



# BEATRICE

# LH4

**Visual Indicator Dante Network Intercom**

## PRODUCT DETAILS



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Visit our Website at [www.glensound.com](http://www.glensound.com)



# GlenSound Electronics Ltd

Thank you for choosing a new GlenSound product.

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Information contained in this manual is subject to change without notice, if in doubt please contact us for the latest product information.

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# PRODUCT WARRANTY

All equipment is fully tested before dispatch and carefully designed to provide you with trouble free use for many years.

We have a policy of supporting products for as long as possible and guarantee to be able to support your product for a minimum of 10 years.

For a period of one year after the goods have been despatched the Company will guarantee the goods against any defect developing after proper use providing such defects arise solely from faulty materials or workmanship and that the Customer shall return the goods to the Company's works or their local dealer.

All non-wear parts are guaranteed for 2 years after despatch and any defect developing after proper use from faulty materials or workmanship will be repaired under this warranty providing the Customer returns the goods to the Company's works or their local dealer.



## EU DECLARATION OF CONFORMITY

### **GS-BEATRICE LH4**

*Visual indicator Dante intercom*

This declaration of conformity is issued under the sole responsibility of the manufacturer.

This equipment is manufactured by GlenSound Electronics Ltd of Brooks Place Maidstone Kent ME14 1HE is **CE** marked and conforms to the following Union harmonisation legislation:

Emissions:	BS EN55032:2015
Immunity:	BS EN55035:2017

Signed for and on behalf of GlenSound Electronics Ltd.

Gavin Davis, Managing Director  
Maidstone, Kent, England

Date: 04/03/2020

## RoHS DIRECTIVE

RoHS 2 Directive 2011/65/EU restrict the use of the hazardous substances listed below in electrical and electronic equipment.

This product conforms to the above directive and for these purposes, the maximum concentration values of the restricted substances by weight in homogenous materials are:

Lead	0.1%
Mercury	0.1%
Hexavalent Chromium	0.1%
Polybrominated Biphenyls	0.1%
Polybrominated Diphenyl Ethers	0.1%
Cadmium	0.01%

# **WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT REGULATIONS 2006 (WEEE)**

Glen sound Electronics Ltd is registered for a business to business sale of WEEE in the UK our registration number is:

**WEE/JJ0074UR**

# **GLENSOUND BEATRICE LH4**

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## **OVERVIEW**

The BEATRICE range of IP intercoms was designed for broadcast, theatre and professional audio applications.

Our Beatrice intercom system utilises the reliable and proven Dante™ network audio transmission protocol to allow real time distribution of uncompressed audio across standard networks. As such the BEATRICE LH4 is fully compatible with other manufacturers' equipment using the Dante protocol. The Beatrice LH4 is also AES67 compliant.

All units in the system are designed to be very easy to use for the operator and simple to setup for the technician. They includes all the basic functionality required for small intercom systems and none of the overly complex installation requirements normally associated with large systems.

The name Beatrice was chosen for our intercom range as she was the love of Dante Alighieri:

*'Dante had fallen in love with another, Beatrice Portinari (known as Bice), whom he first met when he was only nine.'* Source Wikipedia.



## LH4 FRONT PANEL LAYOUT



### 1. Power LED

LED that indicates if the device is powered on or off.

### 2. LCD Display

This LCD Display is used to display the loudspeaker volume level as well as the setup menu. When the device is in its normal rest state, the LCD backlight will switch off after a few seconds.

See the setup mode section for more information.

### 3. Light House

The light house comprises 12 RGB LEDs and can be configured to illuminate upon detection of an incoming call as well as incoming audio presence such as speech or program.

When a call is detected the light house will flash on and off for 5 seconds, and when present audio is detected the light house will illuminate solidly for the duration of the audio being present.

The global channel colour can be configured in the setup menu. The choices of colours available are: Red, Green, Blue, Yellow, Purple, and Orange.

The light house has two brightness settings; low & high for when using the device in differently lit environments.

#### 4. **Setup button**

This button is used for the setup menu. Hold down the button for a few seconds to enter the setup menu. When in the setup menu, push the button once to cycle through the menu pages.

Holding down this button for 13 seconds will reset the device to factory default settings.

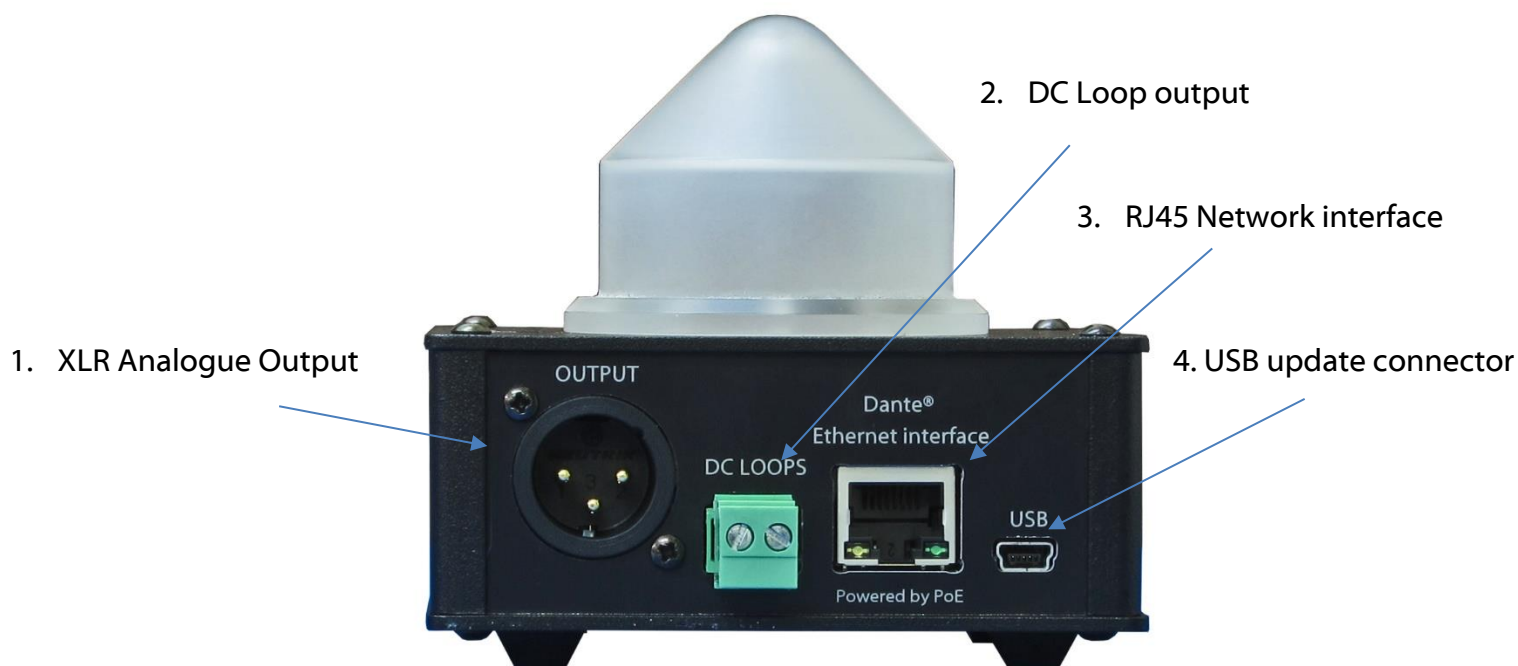
#### 5. **Setup encoder**

The encoder is used for altering settings in the setup menu and for adjusting the loudspeaker ringing volume level.

The encoder is also a push button and long pressing the encoder will save the configuration of the setup page you are.

See the setup mode section for more information.

## **LH4 REAR PANEL LAYOUT**



### **1. XLR Analogue Output**

This male Neutrik XLR connector will output a summed mix of all Dante inputs. The Beatrice LH4 will also output this exact same mix to its Dante transmit channel 1.

### **2. DC Loop output**

This is a logic output that will activate when a call is detected on any one of the 4 input channels. See the wiring info at the end of the manual for pinout.

### **3. RJ45 Network interface**

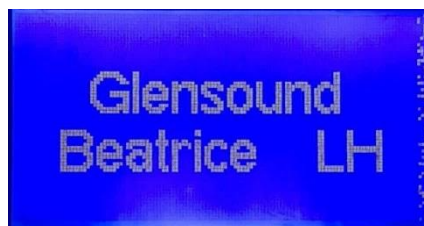
This is a standard 100Mbps Ethernet IP interface. The amber LED indicates network activity and the green LED indicates PoE power status. The PoE source used to power the device can be a mid-span adapter or a network switch with PoE.

### **4. USB update connector**

This Mini USB 2.0 connector is used only for device firmware updates. Please refer to the firmware update section of the manual for a firmware update guide.

## **NORMAL OPERATION**

During normal device operation the LCD will display the product name screen.



If the encoder is adjusted whilst the device is in this state, then the loudspeaker volume level will be altered. The range is 0 to 13.



After no adjustment for a few seconds, the LCD backlight will turn off.

During normal operation, the Beatrice LH4 is continuously listening to its Dante inputs for call and presence detection (depending on the ring ch and pres ch config) and will subsequently illuminate the RGB light house with the colour set if this is true.

## **SETUP MODE**

The Beatrice LH4 has a configuration mode that allows the user to adjust certain settings and parameters of the device.

To enter setup mode, press the blue enter setup button for 3 seconds. You will be greeted with the first setup page.

To cycle through to the next page, simply press the encoder switch.

### **1. Ring CH**



In this first setup page, turning the encoder will allow selection of which incoming Dante channels the Beatrice LH4 will listen to for detecting a call.

The currently chosen channel(s) are indicated by a rectangular box around the channel number.

To save the selection, press and hold the encoder switch for a few seconds. The display will show "Saved!"

### **2. Pres CH**

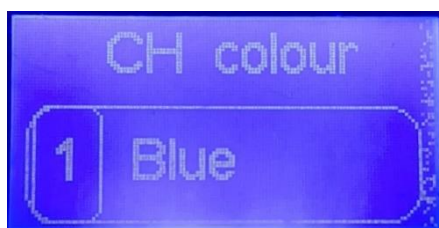


In the second setup turning the encoder will allow selection of which incoming Dante channels the Beatrice LH4 will listen to for detecting audio presence.

The currently chosen channel(s) are indicated by a rectangular box around the channel number.

To save the selection, press and hold the encoder switch for a few seconds. The display will show "Saved!"

### **3. CH colour**



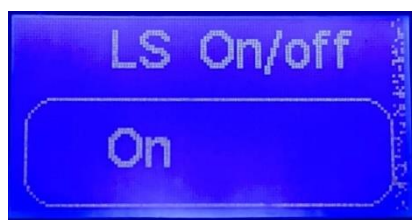
In the third setup mode, the global channel colour can be set for each of the four Dante inputs.

When the selection rectangle is hovering over the channel number; turning the encoder will cycle through each channel.

When you wish to change the colour of the highlighted channel; simply long press the encoder button and the rectangle will now highlight the colour name. Now, turning the encoder will change which colour is selected.

When you have chosen the colour you want to select, long press the encoder so that the selection rectangle returns to highlighting the channel number.

#### **4. LS On/off**



Turning the encoder adjusts the LS ring mute. If 'Off' is chosen, then the loudspeaker is permanently muted regardless of the volume setting.

Make sure to long press the encoder when you have chosen your setting. The display will show 'Saved!'.

#### **5. Brightness**



Turning the encoder adjusts the light house RGB LED brightness. Low and high allow different brightness for using the device in differently lit environments.

Make sure to long press the encoder when you have chosen your setting. The display will show 'Saved!'.

To leave setup mode, simply push the encoder switch again to return to normal usage.

The device will exit setup mode automatically after a few minutes if the device is not interacted with.

## **RESET TO FACTORY DEFAULT SETTINGS**

To reset the device to a base default configuration simply hold down the update button continuously for 13 seconds. The LCD display will show 'Reset!' when the defaults have been applied.

The default settings are as follows:

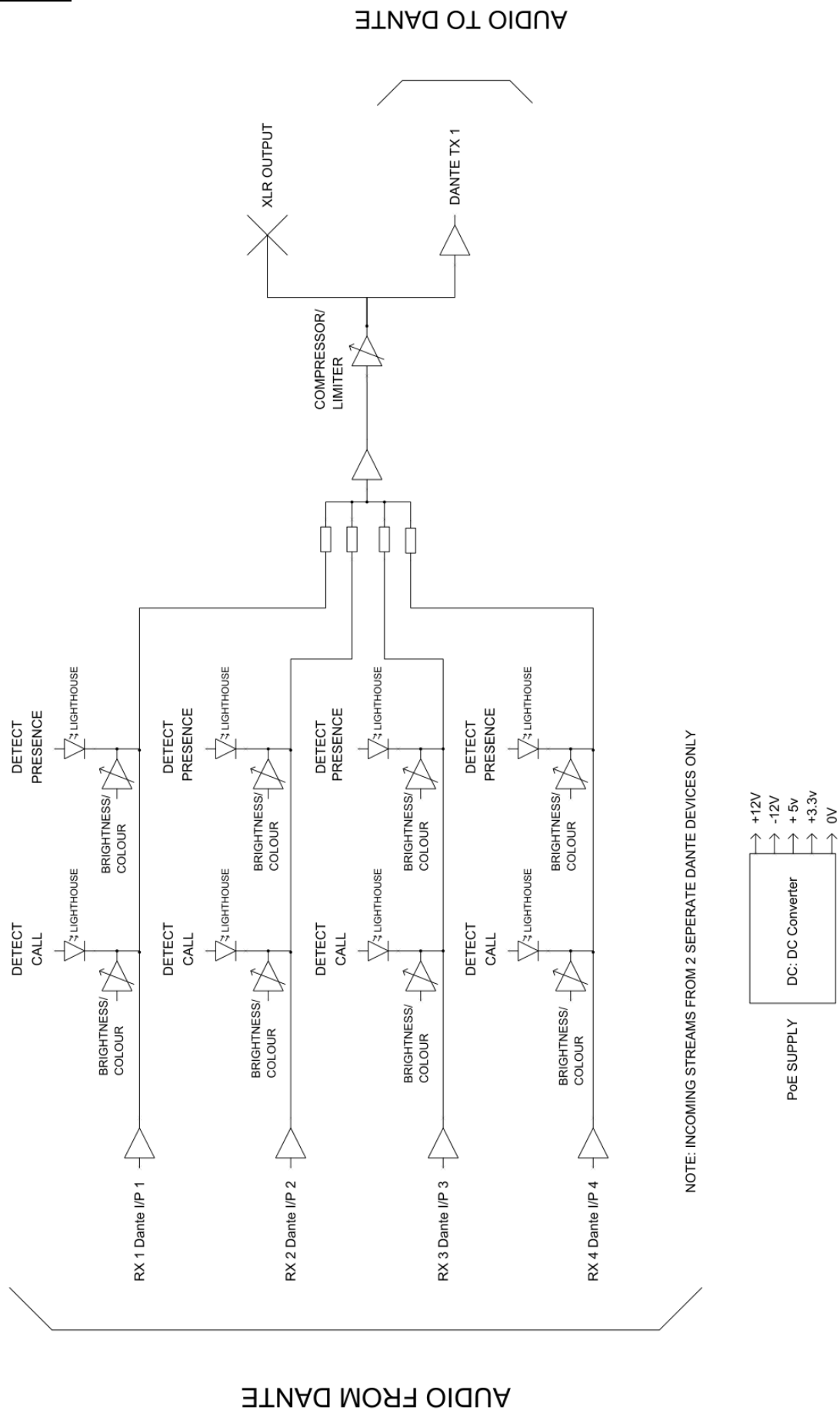
Ring CH	(Dante 1)
Pres CH	(Dante 2)
CH Colour	(1 – Red) (2 – Green) (3 – Blue) (4 – Purple)
LS On/off	On
Brightness	High
LS level	10

## **CALLING FROM OTHER BEATRICE DEVICES**

A standard 20kHz sinewave tone is how the Beatrice LH4 listens for call detection. This is standard among all GlenSound Beatrice devices as well as some other intercom manufacturer's products.

When the Beatrice LH4 receives a call, the light house LEDs will flash (colour based on what is set in the menu) and the device will ring for a few seconds.

# AUDIO BLOCK DIAGRAM (analogue representation of digital circuits)





## **CONNECTING THE BEATRICE UNITS TO A DANTE NETWORK**

The Beatrice units are network audio devices utilizing the reliable and versatile Dante audio over IP protocol. Dante is a proprietary system (although very widely used) the originators of which are Audinate.

The information below is only meant as a very basic guide. Full details of the power of Dante network audio and instructions for using it can be found at [www.audinate.com](http://www.audinate.com)

### **Getting Dante Controller**

If you are connecting the Beatrice to a new Dante network the first thing you will need to do is to get the free Dante controller software from Audinate. This can be downloaded by visiting Audinate's web site at [www.audinate.com](http://www.audinate.com)

### **Connecting Beatrice device to the network**

The Beatrice can be connected to the network that you are going to use for your audio distribution simply by plugging in to the RJ45 network connections on the rear. Once connected to the network it will be possible to see the Beatrice from within the Dante controller and route its' audio circuits.

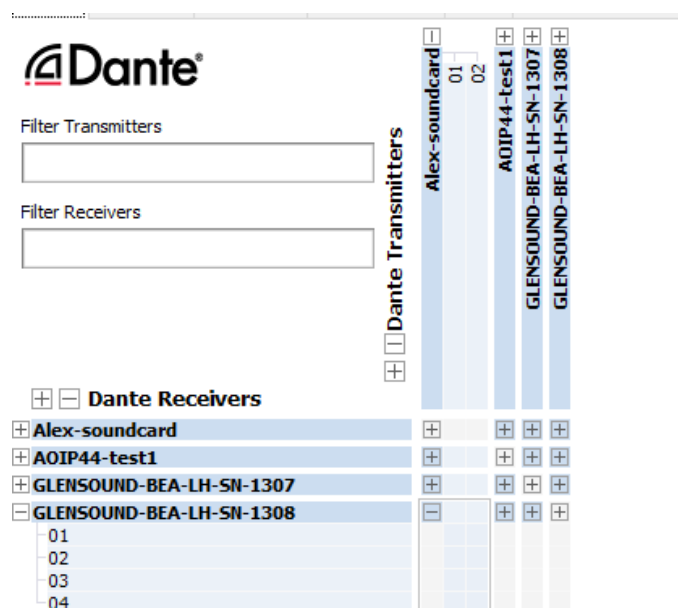
### **Audio Over IP Network**

We strongly recommend that you consider your network topology carefully and would not recommend sharing broadcast audio and general data on the same network.

For more details of audio over IP network structure please visit [www.audinate.com](http://www.audinate.com)

## Running Dante Controller

At the time of writing this manual the Dante Controller looks as per the screenshot below:



The Beatrice LH4 will have been named at the factory during test to allow them to be identified by the Dante controller.

The format used for the factory name is:

'GLENSOUND-BEA-LH4-SN-XXXX'

Where 'BEA-LH4' refers to the Glensound product i.e. Beatrice LH4.

The 'SN-XXXX' refers to the serial number of the Beatrice LH4 which can be found printed on the rear or side of the unit.

The unit may be renamed in Dante controller by opening the 'Device view' window and selecting Beatrice LH4 in the drop-down menu. Go to the 'Device Config' tab and change the name with the Rename Device box.

Note if you upload a new DNT file or clear the devices config then the name will change to 'BEA-LH4-xxXxXx' whereby the 'X's refer to the devices MAC address.

### Dante Controller TIP

If you have never run Dante controller before then make sure that on the bottom left of the Dante controllers' screen 'P' or 'S' is next to a green square as this indicates that it is connected to a network. By clicking 'P' or 'S' a pop up box opens to allow you to set what network interface the controller is using.

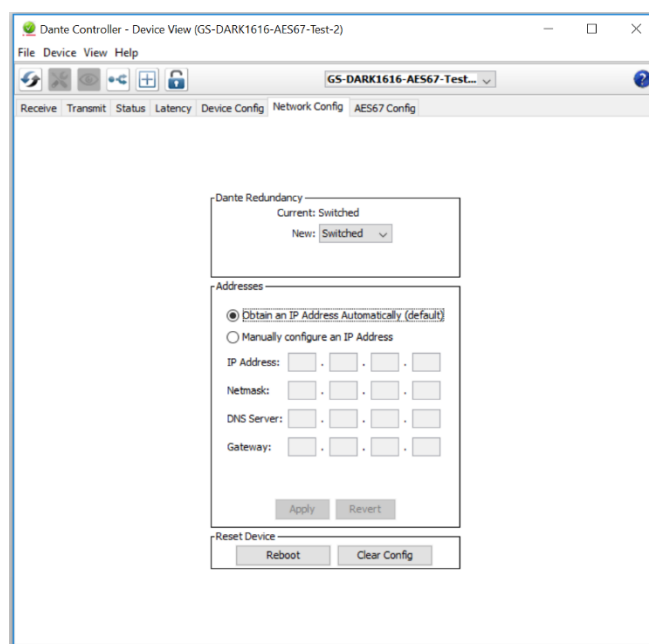
## **Device not showing up in Dante Controller**

If your Dante device does not show up in Dante Controller then the most likely issue is that the device's IP Address is not appropriate for your network.

- A) It maybe that the device is set to obtain an IP address automatically using DHCP (this is the default configuration) and your network is setup for fixed IP addresses only and does not have a DHCP server.
- B) It maybe that the device has had a fixed IP address assigned but that this address is not suitable for your network.

The solution to both scenarios is basically the same.

- 1) You must connect your Dante device directly to the Ethernet port of your computer using an Ethernet cable.
- 2) Make sure that your computer is set to 'Obtain an IP address automatically'
- 3) After a few minutes the Dante device should now appear in Dante Controller.
- 4) Double click the device name to open up device view.
- 5) Open up the 'Network Config' tab
- 6) Either turn on 'Obtain an IP Address Automatically' or correctly configure the 'Manually configure an IP Address' options for your network.
- 7) Click on 'Apply' to confirm the new settings, then disconnect the computer and reconnect the Dante device to your network.



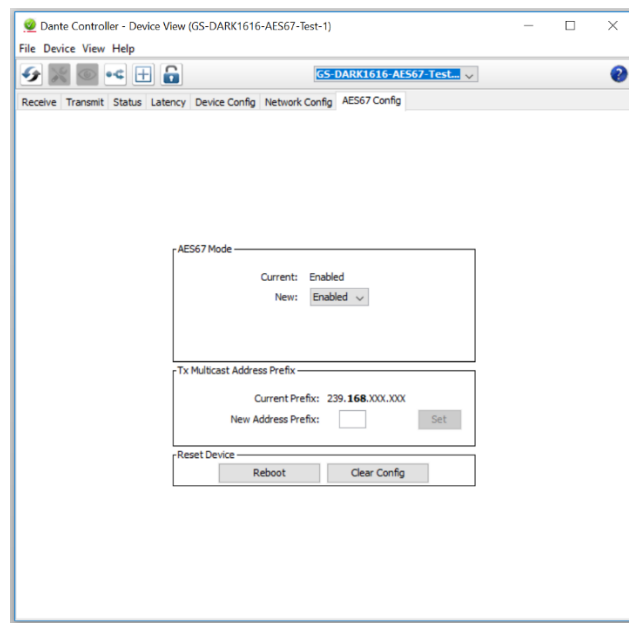
## **AES67 MODE**

The Beatrice unit uses a chipset from Audinate called the Ultimo for its network audio interface. Audinate are the company behind Dante and as such the primary network audio protocol is Dante, however Audinate have enabled their chip to comply with AES67 and therefore the Beatrice can be set to AES67 mode for interaction with other AES67 devices.

Please note however that Glensound are relying on Audinate's AES67 interface and are unfortunately not able to provide full AES67 support for the unit. AES67 support should be sought directly from Audinate.

### **Turning On AES67 Mode**


If you want to use your Beatrice on an AES67 network and it has not been set to AES67 mode then this can be set in Dante controller by double clicking the Beatrice to open the Device View window where you will find an AES67 tab to enable AES67 support.

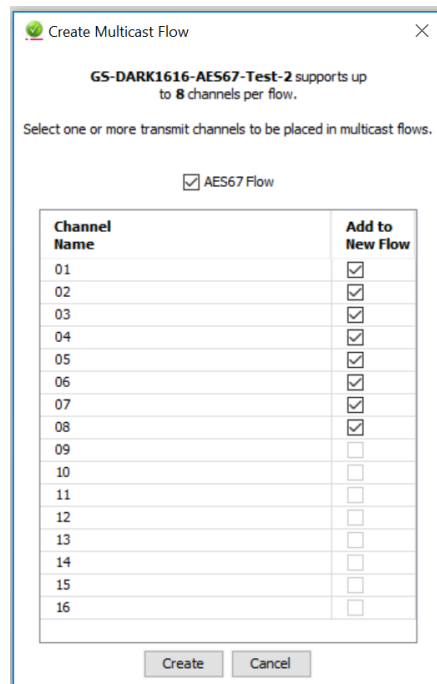


Once the AES67 drop down box has been enabled you'll have to reboot the Beatrice unit for the change to take effect. After the reboot go back to the AES67 tab and set the multicast prefix address to one that is suitable for your network.

## Sending AES67 Audio

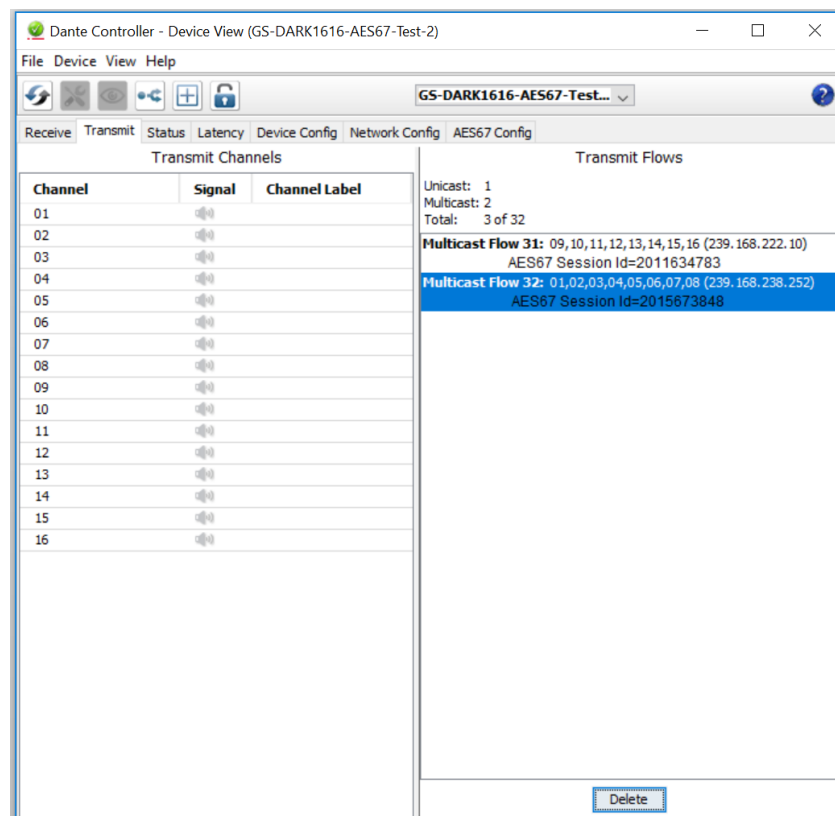
To transmit AES67 audio to the network a multicast flow must first be setup.

This is done by selecting the 'Create New Multicast Flow' Icon  in the Device View.



Tick the AES67 Flow check box, then select channels to be included in the flow then click 'Create'

Once set the flows can be seen in the transmit tab of the device view.



## **Receiving AES67 Audio**

Once a compatible AES67 stream is detected on the network by Dante Controller the AES67 flows will appear in the Dante Transmitters section in the Routing tab.

## **AES67 Restrictions**

AES67 flows can only be generated with the following constraints:

- Multicast Only
- Non-redundant
- Destination address in range 239.nnn.0.0 to 239.nnn.255.255 (239.nnn/16), port 5004
- 48kHz sampling rate
- 24 bit linear (L24) encoding
- 1 msec packet time
- Up to 8 channels per stream

Received AES67 flows have the following constraints:

- Multicast Only
- Non-redundant
- Destination address in range 239.nnn.0.0 to 239.nnn.255.255 (239.nnn/16), port 5004. Must match destination address range.
- 48kHz sampling rate
- L16 or L24 encoding
- 125usec, 250usec, 333usec, 1 msec packet time
- Up to 8 channels per stream

# UPDATING FIRMWARE

## Equipment needed

- A windows based PC
- USB Type A to Micro B cable
- A copy of 'DfuSe Demo' software
- The latest firmware from GlenSound
- A Beatrice LH4 and a PoE source

## Instructions

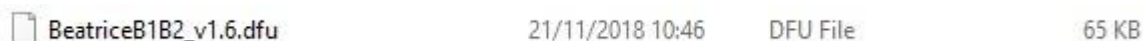
### 1. Download and install DfuSE Demo

'DfuSE Demo' is a firmware updating tool that is required for loading new firmware on to the STM32 Device.

It can be downloaded from the STMicroelectronics website found here: <https://goo.gl/AbzhsA>. It is the file named "STSW-STM32080".

Once you have downloaded this file you will need to extract the .exe "DfuSe\_Demo\_V3.0.5\_Setup.exe", then run and install it.

### 2. Download firmware



*Figure 1 Example filename*

## Connect To A PC

Connect the Beatrice LH4 to the PC via the USB cable. The micro USB connector is located on the rear panel of the Beatrice LH4 .

### 3. Firmware update preperation

To prepare the Beatrice LH4 for a firmware update;

1. Make sure the device is connected with USB
2. Press and hold down the UPDATE button
3. Power on the unit
4. Release the UDPATE button after a few seconds

Your PC should make an audible sound when this process is successful as windows is detecting a new USB device.

### 4. Loading the firmware

Now open DfuSe Demo.

If the Beatrice LH4 successfully entered DFU mode then it will appear as 'STM Device in DFU Mode' under the 'Available DFU Devices tab'.

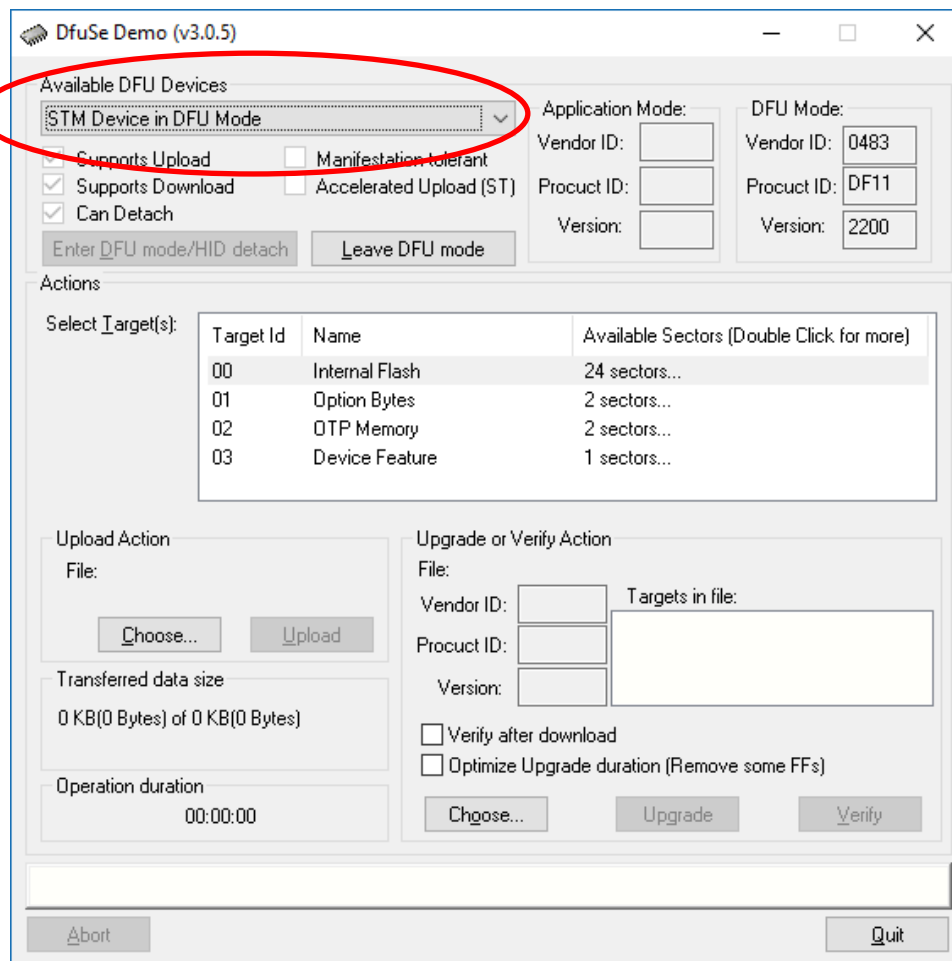


Figure 2 Device successfully recognised

Now the .dfu file needs to be selected so that DfuSe Demo knows the correct firmware to put on to the Beatrice LH4 .

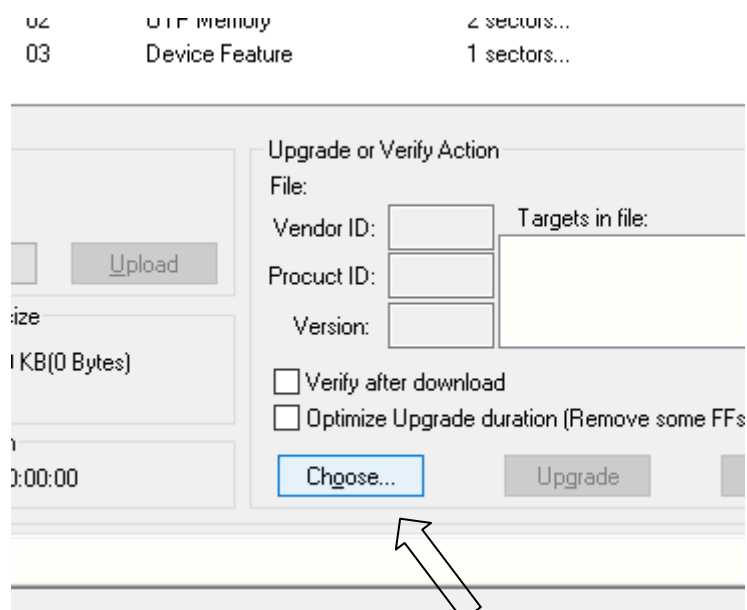


Figure 3 Choose .dfu file



Click choose and then select the .dfu file that you downloaded from the GlenSound website. This will be located in your downloads folder by default.

If the file loads successfully then it will read along the bottom 'File correctly loaded'.

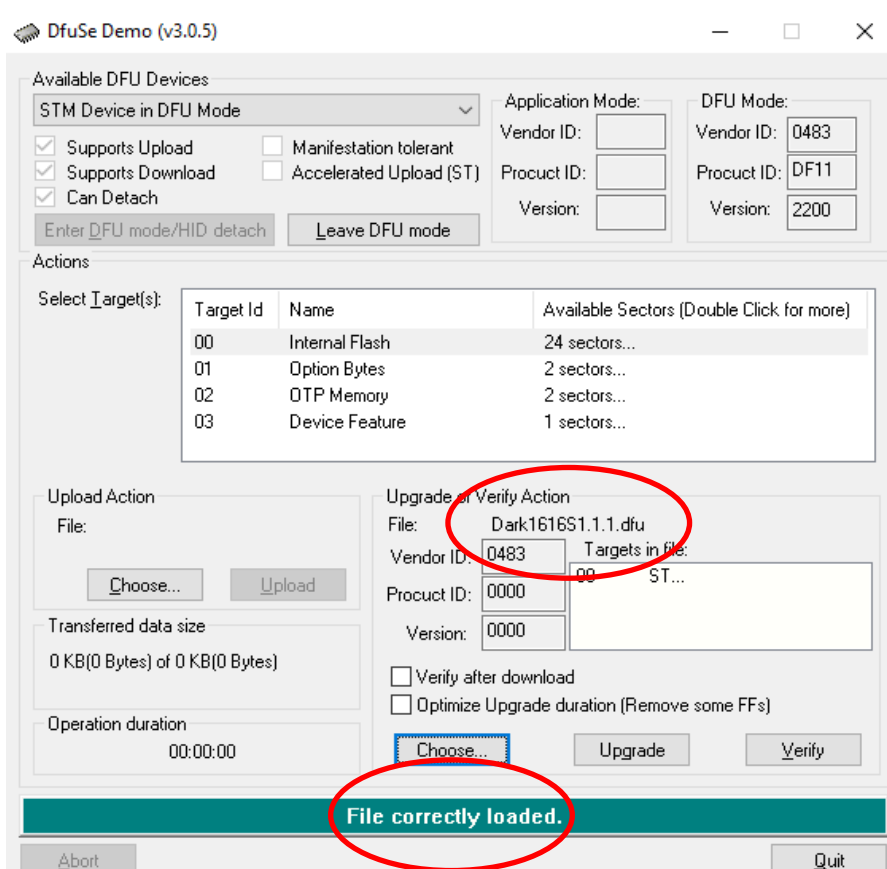


Figure 4 .dfu successfully loaded

## 5. Upgrading the Beatrice LH4 firmware

The firmware is now ready to be put on to the Beatrice LH4 . Tick the 'Verify after download' box first and then click 'Upgrade'.

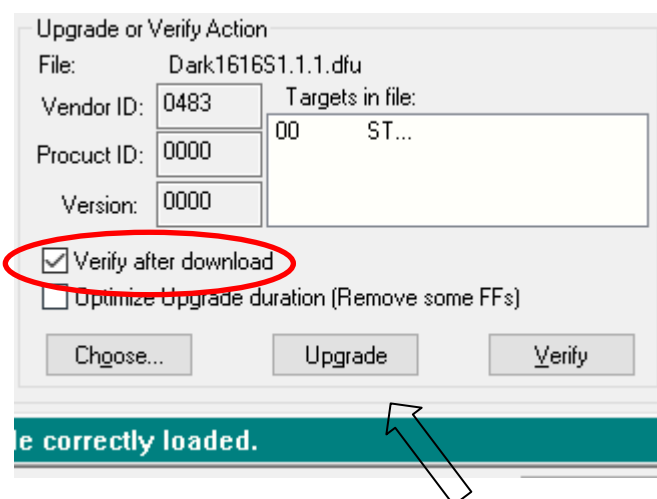


Figure 5 Upgrade

Click yes to proceed.

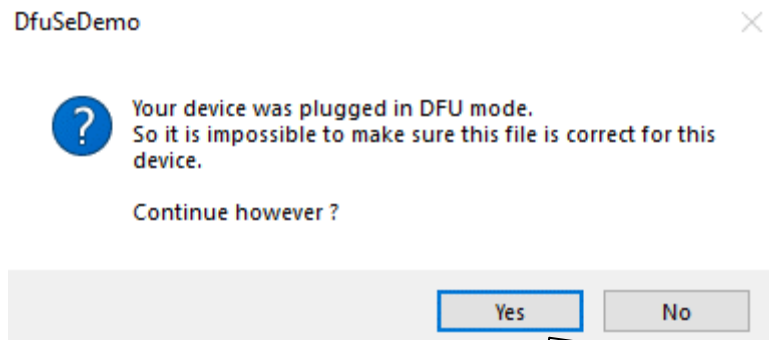


Figure 6 Start upgrade

The progress bar along the bottom will show the status of the operation.

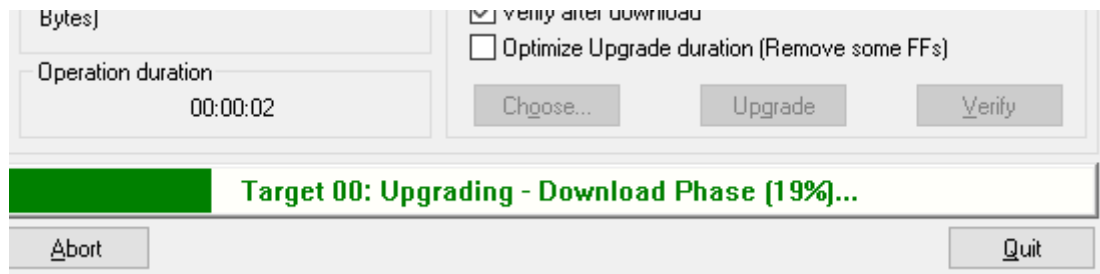


Figure 7 Upgrade status

If the operation was successful, DfuSe Demo will report that “Targery 00: Verify Successful!”.

You may also see that it will report how much data was successfully transferred.

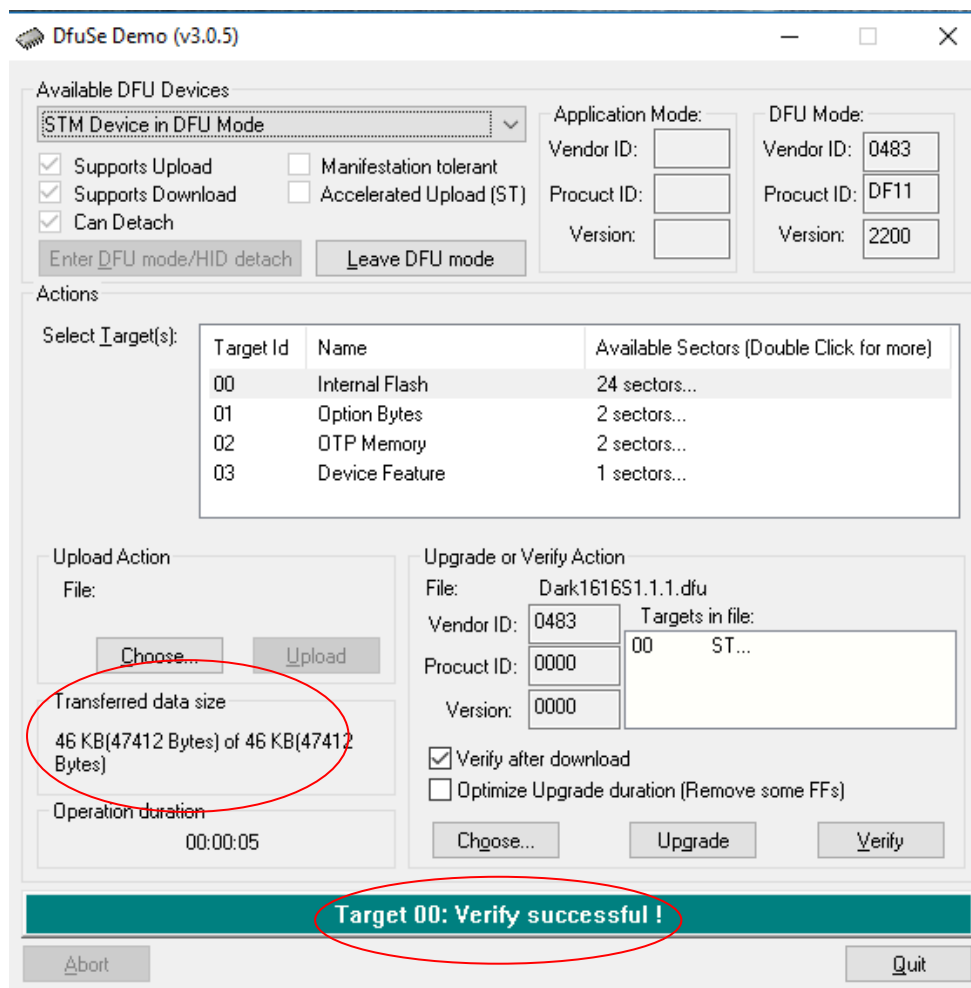


Figure 8 Successful upgrade!

## 6. Final steps

Now click “Leave DFU mode” to finish the procedure.

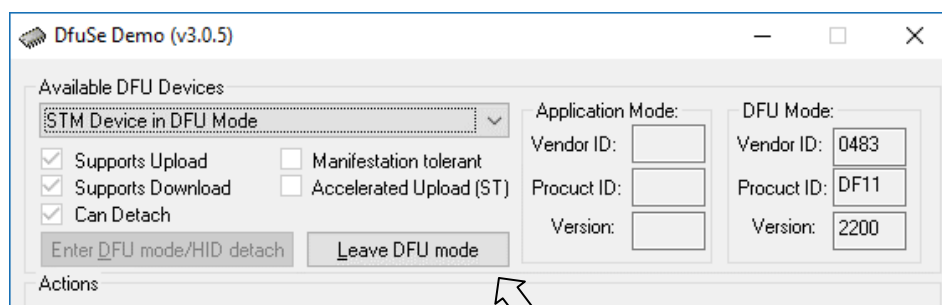


Figure 9 Final step

You may now disconnect the USB cable and continue to use the Beatrice LH4 with the freshly updated firmware!

## **UPDATING THE ULTIMO CHIPSET**

The Ultimo Chipset is a device supplied by Audinate that does most of the processing for the actual Dante/ AES67 network audio streams. There is one Ultimo Chipset in each Beatrice. We supply special code (a .dnt file) that sets up/ initiates the Ultimo Chipset and makes it work in particular way that is compatible to the Beatrice.

### **Finding Out Current Installed Version**

Using Dante<sup>®</sup> controller, double click on the Beatrice device name in the routing tab to open the Device View box.

On the Device View box open the Status Tab.

The 'Product Version:' shows the currently installed version of Ultimo Chipset dnt code.

### **Finding Out What The Latest Available Version Is**

Go the Beatrice's web page at GlenSound.com and open the 'Firmware Latest Version' Tab.

This will give both the latest version numbers/ file names and also the location to download the file from.

### **Updating the device**

The firmware that runs in the Ultimo Chipset is updated using Audinate's Firmware updating tool. The updating tool and a user guide can be downloaded from Audinate's website:

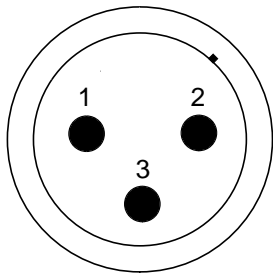
<https://www.audinate.com/products/firmware-update-manager>

### **NOTE:**

Please note we strongly advise that when you do the update that only your PC and the Dante device that you want to update are on the network to save accidentally updating the wrong Dante device.

## **WIRING INFORMATION**

### **XLR Wiring**



XLR PLUG (MALE)

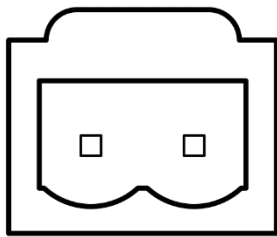
### **STANDARD XLR AUDIO PINOUTS:**

**1: Ground/ Earth**

**2: INPHASE/ POSITIVE +**

**3: MATE/ NEGATIVE -**

### **Terminal connector Wiring**



**1**

**2**

### **2 WAY 5.08MM PITCH TERMINAL BLOCK:**

**1: Ground/ Earth**

**2: DC Loop 1**