



VOID

Inca Series

User Guide

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1.0 Technical and Safety Notices

Please read the following important technical, safety and environmental notices before installing and using your amplifier.

1.1 Technical Notices

All reasonable design and engineering steps have been taken to ensure that these amplifiers always perform satisfactorily in their intended application and environment and will provide appropriate levels of support to ensure that all reasonable customer needs and expectations are met. Such support however is contingent on the following provisions.

- These amplifiers are Class-I products and should be installed with a mains cable including the required earth connection to comply with the Safety Class-I.
- These amplifiers should always be installed by competent and qualified personnel. Amplifier damage or failure caused by installation or operational errors may invalidate support, warranty or guarantees of performance.
- These amplifiers are not suitable for use in locations where they may be accessible to minors.
- These amplifiers are intended to be used specifically for the amplification of audio signals and for connection to moving-coil loudspeaker systems. Use of these amplifiers for amplification of signals outside the audio band (20 Hz to 20 kHz) or to drive transducers other than moving-coil loudspeakers may invalidate support, warranty or guarantees of performance.
- These amplifiers should only be used within professionally installed and configured audio systems comprising input and output ancillary equipment known to be of an appropriate level of performance and in good operating condition. Any damage to, or unsatisfactory performance from, these amplifiers caused by inadequate or failed input or output ancillaries may invalidate support, warranty or guarantees of performance.
- These amplifiers are intended to be installed and operated indoors in a controlled environment (pollution degree, PD2) within an ambient temperature range of 0°C to 40°C. These amplifiers are not intended for use above 2000 metres above sea level. Amplifiers installed or operated in environments outside these limits may invalidate support, warranty or guarantees of performance.

1.2 Safety and Environmental Notices

Note: The intent of the lightning flash with arrowhead symbol in a triangle is to alert the user to the presence of uninsulated “dangerous” voltage within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to humans.



Note: The intent of the exclamation point within an equilateral triangle is to alert the user to the presence of important safety, and operating and maintenance instructions in this manual.

WARNING! TO PREVENT FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.



Ambient Temperature Note: If this equipment is operated in a confined or multiple rack installation, the internal ambient operating temperature may exceed the external ambient temperature.

It is important to ensure in these circumstances that the published maximum operating temperature for the equipment is not exceeded.

Reduced Air Flow: Ensure that rack or other closed installation does not restrict the cooling airflow required for safe and reliable operation of the equipment.

1.3 EC declaration of conformity

For EC Declaration of Conformity please go to:
www.voidacoustics.com/eu-declaration-loudspeakers

1.4 UKCA marking

For details of the UKCA marking go to:
www.voidacoustics.com/uk-declaration-loudspeakers

1.5 Warranty statement

For warranty statement go to:
www.voidacoustics.com/terms-conditions



1.6 Important Safety Instructions

Before using this product, please read and retain these instructions, heed all warnings, and follow all instructions carefully.

- Do not use this apparatus near water.
- Do not submerge the equipment in water or liquids.
- Do not use any aerosol spray, cleaner, disinfectant or fumigant on, near or into the equipment.
- Clean only with a dry cloth.
- Do not block any ventilation opening. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- To reduce the risk of electrical shock, the power cord shall be connected to a mains socket outlet with a protective earthing connection.
- Do not defeat the safety purpose of the polarised or grounding type plug. A polarised plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third 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.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Do not unplug the unit by pulling on the cord; use the plug.
- Only use attachments/accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- 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.
- The appliance coupler, or the AC Mains plug, is the AC mains disconnect device and shall remain readily accessible after installation.
- Adhere to all applicable, local codes.
- Consult a licensed, professional engineer when any doubt or questions arise regarding a physical equipment installation.

1.7 WEEE directive

At the end of its useful life, this product and its components should be disposed of responsibly and recycled wherever possible.



The crossed-out wheeled-bin symbol indicates that this product must not be disposed of with unsorted household waste. Instead, it must be taken to an appropriate collection facility for the recovery and recycling of electrical

and electronic equipment. Separating electrical and electronic equipment from other waste helps reduce the amount of waste sent to landfill or incineration and supports the recovery of valuable resources.

Waste electrical and electronic equipment (WEEE) is subject to the Waste Electrical and Electronic Equipment Regulations 2013, as amended. These regulations are intended to reduce the environmental impact of electrical and electronic equipment by promoting its reuse, recovery and recycling.

Void Acoustics Research Ltd supports the responsible disposal and recycling of its electrical and electronic equipment. When disposing of this product, please use an appropriate local WEEE collection or recycling facility and follow the requirements applicable in your country. For information about the appropriate disposal and recycling arrangements in your country, please contact your local authority or authorised recycling facility.

2.0 Introduction and Overview

2.1 Introduction

Inca Series power amplifiers have been designed to provide configurable, consistent and reliable high performance audio power amplification for residential, commercial and entertainment applications. Please read this manual fully before installing and using an amplifier. If you have any questions regarding amplifier configuration, installation or operation please contact the appropriate customer support portal.

Note: Video training and resources can be found at voidacoustics.com/resources

2.2 Amplifier Overview

Inca Series amplifiers are 1U and 2U power amplifiers available in half-rack and full-rack widths. They can drive both:

- Low-impedance (Lo-Z) loudspeakers
- High-impedance (Hi-Z) loudspeakers

The number of inputs and outputs depends on the amplifier model:

- Analogue inputs: 4 - Inca 500
4 - Inca 2000
8 - Inca 1000
- Digital input: 1 stereo S/PDIF input
- Lo-Z outputs: 4 or 8 (see table below)
- Hi-Z outputs: 2 or 4 (see table below)

In Lo-Z mode, the amplifiers use automatic power sharing. This allows available power to be shared proportionately between pairs of outputs as required.

The table below shows the rack width, number of output channels, and power output for each Inca Series amplifier model.

Mode	Output Channels	Max Rated Output per Channel
Inca 500 (Half-rack width) (1U)		
Lo-Z	Four	125 Watts
Hi-Z	Two	250 Watts
Inca 1000 (Full-rack width) (1U)		
Lo-Z	Eight	125 Watts
Hi-Z	Four	250 Watts
Inca 2000 (Full-rack width) (2U)		
Lo-Z	Four	500 Watts
Lo-Z (BTL)	Two	1000 Watts
Hi-Z	Two	1000 Watts

2.3 Connections

Inca Series signal input and output connections are accomplished via RCA Phono and Euroblock style connectors. A GPIO (General Purpose In/Out) Euroblock connector enables some amplifier functions to be controlled, and wireless or RJ45 socket Ethernet network connection options are also provided.

Inca Series amplifiers have no mains power switch and are operational as soon as mains power is connected via the IEC 60320 mains socket.

2.4 Network Features

Inca Series amplifiers are TCP/IP network connected devices that require a wired or wireless network connection to access their configuration menus. The configuration menus are accessed via the **Inca Series Control Web App** interface and cover Input, Zone, Output and General Settings functions. The configuration menus are fully described in **Section 5.3** of this manual.

2.5 Dimensions

Inca Series amplifier dimensions and features are illustrated in **Figures 3.1, 3.2 and 3.3**. The amplifiers are primarily intended for installation in an equipment rack but in some cases can also be under-desk or wall mounted, or used free standing. They are fan-cooled and must be installed such that ventilation apertures are not obstructed.

2.6 Firmware

This manual describes the features, functions and user interface of **Inca Series** amplifiers running

Firmware Version 1.8.0.



It is strongly recommended that the firmware version installed in the amplifier in use is checked initially, and regularly thereafter. If updated firmware is available, the amplifier should be updated a priority.

The firmware installed in the amplifier can be identified and updated by selecting the **Device** option in the **Inca Series Control Web App Settings Menu**. Firmware versions and amplifier resources can be downloaded, from <https://www.voidacoustics.com/resources>

2.7 Carton Contents

Inca Series amplifiers are shipped in a cardboard carton containing the amplifier unit, a mains cable appropriate for the sales territory, an accessory pack, and a document pack. The full contents are listed in the table below.

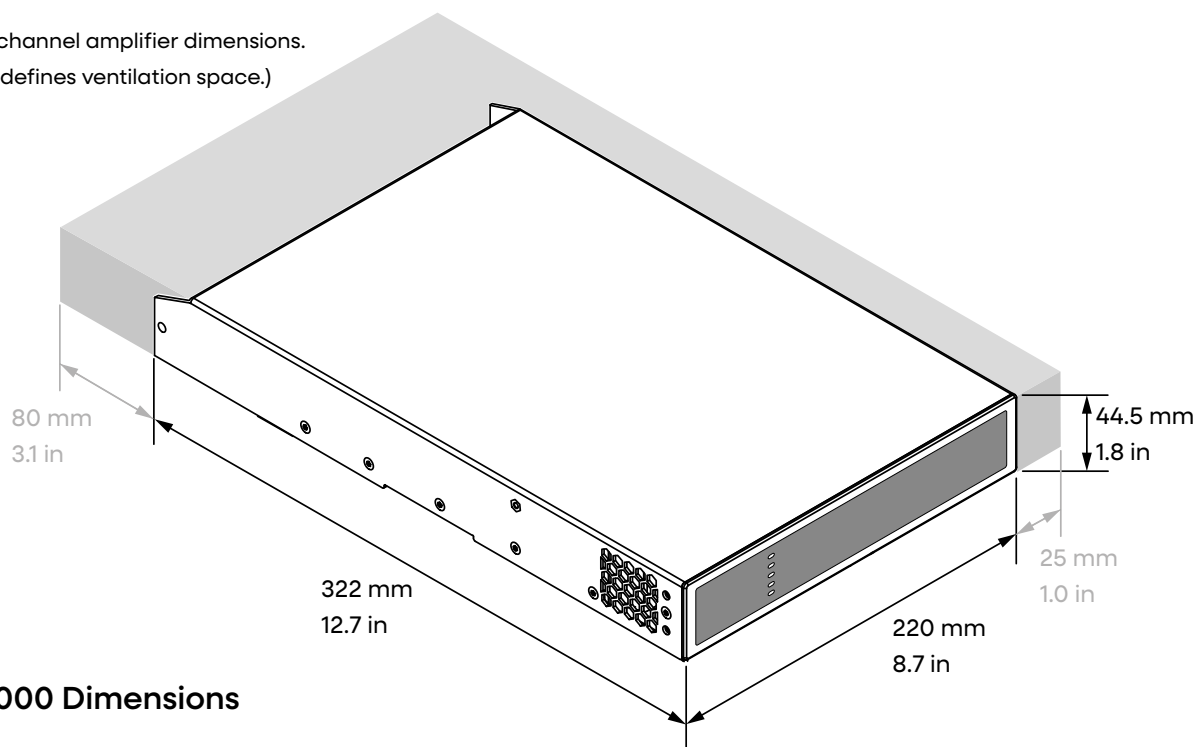
Part	Inca 500	Inca 1000	Inca 2000
Amplifier Unit	1	1	1
Mains power cable	1	1	1
Input connector	2	4	2
GPIO socket connector	1	1	1
Output connector	2	4	2
Adhesive rubber feet	4	4	4
Document pack	1	1	1

3.0 Dimensions

3.1 Inca 500 Dimensions

Figure 3.1

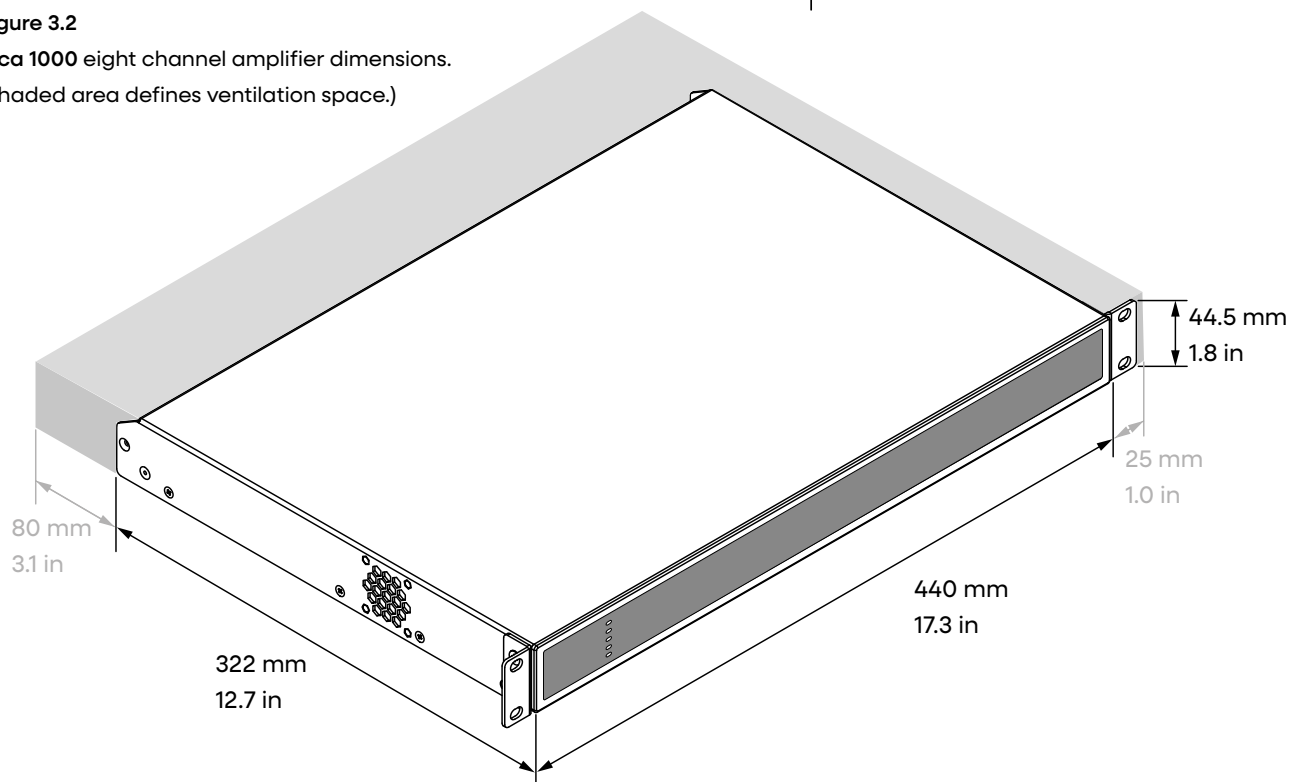
Inca 500 four channel amplifier dimensions.
(Shaded area defines ventilation space.)



3.2 Inca 1000 Dimensions

Figure 3.2

Inca 1000 eight channel amplifier dimensions.
(Shaded area defines ventilation space.)

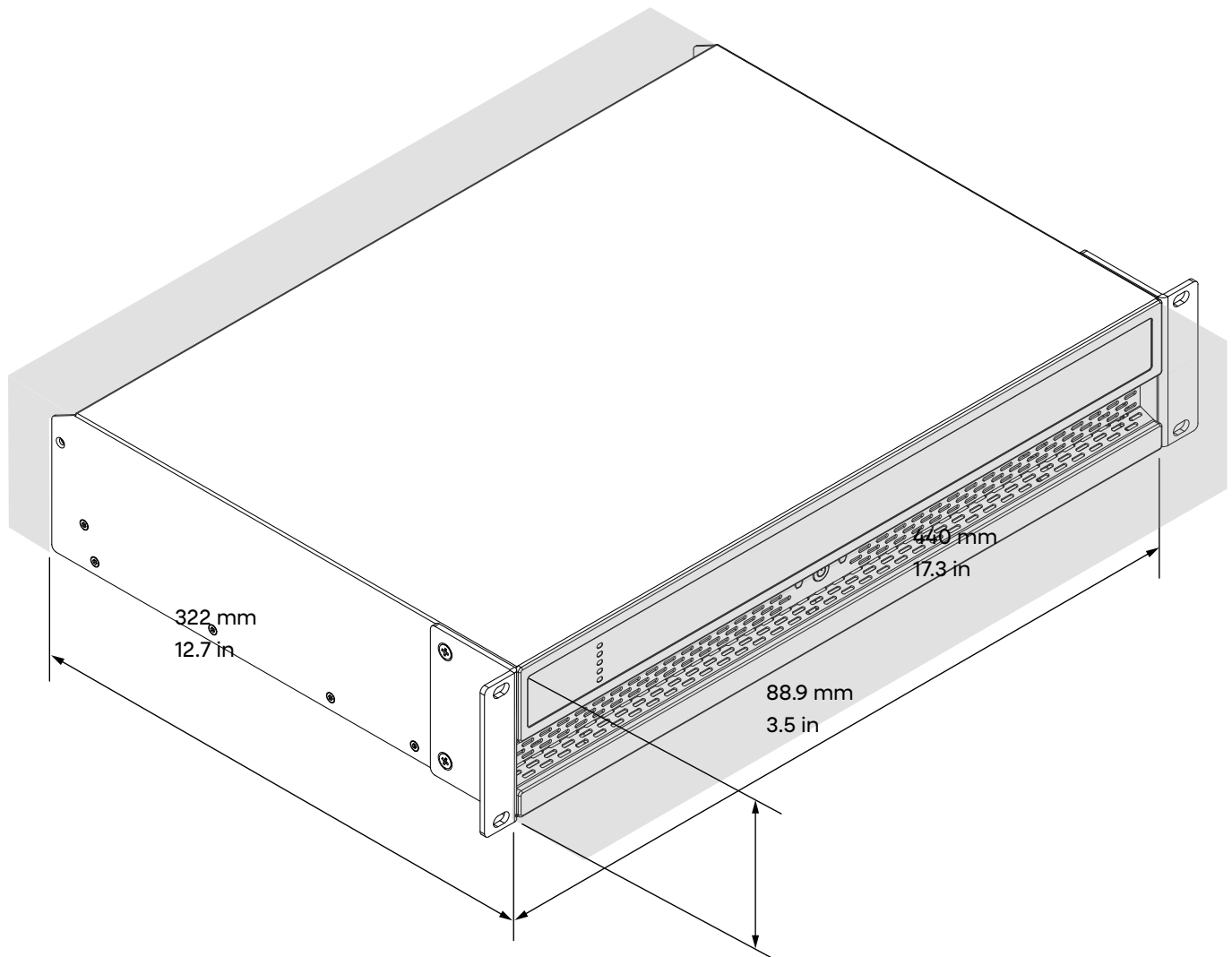


3.3 Inca 2000 Dimensions

Figure 3.3

Inca 2000 2U four output amplifier dimensions.

(Shaded area defines ventilation space.)



Note: The width of the Inca 1000 and Inca 2000 with rack-ears measure at 483 mm (19 in).

4.0 Installation

Note: The rack-mounting and desk/wall mounting components described and illustrated in Sections 4.1 to 4.2 are not supplied with **Inca Series** amplifiers but are available to purchase as accessories.

Contact sales@voidacoustics.com quoting the IT number.

Name	IT number
Inca 500 Rack Mount Kit	IT4457
Inca 500 Wall/Desktop Mount Kit	IT4458

4.1 Inca 500 Mounting

Inca 500 is a 1U half-rack width amplifier, and is shipped without rack mount hardware attached, but can be configured for rack installation using one standard rack-ear and one half-rack extension piece as illustrated in **Figure 4.1**.

The installation and equipment rack should be configured to provide appropriate ventilation airflow space around the sides and rear of the amplifier. Ventilation airflow space of at least 25 mm (1 in) should be maintained along at least one side of the amplifier at all times. Ventilation apertures are also located on the rear panel of the amplifier and must not be obstructed. It is important to retain at least 80 mm (3.1 in) free space for airflow behind the amplifier rear panel.

In addition to rack-mount ears, rack-mount rear support hardware is optionally available and can be attached to the amplifier. Rear support hardware may be appropriate if the amplifier is to be used in a mobile rack or potentially be subject to significant movement. **4.2** illustrates the use of rack-mount rear support hardware.

Multiple **Inca 500** half-rack width amplifiers can also be mechanically connected using an accessory connecting plate. **Figure 4.3** illustrates the use of a connecting plate. A connection plate is included in the kit shown in **Figure 4.1**. Together with 2 x rack-ears a connection plate enables a pair of amplifiers to be joined and installed in a full-width rack space.

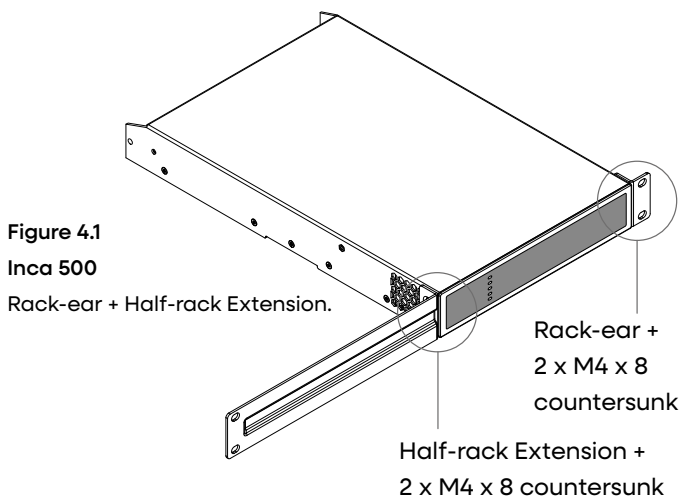


Figure 4.1
Inca 500

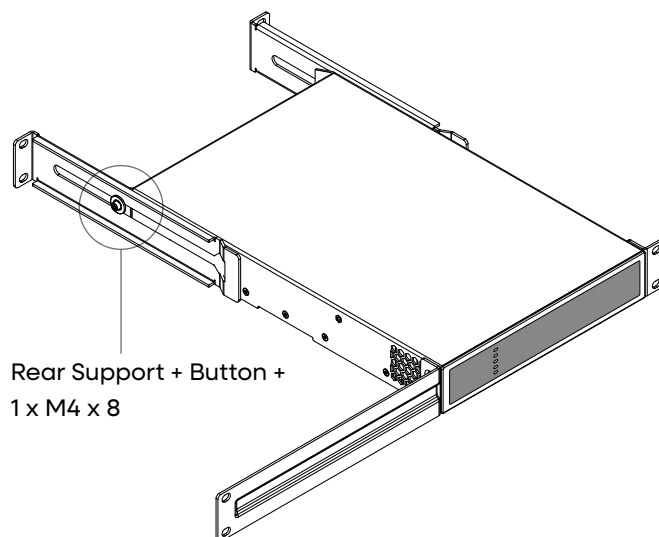
Rack-ear + Half-rack Extension.

Rack-ear +
2 x M4 x 8
countersunk

Half-rack Extension +
2 x M4 x 8 countersunk

Figure 4.2
Inca 500

Rack Support hardware. 2 positions.

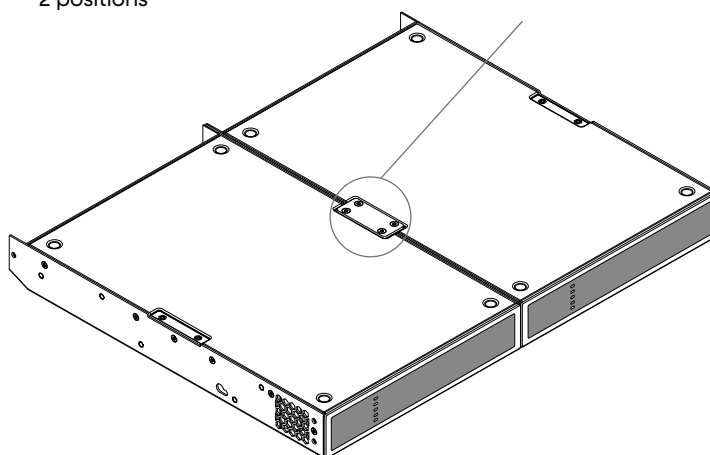


Rear Support + Button +
1 x M4 x 8

Figure 4.3

2 x Inca 500 with Connection Plate.
2 positions

Connection Plate +
4 x M3 x 6 countersunk



4.2 Inca 500 Free-standing

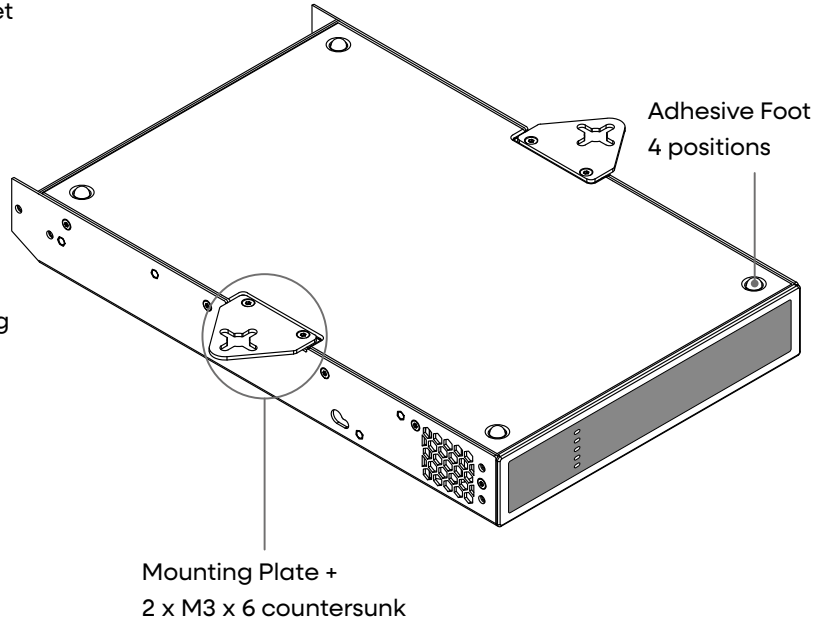
If not installed in an equipment rack, **Inca 500** half-rack width amplifiers can be placed free-standing on a flat surface. Adhesive rubber feet are supplied for this purpose.

Inca 500 half-rack width amplifiers can also be attached to the underside of desks or wall mounted using connecting plate hardware. The adhesive rubber feet should also be used in these circumstances to minimise the possibility of vibration between the amplifier and mounting surface. Wall and desk mounting is illustrated in **Figures 4.4 and 4.5**.

It is important in any free standing installation that airflow through the amplifier's side panel mounted fans and rear panel ventilation apertures is not compromised by adjacent items. At least 80mm of free space behind the amplifier and 25mm along at least one side should be retained at all times.

Figure 4.4

Inca Series with desk/wall Mounting Plate and adhesive feet. 2 positions and 4 positions.



Note: Full-rack width amplifiers are not suitable for under-desk or wall mount installation.

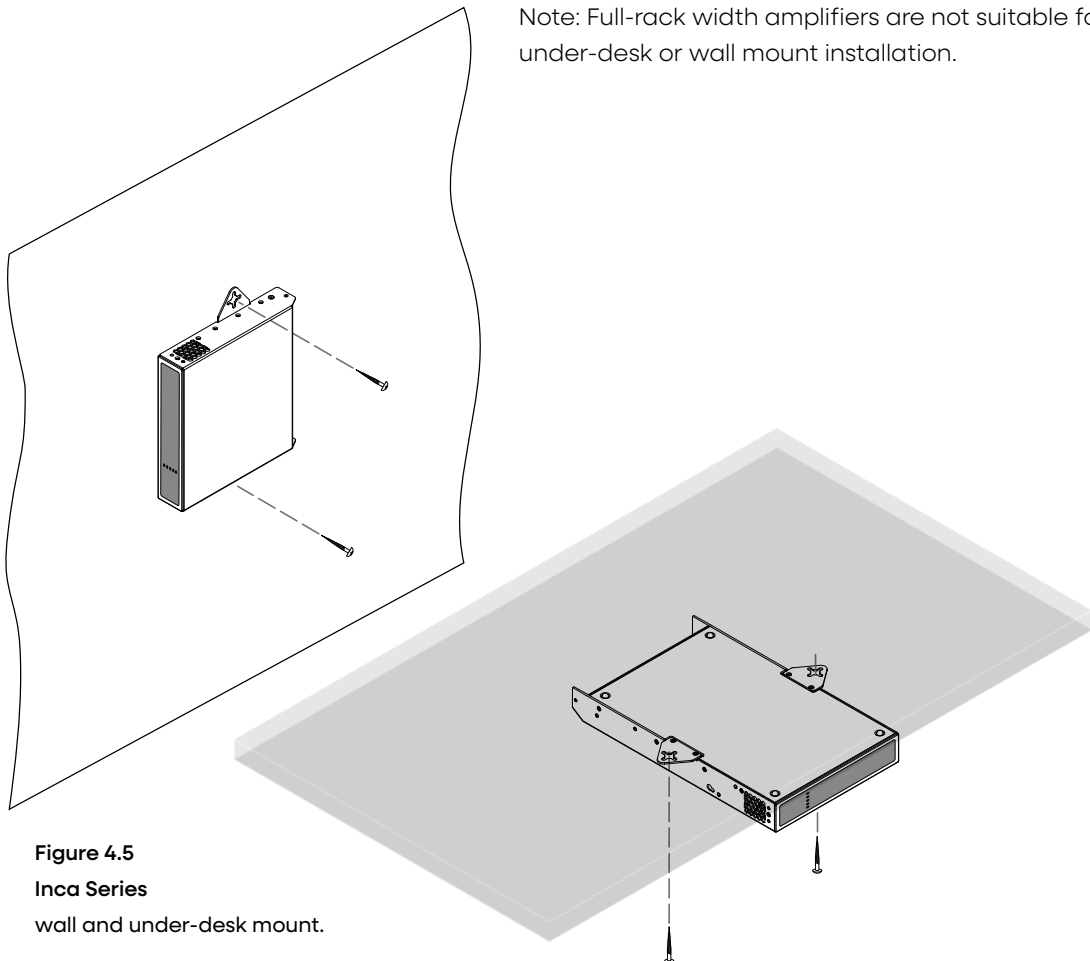


Figure 4.5
Inca Series
wall and under-desk mount.

Note: Full-rack width Inca Series amplifier models are intended for rack-mount or free-standing installation only.

Note: When amplifiers are stacked vertically, a minimum ventilation gap should be provided after every four amplifiers to allow adequate airflow and prevent excessive heat build-up. No more than four amplifiers should be stacked directly together without a ventilation gap.

4.3 Inca 1000 Rack-Mounting

Inca 1000 are 1U full-rack width amplifiers and are supplied with rack-ears fitted. The installation and equipment rack should be configured to provide appropriate ventilation airflow space around the sides and rear of the amplifier. Ventilation airflow space of at least 25 mm (1 in) should be maintained along at least one side of the amplifier at all times. Ventilation apertures are also located on the rear panel of the amplifier and must not be obstructed. It is important to retain at least 80 mm (3.1 in) free space for airflow behind the amplifier rear panel.

In addition to the use of rack-mount ears, rack-mount rear support hardware is optionally available that can be attached to the amplifier. Rear support hardware may be appropriate if the amplifier is to be used in a mobile rack or potentially be subject to significant movement. **Figure 4.7** illustrates the use of rack-mount rear support hardware.

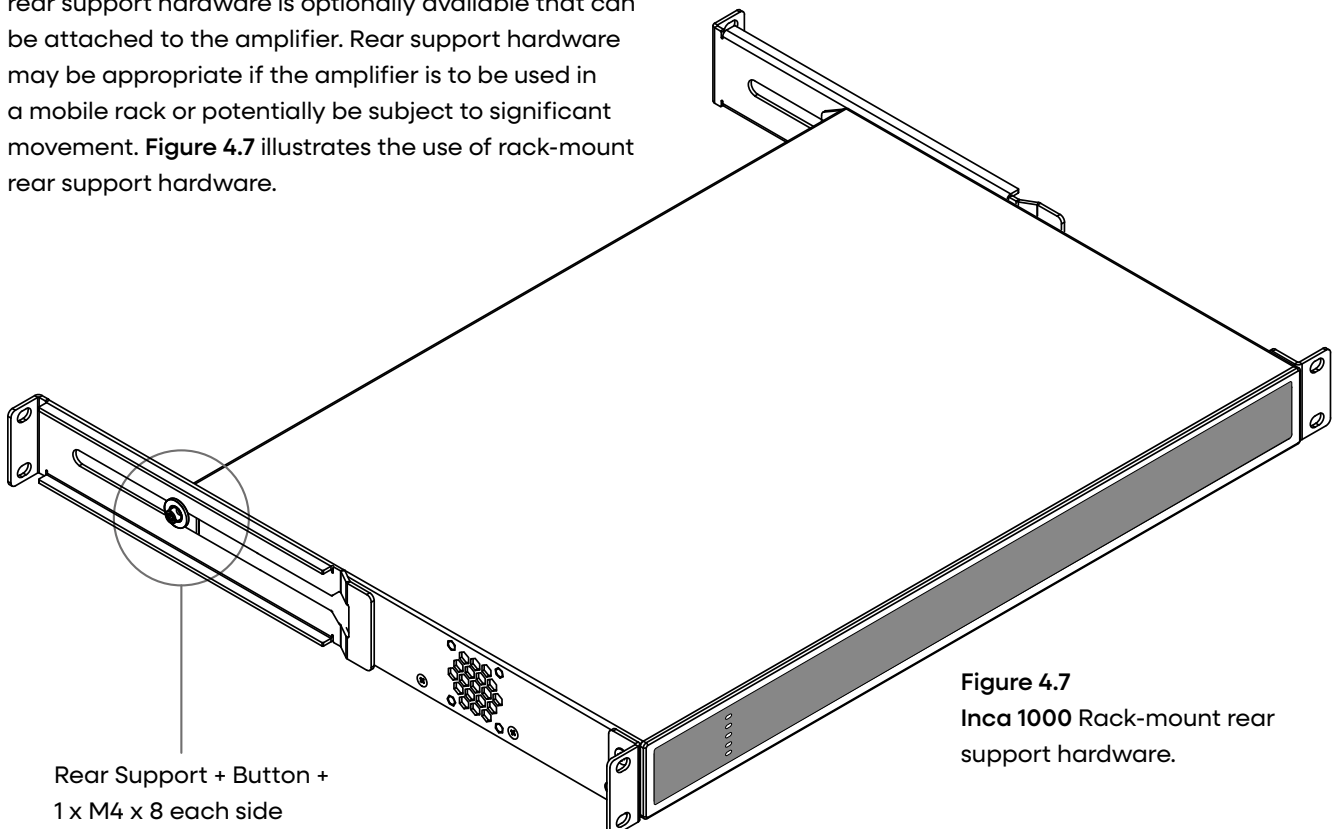


Figure 4.7
Inca 1000 Rack-mount rear support hardware.

4.4 Inca 1000 Free-standing

If not installed in an equipment rack, Inca 1000 full-rack-width amplifiers can be placed free-standing on a flat surface. Adhesive rubber feet are supplied for this purpose. **Figure 4.6** illustrates the adhesive foot locations.

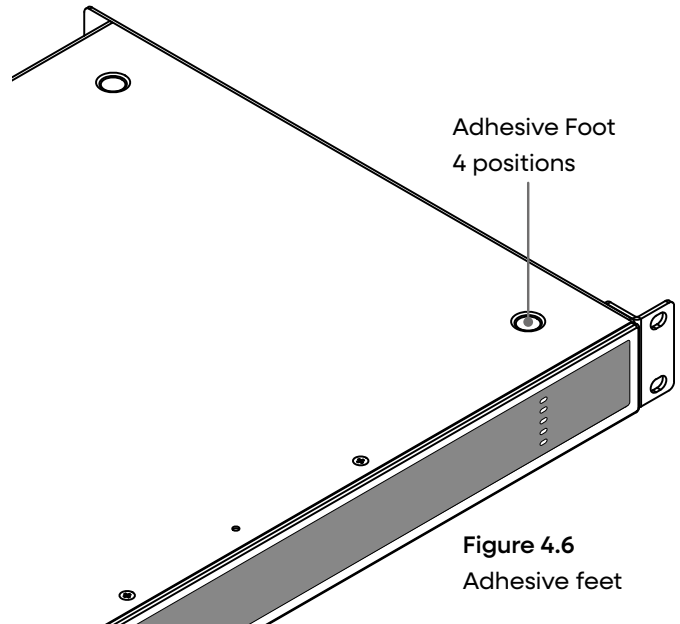


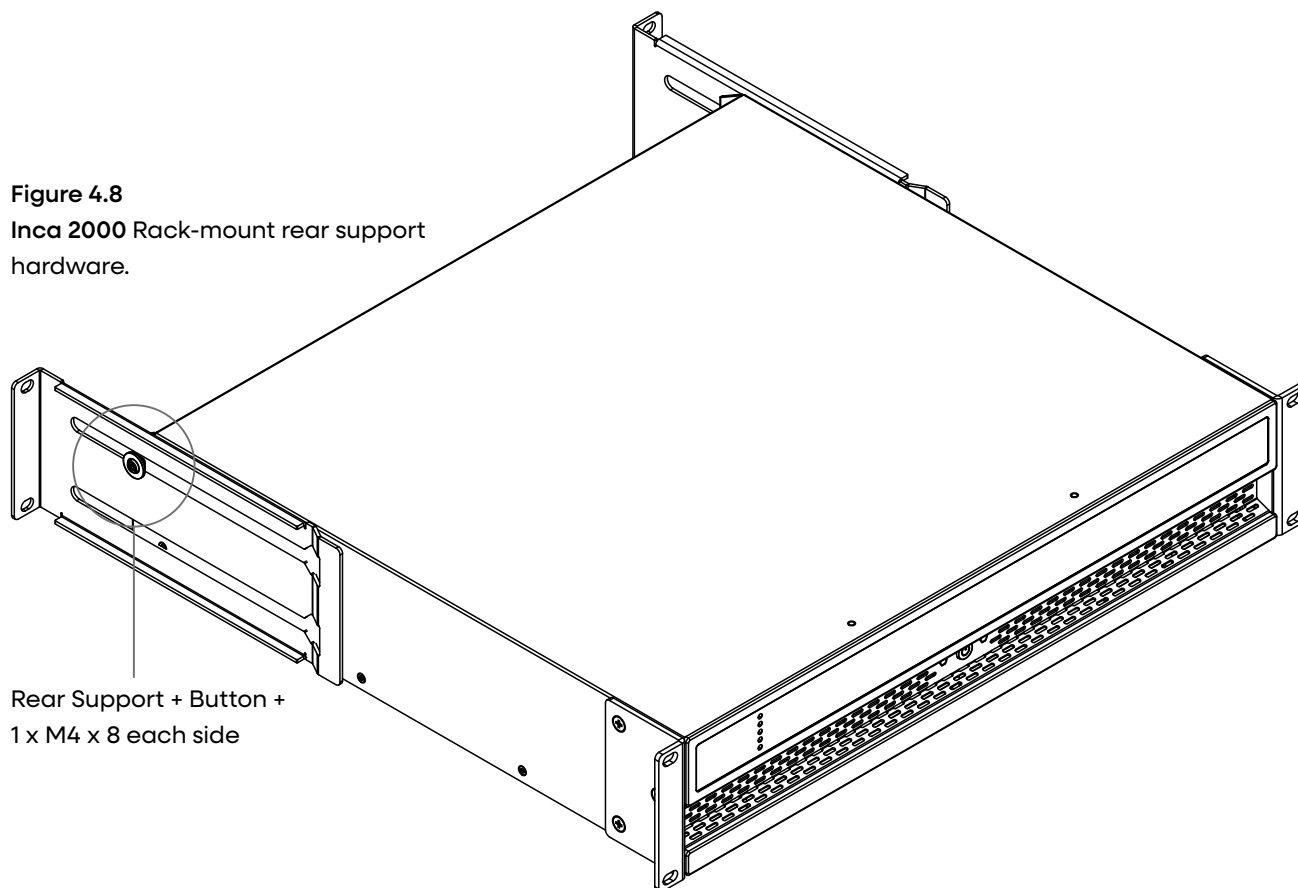
Figure 4.6
Adhesive feet

4.5 Inca 2000 Rack-Mounting

Inca 2000 amplifiers are 2U amplifiers and are shipped with rack-ears attached and are primarily intended for standard (19 inch) equipment rack installation.

Figure 4.8

Inca 2000 Rack-mount rear support hardware.



Rear Support + Button +
1 x M4 x 8 each side

4.6 Inca 2000 Free-standing

If not to be installed in an equipment rack, Inca 2000 amplifiers can be placed free-standing on a flat surface. Adhesive rubber feet are supplied for this purpose (Figure 4.6 for illustration).

It is important that any installation provides space for airflow through the ventilation apertures at the front and rear of the amplifier.

4.7 Inca Series Cooling Method

Product	Cooling
Inca 500	Side to Rear
Inca 1000	Side to Rear
Inca 2000	Front to Rear

5.0 Configuration

Before making input, output and GPIO connections, an initial Inca Series amplifier configuration should be established. It is particularly important that the amplifier output format is configured appropriately for the speakers that are to be connected.

Configuration requires that Inca Series amplifiers are connected to mains power and network services. These connections are described in the following two sections.

5.1 Mains Power Connection

Inca Series amplifiers incorporate a power factor corrected power supply and can be used with mains input voltage from 100 V AC to 240 V AC, 50/60 Hz. Use the mains cable supplied with the amplifier and connect it to a switched mains supply.

Inca Series amplifiers have no mains power switch and are operational as soon as mains power is connected.

5.2 Network Services

Inca Series amplifiers are configured via a web page interface called Inca Series Control. Before the configuration menus can be accessed, Inca Series amplifiers must be connected to the same TCP/IP network as the computer or mobile device that is to be used for configuration access.

Note: Inca Series amplifiers are configured with a static IP address by default. When using multiple amplifiers on the same network, connect and configure each amplifier individually. Set each unit to DHCP or manually assign a unique IP address before connecting the next Inca amplifier.

5.2.1 Wired (Ethernet) Network Connection

To connect an Inca Series amplifier to a TCP/IP network using a wired connection (Ethernet) follow the steps below.

1. Use an Ethernet cable to connect the Inca Series amplifier rear panel Network Control socket (upper socket) to a free socket on a network router or switch, or directly to an Ethernet equipped laptop or desktop computer.
2. Connect the Inca Series amplifier to mains power using the supplied mains cable. Wait for the front panel Network indicator to illuminate green to indicate that the amplifier has network connectivity.

3. Depending on its manufacturer defaults, the Inca Series amplifier network settings will be configured either to DHCP or have a fixed LAN IP address of 192.168.64.100.

In the case of DHCP, the network router will automatically assign the Inca Series amplifier a network address to enable the amplifier to connect automatically to the network. A network scanning application can be used if required to identify the amplifier's IP address.

In the case of an Inca Series amplifier with a fixed IP address, configure the laptop or desktop computer for a fixed IP address in the same IP range; e.g. 192.168.64.10, with Subnet mask of 255.255.255.0 (or prefix 24) and set the Gateway to 192.168.64.1.

4. Open a laptop or desktop web browser and enter the amplifier's DHCP assigned network address or <http://192.168.64.100>. The Inca Series Control Web App interface will open to enable amplifier configuration as required.

Note: Inca Series amplifiers can be configured to use DHCP for network connection if required. However, if an Inca Series amplifier using DHCP is power cycled, it is possible that the TCP/IP network router will assign it a different IP address, leaving its configuration page inaccessible via the previous address. If this occurs, a network scanning app can be used to identify the new IP address. DHCP and Fixed IP address option settings can be found in the Settings Tab menu described in Section 5.3.5.

5.2.2 Wireless (Wi-Fi) Network Connection

To connect an Inca Series amplifier to a TCP/IP network using a wireless connection (Wi-Fi) follow the steps below.

1. With the Inca Series amplifier connected to mains power, wait for the front panel Wi-Fi indicator to illuminate green.
2. Use a mobile, laptop or desktop device to search for available Wi-Fi networks. Connect to "Inca Series (product serial number)" using the password "password". The amplifier serial number can be found on its rear panel.
3. Open a computer or mobile device web browser and enter the IP address: 192.168.4.1. The Inca Series Control Web App interface will open to enable amplifier configuration as required.

4. Select the Inca Series Control Web App Settings Tab followed by Wi-Fi > Wi-Fi Mode > Client to configure the amplifier to connect to the required Wi-Fi network. The Wi-Fi network name and password will be required.

It is strongly recommended that the Inca Series amplifier Access Point Wi-Fi password is changed following initial wireless connection.

5.3 Configuration Menus

Opening a web browser that is network-connected to an Inca Series amplifier initially displays the **Inca Series Control Web App Dashboard** illustrated in **Figure 5.1**. The Dashboard is the 'home' page from which all other configuration options can be accessed.

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

5.3.1 Input Tab

The **Input Tab** provides the following configuration parameters for each amplifier input channel:

- **Input name**
- **Mono/Stereo selection**
- **Input sensitivity**
- **High-pass filter**
- **Gain trim**
- **Five band equalisation**

The **Input Tab** also enables input signals to be mixed and routed to specific amplifier zones. The mix function enables any amplifier input, including stereo or split mono S/PDIF inputs, to be grouped with any other input or inputs to create multiple predefined mixes.

Note: The number of individual mixes possible is equal to the number of amplifier analogue outputs (four outputs enables four mixes, eight outputs enables eight mixes).

Note: Mix inputs are muted by default with their level adjustment sliders set to zero.

Mix operations take place following high-pass filter, input equalisation and mono/stereo selection.

A pink noise or sine wave audio signal **generator**, appropriate for audio system testing and set up, can also be enabled, disabled, and adjusted for gain and frequency via the **Input Tab**. **Figures 5.2, 5.3, and 5.4** illustrate the **Input Tab**, **Input EQ** and **Input Mix** displays respectively.

5.3.2 Zone Tab

The **Zone Tab** enables installation zones to be defined

Note: When adjusting input gain, the input level display should remain green. If it displays red, the input gain should be reduced.

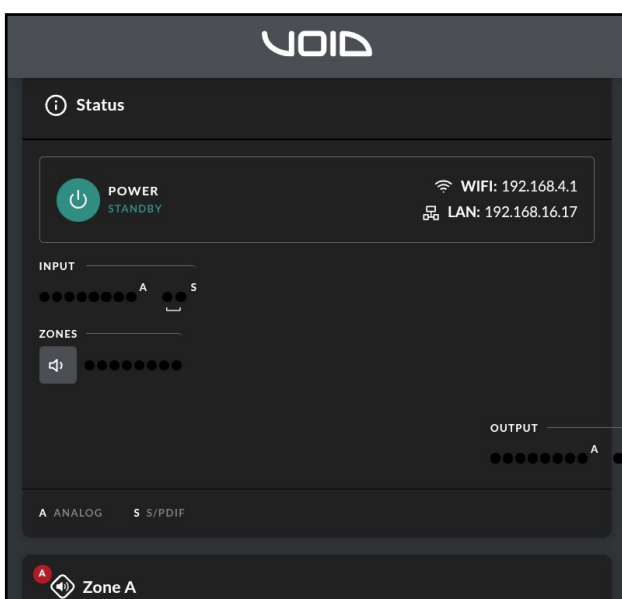


Figure 5.1
Configuration Dashboard display

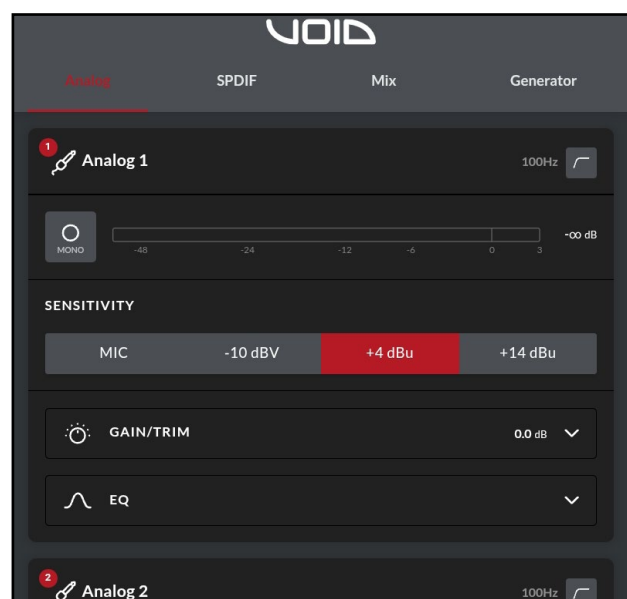


Figure 5.2
Input Tab display (two inputs only shown)

and named, and provides access to further sub-menus. Zones might be bar or restaurant areas for example, or different rooms in a home. For all Zone Tab menus, the installation zone under configuration is selected by highlighting one of the zone identifiers (A to H depending on amplifier output count) at the top of the display. **Figure 5.5** and **5.6** illustrate the **Zone Tab** and **Source** menu displays.

- The **Source** menu enables inputs to be assigned to zones and **Input Priority** or **Input Ducking** to be configured. The **Input Priority** function enables up to three alternative inputs to the **Primary Input** on each of the zones. This provides the possibility to prioritise, replace and mute the input(s) routed to the zone when the alternative input(s) exceed(s) a preset level. The **Primary Input** is the main input, such as background music played in a shopping centre. 1. **Priority Low**, for example commercials, takes priority over the Primary Input. 2. **Priority Mid**, e.g. paging, takes priority over both background music and commercials. 3. **Priority High**, such as an emergency alarm, takes priority over and mutes all other inputs.

The **Input Ducking** function enables an alternative input, **Ducking Low**, to replace and attenuate the **Primary Input** routed to the zone under configuration when the alternative input exceeds a preset level.

Note: The Priority Low parameters can be either set to default values or to its Threshold, Attack, Hold and Release values as required (Manual). The Priority Mid and Priority High parameters can be either set to default values or to their Threshold and Hold values as required. All Input Priorities can also be set to ignore the volume level set for the specified zone (Override Zone Volume).

The Ducking Low parameters can be either set to default values or its Threshold, Depth, Attack, Hold and Release values as required.

- The **Volume** menu allows minimum and maximum zone volume limits to be set, and enables external GPIO volume control to be applied to individual zones. The GPIO configuration menu can be found under the **Settings Tab**, and notes on connecting an external volume control via the GPIO interface can be found in Section 5.5 of this manual.

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

- The **Restrictions** menu enables zone inputs or input mixes to be restricted from routing to particular zones.

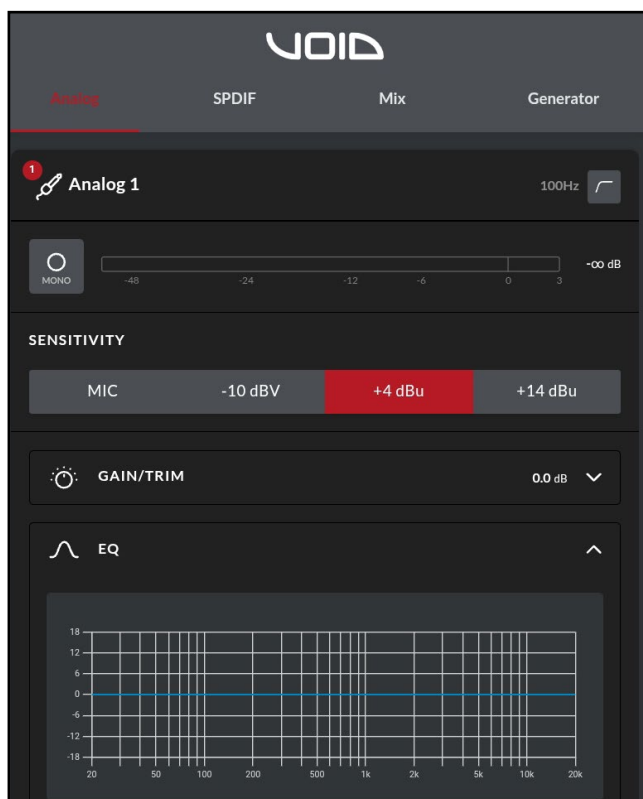


Figure 5.3
Input EQ display

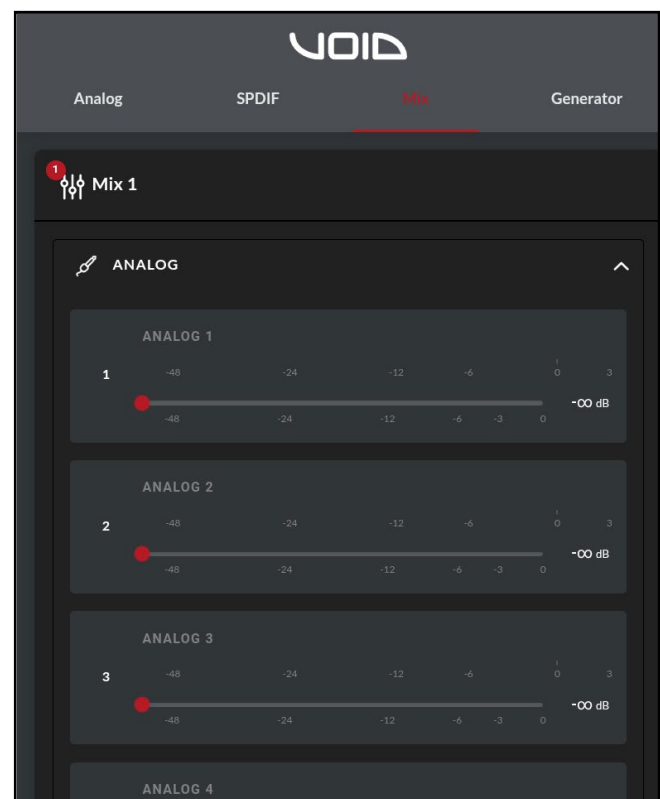


Figure 5.4
Input Mix display

Note: Routing restrictions cannot be applied to priority zone inputs.

Note: If an amplifier is controlled via a third-party control system API, input routing restrictions set via the Input Tab will not apply.

- The **Compressor** option enables default or custom signal compression to be applied to individual zones.

Note: Compression can be useful to reduce the volume difference between loud and quiet audio material. The lower the compression threshold is set, the more the difference between loud and soft will be reduced. The overall zone volume may need to be increased when compression is used. The default compression parameters are appropriate for most installations.

5.3.3 Output Tab

The **Output Tab** enables amplifier outputs to be named, linked to zones, and provides access to **Delay**, **Room Equaliser** and **Speaker Preset** menus. Figure 5.8 illustrates the **Output Tab** display.

For all **Output Tab** menus, the amplifier output under configuration is selected by highlighting one of the output identifiers at the top of the display.

Note: The number of individual outputs available

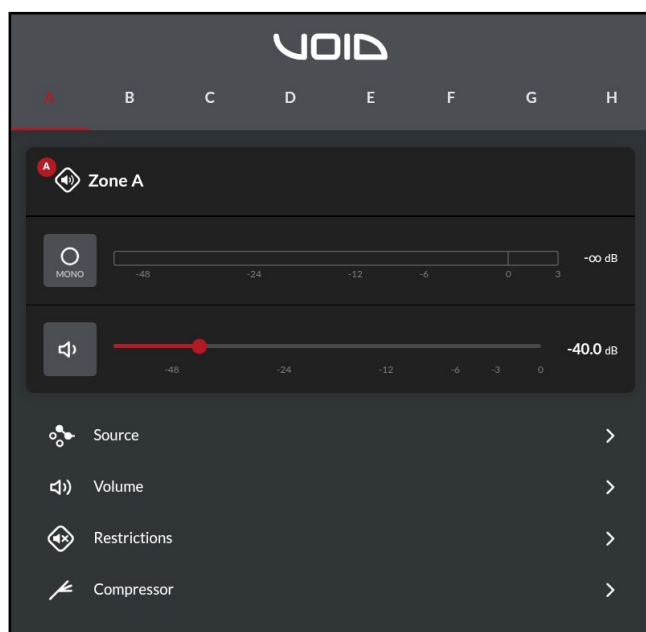


Figure 5.5
Zone Tab display

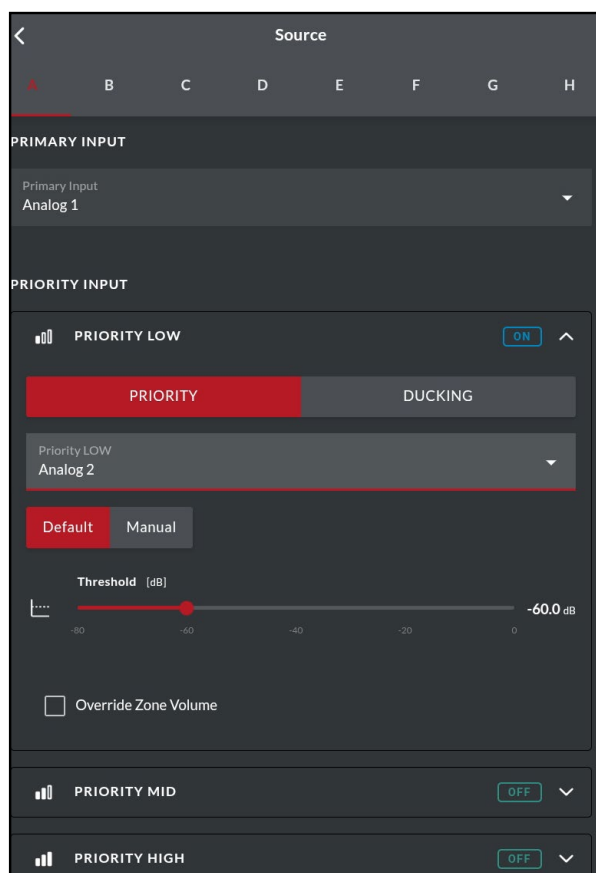


Figure 5.6
Zone Source menu display

for configuration will depend on the **Inca Series** amplifier model and the input, zone and output mode configuration. The following figures illustrate a four output amplifier.

- The **Routing** menu enables zones to be assigned to amplifier outputs.

Note: Routing for zones specified as stereo will automatically offer three output options: left channel, right channel or summed mono. The summed mono signal can potentially be used to drive a mono subwoofer or a 70/100V mono speaker line.

- The **Delay** menu enables delay to be applied to individual amplifier outputs.
- The **Equaliser** menu enables parametric equalisation to be applied to individual amplifier outputs. Equaliser settings configured for one amplifier output can be copied and applied to other outputs.

- The **Speaker Preset** menu enables a set of speaker parameters to be adjusted, and preset configurations to be created, exported, imported or cleared.

Speaker Presets can be simply applied to the selected amplifier output or imported, chosen from a library, exported or cleared. The preset configurations can include any or all of the parameters described in Section 5.3.4 and can be locked to prevent inadvertent modification. **Figures 5.8 to 5.11** illustrate the application of speaker presets.

1. Select either the **IMPORT PRESET FROM LIBRARY** or **SELECT PRESET FROM FILE** option from the **Speaker Preset** menu. If no import option is visible, select **CLEAR** to delete any existing speaker preset data.

Note: All Void Acoustics Inca Series amplifiers are supplied with the latest approved speaker presets pre-installed. If newer presets become available, they can be downloaded from voidacoustics.com/resources and imported via the **Import File** function in the **Speaker Preset** section.

2. Select the appropriate '.zcp' format speaker preset data file to import from either a Library or a computer folder. The preset data will be applied to the selected amplifier output as soon as the file import is complete.
3. If the Speaker Preset data requires modification it can be customised by selecting the **CUSTOMISE PRESET** option.

Note: If an imported Speaker Preset data file includes locked parameters, they will be unavailable for modification.

Note: Inca Series amplifiers are compatible exclusively with Void Acoustics presets.

5.3.4 Speaker Preset Menu Parameters

- The **Crossover & Gain** preset menu enables high or low-pass crossover filters and gain adjustment to be applied to individual amplifier outputs.
- The **Speaker EQ** preset menu enables parametric equalisation to be applied to individual amplifier outputs.
- The **FIR** preset menu enables FIR (Finite Impulse

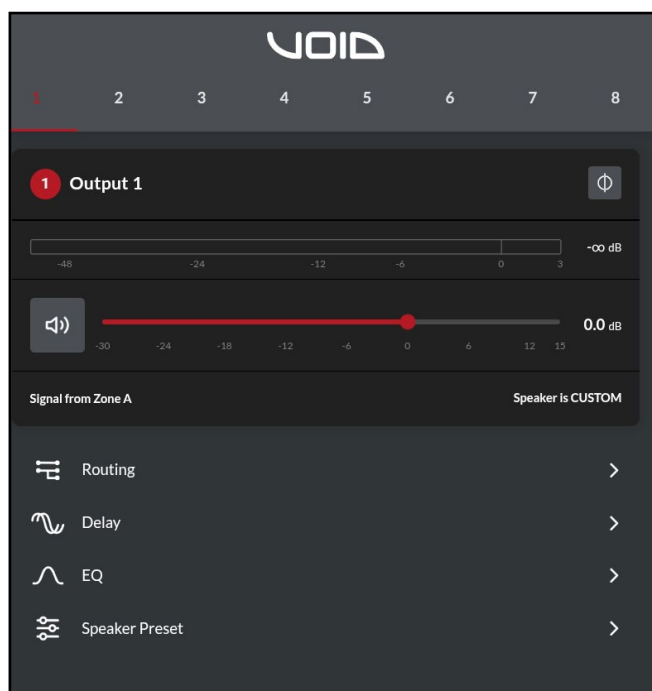


Figure 5.7
Output Tab display

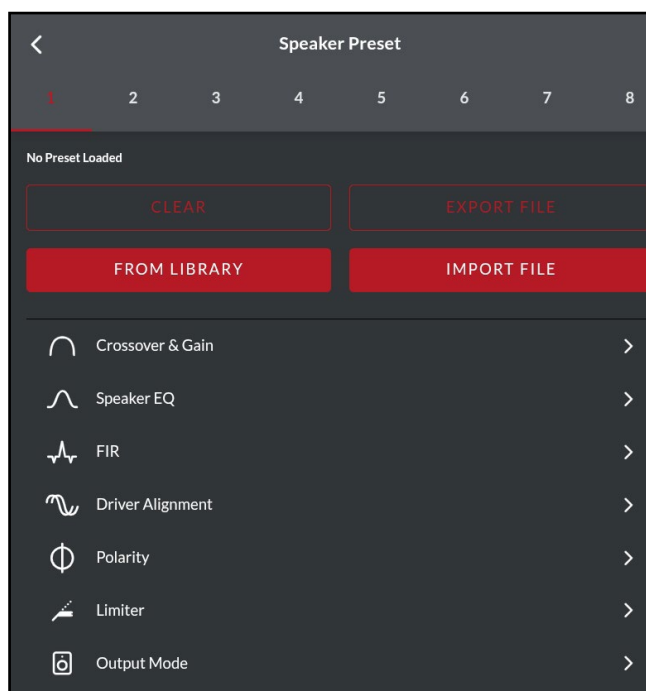


Figure 5.8
Speaker Preset Parameters

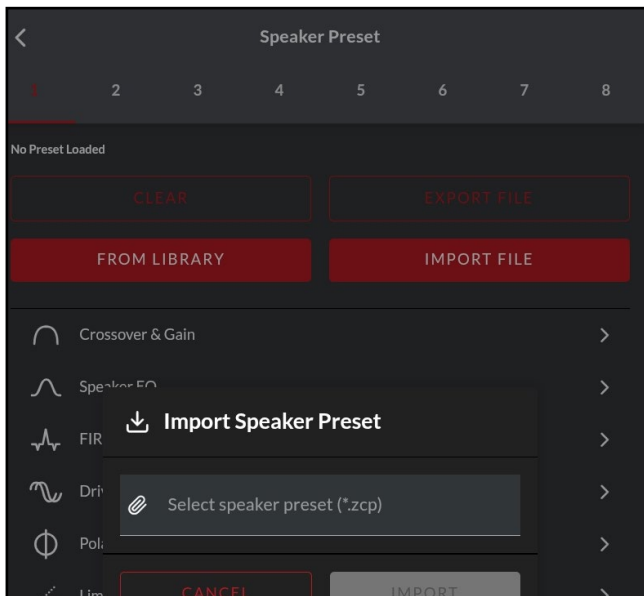


Figure 5.9

Speaker Preset import file selection

Response) based equalisation filter coefficients generated by external speaker measurement software to be imported and applied to individual amplifier outputs. The FIR filter has 512 taps at 48 kHz.

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

- The **Driver Alignment** preset menu enables delay to be applied to individual amplifier outputs.
- The **Polarity** preset menu enables the polarity of individual amplifier outputs to be reversed.

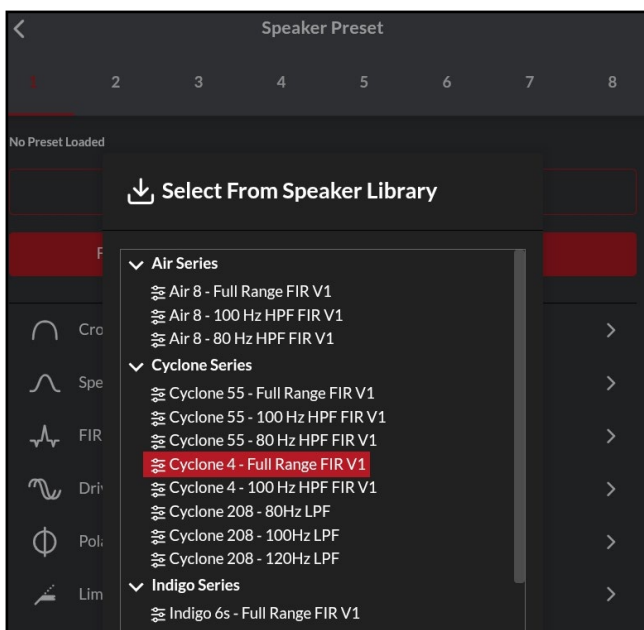


Figure 5.10

Speaker Preset Library



Figure 5.11

Speaker Preset parameter adjustment

- The **Limiter** preset menu enables signal limiting to be engaged or bypassed on individual amplifier outputs. **Clip** limiting, **Peak** limiting and **RMS** limiting can be individually or collectively engaged. The Clip limiting function offers Fast and Normal response time options. The Peak limiting function can be set to either Automatic or Manual parameter values. The RMS Limiter has default parameter values that can be adjusted but has no automatic option.

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

- The **Output Mode** preset menu enables individual amplifier outputs to be switched off or configured for Lo-Z or Hi-Z modes. In Hi-Z modes, a high-pass filter can also be configured and applied to the output. The number of outputs available will depend on the amplifier model, input setup and zone setup. For example, a four output amplifier will have four outputs available if Lo-Z mode is selected but only two outputs available if Hi-Z mode is selected.

Note: Use of a high-pass filter with Hi-Z mode loudspeakers is useful to avoid the possibility of distortion caused by low frequency line transformer saturation. Begin with the default filter setting of 70 Hz. If low frequency distortion is still audible, increase the frequency setting one step at a time until the distortion is no longer audible.

5.3.5 Settings Tab

The **Settings Tab** enables miscellaneous amplifier settings to be configured and installation data to be recorded. The Settings Tab provides access to further sub-menus. **Figure 5.12** illustrates the **Settings Tab**.

- The **System Information** menu provides text fields for the recording of installation data.
- The **Device** menu records amplifier-specific information such as the model number and firmware version. A firmware update routine and identifier button can also be found under the Device menu.
- The **External Devices** menu enables control panels to be paired with an amplifier and configured. Depending on product, setup and configuration, each device can remotely control one single or multiple amplifier zones.
- The **Backup & Restore** menu enables amplifier configuration data to be downloaded to an external archive, and enables previously saved configuration files to be uploaded and adopted by the currently connected amplifier.
- The **Speaker Library** menu enables management of speaker preset libraries. Existing libraries of speaker preset files (.zcl) can be created or imported, and existing libraries edited or fully deleted. **Figure 5.13** illustrates the creation and management of speaker preset libraries.
- The **Security** menu enables a password to be set in order to protect against unauthorised access to the amplifier Inca Series Control Web App. Password protection is particularly important when an amplifier is connected to a wired network as a Wi-Fi password is no longer required to gain access to Inca Series Control Web App.

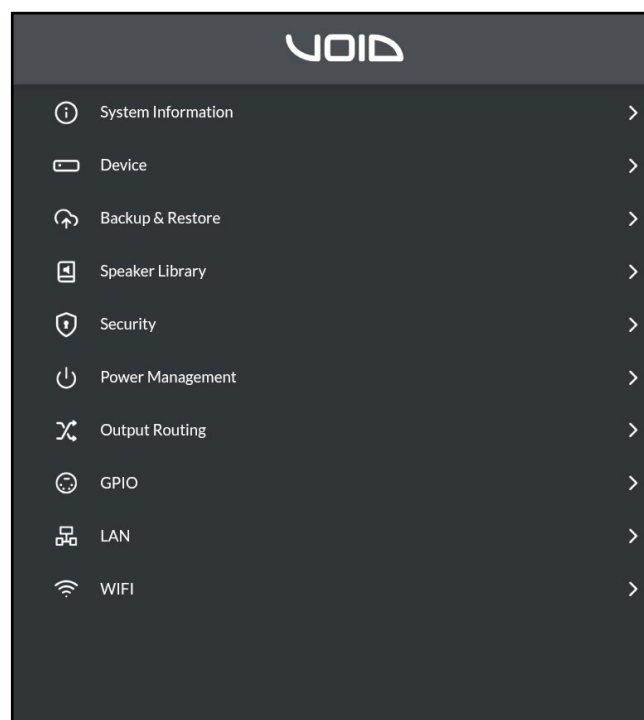


Figure 5.12
Settings Tab menu

Note: It is recommended that a Inca Series Control Web App password is different from that required to gain access to the amplifier via Wi-Fi.

- The **Power Management** menu enables various automatic switch-on options to be engaged. The Power Management menu also offers timed Standby and Mute functions.

Note: In Eco mode the network is switched off during standby.

- The **Output Routing** menu enables specified inputs or zones to be routed to the amplifier S/PDIF outputs. The output level can also be adjusted.

Any zone or input can be routed to either digital output, including inputs not actively assigned to a zone. Primary or priority input status is immaterial. The specified input is always routed to the specified output to be available for use by downstream devices.

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

signal will be fixed.

Note: The digital output function is especially useful when amplifiers are to be daisy-chained and a specific input; a central paging mic, for example, is required to be routed to multiple amplifiers.

- The **GPIO** menu enables configuration of the multi-purpose GPIO interface pins. A description of the individual settings is detailed in **Inca Series Control**.
- The **LAN** menu enables configuration and reset of the wired network options and parameters.
- The **Wi-Fi** menu enables configuration and reset of the wireless network options and parameters.

5.4 Setup and Signal Routing

Thanks to their network based configuration features, **Inca Series** amplifiers offer considerable versatility in terms of sources, signal routing, installation zones and output modes. Inputs can be freely assigned to installation zones, and those zones assigned freely to the available amplifier outputs in either Lo-Z or Hi-Z modes.

This versatility enables, for example, one amplifier simultaneously to drive both Lo-Z and Hi-Z speakers, or for different inputs to be routed to different output zones.

The following paragraphs describe and illustrate the recommended procedure for configuring input, zone and output routing. A general signal flow schematic is also illustrated in **Figure 5.14**.

5.4.1 Input Setup

Open the configuration Dashboard and select the **Input Tab**. The Input Tab is shown in **Figure 5.2**.

- To edit default input names simply select and type in the Input Name field.
- Define a mono or stereo input by selecting the appropriate option. Defining a stereo input will reduce the total number of discrete inputs available.
- Select an input sensitivity option from the drop-down menu: +14dB, +4dB, -10dB and 'microphone' options are available. Generally, the +14dB or +4dB options are appropriate for 'professional audio' source hardware with balanced outputs, while the -10dB option is more appropriate for 'consumer audio' source hardware with unbalanced outputs. The

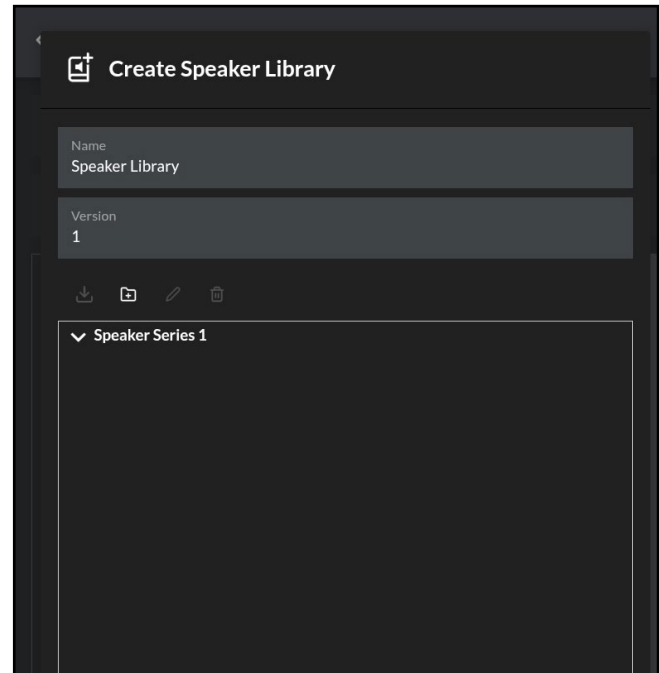


Figure 5.13

Speaker Library Creation and Management

'microphone' option provides the significantly greater sensitivity required for microphones.

Note: Only dynamic microphones are suitable for connection. Phantom power for condenser microphones is not provided.

- If necessary, adjust the input gain using the slider or up/down icons. Gain adjustment is intended to be used for fine output level adjustment following initial

Note: Creating a speaker library in the amplifier will wipe the currently stored library.

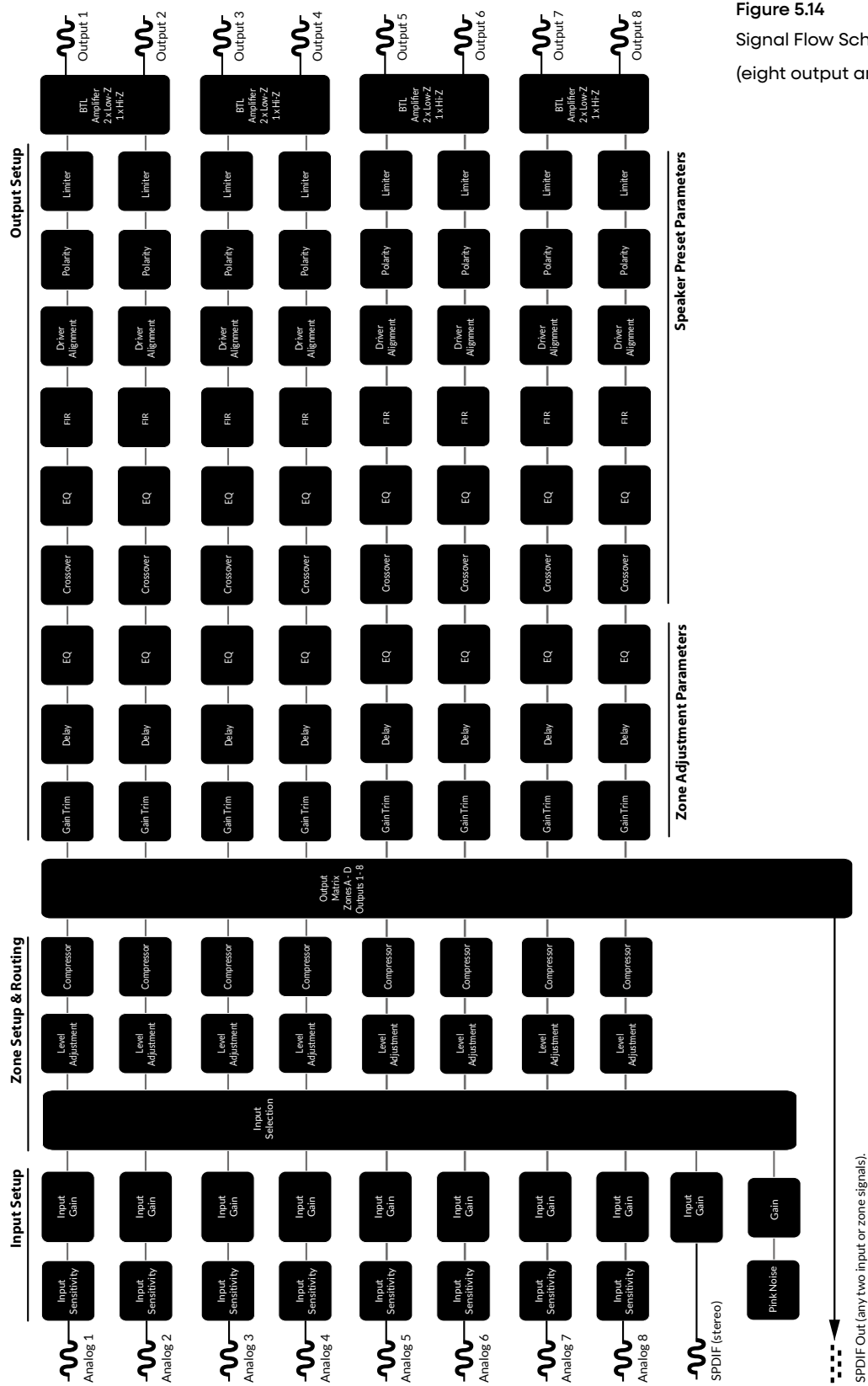


Figure 5.14
Signal Flow Schematic
(eight output amplifier)

use. If necessary, adjust the input EQ using the 5 band equaliser.

5.4.2 Zone Setup & Routing

Open the configuration Dashboard and select the **Zone Tab**. The Zone Tab is shown in **Figure 5.5**.

- Select the zone to be configured. The number of zones available and their channel format (stereo or mono) will depend on the amplifier model, input setup and output mode (Lo-Z or Hi-Z).
- A four output amplifier can have the following zones configured:
 - 2 x stereo Lo-Z zones
 - 4 x mono Lo-Z zones
 - 2 x mono Hi-Z
 - 1 x mono Hi-Z + 1 x stereo Lo-Z zone
 - 1 x mono Hi-Z + 2 x mono Lo-Z zones
- An eight output amplifier can have the following zones configured:
 - 4 x stereo Lo-Z zones
 - 8 x mono Lo-Z zones
 - 4 x mono Hi-Z or zones
 - 2 x mono Hi-Z or + 2 x stereo Lo-Z zone
 - 2 x mono Hi-Z or + 4 x mono Lo-Z zones

Note: When configured in Hi-Z mode **Inca Series** amplifiers operate in 'bridged' format where the output of two channels is combined. This means that the number of output channels available in Hi-Z mode is half that available in Lo-Z mode .

channels to mono.

BTL mode is only allowed for speakers with an impedance of 8 Ohm or higher.

Note: Mono signals might be mono at source, created through combining the left and right channels of a stereo signal (summed mono) or treating the left and right channels of a stereo signal independently (split mono).

- Name zones by typing in the Zone Name field.
- Adjust the zone volume if required by using the slider.
- Define a mono or stereo zone by selecting the appropriate option. Defining a stereo zone will reduce the total number of further zones available.
- Specify an input for the zone by selecting from the drop-down menu. Selecting a stereo input for a mono zone will automatically sum the stereo

5.5 GPIO Setup and Connection

Inca Series amplifiers provide a GPIO socket that enables remote control of volume, standby, mute and trigger functions. The GPIO connector pin functions are described in the **GPIO Settings** menu illustrated in **Figure 5.15**. The connection of GPIO based remote

 volume control and standby/mute are illustrated in **Figure 5.16** and **Figure 5.17** respectively.

 Note: The GPIO connector must not be used for any unintended purpose. Amplifier damage may result from incorrect use of GPIO.

 Note: Shielded cable must be used when connecting standby switches and potentiometers via GPIO.

 Note: GPIO Pin 8 has a low output impedance and is able to supply a maximum current of 10mA.

Note: GPIO Pin 1 and Pin 3 both offer ground connections: Pin 1 is connected directly to the amplifier chassis.

Pin 3 is connected to the chassis via a 220 Ohm resistor. The 'soft ground' connection of Pin 3 is potentially useful for managing ground loops that may cause audible hum.

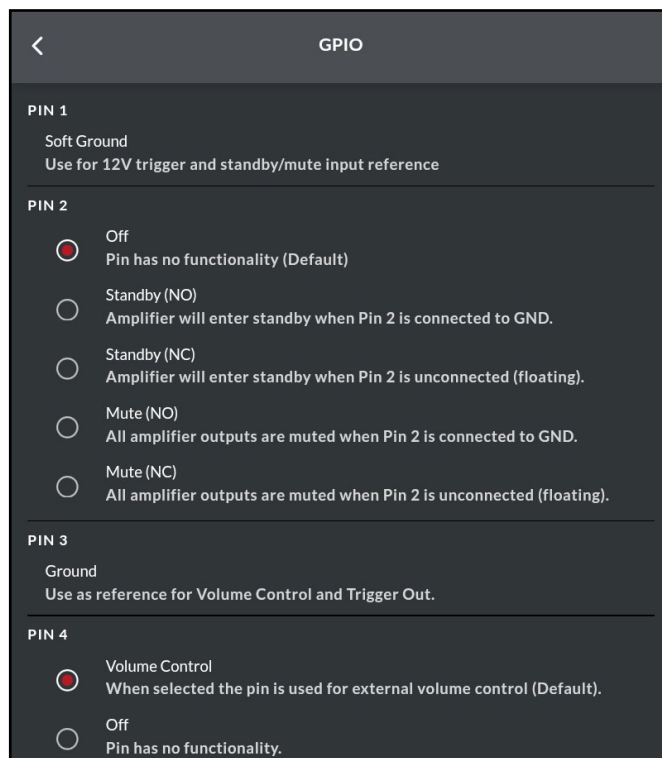


Figure 5.15
GPIO Settings Menu

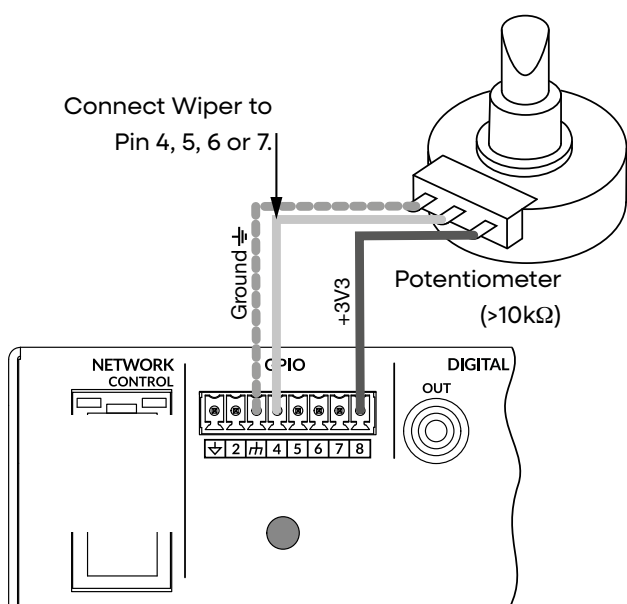


Figure 5.16
Potentiometer connections for remote volume control via GPIO.

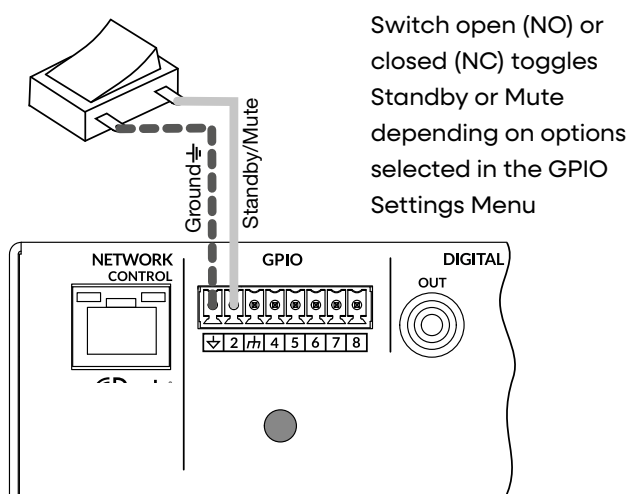


Figure 5.17
Connections for remote standby/mute switch via GPIO.

Note: Wall panel controllers are locked to Inca Series amplifiers.

6.0 Connections

Inca Series amplifier rear panel connections are illustrated in Figures 6.1, 6.2 and 6.3.

6.1 Mains Power Connection

Inca Series amplifiers incorporate a power factor corrected universal power supply and can be used with mains input voltage from 100 V AC to 240 V AC, 50/60 Hz. Use the mains cable supplied with the amplifier.

Inca Series amplifiers have no mains power switch and are operational as soon as mains power is connected. Ensure that all signal, GPIO and output connections are made before connecting the amplifier to mains power.

6.2 Input Connection

Inca Series amplifiers provide four (Inca 500 / Inca 2000) or eight (Inca 1000) balanced or unbalanced analogue audio inputs and a stereo S/PDIF digital audio input. Any input channel can be routed to any output channel. Input routing options can be configured via the amplifier network interface. See Section 5 of this manual.

Analogue Inputs

Inca Series analogue inputs are of line level format with a default input sensitivity of +4dBu (full output voltage swing/sensitivity) in all output modes. Input signal levels up to +24dBu can be handled without input clipping. Input sensitivity options can be set via the amplifier network interface. See Section 5 of this manual.

Balanced input connections to the amplifiers are made via male 'Euro Block' connectors. Connecting cables to the supplied female input connectors is illustrated in Figure 6.3.

Unbalanced input connections to the amplifiers are made via RCA phono sockets connected in parallel with the balanced inputs.

Digital Outputs

Inca Series S/PDIF stereo digital audio output connections are made via a single RCA Phono socket. The S/PDIF output signal can be routed from any input or zone and is intended to be used for daisy-chaining Inca Series amplifiers.

Note: See the Output Routing paragraphs of Section 5.3.3 for more information on Digital Output configuration.

Note: 75Ω RCA Phono cables specifically intended for digital audio should always be used for S/PDIF connections. Standard Phono cables can be used but may not result in optimal performance.

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

Figure 6.1

Inca 500 (1U half-rack width) amplifier rear panel connections.

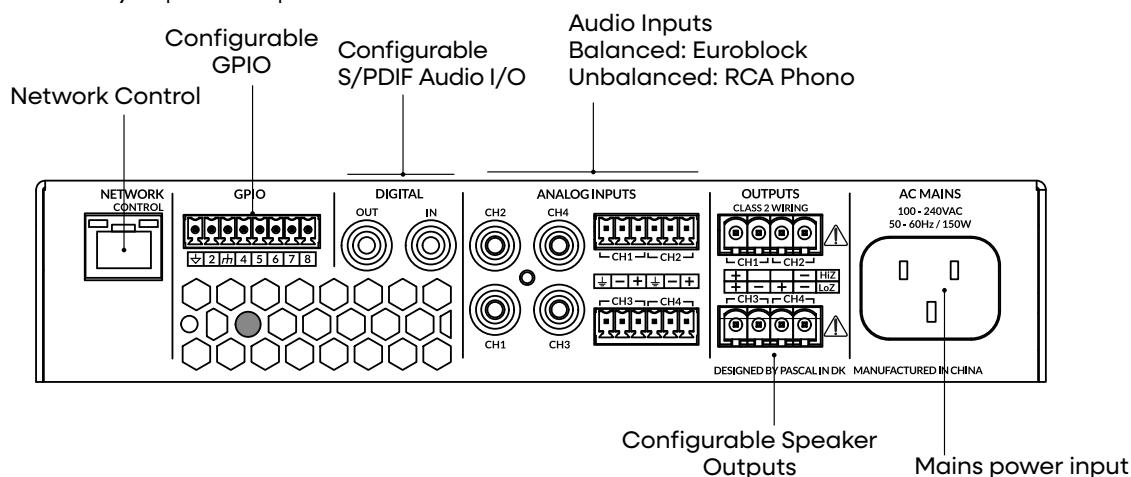


Figure 6.2

Inca 1000 (1U full-rack width) amplifier rear panel connections.

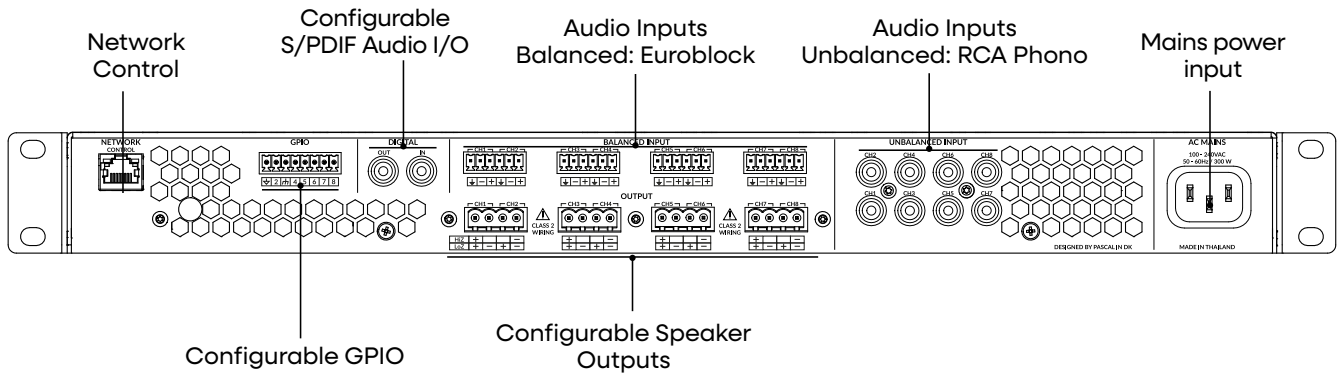
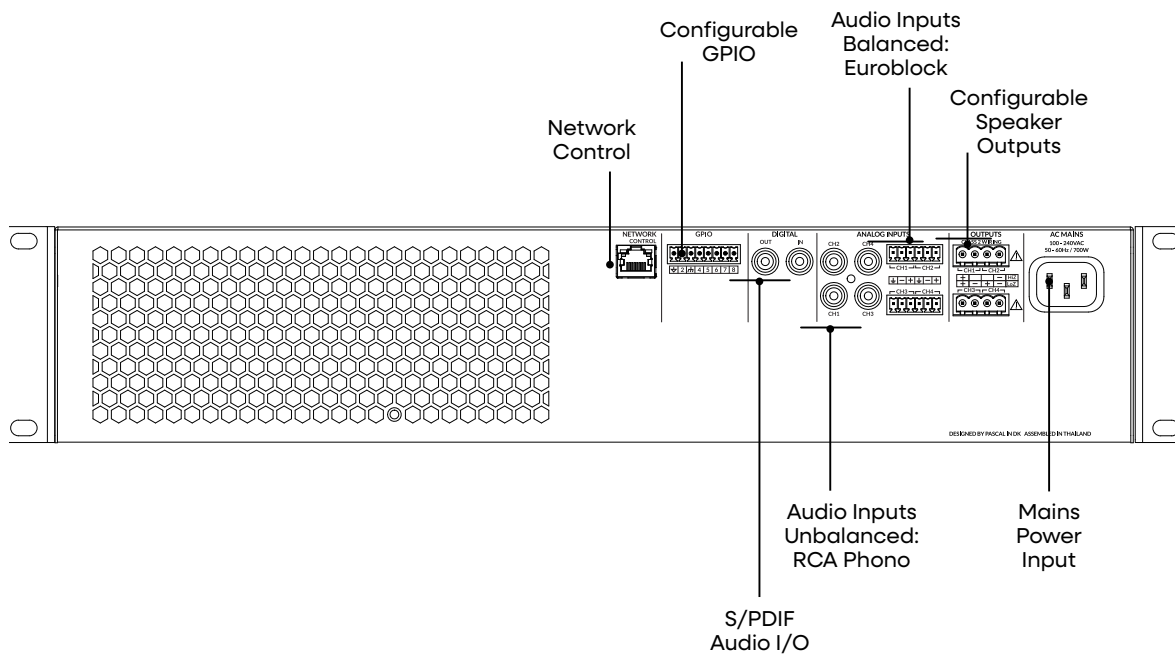


Figure 6.3

Inca 2000 (2U full-rack width) four output rear panel connections.



6.3 Output Connections

Output connections from the amplifiers are achieved via male 'Euro Block' connectors. Ensure that speaker connection polarity is correct throughout the installation:

In the case of Lo-Z speaker connections, positive (+) amplifier terminals should always be connected to positive speaker terminals and negative (-) amplifier terminals always connected to negative speaker terminals.

In the case of Hi-Z speaker connections, the two speaker cable conductors should be connected between the positive (+) terminal of Output 1 and the negative terminal (-) of Output 2, and likewise for any additional Hi-Z outputs.

Output mode options (Lo-Z or Hi-Z) can be configured via the amplifier network interface. See **Section 5** of this manual.

6.4 Speaker Cable Gauge

Inca Series speaker connection cable gauge should be chosen appropriately to reflect the type of installation. The adjacent tables specify the appropriate cable gauge for less than 0.5dB cable loss with different installation types and cable lengths.

6.5 GPIO Connections

If any **Inca Series** GPIO functionality is required, cables will need to be connected to the supplied GPIO connector. Connecting cables to the GPIO connector is illustrated in **Figures 6.5**.

6.6 Network Connections

Inca Series Control

Inca Series amplifiers are TCP/IP network connected devices that are configured via a web-based interface. Wired (Ethernet) and wireless (Wi-Fi) connection options are available. Connecting **Inca Series** amplifiers to a TCP/IP network is described in **Section 5** of this manual. If a wired connection is used, connect an Ethernet cable to the amplifier rear panel Network Control socket.

Cable Gauge Table

Lo-Z installations, 0.5dB attenuation. 4 Ω & 8 Ω loads

Cable Cross Section (mm ²)	Cable Gauge (AWG)	Max Cable Length (Metres, 4 Ω load)	Max Cable Length (Metres, 8 Ω load)
0.75	≈18	5	10
1.5	≈16	10	20
2.5	≈14	17	35
4.0	≈12	28	55

Cable Gauge Table

70V Hi-Z installations, 1.0dB attenuation

20 speakers evenly distributed

Cable Cross Section (mm ²)	Cable Gauge (AWG)	Max Cable Length (Metres), (125 W/channel)	Max Cable Length (Metres), (250 W/channel)
0.75	≈18	90	45
1.5	≈16	180	90
2.0	≈14	<250	150
3.5	≈12	<250	<250

Note: Cable lengths should not exceed 250m.

Cable Gauge Table

100V Hi-Z installations, 1.0dB attenuation

20 speakers evenly distributed

Cable Cross Section (mm ²)	Cable Gauge (AWG)	Max Cable Length (Metres), (125 W/channel)	Max Cable Length (Metres), (250 W/channel)
0.75	≈18	190	90
1.5	≈16	<250	180
2.0	≈14	<250	<250
3.5	≈12	<250	<250

Note: Cable lengths should not exceed 250m.

Figure 6.3

Balanced analogue input cable connections.

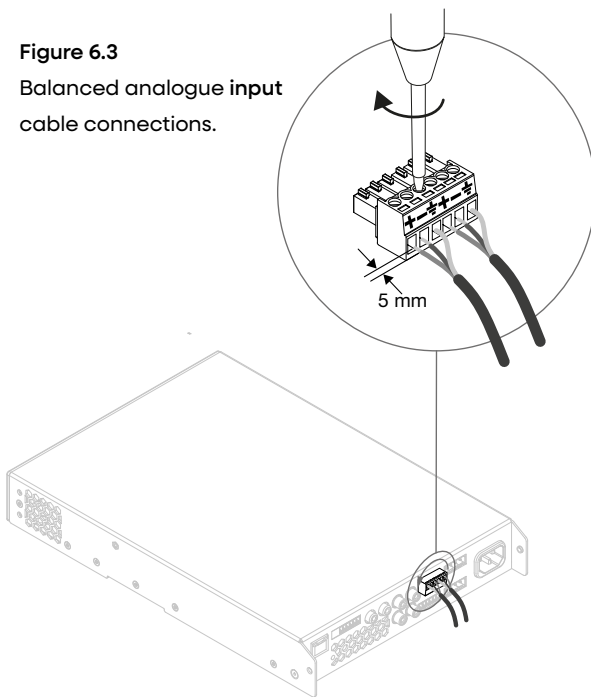


Figure 6.5

GPIO cable connections.

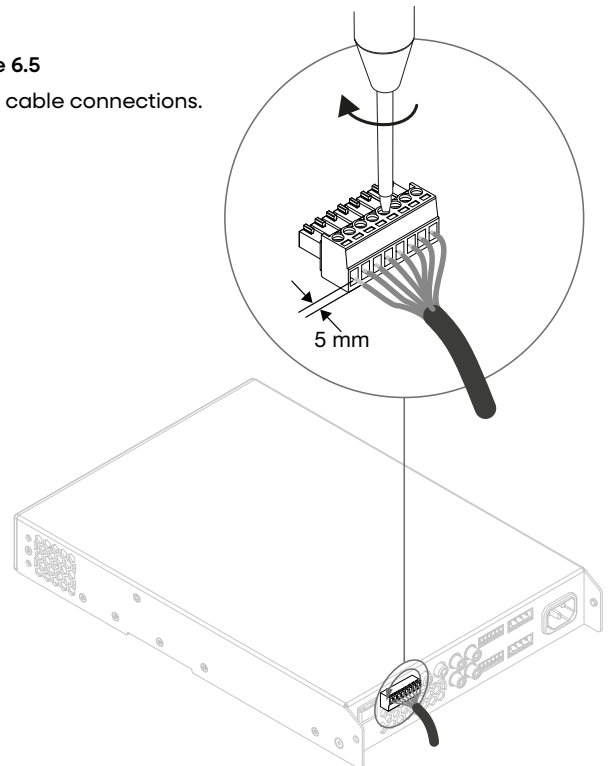
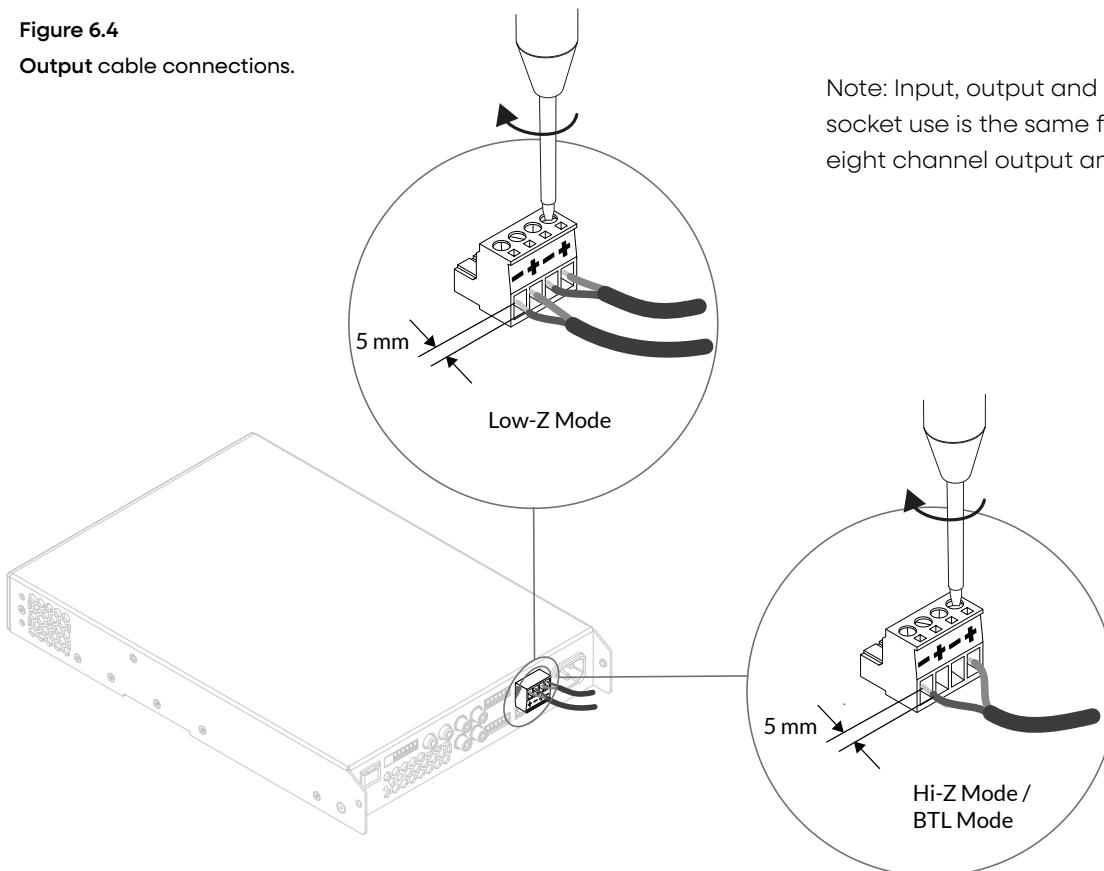


Figure 6.4

Output cable connections.



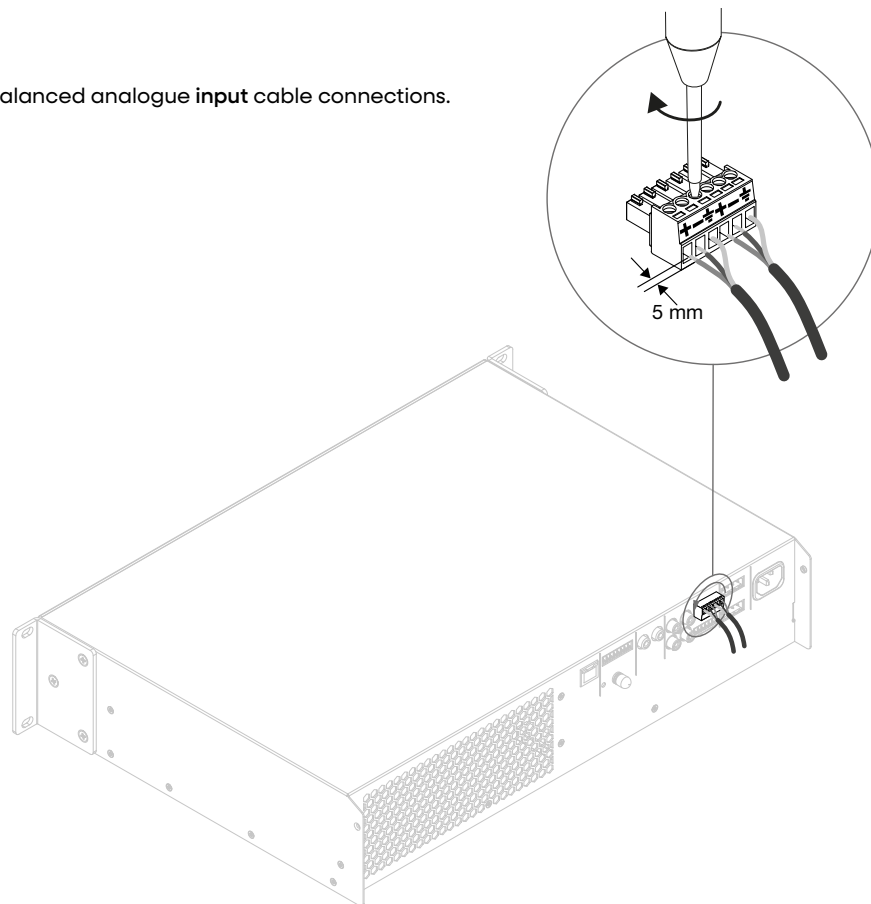
Note: Input, output and GPIO connection socket use is the same for two, four and eight channel output amplifiers.



The exclamation point printed next to the output terminals of the amplifiers is, in addition to the CLASS 2 WIRING text, intended to alert users to the risk of hazardous voltages. Output connectors that could pose a risk are marked with the exclamation point. Do not touch the output terminals while the amplifier is switched on. Make all connections with the amplifier switched off.

Figure 6.6

Four output amplifier balanced analogue input cable connections.

**Figure 6.7**

Four output amplifier Output cable connections.

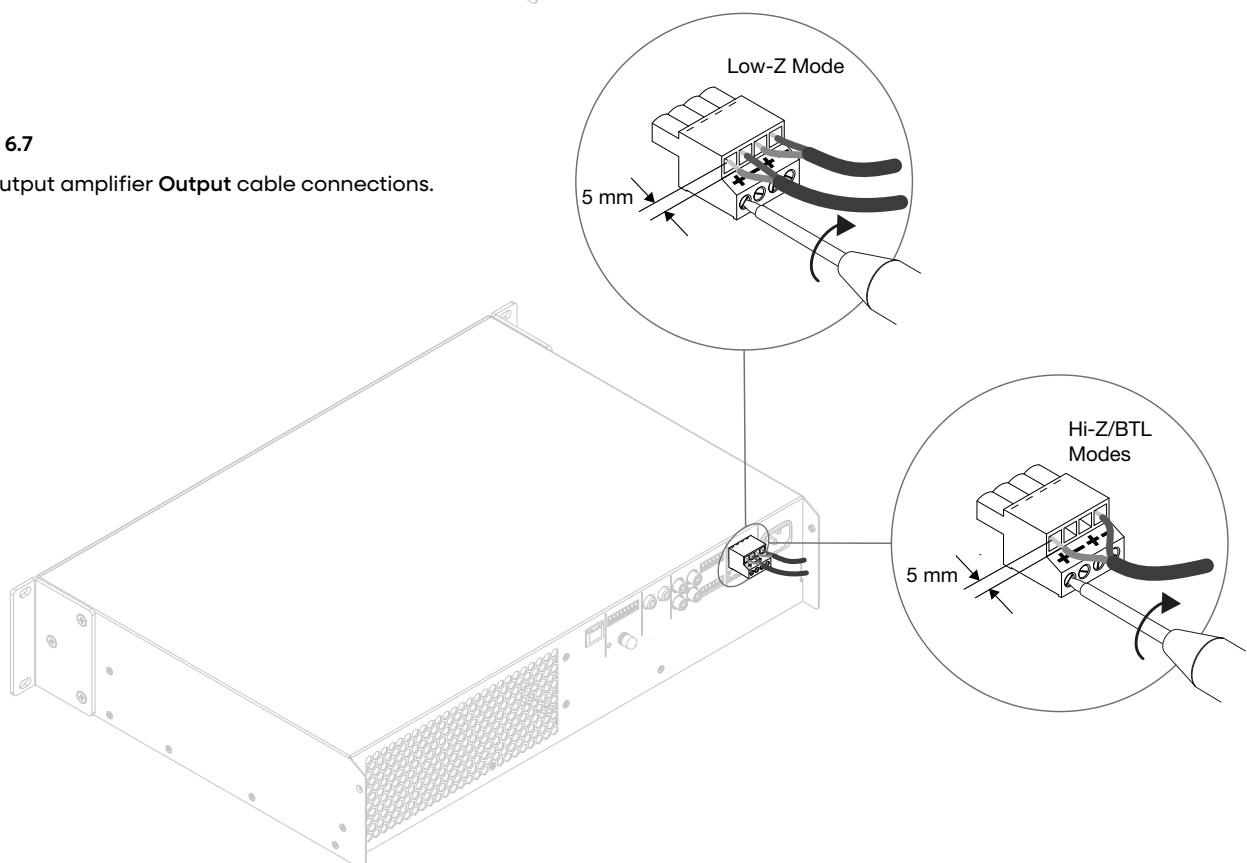
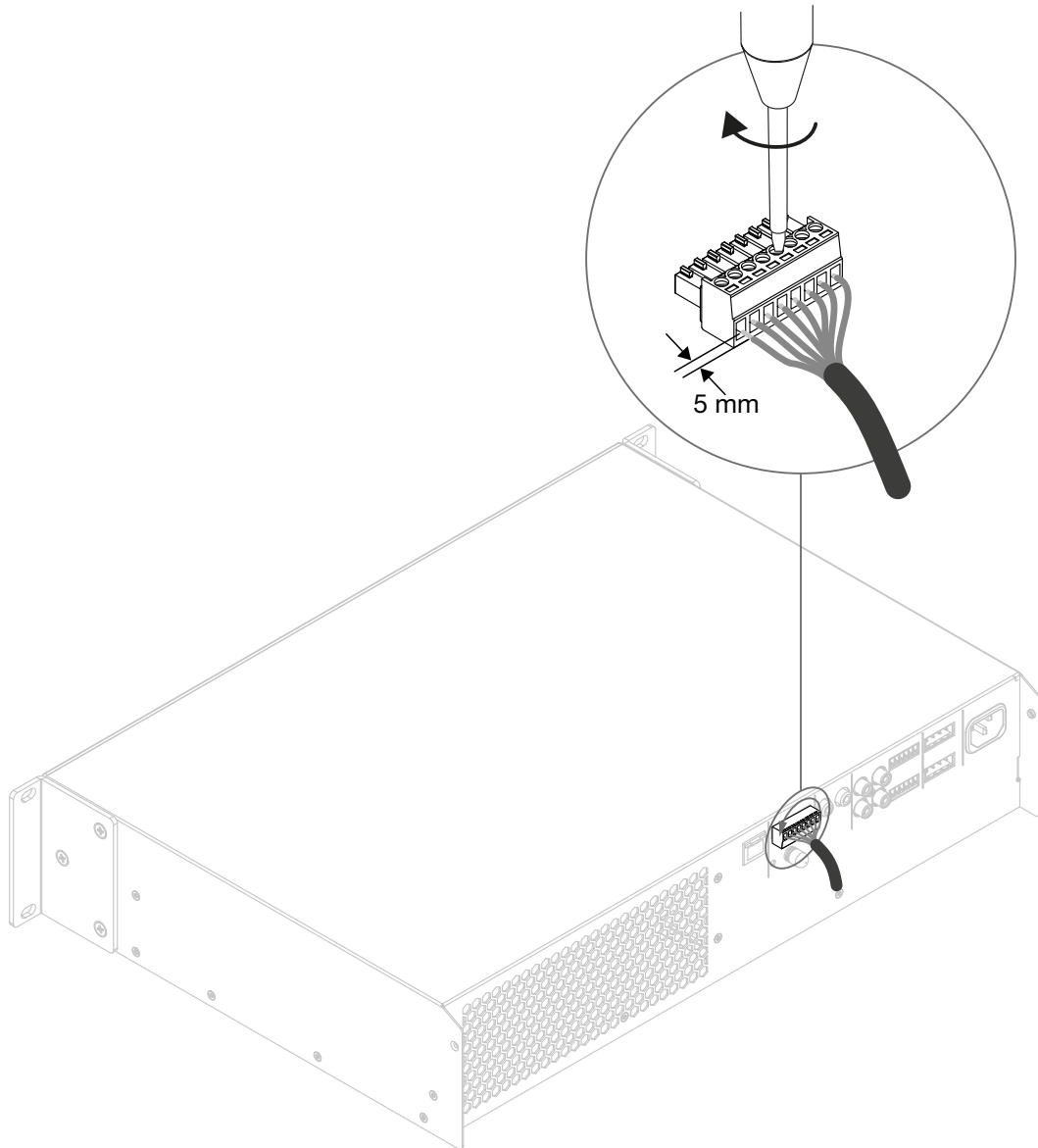


Figure 6.8

Four output amplifier GPIO cable connections.



7.0 Operation

Once all connections have been made and configuration options selected, Inca Series amplifiers are ready for use. If an input signal above -60dB is present on any input, the front panel Input and Standby indicators will illuminate green to indicate normal amplifier operation. Audio will be heard from any connected speakers.

Note: **Inca Series** amplifiers will not switch on from Standby Mode unless an input signal is present, a network 'ON' command is received, or an external standby switch (or 12V trigger) is operated. Standby behaviour can be configured via the Power Management menu of the Settings Tab.

Amplifier outputs will mute if no input signal is present for 5 minutes, and the amplifier will switch automatically to Standby Mode if no signal is present on any input for more than 15 minutes. Alternative standby and mute delay times can be selected via the Settings Tab. Amplifier cooling fan speed is temperature controlled. The fan will switch off when the amplifier enters standby mode.

7.1 Front Panel Indicators

Inca Series amplifier front panel indicators illuminate to indicate the following operational states:

Status:	Off – Mains power disconnected. Green – Amplifier operational. Pulse Green – Standby Mode. Amber – GPIO triggered Standby Mode
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 pair is in overload/protection mode.

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

Wi-Fi: Off – Wi-Fi disabled.
Green – Wi-Fi enabled.

7.2 Automatic Power Sharing

Inca Series amplifiers incorporate a power sharing feature that automatically shares the total power available from the amplifier's internal power supply across each pair of output channels. If one channel temporarily demands more than the amplifier's continuous power rating while other channel is demanding less, the excess power available from the internal power supply is automatically made available to the over-power channel. Power sharing optimises the amplifier's ability to deliver maximum power into dynamic loudspeaker loads when playing music programme material.

7.3 Default Reset

Inca Series amplifiers can be returned to their default settings via either the Inca Series Control Web App Settings Tab or the hardware reset pinhole button. The reset pinhole button is located on the underside panel of the amplifier.

To reset the amplifier using the pinhole button, follow the steps below:

- Disconnect the amplifier from mains power.
- Use an appropriate tool to press and hold the reset pinhole button while simultaneously reconnecting mains power.
- Continue to hold the reset pinhole button for 3 seconds as the amplifier restarts.

The amplifier will restart with all settings at their default state. Any previously configured settings will be deleted.

8.0 Specifications

Model	INCA 500	INCA 1000
Channels	4	8
Total System Power	500 W	1000 W
Output Power @ 4/8 Ω	4 x 125 W	8 x 125 W
Output Power @ 70/100 V*	2 x 250 W	4 x 250 W
Powershare (up to) Across all channels**	2 x 250 W	4 x 250 W
Power Consumption	150 W	300 W
Dimensions	44.5 x 220 x 322 mm (1.8 x 8.7 x 12.7 in)	44.5 x 440 x 322 mm (1.8 x 17.3 x 12.7 in)
Weight	2.8 kg (6.2 lbs)	3.8 kg (8.4 lbs)
Power Ratings	1% THD @ 120 Vac and 230 Vac	
Output Circuitry	UMAC™ Class D - full bandwidth PWM modulator with ultra-low distortion	
Output Voltage	45 Vrms (S.E) - 70/100 V (Hi-Z)	
Signal To Noise-Ratio	>106dB (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/-0.8 dB (8 Ω load, 3 dB below rated power)	
Protection Circuits	Short circuit -, DC -, Under-voltage -, Temperature - and Overload protection	
Power Supply	UREC™ universal mains switch mode power supply with Power Factor Correction (PFC) and standby converter	
Operating temperature	0-40°C	
Operating Voltage/ Frequency	Universal Mains, 100 V - 240 V, 50 Hz - 60 Hz	
Standby Consumption	< 0.5 W	
Accessories	2x Rack-ears (optional) 1x ½ rack-plate extension 2x ½ rack-mounting plates 2x Rear supports	2x Rack-ears (fitted) 2x Rear supports

*100 V line mode is @ -1dB ($\approx$ 90 V)

** Inca 500 may only Powershare across Ch1-2 and Ch3-4w

Inca 1000 may only Powershare across Ch 1-2, Ch 3-4, Ch 5-6 and Ch 7-8

Model	INCA 2000
Channels	4 x Lo-Z/2 x Hi-Z
Output Power @ 2 Ω	4 x 500 W (SE)*
Output Power @ 4 Ω	4 x 500 W (SE)* 2 x 1000 W (BTL)**
Output Power @ 8 Ω	4 x 250 W (SE)* 2 x 1000 W (BTL)**
Output Power @ 70 V*	2 x 1000 W (BTL)**
Output Power @ 100 V*	2 x 1000 W (BTL)**
Total System Power	2000 W
Power Consumption	700 W
Output Voltage	45 Vrms (S.E)* - 90 Vrms (BTL)** - 70/100 V (Hi-Z)
Dimensions	88.9 x 440 x 322 mm (3.5 x 17.3 x 12.7 in)
Weight	7.3 kg (16.1 lbs)
Output Circuitry	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	Short circuit -, DC -, Under-voltage -, Temperature - and Overload protection
Power Supply	UREC™ universal mains switch mode power supply with Power Factor Correction (PFC) and standby converter
Operating temperature	0-40°C
Operating Voltage/ Frequency	Universal Mains, 100 V - 240 V, 50 Hz - 60 Hz
Standby Consumption	< 0.5 W
Accessories	2x Rack-ears (fitted), 4 x adhesive feet, input, connection plugs

*SE – conventional, single ended output mode

**BTL – bridge-tied load output mode

Power Efficiency Data

The following table describes the efficiency and power performance of **Inca Series** amplifiers. The table also includes the derived thermal losses.

1/8th Full Power						
Model	Load (Ohms)	Power In (W)	Power Out (W)	Efficiency (%)	Thermal Loss (W)	Thermal Loss (BTU)
Inca 500	4	107	62.5	58.6	44.5	152
Inca 1000	4	200	125	62.5	75	256
Inca 2000	2	378	250	66.6	128	436

Standby and Idle					
Model	Standby (mW)	Idle @ 120V (W)	Idle @ 120V (BTU)	Idle @ 230V (W)	Idle @ 230V (BTU)
Inca 500	<500*	14.5	49	15.9	54
Inca 1000	<500*	27.7	94	30.2	103
Inca 2000	<500*	23.2	79	25.6	87

*As per compliance to ErP

Propagation Delay Data

The following tables describes the input/output latency performance of **Inca Series** amplifiers.

4 Channel Amplifiers			
		OUT	
		Analogue	S/PDIF
IN	Analogue	1177µS	458µS
	S/PDIF	1833µS	1104µS

8 Channel Amplifiers			
		OUT	
		Analogue	S/PDIF
IN	Analogue	1307µS	600µS
	S/PDIF	1955µS	1250µS

9.0 Changelog

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