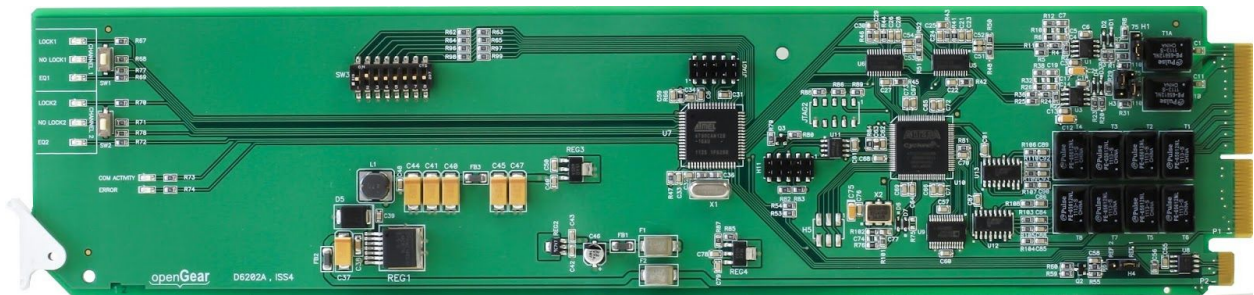


# D6202B

OPENGear DUAL 1 X 4 AES/EBU DISTRIBUTION AMPLIFIER - 110  
OHM WITH SRC

## User Manual



by Ward-Beck Systems

Rev:Jan.01 2015

## Ward-Beck Part Number: D6202B

- Document Issue: 1
- Printed in Canada

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

## Copyright

©2015 Ward-Beck Systems Ltd. All rights reserved.

Contents of this publication may not be reproduced in any form without the written permission of Ward-Beck Systems Ltd. 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 Ward-Beck Systems Ltd. Ward-Beck Systems Ltd. assumes no responsibility or liability for errors or inaccuracies that may appear in this manual.

## Trademark



is a registered trademark of Ross Video Limited.



is a registered trademark of Ward-Beck Systems Ltd.

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.

### Symbols 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 Ward-Beck Systems Ltd. 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

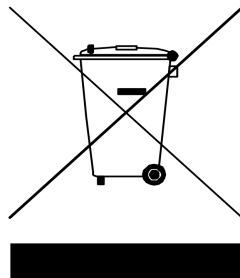
Routine maintenance to this openGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All openGear products 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, Ward-Beck Systems Ltd. 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

## Overview

The D6202B is a Dual AES/EBU distribution amplifier designed for broadcast use. It can provide four copies of each incoming signal when used with a T6303A rear assembly. It may also be used to provide up to eight outputs that are sample rate converted. When used with the T6403A up to twenty 1 x 4 AES DA's with SRC can be provided in a single two rack unit frame. The D6202B supports audio sampling frequencies from 30kHz to 192 kHz. Cable equalization and reclocking techniques enable the D6202B to recover the incoming digital audio signal reliably. The D6202B is housed in the openGear OG3-FR-C series frames.

## Functional Block Diagram

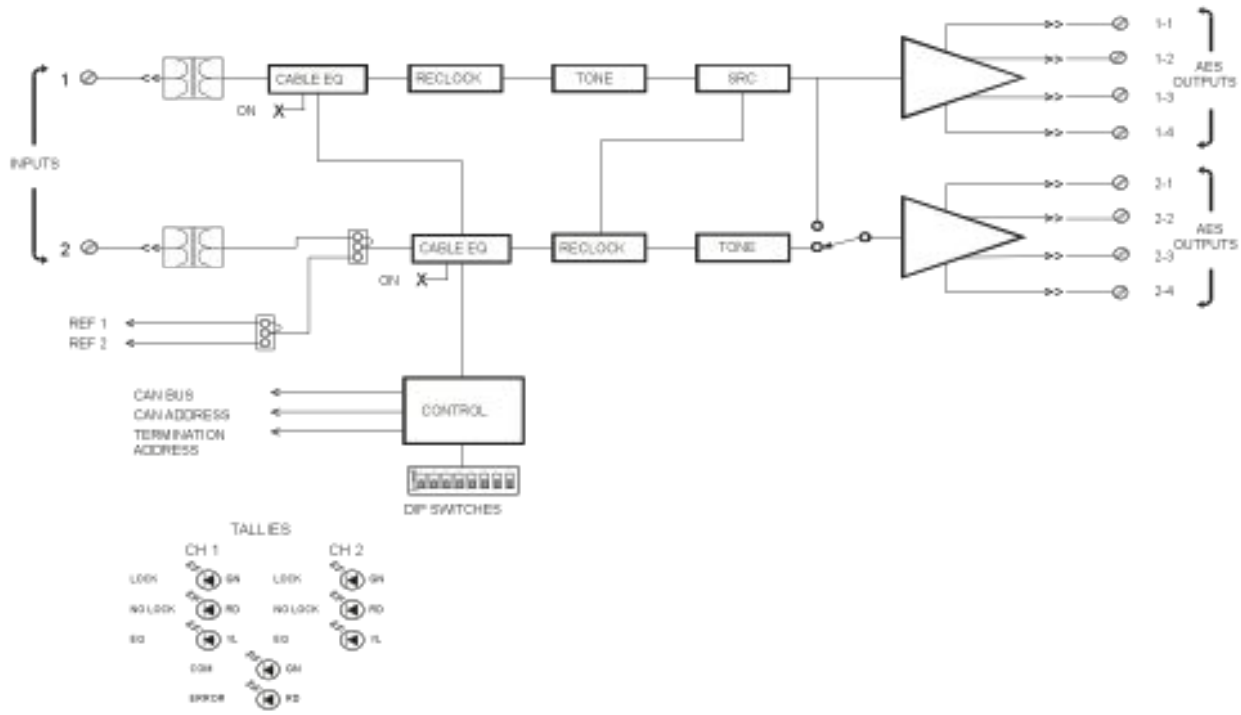


Figure 1. Simplified Block Diagram of the D6202B Functions

## Features

The following features make the D6202B 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
- Provides sample rate conversion
- Higher density with up to 20 cards with SRC in a OG3-FR-C frame
- 5 year warranty
- Fits openGear OG3-FR-C series frames

## Documentation Terms

The following terms are used throughout this guide:

- “**Frame**” refers to the **OG3-FR-C** frame that houses the **D6202B** card.
- “**Operator**” and “**User**” refer to the person who uses the **D6202B**.
- “**Board**”, and “**Card**” refer to the **D6202B** card itself, including all components and switches.

# Installation and Setup

## Static Discharge

Whenever handling the D6202B and other related equipment, please observe all static discharge precautions as described in the following note:



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 D6202B 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 Ward-Beck Systems Ltd. directly.

## Rear Module Options

There are two rear module options available for the D6202B AES/EBU distribution amplifier.

On the 20-slot **OG3-FR-C** frame, the T6303A rear module occupies two slots and provides I/O for one D6202B card. For higher density applications the T6403A rear module occupies two slots and provides I/O for two D6202B cards. All connections are 110 Ohms and are made on Phoenix™ pluggable screw terminal type connectors

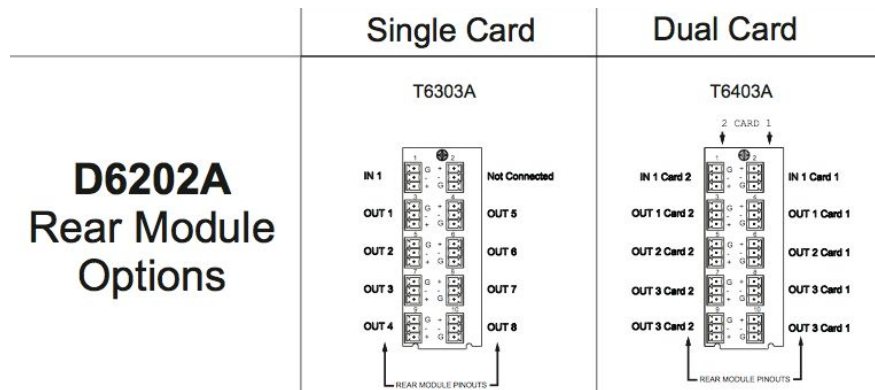


Figure 2. Rear Module Terminations

## Board Installation

Use the following procedure to install the D6202B in an openGear OG3-FR-C Series frame.

1. Refer to the User Manual of the openGear OG3-FR-C series frame to ensure that the frame is properly installed according to instructions.
2. When using the D6202B with the T6303A for maximum I/O please note that the even numbered slots are to be used. Plug the D6202B modules into slots 2,4,6,8,10,12,14,16,18, and 20 for a maximum of 10 cards. Slot 1 is the left most slot as you look into the frame from the front.
3. When using the D6202B with the T6403A for maximum density you may insert the card into any slot for up to 20 cards per frame.
4. After selecting the desired frame installation slot, hold the D6202B 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 D6202B in an openGear OG3-FR-C Series frame.



## User Controls

### User Control Diagram

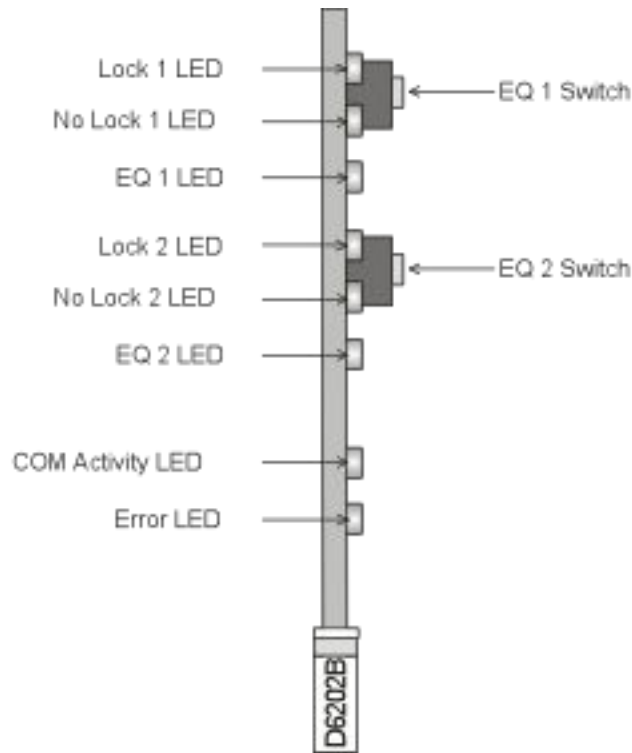


Figure 3. Card-edge User Controls

### 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 D6202B can recover digital audio signals conforming to AES/EBU specifications and transmitted over 110 Ohm, twisted pair cable, up to 100 metres (300 ft) long without equalization. For cable lengths in excess of 100 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.

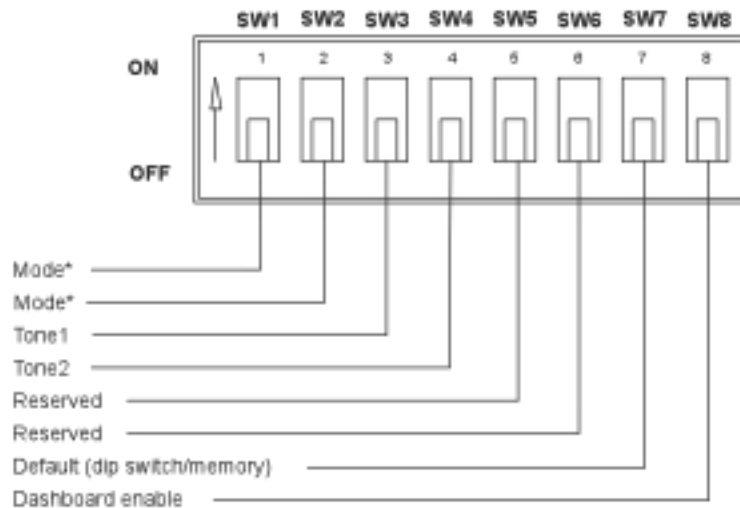
## LEDs

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 D6201B 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>Mode*</b>   | <b>SW1</b> | <b>SW2</b> |
|--|------------|------------|
| 1 x 8  | Off        | Off        |
| Dual 1 x 4   | Off        | On         |
| 1 x 8 with SRC<br>Note: Using this feature disables tone generation. | On         | Off        |
| Not Used   | On         | On         |

| <b>Tone 1</b> |                                   |
|---------------|-----------------------------------|
| On            | Turns tone generator in AES 1 on  |
| Off           | Turns tone generator in AES 1 off |

| <b>Tone 2</b> |                                   |
|---------------|-----------------------------------|
| On            | Turns tone generator in AES 2 on  |
| Off           | Turns tone generator in AES 2 off |

| <b>Default (power up default parameter settings)</b> |  |
|--|--|
| 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  |

| <b>Dashboard Enable</b> |  |
|-------------------------|--|
| 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                         |

## 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 a D6202B card:

| MENU                       | ITEM          | DISPLAY  | DESCRIPTION  |
|----------------------------|---------------|--|--|
| Card Info<br>(Read Only)   | Product       | D6202B   | Product identification code  |
|                            | Name          | Balanced AES<br>AudioDistribution<br>Amplifier | Product functional description                                     |
|                            | Supplier      | Ward-Beck Systems Ltd.                         | Manufacturer of the card   |
|                            | Software Rev. | ##   | Two digit software revision code                                   |
|                            | Web site      | www.ward-beck.com                              | Manufacturer's web address   |
| Card Status<br>(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<br>(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.<br>A sampling signal must be connected to AES input 2 or jumpers on card may be set to select between AES2 or frame reference 1 or 2 |

| <b>AES INPUT 1</b>                  |                |                |  |
|-------------------------------------|----------------|----------------|--|
| <b>MENU</b>                         | <b>ITEM</b>    | <b>DISPLAY</b> | <b>DESCRIPTION</b>   |
| Card Settings<br>(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                                  |

| <b>AES INPUT 2</b>                  |                |                |  |
|-------------------------------------|----------------|----------------|--|
| <b>MENU</b>                         | <b>ITEM</b>    | <b>DISPLAY</b> | <b>DESCRIPTION</b>   |
| Card Settings<br>(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                                  |

## Technical Specifications

### DIGITAL INPUT

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

### DIGITAL OUTPUT

|                          |                   |
|--------------------------|-------------------|
| Resolution               | 24 Bit            |
| Output Level             | 2.5 V p-p nominal |
| Output Impedance         | 110 Ohm balanced  |
| Sampling Frequency Range | 30 kHz to 192 kHz |
| Jitter                   | Less than 5 ns    |

### GENERAL

|                    |                              |
|--------------------|------------------------------|
| Power Requirements | +12 V, 4 Watts, MAX          |
| Dimensions         | 3.025" high x 12.800" deep   |
| Weight             | approx. 0.115 kg (0.252 lbs) |

*NOTE: Ward-Beck Systems Ltd. reserves the right to change performance specifications without prior notice.*

## Warranty and Repair Policy

The openGear D6202B is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of FIVE (5) years from the date of shipment from our factory. In the event that your openGear D6202B proves to be defective in any way during this warranty period, Ward-Beck Systems Ltd. reserves the right to repair or replace this piece of equipment with a unit of equal or superior performance characteristics.

Should you find that this openGear D6202B has failed after your warranty period has expired, we will repair your defective product should suitable replacement components be available. You, the owner, will bear any labor and/or part costs incurred in the repair or refurbishment of said equipment beyond the FIVE (5) year warranty period.

In no event shall Ward-Beck Systems be liable for direct, indirect, special, incidental, or consequential damages (including loss of profits) incurred by the use of this product. Implied warranties are expressly limited to the duration of this warranty.

This openGear D6202B User Manual provides all pertinent information for the safe installation and operation of your openGear Product. Ward-Beck policy dictates that all repairs to the openGear D6202B are to be conducted only by an authorized Ward-Beck Systems factory representative. Therefore, any unauthorized attempt to repair this product, by anyone other than an authorized Ward-Beck Systems factory representative, will automatically void the warranty. Please contact Ward-Beck Technical Support for more information.

### In Case of Problems

Should any problem arise with your openGear D6202B, please contact the Ward-Beck 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 D6202B. 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 Ward-Beck Systems Ltd. will be shipped collect.

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

**WARD-BECK SYSTEMS LTD.**  
**945 Middlefield Road, Unit 9, Toronto, Ontario M1V 5E1**  
**V 416 335 5999 F 416 335 5202 Toll-Free 800 771 2556**  
**Website: [www.ward-beck.com](http://www.ward-beck.com)**  
**E-Mail: [sales@ward-beck.com](mailto:sales@ward-beck.com)**

## Ordering Information

### Standard Equipment

- D6202B AES/EBU Distribution Amplifier 75 Ohm

### Optional Equipment

- D6202BUM AES/EBU Distribution Amplifier 75 Ohm User Manual (additional User Manual)
- T6301A Single Card Rear Module (for installation into OG3-FR-C frame for maximum I/O)
- T6401A Dual Card Rear Module (for installation into OG3-FR-C frame for maximum density)
- OG3-FR-C Digital Products Frame and Power Supply with Cooling Fans (2RU, holds up to 20 cards)

Your D6202B Distribution Amplifier is a part of the openGear family of products. Ward-Beck 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.