OWNER'S MANUAL

MANUALE UTENTE

# KPS SERIES

Multichannel DSP Amplifiers

KPS 162 | KPS 162D

KPS 164 | KPS 164D

KPS 168 | KPS 168D

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**ATTENTION**

## CAUTION

RISK OF ELECTRIC SHOCK

DO NOT OPEN

**CAUTION**

WARNING: SHOCK HAZARD – DO NOT OPEN

ATTENTION: RISQUE D'ELÉCTROCUTION - NE PAS OUVRIR

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE

ATTENTION: NE PAS EXPOSER CE MATÉRIEL À LA PLUIE OU L'HUMIDITE AFIN DE REDUIRE LE RISQUE D'INFLAMMATION OU DE CHOC ELÉCTRIQUE

PROTECTING EARTHING TERMINAL. THE APPARATUS SHOULD BE CONNECTED TO A MAINS SOCKET WITH A PROTECTIVE EARTH CONNECTION.

**RCF S.p.A. thanks you for purchasing this product, which has been designed to guarantee reliability and high performance.**

# SAFETY PRECAUTIONS AND GENERAL INFORMATION

Symbols used in this document give notice of important operating instructions and warnings which must be strictly followed.

| | | |
|---|---|---|
|  | **CAUTION** | Important operating instructions explains hazards that could damage a product, including data loss |
|  | **WARNING** | Important advice concerning the use of dangerous voltages and the potential risk of electric shock, personal injury or death. |
|  | **IMPORTANT NOTES** | Helpful and relevant information about the topic |
|  | **SUPPORTS, TROLLEYS AND CARTS** | Information about the use of supports, trolleys and carts. Reminds to move with extreme caution and never tilt. |
|  | **WASTE DISPOSAL** | This symbol indicates that this product should not be disposed with your household waste, according to the WEEE directive (2012/19/EU) and your national law. |

## IMPORTANT NOTES

This manual contains important information about the correct and safe use of the device. Before connecting and using this product, please read this instruction manual carefully and keep it on hand for future reference. The manual is to be considered an integral part of this product and must accompany it when it changes ownership as a reference for correct installation and use as well as for the safety precautions. RCF S.p.A. will not assume any responsibility for the incorrect installation and / or use of this product.

## SAFETY PRECAUTIONS

**1.** All the precautions, in particular the safety ones, must be read with special attention, as they provide important information.

**2.** This is a professional product. Its use is reserved to instructed persons, in relation to the connected risks.

**3.** Power supply from mains:

a. The mains voltage is sufficiently high to involve a risk of electrocution; install and connect this product before plugging it in.

b. Before powering up, make sure that all the connections have been made correctly and the voltage of your mains corresponds to the voltage shown on the rating plate on the unit, if not, please contact your RCF dealer.

c. The metallic parts of the unit are earthed through the power cable. An apparatus with CLASS I construction shall be connected to a mains socket outlet with a protective earthing connection.

d. Protect the power cable from damage; make sure it is positioned in a way that it cannot be stepped on or crushed by objects.

e. To prevent the risk of electric shock, never open this product: there are no parts inside that the user needs to access.

f. Be careful: in the case of a product supplied by manufacturer only with POWERCON connectors and without a power cord, all power cords and plug assemblies shall be in compliance with the requirements of the IEC 62368-1 and certified and suitable for use in the particular countries where the product shall be installed.

**4.** Make sure that no objects or liquids can get into this product, as this may cause a short circuit. This apparatus shall not be exposed to dripping or splashing. No objects filled with liquid, such as vases, shall be placed on this apparatus. No naked sources (such as lighted candles) should be placed on this apparatus.

**5.** Never attempt to carry out any operations, modifications or repairs that are not expressly described in this manual. Contact your authorized service centre or qualified personnel should any of the following occur:

- The product does not function (or functions in an anomalous way).
- The power cable has been damaged.
- Objects or liquids have got in the unit.
- The product has been subject to a heavy impact.

**6.** This product does not contain user replaceable fuses. Fuses replacement is a service operation and must be performed by qualified personnel.

**7.** If this product is not used for a long period, disconnect the power cable.

**8.** If this product begins emitting any strange odours or smoke, switch it off immediately and disconnect the power cable.

**9.** Do not connect this product to any equipment or accessories not foreseen. For suspended installation, only use the dedicated anchoring points and do not try to hang this product by using elements that are unsuitable or not specific for this purpose. Also check the suitability of the support surface to which the product is anchored (wall, ceiling, structure, etc.), and the components used for attachment (screw anchors, screws, brackets not supplied by RCF etc.), which must guarantee the security of the system / installation over time, also considering, for example, the mechanical vibrations normally generated by transducers. To prevent the risk of falling equipment, do not stack multiple units of this product unless this possibility is specified in the user manual.

**10.** **RCF S.p.A. strongly recommends this product is only installed by professional qualified installers (or specialised firms) who can ensure correct installation and certify it according to the regulations in force. The entire audio system must comply with the current standards and regulations regarding electrical systems.**

**11.** Supports, trolleys and carts.

The equipment should be only used on supports, trolleys and carts, where necessary, that are recommended by the manufacturer. The equipment / support / trolley / cart assembly must be moved with extreme caution. Sudden stops, excessive pushing force and uneven floors may cause the assembly to overturn. Never tilt the assembly.

**12.** There are numerous mechanical and electrical factors to be considered when installing a professional audio system (in addition to those which are strictly acoustic, such as sound pressure, angles of coverage, frequency response, etc.).

**13.** Hearing loss. Exposure to high sound levels can cause permanent hearing loss. The acoustic pressure level that leads to hearing loss is different from person to person and depends on the duration of exposure. To prevent potentially dangerous exposure to high levels of acoustic pressure, anyone who is exposed to these levels should use adequate protection devices. When a transducer capable of producing high sound levels is being used, it is therefore necessary to wear ear plugs or protective earphones. See the manual technical specifications to know the maximum sound pressure level.

## OPERATING PRECAUTIONS

- Place this product far from any heat sources and always ensure an adequate air circulation around it.
- Do not overload this product for a long time.
- Never force the control elements (keys, knobs, etc.).
- Do not use solvents, alcohol, benzene or other volatile substances for cleaning the external parts of this product.

## IMPORTANT NOTES

To prevent the occurrence of noise on line signal cables, use screened cables only and avoid putting them close to:

- **Equipment that produces high-intensity electromagnetic fields**
- **Power cables**
- **Loudspeaker lines**

**WARNING! CAUTION! To prevent the risk of fire or electric shock, never expose this product to rain or humidity.**

**WARNING! to reduce the risk of electric shock, do not disassemble this product unless you are qualified. Refer servicing to qualified service personnel.**

## CORRECT DISPOSAL OF THIS PRODUCT

This product should be handed over to an authorized collection site for recycling waste electrical and electronic equipment (EEE). Improper handling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substances that are generally associated with EEE. At the same time, your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, waste authority or your household waste disposal service.

## CARE AND MAINTENANCE

To ensure a long-life service, this product should be used following these advices:

- If the product is intended to be set up outdoors, be sure it is under cover and protected to rain and moisture.
- Always use a dry cloth to clean the exterior surfaces of the speaker and always do it when the power is turned off.

**CAUTION: to avoid damaging the exterior finishes do not use cleaning solvents or abrasives.**

## FCC NOTES

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

**Modifications**: Any modifications made to this device that are not approved by RCF may void the authority granted to the user by the FCC to operate this equipment.

**RCF S.p.A. reserves the right to make changes without prior notice to rectify any errors and / or omissions. Always refer to the latest version of the manual on www.rcf.it.**

# KPS SERIES

The KPS Series Class-D multichannel amplifiers for professional audio installations are designed to offer maximum flexibility in complex and demanding scenarios such as conference centers, corporate systems, retail environments, theme parks, and museums.

KPS amplifiers provide 160 W and 800 W per channel, available in 2-, 4-, and 8-channel configurations, with dynamic and asymmetric power allocation between channels without having to bridge channels or lose channel count. Outputs can be configured for low-impedance (2.7, 4 and 8 ohms) or high-impedance (70 / 100 V) systems.

The powerful onboard DSP enables precise and optimized signal processing in all situations, along with complete management of the input/output matrix. In addition, the preset library for RCF speakers makes KPS amplifiers a ready-to-use solution.

Configuration is enabled through the RCF RDSpace software, available as both a desktop application and a web-based version accessible from mobile devices such as smartphones and tablets. In this mode, direct access to devices is also possible without the need for a network switch, thanks to native Wi-Fi connectivity. The device features an integrated wireless access point, enabling straightforward Wi-Fi configuration directly on the unit, no external access point required.

In addition to balanced and unbalanced analogue inputs, KPS amplifiers feature an S/PDIF digital input that can be forwarded to subsequent units, creating a common audio bus.

Every KPS Series model can be ordered with an integrated Audinate Dante™ audio-over-IP interface, providing bidirectional, low-latency, lossless multichannel audio transport over standard Ethernet infrastructure. The units enable seamless integration with automation ecosystems such as Q-SYS, AMX, Crestron, or Control4.

KPS amplifiers combine modern design, advanced processing, and quality audio for versatile applications.

- **Small Shops**. Clear background music for small retail and service environments.
- **Large Retail Stores**. Consistent, quality audio across extensive multi-zone retail spaces.
- **Bars and Restaurants**. Flexible audio zoning for venues with multiple areas or programs.
- **Fitness Centers**. High-power, flexible audio for varied fitness environments.
- **Corporate Spaces**. Efficient audio solutions for offices, meeting spaces, and communal areas.
- **Houses of Worship**. Clear amplification for speech intelligibility over large spaces.
- **Theme Parks**. Highly intelligible, evenly distributed sound across expansive grounds.
- **Sport Facilities**. Powerful, evenly covered sound that keeps every seat in the game.

# UNPACKING, INSTALLATION AND COOLING

Check the carton box and its contents and if there is any sign of damage (should the amplifier be damaged, immediately inform your local distributor / dealer and the forwarder).

It is always advisable to keep the packing materials, even if the amplifier has arrived in good condition. The power cord is included.

KPS amplifiers can be installed into a 19" rack cabinet (mounting accessories are required for ½ rack unit models). They shall not be installed in a place with:

- too high temperature, dust or excessive humidity;
- exhaust air ventilators;
- permanent vibrations;
- high-intensity electromagnetic fields (due to transformers, transmitters, etc.).

Make sure there is an adequate ventilation and amplifiers sides have enough room.

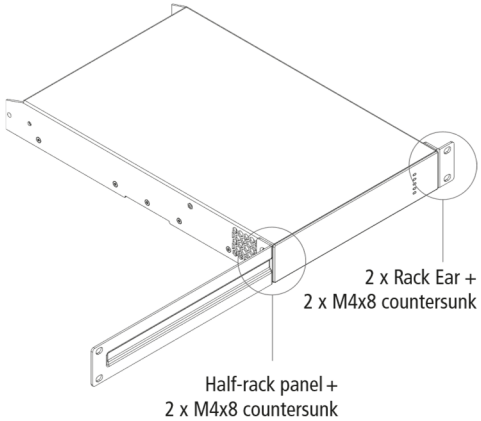
The temperature inside the rack cabinet should be kept below 35°C (95°F).

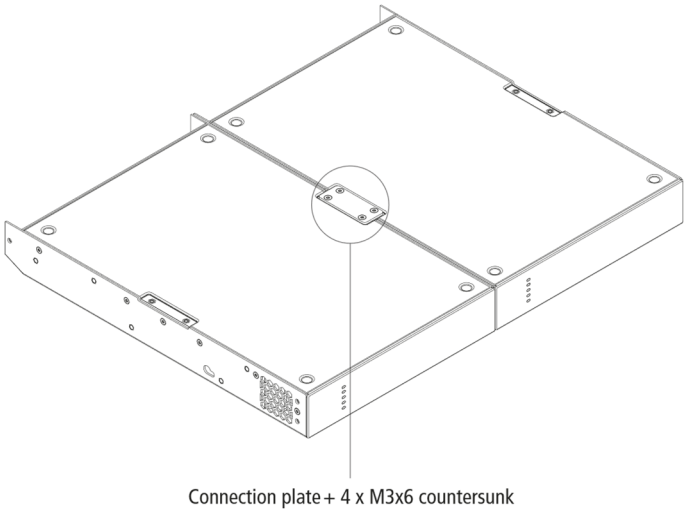
**For safety reasons, never disconnect the earth (ground) pin of the mains power cord. Use audio shielded cables to avoid hum and interference.**

## ½ RACK UNIT MODELS INSTALLATION

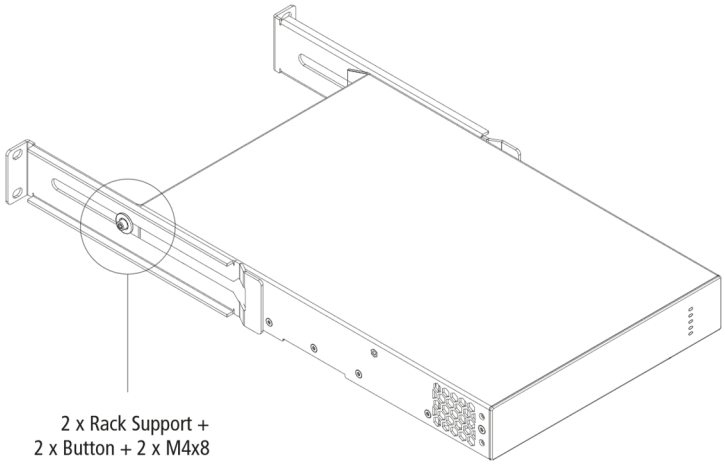
KPS 162 and KPS 164 require specific mounting accessories to be installed inside standard 19'' rack cabinets.

With the mounting accessory **RMK KPS** it is possible to install both a single device or two devices in a single rack unit.

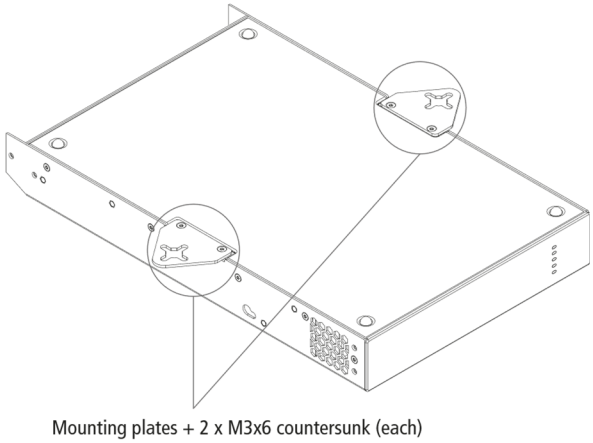


For the rear support of the devices into the rack cabinet can be used both **RRB KPS** (figure C) or **AR 1050** accessories.

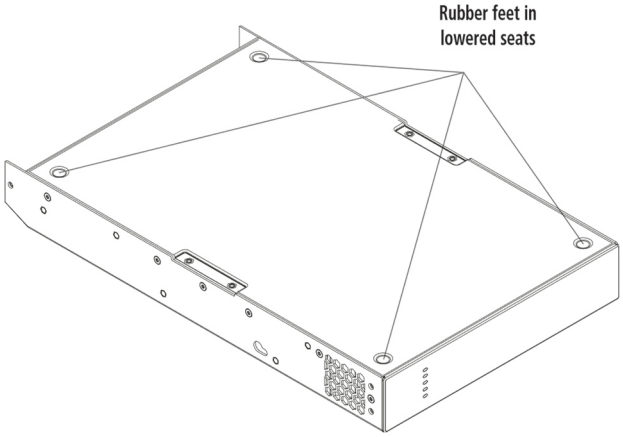



These models can be also installed on a wall, ceiling, top or under-desk or any other flat surface using the **WMK KPS** accessory.




**Always make sure the airflow through the amplifier's side panel mounted fans and rear panel ventilation openings is not blocked by adjacent items. Leave at least 80 mm of free space behind the amplifier and 25 mm on its side.**

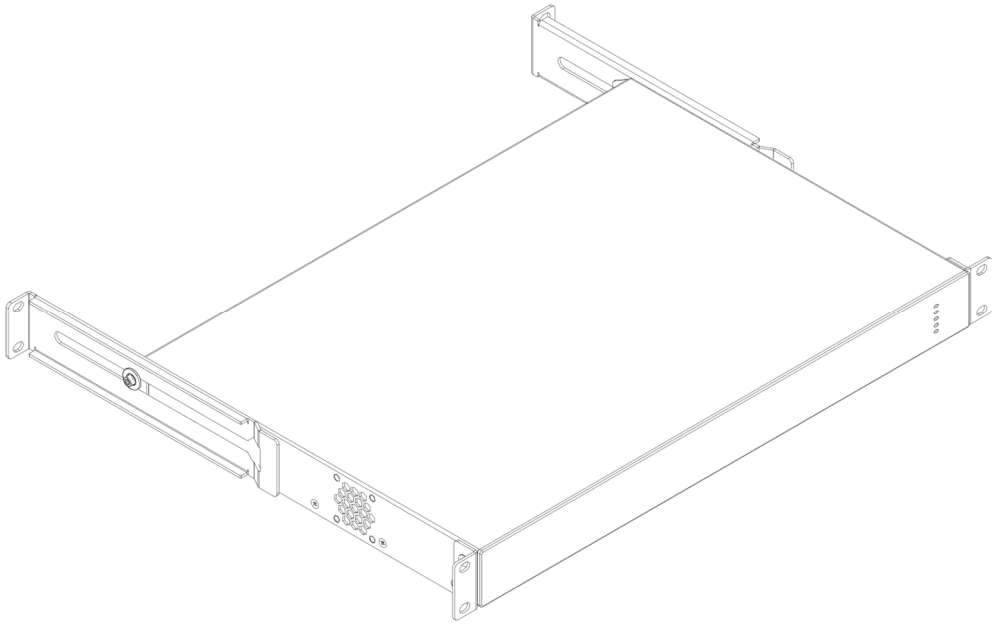
For desk-top installation 4 adhesive rubber feet are included in the box, to be applied in the dedicated lowered seats.



## FULL RACK UNIT MODELS INSTALLATION

KPS 168 can be installed inside standard 19'' rack cabinets. The rack ears are included in the product.

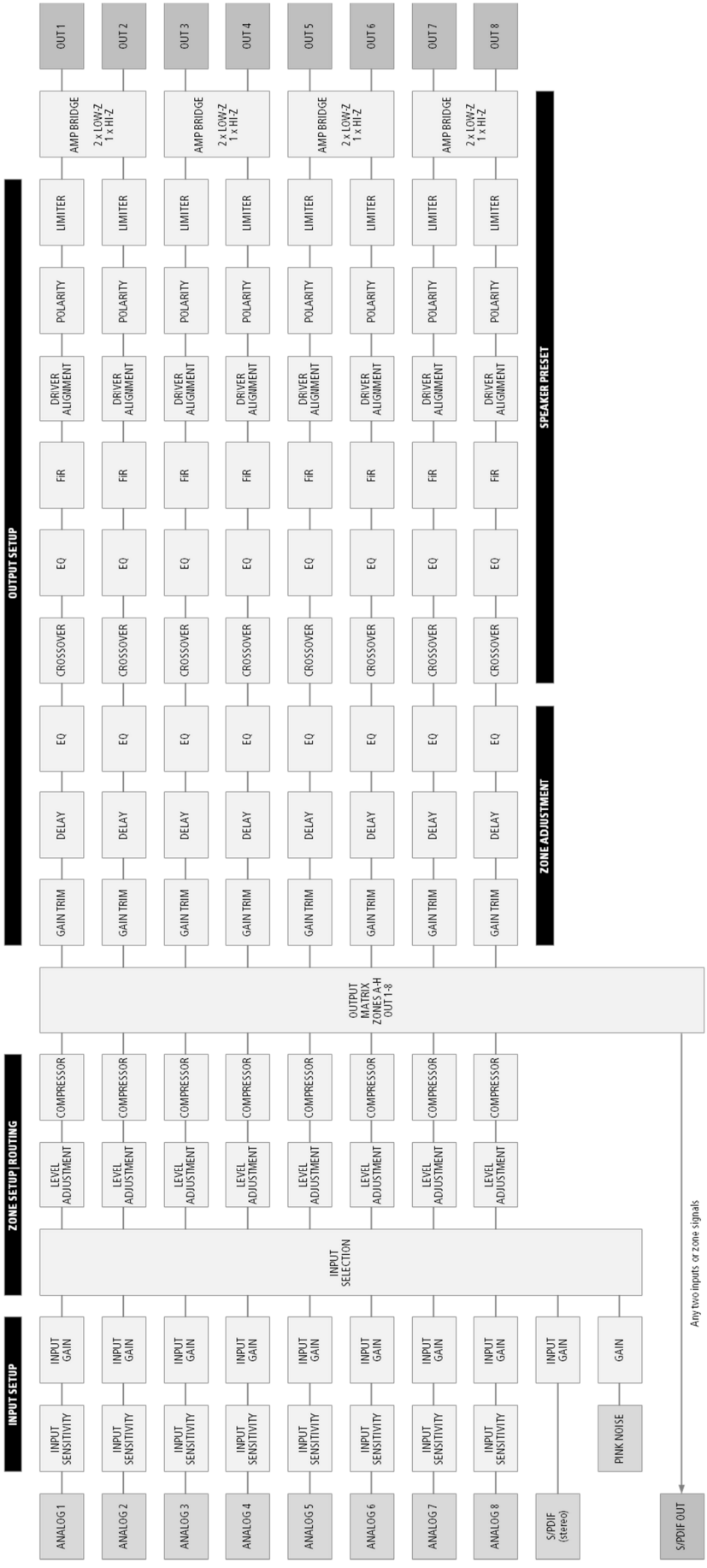
For the rear support of the devices into the rack cabinet can be used both **RRB KPS** or **AR 1050** accessories.



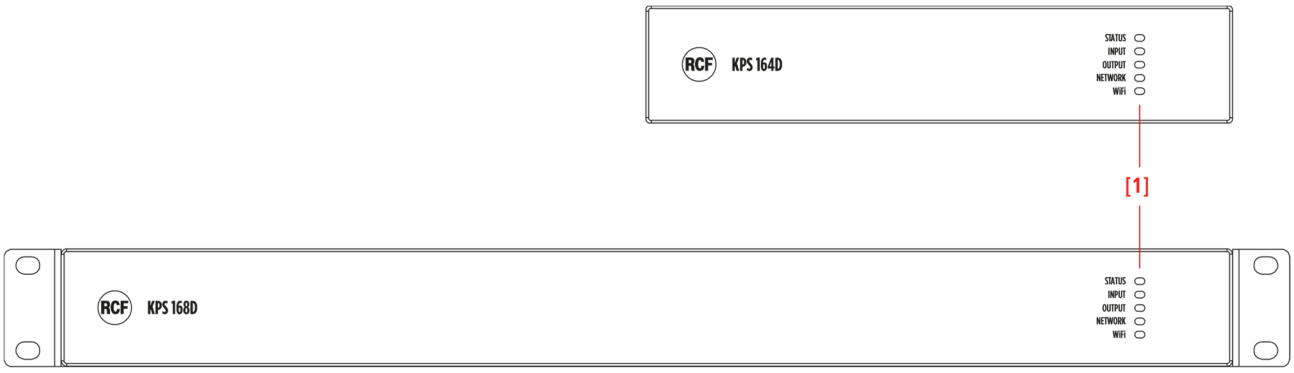
**KPS 168 is not suitable for wall mount or under-desk installation.**

For desk-top installation 4 adhesive rubber feet are included in the box, to be applied in the dedicated lowered seats.

# AUDIO BLOCK DIAGRAM



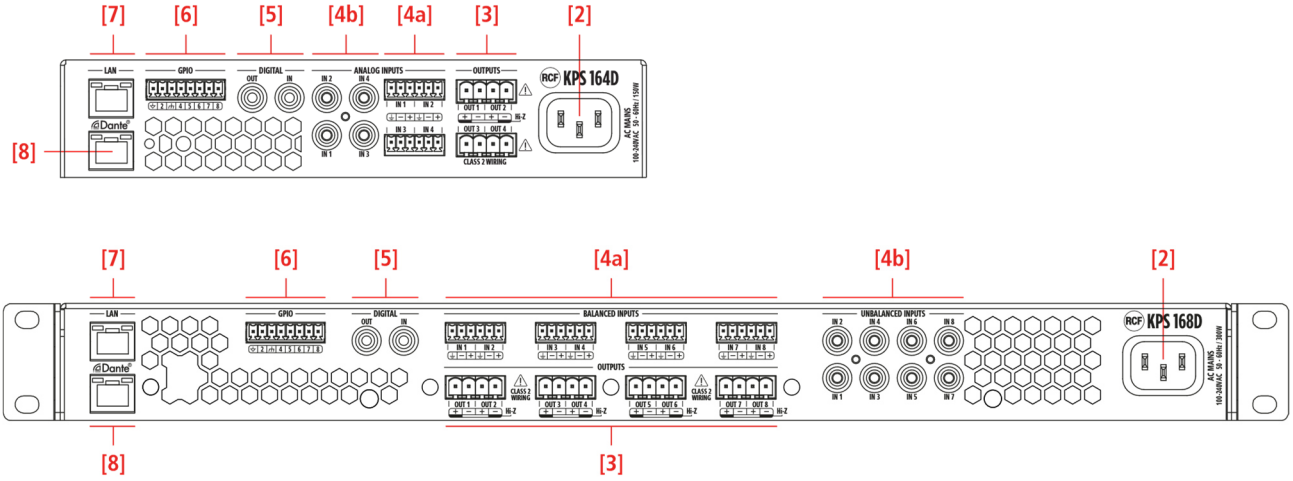
# FRONT PANELS




**[1]** Operational states LEDs:

| | | |
|---|---|---|
| **STATUS** | **OFF** | Mains disconnected |
| | **GREEN** | Amplifier full operational |
| | **FLASHING GREEN** | Stand-by |
| | **YELLOW** | Stand-by triggered by GPIO |
| **INPUT** | **OFF** | No input signal |
| | **GREEN** | Signal presence detected for one or more inputs |
| | **YELLOW** | Signal limiting/clipping on one or more inputs |
| **OUTPUT** | **OFF** | No output signal |
| | **GREEN** | Signal presence detected for one or more outputs |
| | **YELLOW** | Signal limiting/clipping on one or more outputs |
| | **RED** | Overload/protection mode for one or more channel pair |
| **NETWORK** | **OFF** | No Ethernet network detected |
| | **GREEN** | Ethernet network detected |
| **WiFi** | **OFF** | WiFi disabled |
| | **GREEN** | WiFi enabled |

# REAR PANELS




**[2]** **MAINS POWER CONNECTION**. KPS amplifiers incorporate a power factor corrected universal power supply and can be used with mains input voltage from 100 V AC to 240 V AC, 50 / 60 Hz. Use the mains cable supplied with the amplifier.

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

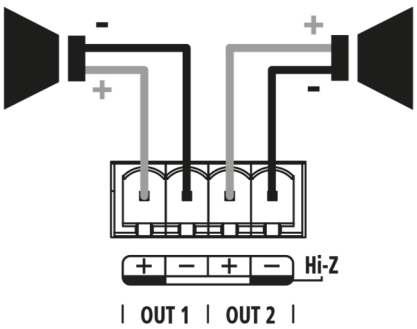
**[3]** **SPEAKER OUTPUTS**

Speakers' outputs allow either a two channels connection for Low-impedance speakers or a single 70 / 100 V line for speakers equipped with line transformers.

Connector: EUROBLOCK (removable screw terminal block).

### TWO CHANNELS – LOW IMPEDANCE CONNECTION

Connect speakers as shown in the figure.

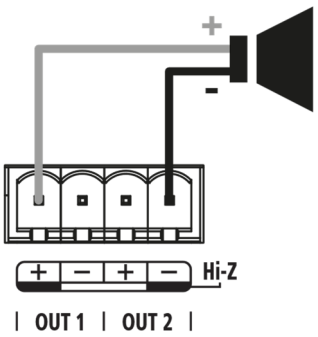



Minimum impedance per speaker output: 4 Ω.
Maximum delivered power @ 4 Ω: 160 W
Powershare across channels: up to 250 W

**An impedance load lower than 4 Ω overloads the amplifier. Class 2 wiring required.**

### BRIDGE MODE – HI IMPEDANCE CONNECTION

Connect speakers as shown in the figure.




Channels 1 and 2 are bridged and can work with both Low- and Hi-impedance speakers.

Bridge or Hi-impedance output mode must be set in the RDSpace configuration software.

**Do NOT connect the other two terminals.**

**The overall speaker power shall not exceed 320 W.**

**Bridge mode is allowed only for speakers with impedance higher or equal to 8 Ω.**

### ANALOG AUDIO INPUTS

KPS analog inputs are LINE level format with a default input sensitivity of +4 dBu (full output voltage swing/sensitivity) in all output modes. Input signal levels up to +24 dBu can be handled without clipping.

Input sensitivity options can be set via the RDSpace configuration software.

**[4a] BALANCED AUDIO INPUTS**

Connector: EUROBLOCK (removable screw terminal block).

**[4b] UNBALANCED AUDIO INPUTS**. Connected in parallel with the balanced inputs.

Connector: RCA socket.

**[5] DIGITAL S/PDIF INPUT/OUTPUT**. This digital signal can be routed from any input or zone and allows to daisy-chain two or more KPS amplifiers.

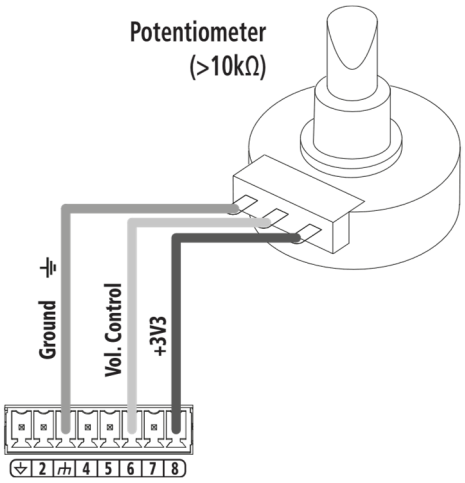
75 Ω RCA Phono cables specifically intended for digital audio should always be used for S/PDIF connections. Standard Phono cables can be used but may not result in optimal performance.

Connector: Single RCA socket.

**[6]** **CONFIGURABLE GPIO**. Set of 5 GPIO that can be configured in the RDSpace software to perform the following functions: Stand-by, Mute and Volume control.

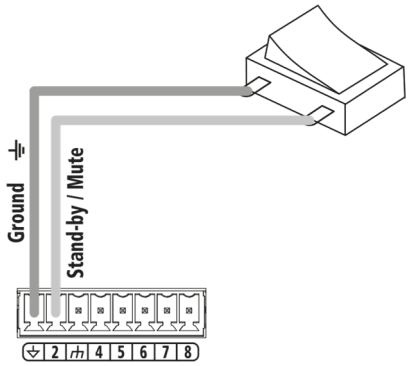
Connector: EUROBLOCK (removable screw terminal block).

**Connection for remote volume control**




Connect Vol. Control wire to Pin 4, 5, 6 or 7.

**Connection for Stand-by / Mute**




Switch function (Stand-by, Mute) and operating mode (NO, NC) shall be configured n RDSpace software.

**[7]** **LAN CONTROL PORT**. KPS amplifiers can be connected to a LAN via a standard Ethernet connection, allowing to access the device for configuration and control via RDSpace software.

Connector: RJ 45.

**[8]** **DANTE PORT (OPTIONAL).** KPS **"D"** models are compatible with Audinate Dante® audio over IP (AoIP) networks and installations. To configure the network use the Audinate Dante® Controller app that can be downloaded from: www.audinate.com/products/software/dante-controller.

Connector: RJ 45.

# RDSpace CONFIGURATION SOFTWARE

**RDSpace** is an adaptive software for managing KPS amplifiers in professional audio systems. Through a single interface, users can handle every stage of deployment—input routing, zone definition, output optimization, and speaker calibration—with real-time monitoring. The software scales smoothly from small venues to large, multi-zone networks, giving operators quick access to presets or deeper configuration tools as the project demands.

RDSpace allows management of linear-phase FIR filtering, speaker presets and user presets, flexible routing, parametric EQ, precision delay, and full device control. All configuration and monitoring take place in a single application, with the same unified interface, giving operators complete command of the entire audio system from every screen.

## CONFIGURATION

Before making input, output and GPIO connections, an initial KPS amplifier configuration should be established. It is particularly important that the amplifier output format is configured appropriately for the speakers that are to be connected. Configuration requires that KPS amplifiers are connected to mains power and network services.

### MAINS POWER CONNECTION

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

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

### NETWORK SERVICES

Before the configuration menus can be accessed, KPS amplifiers must be connected to the same network as the computer or mobile device that is to be used for configuration access.

### WIRED (ETHERNET) NETWORK CONNECTION

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

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

   **KPS amplifiers are configured by default with the fixed LAN IP address 192.168.64.100.**
4. Configure the laptop or desktop computer for a fixed IP address in the same IP range, e.g. 192.168.64.10, with Subnet mask of 255.255.255.0 (or prefix 24) and set the Gateway to 192.168.64.1.
5. Open the RDSpace desktop app or a web browser page and enter the address http://192.168.64.100. The KPS control interface will open to enable amplifier configuration as required.

KPS amplifiers can be configured to use DHCP for network connection if required. However, if a KPS amplifier using DHCP is power cycled, it is possible that the TCP/ IP network router will assign it a different IP address, leaving its configuration page inaccessible via the previous address. If this occurs, a network scanning app can be used to identify the new IP address.

The second network socket present on the amplifier rear panel is intended for Audinate Dante® AoIP network connection only. It cannot be used for [AMP NAME] control connection.

### WIRELESS (WiFi) Network Connection

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

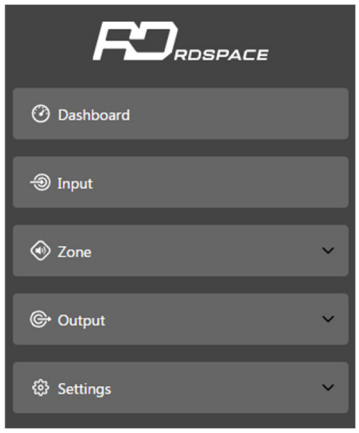
1. Connect the amplifier to mains power using the supplied mains cable.
2. Wait for the front panel **WiFi** indicator to illuminate green to indicate that the amplifier has network connectivity.

   **KPS amplifiers are configured by default with the fixed WiFi IP address 192.168.4.1.**
3. Use a mobile, laptop or desktop device to search for available WiFi networks. Connect to, **RCF [KPS] [ACCESS POINT ID]** using the password, "password". The amplifier access point ID can be found on its rear panel.
4. Open a computer or mobile device web browser and enter the address http://192.168.4.1. The KPS control web app interface will open to enable amplifier configuration as required.
5. Select the Web App Settings Tab followed by WiFi > WiFi Mode > Client to configure the amplifier to connect to the required WiFI network. The WiFi network name and password will be required.

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

## MAIN MENU

RDSpace is the software platform designed for the configuration, control, and monitoring KPS amplifiers. Its main menu offers intuitive access to all key system functions, organized by signal flow and system logic.




**DASHBOARD**. Provides a general overview of the system status.

**INPUT**. Provides configuration parameters for each amplifier input channel.

**ZONE**. Enables installation zones to be defined and named.

**OUTPUT**. Enables amplifier outputs to be named, linked to zones, and provides access to other configuration menus.

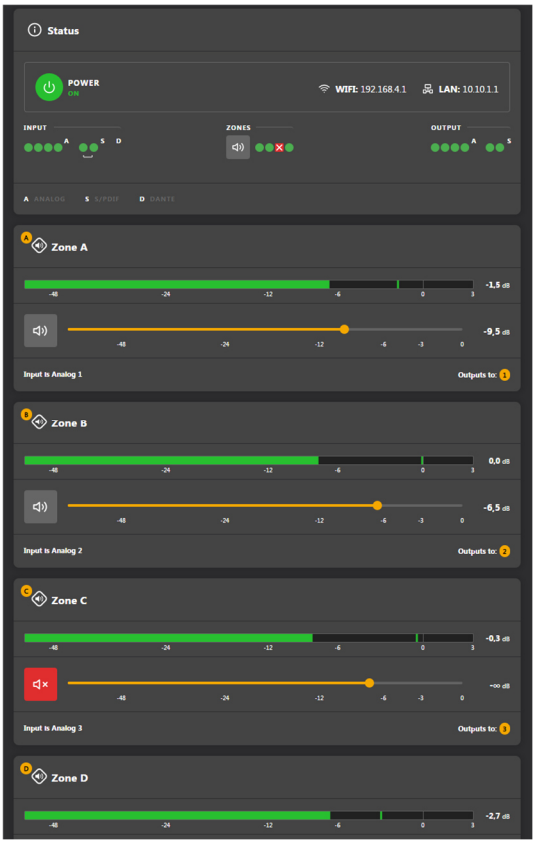
**SETTINGS**. Enables miscellaneous amplifier settings to be configured and installation data to be recorded.

## DASHBOARD

DASHBOARD displays the amplifier status, output zones and the configuration menu tabs.

It also enables immediate access to zone volume control.

The functions available under each configuration menu tab are described in the following paragraphs.




## INPUT

INPUT tab provides the following configuration parameters for each amplifier input channel:

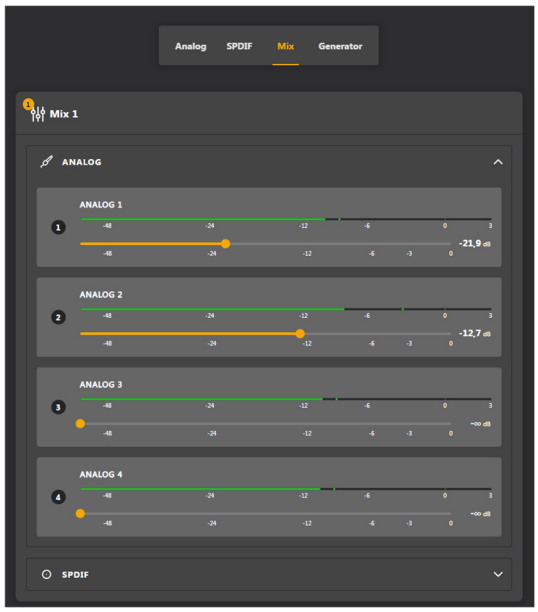
- Input name
- Mono/Stereo selection
- Input sensitivity
- High-pass filter
- Gain trim
- Five band equalisations

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

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

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

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

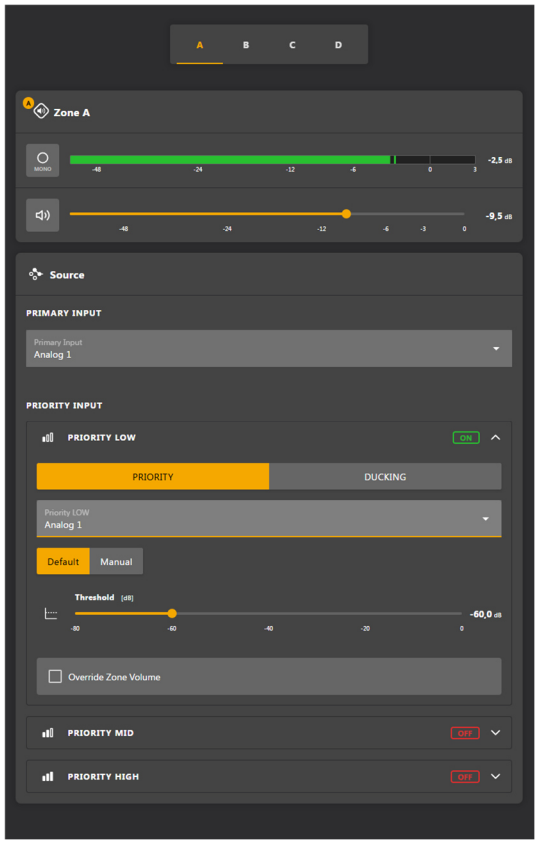



A pink noise or sine wave audio signal generator, appropriate for audio system testing and set up, can also be enabled, disabled, and adjusted for gain and frequency via the Input tab.

## ZONE

ZONE tab enables installation zones to be defined / named, and provides access to further sub-menus.

Zones might be bar or restaurant areas for example, or different rooms in a home. For all Zone tab menus, the installation zone under configuration is selected by highlighting one of the zone identifiers (A to H depending on amplifier output count) at the top of the display. Diagram 6F and 6G illustrates the Zone Tab and Source menu displays.



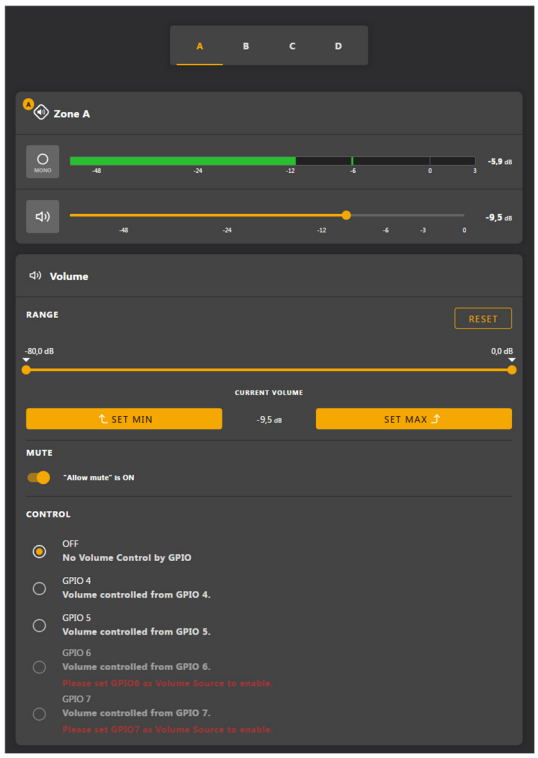

**Source** menu enables inputs to be assigned to zones and Input Priority or Input Ducking to be configured. The Input Priority function enables up to three alternative inputs to the Primary Input on each of the zones. This provides the possibility to prioritize, replace and mute the input(s) routed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

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

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

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

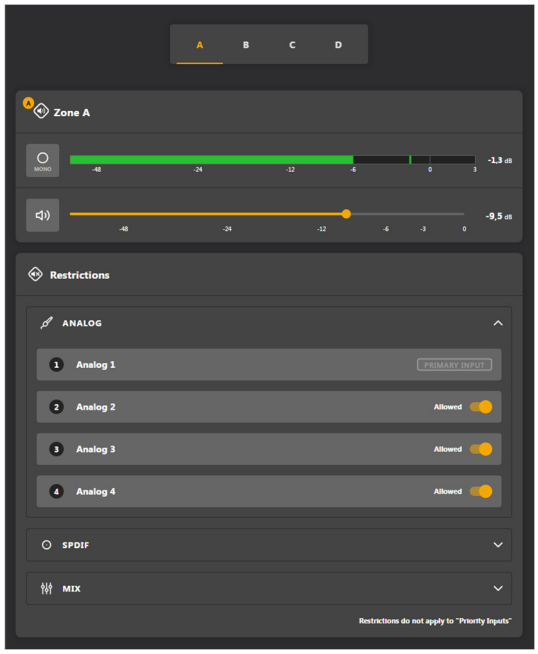
The **Volume** menu allows minimum and maximum zone volume limits to be set, and enables external GPIO volume control to be applied to individual zones. The GPIO configuration menu can be found under the Settings Tab, and notes on connecting an external volume control via the Note: If an amplifier is controlled via a third-party control system API, volume level limits set via the Input Tab will not apply.




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

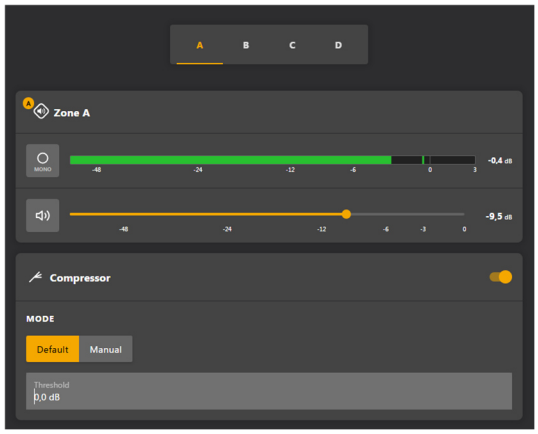
Routing restrictions cannot be applied to priority zone inputs.

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



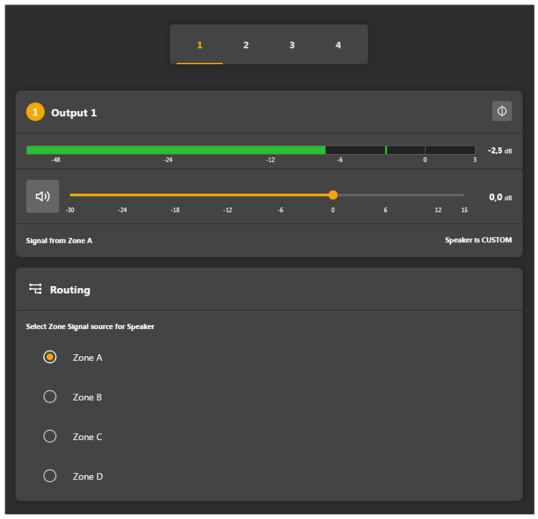

**Compressor** option enables default or custom signal compression to be applied to individual zones.

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



## OUTPUT

The Output tab enables amplifier outputs to be named, linked to zones, and provides access to Delay, Room Equalizer and Speaker Preset menus. Diagram 6H illustrates the Output Tab display.



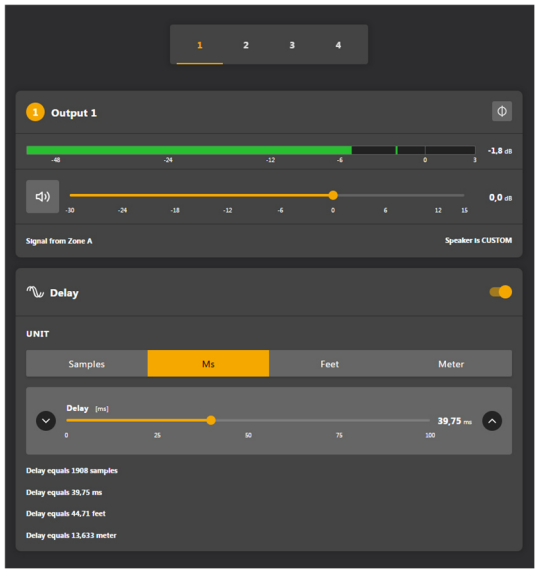

For all Output Tab menus, the amplifier output under configuration is selected by highlighting one of the output identifiers at the top of the display.

The number of individual outputs available for configuration will depend on the [AMP NAME] amplifier model and the input, zone and output mode configuration. The diagrams following illustrate a four output amplifier.

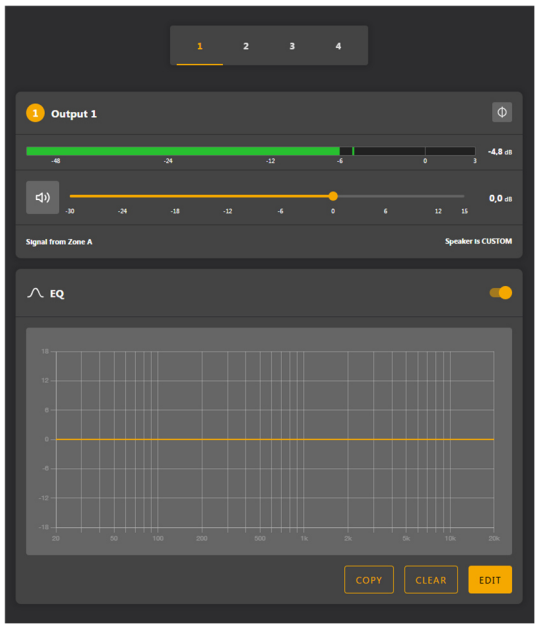
**Routing** menu enables zones to be assigned to amplifier outputs.

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

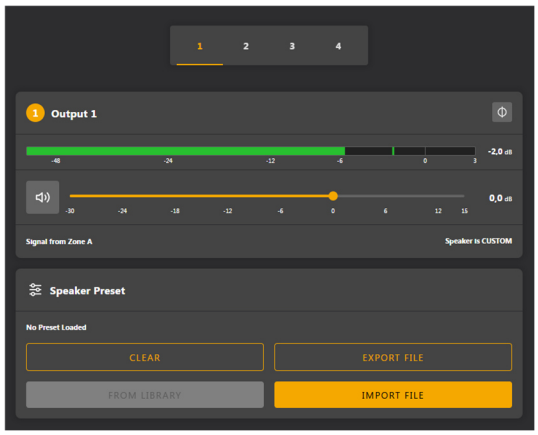
**Delay** menu enables delay to be applied to individual amplifier outputs.



**Equalizer** menu enables parametric equalization to be applied to individual amplifier outputs. Equalizer settings configured for one amplifier output can be copied and applied to other outputs.




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




Speaker Presets can be simply applied to the selected amplifier output or imported, chosen from a library, exported or cleared. The preset configurations can include a wide set of parameters described in the following, and can be locked to prevent inadvertent modification.

Speaker Preset can be imported and applied to amplifier outputs. To import speaker preset parameters:

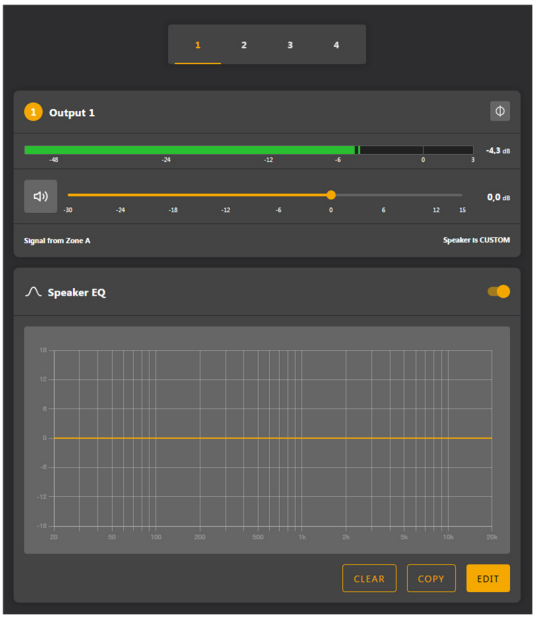
1. select either the FROM LIBRARY or IMPORT FILE option from the Speaker Preset menu. If no import option is visible, select CLEAR to delete any existing speaker preset data.
2. Select the appropriate '.zcp' format speaker preset data file to import from either a Library or a computer folder. The preset data will be applied to the selected amplifier output as soon as the file import is complete.
3. If the Speaker Preset data requires modification it can be customized by selecting the CUSTOMIZE PRESET option.

The FROM LIBRARY option will be unavailable if no speaker preset libraries have been created.

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

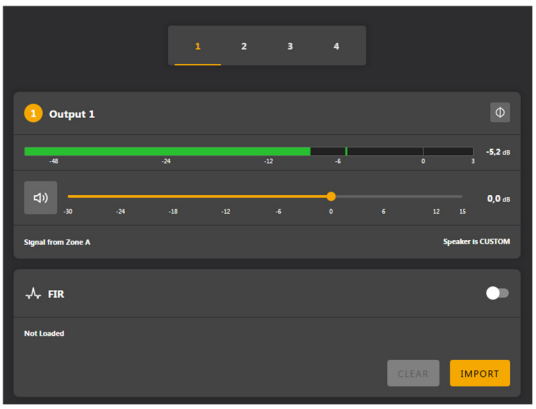
**Crossover & Gain** preset menu enables high or low-pass crossover filters and gain adjustment to be applied to individual aplifier outputs.


**Speaker EQ** preset menu enables parametric equalization to be applied to individual amplifier outputs

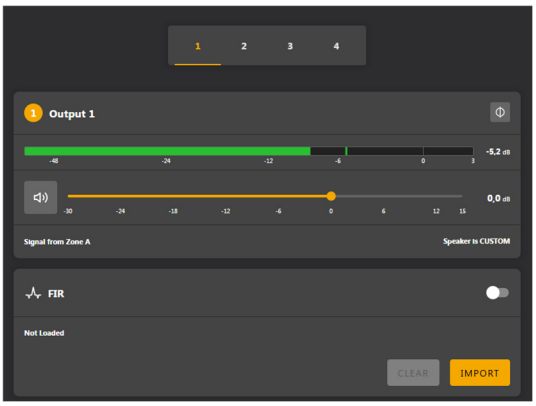



**FIR** preset menu enables FIR (Finite Impulse Response) based equalization filter coefficients generated by external speaker measurement software to be imported and applied to individual amplifier outputs. The FIR filter has 512 taps at 48kHz.

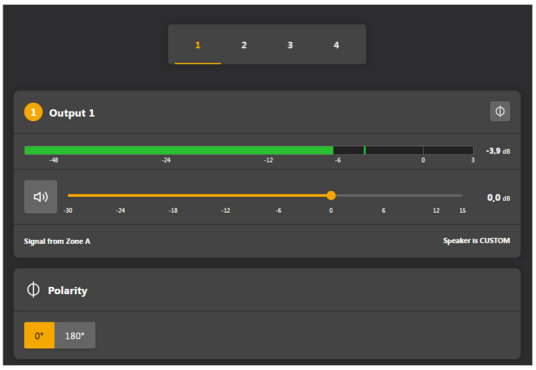
FIR coefficient files in either .csv or .txt format can be imported.



**Driver Alignment** preset menu enables delay to be applied to individual amplifier outputs.

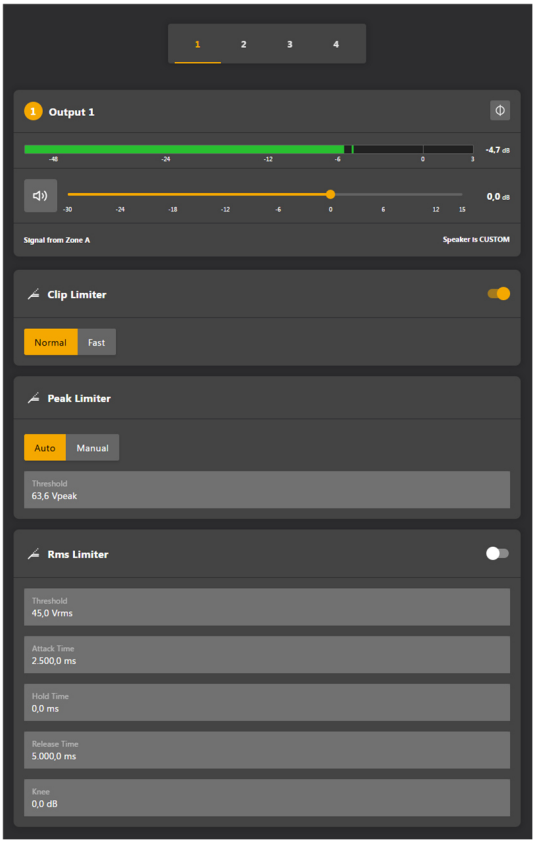



**Polarity** preset menu enables the polarity of individual amplifier outputs to be reversed.

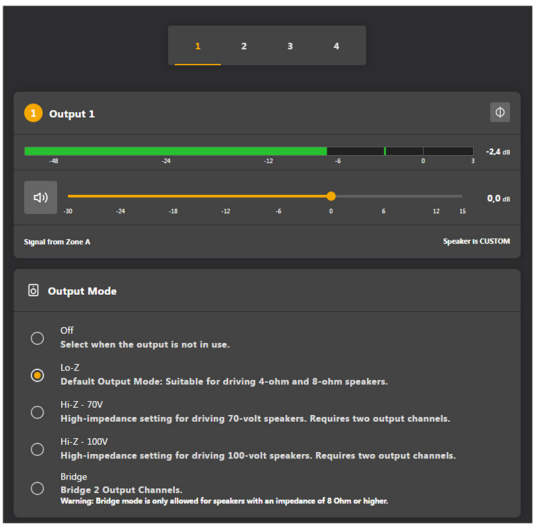



**Limiter** preset menu enables signal limiting to be engaged or bypassed on individual amplifier outputs. Clip limiting, Peak limiting and RMS limiting can be individually or collectively engaged. The Clip limiting function offers Fast and Normal response time options. The Peak limiting function can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

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



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



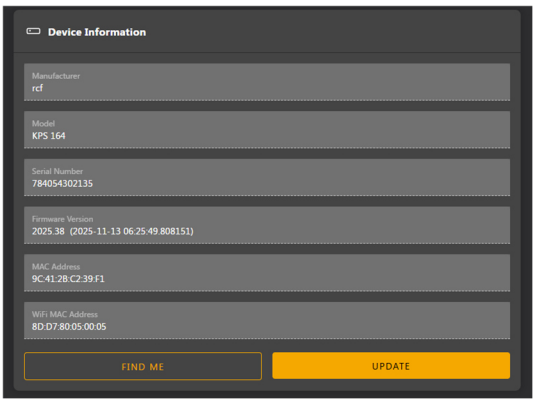

Use of a high-pass filter with Hi-Z mode loudspeakers is useful to avoid the possibility of distortion caused by low frequency line transformer saturation. Begin with the default filter setting of 70Hz. If low frequency distortion is still audible, increase the frequency setting one step at a time until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

## SETTINGS

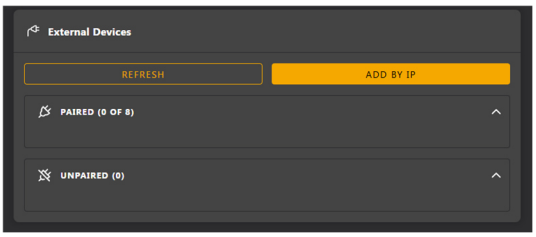
**Settings** tab enables miscellaneous amplifier settings to be configured and installation data to be recorded. The Settings Tab provides access to further sub-menus.

**System Information** menu provides text fields for the recording of installation data.

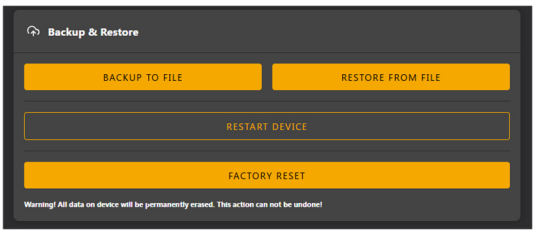

**Device** menu records amplifier specific information such as the model number and firmware version. A firmware update routine and identifier button can also be found under the Device menu.



**External Devices** menu enables control panels to be paired with an amplifier and configured. Depending on product, setup and configuration, each device can remotely control one single or multiple amplifier zones.

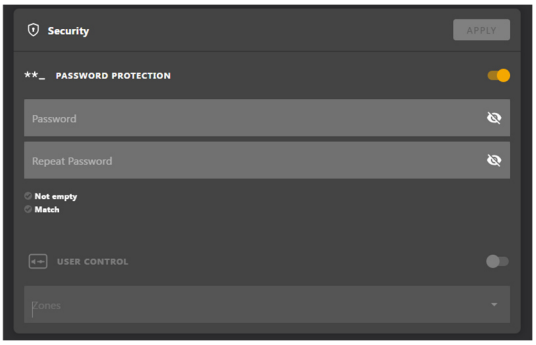



**Backup & Restore** menu enables amplifier configuration data to be downloaded to an external archive, and enables previously saved configuration files to be uploaded and adopted by the currently connected amplifier.



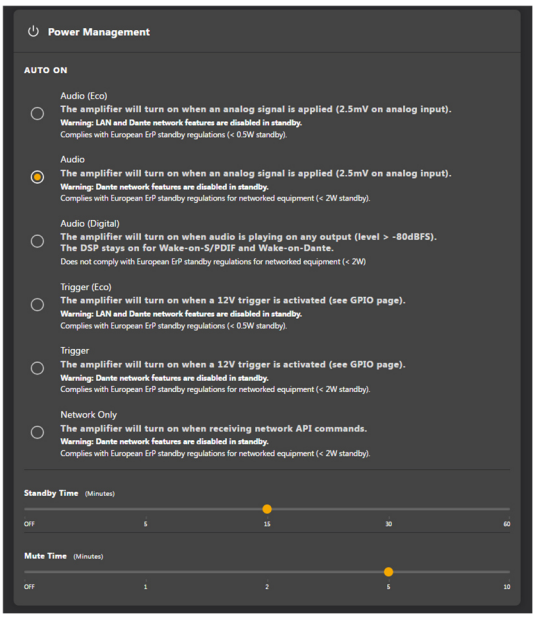

**Speaker Library** menu enables management of speaker preset libraries. Existing libraries of speaker preset files (.zcl) can be created or imported, and existing libraries edited or fully deleted.


**Security** menu enables a password to be set in order to protect against unauthorised access to the amplifier Control Web App. Password protection is particularly important when an amplifier is connected to a wired network as the a WiFi password is no longer required to gain access to Control Web App.




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

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




In Eco mode the network is switched off during standby. When the amplifier has Dante® enabled use the Audio (Digital) or Network Only settings.

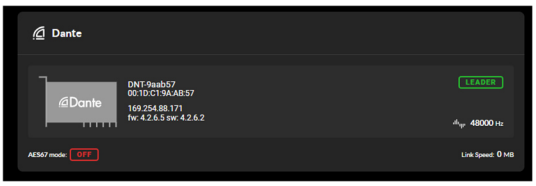
**Output Routing** menu enables specified inputs or zones to be routed to the amplifier S/PDIF outputs. The output level can also be adjusted.


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

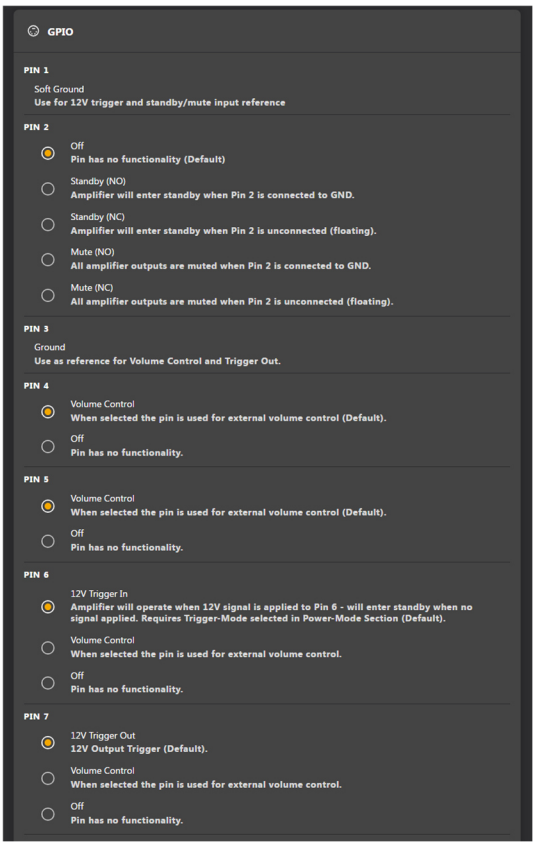
When a zone is selected for the digital S/PDIF (or Dante®) output - the output signal is variable. However, when an input signal is routed out an S/PDIF (or Dante®) output, the signal will be fixed.

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

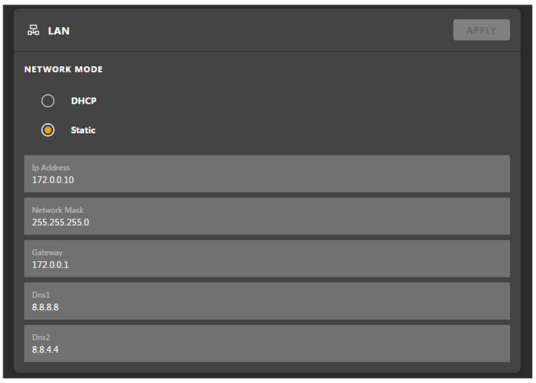
**Dante** menu enables identification of Dante® capable devices present on the AoIP network. Dante® devices must be appropriately enabled and configured using Dante® Controller. Use Dante® Controller to activate AES67 mode if required.



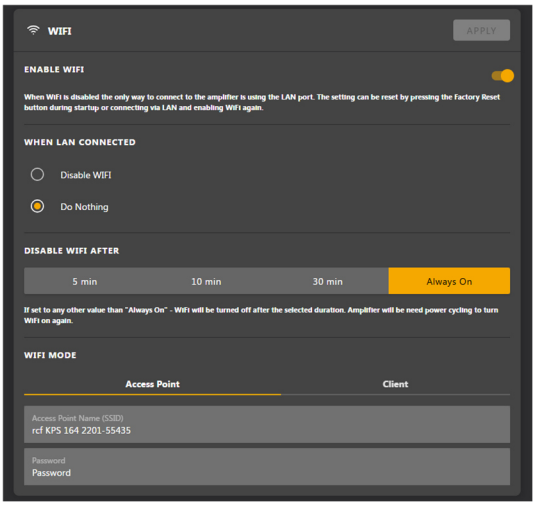
**GPIO** menu enables configuration of the multi-purpose GPIO interface pins. A description of the individual settings is detailed in [AMP NAME] Control.




**LAN** menu enables configuration and reset of the wired network options and parameters.




**WiFi** menu enables configuration and reset of the wireless network options and parameters.



# POWER EFFICIENCY DATA

The following tables describe the efficiency and power performance of KPS amplifiers, including the derived thermal losses.

### 1/8TH FULL POWER

| | Load [Ohm] | $P_{in}$ [W] | $P_{Out}$ (1) [W] | Efficiency [%] | Thermal Loss [W] | Thermal Loss [BTU/h] |
|---|---|---|---|---|---|---|
| **KPS 162 / KPS 162D** | 4 | 54.1 | 31.25 | 57.8 | 22.85 | 78 |
| **KPS 164 / KPS 164D** | 4 | 107 | 62.5 | 58.6 | 44.5 | 152 |
| **KPS 168 / KPS 168D** | 4 | 200 | 125 | 62.5 | 75 | 256 |

### STAND BY AND IDLE

| | Stand by [W] | Idle @ 120V [W] | Idle @ 120V [BTU] | Idle @ 230V [W] | Idle @ 230V [BTU] |
|---|---|---|---|---|---|
| **KPS 162 / KPS 162D** | <0.5 | 9.1 | 31 | 9.8 | 33 |
| **KPS 164 / KPS 164D** | <0.5 | 14.5 | 49 | 15.9 | 54 |
| **KPS 168 / KPS 168D** | <0.5 | 27.7 | 94 | 30.2 | 103 |

# PROPAGATION DELAY DATA

The following tables describes the input/output latency performance of KPS amplifiers.

| 2 & 4 CHANNEL AMPLIFIERS | | | | |
|---|---|---|---|---|
| | | OUT | | |
| | | Analogue | S/PDIF | Dante® (*) |
| IN | Analogue | 1177 µs | 458 µs | 1520 µs |
| | S/PDIF | 1833 µs | 1104 µs | 2166 µs |
| | Dante® | 1895 µs | 1166 µs | 2125 µs |

| 8 CHANNEL AMPLIFIERS | | | | |
|---|---|---|---|---|
| | | OUT | | |
| | | Analogue | S/PDIF | Dante® (*) |
| IN | Analogue | 1307 µs | 600 µs | 1662 µs |
| | S/PDIF | 1955 µs | 1250 µs | 2312 µs |
| | Dante® | 2017 µs | 1312 µs | 2125 µs |

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

# CONNECTIONS

## SPEAKER CABLE GAUGE

KPS speaker connection cable gauge should be chosen appropriately to reflect the type of installation. The tables below specify the appropriate cable gauge with different installation types and cable lengths.

| Low impedance installations \| 0.5 dB attenuation \| 4Ω and 8Ω loads | | | |
|---|---|---|---|
| **Cable cross section ($mm^2$)** | **Cable gauge (AWG)** | **Max cable length \| 4Ω (m)** | **Max cable length \| 8Ω (m)** |
| 0.75 | ≈18 | 5 | 10 |
| 1.5 | ≈16 | 10 | 20 |
| 2.5 | ≈14 | 17 | 35 |
| 4.0 | ≈12 | 28 | 55 |

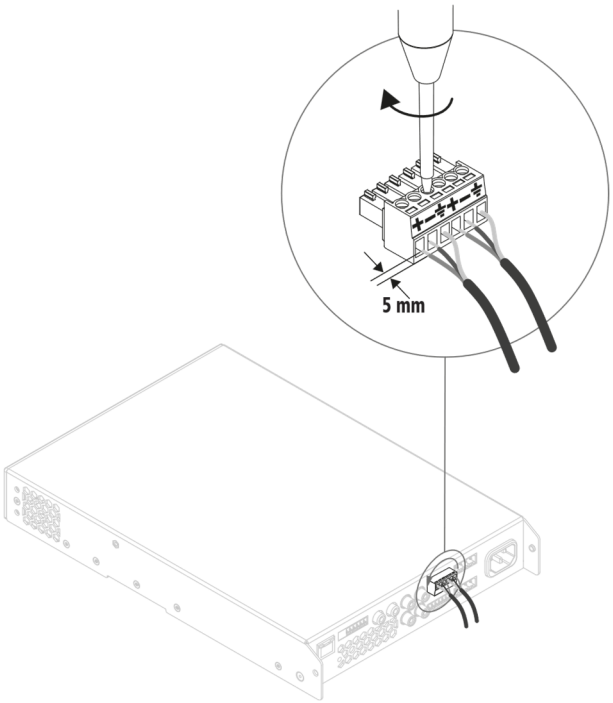
| 100V Hi impedance installations \| 1.0 dB attenuation \| 20 speakers evenly distributed | | | |
|---|---|---|---|
| **Cable cross section ($mm^2$)** | **Cable gauge (AWG)** | **Max cable length \| 320W (m)** | |
| 0.75 | ≈18 | 90 | |
| 1.5 | ≈16 | 180 | |
| 2.0 | ≈14 | < 250 | |
| 3.5 | ≈12 | < 250 | |
| Note: Cable lengths should not exceed 250 m. | | | |

| 70V Hi impedance installations \| 1.0 dB attenuation \| 20 speakers evenly distributed | | | |
|---|---|---|---|
| **Cable cross section ($mm^2$)** | **Cable gauge (AWG)** | **Max cable length \| 320W (m)** | |
| 0.75 | ≈18 | 45 | |
| 1.5 | ≈16 | 90 | |
| 2.0 | ≈14 | 150 | |
| 3.5 | ≈12 | < 250 | |
| Note: Cable lengths should not exceed 250 m. | | | |

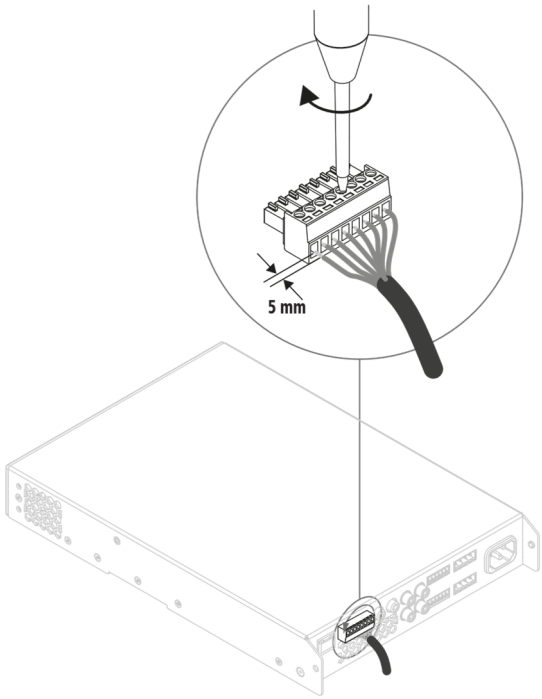
## CONNECTION DIAGRAMS

Below are provided the instructions for a correct wiring of all parts of the device.

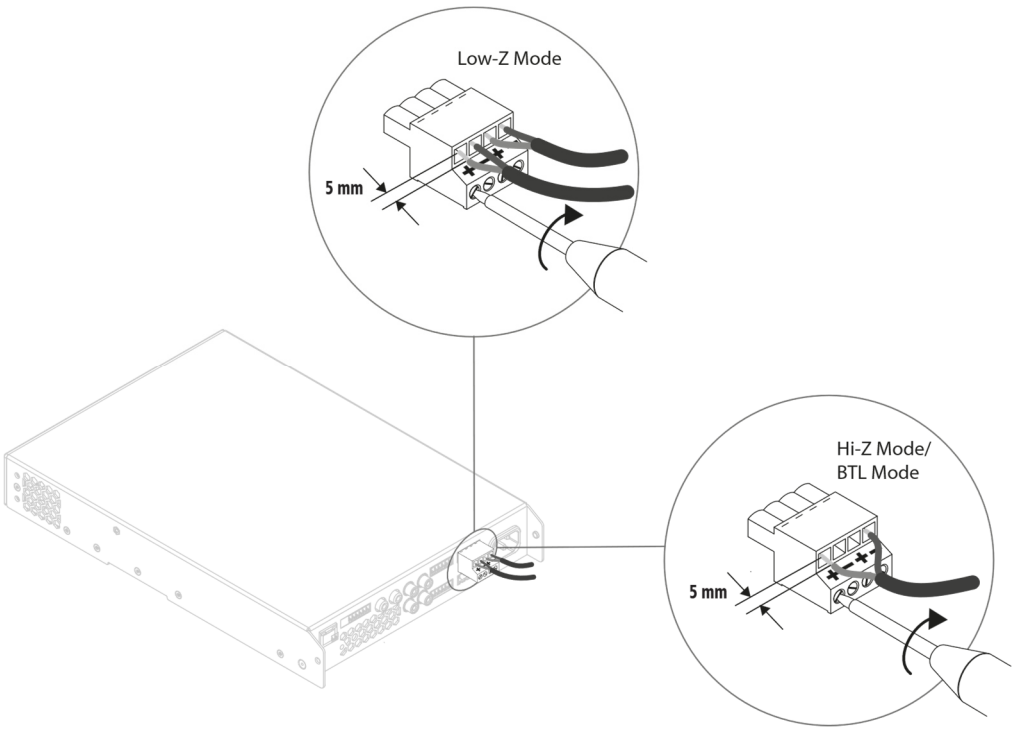
### BALANCED ANALOG INPUTS




### GPIO

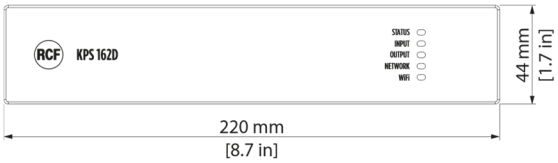


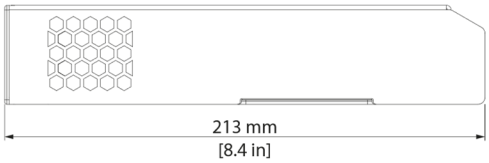

### POWER OUTPUTS

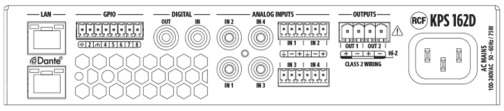


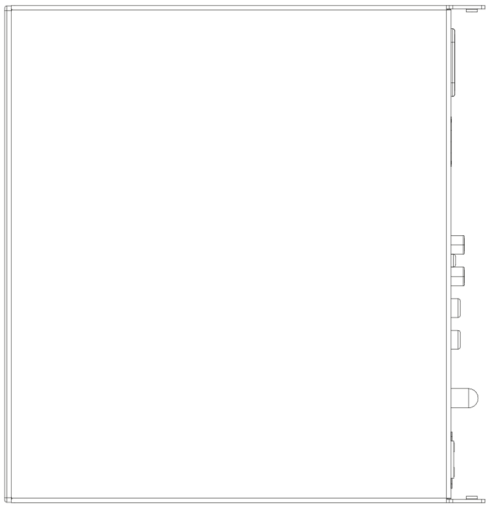
# DIMENSIONS

## KPS 162 | KPS 162D

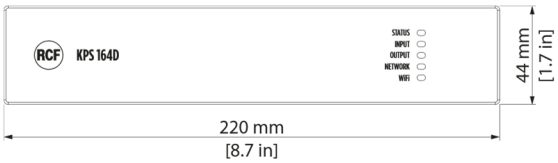


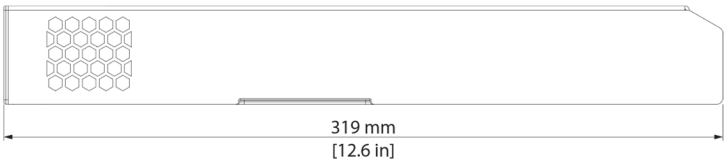



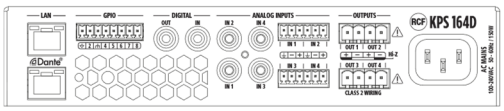



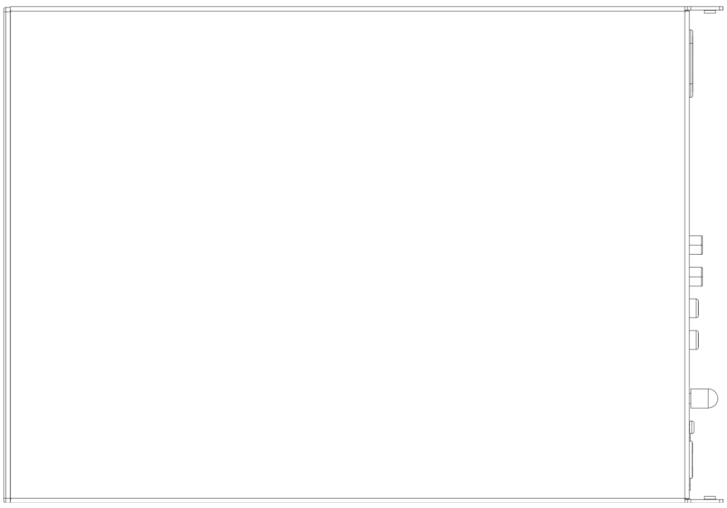



## KPS 164 | KPS 164D

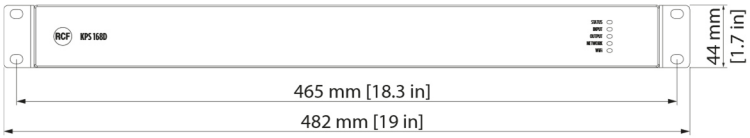


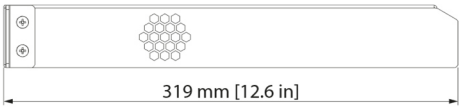



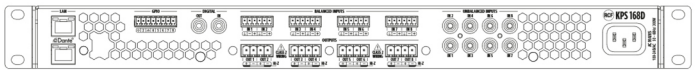



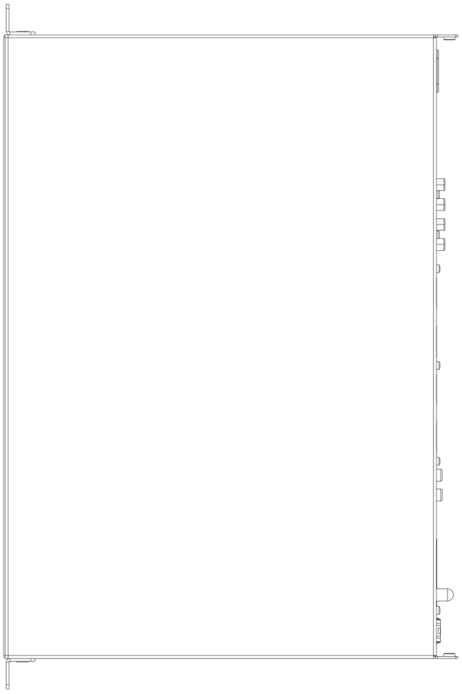



# KPS 168 | KPS 168D



# SPECIFICATIONS

| | KPS 162 \| KPS 162D | KPS 164 \| KPS 164D | KPS 168 \| KPS 168D |
|---|---|---|---|
| **Amplifier specifications** | | | |
| Amplifier Class | D | D | D |
| Number of channels | 2 | 4 | 8 |
| Power output @ 4 ohm | 2 x 160 W | 4 x 160 W | 8 x 160 W |
| Power output @ 8 ohm | 2 x 160 W | 4 x 160 W | 8 x 160 W |
| Power output bridged @ 4 ohm | 1 x 320 W | 2 x 320 W | 4 x 320 W |
| Power output bridged @ 8 ohm | 1 x 320 W | 2 x 320 W | 4 x 320 W |
| Power output @ 100 V | 1 x 320 W | 2 x 320 W | 4 x 320 W |
| Power output @ 70 V | 1 x 320 W | 2 x 320 W | 4 x 320 W |
| Frequency Response (-3dB) | 20 Hz ÷ 20000 Hz | 20 Hz ÷ 20000 Hz | 20 Hz ÷ 20000 Hz |
| SNR Analog inputs | >106 dB | >106 dB | >106 dB |
| SNR Digital inputs | >106 dB | >106 dB | >106 dB |
| Distortion (THD+N) | <0.05 % | <0.05 % | <0.05 % |
| **Input section** | | | |
| Total number of inputs | 5 \| 9 | 5 \| 9 | 9 \| 13 |
| Mic+Line inputs | 4 | 4 | 8 |
| Mic+Line connectors | Euroblock, RCA | Euroblock, RCA | Euroblock, RCA |
| Digital inputs | 1 \| 5 | 1 \| 5 | 1 \| 5 |
| Digitgal connectors | RCA, RJ45 | RCA, RJ45 | RCA, RJ45 |
| Digital type | DANTE, S/PDIF | DANTE, S/PDIF | DANTE, S/PDIF |
| General Purpose Inputs (GPI) | 5 | 5 | 5 |
| Programmable GPI | Yes | Yes | Yes |
| **Output section** | | | |
| Signal output number | 1 | 1 | 1 |
| Signal output connectors | RCA | RCA | RCA |
| Power output connectors | Euroblock | Euroblock | Euroblock |
| General Purpose Outputs (GPO) | 5 | 5 | 5 |
| Programmable GPO | Yes | Yes | Yes |
| **Processing** | | | |
| DSP | Yes | Yes | Yes |
| **Configuration and Controls** | | | |
| Configuration | PC Software | PC Software | PC Software |
| Network | Ethernet | Ethernet | Ethernet |
| RCF speakers presets | Yes | Yes | Yes |
| Priority | Yes | Yes | Yes |
| Protocols for system integration | AMX, CRESTRON, Q-SYS, Symetrix, Control 4, RTI, Nice | AMX, CRESTRON, Q-SYS, Symetrix, Control 4, RTI, Nice | AMX, CRESTRON, Q-SYS, Symetrix, Control 4, RTI, Nice |
| **Protections** | | | |
| Cooling | Forced | Forced | Forced |
| Short circuit | Yes | Yes | Yes |
| Thermal | Yes | Yes | Yes |
| DC | Yes | Yes | Yes |
| Fuses | Yes | Yes | Yes |
| VHF (Very High Frequencies) | Yes | Yes | Yes |
| **Power requirement** | | | |
| Operating voltage | 90-240 V~ 50/60Hz | 90-240 V~ 50/60Hz | 90-240 V~ 50/60Hz |

| | KPS 162 \| KPS 162D | KPS 164 \| KPS 164D | KPS 168 \| KPS 168D |
|---|---|---|---|
| Power consumption | 75 W | 150 W | 300 W |
| **Standard compliance** | | | |
| Safety agency | CE compliant, UL62368-1 | CE compliant, UL62368-1 | CE compliant, UL62368-1 |
| **Physical specifications** | | | |
| Cabinet/Case Material | Metal | Metal | Metal |
| Color | Black | Black | Black |
| Rack mounting | 1/2 19", 1U, Optional rack mounting accessory required | 1/2 19",1U , Optional rack mounting accessory required | 19",1U |
| **Size** | | | |
| Height | 44 mm / 1.7 inches | 44 mm / 1.7 inches | 44 mm / 1.7 inches |
| Width | 220 mm / 8.7 inches | 220 mm / 8.7 inches | 440 mm / 17.3 inches |
| Depth | 213 mm / 8.4 inches | 319 mm / 12.6 inches | 319 mm / 12.6 inches |
| Weight | 2 kg / 4.4 lbs | 2.8 kg / 6.2 lbs | 3.8 kg / 6.2 lbs |

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