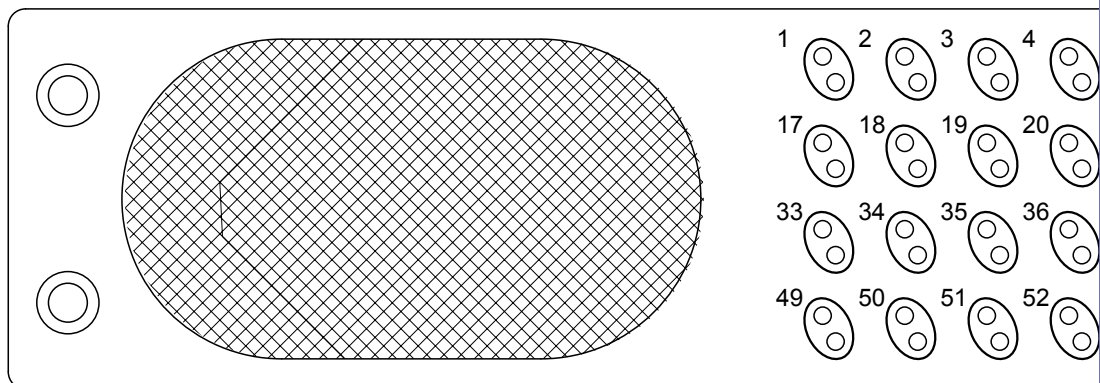


# **BM-A1-64DANTE**

## **DANTE Confidence Monitor**



## **Installation and User Guide**

# Reference To Statement Of Conformity

This document confirms that products bearing the CE label meet all the requirements in the EMC directive 2004/108/EC and LV directive 2006/95/EC laid down by the Member States Council for adjustment of legal requirements. Furthermore the products comply with the rules and regulations from 30 August 1995 referring to the electromagnetic compatibility of devices. Bel Digital Audio Limited BM-A1-64DANTE units bearing the CE label comply with the following harmonised or national standards:

EMC:

BS EN 55103-1 :2009

BS EN 55103-2 :2009

Safety:

BS EN 60950-1: 2006 (ed. 2) + A1:2010

Insulation:

Class1



Instructions for Disposal of WEEE by Users in the European Union

The symbol shown here is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for recycling of waste electrical and electronic equipment.

The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

## User's Notice and disclaimer:

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The information contained in this manual has been carefully checked for accuracy; however no guarantee is given with respect to its correctness. Bel Digital Audio Ltd. accepts no responsibility or liability for any errors or inaccuracies that may appear in this manual or the products and software described in it. Specifications and information contained in this manual are subject to change at any time without notice.

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This appliance has a serial number located on the rear panel. Please record the serial number here for your records.

Model Number.....BM-A1-64DANTE

Serial Number.....

# Contents

<b>Reference To Statement Of Conformity .....</b>	<b>2</b>
<b>Important Safety Instructions .....</b>	<b>4</b>
Important Safety Precautions .....	5
Important Safety Information .....	5
<b>Introduction .....</b>	<b>6</b>
What's In The Box .....	6
BM-A1-64DANTE Main Features .....	6
Front Panel Description .....	7
Rear Panel Description .....	8
<b>Installation .....</b>	<b>9</b>
Hardware Considerations .....	9
Power Supply Considerations .....	9
Fuses And Ratings .....	9
Unit Connections .....	9
DANTE Inputs .....	9
Analogue Outputs .....	9
AES/EBU Output .....	9
USB Port .....	9
<b>Configuration .....</b>	<b>10</b>
Dante Controller .....	10
<b>Operation .....</b>	<b>11</b>
Front Panel Operation .....	11
Single channel monitor mode .....	11
Multi-channel monitor mode .....	11
Presets .....	12
Storing a Preset .....	12
Recalling a Preset .....	12
Clearing a channel from the monitor mix .....	12
Clearing an entire monitor mix .....	12
Volume .....	13
Tone .....	13
Mute .....	13
PSU Status .....	13
<b>Technical Specifications .....</b>	<b>14</b>

# Important Safety Instructions

1. Read these instructions
2. Keep these instructions
3. Heed all warnings
4. Follow all instructions
5. Do not use this apparatus near water
6. Do not expose this apparatus to rain or moisture.
7. Clean only with a dry cloth
8. Do not block any ventilation openings. Install with accordance with the manufacturer's instructions.
9. No naked flames, such as lighted candles, should be placed on the apparatus.
10. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
11. There are no user-adjustments, or user-servicable items, inside this apparatus. Do not remove the covers of this apparatus; doing so will invalidate your warranty.
12. Adjustments or alterations to this apparatus may affect the performance such that safety and/or international compliance standards may no longer be met.
13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.

## Caution

14. Hazardous voltages may be present inside this apparatus.
15. Do not operate this apparatus with the covers removed.
16. To reduce the risk of electric shock, do not perform any servicing other than that contained in these Installation Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel and ensure that all power cords are disconnected when servicing this apparatus.
17. Only use attachments/accessories specified by the manufacturer.

## Power Safety

18. This apparatus is fitted with a universal power supply, approved and certified for operation in this apparatus. There are no user-replaceable fuses.
19. An external over-current protection device is required to protect the wiring to this apparatus. This protection device must be installed according to current wiring regulations. In certain countries this function is supplied by use of a fused plug.
20. If an extension power cable or adaptor is used, ensure that the total power rating of the power cable and/or adaptor is not exceeded.
21. An external disconnect device is required for this apparatus; a detachable power cord is a suitable disconnect device.
22. The apparatus should be located close enough to an AC outlet so that you can easily grasp the power cord plug at any time.
23. This apparatus is a Class I construction and shall be connected to an AC outlet with a protective grounding connection.
24. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
25. Unplug this apparatus during lightning storms or when unused for long periods of time.
26. All power cords must be disconnected to isolate this apparatus completely.
27. Caution: To reduce the risk of electric shock, plug each power supply cord into separate branch circuits employing separate service grounds
28. This equipment is not supplied with a detachable power cord. The device should be connected to a power supply only of the type described in the Installation Guide or as marked on the device. The power cord must be earthed and precautions should be made so that the grounding is not defeated. A mains cord, fitted with an IEC 60320 C13 type socket, appropriate sized conductors and plug to suit local electrical requirements.
29. The power supply cord (i.e. conductor, coupler (IEC60320 C13) and plug combination) must be suitably rated for apparatus and the country of use (meeting local electrical requirements). A power supply cord with a rating of not less than 125% of current rating is suitable. The minimum rating for the power supply cord at 110 / 230V ac to be 1A.

## Installation

30. When installing this apparatus, either fix it into a standard 19" rack or place the apparatus on a secure level surface. When this apparatus is rack mounted, fit all rack screws.
31. Ensure that no strain is placed on the cables connecting to this apparatus. Ensure also that such cables are not placed where they can be stepped on, pulled or tripped over.
32. Do not operate this apparatus whilst it is covered or boxed in any way.

## Important Safety Precautions



**CAUTION:** TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

**CAUTION:** RISK OF ELECTRIC SHOCK. THIS EQUIPMENT HAS MORE THAN ONE POWER CORD. TO REDUCE THE RISKS OF ELECTRIC SHOCK DISCONNECT BOTH POWER SUPPLY CORDS BEFORE SERVICING



The lightning flash with arrowhead symbol, within equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating instructions and maintenance (servicing) instructions in the literature accompanying the appliance.

## Important Safety Information

This apparatus has no mains switch or other user-operated control for disconnecting the AC mains power. The mains plugs or the appliance couplers (IEC sockets) are used as the disconnect devices. Either device must remain readily operable and accessible when the apparatus is installed for use.

This unit includes thermally resettable fuses that are integral to the power supply circuitry, but the unit must always be powered from a supply fitted with an HRC type (High In-Rush Current) fuse with a rating of 1 A.

**Warning:** Excessive sound pressure levels from headphones can cause hearing loss.

Thank you for buying this Bel Digital Audio product. The BM-A1-64DANTE Confidence Monitor is designed to provide a unique method of reliably monitoring audio on Audinate's Dante IP network. With a fully scalable infrastructure, Dante is able to provide up to 512 channels on a 1GB backbone (visit [www.audinate.com](http://www.audinate.com) for further details).

Capable of monitoring up to 64 channels (at 48 kHz), and operating at sample rates of up to 96 kHz, the BM-A1-64DANTE can be easily configured to quickly monitor individual channels or even a combination of channels. Mix combinations can be stored as presets, enabling them to be quickly recalled when required. In addition, the BM-A1-64DANTE provides conversion of selected channels as combined stereo pairs to both analogue and AES/EBU output formats.

The BM-A1-64DANTE is a very high quality product, engineered for maximum reliability in professional broadcast, live and production environments. It requires virtually no configuration on installation, or adjustment in normal use.

This manual covers the BM-A1-64DANTE's connections and indications, including its various options for monitoring. Please keep the manual in a safe place once you have installed the unit.

**Important** – Please do take the time to register your BM-A1-64DANTE with Bel Digital Audio Ltd., by emailing us the unit's serial number and your contact details to [info@beldigital.com](mailto:info@beldigital.com). Thank you.

**Environment** – The BM-A1-64DANTE's range of operating temperature and relative humidity (RH) are as follows:

Temperature: 5°C to 40°C

RH: Operating 20 to 80%

## What's In The Box

### Unpacking

Unpack the BM-A1-64DANTE with care. It is always a good idea to store all packaging (if practical), in case you ever need to return the unit to Bel for any reason.

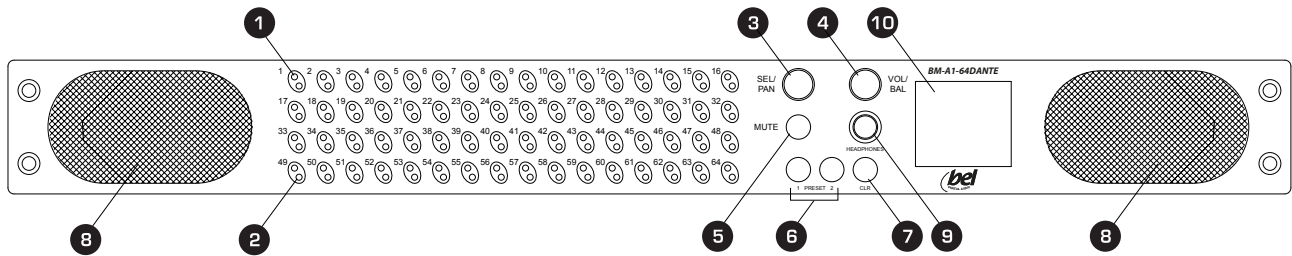
The shipping carton should contain the items listed below. Please contact your distributor immediately if any of them are missing or damaged.

- BM-A1-64DANTE
- Instruction manual
- 2 x IEC connector retaining clamp

## BM-A1-64DANTE Main Features

- Dante audio-over-IP monitor, in a sturdy and compact 1U chassis - suitable for fixed installation and tour-sound use
- Monitors up to 64 channels at 48kHz
- 44.1 - 96 kHz, 24-bit operation
- Onboard matrix enables access to 512 audio sources using Dante Controller software
- Configure user-defined channel combinations, or monitor individual channels
- LED signal level indication of all 64 channels
- Full audio redundancy over a Gigabit Ethernet network
- Stereo analogue and AES/EBU outputs of selected monitor sources for connection to external speakers or other devices
- Audinate announced AES67 interoperability and AVB ready
- Redundant power supply as standard

## Front Panel Description



① **Signal Present LED** – a bi-colour LED per channel, indicating signal present. The LED illuminates green from -54 dBFS and red from -6 dBFS.

② **Channel Select LED** – a blue LED indicates the selected channel for monitoring. A combination of channels may be selected and each will be indicated by its blue LED being illuminated.

③ **SEL/PAN** – Rotary encoder to scroll through the 64 audio channels and select the channel to monitor. The Channel Select LED ② indicates which channel is active. While the Channel Select LED is flashing it is possible to choose how the channel is panned. Multiple presses of the encoder will pan the channel to the left speaker, right speaker, both speakers or no speaker (i.e., not routed).

④ **VOL** – Rotary encoder to control the volume of the front panel speakers or headphone level.

⑤ **MUTE** – Pressing this switch mutes the front speakers and the headphone output

⑥ **Preset 1 and 2** – Two preset memory locations are available to enable instant recall of user channel monitor combinations.

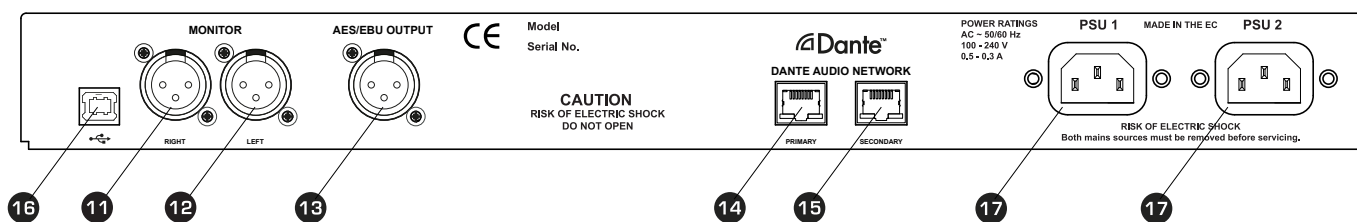
⑦ **CLR** – The clear button allows the user to clear all channels currently routed to the monitor speakers. For protection against unintended operation, it is necessary to press and hold the CLR button for approximately 2 seconds in order to activate the clear function.

⑧ **Speakers** – Two front panel mounted speakers present the selected audio channel(s).

⑨ **Headphone** – Headphone output (¼" TRS output jack) with speaker mute facility.

⑩ **Display** – provides information including two channel high resolution bargraph meters (following the selected channels routed to either left speaker, right speaker, or both), PSU 1 and PSU 2 status indication, channel pan indication and Preset status.

## Rear Panel Description



- 11 **RIGHT** – Line output (XLR) which carries the same audio as the right speaker (fixed level).
- 12 **LEFT** – Line output (XLR) which carries the same audio as the left speaker (fixed level).
- 13 **AES/EBU OUTPUT** – Balanced AES output (XLR) which carries the same audio as the left and right speaker.
- 14 **DANTE AUDIO NETWORK PRIMARY** – RJ45 Dante port for the primary network.
- 15 **DANTE AUDIO NETWORK SECONDARY** – RJ45 Dante port for the secondary (redundant) network.
- 16 **USB** – Type B USB socket providing access for firmware updates.
- 17 **PSU1, PSU2** – AC inputs, 2 x IEC sockets. Autoranging from 100 to 240 V AC 50/60 Hz.



## Hardware Considerations

The BM-A1-64DANTE is built in a 1U 19" enclosure. It is intended to be permanently installed in a standard 19" equipment rack. There are ventilation grilles in the top, bottom and both sides of the enclosure, and care must be taken to ensure that these are not blocked by cables or other equipment when the unit is installed. Do not install any other items of equipment immediately above or below to the BM-A1-64DANTE; the use of 1U blanking panels is recommended.

## Power Supply Considerations

The BM-A1-64DANTE is fitted with two separate, auto-ranging switch-mode power supplies (PSUs). The operating voltage range is 100 to 240 V AC, 50/60 Hz. The internal power rails are diode-paralleled to the two supplies, and the unit will operate normally if only one PSU is powered or functional. For maximum protection when using both PSUs, the two AC inlet cables should be connected to mains circuits which are as independent of each other as possible.

If redundant operation is not required, only one AC supply cable need be connected; either AC inlet may be used.

## Fuses And Ratings

Each of the BM-A1-64DANTE's PSUs has an internal resettable fuse for PSU protection. These fuses are not accessible to the user. The unit should be powered from a mains supply (supplies) fitted with an external HRC-type fuse (High Inrush Current) rated at 1 A.

## Unit Connections

### DANTE Inputs

The BM-A1-64DANTE provides two DANTE RJ45 Ethernet connections (**PRIMARY** and **SECONDARY**). The primary port is connected to the main network. The secondary port is connected to the redundant network which should be entirely separate to the primary network (see [www.audinate.com](http://www.audinate.com) for a detailed explanation on configuring redundant networks).

**Note:** If using Audinate's Dante Virtual Network on a PC or Mac, ensure that this is connected to the **PRIMARY** port **14** .

For best practice, always use either Cat-5e or Cat-6 Ethernet cables when using Dante networks. However, for 100 Mbps networks, Cat-5 cable may be used.

### Analogue Outputs

A pair of analogue monitor line level outputs are provided on the rear panel. These mirror the sources that are fed to the front panel speakers and can either be used to feed external speakers or be used as a breakout of the selected channel(s) from the Dante network.

**Note:** the line level outputs do not follow the mute status on the front panel. They are always active.

### AES/EBU Output

Similarly to analogue outputs above, the AES/EBU output follows the channel selection(s) to the front panel speaker. The output is balanced and is compliant with AES3-1992.

**Note:** the AES/EBU output does not follow the mute status on the front panel. It is always active.

### USB Port

The BM-A1-64DANTE includes a USB Type-B socket. The function of this port is for firmware updates.

## Dante Controller

When shipped, the BM-A1-64DANTE is configured to monitor the first 64 channels on a Dante network and operate at a sampling frequency of 48 kHz. However a Dante network may have a channel count of up to 512 channels, with multiple 3rd party Dante devices connected to the network. It is therefore possible to configure the Dante monitor so that it monitors any of these sources (up to a total of 64 at 48 kHz) by use of the internal routing matrix.

Access to this routing matrix is via the Audinate Dante Controller software package.

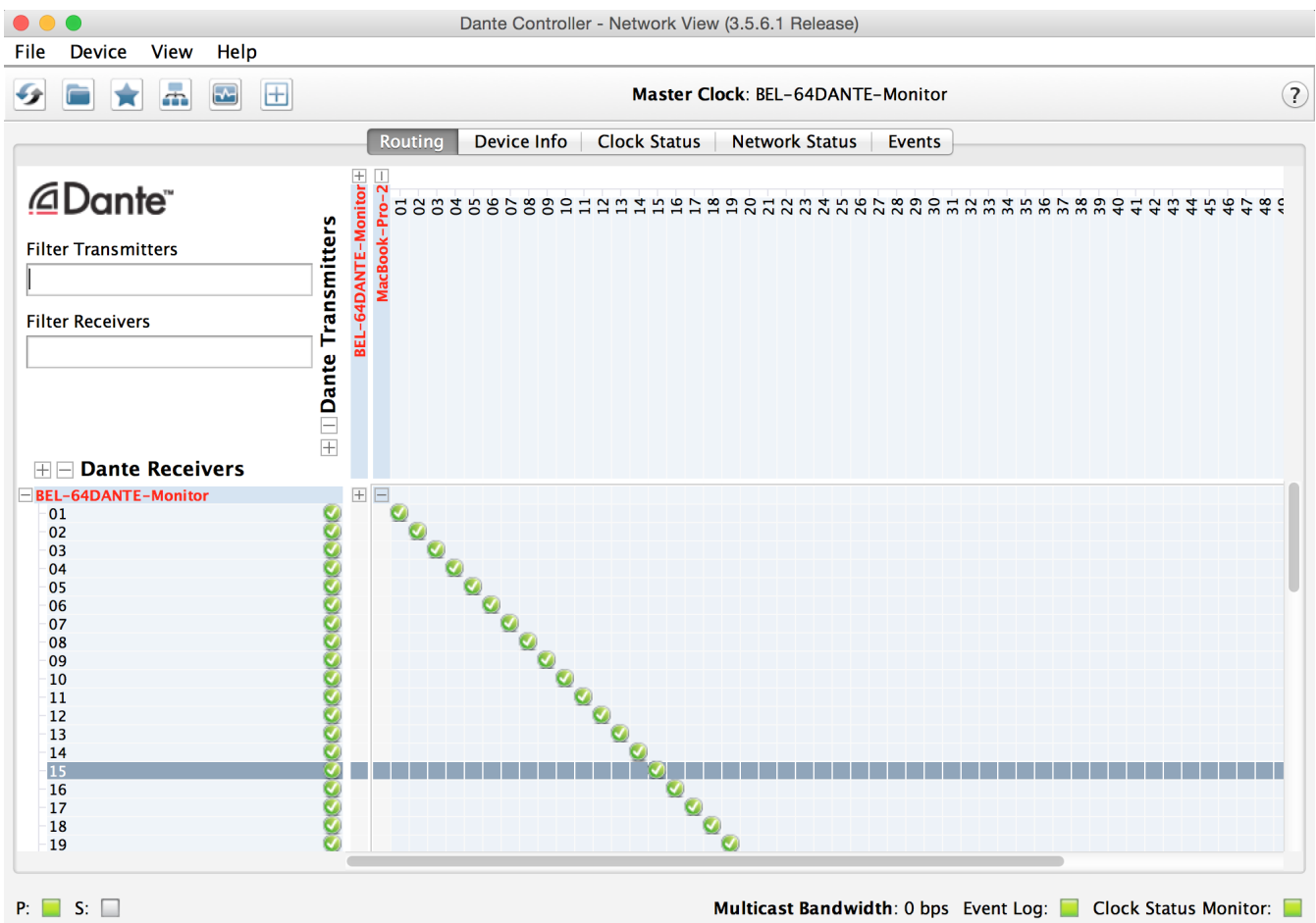
As the BM-A1-64DANTE is a monitoring device, it is highly likely that the Dante Controller is already installed and operating on the existing Dante network. However, if you do require further details on the operation of Dante Controller then these can

be found on the Audinate website (see <https://www.audinate.com/products/software/dante-controller>). The Dante Controller user guide can be downloaded from <http://dev.audinate.com/GA/dante-controller/userguide/pdf/latest/AUD-MAN-DanteController-3.6.x-v1.1.pdf>.

When connected to the Dante network, the confidence monitor can be identified in Dante Controller as **BEL-64DANTE-Monitor**.

In addition to being able to utilise the onboard 64x64 matrix, it is also possible to reconfigure the monitor to operate at other sample rates (up to 96 kHz) by use of the Dante Controller application.

All settings are stored on the BM-A1-64DANTE and are retained upon power-down. Therefore if the selection of channels to be fed to the Dante monitor does not change then there is no requirement to run the Dante Controller application again.



## Front Panel Operation

The BM-A1-64DANTE provides a very intuitive front panel interface that allows the user to monitor any audio channels present on the front panel.

All 64 channels are represented on the front panel. Each channel includes a green/red Signal Present LED **1** and a blue Channel Select LED **2**.

While rotating the **SEL** encoder **3** the blue Channel Select LED will scroll across the channels indicating which channel is active.

There are two methods of monitoring:

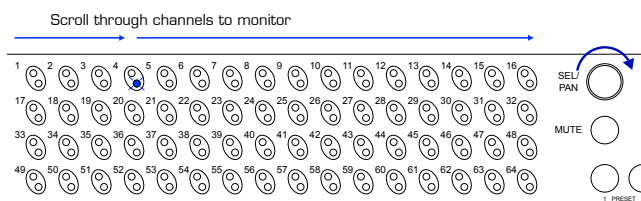
- **Single channel monitor mode** - monitoring of one channel at a time.
- **Multi-channel monitor mode** - simultaneous monitoring of multiple channels.

### Single channel monitor mode

Single channel monitor mode is the default mode of the BM-A1-64DANTE. If no channels are routed to the monitor speakers (i.e., no blue Channel Select LEDs are illuminated on the front panel) then simply turning the **SEL** encoder will allow you to monitor each channel in turn.

As the **SEL** encoder is turned the blue Channel Select LED will scroll through each channel in turn. Stop turning the **SEL** encoder at the required channel. This method of monitoring is ideal if only one channel is to be monitored at a time. The Channel Select LED and the channel number between the bargraph meters indicate which channel is currently being monitored.

The channel selected will be routed to both left and right speakers.

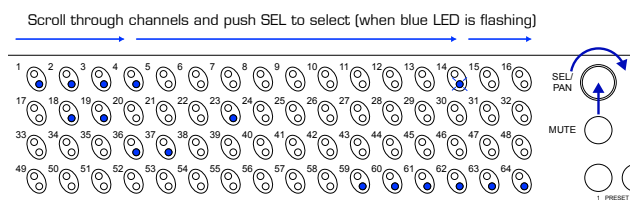


**Hint:** the quickest way to enter single channel mode if blue Channel Select LEDs are visible on the front panel is to press and hold the clear button (**CLR** **7**) - see "Front Panel Description" on page 7 and "Clearing an entire monitor mix" on page 12).

## Multi-channel monitor mode

The BM-A1-64DANTE is capable of monitoring multiple channels simultaneously. This is achieved by use of the **SEL/PAN** control **3**.

When turning the **SEL** encoder, the blue Channel Select LED will flash for a period of time (approximately 2 seconds). When the LED is flashing the monitor is in **audition mode** (whereby it allows the user to hear what is on that channel, over and above any other channels that may already be selected in the mix - think of it as a temporary solo mode as found on a mixing console). While the LED is flashing it is possible to route that channel to the monitor mix by pushing the **SEL/PAN** encoder in. The first press routes the channel to the left speaker. Pressing it again routes that channel to the right speaker. Further presses route the channel to both speakers and then clears the channel. This way it is possible to select a channel and decide which speaker(s) it should be routed to.



Route to left speaker

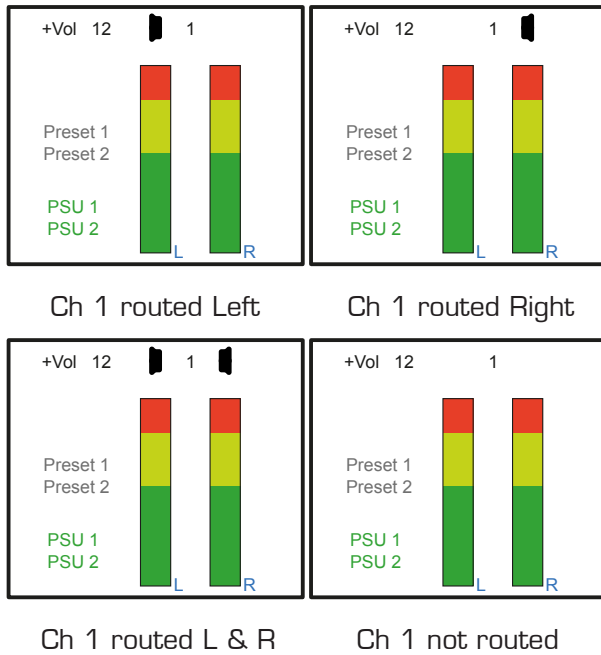
Route to right speaker

Route to both speakers

Clear routing

SEL/PAN encoder presses

Visual indication of how a channel is panned is provided on the display by way of speaker icons located above the left and right bargraphs.



**Note:** routing a channel to the mix can only happen in **audition mode**, i.e., only when the blue Channel Select LED is flashing. If the LED is not flashing then it is not possible to route the channel to the current mix.

Following the above procedure it is possible to add additional channels to the monitor mix. Each channel in the mix will be identified on the front panel by its associated blue Channel Select LED being illuminated.

**Note:** as additional channels are added the overall mix is compensated to accommodate them. Therefore quiet or silent channels will result in the overall volume being attenuated. It is recommended that the channels chosen be limited to those that actually have audio on them.

**Hint:** To clear the selection of multiple channels to the monitor mix, press and hold the **CLR** button.

## Presets

Two presets are available to store and easily recall monitor mixes.

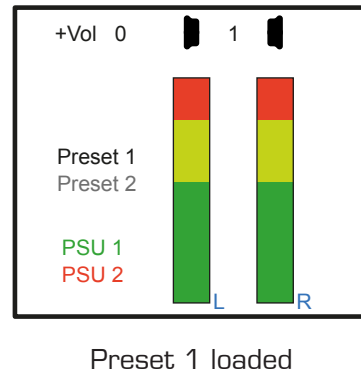
### Storing a Preset

- With the desired channels selected (indicated by their blue Channel Select LEDs being illuminated) choose which Preset location to use.
- Press and hold the chosen Preset button (either **Preset 1** or **Preset 2**: see item 6 on "Front Panel Description" on page 7).

- The Preset button will flash. Continue to press the button until the button stops flashing.
- The Preset has now been stored with the current monitor mix.

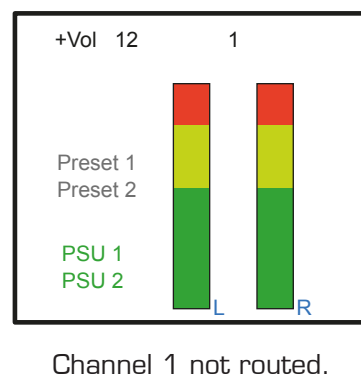
### Recalling a Preset

- Press the desired Preset button on the front panel. The preset will load and will be confirmed on both the front panel display and also by the appropriate blue Channel Select LEDs illuminating.



### Clearing a channel from the monitor mix

It is possible to clear a channel from the current monitor mix by reselecting it using the **SEL** encoder and while the blue Channel Select LED is flashing, push the encoder enough times so that the channel is neither routed to the left or right speakers. This is indicated by the speaker icons not being visible above the bargraph meters. With no speaker icons visible, the channel is no longer routed to the monitor mix.



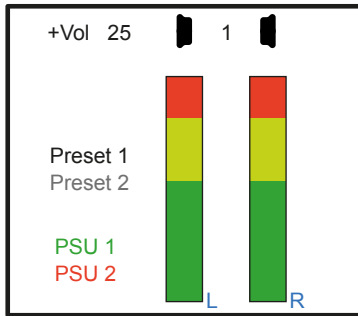
### Clearing an entire monitor mix

To clear an entire monitor mix use the **CLR** button on the front panel. As a safety precaution against accidentally clearing a monitor mix it is necessary to push and hold the button for approximately two seconds in order to clear the monitor mix. When pressing the **CLR** button it will flash. Once the **CLR** button stops flashing the monitor mix is cleared.

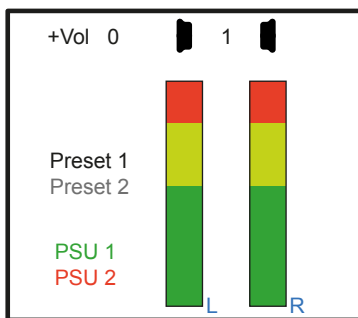
## Volume

Rotate the **VOL** encoder **4** to alter the level applied to the front panel speakers and headphone output. A numeric volume indicator (with values between 0 and 25) is provided on the front panel display.

The volume control does not affect the rear panel audio outputs.



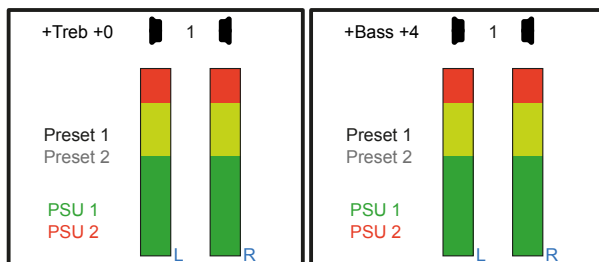
Maximum Volume



Minimum Volume

## Tone

It is possible to adjust the tone of the speaker output (bass and treble) by pressing in the **VOL** encoder. Each press cycles through VOL > Treble > Bass controls. Use the encoder to alter the value. These settings are stored upon power-down.



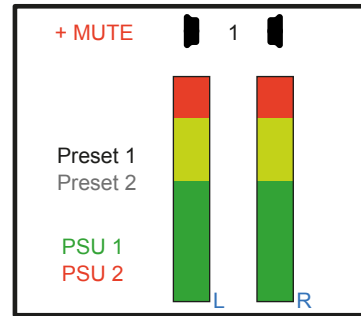
Treble control

Bass control

## Mute

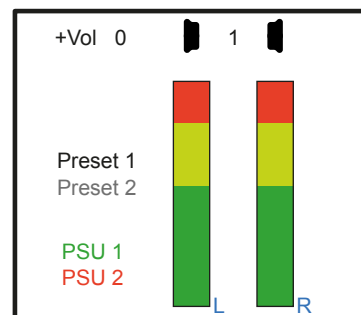
The front panel **MUTE** button **5** mutes the audio output to the front panel speakers and headphone output. It does not affect the rear panel audio outputs.

When mute is active, the **MUTE** button will illuminate red. The display will also indicate that mute is active.



## PSU Status

The BM-A1-64DANTE comes as standard with power supply redundancy. The status of PSU 1 and PSU 2 is provided on the front panel display. If green, the status of the power supply is good. When the PSU text is red it notifies that the power supply is not operating (i.e., it is likely that the supply is not plugged into the mains).



PSU 1 good, PSU 2 fail

# Technical Specifications

<b>DANTE</b>	
Connectors	2 x RJ45
Format	Dante Audio Network
Sample frequency	44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz
<b>AES OUTPUT</b>	
AES/EBU outputs	Copy of speaker outputs on 1 x XLR3M connector (fixed level) 110Ω balanced
Sampling frequency	Follows input sample frequency
<b>LINE OUTPUTS</b>	
Line output	Copy of speaker outputs on 2 x XLR3M connectors (fixed level)
Noise+THD	-90 dB w.r.t. maximum output
Frequency response	20 Hz to 20 kHz ±1 dB
<b>SYNCHRONISATION</b>	
Source	Dante network Master Clock
<b>POWER SUPPLY</b>	
Type	2 x independent switch-mode regulated, auto-ranging
Inputs	2 x 100 to 240 V AC, 50/60 Hz
Power consumption	16 W
Connectors	2 x IEC with retaining clips
<b>PHYSICAL</b>	
Dimensions (w x d x h)	482 x 200 x 44 (mm) / 19" x 7.87" x 1.73" [1U] (with rack ears fitted)
Weight	2.75 kg / 6lbs

Specifications and information contained in this manual are subject to change at any time without notice.

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