Glensound
Keeps Working

NSA16

Dante/AES67 Inline Network Signal Adjuster

PRODUCT DETAILS

Dante®

RAVENNA®
AES67 & ST 2110 built-in

6 BROOKS PLACE, MAIDSTONE, KENT, ME141HE. ENGLAND.
Visit our website at www.glensound.com
TEL: +44 (0) 1622 753662
FAX: +44 (0) 1622 762330

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 your 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

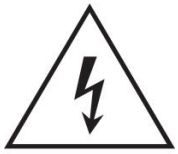
EMAIL ADDRESSES

General and Technical enquires: office@glensound.com

Sales enquires: sales@glensound.com

Patents: audinate.com/patents

IMPORTANT SAFETY INSTRUCTIONS



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

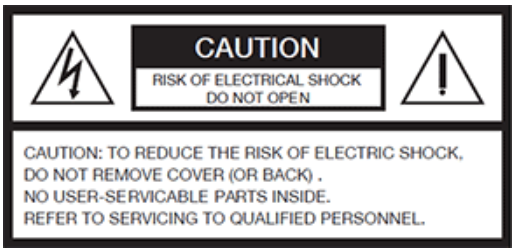
This symbol is intended to highlight that the equipment must have a valid earth connection with the protective earthing conductor.

This product is fitted with an internal ceramic fuse cartridge.
In the event of fuse blow, a replacement fuse must exhibit the follow specifications:
Rating: 250VAC 2A
Sand/silica filled
Time delay blow
5mm x 20mm

High sound pressure
Hearing damage risk
Do not listen at high volume levels for long periods.

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) This product is intended for indoor use only
6) The intended ambient operating temperature of this product is 0°c to 40°c
7) Do not use this apparatus near water
8) Clean only with a dry cloth
9) Do not block any ventilation openings. Install in accordance with manufacturer's instructions
10) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat
11) 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
12) Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles and the point where they exit from the apparatus
13) The socket outlet used for mains power to this device must be easily accessible
14) Only use attachments/ accessories specified/ supplied by the manufacturer
15) 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
16) Unplug this apparatus during lightning storms or when unused for long periods of time
17) 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
18) Do not attempt to modify this product. Doing so could result in personal injury and/ or product failure



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.

CE

EU DECLARATION OF CONFORMITY

NSA16

Dante/AES67 Inline Network Signal Adjuster

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.

Marc Wilson, Managing Director
Maidstone, Kent, England

Date: 06/03/25

RoHS DIRECTIVE

RoHS 2 Directive 2011/65/EU restricts 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)

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

WEE/JJ0074UR

Contents

Overview

Simplify your audio workflow with the NSA16, a 16-channel network audio controller designed for intuitive operation. Featuring 8 easily managed stereo or mono channel groups, the NSA16 offers precise volume control, mute functionality, and clear signal presence indication for each pair. Monitor your mix with the dedicated headphone output, ensuring perfect sound at every stage. Built for critical applications, the NSA16 boasts redundant network and power connections to ensure uninterrupted audio flow. Plus, the panel lock feature prevents accidental adjustments, providing peace of mind during live events or installations.

The NSA16 is available with either a Dante or Ravenna network audio interface.

NSA16 Front Panel Layout

Mute channel

The switch mutes the audio of the two channels that it controls. The mute status is indicated by the Mute LED below the button. It can be toggled on or off, of pushed and held to behave momentarily.

Mix active button

This button makes the pot become active and effect the volume of the two channels Dante output level. When active the audio is also sent to the headphone output and stereo mix metering LEDs.

If this button is pushed and held down – the button LED flashes and the audio sent to the headphone output changes from post-fader to pre-fader. This is also reflected on the stereo mix metering LEDs. It does not effect the Dante output audio.

Channel volume

This potentiometer will effect the audio level when the 'Active' button has been pressed and the button LED is solidly on.

The gain range of the pot is -INF to +10dBu.

The pot will then only change the volume if it's current position is close to it's last known position when the Active button was last pressed. This is to prevent unintentionally raising or lowering the volume as soon as the Active button is pressed (if the pot position had changed whilst being inactive).

This also means that when you have created a mix with different volume levels for all pots - if the Active buttons are unselected, the mix is saved and will be remembered if the power to the unit is interrupted.

The potentiometer is retractable and can be pushed in so that it's flush with the front panel, this means it can't be accidentally knocked and adjusted.

Audio presence LED

This LED indicates pre-fader audio is present on the two incoming Dante channels.

Power LED

This LED indicates is the unit is powered on.

Stereo mix metering

This bank of 16 x 2 LEDs reflects the stereo audio sent to Dante and the headphone output which can be a post-fader or pre-fader mix depending on the Active and Mute buttons states. It has two scales: dBu and (PPM). When no Active buttons are active, the metering is disabled.

Leader mode active

This LED indicates if Leader mode is active (where the group 8 pot and mute effects all channels).

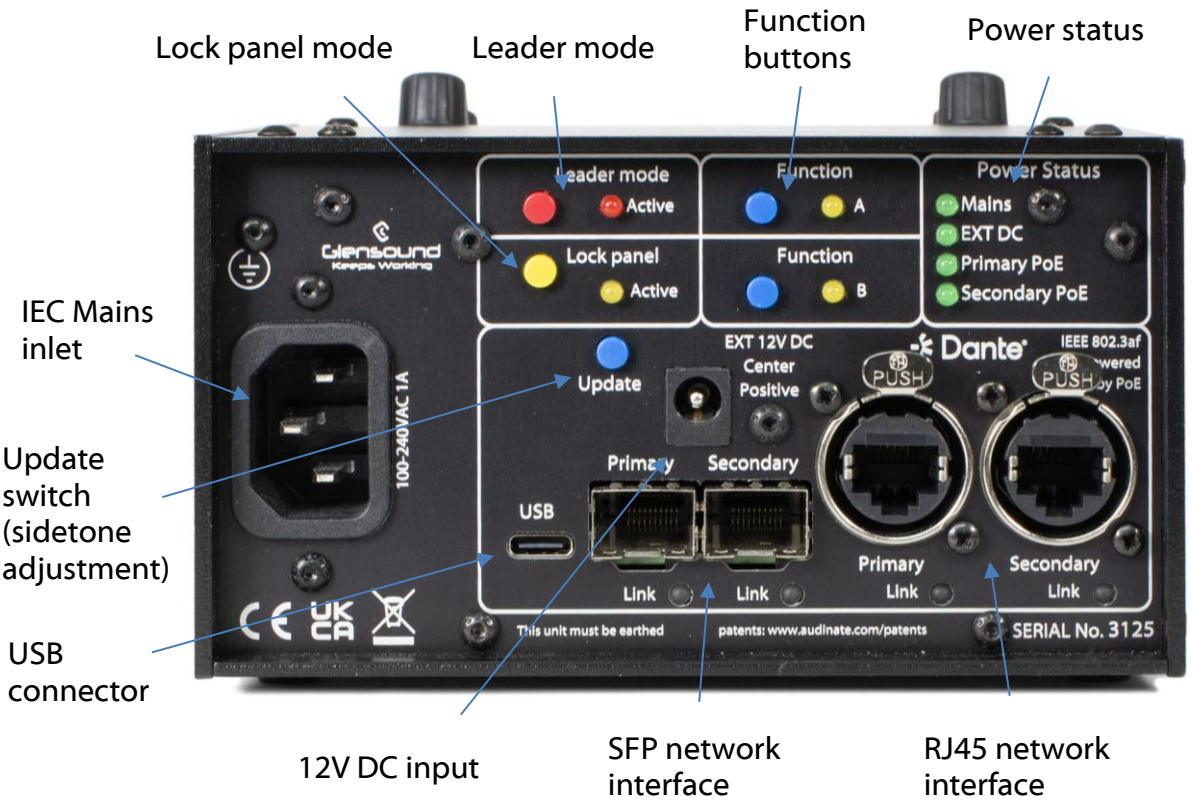
Headphone socket

3 pin stereo 6.35mm or 3.5mm jack sockets allow one pair of headphones to be connected. The audio sent to the headphones can be a post-fader or pre-fader mix of audio depending on the Active and Mute buttons states.

Headphone volume

This control adjusts the overall level of the headphones. This pot is downstream of all digital mixing controls, so it effects the final volume level of the headphone output only.

NSA16 Rear Panel Layout



Lock panel mode

Push and hold this button for a few seconds to activate 'Lock' mode, where all front panel buttons and controls are locked and cannot be affected.

Leader mode

Push and hold this button for a few seconds to activate 'Leader' mode, where all channel group controls are disabled besides group 8, which then acts as a leader and affects all groups as one.

Functions buttons A and B

So far, the functionality for these buttons is for controlling the front panel global LED brightness. Push and hold both buttons, now the brightness is based on the value of pot 8.

Primary and Secondary Copper Dante network interface

Primary and Secondary 1Gbps ethernet IP interfaces allow connection to a Dante network. The NSA16 can operate in full redundant mode or in switched mode for daisy-chaining network devices. The LED indicates network activity. Both connectors are Neutrik etherCON which allow locking connections with a compatible etherCON cable.

Primary and Secondary SFP Dante network interface

Standard SFP Fibre network interface modules can be fitted in these 2 ports. SFP modules are available in many different formats, if required Glensound can supply suitable SFP modules, contact sales@glensound.co.uk for further information.

12V DC Power Inlet

This is a 2 pin barrel type DC input connector. The centre pin is 2.5mm. It is wired centre pin + Volts. It is designed to accept a + volt DC input between 9 and 15 volts.

Update button and USB C connector

This reversable USB C connector is used for manual firmware updates. The 'Update' button must be pushed and held whilst applying power to the NSA16 for the NSA16 to enter it's update mode. Please see this section for more information.

Power Status LEDs

For redundancy purposes the NSA16 can be powered from multiple power sources. It can be powered from any of the following:

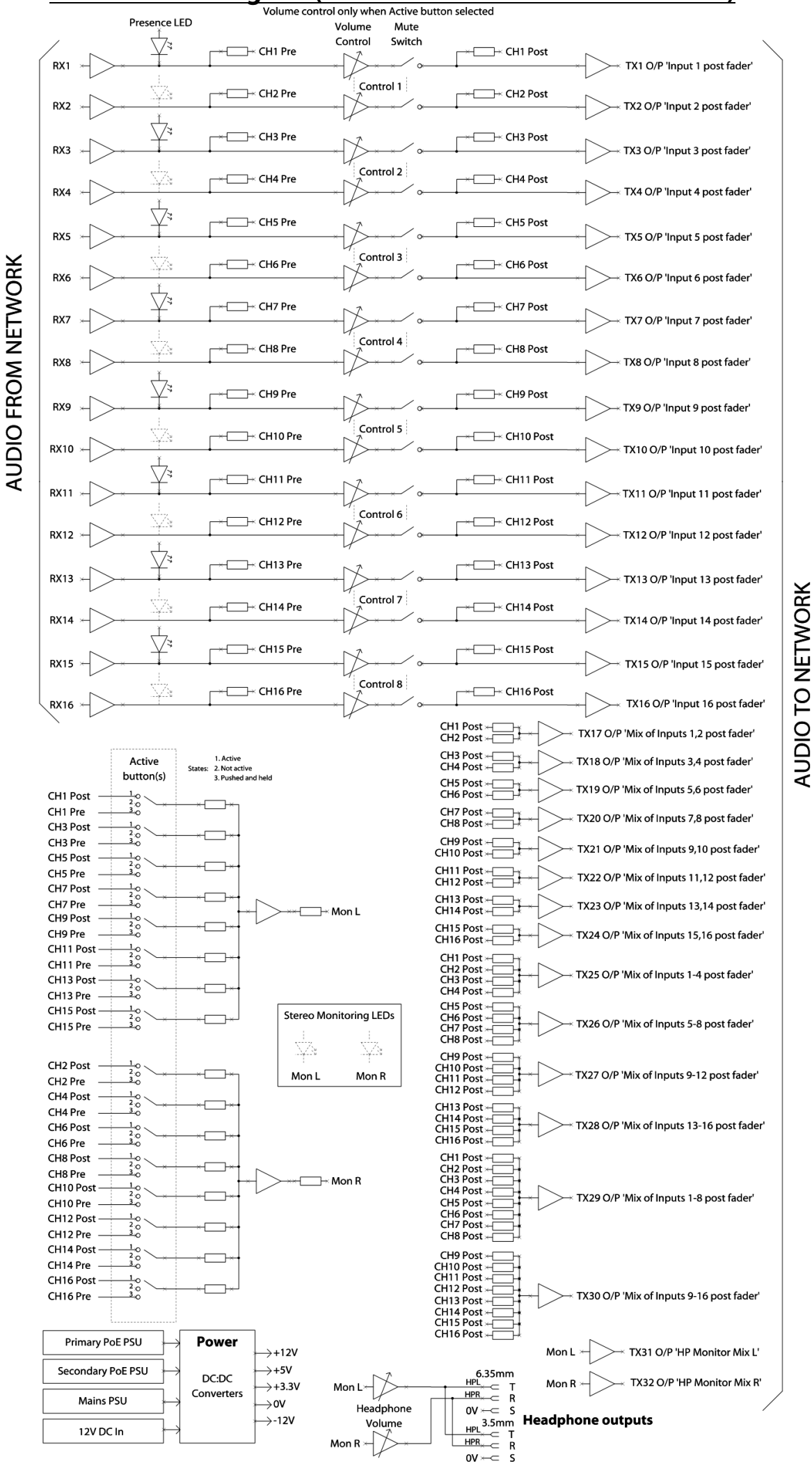
A. Mains (100-240VAC)
B. EXT DC (12V)
C. Power Over Ethernet (PoE IEEE 802.3af) on the primary CAT5 network connection
D. Power Over Ethernet (PoE IEEE 802.3af) on the secondary CAT5 network connection

The LEDs indicate which power sources are currently active.

IEC Mains Inlet

This 20W 3-pin IEC Mains inlet accepting a mains input range of 100 – 240 VAC.
********THIS UNIT MUST BE EARTHED********

Device Block Diagram (NSA16 DFU Firmware version v2.0)



Connecting The Dante NSA16 To A Dante Network

Note: The following section applies only to NSA16's with the Dante interface (Not Ravenna):

The NSA16 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.getdante.com

Getting Dante Controller

If you are connecting the NSA16 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.getdante.com

Connecting NSA16 device to the network

The NSA16 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 unit. Once connected to the network it will be possible to see the NSA16 from within the Dante controller and route its' audio circuits.

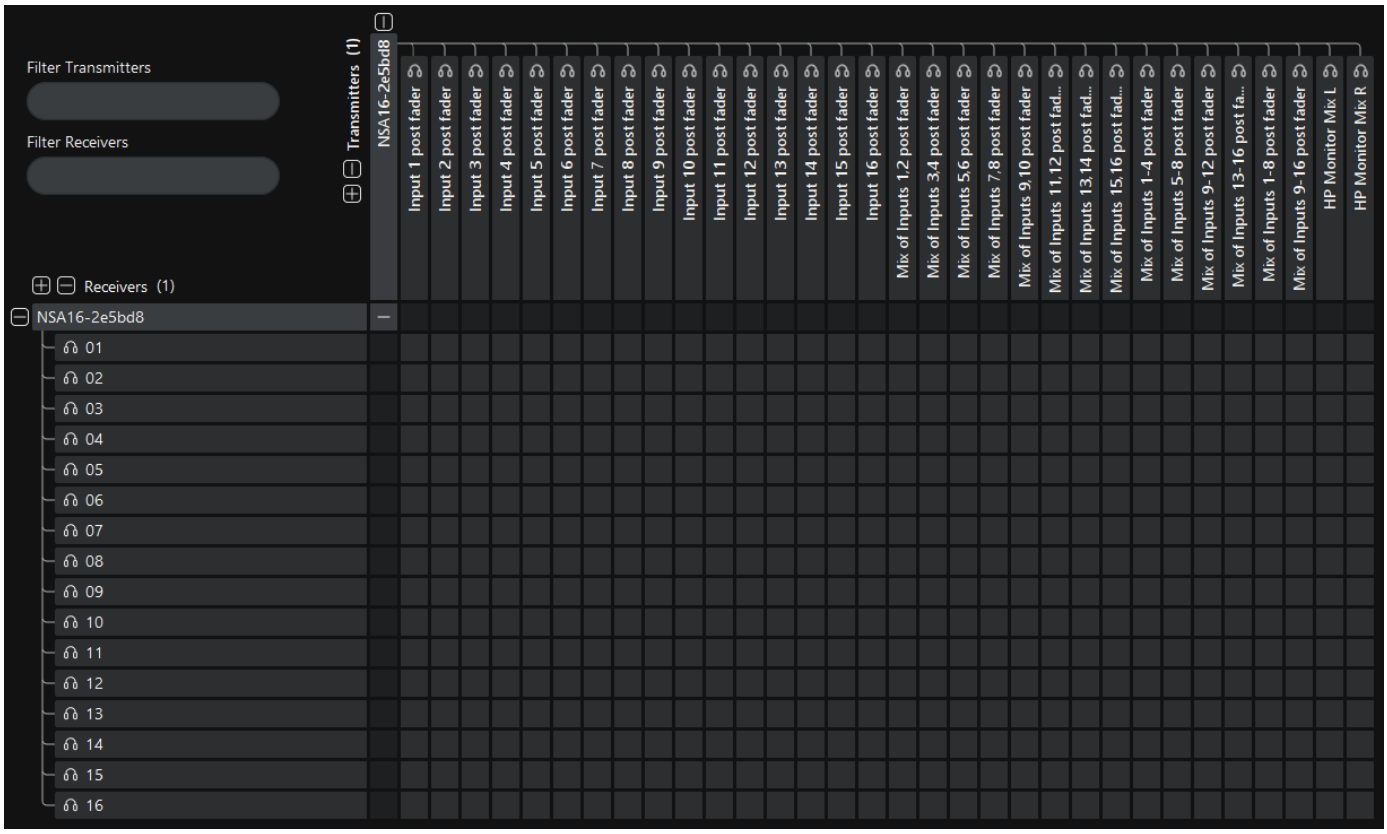
Audio Over IP Network

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.getdante.com

Running Dante Controller

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



The NSA16 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:

'NSA16-SN-XXXX'

Where 'NSA16' refers to the Glensound product i.e. NSA16

The 'SN-XXXX' refers to the serial number of the NSA16 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 NSA16 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 'NSA16-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.

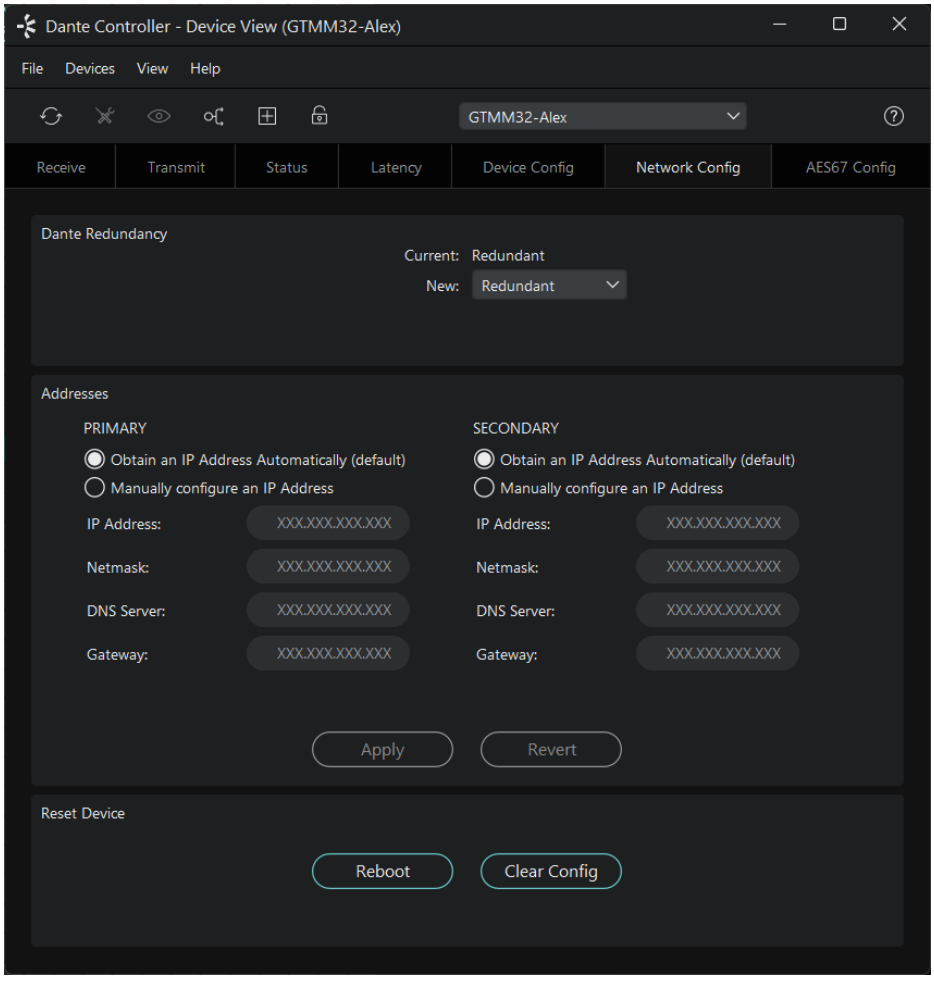
Device not showing up in Dante Controller

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.

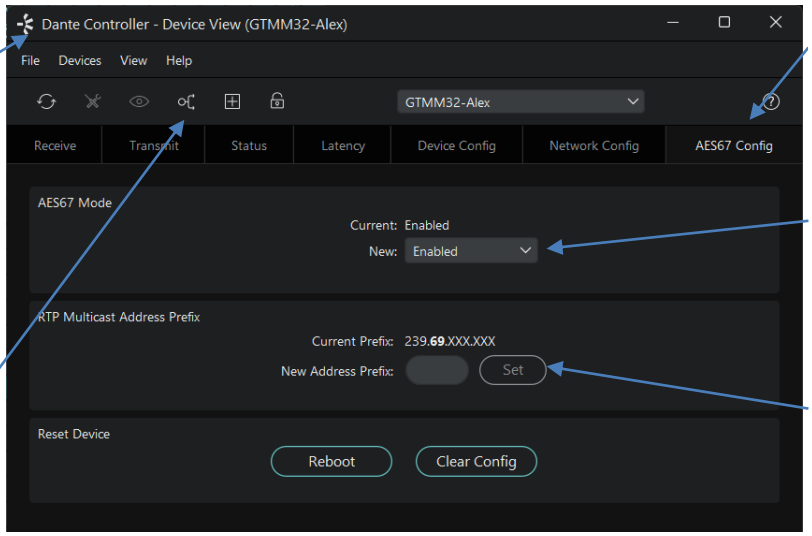


AES67 Mode with the Dante NSA16

The NSA16 uses a module from Audinate called the Brooklyn 3 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 NSA16 can be set to AES67 mode for interaction with other AES67 devices.

Sending AES67 audio

1. Double click on the device in Dante controller to open the Device View window

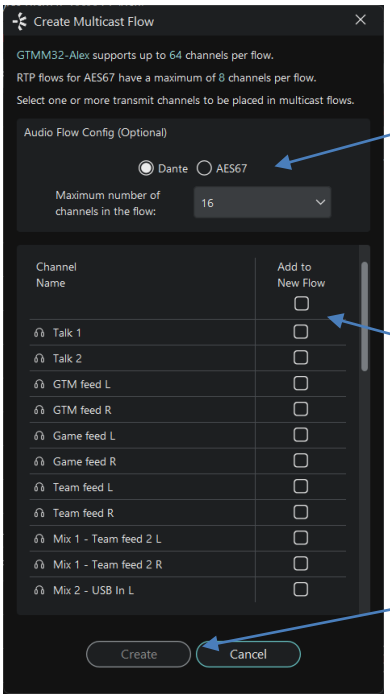


2. Open the AES67 Config tab

3. Enable AES67 mode. Reboot for changes to take effect.

4. Allows setting a different multicast prefix address if needed

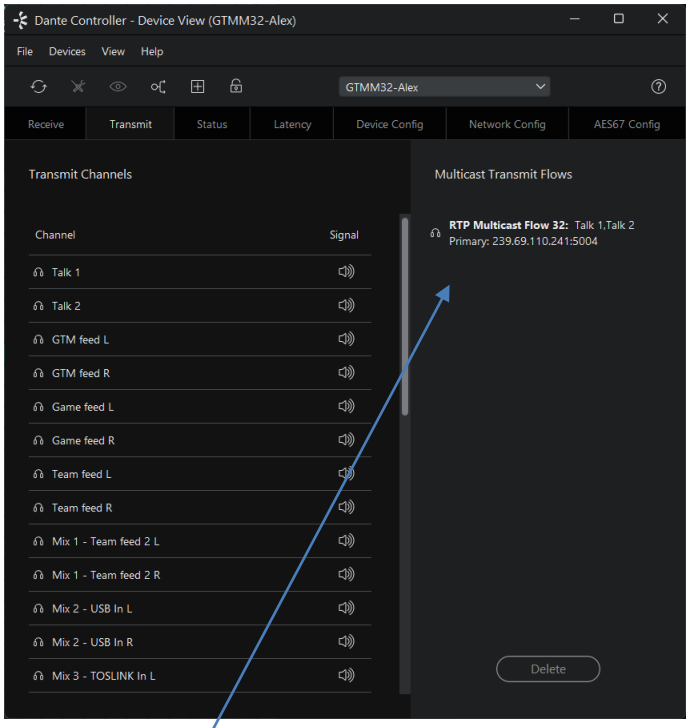
5. Create multicast flow



Select 'AES67'

Select channels to be included in the flow

Create the flow

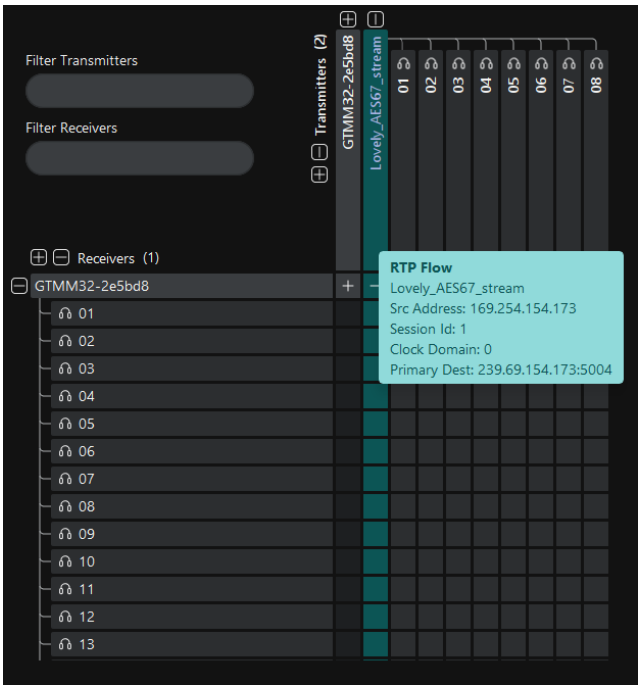


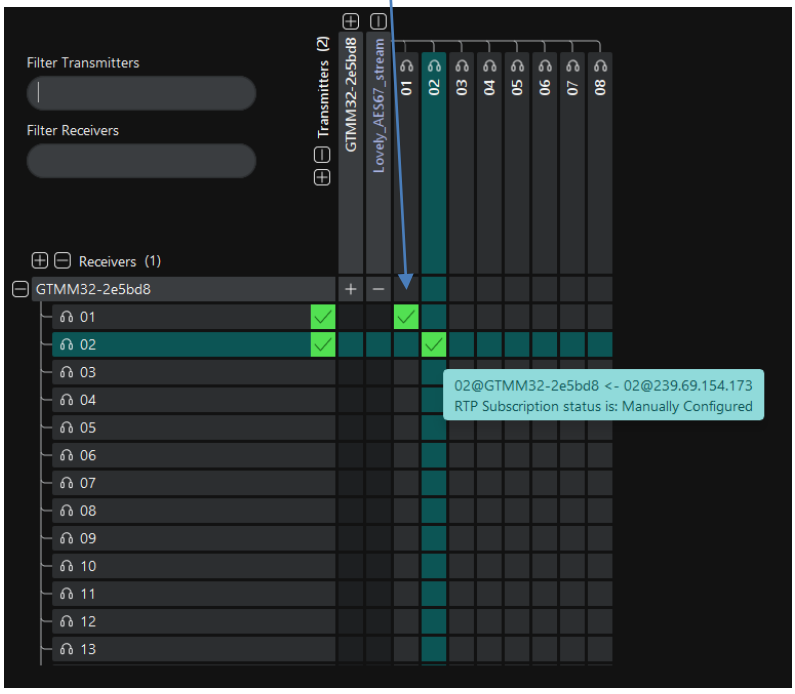
Once set the flows can be seen in the transmit tab of the device view.

Receiving AES67 Audio

Compatable AES67 stream from a non Dante device are detected (shows as a blue transmitter)

Make subscriptions in the router matrix as normal





AES67 Restrictions

AES67 flows originating from a Dante device can only be generated with the following parameters:

- 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 must adhere to these parameters to work with Dante devices:

- Multicast Only
- Non-redundant
- Destination address in range 239.nnn.0.0 to 239.nnn.255.255 (239.nnn/16), port 5004. **Stream must match destination address range (i.e the RTP Multicast Address prefix of the Dante device).**
- 48kHz sampling rate
- L16 or L24 encoding
- 125usec, 250usec, 333usec, 1 msec packet time
- Up to 8 channels per stream

The NSA16 also supports SMPTE-ST2110-30 via Dante Domain Manager (DDM), with a licesnse purchased from Audinate.

Updating The Dante NSA16 firmware

The Dante NSA16 has Dante specific firmware that runs inside the Dante module, known as Brooklyn 3.

The Brooklyn 3 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 3 Module in each NSA16.

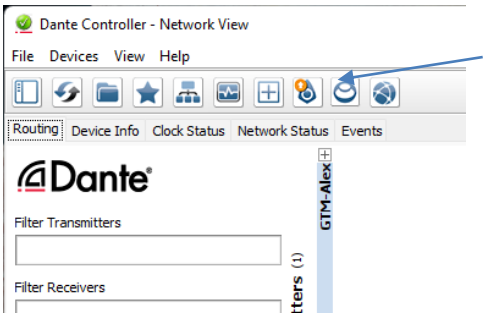
Updating the device

The firmware that runs in the Brooklyn 3 Module can be updated using the built-in Dante Updater in Dante Controller. Please ensure you have a connection to the internet.

If you want to update devices on a Dante network that is not connected to the Internet, you can download the files ahead of time to your computer, move the computer to the offline network, and then update the devices using the downloaded files.

Dante Updater displays a list of all online firmware files in the Library tab, so you can choose which files to download, or even download the entire database if you are not sure which files you will need. For further details please visit www.getdante.com

1.

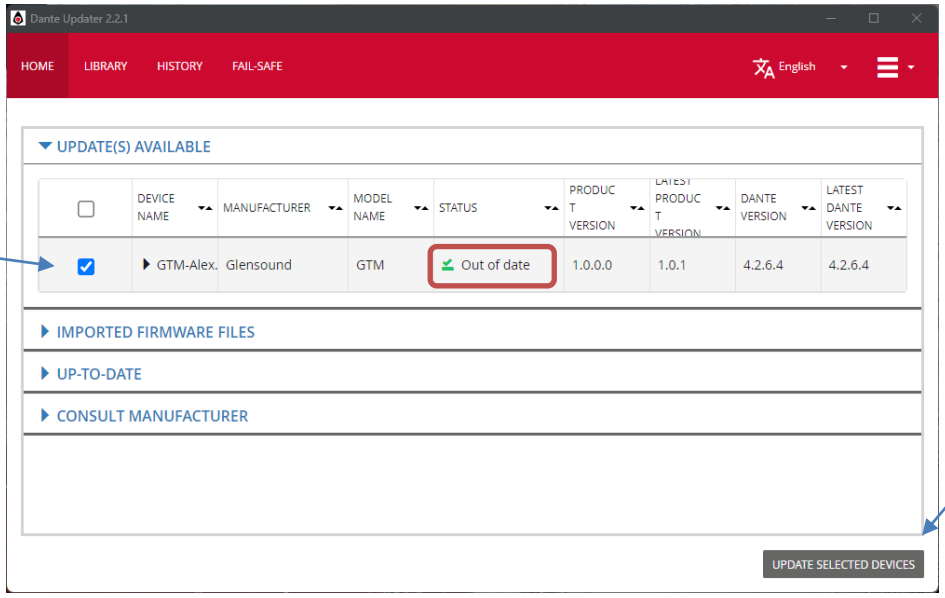


Dante controller notifies you if a device on your network is out of date.

Click the icon

2.

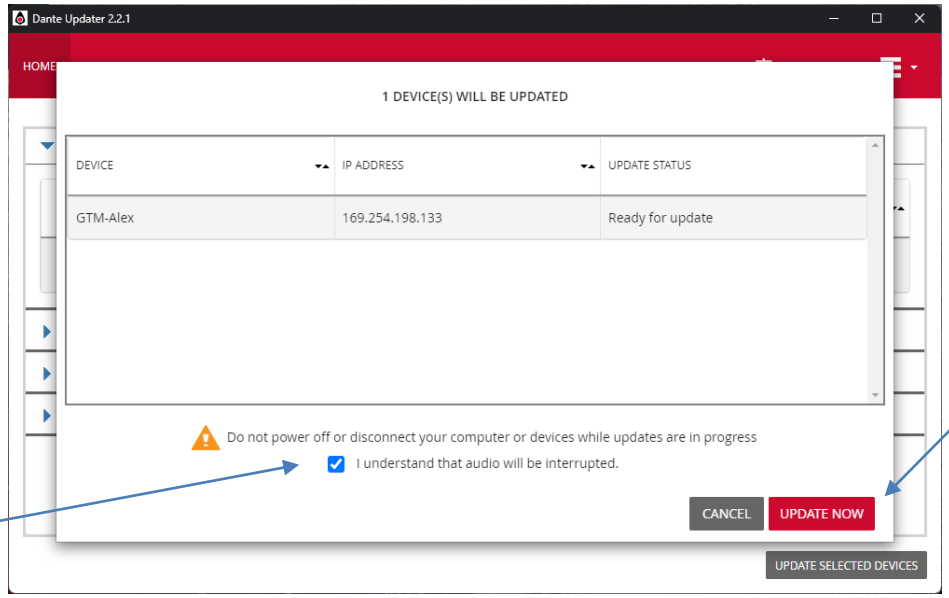
A. Tick the box to choose your unit for updating



B. Press to update device

3.

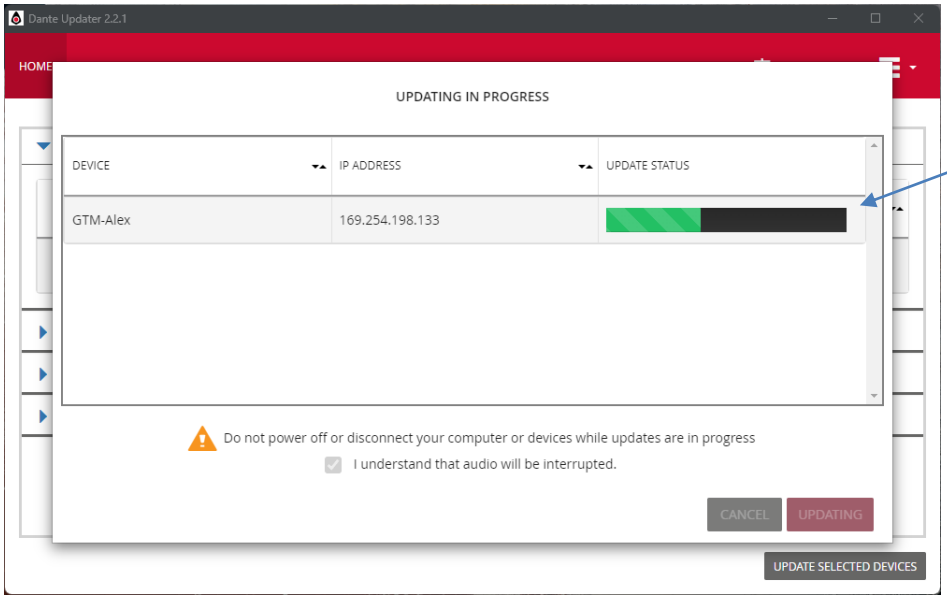
Caution! Audio will be interrupted during the device update



A. Tick box to confirm

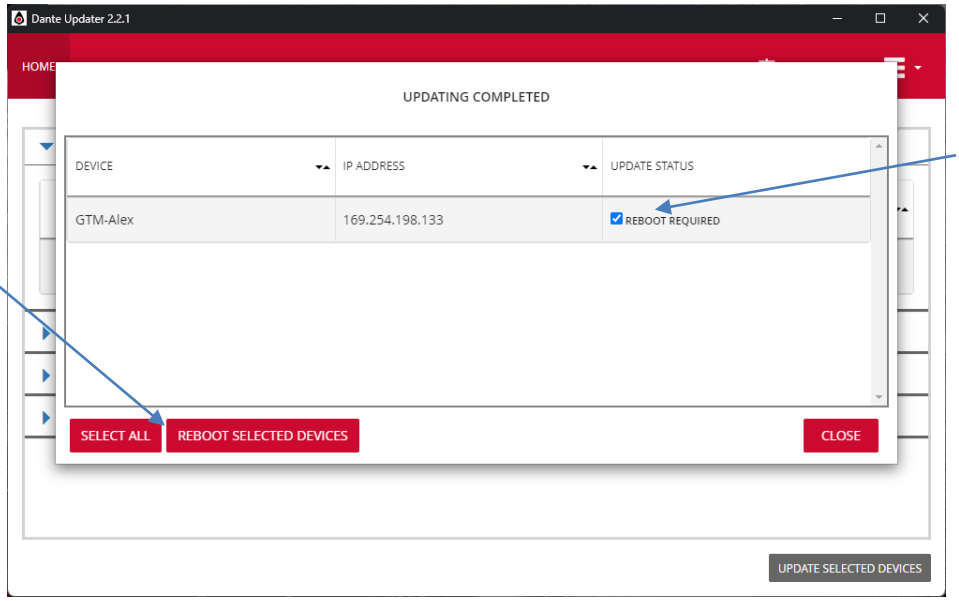
B. Press to update device

4.



Update is in progress

5.



A. Update finished. Tick box to continue

B. Press to reboot device

Update finished, device will now reboot

Connecting the Ravenna NSA16 to a Ravenna network

Note: The following section applies only to NSA16's with the Ravenna interface (Not Dante):

The Ravenna NSA16 natively support the following protocols and features:

- RAVENNA
- AES67
- SMPTE ST2110-10, ST2110-30 (Full conformance up to and including Level C and Level CX - when device supports higher than 48kHz)
- ST2022-7 (Seamless protection switching)
- NMOS IS-04 (Discovery)
- NMOS IS-05 (Routing)
- TR-1001 (System Environment and device behaviour)
- Full remote control from a web browser

Device management

Accessing the Ravenna NSA16's management webpage

Tools needed:

- NSA16 connected to a network
- PC connected to the same network
- A web browser

Ways to access the management interface

- Using the device DNS name

```
http://<device name><_serialnumber>.local/advanced
```

Example NSA16 with serial number 001:

```
http://NSA16_001.local/advanced
```

- With a static IP address

Example for unit with a static IP address:

```
http://192.168.0.1/advanced
```

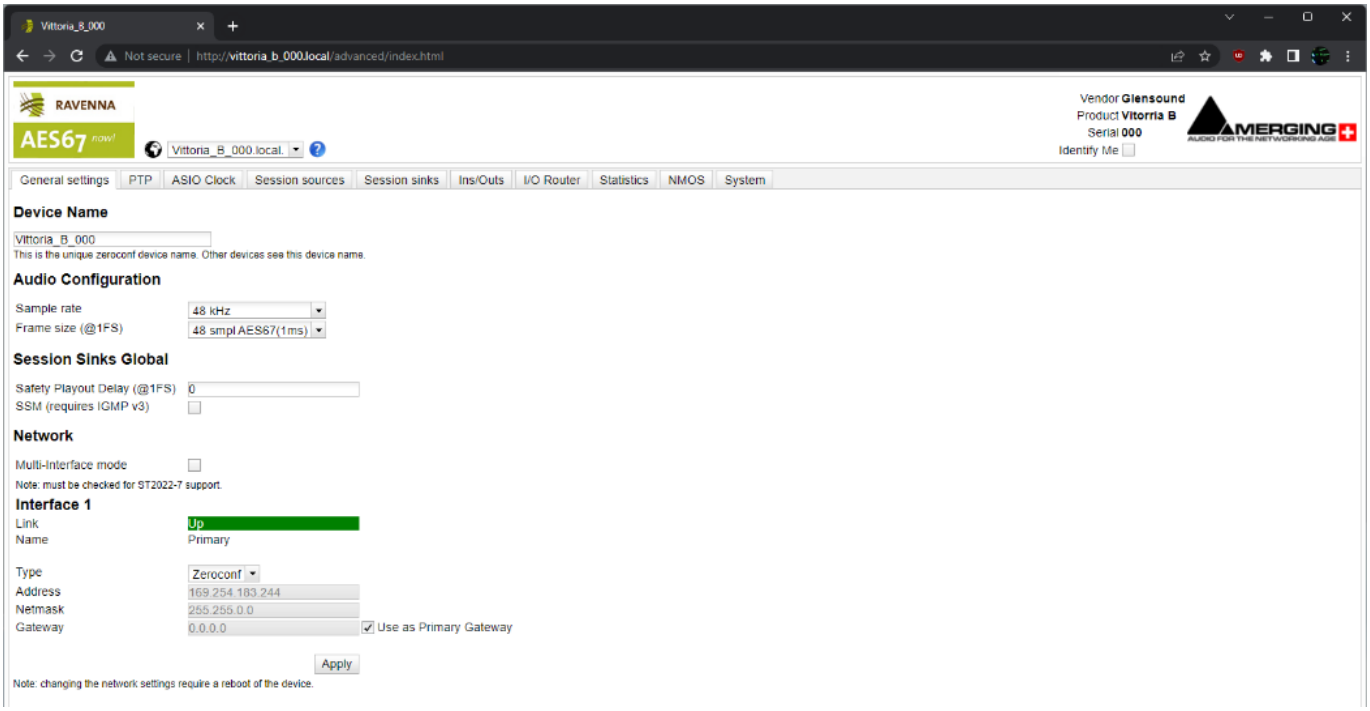
- Using Aneman (Audio network manager)

See this section

The management interface

Glensound use Merging Technologies ZMAN modules to implement the RAVENNA/AES67 solution.

This is the default device home page.



This web interface can control all aspects of the network audio settings as well as creating and managing audio streams between devices.

For a complete guide to using the web interface please visit:

https://merging.atlassian.net/l/cp/Nu7GMDoh

Various useful resources:

https://www.RAVENNA-network.com/downloads/

Network considerations when using RAVENNA:

https://merging.atlassian.net/l/cp/mWmiY9BT

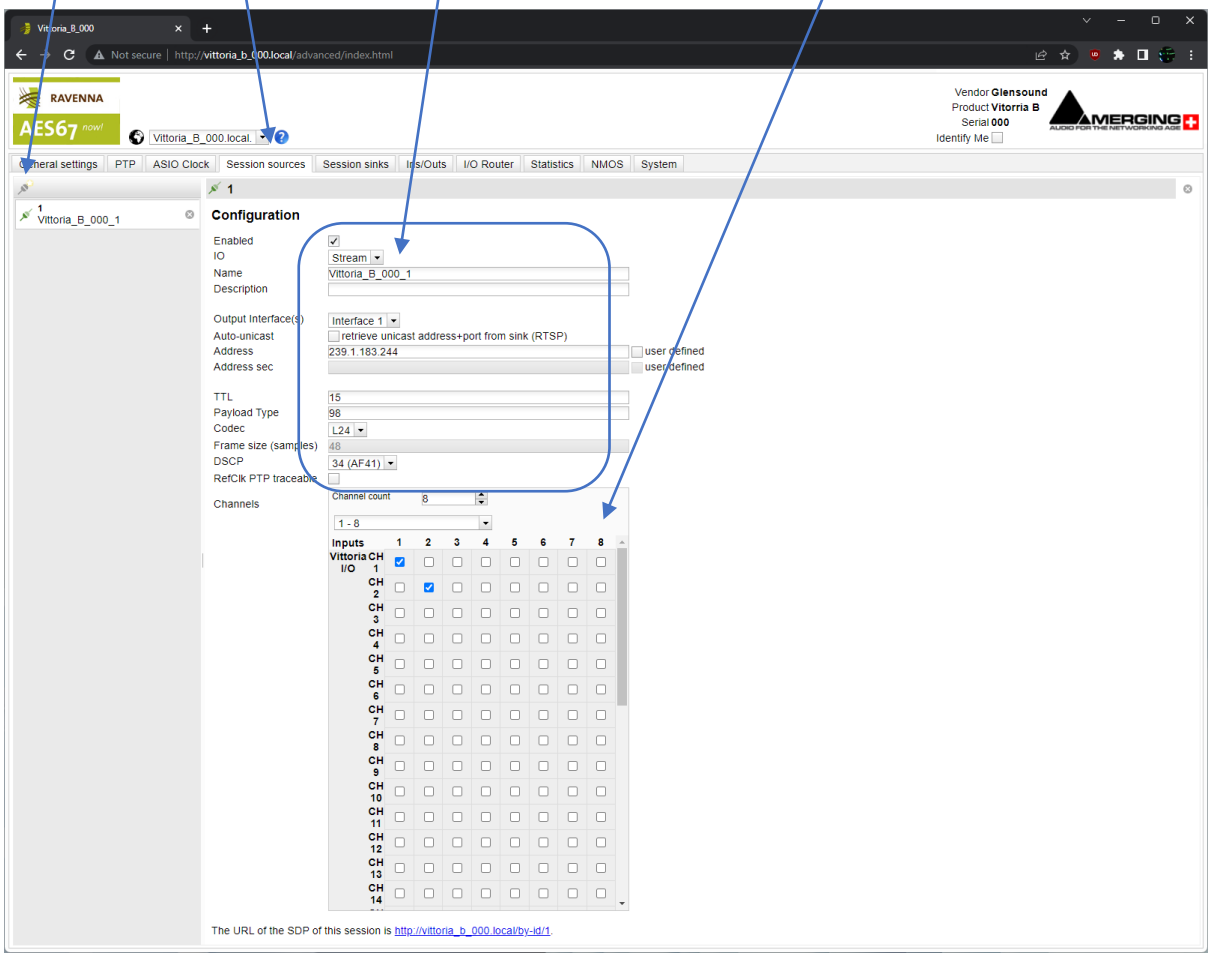
Making audio streams

Navigate to 'Session sources' page

Select 'create session' button

Input desired stream configuration

Select audio channels to send



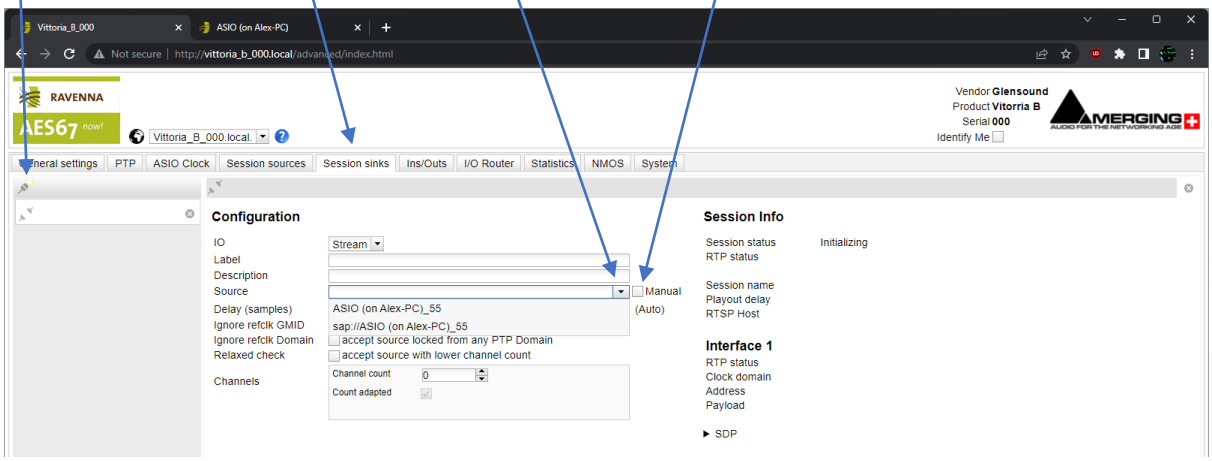
Receiving audio streams

Navigate to 'Session sinks' page

Select 'create session sink' button

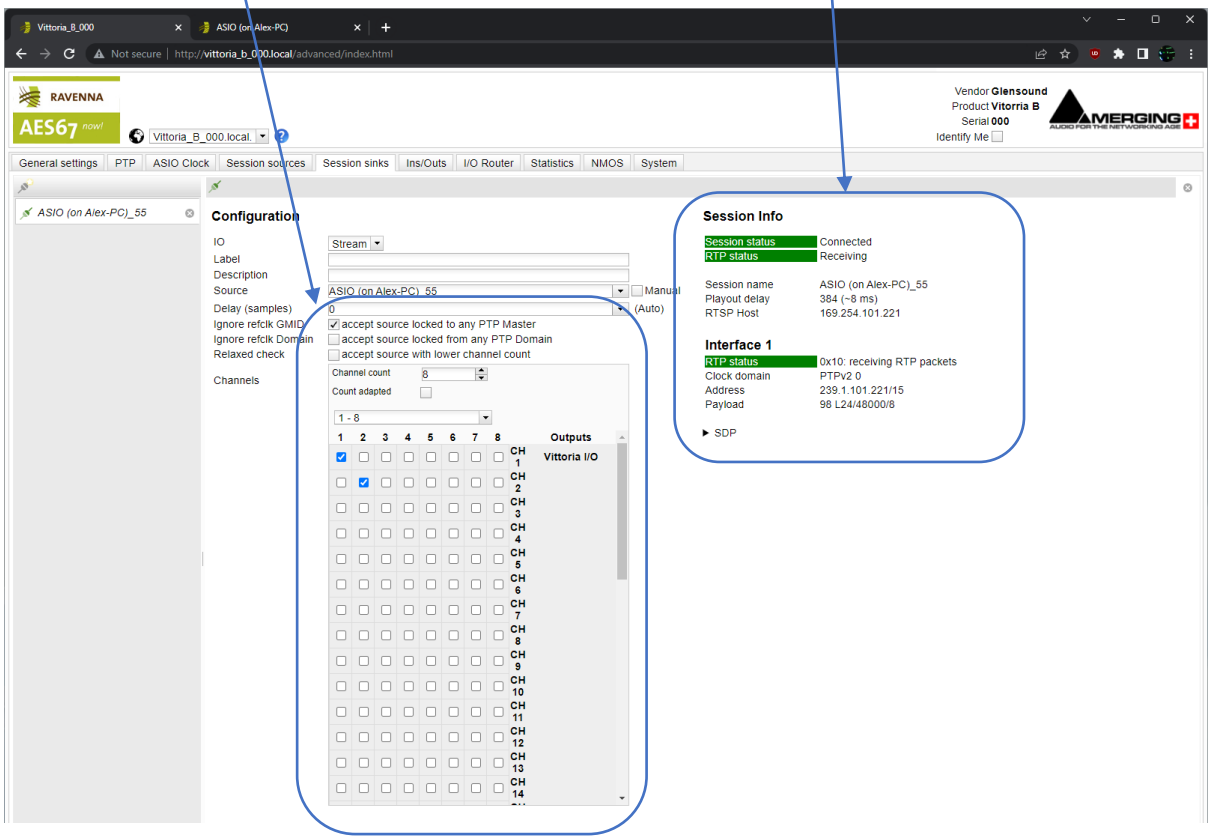
Select stream from drop down menu

Select 'Manual' to manually input address and SDP descriptors



Set and configure where network audio stream is mapped to local device audio

Session info



Aneman audio network manager

Whilst Glensound's RAVENNA/AES67 devices can be entirely controlled from the web page they are also fully supported in Aneman.

Aneman is a software tool for easily managing RAVENNA/AES67 networks (similar to Dante controller).

Downloading and installing Aneman

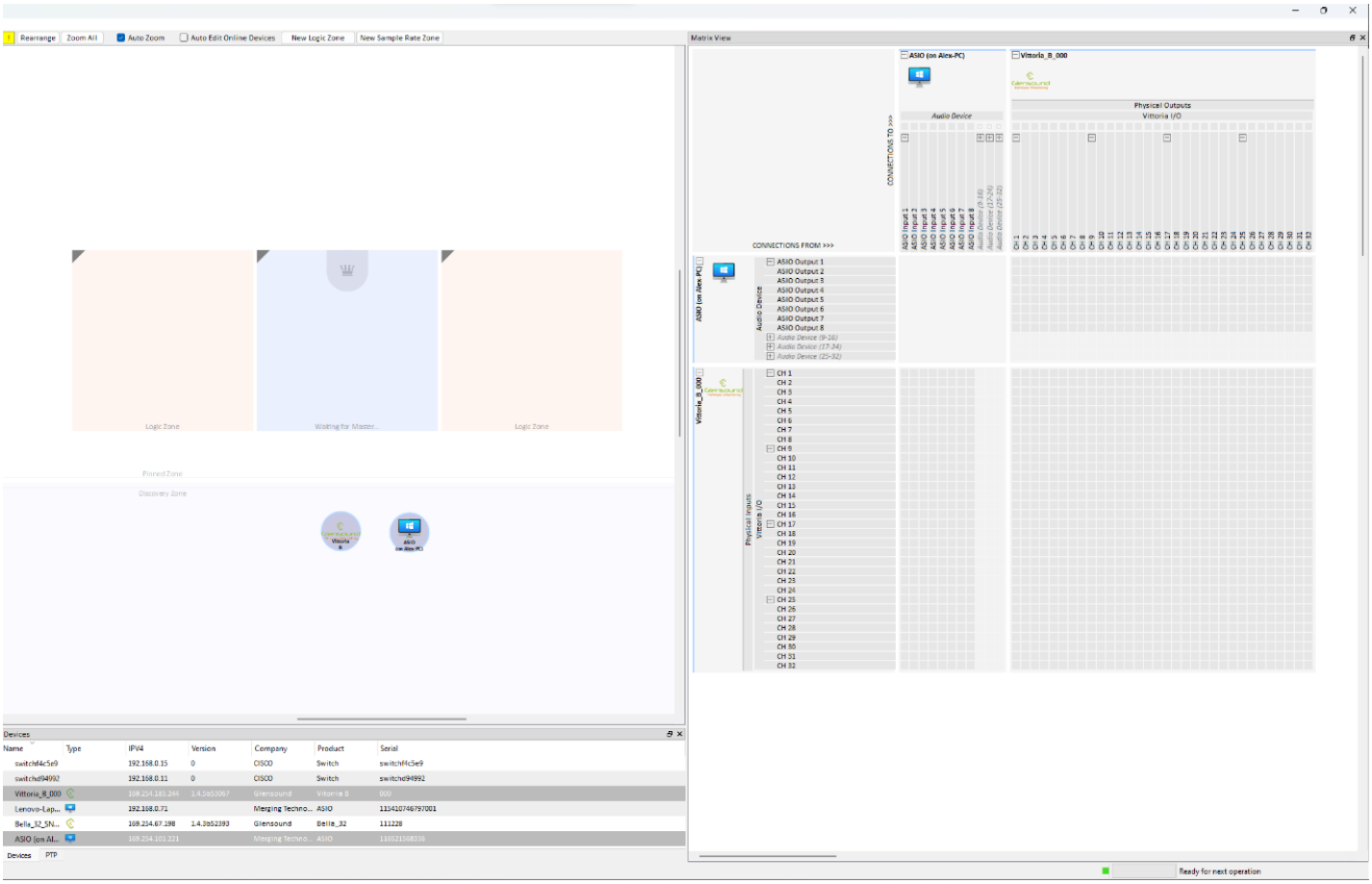
Download and install Aneman here: https://www.merging.com/products/aneman

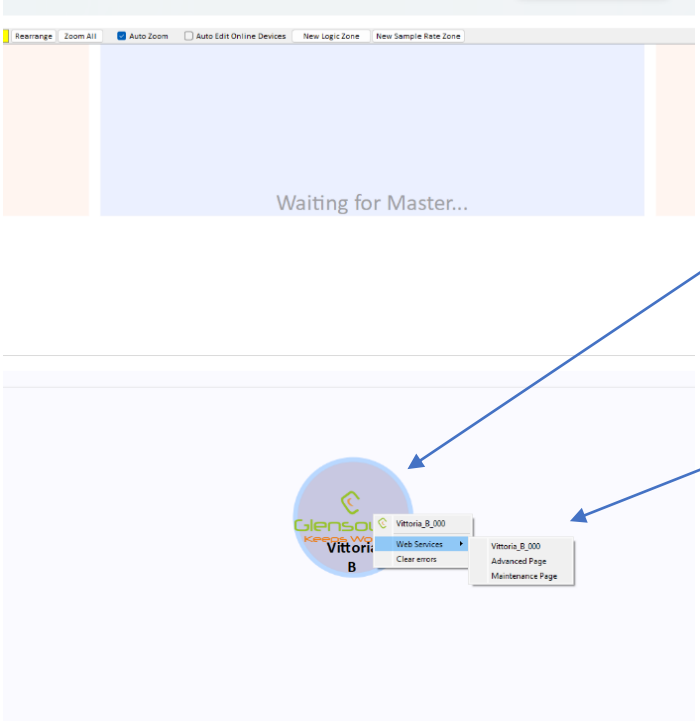
Please see the Aneman user guide for a complete manual:

https://www.merging.com/uploads/assets/Installers/KHEPRI_X.0.5_HotFix4/October2022/Aneman/ANEMAN%20User%20Manual.pdf

Using Aneman

This is the Aneman world, device and matrix view.

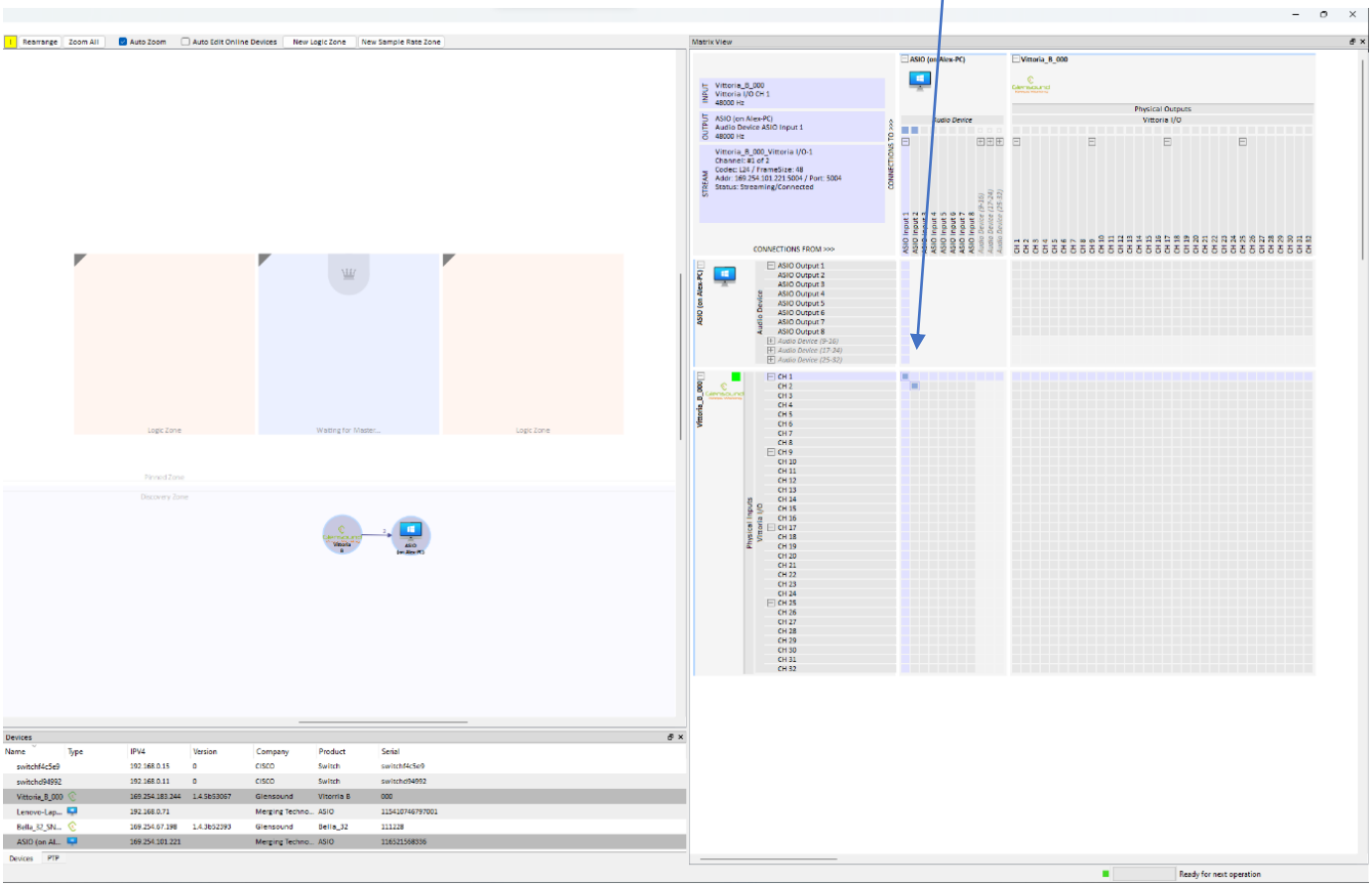




Right click device for shortcut to advanced web page

'Maintenance page' is for updating device RAVENNA firmware

Select matrix crosspoints to easily create audio pathways between devices



Updating NSA16 Ravenna firmware

Ways to access the firmware update page

In a browser go to port 8080 of the device to access the firmware update page.

- Using the device DNS name

```
http://<device name><_serialnumber>:8080
```

Example NSA16 with serial number 001:

```
http://NSA16_001:8080
```

- With a static IP address

Example for unit with a static IP address:

```
http://192.168.0.1:8080
```

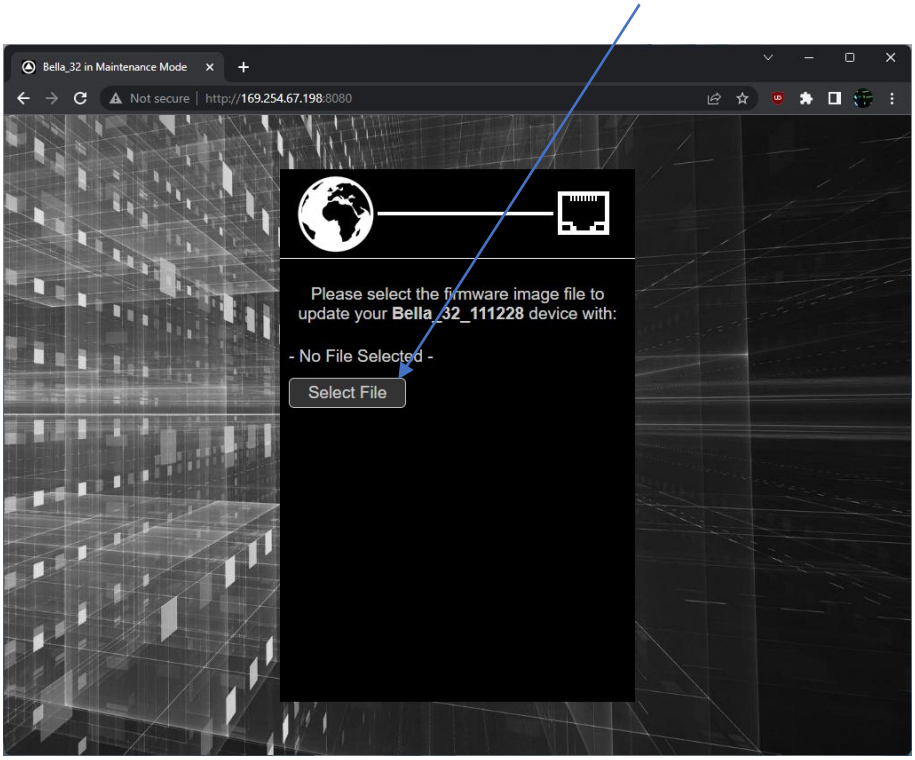
- Using Aneman (Audio network manager)

See this section

Updating firmware

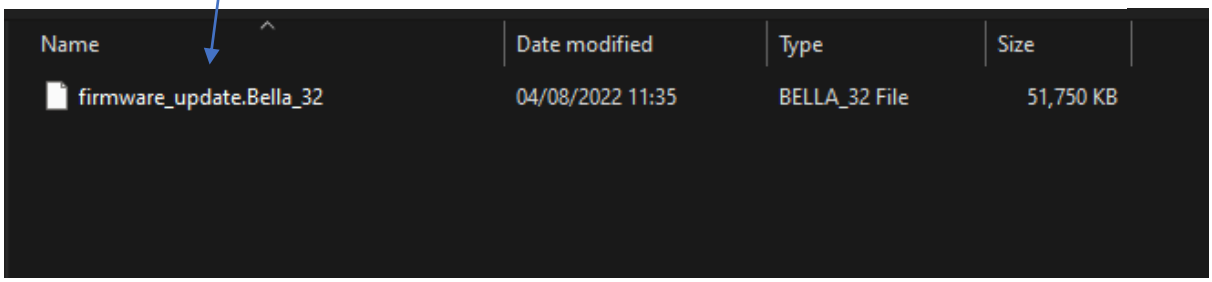
This is the firmware update view.

Choose 'Select File' to open the file browser

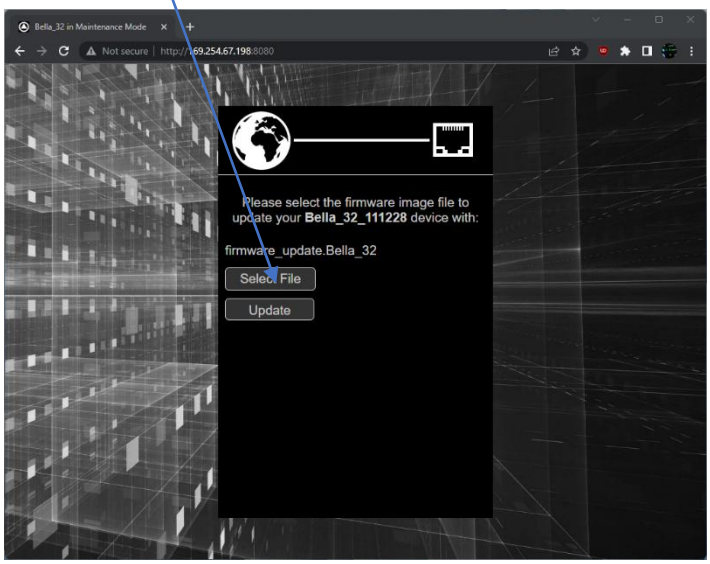


File will be called ‘firmware_update.<Device_name>’

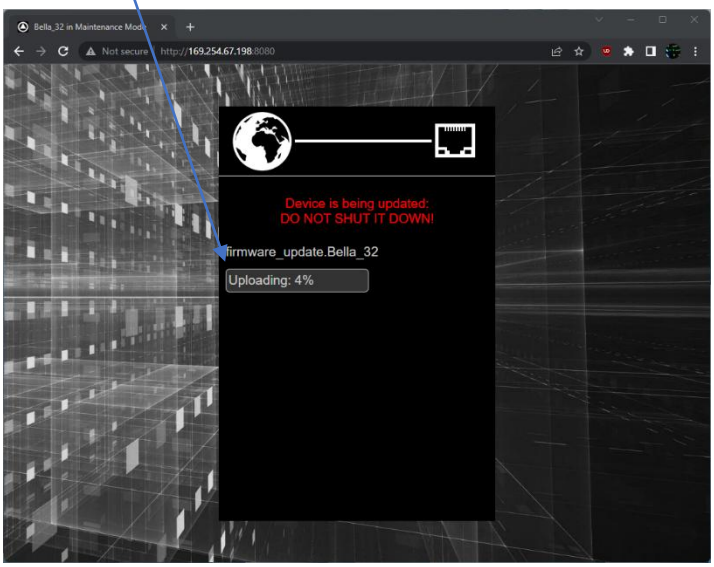
Here is an example of a firmware file for a Glensound Bella 32



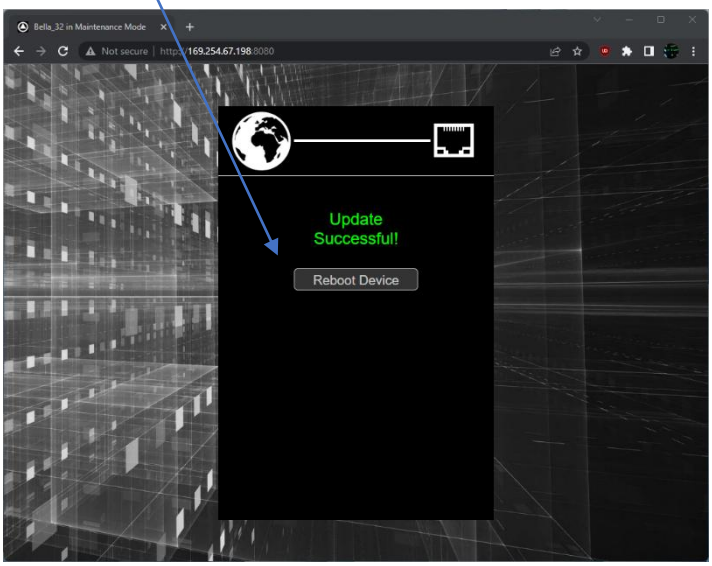
Choose ‘Update’ to begin update process



Update in progress – Do not interrupt power to the device



Update successful – Choose reboot to finish update process. Firmware has now been updated



Updating NSA16 device firmware with Glensound Activator

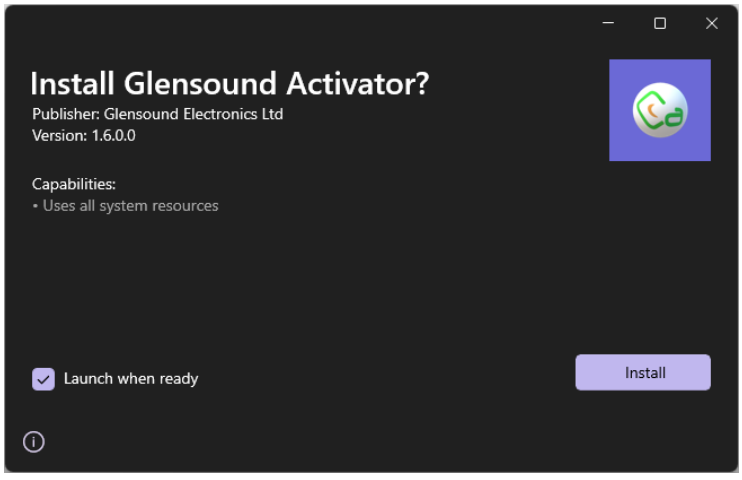
The device microcontroller firmware is the main firmware that operates the NSA16 (both variants). It can be updated via Glensound Activator using USB.

Items needed

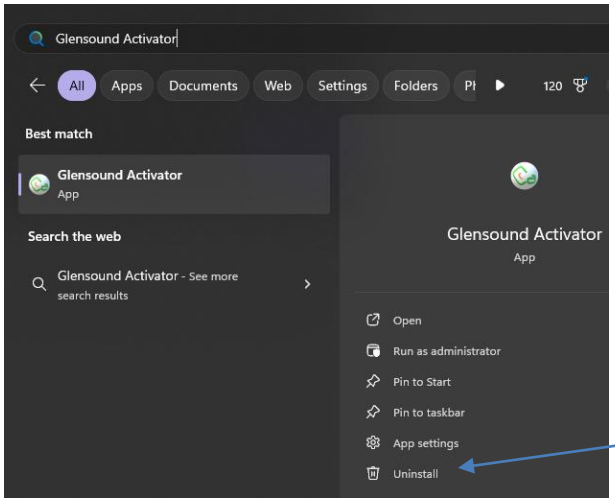
- A Windows PC
- USB C cable
- Power source for the NSA16
- A .dfu firmware file
- Glensound Activator
- STM device driver installed

Install Glensound Activator

1. Download activator from the following link: https://www.glensound.co.uk/Software/Dante/GS_Activator_v1.6.0.zip
2. Extract all contents of the downloaded folder
3. Run the "GlenActivator_1.6.0.0_Win32.msix' file



Click to install



Glensound Activator is now installed.

You can uninstall at any time by simply right clicking on Activator in the Windows start menu and selecting 'Uninstall'

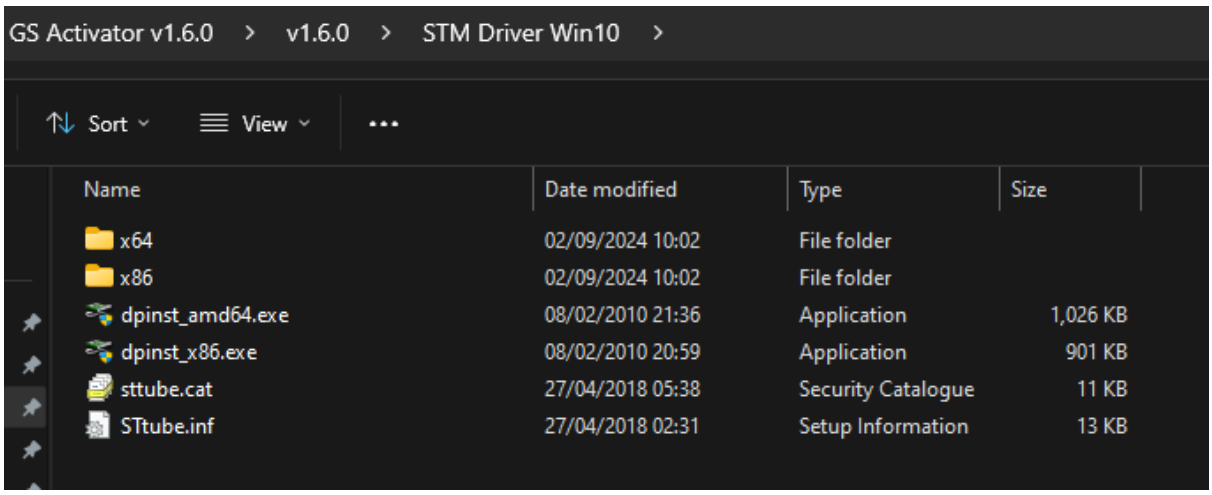
Click to uninstall

Install STM device driver

Once Glensound Activator is installed you need to install the STM device driver from STMicroelectronics for Windows to recognise STM32 devices.

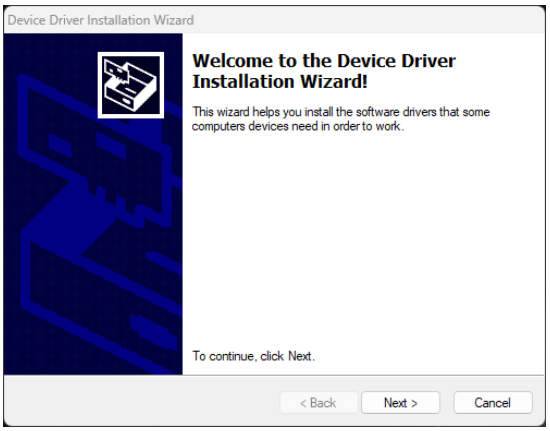
Navigate to the folder titled 'STM Driver Win10'

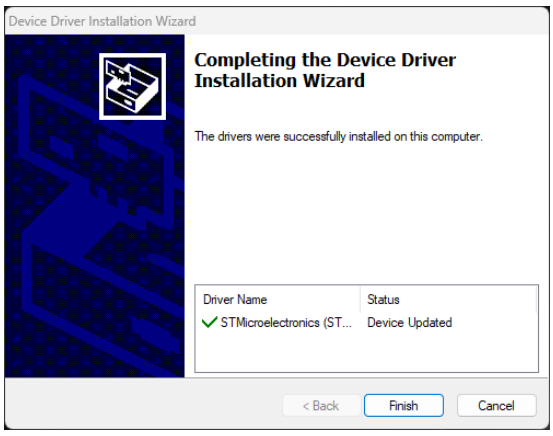
In this folder are two .exe driver installers.



If your PC is 64 bit run dpinst_amd64.exe

If your PC is 32 bit run dpinst_x86.exe



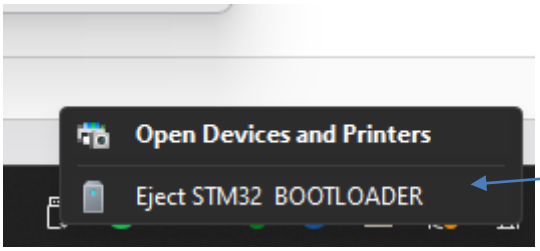


You PC should now be able to recognize STM devices.

Put the NSA16 in 'DFU' mode

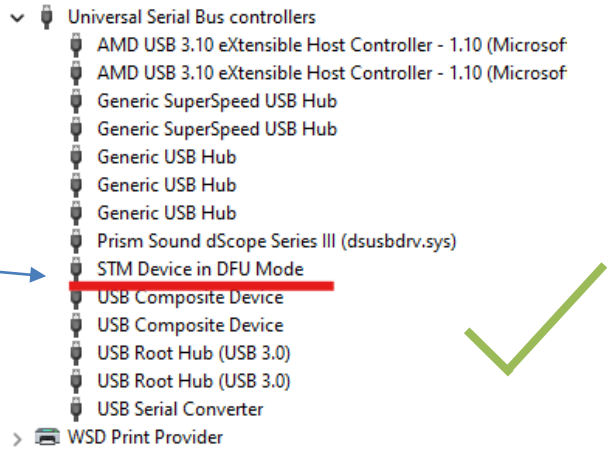
1. Plug the USB cable from your PC in to the NSA16
2. Push and hold the 'Update' button
3. Power up the NSA16
4. Wait a few seconds and then release the the 'Update' button
5. The device should now be in 'DFU mode' and ready for updating

To verify if Windows has successfully detected the device look for this icon in the taskbar

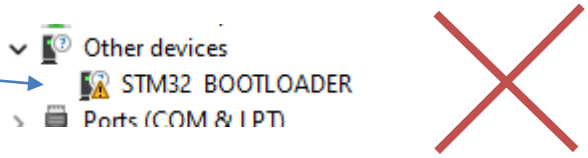


When selected it should show this

If you don't see the icon in the taskbar you can verify if the device has been detected by checking the Windows Device Manager for this device



If the device appears like this then the driver was not installed correctly and Glensound Activator won't be able to see it

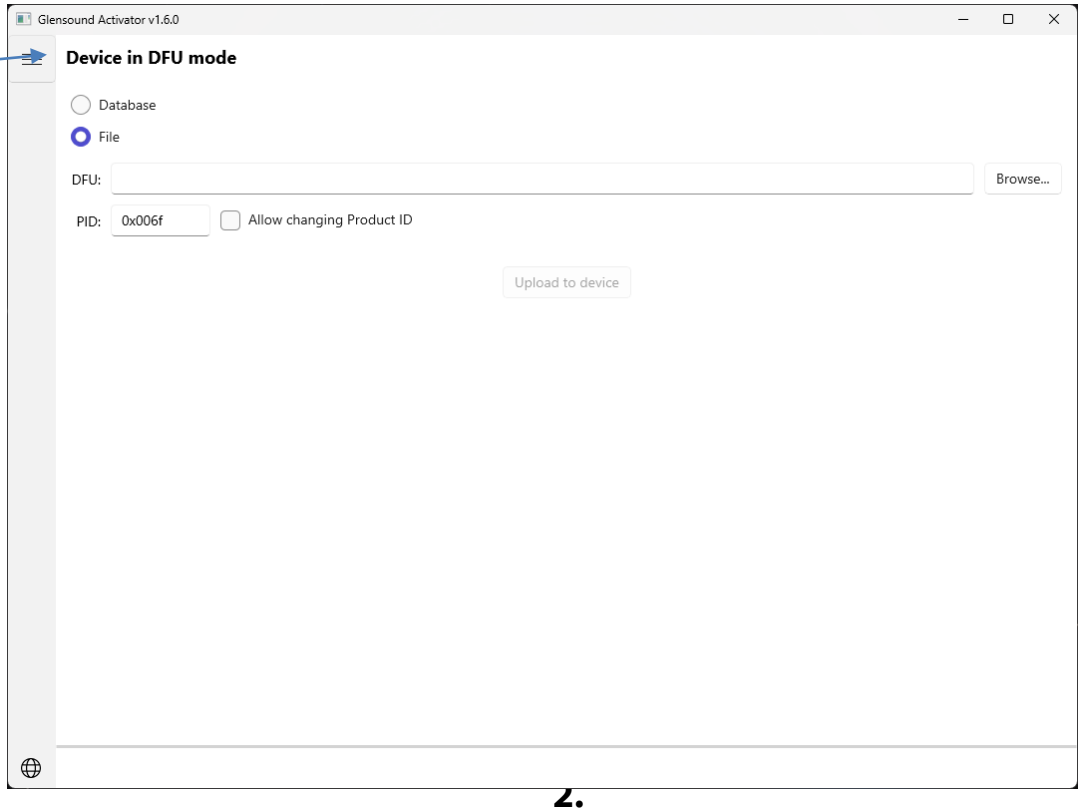


Update the firmware in Glensound Activator

Now open Glensound Activator

1.

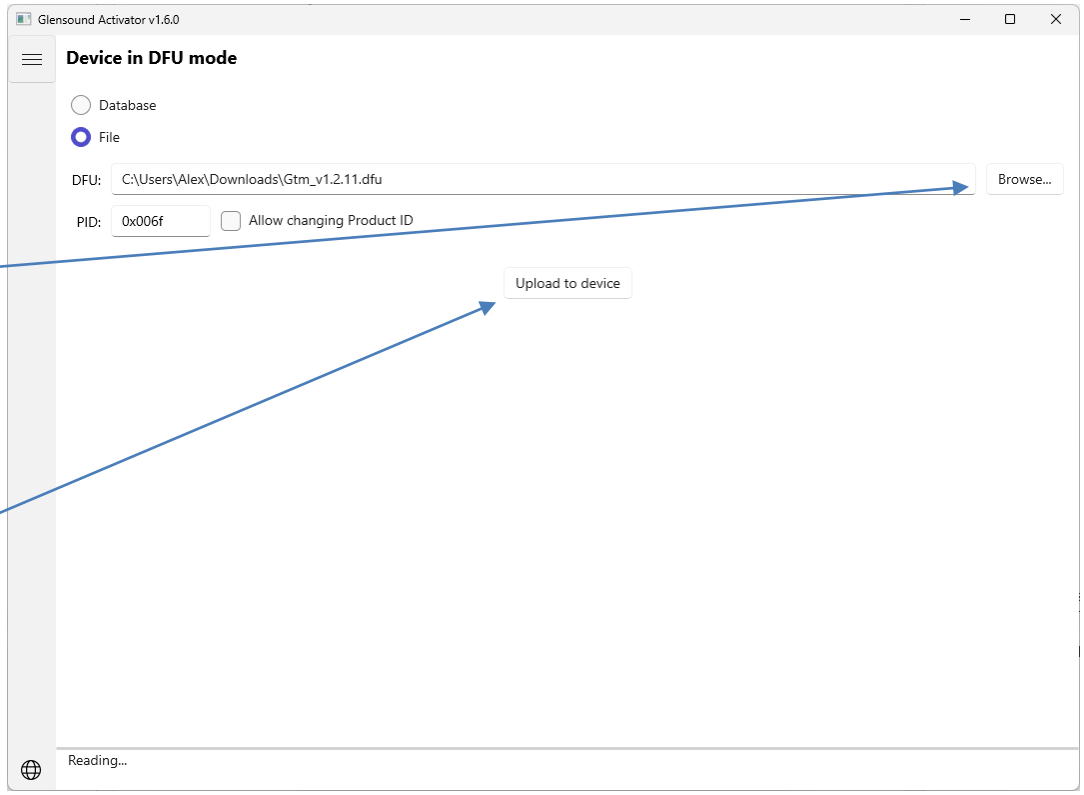
Device has been recognised



2.

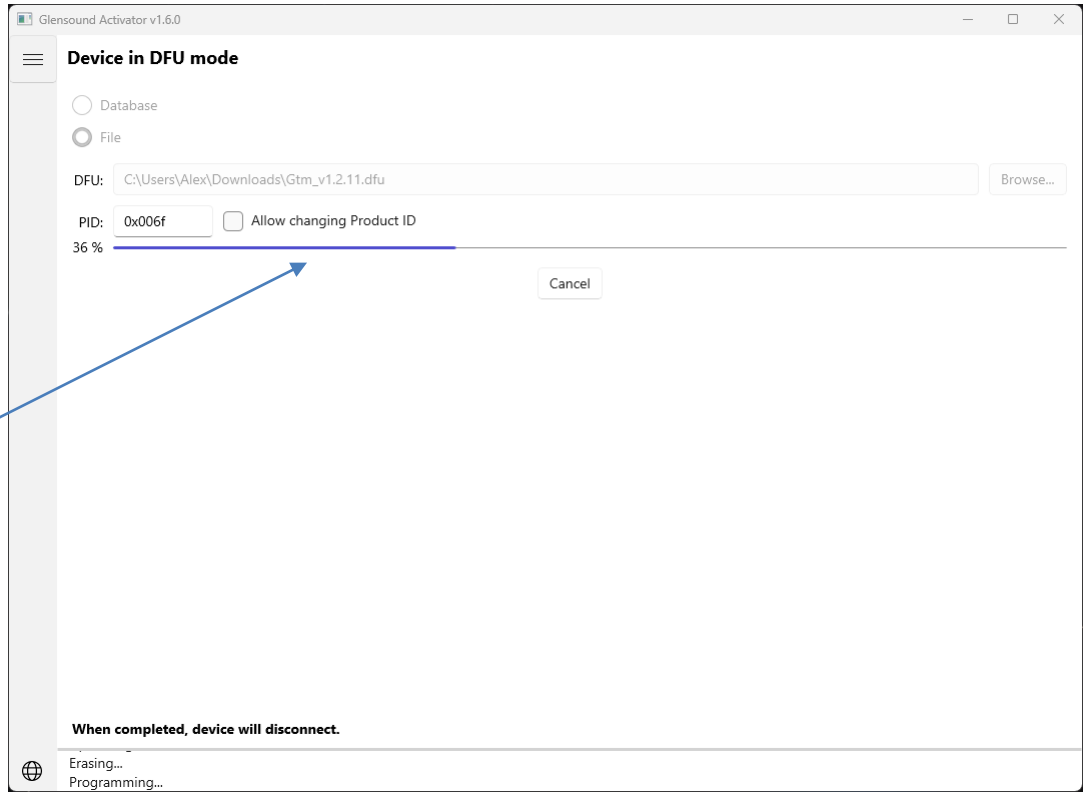
A. Choose Browse and select your .dfu file

B. Click to begin updating



Caution! Audio will be interrupted during the device update

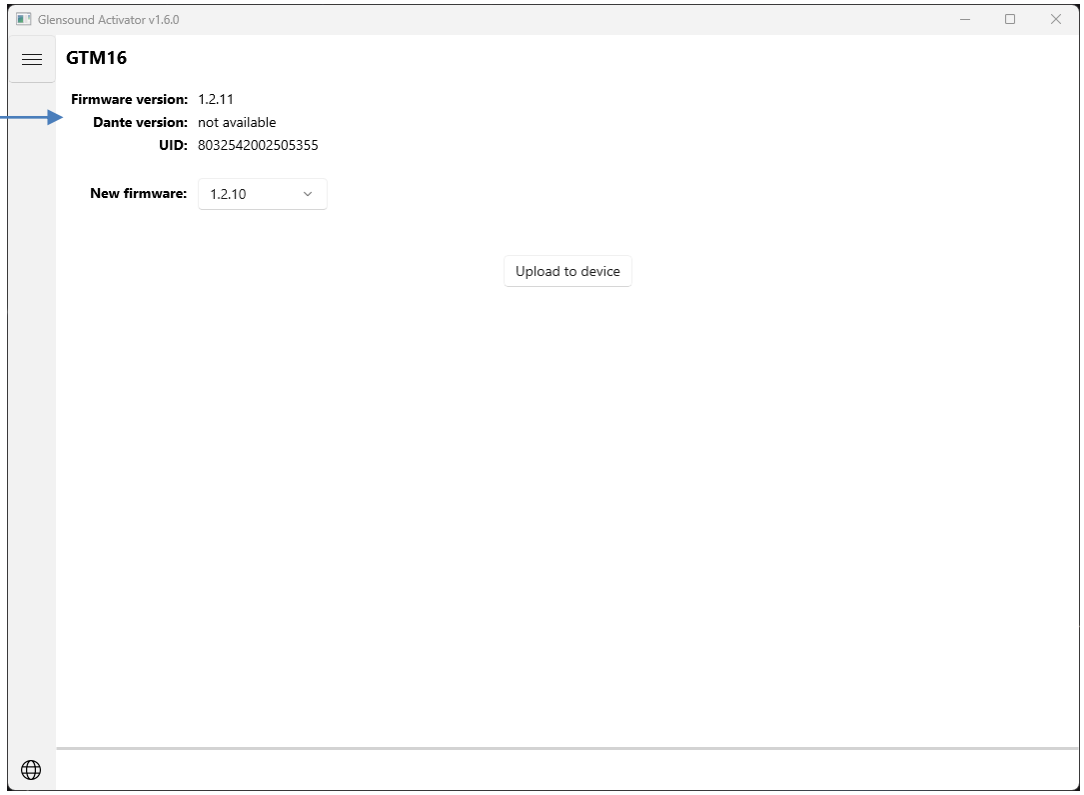
3.



Update progression bar

When the update is finished, the device will restart automatically

4.

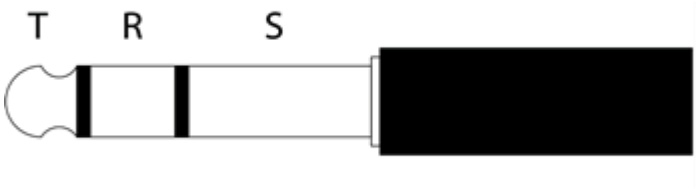


Update complete. Device displays the firmware version that is running on the device.

Note that devices that don't support Glensound Controller features may not show here once the update is complete.
This is normal behaviour, and the update was still completed.

The device can now be safely disconnected from USB and the firmware update process is complete

Wiring information



STANDARD HEADPHONE WIRING:

TIP: A/ LEFT Ear

RING: B/ RIGHT Ear

SLEEVE: Ground / Earth