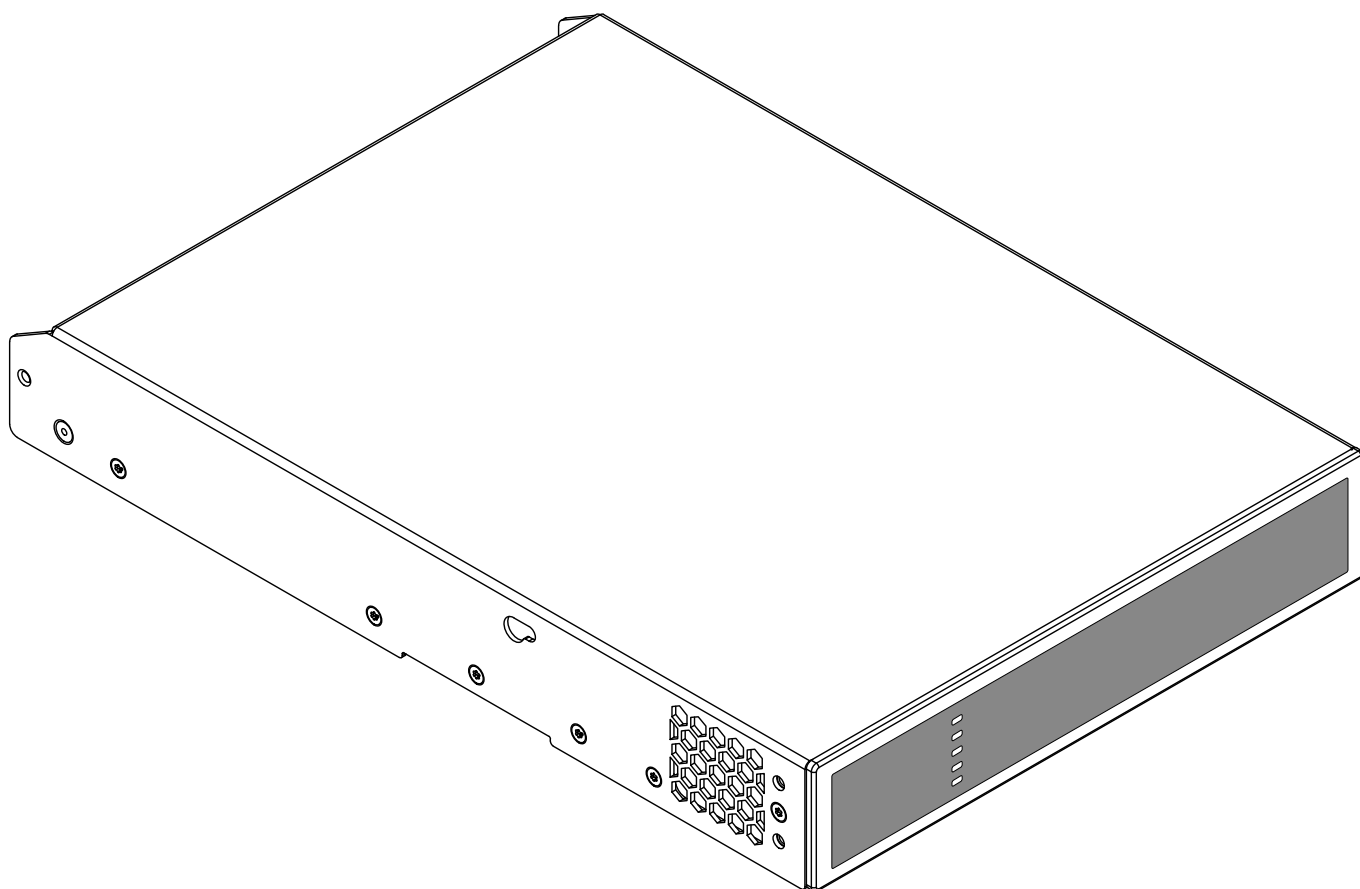




CXA SERIES DIGITAL AMPLIFIERS



INSTALLATION GUIDE / USER MANUAL

CXA125 / CXA2125 / CXA250 / CXA2250 / CXA4250 / CXA4250D

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 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 (20Hz to 20kHz) 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 equipments 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 indoor 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 re-seller.

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.



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.
- 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 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.
- 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.

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 properly to recycle or dispose of this product.

Introduction and Overview

1. Introduction

CXA 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.

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

- 2. Overview
- 3. Carton Contents
- 4–5. Installation
- 6. Configuration
- 7. Connections
- 8. Operation
- 9. Specifications

2. Amplifier Overview

CXA125, 2125, 250, 2250 amplifiers are **half rack** and CXA4250, CXA425D are **full rack** width, 1U format power amplifiers that can drive both conventional low impedance (Lo-Z, 4Ω to 16Ω) loudspeakers and high impedance (Hi-Z, 70V/100V) transformer coupled 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, four or eight outputs (Lo-Z mode), or one, two or four outputs (Hi-Z mode).

CXA amplifiers also incorporate automatic power sharing technology that enables power to be shared proportionately as required between pairs of outputs in Lo-Z mode.

CXA amplifier model rack widths, output channel counts and power outputs are as follows:

CXA125 two output amplifier (half rack width)		
Mode	Channels	Max Rated Output per Channel
Lo-Z	Two	60 Watts
Hi-Z	One	125 Watts

CXA250 two output amplifier (half rack width)		
Mode	Channels	Max Rated Output per Channel
Lo-Z	Two	125 Watts
Hi-Z	One	250 Watts

CXA2125 four output amplifier (half rack width)		
Mode	Channels	Max Rated Output per Channel
Lo-Z	Four	60 Watts
Hi-Z	Two	125 Watts

CXA2250 four output amplifier (half rack width)		
Mode	Channels	Max Rated Output per Channel
Lo-Z	Four	125 Watts
Hi-Z	Two	250 Watts

CXA4250/4250D eight output amplifier (full rack width)		
Mode	Channels	Max Rated Output per Channel
Lo-Z	Eight	125 Watts
Hi-Z	Four	250 Watts

Introduction and Overview

2.1 Connections

CXA 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.

CXA 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

CXA 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 CXA control web app interface and cover Input, Zone, Output and General Settings functions. The configuration menus are fully described in **Section 6** of this manual.

Audinate Dante®

CXA amplifiers are optionally compatible with Audinate Dante® Audio Over IP (AoIP) networks and installations.

Dante® equipped versions of CXA 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

CXA 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

This manual describes the features, functions and user interface of CXA 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 as a priority.

The firmware installed in the amplifier can be identified and updated by selecting the **Device** option in the Control web app **Settings Menu**. Firmware versions can be checked, and firmware downloaded, from the CXA website:

3. Carton Contents

CXA 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 is listed below.

- Amplifier unit
- Mains power cable
- Input connector x 2 or 4
- GPIO socket connector x 1
- Output connector x 1, 2 or 4
- Adhesive rubber feet x 4
- Document pack

Overview

Diagram 2A

CXA two channel amplifier dimensions.
(Shaded area defines ventilation space.)

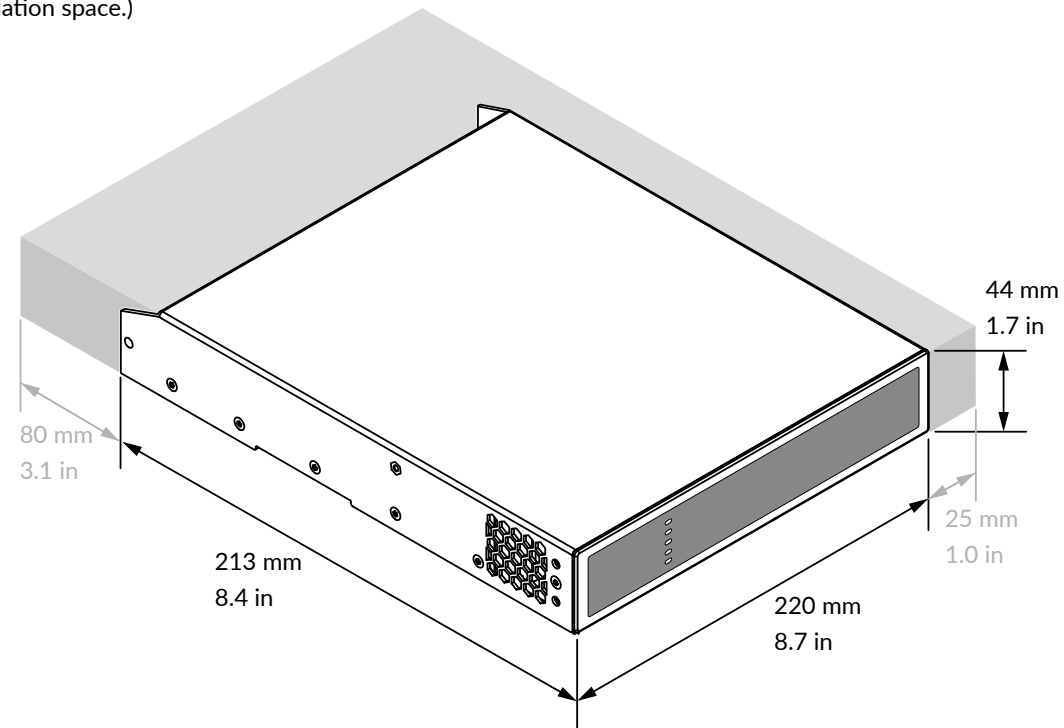
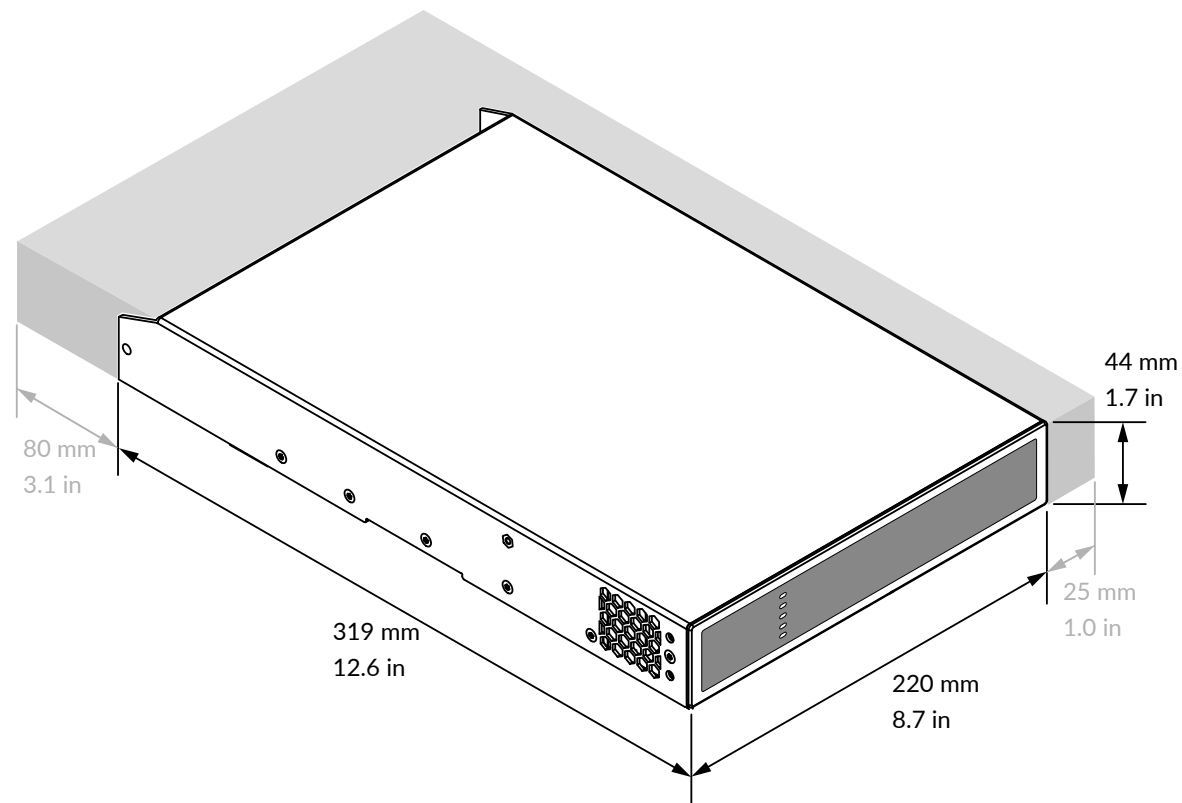


Diagram 2B

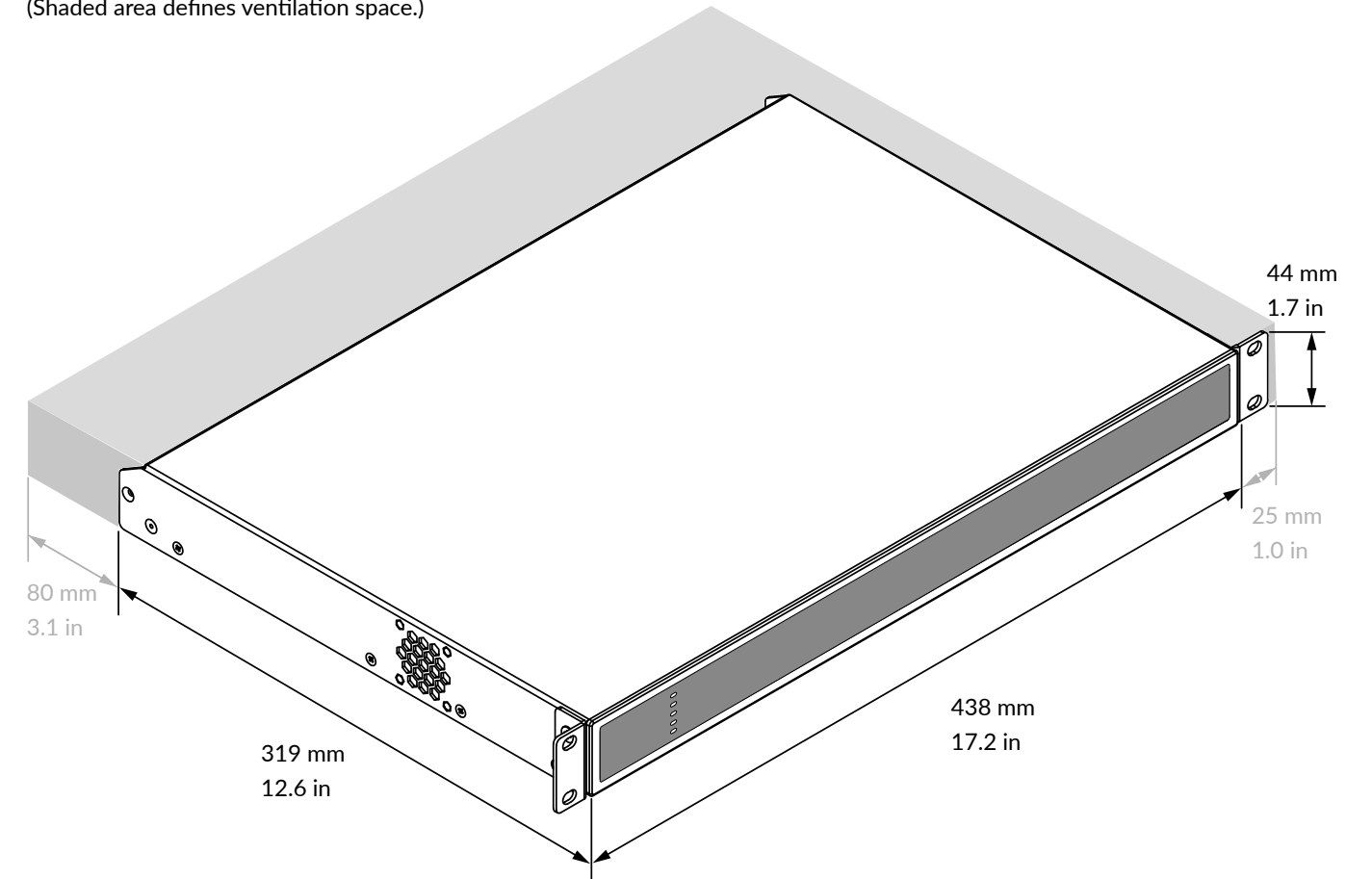
CXA four channel amplifier dimensions.
(Shaded area defines ventilation space.)



Overview

Diagram 2C

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



Installation

4. Half Rack Width Amplifier Installation

CXA models

Note: The rack mounting and desk/wall mounting components described and illustrated in Sections 4.1 to 4.2 are not supplied with CXA amplifiers but are available to purchase as accessories. Contact your amplifier re-seller for more information.

4.1 CXA Mounting

CXA 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.

Multiple CXA half rack width amplifiers can also be mechanically connected using an accessory connecting plate. **Diagram 4C** illustrates the use of a connecting plate. A connection plate is included in the kit shown in Diagram 4A. 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.

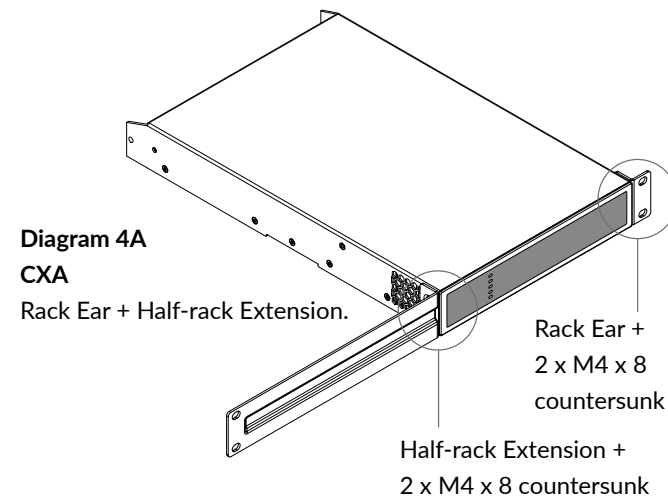


Diagram 4B
CXA
Rack Support hardware. 2 positions.

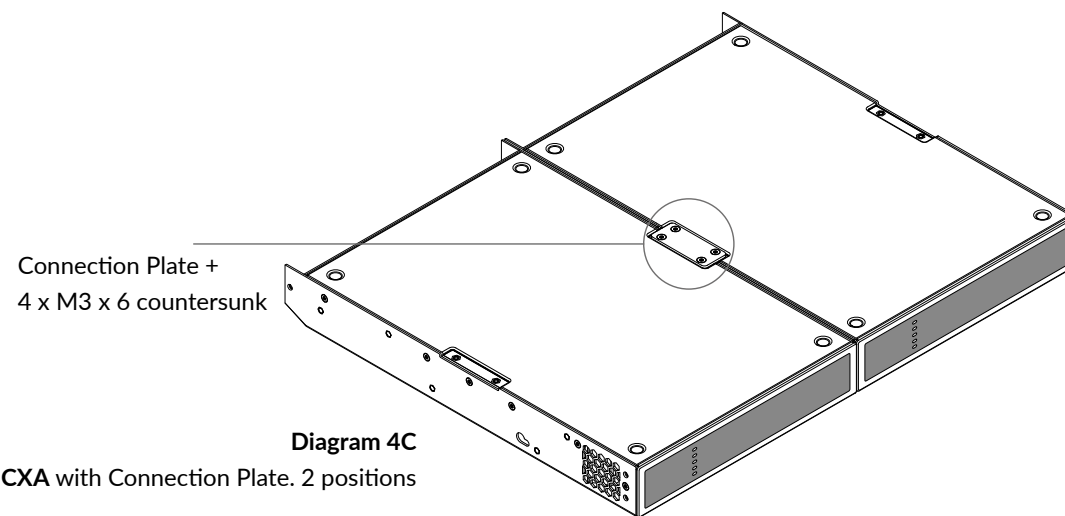
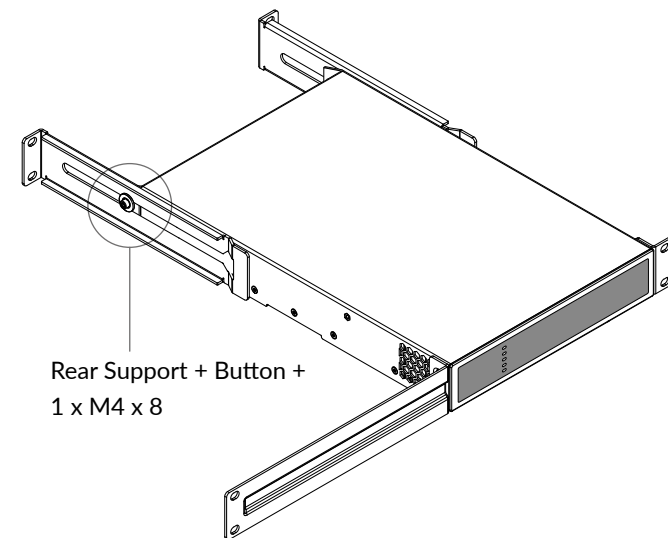


Diagram 4C
2 x CXA with Connection Plate. 2 positions

Installation

4.2 Free-standing

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

CXA 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 80mm of free space behind the amplifier and 25mm along at least one side should be retained at all times.

Diagram 4E
CXA
wall and under-desk mount.

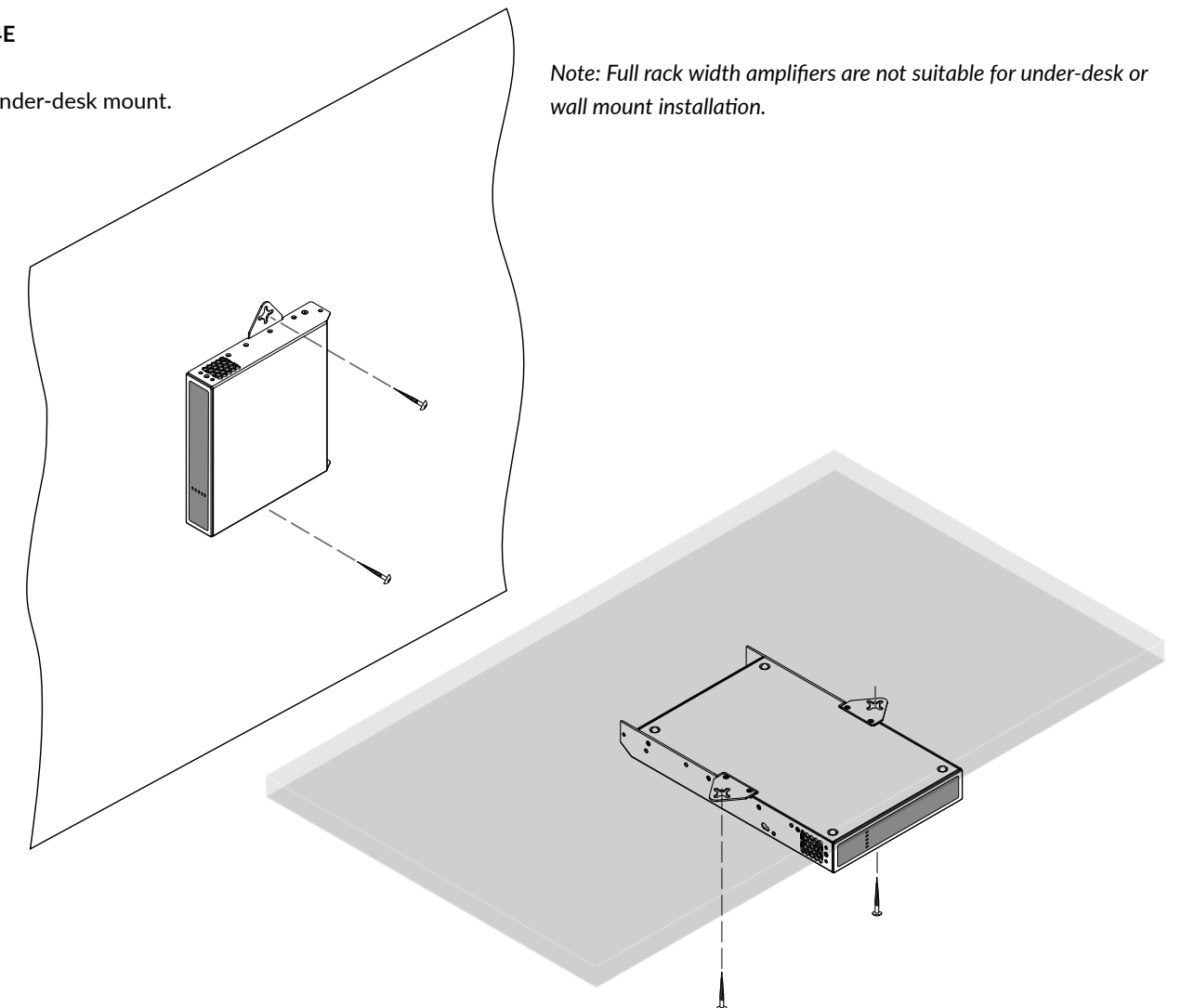


Diagram 4D
CXA

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

Adhesive Foot
4 positions

Mounting Plate +
2 x M3 x 6 countersunk

Installation

5. Full Rack Width Amplifier Installation

CXA models

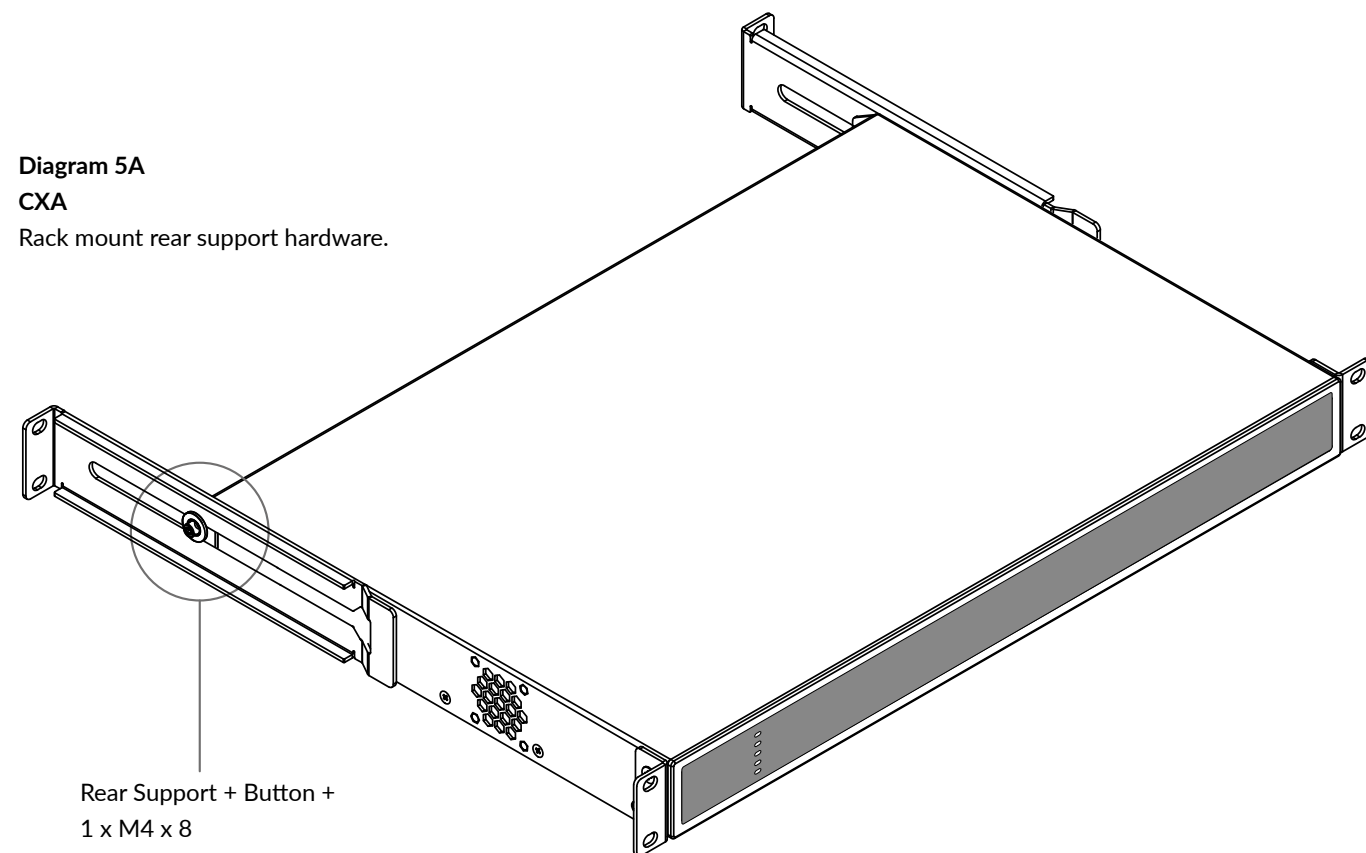
Note: Full rack width CXA amplifier models are intended for rack mount or free-standing installation only.

5.1 Rack Mounting

CXA 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.

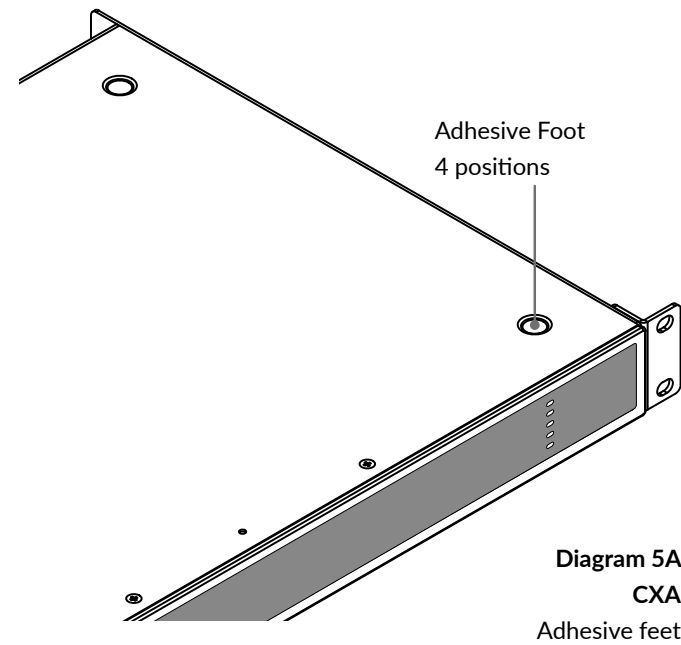
In addition to the use of rack mount ears, rack mount rear support hardware is optionally available that can be attached to the amplifier. Rear support hardware may be appropriate if the amplifier is to be used in a mobile rack or potentially be subject to significant movement. **Diagram 5A** illustrates the use of rack mount rear support hardware.

Diagram 5A
CXA
Rack mount rear support hardware.



5.2 Free-standing

If not installed in an equipment rack, **CXA** 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.



Configuration

6. Configuration

Before making input, output and GPIO connections, an initial CXA 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 CXA amplifiers are connected to mains power and network services. These connections are described in the following two sections.

6.1 Mains Power Connection

CXA amplifiers incorporate a power factor corrected 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 and connect it to a switched mains supply.

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

6.2 Network Services

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

6.2.1 Wired (Ethernet) Network Connection

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

1. Use an Ethernet cable to connect the **CXA** 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 **CXA** 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 **CXA** 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 **CXA** 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 **CXA** amplifier with a fixed IP address, configure the laptop or desktop computer for a fixed IP address in the same IP range; eg. 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 **CXA** Control Web App interface will open to enable amplifier configuration as required.

Note: CXA amplifiers can be configured to use DHCP for network connection if required. However, if a CXA 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 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 CXA control connection.

6.2.2 Wireless (WiFi) Network Connection

To connect a **CXA** amplifier to a TCP/IP network using a wireless connection (WiFi) follow the steps below.

1. With the **CXA** amplifier connected to mains power, wait for the front panel WiFi indicator to illuminate green.

2. Use a mobile, laptop or desktop device to search for available WiFi networks. Connect to, **CXA** (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 **CXA** Control Web App interface will open to enable amplifier configuration as required.

4. Select the Web App Settings Tab followed by WiFi > WiFi Mode > Client to configure the amplifier to connect to the required WiFi network. The WiFi network name and password will be required.

It is strongly recommended that the CXA amplifier Access Point WiFi password is changed following initial wireless connection.

Configuration

6.3 Configuration Menus

Opening a web browser that is network connected to a CXA amplifier initially displays the CXA Control Web App Dashboard illustrated in Diagram 6A. 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.

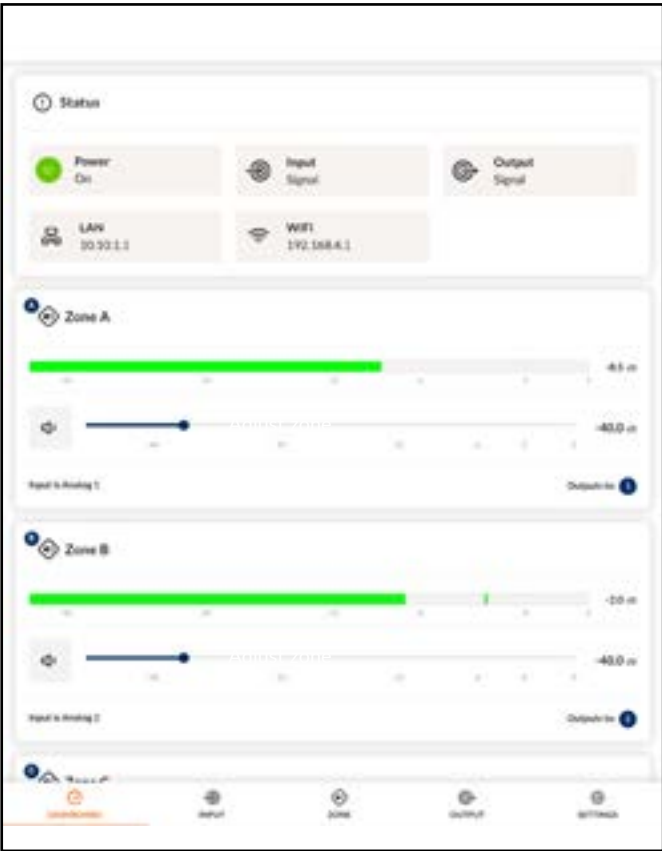


Diagram 6A
Configuration Dashboard display

6.3.1 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 (two outputs enables two mixes, 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.

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

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**. **Diagrams 6B, 6C, 6D and 6E** illustrate the **Input Tab**, **Dante® Input Tab**, **Input EQ** and **Input Mix** displays respectively.

Note: The inputs displayed in the Dante® input tab will correspond to those configured and enabled in the Dante® Controller Mac OS 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 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. **Diagram 6F and 6G** illustrates 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 prioritize, replace and mute the input(s) routed to the zone when the alternative input(s)



Diagram 6D
Dante® Input display



Diagram 6E
Input Mix display

Configuration

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

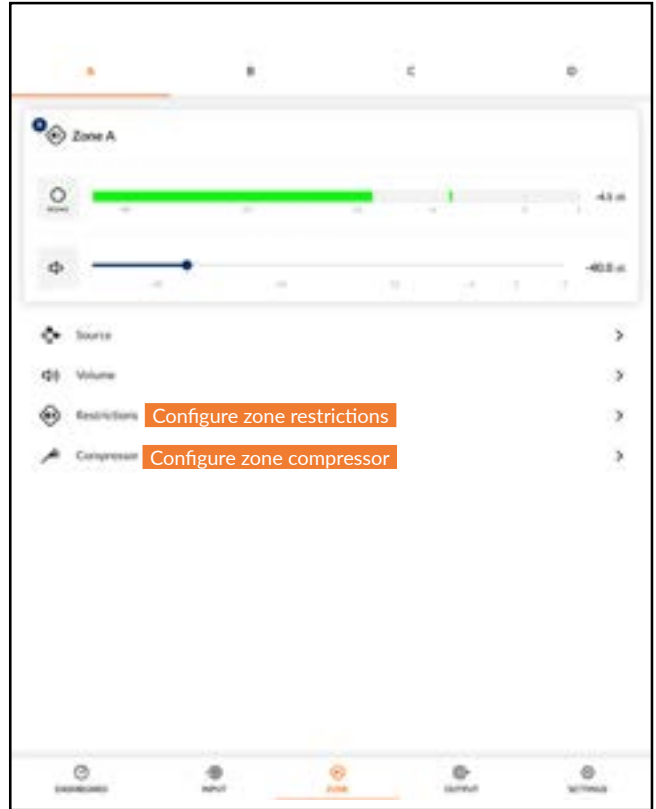


Diagram 6F
Zone Tab display



Diagram 6G
Zone Source menu display

GPIO interface can be found in Section 6.5 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.

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.

Configuration

6.3.3 Output Tab

The **Output Tab** enables amplifier outputs to be named, linked to zones, and provides access to **Delay**, **Room Equalizer** and **Speaker Preset** menus. **Diagram 6H** 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 for configuration will depend on the **CXA** amplifier model and the input, zone and output mode configuration. The diagrams following 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 **Equalizer** menu enables parametric equalization to be applied to individual amplifier outputs. Equalizer settings configured for one amplifier output can be copied and applied to other outputs.

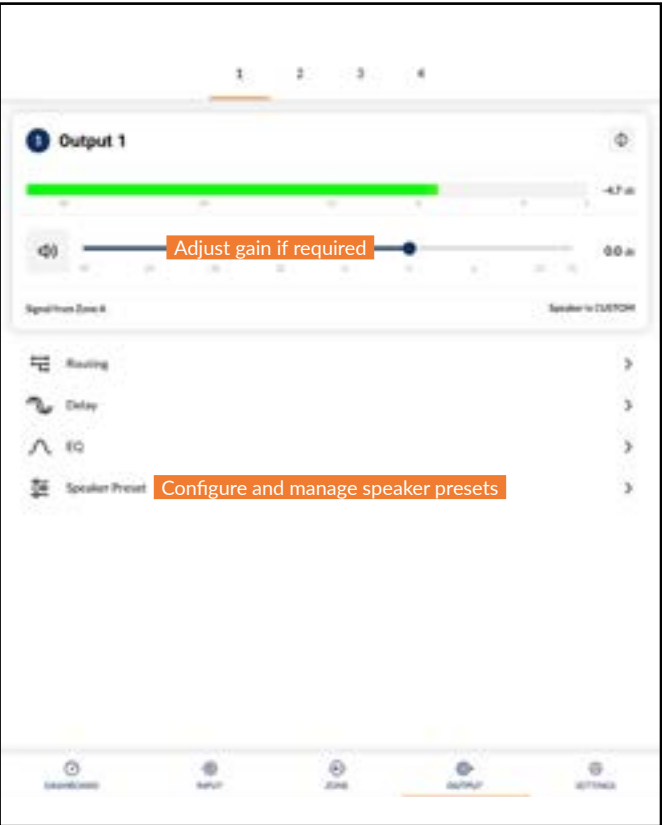


Diagram 6H
Output Tab display

- 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 6.3.4 and can be locked to prevent inadvertent modification. **Diagrams 6I to 6L** illustrate the application of speaker presets.

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

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: The **SELECT PRESET FROM LIBRARY** option will be unavailable if no speaker preset libraries have been created. Speaker preset library creation and management is described in Section 6.3.5.*

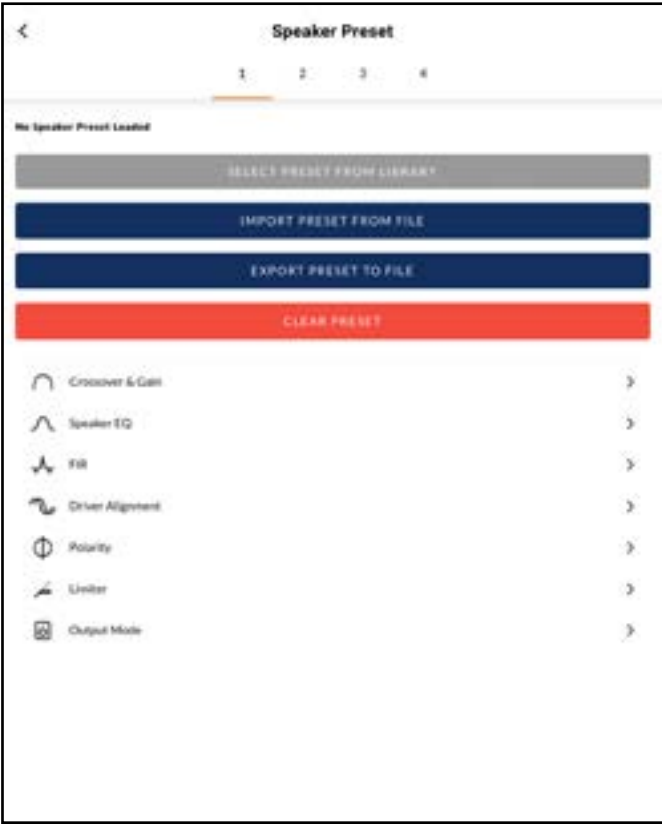
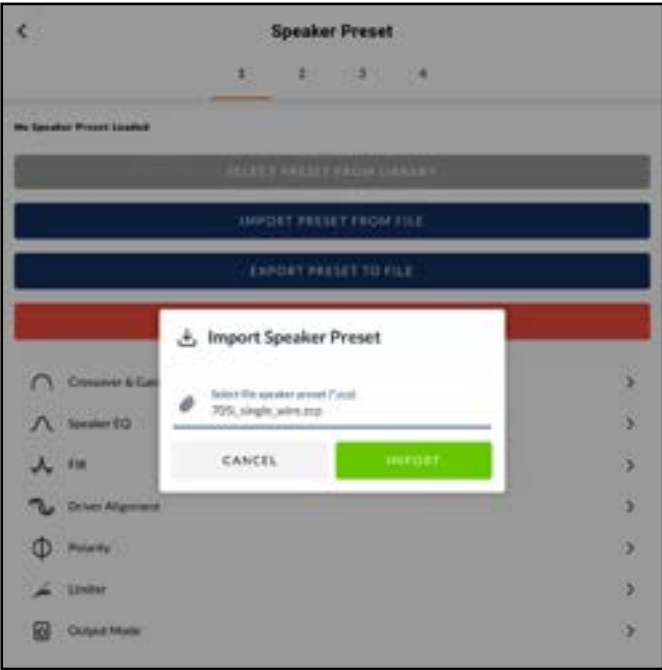


Diagram I
Speaker Preset Parameters

Configuration

Diagram 6J
Speaker Preset import file selection



- 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 customized by selecting the CUSTOMIZE PRESET option.

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



Diagram 6K
Speaker Preset applied

Diagram 6L
Speaker Preset parameter adjustment



6.3.4 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 equalization to be applied to individual amplifier outputs.
 - The **FIR** preset menu enables FIR (Finite Impulse Response) based equalization filter coefficients generated by external speaker measurement software to be imported and applied to individual amplifier outputs. The FIR filter has 512 taps at 48kHz.
- 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.

Configuration

- 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 two output amplifier will have two outputs available if Lo-Z mode is selected but only one output 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 70Hz. If low frequency distortion is still audible, increase the frequency setting one step at a time until the distortion is no longer audible.

6.3.5 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. **Diagram 6M** 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



Diagram 6M
Settings Tab menu



Diagram 6N
The External Devices display

Configuration

paired with an amplifier and configured. Depending on product, setup and configuration, each device can remotely control one single or multiple amplifier zones. **Diagram 6N** illustrates the **External Devices** display.

- 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. **Diagram 6O** 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 Control Web App. Password protection is particularly important when an amplifier is connected to a wired network as the a WiFi password is no longer required to gain access to Control Web App.

Note: It is recommended that a Control Web App password is different from that required to gain access to the amplifier via WiFi.

- 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. When the amplifier has Dante® enabled use the Audio (Digital) or Network Only settings.

- 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 (or Dante®) output - the output signal is variable. However, when an input signal is routed out an S/PDIF (or Dante®) 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 **Dante®** menu enables identification of Dante®

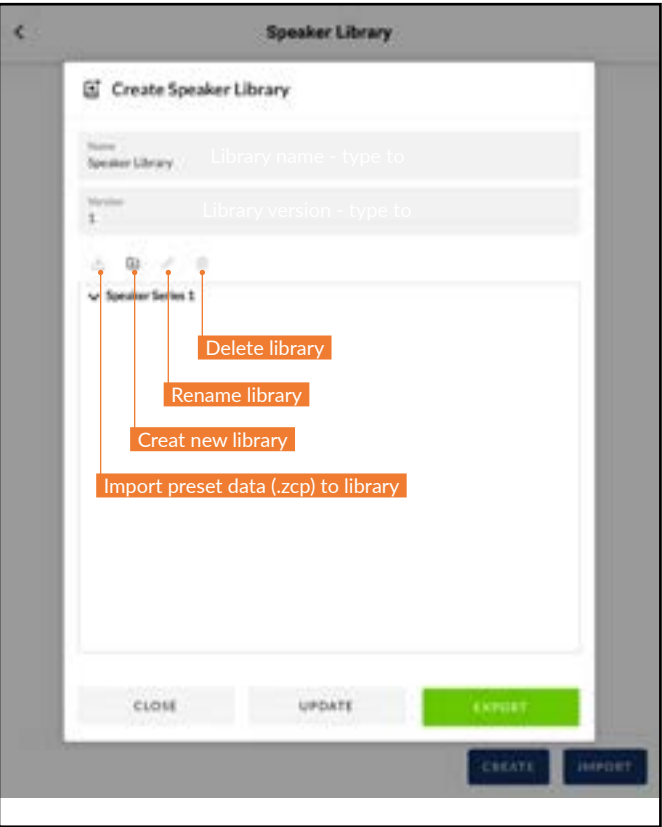


Diagram 6O
Speaker Library Creation and Management

capable devices present on the AoIP network. Dante® devices must be appropriately enabled and configured using Dante® Controller. Use Dante® Controller to activate AES67 mode if required.

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

6.4 Setup and Signal Routing

Thanks to their network based configuration features, **CXA** 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.

Configuration

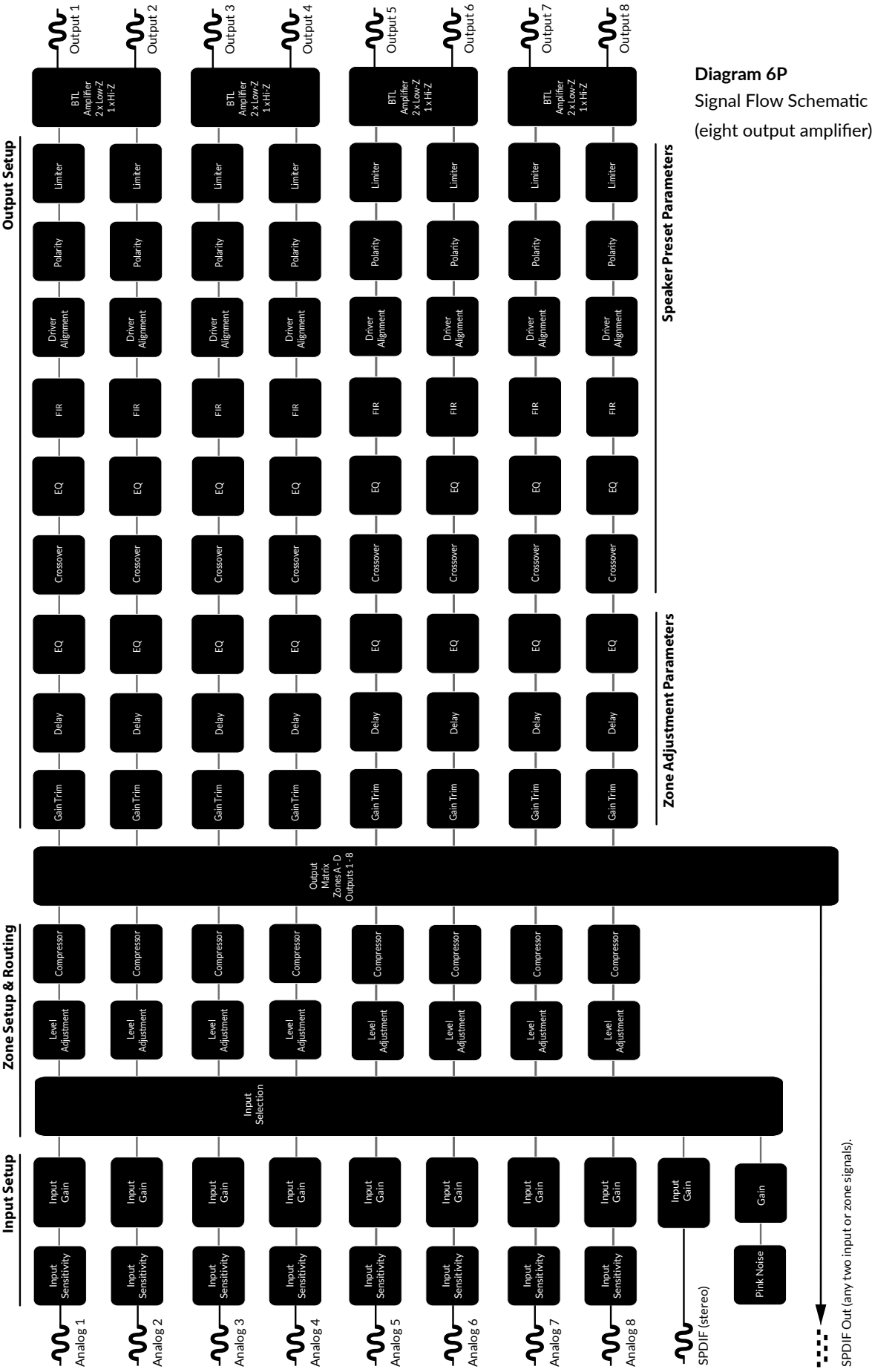


Diagram 6P
Signal Flow Schematic
(eight output amplifier)

Configuration

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 **Diagram 6P**.

6.4.1 Input Setup

Open the configuration Dashboard and select the **Input Tab**. The Input Tab is shown in **Diagram 6B**.

- 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 '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 use. If necessary, adjust the input EQ using the 5 band equalizer.

6.4.2 Zone Setup & Routing

Open the configuration Dashboard and select the **Zone Tab**. The Zone Tab is shown in **Diagram 6F**.

- 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). For example, a two output amplifier can have the following zone configurations:
 - 1 x stereo Lo-Z zone
 - 2 x mono Lo-Z zones
 - 1 x mono 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 CXA 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 .

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

Note: Mono signals might be mono at source, created though 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 channels to mono.

Configuration

6.5 GPIO Setup and Connection

CXA 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 **Diagram 6Q**. The connection of GPIO based remote volume control and standby/mute are illustrated in **Diagram 6R** and **Diagram 6S** 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.*

Diagram 6Q

GPIO Settings Menu

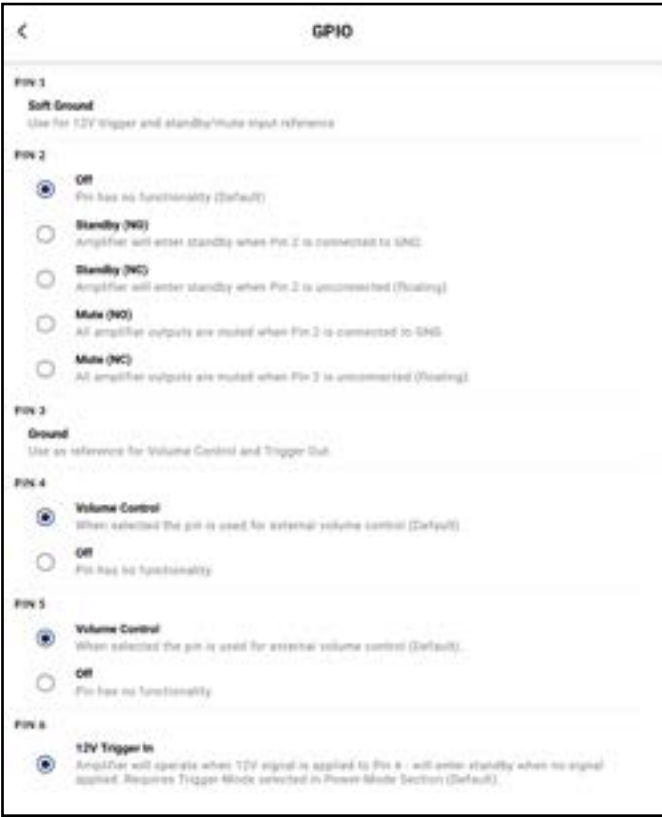


Diagram 6R

Potentiometer connections for remote volume control via GPIO.

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

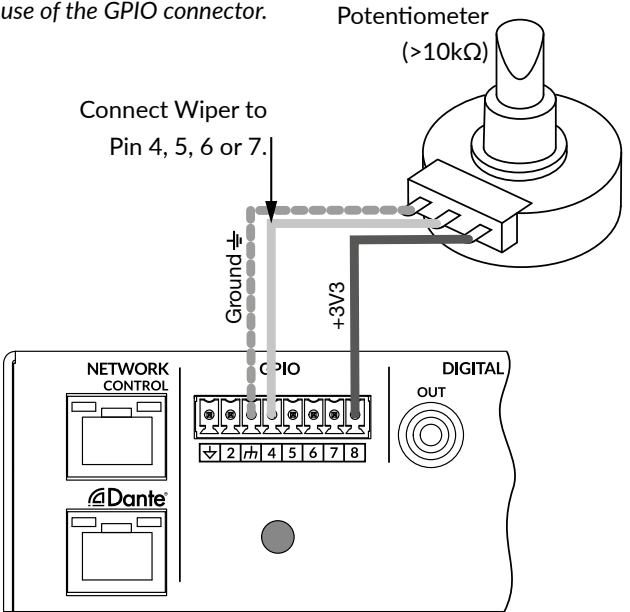
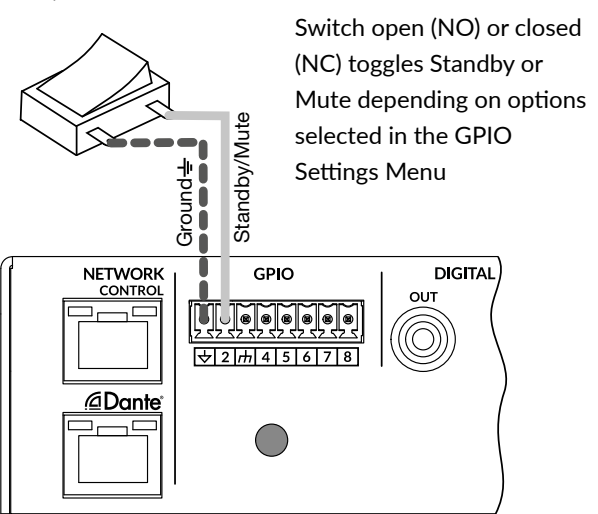


Diagram 6S

Connections for remote standby/mute switch via GPIO.

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



Connections

7. Connections

CXA amplifier rear panel connections are illustrated in Diagrams 7A and 7B.

7.1 Mains Power Connection

CXA 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.

CXA 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 CXA 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 amplifier network interface. See Section 6 of this manual.

Analog Inputs

CXA 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 amplifier network interface. See Section 6 of this manual.

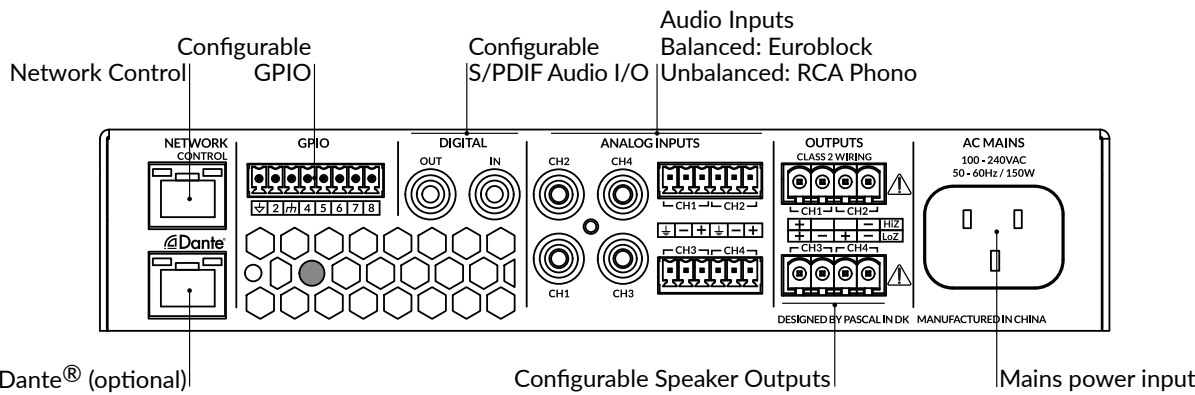
Balanced input connections to the amplifiers are made via male 'Euro Block' connectors. Connecting cables to the supplied female input connectors is illustrated in Diagram 7C.

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

Diagram 7A

Half rack width CXA amplifier rear panel connections.

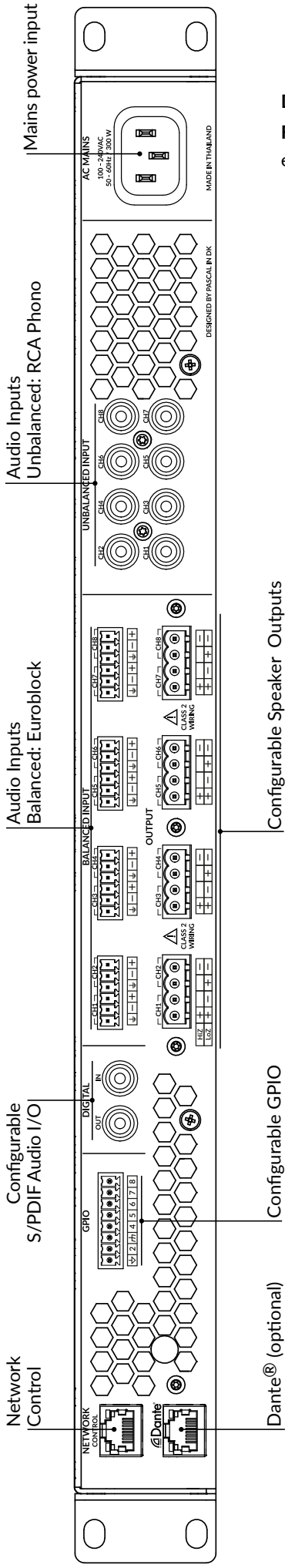
Note: Two output amplifier model connection sockets differ only in the deletion of channel 3 and channel 4 output connectors.



Connections

Diagram 7B

Full rack width CXA amplifier rear panel connections.



Connections

7.5 Speaker Cable Gauge

CXA 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.

7.5 GPIO Connections

If any CXA 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

CXA Control

CXA amplifiers are TCP/IP network connected devices that are configured via a web page based interface. Wired (Ethernet) and wireless (WiFi) connection options are available. Connecting CXA 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®

Half rack width CXA 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 Mac OS and Windows application available for download from: www.audinate.com/products/software/dante-controller.

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

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

Connections

Diagram 7C
Balanced analog input cable connections.

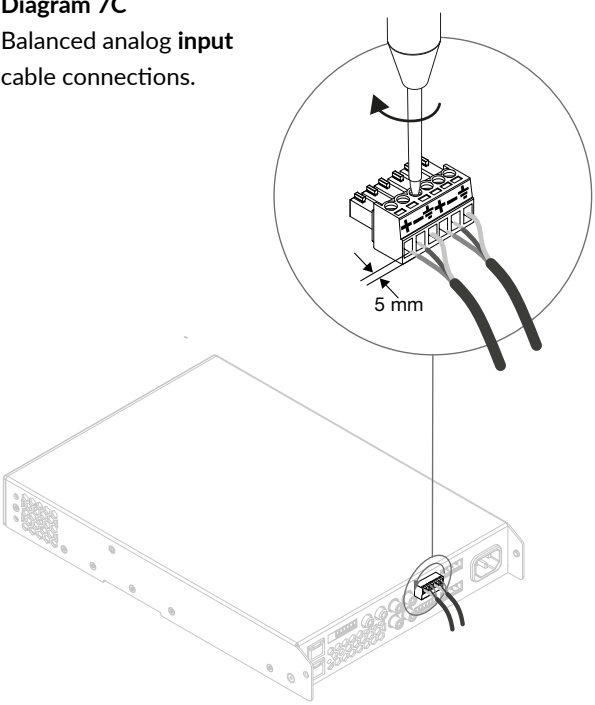


Diagram 7E
GPIO cable connections.

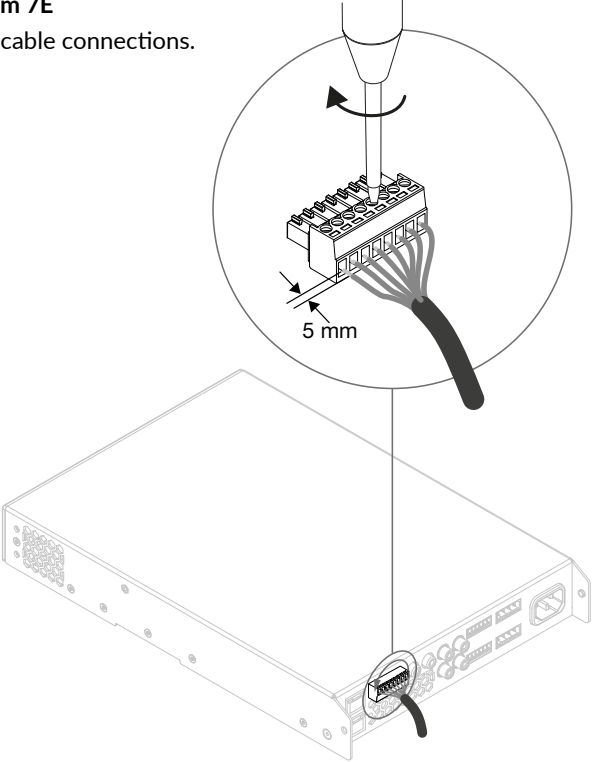
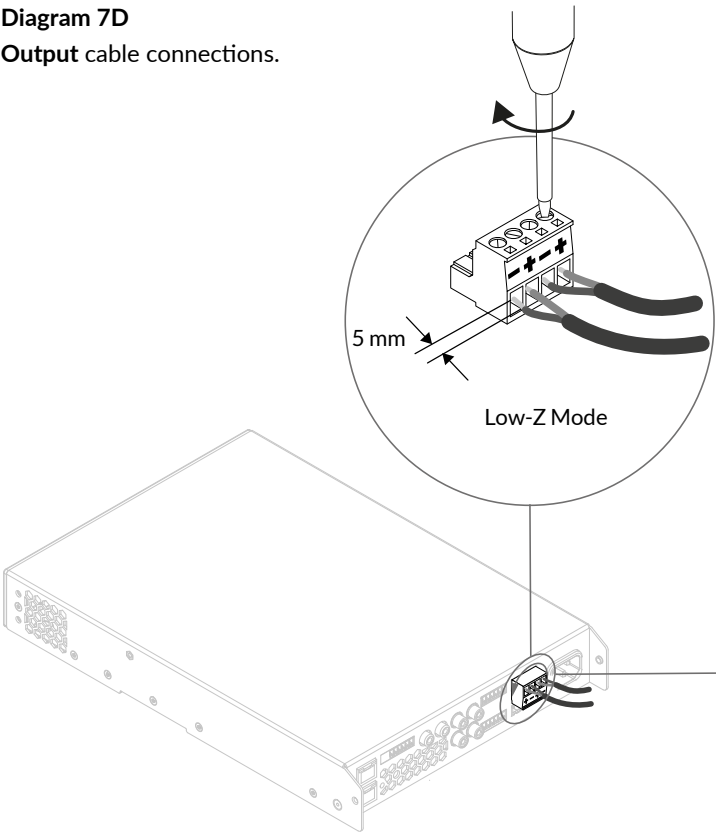


Diagram 7D
Output cable connections.



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.

Operation

8. Operation

Once all connections have been made and configuration options selected, CXA 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: CXA 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 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

CXA 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.
- WiFi:

Off – WiFi disabled.
Green – WiFi enabled.

8.2 Automatic Power Sharing

CXA 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.

8.3 Default Reset

CXA amplifiers can be returned to their default settings via either the 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

Model	CXA125	CXA250	CXA2125	CXA2250	CXA4250/D
Total System Power	125 W	250 W	250 W	500 W	1000 W
Output Power @ 4/8Ω	2 x 60 W	2 x 125 W	4 x 60 W	4 x 125 W	8 x 125 W
Output Power @ 70/100V*	1 x 125 W	1 x 250 W	2 x 125 W	2 x 250 W	4 x 250 W
Powershare (up to) Across all channels	1 x 125 W	1 x 250 W	1 x 250 W**	2 x 250 W***	4 x 250 W****
Power Consumption	75W	75W	75W	150W	300 W
Dimensions	44 x 220 x 213 mm (1.7 x 8.7 x 8.4 in)	44 x 220 x 213 mm (1.7 x 8.7 x 8.4 in)	44 x 220 x 319 mm (1.7 x 8.7 x 12.6 in)	44 x 220 x 319mm (1.7 x 8.7 x 12.6 in)	44 x 220 x 319mm (1.7 x 17.3 x 12.6 in)
Weight	2kg (4.4 lbs)	2kg (4.4 lbs)	2.8kg (6.2 lbs)	2.8kg (6.2 lbs)	3.8 kg (8.4 lbs)
Power Ratings	1% THD @ 120Vac and 230Vac				
Output Circuitry	UMAC™ Class D - full bandwidth PWM modulator with ultra-low distortion				
Output Voltage	70Vp / 140Vpp (unloaded) // Bridged 140Vp / 280 Vpp (unloaded)				
Signal To Noise-Ratio	>106dB (A-weighted, 20Hz-20kHz, 8Ω load)				
THD+N (typical)	< 0.05% (20Hz-20kHz, 8Ω load, 3dB below rated power)				
Frequency Response	20Hz-20kHz (+0/-0.8dB (8Ω load, 3dB below rated power)				
Protection Circuits	Short circuit -, DC -, Undervoltage -, 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, 100V-240V, 50Hz-60Hz				
Standby Consumption	< 0.6W				
Accessories	2x Rack ears 1x ½ rack plate extension 2x ½ rack mounting plates 2x Rear supports				
Options	Audinate Dante® AoIP compatibility: Ultimo Chip 4x4, 2 flows rx/tx ("D" Versions Only)				

*100V line mode is @ -1dB (≈ 90 V)
** CXA2125 may only Powershare 125W across Ch1-2 and 125W across Ch3-4
*** CXA2250 may only Powershare 250W across Ch1-2 and 250W across Ch3-4
**** CXA4250/D may only Powershare 250W across Ch 1-2, Ch 3-4, Ch 5-6 and Ch 7-8

Specifications

Power Efficiency Data

The following table describes the efficiency and power performance of **CXA** 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)
CXA125	4	32.8	15	45.7	17.8	61
CXA250	4	54.1	31.25	57.8	22.9	78
CXA2125	4	58.7	30	51.1	28.7	98
CXA2250	4	107	62.5	58.6	44.5	152
CXA4250	4	200	125	62.5	75	256

Standby and Idle					
Model	Standby (mW)	Idle @ 120V (W)	Idle @ 120V (BTU)	Idle @ 230V (W)	Idle @ 230V (BTU)
CXA125	<500*	9.1	31	9.8	33
CXA250	<500*	9.1	31	9.8	33
CXA2125	<500*	13.1	45	13.6	46
CXA2250	<500*	14.5	49	15.9	54
CXA4250	<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 **CXA** amplifiers.

2 & 4 Channel Amplifiers				
		OUT		
		Analogue	S/PDIF	Dante®*
IN	Analogue	1177µS	458µS	1520µS
	S/PDIF	1833µS	1104µS	2166µS
	Dante®*	1895µS	1166µS	2125µS

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

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.

*Dante® network latency not included.

