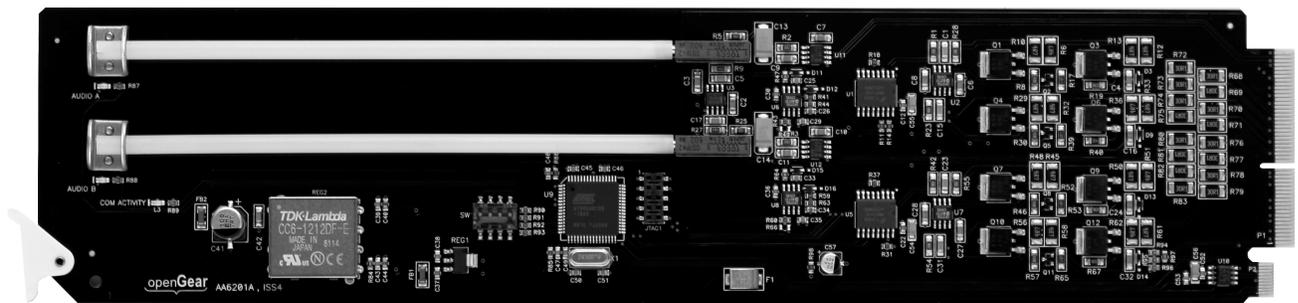


# 9241

## Universal Analog Audio Distribution Amplifier Owner's Manual



Cobalt Part Number: 9241  
V.1.7

## 9241 • Universal Analog Audio Distribution Amplifier

---

### Cobalt Digital Part Number: 9241

- Version 1.7
- Printed in the USA

The information contained in this Owner's Manual is subject to change without notice or obligation.

---

### Copyright

© 2014 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.

---

### 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 a 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 so as to avoid personnel injury and to prevent product damage.

Products may require specific equipment, and /or installation procedures 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 the openGear 8000 series frame. Refer to the openGear 8000 series frame User Manual for important safety instructions regarding the proper installation and safe operation of the frame as well as it's 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 cords 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 within 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 type and rating.

Only use attachments/accessories specified by the manufacturer.

---

## EMC Notices

### **US 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 users will be required to correct the interference at their 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 classe "A" est conforme à 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.

### **Maintenance/User Serviceable Parts**

Routine maintenance to this openGear® product is not required. This product contains no user serviceable parts. If the module 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 openGear 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.

# Introduction

This chapter contains the following sections:

- Overview
- Functional Block Diagram
- Features
- Documentation Terms

## Overview

The 9241 is an analog audio distribution amplifier designed for broadcast use. It can be used as either a mono or two channel (stereo) audio DA. When used as a mono DA it can provide eight copies of the single (mono) input signal or four copies each of the two (stereo) inputs.

The 9241 is housed in the openGear 8310-series (10-slot) or 8321-series (20-slot) frame. If the frame has an optional network controller card installed, the 9241 can be monitored and controlled using the Dashboard remote control software.

## Functional Block Diagram

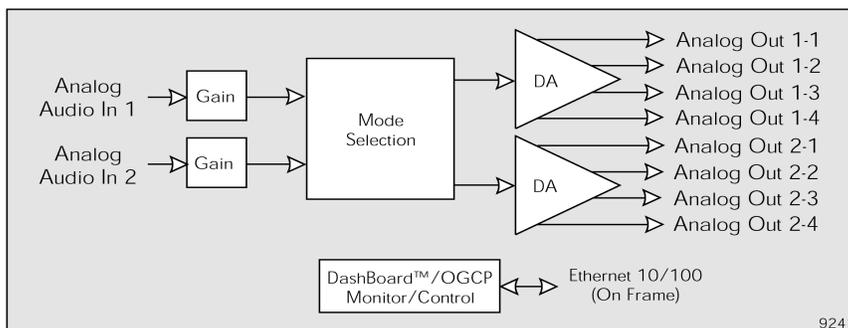


Figure 1. Simplified Block Diagram of the 9241 Functions

## Features

The following features make the 9241 the best solution for analog audio distribution.

- Handles mono or stereo signals
- Has summing capability
- Silence detection
- 5 year warranty
- Fits openGear 8310/8321 series frames

## Documentation Terms

The following terms are used throughout this guide:

- **“Frame”** refers to the 8310 or 8321 frame that houses the **9241** card.
- **“Operator”** and **“User”** refer to the person who uses the **9241**.
- **“Board”**, and **“Card”** refer to the **9241** card itself, including all components and switches.

# Installation and Setup

This chapter contains the following sections:

- Static Discharge
- Unpacking
- Rear Module Options
- Board Installation

## Static Discharge

Whenever handling the 9241 and other related equipment, please observe all static discharge precautions as described in the following 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 wearing synthetic fiber clothing. Always exercise proper grounding precautions when working on circuit boards and related equipment.

## Unpacking

Unpack each 9241 you received from the shipping container, and check the contents against the packing list to ensure that all items are included. If any items are missing or damaged, contact your sales representative or Cobalt Digital Inc. directly.

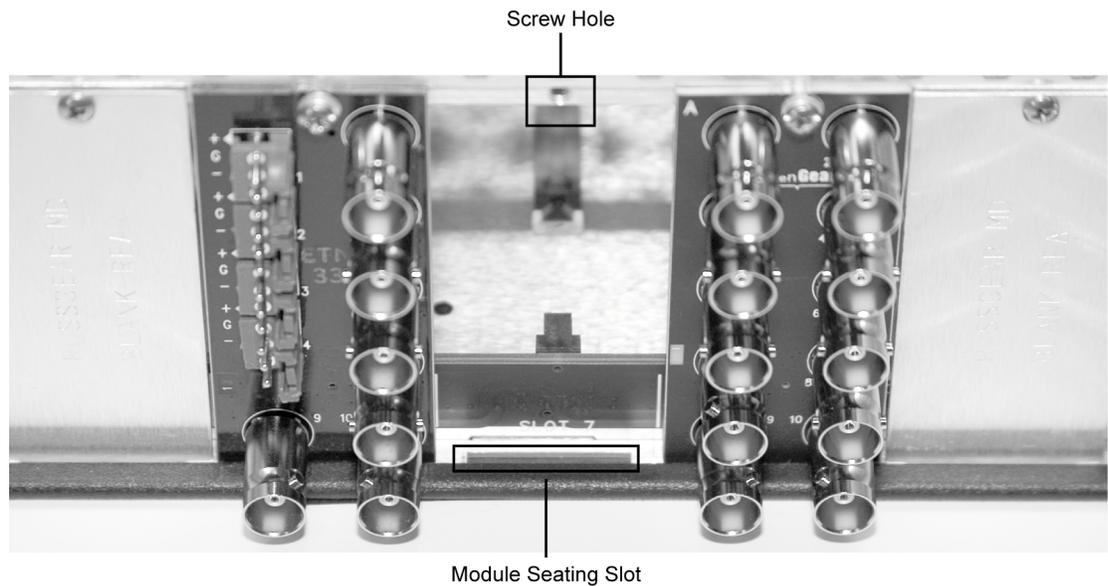
---

## Rear Module Installation (Optional)

If you are installing the card into a slot with no rear module, you should have ordered and received one rear module. You will need to install it in your frame before you can connect cables.

Use the following steps to install a rear module in an openGear frame:

1. Refer to the openGear frame Owner's Manual, to ensure that the frame is properly installed according to instructions.
2. On the rear of the frame, locate the card frame slot.
3. As shown in Figure 2, seat the bottom of the rear module in the seating slot at the base of the frame's back plane.



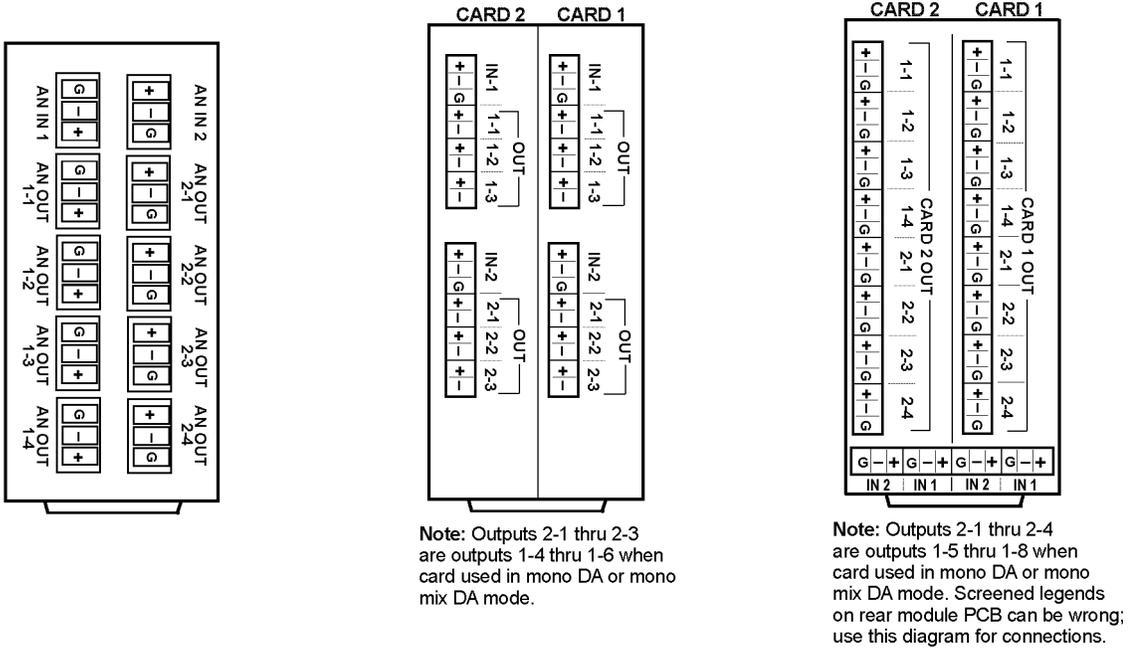
*Figure 2. Rear Module Installation*

4. Align the top hole of the rear module with the screw hole on the top edge of the frame back plane.
5. Using a Phillips driver and the supplied screw, fasten the rear module to the frame back plane. Do not over tighten.

All modules are installed using the same method above.

The following section shows the rear modules available for the 9241.

## Rear Modules



### RM20-9241-B

### RM20-9241-C/S

### RM20-9241-D/S

The rear modules shown below provides the input/output connections shown. Split rear modules provide connections for two cards in adjacent slots using one rear module.

**Note:** Screen legends may not agree with connections shown here. Use the labeling shown here.

**Note:** The RM20-9241-C/S and RM20-9241-D/S rear modules are usable only with the 20-slot frame. RM20-9241-B rear module available for 8310-series (10-slot frame) as part number RM-9241-B.

Figure 3. 9241 Rear Modules

# User Controls

This chapter contains a description of the 9241 user controls:

- LEVEL CONTROLS
- LEDs
- DIP Switch Settings
- Remote Control

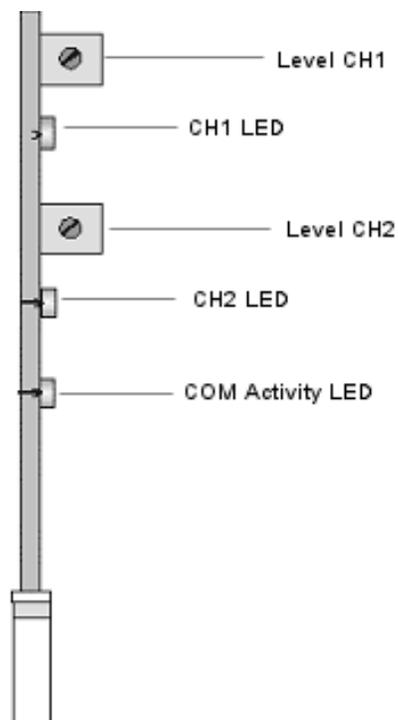


Figure 4. Card-edge User Controls

## Level CH1 and CH2

The level controls are used to adjust the output levels of the 9241. When using the 9241 as a mono DA CH1 level control is used. When using the card as a stereo DA both CH1 and CH2 controls are used. These ten turn potentiometers give precise control of the output signal over a 30 dB range.

## LEDs

The front-edge of the card features LEDs that display the status of the input signals. Descriptions are provided in the following table:

LED	Color	Location	Display and Description
CH1	Green	Top of the card	When illuminated there is a valid analog signal at input CH1.
CH2	Green	Second from the top	When illuminated there is a valid analog signal at input CH2.
COM	Green	Third from the top	When on indicates that communications on the CAN bus is operating properly

*Table 1. Status LED Descriptions*

## DIP Switch Settings

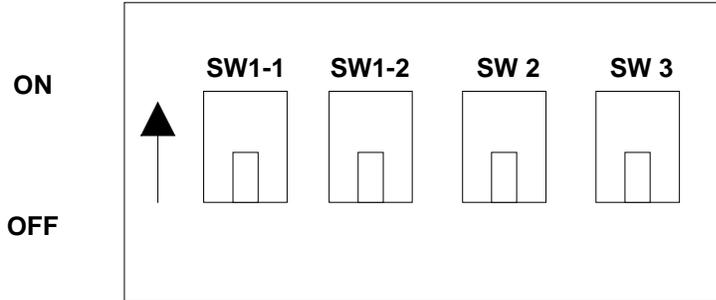


Figure 5. Card-edge User Controls

Switch	Mode		
SW1-1, SW1-2 (Audio mode)	SW1-1	SW1-2	
	OFF	OFF	Stereo DA (Dual 1x4)
	OFF	ON	Mono Mix (Sum CH1 and CH2)
	ON	OFF	Mono DA (CH1 > 1x8)
	ON	ON	Reserved
SW2 (Power-up defaults)	ON		Get card parameters from non volatile memory, ignore dip switch settings. (Configurable with DashBoard Control system)
	OFF		Get card parameters from the DIP switch
SW3 (Card edge control enable)	ON		Card edge control <b>enabled</b> . DashBoard control <b>disabled</b> . Only card status is available on Dashboard. Users are prevented from changing parameters using Dashboard.
	OFF		Card edge control <b>disabled</b> . DashBoard control <b>enabled</b> . Full, normal DashBoard access and control of all card controls and parameters.

# REMOTE CONTROL

## DashBoard Control

This card may be monitored or controlled by a remote computer through DashBoard the free configuration monitoring software available to openGear users.

With DashBoard installed on your computer the following menus are available when interrogating an 9241 card:

MENU	ITEM	DISPLAY	DESCRIPTION
Card Info (Read Only)	Product	9241	Product identification code
	Name	Analog Audio Distribution Amplifier	Product functional description
	Supplier	Cobalt Digital Inc.	Manufacturer of the card
	Software Rev.	##	Two digit software revision code
	Web site	www.cobaltdigital.com	Manufacturer's web address

MENU	ITEM	DISPLAY	DESCRIPTION
Card Status (Read Only)	Card Status	Green Dot - OK	Card is functioning properly and appropriate signals are connected
		Red Dot - Silence Detected (CH1, CH2 or both)	Audio signal is not present
	Input CH1	Audio detected	Audio signal is present
		Silence detected	Audio signal is not present
	Input CH2	Audio detected	Audio signal is present
		Silence detected	Audio signal is not present

MENU	ITEM	DROP DOWN SELECTION	DESCRIPTION
Card Settings (Drop down selection)	Mode	Stereo DA (Dual 1 x 4)	Functions as a stereo DA Signals must be connected to both inputs
		Mono Mix ((CH1 + CH2)/2)	Functions as a summing DA Signals must be connected to both inputs
		Mono DA (CH1 → 1 x 8)	Functions as a mono DA Input signal connected to CH1

<b>MENU</b>	<b>ITEM</b>	<b>DROP DOWN SELECTION</b>	<b>DESCRIPTION</b>
Card Settings (Drop down selection)	Silence Detection Time Interval	Range from OFF to 45 seconds in 5 second intervals	Sets the time interval allowed for no signal present or signal below threshold before alarm is activated  The default is off ie. as soon as signal falls below threshold alarm is set
	Silence Detection Threshold (dBu)	Range from – 20 to -60 dBu in 5 dBu increments	Sets the threshold below which the signal is considered lost.  The default is -45 dBu

**NOTE:**

Once the card settings are set click the SAVE button to save the set-up for that card.

# Specifications

## Technical Specifications

### INPUT

Input Impedance	Greater than 20K $\Omega$ balanced
Common Mode Rejection	Greater than 80dB, 20Hz to 20kHz
Maximum Input Level	+27.5 dBu

### PERFORMANCE

Gain	-14dB to +18dB continuously variable
Frequency Response	$\pm 0.1$ dB from 20Hz to 20kHz
Noise	Better than -95 dBu, 20Hz to 20kHz at unity gain
Harmonic Distortion	Less than 0.01%

### OUTPUT

Maximum Output Level	+26 dBu
Output Impedance	60 $\Omega$ balanced
Output Isolation	Greater than 60dB

### GENERAL

Power Requirements	+12 V, 215 mA idling
Dimensions	3.025" high x 12.800" deep
Weight	approx. 0.115 kg (0.252 lbs)

*Cobalt Digital Inc. reserves the right to change performance specifications without prior notice.*

# Warranty and Service Information

## 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.

### ***In Case of Problems***

Should any problem arise with your openGear 9241, please contact the Cobalt Digital Technical Support Department. (Contact information is supplied at the end of this publication.)

A Return Material Authorization number (RMA) will be issued to you, as well as specific shipping instructions, should you wish our factory to repair your openGear 9241. If required, a temporary replacement module will be made available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Cobalt Digital Inc. will be shipped collect.

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

# Ordering Information

## ***Standard Equipment***

- **9241** Universal Analog Audio Distribution Amplifier

## ***Optional Equipment***

- **9241-OM** Universal Analog Audio Distribution Amplifier Owner's Manual (additional User Manual)
- **RM-9241-B Rear Module** (for installation into 8310-C frame) (Standard Width) 2 Differential Analog Audio In, 8 Differential Analog Audio Outs
- **RM20-9241-B Rear Module** 20-Slot Frame Rear I/O Module (Standard Width) 2 Differential Analog Audio In, 8 Differential Analog Audio Outs
- **RM20-9241-C/S Rear Module** 20-Slot Frame Rear I/O Module (Split) Dual 1x3 Differential Analog Audio In/Out (connections are per card)
- **RM20-9241-D/S Rear Module** 20-Slot Frame Rear I/O Module (Split) Dual 1x4 Differential Analog Audio In/Out (connections are per card)

Your **9241** Distribution Amplifier is a part of the openGear family of products. Cobalt Digital offers a full line of openGear terminal equipment including distribution, conversion, monitoring, muxing, demuxing and processing of AES/EBU and HD/SD-SDI as well as analog audio and video products.

# Contact Us

Contact our friendly and professional support representatives for the following:

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

<b>PHONE</b>	<b>General Business Office and Technical Support</b>	217 • 344 • 1243
	<b>Fax</b>	217 • 344 • 1245
<b>E-MAIL</b>	<b>General Information</b>	sales@cobaltdigital.com
	<b>Technical Support</b>	support@cobaltdigital.com
<b>POSTAL SERVICE</b>	<b>Cobalt Digital Inc.</b>	2406 E. University Ave. Urbana, IL 61802

# Visit Us

Please visit us at our website for:

- Company information
- Related products and full product lines
- On-line catalog
- Trade show information
- News

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