VIRGIL OB

DANTE™ NETWORK AUDIO HEADPHONE AMPLIFIER

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:

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Technical enquires: techinfo@glensound.co.uk

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IMPORTANT SAFETY INSTRUCTIONS
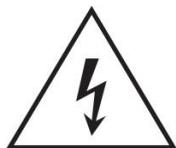
This symbol is intended to warn that dangerous voltages within the product are present and constitute a risk of electric shock.

This symbol is intended to highlight that there are important operating & maintenance instructions in the literature accompanying this unit.

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) Clean only with a dry cloth
7) Do not block any ventilation openings. Install in accordance with manufacturer's instructions
8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat
9) Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has 2 blades with one wider than the other. A grounding type plug has 2 blades and third grounding prong. The wider blade or the 3rd prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet
10) Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles and the point where they exit from the apparatus
11) Only use attachments/ accessories specified/ supplied by the manufacturer
12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/ apparatus combination to avoid injury from tip over
13) Unplug tis apparatus during lightning storms or when unused for long periods of time
14) 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
15) Do not attempt to modify this product. Doing so could result in personal injury and/ or product failure

CAUTION
RISK OF ELECTRICAL SHOCK
DO NOT OPEN

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

WARNING:

To reduce the risk of fire or electric shock, do not expose this product to rain or moisture.
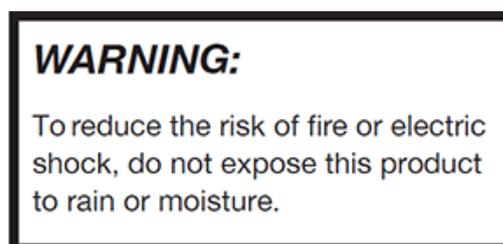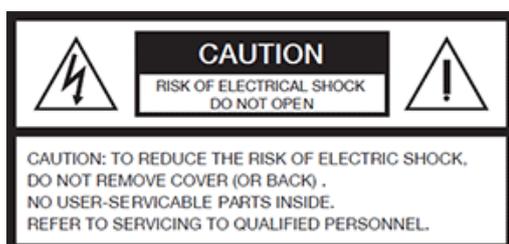
PRODUCT WARRANTY:

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.

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

EU DECLARATION OF CONFORMITY FOR:

Virgil OB
Two audio input, PoE headphone amplifier

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: 07/07/2018

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 VIRGIL OB

Handbook Contents

Issue 1

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Contents

OVERVIEW

Virgil was the Roman poet who guided Dante through Hell and Purgatory, the Glensound Virgil OB is a clever little headphone amplifier for providing crystal clear audio into studio & broadcast headphones.

Packaged in a small & robust format and designed for outside broadcast & theatre applications wherever a headphone circuit or analogue output is required, the Virgil provides a simple interface between Dante® / AES67 network audio systems and users headphones or other analogue audio equipment

The Virgil OB encompasses our unique headphone amplifier circuit which automatically provides the correct output level to match the impedance of the attached headphones (to produce the same volume high impedance headphones require a much greater output level than low impedance).

The audio inputs of the Virgil OB are Dante®/ AES67 compliant network audio circuits. 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 Glensound Virgil OB Dante® audio interface will be compatible with any other manufacturers' Dante® audio interface.

Network audio routing is managed by the Dante® Controller software. Further details of Dante network audio, and the Dante Controller software can be found at www.audinate.com

PANEL LAYOUT & FUNCTIONS

Front Panel

1. **Power ON LED**   2. **Volume Control**   3. **Headphone Connections**

1. Power ON LED

This bright blue LED indicates that the Virgil 1 is receiving power from the network and is working correctly.

2. Volume Controls

This potentiometer equally adjusts the headphone volume of the two input circuits being received from the Dante network.

It also can adjust the output volume of the balanced line level XLR outputs on the rear panel.

3. Headphone Connectors

These 2 headphone jacks are wired in parallel with each other. They are both 3 pole TRS (Tip Ring Sleeve) but both can accommodate 2 pole 'mono' jacks.

The left jack socket is designed to accept standard 3.5mm plugs and the right socket accepts standard 6.35mm (1/4") plugs.

Rear Panel

4. Network Connection   **5. Analogue Audio Outputs**

4. Network Connection

This is a standard network RJ45 connector. Connect this to your Dante®/ AES67 network to provide the audio source for the Virgil OB.

The unit may also be powered from a suitable PoE (Power Over Ethernet) switch or mid span power source.

5. Analogue Audio Outputs

This pair of line level (0dBu) balanced analogue audio outputs are derived from the 2 incoming network audio sources.

The output level can be fixed (same level as routed to the Virgil OB) or the level can follow the gain/ loss available on the front panel volume control.

Side Panel

6. USB Socket   **7. Post/ Pre Fader Switch**

POST-FADER

5V/0.5A

PRE-FADER
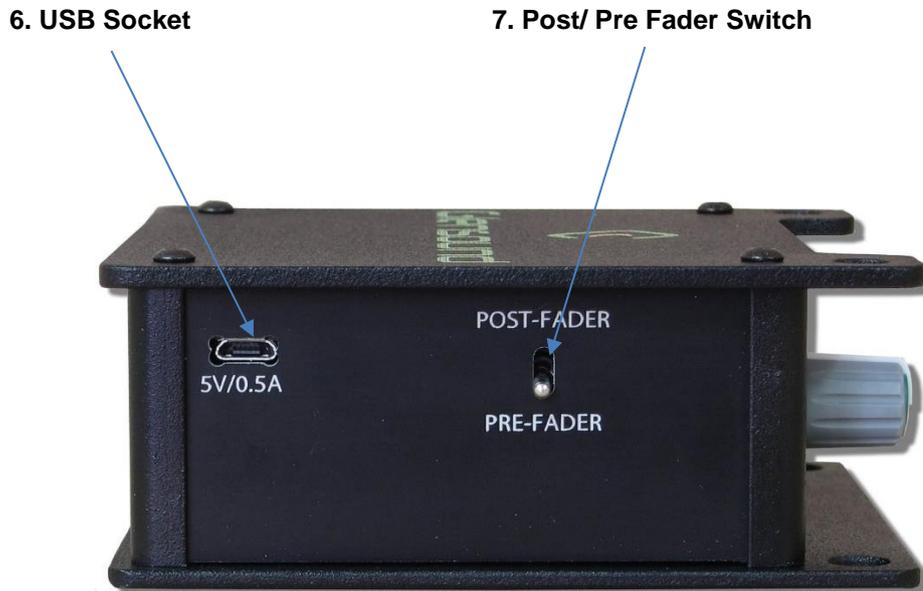
6. USB Socket

This micro USB socket has a dual purpose.

It can be used to either power the Virgil OB from a suitable standard USB power source and it also provides a connection for a computer to upload new firmware into the unit if ever advised to by our technical department.

7. Post/ Pre Fader Switch

This toggle switch is used for changing whether the rear panel analogue audio outputs are fed at the same level as the incoming audio from the network (PRE-FADER) or if the front panel volume control will adjust these output levels (POST-FADER)

CONNECTING THE VIRGIL OB TO A DANTE NETWORK

The Virgil OB is a network audio device 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

Two Audio Inputs

There are just 2 audio inputs to the Virgil OB from the Dante® network. One input is routed to the left ear and the other to the right ear of the headphone amplifier. If you would like the same audio source in both ears then this can be achieved by routing the same source to both the inputs channels in Dante controller.

Getting Dante Controller

If you are connecting the inferno 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 Virgil OBs To A Network

Virgil OBs can be connected to the network that you are going to use for your audio distribution simply by plugging in the network connection on the rear. Once connected to the network it will be possible to see the Virgil OB from within the Dante® controller and route the 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, Dante Controller looks as per the screenshot below:
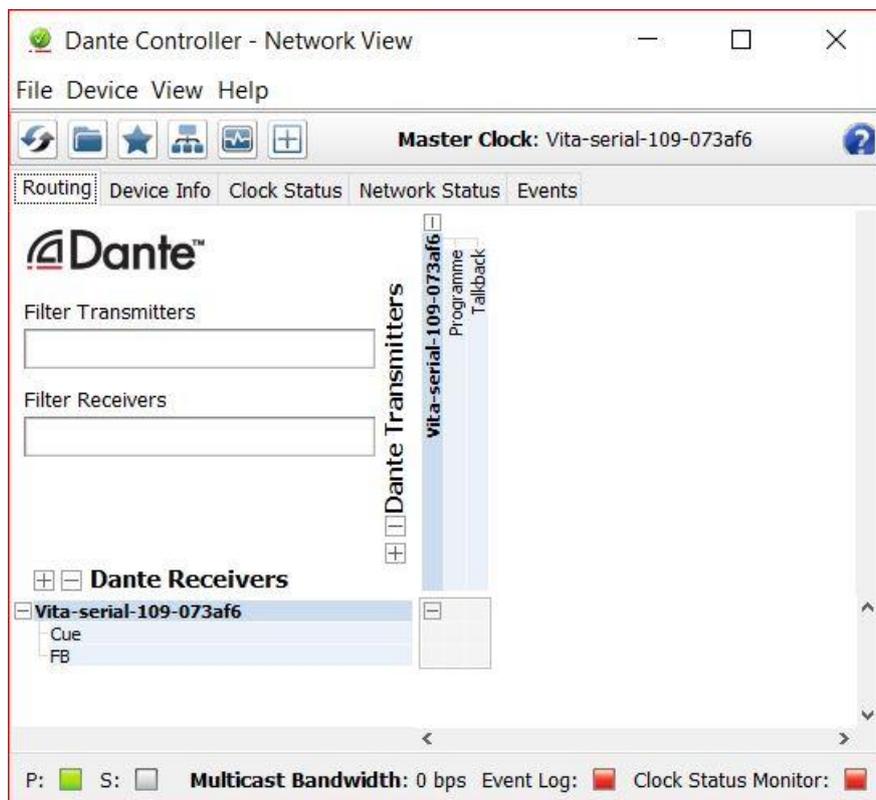
The Virgil OB will have been named at the factory during test to allow them to be identified by the Dante controller.

The format used for the factory name is:

'Virgil-serial-XXX-YYY'. 'XXX' will be the units 3 digit serial number, and 'YYY' will be the Vita's 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.

HEADPHONE OUTPUT ATTENUATION

By default the Virgil OB's front panel headphone volume potentiometer is set to allow an output level off between -20 and +10dB (measured into 600 Ohms). This means that incoming audio signals cannot be completely turned off (which many broadcasters find useful to stop 'talent' turning important audio information off and missing vital cues).

It is possible to alter the range of the volume potentiometer to allow the headphone output to become fully attenuated (off). Note: Virgil OBs can be supplied like this straight from the factory by special order.

How To Change The Output Volume Range

This is done by linking out a pair of hardware resistors that stop the potentiometer fully closing. There are 2 pairs of solder pads on the internal pcb to make this job easier.

1) Remove the 4 screws that hold the bottom plate onto the unit. Note this is the plate that has the beltclip attached.
2) Remove the bottom plate.
3) Locate the 2 pairs of solder pads located just behind the potentiometer.
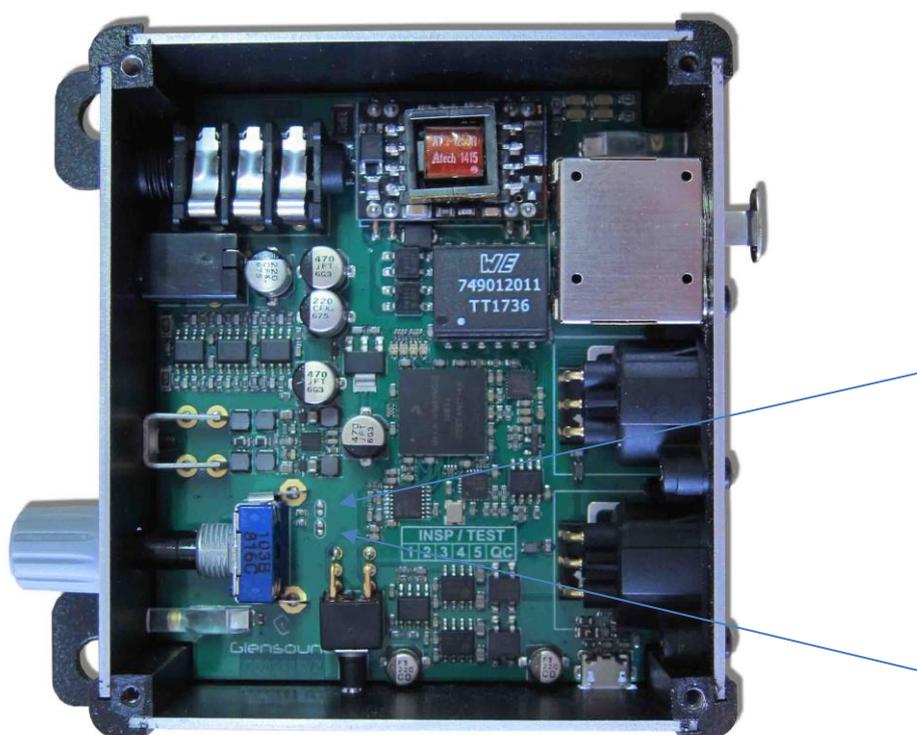
4) Carefully form a solder bridge between each pair of pads.
5) Rebuild the Virgil OB in the reverse order of dis-assembly.

AES67 MODE

The Virgil OB uses a chipset from Audinate called Ultimo for its network audio interface. Audinate are the company behind Dante® and as such the chipset's primary network audio protocol is Dante®, however Audinate have enabled their chipset to comply with AES67 and therefore the AoIP22 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 Virgil OB 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 Virgil OB to open the Device View window where you will find an AES67 tab to enable AES67 support.
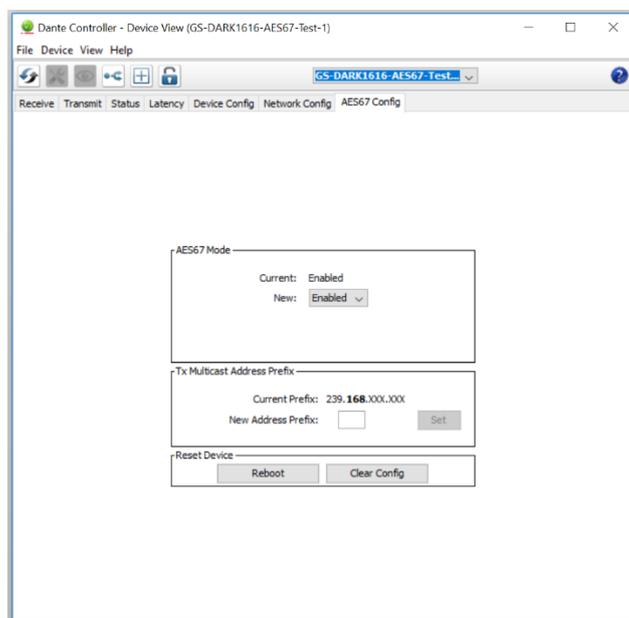
Once the AES67 drop down box has been enabled you'll have to reboot the Virgil OB for the change to take effect. After the reboot go back to the AES67 tab and set the multicast prefix address to one that is suitable for your network.

2. 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.

3. AES67 Restrictions

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 2 channels per stream

UPDATING FIRMWARE

The Virgil OB is a digital audio system comprising of a Micro Controller and DAC converters. These items run software and may need to be occasionally updated.

Equipment needed

- A windows based PC
- USB Type A to Micro B cable
- A copy of 'DfuSe Demo' software
- The latest firmware from Glensound
- An Virgil OB

Instructions

1. Download and install DfuSE Demo

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

   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 Virgil OB can be found on the Glensound website, under the product page for Virgil OB. 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 Virgil OB to the PC via the USB cable. The Micro USB connector is located on the left panel of the Virgil OB.

4. Firmware update preperation

To prepare the Virgil OB for a firmware update;

1. Connect the unit to a PC via the USB connector
2. Power on the unit (connect to a PoE switch)

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 Virgil OB successfully entered DFU mode then it will appear as 'STM Device in DFU Mode' under the 'Available DFU Devices tab'.
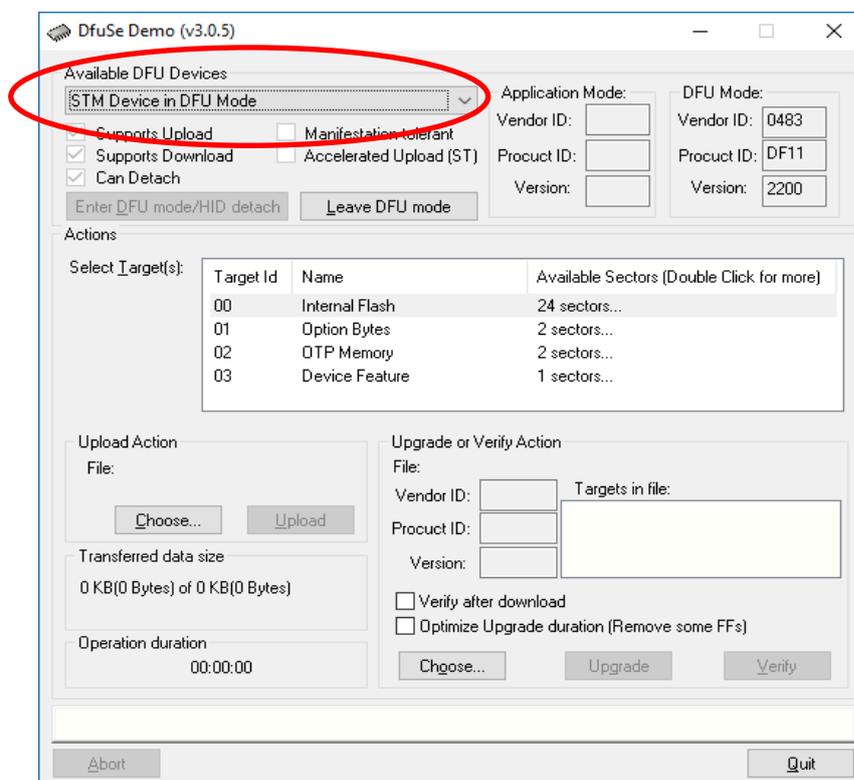
Figure 2 Device successfully recognised

Now the .dfu file needs to be selected so that DfuSe Demo knows the correct firmware to put on to the Virgil OB.
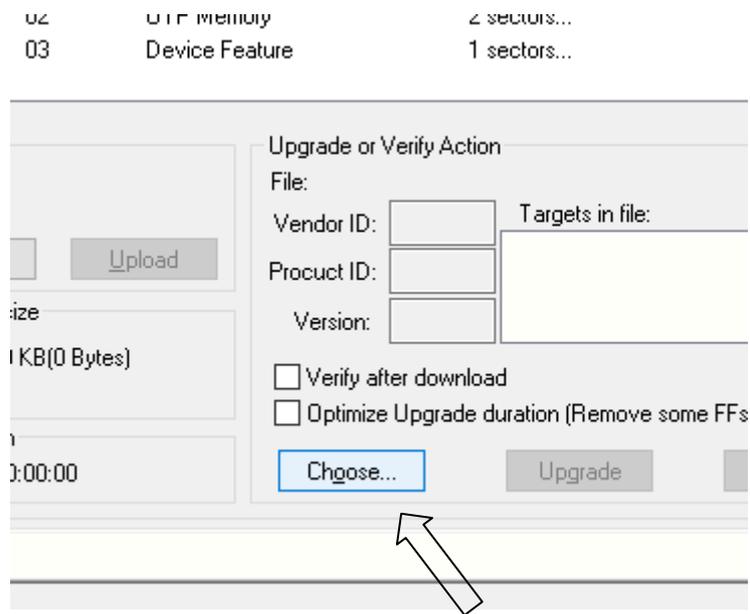
Figure 3 Choose .dfu file

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'.

6. Upgrading the Virgil OB firmware

The firmware is now ready to be put on to the Virgil OB. Tick the 'Verify after download' box first and then click 'Upgrade'.
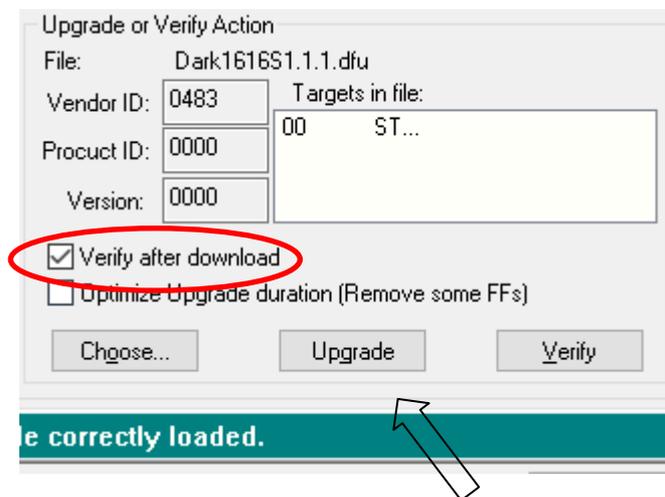
Figure 5 Upgrade

Click yes to proceed.
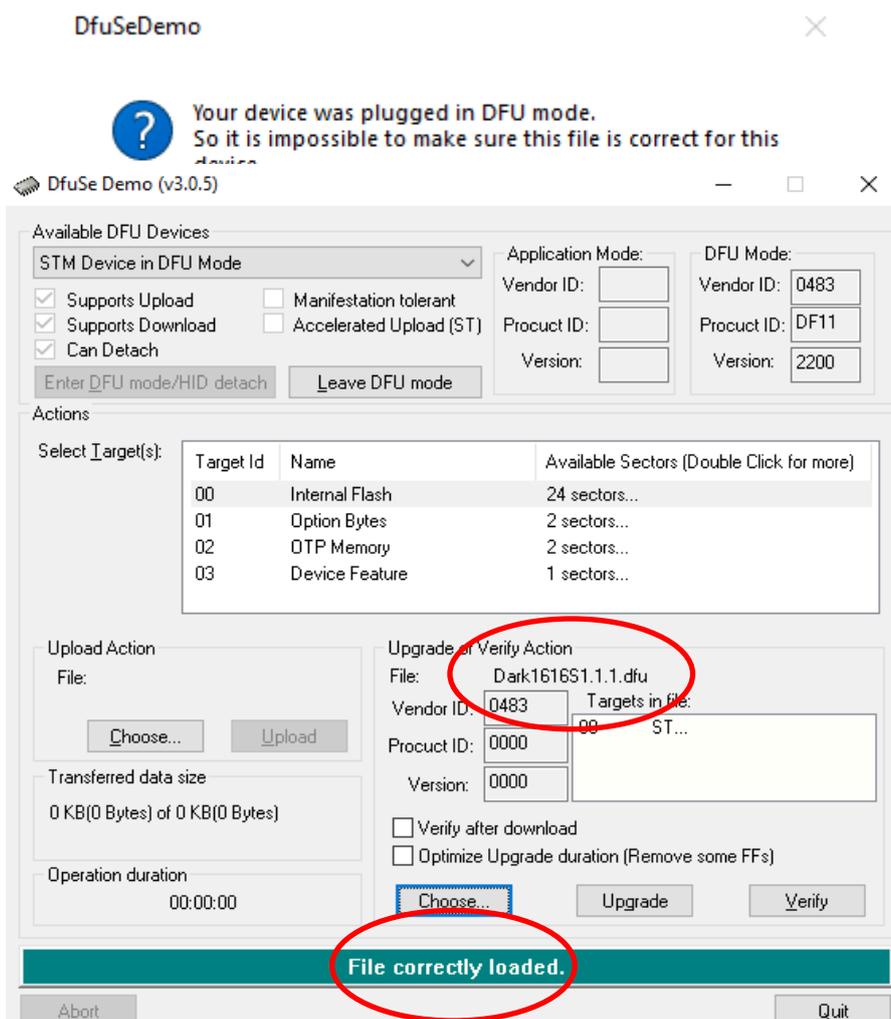
Figure 4 .dfu successfully loaded

The progress bar along the bottom will show the status of the operation.If the operation was successful, DfuSe Demo will report that "Targery 00: Verify Successful!".
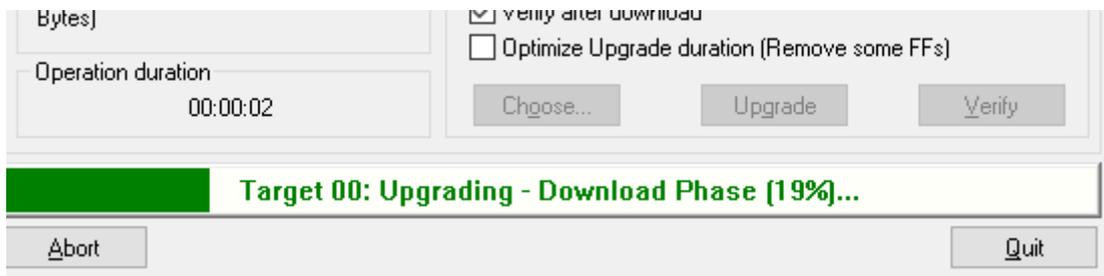
Figure 7 Upgrade status

You may also see that it will report how much data was successfully transferred.
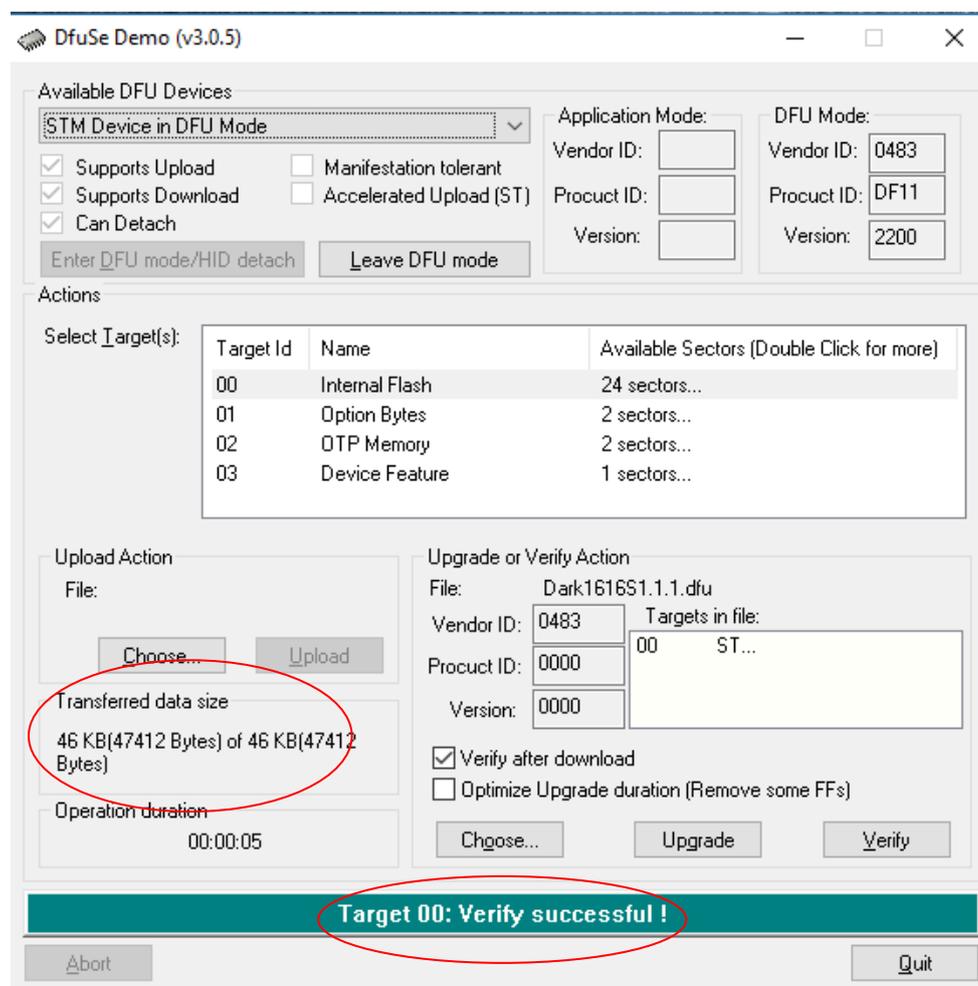
Figure 8 Successful upgrade!

7. Final steps

Now click "Leave DFU mode" to finish the procedure.
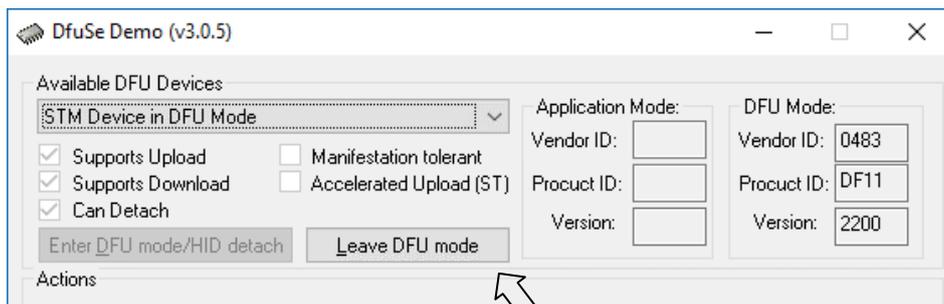
Figure 9 Final step

You may now disconnect the USB cable and continue to use the AoIP22 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 Virgil OB. 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 Virgil OB.

1. Finding Out Current Installed Version

Using Dante® controller double click on the Virgil OB device name in the routing tab to open the Device View box.

In the Device View box open the Status Tab.

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

2. Finding Out What The Latest Available Version Is

Go the Virgil OB's webpage 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 Ultimo Chipset

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 Virgil OB that you want to update are on the network to save accidently updating the wrong Dante device.

WIRING INFORMATION

RING

TIP
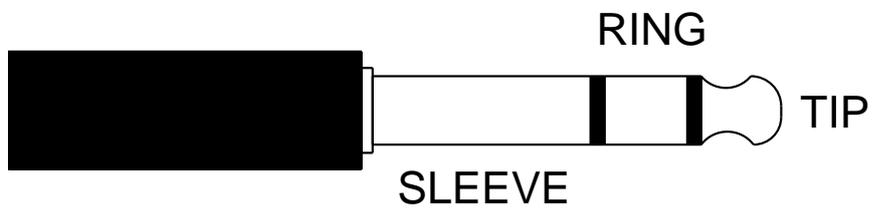
SLEEVE

STANDARD HEADPHONE WIRING:

TIP: A/ LEFT Ear

RING: B/ RIGHT Ear

SLEEVE: Common/ Earth

PLEASE NOTE: MONO HEADPHONE JACKS CAN BE USED WITHOUT CAUSING ANY DAMAGE TO THE VIRGIL OB

SPECIFICATION

AUDIO

Headphone Impedance
32 to 1000 Ohms
(Auto output level to match impedance)

Maximum Headphone Output
+15.8dB into 600 Ohms

Headphone Frequency Response
>= -0.1dB 22Hz to 22kHz

Headphone Noise
-74dB @ lineup (residual noise)

Headphone THD + Noise (ref =8dBu)
0.008% @ 1kHz

Headphone Volume Pot Range
+10dB to -20dB (standard)
+10dB to Off (to special order)

Output Power
1 Watt

Headphone Jacks
1 x 6.35mm (1/4") & 1 x 3.5mm Stereo Sockets
Suitable for both stereo & mono headphones

Audio Inputs
2 off, 1 routed to left, 1 routed right

Full Scale
0dBFs = +18dBu

Balanced Output Impedance
+<50 Ohms

Maximum Balanced Output Level
+18dBu

Balanced Output Frequency Response
>= -0.1dB 22Hz to 22kHz

Balanced Output Noise
-74dB @ lineup (residual noise)

Balanced Out THD + Noise (ref =8dBu)
0.008% @ 1kHz

OTHER

Dante/ AES67 Network Interface
Sample Frequency: 48 - 96kHz
Resolution: 24 Bit
DDM Certified

Dimensions
42 x 101 x 103mm (H x W x D)

Weight
200g

Power Input
Power Over Ethernet (PoE)

Power Consumption
<2 Watts