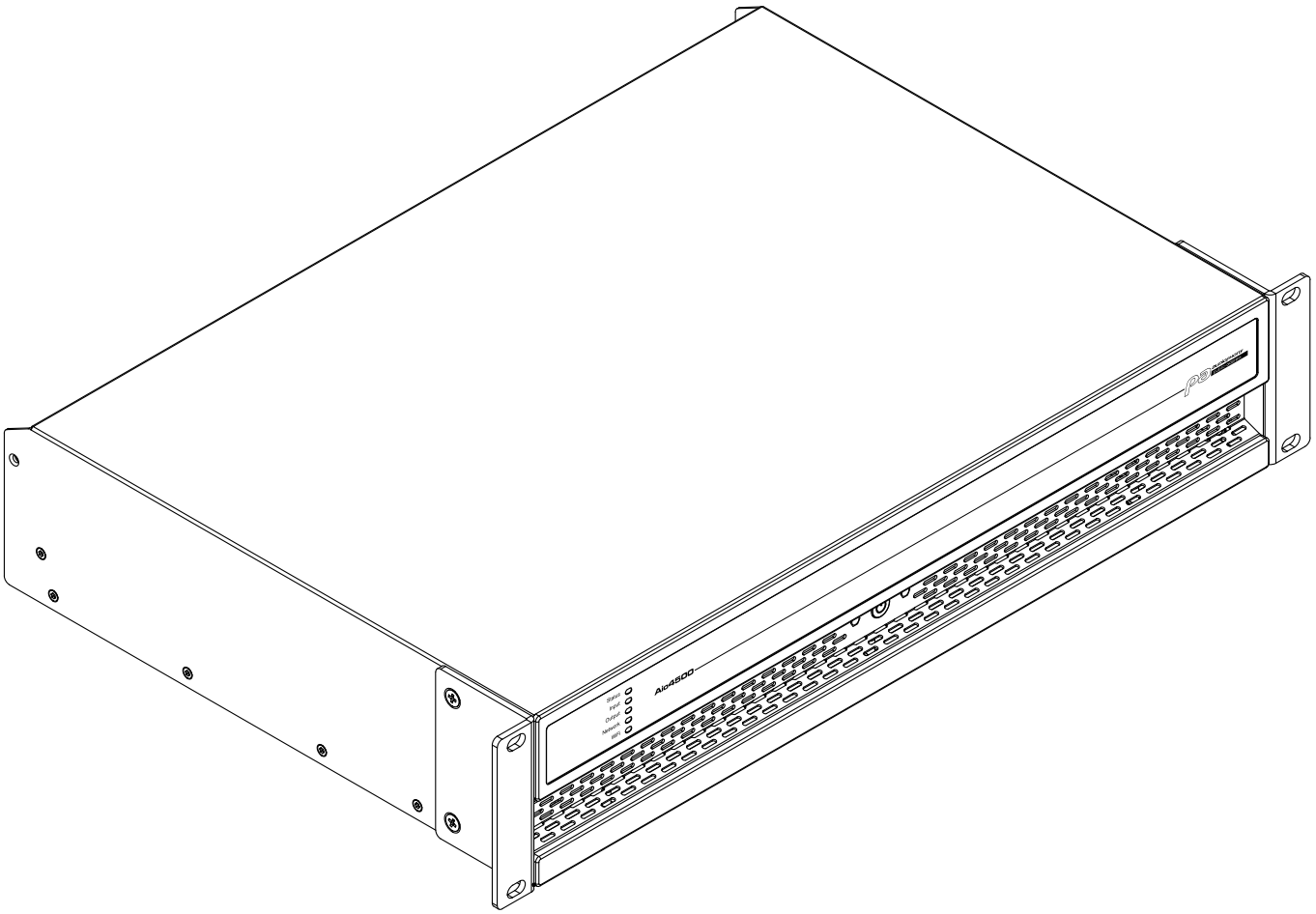
audiophony
public-address



Aio4500

4x4 digital powered amplifier - 4x500W - 2x1000W - 100V and 8Ω bridged - 2U

USER GUIDE

H11856 - Version 1 / May 2026

Technical and safety advice

Please read the following technical, safety and environmental instructions carefully before installing and using your amplifier.

Technical notes

Every reasonable measure has been taken in terms of design and engineering to ensure that these amplifiers always perform satisfactorily within their intended application and environment, and that they provide an adequate level of support to meet all reasonable customer needs and expectations. This support is, however, subject to the following conditions.

- These amplifiers are Class I devices and must be installed using a power cable with the required earth connection in order to comply with Class I safety standards.
- These amplifiers must always be installed by competent and qualified personnel. Any damage to or malfunction of the amplifier resulting from installation or operating errors may invalidate the support, warranty or performance guarantees.
- These amplifiers must not be used in places where minors might have access to them.
- These amplifiers are specifically designed for amplifying audio signals and for connection to moving-coil loudspeakers. Using these amplifiers to amplify signals outside the audio band (20 Hz to 20 kHz) or to power transducers other than moving-coil speakers may result in the cancellation of support, warranty or performance guarantees.
- These amplifiers must only be used in audio systems installed and configured by professionals, comprising auxiliary input and output equipment of recognised performance standards and in good working order. Any damage to these amplifiers or any unsatisfactory performance on their part resulting from unsuitable or faulty auxiliary input or output equipment may result in the cancellation of support, warranty or performance guarantees.
- These amplifiers are intended for indoor installation and use in a controlled environment (pollution degree PD2), at an ambient temperature between 0 °C and 40 °C. They are not designed for use at altitudes exceeding 2,000 metres. Installing or using these amplifiers in environments that do not comply with these limits may result in the cancellation of support, warranty or performance guarantees.
- Specific warranty terms and conditions are the responsibility of the amplifier retailer.

Safety and environmental notices

Note: The symbol depicting a lightning bolt with an arrow inside a triangle is intended to alert the user to the presence of 'dangerous' uninsulated voltage inside the product's housing, the intensity of which may be sufficient to pose a risk of electric shock to people.

Note: The exclamation mark inside an equilateral triangle is intended to draw the user's attention to the presence, in this manual, of important instructions relating to safety, operation and maintenance.

WARNING! TO AVOID THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

Note regarding ambient temperature: if this equipment is used in a confined space or within a multi-rack installation, the internal ambient temperature may exceed the external ambient temperature. In such circumstances, it is important to ensure that the maximum operating temperature specified for the equipment is not exceeded.

Reduced airflow: ensure that the rack or any other enclosed structure does not obstruct the flow of cooling air required for the safe and reliable operation of the equipment.
Leave a space of one unit between each amplifier.

Technical and safety advice

Important safety instructions

- Please read these instructions.
- Please keep these instructions.
- Please observe all safety warnings.
- Follow all the instructions.
- Do not use this appliance near a source of water.
- Do not immerse the device in water or other liquids.
- Do not use any aerosols, cleaning products, disinfectants or fumigants on, near or inside the equipment.
- Clean with a dry cloth only.
- Do not block any ventilation openings. Install the appliance in accordance with the manufacturer's instructions.
- Do not install it near heat sources such as radiators, air vents, stoves or any other equipment (including amplifiers) that generates heat.
- To reduce the risk of electric shock, the power cord must be plugged into a socket with a safety earth connection.
- Do not compromise the safety function of the earthed plug. An earthed plug has two pins and a third earth pin. The third pin is provided for your safety. If the plug supplied does not fit your socket, consult an electrician to have the obsolete socket replaced.
- Make sure the power cord is not stepped on or pinched, particularly around the plugs, sockets and where it exits the appliance.
- Do not unplug the appliance by pulling on the cord; instead, use the plug.
- Only use accessories recommended by the manufacturer.
- Unplug this appliance during a thunderstorm or if it is not going to be used for a long period of time.
- Always have maintenance work carried out by a qualified technician. Service is required if the appliance has suffered any damage, for example if the power cord or plug is damaged, if liquid has been spilled or objects have fallen inside the appliance, if the appliance has been exposed to rain or moisture, if it is not operating normally, or if it has been dropped.
- The appliance's plug must be used to disconnect it from the mains supply and must remain easily accessible after installation.
- Please comply with all applicable local regulations.
- If you have any doubts or questions regarding the physical installation of equipment, consult a qualified engineer.

Environmental Statement

This product complies with international directives, including the Restriction of Hazardous Substances (RoHS) Directive for electrical and electronic equipment, the REACH Regulation (Registration, Evaluation, Authorisation and Restriction of Chemicals) and the Waste Electrical and Electronic Equipment (WEEE) Directive. Please consult your local waste management authorities for information on how to recycle or dispose of this product correctly.

EC Declaration of Conformity

This product complies with all the essential requirements and other specifications set out in the Directive
- 2014/53/EU (RED)
- 2014/35/EU (LVD)
- 2014/30/EU (EMC)
- 2011/65/EU (RoHS)

The full EU declaration is available at audiophony-pa.com.

Introduction and overview

1. Introduction

The Aio4500 power amplifier has been designed to deliver high-performance, configurable, consistent and reliable audio amplification for residential, commercial and entertainment applications.

This manual describes the features, installation and functions of the Aio4500 model. Please read this manual in full before installing and using the amplifier. If you have any questions regarding the configuration, installation or operation of the amplifier, please contact the relevant customer service department.

Following this introduction, the handbook is divided into sections covering the following topics:

2. Introduction to the amplifier

The Aio4500 amplifier is a 2U power amplifier that occupies the full width of a rack, capable of driving both conventional low-impedance speakers (Lo-Z, 4 Ω to 16 Ω) and high-impedance (Hi-Z, 70 V/100 V) speakers connected via a transformer. It offers four analogue inputs, one stereo S/PDIF digital input, and two (Lo-Z mode) or four outputs (Hi-Z or Lo-Z BTL mode). The number of output channels and the output power ratings of the Aio4500 amplifier are as follows:

Aio4500 amplifier with four outputs

Mode	**Channels**	**Maximum rated power per channel**
Lo-Z	Four	500 watts
Lo-Z (BTL)	Two	1,000 watts
Hi-Z	Two	1,000 watts

Note: In Lo-Z BTL (bridged load) mode, two of the amplifier's output channels are combined to form a single, double-power output channel. BTL mode can be enabled via the amplifier's output mode configuration menu, described in section 5 of this manual.

2.1 Connections and power-up

The Aio4500's signal input and output connections **are made** via RCA and Euroblock connectors. A GPIO (General Purpose In/Out) Euroblock connector allows certain amplifier functions to be controlled remotely; wireless network connection options or

When using the 70V Hi-Z mode, the line impedance must not be less than 5.5 ohms. When using the 100 V Hi-Z setting, the line impedance must not be less than 11 ohms

Please note: The total power of all connected speakers must not exceed the amplifier's maximum power rating.

connection via an RJ45 Ethernet socket are also available. The connectors and cable connections are described and illustrated in section **6** of this manual.

The **Aio4500** amplifier is fitted with a power button on the front panel. Press this button once to switch the amplifier on or off. The amplifier's power management settings can be configured via the Aio's web configuration interface **,** in **the 'Settings' menu** described in section **5** of this manual.

2.2 Network features

Aio4500 amplifiers are devices connected to a TCP/IP network that require a wired or wireless network connection to access their configuration menus. These menus are accessed via the web interface of the Aio4500 control application and cover functions relating to inputs, zones, outputs and general settings. The configuration menus are described in detail in section **4** of this manual.

2.3 Firmware

This manual describes the features, functions and user interface of the **Aio4500** amplifier running firmware version **2026.9.1.**

We strongly recommend that you check the firmware version installed on your amplifier right from the start, and then at regular intervals. If a firmware update is available, you should install it as a matter of priority.

The firmware installed on the amplifier can be identified and updated by selecting the **'Device'** option in the **'Settings'** menu of the Aio's web-based configuration interface. You can check the firmware versions and download the firmware from the website: https://audiophony-pa.com

3. Contents of the box

The **Aio4500** amplifier is supplied in a box containing the amplifier, a power cable suitable for the local market, a pack of accessories and a documentation pack. The full contents are listed below.

- Amplifier unit
- Rack mounting brackets (fitted)
- Mains power cable
- Input connector x 2
- GPIO connector x 1
- Output connector x 2
- Adhesive rubber feet x 4
- Documentation folder

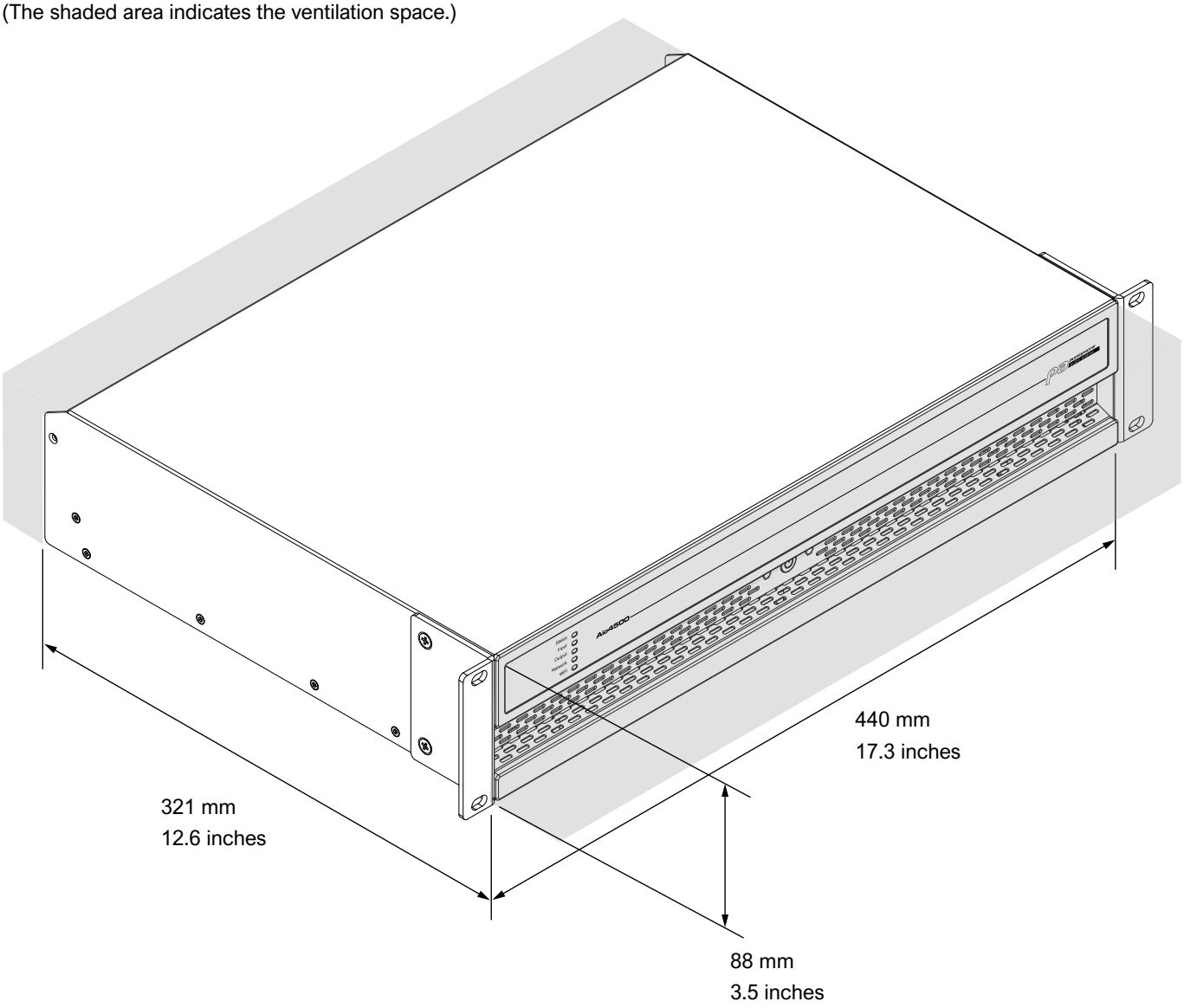
4. Installation

4.1 Amplifier location

The **Aio4500** amplifier comes with mounting brackets already attached and is primarily designed for installation in a standard (19-inch) rack cabinet. If it is not to be installed in a rack cabinet, the Aio4500 amplifier can be placed directly on the floor on a flat surface. Adhesive rubber feet are supplied for this purpose.

It is important that any installation leaves sufficient space to allow air to circulate through the ventilation openings at the front and rear of the amplifier. This is illustrated in Figure 4A.

Figure 4A
Dimensions of the **Aio4500** 2Uamplifier .
(The shaded area indicates the ventilation space.)



Configuration

5. Configuration

Before connecting the input, output and GPIO pins, you should carry out the initial setup of the Aio4500 amplifier. It is particularly important that the amplifier's output format is correctly configured for the speakers that will be connected.

To set up the Aio4500 amplifier, it must be plugged into the mains and connected to the network. These connections are described in the following two sections.

5.1 Mains connection

The **Aio4500** amplifier is fitted with a power factor correction power supply and can operate with a mains input voltage of between 100 V AC and 240 V AC, at 50/60 Hz. Use the power cable supplied with the amplifier and plug it into a mains socket fitted with a switch.

The **Aio4500** amplifier does not have a power switch and switches on as soon as it is plugged in.

5.2 Network services

The Aio4500 amplifiers are configured via a web interface known as the 'Aio Configuration Web Interface '. Before you can access the configuration menus, the Aio4500 amplifiers must be connected to the same TCP/IP network as the computer or mobile device that will be used to access the configuration.

5.2.1 Wired network connection (Ethernet)

To connect an **Aio4500** amplifier to a TCP/IP network via a wired (Ethernet) connection, follow the steps below.

1. Use an Ethernet cable to connect the 'Network Control' socket on the rear of the **Aio4500** amplifier to an available port on a router or network switch, or directly to a laptop or desktop computer equipped with an Ethernet port.

2. Connect the **Aio4500** amplifier to the mains using the power cable supplied. Wait until the 'Network' indicator on the front panel lights up green to show that the amplifier is connected to the network.

3. According to the manufacturer's default settings, the network settings for the **Aio4500** amplifier will be configured either in DHCP mode or with a static LAN IP address of 192.168.64.100.

Using the DHCP protocol, the router will automatically assign a network address to the **Aio4500** amplifier, enabling it to connect to the network automatically. If necessary, you can use a network analysis tool to identify the amplifier's IP address.

If you are using an **Aio4500** amplifier with a static IP address, configure your laptop or desktop computer with a static IP address within the same IP address range; for example, 192.168.64.10, with a subnet mask of 255.255.255.0 (or a 24-bit prefix) and set the gateway to 192.168.64.1.

4. Open a web browser on your laptop or desktop computer, then enter the IP address assigned to the amplifier by DHCP or go to http://192.168.64.100. The AioControl app interface will open, allowing you to configure the amplifier to suit your needs.

Note: The **Aio4500** *amplifier can be configured to use the DHCP protocol for network connectivity if required. However, if an* **Aio4500** *amplifier using DHCP is restarted, the TCP/IP network router may assign it a different IP address, making its configuration page inaccessible via the previous address. If this happens, a network scan application can be used to identify the new IP address. The settings for the DHCP and Fixed IP Address options can be found in the Settings tab menu described in section 6.3.*

5.2.2 Connecting to a wireless network (Wi-Fi)

To connect an **Aio4500** amplifier to a TCP/IP network via a wireless connection (Wi-Fi), follow the steps below.

1. Once the **Aio4500** amplifier is plugged in, wait until the Wi-Fi indicator on the front panel lights up green.

2. Use a mobile phone, laptop or desktop computer to search for available Wi-Fi networks. Connect to **'Aio4500** (product serial number)' using the password **'password'.** The amplifier's serial number can be found on its rear panel**.**

3. Open the web browser on your computer or mobile device, then enter the following IP address: 192.168.4.1. The Aio's web configuration interface will open, allowing you to configure the amplifier to suit your needs.

4. In the Aio's web configuration interface, select the 'Settings' tab, then 'Wi-Fi' > 'Wi-Fi Mode' > 'Client' to configure the extender to connect to the desired Wi-Fi network. You will be asked for the Wi-Fi network name and password.

We strongly recommend changing the password for the Aio4500 amplifier's Wi-Fi access point after the first wireless connection.

Configuration

5.3 Configuration menus

When you open a web browser connected to the network of an **Aio4500** amplifier, the AioControl web configuration interface initially appears as the dashboard shown in Figure **5A**. The dashboard is the home page from which all other configuration options can be accessed.

The dashboard displays the amplifier status, output zones and configuration menu tabs. It also provides immediate access to zone volume controls. The functions available under each tab in the configuration menu are described in the following sections.

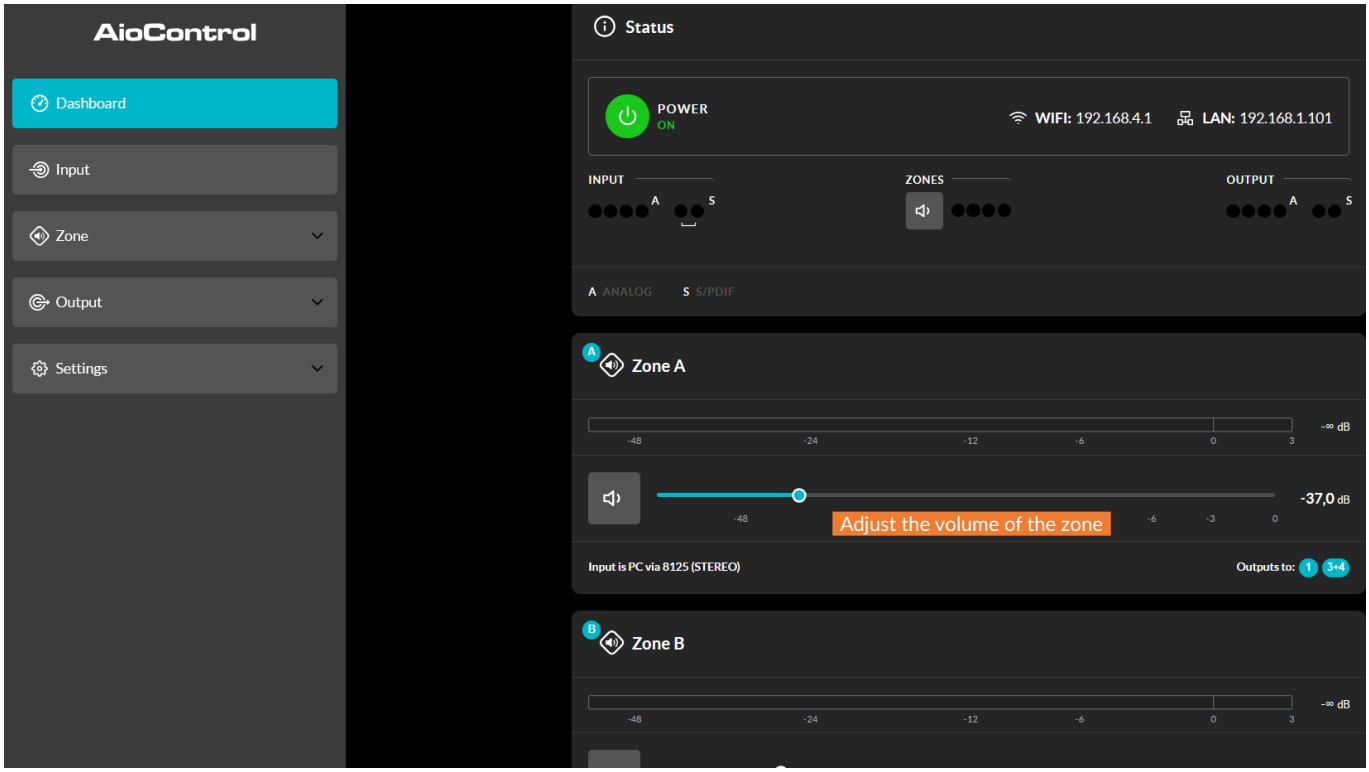


Figure 5A: Configuration dashboard display

5.3.1 'Input' tab

The 'Input' tab offers the following configuration settings for each of the amplifier's input channels:

- **Input name**
- **Mono/stereo selection**
- **Input sensitivity**
- **High-pass filter**
- **Gain control**
- **Five-band equalisation**

The 'Input' tab also allows you to mix input signals and route them to specific amplifier zones. The mixing function enables you to combine any amplifier input—including separate stereo or mono S/PDIF inputs—with one or more other inputs to create multiple preset mixes.

Note: The number of possible individual mixes corresponds to the number of analogue outputs on the amplifier (four outputs allow for four mixes).

Note: The mix inputs are disabled by default and their level controls are set to zero.

Mixing takes place after the high-pass filter, input equalisation and mono/stereo selection.

An audio signal generator producing pink noise or a sine wave, suitable for testing and configuring audio systems, can also be enabled, disabled and adjusted for gain and frequency via the **'Input'** tab . Figures **5B, 5C, 5D and 5E illustrate** the displays of the **'Input'** tab , the input equaliser and the input mix, **respectively** .

Configuration

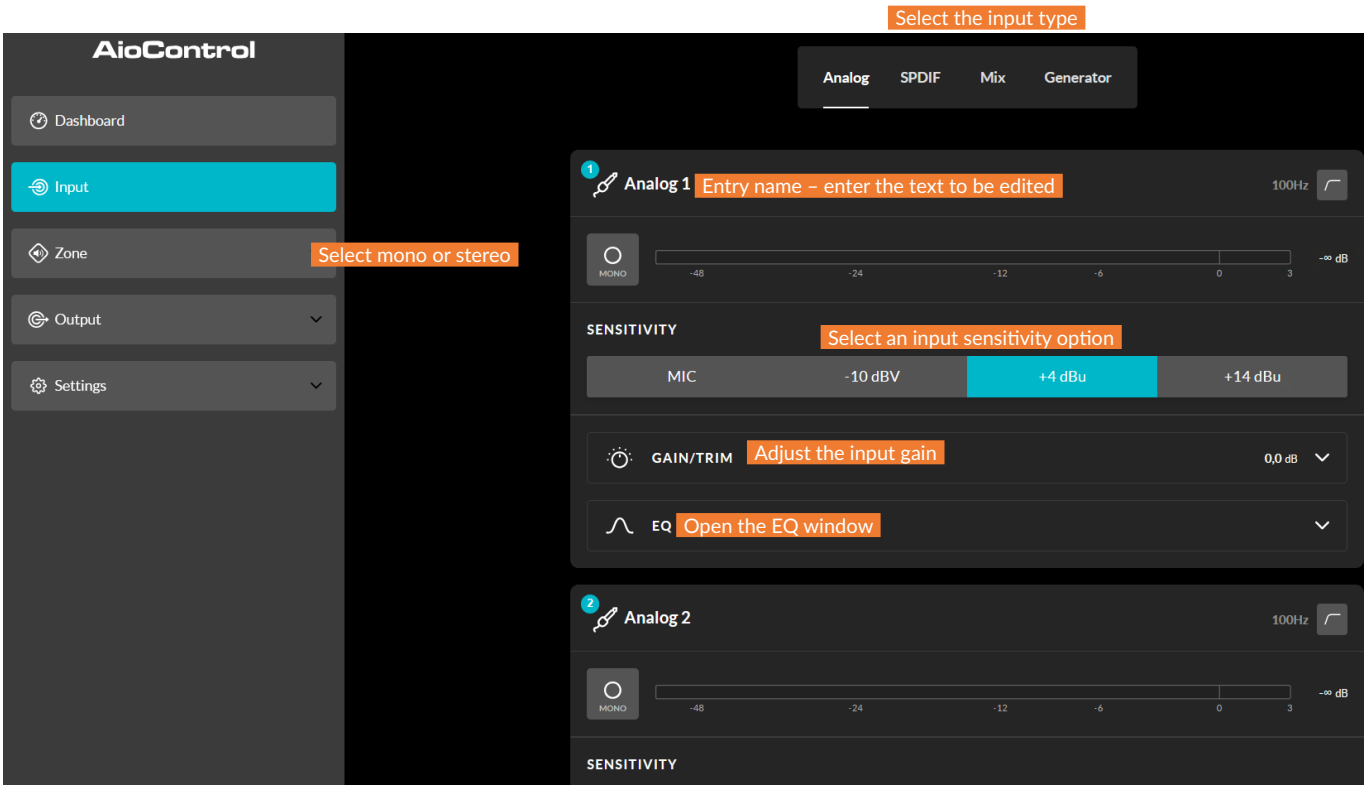


Figure 5B: The 'Input' tab (only two inputs are shown)

Note: When adjusting the input gain, the input level indicator should remain green. If it turns red, reduce the input gain.

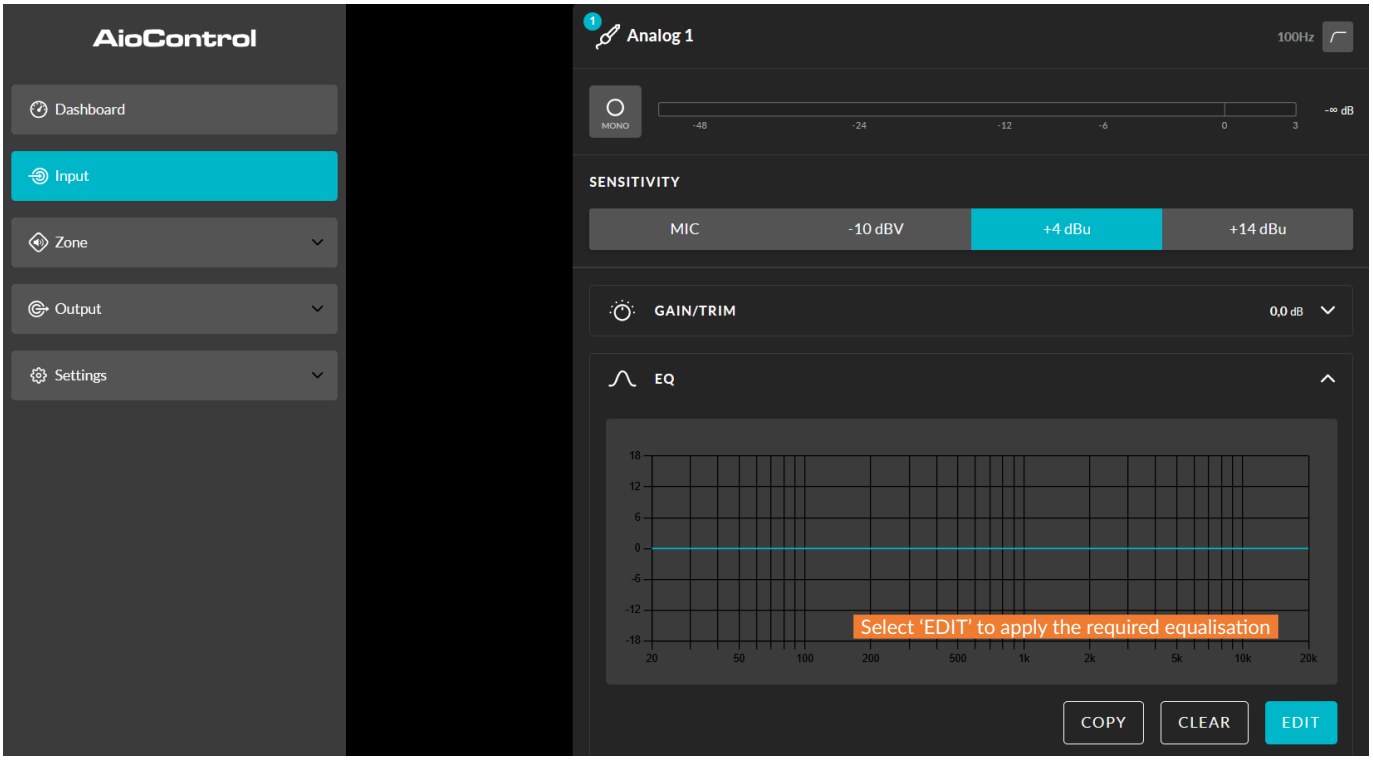
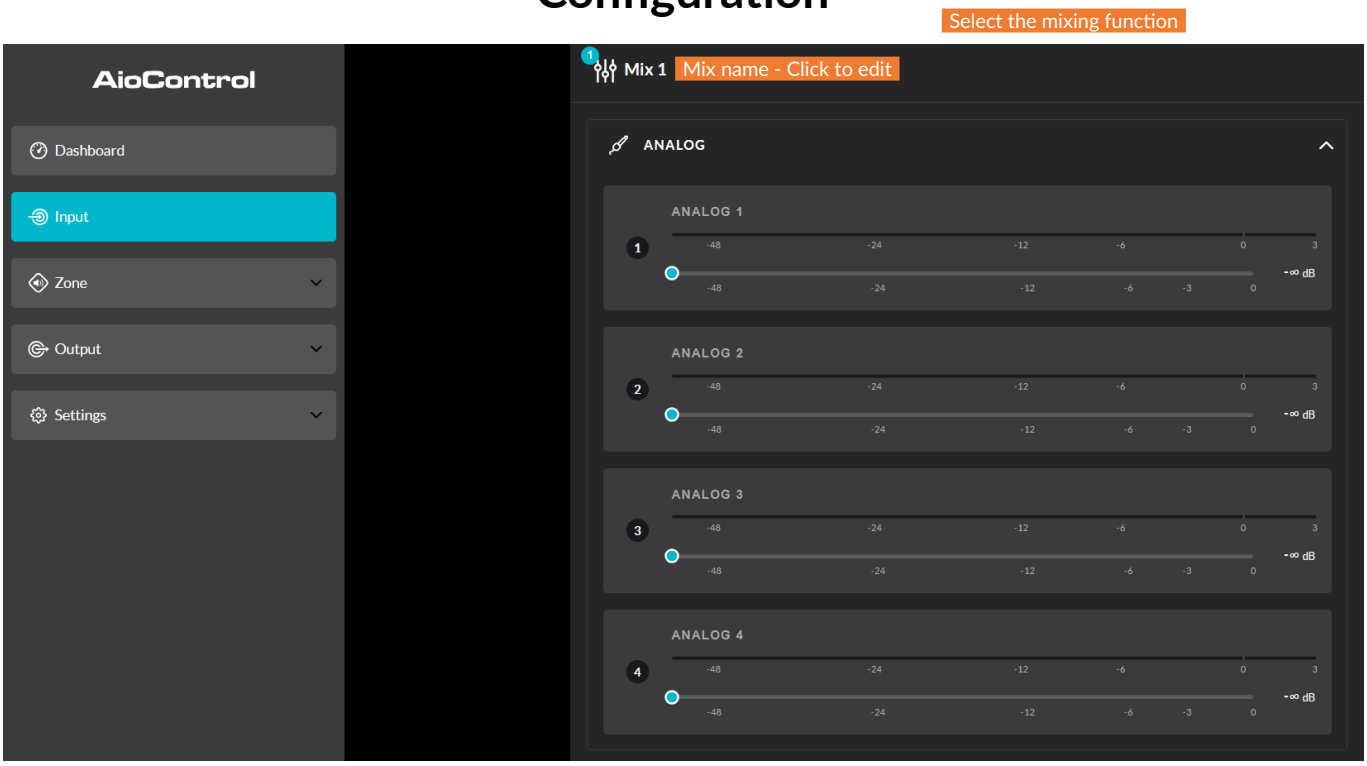


Figure 5C: Input equaliser display

Configuration



5D diagram

Displaying the input mix

5.3.2 'Zone' tab

The ' **Zone**' tab allows you to define and name installation zones, and provides access to other sub-menus. Zones may correspond, for example, to bar or restaurant areas, or to different rooms in a house. For all menus in the "Zone" tab, the installation zone to be configured is selected by highlighting one of the zone identifiers (A to H, depending on the number of amplifier outputs) at the top of the screen. Figures 6E **and 6F** illustrate the **"Zone" and "Source"**menu displays .

- The **Source** menu allows you to assign inputs to zones and configure input priority or input attenuation. The **Input Priority** function allows you to define up to three alternative inputs to the primary input on each zone. This offers the option to prioritise, replace or mute the input(s) routed to the zone when the alternative input(s) exceed a predefined level. The Primary Input is the main input, such as background music played in a shopping centre. 1. **Priority Low**, for example for advertisements, takes priority over the main input. 2. **Priority Mid**, for example for announcements, takes priority over both background music and advertisements. 3. **Priority High**, such as an emergency alarm, takes priority over all other inputs and mutes them.

The **'Input Ducking'** function allows a secondary input, **'Ducking Low'**, to override and attenuate the main input routed to the zone being configured when the level of this secondary input exceeds a predefined threshold.

***Note**: The **'Priority Low'** parameters can be set either to their default values or to their threshold, attack, hold and release values, as required (Manual Mode). The **"Priority Mid"** and **"Priority High"** parameters can be set either to their default values or to their threshold and hold values, as required. All input priorities can also be configured to override the volume level set for the specified zone (Override zone volume).*

*The **Ducking Low** settings can be set either to their default values or to the desired threshold, depth, attack, hold and release values.*

- The **Volume menu allows you** to set the minimum and maximum volume limits for each zone and to apply external volume control via GPIO to individual zones. The GPIO configuration menu is located under the Settings tab **;** instructions on connecting an external volume control via the GPIO interface can be found in section 6.5 of this manual.

Note: If an amplifier is controlled via the API of a third-party control system, the volume limits set in the 'Input' tab will not apply.

- The **'Restrictions' menu** allows you to prevent zone inputs or input mixes from being routed to specific zones.

Note: Routing restrictions cannot be applied to entries in priority zones.

Note: If an amplifier is controlled via the API of a third-party control system, the input routing restrictions defined in the 'Input' tab will not apply.

Configuration

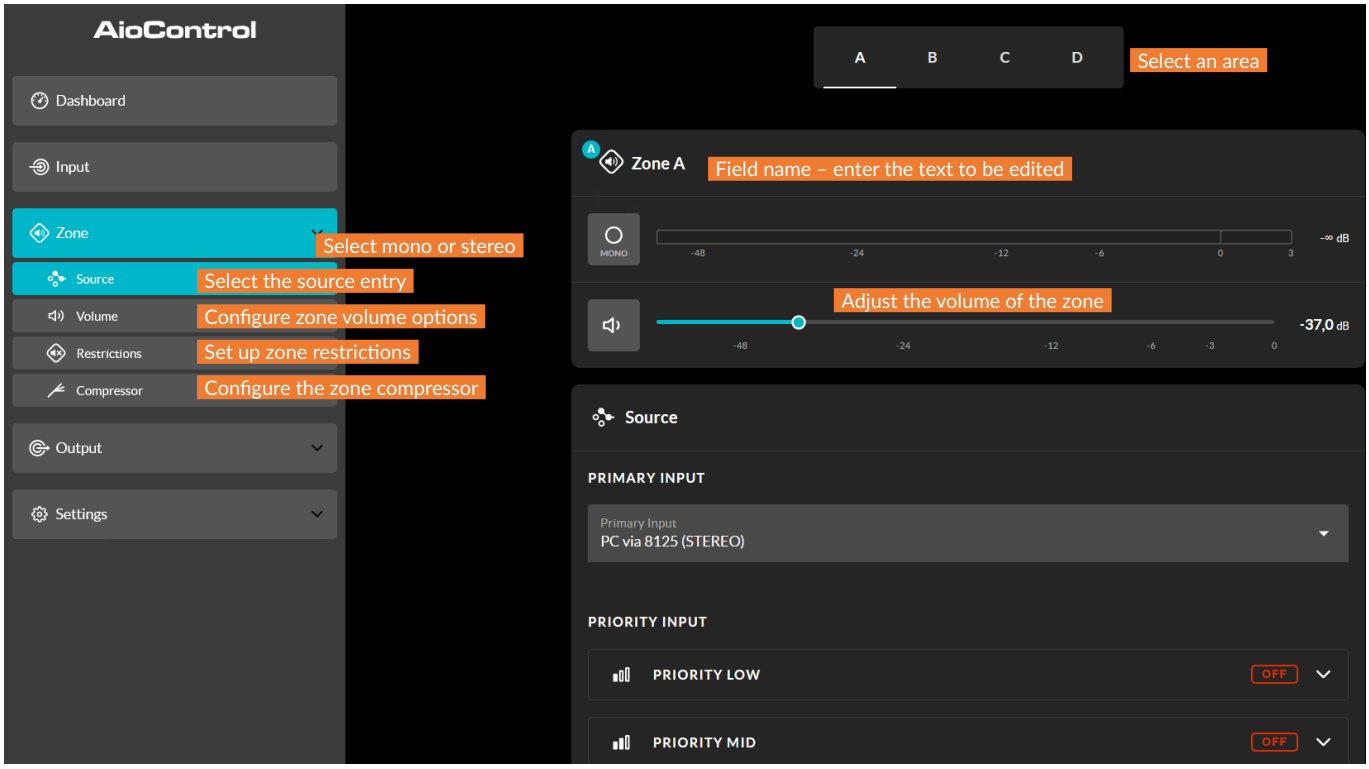


Figure 5E: The 'Zone' tab

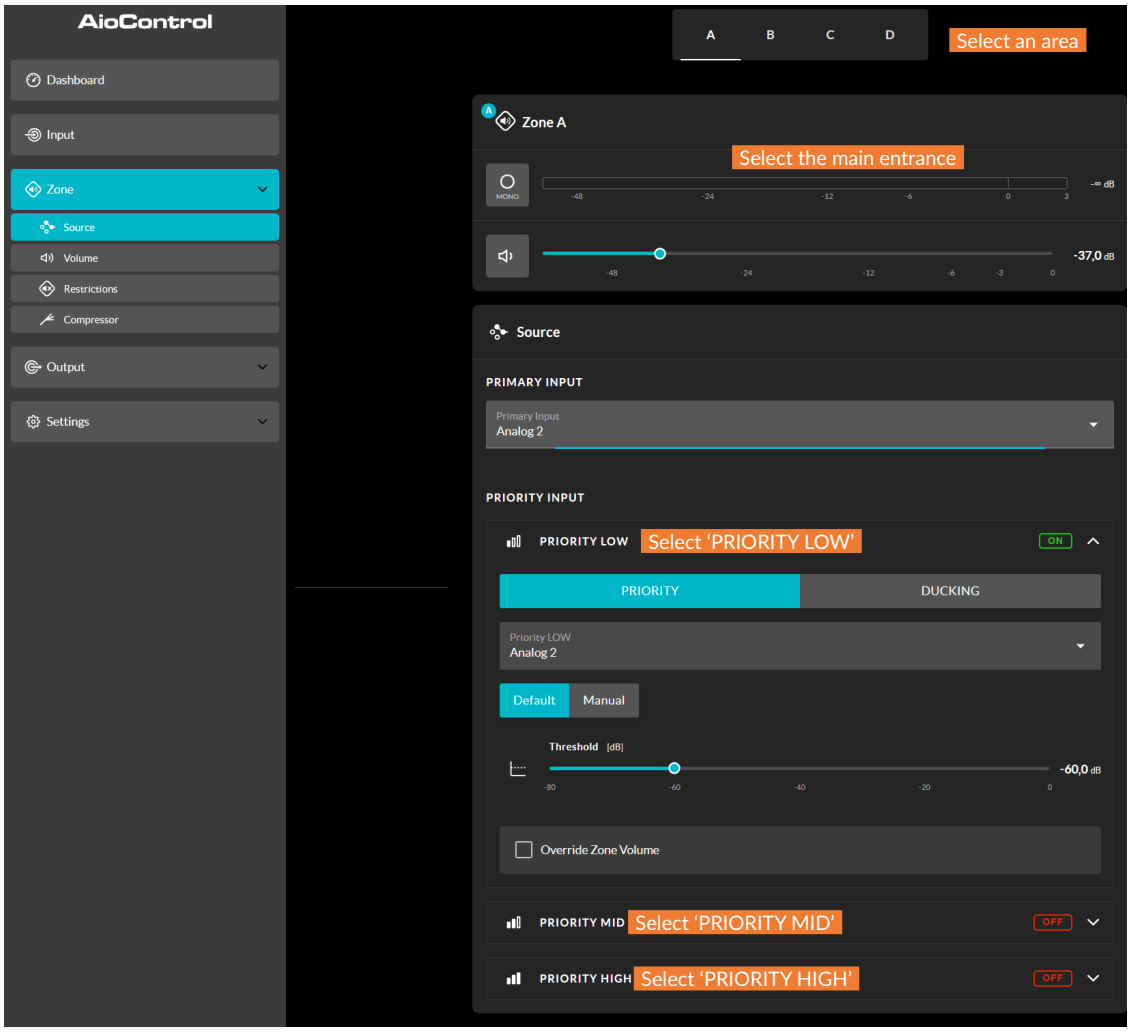


Diagram 5F

Displaying the 'Source **Zone**'menu

- The **'Compressor'** option allows you to apply default or custom signal compression to individual zones.

Note: Compression can be useful for reducing the volume difference between loud and quiet sections of an audio recording. The lower the compression threshold, the smaller the difference between loud and quiet sections will be. It may be necessary to increase the overall volume of the track when compression is used. The default compression settings are suitable for most setups.

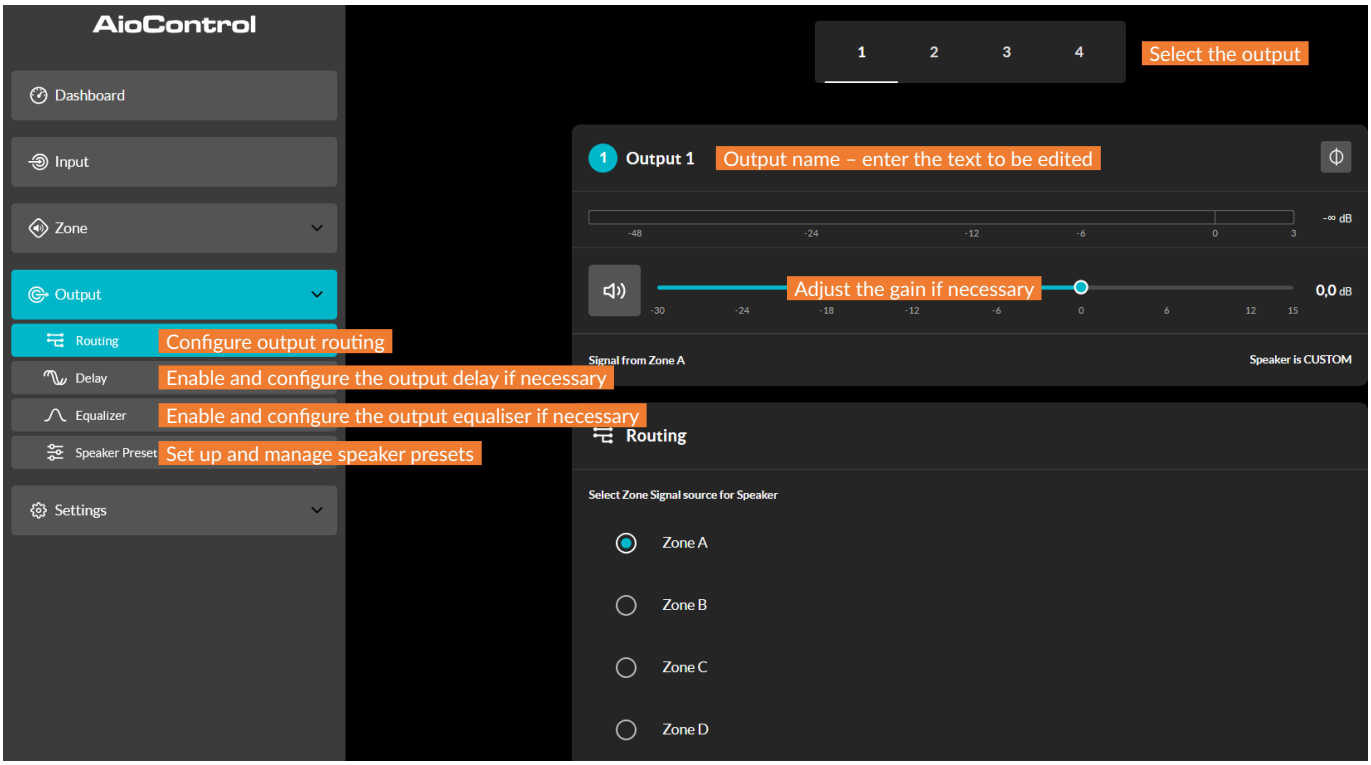
5.3.3 'Output' tab

The **'Output'**tab allows you to name the amplifier's outputs, assign them to zones, and access the 'Delay' , 'Room Equalizer' and 'Speaker Preset' menus . Figure 5H shows the **'Output'**tab display .

For all menus in the **'Output'** tab , the amplifier output to be configured is selected by highlighting one of the output identifiers at the top of the screen.

Note: The number of individual outputs that can be configured depends on the amplifier model, as well as the configuration of the inputs, zones and output modes. The diagrams below show an amplifier with four outputs.

- The **'Routing'** menu allows you to assign zones to the amplifier's outputs.



5G diagram
Displaying the 'Output' tab.

Note: When routing zones defined as stereo, three output options are automatically available: left channel, right channel or combined mono signal. The combined mono signal can be used to drive a mono subwoofer or a 70/100 V mono speaker line.

- The **'Delay'** menu allows you to apply a delay effect to the amplifier's individual outputs.
- The **'Equalizer'** menu allows you to apply parametric equalisation to the amplifier's various outputs. The equalisation settings defined for one output can be copied and applied to the other outputs.

Configuration

- The **'Speaker Preset'** menu allows you to adjust a range of speaker settings, as well as create, export, import or reset preset configurations.

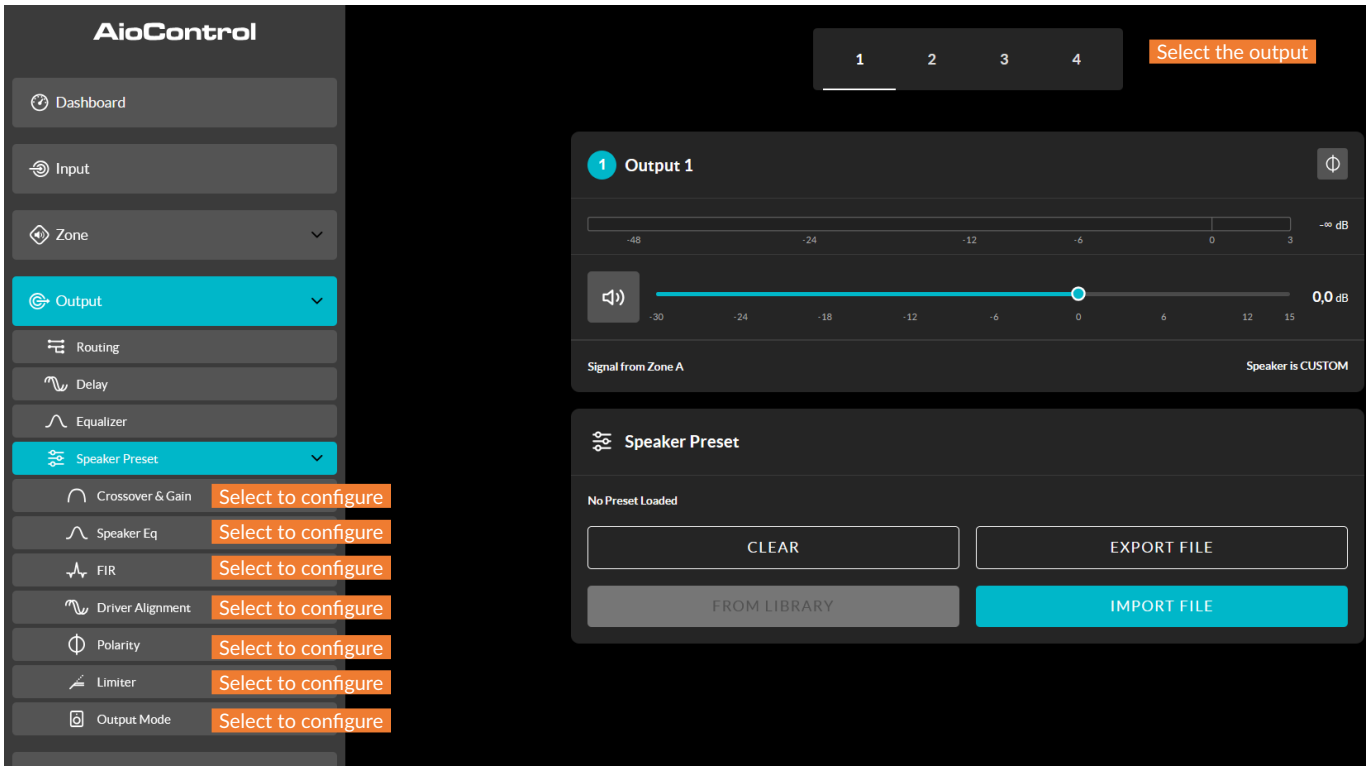


Diagram 5H
Speaker presets

Speaker presets can be easily applied to the selected amplifier output, or imported from a library, exported or deleted. Preset configurations may include all or some of the parameters described in section 5.3.4 and can be locked to prevent accidental changes. Figures **5I** to **5L** illustrate the application of speaker presets.

Speaker preset data provided by third parties for use with specific speakers can be imported and applied to the amplifier's outputs. To import the speaker preset settings, follow the steps described below and illustrated in the diagrams.

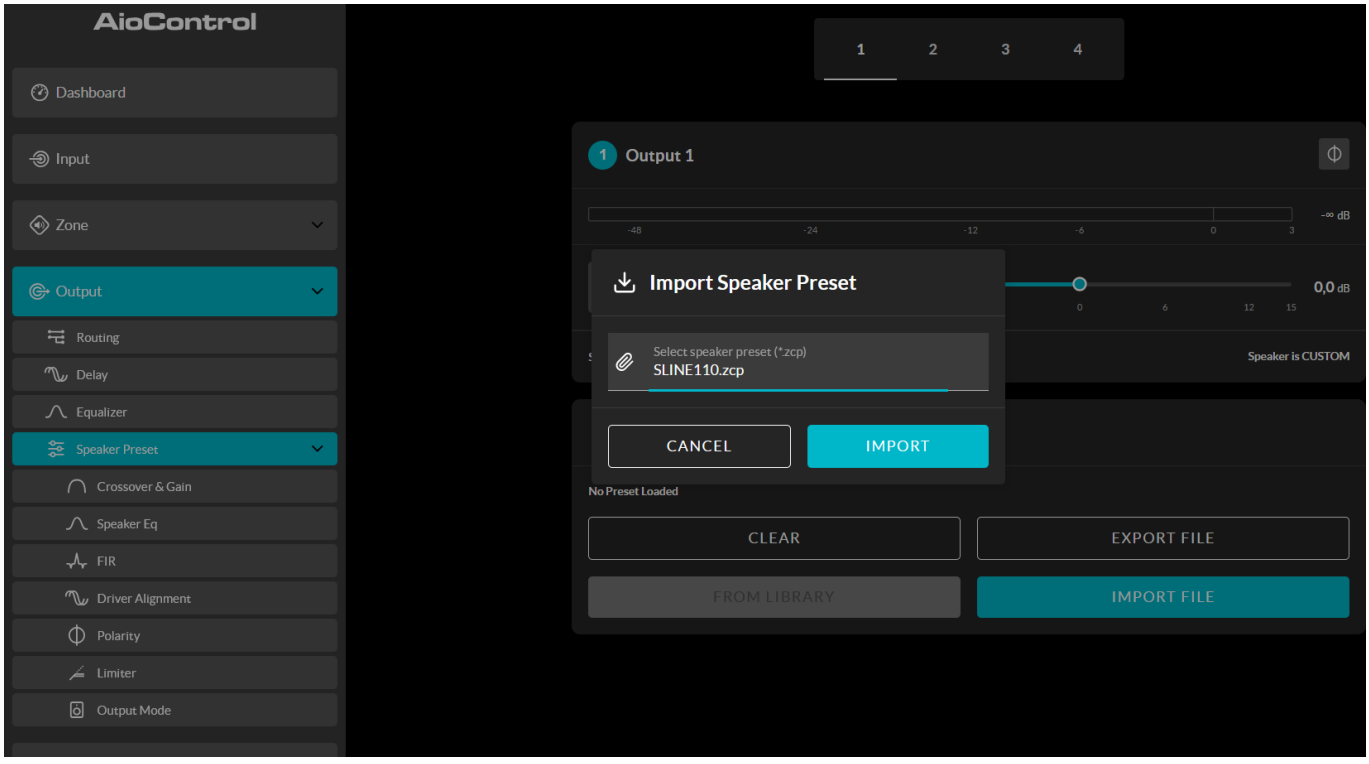


Figure 5I: Selecting the speaker preset import file

Configuration

1. Select **the ‘IMPORT PRESET FROM LIBRARY’** or **‘SELECT PRESET FROM FILE’ option** from the **‘Speaker Preset** ’ menu. If no import option appears, select **“CLEAR”** to delete all existing speaker preset data.

*Note: The **‘SELECT PRESET FROM LIBRARY’** option will not be available if no speaker preset library has been created. The creation and management of speaker preset libraries are described in section 5.3.5.*

2. Select the appropriate ‘.zcp’ speaker preset file to import from a library or folder on your computer. The preset data will be applied to the selected amplifier output as soon as the file has finished importing.

3. If the speaker preset settings need to be changed, you can customise them by selecting the **‘CUSTOMISE PRESET’** option.

Note: if an imported speaker preset file contains locked settings, these cannot be changed.

5.3.4 Settings in the speaker presets menu

- The **‘Crossover & Gain’** presets menu allows you to apply high-pass or low-pass crossover filters, as well as adjust the gain, to each of the amplifier’s outputs.
- The speaker EQ presets menu allows you to apply parametric equalisation to the amplifier’s individual outputs.

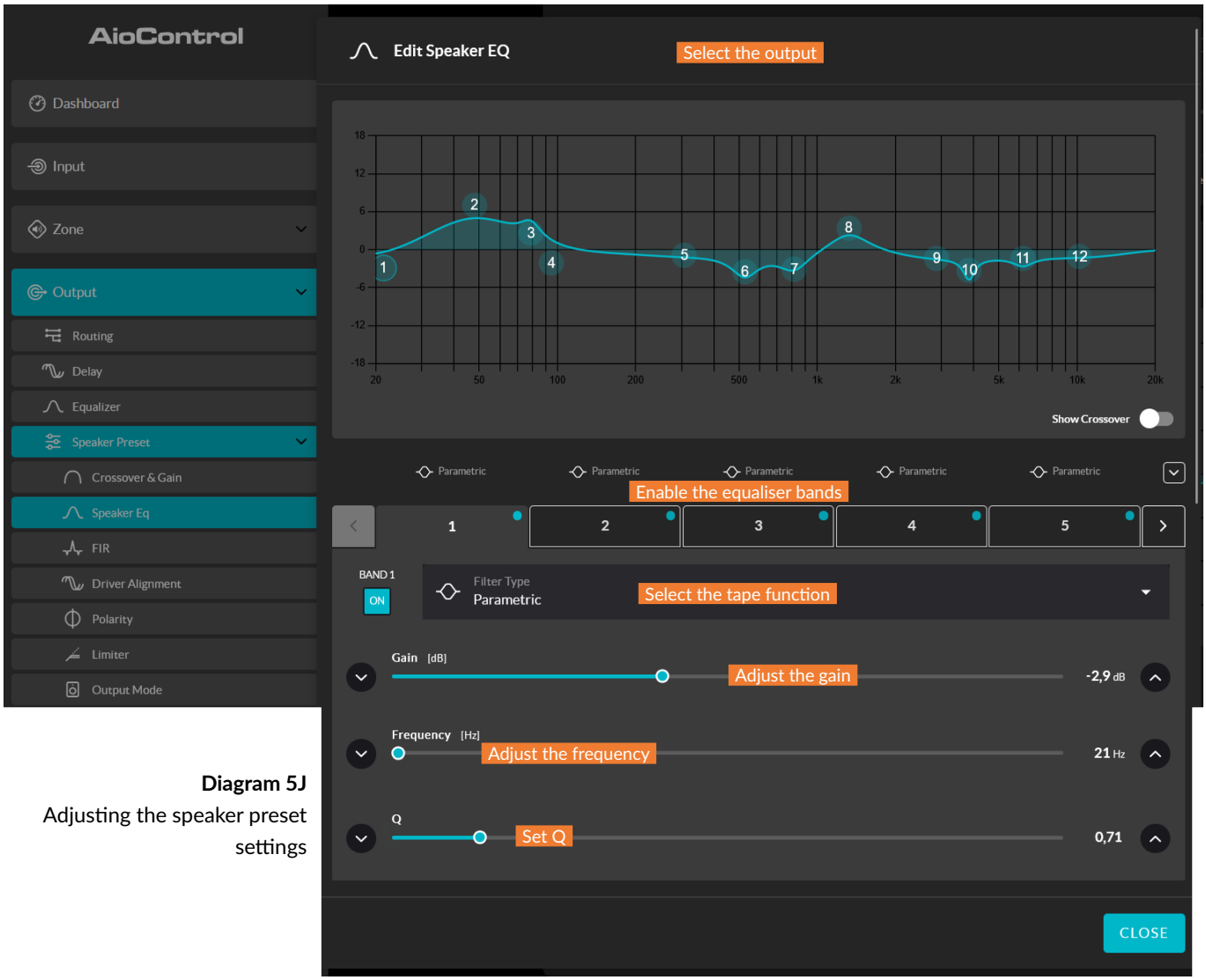


Diagram 5J
Adjusting the speaker preset settings

Configuration

- The **FIR** presets menu allows you to import FIR (Finite Impulse Response) equalisation filter coefficients generated by external speaker measurement software, and then apply them to the amplifier's individual outputs. The FIR filter features 512 samples at 48 kHz.

Note: FIR coefficient files in .csv or .txt format can be imported.

- The **'Driver Alignment** ' presets menu allows you to apply a delay to the amplifier's individual outputs.
- The polarity presets menu allows you to reverse the polarity of the amplifier's individual outputs.
- The limiter presets menu allows you to enable or disable signal limiting on each of the amplifier's outputs. Peak limiting, peak-to-peak limiting and **RMS** limiting can be enabled individually or simultaneously. The peak limiting function offers two response time options: 'Fast' and 'Normal'. The peak limiting function can be set to 'Automatic' or 'Manual'. The RMS limiter has default settings that can be adjusted, but does not offer an automatic option.

Note: In automatic mode, the peak limiter settings adjust automatically based on the high-pass filter settings in Crossover & Gain.

- The output mode presets menu allows you to disable individual amplifier outputs or configure them in Lo-Z or Hi-Z mode. In Hi-Z mode, it is also possible to configure and apply a high-pass filter to the output. The number of available outputs depends on the amplifier model, the input configuration and the zone configuration. For example, a four-output amplifier will have four outputs if Lo-Z mode is selected, but only two outputs if Hi-Z or bridge mode is selected.

Note: Using a high-pass filter with speakers in Hi-Z mode helps to prevent any distortion caused by line transformer saturation at low frequencies. Start with the filter's default setting of 70 Hz. If distortion in the low frequencies is still audible, increase the frequency in small increments until the distortion disappears.

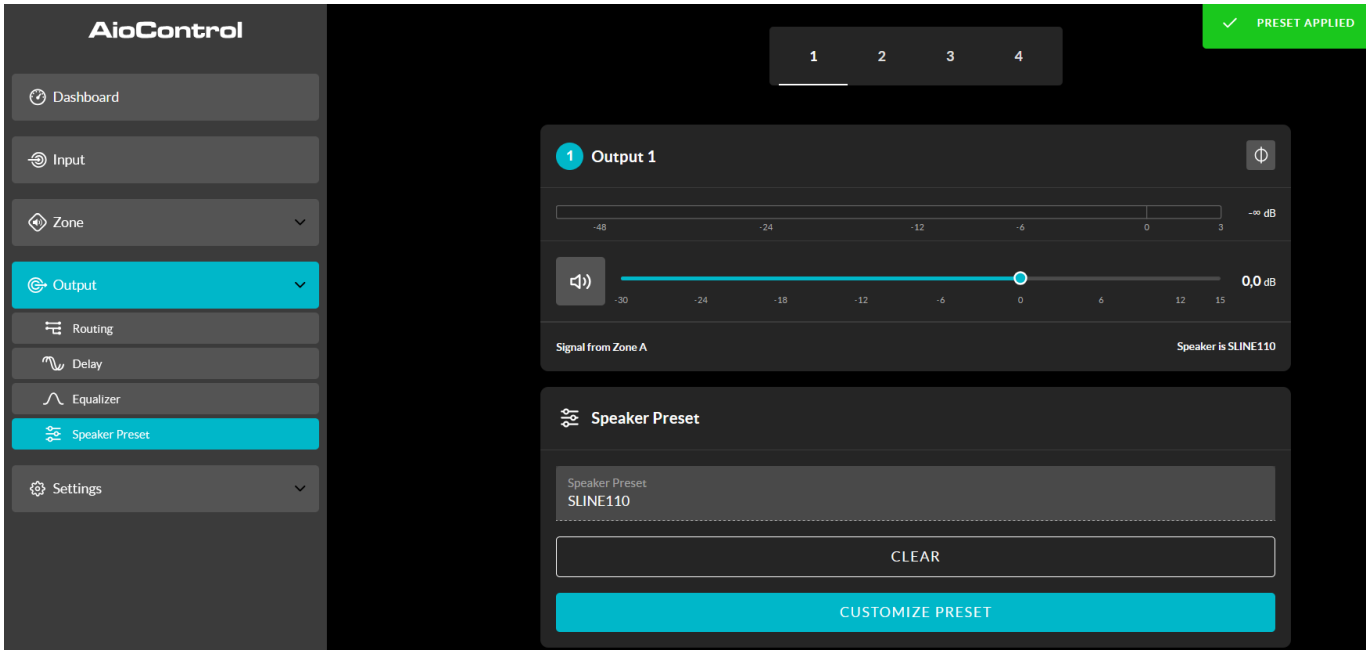


Diagram 5K
Speaker preset applied

Configuration

5.3.5 'Settings' tab

The **'Settings'** tab allows you to configure various amplifier settings and save the installation data. The 'Settings' tab provides access to other sub-menus. Figure 5L shows the **'Settings'** tab .

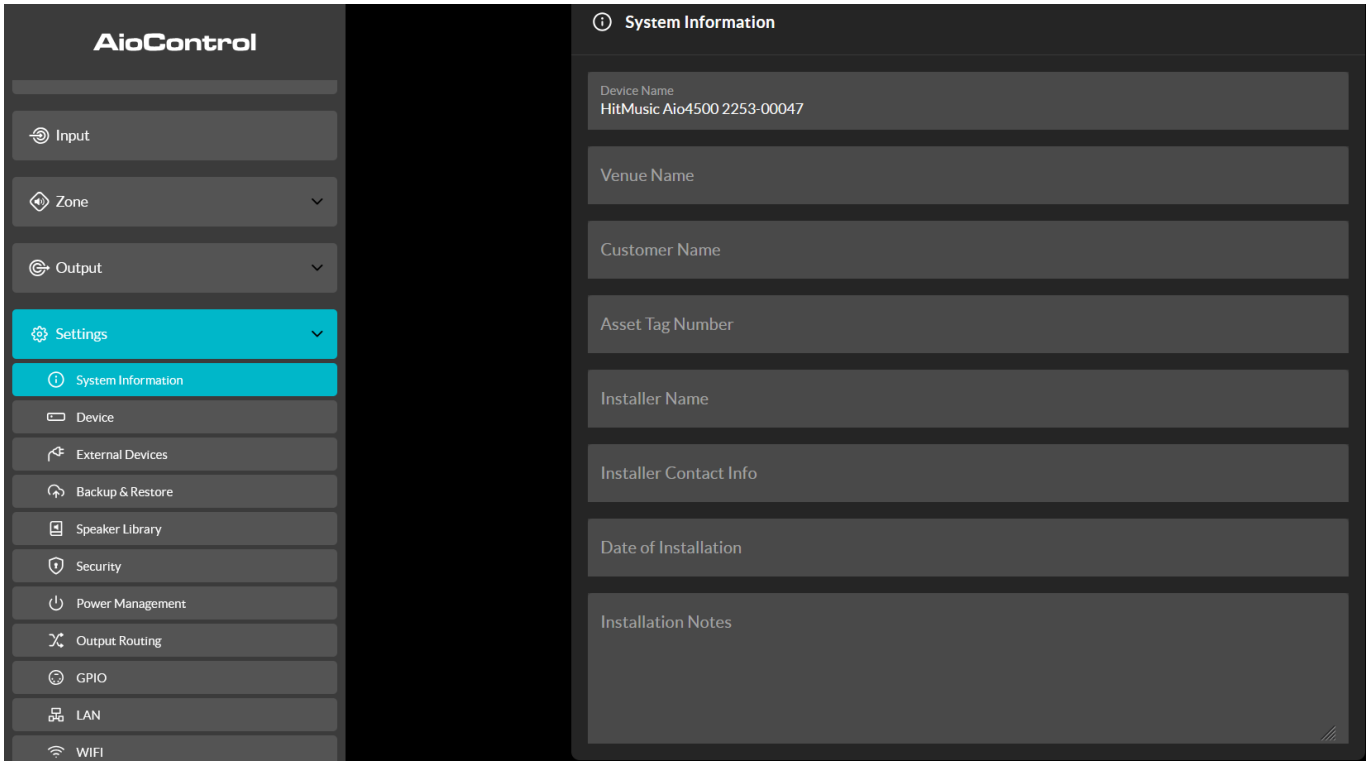


Figure 5L: 'Settings' tab menu

- The **'System Information** ' menu contains text fields for entering installation details.
- The **'Device'** menu contains information specific to the amplifier, such as the model number and firmware version. A firmware update function and an identification button are also available in this menu.
- The **'External Devices'** menu allows you to pair control panels with an amplifier and configure them. Depending on the product, installation and configuration, each device can remotely control one or more amplifier zones. Figure **5M** shows the **'External Devices'** menu display **.**
- The **'Backup & Restore'** menu allows you to download the amplifier's configuration data to an external storage device, as well as to load previously saved configuration files and apply them to the currently connected amplifier.
- The **'Speaker Library'** menu allows you to manage libraries of speaker presets. You can create or import existing libraries of speaker preset files (.zcl), as well as edit or completely delete existing libraries. Figure **5N** illustrates the creation and management of speaker preset libraries.
- The **'Security'** menu allows you to set a password to prevent unauthorised access to the amplifier's AioControl app. Password protection is particularly important when an amplifier is connected to a wired network, as the Wi-Fi password is then no longer required to access the AioControl app.

Note: We recommend using a different password for the control app and the one required to access the amplifier via Wi-Fi.

- The **'Power Management'** menu allows you to enable various automatic start-up options. It also offers programmable sleep and mute functions.
- The **'Output Routing'** menu allows you to route specific inputs or zones to the amplifier's S/PDIF outputs. The output level can also be adjusted.

Configuration

Any zone or input can be routed to any of the digital outputs, including inputs that are not actively assigned to a zone. The status of the input (whether it is a main or priority input) is irrelevant. The specified input is always routed to the specified output so that it is available to downstream devices.

Note: When a zone is selected for S/PDIF digital output, the output signal is variable. However, when an input signal is routed to an S/PDIF output, the signal is fixed.

Note: The digital output function is particularly useful when amplifiers need to be connected in series and a specific input – such as a central PA microphone – needs to be routed to several amplifiers.

- The **'GPIO'** menu allows you to configure the pins on the versatile GPIO interface. You will find a detailed description of each setting in the 'GPIO' section.
- The **'LAN'** menu allows you to configure and reset the wired network options and settings.
- The **'Wi-Fi'** menu allows you to configure and reset wireless network options and settings.

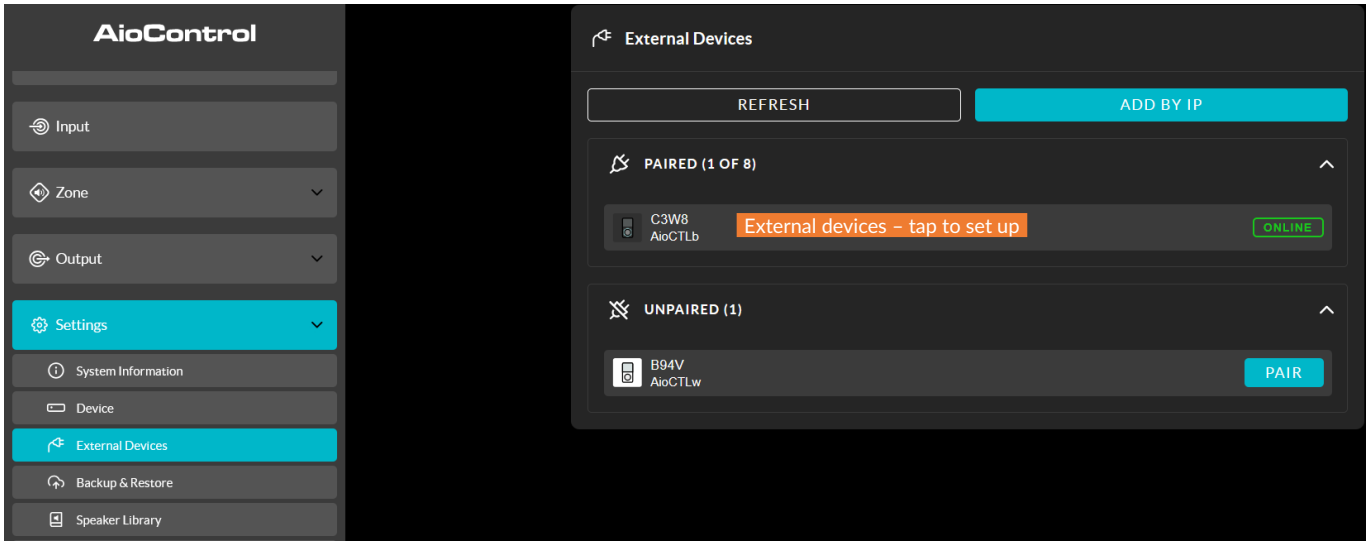


Figure 5M: The 'External Devices' screen

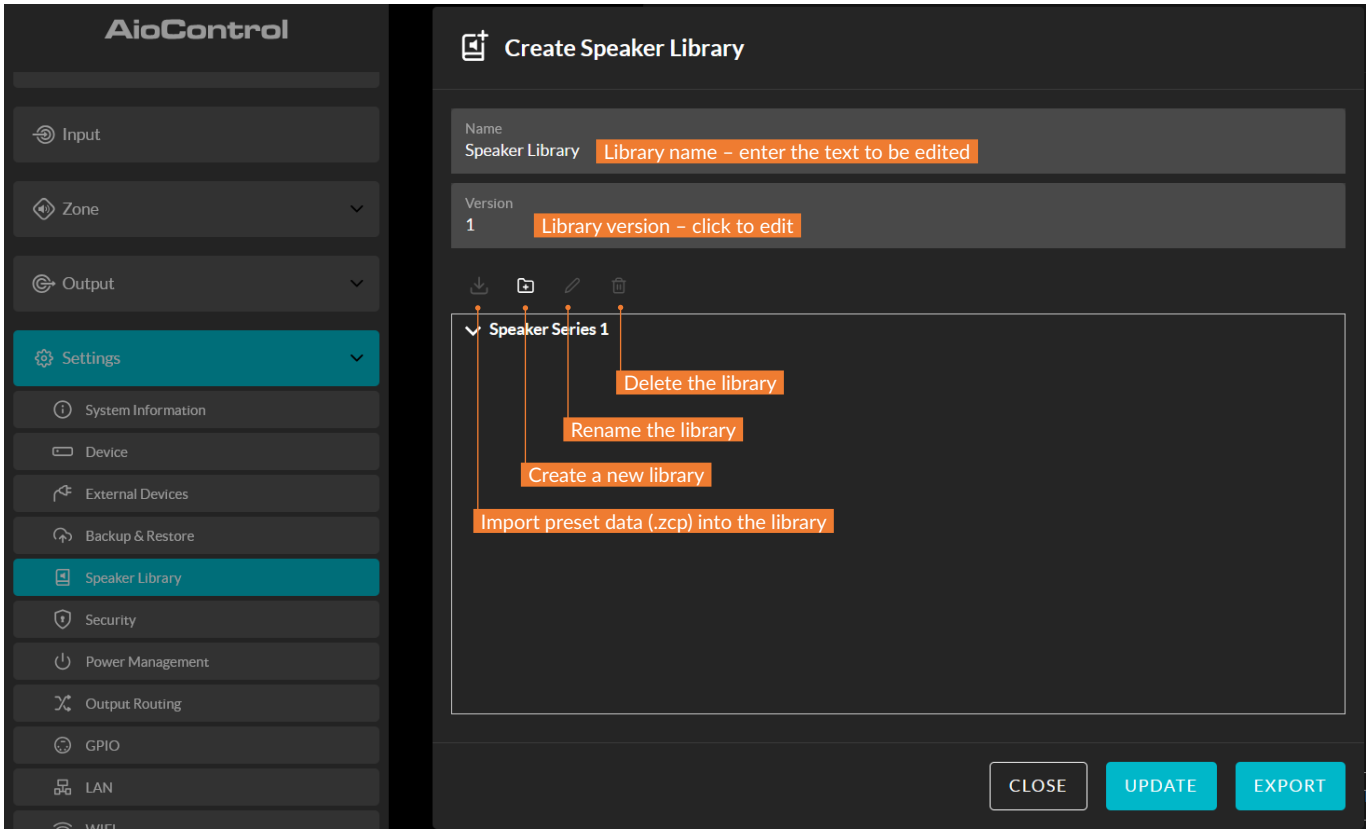


Figure 5N: Creating and managing the speaker library

5.4 Signal configuration and routing

Thanks to its network configuration features, the **Aio4500** amplifier offers great versatility in terms of sources, signal routing, installation zones and output modes. Inputs can be freely assigned to installation zones, and these zones can in turn be freely assigned to the amplifier's available outputs, in either Lo-Z or Hi-Z mode.

This versatility means, for example, that a single amplifier can drive both low-impedance and high-impedance speakers simultaneously, or route different inputs to different output zones.

The following sections describe and illustrate the recommended procedure for configuring the routing of inputs, zones and outputs. A general diagram of the signal flow is also shown in Figure **5O.**

5.4.1 Configuring inputs

Open the configuration dashboard and select **the 'Input' tab**. The 'Input' tab is shown in Figure **5B.**

- To change the default names of the entries, simply select the 'Entry name' field and enter the new name.
- Set a mono or stereo input by selecting the appropriate option. Setting a stereo input will reduce the total number of separate inputs available.
- Select an input sensitivity option from the drop-down menu: the options +14 dB, +4 dB, -10 dB and 'microphone' are available. As a general rule, the +14 dB or +4 dB options are suitable for professional audio sources with balanced outputs, whilst the -10 dB option is better suited to consumer audio sources with unbalanced outputs. The "microphone" option offers the significantly higher sensitivity required for microphones.

Note: Only dynamic microphones can be connected. Phantom power for condenser microphones is not provided.

- If necessary, adjust the input gain using the slider or the up/down icons. The gain control is designed to allow for precise adjustment of the output level after initial use. If necessary, adjust the input equalisation using the 5-band equaliser.

5.4.2 Zone configuration and routing

Open the configuration dashboard and select the **'Zone'** tab . The 'Zone' tab is shown in Figure **5F.**

- Select the zone to be configured. The number of available zones and their channel format (stereo or mono) depend on the amplifier model, the input configuration and the output mode (Lo-Z or Hi-Z).
- A four-output amplifier can be configured for the following zones:
  - 2 low-impedance stereo zones
  - 4 low-impedance mono zones
  - 2 high-impedance mono zones
  - 1 high-impedance mono zone + 1 low-impedance stereo zone
  - 1 high-impedance mono zone + 2 low-impedance mono zones

Note: When configured in Hi-Z mode, the **Aio4500** *amplifier operates in 'bridged' mode, in which the outputs of two channels are combined. This means that the number of output channels available in Hi-Z mode is half that available in Lo-Z mode.*

BTL mode is only permitted for speakers with an impedance of 8 ohms or more.

Note: Mono signals may be mono at the source, obtained either by combining the left and right channels of a stereo signal (summed mono) or by processing the left and right channels of a stereo signal independently (split mono).

- Name the zones by entering a name in the 'Zone name' field.
- Adjust the volume for the area using the slider if necessary.
- Define a mono or stereo zone by selecting the appropriate option. Defining a stereo zone will reduce the total number of additional zones available.
- Select an input for the zone from the drop-down menu. If you select a stereo input for a mono zone, the stereo channels will automatically be combined into mono.

Configuration

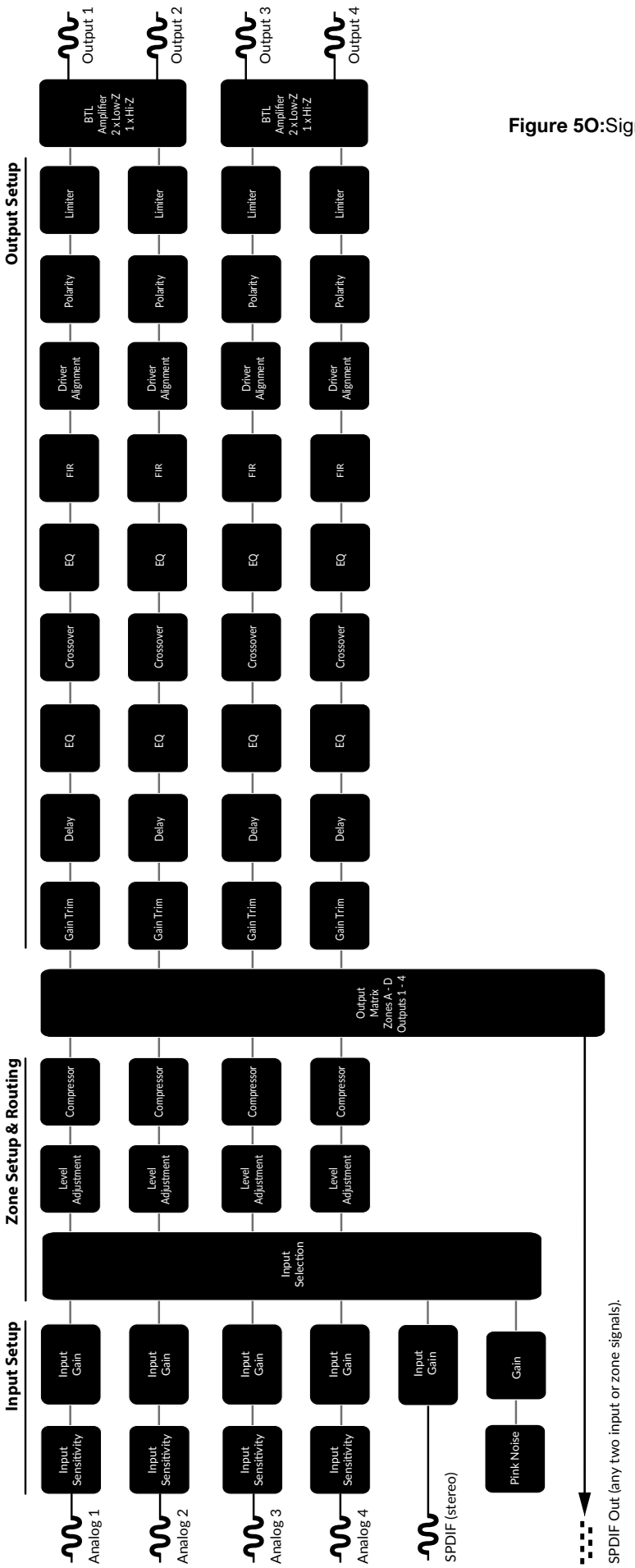


Figure 5O: Signal flow diagram

Configuration

5.5 Configuring and connecting the GPIO pins

The Aio4500 amplifier is equipped with a GPIO connector that allows remote control of volume, standby, mute and trigger functions. The functions of the GPIO connector pins are described in the **'GPIO'** menu shown in Figure **5P**. The connection of the remote volume and standby/mute controls via GPIO is shown in Figures **5Q** and **5R** respectively.

Note: Under no circumstances should the GPIO connector be used for purposes other than those for which it was designed. Incorrect use of the GPIO may damage the amplifier.

Note: You must use a shielded cable to connect the sleep switches and potentiometers via the GPIO pins.

Note: GPIO pin 8 has a low output impedance and can supply a maximum current of 10 mA.

Note: GPIO pins 1 and 3 both provide a ground connection: pin 1 is connected directly to the amplifier chassis. Pin 3 is connected to the chassis via a 220-ohm resistor. The 'floating ground' connection on pin 3 may be useful for managing ground loops that could cause audible humming.

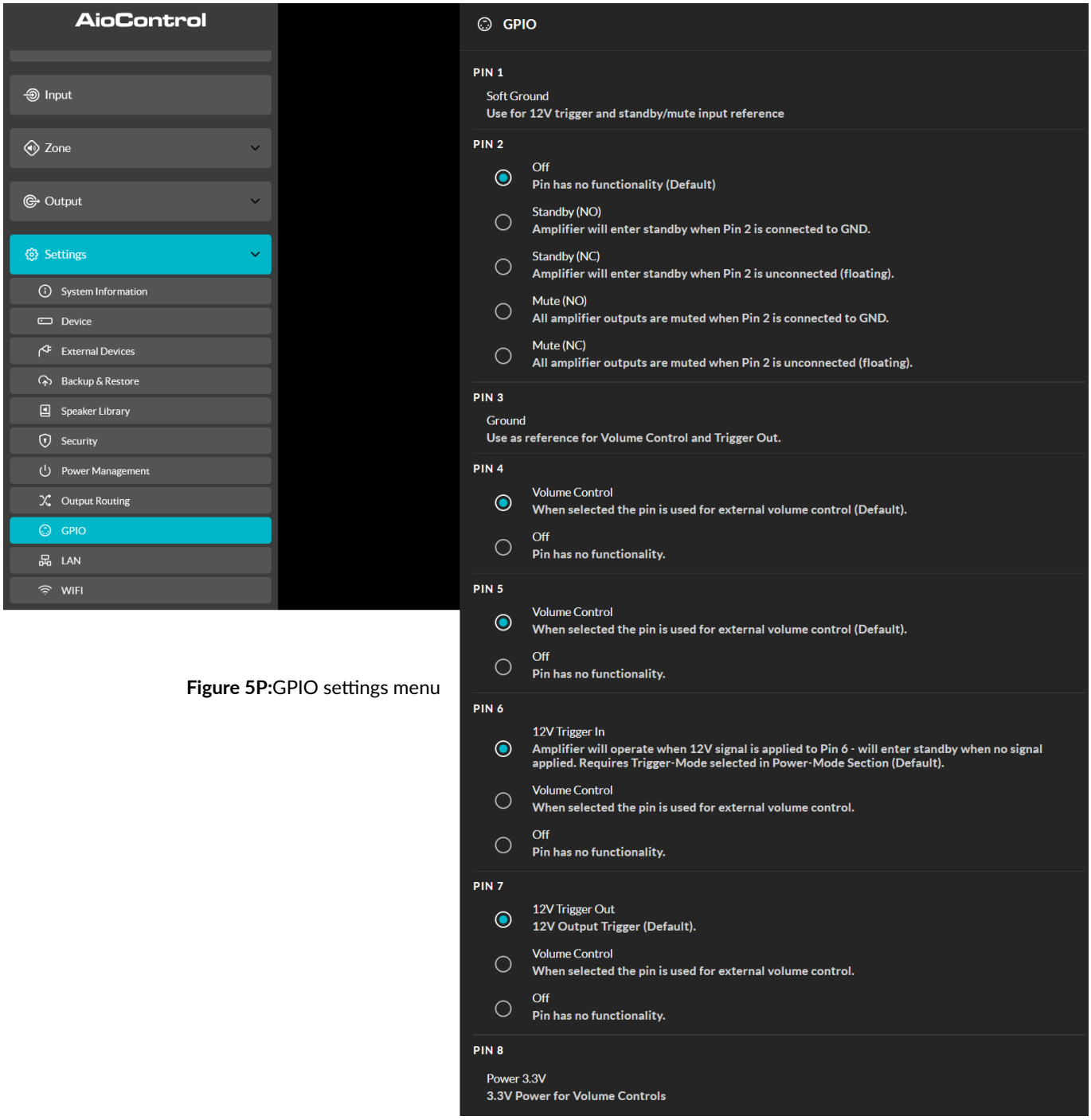


Figure 5P:GPIO settings menu

Configuration

Diagram 5Q

: Connection of potentiometers for remote volume control via GPIO.

Note: Figure 6D illustrates a use of the GPIO connector.

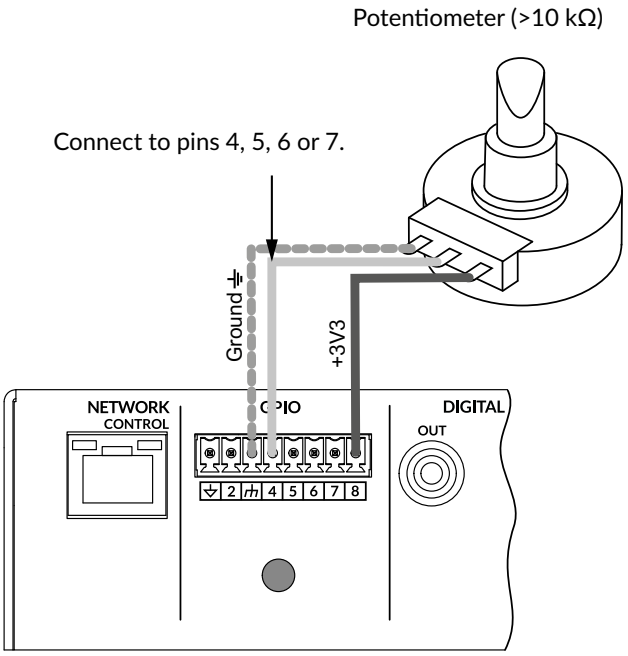
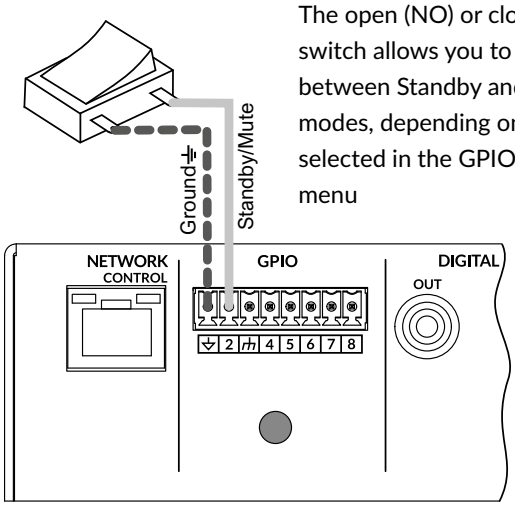


Figure 5R

: Connections for remote control of standby/silent mode via GPIO.

Note: Figure 6D illustrates one way of using the GPIO connector.



The open (NO) or closed (NC) switch allows you to toggle between Standby and Mute modes, depending on the options selected in the GPIO settings menu

Connections

6. Connections

The connections on the rear panel of the Aio4500 amplifier are shown in Figures 6A and 6B.

6.1 Mains connection

The Aio4500 amplifier is fitted with a universal power supply with power factor correction and can operate with a mains input voltage of between 100 V AC and 240 V AC at 50/60 Hz. Use the power cable supplied with the amplifier.

The Aio4500 amplifier does not have a power switch and switches on as soon as it is plugged into the mains. **Ensure that all signal, GPIO and output connections are properly established before plugging the amplifier into the mains.**

6.2 Connecting the inputs

The **Aio4500** amplifiermodel **offers** four balanced or unbalanced analogue audio inputs and one S/PDIF stereo digital audio input. Any input channel can be routed to any output channel. Input routing options can be configured via the amplifier's network interface. See section **6** of this manual.

analogue **inputs**The analogue inputs are line-level inputs and have a default input sensitivity of +4 dBu (maximum output voltage amplitude/sensitivity) in all output modes. Input signal levels of up to +24 dBu can be processed without clipping. Input sensitivity options can be configured via the amplifier's web interface. See section **5** of this manual.

The balanced input connections to the amplifiers are made using 'Euro Block' male connectors. Figure **6B** shows how to connect the cables to the female input connectors provided **.**

The unbalanced input connections on the amplifiers are via RCA sockets connected in parallel with the balanced inputs.

Digital outputs

The Aio4500's S/PDIF stereo digital audio output is connected via a single RCA socket. The S/PDIF output signal can be routed from any input or zone and is designed for daisy-chaining **Aio4500** amplifiers.

Note: For more information on configuring digital outputs, see the sections on output routing in section 5.3.3.

Note: It is recommended that you always use 75 Ω RCA cables specifically designed for digital audio for S/PDIF connections. Standard RCA cables can be used, but their performance may not be optimal.

Note: The S/PDIF output level is set to -10 dB by default to reduce the risk of clipping in the downstream input.

6.3 Output connections

The amplifier output connections are made using 'Euro Block' male connectors. Please ensure that the speaker polarity is correct throughout the installation:

When connecting low-impedance (Lo-Z) speakers, the positive (+) terminals on the amplifier must always be connected to the positive terminals on the speakers, and the negative (–) terminals on the amplifier must always be connected to the negative terminals on the speakers.

When connecting Hi-Z speakers, both wires of the speaker cable must be connected between the positive (+) terminal of output 1 and the negative (-) terminal of output 2; the same applies to any additional Hi-Z outputs.

The output mode options (Lo-Z or Hi-Z) can be configured via the amplifier's network interface. See section **5** of this manual.

Figure 6C shows how to connect the cables to the female output connector provided.

6.4 Speaker cable cross-section

The diameter of the speaker connection cables for**the Aio4500** should be selected according to the type of installation. The tables opposite show the appropriate cable diameter required to achieve a signal loss of less than 0.5 dB, depending on the different types of installation and cable lengths.

6.5 GPIO connections

If you need to use the **Aio4500's** GPIO features, you will need to connect the cables to the GPIO connector provided. The cable connections to the GPIO connector are shown in **the 6D diagrams**.

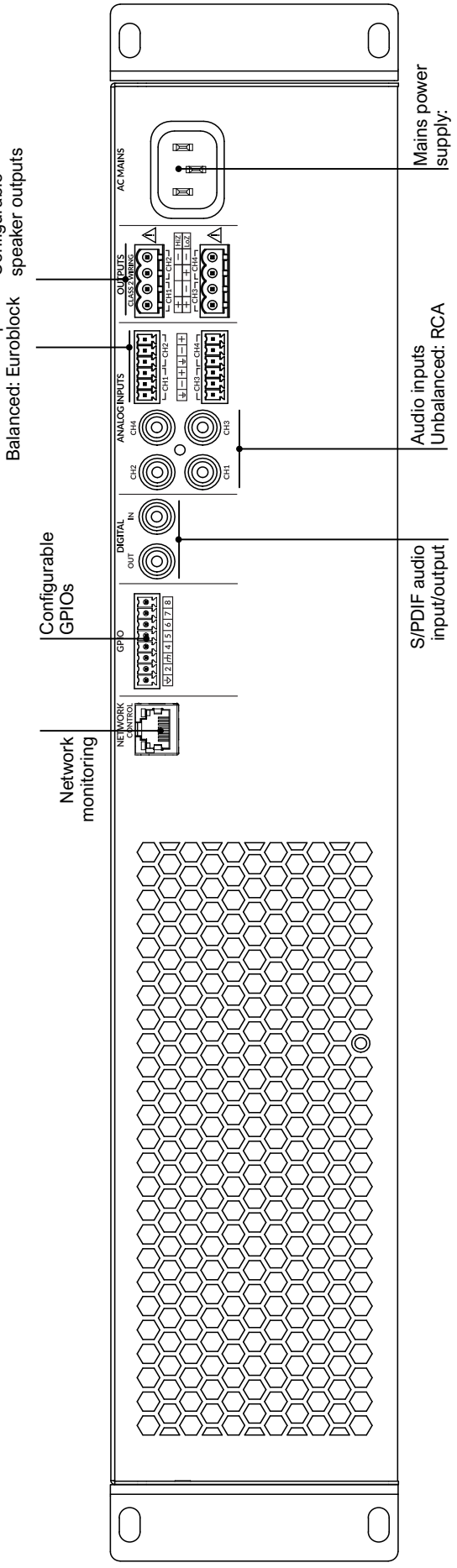
6.6 Network connections

AioControl

The Aio4500 amplifier is a device connected to a TCP/IP network that is configured via a web interface. Both wired (Ethernet) and wireless (Wi-Fi) connection options are available. The procedure for connecting the **Aio4500** amplifier to a TCP/IP network is described in section 5 of this manual. If you opt for a wired connection, plug an Ethernet cable into the rear panel of the amplifier

Connections

Figure 6A: Rear panel connections



Connections

Cable cross-section table: Lo-Z installations, 0.5 dB attenuation. 2 Ω, 4 Ω and 8 Ω loads

Cross-section of the cable (mm^2)	Cable gauge (AWG)	Maximum cable length (in metres, 2 Ω load)	Maximum cable length (in metres, 4 Ω load)	Maximum cable length (in metres, 8 Ω load)
0.75	≈18	N/A	5	10
1.5	≈16	5	10	20
2.5	≈14	8	17	35
4.0	≈12	14	28	55

Cable cross-section chart

70 V Hi-Z installations, 1.0 dB attenuation

20 speakers evenly distributed

Cross-section of the cable (mm^2)	Cable gauge (AWG)	Maximum cable length (in metres), (1,000 W per channel)	Maximum cable length (in metres), (1,200 W per channel)
0.75	≈18	25	20
1.5	≈16	50	40
2.0	≈14	80	60
3.5	≈12	125	100

Cable cross-section chart

100 V Hi-Z installations, 1.0 dB attenuation

20 speakers evenly distributed

Cross-section of the cable (mm^2)	Cable gauge (AWG)	Maximum cable length (in metres), (1,000 W per channel)	Maximum cable length (in metres), (1,500 W per channel)
0.75	≈18	50	30
1.5	≈16	100	60
2.0	≈14	160	100
3.5	≈12	250	160

Connections

Figure 6B
Connections for balanced analog input cables

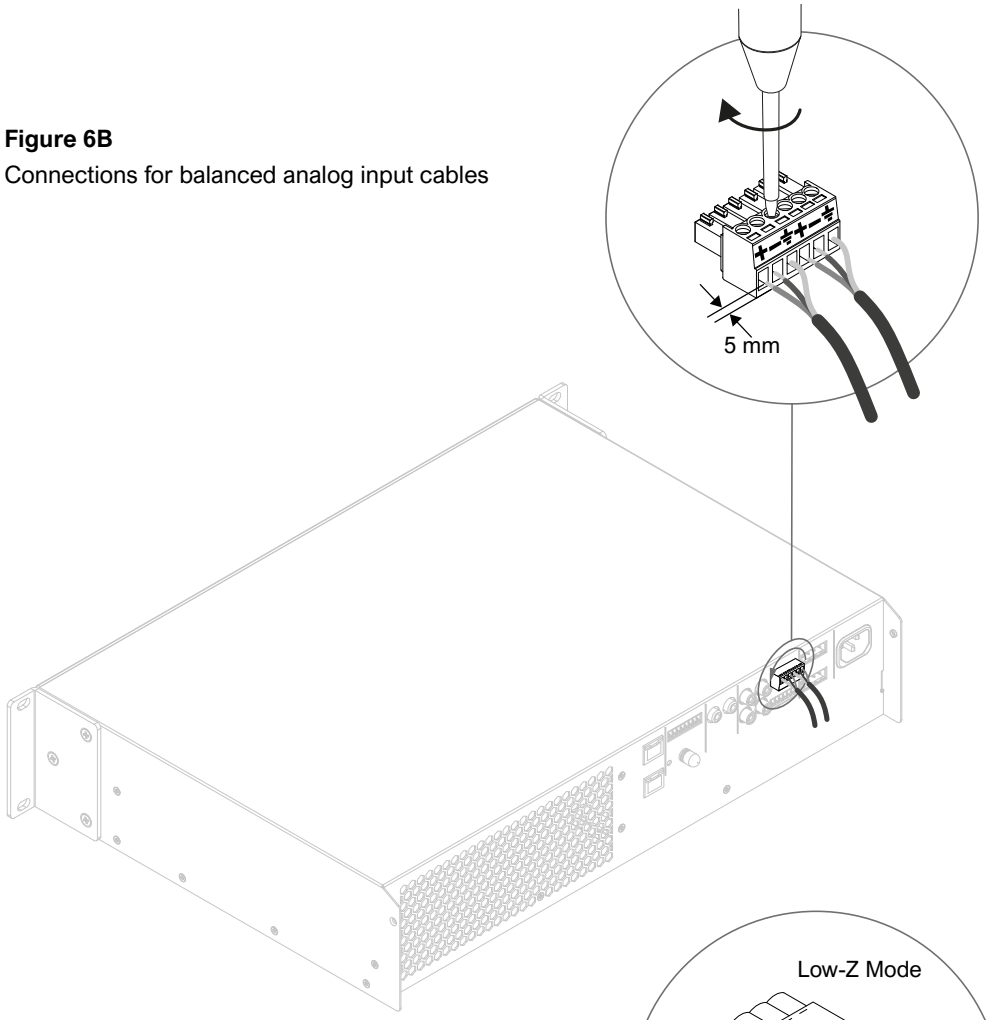
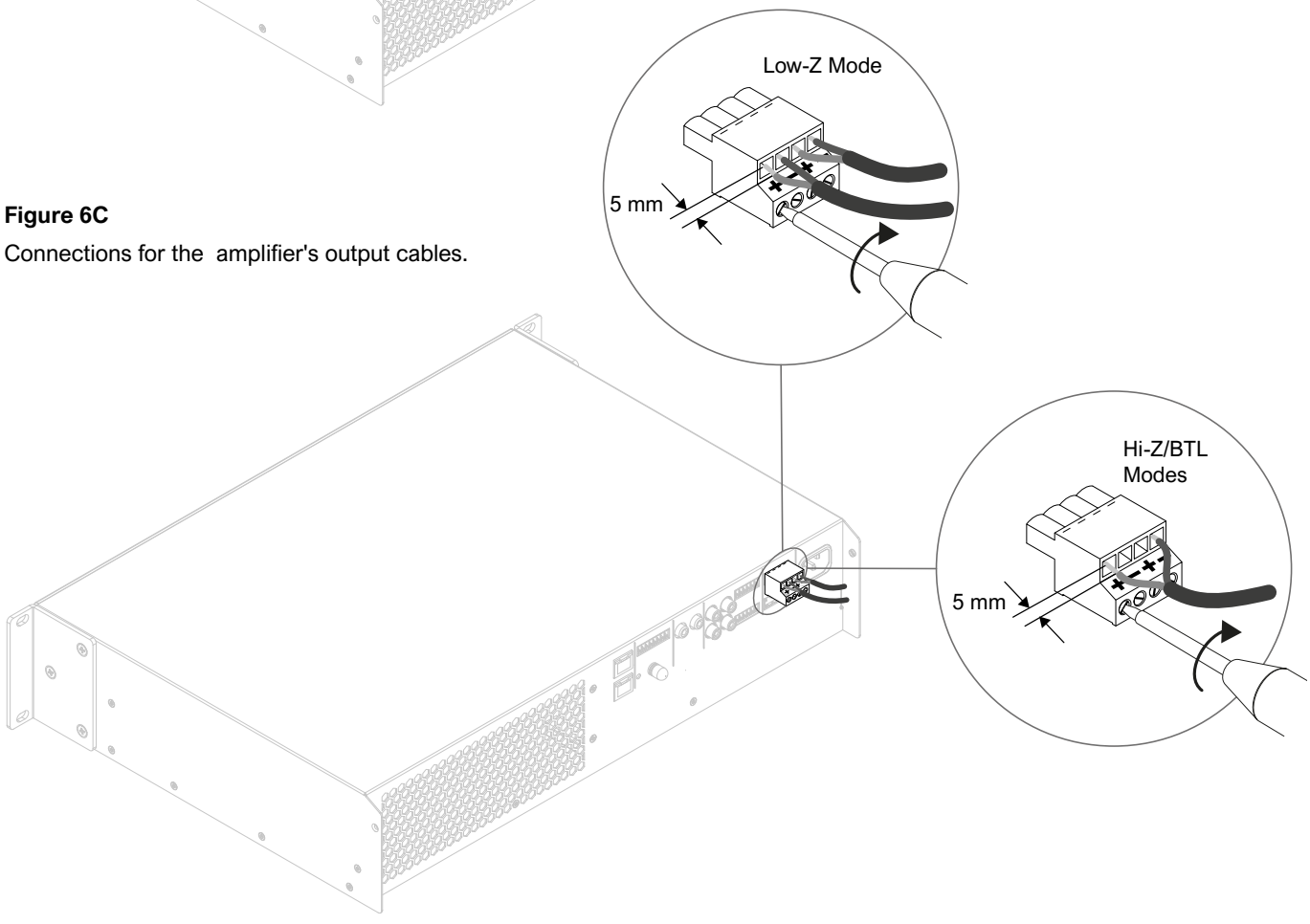
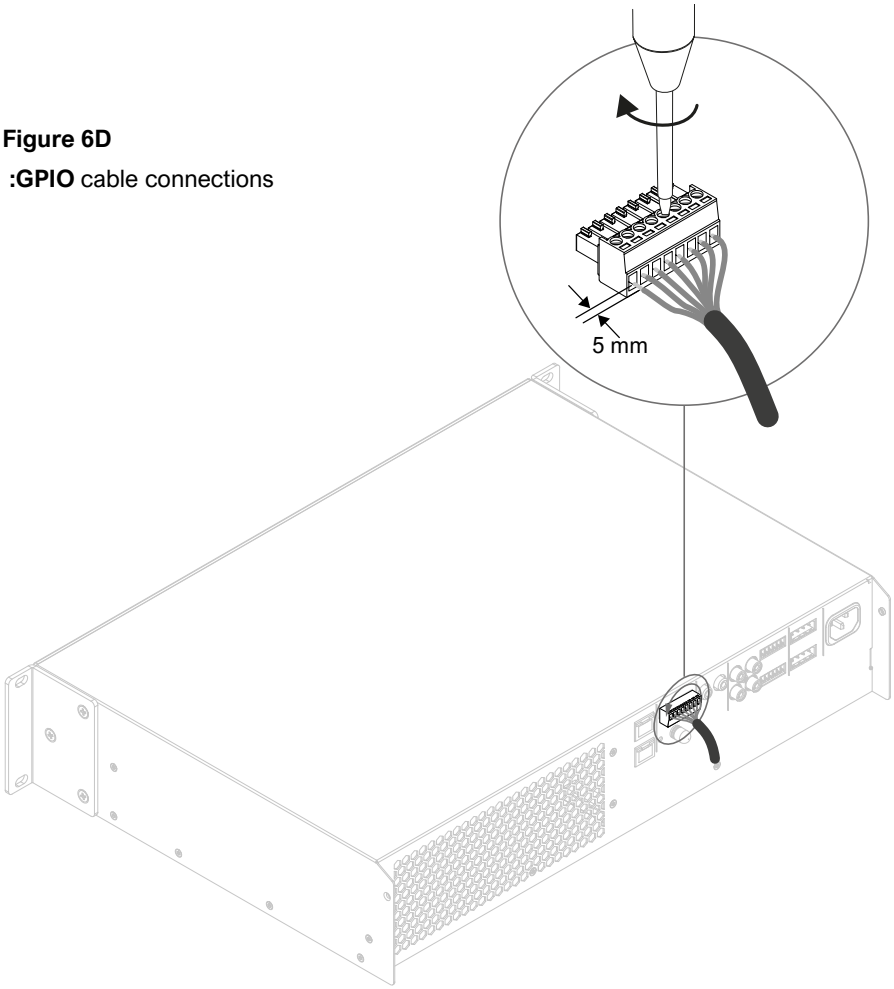


Figure 6C
Connections for the amplifier's output cables.



Connections

Figure 6D
:GPIO cable connections



The exclamation mark printed next to the amplifier output terminals, together with the words 'CLASS 2 WIRING', is intended to alert users to the risk of dangerous voltages. Output connectors that may present a hazard are marked with this exclamation mark. Do not touch the output terminals whilst the amplifier is switched on. Make all connections whilst the amplifier is switched off.

7. How it works

Once all connections have been made and the configuration options selected, the Aio4500 amplifier is ready for use. If an input signal greater than -60 dB is present at any of the inputs, the 'Input' and 'Standby' indicators on the front panel will light up green to indicate that the amplifier is operating normally. The sound will then be played through the connected speakers.

Note: By default, the **Aio4500** *amplifier does not wake from standby mode unless an input signal is present, an 'ON' network command is received, or an external standby switch (or 12 V trigger) is activated. The standby behaviour can be configured via the "Power Management" menu in the "Settings" tab of the web control application.*

The amplifier's outputs are muted if no input signal is detected for 5 minutes, and the amplifier automatically switches to standby mode if no signal is detected on any input for more than 15 minutes. Different time delays for standby and mute can be selected via the **'Settings'** tab . The speed of the amplifier's cooling fan is regulated according to the temperature. The fan stops when the amplifier enters standby mode.

7.1 Front panel indicators

The indicators on the front panel of the **Aio4500** amplifier light up to indicate the following operating states:

Status: Off – Mains power disconnected.
Green – Operational amplifier.
Flashing green – Standby mode.
Amber – Standby mode triggered by GPIO

Input: Off – No input signal present.
Green – Signal present on one or more inputs.
Amber – Signal limiting/clipping on one or more inputs.

Output: Off – No output signal present.
Green – Signal present on one or more outputs.
Amber – Signal limiting/clipping on one or more outputs.
Red – One or more channel pairs are in overload/protection mode

Network: Off – No Ethernet network detected.
Green – Ethernet network detected.

WiFi: Off – WiFi disabled.
Green – WiFi enabled.

7.2 Factory reset

The Aio4500 amplifier can be reset to its default settings either via the 'Settings' tab in the web control application or using the power button on the front panel.

To reset the amplifier using the power button on the front panel, follow these steps:

- Unplug the amplifier from the mains.
- Hold down the power button on the front panel whilst plugging the device back into the mains.
- Hold down the power button on the front panel for 3 to 5 seconds whilst the amplifier restarts.

The amplifier will restart with all settings reset to their default values. Any settings previously configured will be deleted.

Technical specifications

Model	**Aio4500**
Channels	4 x Lo-Z / 2 x Hi-Z
Output power at 4 Ω	4 x 500 W (SE)
Output power at 8 Ω	4 x 250 W (SE) 2 x 1,000 W (BTL)**
Output power at 70 V*	2 x 1,000 W (BTL)
Output power at 100 V*	2 x 1,000 W (BTL)
When using the 70V Hi-Z mode, the line impedance must not be less than 5.5 ohms. When using the 100 V Hi-Z setting, the line impedance must not be less than 11 ohms	
Total system power	2000 W
Power consumption	700 W
Output voltage	65 Vp / 130 Vpp (SE unloaded) 130 Vp / 260 Vpp (BTL unloaded)
Dimensions	88 × 440 × 321 mm (3.5 x 17.3 x v inches)
Weight	7.4 kg (16.3 lb)
Output circuits	UMAC™ Class D – full-bandwidth PWM modulator with ultra-low distortion
Signal-to-noise ratio	>108 dB (A-weighted, 20 Hz–20 kHz, 8 Ω load)
THD+N (typical)	< 0.05% (20 Hz–20 kHz, 8 Ω load, 3 dB below rated power)
Frequency response	20 Hz–20 kHz (+0/-0.5 dB (8 Ω load, 3 dB below rated power))
Protection circuits	Protection against short circuits, direct current, undervoltage, excessive temperatures and overloads
Power supply	UREC™ universal switching power supply with power factor correction (PFC) and standby converter
Operating temperature	0-40°C
Operating voltage and frequency	Universal power supply, 100 V–240 V, 50 Hz–60 Hz
Standby power consumption	< 0.5W
Accessories	2 x mounting brackets (fitted), 4 x adhesive feet, power socket, connection plugs

*SE – conventional output mode, single-ended
BTL – bridge output mode

Technical specifications

Energy efficiency data

The following table sets out the efficiency and power specifications for the Aio4500 amplifier .
It also shows the calculated heat losses.

1/8th of the maximum power						
Model	**Load (Ohms)**	**Power In (W)**	**Output power (W)**	**Efficiency (%)**	**Thermal Loss (W)**	**Thermal Loss (BTU)**
Aio4500	4	346	250	72.2	96	327

Standby and idle mode				
On standby (mW)	**Standby power consumption at 120 V (W)**	**Standby power consumption at 120 V: (BTU)**	**Standby power consumption at 230 V: (W)**	**Standby power consumption at 230 V (BTU)**
<500*	23.2	79	25.6	87

*In accordance with the ErP Directive

Data on the propagation delay

The following tables show the I/O latency performance of the nd the Aio4500 amplifier.

4-channel amplifier			
		OUT	
		Analogue	S/PDIF
IN	Analogue	1,177 µs	458 µs
	S/PDIF	1,833 µs	1,104 µs

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