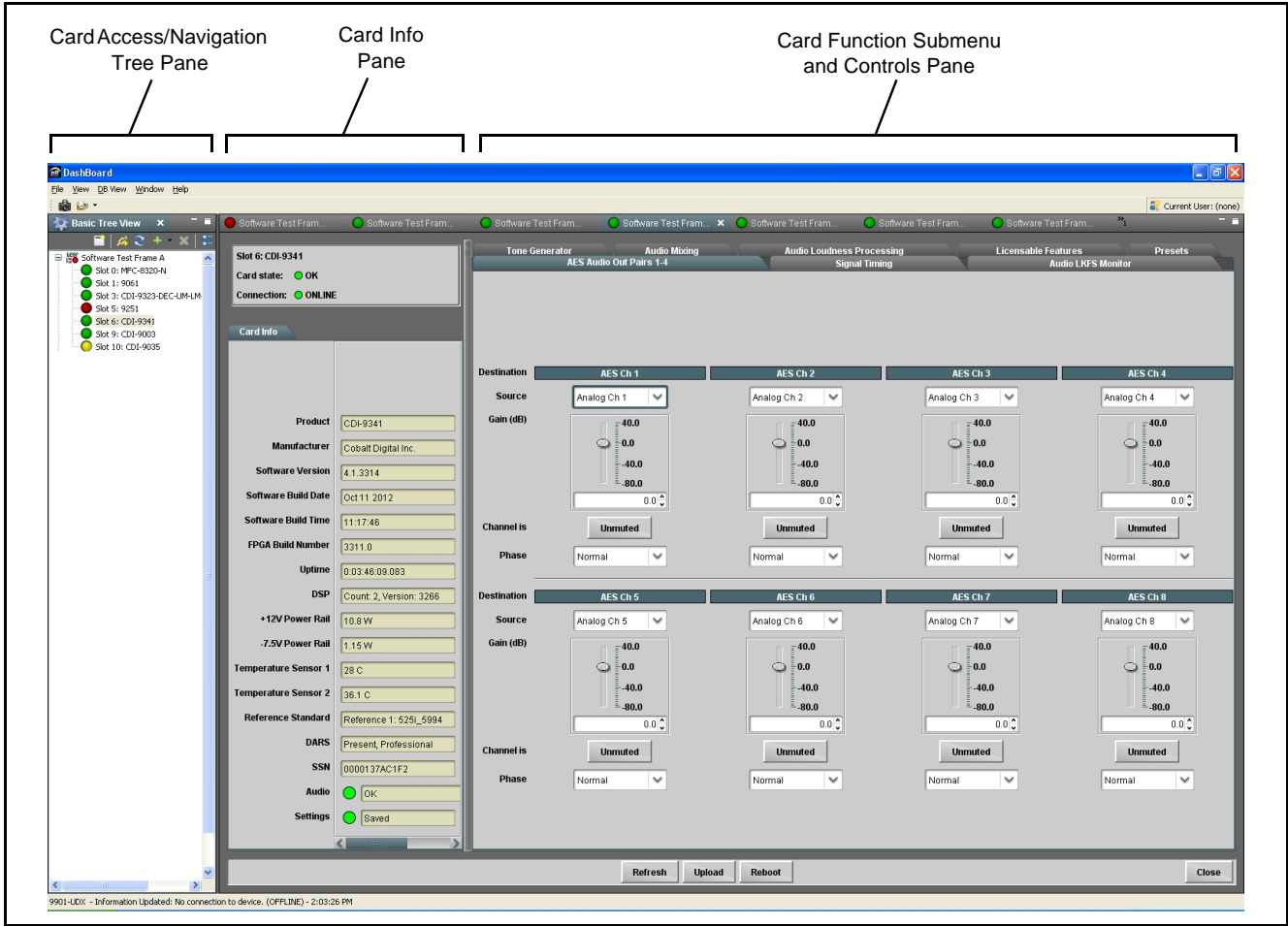
1. On the computer connected to the frame LAN, open DashBoard™.
2. As shown below, in the left side Basic View Tree locate the Network Controller Card associated with the frame containing the 9341 card to be accessed (in this example, “MFC-8320-N SN: 00108053”).



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-9341”).

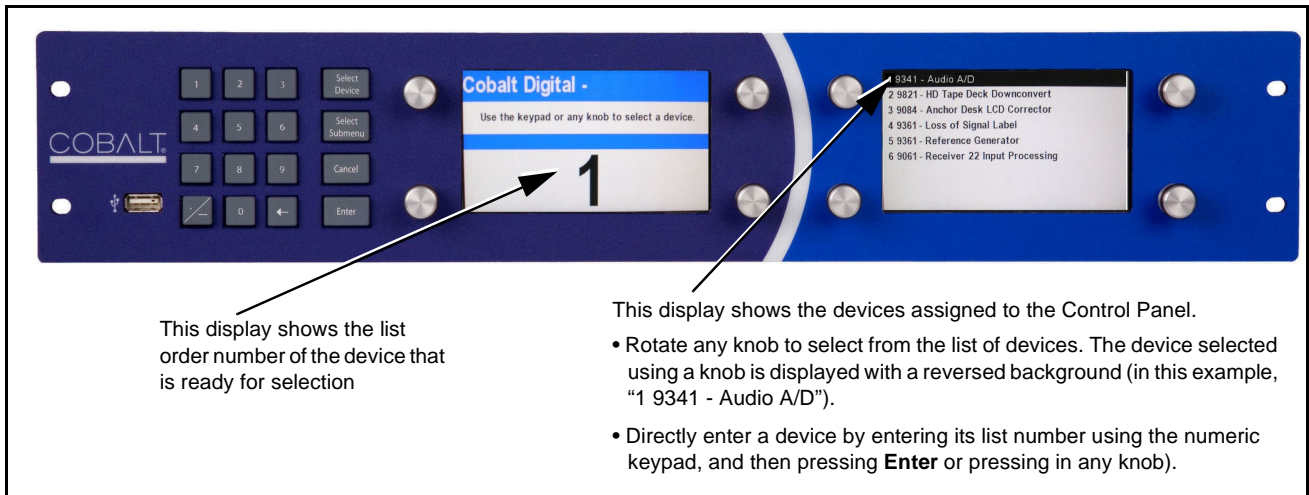


As shown on the next page, when the card is accessed a DashBoard™ function submenu screen is displayed. (The particular submenu screen displayed is the previously displayed screen from the last time the card was accessed by DashBoard™).



### Accessing the 9341 Card Using a Cobalt® Control Panel

Press the **Select Device** key and select a card as shown in the example below.



## Checking 9341 Card Information

The operating status and software version the 9341 card can be checked using DashBoard™ or the card edge control user interface. Figure 3-4 shows and describes the 9341 card information screen using DashBoard™ and accessing card information using the card edge control user interface.

**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. 3-20) for corrective action.

The **Tree View** shows the cards seen by DashBoard™. In this example, Network Controller Card MFC-8320-N (serial number ...8055) is hosting a 9341 card in slot 6.

**Software Release Number and Software Build Number**  
Refer to these numbers to check that documentation (such as this manual) matches the card's Software Release Number and Software Build Number. Use these numbers also when communicating to Cobalt® regarding this card.

**Power Consumption Display**  
This display shows the power consumed by the 9341 for both the +12V and -7.5V rails.


**Status Displays**  
Display shows the Reference Standard format being received (if any) by the 9341. Green Settings icon shows that any changes made on DashBoard™ are successfully saved on the card's memory.

Slot 6: CDI-9341	
Card state:	OK
Connection:	ONLINE
<b>Card Info</b>	
Product	CDI-9341
Manufacturer	Cobalt Digital Inc.
Software Version	4.1.3314
Software Build Date	Oct 11 2012
Software Build Time	11:17:46
FPGA Build Number	3311.0
Uptime	0:04:02:24.241
DSP	Count 2, Version: 3266
+12V Power Rail	10.8 W
-7.5V Power Rail	1.16 W
Temperature Sensor 1	28.1 C
Temperature Sensor 2	35.5 C
Reference Standard	Reference 1: 525I_5994
DARS	Present, Professional
SSN	0000137AC1F2
Audio	OK
Settings	Saved

Figure 3-4 9341 Card Info Utility

## 9341 Function Submenu List and Descriptions

Table 3-1 individually lists and describes each 9341 function submenu 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.



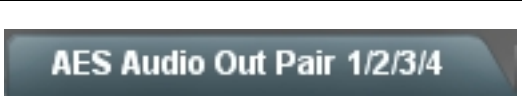
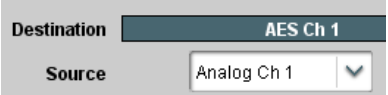
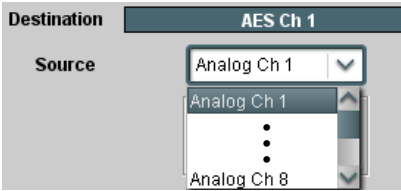


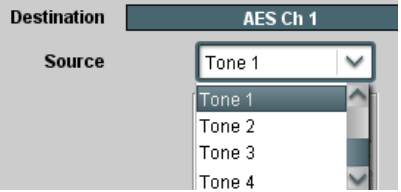
The table below provides a quick-reference to the page numbers where each function submenu item can be found.

Function Submenu Item	Page	Function Submenu Item	Page
AES Audio Out Pair 1/2/3/4	3-9	Tone Generator	3-17
Signal Timing	3-12	Licensable Features	3-17
Audio Mixing	3-12	Presets	3-18

**Table 3-1 9341 Function Submenu List**

<div style="background-color: #333; color: white; padding: 5px; text-align: center; font-weight: bold;">AES Audio Out Pair 1/2/3/4</div>	<p>Provides routing of audio sources to destination AES output channels 1 thru 8 (AES Audio Out Pairs 1-4). It also provides Gain, Mute, and Phase Invert controls for each channel.</p>
<p>The screenshot shows the 'AES Audio Out Pairs 1-4' control panel. It is organized into two rows of four channels each. Each channel (AES Ch 1 through AES Ch 8) has the following controls:</p> <ul style="list-style-type: none"> <li><b>Destination:</b> A dropdown menu showing the selected destination channel (e.g., 'AES Ch 1').</li> <li><b>Source:</b> A dropdown menu showing the selected audio source (e.g., 'Analog Ch 1').</li> <li><b>Gain (dB):</b> A vertical slider and a numeric input field. The slider ranges from -80.0 to 40.0 dB, with 0.0 dB in the center. The numeric input is currently set to 0.0.</li> <li><b>Channel is:</b> A button labeled 'Unmuted'.</li> <li><b>Phase:</b> A dropdown menu set to 'Normal'.</li> </ul>	

Table 3-1 9341 Function Submenu List — continued

	(continued)
<p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• <b>AES Ch 2 thru AES Ch 8</b> have controls that are identical to the <b>Source, Gain, Mute,</b> and <b>Phase</b> controls described here for <b>AES Ch 1</b>. Therefore, only the <b>AES Ch 1</b> controls are shown here.</li> <li>• For each channel, its source and destination should be considered and appropriately set. Unused destination channels should be set to the <b>Silence</b> selection.</li> </ul>	
<p>• <b>AES Channel Source</b></p> 	<p>Using the <b>Source</b> drop-down list, selects the audio source to be routed to the corresponding AES output channel from the choices described below.</p>
<p>• <b>Analog Ch 1 thru Ch 8 as Source</b></p> 	<p><b>Analog Ch 1 thru Analog Ch 8</b> range in Source drop-down list enables an analog input channel (Ch 1 thru Ch 8) to be the source for the selected destination AES channel.</p> <p>(In this example, Analog Ch1 is the source for destination AES Ch 1)</p>
<p>• <b>Down Mix Left or Right as Source</b></p> 	<p><b>Down Mix Left</b> and <b>Down Mix Right</b> selections in Source drop-down list allow either downmix left or right channel to be the source for the selected destination AES channel.</p> <p>(In this example, the Down Mix Left channel is the source for destination AES Ch 1)</p> <p><b>Note:</b> Down Mix Left and Down Mix Right channels are a stereo pair derived from the L, C, R, Ls, and Rs channel inputs selected using the Audio Mixing function. The stereo pair consists of basic L/R PCM signals with no additional encoded information.</p> <p>Refer to <b>Audio Mixing</b> function description on page 3-12 for more information.</p>
<p>• <b>Mono Mix as Source</b></p> 	<p><b>Mono</b> selection in Source drop-down list allows mono mix content to be the source for the selected destination AES channel.</p> <p>(In this example, the mono content is the source for destination AES Ch 1)</p> <p><b>Note:</b> Mono mix content is set up using Mono Mixer Selection in the <b>Audio Mixing</b> function). Refer to <b>Audio Mixing</b> function description on page 3-12 for more information.</p>
<p>• <b>Tone Generator 1 thru 4 as Source</b></p> 	<p><b>Tone Generator 1 thru Tone Generator 4</b> range in Source drop-down list enables one of four tone generators (Tone 1 thru Tone 4) to be the source for the selected destination AES channel.</p> <p>(In this example, Tone 1 (tone generator 1) is the source for destination AES Ch 1)</p> <p><b>Note:</b> Tone generator frequencies can be independently set for the four tone generator sources.</p> <p>Refer to <b>Tone Generator</b> function description on page 3-17 for more information.</p>

**Table 3-1 9341 Function Submenu List — continued**


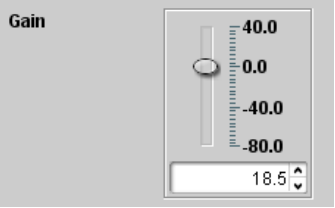
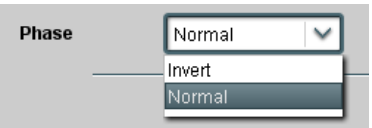
<div style="background-color: #333; color: white; padding: 5px; text-align: center;">AES Audio Out Pair 1/2/3/4</div>	(continued)
<p>• <b>Silence (Mute) as Source</b></p>  <p>The screenshot shows a control panel for 'AES Ch 1'. The 'Destination' is set to 'AES Ch 1'. The 'Source' dropdown menu is open, showing 'Silence' as the selected option. The dropdown list also shows 'Silence' as an available option.</p>	<p><b>Silence</b> selection in Source drop-down list mutes the selected destination AES channel. <b>Use this setting for unused destination channels.</b></p> <p>(In this example, silence (muting) is applied to AES Ch 1)</p>
<p>• <b>Gain Control</b></p>  <p>The screenshot shows a vertical slider for 'Gain' ranging from -80.0 to 40.0 dB. The slider is positioned at 18.5 dB. Below the slider is a numeric input field containing '18.5'.</p>	<p>Adjusts and displays relative gain (in dB) applied to the corresponding destination AES channel.</p> <p>(-80 to +40 dB range in 0.1 steps; unity = 0.0 dB)</p>
<p>• <b>Phase Control</b></p>  <p>The screenshot shows a 'Phase' dropdown menu with 'Normal' selected. The dropdown list shows 'Normal' and 'Invert' as options.</p>	<p>Selects between <b>Normal</b> and <b>Invert</b> phase (relative to source original phase) for the destination AES channel.</p>

Table 3-1 9341 Function Submenu List — continued

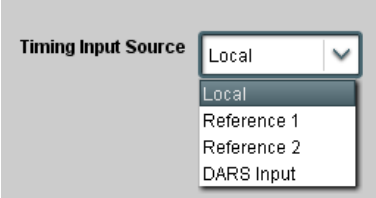
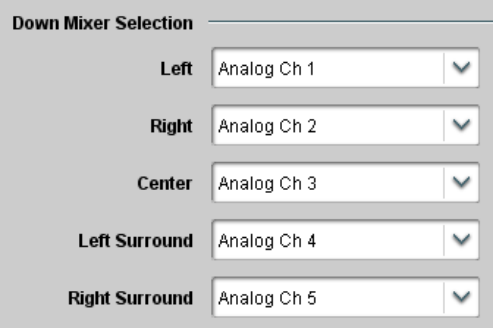
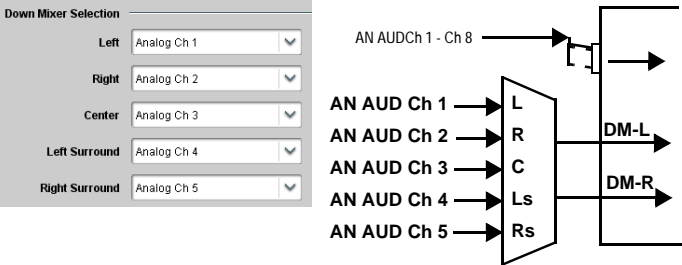
<div style="background-color: #333; color: white; padding: 5px; text-align: center; font-weight: bold;">Signal Timing</div>	<p>Provides timing reference selection for the AES outputs.</p>
<p>• <b>Timing Input Source</b></p> 	<p>Selects timing reference from the choices below:</p> <ul style="list-style-type: none"> <li>• <b>Local:</b> Timing is derived from the card's internal clock with no association with external signals.</li> <li>• <b>Reference 1; Reference 2:</b> Timing is derived from either Reference 1 or Reference 2 external frame sync reference signals distributed with the card frame. Output audio is synchronized to the received black burst or tri-level video reference.</li> <li>• <b>Note:</b> If Reference 1 or Reference 2 is selected and an appropriate external reference is not received, the <b>Reference Standard INVALID</b> message appears in the Card Info status portion of DashBoard™, indicating invalid frame sync reference error. If <b>DARS Input</b> or <b>Local</b> is being used, this message may still appear but is of no consequence.</li> <li>• <b>DARS Input:</b> Timing is derived from the DARS input BNC.</li> </ul>
<div style="background-color: #333; color: white; padding: 5px; text-align: center; font-weight: bold;">Audio Mixing</div>	<p>Provides down-mix audio routing selections that multiplexes any five audio channel sources into a stereo pair (Down Mix Left and Down Mix Right), or selection of any two audio sources to be mono-mixed to serve as a monaural source.</p> <p>With an optional upmixer licensable feature activated, any normal PCM stereo pair can be fed to the upmixer to generate 5.1 surround sound audio which in turn can be applied to six user-selectable channels.</p>
<p>• <b>Down Mixer Selection</b></p> 	<p>Separate drop-down lists for <b>Left</b>, <b>Right</b>, <b>Center</b>, <b>Left Surround (Ls)</b>, and <b>Right Surround (Rs)</b> inputs allow analog channel audio source selection for each of the five downmixer inputs.</p> <p>The example below shows selection from various sources and the resulting stereo pair DM-L and DM-R. The two signals comprising the pair can be routed and processed the same as any other audio input source.</p>  <p><b>Note:</b> The stereo pair consists of basic L/R PCM signals with no additional encoded information.</p>



Table 3-1 9341 Function Submenu List — continued




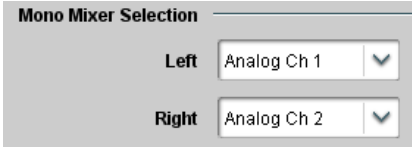
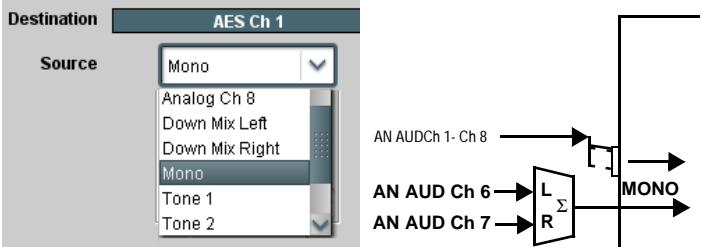
	(continued)
<p>• <b>Center Mix Ratio Control</b></p> 	<p>Adjusts the attenuation ratio of center-channel content from 5-channel source that is re-applied as Lt and Rt content to the DM-L and DM-R stereo mix.</p> <ul style="list-style-type: none"> <li>• Minimum attenuation setting (-0.0 dB) applies no ratiometric reduction. Center channel content is restored as in-phase center-channel content with no attenuation, making center-channel content more predominate in the overall mix.</li> <li>• Maximum attenuation setting (-10.0 dB) applies a -10 dB ratiometric reduction of center-channel content. Center-channel content is restored as in-phase center-channel content at a -10 dB ratio relative to overall level, making center-channel content less predominate in the overall mix.</li> </ul> <p>(0.0 dB to -10.0 dB range in 0.1 dB steps; default = -3 dB)</p> <p><b>Note:</b> Default setting of -3.0 dB is recommended to maintain center-channel predominance in downmix representative to that of the original source 5-channel mix.</p>
<p>• <b>Surround Mix Ratio Control</b></p> 	<p>Adjusts the attenuation ratio of surround-channel content from 5-channel source that is re-applied as Lo and Ro content to the DM-L and DM-R stereo mix.</p> <ul style="list-style-type: none"> <li>• Minimum attenuation setting (-0.0 dB) applies no ratiometric reduction. Surround-channel content is restored with no attenuation, making Lo and Ro content more predominate in the overall mix.</li> <li>• Maximum attenuation setting (-10.0 dB) applies a -10 dB ratiometric reduction of surround-channel content. Surround-channel content is restored at a -10 dB ratio relative to overall level, making surround-channel content less predominate in the overall mix.</li> </ul> <p>(0.0 dB to -10.0 dB range in 0.1 dB steps; default = -3 dB)</p> <p><b>Note:</b> Default setting of -3.0 dB is recommended to maintain surround-channel predominance in downmix representative to that of the original source 5-channel mix.</p>
<p>• <b>Mono Mixer Selection</b></p> 	<p>Separate drop-down lists for <b>Left</b> and <b>Right</b> inputs allow selected analog input or the DM-L / DM-R input channels to provide an additional mono-mixed channel.</p> <p>The resulting mono mix (<b>Mono</b>) is available as an audio source for any of the eight destination AES output channels as shown below.</p>  <p><b>Note:</b> Selection of any two channels for mono mixing in no way affects the source channels themselves.</p>


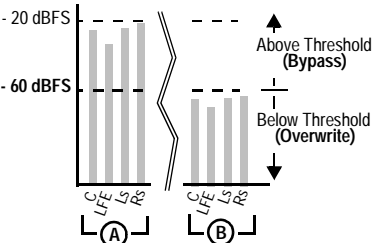


Table 3-1 9341 Function Submenu List — continued

<h2 style="margin: 0;">Audio Mixing</h2>	<p>(continued)</p>
<p><b>Option</b> </p>	
<p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• 2.0-to-5.1 upmixer function is an optional licensable feature. This function and its controls appear only when a license key is entered and activated. Refer to <b>Licensable Features</b> function description on page 3-17 for more information.</li> <li>• Channel sources used by the upmixer are post-processed signals received from the Audio Routing/Gain Control function. When active, the channel selections made using this function are <b>directly routed to the AES discrete pairs</b>. Refer to 2.0-to-5.1 Upmix Function (p. 1-8) in Chapter 1, "Introduction" for detailed functional description and signal flow.</li> <li>• For any six channels selected for this function, the <b>Left</b> and <b>Right</b> channel selections always serve as the stereo input pair.</li> </ul>	
<p>• <b>2.0-to-5.1 Up Mixer Selection</b></p>	<p>Separate drop-down lists for <b>Left</b>, <b>Right</b>, <b>Center</b>, <b>LFE</b>, <b>Left Surround</b>, and <b>Right Surround</b> allow audio source selection, and channel assignments for the six generated 5.1 channels.</p> <p>The example below shows selection of AES Out channels 1 and 2 as the received stereo source (AES Ch1 and Ch 2 for <b>Left</b> and <b>Right</b> drop-down list selections in the Up Mixer Selection tool).</p> <p>Using the setup shown in the example, when upmix is active the AES channel 1/2 stereo pair is overwritten with the new stereo pair L/R on channels 1/2. As selected in the example, the additional 5.1 channels C, LFE, Left Surround (Ls), and Right Surround (Rs) overwrite AES Ch 3 – Ch 6, respectively.</p>
<div style="border: 1px solid #ccc; padding: 5px; background-color: #f9f9f9;"> <p><b>Up Mixer Selection</b></p> <p><b>Left</b> AES Out Ch 1 <span style="float: right;">▼</span></p> <p><b>Right</b> AES Out Ch 2 <span style="float: right;">▼</span></p> <p><b>Center</b> AES Out Ch 3 <span style="float: right;">▼</span></p> <p><b>LFE</b> AES Out Ch 4 <span style="float: right;">▼</span></p> <p><b>Left Surround</b> AES Out Ch 5 <span style="float: right;">▼</span></p> <p><b>Right Surround</b> AES Out Ch 6 <span style="float: right;">▼</span></p> </div>	<div style="display: flex; align-items: center;"> <div style="border: 1px solid #ccc; padding: 5px; background-color: #f9f9f9; margin-right: 20px;"> <p><b>Up Mixer Selection</b></p> <p><b>Left</b> AES Out Ch 1 <span style="float: right;">▼</span></p> <p><b>Right</b> AES Out Ch 2 <span style="float: right;">▼</span></p> <p><b>Center</b> AES Out Ch 3 <span style="float: right;">▼</span></p> <p><b>LFE</b> AES Out Ch 4 <span style="float: right;">▼</span></p> <p><b>Left Surround</b> AES Out Ch 5 <span style="float: right;">▼</span></p> <p><b>Right Surround</b> AES Out Ch 6 <span style="float: right;">▼</span></p> </div> <div style="text-align: center;"> <p><b>AES Ch 1 – Ch 8</b></p> </div> </div>
<p>• <b>Up Mixer Mode Control</b></p>	<p>Enables or bypasses upmixer as follows:</p> <ul style="list-style-type: none"> <li>• <b>Auto:</b> Automatic enable/bypass of 5.1 upmix function as follows:             <ul style="list-style-type: none"> <li>• If detected signal level on <b>all four</b> of the selected channels designated as <b>Center</b>, <b>LFE</b>, <b>Left Surround</b>, and <b>Right Surround</b> are <b>below</b> the level threshold set using the <b>5.1 Detection Threshold</b> control, upmixer overwrites all six selected channels with the new 5.1 content generated by the upmixer.</li> <li>• If detected signal level on <b>any of the four</b> of the selected channels designated as <b>Center</b>, <b>LFE</b>, <b>Left Surround</b>, and <b>Right Surround</b> is <b>above</b> the level threshold set using the <b>5.1 Detection Threshold</b> control, upmixer is bypassed and the original channels pass unaffected.</li> </ul> </li> <li>• <b>Always Upmix:</b> Manual enable turns on upmixer and overwrites content on all six selected channels with new 5.1 content generated by the upmixer regardless of original signal level or content.</li> <li>• <b>Bypass:</b> Manual disable bypasses the upmixer. When bypassed, the six selected audio channels pass unaffected.</li> </ul>
<div style="border: 1px solid #ccc; padding: 5px; background-color: #f9f9f9;"> <p><b>Up Mixer Controls</b></p> <p><b>Mode</b> Auto <span style="float: right;">▼</span></p> <ul style="list-style-type: none"> <li>Auto</li> <li>Always Upmix</li> <li>Bypass</li> </ul> </div>	

**Table 3-1 9341 Function Submenu List — continued**

<div style="background-color: #333; color: white; padding: 5px; text-align: center; font-weight: bold;">Audio Mixing</div>	(continued)
<p><b>• Up Mixer Status Display</b></p> <div style="margin-bottom: 10px;"> <p>Status <span style="border: 1px solid gray; padding: 2px;">Auto Mode - Currently Upmixing</span></p> </div> <div style="margin-bottom: 10px;"> <p>Status <span style="border: 1px solid gray; padding: 2px;">Auto Mode - Currently Bypassed</span></p> </div> <div style="margin-bottom: 10px;"> <p>Status <span style="border: 1px solid gray; padding: 2px;">Upmixing</span></p> </div> <div> <p>Status <span style="border: 1px solid gray; padding: 2px;">Bypassed</span></p> </div>	<p>Shows activity status of upmixer processing as follows:</p> <ul style="list-style-type: none"> <li>• <b>Auto Mode - Currently Upmixing:</b> With upmixer enable set to <b>Auto</b>, indicates selected channels designated as <b>Center, LFE, Left Surround, and Right Surround</b> are clear for use (as described above); upmixer is currently up-mixing received stereo pair and overwriting the six selected channels with new 5.1 upmix.</li> <li>• <b>Auto Mode - Currently Bypassed:</b> With upmixer enable set to <b>Auto</b>, indicates selected channels designated as <b>Center, LFE, Left Surround, and Right Surround</b> have content (such as existing original 5.1 or other content); upmixer is bypassed (disabled) and allows normal passage of six selected channels.</li> <li>• <b>Upmixing:</b> Indicates upmixer is manually enabled (set to Always Upmix) and is currently up-mixing received stereo pair and overwriting the six selected channels with new 5.1 upmix.</li> <li>• <b>Bypassed:</b> Indicates upmixer is manually disabled (set to Bypass) and is currently passing all selected channels unaffected.</li> </ul>
<p><b>• Auto Crossfade Speed Controls</b></p> <div style="margin-bottom: 10px;"> <p><b>Auto Crossfade Speed Upmix to Bypass</b> <span style="border: 1px solid gray; padding: 2px;">Very Slow</span></p> <div style="border: 1px solid gray; padding: 2px;"> <p>Very Slow</p> <p>Slow</p> <p>Medium</p> <p>Quick</p> <p>Very Quick</p> <p>Instant</p> </div> </div> <div> <p><b>Auto Crossfade Speed Bypass to Upmix</b> <span style="border: 1px solid gray; padding: 2px;">Very Slow</span></p> <div style="border: 1px solid gray; padding: 2px;"> <p>Very Slow</p> <p>Slow</p> <p>Medium</p> <p>Quick</p> <p>Very Quick</p> <p>Instant</p> </div> </div>	<p>Individual controls select the relative crossfade transition speed between Upmix to Bypass (going to inactive; from 5.1 to 2.0) and Bypass to Upmix (going to active; from 2.0 to 5.1) when upmixer enable is set to <b>Auto</b> and the active threshold (as set by the <b>5.1 Detection Threshold</b> control) is crossed in either direction.</p> <p>To suit program material and production aesthetic preferences, several choices are available as shown to the left. Slower settings allow for a more gradual transition between modes, however with a longer interval before levels stabilize. Faster settings conversely allow for a smaller interval before levels stabilize, however with greater perceived abruptness.</p>

Table 3-1 9341 Function Submenu List — continued

<div style="background-color: #333; color: white; padding: 5px; text-align: center; font-weight: bold;">Audio Mixing</div>	(continued)
<p>• <b>5.1 Detection Threshold Control</b></p> 	<p>Adjusts the threshold at which selected channels designated as C, LFE, Ls, and Rs are considered to have viable content, or at which signal levels can be considered insignificant when upmixer enable is set to <b>Auto</b>. Setting affects automatic enable/bypass of 5.1 upmix function as follows:</p> <ul style="list-style-type: none"> <li>• If detected signal level on <b>all four</b> of the selected channels designated as Center, LFE, Left Surround, and Right Surround are <b>below</b> the level threshold set using the <b>5.1 Detection Threshold</b> control, upmixer allows <b>overwrite</b> of all six selected channels with the new 5.1 signal complement.</li> <li>• If detected signal level on <b>any of the four</b> of the selected channels designated as Center, LFE, Left Surround, and Right Surround is <b>above</b> the level threshold set using the <b>5.1 Detection Threshold</b> control, upmixer is <b>bypassed</b>, thereby releasing the selected six channels and allowing the original channels to pass unaffected.</li> </ul> <p>(Range is -150 dB to 0 dB in 0.1dB steps; 0 dB equivalent to +24 dBu=&gt; 0 dBFS)</p> <hr/> <p>Typically, the <b>5.1 Detection Threshold</b> control should be set to provide a usable threshold that maintains a threshold at which valid levels large enough over the threshold <b>disable</b> the auto upmix (<b>A</b>, left), while nuisance levels considerably below the threshold (<b>B</b>, left) are rejected, allowing the upmixer to stay locked in the enabled mode and <b>overwrite</b> these signals with the new signals.</p>  <p>Optimum setting is dependent on program material general overall levels. A -60 dB setting is recommended for material closely adhering to the SMPTE -20 dBFS Alignment level for normal material such as dialog.</p>
<p>• <b>Center Width Control</b></p> 	<p>Adjusts center channel content (in terms of percentage) applied to L and R channels.</p> <ul style="list-style-type: none"> <li>• Minimum setting keeps all L+R (mono) content confined to center (C) channel, with any center channel content removed from L and R channels.</li> <li>• Higher settings progressively blend respective L and R mono content back into L and R channels, with 100% setting resulting in center channel level going to zero and L/R channels becoming normal L/R channels containing some mono content.</li> </ul> <p>(0% to 100% range in 0.1% steps; default = 0%)</p>
<p>• <b>Surround Depth Control</b></p> 	<p>Adjusts surround channel content (in terms of percentage) applied to Ls and Rs channels.</p> <ul style="list-style-type: none"> <li>• Maximum setting results in greatest surround channel levels.</li> <li>• Lower settings progressively diminish surround channel levels, with 0% setting resulting in no Ls or Rs level, with Ls and Rs content progressively folded back into L and R, respectively.</li> </ul> <p>(0% to 100% range in 0.1% steps; default = 100%)</p>

**Table 3-1 9341 Function Submenu List — continued**


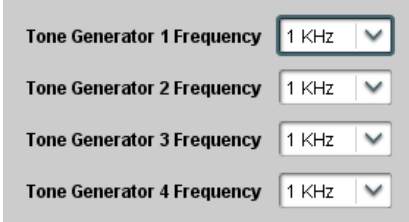

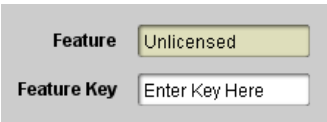
	<p>Sets the test tone frequency for each of four tone generators (Tone Generator 1 thru 4).</p>
<p>• <b>Frequency Selection Lists</b></p> 	<p>Selects the frequency independently for each of the four tone generators. 18 discrete sine wave frequencies are available, ranging from 50 Hz to 16 kHz (default frequency is 1.0 kHz).</p> <p><b>Note:</b> Unity-gain signal level is equivalent to -20 dBu.</p>
	<p>Allows activation of optional licensed features.</p>
<p><b>Note:</b> For card pre-ordered with licensed feature(s), the activation steps described below are not required; the feature will already be installed activated. To order features and obtain a license key, contact Cobalt<sup>®</sup> sales at sales@cobaltdigital.com or at the contact information in Contact Cobalt Digital Inc. in Chapter 1, “Introduction”. Please provide the “SSN” number of your card (displayed in the Card Info pane) when contacting us for your key.</p>	
<p>• <b>License Feature and Key Entry window</b></p> 	<p>Activate licensable feature as described below.</p> <ol style="list-style-type: none"> <li>1. Enter the feature key string in the <b>Feature Key</b> box. Press return or click outside of the box to acknowledge entry.             <p><b>Note:</b> Entry string is case sensitive. Do not enter any spaces.</p> </li> <li>2. In the Dashboard™ Card Info pane, wait for the feature identification to be shown for the card product number (for example, “-UM” appearing after the card part number) and <b>Valid Key Entered</b> to be displayed. This indicates the key was correctly entered and recognized by the card.             <p><b>Note:</b> If Dashboard™ card function submenu/control pane does not re-appear, close the card and re-open it.</p> </li> <li>3. Click and confirm <b>Reboot</b>. When the card function submenu/control pane appears again, the licensable feature will be available.             <p><b>Note:</b> Applying the licensable feature and its reboot has no effect on prior settings. All control settings and drop-down selections are retained.</p> </li> </ol>

Table 3-1 9341 Function Submenu List — continued


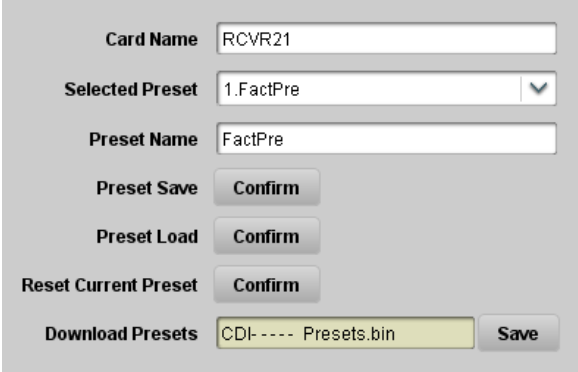

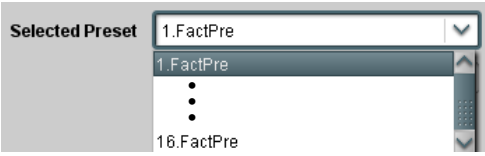
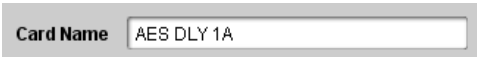




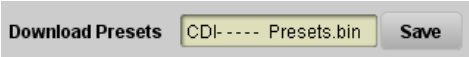
	<p>Prestets allow up to 16 card user settings configuration presets to be saved in a Preset and then recalled (loaded) as desired. All current settings (including list selections and scalar (numeric) control settings such as Gain, etc.) are saved when a Preset Save is invoked.</p>
	<p>The <b>Preset Name</b> field and <b>Preset Save</b> button allow custom user setting configurations to be labeled and saved to a Preset for future use.</p> <p>The <b>Preset Load</b> button and the <b>Selected Preset</b> drop-down list allow saved presets to be selected and loaded as desired. When a preset is loaded, it immediately becomes active with all user settings now automatically set as directed by the preset.</p> <p>Saved presets can be uploaded to a computer for use with other same-model COMPASS™ cards.</p> <p>Each of the items to the left are described in detail on the following pages.</p>
<p>• <b>Preset Save and Load</b></p> 	<ul style="list-style-type: none"> <li>• <b>Preset Save</b> stores all current card control settings to the currently selected preset. (For example, if Preset 1 is selected in the Selected Preset drop-down list, clicking and confirming Preset Save will then save all current card control settings to Preset 1)</li> <li>• <b>Preset Load</b> loads (applies) all card control settings defined by whatever preset (<b>Preset 1</b> thru <b>Preset 16</b>) is currently selected in the <b>Selected Preset</b> drop-down list. (For example, if Preset 3 is selected in the Selected Preset drop-down list, clicking and confirming Preset Load will then apply all card control settings defined in Preset 3)</li> </ul> <p>The above buttons have a <b>Confirm?</b> pop-up that appears, requesting confirmation.</p> <p><b>Note:</b> Applying a change to a preset using the buttons described above <b>rewrites</b> the previous preset contents with the invoked contents. Make certain change is desired before confirming preset change.</p>
<p>• <b>Selected Preset</b></p> 	<p><b>Selected Preset 1</b> thru <b>Selected Preset 16</b> range in drop-down list selects one of 16 stored presets as ready for <b>Save</b> (being written to) or for <b>Load</b> (being applied to the card).</p> <p><b>Note:</b> The preset names shown to the left are the default (unnamed) preset names. All 16 presets in this case are loaded identically with the factory default settings.</p>
<p>• <b>Card Name</b></p> 	<p>Text entry field provides for optional entry of card name, function, etc. (as shown in this example).</p> <p><b>Note:</b> Card name can be 31 ASCII characters maximum.</p>

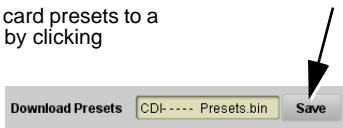
Table 3-1 9341 Function Submenu List — continued

	<p>(continued)</p>
<p>• <b>Reset Current Preset</b></p> 	<ul style="list-style-type: none"> <li>• <b>Reset Current Preset</b> resets all parameters (including preset custom name entered) of the currently selected Preset (as displayed in the <b>Selected Preset</b> field) to factory default settings.</li> </ul> <p>The button has a <b>Confirm?</b> pop-up that appears, requesting confirmation.</p>
<p>• <b>Preset Name</b></p> 	<p>With one of 16 presets selected, provides for entry of custom name for the preset (as shown in example below).</p>  <p>Entering text in Preset Name field (in this example, "RCVR21") applies custom name to selected Preset (in this example, Preset 2)</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• Preset name can be seven ASCII characters maximum.</li> <li>• The Preset ID number does not need to be entered; it is added automatically.</li> </ul>
<p>• <b>Download Presets</b></p> 	<p>Download Presets allows all 16 presets to be stored to a specified location on a network computer for use with other same-model COMPASS™ cards.</p> <p>Refer to Cobalt® reference guide "COMPASS™ Remote Control User Guide" (PN 9000RCS-RM) for instructions on using the Download Presets function.</p>

Download a presets file to a computer on the card's DashBoard network to save presets. Preset files stored on a computer can then be uploaded back to the card.

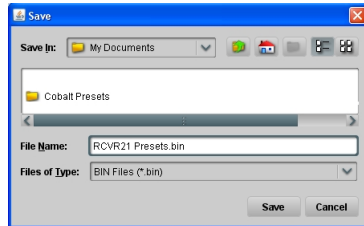
Note also that a presets file can **also be uploaded to other same-model COMPASS® cards**. In this manner, presets built up using a single card can be easily applied to other same-model cards without repeating the setup work on the other cards.

**Download (save)** card presets to a network computer by clicking **Download Presets – Save** at the bottom of the Presets page.

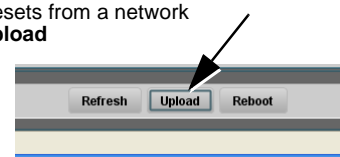


Browse to a desired save location (in this example, *My Documents\Cobalt Presets*).

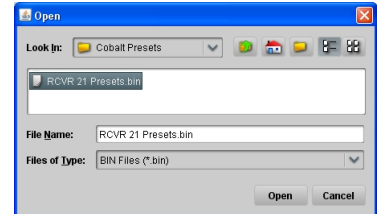
The file can then be renamed if desired (*RCVR21 Presets* in this example) before saving.



**Upload (open)** card presets from a network computer by clicking **Upload** at the bottom of DashBoard.



Browse to the location where the file was saved on the computer or drive (in this example, *My Documents\Cobalt Presets*).



Select the desired file and click **Open** to load the file to the card.

To upload presets saved from one card to another same-model card, simply click **Upload** on the other same-model card's DashBoard page and repeat the same steps here.

**Note:**

- Preset transfer between card download and file upload is on a **group** basis (i.e., individual presets cannot be downloaded or uploaded separately).
- After uploading a presets file, engagement of a desired preset is only assured by pressing the Preset Load button for a desired preset.

## Troubleshooting

This section provides general troubleshooting information and specific symptom/corrective action for the 9341 card. The 9341 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 9341 card itself and its remote control systems all (to varying degrees) provide error and failure indications. Depending on how the 9341 card is being used (i.e, standalone or network controlled through DashBoard™ or a Remote Control Panel), check all available indications in the event of an error or failure condition.

The various 9341 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.

- Basic Troubleshooting Checks (p. 3-23)
- 9341 Processing Error Troubleshooting (p. 3-24)
- Troubleshooting Network/Remote Control Errors (p. 3-25)



### DashBoard™ Status/Error Indicators and Displays

Figure 3-5 shows and describes the DashBoard™ status indicators and display. These indicator icons and displays show status and error conditions relating to the 9341 card itself and remote (network) communications.

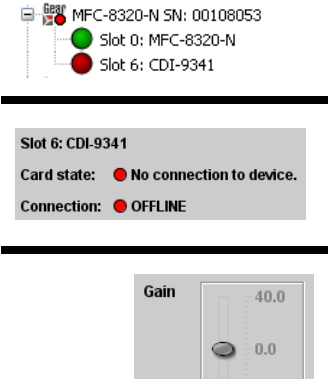
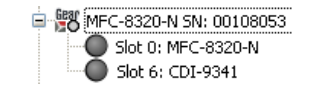
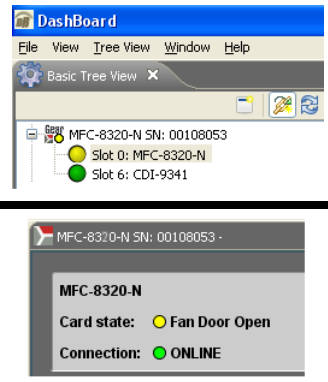

Indicator Icon or Display	Error Description
	<p>Red indicator icon in Card Access/Navigation Tree pane shows card with Error condition (in this example, the Card Access/Navigation Tree pane shows a general error issued by the 9341 card in slot 6).</p> <p>Specific errors are displayed in the Card Info pane (in this example “No connection to device” indicating 9341 card is not connecting to frame/LAN).</p> <p>If the 9341 card is not connecting to the frame or LAN, all controls are grayed-out (as shown in the example here).</p>
	<p>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 9341 card in slot 6 and the MFC-8320-N Network Controller Card for its frame in slot 0 are not being seen).</p>
	<p>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).</p> <p>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.</p>
	<p>Reference Standard display showing INVALID message indicates incompatible or no reference signal present on indicated external reference input (in this example, message shows an invalid or missing signal on external Reference 1).</p>

Figure 3-5 DashBoard™ Status Indicator Icons and Displays

Access Card Info panes for specific cards by clicking the card slot position in the Card Access/Navigation Tree pane (as shown in the example in Figure 3-6).

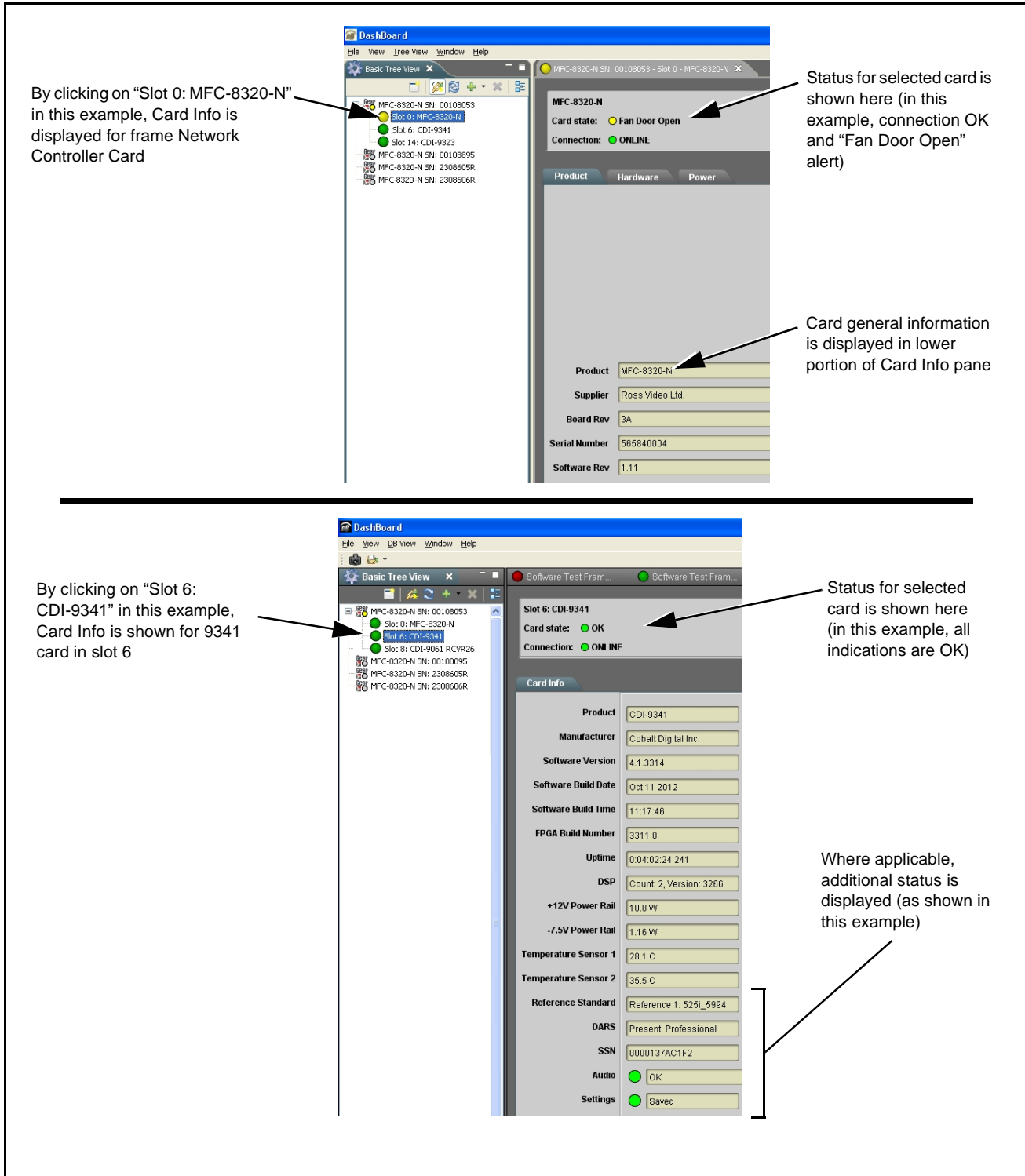


Figure 3-6 Selecting Specific Cards for Card Info Status Display

## 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
<p><b>Verify power presence and characteristics</b></p>	<ul style="list-style-type: none"> <li>• On both the frame Network Controller Card and the 9341, 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.</li> <li>• Check the Power Consumed indications for both the +12 V and -7.5 V supply rails for the 9341 card. This can be observed using the DashBoard™ Card Info pane, or using the card edge controls and indicators as shown in Figure 3-4 on page 3-7.               <ul style="list-style-type: none"> <li>• If either of the rail supplies show <b>no</b> power being consumed, either the frame power supply, connections, or the 9341 card itself is defective.</li> <li>• If either of the rail supplies show <b>excessive</b> power being consumed (see Technical Specifications (p. 1-13) in Chapter 1, “Introduction”), the 9341 card may be defective.</li> </ul> </li> </ul>
<p><b>Check Cable connection secureness and connecting points</b></p>	<p>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.</p>
<p><b>Card seating within slots</b></p>	<p>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.)</p>
<p><b>Check status indicators and displays</b></p>	<p>On both DashBoard™ and the 9341 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.</p>
<p><b>Troubleshoot by substitution</b></p>	<p>All cards within the frame can be hot-swapped, replacing a suspect card or module with a known-good item.</p>

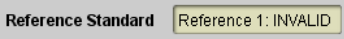
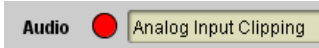
## 9341 Processing Error Troubleshooting

Table 3-3 provides 9341 processing troubleshooting information. If the 9341 card exhibits any of the symptoms listed in Table 3-3, follow the troubleshooting instructions provided.

**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 9341 card edge status indicators.

**Note:** Where errors are displayed on both the 9341 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
<p>DashBoard™ shows Reference Invalid message in 9341 Card Info pane.</p> 	<p>Frame video reference signal invalid or not being received</p>	<ul style="list-style-type: none"> <li>If external video reference signal is not intended to be used, make certain the Timing Input Source selection list is set to either <b>DARS Input</b> or <b>Local</b> as appropriate.</li> </ul> <p><b>Note:</b> If <b>DARS Input</b> or <b>Local</b> is being used, this message may still appear but is of no consequence.</p> <ul style="list-style-type: none"> <li>If external video reference signal is intended to be used, make certain selected external reference is active on 20-slot frame bus and is compatible with 9341 card. (External reference signals Reference 1 and Reference 2 are distributed to the 9341 and other cards via a frame bus.)</li> </ul> <p>Refer to <b>Signal Timing</b> function submenu tab on page 3-12 for more information.</p>
<p>Audio not processed or passed through card.</p>	<p>Upmixer inadvertently enabled (Upmixer Licensed Feature Only)</p>	<p>Make certain upmixer is set to <b>Bypass</b> if not intended for use.</p> <p><b>Note:</b> When manually enabled or set for automatic enable with appropriate signal levels, upmixer overwrites selected channels with new data; same-channel output will no longer represent same-channel inputs for selected channels.</p>
<p>DashBoard™ shows red <b>Audio</b> icon and Analog Input Clipping message in Card Info pane.</p>  <p>Card edge display shows code E101 .</p>	<p>Analog peak audio input on selected input exceeds +24 dBu level</p>	<p>Reduce analog audio level at the source.</p> <p><b>Note:</b> Card audio gain controls cannot be used to correct analog input overload condition. The condition must be corrected at the source.</p>

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## 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. 1-17) in Chapter 1, “Introduction“for contact information.

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