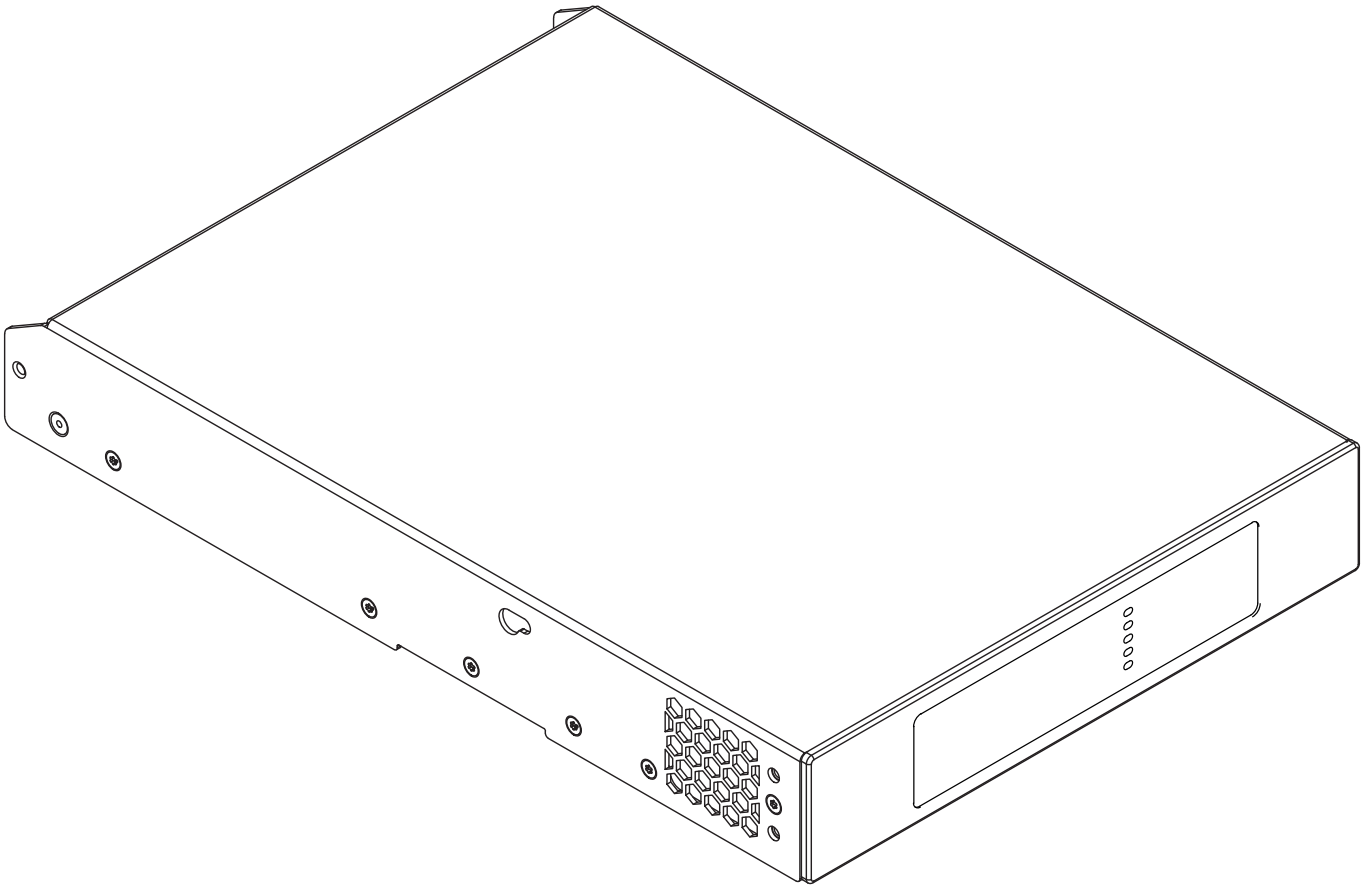
SONANCE

PowerZone® Connect PRO 300.2/300.2D • 600.2/600.2D • 600.4/600.4D • 1200.4/1200.4D

INSTALLATION GUIDE / USER MANUAL



Technical and Safety Notices

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

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 must be connected to a mains socket outlet with a protective earthing connection.
- 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 that is 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 meters above sea level. Amplifiers installed or operated in environments outside these limits may invalidate support, warranty or guarantees of performance.
- Specific warranty terms are the responsibility of the amplifier reseller.

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 persons.

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.

Technical and Safety Notices

Important Safety Instructions

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- 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 polarized or grounding type plug. A polarized 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.
- 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.

Additional Safety Notices

- Adhere to all applicable local codes.
- Consult a licensed professional engineer when any doubt or questions arise regarding a physical equipment installation.
- Do not use any aerosol spray, cleaner, disinfectant or fumigant on, near or into the equipment

Environmental Statement

This product complies with international directives, including but not limited to the Restriction of Hazardous Substances (RoHS) in electrical and electronic equipment, the Registration, Evaluation, Authorization and restriction of Chemicals (REACH) and the disposal of Waste Electrical and Electronic Equipment (WEEE). Consult your local waste disposal authority for guidance on how to properly recycle or dispose of this product.

Introduction and Overview

1. Introduction

PowerZone Connect PRO 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 our technical support.

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

2. Amplifier Overview

PowerZone Connect PRO 300.2/300.2D, 600.2/600.2D, 600.4/600.4D and 1200.4/1200.4D amplifiers are **half-rack** and **full-rack** width, 1U format power amplifiers that can drive both high impedance (Hi-Z, 70 V / 100 V) transformer coupled loudspeakers and conventional low impedance (Lo-Z @ 8 Ω) loudspeakers.

The amplifiers provide four or eight analog inputs depending on model type, one stereo S/PDIF digital input, 4x4 Dante® channels on selected models, and either two or four outputs.

PowerZone Connect PRO amplifiers incorporate automatic power sharing technology that distributes power proportionately as required between pairs of outputs in both Hi-Z and Lo-Z modes. *(Note: This feature is exclusively available on the 300.2, 300.2D, 600.4, and 600.4D models.)*

PowerZone Connect PRO amplifier model rack widths, output channel counts and power outputs are as follows:

PowerZone Connect PRO 300.2/300.2D
(half-rack width)

Mode	Channels	Max Rated Output per Channel
Hi-Z	Two	150 Watts
Lo-Z	Two	150 Watts

PowerZone Connect PRO 600.2/600.2D
(half-rack width)

Mode	Channels	Max Rated Output per Channel
Hi-Z	Two	300 Watts
Lo-Z	Two	300 Watts

PowerZone Connect PRO 600.4/600.4D
(full-rack width)

Mode	Channels	Max Rated Output per Channel
Hi-Z	Four	150 Watts
Lo-Z	Four	150 Watts

PowerZone Connect PRO 1200.4/1200.4D
(full-rack width)

Mode	Channels	Max Rated Output per Channel
Hi-Z	Four	300 Watts
Lo-Z	Four	300 Watts

Introduction and Overview

2.1 Connections

PowerZone Connect PRO 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.

PowerZone Connect PRO amplifiers have no mains power switch and are operational as soon as mains power is connected via the IEC 60320 mains socket.

2.2 Network Features

PowerZone Connect PRO 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 PowerZone Control Center desktop application or PowerZone Control web app and cover Input, Zone, Output and General Settings functions. The configuration menus are fully described in **Section 6** of this manual.

Audinate Dante®

PowerZone Connect PRO amplifiers are optionally compatible with Audinate Dante® audio over IP (AoIP) networks and installations.

Dante® equipped versions of PowerZone Connect PRO amplifiers enable the transmission and receipt of digital audio over an Ethernet network using the IP based Dante® protocol. Configuration and management of the IP routing for Dante® digital audio, including the setting of network parameters such as IP addresses and subnet masks, is administered by Audinate's Dante® Controller software application. Dante® Controller downloads and comprehensive guidance on the configuration and installation of Dante® based audio over IP can be found at: www.audinate.com/products/software/dante-controller.

2.3 Dimensions

PowerZone Connect PRO amplifier dimensions and features are illustrated in **Diagrams 2A, 2B and 2C**. 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.

2.4 Firmware

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 as a priority.

The firmware installed in the amplifier can be identified and updated by selecting the **Device** option in the PowerZone Control web app **Settings Menu**.
Firmware can be downloaded either directly within the PowerZone Control Center desktop application or from the Sonance website at sonance.com.

3. Carton Contents

PowerZone Connect PRO 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 below.

- Amplifier unit
- Mains power cable
- Input connector x 2 (or 4)
- Output connector x 2 (or 4)
- Rack Mount Ears x 2 (full width models only)

Overview

Diagram 2A
PowerZone Connect PRO two channel amplifier dimensions 300.2/300.2D & 600.2/600.2D.
(Shaded area defines ventilation space.)

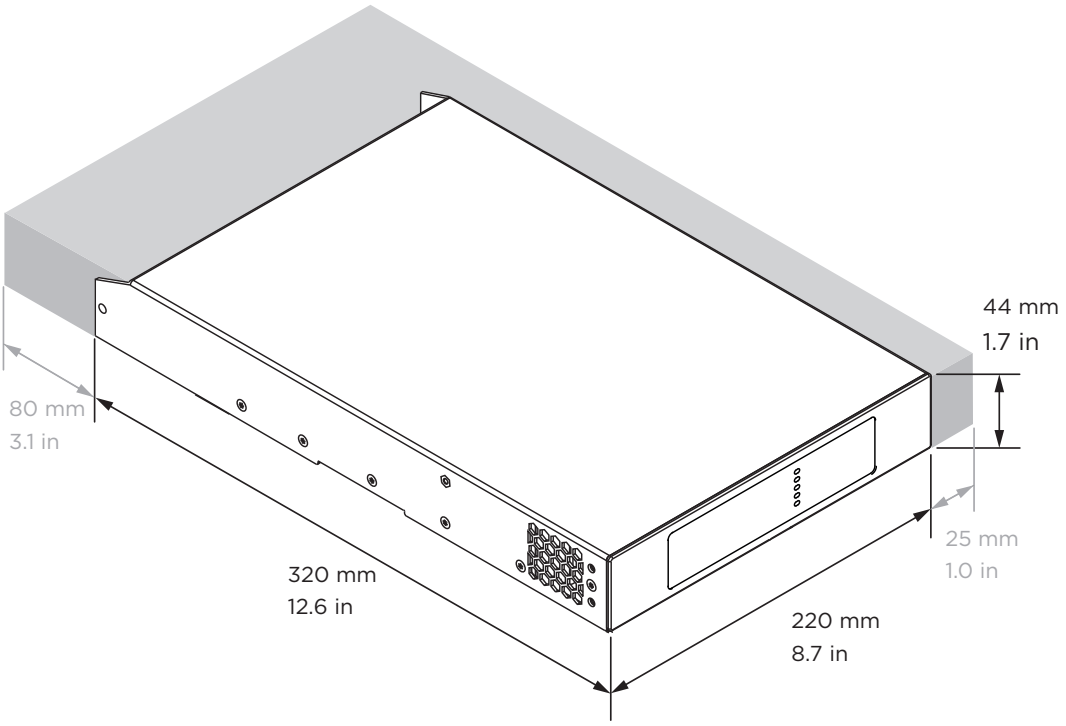
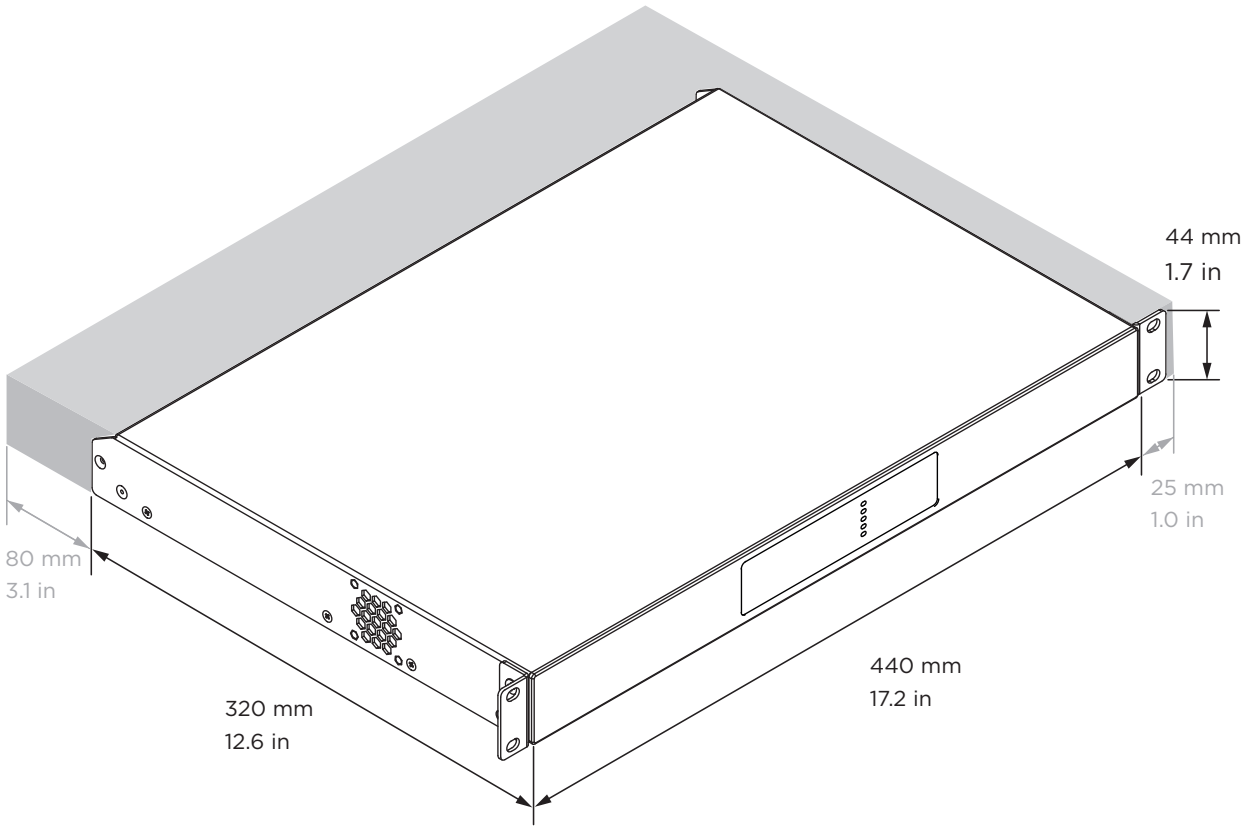


Diagram 2B
PowerZone Connect PRO four channel amplifier dimensions 600.4/600.4D & 1200.4/1200.4D.
(Shaded area defines ventilation space.)



Installation

4. Half-rack Width Amplifier Installation

PowerZone Connect PRO 300.2/300.2D, and 600.2/600.2D

Note: The rack mounting and desk/wall mounting components described and illustrated in Sections 4.1 to 4.3 are not supplied with PowerZone Connect PRO amplifiers but are available to purchase as accessories. Contact your amplifier reseller for more information.

4.1 PowerZone Connect PRO Mounting

PowerZone Connect PRO half-rack width amplifiers are 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 **Diagram 4A**. 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. **Diagram 4B** illustrates the use of rack mount rear support hardware.

Two PowerZone Connect Pro half-rack width amplifiers can also be mechanically connected using accessory connecting plates. **Diagram 4C** illustrates the use of connecting plates.

Diagram 4A
PowerZone Connect PRO
Rack Ear + Half-rack Extension.

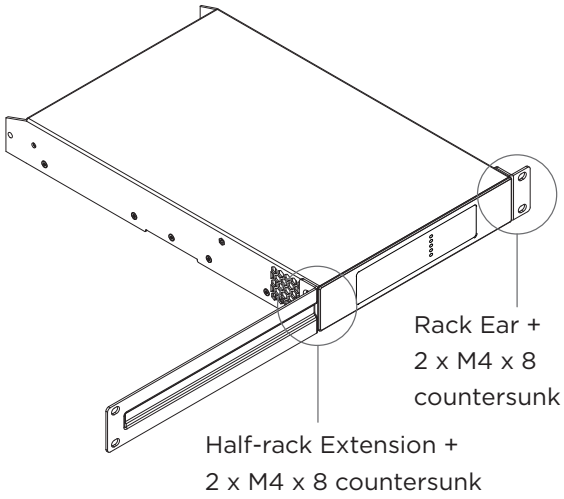
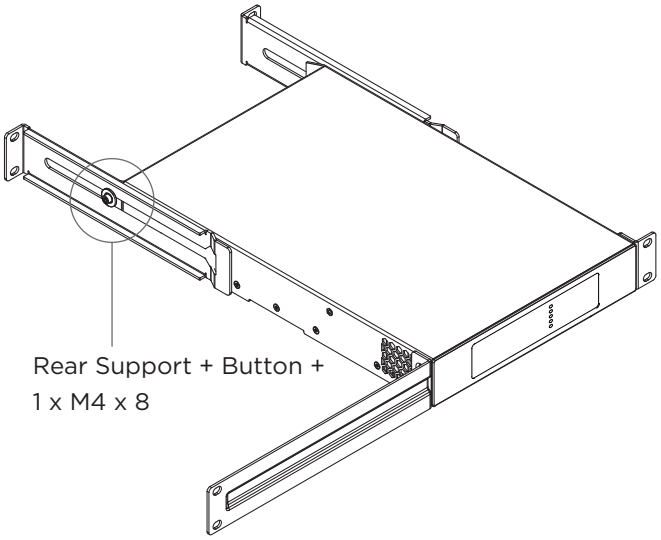


Diagram 4B
PowerZone Connect PRO
Rack Support hardware. 2 positions.



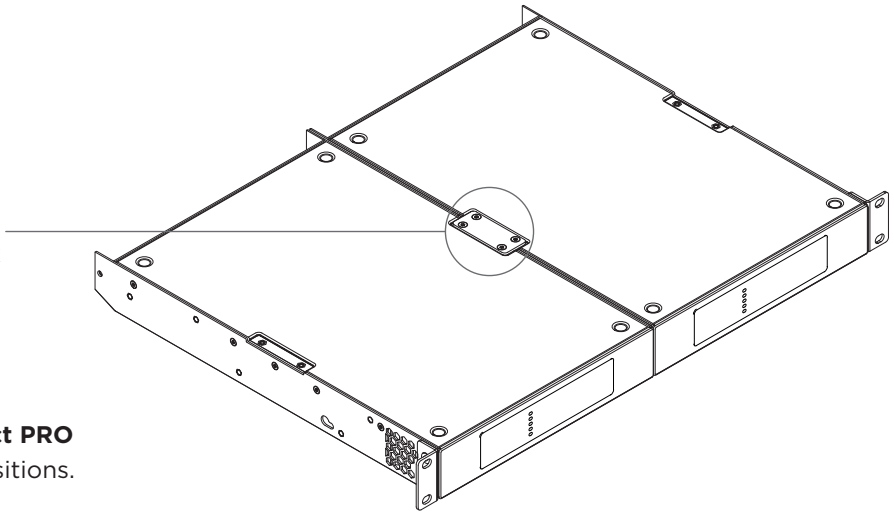


Diagram 4C
2 x **PowerZone Connect PRO**
Connection Plate. 2 positions.

Installation

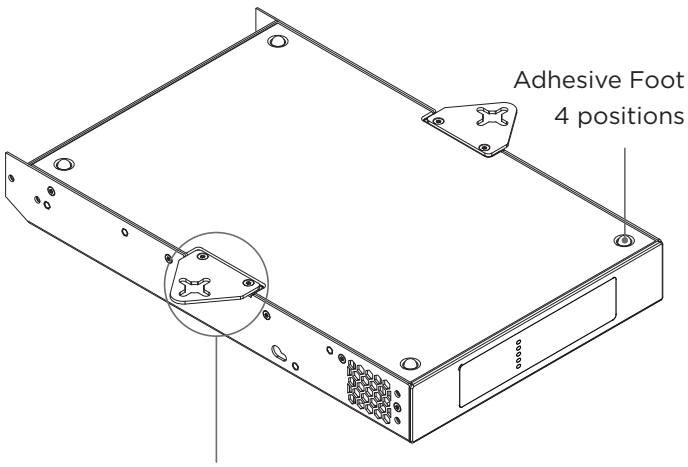
4.2 Free-standing

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

PowerZone Connect PRO 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 **Diagrams 4D and 4E**.

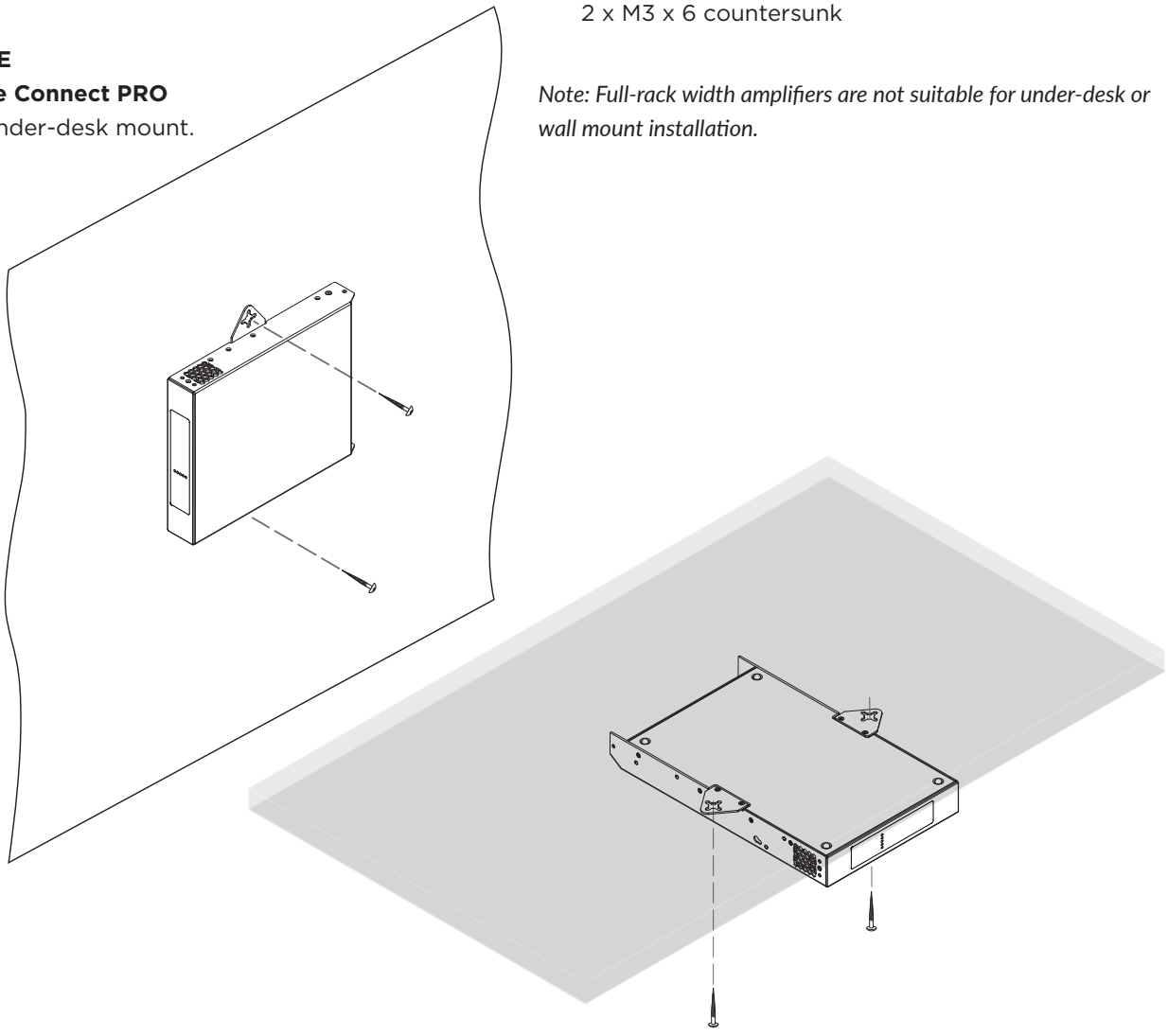
It is important in any free standing installation that airflow through the amplifier's side panel mounted fans and rear panel ventilation apertures is not compromised by adjacent items. At least 80 mm (3.1 in) of free space behind the amplifier and 25 mm (1 in) along at least one side should be retained at all times.

Diagram 4D
PowerZone Connect PRO
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.

Diagram 4E
PowerZone Connect PRO
Wall and under-desk mount.



Installation

5. Full-rack Width Amplifier Installation

PowerZone Connect PRO 600.4/600.4D and 1200.4/1200.4D

Note: Full-rack width PowerZone Connect PRO amplifier models are intended for rack mount or free-standing installation only.

5.1 Rack Mounting

PowerZone Connect PRO full-rack width amplifiers 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. **Diagram 5A** illustrates the use of rack mount rear support hardware.

5.2 Free-standing

If not installed in an equipment rack, PowerZone Connect PRO full-rack width amplifiers can be placed free-standing on a flat surface. Adhesive rubber feet are supplied for this purpose. **Diagram 5B** illustrates the adhesive foot locations.

Diagram 5B
PowerZone Connect PRO
Adhesive feet.

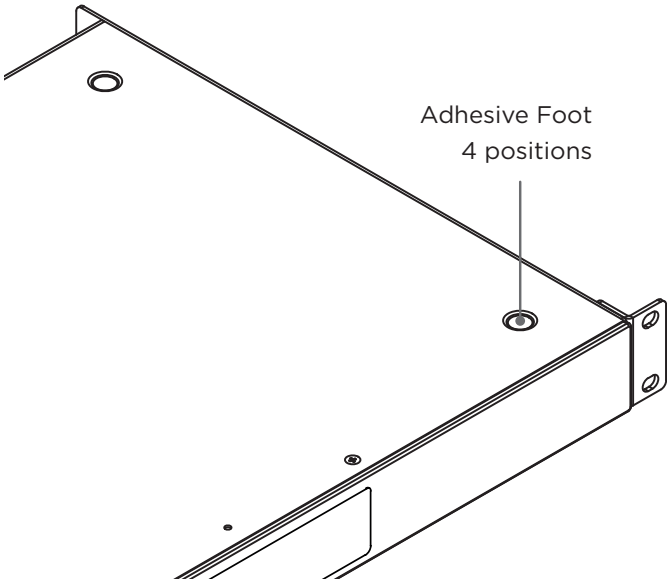
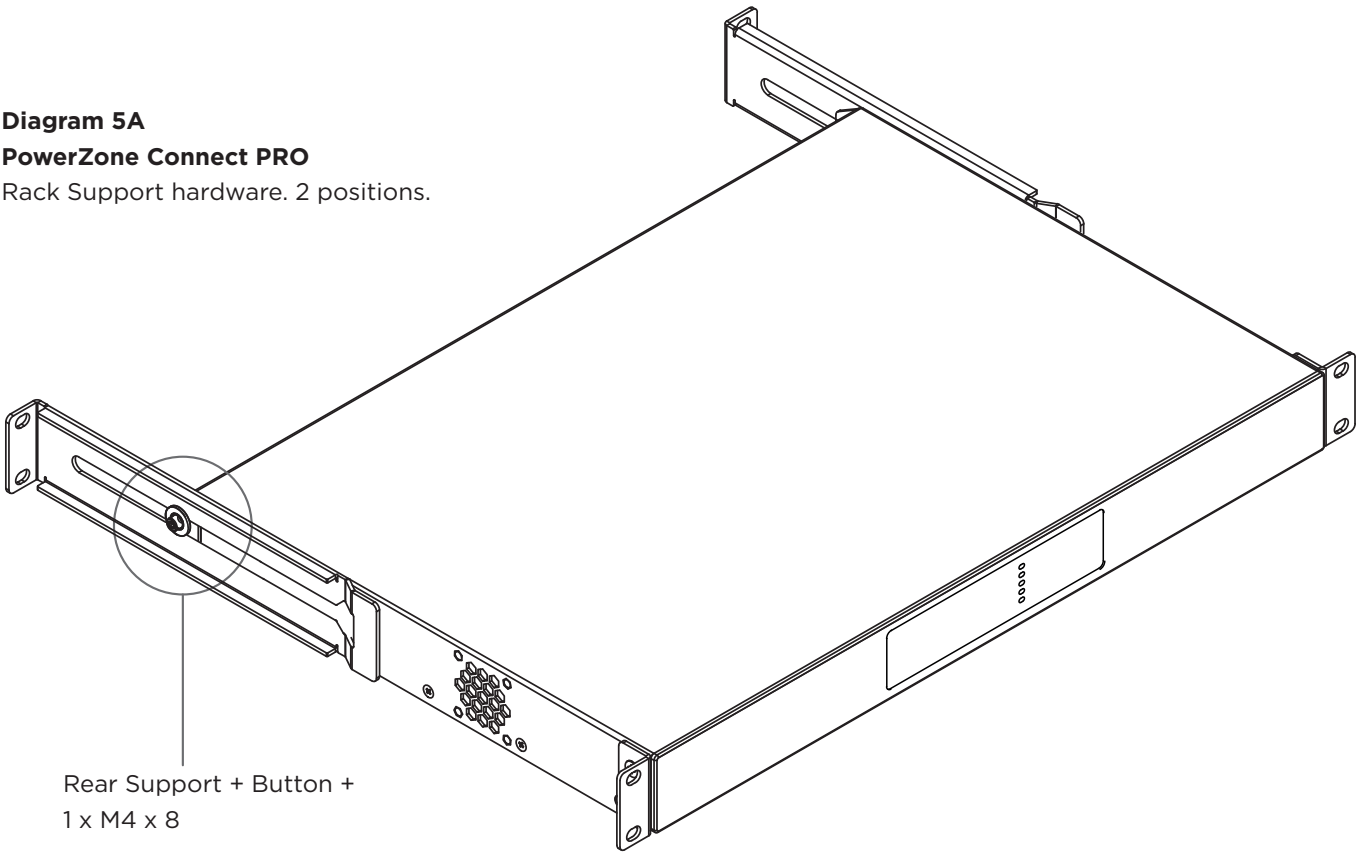


Diagram 5A
PowerZone Connect PRO
Rack Support hardware. 2 positions.



6. Configuration

Before making input, output, and GPIO connections, establish the initial PowerZone Connect Pro amplifier configuration.

Important: Configure the amplifier output format appropriately for the connected speakers before making output connections.

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

6.1 Mains Power Connection

PowerZone Connect PRO 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.

1U format PowerZone Connect Pro amplifiers have no mains power switch and are operational as soon as mains power is connected.

6.2 Network Services

PowerZone Connect PRO amplifiers can be configured using the PowerZone Control Center desktop application or the PowerZone Control web app.

The amplifier can be accessed through a wired Ethernet connection or through its built-in Wi-Fi access point for initial wireless setup.

6.2.1 Wired (Ethernet) Network Connection

To connect a PowerZone Connect PRO amplifier to a TCP/IP network using a wired Ethernet connection, follow the steps below.

1. Use an Ethernet cable to connect the amplifier rear panel Network Control socket to a network router or switch, or directly to an Ethernet-equipped laptop or desktop computer.

2. Connect the 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. PowerZone Connect PRO amplifiers are configured for DHCP by default. When connected to a network with a DHCP server, the amplifier will automatically be assigned an IP address. If needed, use the PowerZone Control Center desktop application or a network scanning app to identify the amplifier on the network.

4. If a DHCP server is not available, configure the laptop or desktop computer with a fixed IP address in the same IP range as the amplifier's default LAN IP address. For example, use IP address 192.168.64.10, subnet mask 255.255.255.0 (or prefix /24), and gateway 192.168.64.1.

5. Open the PowerZone Control Center desktop application and select the amplifier to configure it. Alternatively, open a web browser and enter the amplifier's IP address. The PowerZone Control web app interface will open to enable amplifier configuration as required.

Note: If a PowerZone Connect PRO 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, use the PowerZone Control Center desktop application or 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 6.3.

Note: The second network socket present on the amplifier rear panel is intended for Audinate Dante® AoIP network connection only. It cannot be used for PowerZone Connect PRO control connection.

6.2.2 Wireless (Wi-Fi) Network Connection

PowerZone Connect PRO amplifiers include a built-in Wi-Fi access point that can be used for initial wireless configuration or connect it to an existing Wi-Fi network. To connect directly to the amplifier using Wi-Fi, follow the steps below.

1. Connect the PowerZone Connect PRO amplifier to mains power using the supplied mains cable and 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 'Sonance PZcP (model) (serial number)' using the password, **'password'**. The amplifier serial number can be found on its rear panel.

3. Open a mobile, laptop or desktop device web browser and enter the following IP address: 192.168.4.1. The amplifier configuration web interface will open in the browser to enable amplifier configuration as required.

4. To connect the amplifier to an existing Wi-Fi network, select **Settings** > **WiFi** > **WiFi Mode** > Client in the PowerZone Control web app, then enter the required Wi-Fi network name and password and apply changes.

5. Once the amplifier is configured in Wi-Fi Client mode, access the amplifier from a device connected to the same Wi-Fi network. **It is strongly recommended that the PowerZone Connect PRO amplifier Wi-Fi password is changed** following initial wireless connection.

Configuration

6.3 Configuration Menus

When the PowerZone Control interface is opened, the Dashboard tab is displayed first.

The Dashboard provides an overview of amplifier power and network status, input activity, zone status, output activity, and available zones. It also provides immediate access to zone volume controls.

The main interface tabs are Dashboard, Input, Zone, Output, and Settings. The following sections provide a general overview of the main interface tabs and key configuration areas.

Note: The PowerZone Control interface includes contextual tooltips that provide detailed guidance for many settings and controls. Click or tap the circular ? icons in the interface to view additional information about a setting or control.

Because available settings and software behavior may change with firmware updates, use the in-app tooltips as the primary reference for detailed configuration guidance.

6.3.1 Input Tab

The Input tab provides configuration controls for each amplifier input channel.

For each analog input, the following parameters are available:

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

Click or tap the input name to rename the input. The high-pass filter button enables a 100 Hz high-pass filter for the selected input.

The Input tab may also include S/PDIF, Dante®, Mix, and Generator sections, depending on the amplifier model and installed options.

The Mix section enables input signals to be mixed and routed to amplifier zones. The number of available mixes is equal to the number of amplifier outputs.

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

Diagram 6A
Configuration Dashboard display

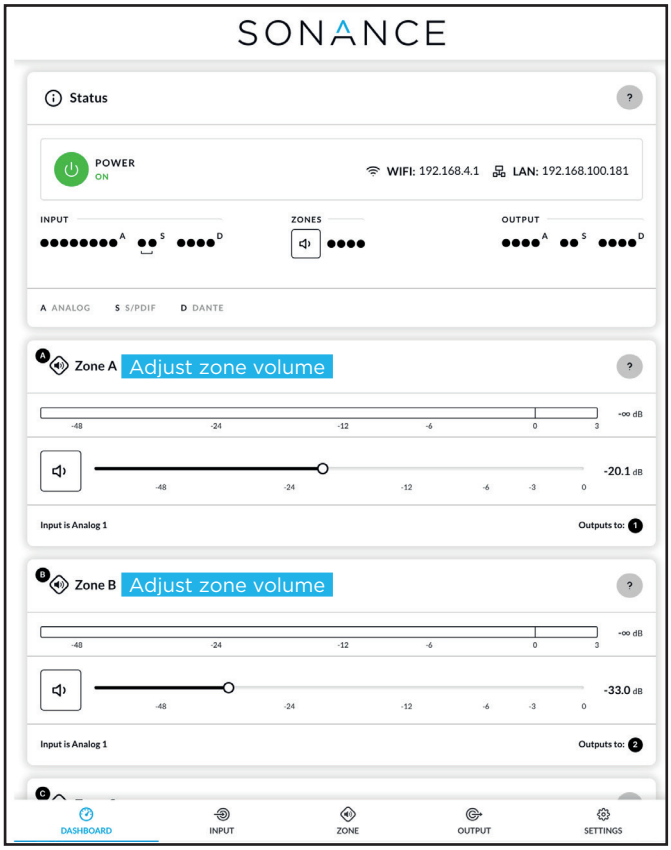
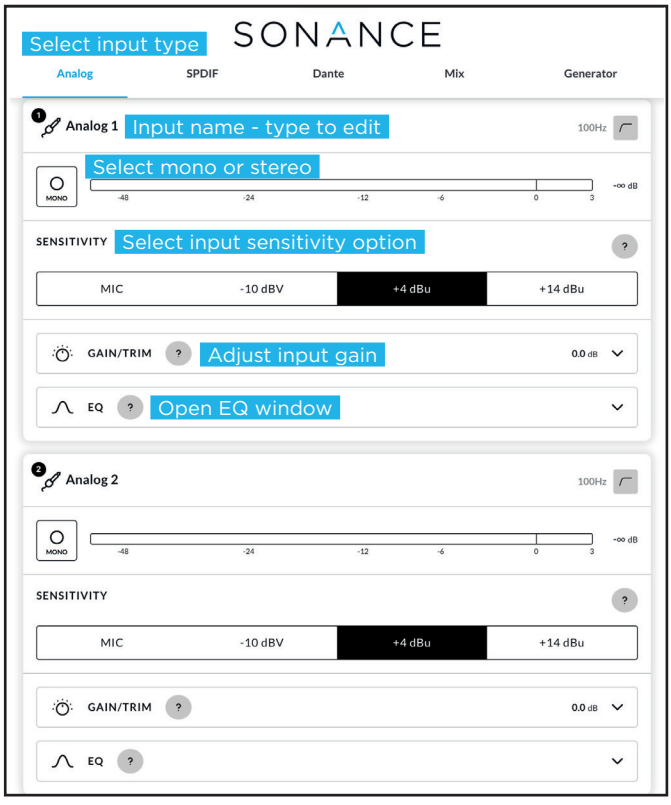


Diagram 6B
Input Tab display (two inputs only shown)



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

Configuration

Diagram 6C

Input EQ display

Diagram 6D

Dante® Input display

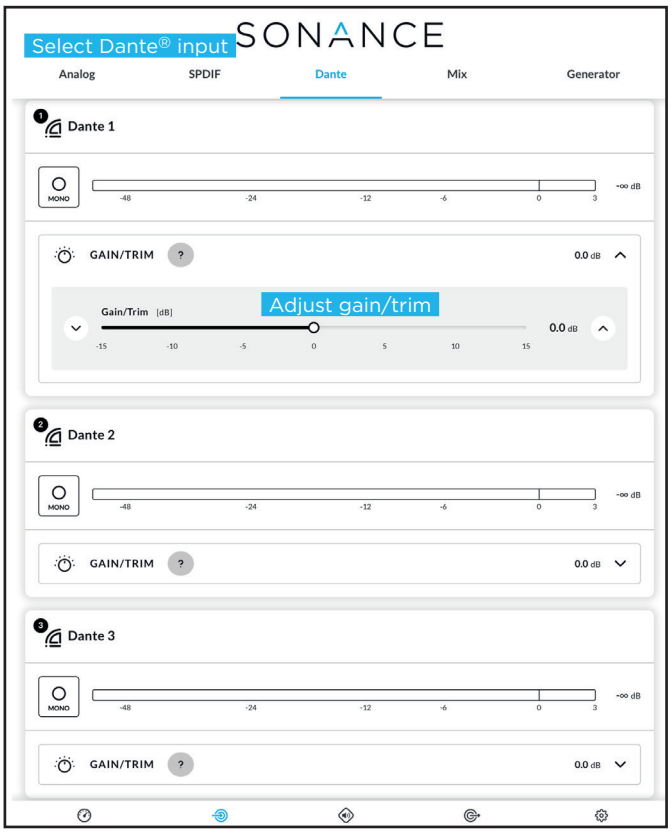
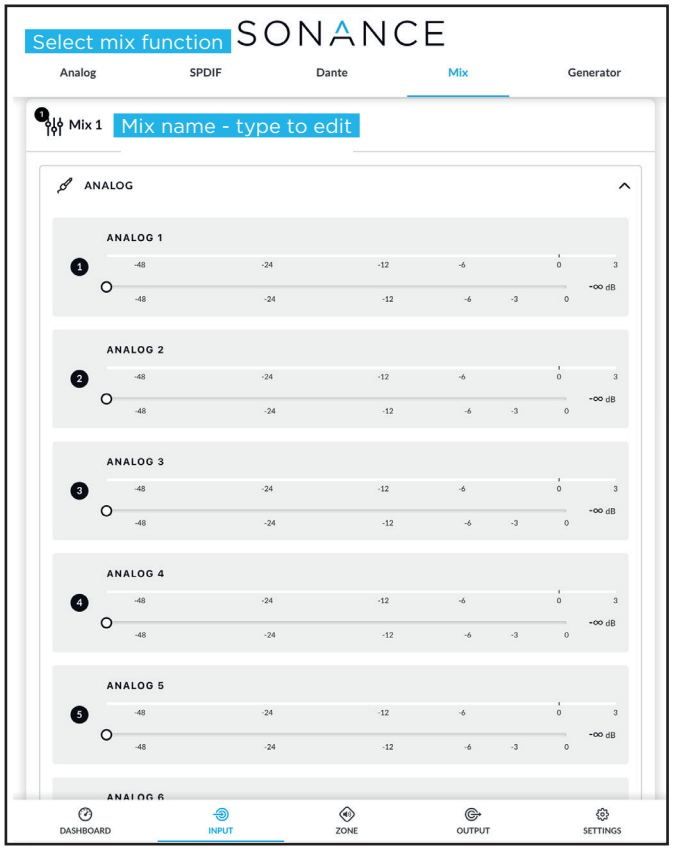


Diagram 6E

Input Mix display



The Generator section provides a pink noise or sine wave audio signal generator for audio system testing and setup.

The inputs displayed in the Dante® input tab (if available) will correspond to those configured and enabled in the Dante® Controller macOS or Windows application. If no inputs are displayed they must first be enabled in Dante® Controller.

6.3.2 Zone Tab

The Zone tab enables installation zones to be defined, named, configured, and controlled. Zones might represent areas such as a room, bar, restaurant area, lobby, patio, or other speaker zone within an installation.

Available zones are selected using the zone identifiers at the top of the display. The number of available zones depends on the amplifier model, output configuration, and whether zones are configured for mono or stereo operation.

Configuration

For each zone, the following controls and menus are available:

- **Zone name**
- **Mono/Stereo selection**
- **Zone level meter**
- **Zone volume control**
- **Source**
- **Volume**
- **Restrictions**
- **Compressor**

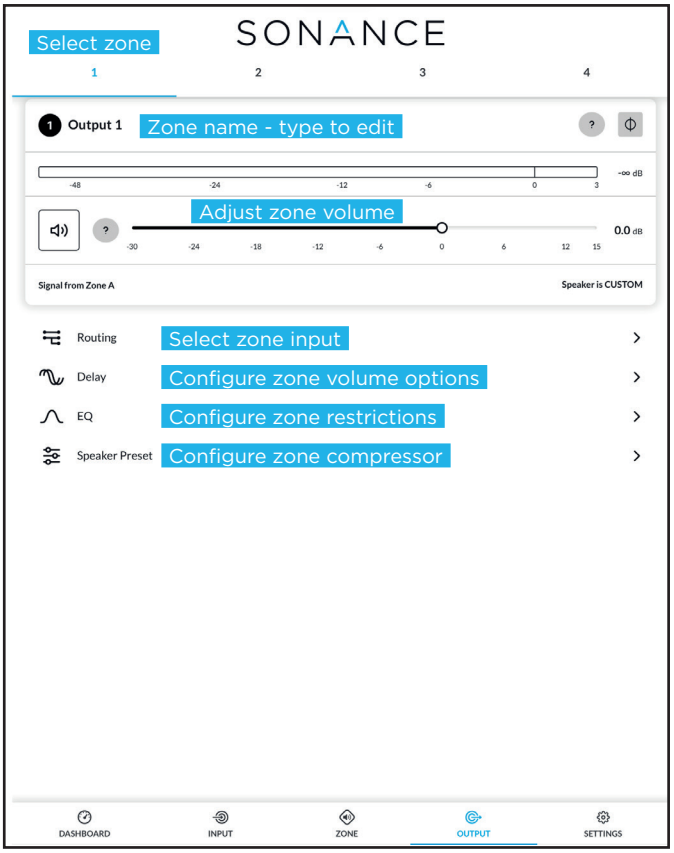
Click or tap the **zone name** to rename the zone. Use the **mono/stereo** control to define the zone format. Use the **zone volume** control to adjust the listening level for the selected zone.

The **Source** menu enables inputs or input mixes to be assigned to the selected zone. It also provides access to source priority and ducking options where supported.

The **Volume** menu provides additional zone volume settings, including minimum and maximum volume limits. External GPIO volume control can also be assigned to individual zones where required. GPIO configuration is available in the Settings tab.

Diagram 6F

Zone Tab display



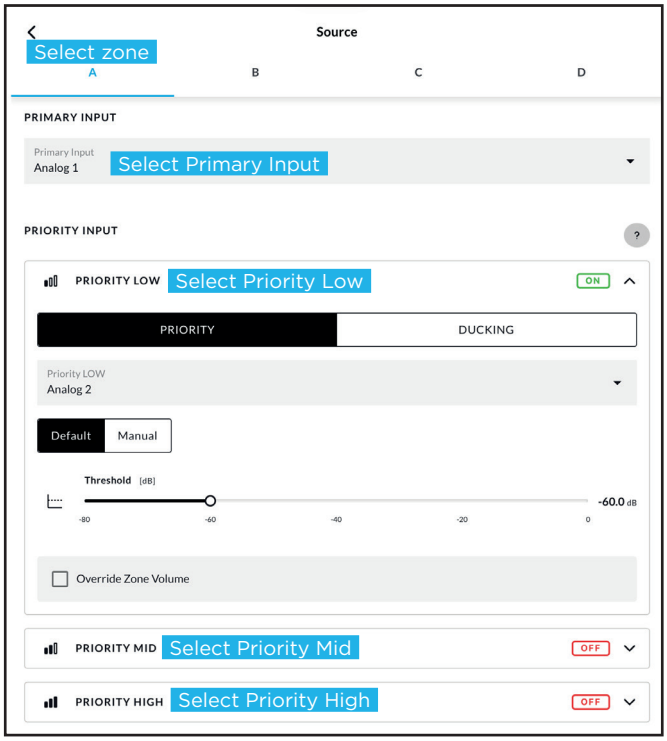
The **Restrictions** menu enables specific inputs or input mixes to be restricted from routing to selected zones. Routing restrictions do not apply to priority inputs.

The **Compressor** menu enables signal compression to be applied to individual zones. Compression can be useful to reduce the level difference between louder and quieter audio material.

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.

Diagram 6G

Zone Source menu display



6.3.3 Output Tab

The Output tab enables amplifier outputs to be named, routed to zones, adjusted, and configured. For each output, the available menus include Routing, Delay, EQ, and Speaker Preset.

Available outputs are selected using the output identifiers at the top of the display. The number of outputs available for configuration depends on the amplifier model and output configuration.

Configuration

For each output, the following controls and menus are available:

- **Output name**
- **Output polarity**
- **Output level**
- **Routing**
- **Delay**
- **EQ**
- **Speaker Preset**

Click or tap the **output name** to rename the output. Use the output polarity control to reverse **output polarity** if required. Use the output level control to adjust output gain if required.

The **Routing** menu enables zones to be assigned to amplifier outputs. For stereo zones, available routing options may include left channel, right channel, or summed mono.

The **Delay** menu enables delay to be applied to individual amplifier outputs.

The **EQ** menu enables parametric equalization to be applied to individual amplifier outputs. Equalizer settings can be adjusted, copied, or cleared as required

The EQ menu also supports importing *REW (Room EQ Wizard)* filter settings, allowing measurement-based equalization filters to be imported into individual amplifier outputs. Imported REW filters can be reviewed and adjusted in the EQ menu as required.

The **Speaker Preset** menu enables speaker-specific output parameters to be applied, imported, exported, customized, or cleared. Speaker presets are discussed in detail in Section 6.3.4.

The Sonance speaker preset library is available by default and includes preset configurations for supported Sonance loudspeakers. Additional speaker presets may also be imported from preset files or added to a speaker preset library where required.

Speaker presets may include crossover, EQ, FIR, driver alignment, polarity, limiter, and output mode settings.

Diagram I

Speaker Preset Parameters

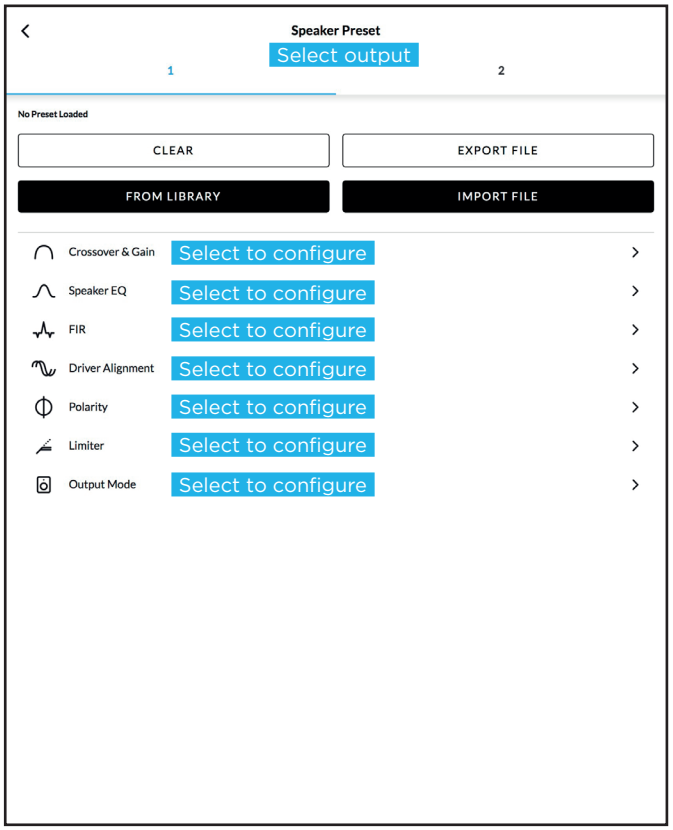
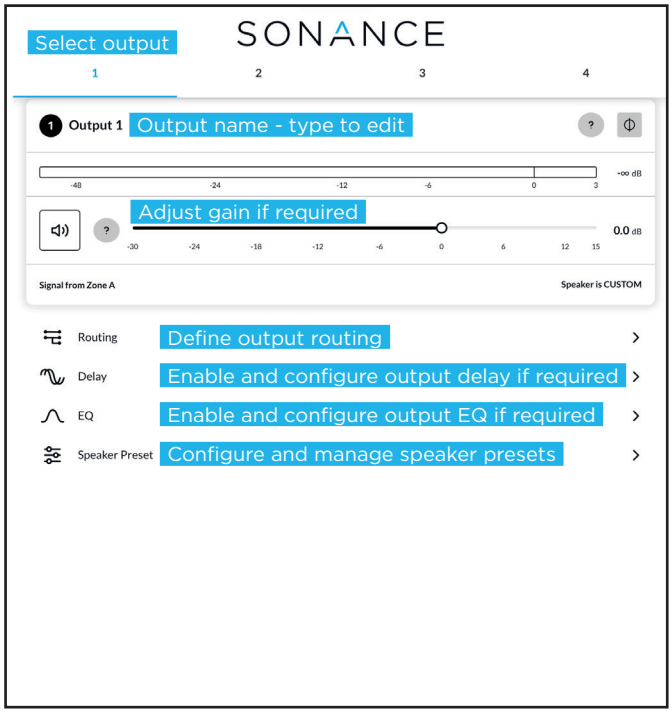


Diagram 6H

Output Tab display



Configuration

Diagram 6J
Speaker Preset import file selection

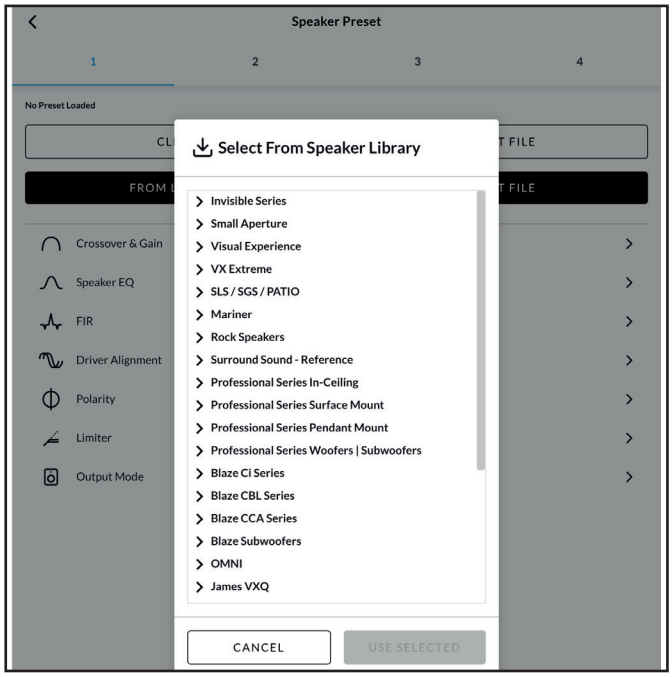
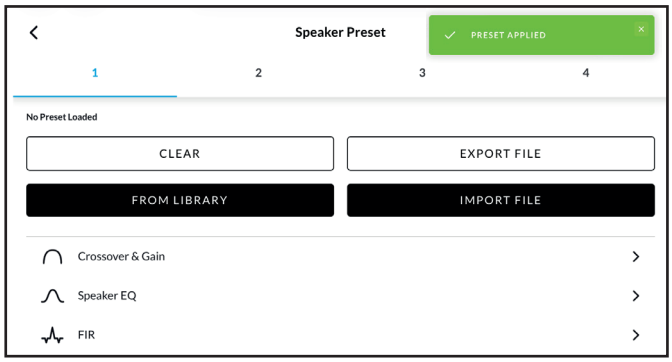


Diagram 6K
Speaker Preset applied



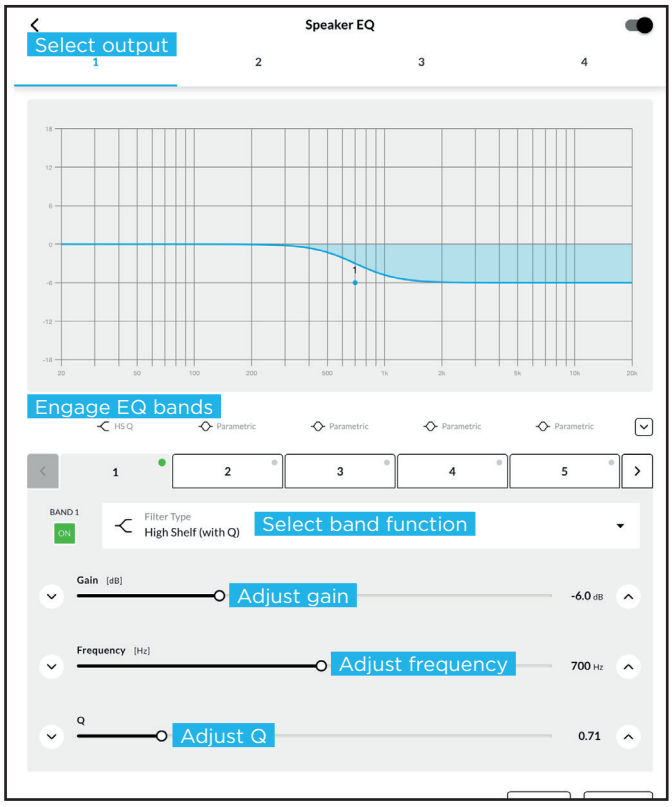
6.3.4 Speaker Preset Menu Parameters

The Speaker Preset menu provides access to speaker-specific output processing and protection parameters. Speaker presets can be used to apply recommended settings for a specific loudspeaker or speaker system.

Speaker preset parameters may include:

- **Crossover & Gain**
- **Speaker EQ**
- **FIR**
- **Driver Alignment**
- **Polarity**
- **Limiter**
- **Output Mode**

Diagram 6L
Speaker Preset parameter adjustment



Speaker presets can be imported from a preset file, selected from a speaker preset library, exported for reuse, customized, or cleared from the selected output. Imported speaker preset files may include locked parameters. Locked parameters cannot be modified unless an unlocked version of the preset is provided.

The **Crossover & Gain** menu enables high-pass or low-pass crossover filters and gain adjustment to be applied to individual amplifier outputs. These settings are typically used to match the amplifier output to the connected speaker type and system design.

The **Speaker EQ** menu enables parametric equalization to be applied to individual amplifier outputs. Speaker EQ can be used to apply loudspeaker correction or system tuning filters.

The **FIR** menu enables FIR filter data to be imported and applied to individual amplifier outputs. FIR filters are typically generated using external speaker measurement or tuning software.

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

Configuration

The **Driver Alignment** menu enables delay to be applied to individual amplifier outputs for loudspeaker driver or system alignment.

The **Polarity** menu enables the polarity of individual amplifier outputs to be reversed.

The **Limiter** menu enables output limiting to be configured for individual amplifier outputs. Limiter settings can be used to help protect connected loudspeakers and maintain system performance.

The **Output Mode** menu enables individual amplifier outputs to be switched off or configured for the connected speaker type. Available output modes include Off, Hi-Z - 70V, Hi-Z - 100V, and Lo-Z.

The Output Filter setting enables a high-pass filter to be applied to the selected output. A high-pass filter is recommended for high-impedance speaker systems to reduce low-frequency content that may cause transformer saturation or distortion.

6.3.5 Settings Tab

The Settings tab provides access to amplifier information, system configuration, network settings, security options, backup and restore functions, and other device-level settings.

The Settings tab includes the following menus:

- **System Information**
- **Device**
- **External Devices**
- **Backup & Restore**
- **Speaker Library**
- **Security**
- **Power Management**
- **Appearance**
- **Output Routing**
- **GPIO**
- **LAN**
- **WiFi**

The **System Information** menu provides editable fields for recording installation information, including device name, venue name, customer name, etc.

The **Device** menu displays amplifier-specific information. The Device menu also provides access to the “Find Me” function, which illuminates the front panel indicators to help identify the amplifier, and also the firmware “Update” function.

The **External Devices** menu enables compatible external devices or control interfaces to be discovered, paired, and managed. Devices can be refreshed, paired from the discovered-device list, or added manually by IP address where supported.

The **Backup & Restore** menu enables the amplifier configuration to be saved to a file or restored from a previously saved file. This menu also provides access to device restart and factory reset functions.

Warning: A factory reset permanently erases all configuration data from the amplifier.

Diagram 6M
Settings Tab menu

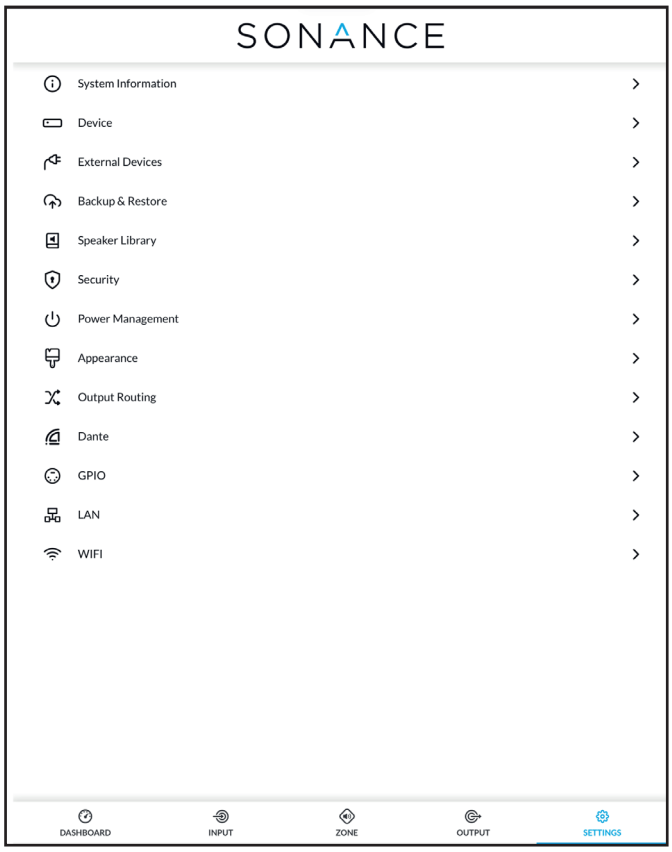
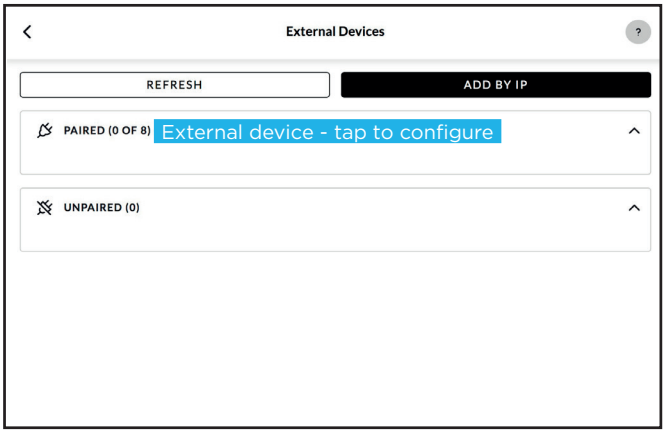


Diagram 6N
The External Devices display



The **Speaker Library** menu provides access to available speaker preset libraries. The default Sonance speaker library is included and provides preset configurations for supported Sonance, Blaze, and James loudspeakers. Additional libraries may be imported, created, or edited where required.

The **Security** menu enables password protection and user control options. Password protection helps prevent unauthorized access to the amplifier configuration interface. User control can be used to limit access to selected zone controls.

The **Power Management** menu enables amplifier standby, wake, and power behavior to be configured.

The **Appearance** menu enables the PowerZone Control interface to be switched between light mode and dark mode.

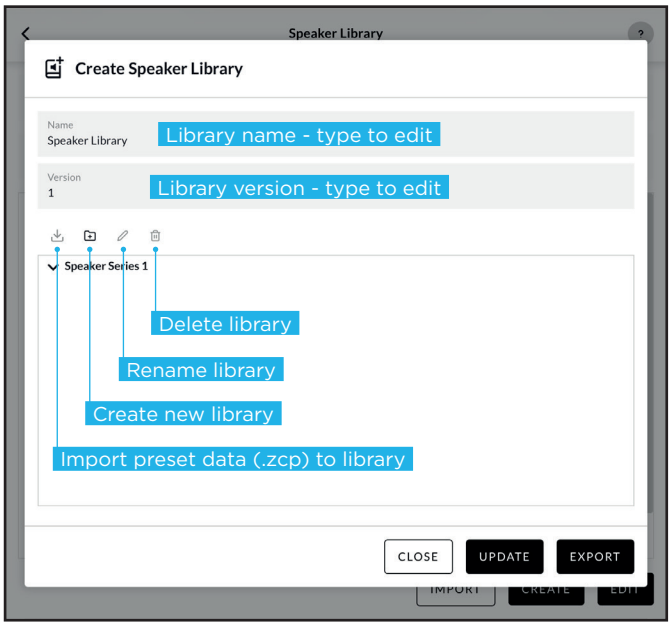
The **Output Routing** menu enables specified inputs or zones to be routed to the amplifier's digital outputs where supported.

The **GPIO** menu enables the multi-purpose GPIO pins to be configured for supported functions such as standby, mute, trigger, and external volume control. GPIO wiring and connection information is provided in Section 6.5.

The **LAN** menu enables wired network settings to be configured.

The **WiFi** menu enables wireless network settings to be configured.

Diagram 6O
Speaker Library Creation and Management



6.4 Setup and Signal Routing

PowerZone Connect PRO amplifiers provide flexible signal routing for a wide range of installations. Inputs can be assigned to zones, and zones can then be routed to amplifier outputs. This allows different source signals to be routed to different areas of an installation, or the same source signal to be routed to multiple zones.

Signal routing is configured in three main steps:

1. Configure the required input sources in the Input tab.

2. Configure zones and assign sources in the Zone tab.

3. Assign zones to amplifier outputs in the Output tab.

A general signal flow schematic is illustrated in Diagram 6P.

6.4.1 Input Setup

Open the Input tab to configure the required input sources.

For each input, confirm or configure the input name, mono/stereo setting, input sensitivity, high-pass filter, gain/trim, and input EQ as required.

Select an input sensitivity setting appropriate for the connected source equipment. Generally, +4 dBu or +14 dBu are appropriate for professional audio source equipment, while -10 dBV is appropriate for consumer audio source equipment. The MIC setting provides the higher sensitivity required for microphone-level sources.

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

Adjust input gain only as required after selecting the appropriate input sensitivity. If the input meter indicates clipping or limiting, reduce the input gain or select a less sensitive input setting.

Lastly, if necessary, adjust the input EQ using the 5-band equalizer.

Configuration

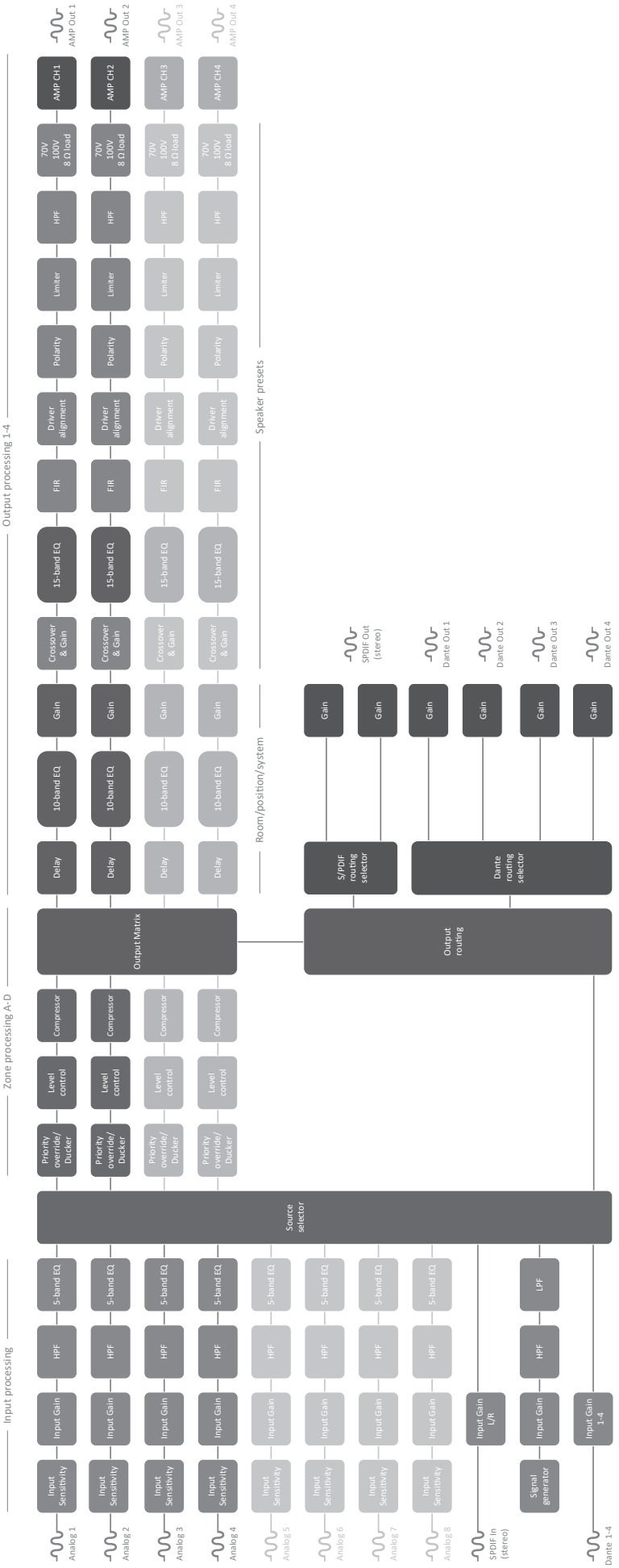


Diagram 6P
Signal Flow Schematic
(four output amplifier)

6.4.2 Zone Setup & Routing

Open the Zone tab to configure zones and assign sources.

Select the zone to be configured using the zone identifiers at the top of the display. The number of zones available depends on the amplifier model and configuration.

For each zone, configure the zone name, mono/stereo setting, source assignment, volume settings, restrictions, and compressor settings as required.

Use the Source menu to assign an input or input mix to the selected zone. Selecting a stereo input for a mono zone will automatically sum the stereo channels to mono.

6.4.3 Output Setup and Routing

Open the Output tab to assign zones to amplifier outputs.

Select the output to be configured using the output identifiers at the top of the display. For each output, configure the output name, polarity, output level, routing, delay, EQ, speaker preset, and output mode as required.

Use the Routing menu to assign a zone to the selected output. For stereo zones, available routing options may include left channel, right channel, or summed mono.

Use the Speaker Preset menu to apply the appropriate output mode and speaker-specific processing for the connected speaker type.

Caution: Lo-Z output mode is intended for speakers with a nominal impedance of 8 ohms or higher. Connecting speakers or speaker loads below 8 ohms may cause the amplifier to enter protection mode or may result in reduced performance.

6.5 GPIO Setup and Connection

PowerZone Connect PRO amplifiers provide a configurable GPIO connector for external control and trigger functions. GPIO functions may include standby, mute, 12V trigger input, 12V trigger output, and external volume control, depending on the selected pin configuration.

GPIO pin functions are configured in the Settings > GPIO menu. The GPIO menu displays each pin, its available functions, and the currently selected configuration. Refer to the on-screen descriptions and tooltips when configuring GPIO behavior.

Caution: The GPIO connector must not be used for any unintended purpose. Incorrect GPIO wiring or configuration may damage the amplifier or connected equipment.

Caution: Use shielded cable when connecting external standby switches, mute switches, trigger wiring, or potentiometers via GPIO.

The GPIO connector includes ground reference pins, configurable control pins, and a 3.3V supply for external volume controls.

* Pin 1 provides a soft ground reference for 12V trigger and standby/mute input functions.

* Pin 2 can be configured for standby or mute control, normally open or normally closed.

* Pin 3 provides a ground reference for external volume control and trigger output functions.

* Pins 4 and 5 can be individually configured for external volume control.

*Pin 6 and 7 can individually be configured for 12V trigger input, external volume control, or no function.

*Pin 8 provides 3.3V power for external volume controls.

Configuration

Note: GPIO Pin 1 and Pin 3 both provide ground connections. Pin 1 is connected directly to the amplifier chassis. Pin 3 is connected to the chassis through a 220 ohm resistor. The soft ground connection of Pin 3 is potentially useful for managing ground loops that may cause audible hum.

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

External volume control can be implemented using a potentiometer connected to the appropriate GPIO pins. Standby or mute control can be implemented using an external switch connected to the configured GPIO pin and ground reference. Refer to Diagrams 6R and 6S for example wiring.

Diagram 6Q
GPIO Settings Menu

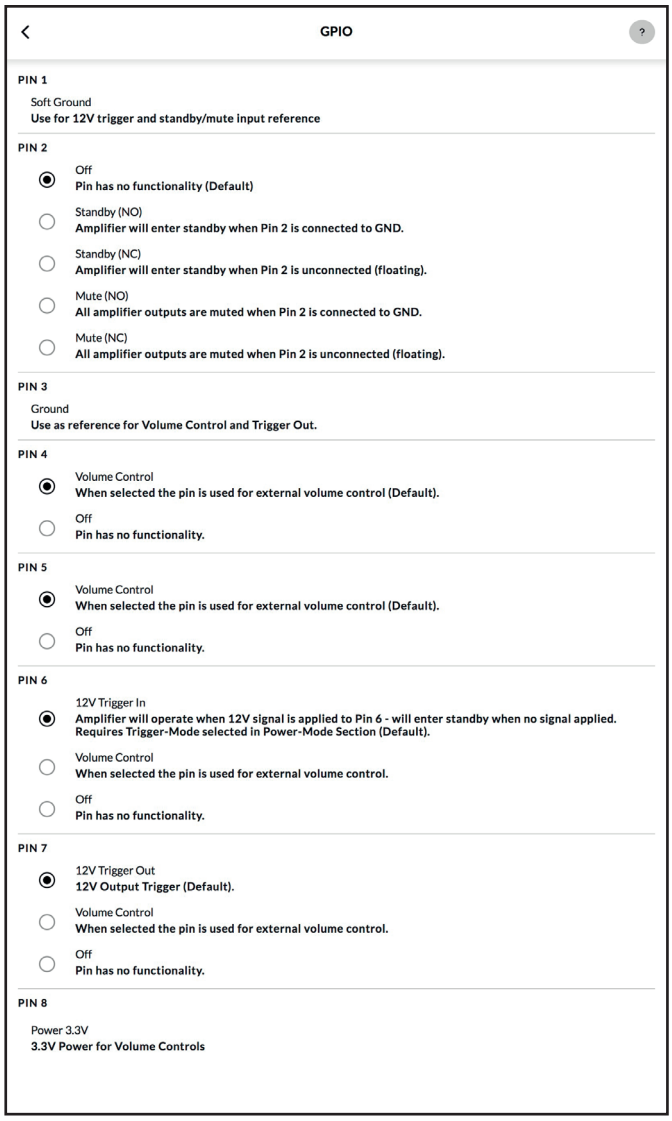


Diagram 6R
Potentiometer connections for remote volume control via GPIO.

Note: Diagram 7E illustrates use of the GPIO connector.

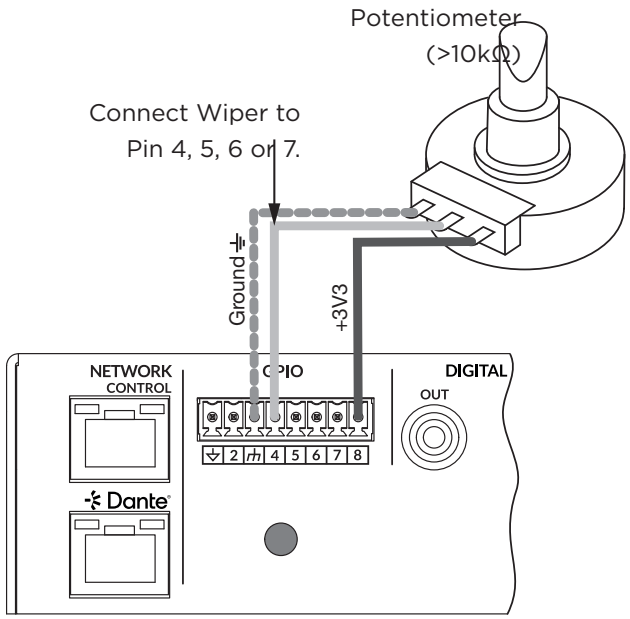
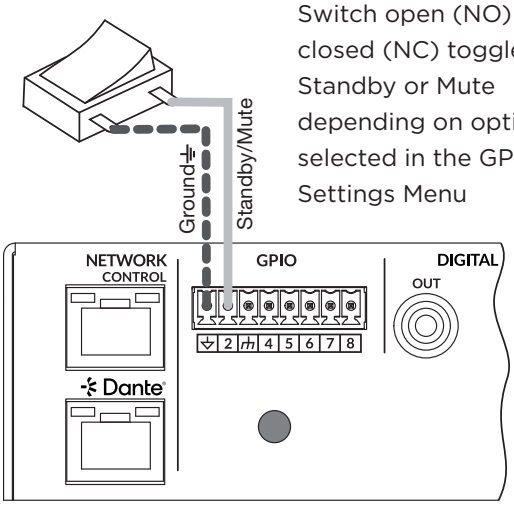


Diagram 6S
Connections for remote standby/mute switch via GPIO.

Note: Diagram 7E illustrates use of the GPIO connector.



Switch open (NO) or closed (NC) toggles Standby or Mute depending on options selected in the GPIO Settings Menu

7. Connections

PowerZone Connect PRO amplifier rear panel connections are illustrated in Diagrams 7A and 7B.

7.1 Mains Power Connection

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

PowerZone Connect PRO 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.**

7.2 Input Connection

All PowerZone Connect PRO amplifier models provide four balanced or unbalanced analog 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 PowerZone Control interface. See **Section 6** of this manual.

Analog Inputs

PowerZone Connect PRO analog 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 PowerZone Control interface. See **Section 6** 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 **Diagram 7C.**

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

Digital Outputs

PowerZone Connect PRO 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 PowerZone Connect PRO amplifiers.

Note: See the Output Routing paragraphs of Section 6.3.3 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.

7.3 Output Connections

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

Supplied plugs are provided to block the center two positions of the 4-pin output connector, helping prevent accidental misconnections during installation.

For Hi-Z and 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.

Output mode options (Hi-Z or Lo-Z) can be configured via the PowerZone Control interface.

Note: see the Speaker Preset Menu Parameters of Section 6.3.4 for more information on selecting Hi-Z or Lo-Z output modes.

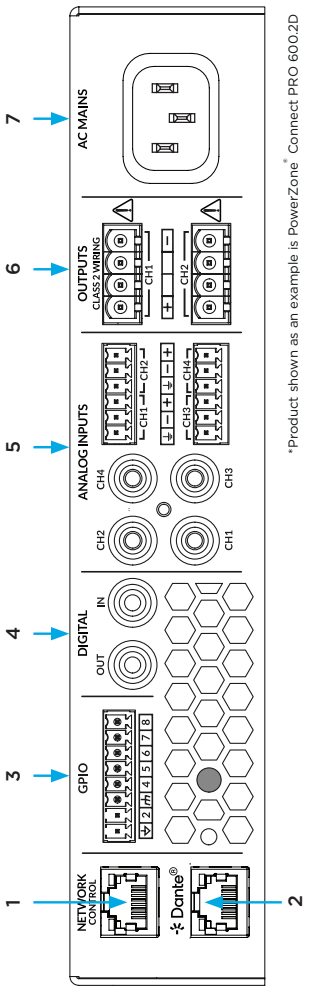
Connecting cables to the supplied female **output** connector is illustrated in **Diagram 7D.**

Connections

Diagram 7A

Half-rack width

PowerZone Connect PRO amplifier rear panel connections.



*Product shown as an example is PowerZone® Connect PRO 600.2D

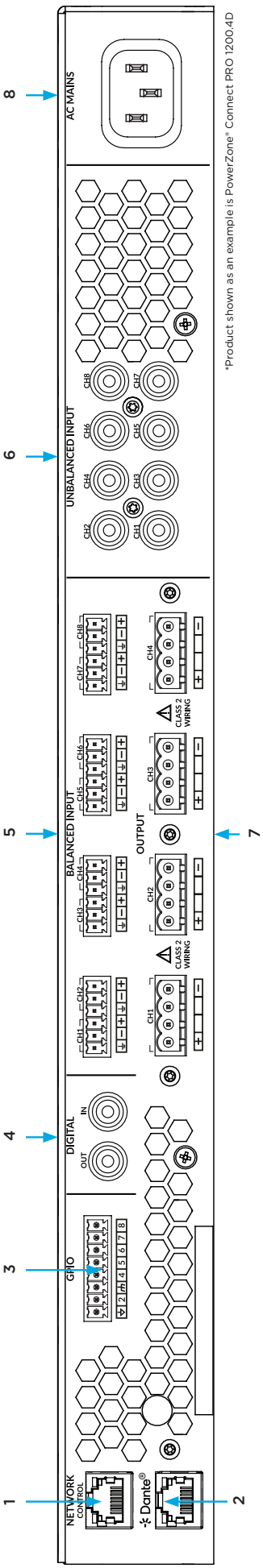
Half-rack

1. Network Control
2. Dante® (optional)
3. Configurable GPIO
4. Configurable S/PDIF Audio I/O
5. Audio Inputs:
Balanced: Euroblock
Unbalanced: RCA Phono
6. Configurable Speaker Outputs
7. Power Input

Diagram 7B

Full-rack width

PowerZone Connect PRO Amplifier rear panel connections.



*Product shown as an example is PowerZone® Connect PRO 1200.4D

Full-rack

1. Network Control
2. Dante® (optional)
3. Configurable GPIO
4. Configurable S/PDIF Audio I/O
5. Balanced Audio Inputs: Euroblock
6. Unbalanced Audio Inputs: RCA Phono
7. Configurable Speaker Outputs
8. Power Input

Connections

7.4 Speaker Cable Gauge

The PowerZone Connect PRO speaker connection cable gauge should be chosen appropriately to reflect the type of installation. The adjacent tables specify the appropriate cable gauge for different installation types, cable lengths, and allowable cable loss.

7.5 GPIO Connections

If any PowerZone Connect PRO GPIO functionality is required, cables will need to be connected to the supplied GPIO connector. Connecting cables to the GPIO connector is illustrated in **Diagrams 7E**.

7.6 Network Connections

PowerZone Control

PowerZone Connect PRO amplifiers are TCP/IP network devices that can be configured either through the PowerZone Control web app or via the PowerZone Control Center desktop application. Wired (Ethernet) and wireless (Wi-Fi) connection options are available. Connecting PowerZone Connect PRO amplifiers to a TCP/IP network is described in **Section 6** of this manual. If a wired connection is used, connect an Ethernet cable to the amplifier rear panel Network Control socket.

Audinate Dante®

PowerZone Connect PRO amplifiers are optionally compatible with Audinate Dante® audio over IP (AoIP) networks and installations. Connect to a Dante® network via the amplifier rear panel Dante® socket and configure the network as required using the Audinate Dante® Controller macOS and Windows application available for download from: www.audinate.com/products/software/dante-controller.

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 (m), (150 W/channel)	Max Cable Length (m), (300 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 (m), (150 W/channel)	Max Cable Length (m), (300 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.

Cable Gauge Table

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

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

Connections

Diagram 7C
Balanced analog
input cable connections.

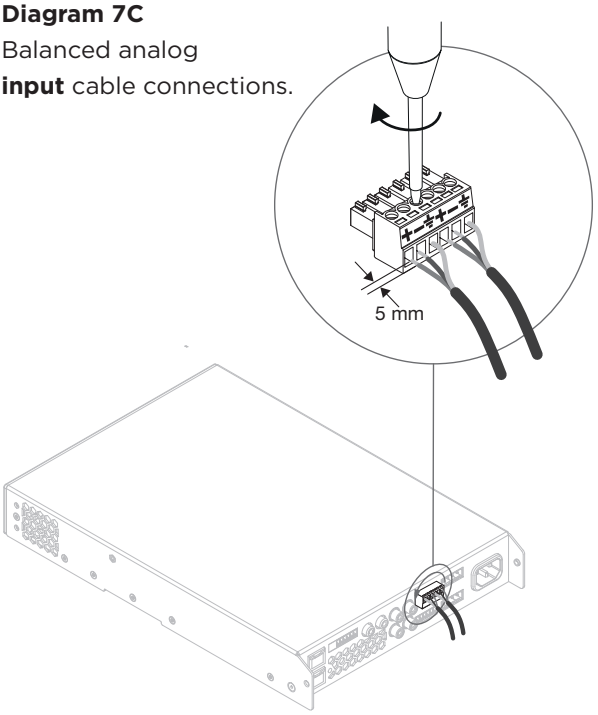


Diagram 7E
GPIO cable connections.

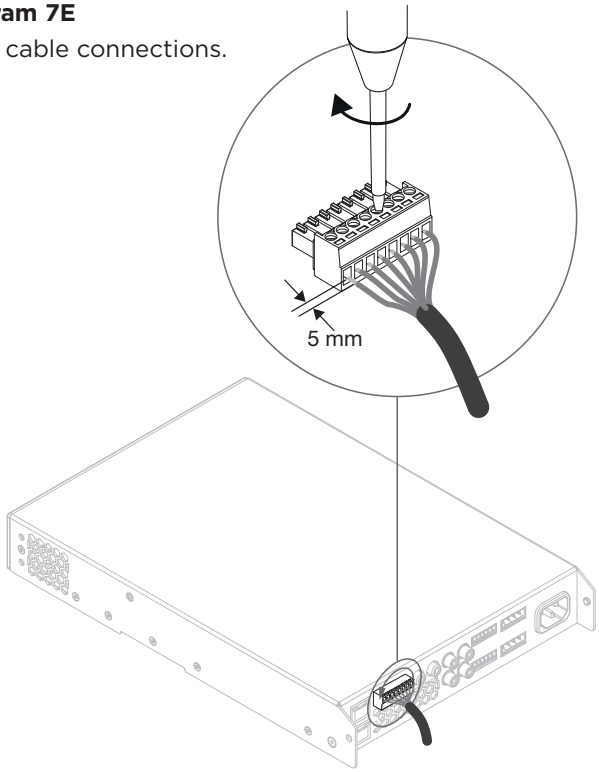
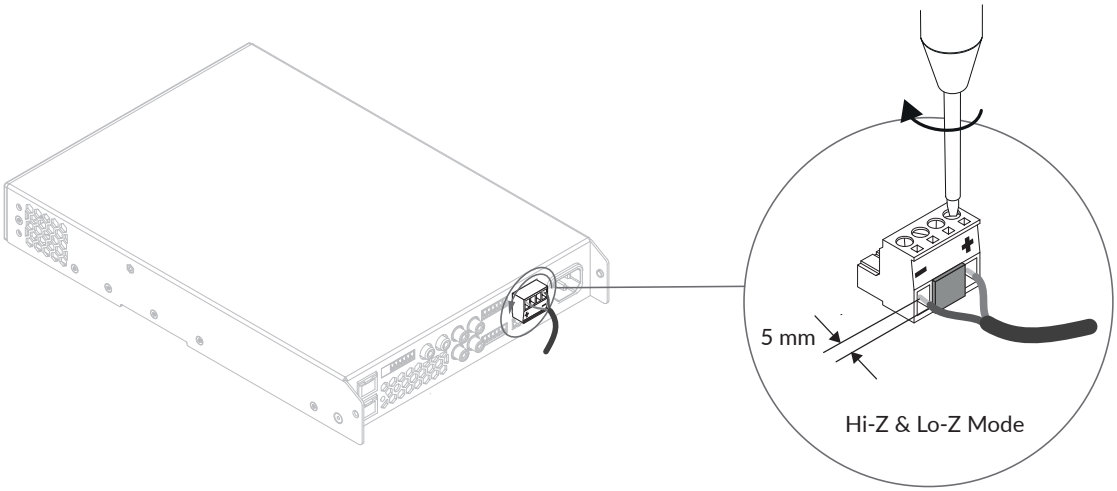


Diagram 7D
Output cable connections.

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.

8. Operation

Once all connections have been made and configuration options selected, PowerZone Connect PRO 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: PowerZone Connect PRO 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.

8.1 Front Panel Indicators

PowerZone Connect PRO 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.

Note: If the front panel indicators are repeatedly lighting up one after another from top to bottom, the amplifier has the "Find Me" mode enabled.

8.2 Automatic Power Sharing

PowerZone Connect PRO amplifiers use automatic power sharing to make unused power from one output channel available to the other output channel in the same channel pair. This helps the amplifier deliver higher short-term output power to dynamic speaker loads when one channel requires more power and the paired channel is using less.

Automatic power sharing is available only on the PowerZone Connect PRO 300.2/300.2D and 600.4/600.4D models. On 300.2/300.2D models, power sharing operates between outputs 1 and 2. On 600.4/600.4D models, power sharing operates independently between outputs 1 and 2, and between outputs 3 and 4.

8.3 Factory Reset

PowerZone Connect PRO amplifiers can be returned to their default settings via either the PowerZone 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.

Specifications

Power Efficiency Data

The following table describes the efficiency and power performance of PowerZone Connect PRO amplifiers. The table also includes the derived thermal losses.

Typical Thermal Performance						
PowerZone Connect PRO	**Load (Ohms)**	**Power In (W)**	**Power Out (W)**	**Efficiency (%)**	**Thermal Loss (W)**	**Thermal Loss (BTU)**
300.2/300.2D	8	59	30	51	29	98
600.2/600.2D	8	103	60	58	43	148
600.4/600.4D	8	98	60	61	38	131
1200.4/1200.4D	8	202	125	62	77	261

Standby and Idle					
PowerZone Connect PRO	**Standby (mW)**	**Idle @ 120V (W)**	**Idle @ 120V (BTU)**	**Idle @ 230V (W)**	**Idle @ 230V (BTU)**
300.2/300.2D	<500*	13.1	45	13.6	46
600.2/600.2D	<500*	14.5	49	15.9	54
600.4/600.4D	<500*	26.6	91	26.3	90
1200.4/1200.4D	<500*	27.7	94	30.2	103

*As per compliance to ErP

Propagation Delay Data

The following tables describes the input/output latency performance of PowerZone Connect PRO amplifiers.

2 Channel Amplifiers				
		OUT		
		Analogue	S/PDIF	Dante®*
IN	Analogue	1177µS	458µS	1520µS
	S/PDIF	1833µS	1104µS	2166µS
	Dante®*	1895µS	1166µS	2125µS

4 Channel Amplifiers				
		OUT		
		Analogue	S/PDIF	Dante®*
IN	Analogue	1307µS	600µS	1662µS
	S/PDIF	1955µS	1250µS	2312µS
	Dante®*	2017µS	1312µS	2125µS

*Dante® network latency not included.

Note: Dante® latency is measured in a Dante® to Dante® connection setup. The propagation delay is both measured from both analog inputs and digital inputs. The total delay of: Amp1 SPDIF input to Dante® out -> Amp2 Dante® input to SPDIF output is 4333 µs. Out of this the network latency accounts for 1000 µs and the ASCRs accounts for 3 x 1000 µs. Out of the final 333 µs seconds, the DSP accounts for roughly 208 µs, leaving 125 µs for the Dante® chip processing. For this test the Dante® process occurs twice resulting in a 62,49 µs delay per Dante® transmission.

Specifications

Model	PowerZone Connect PRO 300.2/300.2D	PowerZone Connect PRO 600.2/600.2D	PowerZone Connect PRO 600.4/600.4D	PowerZone Connect PRO 1200.4/1200.4D
Total System Power	300 W	600 W	600 W	1200 W
Output Power @ 70/100 V	2 x 150 W	2 x 300 W	4 x 150 W	4 x 300 W
Output Power @ 8 Ω	2 x 150 W	2 x 300 W	4 x 150 W	4 x 300 W
Powersharing*	1 x 300 W	N/A	2 x 300 W	N/A
Power Consumption	75 W	150 W	150 W	300 W
Dimensions (HxWxD)	44 x 220 x 320 mm (1.7 x 8.7 x 12.6) in	44 x 220 x 320 mm (1.7 x 8.7 x 12.6) in	44 x 440 x 320 mm (1.7 x 17.3 x 12.6) in	44 x 440 x 320 mm (1.7 x 17.3 x 12.6)in
Weight	2.8 kg (6.2 lbs)	2.8 kg (6.2 lbs)	3.5 kg (7.7 lbs)	3.8 kg (8.4 lbs)
Output Circuitry	UMAC™ Class D - full bandwidth PWM modulator with ultra-low distortion			
Output Voltage**	90 Vrms - 70 / 100 V (Hi-Z)			
Signal-to-Noise Ratio	>106 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, Undervoltage, Temperature, 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	2 Rack ears included (full-rack models only), 4 adhesive feet, input/output connection plugs (included)			
Audinate Dante® Compatibility	Audinate Dante® AoIP compatibility: Ultimo Chip 4x4, 2 flows rx/tx (PowerZone® Connect PRO 300.2D/600.2D/600.4D/1200.4D/2000.2D/4000.4D only)			

**Powersharing allows each pair of channels to deliver up to 300W total power in any ratio.*

*** Output voltage is managed according to selected output mode and load.*

WARRANTY

LIMITED FIVE (5) YEAR WARRANTY

Sonance warrants to the first end-user purchaser that this Sonance-brand product ("Product"), when purchased from an authorized Sonance Dealer/Distributor, will be free from defective workmanship and materials for the period stated below. Sonance will at its option and expense during the warranty period, either repair the defect or replace the Product with a new or re-manufactured Product or a reasonable equivalent.

EXCLUSIONS TO THE EXTENT PERMITTED BY LAW, THE WARRANTY SET FORTH ABOVE IS IN LIEU OF, AND EXCLUSIVE OF, ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND IS THE SOLE AND EXCLUSIVE WARRANTY PROVIDED BY SONANCE. ALL OTHER EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY, IMPLIED WARRANTY OF FITNESS FOR USE, AND IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE ARE SPECIFICALLY EXCLUDED.

No one is authorized to make or modify any warranties on behalf of Sonance. The warranty stated above is the sole and exclusive remedy and Sonance's performance shall constitute full and final satisfaction of all obligations, liabilities and claims with respect to the Product.

IN ANY EVENT, SONANCE SHALL NOT BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL, ECONOMIC, PROPERTY, BODILY INJURY, OR PERSONAL INJURY DAMAGES ARISING FROM THE PRODUCT, ANY BREACH OF THIS WARRANTY OR OTHERWISE.

This warranty statement gives you specific legal rights, and you may have other rights which vary from state to state. Some states do not allow the exclusion of implied warranties or limitations of remedies, so the above exclusions and limitations may not apply. If your state does not allow disclaimer of implied warranties, the duration of such implied warranties is limited to period of Sonance's express warranty. Warranty Period for this Product: Five (5) years from the date on the original sales receipt or invoice or other satisfactory proof of purchase. Additional Limitations and Exclusions from Warranty Coverage: The warranty described above is nontransferable, applies only to the initial installation of the Product, does not include installation of any repaired or replaced Product, does not include damage to allied or associated equipment which may result for any reason from use with this Product, and does not include labor or parts caused by accident, disaster, negligence, improper installation, misuse (e.g. overdriving the amplifier or loudspeaker, excessive heat, cold or humidity), or from service or repair which has not been authorized by Sonance. Obtaining Authorized Service: To qualify for the warranty, you must contact your authorized Sonance Dealer/Installer or call Sonance Customer Service at (949) 492-7777 within the warranty period, must obtain a return merchandise number (RMA), and must deliver the Product to Sonance shipping prepaid during the warranty period, together with the original sales receipt, or invoice or other satisfactory proof of purchase.

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