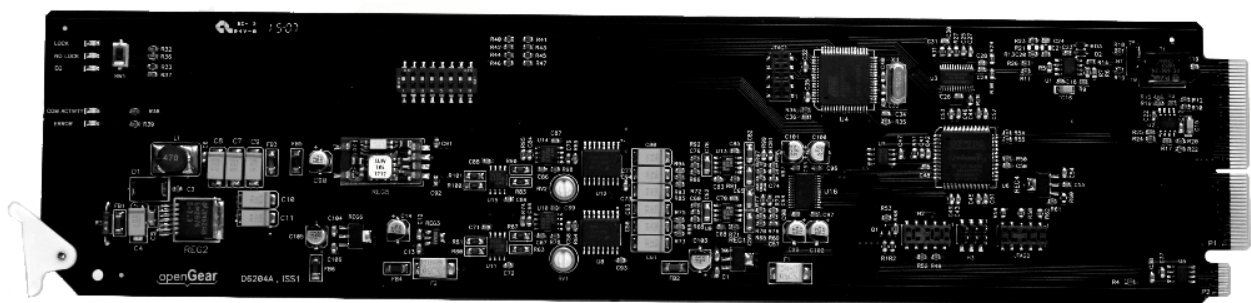


9262

AES/EBU Digital to Analog Audio Converter – 75 Ohm User Manual



CDI Part Number: 9262
V.1.2

9262 • AES/EBU Digital to Analog Audio Converter 75 Ohm User Manual

- Cobalt Digital Part Number: 9262
- Document Version: 1.2
- Printed in the United States.

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

Copyright


© 2012 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

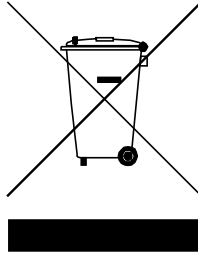
Routine maintenance to this openGear® product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All openGear® 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 9262 is an AES/EBU digital to analog audio converter designed for broadcast use. It provides digital to analog audio conversion along with AES/EBU signal distribution.

The 9262 supports audio sampling frequencies from 30kHz to 192 kHz. It converts the incoming AES/EBU digital audio signal to a stereo analog audio signal using 24 bit conversion technology.

Cable equalization and reclocking techniques enable the 9262 to recover the incoming digital audio signal reliably.

The 9262 is designed for use in the openGear[®] 8320 or equivalent 20-slot series frames.

Functional Block Diagram

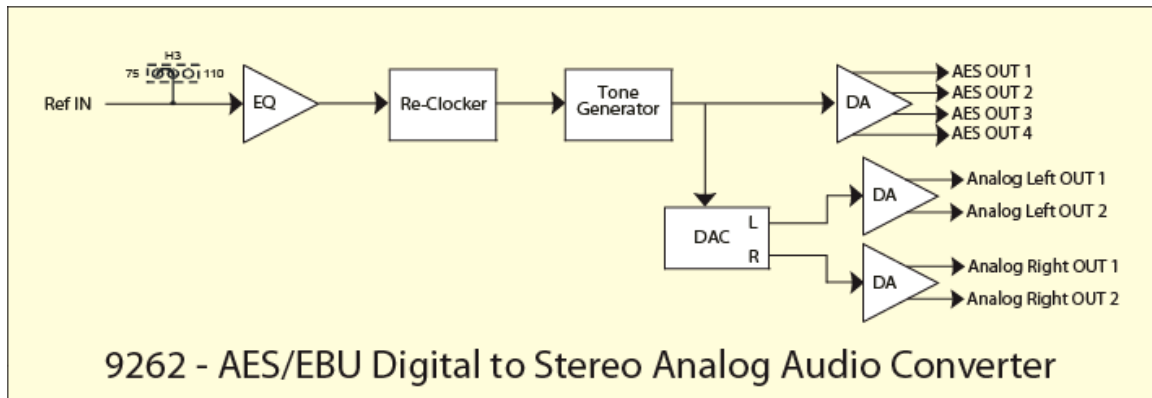


Figure 1. Simplified Block Diagram of the 9262 Functions

Features

The following features make the 9262 the best solution for digital to analog audio conversion.

- Converts AES/EBU digital to analog audio while providing AES/EBU signal distribution
- Cable equalization and data reclocking on the incoming AES/EBU signal
- 24 bit technology provides the highest quality signal conversion
- Supports audio sampling frequencies from 30kHz to 192 kHz
- 5 year warranty
- Fits openGear[®] 8320 series or equivalent 20-slot frames

Documentation Terms

The following terms are used throughout this guide:

- **“Frame”** refers to the **frame-C** frame that houses the **9262** card.
- **“Operator”** and **“User”** refer to the person who uses the **9262**.
- **“Board”**, and **“Card”** refer to the **9262** 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 9262 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 9262 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

If you are installing the card into a slot with no rear module, you should have ordered and received one of the RM-9262-B 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 a 20-slot frame:

1. Refer to the 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.

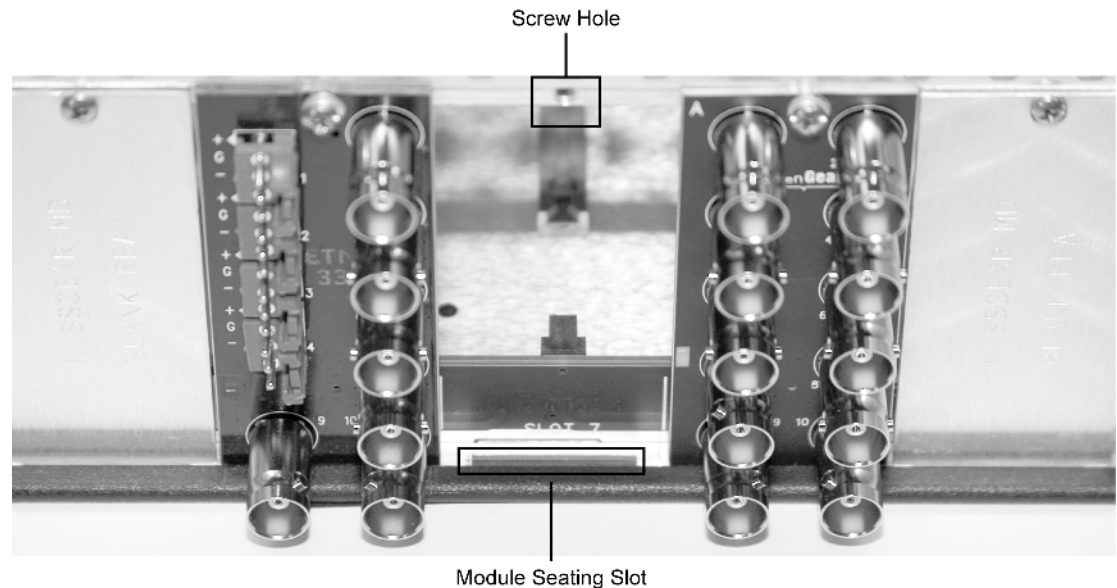


Figure 2. Rear Module Installation

4. Align the top hole of the RM-9262-B 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.

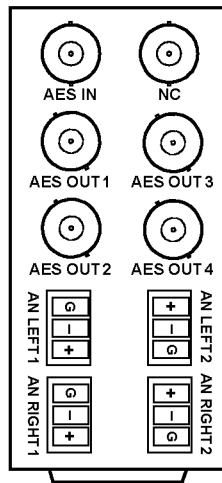
All modules are installed using the same method above.

The following section contains a drawing of the RM-9262-B module.

Rear Module Options

This section provides instructions for connecting cables to the installed BNC rear modules on the frame backplane. Connect the input and output cables according to the following diagram. The input is internally terminated with 75 ohms. It is not necessary to terminate unused outputs. Split rear module RM20-9262-B/S allows two cards to be installed in adjacent slots.

RM20-9262-B



RM20-9262-B/S

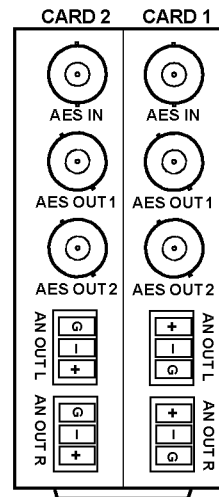


Figure 2. Rear Modules

User Controls

This chapter contains a description of the 9262 user controls:

- EQ Switch
- LEDs
- DIP Switch Settings

User Controls

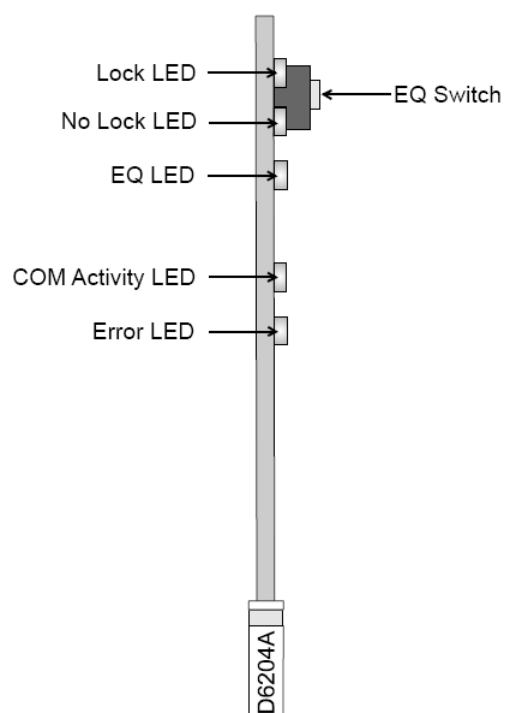


Figure 3. Card-edge User Controls

EQ Switch — SW1

The **EQ Switch (SW1)** is used to insert the cable equalizer into the incoming AES/EBU signal. The 9262 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 Switch SW1 will activate the yellow EQ LED to indicate this feature is activated.
- While the EQ Switch SW1 is 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	Green	Top of the card	When on there is a valid AES/EBU signal at the input.
No Lock	Red	Second from the top	When on a valid AES/EBU signal is not present
EQ	Yellow	Third from the top	When on this indicates that the cable EQ has been inserted by pressing SW1 or that feature has been enabled through Dashboard.
Com Activity	Green	Fourth from the top	When on this indicates that the 9262 is communicating to Dashboard through the CAN bus.
Error	Red	Fifth from the top	When on this indicates that there is an error in the communications to Dashboard through the CAN bus.

Table 1. Status LED Descriptions

DIP switch settings



Figure 4. DIP Switch

Table 1 Analog Output Level

	SW 1-1	SW 1-2	
1	ON	ON	Mute
2	ON	OFF	-12dBFS/+4dBu
3	OFF	ON	-18dBFS/+4dBu
4	OFF	OFF	-20dBFS/+4dBu

SW3 Tone Generator

'ON' – Generates -20dBFS line up tone. This feature requires an input signal for reference. The tone is 1Khz when input sample rate is 48K, 2KHz at 96K and 4KHz at 192 K.

'OFF' – Normal operation.

SW7 Default (power up default parameter settings)

'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.

SW8 Dashboard Enable

'ON' – Only card status is available on Dashboard, users are prevented from changing parameters.

'OFF' – Normal operation, users have full access to the cards parameters.

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

ANALOG (fs=48 kHz, 0 dBFS = +24 dBu)

Maximum Output Level	+24 dBu
Frequency Response	+/-0.2 dB, 20 Hz to 20 kHz
Noise(un-weighted)	84 dBu ,20 Hz to 20 kHz
THD+N	< 0.01%
Stereo Separation	100 dB, 20 Hz to 20 kHz
Output Impedance	60Ω Balanced

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.

Warranty and Repair Policy

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

Office: (217) 344-1243

Urbana, IL 61802 USA

Fax: (217) 344-1245

www.cobaltdigital.com

Email: 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 9262, 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 9262. 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, beyond the warranty period without charge, for the life of the equipment.

Ordering Information

Standard Equipment

- **9262** AES/EBU Digital to Analog Audio Converter 75 Ohm

Optional Equipment

- **9262OM** AES/EBU Digital to Analog Audio Converter 75 Ohm Owner's Manual (additional Owner's Manual)
- **RM-9262-B Standard-Width Rear Module** (20-Slot Frame Rear I/O Module (Standard Width) 1 AES Input BNC, 4 AES Reclocked Output BNCs, 4 Analog Audio Outputs)
- **RM-9262-B/S Split Rear Module** (20-Slot Frame Rear I/O Module (Split) Dual AES Input, 2 AES Outputs per card, 2 Analog Outputs (Stereo Pair) per card)

Your **9262** Digital to Analog Audio Converter is a part of the openGear® family of products. Cobalt Digital offers a full line of 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 Cobalt Digital Inc.

PHONE	General Business Office and Technical Support	217.344.1243
	Fax	217.344.1245
E-MAIL	Sales Information	Sales@cobaltdigital.com
	Support Information	Support@cobaltdigital.com
POSTAL SERVICE	Cobalt Digital Inc.	2406 East University Avenue 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