A1 Power Amplifier

User Manual

Dear Client,

We are honored that you have chosen the CH A1 Power Amplifier. Our team has put all his efforts into designing and manufacturing this top quality versatile and future-proof product and is proud to present it to you. We hope your A1 will bring you uncountable hours of emotion from your musical collection.

But before starting your musical journey, we kindly ask you to pay attention to the information contained in this manual. The A1, as you will discover in the following pages, is a Swiss precision product designed for ultimate performance and flexibility. However, reaching sonic excellence requires your unit to be setup and operated correctly and this what this manual is all about. If you have any questions or require assistance, please don't hesitate to contact your authorized dealer.

We hope you will enjoy your A1 amplifier for many years.

The Concert has just begun...

Cossy F. 

Heeb T. 

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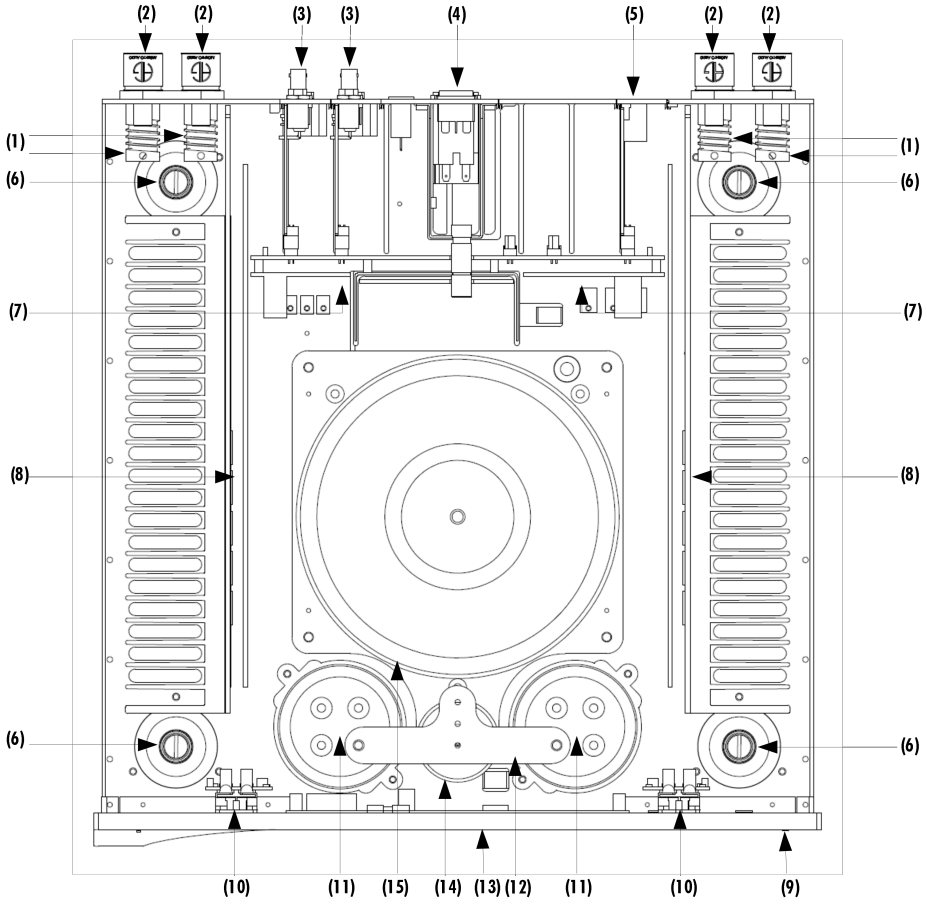
1 Technical highlights

CH products are proudly designed and manufactured in Switzerland by CH Precision Sàrl. Our engineers have put all their know-how into bringing you the A1, a top performances future-proof modular two output channels power amplifier with USB flash-drive firmware update and Ethernet control capabilities. As all CH Precision products, the A1 is highly versatile: a single A1 can be used as a stereo power amplifier (with two mono input boards), or a pair of A1 can be used as mono power amplifiers. Even in monaural mode, 4 setups are possible: left /right mono mode (the transformer of each A1 is dedicated to a loudspeaker, but only one output board is used), bridged mode (to nearly quadruple the available power per channel), passive bi-amp (each channel powers a specific speaker driver) or active bi-amp (when an active crossover network is placed between the preamplifier and the A1). Moreover, multiple A1s can be chained for ultimate performance, using multiple A1s per speakers.

For increased flexibility, the A1 also provides two unique features: global/local feedback ratio and gain adjustments. The amount of global feedback in the amplifying loop of each channel can be adjusted to best match virtually any speaker on the market. The amplifier gain can also be adjusted over a 24 dB wide range, by 0.5 dB steps. This also greatly helps in matching the output level of the preamplifier, the efficiency of the connected loudspeakers and the listening room. Three standard input connectors are available (balanced XLR, single-ended RCA and BNC). Unbalanced inputs can be configured as high impedance input, or a 300 Ohm load can be engaged to match the output of 50 or 75 Ohm D/A controllers or preamplifiers. A pass-through XLR line-level output is also provided for daisy-chaining multiple A1s.



A1 main components

(1) Output coil for HF immunity
(2) Argento Audio speaker terminals
(3) Monaural analog input boards (each A1 can be equipped with 1 or 2 such boards)
(4) Mains switch and power cord receptacle
(5) USB (firmware update) and RJ-45 (control) board
(6) Adjustment shafts and screws
(7) Power supply regulation boards
(8) Heatsink-mounted monaural amplifier boards
(9) User interface buttons
(10) Rectifying diode bridges, mounted onto the front panel
(11) Custom rectifying capacitors
(12) Main analog star-ground oxygen-free copper plate
(13) AMOLED display (on front panel)
(14) Standby power transformer (ensures green mode Standby)
(15) Main power transformer

1.1 Unmatched flexibility

The A1 offers unmatched system integration flexibility. Not only does it provide multiple modes of operation (stereo, mono, bridged and active or passive bi-amp) but is also provides adjustments to match speaker impedance and sensitivity through feedback and gain controls. Operating modes can be selected by the user from the A1's front panel. In addition, multiple A1s can be daisy-chained for ultimate performance in multi-amplification systems.

1.1.1 Operation modes

The A1 integrates two power amplification channels and provides the option to support a single or dual input boards. In its default configuration, the A1 is delivered with a single input board and provides following modes of operation:

- **Bridge mode**: In this mode, the A1 operates as a very high power mono power amplifier, where both amplification channels are used in balanced mode for a single audio channel. When configured in Bridged Mono Mode, the A1 can deliver up to 350 W under 8 Ohm. It is optimal for high impedance speakers in large rooms, requiring large voltage swings.

- **Monaural mode**: In this mode, the entire power of the transformer is dedicated to a single output channel. In Left or Right Mono Mode, the A1 can deliver 550 W under 1 Ohm. It is optimal for low impedance speakers, requiring large amount of current.

- **Passive bi-amplification mode**: In this mode, the A1 operates its two power amplification stages in parallel, each channel driving a different speaker terminal with the same signal. Feedback and gain can be adjusted independently for each channel to best match the individual speaker sections. In Passive Bi-Amp Mode, each channel delivers 100 W under 8 Ohm. It is optimal with speakers with more than one binding post pair on its passive crossover filter network.

By adding a second input board, the A1 provides following additional operating modes:

- **Stereo mode**: In Stereo Mode, each amplification stage is driven by its dedicated input board and the amplifier operates as a standard stereo power amplifier. Feedback and gain settings are shared among both amplification channels and the

A1 delivers 100 W under 8 Ohm per channel. It is the configuration used when a single A1 drives a pair of speakers.

- **Active bi-amplification mode**: As for Stereo Mode, Active Bi-Amp Mode links each amplification stage to its dedicated input board. Feedback and gain can however be adjusted individually for each channel in order to best match the requirements of each driver. An active cross-over is generally used to split the signal into different frequency bands between the system controller/preamplifier (such as CH Precision's L1) and the power amplifiers. In the Active Bi-Amp Mode, the A1 delivers 100 W under 8 Ohm on each channel. It is optimal if the speaker has an external active crossover filter network.

1.1.2 Feedback control

One of the A1's most unique features is its user controllable feedback. This feature provides control over the ratio between global and local feedback applied in the A1's amplification stage. Global feedback takes a portion of the output signal after the power stage and feeds it back to the input of the amplifier. This ensures a very low output impedance and low distortion figures. Local feedback, on the other hand, does not include the output stage and lets the latter operate in open loop mode. This favors small signal details and timing. As a rule of thumb, a higher ratio of global feedback is preferred for grip and control in the low frequencies whereas a lower ratio is preferred for speed and details in the high frequencies. This rule is however not absolute as each speaker and cross-over are different and we highly recommend to try out various settings to find the best match with the connected loudspeakers, especially if the A1 is driving a complete full bandwidth loudspeaker. In multi-amplification systems, different feedback settings are commonly used for the various speaker sections opening a whole new level of performance. We recommend to start with pure local feedback and increase the global feedback until the bass are tight enough for your personal taste. Feedback settings can be adjusted on the fly from the A1's front panel.

1.1.3 Gain control

The A1 provides an integrated gain control with a 24 dB range and 0.5 dB steps. This gain control allows for optimal matching of speaker sensitivity, room size, and preamplifier output level. In multi-amplification systems it can be used to match the sensitivity of the individual speaker sections. Gain is conveniently accessed by a front panel control and can be set on the fly.

1.1.4 Bias adjustment

The A1 provides an advanced bias control circuitry that not only follows slow temperature variations, but also accurately takes into account all the dynamic aspects induced by transients in the musical content.

1.2 Advanced monitoring circuit

1.2.1 Power monitoring

Each power amplifier board is equipped with a DSP that monitors the instantaneous voltage and current output of each A1's channel. Both values are sampled at around 100 kHz, ensuring peak values are properly detected. This circuitry has several purposes: give the user a feedback of the peak power fed to the speakers, and detect malfunctions such as short-circuits or amplifier damage.

1.2.2 Temperature monitoring

The DSPs are also responsible for reading both the power transistors and the radiators temperatures. If the temperature gets excessive, the class-A polarization is turned off, forcing the A1 to work in pure class-B. If removing the output stage bias current is still not enough, and the temperature keeps rising, the A1 will protect itself by entering standby mode. Please note that under normal conditions, none of the above should happen.

1.3 Mechanical construction

The A1 power amplifier is assembled from high-quality aluminum and steel elements with no visible screws on the front, top and side panels. The front panel, base, side panels and top cover are machined from aluminum. The power supply is based on a fully shielded 1200 VA toroidal transformer and custom rectifying capacitors sitting in the central position of the unit. Argento Audio internal wiring is used throughout the unit and binding posts from the same manufacturer provide the best possible interface to your speaker cables. The area where the air flows to cool down the amplifier is isolated from the rest of the A1, ensuring all electronics are preserved from dust accumulation. Pin assembly of all chassis elements provides smooth joints between elements while screws every 6cm ensures protection against electromagnetic interferences. First class mechanical and chemical surface treatments provide the luxury finish of the A1.

Four steel feet support the unit. Each feet ends with a elastomer ring to sit on delicate surfaces but is also equipped with a height adjustable steel spike to fine tune unit positioning. Horizontal adjustment is done with the provided screwdriver through the four adjustment shafts accessible from the top of the unit. In addition to providing convenient horizontal adjustment from the top of the unit, the shafts also serve as vibration evacuation channels for any stacked unit. Special shaft covers are provided to interface with the spikes of the stacked unit. Any vibration from the upper unit is transmitted by the shaft cover to the shaft of the lower unit and from there to the lower unit's feet or spikes, forming a privileged path for vibrations evacuation.

The area where the air flows to cool down the amplifier is hermetically sealed from the rest of the A1, ensuring the electronic circuitry is protected from gradually gathering dust.

1.4 Modular architecture and slot-in boards

The A1 benefits from a fully modular architecture. It features separated sections for power rails, analog and digital power supplies, front panel, signal routing and central host processor, monaural analog input boards and single channel amplification boards. This modular architecture combined with the USB plug for firmware update allows for easy servicing and upgrade should one section become faulty or obsolete.

The slot-in boards section consists in a vertically mounted mother board with optional boards plugged into it. Optional boards provide audio functionality and connectivity to other equipment. There are two types of slot-in boards:

- ANALOG_IN: provides mono single-ended RCA and BNC (both configurable as either high impedance or 300 Ohm terminated) and balanced XLR analog audio input. One (left or right) or two (left and right) such boards can be fitted into the A1. By default, the A1 is factory delivered with a single ANALOG_IN board.

- CONTROL: provides a USB port for software upgrade and an Ethernet port for command. The CONTROL board is factory mounted in each A1.

There are three slots in the A1. Two of them can be populated with a left ANALOG_IN and/or a right ANALOG_IN board. The last slot is dedicated to the CONTROL board. Note that optional boards MUST be installed by a qualified technician. Failure to do so will void any warranty.

1.4.1 Monaural analog inputs: ANALOG_IN board

The ANALOG_IN board features a user selectable mono analog input on three different connectors: single-ended RCA, single-ended BNC and balanced XLR. Both the RCA and BNC inputs can be configured for high-impedance or 300 Ohms load. In addition to its inputs, the ANALOG_IN board includes an XLR output providing a pass-through of the input signal.

1.4.2 Firmware update and control: CONTROL board

The CONTROL board is factory installed into the A1. It provides a USB port for software updates using a flash drive and an Ethernet port for controlling the unit over a network.

1.5 Power supply

The power supply of the A1 is a linear supply with multiple independent local regulations. It is based on an oversized magnetically shielded toroidal 1200 VA mains transformer. A secondary (also toroidal) transformer is used as Standby transformer to ensure green Standby mode, meeting the latest energy saving regulations. Both transformers have static shields between primaries and secondaries. They are mounted on a separate steel plate which is isolated from the main base steel plate by silent blocks.

Custom made 4-poles capacitors are used for rectification. These capacitors exhibit exceptionally low ESR, high speed and high capacitance, providing instantaneous response to current draws from the output stage.

Discrete (power-transistor and op-amp based) ultra low noise regulators are used throughout the power supply to ensure the purest low noise DC feed possible to the different sections. The input stages of the power section are also fully regulated to avoid any coupling distortion. A massive oxygen-free copper plate is used for signal ground.

Input AC voltage to the power supply can be set to 100V, 115V or 230V AC depending on your local mains voltage.

2 Before use

Please read this manual carefully before making connections or operating your A1. After reading this manual, please store it in an accessible place for future reference. If after reading this manual you feel unsure about how to make connections or how to operate the unit, please contact your authorized dealer for assistance.

2.1 Package content

Make sure that the package content is complete. If not, please contact your authorized dealer. Your package should contain:

- A1 power amplifier with one (mono bridged or mono passive bi-amp modes only) or two input boards, depending on the ordered configuration
- A power cord
- Four adjustment steel spikes
- A suction cup (used to unscrew the top covers)
- An accessory box containing:
    - a spike adjustment screwdriver
    - an Allen key
    - a Torx 10 screwdriver
    - four stacking covers
    - a USB stick containing the latest CH Precision firmwares.
    - a set of four CH Support Discs

Please store the packaging for future use. Check your A1 for any apparent damage. In case of a damage, immediately contact your authorized dealer. If your A1 is cold due to transport, please let it warm up to room temperature before powering it up.

2.2 Safety notice

Make sure to observe the following rules:

- Install your A1 power amplifier on a stable base
- Do not install your A1 power amplifier near water

- Always handle with care. The A1 power amplifier is heavy, so have someone help you when moving it around
- Do not expose the unit to any kind of liquid
- Do not install in direct sun light or near any heat source such as radiators or other apparatus generating heat
- Do not install in a confined space and make sure sufficient air can flow around the unit, including under the unit.
- Never install your A1 power amplifier directly on a carpet or any soft material, as fresh air flow from openings under the unit to the side apertures is required for proper cooling of the unit.
- Do not operate under high ambient temperature (>40°C) or with extremely high humidity such as in humid cellars
- Only use options and accessories specified or recommended by the manufacturer
- Do not open the unit nor try to service it by yourself. Do not try to install any option board by yourself. Always refer to a qualified technician for service, maintenance or upgrades. Failure to do so will void the unit's warranty

2.3 User manual

Please read this manual carefully before making connections or operating your A1 power amplifier. After reading, store the manual in an accessible place for future reference. If, after reading this manual, you feel unsure about how to make connections or how to operate the unit, please contact your authorized dealer.

2.4 Mains supply

Make sure to use 3 terminals (phase, neutral and earth) power cords with ground conductor. Make sure that the mains voltage selection of the unit matches your mains voltage.

Make sure your A1 power amplifier is disconnected from AC wall power in the following cases:

- When making connections (it is also recommended to disconnect the rest of the system from AC wall power)
- When cleaning
- During thunder storms
- When unused for a long period

2.5 Transport and packaging

The A1 power amplifier must always be stored in its original packaging for transportation. Doing so will ensure optimal level of protection of your unit. Therefore, keep all the packaging material in a dry and clean place for future use.

In addition, the transformer base plate must be secured for transportation to avoid excessive constraints on the silent blocks isolating the chassis from transformer vibrations. This is done by the insertion of three security screws on the bottom of the unit. Failure to do so will void the warranty as it may cause the silent blocks to tear up and the heavy transformer module to move inside the A1, resulting in severe damages to all A1 components. Do not forget to install these screws for transportation and to remove them at installation of the unit in its new location.

Finally we recommend to remove the adjustment spikes and to put them into the A1 box for transportation. Indeed, vibrations during transport may cause the adjustment spikes to move from their fully retracted position. There is risk of scratching the installation base if the spikes are not fully retracted when installing the unit.

2.6 Cleaning

Use a soft, dry towel or cloth for cleaning. Never use any solvent or liquids as they may damage the surface treatment or penetrate inside the unit.

2.7 Maintenance and service

The A1 power amplifier contains no user serviceable parts. Do not try to open, modify or repair your A1 by yourself. This will void any warranty. Your A1 power amplifier must be checked by a qualified technician in any of the following cases:

- The unit is not functioning properly
- The mains cable or the power cord receptacle is damaged
- The unit has been dropped to the floor or presents external damage
- The A1 power amplifier has been exposed to liquids (such as rain) or unknown substances

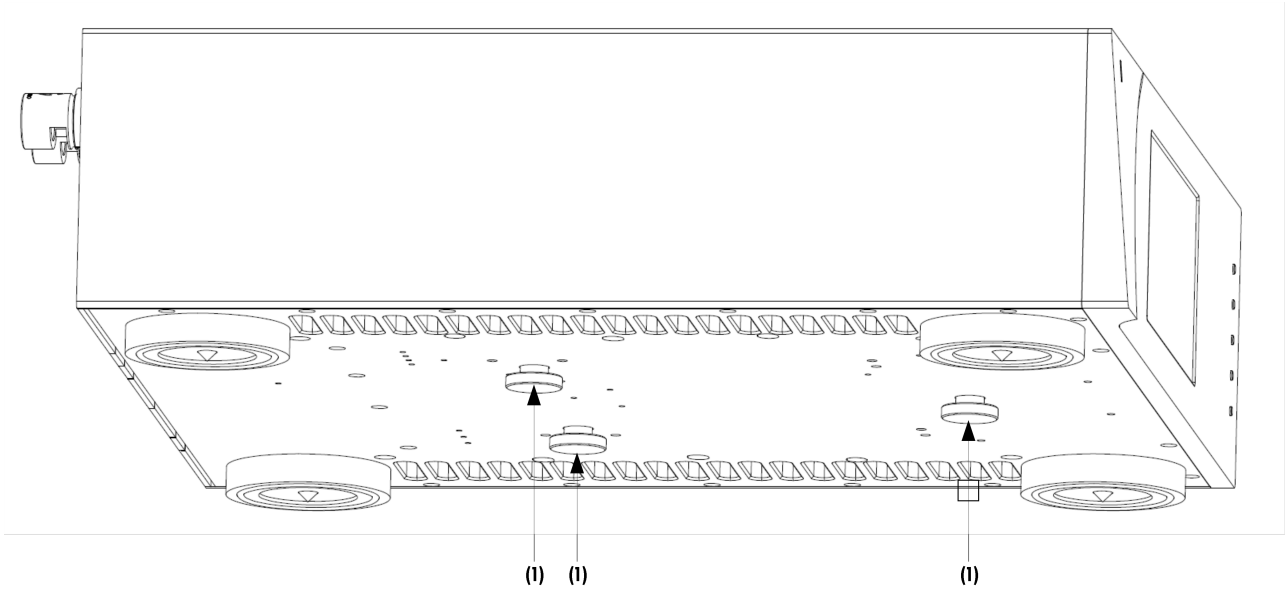
3 Installation

3.1 Unpacking

Unpack the A1 power amplifier and store the packaging for future transportation. Be careful when lifting the A1 as the unit is heavy (over 40kg). Get someone to help you if necessary. When unpacking and installing the A1, take care not to damage the high quality surface treatments.

3.1.1 Removing the security screws

The transformer base plate must be secured during transportation to avoid damage to the isolating silent blocks. Three security screws are located on the bottom of the unit. To remove the security screws, tilt the unit on its side and unscrew. Do not tilt the unit on the front or back panels as this may damage the front plate or the connectors.



Security screw location

(1) Security screws. Must be mounted for transport and removed at installation

3.2 Unit positioning

We recommend to locate the A1 close to the loudspeaker it drives, using short loudspeaker cables.

For best transmission and immunity to external noise, we recommend to connect the A1 input to the upstream unit (preamplifier) using a balanced XLR cable.

When delivered from factory, the A1 amplifier's four feet sit on elastomer rings, ensuring both scratch-protection for the base on which the unit sits, as well as safe anti-slipping unit positioning.

But a more advanced vibration-channeling mechanical coupling can be implemented, thanks to the steel spikes and the polymer

support discs provided with the A1. To use this optimal coupling, simply go through the following steps:

1. Place the A1 unit on a stable base at its approximate final position, for instance in your preferred audio rack. Make sure cooling air is able to freely flow around the unit.

2. Gently lift the unit's corners and insert a support disc under each foot. The foot's elastomer ring should disappear in the support disc's groove when properly placed. Carefully check all four feet perfectly fit in each support disc before pursuing any further. The unit should stably rest on its feet at that point.

3. Unscrew the four top covers from the A1's shafts with the provided suction cup. Be careful not to scratch their delicate finish.

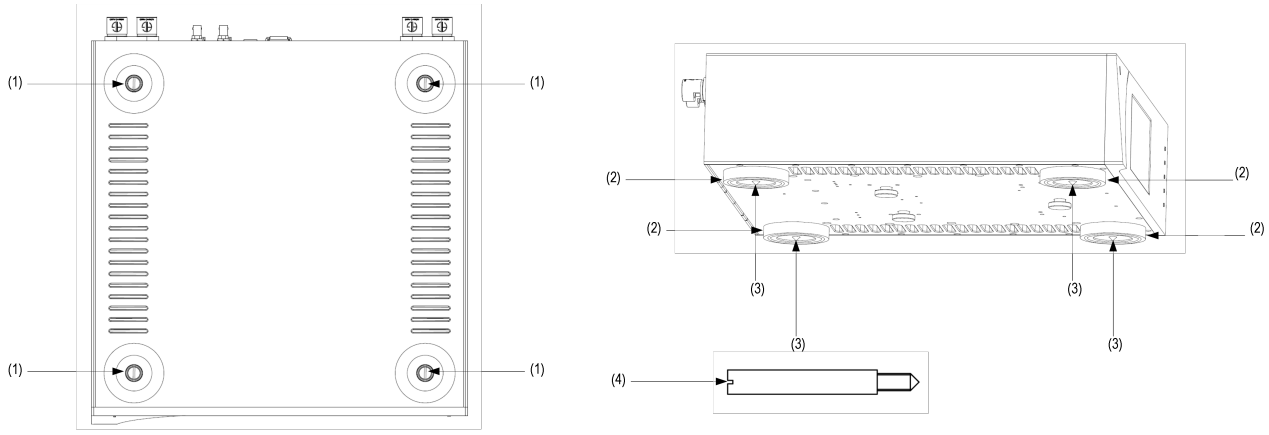
4. Insert the adjustment spikes into each adjustment shaft.

5. Softly screw clockwise each adjustment spikes into the shaft with the provided screwdriver, until any resistance is felt (just before the unit's corner starts to lift).

6. Then screw clockwise each spike by the same amount (for instance two full turns).

7. If the base is flat, the unit should be stable and horizontal. If not, correct the unit's stability and horizontality by turning clockwise or anti-clockwise the required spikes.

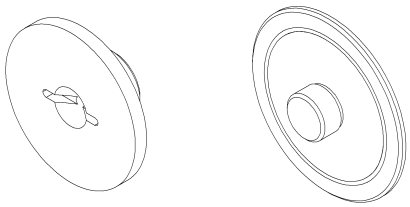
8. If no CH Precision unit is to be stacked on top of the A1, screw the four top covers back. Otherwise, screw the four polymer stacking caps instead, and gently lay down the unit to be stacked on top of it. Be very careful that both units are perfectly aligned in order not to scratch the A1's top plate with the other unit's feet. Repeat steps 3 to 8.



Adjustment shafts, feet and spikes

(1) Adjustment shafts. Insert adjustment spikes and use screwdriver to secure and adjust individual feet spikes
(2) Feet
(3) Adjustment spike heads (when inserted into adjustment shafts)
(4) Adjustment spike

Never stack any component other than CH's on your A1. Never use the aluminum shaft covers (top covers) when another CH component is to be stacked on top of your A1.

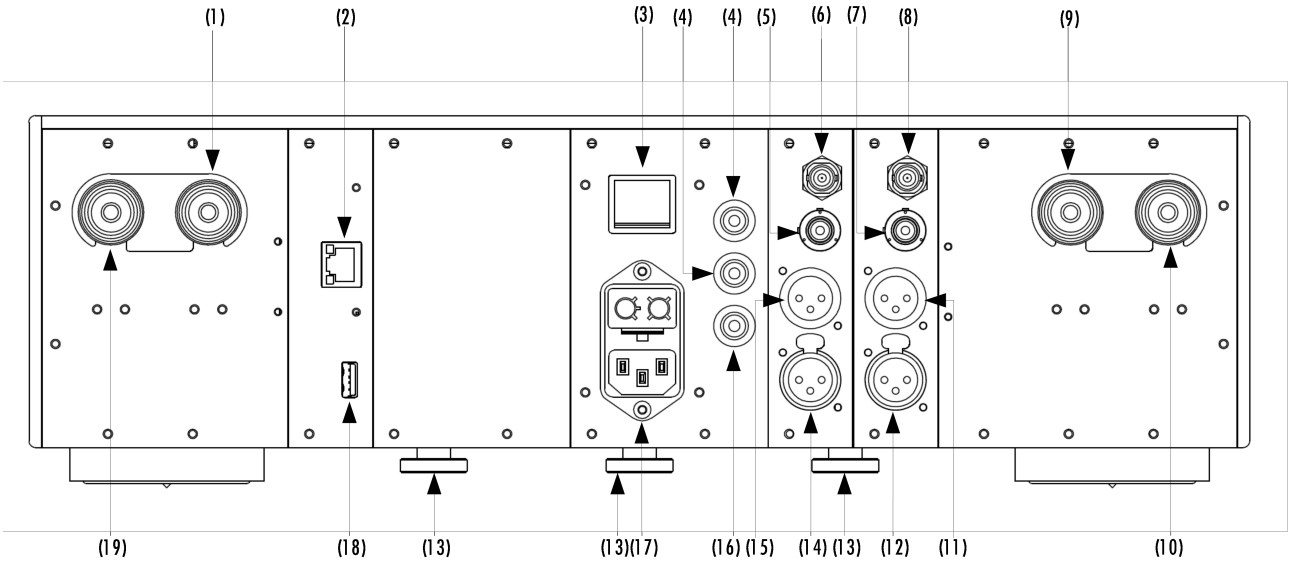


Shaft covers (left: stacking cover, right: top cover)

3.3 Connections

This section provides information about how to connect your A1 power amplifier to your system. As the A1 is a modular design with different optional boards, the description applies to the example configuration presented below. For details about how to integrate you A1(s) in a specific setup, please refer to the Amplifier modes section of this user manual. If you don't feel secure with the connections to be applied to your configuration, please contact your authorized dealer for assistance.

The example configuration is a stereo-ready (2 input boards) power amplifier. Your configuration could only contain a single input board.



A1 rear panel connections

(1) Argento Audio right positive (or bridged mono positive) speaker terminal
(2) Ethernet port for command interface [CONTROL board]
(3) Power on/off switch
(4) Analog ground connectors. Bottom one can be connected to digital ground (Earth) using provided jumper
(5) RCA single-ended analog input for right channel [Right ANALOG_IN board]
(6) BNC single-ended analog input for right channel [Right ANALOG_IN board]
(7) RCA single-ended analog input for left channel [Left ANALOG_IN board]
(8) BNC single-ended analog input for left channel [Left ANALOG_IN board]
(9) Argento Audio left positive (or bridged mono negative) speaker terminal
(10) Argento Audio left negative speaker terminal

(11) XLR balanced analog output (pass-through for A1 chaining) for left channel [Left ANALOG_IN board]
(12) XLR balanced analog input for left channel [Left ANALOG_IN board]
(13) Transportation security screws (to be removed once A1 is placed in its definitive position)
(14) XLR balanced analog input for right channel [Right ANALOG_IN board]
(15) XLR balanced analog output (pass-through for A1 chaining) for right channel [Right ANALOG_IN board]
(16) Earth connector. Internally connected to digital ground
(17) Power fuse and voltage selection and power cord receptacle
(18) USB port for software upgrades. [CONTROL board]
(19) Argento Audio right negative speaker terminal

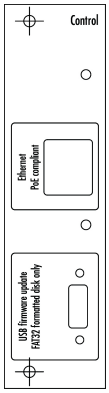
The CONTROL board is mandatory in any A1 configuration and is always factory installed. Depending on arrangement of optional boards in the A1's expansion slots, connector arrangement may slightly differ on your unit. Each A1 unit provides 2 expansion slots, each supporting a monaural analog input (ANALOG_IN) board.

ANALOG_IN boards provides 3 monaural user-selectable analog input connectors (balanced XLR, single-ended high impedance (Hi-Z) / 300 Ohm RCA and BNC) as well as an XLR output monitoring the input signal. This output is used to daisy-chain multiple A1s in multi-amplification systems.

Installation and removing of optional boards must be done by a qualified technician only. Do not attempt to install or remove any optional board by yourself as this would void the unit's warranty.

3.3.1 CONTROL board

The CONTROL board is factory installed into the A1. It provides a USB port for software updates and an Ethernet port for controlling the unit over a network. Following drawing shows the layout of the back panel of the CONTROL board:



CONTROL board back panel layout

3.3.1.1 USB port

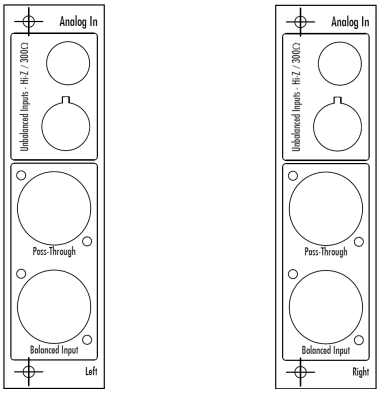
The USB port on the CONTROL board is dedicated to the firmware update of the A1 unit. Do not use it for any other purpose. For more information on unit firmware update, please refer to the corresponding section of this manual.

3.3.1.2 Ethernet port

The Ethernet port on the CONTROL board is dedicated to network based control of the unit. This functionality is currently not implemented, thus leave the Ethernet port unconnected. A future A1 firmware release will provide this functionality.

3.3.2 ANALOG_IN boards

ANALOG_IN boards feature a user selectable mono analog input on three different connectors: single-ended RCA, single-ended BNC and balanced XLR. The analog stage design is fully discrete and balanced. Both the RCA and BNC inputs can be configured for high-impedance or 300 Ohms load, the later allowing for optimal signal transmission when connected to the outputs of 50 or 75 Ohm D/A controllers or preamplifiers. In addition to their inputs, ANALOG_IN boards include an XLR output providing a pass-through of the input signal. This output can be used to daisy-chain multiple A1s in multi-amplification systems for ultimate performance. Balanced connections are recommended for optimal performance. Following drawing shows the layout of the connectors on the ANALOG_IN boards:



ANALOG_IN panel layout

3.3.3 Power cord receptacle and voltage selection

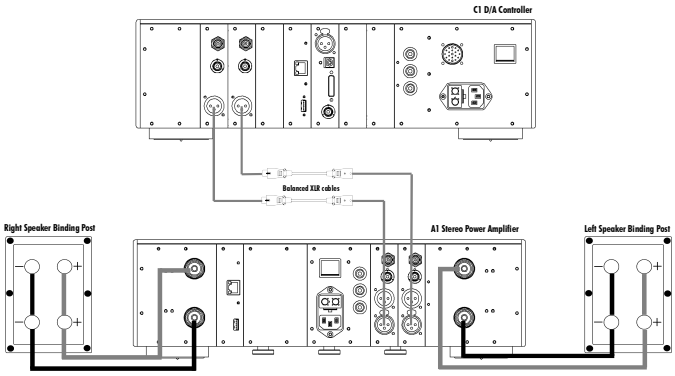
Make sure that the voltage selection is set to the correct value with respect to the AC voltage in your location. Connect the power cord to the power cord receptacle and plug the power plug to an AC wall outlet only after all other connections have been made.

3.4 Amplifier modes

This section describes most standard setups in which one or multiple A1s can be integrated into.

3.4.1 Stereo mode

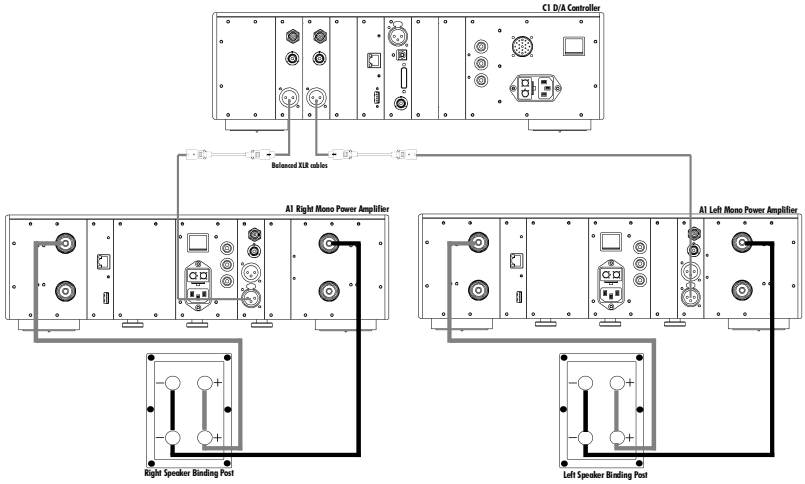
A single A1 equipped with two analog input boards can be used as a stereo power amplifier. This is the simplest configuration that already allows to enjoy the unique sound of the A1 amplifier. The picture below shows how it should be connected in this case.



Stereo mode

3.4.2 Bridge mode

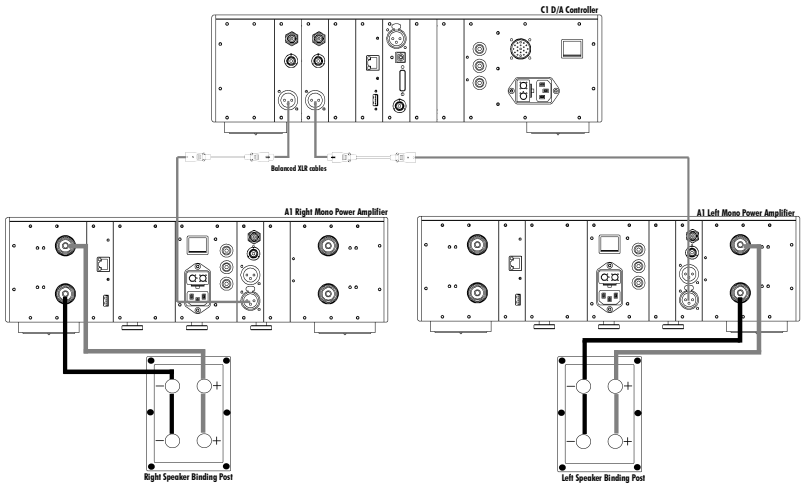
A pair of A1s, each equipped with a single analog input board can be used as a pair of high power with high voltage swing monoblocks. This configuration should be used when low efficiency high impedance speakers are used in large rooms to achieve higher sound level than possible with a single stereo A1. This configuration also exhibits a better signal-to-noise ratio. The picture below shows how they should be connected in this case.



Bridge mode

3.4.3 Monaural mode

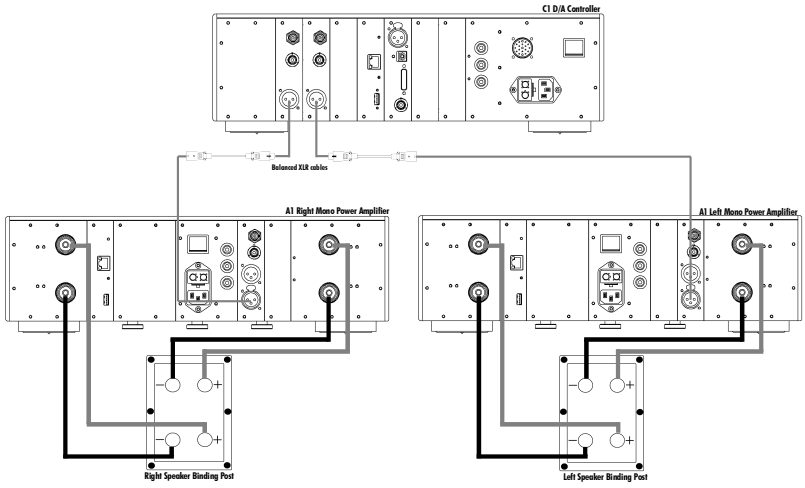
A pair of A1s, each equipped with a single analog input board can be used as a pair of high power with very high current capability monoblocks. This configuration should be used when low efficiency low impedance speakers are used in large rooms to achieve higher sound level than possible with a single stereo A1. The picture below shows how they should be connected in this case.



Monaural mode

3.4.4 Passive bi-amplification mode

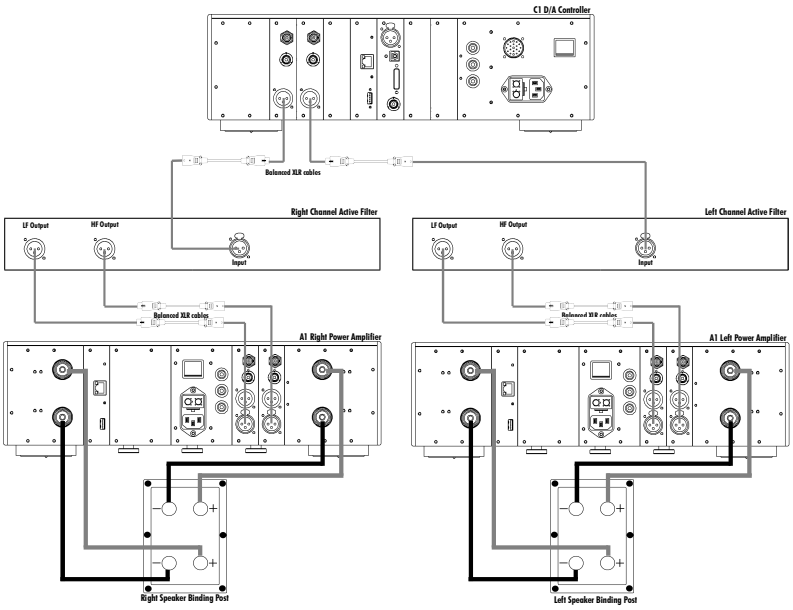
A pair of A1s, each with a single analog input board installed, can be used in passive bi-amplification mode. In such a case, each output board of each A1 feeds the speaker's drivers of a given frequency range. The main advantage of this configuration is the possibility to set optimal global/local feedback ratio for the different frequency bands. The picture below shows how the A1s should be connected in this case.



Passive bi-amp mode

3.4.5 Active bi-amplification mode

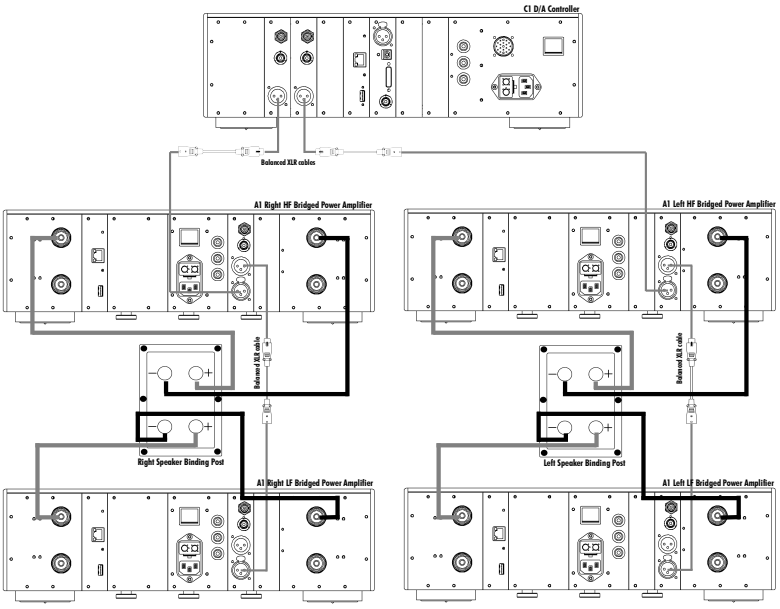
A pair of A1s, each with two analog input boards installed, can be used in active bi-amplification mode. In such a case, each output board of each A1 feeds the speaker's drivers of a given frequency range. This configuration is optimal when an active crossover network is used. Optimal global/local feedback ratio can be set for the different frequency bands. The picture below shows how they should be connected in this case.



Active bi-amp mode

3.4.6 Chained mode

When more than one A1 is to be used to drive a single speaker, they can be chained. This allows for ultimate configuration taking both advantage of the increased power available in bridged mode, and the flexibility provided by multi-amplification (optimal feedback ratio setting for each frequency band). The picture below shows an example of such a chained configuration, namely a passive bi-amp bridged mode.



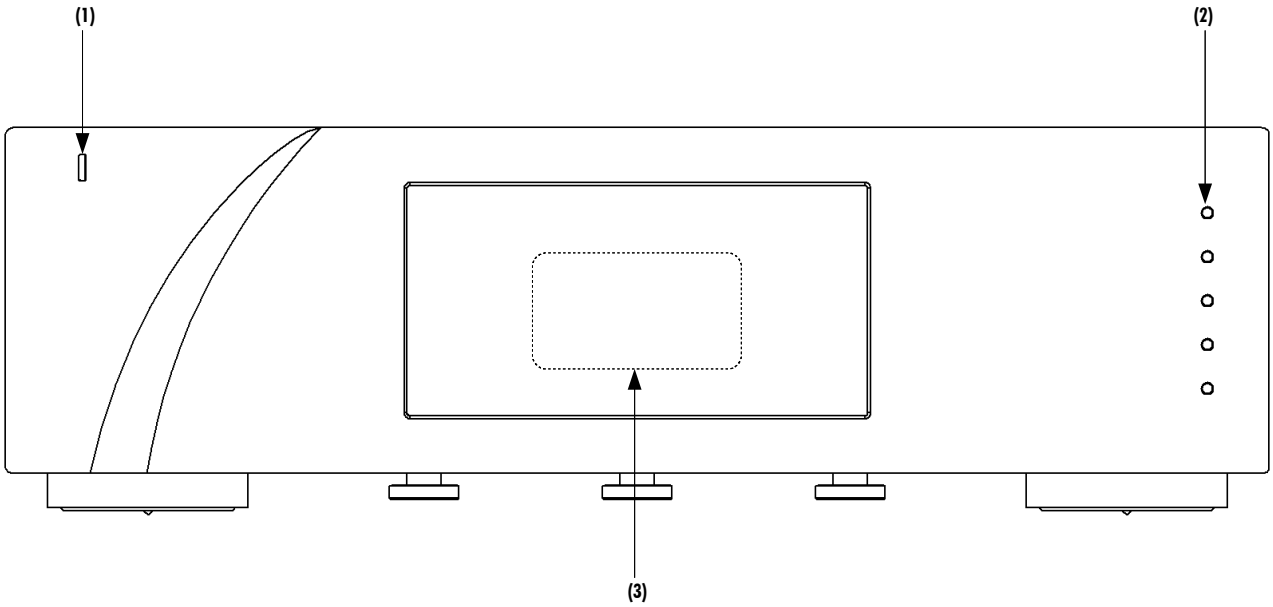
Passive bi-amp bridged mode (chained A1s)

4 Operation

The A1 Power amplifier is operated either from the unit's front panel display and pushbuttons or from the CH Precision Android App available on tablets. The tablet reflects the state of the unit settings and allows the user to adjust the settings on the fly.

4.1 Front panel controls

4.1.1 Front panel



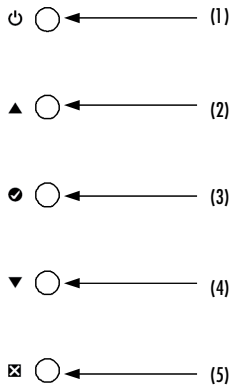
Front panel elements

(1) Standby LED
(2) Five user control push-buttons
(3) Display area (high-definition AMOLED display

The standby LED lights up when the unit is in standby. It is normally turned-off during operation. The LED can also be programmed to remain on during operation. The display is a high-definition AMOLED panel with very wide viewing angle, high contrast and high brightness ensuring optimal reading comfort. The color and brightness of the display can be configured according to user's taste.

4.1.2 Front face push-buttons

The push-buttons located on the front panel of the A1 are the main user input devices.



Front panel push-buttons

Button number	Button symbol	Description
1	⏻	Standby (long push) / Mute/Unmute (short push)
2	▲	Up
3	✔	OK
4	▼	Down
5	☒	Cancel

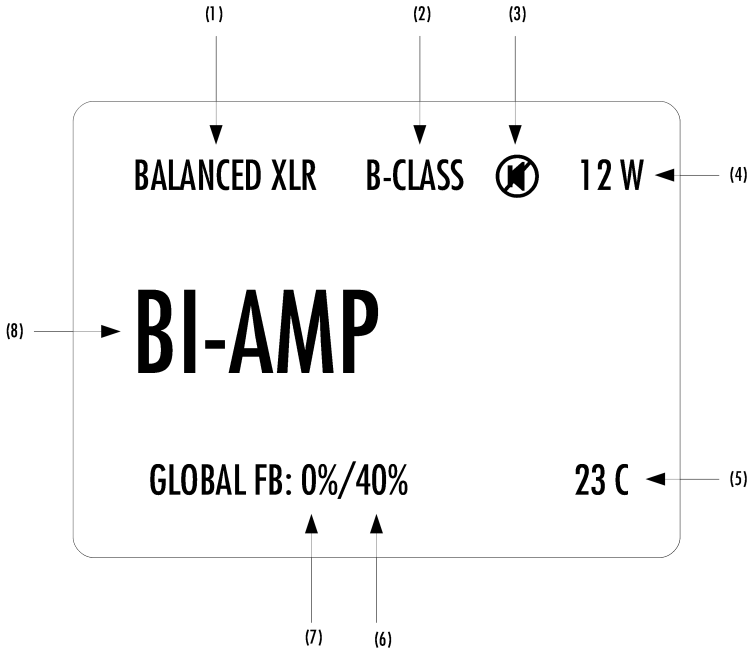
Front panel push-buttons description

4.2 Operating modes

The A1 power amplifier has two main operating modes: Normal mode and Menu mode. Normal mode is mainly used to display general status (such as power or temperature) of the A1 whereas Menu mode is used to configure the unit. The A1 also includes Shortcuts for quick access to selected Menu mode items. Shortcuts are user programmable and most Menu mode items can be selected as Shortcuts.

4.2.1 Normal mode

In normal mode, the A1 can be configured to display its general status, such as operating mode (stereo/mono), input (XLR/BNC/RCA), feedback ratio, peak power and average temperature in a standard CH Precision manner. It can also be set to display a peak-power vu-meter, or a temperature gauge of each output channel. When powered-on, the A1 starts in Normal mode. The status display looks as follows:



Normal mode display elements

(1) Input connector selected, and impedance termination.
(2) B-CLASS is displayed if the A1 gets too warm and the Class-A polarization is turned off
(3) Mute indication. If the ⊗ symbol is present, the output is muted
(4) Meter level of instantaneous power. Gives an image of peak power fed to the load. Except for bridged mode, the maximum power (among the 2 channels of the A1) is displayed
(5) Average temperature of the 2 output boards (in degrees Celsius).
(6) Global feedback applied in the right channel output board (only displayed in bi-amp modes)
(7) Global feedback applied in the left channel output board (bi-amp modes) or in both channels output boards (stereo or bridged modes)
(8) Amplifier mode (stereo, mono, bi-amp or bridged)

Displayed elements depend on the installed optional boards and user settings. In the example above, the A1 is set as a bi-amplifying mono power amplifier, using its balanced XLR input connectors, running in class-B with its output muted (by the way, in that case the power display should be 0 W). Its internal temperature is 23°C (which is not a temperature at which it can turn to class-B mode). The left channel is only applying local feedback, while the right channel is applying a mix of 40% global feedback and 60% local feedback.

Following table shows the actions of the front panel push-buttons in Normal mode.

Front face push buttons	Unit State	Unit Action
⏻, short push	STANDBY Any other state	Wake from STANDBY Mute/Unmute
⏻, long push	STANDBY Any other state	Wake from STANDBY Go to STANDBY
▲	Any state	Enter Shortcuts mode

⊘	Any state	Enter Shortcuts mode
▼	Any state	Enter Shortcuts mode
⊠	Any state	No effect

Push-buttons actions in Normal mode

4.2.2 Shortcuts

The A1 amplifier is configured by a set of menus as described in the next sections. To allow quick access to the most frequently used configuration menu items, the A1 offers the concept of Shortcuts. Shortcuts are fully programmable and the user may choose any configuration parameter as a Shortcut. There are up to 6 user programmable Shortcuts. To learn how to program individual Shortcuts, please refer to the SHORTCUTS menu item in the next section.

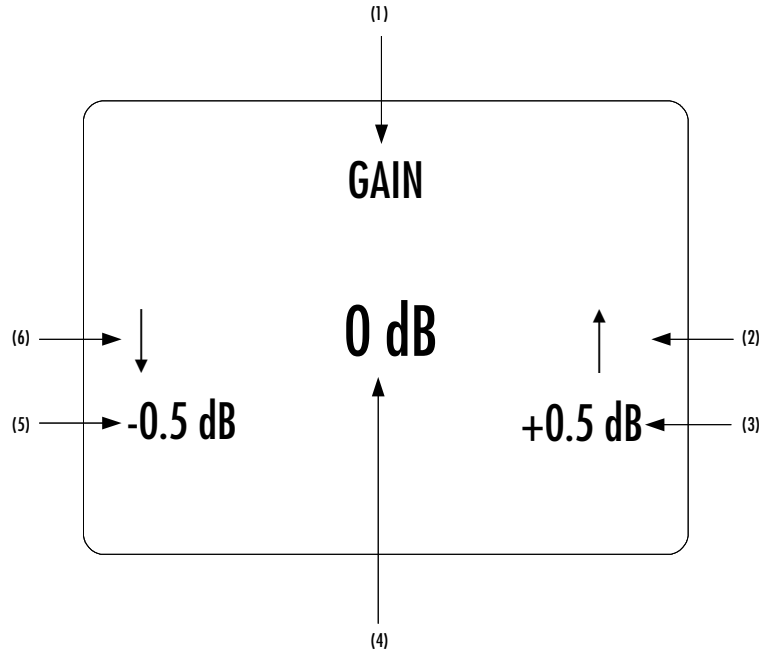
Shortcuts are accessed from Normal mode by a push of the OK [⊘], UP [▲] or DOWN [▼] buttons on the front face. Additional OK [⊘] push skips to the next Shortcut. The last Shortcut is always dedicated to entering the Menu mode (SETUP). On this last Shortcut, an OK [⊘] push will return to Normal Mode and an UP [▲] push will enter the Menu mode. The individual parameter for a given Shortcut is modified using UP [▲] or DOWN [▼] buttons. If there is no user action for about 10 s the unit will revert to Normal mode.

Following table shows the actions of the push-buttons for Shortcuts.

Front face push buttons	Unit State	Unit Action
STANDBY [⏻] Short Push	Any state	Mute/Unmute
STANDBY [⏻] Long Push	Any state	Go to STANDBY
UP [▲]	Shortcuts (except last) Last Shortcut (SETUP)	Modify parameter up (when available) No action
OK [⊘]	Shortcut (except last) Last Shortcut (SETUP) or after current Shortcut has been modified	Skip to next Shortcut Exit Shortcuts mode (Normal mode)
DOWN [▼]	Shortcuts (except last) Last Shortcut (SETUP)	Modify parameter down (when available) Enter Menu mode
CANCEL [⊠]	Shortcuts	Exit Shortcuts mode (Normal mode)

Push-buttons actions for Shortcuts

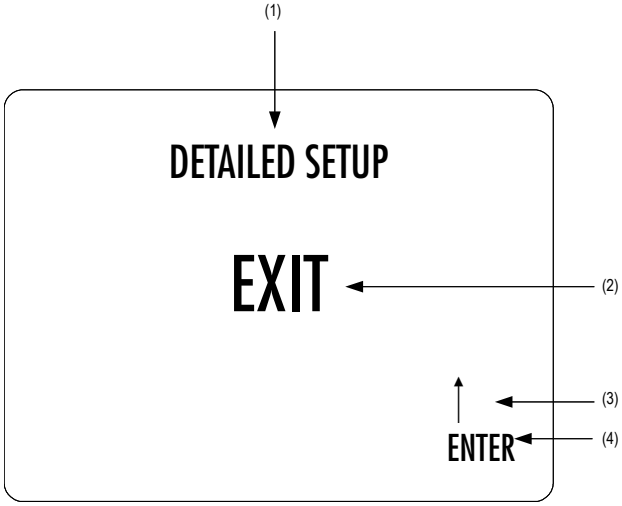
The GAIN Shortcut gives a good illustration of how to navigate a Shortcut screen. Navigating other Shortcuts is similar.



GAIN Shortcut display elements

(1) Shortcut title (Parameter being adjusted, for other Shortcuts, title changes accordingly)
(2) Arrow indicating UP button [▲] if applies. The item below indicates the next parameter value (up direction)
(3) Next Parameter Value if UP button [▲] is pushed (parameter up)
(4) Current Parameter Value
(5) Next Parameter Value if DOWN button [▼] is pushed (parameter down)
(6) Arrow indicating DOWN button [▼] if applies. The item below indicates the previous parameter value (down direction)

The last Shortcut (SETUP) is always the same and cannot be removed or altered. It gives access the Menu mode to access the detailed setup of the unit.



SETUP Shortcut display elements

(1) Shortcut title. It indicates that Detailed Setup (Menu mode) can be entered at this stage
(2) Current value of the parameter. Default action is to exit (go back to Normal mode)

(3) Arrow indicating UP button [▲]

(4) Next parameter value. If UP button [▲] is pushed, the unit enters into Menu mode

4.2.3 Menu mode

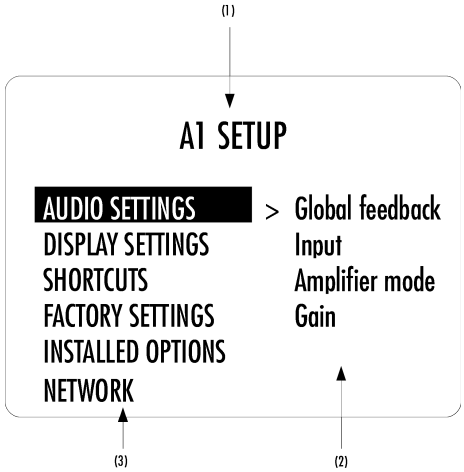
The Menu mode allows for Configuration and Setup of the A1 power amplifier through a set of menus. Menu mode is entered from the last Shortcut item (see above). From Normal mode, enter the Shortcut mode by pushing the OK [⊘] button. By successive OK [⊘] button pushes, step to the last Shortcut item (DETAILED SETUP) and push the TOP [▲] button once to enter the Menu mode.

Navigation in Menu mode is based on UP [▲] and DOWN [▼] buttons to select an item or to change a value. The OK [⊘] button is used for validation and CANCEL [⊠] to exit without saving.

Front face push buttons	Unit Action
STANDBY [⏻] Short Push	Mute/Unmute the unit
STANDBY [⏻] Long Push	Put the unit into Standby
UP [▲]	Move to next menu item upward
OK [⊘]	Enter next menu level or Validate choice (save setting)
DOWN [▼]	Move to next menu item downward
CANCEL [⊠]	Return to previous menu level without saving

Push-button actions in Menu mode

Following illustration shows the elements of a the A1 SETUP Menu page, the entry point to the A1 menu structure.



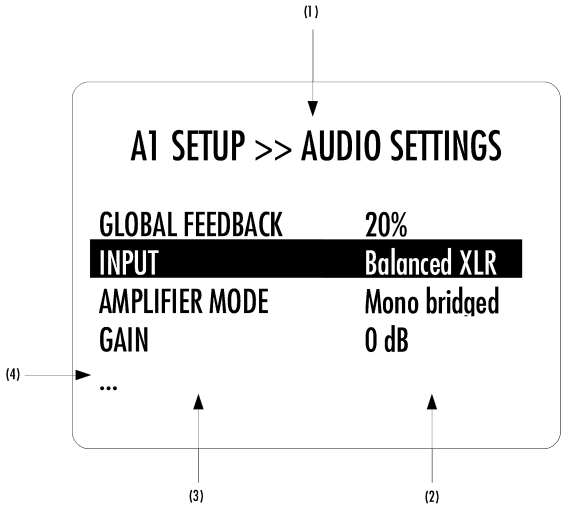
A1 SETUP menu display elements

(1) Menu title. When entering a menu item, the title also shows the parent menu. If the AUDIO SETTINGS menu is entered, the title line would display A1 SETUP >> AUDIO SETTINGS.

(2) Shows the accessible parameters when entering the currently highlighted menu item. In this example, AUDIO SETTINGS is highlighted and the second column shows the parameters accessible in the AUDIO SETTINGS menu.

(3) List of items in the current menu. Navigate from one item to the other by pressing the UP [▲] and DOWN [▼] buttons. To enter the highlighted menu item, press the OK [●] button. To return to the previous menu level press the CANCEL [⊠] button. In this example, the CANCEL [⊠] button exits the Menu mode and sets the unit back to Normal mode.

Once a menu item is selected by a push of the OK [●] button, parameters for the corresponding menu item can be navigated and accessed. As an example, the following drawing shows the display elements of the A1 SETUP >> AUDIO SETTINGS sub-menu.



A1 SETUP >> AUDIO SETTINGS menu display elements

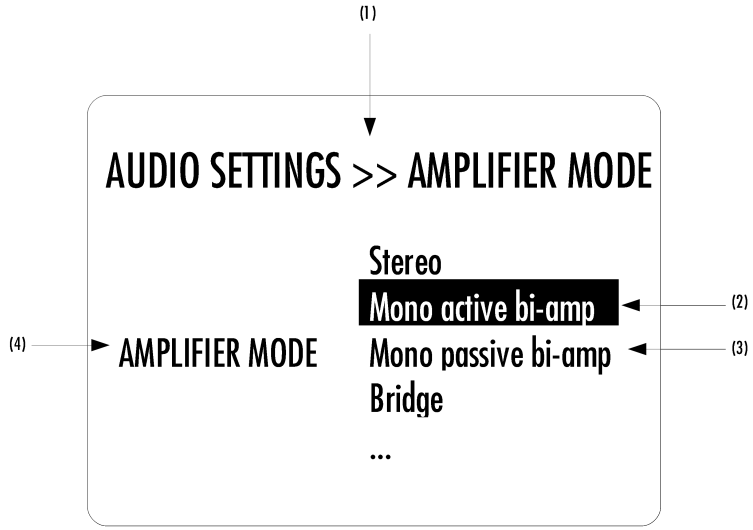
(1) Menu title. A1 SETUP >> AUDIO SETTINGS shows that the parent menu is A1 SETUP. By pushing the CANCEL [⊠] button, the unit returns to the parent menu.

(2) This is the Parameter Value column. For each item in the Parameter column, the Parameter Value item on the same line indicates the current value of the Parameter.

(3) This is the Parameter column. The currently active Parameter is highlighted. Use the UP [▲] and DOWN [▼] buttons to navigate from Parameter to Parameter, and the OK [●] button to enter the edition mode of that parameter.

(4) If the first or last item in the Parameter column is indicated by '...' it means that there are additional Parameters not displayed currently on-screen. Use the UP [▲] and DOWN [▼] buttons to navigate towards the '...' to make the corresponding Parameters appear on screen.

Once a terminal Parameter (e.g. a Parameter not giving access to a further sub-menu) is selected by pushing the OK [●] button, the A1 displays the corresponding Parameter adjustment screen. Following example shows the AUDIO SETTINGS >> AMPLIFIER MODE Parameter adjustment screen. Other Parameters are similar but may show more (or less) choices for the Parameter value. Once a Parameter is set to the desired value, an OK [●] button push saves the new Parameter Value and gets back to the parent level (save and exit). On the other hand, a CANCEL [⊠] button push gets back to the parent menu (in the case of this example: AUDIO SETTINGS), but possible modifications of the Parameter Value are discarded (exit without saving).



AUDIO SETTINGS >> AMPLIFIER MODE menu display elements

(1) Menu title. AUDIO SETTINGS >> AMPLIFIER MODE shows that the parent menu is AUDIO SETTINGS. To access the parent menu, push the CANCEL [⊠] button

(2) The current Parameter Value is highlighted. Push the UP [▲] or DOWN [▼] buttons to navigate through Parameter Values

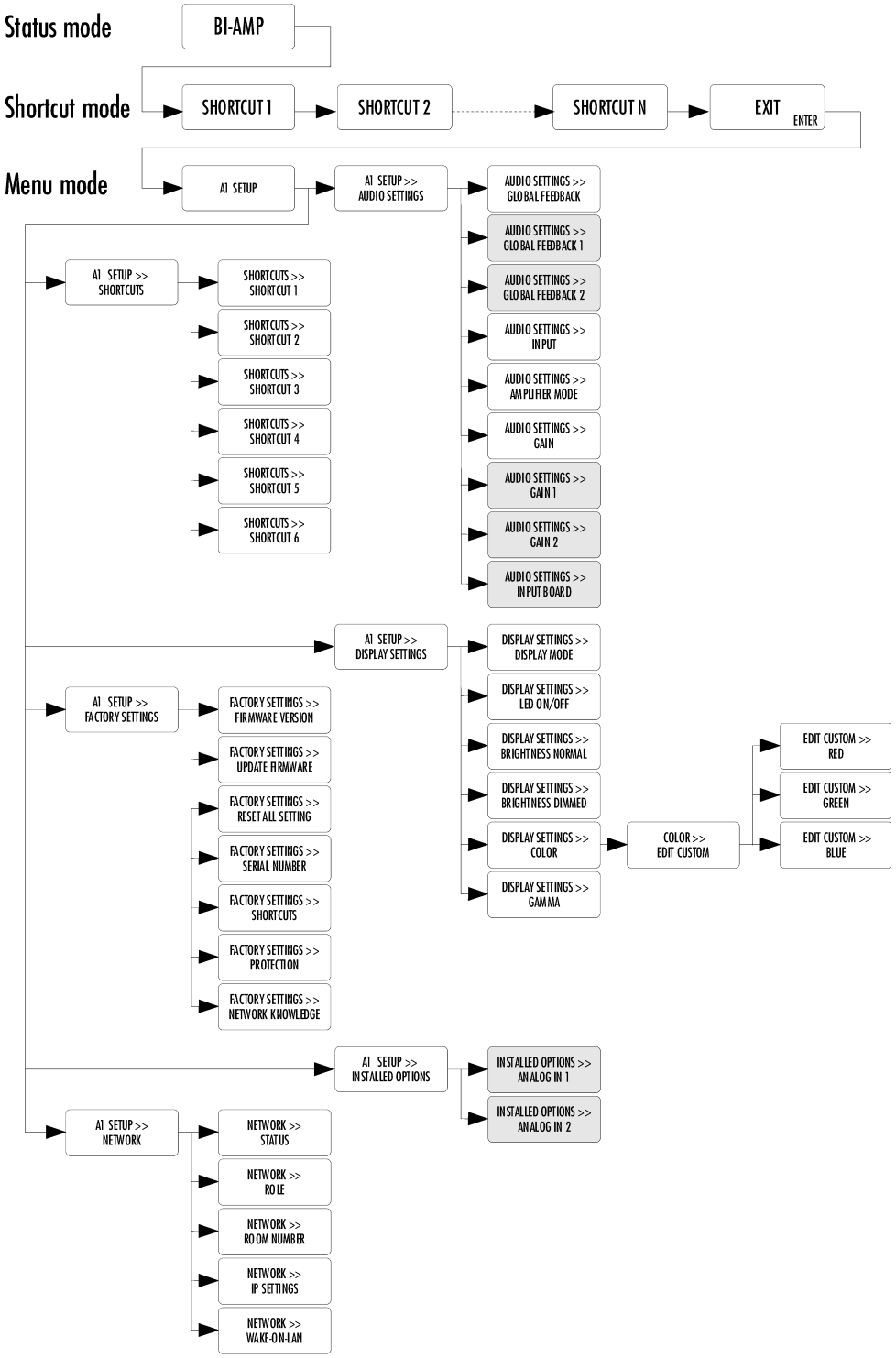
(3) Other possible Parameter Value(s). Number of other possible Parameter Value(s) depends on Parameter

(4) Parameter for which the Parameter Value can be modified in the current menu screen.

The following section gives detailed information about the menu structure and the various Parameters. Note that certain Parameters may or may not appear in the menu depending on installed options. For instance if only a single ANALOG_IN board is installed or an amplifier mode requiring two input boards is selected, CHANNEL selection menu items (to select the left or right input board) will be hidden.

4.3 Configuration

Configuration of your A1 amplifier is accomplished by settings parameters in the Menu mode (see previous section for how to access Menu mode and how to navigate menu items). Following diagram shows the complete menu structure (terminal items not shown). Grayed menu items are items which depend on installed optional slot-in boards.



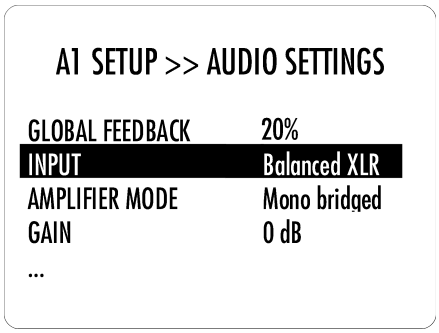
A1 Amplifier menu structure

There are five main menus used for configuration of the A1:

- AUDIO SETTINGS: Allows to adjust audio related parameters
- DISPLAY SETTINGS: Allows to adjust display related parameters
- SHORTCUTS: Allows to assign and modify Shortcuts for user interface customization
- FACTORY SETTINGS: Indicates the software version and allows to update it. Also allows to return to factory settings
- INSTALLED OPTIONS: Provides information about the installed optional slot-in boards
- NETWORK: Provides information about the network setup and enables its configuration

4.3.1 A1 configuration menu items

4.3.1.1 AUDIO SETTINGS



The A1 SETUP >> AUDIO SETTINGS menu allows configuration of the audio related Parameters of the unit. Accessible Parameters are:
- GLOBAL FEEDBACK: Sets the amount of global feedback for output channels
- GLOBAL FEEDBACK 1: Sets the amount of global feedback for first channel
- GLOBAL FEEDBACK 2: Sets the amount of global feedback for second channel
- INPUT: Selects an input connector and impedance termination
- AMPLIFIER MODE: Selects in which mode the amplifier works (stereo/mono)
- GAIN: Adjusts the gain for both channels
- GAIN 1: Adjusts the gain for first channel
- GAIN 2: Adjusts the gain for second channel
- INPUT BOARD: Selects which input board should be used

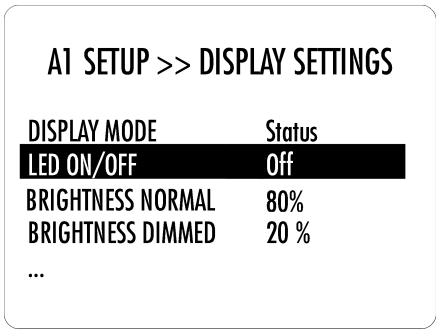
The following table details the Parameters of the AUDIO SETTINGS menu:

PARAMETER	PARAMETER VALUES	REQUIRED OPTIONS	REMARKS
GLOBAL FEEDBACK	0, 20, …, 80, 100%	Stereo or bridged mode	None
GLOBAL FEEDBACK 1 / GLOBAL FEEDBACK 2	0, 20, …, 80, 100%	Bi-amp mode	None
INPUT	Balanced XLR Hi-Z BNC 300 Ohm BNC Hi-Z RCA 300 Ohm RCA Hi-Z	None	None
AMPLIFIER MODE	Stereo Mono active bi-amp	2 input boards 2 input boards	None

	Mono passive bi-amp Bridge Monaural 1 Monaural 2	None None None None	
GAIN	24 dB range by 0.5 dB steps	Stereo or bridged mode	None
GAIN 1 / GAIN 2	24 dB range by 0.5 dB steps	Bi-amp mode	In passive bi-amp mode, channels 1 and 2 can only have a gain difference of up to 6 dB
INPUT BOARD	Left, Right	2 input boards + passive bi-amp or bridged mode	

Details of AUDIO SETTINGS menu Parameters

4.3.1.2 DISPLAY SETTINGS



The A1 SETUP >> DISPLAY SETTINGS menu allows configuration of the display related Parameters of the unit. Accessible Parameters are:
- DISPLAY MODE: Selects what is displayed in normal mode
- LED ON/OFF: Selects if the LED is turned on
- BRIGHTNESS NORMAL: Sets the normal display brightness
- BRIGHTNESS DIMMED: Sets the dimmed display brightness
- COLOR: Selects the display color
- GAMMA: Fine tunes the AMOLED's display RGB gamma curve

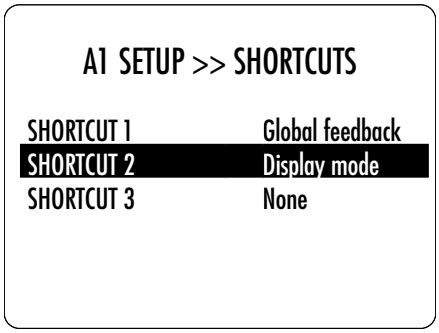
The following table details the Parameters of the DISPLAY SETTINGS menu:

PARAMETER	PARAMETER VALUES	REQUIRED OPTIONS	REMARKS
DISPLAY MODE	Status Power Temperature Off	None	Selects what to display when the unit is idle for several seconds: General status page, power-meter, temperature gauges or turn off the display.
LED ON/OFF	On Off	None	Allows to keep the LED on when the unit is on.
BRIGHTNESS NORMAL	10% 20% 30% ... 90% 100%	None	Sets the display brightness when the unit is operated.

BRIGHTNESS DIMMED	10% 20% 30%	None	Sets the display brightness when the unit is left idle for several seconds.
COLOR	*Predefined colors* Custom color Edit custom color	None	Selects the display color for PCM playback *Predefined colors* represents a set of factory defined colors Custom color is a user definable color. To Edit the custom color select the Edit custom color Value. Sub-menus allow to individually configure Red, Green and Blue components (RGB) of the custom color.
GAMMA	RBG and global brightness gamma curve correction, +/-30%	None	Fine adjustment the gamma scale of the RGB components of the display. Allows to have perfectly dark background and to match other CH Precision unit's display color, even at low brightness.

Details of DISPLAY SETTINGS menu Parameters

4.3.1.3 SHORTCUTS



The A1 SETUP >> SHORTCUTS menu allows configuration of the Shortcuts.
Accessible Parameters are:
- SHORTCUT1: Defines action for Shortcut #1
- SHORTCUT2: Defines action for Shortcut #2
- SHORTCUT3: Defines action for Shortcut #3
- SHORTCUT4: Defines action for Shortcut #4
- SHORTCUT5: Defines action for Shortcut #5
- SHORTCUT6: Defines action for Shortcut #6

Note that unused Shortcuts are not displayed. The first available (e.g. non defined) Shortcut has a Parameter Value of 'None' (the example on the left has 2 defined Shortcuts, hence Shortcut #3 has a Parameter Value of 'None')

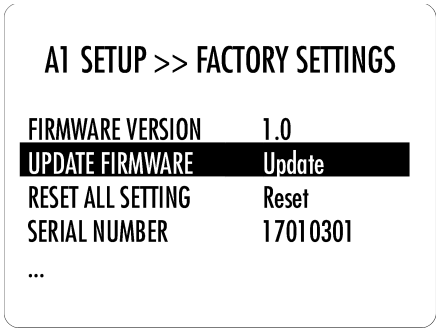
The following table details the Parameters of the SHORTCUTS menu:

PARAMETER	PARAMETER VALUES	REQUIRED OPTIONS	REMARKS
SHORTCUT 1	Any Parameter of the AUDIO SETTINGS and DISPLAY SETTINGS menus or None	None	If SHORTCUT 1 is not defined, Parameter value for SHORTCUT 1 is set to 'None'. SHORTCUT 2 to 6 are not displayed in this case.
SHORTCUT 2	Any Parameter of the AUDIO SETTINGS and DISPLAY	None	If SHORTCUT 2 is not defined, Parameter value for SHORTCUT 2 is set to 'None'. SHORTCUT 3 to 6 are not

	SETTINGS menus or None		displayed in this case.
SHORTCUT 3	Any Parameter of the AUDIO SETTINGS and DISPLAY SETTINGS menus or None	None	If SHORTCUT 3 is not defined, Parameter value for SHORTCUT 3 is set to 'None'. SHORTCUT 4 to 6 are not displayed in this case.
SHORTCUT 4	Any Parameter of the AUDIO SETTINGS and DISPLAY SETTINGS menus or None	None	If SHORTCUT 4 is not defined, Parameter value for SHORTCUT 4 is set to 'None'. SHORTCUT 5 and 6 are not displayed in this case.
SHORTCUT 5	Any Parameter of the AUDIO SETTINGS and DISPLAY SETTINGS menus or None	None	If SHORTCUT 5 is not defined, Parameter value for SHORTCUT 5 is set to 'None'. SHORTCUT 6 is not displayed in this case.
SHORTCUT 6	Any Parameter of the AUDIO SETTINGS and DISPLAY SETTINGS menus or None	None	If SHORTCUT 6 is not defined, Parameter value for SHORTCUT 6 is set to 'None'.

Details of SHORTCUTS menu Parameters

4.3.1.4 FACTORY SETTINGS



The A1 SETUP >> FACTORY SETTINGS menu allows to get information about current A1 firmware version, to update the A1 firmware and to reset the unit to default configuration (or subset of settings).
Accessible Parameters are:
- FIRMWARE VERSION: Current firmware version (read only)
- UPDATE FIRMWARE: Allows to update the unit's firmware
- RESET ALL SETTINGS: Returns the unit to factory settings
- SERIAL NUMBER: Displays the serial number of the machine
- SHORTCUTS: Redefines all Shortcuts to factory default
- PROTECTION: Allows to bypass amplifier's protections
- NETWORK KNOWLEDGE: Clears list of detected devices on network

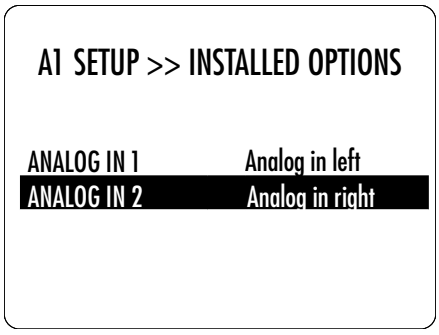
The following table details the Parameters of the FACTORY SETTINGS menu:

PARAMETER	VALUE	REQUIRED OPTIONS	REMARKS
FIRMWARE VERSION	*Firmware version*	None	*Firmware version* indicates the version of the current firmware. Format is *x.y.* This parameter is read only.
UPDATE FIRMWARE	Update	None	Selecting 'Update' launches the A1 firmware update process. A USB flash disc drive with a valid set of firmware must be inserted in the A-shaped USB port
RESET ALL SETTINGS	Reset	None	Selecting 'Reset' returns the A1 to its factory settings. Factory

			settings are detailed in the Specifications section.
SERIAL NUMBER	*Serial number*	None	*Serial number* indicates the serial number of the A1. Format is yymm03nn. This parameter is read only.
SHORTCUTS	Default mapping	None	Selecting 'Default Mapping' returns the A1's Shortcuts to their factory settings. Factory settings are detailed in the Specifications section.
PROTECTION	Disabled Enabled	None	Output short-circuit, output-DC, over-heat and amplifier-fault detection circuitry protect both the amplifier and the connected loudspeakers. In some regions of the world, the power distribution grid can be so polluted that spurious power grid noise can trig false error, thus muting or powering down the amplifier. In such extreme cases, and if it is of major importance that the A1 runs uninterrupted, protections can be temporary disabled by the end user, at his own risk.
NETWORK KNOWLEDGE	Reset	None	Clears the A1's memory of other CH Precision devices it has discovered through the TCP/UDP proprietary protocol.

Details of FACTORY SETTINGS menu Parameters

4.3.1.5 INSTALLED OPTIONS



The A1 SETUP >> OPTIONS menu provides read-only information about installed slot-in boards. Details are:
- ANALOG IN 1: Input board installed in Slot 1
- ANALOG IN 2: Input board installed in Slot 2

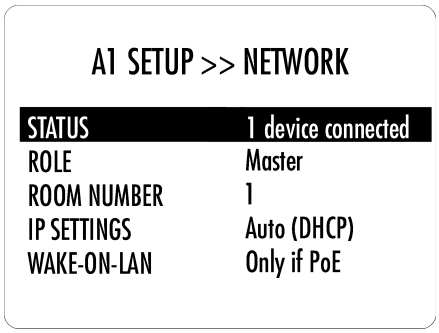
Each slot indicates the type of board it handles. A '-' indicates that the slot is currently unpopulated.

The following table details the Parameters of the INSTALLED OPTIONS menu:

PARAMETER	PARAMETER VALUES	REQUIRED OPTIONS	REMARKS
ANALOG IN 1, 2	Analog in left, Analog in right, -	At least 1x ANALOG_IN	Parameters are Read Only

Details of INSTALLED OPTIONS menu Parameters

4.3.1.6 NETWORK



The A1 SETUP >> NETWORK menu allows knowledge and customization of the network related Parameters of the unit. Accessible Parameters are:

- STATUS: Listing of all CH products detected (product type, IP and MAC addresses
- ROLE: Defines how the A1 interacts with other devices on the network
- ROOM NUMBER: Group units connected to a single network by room
- IP SETTINGS: Low-level network configuration
- WAKE-ON-LAN: Select if the unit can be powered on from the network

The following table details the Parameters of the NETWORK menu:

PARAMETER	PARAMETER VALUES	REQUIRED OPTIONS	REMARKS
STATUS	IP address Product type MAC address	Connection to a router via its RJ-45 Ethernet port	List of CH Precision devices and Android remote controls detected by the A1 (product type, IP and MAC addresses) Read Only parameters
ROLE	Offline Power master Master Slave Custom	Connection to a router via its RJ-45 Ethernet port (on the Control board).	When physically connected to a network, the A1 can ignore this network (offline) or connect to it as being the master or as a slave. This networking facility allows information sharing among CH products.
ROOM NUMBER	1 … 7	Connection to a router via its RJ-45 Ethernet port	Define the room in which room the A1 is (multiroom applications). This prevents CH Precision units connected to the same network but located in different systems/rooms to interact with each others.
IP SETTINGS	Auto (DHCP) Direct-Link Manual	Connection to a router via its RJ-45 Ethernet port	Auto should be selected if the A1 is connected to a router with DHCP server feature.
WAKE-ON-LAN	No Only if PoE Yes	Connection to a router via its RJ-45 Ethernet port	If No is selected, the A1 can't be woken up by the app. Standby mode will consume less than 0.5W. When Only if PoE is selected, the A1 can only be waken by the app if connected to a Power-over-Ethernet switch. Standby mode will draw less than 0.5W from the mains plug. If Yes is selected, the A1 can always be woken up by the app. Standby mode will draw a couple of watts from the mains plug.

Details of NETWORK menu Parameters

5 Firmware update

5.1 Preparing the USB stick

The firmware of all the CH Precision units can be updated using the USB port located at the back of the unit. Before starting the firmware update, it is necessary to load a USB stick with files containing the new firmware. Use the FAT32 formatted USB 2.0 stick provided with you A1. Please note that some USB sticks might not be detected by the A1 USB port. CH Precision recommends the use of Sandisk USB 2.0 sticks such as the one delivered with the unit.

The following procedure describes how to load the USB stick with the correct files:

1. Download the latest A1 firmware file from www.ch-precision.com
2. Decompress the `.zip` file and copy the decompressed files to the root of your USB stick. After doing so, your USB stick should contain the following files:

- `A1_xxx.ds1`
- `A1_xxx.mc1`
- `A1_xxx.ol1`

where '`xxx`' indicates the firmware revision.

Make sure all these files are present at the root of your USB stick, and that only one version of these files is present. Any missing file will make the firmware update procedure fail, while multiple versions of the same unit's firmware can lead to unstable A1 behavior after update.

5.2 Updating the unit's firmware

1. Perform the operations described in section 5.1
2. Connect the USB stick to the USB port located at the back of your A1 unit
3. Navigate to the FACTORY SETTINGS menu (see section 4) and select the UPDATE FIRMWARE item
4. Start the Firmware Update process by pushing the encoder button. Please note that the unit will perform a Reset (the display briefly turns off and on) during the procedure
5. Once the firmware update is complete, the unit automatically goes into Standby mode. Remove the USB stick and turn the unit on. The new firmware is now active. To verify that the firmware update is effective, navigate to the FACTORY SETTINGS menu and select the FIRMWARE VERSION item. The displayed firmware revision should match the firmware revision on the files copied to the USB stick

Note: The firmware update process lasts 5-10 minutes, **do NOT interrupt it!**

When performing a firmware update, do NOT press or turn any of the unit's front panel button/encoder, do NOT unplug the unit from the AC wall socket and do NOT turn the mains power switch off. Interruption of the firmware update procedure may result in corrupted firmware and a malfunctioning unit. In case something went wrong during a firmware update and the unit is malfunctioning, apply the emergency firmware update procedure described in the next section.

5.3 Emergency firmware update procedure

Perform the following Emergency Firmware Update procedure if your unit doesn't power up normally.

1. Perform the operations described in section 5.1

2. Power the unit off (back panel mains power switch to OFF)

3. Push and keep the standby/mute button pushed and power up the unit (back panel mains power switch to ON). Keep the standby/mute button pushed for a couple more seconds after you turned the unit on.

4. The unit performs the emergency firmware update. Once the operation is complete, the unit automatically goes into Standby mode. Remove the USB stick and turn the unit on. The new firmware is now active. To verify that the firmware update is effective, navigate to the FACTORY SETTINGS menu and select the FIRMWARE VERSION item. The displayed firmware revision should match the firmware revision on the files copied to the USB stick

5. If the emergency firmware update procedure fails, try the same procedure again using a different USB stick. If the failure persists, turn off your unit and contact your authorized dealer for assistance.

Note: The emergency firmware update procedure lasts 5-10 minutes, **do NOT interrupt it!**

6 Troubleshooting

Error	Action
No power	Check the AC power cord Check the power button at the back of the unit Check the mains fuse on the AC power cord receptacle
No sound (general)	Check that your source is playing Check that your A1 is turned-on and that speakers are properly connected Check that the system volume setting is not too low Check that the correct input is selected on your D/A controller or preamplifier Check that the correct input is selected on your A1 amplifier Check that the correct amplifier mode is engaged
No sound ("⊗" is displayed)	Your A1 is muted (display area 3 ⊗ must be off). Unmute using first button
Lost in the settings?	Restore factory settings and start your setup again
Software update fails	Try Emergency Software Update procedure If it fails, download the latest A1 firmware from www.ch-precision.com, prepare a software update image on a FAT32 formatted USB stick and run the Emergency Software Update procedure again

Troubleshooting

If the error cannot be corrected using the information from the above table, disconnect the unit from AC wall power and from the rest of your system and contact your authorized dealer.

7 Specifications

Output power	
Stereo, passive & active bi-amp modes	2 x 100W_{RMS} / 8Ω, 2 x 175W_{RMS} / 4Ω, 2 x 300W_{RMS} / 2Ω
Left or right mono mode	1 x 175W_{RMS} / 4Ω, 1 x 300W_{RMS} / 2Ω, 1 x 550W_{RMS} / 1Ω
Bridge mode	1 x 350W_{RMS} / 8Ω, 1 x 600W_{RMS} / 4Ω, 1 x 800W_{RMS} / 2Ω
Analog inputs (per Analog_In input board, two Analog_In input boards are required for Stereo & active bi-amp modes)	
Single-ended	1x RCA + 1x BNC per input board (Zin = 47kΩ or 300Ω)
Balanced	1x XLR per input board (Zin = 94kΩ; pin1 = GND, pin2 = +, pin3 = -)
Amplification	
Input stage	Ultra low noise, high slew rate, zero global feedback, full discrete class A design
Output stage	Ultra low noise, high slew rate, with adjustable feedback, full discrete class AB design
Feedback	Unique user programmable local/global feedback ratio of the amplification stage
Gain	24 dB range adjustable gain, 0.5 dB steps
Analog Audio outputs	
Speaker terminals	2 pairs of Argento Audio binding posts
THD+Noise	Less than 0.01% (1kHz signal, BW 20Hz-20kHz, 10W_{RMS} under 8Ω, all operating modes) with 100% global feedback
SNR (A)	Better than 115dB (Stereo Mode), better than 118dB (Bridge Mode)
Bandwidth	DC to 450kHz (-3dB) at 1W_{RMS}
General	
Display	480 x 272 24bits RGB AMOLED
Power supply	Selectable 100V, 115V or 230V AC, 47Hz to 63Hz, <1W in Standby
Dimensions (L x D x H)	440mm x 440mm x 120mm (main body) 440mm x 492mm x 160mm (overall including connectors and feet)
Weight	43kg
Firmware update / Control	USB port for firmware update / Ethernet based system control

Design and Specifications are subject to change without notice. Weight and dimensions are approximate

Illustrations are informative only and may differ from the actual production model

Enclosure designed by Mana Ishoni

FCC-Notice

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- adjust or relocate the receiving antenna
- increase the separation between the equipment and the receiver
- connect the equipment into a mains outlet on a circuit different from that to which the receiver is connected
- consult the dealer or an experienced ratio/TV technician for help

Disposal – Environmental care

Directive 2002/96/EG of the European Parliament requires consumer electro-technical appliances to be disposed separately and have to be indicated with the following symbol. Should you dispose this component please do so in conformity with local and global legal and environmental regulations and according to best practices. We strongly encourage you to recycle any batteries used with this component.