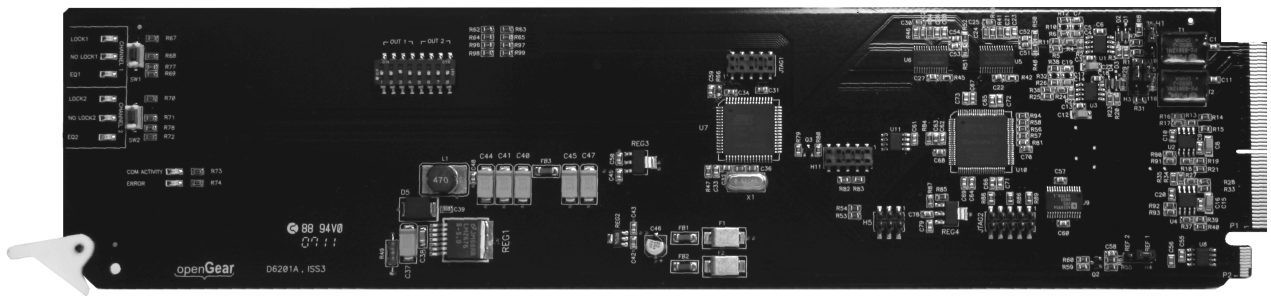


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# 9253

## Dual 1 x 4 AES/EBU Distribution Amplifier-75 Ohm with SRC User Manual



CDI Part number: 9253  
V1.3

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## 9253 • Dual 1 x 4 AES/EBU Distribution Amplifier-75 Ohm with SRC, User Manual

- Cobalt Digital Part Number: 9253
- Document Version: 1.3 (Apr 2021)
- Printed in the USA.

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

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## 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.

### 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**

Refer to the frame 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.

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### 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**

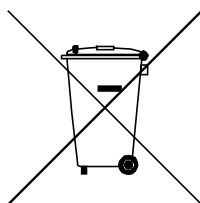
Routine maintenance to this product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. This product is covered 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 9253 is a Dual AES/EBU distribution amplifier designed for broadcast use. It can provide four copies of each incoming signal. It may also be used to provide up to eight outputs that are sample rate converted.

The 9253 supports audio sampling frequencies from 30kHz to 192 kHz. Cable equalization and reclocking techniques enable the 9253 to recover the incoming digital audio signal reliably.

The 9253 is housed in the HPF-9000 or similar 20-slot frames.

## Functional Block Diagram

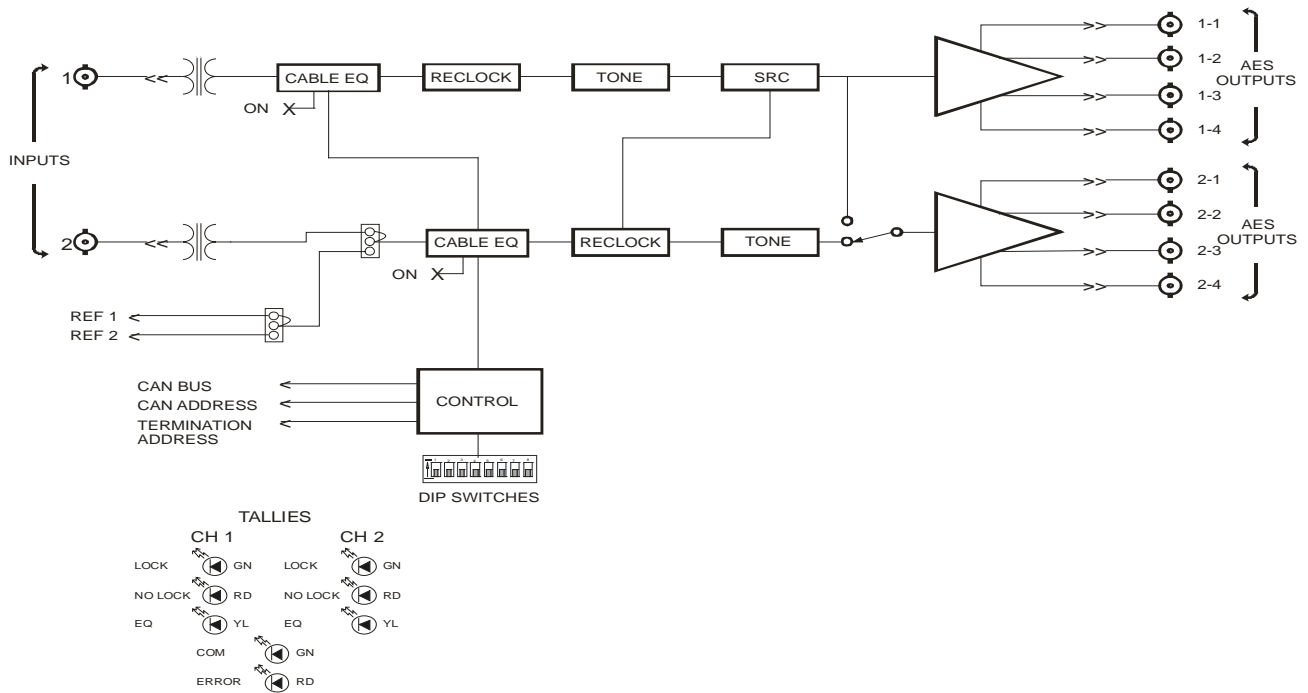


Figure 1. Simplified Block Diagram of the 9253 Functions

## Features

The following features make the 9253 the best solution for digital audio distribution.

- Cable equalization and data reclocking on the incoming AES/EBU signal
- Supports audio sampling frequencies from 30kHz to 192 kHz
- 5 year warranty
- Fits HPF-9000 and similar series 20-slot frames

## Documentation Terms

The following terms are used throughout this guide:

- **“Frame”** refers to the **HPF-9000** or similar 20-slot frame that houses the **9253** card.
- **“Operator”** and **“User”** refer to the person who uses the **9253**.
- **“Board”**, and **“Card”** refer to the **9253** 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 9253 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 9253 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.



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## Rear Module Installation

If you are installing the card into a slot with no rear module, you should have ordered and received an appropriate 9253 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 the frame:

1. On the rear of the frame, locate the card frame slot.
2. 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.

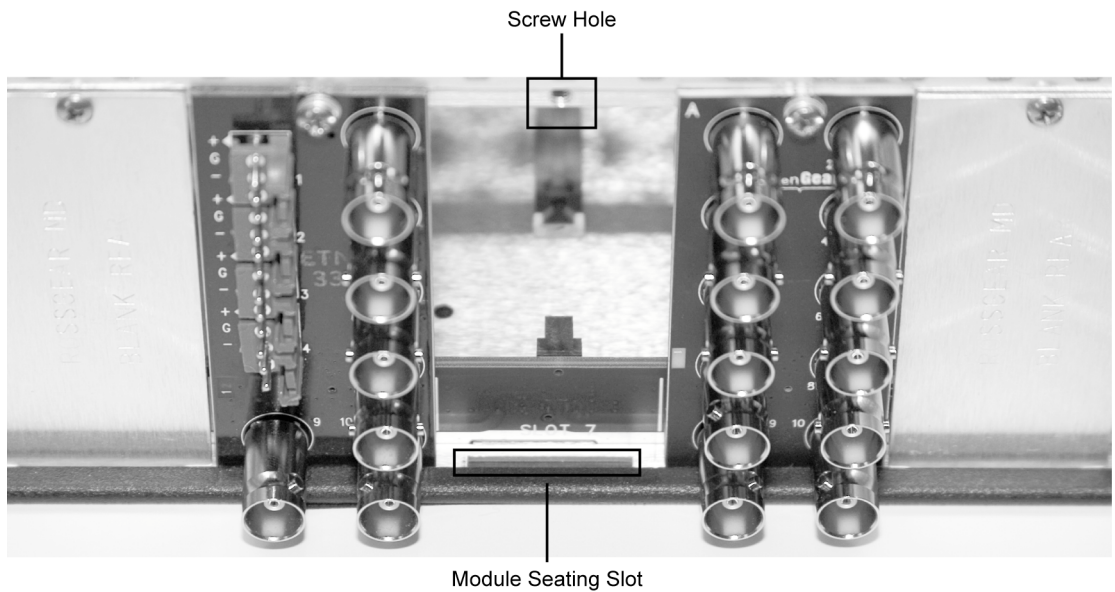


Figure 2. Rear Module Installation

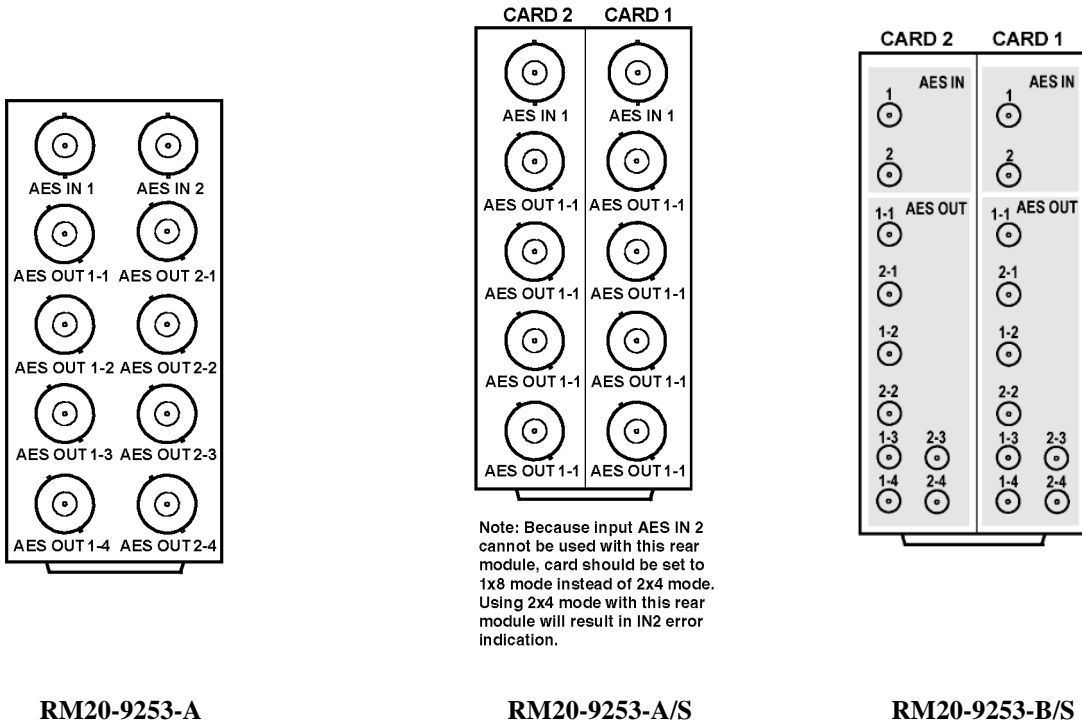
3. Align the top hole of the RM-9253-A with the screw hole on the top edge of the frame back plane.
4. Using a Phillips driver and the supplied screw, fasten the rear module to the frame back plane. Do not over tighten.

All modules are installed using the same method above.

The following section contains a drawing of the RM-9253-A module.

## Rear Module Options


All connections are 75 Ohms. Rear module RM20-9253-A uses BNC type connectors. Rear modules RM20-9253-A/S, RM20-9253-B/S-DIN and RM20-9253-B/S-HDBNC are “split” rear modules that accommodate 2 cards per rear module in adjacent slots. The –B/S module is available with DIN 1.0/2.3 or HD-BNC connectors.



RM20-9253-A

RM20-9253-A/S

RM20-9253-B/S



**COBALT**

RM20-9001-B/S-DIN

\*\*SAMPLE-NOT FOR USE\*\*

Due to the density of connector placement on Rear Modules using high-density connectors (e.g., RM20-9001-B/S-DIN), these modules use a QR barcode label instead a regular label. Simply scan the image with a smart phone and a link to the rear module label (as shown in our catalog) will appear. (Smart phone must have a QR reader app such as QuickMark QR Code Reader or equivalent.)

Not all devices may be able to acquire the image. If this occurs, use the device to access the web page for card/rear module to view the diagram.

Figure 2. 9253 Rear Modules

## Board Installation

Use the following procedure to install the 9253 in a frame.

1. Refer to the frame User Manual to ensure that the frame is properly installed according to instructions.
2. After selecting the desired frame installation slot, hold the 9253 card by the edges and carefully align the card edges with the slots in the frame. Then fully insert the card into the frame until the rear connection plugs are properly seated on the midplane and rear module.

This completes the procedure for installing the 9253 in the frame.

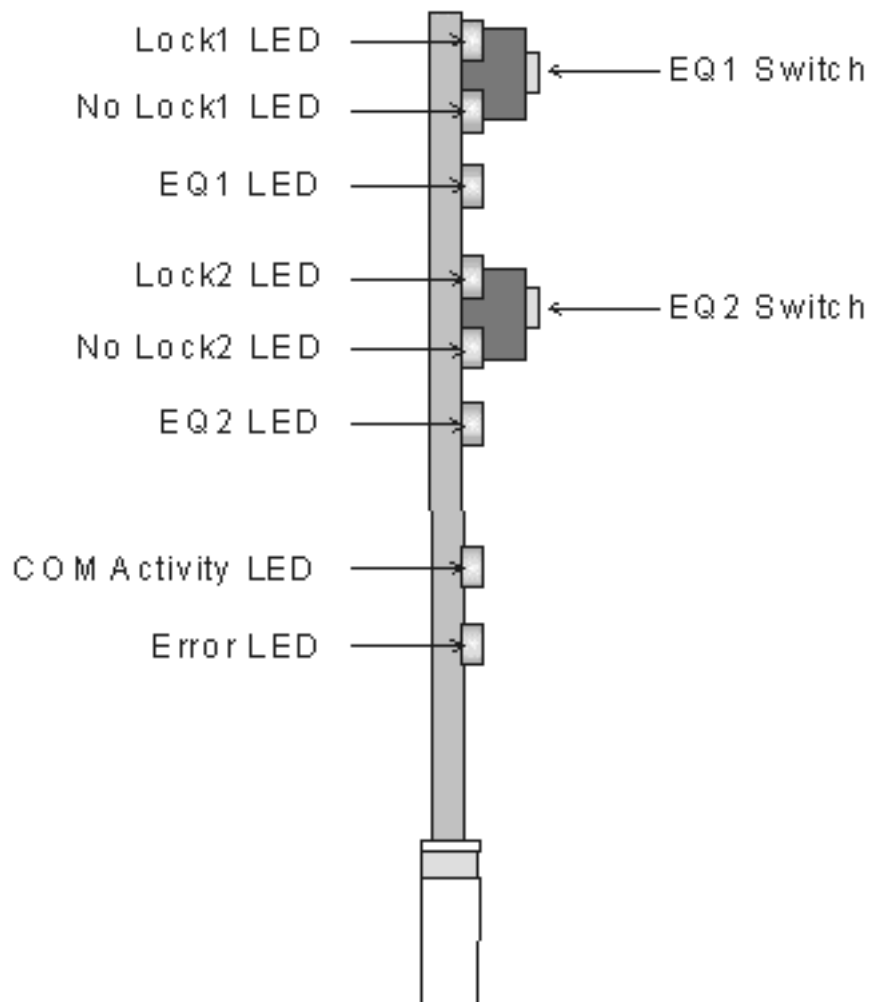
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# User Controls

This chapter contains a description of the 9253 user controls:

- EQ Switch
- LEDs
- DIP Switch Settings
- Remote Control

## User Controls



**Figure 3. Card-edge User Controls**

## EQ Switch — SW1 and SW2

The **EQ Switches (SW1 and SW2)** are used to insert the cable equalizer into the incoming AES/EBU signal. The 9253 can recover digital audio signals conforming to AES/EBU specifications and transmitted over 75ohm, coaxial cable, up to 600 metres (2000 ft) long without equalization. For cable lengths in excess of 600 metres, we recommend that the input equalization be activated. Note that switching the EQ in and out can cause audible artefacts.

- Pressing the EQ Switches SW1 or SW2 will activate the appropriate yellow EQ LED to indicate this feature is activated.
- While the EQ Switches SW1 or SW2 are activated pressing it again will disable the EQ and the yellow EQ LED will go off.

## LEDs


The front-edge of the card features LEDs that display the status of the input signals.

As selections are made in the menus, (refer the subsequent chapter for complete menu descriptions), the LEDs display the status of the input signals. Descriptions are provided in the following table:

LED	Color	Location	Display and Description
Lock 1	Green	Top of the card	When illuminated there is a valid AES/EBU signal at the input of AES1.
No Lock 1	Red	Second from the top	When illuminated a valid AES/EBU signal is not present at the input of AES 1
EQ 1	Yellow	Third from the top	When illuminated this indicates that the cable EQ for AES 1 has been inserted by pressing SW1 or that feature has been enabled through Dashboard.
Lock 2	Green	Fourth from the top	When illuminated there is a valid AES/EBU signal at the input of AES 2.
No Lock 2	Red	Fifth from the top	When illuminated a valid AES/EBU signal is not present at the input of AES 2.
EQ 2	Yellow	Sixth from the top	When illuminated this indicates that the cable EQ for AES 2 has been inserted by pressing SW2 or that feature has been enabled through Dashboard.
Com Activity	Green	Seventh from the top	When illuminated this indicates that the 9253 is communicating to Dashboard through the CAN bus.
Error	Red	Eighth from the top	When illuminated this indicates that there is an error in the communications to Dashboard through the CAN bus.

Table 1. Status LED Descriptions

# DIP Switch Settings

<b>SW1/2 – Mode</b>	1x8	1 2 3 4 5 6 7 8	On ↑		1 2 3 4 5 6 7 8
	Dual 1x4	●●○○○○			○○○○○○○○
	1x8 w/ SRC	●○○○○○○			○○○○○○○○
	(not used)	○○○○○○○○			○○○○○○○○
		○○○○○○○○			○○○○○○○○
<hr/>					
<b>SW3 – Tone AES 1</b>	Enable AES 1 tone gen	1 2 3 4 5 6 7 8	○○○●○○○○		○○○○○○○○
	Disable AES 1 tone gen	1 2 3 4 5 6 7 8	○○○●○○○○		○○○○○○○○
<hr/>					
<b>SW4 – Tone AES 2</b>	Enable AES 2 tone gen	1 2 3 4 5 6 7 8	○○○○●○○○		○○○○○○○○
	Disable AES 2 tone gen	1 2 3 4 5 6 7 8	○○○○●○○○		○○○○○○○○
<hr/>					
<b>SW5/6 – Reserved</b>					
<hr/>					
<b>SW7 – Default Power-Up State</b>					
Get parameters from non-volatile memory, ignore DIP switch settings (configurable w/ DashBoard)		1 2 3 4 5 6 7 8	○○○○○○○●○○		○○○○○○○○
Get parameters from DIP switch		1 2 3 4 5 6 7 8	○○○○○○○○●○		○○○○○○○○
<hr/>					
<b>SW8 – DashBoard Enable</b>					
Display only card parameters – users are prevented from changing parameters		1 2 3 4 5 6 7 8	○○○○○○○○●○		○○○○○○○○
Normal remote control operation – users have full access to parameters		1 2 3 4 5 6 7 8	○○○○○○○○●○		○○○○○○○○

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# 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.

MENU	ITEM	DISPLAY	DESCRIPTION
Card Info (Read Only)	Product	9253	Product identification code
	Name	Dual Unbalanced AES Distribution Amplifier	Product functional description
	Supplier	Cobalt Digital Inc.	Manufacturer of the card
	Software Rev.	##	Three digit software revision code
	Web site	<a href="http://www.cobaltdigital.com">www.cobaltdigital.com</a>	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 – No AES signal detected	AES signal is not present at either input
	AES Input 1	Locked	AES signal is present
		Unlocked	AES signal is not present
	AES Input 2	Locked	AES signal is present
		Unlocked	AES signal is not present

MENU	ITEM	BUTTON SELECTION	DESCRIPTION
Card Settings (Button selection)	Mode	1 x 8	Functions as a 1 in 8 out AES DA
		1 x 4	Functions as dual 1 in 4out AES DA
		1 x 8 w/SRC	Functions as a 1 in 8 out AES DA with Sample Rate Conversion. <b>Note:</b> A sampling signal source must be connected to AES input 2 or derived from frame reference. Card jumpers set the card for the desired source. See Sampling Signal Source Select Jumpers on next page.

## AES INPUT 1

MENU	ITEM	BUTTON SELECTION	DESCRIPTION
Card Settings (Button selection)	Equalizer	Enabled	Equalizer is on to assist in recovering signals over long cable runs
		Disabled	Cable equalizer is turned off
	Tone Generator	Enabled	Tone generator for AES 1 turned on
		Disabled	Tone generator for AES 1 turned off

## AES INPUT 2

MENU	ITEM	BUTTON SELECTION	DESCRIPTION
Card Settings (Button selection)	Equalizer	Enabled	Equalizer is on to assist in recovering signals over long cable runs
		Disabled	Cable equalizer is turned off
	Tone Generator	Enabled	Tone generator for AES 2 turned on
		Disabled	Tone generator for AES 2 turned off

## Sampling Signal Source Select Jumpers

The following jumpers set the card sampling signal source to use either **AES Input 2**, or one of the frame references (**REF 1** or **REF 2**). Set the jumpers as follows:

- **To use AES Input 2:** Near upper rear of card, locate jumper near H3 and R29. **Install jumper on pins 1-2.**
- **To use Frame Reference:** Near upper rear of card, locate jumper near H3 and R29. **Install jumper on pins 2-3.**
  - **To use REF1:** Locate jumper on lower rear of card near H4. **Install jumper on pins 2-3.**
  - **To use REF2:** Locate jumper on lower rear of card near H4. **Install jumper on pins 1-2.**



# Specifications

## Technical Specifications

### DIGITAL INPUT

Resolution	24 Bit
Input Level	0.2-7 Vp-p
Input Impedance (transformer balanced)	75Ω, 110 Ω, HiZ
Sampling Frequency Range	30 kHz to 192 kHz

### DIGITAL OUTPUT

Resolution	24 Bit
Output Level	1 V p-p nominal
Output Impedance	75Ω unbalanced
Sampling Frequency Range	30 kHz to 192 kHz
Jitter	Less than 5 ns

### GENERAL

Power Requirements	+12 V, 4Watts, MAX
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.*

## Cobalt Digital Inc. Limited Warranty

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

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

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

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

Cobalt Digital Inc. Factory Service Center

2506 Galen Drive

Champaign, IL 61821 USA

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

Office: (217) 344-1243

Fax: (217) 344-1245

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

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# Ordering Information

## ***Standard Equipment***

- **9253** AES/EBU Distribution Amplifier 75 Ohm

## ***Optional Equipment***

- **RM20-9253-A** 20-Slot Frame Rear I/O Module (Standard Width) 2 AES Input BNCs, 8 AES Output BNCs
- **RM20-9253-A** 20-Slot Frame Rear I/O Module (Standard Width) 2 AES Input BNCs, 8 AES Output BNCs
- **RM20-9253-A/S** 20-Slot Frame Rear I/O Module (Split) AES IN 1 Input BNC, 4 AES DA Output BNCs (connections are per card)
- **RM20-9253-B/S-HDBNC** 20-Slot Frame Rear I/O Module (Split, High Density) 2 AES Input BNCs, 8 AES Output BNCs (connections are per card; all connectors HD-BNC)
- **RM20-9253-B/S-DIN** 20-Slot Frame Rear I/O Module (Split, High Density) 2 AES Input BNCs, 8 AES Output BNCs (connections are per card; all connectors DIN1.0/2.3)
- **HPF-9000-CN** High-Power 20-Slot Frame; 2RU with fans, cover plates for unused slots. Includes one PSU-9000 Power Supply Module and MFC-8320-N Network Controller Card.
- **oGx** 20-Slot Frame and Power Supply with Cooling Fans (2RU, holds 20 cards maximum)

# 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>	<a href="mailto:request@cobaltdigital.com">request@cobaltdigital.com</a>
	<b>Technical Support</b>	<a href="mailto:request@cobaltdigital.com">request@cobaltdigital.com</a>
<b>POSTAL SERVICE</b>	<b>Cobalt Digital Inc.</b>	2506 Galen Drive Champaign, IL 61821 USA

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