Glensound

DARK1616S

DANTE NETWORK AUDIO
16 INPUT 16 OUTPUT AES3 & LINE LEVEL
ANALOGUE INTERFACE

PRODUCT DETAILS

Glensound Electronics Ltd

Thank you for choosing a new Glensound product.

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

If you need any help with the product then we can be contacted at:

Glensound Electronics Ltd
1 – 6 Brooks Place
Maidstone
Kent
ME14 1HE
United Kingdom

Telephone: +44 (0) 1622 753662

Fax: +44 (0) 1622 762330

EMAIL ADDRESSES

General enquires: office@glensound.co.uk

Technical enquires: techinfo@glensound.co.uk

Sales enquires: sales@glensound.co.uk

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.

⚠️ **SAFETY WARNING** ⚠️

The DARK1616S contains no user serviceable parts and **must not** be dissasembled in any way.

$\mathsf{C}\,\mathsf{E}$

EU DECLARATION OF CONFORMITY FOR:

DARK1616S

Sixteen channel AoIP, AES3/Analogue I/O interface

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 $\mathsf{C}\,\mathsf{E}$ marked and conforms to the following Union harmonisation legislation:

Low Voltage Directive:	EN60065 and EN62368-1:2014
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: 21/03/2018

RoHS DIRECTIVE

EC directive 2002/95/EC restricts the use of the hazardous substances listed below in electrical and electronic equipment.

This product conforms to the above directive and for this 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)

Glensound Electronics Ltd is registered for business to business sales of WEEE in the UK our registration number is:

WEE/JJ0074UR

GLENSOUND DARK1616S
Handbook Contents

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OVERVIEW

The Glensound DARK1616S is an analogue to digital and digital to analogue converter designed to connect AES3 and line level analogue audio circuits to a Dante®/ AES67 audio network. The DARK1616S can also be synchronised with a studio clock.

Dante® network audio is a common protocol for distributing high quality linear audio over standard IP networks and it is widely used by many audio equipment manufacturers. The DARK1616S Dante® audio interface is compatible with all Dante® audio interfaces across all manufacturers. Further details of Dante® network audio can be found at www.audinate.com

Intended for live on-air broadcast applications, the DARK1616S has been designed with multiple redundancy capabilities. It has 2 mains power sources and it also has fully redundant network connections for both Copper & Fibre circuits.

The DARK1616S provides 8 balanced AES3 inputs and 8 balanced AES3 outputs to the Dante® network and 16 analogue line level (0dB) inputs to the Dante® network and 16 analogue line level (0dB) outputs from the Dante® network. The rear panel D25 connectors are wired to AES59 (also known as the Tascam standard).
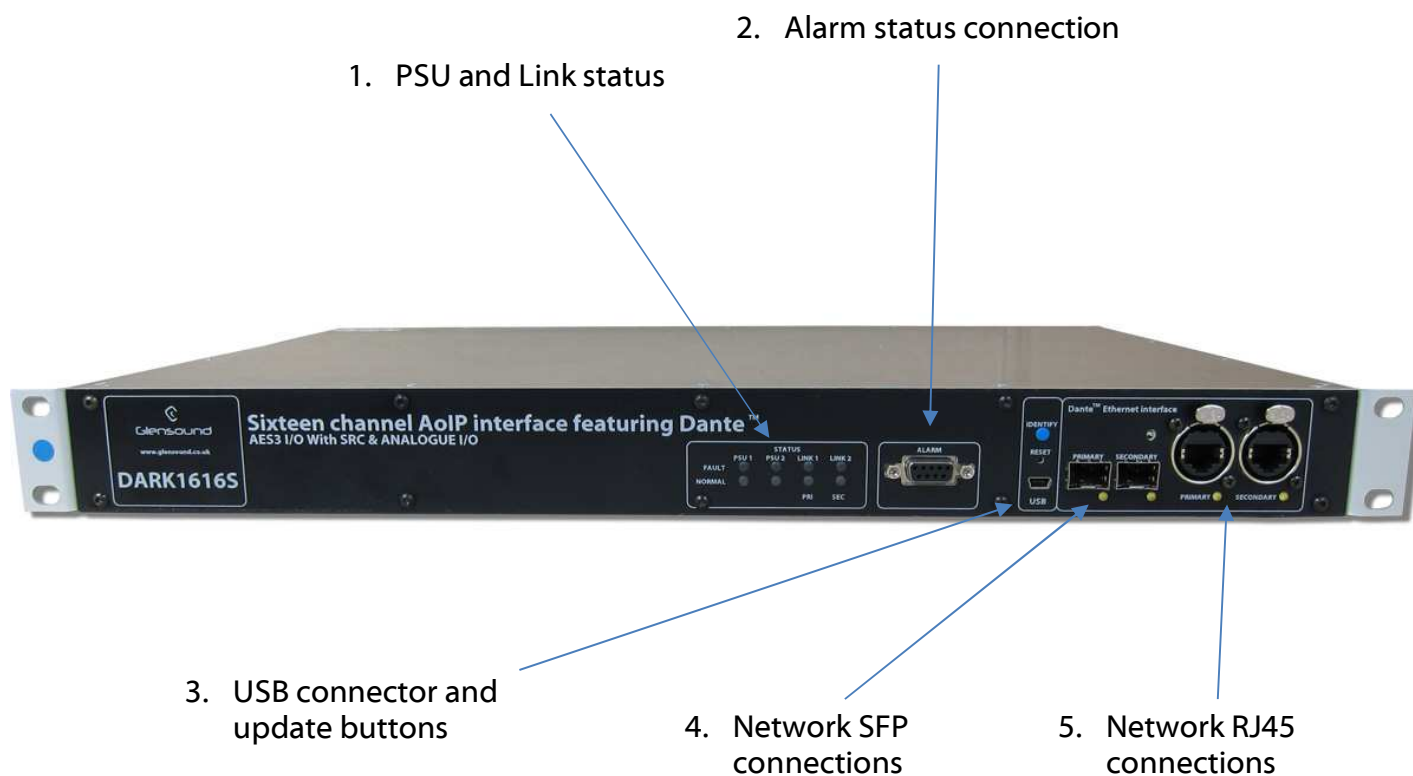
The DARK1616S analogue and AES3 outputs are paired. When the same audio signal from the Dante® network is presented on one channel's AES3 output, it will appear as an analogue audio signal on the equivalent analogue output.

For each channel only 1 audio input signal can be sent to the Dante® network, in Auto mode the AES3 input has priority over the analogue, otherwise a source can be selected using GlenControler.

GlenController is a Windows 10 application that allows parameters of the Dark1616S to be confugured (such as input type and AES3 output clock source). It also allows live metering of input and output channels.

DARK1616S FRONT PANEL LAYOUT

2. Alarm status connection

1. PSU and Link status

3. USB connector and update buttons

4. Network SFP connections

5. Network RJ45 connections

1. **PSU and Link status**

There are 4 red LEDs and 4 green LEDs that illuminate depending on the status of the link. Red indicates no connection, green indicates a successful connection.

For example, if you have connected the DARK1616S to two separate PSUs, only one of which works then you will have a red 'Fault' LED illuminate to warn you that there is no power detected on the connection that is not receiving mains power.

2. **Alarm status connection**

This 8-way female D-type connector will report the failure of a link status if one is detected whilst in operation.

3. **USB connector and update buttons**

The MINI USB connection allows the firmware of the DARK1616S to be updated. To prepare the DARK1616S for a firmware update; power on the unit, press and hold down the reset button, press and hold down the identify button, release the reset button and then release the identify button a second after.

4. **Network SFP Connections**

There are 2 standard network data SFP sockets provided to allow redundant network connectivity if using Dante network audio protocol. They are both gigabit network connections. They accept standard SFP modules. The status LEDs flash to show when data is being correctly communicated with the attached switch.

If you require SFP modules then please email sales@glensound.co.uk for a quotation.
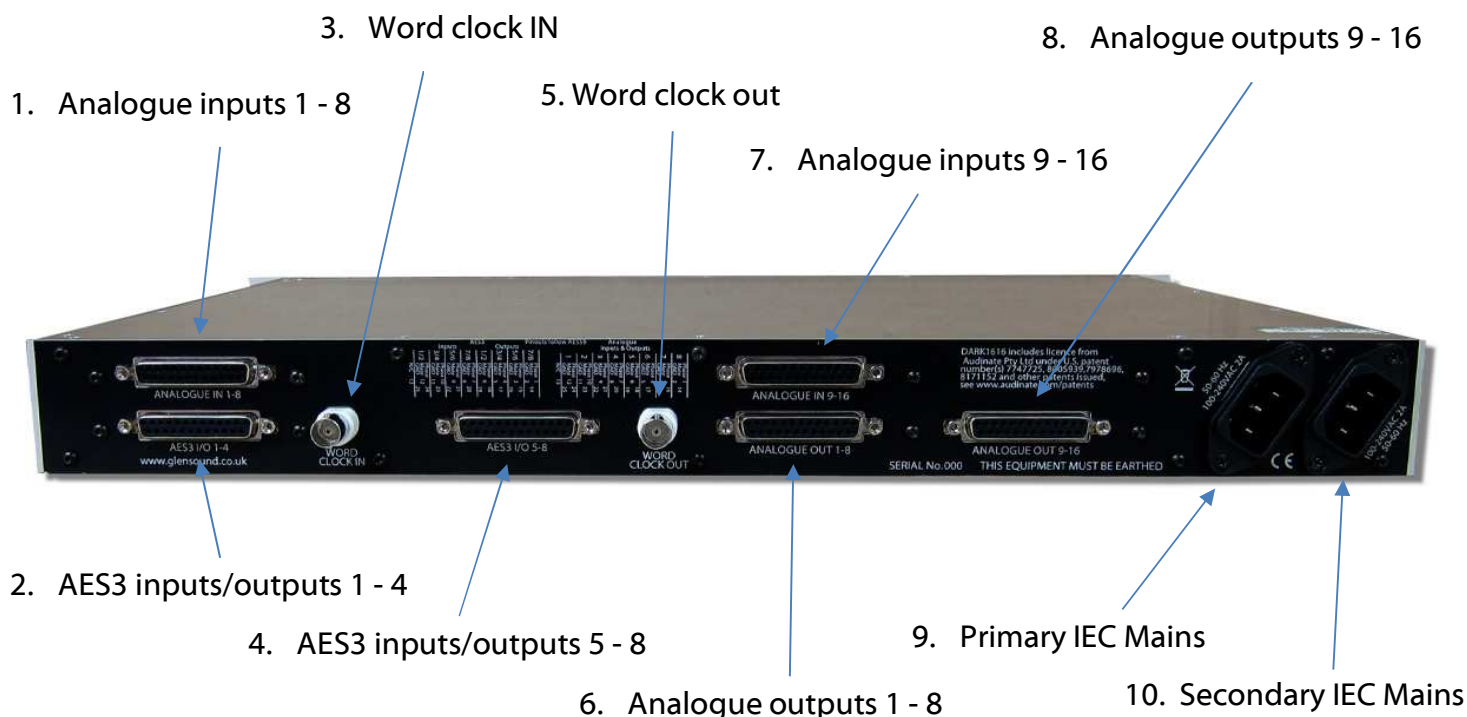
Network Note

Factory default is to have the SFP & RJ45 sockets set to work in redundant mode.

It is possible using Dante controller to set these network interfaces to work as a network switch instead of the redundant mode, meaning other network equipment can be connected to them.

5. **Network RJ45 connections**

There are 2 standard network data RJ45 sockets provided to allow redundant network connectivity if using Dante network audio protocol. They are both gigabit network connections. The status LEDs flash to show when data is being correctly communicated with the attached switch.

DARK1616S REAR PANEL LAYOUT

3. Word clock IN

8. Analogue outputs 9 - 16

5. Word clock out

1. Analogue inputs 1 - 8

7. Analogue inputs 9 - 16

2. AES3 inputs/outputs 1 - 4

4. AES3 inputs/outputs 5 - 8

9. Primary IEC Mains

6. Analogue outputs 1 - 8

10. Secondary IEC Mains

A detailed wiring table for the pins of all rear panel connections can be found at the end of the manual.

1. Analogue inputs 1 - 8

A 25-way female D-type connector allows a breakout cable to be attached to send analogue line level (0dB) signals **in** to the DARK1616S on channels 1 - 8. This connector is wired to AES59 standard (also known as the Tascam standard).

The signals can then be routed via Dante to anywhere on a network or back out of the DARK1616S via it's analogue or AES3 digital outputs.

2. AES3 inputs/outputs 1 - 4

A 25-way female D-type connector allows a breakout cable to be attached to send and receive 1 – 4 balanced digital AES3 signals. This audio can be routed to anywhere on a network via Dante.

AES3 digital inputs signals always take priority over analogue inputs.

Therefore, sending an input to channel 1 in both digital and analogue domains will result in the digital signal being accepted and the analogue signal being disregarded.

Despite this, the DARK1616S will always ouput audio simultaneously to both digital and analogue connections.

3. **Word Clock in**

   A BNC connector allows a studio clock signal to be sent to the DARK1616S.

   This will enable the DARK1616S to synchronise it's AES3 output sample rate with the studio clock.

   AES3 outputs will not work when the DARK1616S does not have a word clock connected.

4. **AES3 inputs/outputs 5 – 8**

   A 25-way female D-type connector allows a breakout cable to be attached to send and receive balanced digital AES3 signals on channels 5 - 8. This audio can be routed to anywhere on a network via Dante.

   AES3 digital inputs signals always take priority over analogue inputs.

5. **Word clock out**

   This BNC connector will output a clock signal that follows the rate of the AES3 outputs.

6. **Analogue outputs 1 – 8**

   A 25-way female D-type connector allows a breakout cable to be attached to send analogue audio signals **out** of the DARK1616S on channels 1 - 8. This connector is wired to AES59 standard (also known as the Tascam standard).

   The signals output from this connection can be audio received via the Dante network.

7. **Analogue inputs 9 – 16**

   A 25-way female D-type connector allows a breakout cable to be attached to send analogue line level (0dB) signals from channels 9 - 16 **in** to the DARK1616S. This connector is wired to AES59 standard (also known as the Tascam standard).

   The signals can then be routed via Dante to anywhere on a network or back out of the DARK1616S via it's analogue or AES3 digital outputs

8. **Analogue outputs 9 – 16**

   A 25-way female D-type connector allows a breakout cable to be attached to send analogue signals **out** of the DARK1616S on channels 9 - 16. This connector is wired to AES59 standard (also known as the Tascam standard).

   The signals output from this connection can be audio received via the Dante network

9. **Primary IEC Mains**

The standard IEC mains plug accepts external AC voltages of 100 - 240 VAC +/- 10%. There is a non-accessable internal fuse for this input.
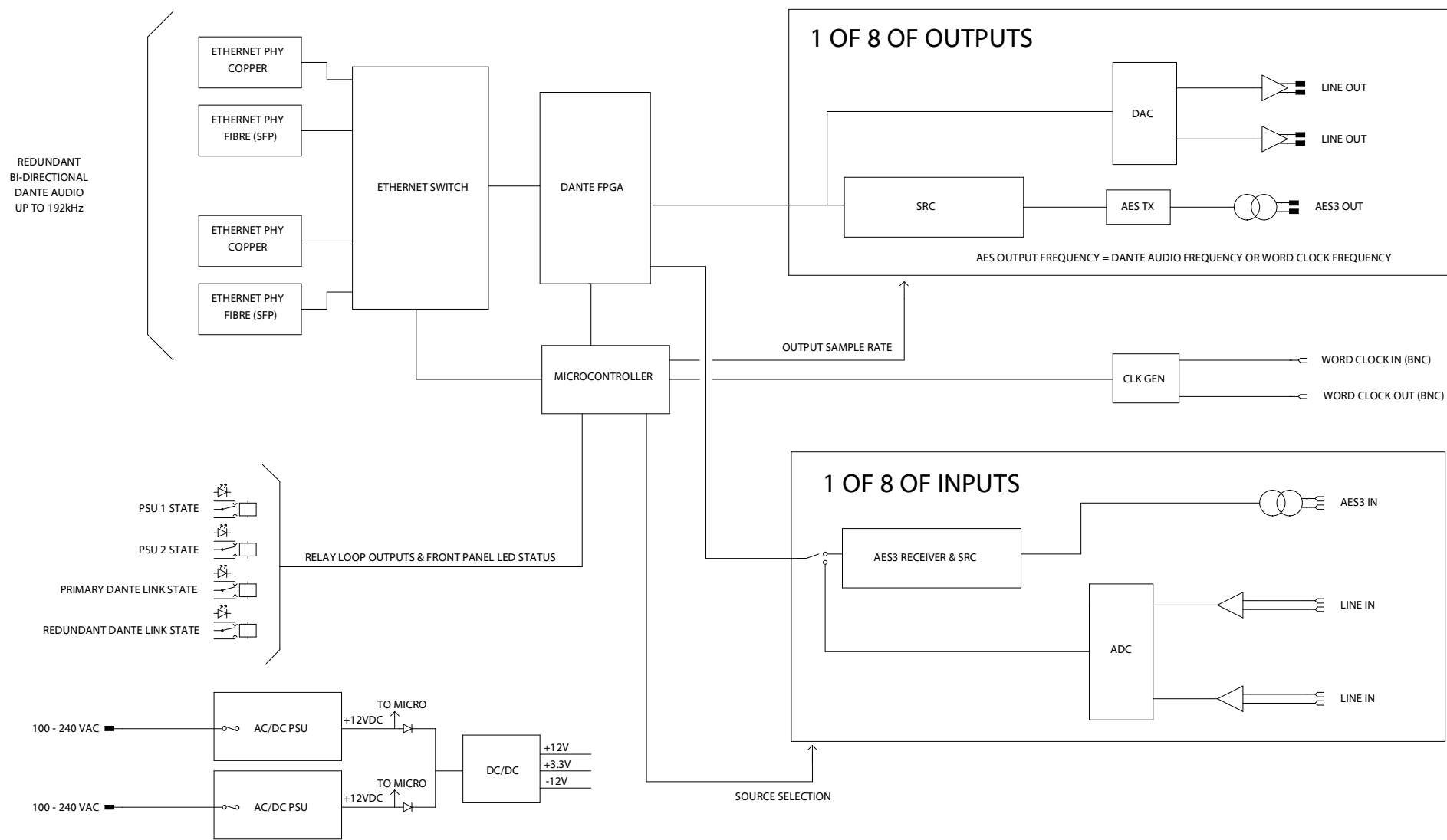
The DARK1616S is designed to operate with either primary or secondary mains sources or both for power redundancy.

10. **Secondary IEC Mains**

The standard IEC mains plug accepts external AC voltages of 100 - 240 VAC +/- 10%. There is a non-accessable internal fuse for this input.

The DARK1616S is designed to operate with either primary or secondary mains sources or both for power redundancy.

REDUNDANT
BI-DIRECTIONAL
DANTE AUDIO
UP TO 192kHz

ETHERNET PHY COPPER

ETHERNET PHY FIBRE (SFP)

ETHERNET PHY COPPER

ETHERNET PHY FIBRE (SFP)

ETHERNET SWITCH

DANTE FPGA

MICROCONTROLLER

1 OF 8 OF OUTPUTS

DAC

LINE OUT

LINE OUT

SRC

AES TX

AES3 OUT

AES OUTPUT FREQUENCY = DANTE AUDIO FREQUENCY OR WORD CLOCK FREQUENCY

OUTPUT SAMPLE RATE

CLK GEN

WORD CLOCK IN (BNC)

WORD CLOCK OUT (BNC)

PSU 1 STATE

PSU 2 STATE

PRIMARY DANTE LINK STATE

REDUNDANT DANTE LINK STATE

RELAY LOOP OUTPUTS & FRONT PANEL LED STATUS

1 OF 8 OF INPUTS

AES3 RECEIVER & SRC

AES3 IN

LINE IN

ADC

LINE IN

100 - 240 VAC

AC/DC PSU

TO MICRO
+12VDC

100 - 240 VAC

AC/DC PSU

TO MICRO
+12VDC

DC/DC

+12V
+3.3V
-12V

SOURCE SELECTION

CONNECTING THE DARK1616S TO A DANTE NETWORK

The DARK1616S is a network audio device utilizing the reliable and versatile Dante audio over IP protocol. Dante is a widely used proprietary system made by Audinate.

For full details of the power of Dante network audio and instructions for using it, visit www.audinate.com

Getting Dante Controller

If you are connecting the DARK1616S 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

Connecting DARK1616S To the Network

The DARK1616S can be connected to the network that you are going to use for your audio distribution simply by plugging in either, and, or any of the network connections on the front panel. Once connected to the network it will be possible to see the DARK1616S 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

Running Dante Controller

At the time of writing this manual the Dante Controller looks as per the screenshot below:
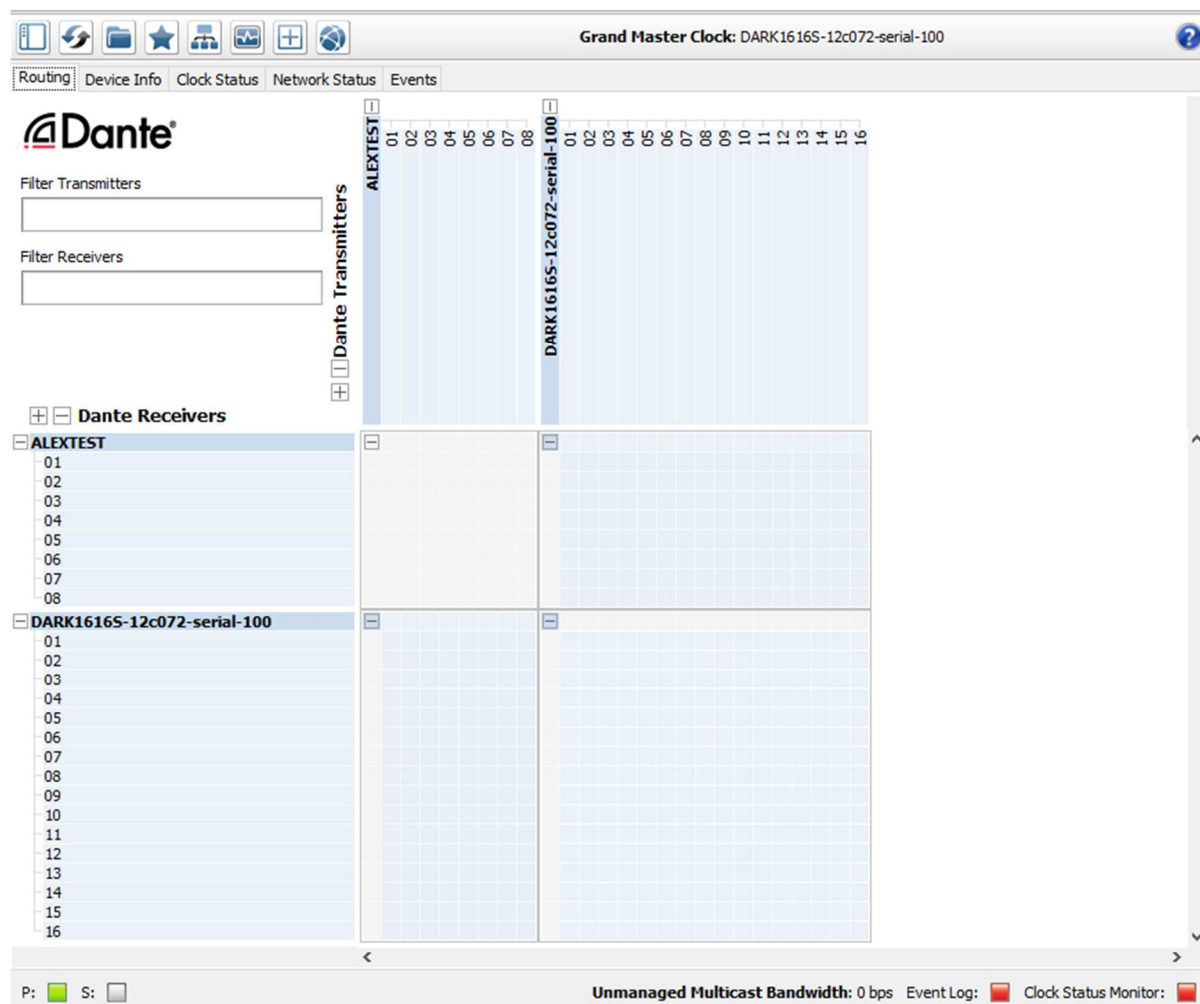
The DARK1616S will have been named at the factory during test to allow them to be identified by the Dante controller.

The format used for the factory name is:

'DARK1616S-12c072- serial-100'

Where 'DARK1616S-12c072' refers to the Glensound product and MAC address and 'serial-100' refers to the its serial number.

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.

WINDOWS 10 REMOTE CONTROL APPLICATION

1. General

A Windows 10 Application called GlenController is provided to allow configuration and setup of the Dark1616S. It allows configuration items such as AES3 output clock source and digital Fs levels to be set and also allows day to day operations such as monitoring levels and selecting input sources.

GlenController is our own application that controls a number of different products.

2. Installing GlenController

Full details of the installation process and location of filers required to install GlenController can be found on its web page:

http://www.glensound.co.uk/product-details/glencontroller/

3. Uninstalling GlenController

Find the app in the 'All apps' list then right-click and select 'Uninstall'.

GLENCONTROLLER App

The Dark1616S has a remote control utility called GlenController. This app allows the Dark1616S to be set up and controlled remotely, things such as clock source, Fs level, filtering and metering can all be controlled/ seen via the app.

The below guide is meant as an indication of the facilities available on the app, but being software developments are likely to be constantly evolving.
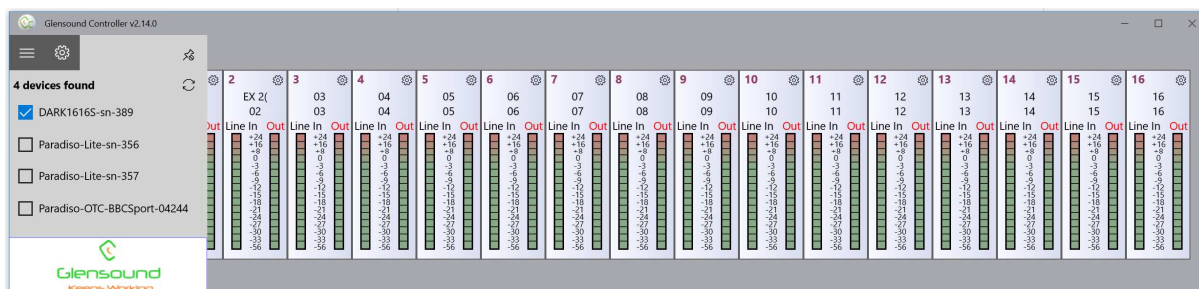
Running The App

To run GlenController, click the Windows icon in the bottom left corner of the screen, and find it in the 'All apps' list and double click.

Starting The App

When the app first starts it looks for compatible devices across your network, and it will show a list of any available units that it can connect to on the left hand side of the screen.
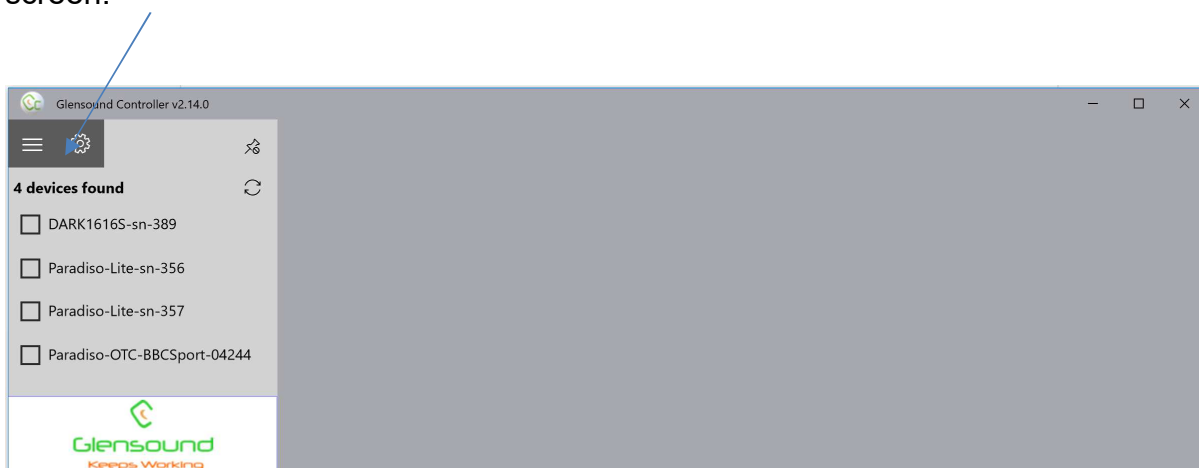
Tick the box against the name of the device that you want to control and it will appear in the main screen area:
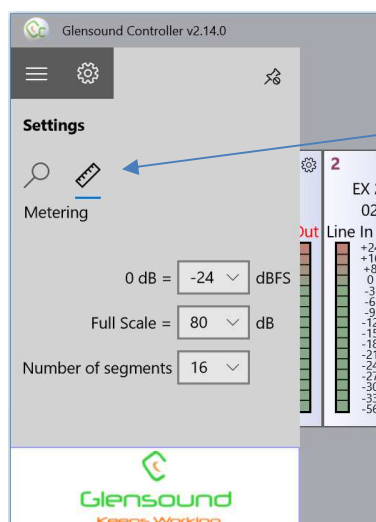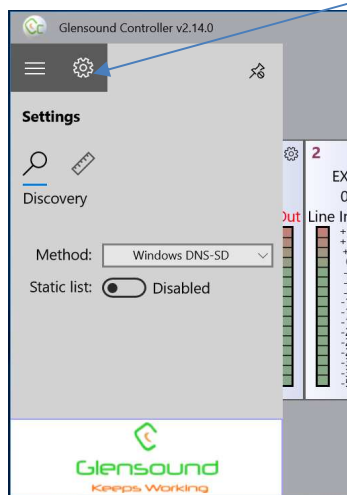
App Controls

Pressing this button toggles the side bar in and out:
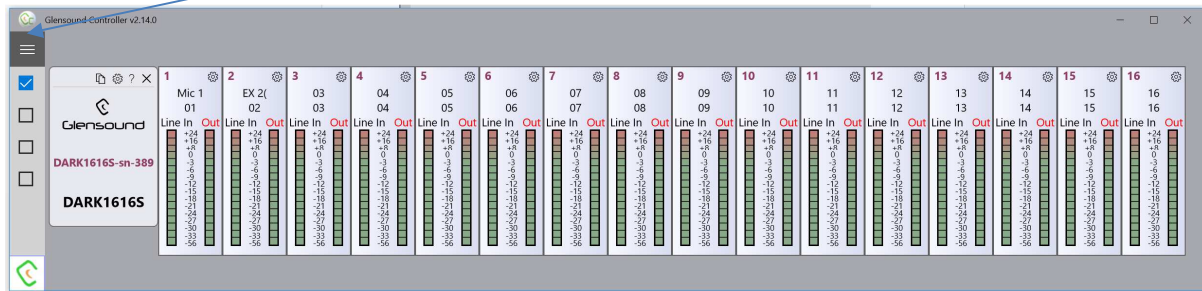
Pressing the settings button provides in the 'Discovery' view different automatic discovery methods and options for adding static ip addresses.

Discovery refers to the App discovering the Glensound hardware product(s) on your network that it can provide remote control facilities for.


Pressing the Metering Icon in the settings view opens options for dBFs line up, overall scale range (in dB) and the number of segments (resolution) of the meters.

Pressing the settings button opens up dasboard settings

'Use CH1 as Master' if this tick box is selected then when a change is made to CH1 all other channels follow
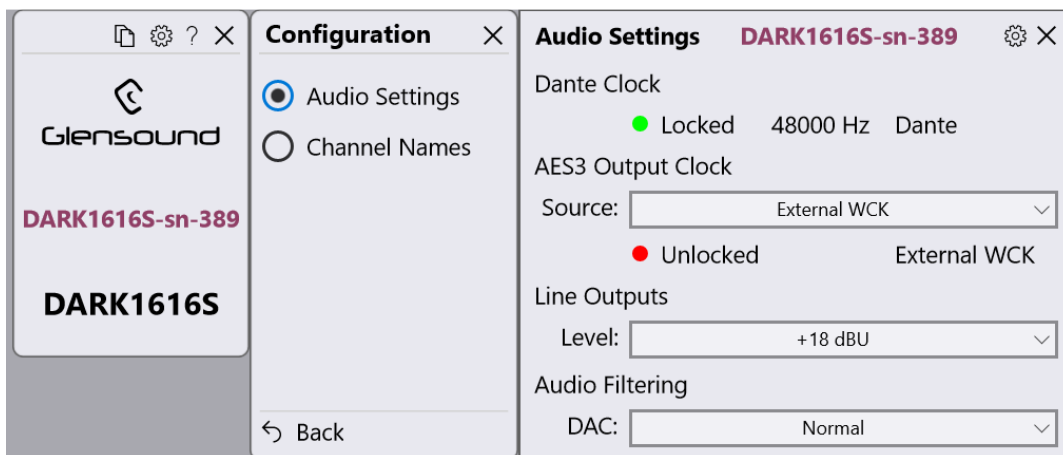
Access mode setup allows sole or shared control of the Dark1616S by different PCs running the App and the control can also be password protected

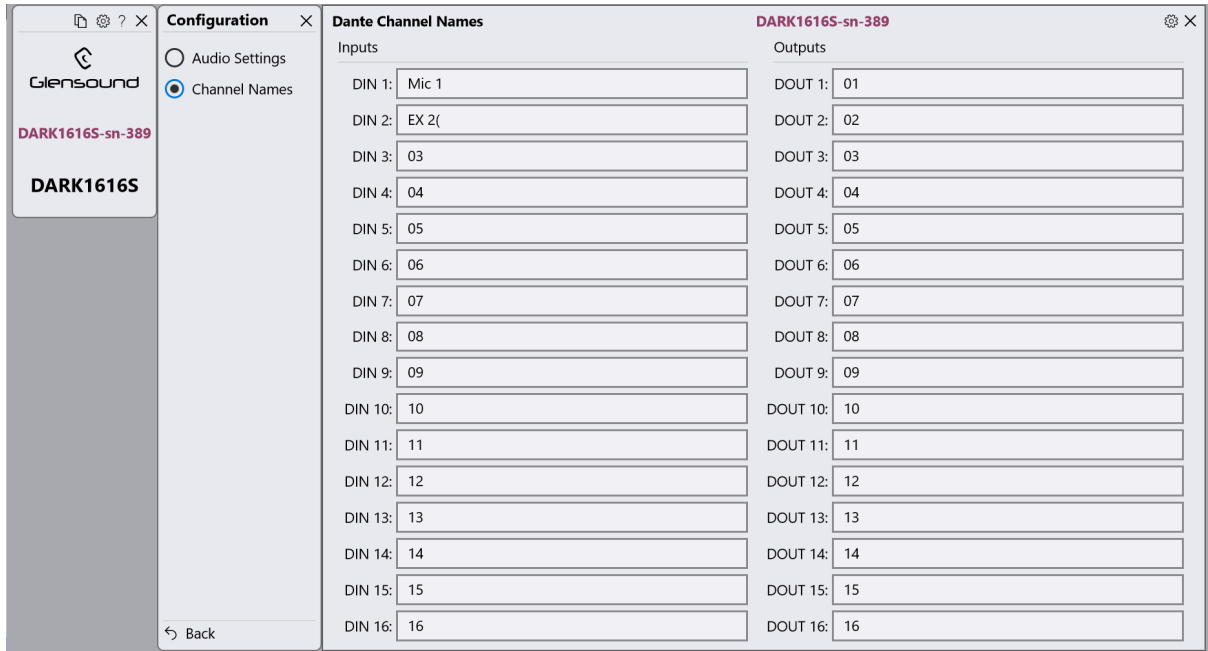Configuration opens up further audio and channel name options
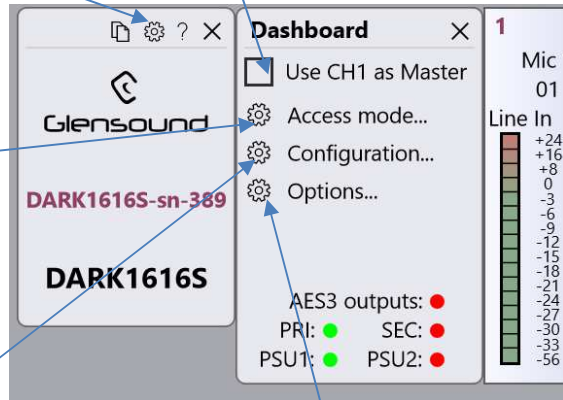
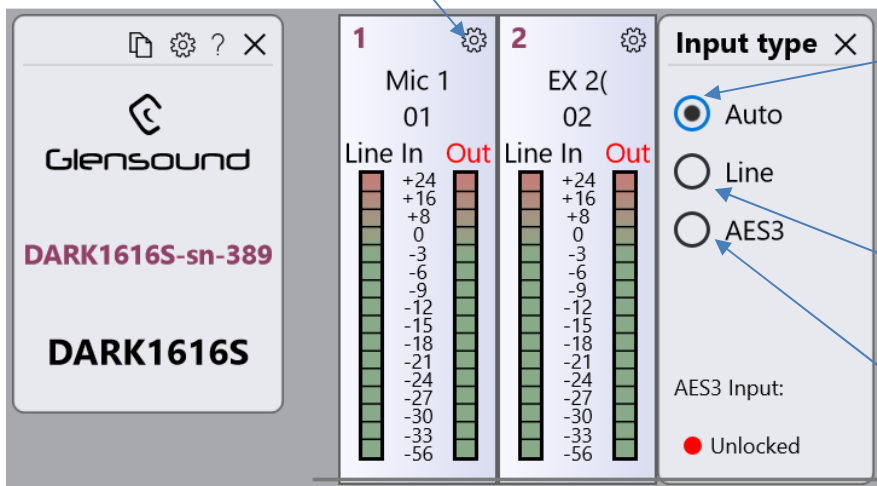Options allows you set what items such as meters are shown in the channel view.

In Audio Settings AES3 output clock source can be set, Full scale (Fs) output levels can be set and curent clock source and frequency can be seen

Dashboard

☐ Use CH1 as Master
⚙ Access mode...
⚙ Configuration...
⚙ Options...

AES3 outputs: ●
PRI: ●   SEC: ●
PSU1: ●   PSU2: ●

Glensound
DARK1616S-sn-389
DARK1616S

Mic 1
01
Line In
+24
+16
+8
0
-3
-6
-9
-12
-15
-18
-21
-24
-27
-30
-33
-56

Configuration

◉ Audio Settings
○ Channel Names

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Glensound
DARK1616S-sn-389
DARK1616S

Audio Settings   DARK1616S-sn-389

Dante Clock
   ● Locked   48000 Hz   Dante

AES3 Output Clock
Source: [External WCK ∨]
   ● Unlocked   External WCK

Line Outputs
Level: [+18 dBU ∨]

Audio Filtering
DAC: [Normal ∨]

Changing Dante Channel Names allows names to be changed that appear in the channel views of the GlenController App and also the channel names that appear in Dante Controller.

Dante Channel Names		DARK1616S-sn-389	
Inputs		**Outputs**	
DIN 1:	Mic 1	DOUT 1:	01
DIN 2:	EX 2(	DOUT 2:	02
DIN 3:	03	DOUT 3:	03
DIN 4:	04	DOUT 4:	04
DIN 5:	05	DOUT 5:	05
DIN 6:	06	DOUT 6:	06
DIN 7:	07	DOUT 7:	07
DIN 8:	08	DOUT 8:	08
DIN 9:	09	DOUT 9:	09
DIN 10:	10	DOUT 10:	10
DIN 11:	11	DOUT 11:	11
DIN 12:	12	DOUT 12:	12
DIN 13:	13	DOUT 13:	13
DIN 14:	14	DOUT 14:	14
DIN 15:	15	DOUT 15:	15
DIN 16:	16	DOUT 16:	16

Configuration
○ Audio Settings
◉ Channel Names

DARK1616S-sn-389

DARK1616S

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Select the settings Icon to open up more options

Input type
◉ Auto
○ Line
○ AES3

AES3 Input:
● Unlocked

AUTO:
If a valid AES3 input signal is present this will be routed to the Dante network instead of the analogue Line input.
LINE:
Analogue line input will be routed to the Dante network
AES:
The AES3 input circuit will be routed to the Dante network

If Channel Names have been set then the top line shows the Input Name and the bottom line shows the Output Name

1 ⚙	**2** ⚙	**3** ⚙	**4** ⚙	**5**
Mic 1	Mic 2	Mic 3	Mic 4	
01	Monitor	Record	PGM	

Line In / Out (for channels 1–5)

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DARK1616S-sn-389

DARK1616S

Configuration ✕

○ Audio Settings

○ Channel Names

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UPDATING FIRMWARE

The DARK1616S is a complex digital audio system comprising of a DSP and several Micro Controllers. All these items run software and may need to be occasionally updated.

Equipment needed

- A windows based PC
- USB Type A to Mini B cable
- A copy of 'DfuSe Demo' software
- The latest firmware from Glensound
- A DARK1616S and mains power

Instructions

1. Download and install DfuSE Demo

   'DfuSE Demo' is a firmware updating tool that is required for loading new firmware on to the DARK1616S.

   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

   The latest firmware for the DARK1616S can be found on the Glensound website, under the product page for DARK1616S. Once you have downloaded the file, place it in a folder or location of your choice.

Name	Date	Type	Size
Dark1616S1.1.1.dfu	21/03/2018 11:18	DFU File	47 KB

Figure 1 Example filename

3. Connect To A PC

   Connect the DARK1616S to the PC via the USB cable. The Mini USB connector is located on the front panel of the DARK1616S.

Figure 2 Front panel USB connector

4. Firmware update preperation

To prepare the DARK1616S for a firmware update;

1. Power on the unit
2. Press and hold down the reset button
3. Press and hold down the identify button
4. Release the reset button and then release the identify button a second after

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

5. Loading the firmware

Now open DfuSe Demo.

If the DARK1616S successfully entered DFU mode then it will appear as 'STM Device in DFU Mode' under the 'Available DFU Devices tab'.
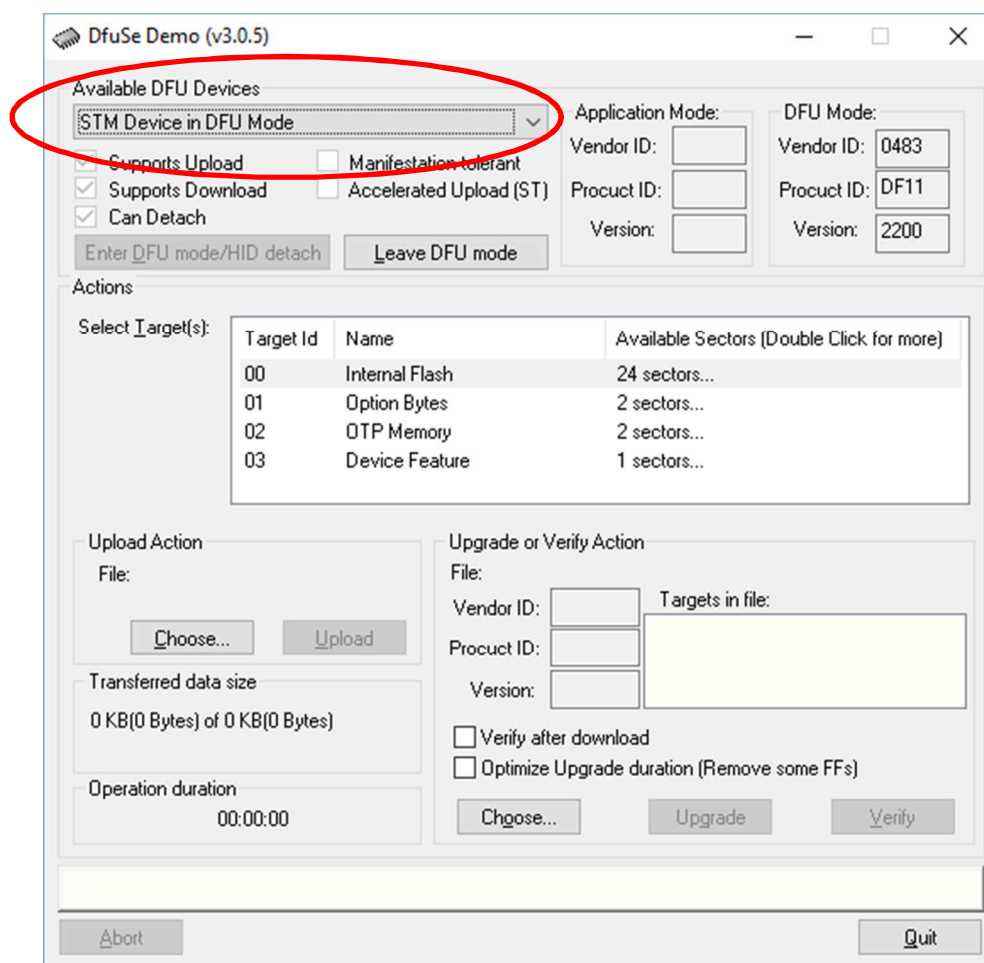
Figure 3 Device successfully recognised

Now the .dfu file needs to be selected so that DfuSe Demo knows the correct firmware to put on to the DARK1616S.
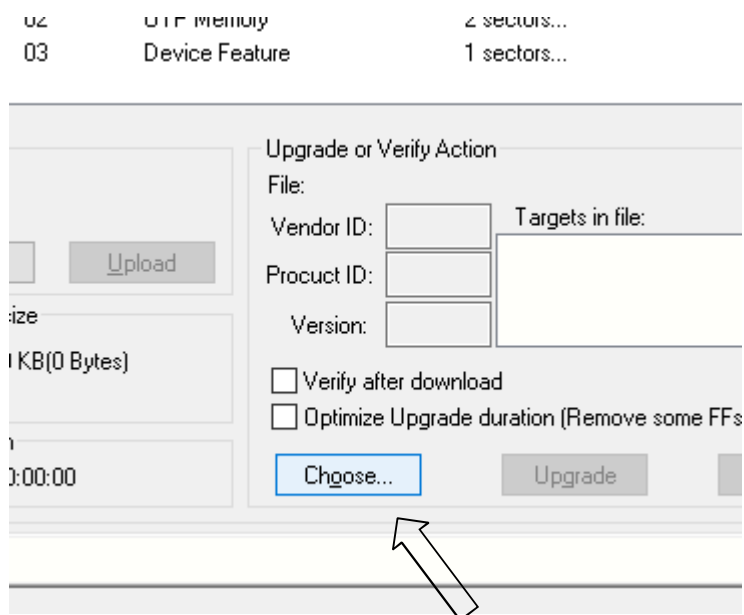
Figure 4 Choose .dfu file

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'.
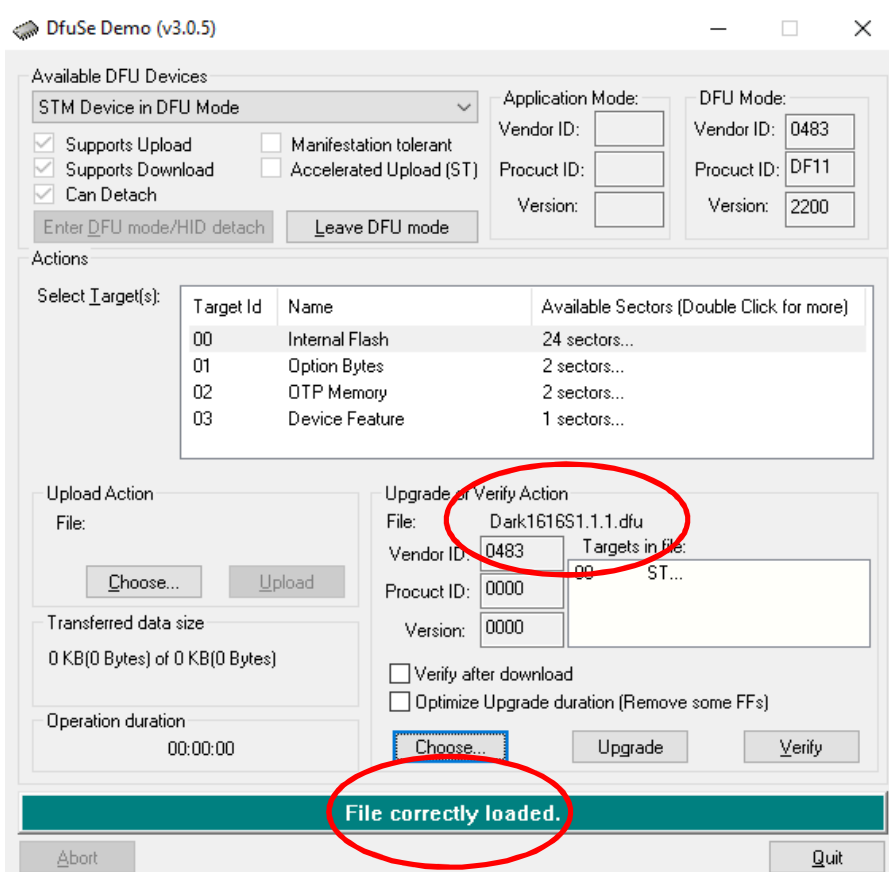

Figure 5 .dfu successfully loaded

6. Upgrading the DARK1616S firmware

The firmware is now ready to be put on to the DARK1616S. Tick the 'Verify after download' box first and then click 'Upgrade'.
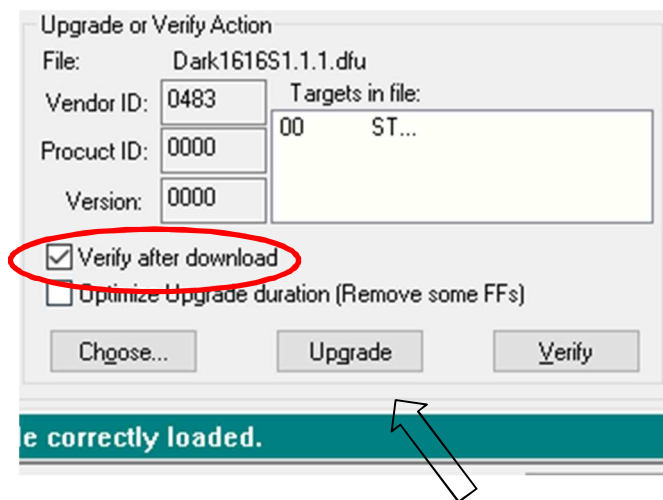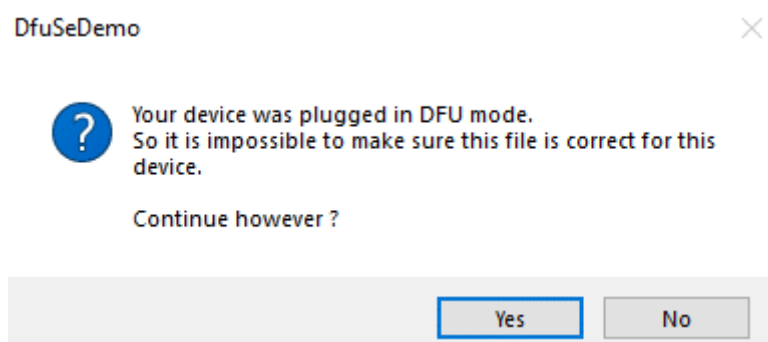

Figure 6 Upgrade

Click yes to proceed.

Figure 7 Start upgrade

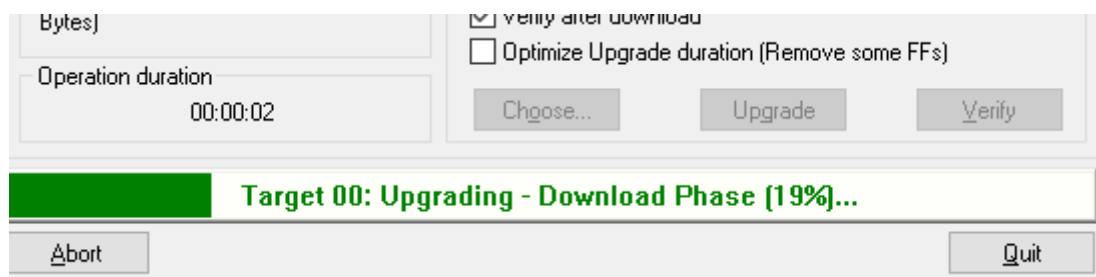The progress bar along the bottom will show the status of the operation.

Figure 8 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.
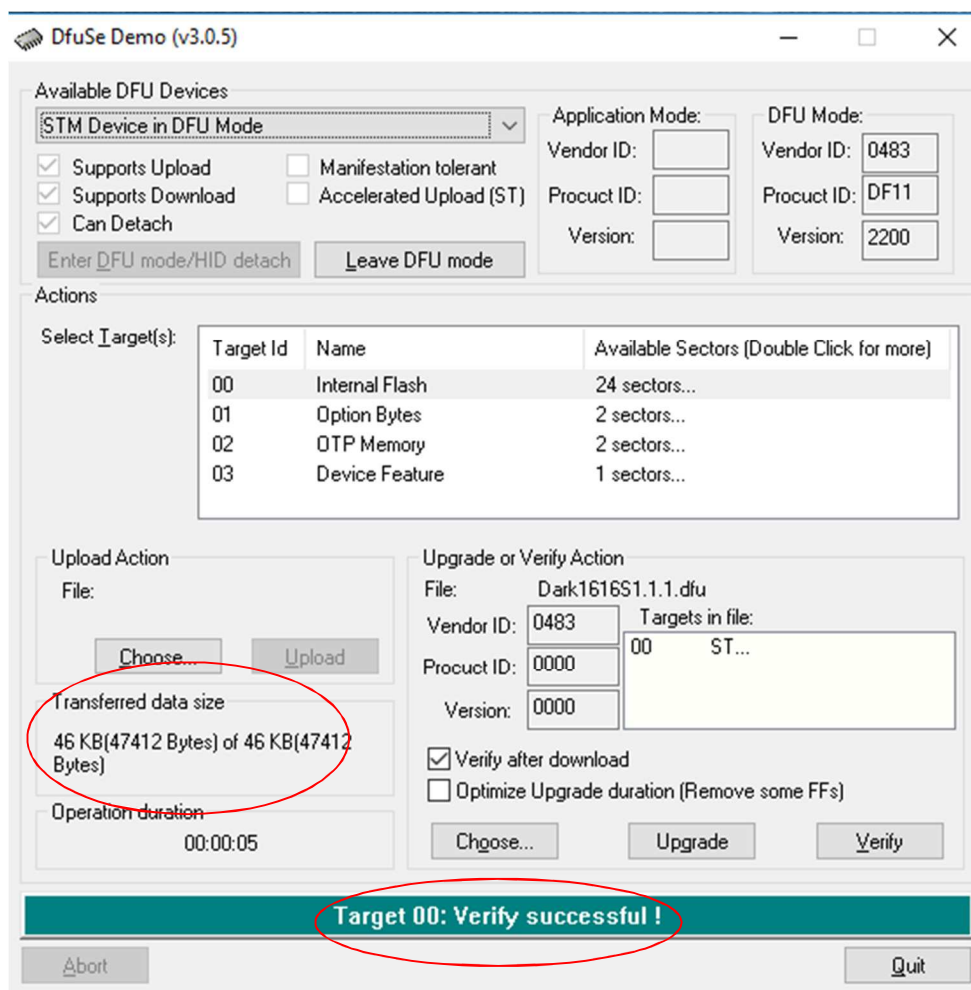

Figure 9 Successful upgrade!

7. Final steps
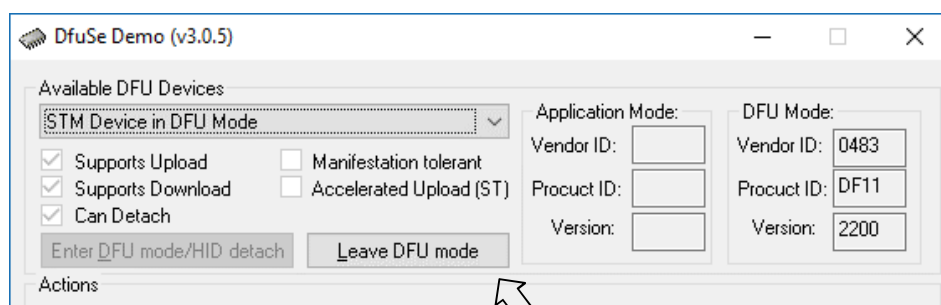
Now click "Leave DFU mode" to finish the procedure.

Figure 10 Final step

You may now disconnect the USB cable and continue to use the DARK1616S with the freshly updated firmware!

UPDATING THE BROOKLYN MODULE

The Brooklyn module is a device supplied by Audinate that does most of the processing for the actual Dante/ AES67 network audio streams. There is one Brooklyn module in each Dark1616M. We supply special code (a .dnt file) that sets up/ initiates the Brooklyn module and makes it work in particular way and we also run extra code on its internal microprocessor to make it work correctly with the Dark1616M.

1. Finding Out Current Installed Version

Open Dante Controller.
Open Device Info tab.
Double Click in the device that you are working with….a new window will open called 'Device View (name of device'
Open the status tab.
The Firmware Version (of the Brooklyn module) will be found under the 'Device Information' heading.

2. Finding Out What The Latest Available Version Is

Go the Dark1616M's web page at http://www.glensound.co.uk/product-details/dark-1616m/ 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.

3. Updating the Brooklyn Module

The firmware that runs on the Brooklyn module 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

Please note we strongly advise that when you do the update that only your PC and the Dark1616M that you want to update are on the network to save accidently updating the wrong Dante device.

AES67 MODE

The Dark1616S uses a module from Audinate called a Brooklyn Module for its network audio interface. Audinate are the company behind Dante® and as such the module's primary network audio protocol is Dante, however Audinate have enabled their module to comply with AES67 and therefore the Dark1616S 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.

1. Turning On AES67 Mode

If you want to use your Dark1616S 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 Dark1616S to open the Device View window where you will find an AES67 tab to enable AES67 support.
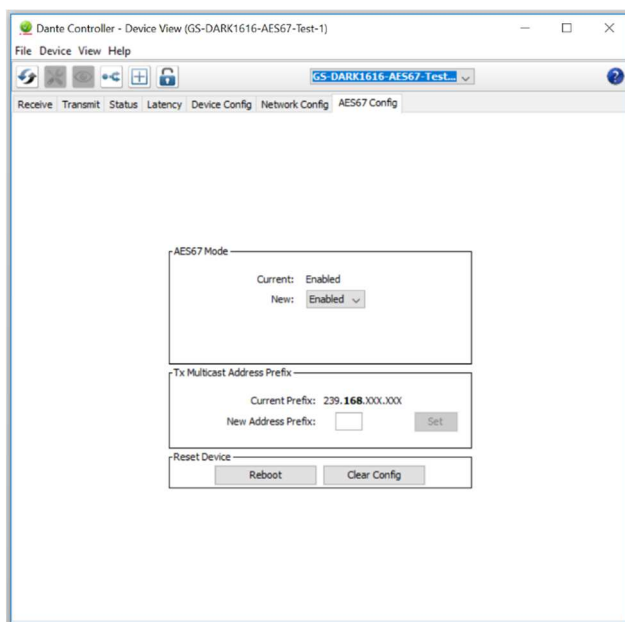
Once the AES67 drop down box has been enabled you'll have to reboot the Paradiso for the change to take effect. After the reboot go back to the AES67 tab and set the multicast prefix address to one that is suitable for your newtork.
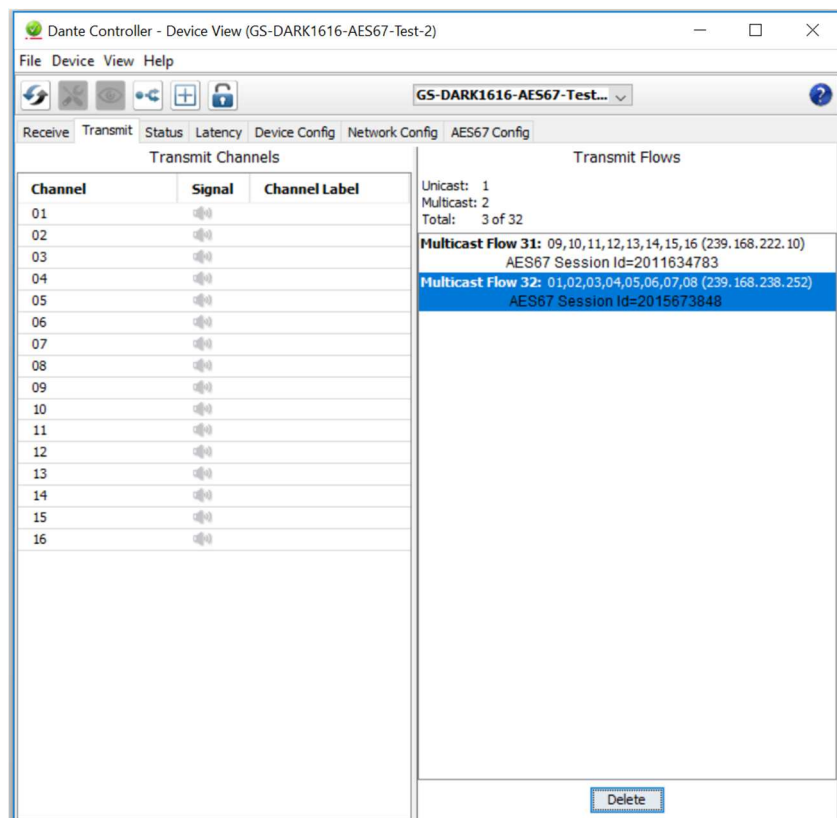
2. Sending AES67 Audio

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.
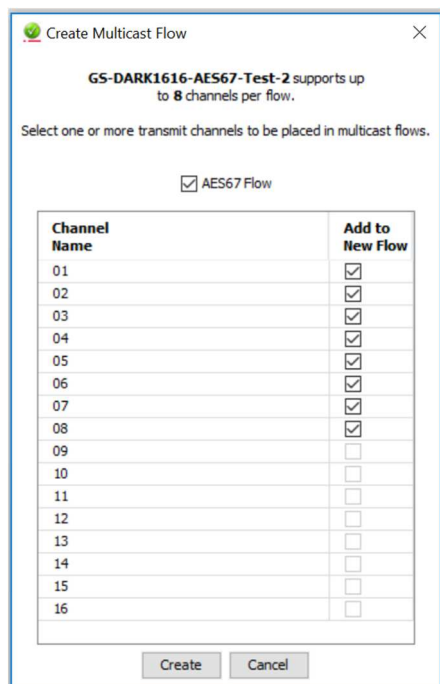
Tick the AES67 Flow check box, then select up to 8 channels to be included in the flow then click 'Create'

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

3. 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.

4. 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:

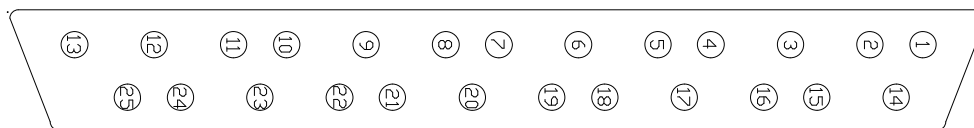- Multicast Only
- Non-redundant
- Destination address in range 239.nnn.0.0 to 239.nnn.255.255 (239.nnn/16), port 5004. Must match destinatio address range.
- 48kHz sampling rate
- L16 or L24 encoding
- 125usec, 250usec, 333usec, 1 msec packet time
- Up to 8 channels per stream

WIRING INFORMATION

AUDIO I/O D25 SOCKET PIN OUT

The wiring used for the DARK1616S conforms to AES59 (Also known as the Tascam standard). Pre-made break out cables are available from a number of suppliers.

ANALOGUE AUDIO INPUTS 1 - 8

Input 1	Pins 24, 12, 25	In Phase, Mate, Ground
Input 2	Pins 10, 23, 11	In Phase, Mate, Ground
Input 3	Pins 21, 9, 22	In Phase, Mate, Ground
Input 4	Pins 7, 20, 8	In Phase, Mate, Ground
Input 5	Pins 18, 6, 19	In Phase, Mate, Ground
Input 6	Pins 4, 17, 5	In Phase, Mate, Ground
Input 7	Pins 15, 3, 16	In Phase, Mate, Ground
Input 8	Pins 1, 14, 2	In Phase, Mate, Ground

ANALOGUE AUDIO INPUTS 9 - 16

Input 9	Pins 24, 12, 25	In Phase, Mate, Ground
Input 10	Pins 10, 23, 11	In Phase, Mate, Ground
Input 11	Pins 21, 9, 22	In Phase, Mate, Ground
Input 12	Pins 7, 20, 8	In Phase, Mate, Ground
Input 13	Pins 18, 6, 19	In Phase, Mate, Ground
Input 14	Pins 4, 17, 5	In Phase, Mate, Ground
Input 15	Pins 15, 3, 16	In Phase, Mate, Ground
Input 16	Pins 1, 14, 2	In Phase, Mate, Ground

ANALOGUE AUDIO OUTPUTS 1 - 8

Output 1	Pins 24, 12, 25	In Phase, Mate, Ground
Output 2	Pins 10, 23, 11	In Phase, Mate, Ground
Output 3	Pins 21, 9, 22	In Phase, Mate, Ground
Output 4	Pins 7, 20, 8	In Phase, Mate, Ground
Output 5	Pins 18, 6, 19	In Phase, Mate, Ground
Output 6	Pins 4, 17, 5	In Phase, Mate, Ground
Output 7	Pins 15, 3, 16	In Phase, Mate, Ground
Output 8	Pins 1, 14, 2	In Phase, Mate, Ground

ANALOGUE AUDIO OUTPUTS 9 - 16

Output 9	Pins 24, 12, 25	In Phase, Mate, Ground
Output 10	Pins 10, 23, 11	In Phase, Mate, Ground
Output 11	Pins 21, 9, 22	In Phase, Mate, Ground
Output 12	Pins 7, 20, 8	In Phase, Mate, Ground
Output 13	Pins 18, 6, 19	In Phase, Mate, Ground
Output 14	Pins 4, 17, 5	In Phase, Mate, Ground
Output 15	Pins 15, 3, 16	In Phase, Mate, Ground
Output 16	Pins 1, 14, 2	In Phase, Mate, Ground

AES3 AUDIO INPUTS/ OUTPUTS 1 - 4

Input 1/2	Pins 24, 12, 25	In Phase, Mate, Ground
Input 3/4	Pins 10, 23, 11	In Phase, Mate, Ground
Input 5/6	Pins 21, 9, 22	In Phase, Mate, Ground
Input 7/8	Pins 7, 20, 8	In Phase, Mate, Ground
Output 1/2	Pins 18, 6, 19	In Phase, Mate, Ground
Output 3/4	Pins 4, 17, 5	In Phase, Mate, Ground
Output 5/6	Pins 15, 3, 16	In Phase, Mate, Ground
Output 7/8	Pins 1, 14, 2	In Phase, Mate, Ground

AES3 AUDIO INPUTS/ OUTPUTS 5 – 8
Input 9/10	Pins 24, 12, 25	In Phase, Mate, Ground
Input 11/12	Pins 10, 23, 11	In Phase, Mate, Ground
Input 13/14	Pins 21, 9, 22	In Phase, Mate, Ground
Input 15/16	Pins 7, 20, 8	In Phase, Mate, Ground
Output 9/10	Pins 18, 6, 19	In Phase, Mate, Ground
Output 11/12	Pins 4, 17, 5	In Phase, Mate, Ground
Output 13/14	Pins 15, 3, 16	In Phase, Mate, Ground
Output 15/16	Pins 1, 14, 2	In Phase, Mate, Ground

ALARMS D9 SOCKET PIN OUT
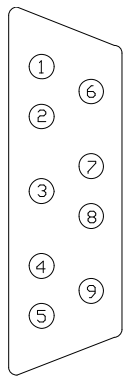
ALARMS
PSU1 Failure NC	Pin 1	Closed Contact when PSU1 fails
PSU1 Failure NO	Pin 6	Open Contact when PSU1 fails
PSU2 Failure NC	Pin 2	Closed Contact when PSU2 fails
PSU2 Failure NO	Pin 7	Open Contact when PSU2 fails
LINK Primary Failure NC	Pin 3	Closed Contact when Primary link fails
LINK Primary Failure NO	Pin 8	Open Contact when Primary link fails
LINK Secondary Failure NC	Pin 4	Closed Contact when Secondary link fails
LINK Secondary Failure NO	Pin 9	Open Contact when Secondary link fails
COMMON	Pin 5	Common for above (Internally linked to Ground)