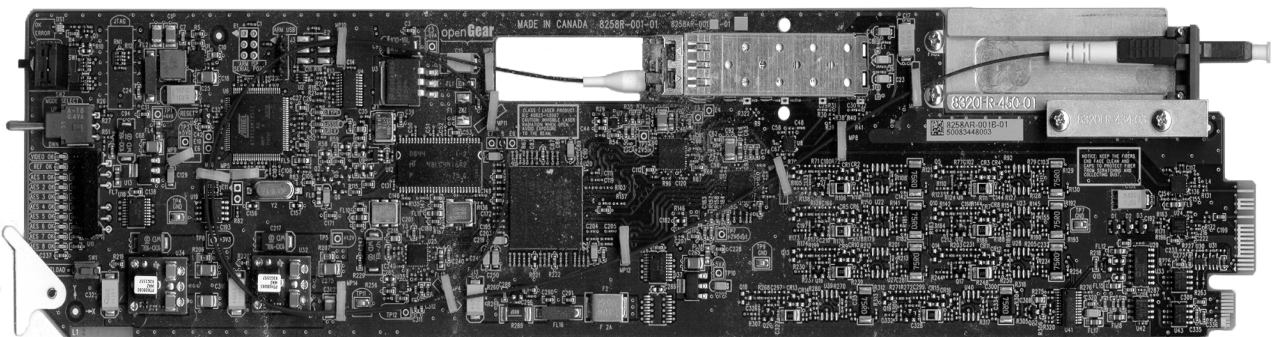


# 9215-EO-EM

## AES/EBU Fiber Audio Embedder User Manual



9215-UM  
Version: 1.1



---

## 9215-EO-EM • Fiber Transmitter / AES-EBU Audio Embedder User Manual

- Cobalt Digital Inc. Part Number: **9215-OM**
- Document Version: **1.1**
- Printed in the United States.
- Last Author: CGG

The information contained in this manual is subject to change without notice or obligation.

---

### Copyright

© 2013 Cobalt Digital Inc.. All rights reserved.

Contents of this publication may not be reproduced in any form without the written permission of Cobalt Digital Inc.. Reproduction or reverse engineering of copyrighted software is prohibited.

---

### Patents

This product is protected by the following US Patents: 4,205,346; 5,115,314; 5,280,346; 5,561,404; 7,034,886; 7,508,455. This product is protected by the following Canadian Patents: 2039277; 1237518; 1127289. Other patents pending.



---

### Notice

The material in this manual is furnished for informational use only. It is subject to change without notice and should not be construed as commitment by Cobalt Digital Inc.. Cobalt Digital Inc. assumes no responsibility or liability for errors or inaccuracies that may appear in this manual.

---

### Trademarks

-  is a registered trademark of Ross Video Limited.
-  is a registered trademark of Cobalt Digital Inc.
- All other product names and any registered and unregistered trademarks mentioned in this manual are used for identification purposes only and remain the exclusive property of their respective owners.

---

# Important Regulatory and Safety Notices

Before using this product and any associated equipment, refer to the “**Important Safety Instructions**” listed below to avoid personnel injury and to prevent product damage.

Products may require specific equipment, and/or installation procedures to be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these specific requirements.

## Symbol Meanings



---

*This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage or injury to persons or equipment.*

---



---

**Warning** — The symbol with the word “**Warning**” within the equipment manual indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

---



---

**Caution** — The symbol with the word “**Caution**” within the equipment manual indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

---



---

**Notice** — The symbol with the word “**Notice**” within the equipment manual indicates a situation, which if not avoided, may result in major or minor equipment damage or a situation which could place the equipment in a non-compliant operating state.

---



---

**ESD Susceptibility** — This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.

---

## Important Safety Instructions



---

**Caution** — This product is intended to be a component product of an 8300 series frame. Refer to the frame User Manual for important safety instructions regarding the proper installation and safe operation of the frame as well as its component products.

---



---

**Warning** — Certain parts of this equipment namely the power supply area still present a safety hazard, with the power switch in the OFF position. To avoid electrical shock, disconnect all A/C power cards from the chassis’ rear appliance connectors before servicing this area.

---



---

**Warning** — *Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after any servicing.*

*This product contains safety critical parts, which if incorrectly replaced may present a risk of fire or electrical shock. Components contained with the product's power supplies and power supply area, are not intended to be customer serviced and should be returned to the factory for repair. To reduce the risk of fire, replacement fuses must be the same time and rating. Only use attachments/accessories specified by the manufacturer.*

---

## EMC Notices

### **United States of America FCC Part 15**

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

---



**Notice** — *Changes or modifications to this equipment not expressly approved by Cobalt Digital Inc. could void the user's authority to operate this equipment.*

---

### **CANADA**

This Class "A" digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe "A" est conforme a la norme NMB-003 du Canada.

### **EUROPE**

This equipment is in compliance with the essential requirements and other relevant provisions of **CE Directive 93/68/EEC**.

### **INTERNATIONAL**

This equipment has been tested to **CISPR 22:1997** along with amendments **A1:2000** and **A2:2002**, and found to comply with the limits for a Class A Digital device.

---



**Notice** — *This is a Class A product. In domestic environments, this product may cause radio interference, in which case the user may have to take adequate measures.*

---

---

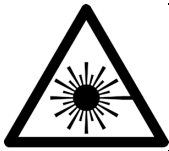
# Important Laser Safety Measures and Notices

Before using this product and any associated equipment, refer to the sections below so as to avoid personnel injury and to prevent product damage. For further safety information when using fiber products, consult the following publications:

- *IEC-60825- 2, Safety of Laser Products - Part 2: Safety of Optical Fiber Communication Systems (OFCS)* (for use outside of the U.S.A.)
- *ANSI Z136.2, Safe Use of Optical Fiber Communication Systems Utilizing Laser Diode and LED Sources* (for use in the U.S.A.)

Products may require specific equipment, and /or installation procedures be carried out to satisfy certain regulatory compliance requirements.

---



**Caution** — *Before operating or servicing this product, all personnel should be familiar with laser safety and fiber handling practices.*

---

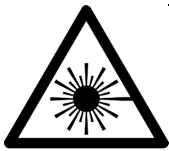
## Safety Measures for Operation

During normal operation of this product, heed the following safety measures:

- Do not stare at, or into, broken, or damaged, fibers.
- Do not stare at, or into, optical connectors.
- Only properly trained and authorized personnel should be permitted to perform laser/fiber optic operations.
- Ensure that appropriate labels are displayed in plain view and in close proximity to the optical port on the protective housing/access panel of the terminal equipment.

## Safety Measures for Maintenance and Servicing

---



**Warning** — *Do not use optical equipment, such as a microscope or an eye loupe, to stare at the energized fiber end. Doing so may damage your eyes.*

---

During maintenance and servicing of this product, only properly trained and authorized personnel shall be allowed to use optical test or diagnostic equipment.

## Laser Information

---



*CLASS 1 LASER PRODUCT  
IEC 60825-1:2007*

**Caution** — *INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO THE BEAM.*

---

## Maintenance/User Serviceable Parts

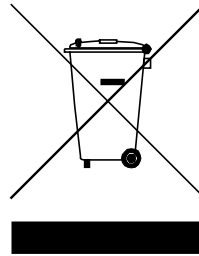
Routine maintenance to this Cobalt Digital Inc. product is not required. This product contains no user serviceable parts. If the frame does not appear to be working properly, please contact Technical Support using the numbers listed under the “Contact Us” section on the last page of this manual. All Cobalt Digital Inc. products are covered by a generous 5-year warranty and will be repaired without charge for materials or labor within this period. See the “Warranty and Repair Policy” section in this manual for details.

## Environmental Information

**The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.**

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Cobalt Digital Inc. encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.



If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You can also contact Cobalt Digital Inc. for more information on the environmental performances of our products.

---







# Contents

|   |            |
|---|------------|
| <b>Introduction</b>                               | <b>1-1</b> |
| In This Chapter .....                             | 1-1        |
| A Word of Thanks .....                            | 1-1        |
| Overview.....                                     | 1-2        |
| Features .....                                    | 1-2        |
| Functional Block Diagram.....                     | 1-3        |
| Documentation Terms and Conventions .....         | 1-4        |
| <br>  |            |
| <b>Installation</b>                               | <b>2-1</b> |
| In This Chapter .....                             | 2-1        |
| Before You Begin .....                            | 2-2        |
| Static Discharge.....                             | 2-2        |
| Unpacking.....                                    | 2-2        |
| Working with Fiber Optic Connectors.....          | 2-2        |
| Installing the 9215-EO-EM.....                    | 2-2        |
| Rear Modules for the 9215-EO-EM .....             | 2-3        |
| Installing a Rear Module .....                    | 2-3        |
| Installing the 9215-EO-EM .....                   | 2-4        |
| Cabling for the 9215-EO-EM .....                  | 2-6        |
| 8321 Series Frame Cabling Overview .....          | 2-6        |
| Software Upgrades for the 9215-EO-EM .....        | 2-7        |
| Performing Software Upgrades .....                | 2-7        |
| <br>  |            |
| <b>User Controls</b>                              | <b>3-1</b> |
| In This Chapter .....                             | 3-1        |
| Card Overview .....                               | 3-2        |
| Control and Monitoring Features.....              | 3-4        |
| Status and Selection LEDs on the 9215-EO-EM ..... | 3-4        |
| Reference Compatibility .....                     | 3-6        |
| Frame Rate Compatibility.....                     | 3-6        |
| Operation Notes .....                             | 3-7        |
| Audio Proc Amp Controls .....                     | 3-7        |
| Minimum Delay Overview .....                      | 3-7        |
| <br>  |            |
| <b>Menus</b>                                      | <b>4-1</b> |
| In This Chapter .....                             | 4-1        |
| SNMP Monitoring and Control .....                 | 4-2        |
| DashBoard Menus for the 9215-EO-EM .....          | 4-3        |
| Status Tab .....                                  | 4-3        |
| Setup Menus .....                                 | 4-6        |
| Input Status Menus .....                          | 4-8        |
| AES Inputs 1-8 Menus.....                         | 4-9        |

|                              |      |
|------------------------------|------|
| Embedded Outputs Menus ..... | 4-10 |
| Alarm Enables Menus .....    | 4-11 |
| Card-edge Menu System .....  | 4-14 |
| Navigation .....             | 4-14 |
| Card-edge Menus .....        | 4-14 |
| Menu Descriptions .....      | 4-16 |

## **Specifications** **5-1**

|   |     |
|---|-----|
| In This Chapter .....                     | 5-1 |
| 9215-EO-EM Technical Specifications ..... | 5-2 |
| Channel Status Data Table .....           | 5-4 |
| Passing the Status Bytes .....            | 5-4 |

## **Service Information** **6-1**

|                                  |     |
|----------------------------------|-----|
| In This Chapter .....            | 6-1 |
| Troubleshooting Checklist .....  | 6-2 |
| Bootload Button .....            | 6-2 |
| Warranty and Repair Policy ..... | 6-3 |

# Introduction

---

## In This Chapter

This chapter contains the following sections:

- Overview
- 9215-EO-EM Functional Block Diagram
- Documentation Terms and Conventions

### A Word of Thanks

Congratulations on choosing a **9215-EO-EM AES/EBU Fiber Audio Embedder**. The Cobalt Digital Inc. line includes video decoders and encoders, audio embedders and de-embedders, distribution amplifiers, format converters, and much more. Cobalt Digital Inc. modular conversion gear will meet your signal conversion needs now, and well into the future.

Should you have a question pertaining to the installation or operation of your 9215-EO-EM, please contact us at the numbers listed on the back cover of this manual. Our technical support staff is always available for consultation, training, or service.

---

# Overview

The 9215-EO-EM is a broadcast-quality embedder with one multi-rate SDI input which supports up to 16 channels of embedded audio and eight AES 75ohm unbalanced audio inputs. A single mode fiber interface with an LC/UPC connector provides an SDI output.

The 9215-EO-EM can take in up to eight AES inputs and embeds them into any of the 16 possible audio channels in an SD or HD-SDI output. If the input is a synchronous 48kHz signal, the audio will be embedded into the SDI signal unaltered. If the input is not a synchronous 48kHz signal, it may be converted using Sample Rate Conversion (SRC) before it is embedded on the SDI output.

The AES inputs have the following adjustments available: delay, gain, invert, and sum.

Card status and control parameters are displayed and configured using the DashBoard Control System™.

## Features

The 9215-EO-EM includes the following features:

- Supports HD-SD SDI SMPTE-292M, 1.5Gbps and SMPTE 259M, 270Mbps
- Supports AES-3id-2001, and EBU tech 3250
- Audio embedding for all popular formats 480i, 576i, 720p, and 1080i
- Embeds four audio groups with selection of primary and backup sources
- Eight AES-3id 75ohm unbalanced inputs with SRC on DIN 1.1/2.3 connectors
- One SDI processed output
- Automatic input video format detection
- SNMP support available
- Input buffer with a bypass option
- User defined loss of signal output
- Audio controls such as gain, invert, delay, and sum
- Internally generated test patterns and test tones
- Reports status and configuration remotely via the DashBoard Control System™
- Fits 20-slot frame
- 5-year transferable warranty

# Functional Block Diagram

This section provides a functional block diagram that outlines the workflow of the 9215-EO-EM.

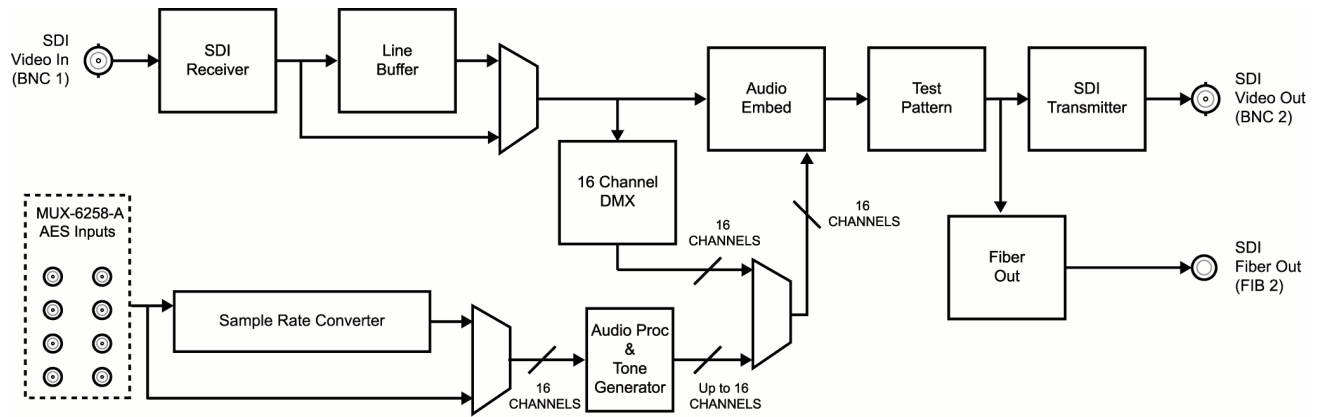


Figure 1.1 9215-EO-EM — Simplified Block Diagram

---

# Documentation Terms and Conventions

The following terms and conventions are used throughout this manual:

- “**Frame**” refers to a 20-slot frame that houses the 9215-EO-EM, as well as any openGear frames.
- All references to frame includes all versions of the 20-slot frame and any available options unless otherwise noted.
- “**Operator**” and “**User**” refer to the person who uses 9215-EO-EM.
- “**Board**”, and “**Card**” refer to openGear terminal devices within openGear frames, including all components and switches.
- “**System**” and “**Video system**” refer to the mix of interconnected production and terminal equipment in your environment.
- “**-line mode** ” refers to broadcast situations using **NTSC** composite (analog) signal reference inputs.
- “**-line mode** ” refers to broadcast situations using **PAL-B** composite (analog) signal reference inputs.
- “**PAL**” refers to PAL-B unless otherwise stated.
- “**Operating Tips**” and “**Note**” boxes are used throughout this manual to provide additional user information.

# Installation

---

## In This Chapter

This chapter provides instructions for installing the Rear Module(s) for the 9215-EO-EM, installing the card into the frame, cabling details, and updating the card software.

The following topics are discussed:

- Before You Begin
- Installing the 9215-EO-EM
- Cabling for the 9215-EO-EM
- Software Upgrades for the 9215-EO-EM

---

# Before You Begin

## Static Discharge

Throughout this chapter, please heed the following cautionary note:



---

**ESD Susceptibility** — *Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Always exercise proper grounding precautions when working on circuit boards and related equipment.*

---

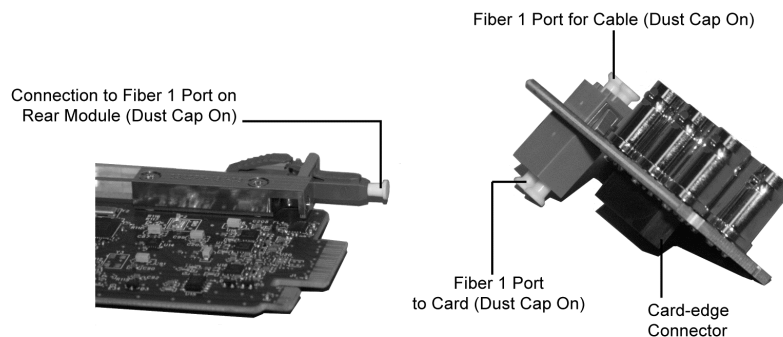
## Unpacking

Unpack each 9215-EO-EM you received from the shipping container and ensure that all items are included. If any items are missing or damaged, contact your sales representative or Cobalt Digital Inc. directly.

## Working with Fiber Optic Connectors

Keep the following in mind when working with fiber optic connectors:

- Every time you are required to insert a connector into a device or mating sleeve, you must clean the connector. All exposed surfaces of the ceramic ferrule must be clean. Follow your facility practices of cleaning fiber optic connectors.
- Connectors must always be inserted into a device or have a dust cap on. Refer to **Figure 2.1** for dust cap locations.
- A poor optical connection is often similar to a poor electrical connection. Try removing the connector, cleaning, and re-inserting the connector. A bad connection can result in experiencing instability of signal, high loss, or a noisy signal.



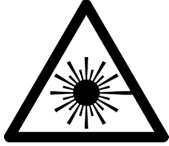
**Figure 2.1** Card Connectors with Dust Caps Installed

---

# Installing the 9215-EO-EM

This section outlines how to install a Rear Module in a 20-slot frame. You cannot install the 9215-EO-EM in a 8310 series or a 8320 series frame.





**Caution** — Never attempt to look down the barrel of a connected fiber or device transmitting an optical signal. The transmitted light is not in the visible spectrum and may cause permanent eye damage. Turn off all laser sources before disconnecting devices.

## Rear Modules for the 9215-EO-EM

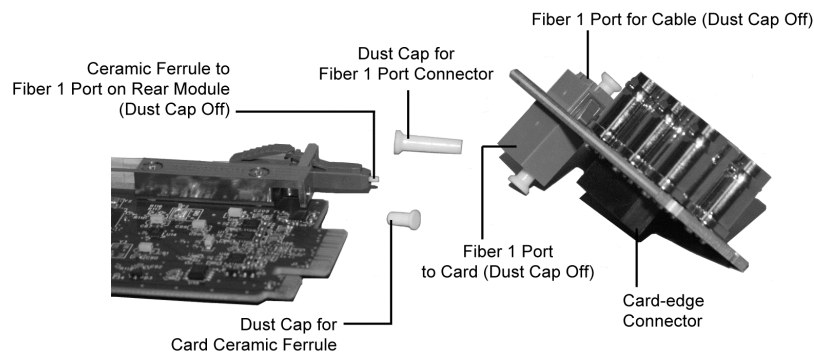
When installing the 9215-EO-EM in the 20-slot frame, the **RM-20-9215-B** Full Rear Module is required. Refer to the section “**8321 Series Frame Cabling Overview**” for cable designations.

### Installing a Rear Module

If the Rear Module is already installed, proceed to the section “**Installing the 9215-EO-EM**”.

Use the following procedure to install a Rear Module in your 20-slot frame:

1. Locate the card frame slots on the rear of the frame.
2. Remove the Blank Plate from the slot you have chosen for the 9215-EO-EM installation.
3. Remove the dust cap from the Fiber ports on the Rear Module that faces the interior of the frame. Refer to **Figure 2.1** and **Figure 2.2** for dust cap locations.



**Figure 2.2** Card Connectors with Dust Caps Removed

4. Install the bottom of the Rear Module in the **Module Seating Slot** at the base of the frame’s back plane.
5. Align the top hole of the Rear Module with the screw on the top-edge of the frame back plane.
6. Using a Phillips screwdriver and the supplied screw, fasten the Rear Module to the back plane of the frame. Do not over tighten.
7. Ensure proper frame cooling and ventilation by having all rear frame slots covered with Rear Modules or Blank Plates.

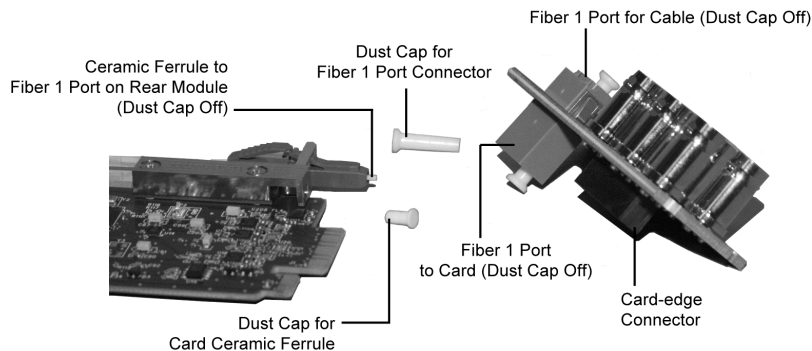
This completes the procedure for installing a Rear Module in the frame.

### Installing the 9215-EO-EM

The 9215-EO-EM uses a single mode, LC/UPC connector to interface with the **RM20-9215-B** Full Rear Module. This section outlines how to install the 9215-EO-EM in a frame.

Use the following procedure to install the 9215-EO-EM in the frame:

1. Locate the Rear Module you installed in the procedure “**Installing a Rear Module**”.
2. Ensure that the Rear Module is the **8320AR-044 Full Rear Module**.
3. Remove the dust caps from the connector on the card end.
  - Refer to **Figure 2.1** and **Figure 2.3** for dust cap locations.
  - Refer to the section “**Important Laser Safety Measures and Notices**” at the beginning of this manual for safety information when handling fiber optic components.



**Figure 2.3** Card Connectors with Dust Caps Removed

4. Ensure that the exposed surface of the ceramic ferrule of the connectors is clean. Refer to the section “**Working with Fiber Optic Connectors**” for cleaning tips.
5. Hold the card by the edges and carefully align the card-edges with the slots in the frame.
6. Fully insert the card into the frame until the rear connection plus is properly seated in the Rear Module. You will feel a click when the card mates onto the rear module.
7. Affix the supplied **Rear Module Label** to the BNC area of the Rear Module.
8. Remove the dust cap from the Fiber 1 port (the topmost fiber optic port) on the Rear Module that faces the exterior of the frame.
9. Ensure the ceramic ferrule of the Fiber 1 port connector is clean..
10. Cable your rear module as outlined in the section “**Cabling for the 9215-EO-EM**”.

This completes the procedure for installing the 9215-EO-EM in the frame.

## Cabling for the 9215-EO-EM

This section provides information for connecting cables to the installed Rear Modules on the 8321s. Connect the input and output cables according to the following sections.

The 9215-EO-EM accommodates eight synchronous AES input streams at 48kHz or any asynchronous AES streams from 32kHz to 96kHz with SRC enabled. Note that SRC should only be used with Pulse Code Modulation (PCM) digital audio and not any form of compressed signal, such as Dolby®.

The optical connector used to mate the card to the rear module is designed for blind mate optical connectors. All fiber interfaces are single mode fibers.

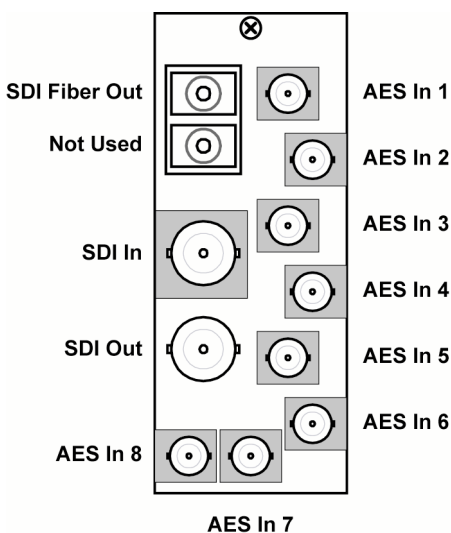


**Notice** — Every time you are required to insert a connector into a device or mating sleeve, you must clean the connector. All exposed surfaces of the ceramic ferrule must be clean. Follow your facility practices of cleaning fiber optic connectors.

Connectors must always be inserted into a device or have a dust cap on.

### 20-Slot Frame Cabling Overview

In the 20-slot frame, the 9215-EO-EM is used with the **RM20-9215-B** Full Rear Module. Each card occupies two slots and provides one SDI input, one SDI output, one fiber output, and eight unbalanced AES inputs. (**Figure 2.4**)



**Figure 2.4** Cable Connections for the **RM-20-9215-B** Rear Module

---

# Software Upgrades for the 9215-EO-EM

This section provides instructions for installing a license key and upgrading the software for your 9215-EO-EM using the DashBoard Control System™.

## Performing Software Upgrades

DashBoard enables you to upload software upgrades to the 9215-EO-EM.

Use the following procedure to upload software to the 9215-EO-EM:

1. Contact Technical Support for the latest software version file.
2. In DashBoard, display the **Device** tab of the 9215-EO-EM by double-clicking its status indicator in the **Basic Tree View**.
3. From the **Device** tab, click **Upload** to display the **Select File for upload** dialog box.
4. Navigate to the \*.bin upload file you wish to upload. DashBoard automatically selects the last directory that you loaded from.
5. Click **Open** to display a confirmation dialog box. This dialog box displays the selected upload file name, type, size, and the file creation date.
6. From the **Confirmation** dialog box, select one of the following:
  - **Cancel** — Select this option to cancel the upload of the file and return to the **Device View**.
  - **Continue** — Select this option to upload the file. While uploading, an **Uploading Progress** dialog box opens.



---

**Notice** — *Clicking the **Cancel** button while uploading will leave the card in an invalid state. Do not click **Cancel** unless the uploading progress has stopped completely for 60 seconds or more. If upload fails, repeat the upload process from DashBoard. If the upload process fails again, refer to the section "**Bootload Button**".*

---

7. Monitor the upgrade progress bar displayed in DashBoard while the software is upgraded on your 9215-EO-EM.
8. To complete the upgrade process, you must reboot the card as follows:

---

**Note** — *The communications processor of the 9215-EO-EM requires approximately 30 seconds to re-start and re-establish network communications.*

---

- The 9215-EO-EM automatically saves all your settings before starting the reboot process.
- The status of all the cards in the frame are grayed out until the reboot process is complete.

This completes the procedure to upload software to the 9215-EO-EM.

# User Controls

---

## In This Chapter

This chapter provides a general overview of the user controls available on the 9215-EO-EM.

The following topics are discussed:

- Card Overview
- Control and Monitoring Features
- Reference Compatibility
- Operation Notes

---

# Card Overview

This section provides a general overview of the 9215-EO-EM components. For information on the LEDs available on the card-edge, refer to the section “Control and Monitoring Features”.

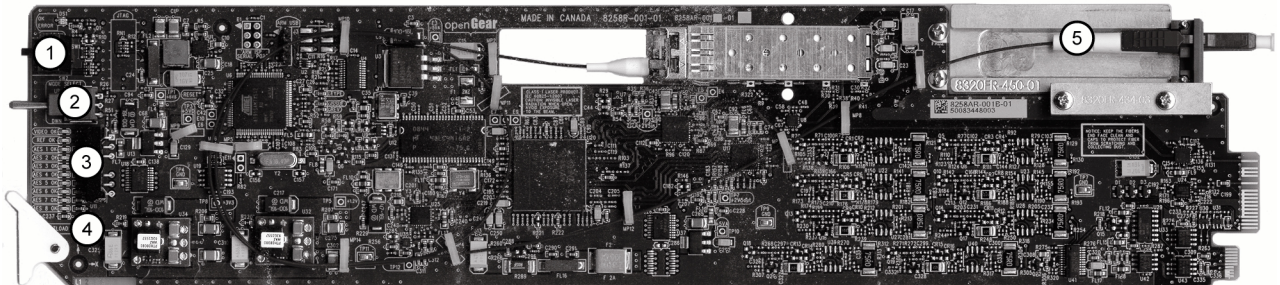


Figure 3.1 9215-EO-EM — Card-edge Components

- |                           |                           |                          |
|---------------------------|---------------------------|--------------------------|
| 1) Function Select Switch | 3) Four Character Display | 5) Fiber Optic Connector |
| 2) Mode Select Switch     | 4) Bootload Button        |                          |

## 1. Function Select Switch

Use this switch to select general operation functions and menu items. This switch works in conjunction with the Mode Select Switch.

## 2. Mode Select Switch

Use this switch to enable, disable, and select specific configurations within the operational function modes menu (selected first with the Function Select Switch).

## 3. Four Character Display

This display is located on the card-edge and reports the menu and options selected using the Function Select Switch and the Mode Select Switch.

## 4. Bootload Button

Use this button for factory service in the unlikely event of a complete card failure. Do not press this button unless instructed to do so by Cobalt Digital Inc. Technical Support personnel.

## 5. Fiber Optic Connector

The 9215-EO-EM use a blind mate, single mode, LC/UPC connector to interface with the Full Rear Module (RM20-9215-B). The rear module is passive, which allows for the 9215-EO-EM to be replaced without the need to remove any connected BNC or fiber optic cables.

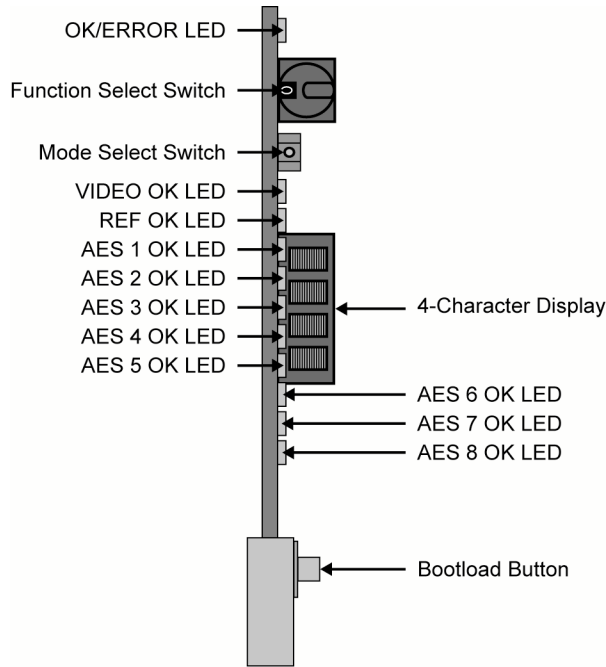
The fiber optic connector for the card includes a dust cap. The dust cap must stay on at all times when not installed in a frame. Ensure to keep the fibers end face clean and use the caps to protect the fiber from scratches and collecting dust.

***For More Information...***

- on using the switches, refer to the section “**Card-edge Menu System**”.
- on the LEDs located on the card-edge, refer to the section “**Status and Selection LEDs on the 9215-EO-EM**”.
- on handling fiber optic components, refer to the section “**Important Laser Safety Measures and Notices**” at the beginning of this manual.
- on using fiber connectors, refer to the section “**Working with Fiber Optic Connectors**”.

# Control and Monitoring Features

This section provides information on the card-edge LEDs for the 9215-EO-EM. Refer to **Figure 3.2** for the location of the LEDs and controls.



**Figure 3.2** 9215-EO-EM Card-edge Controls

## Status and Selection LEDs on the 9215-EO-EM

The front-edge of the 9215-EO-EM has LED indicators for the power, video input status, and communication activity. Basic LED displays and descriptions are provided in **Table 3.1**.

**Table 3.1** LEDs on the 9215-EO-EM

| LED      | Color                     | Display and Description   |
|----------|---------------------------|---|
| OK/ERROR | Green                     | When lit green, this LED indicates that the card is functioning normal and that no anomalies have been detected. The following conditions must be satisfied: <ul style="list-style-type: none"> <li>a valid input signal is present</li> <li>a valid reference signal is present when a reference is required, and that the reference standard matches the input standard.</li> </ul> |
|          | Flashing Green            | When flashing green, this LED indicates the bootloader is waiting for a software upload.  |
|          | Flashing Green and Orange | When lit green with flashing orange, this LED indicates there is a signal error, such as a missing or invalid input or reference.   |
|          | Orange                    | When lit orange, this LED indicates the card is powering on.  |



| LED      | Color          | Display and Description   |
|----------|----------------|---|
|          | Red            | When lit red, this LED indicates the card is not operational.                                     |
|          | Off            | When off, this LED indicates there is no power to the card.                                       |
| VIDEO OK | Green          | When lit, this LED indicates that the video input is valid.                                       |
|          | Flashing Green | When flashing, this LED indicates that video is present, but the input format is unsupported.     |
|          | Off            | When unlit, this LED indicates the absence of an input signal.                                    |
| REF OK   | Green          | When lit, this LED indicates a valid reference signal.  |
|          | Flashing Green | When flashing, this LED indicates that the reference signal is present but the format is invalid. |
|          | Off            | When unlit, this LED indicates that a reference signal is not present or is not supported.        |
| AES # OK | Yellow         | When lit, an LED indicates a valid signal is detected on the corresponding AES input.             |

---

## Reference Compatibility

It is important to remember that if you are using **Frame 1** or **Frame 2** as the reference, the input video frame rate must match the reference frame rate.

### Frame Rate Compatibility

Refer to **Table 3.2** for frame rate compatibility.

**Table 3.2** *Compatible Video Formats*

| Reference   | Output     |            |             |         |          |         |
|-------------|------------|------------|-------------|---------|----------|---------|
|             | 480i/59.94 | 720p/59.94 | 1080i/59.94 | 576i/50 | 1080i/50 | 720p/50 |
| 480i/59.94  | ✓          | ✓          | ✓           |         |          |         |
| 720p/59.94  | ✓          | ✓          | ✓           |         |          |         |
| 1080i/59.94 | ✓          | ✓          | ✓           |         |          |         |
| 576i/50     |            |            |             | ✓       | ✓        | ✓       |
| 720p/50     |            |            |             | ✓       | ✓        | ✓       |
| 1080i/50    |            |            |             | ✓       | ✓        | ✓       |

---

## Operation Notes

This section provides brief notes when operating the 9215-EO-EM.

### Audio Proc Amp Controls

The 9215-EO-EM includes Processing Amplifiers (Proc Amps) for the audio outputs on the card. Note that these features are not available when using the card-edge controls.

Proc Amp adjustments are applied in the following order:

- 1. Sum** — This option enables both channels to carry the average of the two input channels (A+B/2). When the input is summed, the original signals are no longer available for output. This option only operates with AES input pairs.
- 2. Delay** — This option enables you to adjust the delay of the audio channel. If you have enabled the Delay Lock feature, changing the delay value for one channel automatically changes the value for the other channel.
- 3. Gain** — This option allows you to adjust the gain by +/- 20dB in 1dB increments. If you have enabled the Gain Lock feature, changing the gain value for one channel automatically changes the value for the other channel.
- 4. Invert** — This option enables you to invert the polarity of the audio signal for the selected channel.

### Minimum Delay Overview

The line buffer stores incoming video in relation to the incoming video clock timing. The video data is then read out in relation to the reference timing. This allows the input video to be switched between sources that may not be perfectly timed without timing glitches. Video source timing must remain within the buffer window to properly switch between sources. **Table 3.3** provides information on the buffer window available depending on how the Minimum Delay feature is configured in DashBoard.

**Table 3.3** *Minimum Delay*

| If the option is... | Format | Minimum Delay | Maximum Delay |
|---------------------|--------|---------------|---------------|
| <b>Disabled</b>     | HD     | 1/4 line      | 1/2 line      |
|                     | SD     | 1/4 line      | 1/2 line      |
| <b>Enabled</b>      | HD     | 1/64 line     | 1/32 line     |
|                     | SD     | 1/32 line     | 1/16 line     |



# Menus

---

## In This Chapter

This chapter provides a summary of the menus available for the 9215-EO-EM.

The following topics are discussed:

- SNMP Monitoring and Control
- DashBoard Menus for the 9215-EO-EM
- Card-edge Menu System

---

## SNMP Monitoring and Control

The Network Controller Card in a 20-slot frame provides optional support for remote monitoring of your frame and using the Simple Network Management Protocol (SNMP), which is compatible with many third-party monitoring and control tools.

Refer to your 9215-EO-EM Management Information Base (MIB) files for a breakdown of SNMP controls on the cards. Refer to the *MFC-8300 Series User Manual* for additional information on SNMP Monitoring and Control.

## DashBoard Menus for the 9215-EO-EM

This section briefly summarizes the menus, items, and parameters available from the DashBoard Control System™ for the 9215-EO-EM. Parameters marked with an asterisk (\*) are the factory default values.

The DashBoard Control System™ enables you to monitor and control openGear frames and cards from a computer. DashBoard communicates with other cards in the 20-slot frame through the Network Controller Card.

### Status Tab

**Table 4.1** summarizes the **Status** tab parameters available in DashBoard for the 9215-EO-EM.

**Table 4.1 Status Tab Items**

| Menu                        | Item                           | Parameters                  | Description   |
|-----------------------------|--------------------------------|-----------------------------|---|
| <b>Product (Read-only)</b>  | Product                        | 9215-EO-EM                  |   |
|                             | Supplier                       | Cobalt Digital Inc.         |   |
|                             | Board Rev                      | ##                          |   |
|                             | Rear Module                    | #                           | Type of rear module in the slot   |
|                             | Board S/N                      | #####                       | Indicates the card serial number  |
|                             | Software Rev                   | ##.##                       | Indicates the software version  |
|                             | Firmware Rev                   | #####                       | Indicates the firmware version  |
| <b>Hardware (Read-only)</b> | HW Status                      | OK                          | Indicates the status of the hardware including the SFP module. Some messages displayed are dependent on the settings in the <b>Alarms Enable</b> tab. |
|                             |                                | FPGA load invalid           |   |
|                             |                                | Incomp I/O Module           |   |
|                             |                                | Current out of spec         |   |
|                             |                                | Internal Error              |   |
|                             |                                | SFP Temp Low                |   |
|                             |                                | SFP Temp High               |   |
|                             |                                | SFP Power High              |   |
|                             |                                | SFP Power Low               |   |
|                             |                                | SFP Tx Fault                |   |
|                             | SFP Not Detected               |                             |   |
|                             | Voltage (mV)                   | #                           | Supply Voltage  |
| Current (mA)                | #                              | Current consumption of card |   |
| <b>Hardware (Read-only)</b> | Optical Module Temperature (C) | #                           | Indicates the temperature of the Optical Module   |

| Menu                      | Item                       | Parameters                | Description  |
|---------------------------|----------------------------|---------------------------|--|
|                           | Optical Tx Wavelength (nm) | #                         | Indicates the wavelength being transmitted   |
|                           | CPU Headroom               | #                         | Processing power available   |
|                           | RAM Available              | ###                       | On-board processing memory available   |
|                           | Uptime (h)                 | #                         | Displays the number of hours since the last reboot of the card   |
|                           | Configuration Bank         | #                         | Storage count  |
| <b>Signal (Read-only)</b> | Signal Status              | OK                        | Indicates when the channel is functioning normally or if anomalies are detected  |
|                           |                            | No Input                  |  |
|                           |                            | Invalid Format            |  |
|                           |                            | Incompatible              |  |
|                           |                            | Non-Sync Video            |  |
|                           |                            | Group Not Present         |  |
|                           |                            | Group Channel Silent      |  |
|                           | Audio Status               | OK                        | Indicates the status of the audio source   |
|                           |                            | AES Input Not Present     |  |
|                           |                            | Source Missing            |  |
|                           |                            | Source Async              |  |
|                           |                            | AES Input Silent          |  |
|                           |                            | Group 4 Reduced to 20bit* |  |
|                           |                            | Backup Source Missing     |  |
|                           |                            | Backup Source Async       |  |
|                           | Reference Status           | OK                        | Indicates that a valid reference source is present   |
|                           |                            | No Ref - Video            | The following conditions are occurring: <ul style="list-style-type: none"> <li>• Card reference is set to Frame 1 or Frame 2</li> <li>• A valid reference signal is not present</li> <li>• Card has gone to Video Timing Mode</li> </ul> |

\*This parameter indicates that there are more than 3 groups of 24-bit SD embedded audio sources.



| Menu                            | Item                   | Parameters                      | Description   |
|---------------------------------|------------------------|---------------------------------|---|
| <b>Signal<br/>(Read-only)</b>   | Reference Status       | No Ref - Free Run               | The following conditions are occurring: <ul style="list-style-type: none"> <li>• Card reference is set to Frame 1 or Frame 2</li> <li>• A valid reference signal is not present</li> <li>• A valid video signal is not present</li> <li>• Card has gone to Free Run Mode</li> </ul> |
|                                 |                        | Invalid Format - Video          | Card has detected an invalid <sup>†</sup> reference format and has switched to Video Timing Mode  |
|                                 |                        | Invalid Format - Free Run       | The following conditions are occurring: <ul style="list-style-type: none"> <li>• Card has detected an invalid<sup>b</sup> reference format</li> <li>• Input video is missing or invalid</li> <li>• Card has switched to Free Run Mode</li> </ul>                                    |
|                                 | Input Format           | #                               | Indicates the input video format  |
|                                 | Reference Format       | #                               | Indicates the reference video format  |
|                                 | Output Format          | #                               | Indicates the output video format   |
|                                 | Optical Module Status  | OK                              | Indicates the status of the card Optical Module   |
|                                 |                        | Temp High                       |   |
|                                 |                        | Temp Low                        |   |
|                                 |                        | Rx Power High                   |   |
|                                 |                        | Rx Power Low                    |   |
|                                 |                        | Rx Fault                        |   |
|                                 | Not Detected           |                                 |   |
|                                 | Optical Tx Power (dBm) | #                               | Indicates the output power of the Optical Module  |
| Embedded Audio Status - Group # | PCM                    | Indicates the presence of input |   |
|                                 | No Input               |                                 |   |
|                                 | PCM-Silent             |                                 |   |
|                                 | Non-PCM                |                                 |   |
|                                 | Async                  |                                 |   |
|                                 | Mixed                  |                                 |   |

<sup>†</sup>Refer to the section “**Reference Compatibility**” for a complete list of supported references.

| Menu                            | Item  | Parameters | Description                     |
|---------------------------------|-------|------------|---------------------------------|
| Signal – AES Inputs (Read-only) | AES # | PCM        | Indicates the presence of input |
|                                 |       | No Input   |                                 |
|                                 |       | PCM-Silent |                                 |
|                                 |       | Non-PCM    |                                 |
|                                 |       | Async      |                                 |
|                                 |       | Mixed      |                                 |

## Setup Menus

Table 4.2 summarizes the Setup Menu options available in DashBoard.

Table 4.2 Setup Menu Items

| Menu  | Item          | Parameters          | Description  |
|-------|---------------|---------------------|--|
| Setup | Reference     | Frame 1*            | Selects the reference source   |
|       |               | Frame 2             |  |
|       |               | Video               |  |
|       | Minimum Delay | Checkbox selected*  | Provides the shortest video delay through the card. When using SD, the delay is 7us. When using HD, the delay is 1.5us.        |
|       |               | Checkbox unselected | The total video delay through the card will be the values above plus half a video line   |
|       | Loss of Input | Black               | Sets the output to Black in the event of a loss of video input   |
|       |               | Blue                | Sets the output to Blue in the event of a loss of video input  |
|       |               | Custom*             | Sets the output to a custom color in the event of a loss of video input. Use the Y, Cr, and Cb sliders to configure the color. |
|       |               | Y slider            | Sets the luminance component of the Loss of Input Custom video signal.   |
|       |               | Cr slider           | Sets the Cr component of the Loss of Input Custom video signal.  |
|       |               | Cb slider           | Sets the Cb component of the Loss of Input Custom video signal.  |

| Menu             | Item                   | Parameters  | Description  |
|------------------|------------------------|---|--|
|                  | Test Pattern           | None  | Specifies the type of test pattern to output                     |
| <b>Setup</b>     | Test Pattern           | 100% Color Bars   | Specifies the type of test pattern to output                     |
|                  |                        | Frequency Sweep   |  |
|                  |                        | Black   |  |
|                  |                        | Blue  |  |
|                  |                        | Matrix Pathological   |  |
|                  |                        | Luma Ramp   |  |
|                  |                        | Y/C Ramp  |  |
|                  |                        | 75% SMPTE Bars  |  |
|                  | SD Audio               | 20 Bit*   | Embeds 20bit audio   |
|                  |                        | 24 Bit  | Embeds 24bit audio   |
|                  |                        | Auto  | Embeds 20-24bit audio depending on the source and number of bits |
|                  | Silence Threshold (dB) | -96 to 0  | Audio below the specified threshold value is considered silent   |
|                  | Silence Timeout (sec)  | 1 to 60   | Audio silent for longer than the specified value raises an alarm |
|                  | Edit Permission        | Unlocked*   | All menu options are unlocked and can be edited.                 |
| Locked           |                        | All menu items, except this one, are locked and read-only.                  |  |
| All Audio        | Reset                  | Resets the parameters in the Embedded Audio Outputs tab to factory defaults |  |
| Factory Defaults | Reset                  | Resets all parameters to factory defaults.                                  |  |

## Input Status Menus

Table 4.3 summarizes the **Input Status Menu** options available in DashBoard.

**Table 4.3 Input Status Menu Items**

| Menu                           | Item   | Parameters  | Description   |
|--------------------------------|--|---|---|
| <b>Video Input &amp; Embed</b> | Input Format (read-only)                       | #   | Displays the format of the video input  |
|                                | CRC Errors (read-only)                         | #   | Displays the count of the CRC errors on the video input. This 14bit counter is reset on loss of video, or by user request. The counter is non-latching, and will roll over from maximum count to zero. <ul style="list-style-type: none"> <li>For SD formats, it displays both active picture and full frame errors.</li> <li>For HD formats, it displays the total count of errors.</li> </ul> |
|                                | Error Count                                    | Reset   | Resets the CRC Errors field   |
|                                | Embedded Audio - Group # Channel # (read-only) | PCM   | Displays the status of each group and channel of embedded audio   |
|                                |  | No Input  |   |
|                                |  | PCM-Silent  |   |
|                                |  | Non-PCM   |   |
| Async                          |  |   |   |
| Mixed                          |  |   |   |
| Word Length (read-only)        | #bit   | Displays the word length of the audio in number of bits |   |
| <b>Audio – AES #</b>           | Ch A Status (read-only)                        | PCM   | Displays the status of the Channel A input  |
|                                |  | No Input  |   |
|                                |  | PCM-Silent  |   |
|                                |  | Non-PCM   |   |
|                                |  | Async   |   |
|                                | Mixed  |   |   |
|                                | Ch B Status (read-only)                        | Same as above   |   |

| Menu                 | Item                              | Parameters          | Description  |
|----------------------|-----------------------------------|---------------------|--|
| <b>Audio – AES #</b> | Word Length (read-only)           | #bit                | Displays the number of bits of audio   |
|                      | Emphasis (read-only) <sup>‡</sup> | Checkbox selected   | The incoming AES signal is indicating 50/15 or CCITT J.17 emphasis                 |
|                      |                                   | Checkbox unselected | The incoming AES signal is indicating no emphasis or the emphasis is not indicated |
|                      | Sample Rate (read-only)           | #                   | Displays the sample rate of the AES input  |

## AES Inputs 1-8 Menus

Table 4.4 summarizes the **AES Inputs 1-4** and **AES Inputs 5-8 Menus** options available in DashBoard.

*Table 4.4 AES Inputs 1-8 Menu Items*

| Menu         | Item                   | Parameters              | Description   |
|--------------|------------------------|-------------------------|---|
| <b>AES #</b> | Sum                    | Checkbox selected       | Both channels will carry the average of the two input channels (A+B/2). When the input is summed, the original signals are no longer available for output.  |
|              |                        | Checkbox unselected*    | Disables this feature   |
|              | Sample Rate Conversion | Off                     | SRC is not used on an input. Select this option when using non-PCM audio data   |
|              |                        | On*                     | SRC is used on an input   |
|              | Ch A Delay (ms)        | 0* to 1000              | Adjusts the delay of the channel of audio   |
|              | Ch B Delay (ms)        | Same as above           |   |
|              | Delay Lock             | Checkbox selected       | Locks the Delay slider of both channels together. If the values for the two channels are different, that change is maintained when the channels are locked. |
|              |                        | Checkbox unselected*    | The Delay slider is unlocked  |
|              | Ch A Gain (dB)         | -18 to +18 <sup>§</sup> | Adjusts the gain of the channel of audio  |
|              | Ch B Gain (dB)         | Same as above           |   |

<sup>‡</sup>If the SRC is ON, emphasis of the incoming AES signal is not indicated.

<sup>§</sup>The default value is 0.

| Menu       | Item        | Parameters  | Description  |
|------------|-------------|---|--|
| AES #      | Gain Lock   | Checkbox selected   | Locks the Gain slider of both channels together. If the values for the two channels are different, that change is maintained when the channels are locked. |
|            |             | Checkbox unselected*  | The Gain slider is unlocked  |
|            | Ch A Invert | Checkbox selected   | Inverts the audio signal of the channel  |
|            |             | Checkbox unselected*  | The audio signal is not inverted   |
|            | Ch B Invert | Same as above   |  |
|            | Input       | Reset   | Resets the parameters for the selected input to the default values   |
| Inputs #-# | Reset       | Resets the indicated input parameters to the default values |  |

## Embedded Outputs Menus

Table 4.5 summarizes the Embedded Outputs Menu options available in DashBoard.

*Table 4.5 Embedded Outputs Menu Items*

| Menu    | Item               | Parameters          | Description  |
|---------|--------------------|---------------------|--|
| Group # | Enable             | Checkbox selected*  | Determines if the group is inserted in the output or not   |
|         |                    | Checkbox unselected |  |
|         | Ch # Source        | Mute                | Configures the Primary Source that is inserted in to the embedded group if present   |
|         |                    | Group# Ch#          |  |
|         |                    | #Hz Tone            |  |
|         |                    | #kHz Tone           |  |
|         | Ch # Backup Source | Mute                | Configures the Backup Source that is inserted when the Primary Source is unavailable                                       |
|         |                    | Group# Ch#          |  |
|         |                    | AES #               |  |
|         |                    | #Hz Tone            |  |
|         |                    | #kHz Tone           |  |
|         | Presets            | Pass                | Configures the group source settings with the original group as the Primary Source and original group as the Backup Source |

| Menu           | Item    | Parameters | Description   |
|----------------|---------|------------|---|
| <b>Group #</b> | Presets | Insert     | Configures the group source settings with the original group as the Primary Source, and AES inputs as the Backup Source |
|                |         | Overwrite  | Configures the group source settings with AES inputs as the Primary Source, and embed as the Backup Source              |

## Alarm Enables Menus

Table 4.6 summarizes the Alarm Enables Menu options available in DashBoard.

*Table 4.6 Alarms Menu Items*

| Menu                                     | Item               | Parameters          | Description   |
|--|--------------------|---------------------|---|
| <b>Video Input &amp; Reference Alarm</b> | No Input           | Checkbox selected*  | Signal Status field reports a loss of input   |
|  |                    | Checkbox unselected | Disables the alarm  |
|  | Invalid Input      | Checkbox selected*  | Input Format field displays an alarm when the input video is a format that is not supported |
|  |                    | Checkbox unselected | Disables the alarm  |
|  | Incompatible Input | Checkbox selected*  | Input Format field reports when the frame rate is not the same as the reference input       |
|  |                    | Checkbox unselected | Disables the alarm  |
|  | Non-Sync Video     | Checkbox selected*  | Signal Status field reports if the video input is asynchronous to the reference             |
|  |                    | Checkbox unselected | Disables the alarm  |
|  | No Reference       | Checkbox selected*  | Reference Status field reports loss of input conditions                                     |
|  |                    | Checkbox unselected | Disables the alarm  |
|  | Invalid Reference  | Checkbox selected*  | Reference Format field reports when the reference is a format that is not supported         |
|  |                    | Checkbox unselected | Disables the alarm  |

| Menu                                  | Item                          | Parameters          | Description   |
|---------------------------------------|-------------------------------|---------------------|---|
| <b>Hardware</b>                       | Incompat Rear Module          | Checkbox selected*  | Hardware Status field reports when a rear module is not compatible with the card                      |
|                                       |                               | Checkbox unselected | Disables the alarm  |
| <b>Optical Module Alarms</b>          | Alarm on Abnormal Temperature | Checkbox selected*  | Hardware Status field reports when the temperature of the SFP module is not in range (high/low)       |
|                                       |                               | Checkbox unselected | Disables the alarm  |
|                                       | Alarm on Abnormal Power       | Checkbox selected*  | Hardware Status field reports when the power consumption of the SFP module is not in range (high/low) |
|                                       |                               | Checkbox unselected | Disables the alarm  |
|                                       | Alarm on Not Detected         | Checkbox selected*  | Hardware Status field reports when the optical module is not detected                                 |
|                                       |                               | Checkbox unselected | Disables the alarm  |
| <b>Embedded Input Audio - Group #</b> | Group not present             | Checkbox selected*  | Signal Status field reports when a group is not present on the input                                  |
|                                       |                               | Checkbox unselected | Disables the alarm  |
|                                       | Channel # Silent              | Checkbox selected*  | Signal Status field reports when the specified channel is detected as silent                          |
|                                       |                               | Checkbox unselected | Disables the alarm  |
| <b>AES Inputs - AES #</b>             | Input no present              | Checkbox selected*  | Signal Status field reports when the source for the specified input is not present                    |
|                                       |                               | Checkbox unselected | Disables the alarm  |
|                                       | Channel # Silent              | Checkbox selected*  | Signal Status field reports when the specified channel is detected as silent                          |
|                                       |                               | Checkbox unselected | Disables the alarm  |
| <b>Embedded Outputs - Group #</b>     | Source Missing                | Checkbox selected*  | Embedded Audio Status field reports when the selected source is not present or is silent              |
|                                       |                               | Checkbox unselected | Disables the alarm  |
|                                       | Source Async                  | Checkbox selected*  | Embedded Audio Status field reports when the selected source is asynchronous to the input video       |
|                                       |                               | Checkbox unselected | Disables the alarm  |



| Menu                              | Item                  | Parameters          | Description   |
|-----------------------------------|-----------------------|---------------------|---|
| <b>Embedded Outputs - Group #</b> | Backup Source Missing | Checkbox selected*  | An alarm is displayed when the selected Backup Source is not present or is silent   |
|                                   |                       | Checkbox unselected | Disables the alarm  |
|                                   | Backup Source Async   | Checkbox selected*  | An alarm is displayed when the selected Backup Source is not synchronous to the input video   |
|                                   |                       | Checkbox unselected | Disables the alarm  |
|                                   | SD 24Bit              | Checkbox selected*  | Audio Status field reports when the selected configuration would embed 4 groups of 24bit audio in an SD output. Group 4 is down-sampled to 20bit audio. |
|                                   |                       | Checkbox unselected | Disables the alarm  |
|                                   | All Alarms            | Set                 | Enables all alarms  |
|                                   | All Alarms            | Clear               | Disables all alarms   |

# Card-edge Menu System

This section summarizes the Card-edge Menu system of the 9215-EO-EM and how to navigate the menus and options using the **SW1** and **SW2** switches on the 9215-EO-EM card-edge. A list of the available menus and parameters is provided in **Table 4.7**.

## Navigation

Use the following procedure to navigate the card-edge menus of the 9215-EO-EM:

1. Rotate **SW1** to the required menu.
2. Toggle **SW2** to select the required parameter.

This completes the procedure for navigating the card-edge menus of the 9215-EO-EM.

---

**Note** — *Do not power down the card before ensuring that all edited parameters are saved. Saving edited parameters can take up to 10 seconds.*

---

## Card-edge Menus

**Table 4.7** lists all the menus, and menu items available using the card-edge controls. To activate some of these parameters, it may be necessary to toggle **SW2** in either direction, or it may require that **SW2** be held in either direction for a few seconds. Default values are indicated with an asterisk (\*). Refer to the section “**Menu Descriptions**” for a brief summary of the menus available on the card-edge.

**Table 4.7 Card-edge Menus and Items**

| Menu Select | Card-Edge Menu Label | Menu Name        | Card-Edge Item Label | Item Name         |
|-------------|----------------------|------------------|----------------------|-------------------|
| 0           | 9215-EO-EM slot #    | Home             |                      |                   |
| 1           | Fact Def             | Factory Default  | n/a                  | Factory Default   |
| 2           | Ref Src              | Reference Source | Fr 1*                | Frame 1 Reference |
|             |                      |                  | Fr 2                 | Frame 2 Reference |
|             |                      |                  | Vid                  | Video             |
| 3           | LOI                  | Loss of Input    | Black                |                   |
|             |                      |                  | Blue                 |                   |
|             |                      |                  | Custom*              |                   |
| 4           | Test Patt            | Test Pattern     | None*                |                   |
|             |                      |                  | 75%                  | SMPTE Bars        |
|             |                      |                  | YC Ramp              | Y/C Ramp          |
|             |                      |                  | L Ramp               | Luma Ramp         |

| Menu Select                      | Card-Edge Menu Label | Menu Name               | Card-Edge Item Label | Item Name                                |
|----------------------------------|----------------------|-------------------------|----------------------|--|
|                                  |                      |                         | Matr Path            | Matrix Pathological                      |
|                                  |                      |                         | Blue                 | Flat Field Blue                          |
|                                  |                      |                         | Black                | Flat Field Black                         |
|                                  |                      |                         | Frq Swp              | Frequency Sweep                          |
|                                  |                      |                         | 100%                 | 100% Full Field Bars                     |
| 5                                | Grp Sel              | Group Select            | Grp 1                | Group 1                                  |
|                                  |                      |                         | Grp 2                | Group 2                                  |
|                                  |                      |                         | Grp 3                | Group 3                                  |
|                                  |                      |                         | Grp 4                | Group 4                                  |
| 6                                | Grp Enbl             | Group Enable            | Enabled*             |  |
|                                  |                      |                         | Disabled             |  |
| 7                                | Ch1 Src              | Channel 1 Source        | Mute                 |  |
|                                  |                      |                         | T4k                  | 4kHz Tone                                |
|                                  |                      |                         | T2k                  | 2kHz Tone                                |
|                                  |                      |                         | T1k                  | 1kHz Tone                                |
|                                  |                      |                         | T.5k                 | 500Hz Tone                               |
|                                  |                      |                         | A1A – A8B            | AES 1A to AES 8B                         |
|                                  |                      |                         | G1C1 - G4C4          | Group 1, Channel 1 to Group 4, Channel 4 |
| 8                                | Ch2 Src              | Channel 2 Source        | Same as above        |  |
| 9                                | Ch3 Src              | Channel 3 Source        | Same as above        |  |
| A                                | Ch4 Src              | Channel 4 Source        | Same as above        |  |
| B                                | Ch1 Bkp              | Channel 1 Backup Source | Mute                 |  |
|                                  |                      |                         | T4k                  | 4kHz Tone                                |
| B                                | Ch1 Bkp              | Channel 1 Backup Source | T2k                  | 2kHz Tone                                |
|                                  |                      |                         | T1k                  | 1kHz Tone                                |
|                                  |                      |                         | T.5k                 | 500Hz Tone                               |
|                                  |                      |                         | A1A - A8B            | AES 1A to AES 8B                         |
| 9215-EO-EM User Manual • (V 1.1) |                      |                         |                      | Menus • 4-15                             |

| Menu Select | Card-Edge Menu Label | Menu Name               | Card-Edge Item Label | Item Name                                |
|-------------|----------------------|-------------------------|----------------------|--|
|             |                      |                         | G1C1-G4C4            | Group 1, Channel 1 to Group 4, Channel 4 |
| <b>C</b>    | Ch2 Bkp              | Channel 2 Backup Source | Same as above        |  |
| <b>D</b>    | Ch3 Bkp              | Channel 3 Backup Source | Same as above        |  |
| <b>E</b>    | Ch4 Bkp              | Channel 4 Backup Source | Same as above        |  |

## Menu Descriptions

This section briefly summarizes the menu parameters available in the card-edge display of the 9215-EO-EM.

### **0 — Home**

This read-only menu displays the product name and the slot the card is installed in the frame.

### **1 — Factory Defaults**

This function enables you to return all controls to their factory default values.

Use the following procedure to reset the card parameters to factory default values using the card-edge controls:

1. Rotate **SW1** to **1**. The Four Character Display displays “**Fact Def**”.
2. Toggle **SW2** down and hold for 3 seconds.
3. Release **SW2**.

This completes the procedure to reset the card parameters to factory default values.

### **2 — Reference Source**

This menu enables you to select where the card will look for a reference. The choices are Frame Reference 1 (**Fr 1**), Frame Reference 2 (**Fr 2**), and Video (**Vid**). Refer to the section “**Reference Compatibility**” for details.

### **3 — Loss of Input**

Use this menu to select what type of video displays at the system’s outputs when the input video signal is lost or invalid.

### **4 — Test Pattern**

This menu enables you to specify the type of test pattern to output. Note that this setting is not retained on power down.

### **5 — Group Select**

This menu enables you to select the embedded group before assigning sources to the channels, enabling the group, and selecting backup sources. This menu is used in conjunction with Menus 6 to E.

## **6 — Group Enable**

Use this menu to determine if the selected group is embedded in the output or not.

## **7, 8, 9, A — Channel # Source**

Use Menus 7 to A to configure the source that is inserted into the embedded group if present. These menus are used in conjunction with Menu 5 (Group Select). The following are the default values based on the group selected:

- Group 1 — When Menu 5 is set to Grp1, the default value of Menu 7 is G1C1.
- Group 2 — When Menu 5 is set to Grp 2, the default value of Menu 8 is G2C2.
- Group 3 — When Menu 5 is set to Grp 3, the default value of Menu 9 is G3C3.
- Group 4 — When Menu 5 is set to Grp 4, the default value of Menu A is G4C4.

## **B, C, D, E — Channel # Backup Source**

Use Menus B to E to configure the Backup Source that is inserted when the Primary Source is unavailable. This menu is used in conjunction with Menu 5 (Group Select). The following are the default values based on the group selected:

- Group 1 — When Menu 5 is set to Grp1, the default value of Menu B is G1C1.
- Group 2 — When Menu 5 is set to Grp 2, the default value of Menu C is G2C2.
- Group 3 — When Menu 5 is set to Grp 3, the default value of Menu D is G3C3.
- Group 4 — When Menu 5 is set to Grp 4, the default value of Menu E is G4C4



# Specifications

---

## In This Chapter

This chapter includes the technical specifications for the 9215-EO-EM

The following topics are discussed:

- 9215-EO-EM Technical Specifications
- Channel Status Data Table

# 9215-EO-EM Technical Specifications

This section includes the technical specifications\*\* for the 9215-EO-EM.

**Table 5.1 9215-EO-EM Technical Specifications**

| Category              | Parameter                                       | Specification   |
|-----------------------|---|---|
| <b>SDI Input</b>      | Number of Inputs                                | 1   |
|                       | SDI Data Rates and SMPTE Standards Accommodated | SMPTE 292M, SMPTE 259M-C  |
|                       | Impedance                                       | 75ohm terminating   |
|                       | Return Loss                                     | >15dB to 1.485GHz   |
|                       | Cable Length with Equalizer                     | >10dB from 1.485GHz to 2.97GHz  |
|                       | Connector Type                                  | >300m of Belden 1694A cable @ 270Mbps   |
| <b>Optical Output</b> | Number of Outputs                               | 1   |
|                       | SMPTE Standards Accommodated                    | SMPTE 259M-C, SMPTE 292M  |
|                       | Nominal Wavelength                              | 1310µm  |
|                       | Output Power                                    | -7dBm to -2dBm  |
|                       | Connector Type                                  | Single Mode, LC/UPC   |
| <b>SDI Outputs</b>    | Number of Outputs                               | 1   |
|                       | SDI Data Rates and SMPTE Standards Accommodated | SMPTE 292M, SMPTE 259M-C  |
|                       | Impedance                                       | 75ohm   |
|                       | Return Loss                                     | >15dB to 1.485GHz<br>>10dB 1.485GHz to 2.97GHz                                |
|                       | Signal Level                                    | 800mV, ±10%   |
|                       | DC Offset                                       | 0V ±50mV  |
|                       | Rise and Fall Time (20-80%)                     | 700ps typical (270Mbps)<br>120ps typical (1.485Gbps, 2.97Gbps)                |
|                       | Overshoot                                       | <10%  |
|                       | Connector Type                                  | BNC   |
| <b>AES Inputs</b>     | Number of Inputs                                | 8 AES-3id inputs  |
|                       | Impedance                                       | 75ohm   |
|                       | Input Resolution                                | 24bits  |
|                       | Nominal Signal Level                            | 1V p-p  |
| <b>AES Inputs</b>     | Sampling Rate                                   | 48kHz compliant with SMPTE 272M-A or any rate from 20kHz to 96kHz with SRC on |
|                       | Connector Type                                  | DIN 1.1/2.3   |
| <b>Environmental</b>  | Operating Range                                 | 5°C to 40°C ambient   |
| <b>Power</b>          | Total Power Consumption                         | <8W   |

\*\* Specifications are subject to change without notice.





# Channel Status Data Table

The following table shows the channel status bit information that is used for all output audio.

**Table 5.2 Channel Status Data**

| Byte  | Bit | Function   | Transmitted  |
|-------|-----|--|--|
| 0     | 0   | Professional or Consumer use of Channel Status Block | Professional (1)   |
|       | 1   | Normal Audio or Non-Audio Mode                       | Normal Audio (0)   |
|       | 2-4 | Emphasis   | No Emphasis (100)  |
|       | 5   | Lock Indication                                      | Locked (0)   |
|       | 6-7 | Sampling Rate  | 48kHz (01)   |
| 1     | 0-3 | Channel Mode   | 2 channel stereo (0001)  |
|       | 4-7 | User Bit Mode  | 192-bit (0001)   |
| 2     | 0-2 | Auxiliary Bit Usage                                  | 20-bit audio sample, Aux bits undefined (000)  |
|       | 3-5 | Sample Word Length                                   | 20- or 24-bits (101)   |
|       | 6-7 | Alignment Level                                      | Not Indicated (00)   |
| 3     | 0-7 | Multi-channel Modes                                  | Undefined (0)  |
| 4     | 0-1 | Digital Audio Reference Signal                       | Not a Reference (0)  |
|       | 2   | Reserved   | 0  |
|       | 3-6 | Sampling Frequency                                   | Not Indicated (0000)   |
|       | 7   | Sampling Frequency Scaling Flag                      | No Scaling (0)   |
| 5     | 0-7 | Reserved   | Unused (0)   |
| 6-9   |     | ASCII Source ID                                      | Unused (0)   |
| 10-13 |     | ASCII Destination ID                                 | Unused (0)   |
| 14-17 |     | Local Sample Address                                 | Unused (0)   |
| 18-21 |     | Time of Day  | Unused (0)   |
| 22    | 0-7 | C data reliability                                   | Only the first 5 Status Bytes are marked as Reliable. All other Status Bytes are marked as Unreliable. |
| 23    | 0-7 | CRC  | Calculated CRC   |

## Passing the Status Bytes

The 9215-EO-EM replaces Channel Status Bytes according to Error! Reference source not found. or passes Status Bytes through from input to output. The following conditions must be met for Status Bytes to pass:

- AES inputs must be 48kHz synchronous
- SRC is set to OFF
- Data Word Length in the Channel Status Bytes must match what is embedded

# Service Information

---

## In This Chapter

This chapter contains the following sections:

- Troubleshooting Checklist
- Warranty and Repair Policy

---

# Troubleshooting Checklist

Routine maintenance to this openGear product is not required. In the event of problems with your 9215-EO-EM, the following basic troubleshooting checklist may help identify the source of the problem. If the module still does not appear to be working properly after checking all possible causes, please contact Technical Support at the numbers listed under the “**Contact Us**” section at the end of this manual.

1. **Visual Review** – Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the module, the frame, and any associated peripheral equipment for signs of trouble.
2. **Power Check** – Check the power indicator LED on the distribution frame front panel for the presence of power. If the power LED is not illuminated, verify that the power cable is connected to a power source and that power is available at the power main. Confirm that the power supplies are fully seated in their slots. If the power LED is still not illuminated, replace the power supply with one that is verified to work.
3. **Reseat the Card in the Frame** – Eject the card and reinsert it in the frame.
4. **Check Control Settings** – Refer to the Installation and Operation sections of the manual and verify all user-adjustable component settings.
5. **Input Signal Status** – Verify that source equipment is operating correctly and that a valid signal is being supplied.
6. **Output Signal Path** – Verify that destination equipment is operating correctly and receiving a valid signal.
7. **Card Exchange** – Exchanging a suspect card with a card that is known to be working correctly is an efficient method for localizing problems to individual cards.

## Bootload Button

In the unlikely event of a complete card failure, you may be instructed by Cobalt Digital Inc. Technical Support to perform a complete software reload on the 9215-EO-EM.

Use the following procedure to perform a software reload on the 9215-EO-EM:

1. Eject the card.
2. Press and hold the **Bootload** button, while re-inserting the card into the frame.
3. Release the button.

The **PWR LED** will flash GREEN while the card is waiting for a new software load.

If a new software load is not sent to the card within 60 seconds, the card will attempt to restart with the last operational software load.

Software can be uploaded to the 9215-EO-EM via DashBoard. Refer to your *DashBoard Control System Software User Manual* for further instructions.

---

# Warranty and Repair Policy

## **Cobalt Digital Inc. Limited Warranty**

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

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

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

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

Cobalt Digital Inc. Factory Service Center

2406 E. University Avenue

Urbana, IL 61802 USA

[www.cobaltdigital.com](http://www.cobaltdigital.com)

Office: (217) 344-1243

Fax: (217) 344-1245

Email: [info@cobaltdigital.com](mailto:info@cobaltdigital.com)

THIS LIMITED WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND OF ALL OTHER OBLIGATIONS OR LIABILITIES ON COBALT'S PART. ANY SOFTWARE PROVIDED WITH, OR FOR USE WITH, THE PRODUCT IS PROVIDED "AS IS." THE BUYER OF THE PRODUCT ACKNOWLEDGES THAT NO OTHER REPRESENTATIONS WERE MADE OR RELIED UPON WITH RESPECT TO THE QUALITY AND FUNCTION OF THE GOODS HEREIN SOLD. COBALT PRODUCTS ARE NOT AUTHORIZED FOR USE IN LIFE SUPPORT APPLICATIONS.

COBALT'S LIABILITY, WHETHER IN CONTRACT, TORT, WARRANTY, OR OTHERWISE, IS LIMITED TO THE REPAIR OR REPLACEMENT, AT ITS OPTION, OF ANY DEFECTIVE PRODUCT, AND SHALL IN NO EVENT INCLUDE SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS), EVEN IF IT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.



# Contact Us

---

## Contact Cobalt Digital Inc.

|                           |  |   |
|---------------------------|--|---|
| <b>PHONE</b>              | <b>General Business Office<br/>and Technical Support</b> | 217.344.1243  |
|                           | <b>Fax</b>   | 217.344.1245  |
| <b>E-MAIL</b>             | <b>General Information</b>                               | <u><a href="mailto:Info@cobaltdigital.com">Info@cobaltdigital.com</a></u>   |
|                           | <b>Sales Information</b>                                 | <u><a href="mailto:Sales@cobaltdigital.com">Sales@cobaltdigital.com</a></u> |
| <b>POSTAL<br/>SERVICE</b> | <b>Cobalt Digital Inc.</b>                               | 2406 East University Avenue<br>Urbana, IL 61802 USA                         |

---

## Visit us at the Cobalt Digital Inc. website.

*<http://www.cobaltdigital.com/>*

- Online catalog
  - Related products and full product lines
  - Trade show information
  - Dealer information
  - Cobalt Digital Inc. news
-