# CloudPower™ Series

REMOTE CONTROLLABLE CLASS-D INSTALLATION AMPLIFIERS

## Operation Manual V3.7

*Dante™*

| | |
|---|---|
| CP354 | CP354D |
| CP704 | CP704D |
| CP1504 | CP1504D |
| CP3004 | CP3004D |
| CP716 | CP716D |

# Operation Manual V3.7

### Software version 1.3.5s and above

For any support related questions please contact: info@apex-audio.be
Keep this manual and a record of the product serial number for future reference.

This document has been put together with as much care as possible.
The information within is complete and correct on the date of publication. However, updates on the specifications, functionality or software may have occurred since publication. To obtain the latest version of both manual and software, please visit https://www.apex-audio.be/downloads

APEX-AUDIO.BE/DOWNLOADS

| Serial number of this product |
| --- |
|  |

## Important Safety Instructions

Read the operation manual fully before using device.

CAUTION: to reduce the risk of electric shock, do not remove cover (or back). No user-serviceable parts inside. Refer servicing to qualified service personnel.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of an uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation mark within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the equipment.

### Instructions

Before installing or operating the equipment, read all safety instructions, warnings and operating instructions. Heed all warnings. Follow all instructions. Keep all safety, installation and operating instructions for future reference.

### Installing and Operation Location

Do not use this apparatus near water. Do not expose this apparatus to drips or splashes. Do not place any objects filled with liquids, such as vases, on the apparatus.

Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat. No naked flames, such as lighted candles, should be placed on the apparatus.

Do not install the apparatus in a confined space such as a book case or similar unit. Do not block any ventilation openings. The CloudPower™ is only intended for use/installed within a 19" rack mount system.

Ensure that foreign objects and liquids cannot get into the equipment.

### Power Source and Grounding

This product should be operated only from the power source indicated on the apparatus or in the operating instructions. If you are not sure of the type of power supply to the premises where the equipment is to be used, consult your product dealer or local power company.

Do not defeat the safety purpose of the polarised or grounding-type plug. A polarised plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

Connect Class I construction apparatus to an AC outlet with a protective grounding connection.
Do not overload wall outlets, extension cords or integral convenience receptacles, as this can result in a risk of fire or electric shock.
Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
Unplug this apparatus during lightning storms or when unused for long periods of time.

### Power supply class I grounding requirements:

For protection from fault currents, the equipment shall be connected to a grounding terminal. Plug the system
Power cord into an AC outlet that provides a ground connection. Substitute cords may not provide adequate fault
Protection.

Use only approved power supply cord that complies with the applicable standard in the country where it is intended to be used with a maximum length of 3m and minimum 1.5m and minimum cable section of: 1.5mm$^2$ (16AWG) for models with 16A inlet

CP354 / CP354D
CP704 / CP704D.

Minimum 2.5mm$^2$ (14AWG) for models with 32A inlet

CP1504 / CP1504D
CP3004 / CP3004D
CP716 / CP716D.

THIS DEVICE MUST BE POWERED EXCLUSIVELY BY EARTH CONNECTED MAINS SOCKETS IN ELECTRICAL NETWORKS COMPLIANT TO THE IEC 364 OR SIMILAR RULES
DISCONNECT THE AC MAINS SOURCE BEFORE ATTEMPTING TO CLEAN ANY PART OF THE AMPLIFIER
APEX SUGGESTS TO PLUG THE CloudPower SERIES CP354, CP704 TO A 16 A RATING, C OR D CURVE, 10 kA SECTIONING BREAKER. 20A RATING FOR CP1504, CP3004, CP716. see below.

REFER TO THE ELECTRICAL INSTALLATIONS WIRING PRACTICE BY REGION OR COUNTRY THE APPARATUS IS THE BE USED!

**Cleaning, Maintenance and Servicing**

Unplug the apparatus from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personal.

Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug 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.

**Intended Use**

The equipment may only be used for the purpose described in the operation instructions. Never carry out any work on the equipment other than as specified in the operating manual.

Never push objects of any kind into this product through openings, as they may touch dangerous voltage points or short-cut parts, which could result in a fire or electric shock.

This equipment is not suitable for use in locations where children are likely to be present

WARNING: Excessive sound pressure levels can cause hearing loss.

**Environmental Precaution**

Electrical and electronic equipment may contain hazardous substances for humans and their environment.

The "crossed out wheelie bin" symbol present on the device and represented above is there to remind one of the obligation of selective collection of waste. This label is applied to various products to indicate that the product is not to be thrown away as unsorted municipal waste. At the end of life, dispose of this product by returning it to the point of sale or to your local municipal collection point for recycling of electric and electronic devices.

Customer participation is important to minimize the potential affects on the environment and human health that can result from hazardous substances that may be contained in this product.

Please, dispose of this product and its packaging in accordance with local and national disposal regulations including those governing the recovery and recycling of waste electrical and electronic equipment.

Contact your local waste administration, waste collection company or dealer.

**Safety notices:**

Denmark:
Apparatets stikprop skal tilsluttes en stikkontakt med jord, som giver forbindelse til stikproppens jord.

Finland:
Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan.

Norway:
Apparatet må tilkoples jordet stikkontakt.

Sweden:
Apparaten skall anslutas till jordat uttag

# Table of Contents

# Dear Customer,

Thank you for choosing the Apex CloudPower™ for your sound reinforcement needs. The innovative CloudPower™ series is a professional amplifier solution equipped with integrated DSP features and secure remote control capabilities via the cloud.

With APEX IntelliCloud, you can conveniently manage your amplifiers remotely from your office environment. This not only streamlines your operations but also allows you to monitor performance and make adjustments without the necessity of on-site visits, resulting in valuable time and cost savings.

## Foreword

The APEX CloudPower™ Series professional amplifiers feature built-in DSP and secure remote control over the cloud. Easily connect the amplifier to the WebUI on any HTML5 capable browser (MAC, PC, IOS, Android) with the built-in WiFi hotspot, or to a local area network via cat5 cable. The unique internal streaming source option makes it possible to playback Spotify and Apple AirPlay sources straight from your mobile device without the need for external hardware.

Multiple amplifiers can be controlled through the same webUI using the trusted and comprehensive workflow of our IntelliCloud software. Featuring high-end studio-grade analogue circuit designs, the APEX CloudPower™ Series sets a new benchmark in powered system management and speaker processing design. The proprietary Class-D amplifier control loop features GlidePath technology and exceptionally low intermodulation figures, resulting in wide stereo imaging.

CloudPower™ is founded on our proprietary GlidePath architecture, with DSP and amplifier circuits fully integrated for outstanding performance. GlidePath employs DC coupling throughout the signal path, dramatically reducing the time offsets and distortion associated with AC coupling. The result: crisper, punchier bass and brighter, more natural high frequencies, delivering superb intelligibility and higher perceived volume. CloudPower models with power ratings ranging from 350W to 3000W per channel fit all applications from small commercial spaces to the largest theatre.

Whether the application is a standalone system amplifier, or a comprehensive networked system with multiple amplifiers, the APEX CloudPower™ Series is designed to provide the solution that our clients demand. With comprehensive loudspeaker preset capability, implementing CloudPower™ into your system couldn't be easier.

## Product Highlights

- Class D, DC coupled amplifiers
- All models can directly drive low impedance or 70/100V loudspeakers
- Intuitive IntelliCloud web interface
- Remote management from anywhere in the world
- Built-in Wi-Fi Hotspot for access without network connectivity
- Internal streaming source supporting Spotify and Apple Airplay
- Four analog balanced line inputs
- Dante™ audio network integrated in 'D' models
- 3 stages of on board 64bit DSP:

  **User processing DSP facilities:**
  - Gain, mute and phase inversion
  - Delay, up to 250ms (combined with group delay)
  - X-over HPF and LPF with 19 filter variations
  - 12-band parametric filtering, with choice of 16 filter types including all-pass filters
  - RMS and Peak limiter

  **Speaker processing DSP facilities:**
  - Delay up to 30ms
  - 12-band parametric filtering, with choice of 16 filter types including all-pass filters
  - X-over HPF and LPF with 19 filter variations
  - FIR filter implementation
  - RMS and Peak limiter

  **Group processing DSP facilities:**
  - 6 output groups, assignable between multiple amplifiers in the network
  - Group delay, up to 250ms (combined with user delay)
  - Group gain, mute and phase inversion
  - Additional 12-band parametric EQ per group

- Internal Global Preset and Speaker Preset library
- Apex GlidePath technology - our proprietary control loop provides a load independent frequency response and low harmonic and intermodulation distortion
- Power supply with worldwide operation from 100-240 Vac. Active power factor correction circuitry ensures efficient use of the mains power system
- Low idle loss (heat) through the use of a proprietary control loop which relaxes the output stages' dead time
- Daylight viewable colour OLED display
- Slimline 1U chassis

## APEX CloudPower™ Series

| CP354 | 4 x 350W | CP354D | 4 x 350W with 4x4 Dante™ |
|---|---|---|---|



| CP704 | 4 x 700W | CP704D | 4 x 700W with 4x4 Dante™ |
|---|---|---|---|



| CP1504 | 4 x 1500W | CP1504D | 4 x 1500W with 4x4 Dante™ |
|---|---|---|---|



| CP3004 | 4 x 3000W | CP3004D | 4 x 3000W with 4x4 Dante™ |
|---|---|---|---|



| CP716 | 16 x 700W | CP716D | 16 x 700W with 16x16 Dante™ |
|---|---|---|---|

# Before You Get Started

## About this Manual

Carefully read all instructions and warnings before operating this device. Keep this manual in a safe place so that it can be referred to when required.

The latest manual revision can be downloaded from the download section of the Apex website: http://www.apex-audio.be/downloads

This manual describes use of the CloudPower™ series

## Inspection and Unpacking

This appliance has been carefully packed in the factory and the packaging was designed to withstand rough handling. Should the unit appear to have been damaged in transit, do not discard any of the packing material and notify the carrier immediately as they will be responsible.

Save all the packing materials for future use if you ever need to ship the unit again.

Please check the list below against the contents of the packaging. If any items are missing or damaged, contact the Apex dealer or distributor where you purchased the unit.

- Apex CloudPower™ amplifier
- AC power cable Europe
- Network cable, "straight" type

## Operating Environment

The CloudPower™ is designed to operate in most normal climates, at a temperature between 0 °C and 40 °C (32 - 122 °F), with relative humidity between 10% and 60%.

The Apex CloudPower™ incorporates internal fan-cooling, which should keep the unit within its operating temperature. However, should the unit be installed in an equipment rack it is important to ensure that the temperature inside the rack does not exceed the upper limit. Under such circumstances, additional rack-mounted cooling fans may be necessary.

Do not block any ventilation openings.

Fit solid blanks (not ventilation blanks) to unused rack spaces to ensure effective air circulation. Leaving gaps in between items of equipment degrades the effectiveness of forced–air cooling.

## Power Requirements

Before you connect any unit to the mains, please make sure that the voltage of your local AC supply is within the acceptable range of the unit.

The Apex CloudPower™ is designed to work from an AC supply between 100 V and 240 V, at a frequency between 50 and 60 Hz. No AC voltage selector is provided as the device automatically adjusts to the incoming AC voltage.

Precautions should be taken so that the appliance is properly grounded at all times. This unit must be earthed.
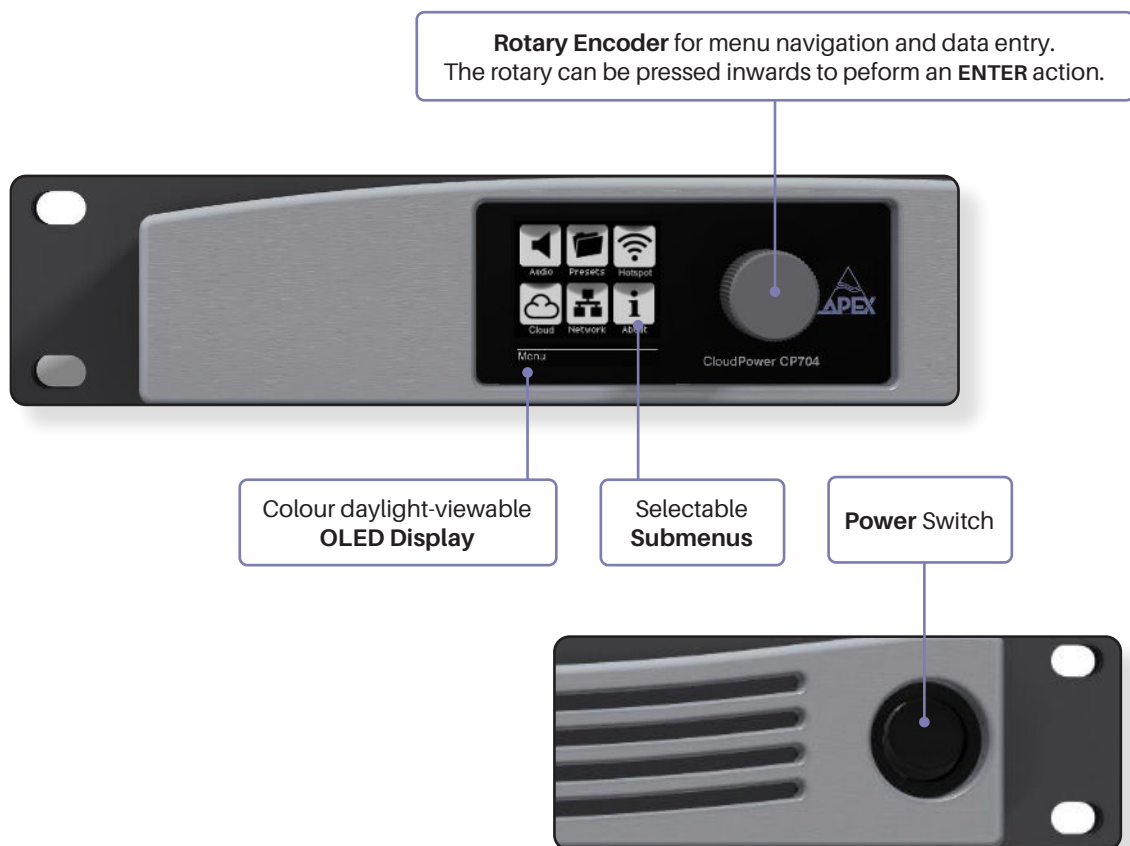
## Installation

If the unit is brought into a warm room from a cold environment, internal condensation may occur. Ensure that the unit has been allowed to reach ambient temperature before switching it on. We recommend one hour.

Although this unit is intended for installation in a standard 19-inch rack it can nevertheless be used free standing. If the unit is installed in a flight-case or in an equipment rack, fix the unit with all four screws through the front panel holes and the four screws from the back panel. For normal use no extra support is needed, but in more extreme conditions, such as on the road, we recommend the unit is supported at the rear.

# Front Panel



The front panel features a modern and intuitive design, with a daylight-viewable color OLED display a single rotary encoder for front-panel operation, a physical power switch and ventilation vents. All incorporated within a compact 1U 19" rack frame, ensuring both functionality and space efficiency.



**Rotary Encoder** for menu navigation and data entry.
The rotary can be pressed inwards to peform an **ENTER** action.

Colour daylight-viewable
**OLED Display**

Selectable
**Submenus**

**Power** Switch

## Rear Panel

CP354D - 4 channel
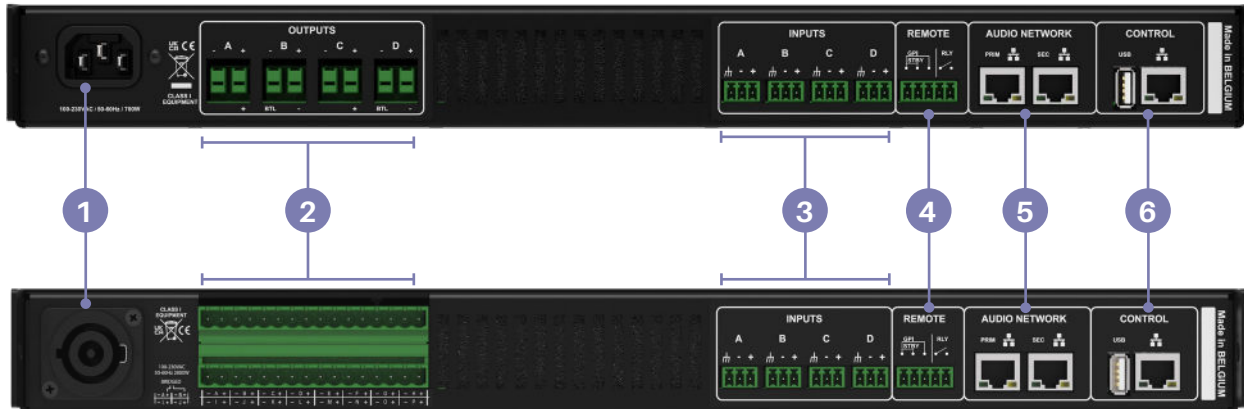


CP716D - 16 channel

**1** IEC connectors accept worldwide operation from 100-240Vac. CloudPower™ must be grounded (earthed) with the safety ground pin to the mains distribution system. Never disconnect the earth (ground) pin on the mains cable (AC power cord).

**2** Amplifier output connectors are sturdy terminal block connectors. Channels are located from left to right. Each channel has a marked hot (+) and cold (-) terminal.
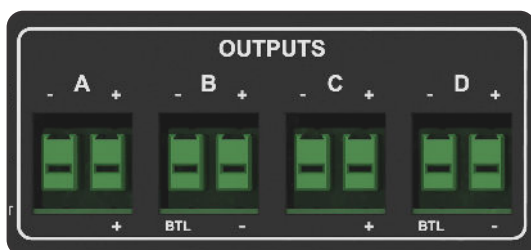


4 channel models
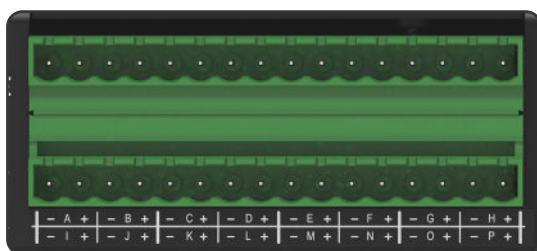


16 channel CP716D

**3** Balanced analog line inputs are available on terminal block connectors with clearly marked hot (+), cold (-) and ground terminals.

The use of twin-and-screen cable is recommended. In order to link inputs, physical splits can be made directly on the terminal block connectors.

The input impedance is 20k Ohms.
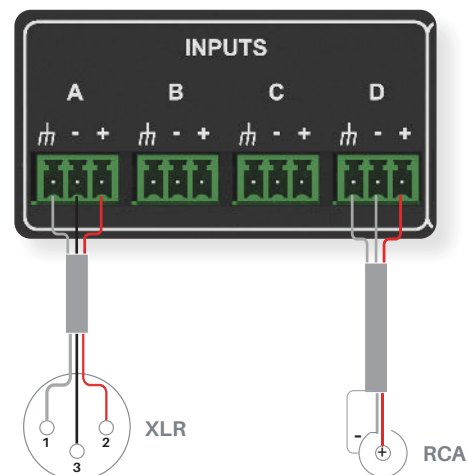


**Balanced**
1 = Ground
2 = Hot +
3 = Cold -

**Unbalanced**
Pin = Hot +
Screen = Cold -
Screen = Ground

**4** Terminal block connector for REMOTE applications, EN-54 ready.

REMOTE

GPI STBY   RLY

RELAY

C — • NC

COIL
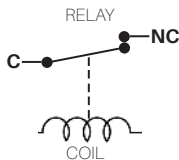
**STBY (Standby)**
Engaging the two pins will put the amplifier modules within the CloudPower unit into Standby mode. The amplifier's DSP and controller continue running. Standby mode can be engaged via IntelliCloud or UDP commands.

**RLY (Relay)**
When the amplifier is turned on and is functioning normally, the relay engages and a connection between the two pins is established. If the amplifier is turned off, or if a fault is detected, the relay opens and disengages the two pins. Connecting multiple amplifier relays in series allows system warning / fault indication through open circuit. This will fulfil the amplifier fault-warning requirement in an EN54 VACIE fire alarm system.

**GPI (General Purpose Input)**
Engaging the two pins will MUTE all channels. This will fulfil the amplifier MUTE requirement in an EN54 VACIE fire alarm system. After the GPI is disengaged, the mutes will return to their last known settings.

Please note: these features are slated for implementation in firmware versions beyond 1.3

**5** RJ-45 Ethernet connectors are available for Dante™ network connectivity on the 'D' models.

Each Dante™ card comes with two network ports: one primary and one secondary. The secondary network port can be configured to provide redundancy for the primary network port. Creating a parallel network ensures that any cable or switch failure does not result in audio loss.

By default, the Dante card is configured in "switched" mode, allowing devices to be connected in a daisy-chain within a single network. However, it is not advisable to use daisy chain mode for more than a few devices.

To enable redundant mode, please configure the settings within Dante™ Controller.

Dante™

AUDIO NETWORK

PRIM    SEC

When the device is connected to an active network, the yellow LINK LED above the in-use connector lights up. Data activity on the network is indicated by the illumination of the green ACT LED. It is normal for the ACT LED to flicker either sporadically or continuously.

The switched 100/1000 Base-T network connections automatically detect whether standard or crossover Cat-5e cables are in use. The green ACT LED flashes to signify network activity. When a 1000 Mbps connection is established, the orange LED remains solid to indicate a 1000 Mbps connection.

**6** RJ-45 Ethernet connector for control via the web interface. Connect this port to your LAN.

The USB connector is intended for service only.

CONTROL

USB

13
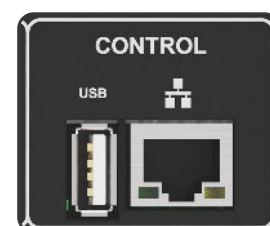
# Processing & Signal Flow

The CloudPower™ offers DSP processing in three stages. Speaker specific processing can be provided by a manufacturer and loaded onto a channel using a SPEAKER PRESET. Additionally, users can apply two layers of processing: first, through the USER controls, affecting individual channels, and second, through six GROUP controls, which can affect multiple channels simultaneously.

The figure below depicts a simplified version of the signal flow:



## USER Processing Features

The USER controls are channel-based features that apply to each channel individually.
They can be operated by the user via the front panel and web interface and offer the following controls:

| | |
|---|---|
| Mixer Matrix | Allows the summation of all available analog and digital inputs via faders. |
| Mute | Controls the mute status. |
| Gain | Controls the amout of gain, ranging from -80 dB to 15 dB. |
| Polarity | Flips the polarity 180°. |
| 12 Band PEQ | 12 bands of EQ with a choice of 16 different filter types per band including all-pass filters. |
| IIR HPF | X-Over infinite impulse response high-pass filter, with a choice of 19 filter variations. |
| IIR LPF | X-Over infinite impulse response low-pass filter, with a choice of 19 filter variations. |
| User Delay | Set a delay time up to 250 ms. Note: the USER delay time is shared with the GROUP delay time, their sum cannot exceed 250ms. |
| RMS Limiter | RMS limiter with adjustable threshold, attack and release times. |
| Peak Limiter | Peak limiter with adjustable threshold and release time. Note: the USER RMS and peak limiter are processed after the group processing block |
| 70/100V HPF | An extra 100 Hz 12dB/oct high-pass filter to protect transformers from distortion and damage when driving a 70/100V system. Note: This filter is processed at the very end of the signal chain, after the SPEAKER processing and can only be activated via the web interface's settings menu: Settings (cog icon) > Output. |

## 6x GROUP Processing Features

The GROUP controls are multi-channel features and will affect all channels assigned to them.
Every channel of each amplifier in the network can be assigned to one or multiple groups, up to 6 in total.
A group can have an unlimited number of channels assigned as members.

Groups can only be accessed through the web interface's sidebar menu and not via the front panel.
They allow the user to operate multiple channels at once and offer the following controls:

| | |
|---|---|
| Group Delay | Relatively add delay time up to 250 ms for every channel in the group. Note: the GROUP delay time is shared with the USER delay, their sum cannot exceed 250ms. |
| Mute | Mute every channel in the group. |
| Gain | Relatively add or subtract gain on every channel in the group, ranging from -80 dB to + 15 dB. |
| Polarity | Flips the polarity 180° for every channel in the group. |
| 12 Band PEQ | 12 bands of EQ for with a choice of 16 different filter types per band including all-pass filters, which effect every channel in the group. |

Note: The group delay and gain settings are relative to the settings of the individual channels, the PEQ settings are absolute.
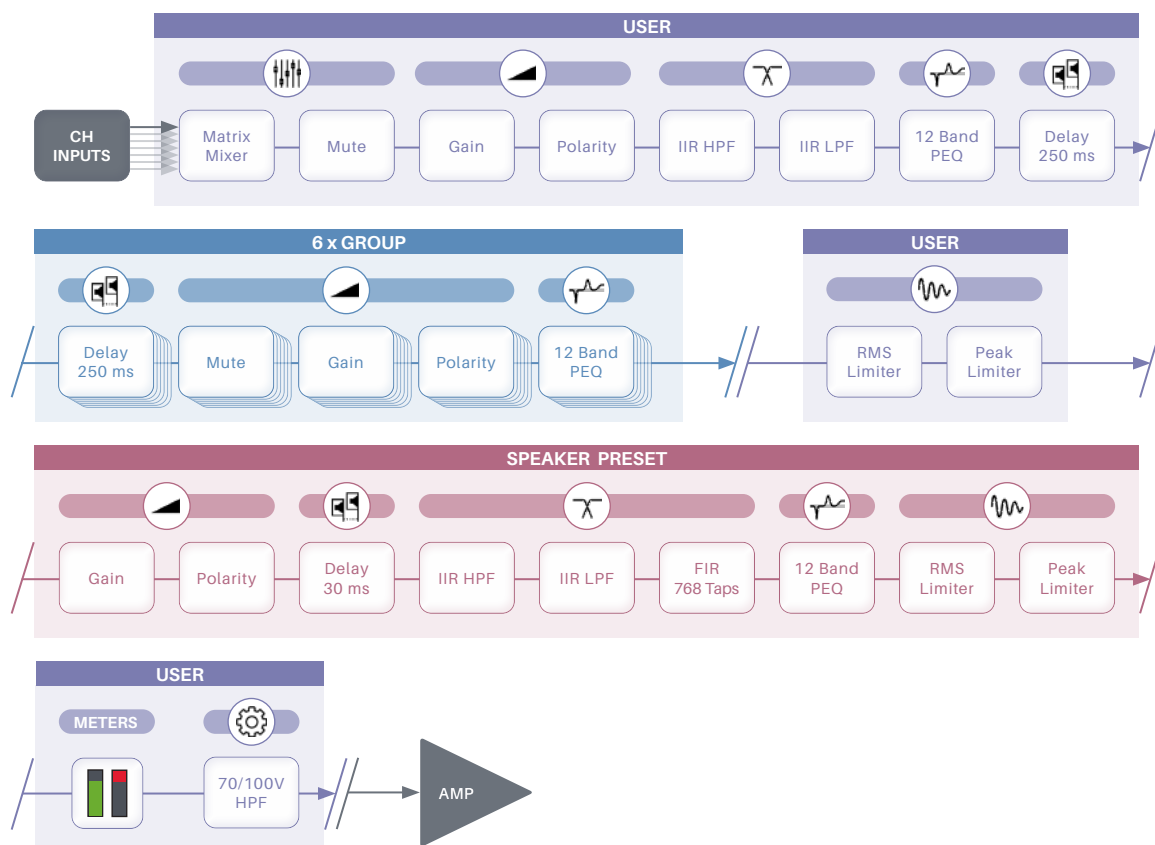
## SPEAKER PRESET Processing Features

SPEAKER PRESETS are channel-based features that can be loaded onto individual channels using preset files that can be made in the preset creator or provided by OEM manufacturers. The user doesn't have direct access to these controls but can choose to load or clear the speaker preset from a channel. A speaker preset can contain the following features:

| | |
|---|---|
| Gain | Controls the amout of gain, ranging from -80 dB to 15 dB. |
| Polarity | Flips the polarity 180°. |
| Speaker Delay | Set a delay time up to 30 ms.<br>Note: the speaker delay is added on top of the combined 250 ms USER/GROUP delay. |
| 12 Band PEQ | 12 bands of EQ with a choice of 16 different filter types per band including all-pass filters. |
| IIR HPF | X-Over infinite impulse response high-pass filter, with a choice of 19 filter variations. |
| IIR LPF | X-Over infinite impulse response low-pass filter, with a choice of 19 filter variations. |
| FIR Filter | Allows to load a FIR filter file with 768 taps. |
| RMS Limiter | RMS limiter with adjustable threshold, attack and release times. |
| Peak Limiter | Peak limiter with adjustable threshold and release time.<br>Note: these are the last limiters at the end of the signal chain. |

## Detailed Signal Path

The chart below illustrates the most extensive signal path possible for a single channel, utilizing the complete processing capability of the CloudPower™. Note that the group blocks consist of 6 layers, indicating that a single channel can undergo processing by all six groups simultaneously. The VU meters, which are visable in the web interface and on the front panel OLED display, are measured at the end of the signal path, just prior to the 70/100V high-pass-filter which closes the processing chain.

## Processing Details

**Delay from input to output**
Min:     1 ms caused by latency, even with all processing features enabled (exept for delay).
Max:     1 ms latency + 250 ms user/group delay + 30 ms speaker preset delay = 281 ms in total.

**Max PEQ bands per channel**
12 user bands + 6 x 12 group bands + 12 speaker preset bands = 96 PEQ bands in total.

**Additional filters**
+ 2 user crossover filters + 2 speaker crossover filters + speaker FIR filer + 70/100V HPF = a maximum of 102 possible filters on a single channel.

**Max limiters per channel**
User RMS & Peak + Speaker RMS & Peak = 4 limiters in total.

**Limiter gain reduction metering**
The gain reduction meters correspond to all limiters in the signal path, indicating the total limiter activity from input to output.

**Gain scale**
At 0 dB gain setting, the amplification from the line input to the amplifier output is 26 dB.
With a gain setting of +15 dB, the amplification reaches 41 dB.

## Output Operation

**70/100V System
WARNING**

When utilizing the amplifier with a 70 or 100V transformer system, ensure that you employ a high-pass filter (HPF) to prevent significant transformer saturation. Our recommended configuration is a 63Hz HPF with a 24dB/octave roll-off. The minimum response requirement is -3dB at 70Hz with a 12dB/octave slope.

Firmware version 1.3 and higher offer an additional 100Hz 12dB/octave HPF at the end stage of the processing for this purpose. You can activate this additional HPF through the web interface via Settings > Output.

**CH-A**

Enable

HPF 100Hz
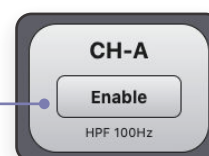
## Presets

The CloudPower™ amplifier has two types of preset libraries, **Global Presets** and **Speaker Presets**.

**Speaker Preset** files contain specific DSP processing settings that can be applied to individual amplifier channels. End users have the option to select a loudspeaker type from a preset library, eliminating the need to configure parameters manually.

These speaker presets are developed by the speaker OEM and can be uploaded and stored in the amplifier's speaker preset folders via the WebUI. If necessary, users can further customize processing using the USER and GROUP controls. Speaker presets can be loaded onto a channel using either the web interface or the front panel.

**Global Preset** files contain all audio DSP settings for each of the amplifier's channels, including:
USER, GROUP and SPEAKER PRESET parameters.

They <u>do not</u> contain any other settings found in the settings menu such as:
Output operation and configuration (100V HPF, bridge mode), network settings and streaming account details.

## Operation Interfaces

A CloudPower™ device can be controlled through either of the following interfaces:

### IntelliCloud Web Interface

The web interface serves as the primary method of operating the amplifier and can be accessed in the following ways:

» Via a local network, whether wired or wireless
» Through the cloud, allowing remote management from anywhere.
» Using the internal hotspot, removing the need for an active network or wired connection.

### Front Panel OLED & Rotary Encoder

Serves as an alternative control method that does not require additional devices or a network connection.

# Front Panel Operation

While the CloudPower™ is primarily designed for use with its intuitive IntelliCloud web interface, the front panel provides a secondary method of controlling the amplifier's most important features without the need for network connectivity. It grants access to the amplifier's IP configuration and allows adjustment of most audio settings. Operation of the front panel rotary control can be locked via the IntelliCloud WebUI to prevent unwanted use.

The colored **OLED display** ensures excellent readability, even in daylight conditions.

All controls are performed using a single **rotary encoder**. Rotate the encoder to navigate through the menus.
Pressing the rotary controller inwards executes an **ENTER** action.

**Please note:**
Changes made from the front panel will be immediately visually updated in the web interface.
However, when changes are made from the web UI while also interacting with the front panel, you will need to exit and re-enter the active menu on the front panel in order for the changes to become visable there.

## 🏠 Homepage

The homepage displays the most important statuses of the amplifier, including the output level and mute status of all channels, along with the status of the network features.

The **STATUS ICONS** display the current status of the network, cloudconnect and hotspot respectively. When connected or active, the icons will turn green. A white icon indicates there is no connection or the feature is turned off.
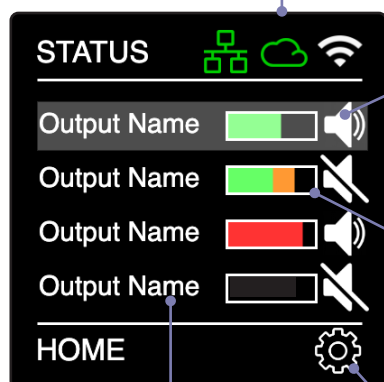
Pressing **ENTER** while a channel is selected will change its **MUTE STATUS**. The selected channel is marked by a grey rectangular background.

The **VU METER** provides a visual indication of the output level for each channel. The color of the VU bar indicates the amount of limiting that is applied.
Green : no limiting is applied.
Orange : 1 to 3 dB of gain reduction is applied.
Red : more than 3 dB of gain reduction is applied.
This indication is related to all limiters in the signal path, and thus, it indicates the total limiter activity from input to output.

Channel names, which can be customized using the web UI are displayed fully on the 4-channel models.

You can access the **SETTINGS MENU** by selecting the cog wheel and pressing **ENTER**. This is where you can access all audio and network features, as well as the preset libraries.

### CP716D - 16 Channel Homepage

For CP716D, the homepage will only display the channel numbering (A, B, C to P) and their corresponding mute status. These mute statuses can also be adjusted directly from the homepage.
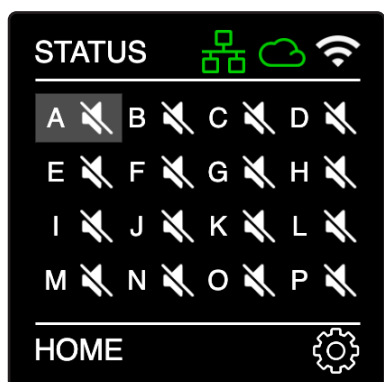
## ⚙ Settings Menu

The settings menu provides access to the audio processing features, global and speaker presets, and network features.

> **Turning** the encoder will highlight the selected submenu. To enter the submenu, **press** the rotary encoder.



> Select and press the **return icon** ↩ to navigate back one level in the menu and return to the hompage.

## ◀ Settings / Audio Menu

Through the audio submenu, we can access audio processing and settings, including the mixing matrix, gain level, delay times, PEQ, crossover, limiter, and the signal generator.

MIXING MATRIX        GAIN LEVELS        DELAY TIMES

> **Turn** the rotary encoder to select and highlight the submenu you wish to access, then **press** the encoder to enter.



PEQ        X-OVER        LIMITER
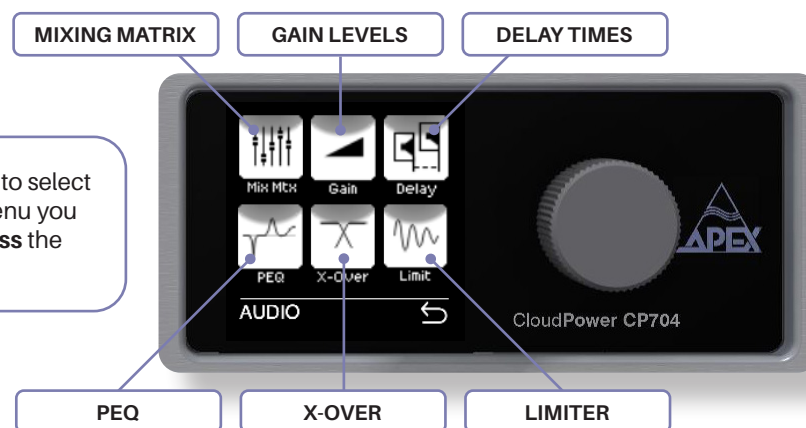


> While in the Audio submenu, keep turning the rotary encoder to view the second page of the audio menu in order to access the **SIGNAL GENERATOR.**

## Settings / Audio / Mixer Matrix

Each of the CloudPower™ channels has its own mixer matrix, allowing you to create a custom mix of input signals for every channel. You can access the mixing matrix through the front panel by navigating to Settings > Audio > Mix Mtx.

| | |
|---|---|
| Output Name 1 => Edit | |
| Output Name 2 => Edit | |
| Output Name 3 => Edit | |
| Output Name 4 => Edit | |
| **AUDIO - Mixer** ↩ | |

To edit a mixing matrix, select and press **=> Edit** on the channel you want to adjust.

| An 1 : -3.5dB | Nw 1 : OFF | Str L : -3.5dB |
|---|---|---|
| An 2 : OFF | Nw 2 : OFF | Str R : OFF |
| An 3 : OFF | Nw 3 : OFF | Sine: OFF |
| An 4 : OFF | Nw 4 : OFF | Pink : OFF |
| **CH A - MIXER** ↩ | | |

In the matrix, you can blend the available inputs for the selected channel:
• Analog inputs 1 to 4
• Network inputs 1 to 4, when fitted with a Dante™card
• Stream L and R for Spotify or Apple AirPlay
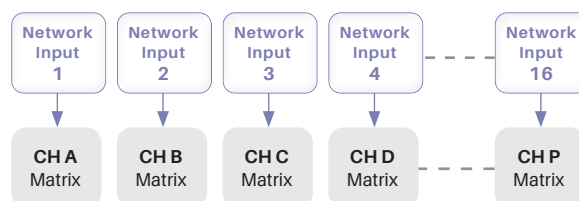• Internal sinewave and pink noise generator

To edit an input value, select the source you wish to edit and press to control it. Turn the rotary to increase or decrease the value and press again to confirm.

Select and press the return icon to navigate back in the menu.

### CP716D - 16 Channel Network Input Routing

The CP716D provides 16 network inputs via Dante™. However, only one of the 16 network inputs will be accessible per channel as illustrated in the figure to the right.

If any two channels require the same network input, this configuration must be set up in an audio network router, such as Dante™Controller.
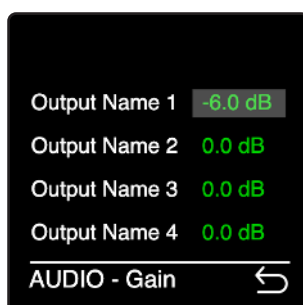
| Network Input 1 | Network Input 2 | Network Input 3 | Network Input 4 | Network Input 16 |
|---|---|---|---|---|
| ↓ | ↓ | ↓ | ↓ | ↓ |
| **CH A** Matrix | **CH B** Matrix | **CH C** Matrix | **CH D** Matrix | **CH P** Matrix |

CP716D Network Input Routing

## Settings / Audio / Gain

The gain setting adjusts the level of amplification for each channel. The default gain setting is 0 dB, but it can be changed to any value ranging from -80 dB to +15 dB in 1 dB increments.
Please exercise caution, as increasing the gain will result in a higher voltage output from the output terminals. To access the gain function via the front panel, navigate to Settings > Audio > Gain.

| | |
|---|---|
| Output Name 1 -6.0 dB | |
| Output Name 2 0.0 dB | |
| Output Name 3 0.0 dB | |
| Output Name 4 0.0 dB | |
| **AUDIO - Gain** ↩ | |

To edit a **gain** value, select the channel you wish to edit and press the dB value to control it. Turn the rotary to increase or decrease the value and press again to again to confirm.

Select and press the return icon to navigate back in the menu.

**Gain Scale**
At 0 dB gain setting, the amplification from the line input to the amplifier output is 26 dB. At +15 dB, the amplification reaches 41 dB.

## Settings / Audio / Delay

Each output channel of the CloudPower™ can have a delay of up to 250 ms inserted by the user.
Note: the total delay of 250 ms per channel is shared between the user delay and group delay.
You can access the user delay function through the front panel by navigating to Settings > Audio > Delay.

| | |
|---|---|
| Output Name 1 | 20.0 ms |
| Output Name 2 | 0.0 ms |
| Output Name 3 | 0.0 ms |
| Output Name 4 | 0.0 ms |
| AUDIO - Delay | ↩ |

To edit a **delay** time, select the channel you wish to edit and press the ms value to control it. Turn the rotary to increase or decrease the value and press again to confirm.

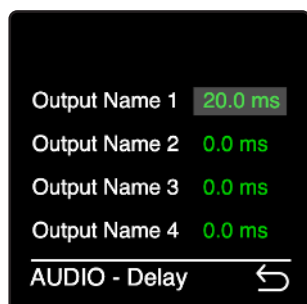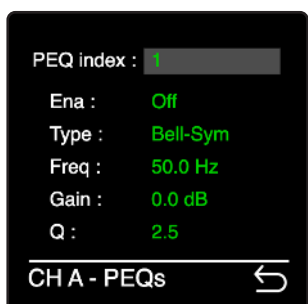Select and press the return icon to navigate back in the menu.

## Settings / Audio / PEQ

The CloudPower™ offers a 12 band PEQ per channel, providing a wide variety of filter types to choose from, including all-pass filters designed to address phase issues. You can access this function through the front panel by navigating to Settings > Audio > PEQ.

| | |
|---|---|
| Output Name 1 | => Edit |
| Output Name 2 | => Edit |
| Output Name 3 | => Edit |
| Output Name 4 | => Edit |
| AUDIO - PEQ | ↩ |

To edit a PEQ, select and press **=> Edit** on the channel you want to adjust

| | |
|---|---|
| PEQ index : | 1 |
| Ena : | Off |
| Type : | Bell-Sym |
| Freq : | 50.0 Hz |
| Gain : | 0.0 dB |
| Q : | 2.5 |
| CH A - PEQs | ↩ |

There are 12 bands of EQ available for each channel.

**PEQ index** indicates which of the bands is being edited.
Press and scroll from 1 to 12 in order to acces the other bands.

**Ena**, enables or disables the selected EQ band.

**Type**, allows you to choose from 16 filtering types:
Bell-Sym, Bell-Asym, Notch, Low-Shelf 6dB or12dB, High-Shelf 6dB or 12db, All-Pass 90° or 180°, High-Pass 6dB or 12dB, High-Pass Vari-Q 12dB, Low-Pass 6dB or 12dB, Low-Pass Vari-Q 12dB and Band-Pass.

**Freq** controls the filter frequency, and is adjustable from10 Hz to 22 kHz for each band.

**Gain** can be set between -40 and +15 dB.

**Q** controlls the filter's Q-factor and can be set between 0.1 and 48.

## Settings / Audio / X-Over

The CloudPower™ provides a crossover with both a high-pass filter (HPF) and low-pass filter (LPF) for every channel. You can access this function through the front panel by navigating to Settings > Audio > X-Over.

```
Output Name 1   => Edit
Output Name 2   => Edit
Output Name 3   => Edit
Output Name 4   => Edit
AUDIO - XOVER       ↩
```

To edit a crossover, select and press **=> Edit** on the channel you want to adjust

```
XOVER :    High Pass
  Ena :    Off
  Type :   BW 6dB
  Freq :   100.0 Hz


CH A - XOVER        ↩
```
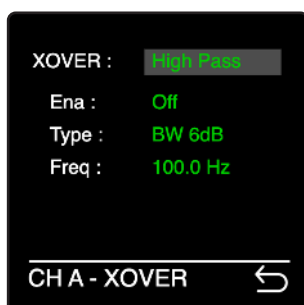
**XOVER** indicates which of the 2 filters is being edited.
Press and scroll to select between the high-pass and low-pass filter.
Both can be active simultaneously.

**Ena**, enables or disables the selected filter.

**Type**, allows you to choose from 19 filtering types:
Butterworth, Bessel and Linkwitz-Riley filters with slopes from 6dB/oct to 48 dB/oct.

**Freq** controls the crossover frequency and is adjustable from 10 Hz to 22 kHz.

**70/100V System Warning**

When utilizing the amplifier with a 70 or 100V transformer system, ensure that you employ a high-pass filter (HPF) to prevent significant transformer saturation. Our recommended configuration is a 63Hz HPF with a 24dB/octave roll-off. The minimum response requirement is -3dB at 70Hz with a 12dB/octave slope.

Firmware version 1.3 and higher offers an additional 100Hz 12dB/octave HPF at the end stage of the processing for this purpose. You can activate this additional HPF through the web interface via Settings > Output.
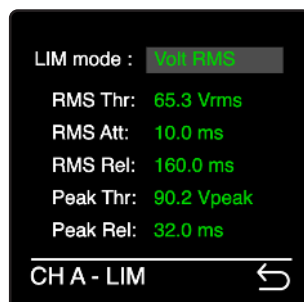
## Settings / Audio / Limiter

Each of the CloudPower™ channels can potentially have four active limiters, two of which are the user RMS and Peak limiters. They are accessible from the front panel via Settings > Audio > Lim.

The user can choose to manually set the limiters or have the CloudPower™ calculate a safe setting for the specific speaker connected to the channel. This is achieved through the **LIM mode** feature.

Please note that the limiters are always active. To prevent them from affecting the sound, you can set their thresholds to the highest possible level.

Output Name 1  => Edit
Output Name 2  => Edit
Output Name 3  => Edit
Output Name 4  => Edit
AUDIO - LIM

To adjust a limiter, select and press **=> Edit** on the channel you want to adjust

LIM mode : Volt RMS
RMS Thr: 65.3 Vrms
RMS Att: 10.0 ms
RMS Rel: 160.0 ms
Peak Thr: 90.2 Vpeak
Peak Rel: 32.0 ms
CH A - LIM

**LIM mode:** enables you to set the limiter manually by adjusting the Vrms threshold, or allows the CloudPower™ to calculate a setting based on the impedance and wattage of your speaker. To achieve this, select the preset that has the same Ohm value as the connected speaker, and then set the correct Wrms and Wpeak values in the controls below.

**RMS Thr:** sets the Vrms or Wrms threshold for the RMS limiter.

**RMS Att:** sets the attack time for the RMS limiter.

**RMS Rel:** sets the release time for the RMS limiter.

**Peak Thr:** set the Vpeak or Wpeak threshold for the peak limiter.

**Peak Rel:** sets the release time for the peak limiter.

When changing the limiter mode, these values will change accordingly.

## Settings / Audio / Signal Generator

Each CloudPower™ amplifier is equipped with a built-in signal generator, accessible through Settings > Sig. Gen. The output from this signal generator can be independently audible on each channel through the matrix mixer.

Sinewave gen :
  Freq :      1000 Hz
  Gain :      -50.0 dB
Pink noise gen :
  Gain :      -50.0 dB
SIGNAL GEN.
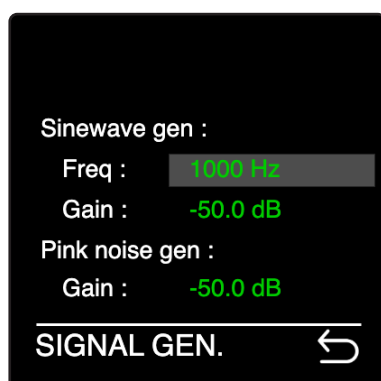
You have access to both a pink noise and a sine wave generator with eight selectable frequencies: 50, 100, 200, 500, 1000, 2000, 5000, or 10000 Hz. The level for the sine wave can be adjusted within the range of -50 dB to -20 dB, while the pink noise level can be adjusted within the range of -50 dB to -10 dB.

Returning to the matrix mixer menu via Audio > Mix Mtx. allows you to make the generator audible on any channel.

Following a reboot, the signal generator gains are reset to -50 dB as a safety precaution.

## 📁 Settings / Presets Menu

The CloudPower™ amplifier features two types of preset libraries: Global and Speaker Presets. For further details, please refer to pages 16, 52 (global) and 59 (speaker) in this manual.

Access the Global and Speaker Presets from the front panel via Settings > Presets.

The initial **Presets** submenu allows you to access either the global or speaker preset library. Highlight and press to enter the desired library.



### Global Preset Menu
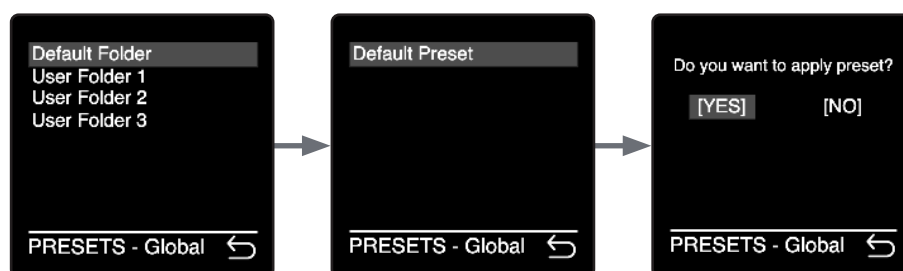


To recall a global preset: Select a global preset folder > Select a preset to load > And finally, press YES to confirm your choice and load the preset.

To restore the amplifier to its standard settings, load the **Default Preset** from the **Default Folder**.

When loading global presets, the amplifier will mute all outputs in order to prevent loud noises and speaker damage due to possible high gain settings.

### Speaker Preset Menu
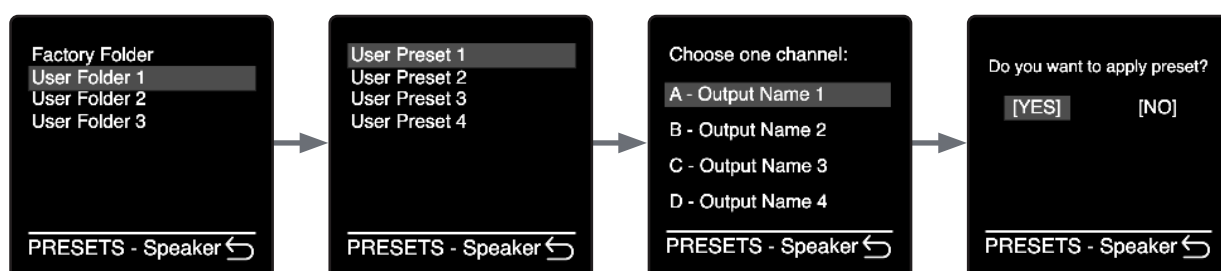


To insert a speaker preset onto a channel: Select a speaker preset folder > Select a preset > Select the channel on which you wish to load the preset > And finally, press YES to confirm your choice and insert the preset.

To clear a channel of a preset, load the **Blank Preset** from the **Factory Folder**.

**Please note:**
The front panel only allows the user to load presets. The creation of presets is done through the web interface.

## 📶 Settings / Hotspot

Each CloudPower™ amplifier features a Hotspot, enabling users to control the amplifier using any mobile device (smartphone, tablet, or laptop) without needing access to the local network to which the amplifier is connected through its CONTROL port. The CloudPower™ IntelliCloud software is web-based, eliminating the need for software installation. You can enable the hotspot from the front panel by navigating to Settings > Hotspot.

| Hotspot | ON |
|---|---|
| SSID | AMP_XXXX |
| Password | 12345678 |

**HOTSPOT** ↩

Press **return** ↩ to apply the changes.

Switch the **Hotspot** to **ON** using the rotary encoder, then search for the **SSID** name within your device's available Wi-Fi networks. Connect to the hotspot and enter IP address **172.24.0.1** in your browser. This will automatically open the IntelliCloud web interface on your device.

**SSID** is the name of the generated hotspot, which you can find in your list of available Wi-Fi networks.

The **Password** will be prompted by your device when attempting to connect to the hotspot.

Both the SSID and Password can be modified via the web interface. By default, these are set to "**AMP_XXXX**" and "**12345678**".

Please note that the web interface will also prompt you for a login and password. By default, both are set to "**admin**" and can be altered in the web UI settings menu > **Credentials**.

## ☁ Settings / Cloud

Every CloudPower™ amplifier is equipped with a Cloud feature. This feature enables users to remotely manage the amplifier via the internet. To enable this, the CONTROL port (on the rear of the amplifier) must be connected to a router with an internet connection. Using a secure connection, users can operate the amplifier and all other CloudPower™ devices within the same network from anywhere in the world.

| Cloud | ON |
|---|---|
| Name | cloudname |
| User | admin |
| Password | admin |

**CLOUD** ↩

Press **return** ↩ to apply the changes.

The front panel only provides control over the cloud function's **ON/OFF** setting.

With the Cloud feature turned **ON**, open a web browser connected to the internet and enter the following URL:

**http://cloudname.apexconnect.me**

This will enable you to connect to the amplifier, which will prompt you for the **User** login and **Password**. By default, both are set to "**admin**". They can be modified by accessing the web UI through Settings > Network > Credentials.

The **cloudname** is a unique name that must be given to the amplifier via the web UI settings menu. When assigning cloud names to your amplifiers, make sure to create unique names by including detailed descriptions or codes. This ensures that no two CloudPower™ amplifiers in the world share the same cloud name. For example: "AmpCompanyLocationA1202"

**Please note:**
When multiple CloudPower™ amplifiers are installed within a single network, accessing one amplifier through the Cloud will provide access to all other amplifiers via the sidebar menu in the IntelliCloud web UI.
However, we recommend enabling the cloud feature for all amplifiers individually. This allows each amplifier to be accessed directly, without relying on the functionality of another unit.

## Settings / Network

The Network menu gives access to the IP setting of the CloudPower™ which can be set from the front panel by navigating to Settings > Network.

**Connect via a router**
Connect the CloudPower™ device's CONTROL connector together with a PC to a router. The use of a router is mandatory in DHCP mode to obtain IP addresses. After a connection is established with the router, the CloudPower™ device will receive an IP address that will be displayed in the network menu. Enter this address in your device's browser, and the IntelliCloud software will open on your device. The IntelliCloud software is web-based, so there is no need for software installation.

| Mode | DHCP |
|------|------|
| IP | 192.168.1.2 |
| Subnet | 255.255.255.0 |

NETWORK ↩
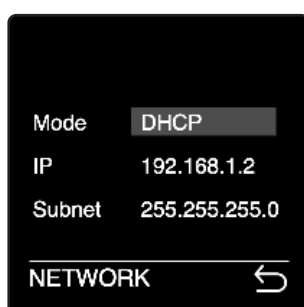
Press **return** ↩ to apply the changes.

**Mode**
Use the rotary encoder to choose between DHCP and **Static** modes.

**IP**
In DHCP mode, an IP address will be automatically displayed when a connection is established with the router.
In static mode, you need to manually enter an IP address.

**Subnet**
For DHCP mode, the subnet will also be automatically displayed when the connection is established.
In static mode, you must manually enter the subnet mask.

## Settings / About

The About menu will display the current firmware version of the device.
You can access this menu by navigating to Settings > About.

| App version | v1.3.0.d |
|-------------|----------|
| Service version | v1.3.0.d |

ABOUT ↩

## Notes on Networking

Providing that the network is properly configured, IntelliCloud is capable of automatically detecting and controlling any CloudPower™ device connected to the network.  Please refer to the IntelliCloud documentation for more details on controlling the CloudPower™ remotely.

**Quick setup tip :**
- Connect your PC together with the CloudPower™ device/s to a wired or wireless router.
- Set all connected devices and your PC to DHCP.
- Open your browser and enter the IP address that is displayed on the network submenu of any of the connected devices.
- The IntelliCloud software will open automatically on your control device.
  The default login and password are "admin"

Configuring simple IP networks is something that most system engineers would be aware of.  Explaining the details of IP networking is therefore outside the scope of this manual. However, we believe it is important to address certain key aspects for better understanding.

**IP Addresses**

All computers, whether they are Windows, Linux or Mac OS based, and most network-based devices such as the CloudPower™, obtain an IP address by the following means:

- If a static IP address has been assigned to the computer or device, then that IP address must always be used. Static IP addresses are fixed and do not change. This is useful when installing CloudPower™ devices into fixed installations whereby all networked audio equipment has been assigned a unique and unchanging IP address. This is very useful for network management.
- If the device or computer is set to automatic mode (whereby no static IP address has been defined) then a unique IP address will be used; however this address may vary every time the device is connected to the network. If a DHCP server is available on the network then the CloudPower™ device will use the IP address provided by it.

**Further information**

In most applications, communication between the CloudPower™ and IntelliCloud software will not require any configuration and will effectively work 'out of the box'.  However, when the CloudPower™ is used in more network critical environments (e.g., broadcast or AV installations) some additional network settings may be required and the information provided below may be of interest.
The communication protocol used by the CloudPower™ is UDP/IP based. It is based on Unicast communications (point-to-point) for the remote control of properties (e.g., modifying an input gain or the frequency of a filter) and Multicast (point-to-multipoint) for auto-discovery of devices and property changes (such as driving meters within IntelliCloud). Multicasting is preferred over broadcasting as it is more suited for network bandwidth control.

**Ethernet cables**

Nowadays, computers and network devices automatically detect the type of connection (irrespective of whether straight or crossover Ethernet cabling is used). The CloudPower™ operates in the same manner, hence there is no need to worry about cable wiring when out in the field.
Remember that there are limits to Ethernet cable length between two devices and this is 95 meters. Any connection will add about 10 m.

**Going wireless**

Using wireless networks may be challenging, but the key to success is to use good quality rugged wireless access points and to configure them correctly.

Configuring an access or router point is not that difficult. There is no requirement to install any software as the computer's web browser is sufficient (all access points have a built-in web-server). Just type in the IP address of your access point into your web browser and you'll be able to configure the device.

In some applications, there may be a requirement to boost the signal level of both the access point and computer (outdoor stadium shows for example). External boosters are available but these will require that the original antenna of the access point or computer be removed (this has a bearing on the type of access point chosen). Note: always check local regulations concerning maximum permitted wireless signal power before up-rating your equipment.

## IntelliCloud Web Interface

The primary mode of operating a CloudPower™ amplifier is through the user-friendly IntelliCloud interface. This fully web-based software is hosted by the CloudPower™ amplifier itslef and can be accessed by any device with a browser. This eliminates the requirement for any software installation, regardless of which operating system you are using.

The interface is responsive and can be easily used with a wide range of devices, including desktop computers, laptops, and landscape-oriented tablets and phones.

## Accessing the Web UI

To access the IntelliCloud interface, you need to establish a connection between your device and the amplifier's server. This can be accomplished using one of the methods outlined below.

For more information, please refer to the **Web UI / Settings / Network** section of this manual.

**Via a LAN**

1. Connect the CONTROL port of the amplifier to the same LAN as your device.
2. If the IP mode is set to DHCP (default), the amplifier will get an IP address assigned by the router. You can view this IP address from the amplifier's front panel: Settings > Network. If the mode is set to Static, you might need to adjust the IP adres from the front panel.
3. Enter the amplifiers's IP address into your web browser's URL.
4. Enter the login credentials to access the web interface, both are set to "admin" by default.

**Remotely via the Cloud, from anywhere in the world**

1. Both the amplifier's CONTROL port and your device must be conneted to a router which has access to the internet.
2. The amplifier's cloud feature must be turned on. You can access this setting from the amplifier's front panel: Settings > Cloud.
3. Enter the amplifiers cloudconnect link into your web browser's URL: **http://cloudname.apexconnect.me**
4. Enter the login credentials to access the web interface, both are set to "admin" by default. Note: You will be prompted for the login credentials twice — first by the relay server, and then by the amplifier's server. Both sets of credentials are the same.

**Via the amplifier's internal Hotspot, wireless**

1. Ensure that the amplifier's internal hotspot is activated. This is can be done through the front panel under Settings > Hotspot.
2. Look for the Hotspot's SSID name among your device's Wi-Fi networks. By default, this name is set to "AMP_XXXX".
3. Connect to the hotspot and enter its password. By default, this is set to "12345678".
4. Enter IP address **172.24.0.1** into your web browser's URL.
5. Enter the login credentials to access the web interface, both are set to "admin" by default.

**Directly via a network cable**

1. Connect the ethernet port of your computer directly to the CONTROL port of the amplifier using a network cable.
2. Make sure the amplifier is in DHCP mode (default), which can be adjusted through the front panel under Settings > Network.
3. In a brief period, the amplifier will be assigned an automatic IP address within the 169.x.x.x range.
4. Note this address from the front panel and enter it into your web browser's URL.
5. Enter the login credentials to access the web interface, both are set to "admin" by default.
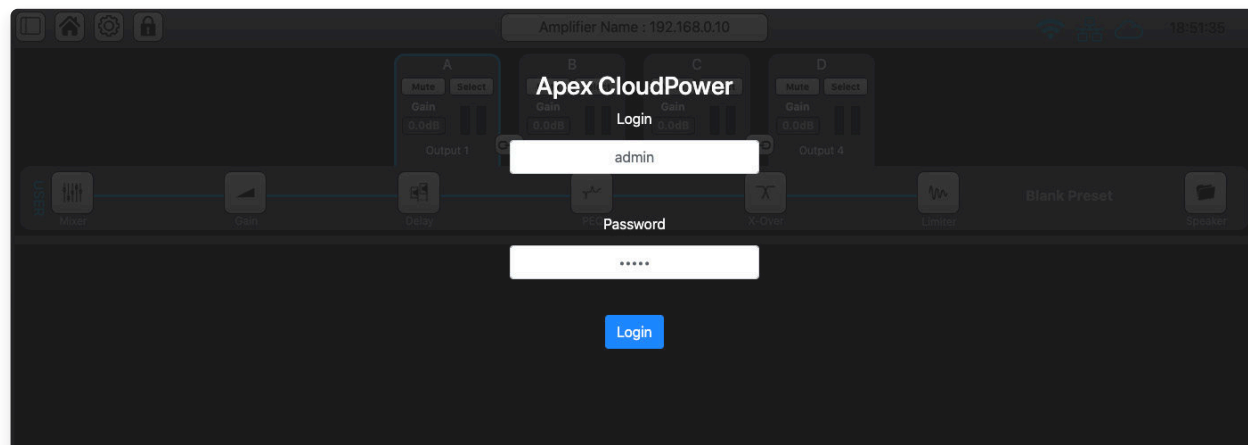
## Login

When connection has been established, the interface will prompt you for the login and password.

By default, both are set to: **admin**

You can change these credidentials via the web interface > Settings > Network



### Browser Info and Advice

- For optimal performance, we recommend using Google Chrome or Mozilla Firefox.
- On desktops and laptops, use a full HD (1920 × 1080 px) window size for the best user exprerience.
- After a firmware update, it is advised to clear your browser cache if you have been using a previous version of the IntelliCloud software on the same device. This will ensure that the interface is displayed correctly.
- Avoid opening multible browser tabs connecting to the same device on the same network.

**Screen Orientation Message**

The software is designed to operate in landscape mode on smartphones and tablets. If you hold your device in portrait mode, the interface will display a reminder.

If you see this message on your desktop computer or laptop, it means your browser window is too narrow. Increase the width of the window to display the interface.
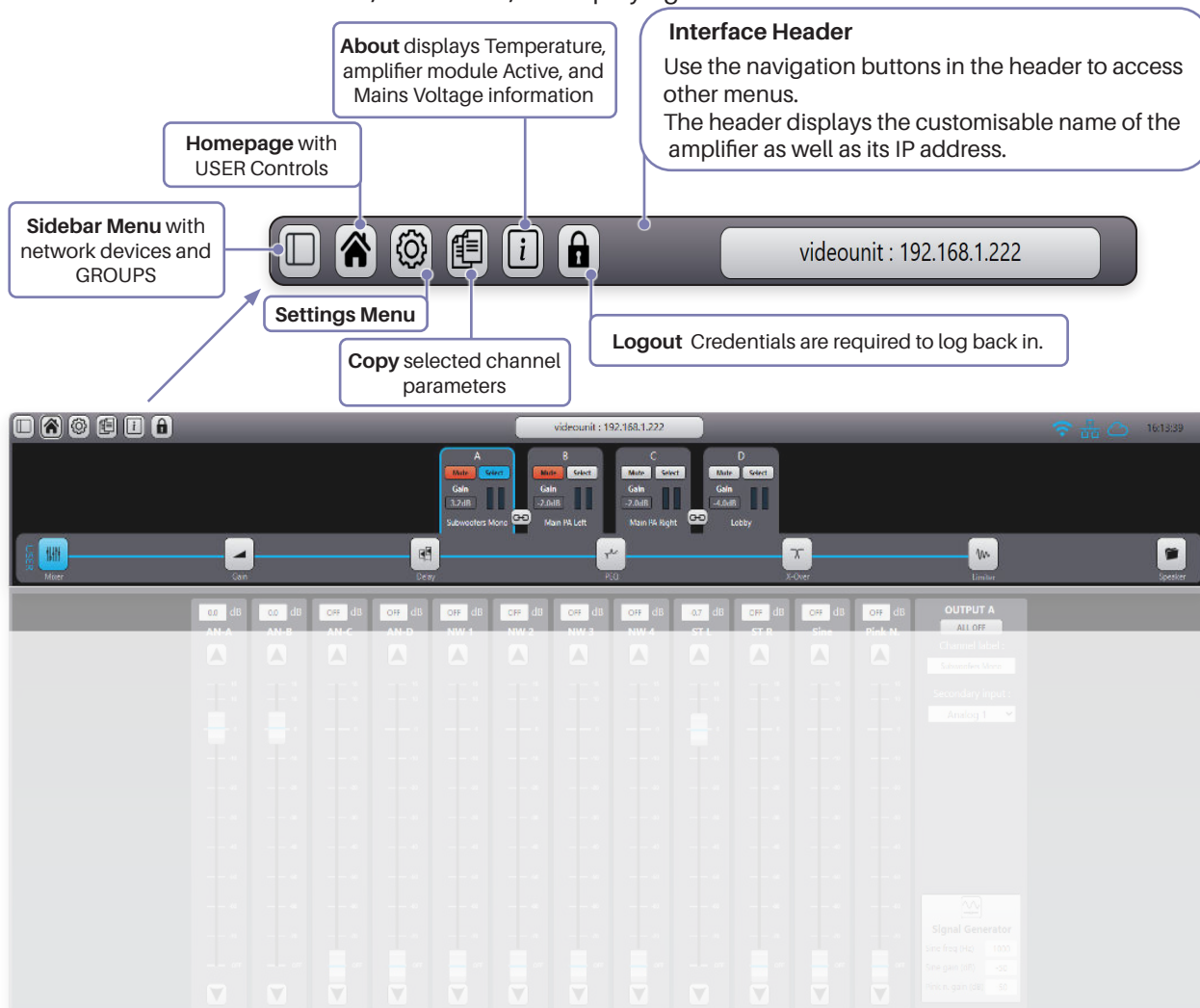
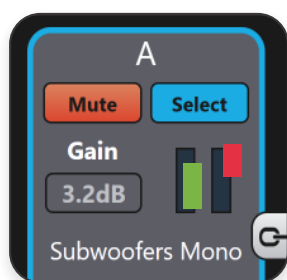APEX CloudPower is only viewable in landscape mode

## 🏠 Homepage | USER Processing

After logging in, the Homepage will be displayed. This is where you have an overview of all the channels and can access the various USER submenus.

The image below displays the homepage for the 4 channel models. The top section allows you to navigate submenus, mute and select channels. This top section remains visible as you move through all the USER submenus. The bottom section shows the submenu that's currently chosen for the selected channel. For instance, in this case, it's displaying the Mixer for channel A.

**About** displays Temperature, amplifier module Active, and Mains Voltage information

**Homepage** with USER Controls

**Sidebar Menu** with network devices and GROUPS

**Settings Menu**

**Copy** selected channel parameters

**Interface Header**
Use the navigation buttons in the header to access other menus.
The header displays the customisable name of the amplifier as well as its IP address.

**Logout** Credentials are required to log back in.

videounit : 192.168.1.222



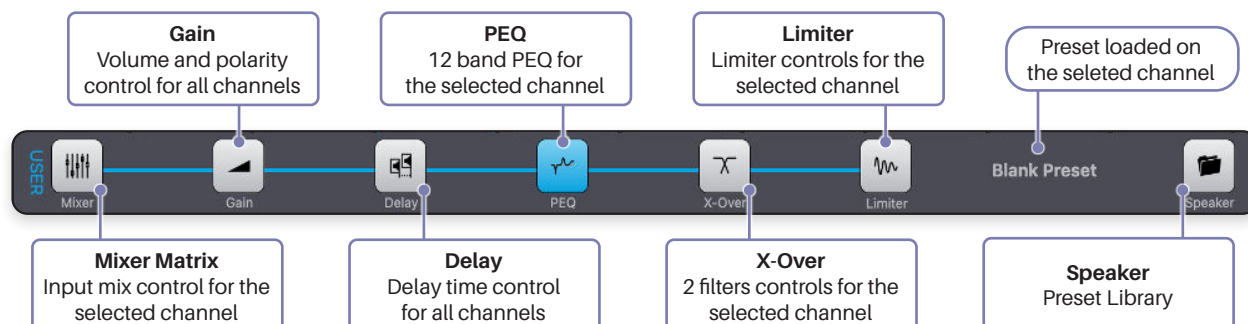Irrelevant parts of the interface have been faded for demonstration purposes.



**Channel Header - 4 channel models**
- Press **Mute** to silence the channel. The button turns red when muted.
- The selected channel is indicated by a blue outline and blue **Select** button.
- The amount of **Gain** is displayed but cannot be controlled here.
- The **VU meters** give an indication of the output voltage and limiting.
- The channel numbering (A,B,C ...) is diplayed at the top, the customisable channel label at the bottom.

## USER Processing Submenus

The USER menu contains all channel-based processing options available to the user. The Mixer, PEQ, X-Over, Limiter, and Speaker menus pertain to individual channels; ensure you have the correct channel selected. The Gain and Delay menus display controls for all channels simultaneously.



**Gain**
Volume and polarity control for all channels

**PEQ**
12 band PEQ for the selected channel

**Limiter**
Limiter controls for the selected channel

Preset loaded on the seleted channel

**Mixer Matrix**
Input mix control for the selected channel

**Delay**
Delay time control for all channels

**X-Over**
2 filters controls for the selected channel

**Speaker**
Preset Library

## 16 Channel Homepage Variation

Depicted below is the homepage for the 16 channel amplifiers. In order to save screenspace, the channel headers are simplified. Note the grey channel background alternates in tint every 4 channels to help you orientate.
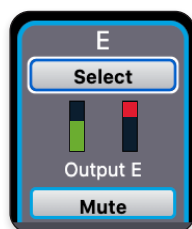




**Channel Header - 16 channel CP716D**

- **Select** a channel to take controll over it's user functions. The selected channels is highligted with a blue line.
- Press **Mute** to silence the channel. It turns red when muted.
- The **VU meters** give an indication of the output voltage and limiting.
- The channel numbering (A,B,C ...) is diplayed at the top, the customisable channel label at the bottom.

## Momentary Parameter Linking

The 4-channel amplifier models provide a momentary linking feature between channels A-B and C-D. When activated, any action performed on one channel will be duplicated on the linked channel. Parameters that are not touched will not synchronize and remain in their individual positions.

This linking feature is designed as a temporary control to speed up the setup process when adjacent channels require the same parameter adjustments.

It is not intended for permanent stereo linking and should not be used as such. Its status will not be stored in the global settings.



Press the **Link** button to activate momentary parameter linking. When activated, the button will turn orange and begin flashing.

## USER / Mixer Matrix

The **Mixer** matrix enables users to route and blend input signals for each individual channel.
Within its side menu, you can rename channels and access the internal signal generator.

**Select** the channel you want to control

Select the **Mixer** submenu



**All faders can be operated in five different ways:**
- Slide using your mouse or finger.
- Tap the arrow buttons for small increments.
- Enter a specific value in the data input field at the top.
- Use the up and down keyboard arrows when a fader is selected.
- Double-click on a fader to set it to unity (0.0 dB).

**Available Mixer Inputs**
- AN    Four analog line inputs located on the rear of the amplifier.
- NW    Dante™ network inputs (4 for 4 ch. amps, 1 per channel for 16 ch. amps).
- ST    Spotify and Apple Airplay streaming Left and Right inputs.
- Internal sine wave generator.
- Internal pink noise generator.

**ALL OFF** acts as a reset and sets every input fader for the selected channel to OFF, the lowest position.

**Channel label** allows you to give the channel a custom name.
This name is displayed in the channel header, the GROUPS routing and on the front panel display (for the 4ch. models).

The **Secondary input** will act as an automatic backup input in case of an audio network connection failure. Please note: this feature is slated for implementation in firmware versions beyond 1.3

The settings of the internal **Signal Generator** can be customized.
The volumes are intentionally kept low and are restricted to -20 dB (sine) and -10 dB (pink noise) for safety precautions, and will reset to their default of -50 dB after a reboot.
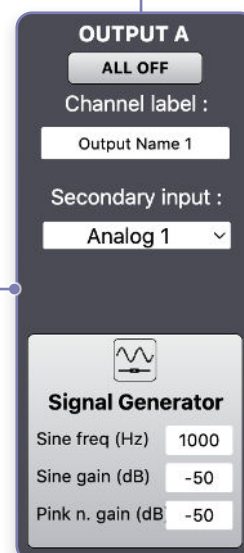
## USER / Gain

The **Gain** submenu show the master input faders for every channels. This is where you will control the volume for each amplifier output. Note: the gain values can be offset if the channel is assinged to a GROUP with gain settings other then unity (0.0 dB).

> You do not have to select a channel, every channel's gain control is visable from the same submenu.



Select the **Gain** submenu

**Polarity** inverts the channel's phase by 180°.

Adjust the faders to reach the desired **output volume**.

Be cautious when double-clicking the fader, as it will set it to unity gain and could potentially result in a high voltage output if an audio source is presented.

It would also be wise to check and set the channel's limiters before applying high gain levels.

**Gain Scale**
At 0 dB gain setting, the amplification from the line input to the amplifier output is 26 dB. At +15 dB, the amplification reaches 41 dB.

## USER / Delay

The **Delay** submenu enables users to set a delay time for each channel, ranging from 0 to 250 ms, with increments of 0.1 ms. The limit of 250 ms is shared between the USER and GROUP delay.

> You do not have to select a channel, every channel's delay control is visable from the same submenu.



Select the **Delay** submenu

Set the desired **delay time** for each channel using the fader, arrows, keyboard, or input field. Double-click on the fader to reset it to 0 ms.
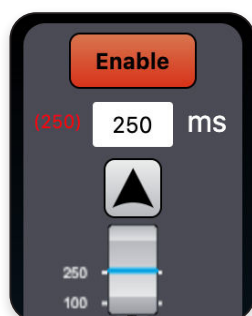
**Enable** turns the delay on and off, allowing for A-B comparisons.

The value inside the parentheses () beside the data input field indicates the sum of GROUP delay and USER delay, which cannot surpass 250 ms.
For example: If this channel is assigned to a group that has a 50 ms delay time, you will not be able to set the USER delay higher than 200 ms.

**Front Panel Delay Control**

The delay time can also be set from the front panel, though it does not offer the Enable button. If you increase the delay time from the front panel to anything above 0 ms, the Enable button will be automatically activated. Similarly, reducing the delay time back to 0 ms from the front panel will switch off the Enable button.

## USER / PEQ

The CloudPower™ offers 12 bands of USER **EQ** per channel, with a wide variation of filter types to choose from.

**Select** the channel you want to control

Select the **PEQ** submenu

**Drag** EQ nodes



| Band Ena | Filter type | Freq. (Hz) | Gain (dB) | Q | Band Ena | Filter type | Freq. (Hz) | Gain (dB) | Q |
|---|---|---|---|---|---|---|---|---|---|
| 1 ☑ | Bell-Sym | 50 | 6 | 1 | 7 ☑ | Bell-ASym | 1000 | -10 | 2,5 |
| 2 ☐ | Bell-Sym | 100 | 0 | 2,5 | 8 ☑ | Bell-ASym | 2000 | 10 | 2,5 |
| 3 ☐ | Bell-Sym | 200 | 0 | 2,5 | 9 ☐ | Bell-Sym | 3000 | 0 | 2,5 |
| 4 ☑ | All-Pass 180° | 250 | 0 | 2,5 | 10 ☑ | High-Shelving 12dB/oct | 4000 | -6 | 2,5 |
| 5 ☐ | Bell-Sym | 400 | 0 | 2,5 | 11 ☐ | Bell-Sym | 5000 | 0 | 2,5 |
| 6 ☑ | Notch | 500 | 0 | 2,5 | 12 ☑ | Low-Pass VariQ 12dB/oc | 12000 | 0 | 1,5 |

**The EQ bands can be set in multible ways:**

- Enter the data into in the ALL tab.
- Drag the EQ nodes on the chart.
- Select a specific band's tab and utilize the detailed controls.
- Copy the settings from another channel.

The **ALL** tab provides an overview of all 12 band settings and allows control over the full PEQ.

To activate a band, click the **checkbox**.

Select a **Filter Type** from the list.

Adjust the **Frequency** within the range of 10 Hz to 22 kHz.

Set the **Gain** between -40 and +15 dB.

Select a **Q**-factor value between 0.1 and 48.

Tap a filter band for detailed control, which can be particularly useful when using tablets or phones. The tab will turn green when its filter is activated, and the selected tab will be outlined in blue.
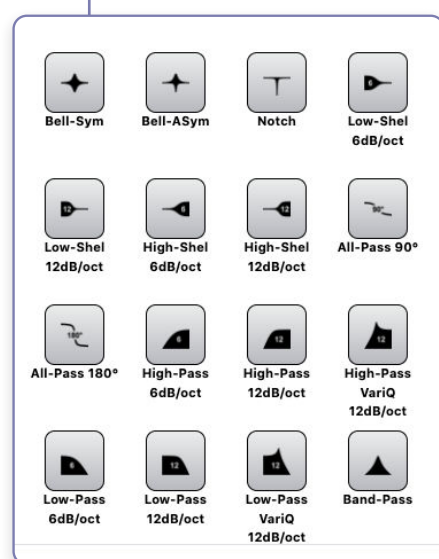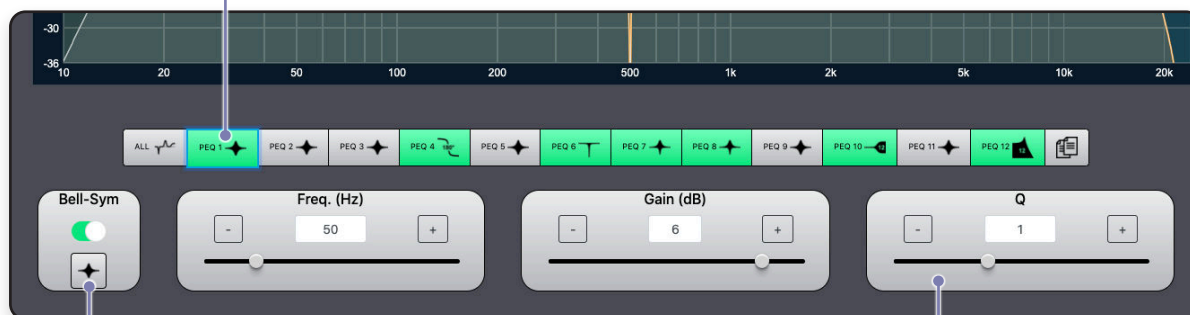


Use the three value boxes to enter the data by sliding the fader, clicking the - and + buttons for small increments or entering the data in the input filed.

Clicking or swiping the latch switch will **activate** the selected filter and display the curve on the chart.
Click the **filter** icon to bring up the filter selection window.



Click on the last tab to access the **Copy** feauture and **Reset** controls.
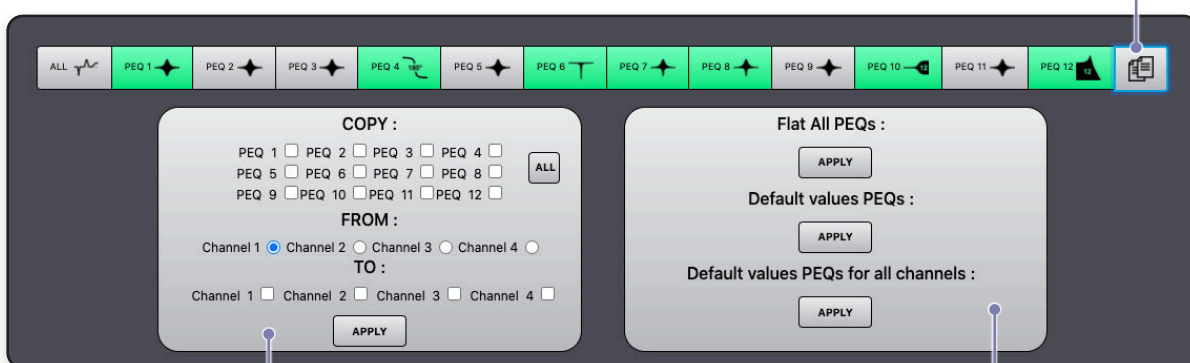


To **copy** PEQ bands, select the bands and the source channel from which you wish to copy, then select the destination channels where these band settings will be pasted. Finally, click **Apply** to execute the copy command.

**Flat All PEQs** sets the gain of all 12 bands of the active channel to 0 dB. It will not affect the frequency and Q settings, or other channel PEQs.
**Default values PEQs** resets all PEQ settings for the channel. It will not affect other channels.
**Default values PEQs for all channels** resets all PEQ settings on every channel.

## Chart Features

Both the PEQ and the X-Over charts offer features to enhance usability and provide feedback.

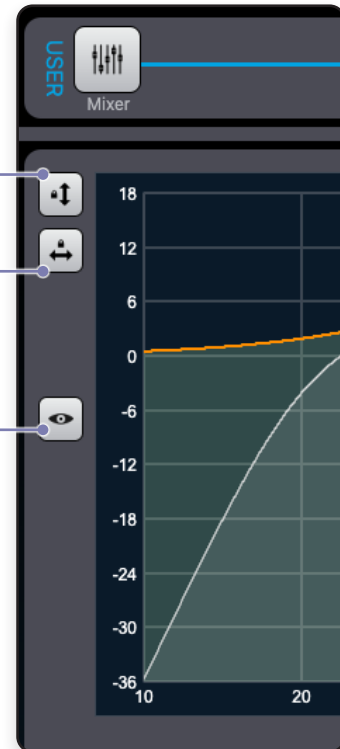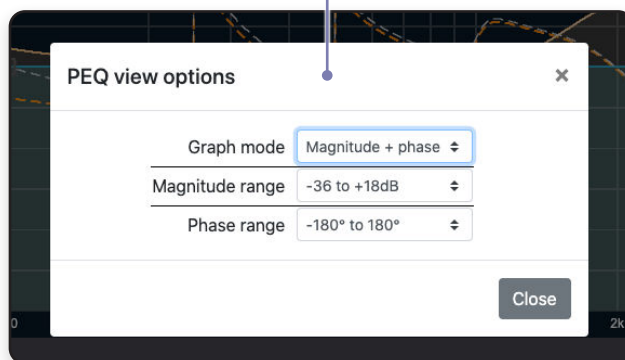The active nodes on the chart can be moved by **dragging** them with your finger or mouse.

Lock **horizontal** movement of the notes in order to avoid changing the **frequency**.

Lock **vertical** movement of the notes in order to avoid changing the **gain**.

The **view options** allow you to choose between viewing the magnitude, phase, or both. You can also control the range for both magnitude and phase scales.

**PEQ view options**

| | |
|---|---|
| Graph mode | Magnitude + phase |
| Magnitude range | -36 to +18dB |
| Phase range | -180° to 180° |

Close

The lines on the chart are color-coded to maintain clarity:
- Orange: Indicates the total effect of either the PEQ or X-Over, depending on the **active** menu.
- White: Reflects the **combined effect** of both the PEQ and X-Over.
- Blue: Highlights the currently **selected band** or filter.
- Solid line: Illustrates the effect on the **Magnitude,** with its scale on the left of the chart.
- Dotted line: Depicts the **Phase** shift, with its scale on the right of the chart.

## USER / X-Over

The CloudPower™ amplifier provides both a **high-pass** and a **low-pass filters** in its user interface. These filters offer a choice of 19 different classic X-over filter types, including Bessel, Butterworth, and Linkwitz Riley, with slopes ranging from 6 to 48 dB/octave.

**Select** the channel you want to control

Select the **X-Over** submenu

Drag filter nodes



Clicking or swiping the **latch switch** will activate the selected filter and display its curve on the chart.

To set the **cutoff frequency**, you can drag the nodes on the chart, use the slider, - and + buttons, or manually enter the value in the input field.
Both filters can be set from 10 Hz to 22 kHz.

Click the **filter** icon to bring up the filter selection window

Butterworth 6dB/oct
Butterworth 12dB/oct
Butterworth 18dB/oct
Butterworth 24dB/oct

Butterworth 30dB/oct
Butterworth 36dB/oct
Butterworth 42dB/oct
Butterworth 48dB/oct

Linkwitz-Riley 12dB/oct
Linkwitz-Riley 24dB/oct
Linkwitz-Riley 36dB/oct
Linkwitz-Riley 48dB/oct

Bessel 12dB/oct
Bessel 18dB/oct
Bessel 24dB/oct
Bessel 30dB/oct

Bessel 36dB/oct
Bessel 42dB/oct
Bessel 48dB/oct

**70/100V System Warning**

When utilizing the amplifier with a 70 or 100V transformer system, ensure that you employ a high-pass filter (HPF) to prevent significant transformer saturation. Our recommended configuration is a 63Hz HPF with a 24dB/octave roll-off. The minimum response requirement is -3dB at 70Hz with a 12dB/octave slope. Firmware version 1.3 and higher offer an additional 100Hz 12dB/octave HPF at the end stage of the processing for this purpose. You can activate this additional HPF through the web interface via Settings > Output.

## USER / Limiter

To protect the connected loudspeakers from damage, each CloudPower™ channel is equipped with a dual-stage **Limiter** that includes an RMS stage which responds to the signal's average power, and a Peak stage designed to react to fast signal spikes and transients.

**Select** the channel you want to control



Select the **Limiter** submenu
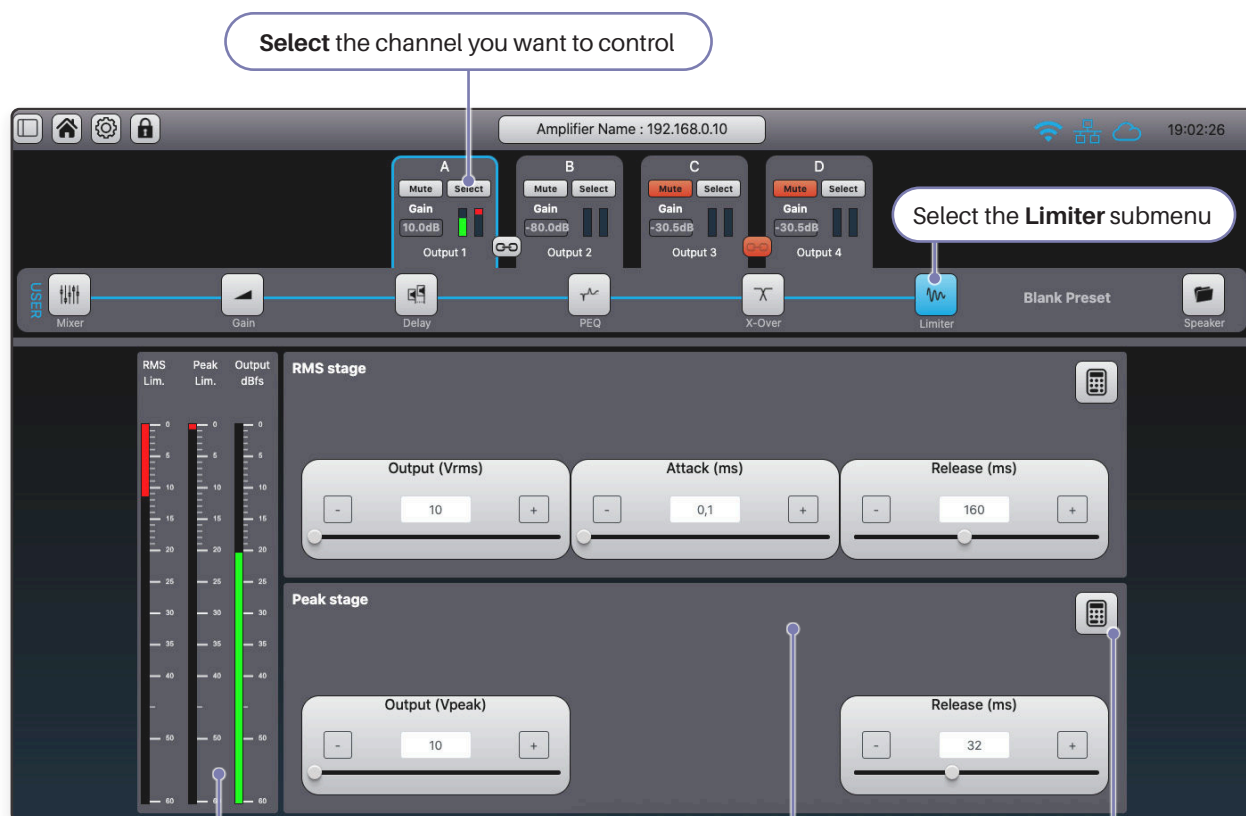
The **red meters** show the selected channel's RMS and Peak gain reduction in dB , while the **green meter** displays the output level after limiting in dBFS.

The **calculators** can be used to calculate settings specific to your speaker.

**Output** (**Vrms**) and (**Vpeak**) serve as **threshold** controls that determine the signal level at which the limiter engages. These thresholds can be adjusted within the range of -56 to +24 dBu.
It's important to ensure that the Peak threshold is set higher than the RMS threshold.
If not, the RMS limiter won't have an impact as the faster responding Peak limiter will eat its dinner.

**Attack** can only be set for the RMS stage and determines the speed at which the limiter responds when the signal level surpasses the RMS threshold. It can be set between 0.1 and 6.000 ms.
The Peak limiter is naturally equipped with a very fast attack setting.

**Release** determines the time it takes for the limiter to recover once the signal falls back below the threshold. Faster release settings might lead to audible distortion or a pumping effect, which can be smoothed by using slower release times.
The range for the RMS stage is 5 to 10,000 ms.
The range for the Peak stage is 5 to 500 ms.

## Limiter Calculator Tool

Clicking the calculator icon opens a window where you can calculate appropriate starting values for your limiter. This calculation is based on the impedance and the maximum output wattage of your speaker and the high-pass filter settings from the crossover menu.



The frequency of the **X-Over**'s high-pass filter (HPF) is used to determine attack and release times that will preserve the integrity of lower frequencies with longer wavelengths. If the HPF is set to a higher frequency, the calculator will permit quicker attack and release settings.

Please note that the calculator also considers the HPF frequency even when the filter is disabled.

Enter the impedance and maximum peak wattage of your loudspeaker.

This information is typically found on the rear of the speaker or in a datasheet.

Click **Apply** to implement the calculated values.

## USER / Speaker Preset Library

The CloudPower™ provides a feature to load pre-made processing **presets** onto each channel, specifically designed to apply speaker-specific settings. These presets can be created using the speaker preset creator or can be supplied by speaker manufacturers.

It's important to note that a **speaker preset** doesn't alter the parameters of the USER processing; instead, it introduces an entirely new layer of processing on top of the existing USER and GROUP processing. You can manage and load these presets as follows:



Select the channel where you wish to load a preset.

Select the **Speaker** menu

Currently loaded preset on the selected channel.

Active preset between > <

### Adding presets to the library

By default, the library consists only of the **Factory Folder**, containing a blank preset.
You can upload new presets to the library either in bundles or as individual files.

To upload a **bundle** of presets: ( .cpspkrfr extention)
- **Create** and **name** a new **folder** and **select** it.
- Press **Upload Folder** and select the .cpspkrfr file from your computer.
- Press **Upload in folder** to confirm.

To upload a **single** preset file ( .cpspkr extention)
- Select a user folder.
- Press **Upload Preset** and select the .cpspkr file from your computer.
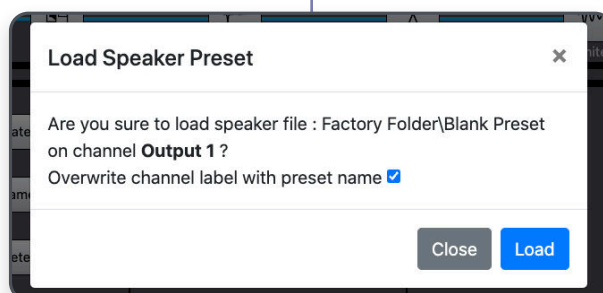- Press **Upload** to confirm.

Folder can be renamed with the **Rename** button.

Both folders and individual presets can be removed with the **Delete Folder** and **Delete Preset** buttons.

### Loading a preset onto a channel

- Make sure to have the correct channel selected.
- Select the desired preset from a folder.
- Press Load.

  A popup will ask for confirmation and offer to replace the channel label with the preset name.

- Click **Load** to confirm and apply the preset.

The name of the preset should be shown in the USER menu header between *Limiter* and *Speaker*.

In the library, the active preset is highlighted between angle brackets: >**name**<

**Load Speaker Preset**     ×

Are you sure to load speaker file : Factory Folder\Blank Preset on channel **Output 1** ?
Overwrite channel label with preset name ☑

Close     Load

## Sidebar Menu | Network Devices

The sidebar menu grands access to the network devices and the GROUP processing.

Click the **Sidebar** button to exand it



The sidebar displays the currently connected device as the "**Local device,**" and it lists other CloudPower™ amplifiers in the network as "**Network devices.**"



When you select another CloudPower™ amplifier within the network, its USER interface will be displayed, allowing you to operate it.

**Important:** To access other devices through "Network devices" in the sidebar menu, it's necessary that all CloudPower™ devices on the network use **the same login credentials.**

## Sidebar Features

Click to open the GROUPS menu.

**GROUPS**

**Local device :**
CP716
192.168.2.116

The amplifier's custom **name** and **IP** adress.

**Status of cp716testlab**

Cloud device name : cp716testlab
IP address : 192.168.2.116
MAC address : 02:81:D7:FD:16:3E
Model : CP0716
Serial number : CE16230003
Device alive : OK
Websocket status : OK

**Network devices :**

CP354
192.168.2.145

Click the info icon to display a popup window containing the amplifier **details** and its **status**.

CP704
192.168.2.115

The **model** is also displayed in the CP Icon.

CP3004
192.168.2.150

Small versions of the **output meters** which turn red when a limiter is active, providing an overview of the output activity in the network.

CP1504
192.168.2.117

**refresh**

Click **refresh** to update the device list.

CP354

Previous active devices that are currently offline are shown with a red outline, indicating that they were previously connected but a connection cannot be established. This could suggest that the amplifier has been turned off or there may be network issues.

If a device was intentionally removed from the network but still appears, performing a reboot of the amplifier will clear the list.

## GROUPS

Groups offer robust control over all the channels within a system. Amplifier channels can be linked to several groups, with each channel potentially belonging to up to six distinct groups. Modifying group settings will impact all amplifier channels within the network assigned to that specific group.

Employing multiple groups can be useful in logically segmenting a expansive system. For instance, amplifier channels responsible for a restaurant area can be grouped together to establish a restaurant sub-master. A master group can also be formed, granting access to system-wide EQ and level adjustments, enabling instantaneous modifications across all amplifier channels in the network.
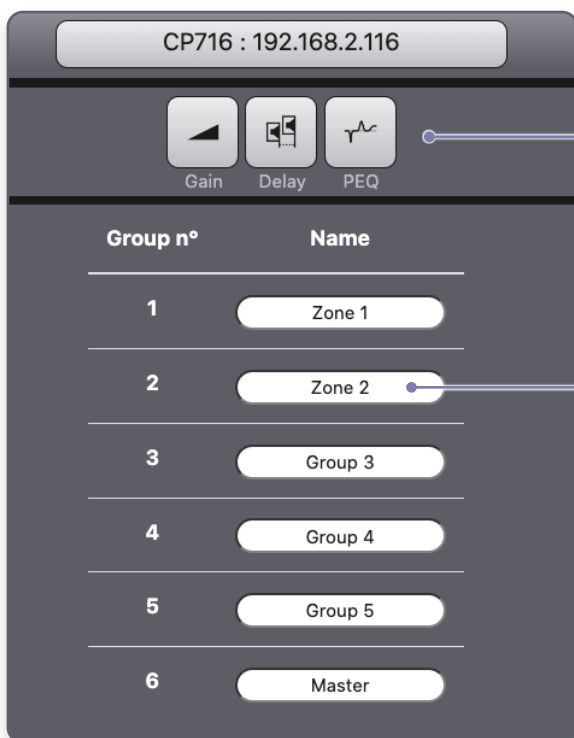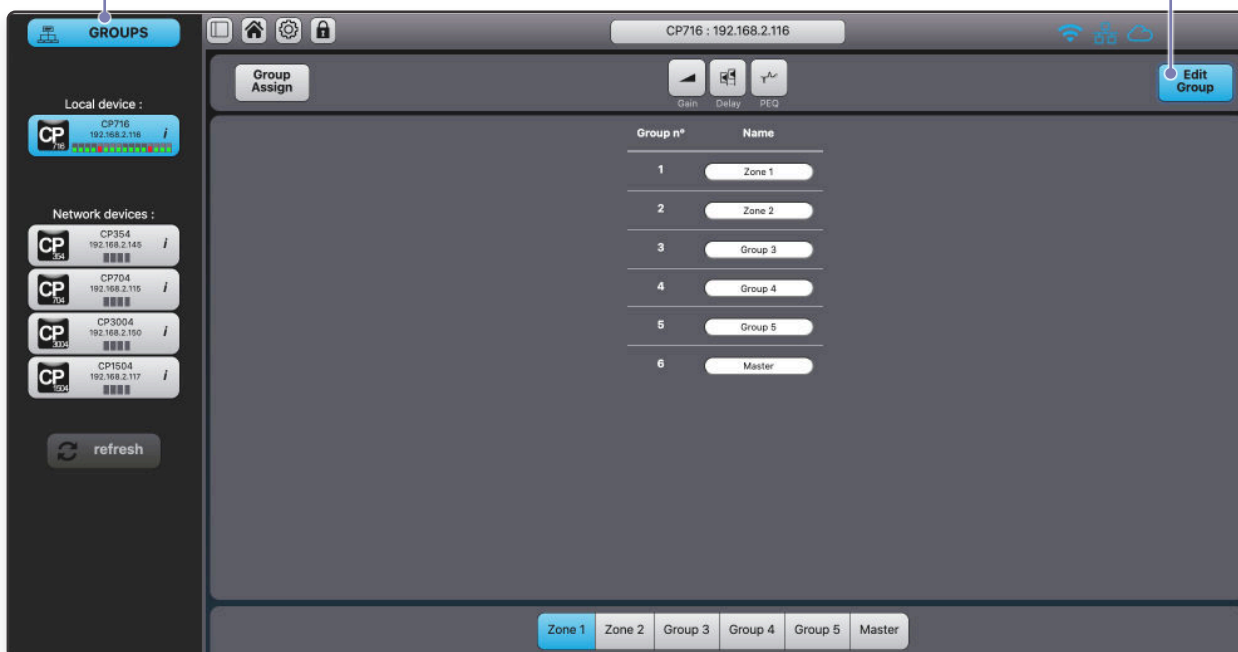
## Edit Groups

The first thing you want to do is give your groups a custom name. This is done in the **Edit Group** menu.

With the sidebar expanded, click on **GROUPS** to open the menu.

Click on **Edit Groups** to access the page where you can customize the names of the six groups.



The three GROUP processing menus

Enter custom **names** for your groups.

When controlling multiple devices from the same web interface, please ensure all devices have the same login credentials.

## Assign Groups

Next, you'll want to assign the channels to one or multiple groups. You can easily do this using the routing matrix in the **Group Assign** menu.

Click on **Assign Groups** to show the routing matrix.

Click on the amplifier **headers** to show their channels in the matrix.
The selected amplifiers header is **blue**.



**Assign** the amplifier's channels to the groups by pressing the buttons in the matrix.

Green buttons indicate assignment.

**Clear** all assignments for the selected amplifier with the **Dot** button.

Toggle the **Arrow** buttons to **expand or collaps** the submenus.
The two arrows at the top allow you to expand and collapse **all** submenus.

The grey and green **dots** offer a clear **overview** of the assignments.

When controlling multiple devices from the same web interface, please ensure all devices have the same login credentials.

## GROUP / Gain

You are now ready to start using the GROUP processing. First in the chain is the **GROUP Gain**. Be sure to select the correct group at the bottom of the screen first.
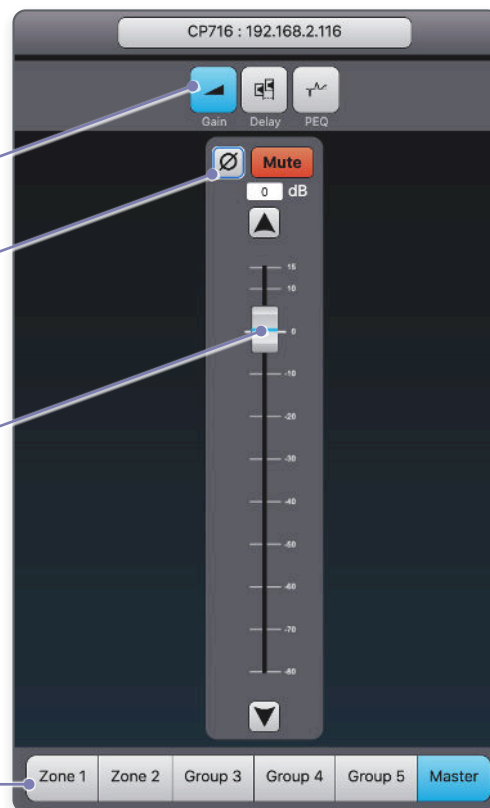
Click **Gain** to access the gain contols.

Click the phase button to flip the **Polarty** of every channel in the group with 180°.
Click **Mute** to silence every channel in the group.

**Gain Fader**
Relatively add or subtract gain from every channel assigned to this group. The range is between -80 and +15 dB.

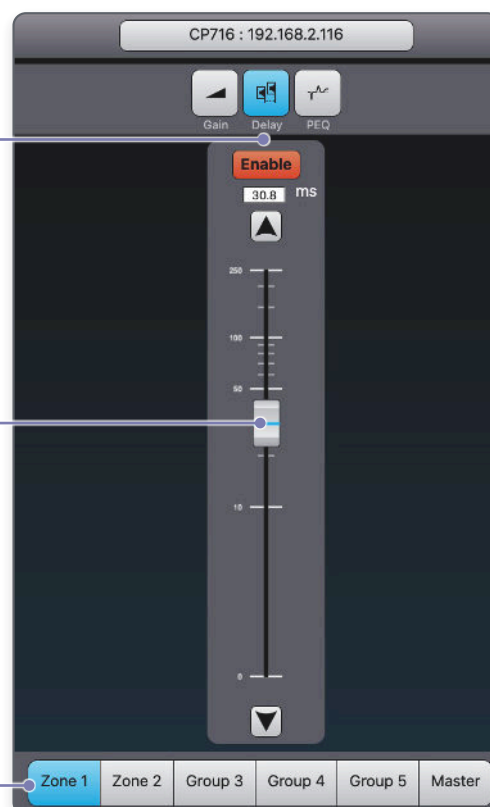**Select** which group to operate.

## GROUP / Delay

In the delay window you can adjust the **GROUP Delay**.

Click **Delay** to access the delay contols.
**Enable** toggles the delay on or off.

**Delay Fader**
Relatively add up to 250 ms of delay to every channel of this group.
Note: the 250 ms is shared with the USER delay time.

**Select** which group to operate.

## GROUP / PEQ

The **GROUP PEQ** enables you to apply an additional layer of EQ processing to all the channels assigned to the group. If a single channel is assigned to multiple groups, it will undergo processing from all the PEQs of those groups.

The GROUP PEQ works exactly the same way as the USER PEQ.
For a detailed explanation, refer to the corresponding section in the manual on page 38.

Click **PEQ** to access the equalizer.



**Select** which group's PEQ to operate.

When controlling multiple devices from the same web interface, please ensure all devices have the same login credentials.

## ⚙ Web UI / Settings Menu

To access the CloudPower™ settings menu, click on the gear icon located in the interface's header. This will open a new page with various setting tabs.

Click on the **Gear** icon in the interface's header to open the **settings** menu.

## ✏ Web UI / Settings / Device Name

In the **Device Name** tab, you have the option to assign a custom name to your amplifier.



**Front Panel Lock:** Select to lock front panel access to the amplifier by disabling the function of its rotary encoder. If the encoder is pressed the OLED will display the unit's IP address and cloud address.

**Device Name:** Enter a custom name for this amplifier and click **Apply** to confirm. The custom name will be displayed in the interface header alongside its IP address, in the sidebar menu devices list, and on the group routing page.

**Locate button:** When selected, a pin icon is displayed on the OLED screen of the relevant amplifier for 15 seconds.

⚠ **Note!** Speakers should be disconnected before making a Reset action. The user will be warned and asked to confirm before the Reset occurs. When confirmed, the following actions will occur:

-All speaker presets will be erased

-All global audio presets will be erased

-User settings will be cleared to default settings

⚠ **Note! Speakers should be disconnected before making a Reset action. The user will be warned and asked to confirm before the Reset occurs. When confirmed, the following actions will occur:**

**-All speaker presets will be erased**

**-All global audio presets will be erased**

**-Amplifier will return to default settings**

**-All settings will be cleared**

**-Cloud connect will be down**

## Web UI / Settings / Global Presets Library

Global Preset files contains all audio DSP settings of every channels of the amplifier, including: USER, GROUP and SPEAKER PRESET parameters.

They do not contain any other settings found in the settings menu such as: Output operation and configuration (100V HPF, bridge mode), network settings and streaming account details.



### Saving and Loading Presets

By default, the library includes only the **Default Folder**, which contains a **Default Preset** that resets all parameters when loaded.

To **save** the current settings **as** a new preset:

• **Create** and **name** a new user folder.

• With a user folder selected, press **Save As Preset.**

• In the popup window, enter a **name** for the preset and press **Save As Preset** to confirm.

To **overwrite** an existing preset:

• Select the preset and press **Save Preset.**

• In the popup window, press **Save Preset** to confirm.

To **Load** a global preset:

• Select the preset and press **Load Preset.**

• In the popup window, press **Load Preset** to confirm.

### Uploading and Downloading Presets

The user-made global presets can be downloaded and uploaded.
These files have a .cpglob extension.

To **Download** a global preset:

• Select it and press **Download Preset.**

To **Upload** a global preset:

• Select the folder where you want to place it.

• Press **Upload Preset.**

• In the popup window, localise the .cpglob file on your device and press **Upload.**

Folders and individual presets can be removed with the **Delete** buttons.

### CAUTION

Exercise caution when loading user-made global presets, as they may contain high gain settings that can result in sudden loud volume output, potentially causing speaker or hearing damage.

When loading the **default** global preset, the amplifier will **mute** all outputs to prevent this.

## Web UI / Settings / Output Mode

In the output window, you have the option to configure channel **bridging** for both A-B (1-2) and C-D (3-4) on the 4-channel CP354 and CP704 models. When the bridge mode is enabled, refer to the diagram below for the correct wiring configuration of the output terminals.

Additionally, there's a **70/100V mode** available per channel. This mode applies a **100Hz 12dB/octave High-Pass Filter** at the final processing stage. The HPF is designed to prevent distortion and potential damage to transformers. Apart from the HPF, this mode does not affect the amplifier's operation.

Keep in mind that any adjustments made within the Output window will not be stored in the global presets.

Press **Enable** to turn on the 70/100V **100Hz 12dB/octavte HPF**.

Press **Enable** to **bridge** adjacent channels on the 4-channel models.

The **Output Wiring** diagram illustrates how to connect the terminals.

Bridged speakers are connected between the positive poles of both amplifier channels, the negative poles are not used.
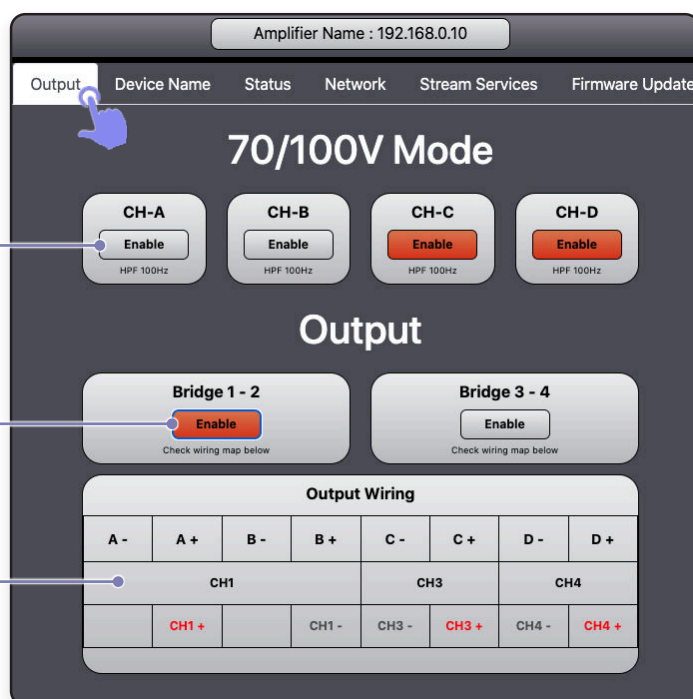
**Please note:**
Bridging is only available for the following models:
- CP354 / 354D
- CP704 / 704D

When **bridged,** the channel headers of the two channels will merge. Please note that only channels A and C settings are retained after switching to bridge mode.

The gain and delay faders of the first channel (A and C) will control the bridged channel.

## Web UI / Settings / Network

In the network tab, you can access all network-related settings, including the device's LAN, hotspot and cloud settings, and login credentials.

### LAN

The LAN section gives control over the amplifiers IP configuration.

| Status | Network | Stream Serv |
| --- | --- | --- |

**Network**

LAN :

IP

192.168.0.10

Mask

255.255.255.0

Gateway

192.168.0.1

☑ DHCP

Apply

**IP**
In DHCP mode, an IP address will be automatically displayed when a connection is established with the router.
In static mode, you need to manually enter an IP address.

**Subnet Mask**
For DHCP mode, the subnet will also be automatically displayed when the connection is established.
In static mode, you must manually enter the subnet mask.

**Gateway**
For DHCP mode, the gateway will also be automatically filled in.
In static mode, provide the router's address, typically ending with "1".

**Connect via a router**
Connect the CloudPower™ device(s) CONTROL connector together with a PC to a router. The use of a router is mandatory in DHCP mode to obtain IP addresses. After a connection is established with the router, the CloudPower™ device will receive an IP address that will be displayed in the network menu. Enter this address in your device's browser, and the IntelliCloud software will open on your device.

### Hotspot

Each CloudPower™ amplifier features a Hotspot, enabling users to control the amplifier using any mobile device (smartphone, tablet, or laptop) without needing access to the local network to which the amplifier is connected through its CONTROL port. The CloudPower™ software is web-based, eliminating the need for software installation. Its primary purpose is to ensure accessibility to the web interface when the LAN cannot be accessed or is experiencing issues.

**HOTSPOT :**

SSID

AMP_XXXX

Password

12345678

☑ ENABLE

Apply

Activate the **Hotspot** by ticking the checkbox. Then search for the **SSID** name within your device's available Wi-Fi networks. Connect to the hotspot and enter IP address **172.24.0.1** in your browser's URL. This will automatically open the IntelliCloud web interface on your device.

**SSID** is the name of the generated hotspot, which you can find in your list of available Wi-Fi networks.
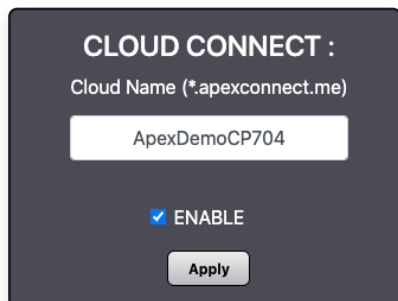
The **Password** will be prompted by your device when attempting to connect to the hotspot.

After making changes to either the name or password, click the **Apply.** Both can also be viewed from the front panel.

Please note that the web interface will also prompt you for a login and password. By default, both are set to "**admin**" and can be altered in the credentials section of this menu.

## Cloud Connect | Remote Access

Every CloudPower™ amplifier is equipped with a Cloud feature. This feature enables users to remotely manage the amplifier via the internet. To enable this, the CONTROL port (on the rear side of the amplifier) must be connected to a router with an internet connection. Using a secure connection, users can operate the amplifier and all other CloudPower™ devices within the same network from anywhere in the world.

**CLOUD CONNECT :**

Cloud Name (*.apexconnect.me)

ApexDemoCP704

☑ ENABLE

Apply

Enter a cloud name for your device enable, check **ENABLE** and click **Apply**.

The name can only consist of alphanumeric characters and must be minimum 10 characters in length.

When assigning cloud names to your amplifiers, make sure to create unique names by including detailed descriptions or codes. This ensures that no two CloudPower™ amplifiers in the world share the same cloud name. For example: "AmpCompanyLocationA1234"

With the Cloud feature enabled, open a web browser connected to the internet and enter the following URL:

**http://cloudname.apexconnect.me**

This will enable you to connect to the amplifier, which will then prompt you for the login and password. By default, both are set to "**admin**".

Note: You will be prompted for the login credentials twice — first by the relay server, and then by the amplifier's server. Both sets of credentials are the same.
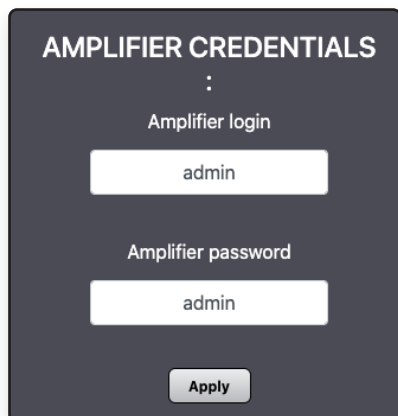
**Please take note:**
When multiple CloudPower™ amplifiers are installed within a single network, accessing one amplifier through the Cloud will provide access to all other amplifiers via the sidebar menu in the IntelliCloud web UI.
However, we recommend enabling the cloud feature for all amplifiers individually. This allows each amplifier to be accessed directly, without relying on the functionality of another unit.

## Login Credentials

Here, you can modify the login credentials that are required when accessing the web interface.

**AMPLIFIER CREDENTIALS :**

Amplifier login

admin

Amplifier password

admin

Apply

Alter the login and password, then click **Apply** to confirm the changes.

When controlling multiple devices from the same web interface, please ensure all devices have the same login credentials.

## Web UI / Settings / Stream Services

CloudPower™ is the first amplifier in its class with an integrated audio source and streaming capability, allowing easy streaming of background music from devices running apps such as Spotify or AirPlay.

Please note it is not possible to stream Spotify and Airplay simultaneously.

The output from the streaming sources will be audible through the **ST L** and **ST R** faders located in the **Mixer** of the USER section.

In a **stereo** setup, one channel will carry ST L, while an other channel will carry ST R.

In a **mono** setup, both ST L and ST R signals need to be combined.

### Spotify

If enabled, the CloudPower™ will function as a playback device for Spotify applications on the same network. If premium account credentials are supplied, only that account will be able to connect with the amplifier, and playback can be controlled from multiple locations.

**Spotify name**
This is the name that will be displayed in the playback devices of your Spotify interface.

**Email Address & Password**
Optionally, you can choose to provide the credentials of your premium Spotify account. This will enable you to play music from various locations and restrict access to non-public users.

Mark the **ENABLE** checkbox and then click on **Apply** to confirm the changes.

Open your **Spotify** application.
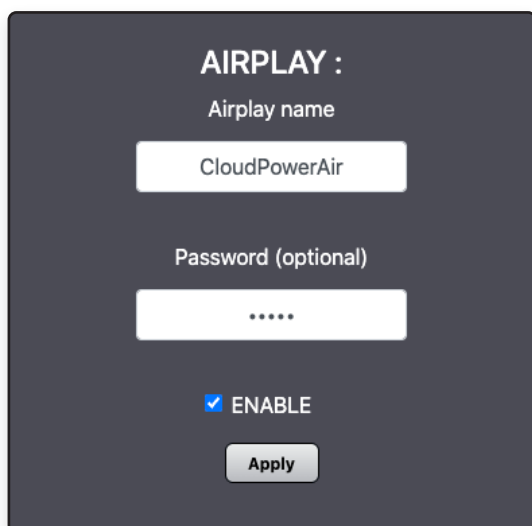
In your list of **playback devices**, you will find the custom CloudPower name available for selection.

Upon connection, the volume will be initially set to around 10% to prevent sudden loudness.
Adjust the fader to achieve a suitable volume level.
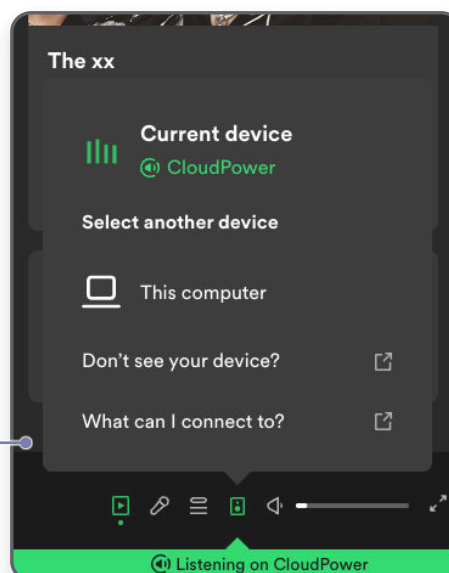
## Apple Airplay

AirPlay streaming can be enabled and customized. Ensure that your mobile device is connected to the same network as your CloudPower™ device.



**AIRPLAY :**

Airplay name

CloudPowerAir

Password (optional)

•••••

☑ ENABLE

Apply

**Airplay name**
This is the name that will be displayed on your devices.

**Password**
Optionally, you can set a password to prevent unauthorized individuals from connecting to the CloudPower.

Check **ENABLE** and then click **Apply**.

The CloudPower should now appear among the selectable devices that support AirPlay.

When you connect, the volume will initially be set to approximately 30% to avoid sudden loudness. Adjust the volume to reach a suitable level.
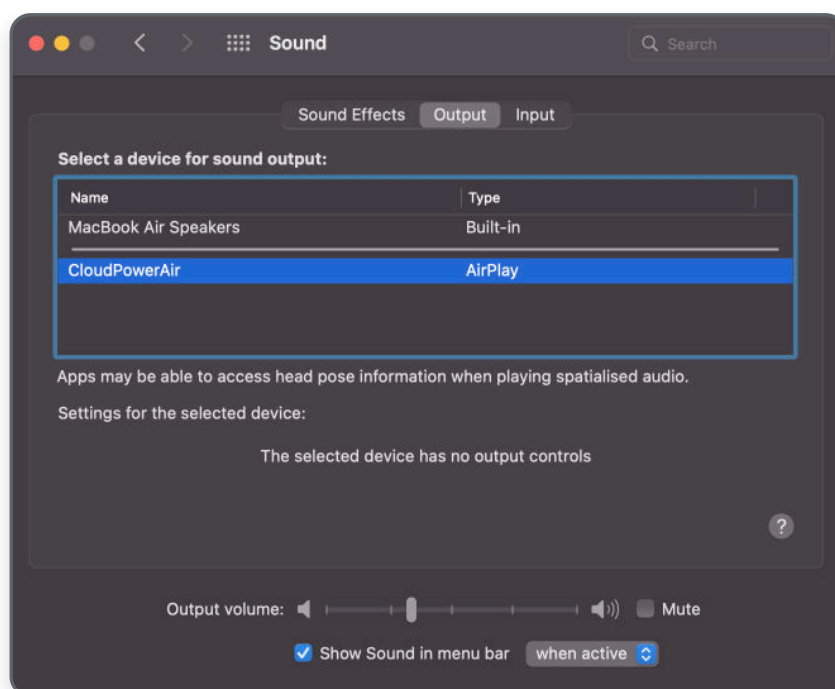
## Web UI / Settings / Firmware Update

Updating the firmware can conveniently be done through the web interface.
Firmware updates will be available when new features are implemented.
Please note that you need to restart the amplifier manually to complete the process.



**To update the firmware:**

1. Download the latest firmware **zip file** from www.apex-audio.be/downloads
2. Select the file using the **Select File** button.
3. Click **Update Now.**
4. The front panel OLED display will show the **updating progress**.
   Do not turn the power off during the update.
   Once completed, the message "**Please Restart**" will appear on the display.
5. Turn the amplifier off and back on to complete the process.

## Web UI / Settings / About

Lastly, the **About** menu will present the device's model, serial number, MAC address, and current firmware version. You can also download the latest manual from this section.
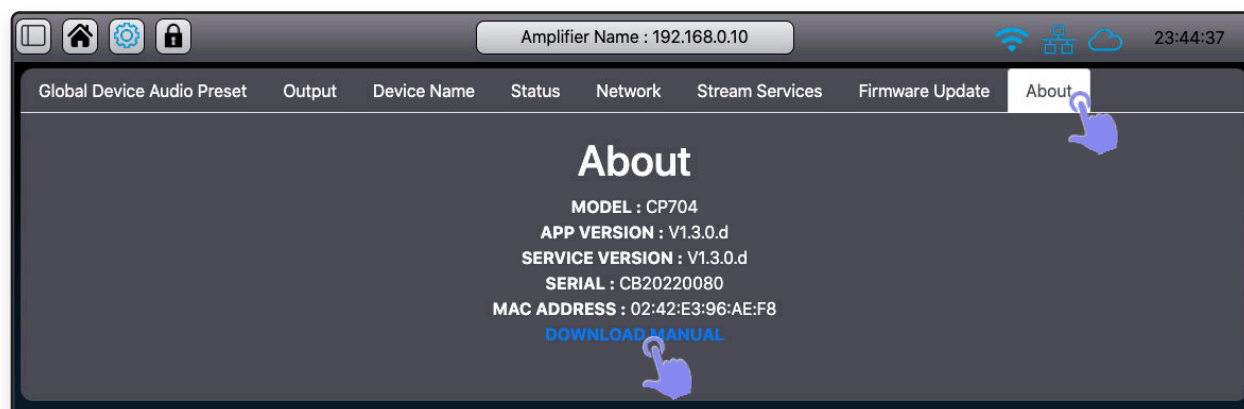
## Copy Channel Parameters

The Copy Channel Parameters tool saves time during configuration by allowing selected parameters (Mixer, Gain, PEQ, Xover, Limiter, Preset) from an amplifier channel to be copied and pasted to one or more of an amplifier's other channels.



Select one or more Destination channels to which the selected Source channel parameters will be pasted

Select one or more channel parameters to be copied from the Source channel

Select the source channel from which channel parameters will be copied

Once the Source, parameters to be copied, and Destination channels have been selected, press Apply to complete the copying / pasting of parameters

## 🔊 Speaker Preset Creator

The web interface hosts its own **Preset Creator** software for designing speaker presets.
To access this feature, simply add "/preset.html" after the IP address in the URL. When controlling a 16 channel amplifier add "/preset16.html" after the IP address in the URL.

For instance: http://192.168.0.10**/preset.html**
http://192.168.0.10**/preset16.html**

Access to this preset creator page can be secured with an OEM code if necessary.
The control interface operates similarly to the USER and GROUP interfaces, with a few exceptions.

**Mute** will mute or unmute the amplifier's channel output. This status is not saved within the preset.

**Select** is used to select the channel to which the connected speaker is allocated while designing a preset.

When a modification is made within any of the submenus, the **ON/OFF** led's will turn to a green **ON** status indicating processing is active.
You can remove the processing on that element using the **CLEAR** button.

Access and **Manage** the preset library.



Added capability to incorporate a **FIR filter** with 768 taps.

To activate the filter:
- Press the filter icon.
- Locate the file on your computer.
- Confirm to upload.
- Toggle the latch switch to the on position.

The X-Over's **Enable Overwrite** feature permits users to modify the crossover frequency of a protected speaker preset using the USER controls.

The frequency specified here becomes the minimum for the HPF or the maximum for the LPF, but it can be adjusted in the opposite direction to attenuate frequencies.

Usage example: The top speaker preset can operate with various subwoofers. Depending on the specific subwoofer in use, adjustments can be made to the top speaker's HPF settings.

The **Delay** function is designed for phase alignment and can be adjusted up to 30 milliseconds.
The **Gain** fader offers additional information regarding the output voltage.
The **Limiter** functions in the same manner as with the user controls.

## Speaker Preset Library

After designing a preset, it can be stored in the **speaker preset library** and optionally protected with an OEM code. These presets can be included with the amplifier upon shipping or made available through a speaker manufacturer's website.
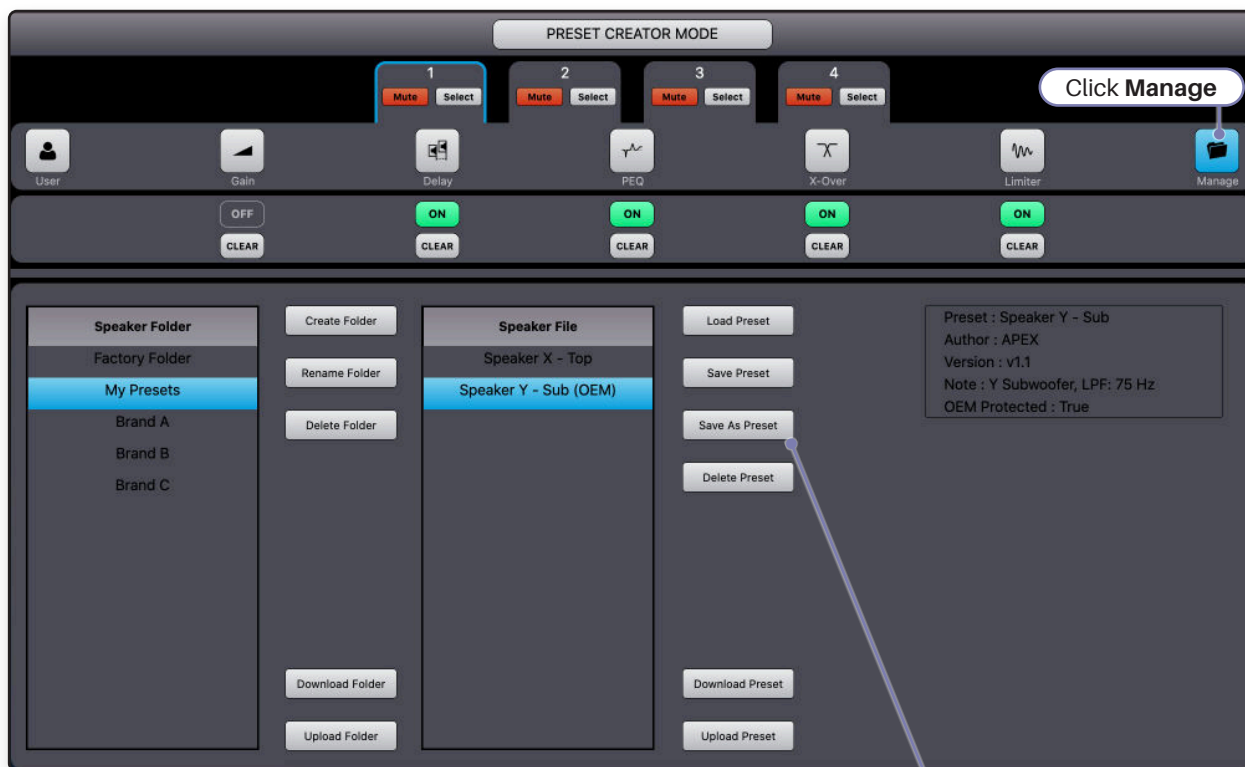


New speaker presets can be saved in **User Folders** using the **Save As Preset** button.

Each preset's name must be unique within the same folder. Trying to use **Save As Preset** with a name that's already in the folder won't work.

To **overwrite** a preset, select it and then press **Save Preset.**

When **saving as** presets, you can add extra information like author, version, and notes. You can also choose to lock presets using an OEM code.

The **OEM locked** presets are specific to amplifiers sharing the same OEM code and cannot be used on amplifiers without the same code.
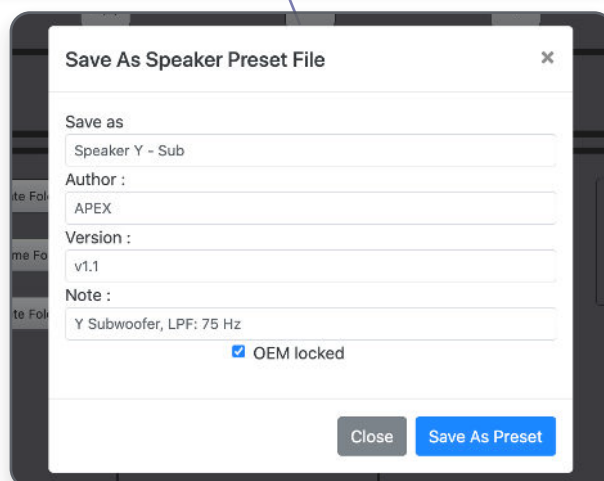
If **multiple** presets are created and stored together in one folder, they can be **downloaded** as a **bundle** using the **.cpspkrfr** extension.
- **Select** the folder and press **Download Folder.**

To download **individual** presets with the **.cpspkr** extension,
- **Select** the preset and press **Download Preset.**

Folders and individual presets can be removed with the **Delete Folder** and **Delete Preset** buttons.

**Upload** presets as bundles (**.cpspkrfr** extension)
- **Create, name** and **select** a new user folder.
- Press **Upload Folder.**
- In the popup window, localise the .cpspkrfr file on your device and press **Upload in folder.**

**Upload** individual presets (**.cpspkr** extension)
- **Select** a user folder.
- Press **Upload Preset.**
- In the popup window, localise the .cpspkr file on your device and press **Upload.**

## OEM Configuration

To secure the speaker creator and avoid incorrect presets from being loaded, an OEM code can be set in the OEM Config window. To reach this page, add "/oem.html" after the IP address in the URL.

For example: http://192.168.0.10/**oem.html**



To **set up** an OEM configuration:
- Click **Set OEM Config**
- Enter an **OEM Label** and **OEM Code** and **Submit**

To **remove** the OEM configuration:
- Click **Delete OEM Config**
- Enter the **OEM Code** and click **Remove**

**Speaker Presets** created under the OEM locked checkbox are now linked to this OEM code. They cannot be uploaded or downloaded to an amplifier unless the same OEM code is set up on that amplifier.

When an OEM mode is set up, you will need the OEM code to be able to access the **Speaker Preset Creator**.

# Application Examples

## Bar

In this bar example, the two rooms are each equipped with their own speaker system comprising of a bar zone with ceiling mount loudspeakers and a dancing area with a stereo set of full range loudspeakers. Each of the systems is able to play any of the selected analog sources. The level can be easily adjusted via the front panel control or via an optional external computer.



Ceiling speakers
**BAR**

Full Range speakers

Subwoofer

**DANCING AREA**

Built-in
music player

Set top box

Analog signal
Speaker
Built-in source
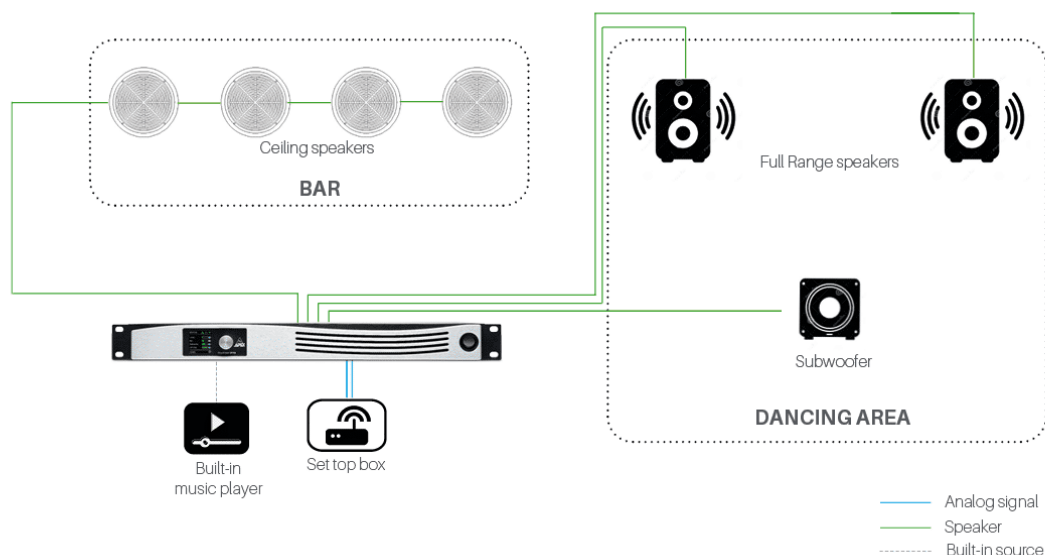
## Museum

In this museum example, all the zones are equipped with their own speaker and amplifier system. The CloudPower devices are connected to a central switch with standard network cabling. Settings can be done with either the central local computer or from a remote location over the internet. Fine tuning can be done with any mobile device connected to an amp's hotspot.



ZONE 1

ZONE 2

ZONE 3

Microphone

Mobile
device

Digital Mixer

Switch

Cloud

Remote
Computer

Local
Computer

ZONE 4

Analog signal
Speaker
Digital Network
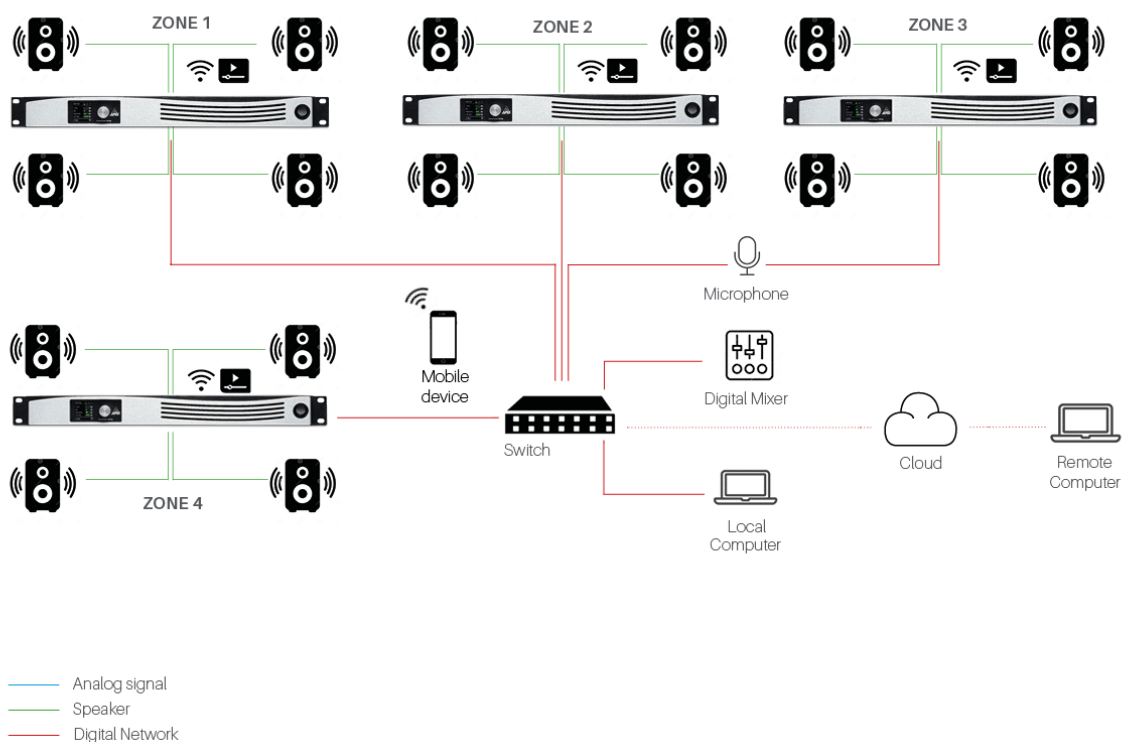
## Restaurant with Karaoke Area

In this restaurant example, the four rooms are each equipped with their own speaker system comprising of a bar zone with full range loudspeakers, a Karaoke area with a small PA system, a restaurant with ceiling loudspeakers and the rest rooms, also equipped with ceiling loudspeakers. Each of the systems is able to play any of the selected analog or digital sources. The IntelliWare web based software has a powerful group function, so changes for every zone can be made from the central computer.



| | | |
|---|---|---|
| Full Range speakers | | |
| BAR | | |
| Full Range speakers | | |
| Subwoofer | KARAOKE SYSTEM | Subwoofer |
| | KARAOKE AREA | |
| Switch | Built-in music player | |
| Computer | Ceiling speakers | |
| | Ceiling speakers | Ceiling speakers |
| | RESTROOMS | RESTAURANT |

Analog signal
Speaker
Digital Network
Built-in source
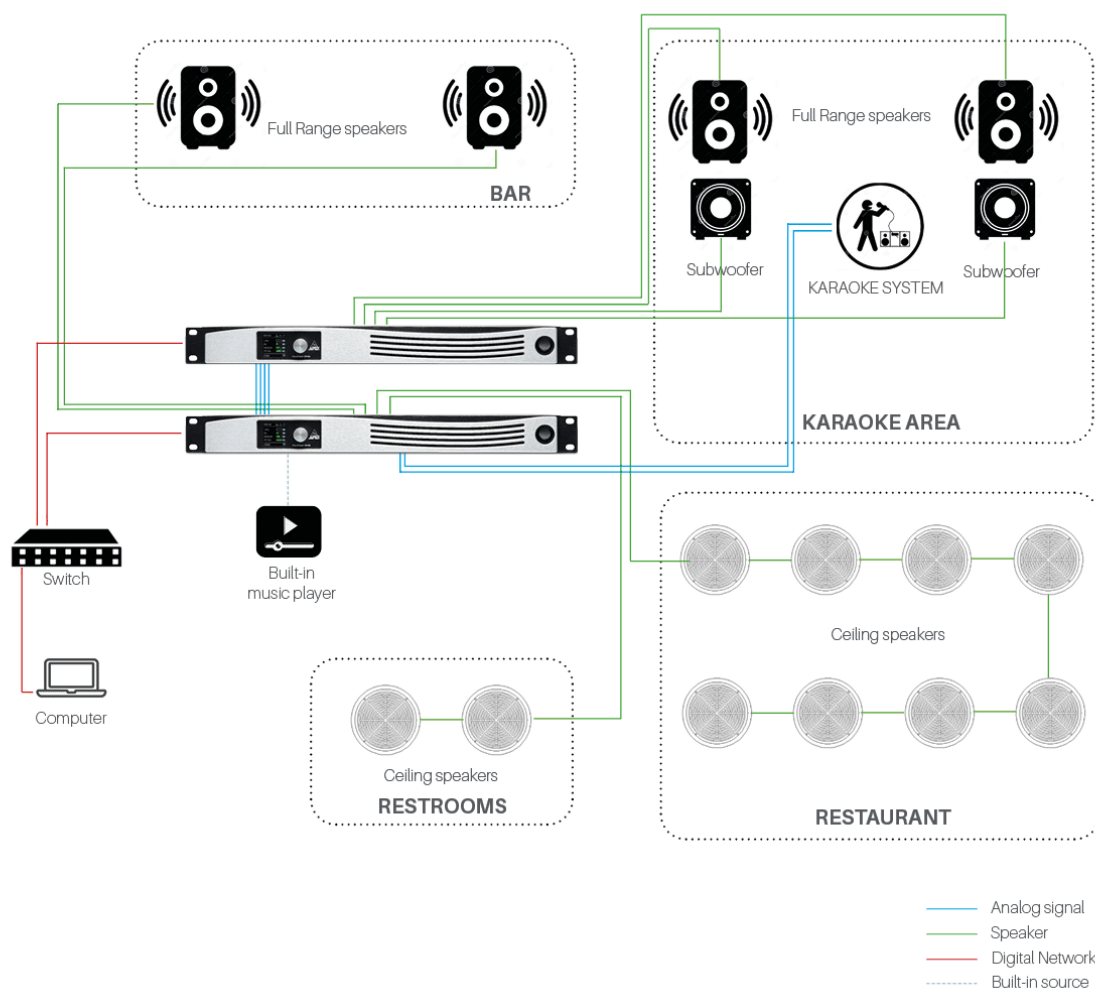
## Specifications  4 Channel Models



### Operating conditions

| | |
|---|---|
| Temperature | 0° to 40° C, 10 to 60 % non-condensing |
| Storage temperature | -20° to 70° C |
| Safety / Compliance | CE Certificate |

### Amplification and power supply

| | |
|---|---|
| Amplification class | Class D GlidePath technology |
| Power supply model | Universal  switch mode power supplies with active PFC |
| Power Factor | > 0,9 above 1/2 P |
| Mains Rating | 100 - 240V @ 50-60 Hz |
| Operating Voltage | 90 - 260V |
| AC Mains connector | IEC C20 Inlet (20 A max) , CP1504 -3004: Powercon 32A |

| MAX AVERAGE POWER CONSUMPTION (1/8) | CP354 / CP354D | CP704 / CP704D | CP1504 / CP1504D | CP3004 / CP3004D |
|---|---|---|---|---|
| Watts (W) | 700 | 700 | 1400 | 2800 |
| Amps @ 230V | 3.1 | 3.1 | 6.1 | 12.2 |
| Amps @ 120V | 5.9 | 5.9 | 11.7 | 23.3 |

### Audio Specifications

| | |
|---|---|
| Frequency response | 1Hz - 22kHz |
| Distortion THD+N | 0,05% @ P/2 , 20Hz- 20 kHz, 22 kHz BW |
| Noise level (20 Hz - 20 kHz @ 8 ohm) | < 100 uV (A) |
| Latency | 1 mS |
| Phase response | ±10 deg 3 Hz - 20 kHz |
| S/N (20 Hz - 20 kHz @ 8 ohm) | CP354 - 704: 115 dB (A), CP1504 - 30004: 118 dB (A) |
| Damping factor | 4000@8ohm <1Khz |
| Input sensitivity | Settable in speaker preset. By default analog in to amplifier output = 26dB |

### DSP

| | |
|---|---|
| Digital Signal Processor | 64 bit FIXED POINT |
| I/O Routing | Flexible routing matrix |

### Dante Audio Networking

| |
|---|
| Dante card prefitted in CP354D / CP704D / CP1504D / CP3004D. Retrofit option card available for CP354 / CP704 / CP1504 / CP3004 |
| 4 Dante input channels with adjustable gain in the amplifier channel mixer |
| Supports 48/96kHz Dante networks |
| Two Gigabit network ports for the Dante network, configurable in switched or redundant mode |
| Supports AES67 |
| Locate function (from Dante Controller, locate mode can be switched on to make the network port LEDs flash to locate them) |

## User processing functions per channel

| | |
|---|---|
| Gain: | -80 to +15dB, 0,1dB steps |
| Polarity: | Normal / inverted |
| Delay: | 0 to 250 ms (Shared between User and Group settings) |
| PEQ: | 12 x PEQ. Each PEQ can be set to a choice of 16 filter types (1) |
| HP/LP filters: | Bessel , Butterworth and Linkwitz Riley with slopes from 6 to 48 dB/oct |
| Limiter: | Peak voltage, RMS voltage |

## Group processing functions

Six global processing group overlays which can link any amplifier channel in the network

| | |
|---|---|
| Gain: | -80 to +15dB, 0,1dB steps |
| Polarity: | Normal / inverted |
| Delay: | 0 to 250 ms (Shared between User and Group settings) |
| PEQ: | 12 x PEQ. Each PEQ can be set to a choice of 16 filter types (1) |

## Speaker processing functions

| | |
|---|---|
| Gain: | -80 to +15dB, 0,1dB steps |
| Polarity: | Normal / inverted |
| Delay: | 0 to 250 ms (Shared between User and Group settings) |
| PEQ: | 12 x PEQ. Each PEQ can be set to a choice of 16 filter types (1) |
| HP/LP filters: | Bessel , Butterworth and Linkwitz Riley with slopes from 6 to 48 dB/oct |
| Limiter: | Peak voltage, RMS voltage |
| FIR filters: | 768 taps per channel |
| (1) Filter types: | Bell-Sym,Bell-Asym, Notch, Low-Shelf 6dB or12dB, High-Shelf 6dB or 12dB |
| | All-Pass 90° or 180°, High-Pass 6dB, or 12dB, High-Pass Vari-Q 12dB, |
| | Low-Pass 6dB  or 12dB, Low-Pass Vari-Q 12dB, Band-Pass |

## Circuit protection

| | |
|---|---|
| Mains and power supply | Under, over voltage, over current protection |
| Power outputs | DC, Over-temp, Over-current limiter, VHF |
| Cooling | Cooling fans with signal control speed |

## Inputs

| | |
|---|---|
| Analog | 4 balanced analog line inputs 4x 3-pin Phoenix |
| A/D conversion | 32 bit |
| Input impedance | 10k Ohm |
| Max. Input level | 21 dBu |
| Digital | 4 input Dante (integral in CP354D / CP704D / CP1504D / CP3004D. Retrofit module available for CP354 / CP704 / CP1504 / CP3004) |
| Internal Streaming source | Two channel internal streaming source supporting Spotify and AirPlay |

## Remote control and monitoring

| | |
|---|---|
| Network connection | Single port Ethernet interface |
| Apex remote control software | Web UI with built in web-server |

## Front panel indicators

| | |
|---|---|
| Daylight viewable colour OLED display | Real time level , limit and fault indicators |

| Amplifier model | CP354 / 354D | CP704 / 704D | CP1504 / 1504D | CP3004 / 3004D |
|---|---|---|---|---|
| Total burst power (all channels driven) | 1400 | 2800 | 6000 | 12000 |
| 2 ohms (with correct limiter setup*) | 350 | 700 | 1500 | 3000 |
| 4 ohms | 350 | 700 | 1500 | 3000 |
| 8 ohms | 350 | 500 | 1500 | 2000 |
| 16 ohms | 250 | 250 | 1000 | 1000 |
| Hi-Z 70V | 280 | 280 | 1500 | 1500 |
| Hi-Z 100V | NA | NA | 1500 | 2500 |
| Peak output power per channel | 90Vpk | 90Vpk | 180Vpk | 180Vpk |
| Max output current per channel | 10Arms | 14Arms | 20Arms | 28Arms |
| **Max Output Power bridged mode** | | | | |
| 4 ohms | 700 | 1400 | NA | NA |
| 8 ohms | 700 | 1400 | NA | NA |
| 16 ohms | 700 | 1000 | NA | NA |
| Hi-Z 70V | 700 | 1000 | NA | NA |
| Hi-Z 100V | 700 | 1000 | NA | NA |
| **Power and Thermal 115V** | | | | |
| Standby power consumption | 11W | 11W | 15W | 29W |
| Idle Power | 30W | 30W | 60W | 120W |
| Idle Current Draw | 0.3A | 0.3A | 0.6A | 1.2A |
| Idle Thermal loss | 102 BTU/h | 102 BTU/h | 204 BTU/h | 408 BTU/h |
| 1/8 Power @ 4 Ohm Power | 185W | 375W | 800W | 1600W |
| 1/8 Power @ 4 Ohm Current Draw | 1.6A | 3.3A | 7A | 14A |
| 1/8 Power @ 4 Ohm Thermal loss | 341 BTU/h | 682 BTU/h | 1364 BTU/h | 2729 BTU/h |
| **Power and Thermal 230V** | | | | |
| Standby power consumption | 11W | 11W | 15W | 29W |
| Idle Power | 30W | 30W | 60W | 120W |
| Idle Current Draw | 0.15A | 0.15A | 0.3A | 0.6A |
| Idle Thermal loss | 102 BTU/h | 102 BTU/h | 204 BTU/h | 408 BTU/h |
| 1/8 Power @ 4 Ohm Power | 185W | 375W | 800W | 1600W |
| 1/8 Power @ 4 Ohm Current Draw | 0.8A | 1.65A | 3.5A | 7A |
| 1/8 Power @ 4 Ohm Thermal loss | 320 BTU/h | 640 BTU/h | 1280 BTU/h | 2560 BTU/h |
| **Physical** | | | | |
| Unit Dimensions | 483 x 44.5 x 358 mm | 483 x 44.5 x 358 mm | 483 x 44.5 x 458 mm | 483 x 44.5 x 458 mm |
| Shipping Dimensions | 610 x 150 x 420 mm | 610 x 150 x 420 mm | 610 x 150 x 610 mm | 610 x 150 x 610 mm |
| Unit Weight | 5 kg - 11 Lbs | 6 Kg - 13 Lbs | 8 kg - 17 Lbs | 10 kg - 22 Lbs |
| Shipping weight | 6.5 Kg - 14.5 Lbs | 7.5 Kg - 16.5 Lbs | 9.5 Kg - 21 Lbs | 11.5 Kg - 25 Lbs |

* For best performance in 2 ohm, current clip should be avoided by lowering the Voltage Peak Limiter Value.
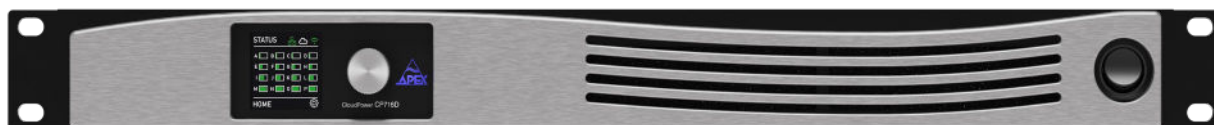Use APEX IntelliDrive built-in Peak Limiter Calculation tool to define the right value.

CP354 / CP354D / CP704 / CP704D



CP1504 / CP1504D / CP3004 / CP3004D

## Specifications   16 Channel Models CP716 / CP716D

| Operating conditions | |
|---|---|
| Temperature | 0° to 40° C, 10 to 60 % non-condensing |
| Storage temperature | -20° to 70° C |
| Safety / Compliance | CE Certificate |
| **Amplification and power supply** | |
| Amplification class | Class D GlidePath technology |
| Power supply model | Universal  switch mode power supplies with active PFC |
| Power Factor | > 0,9 above 1/2 P |
| Mains Rating | 100 - 240V @ 50-60 Hz |
| Operating Voltage | 90 - 260V |
| AC Mains connector | Powercon 32A |
| **Max. average power consumption (1/8)** | |
| Watts (W) | 700W |
| Amps @ 230V | 3,1 |
| Amps @ 120V | 5,9 |
| **Audio Specifications** | |
| Frequency response | 1Hz - 22kHz |
| Distortion THD+N | 0,05% @ P/2 , 20Hz- 20 kHz, 22 kHz BW |
| Noise level (20 Hz - 20 kHz @ 8 ohm) | < 100 uV (A) |
| Latency | 1 mS |
| Phase response | ±10 deg 3 Hz - 20 kHz |
| S/N (20 Hz - 20 kHz @ 8 ohm) | 118 dB (A) |
| Damping factor | 4000@8ohm <1Khz |
| Input sensitivity | Settable in speaker preset. By default analog in to amplifier output = 26dB |
| **DSP** | |
| Digital Signal Processor | 64 bit fixed point |
| I/O Routing | Flexible routing matrix |
| **Dante™ Audio Networking** | |
| 16 Dante input channels with adjustable gain in the amplifier channel mixer | |
| Supports 48/96kHz Dante networks | |
| Two Gigabit network ports for the Dante network, configurable in switched or redundant mode | |
| Supports AES67 | |
| Locate function (from Dante Controller, locate mode can be switched on to make the network port LEDs flash to locate them) | |

## User processing functions per channel

| | |
|---|---|
| Gain: | -80 to +15dB, 0,1dB steps |
| Polarity: | Normal / inverted |
| Delay: | 0 to 250 ms (Shared between User and Group settings) |
| PEQ: | 12 x PEQ. Each PEQ can be set to a choice of 16 filter types (1) |
| HP/LP filters: | Bessel , Butterworth and Linkwitz Riley with slopes from 6 to 48 dB/oct |
| Limiter: | Peak voltage, RMS voltage |

## Group processing functions

Six global processing group overlays which can link any amplifier channel in the network

| | |
|---|---|
| Gain: | -80 to +15dB, 0,1dB steps |
| Polarity: | Normal / inverted |
| Delay: | 0 to 250 ms (Shared between User and Group settings) |
| PEQ: | 12 x PEQ. Each PEQ can be set to a choice of 16 filter types (1) |

## Speaker processing functions

| | |
|---|---|
| Gain: | -80 to +15dB, 0,1dB steps |
| Polarity: | Normal / inverted |
| Delay: | 0 to 250 ms (Shared between User and Group settings) |
| PEQ: | 12 x PEQ. Each PEQ can be set to a choice of 16 filter types (1) |
| HP/LP filters: | Bessel , Butterworth and Linkwitz Riley with slopes from 6 to 48 dB/oct |
| Limiter: | Peak voltage, RMS voltage |
| FIR filters: | 768 taps per channel |
| (1) Filter types: | Bell-Sym,Bell-Asym, Notch, Low-Shelf 6dB or12dB, High-Shelf 6dB or 12dB |
| | All-Pass 90° or 180°, High-Pass 6dB, or 12dB, High-Pass VariQ 12dB, |
| | Low-Pass 6dB  or 12dB, Low-Pass Vari-Q 12dB, Band-Pass |

## Circuit protection

| | |
|---|---|
| Mains and power supply | Under, over voltage, over current protection |
| Power outputs | DC, Overtemp, Overcurrent limiter, VHF |
| Cooling | Cooling fans with signal control speed |

## Inputs

| | |
|---|---|
| Analog | 4 balanced analog line inputs 4x 3-pin Phoenix |
| A/D conversion | 32 bit |
| Input impedance | 10 kOhm |
| Max. input level | 21 dBu |
| Digital | 16 x 16 Dante digital network card |
| Internal Streaming source | Two channel internal streaming source supporting Spotify and AirPlay |

## Remote control and monitoring

| | |
|---|---|
| Network connection | Single port Ethernet interface |
| Apex remote control software | IntelliCloud WebUI with built-in webserver |

## Front panel indicators

| | |
|---|---|
| Daylight viewable colour OLED display | Real time level , limit and fault indicators |

| Amplifier model | CP716D |
|---|---|
| Total burst power (all channels driven) | 11200 |
| 2 ohms (with correct limiter setup) | 700 |
| 4 ohms | 700 |
| 8 ohms | 500 |
| 16 ohms | 250 |
| Hi-Z 70V | 280 |
| Hi-Z 100V | 140 |
| Peak output power per channel | 90Vpk |
| Max output current per channel | 10Arms |
| **Max Output Power bridged mode** | |
| 4 ohms | 1200W |
| 8 ohms | 1400W |
| 16 ohms | 1000W |
| Hi-Z 70V | 1000W |
| Hi-Z 100V | 1000W |
| **Power and Thermal 115V** | |
| Standby power consumption | 29W |
| Idle Power | 120W |
| Idle Current Draw | 1.2A |
| Idle Thermal loss | 408 BTU/h |
| 1/8 Power @ 4 Ohm Power | 1600W |
| 1/8 Power @ 4 Ohm Current Draw | 14A |
| 1/8 Power @ 4 Ohm Thermal loss | 2729 BTU/h |
| **Power and Thermal 230V** | |
| Standby power consumption | 29W |
| Idle Power | 120W |
| Idle Current Draw | 0.6A |
| Idle Thermal loss | 408 BTU/h |
| 1/8 Power @ 4 Ohm Power | 1600W |
| 1/8 Power @ 4 Ohm Current Draw | 7A |
| 1/8 Power @ 4 Ohm Thermal loss | 2560 BTU/h |
| **Physical** | |
| Unit Dimensions | 483 x 44.5 x 415 mm |
| Shipping Dimensions | 560 x 120 x 610mm |
| Unit Weight | 10 kg - 22 Lbs |
| Shipping weight | 11.5 Kg - 25 Lbs |

In the interest of continuous product improvement all values specified are subject to change without notice.
Please refer to the online datasheet for the latest version. It can be found on the download section of our website: https://apex-audio.be/downloadcenter/

# Limited Warranty

GiVa Audiovisual Technologies BV "Apex" warrants you, the original purchaser, or any party that purchases the device from you, that its products are free from defects in material and workmanship under normal use for a period of five (5) years from the date of original purchase. The date of purchase is the date which appears on the first invoice or any other proof of purchase provided by an Apex approved dealer.

Subject to the conditions and limitations set forth below, Apex will, at its discretion, either repair or replace any part of its products that prove to be defective, provided that the product is returned with proof of purchase, shipping prepaid, to an authorised Apex approved service facility.

Warranty cover of any repairs will only extend to the end of the original warranty period.

We will be happy to provide you with a list of authorised dealers to whom you can return the defective unit or who will give you a returns note to enable you to send the unit to the factory.

Service turn-around time will be as fast as reasonably possible. If you are not satisfied with the repair, contact Apex.

**Exclusions and Limitations**

This limited warranty covers only repair or replacement for defective products manufactured by Apex. Apex is not liable for, and does not cover under warranty, any loss of data or any costs associated with determining the source of system problems or removing, servicing or installing Apex products. This warranty excludes 3rd party software, connected equipment or stored data. Apex does not warrant that the operation of the product will be uninterrupted or error-free. In the event of a claim, Apex's sole obligation shall be replacement of the hardware.

This limited warranty does not cover:

1. any damage to this product that results from improper installation, accident, abuse, misuse, natural disaster, insufficient or excessive electrical supply, abnormal mechanical or environmental conditions or other external causes;
2. any damage caused by operating the product outside the permitted or intended uses described by Apex;
3. any damage caused by any unauthorized disassembly, repair, or modification;
4. consumable parts, such as batteries;
5. any cosmetic damage.

Apex is not liable for consequential damages.

This limited warranty also does not apply to any product on which the original identification information (including serial number) has been altered, obliterated or removed or any product that has not been handled or packaged correctly.

Warranty services will be furnished only if the product is accompanied by a copy of the original retail dealer's invoice.

Warranty claims other than those indicated above are expressly excluded.