

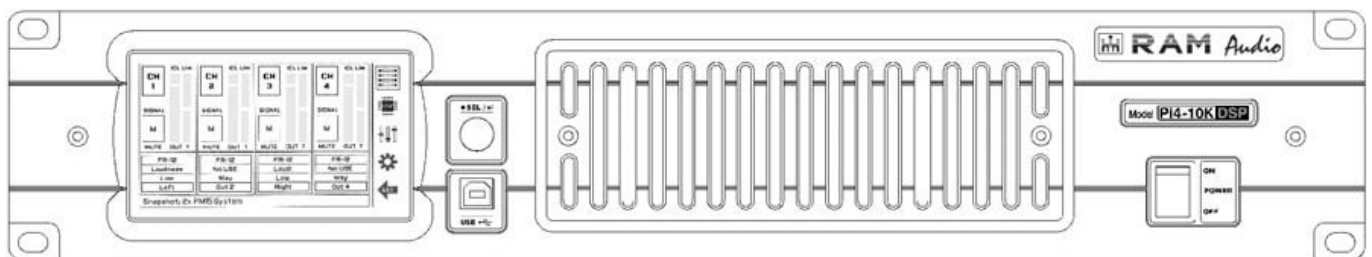


RAM Audio Pi Series Professional Power Amplifiers User Manual

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Professional Power Amplifiers Pi Series Pi2 3K-5K Pi4 6K-10K OPERATION MANUAL



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ramaudio.com

e-mail: support@ramaudio.com

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QXPDQXDoc

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SAFETY PRECAUTIONS



WARNING:

The lightning and arrowhead symbol warns about the presence of uninsulated dangerous voltage. When the device is installed, the plug connected to the socket outlet shall be easily accessible. This device must be grounded/earthed. Connections of the amplifier to the loudspeakers shall be done by a skilled person. Read this manual before using the device.

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Pol.Ind. La Figuera
C/Rosa de Luxemburgo nº34
46970 Alaquas – Valencia – SPAIN
Phone: +34 96 127 30 54
Fax: +34 96 127 30 56
ramaudio.com
support@ramaudio.com
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General Information

Introduction

Pi is a multipurpose series of power amps for touring and installation applications, based on the legendary QuantaPulse™ switching mode power supply with an innovative class H 3 steps topology. It includes a completely renewed PMS™ which incorporates a set of protection systems that works in real-time continuously maintaining all variables of the amp within safe working thresholds always.

Pi amps have been designed with a nonsymmetrical class H topology which allows working with very high

voltages given incredible headroom and a great punch.

All these characteristics make Pi amplifier an interesting device to work with asymmetric loads to squeeze every last drop of power in each way of the sound system.

Pi series has an extra-large 4.3" display with a capacitive touch panel whereby it is possible to control and manage every parameter of the amp and its powerful FIR DSP, also controlled by our RAM_OCS software.

Main Characteristics

- Unmatched audio quality hi-efficiency Class H 3-steps design.
- 2/4 Channels models from 3000W up to 10000W.
- Last generation QuantaPulse™ SMPS
- High voltage output for high headroom performances.
- Advanced Power Management System (PMS EVO™) with high effective protections system acting in real-time.
- Up-side-down design to avoid fan dust accumulation.
- Industry-standard Neutrik® XLR and Speakon® connectors.
- Powerful and fast response cooling system.
- 64 bits double-precision 96kHz FIR DSP
- Extra-large 4.3" IPS display, capacitive touch panel user interface.
- Dante™ and AES3 inputs versions.
- Two Ethernet ports for daisy chain connection.
- USB port for firmware update and DSP control.

Front Panel

See Figure1

1. Main Power Switch:

The position I: Connects the amplifier's current feed.

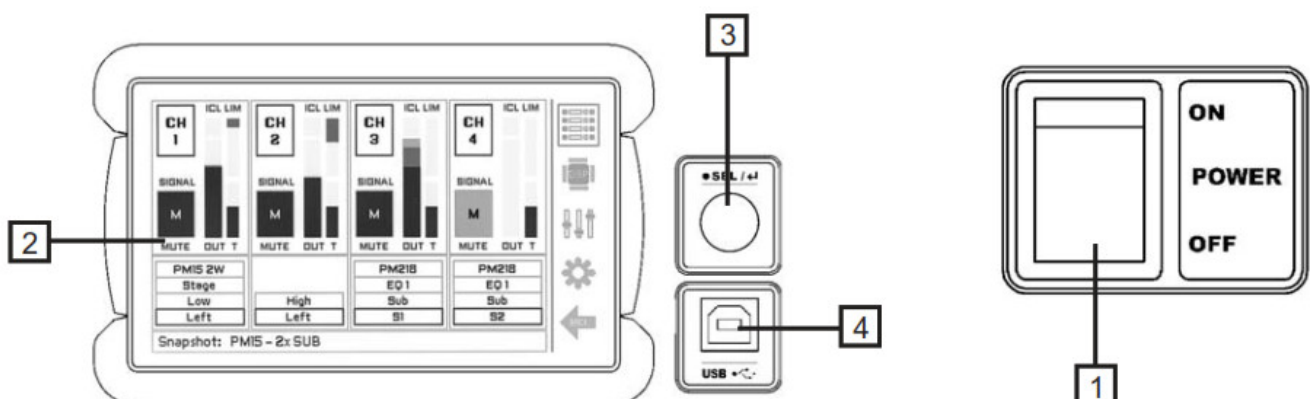
Position O disconnects the Power.

2. Display: See pages 10, 11, and 12.

3. Encoder: to control de display menus.

4. USB Connector: for firmware update and DSP control.

1 Front Panel



Controls: Where and What?

Rear Panel

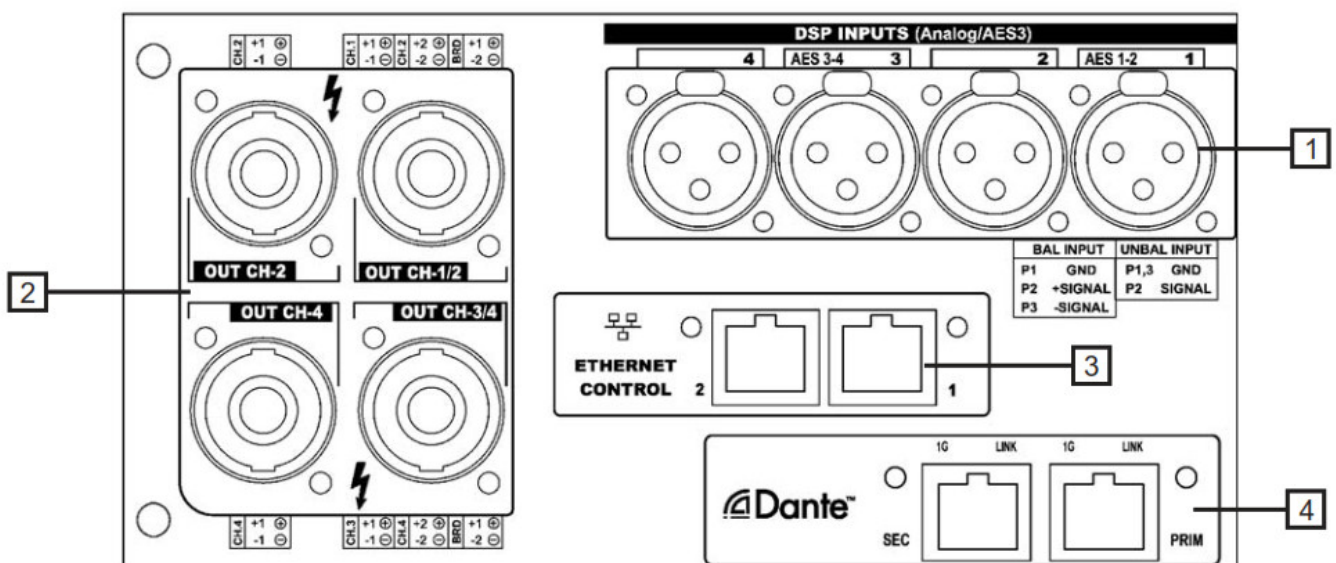
1. **Signal Input:** Female Neutrik ® XLR Connectors for the amplifier's signal input.
2. **Speaker connectors:** Neutrik ® Speakon to connect the speakers.
3. **Ethernet ports:** for daisy chain connection.
4. **Dante Inputs (only in Pi+Dante version):** Digital Inputs Dante™Networking (AES67 and DDM compatible).

Mains Power Cord: to connect the amplifier to the mains network. The color code is:

Blue: Neutral

Brown: Live, single phase

Yellow-green: Protective Earth



Installation and Operation

Connections

The Power switch must always be on the “Off” position before plugging the amp to a properly earthed mains socket (170-265V AC). The color code is

Blue: Neutral

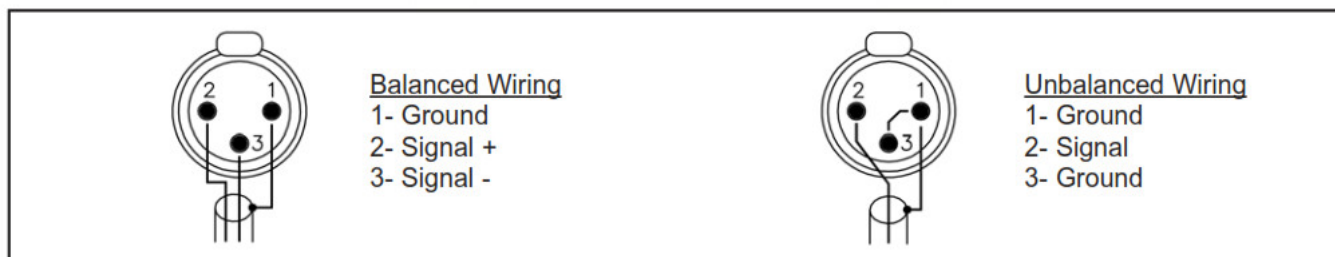
Brown: Live, single-phase

Yellow-green: Protective Earth

The input signal fed to the amplifier can be either balanced or unbalanced. The drawing below describes both ways to wire an XLR connector for the purpose.

Balanced Signal: Connect pin 1 to Ground, pin 2 to Signal + (hot) and pin 3 to Signal – (cold).

Unbalanced Signal: Connect Pin 1 to Ground, pin 2 to Signal and pin 3 to Ground.



Important!: If a connection is done with an unbalanced line and pin 3 on the XLR is not connected to the ground, a 6 dB loss occurs in the line, and only a quarter of the amplifier power is produced.

The amplifier can operate on two different configurations: DUAL, or BRIDGE. The connections for the two modes are different.

DUAL Channel Mode

See Figure 3

- By means of the display, set the Amplifier Mode to “DUAL”.
- Connect the signal lines to the female XLR connectors on all channels.
- Connect the speakers’ lines to the corresponding Speakon on the amp respecting the polarity.
- Use the level control knob on the front panel to adjust each channel independently.

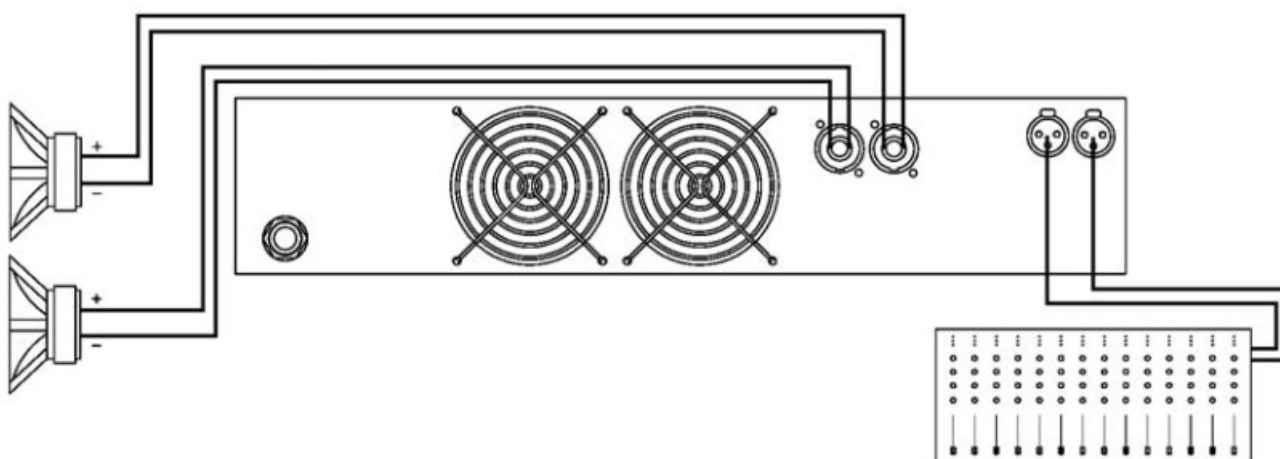
BRIDGE Channel Mode

See Figure 4

- By means of the display, set the configuration mode to “BRIDGE”
- Connect a signal line to input female XLR Channel “A” (or Ch-C in 4 channel models).
- Connect the speaker line to the Channel A Speakon (or Ch-C in 4 channel models) wired to +1 and -2. In this way pin +1 is positive.
- Use Channel-A (or Ch-C in 4 channel modes) control knob to adjust the amp’s output.

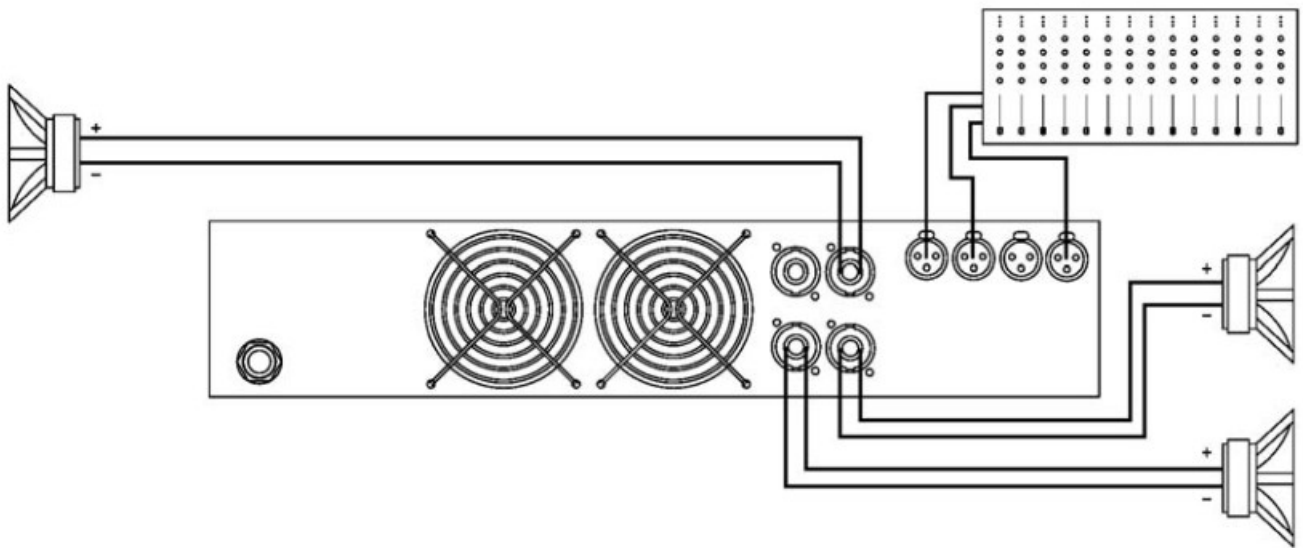
WARNING! The “-“ pins, do not have to be Ground!

3 Dual Channel 2 Ch models

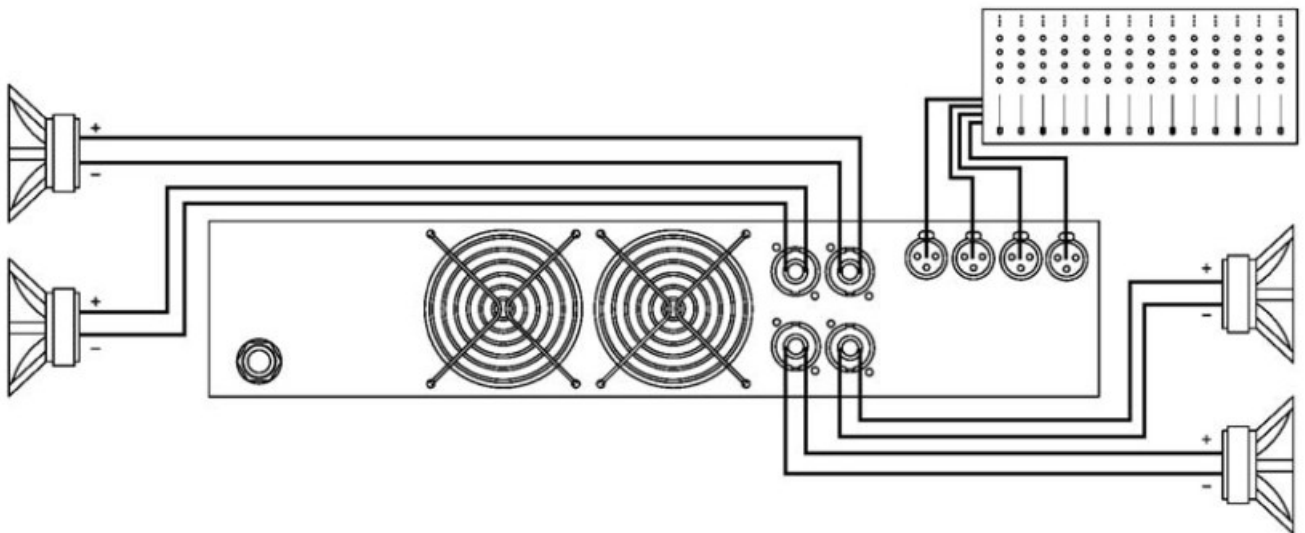


4 Bridge Mode 2 Ch models

Note: speakers have to be wired to +1 and -2.

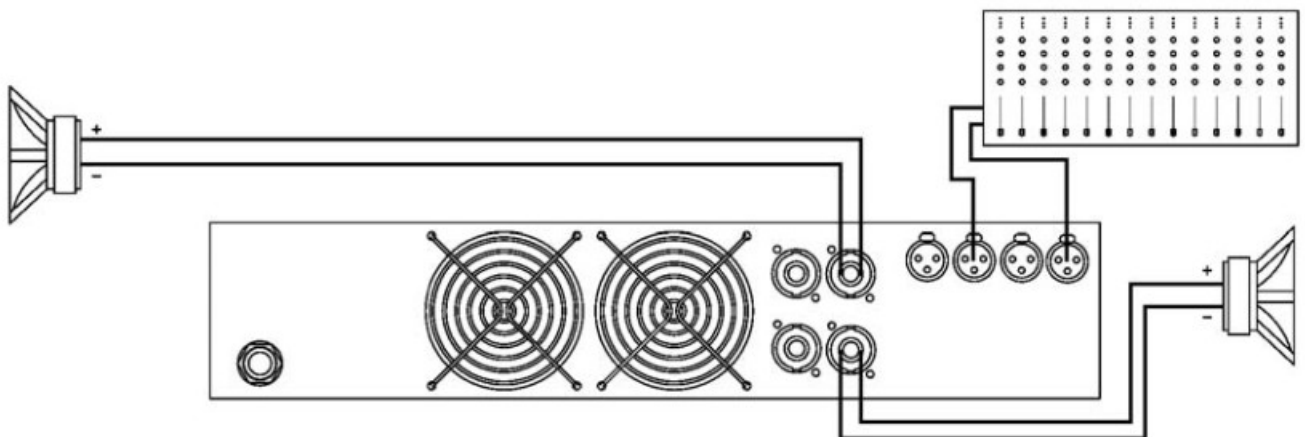


**3 Dual Channel
4 Channel models**



**4 Bridge Mode
4 Channel models**

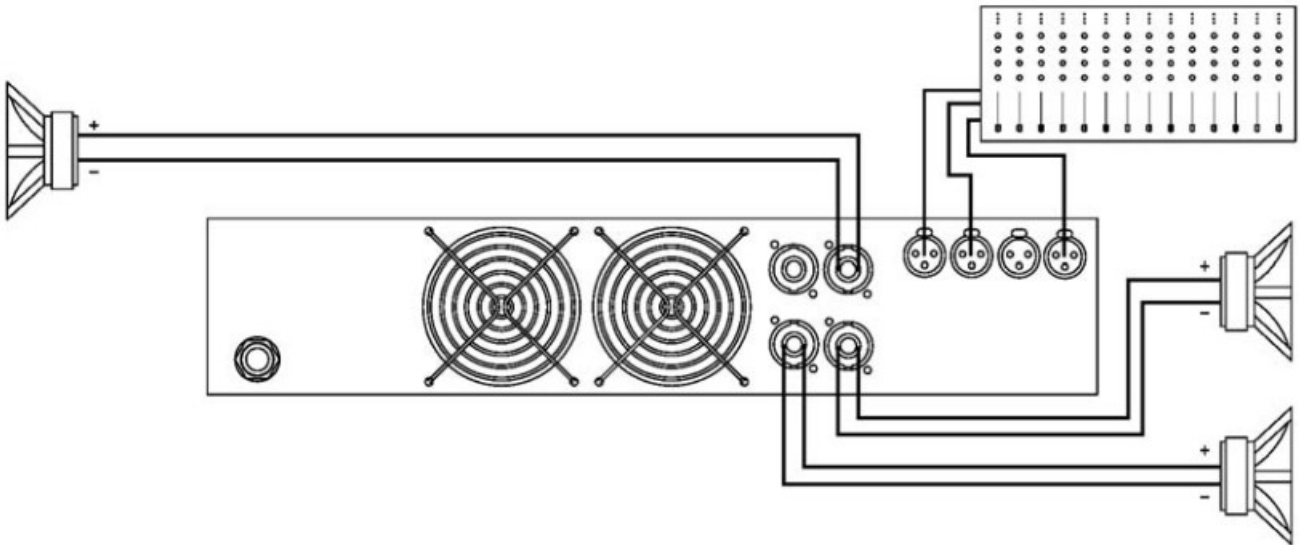
Note: speakers have to be wired to +1 and -2.



Bridge + Dual Mode

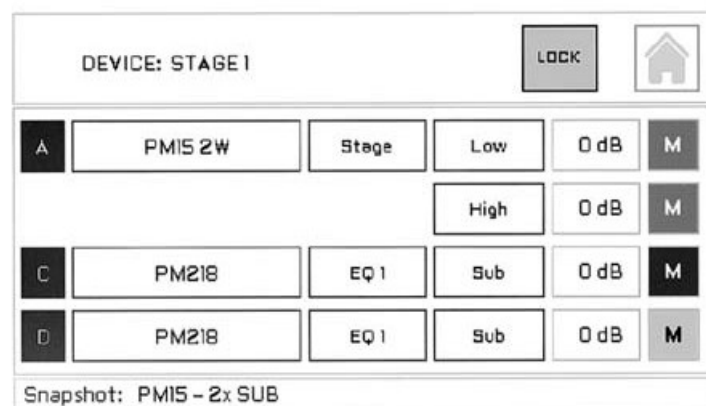
3 Channels Mode

Note: in Bridge mode, speakers have to be wired to +1 and -2.



Configuration

By means of the display, the user can configure amplifier and DSP parameters and monitoring them. There are six different screens as follows:



1. Default Screen:

Device Name: assigned by the user via RAM_OCS

Lock Button: to lock the touch screen

Home Button: to access to Home screen

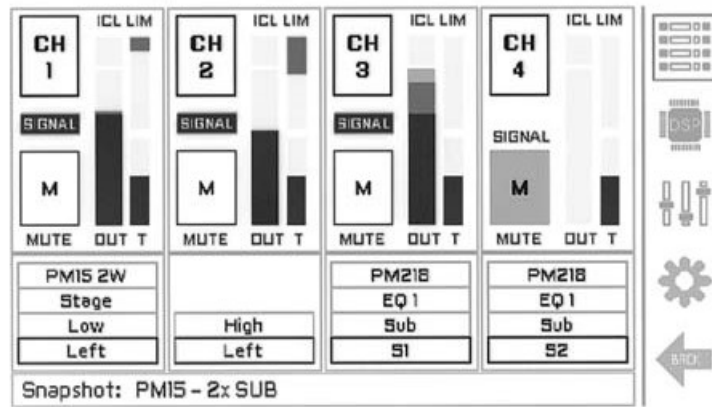
System Input Signal: shines green with signal presence

System Preset, Mode, and Way names of the current process

Level Control for amplifier channel output

Output Mute / Signal: shines green with output signal presence

Snapshot: shows the name of current Snapshot (if loaded one)



2. Home Screen:

Way Output Signal: shines green with signal presence

Mute Button: mutes the amplifier channel output

Output Channel Level

ICL Indicator: shines when clip limiter system is working

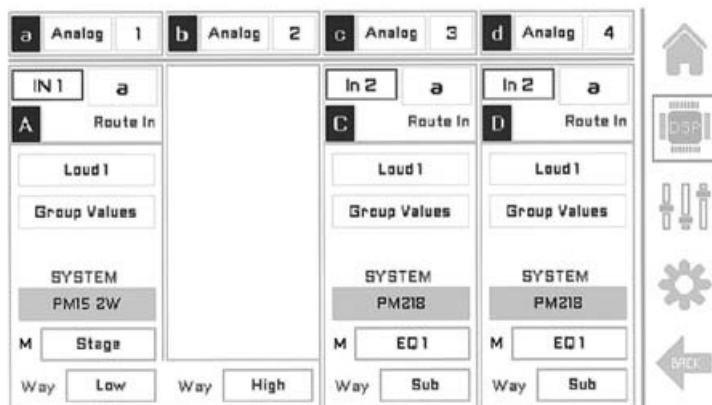
LIM: shows RMS/Peak limiters compression level

T: shows the channel temperature (percentage)

System Preset/Mode/Way/User ID Out names of the current process

Snapshot: shows the name of current Snapshot (if loaded one)

Default Screen Icon: button to access to the Default screen



3. DSP Edit Screen:

Source Input: to select the analog/digital source input

System Input: to select the input of each system

User ID Input Label: shows the name assigned by the user

User EQ: to select the input EQ User Memory

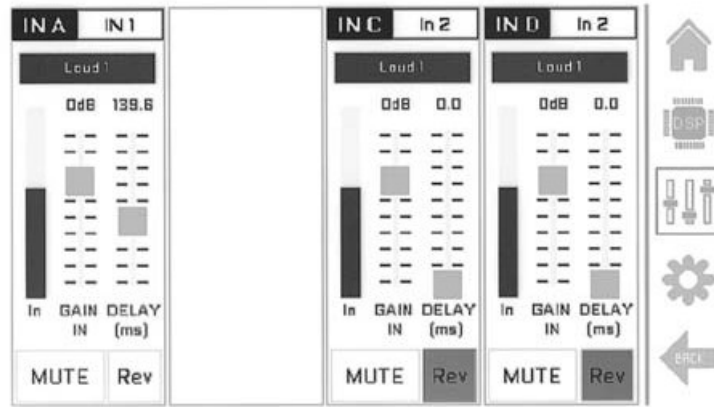
Group Values: shows the control groups values (green if present)

JOIN (optional): to join different outputs to a single input

System Preset Selector

M: to select the Mode EQ

Way: to optionally select the output way



4. User Input Setting Screen:

User ID Input Label: shows the name assigned by the user

User EQ Access Button (see 4.1)

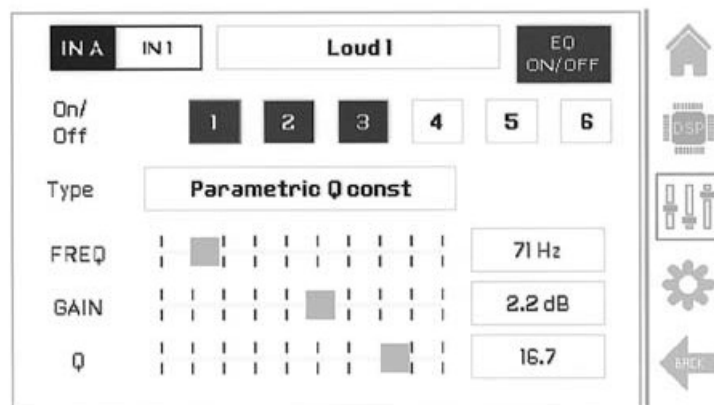
In: Input Level VU meter

GAIN IN: to change the input gain

DELAY: to change the input delay (ms)

MINUTE: to mute input

Rev: to change input polarity



4.1. User EQ Screen:

EQ Memory Name

EQ ON/OFF: to enable/disable User EQ

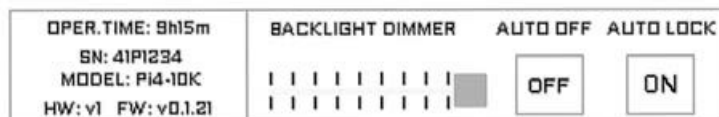
On/Off HP 1-6: to access to specific filter and enable/disable it

Type: to assign the filter type to the selected EQ

FREQ: to assign the frequency to the selected EQ

GAIN: to assign the gain to the selected EQ

Q: to assign the Q to the selected EQ



5. Amp Info & Screen Config: (top section)

OPER. TIME: shows the amp operation time

SN / MODEL: shows serial number and model of the amp

HW / FW: shows the hardware and firmware versions

BACKLIGHT DIMMER: to change the screen brightness

AUTO-OFF: to automatically turn off the screen (selectable time)

AUTO LOCK: to automatically lock the screen after the 60s

OPER.TIME: 8h15m SN: 41P1234 MODEL: P14-10K HW: v1 FW: v0.1.21		BACKLIGHT DIMMER [] []		AUTO OFF AUTO LOCK OFF ON	
SNAPSHOT AMPLIFIER PASSWORD ETHERNET RESET					
Snapshot: PM15 - 2x SUB					
RECALL FROM LIB					
SAVE TO LIB			DELETE SNAPSHOT MEMORY		

5.1. SNAPSHOT Tab:

Snapshot: shows the name of current Snapshot (if loaded one)

RECALL FROM LIB: to recall a Snapshot saved in the library

SAVE TO LIB: to save current amp setup to a Snapshot

DELETE SNAPSHOT MEM: to remove a library Snapshot

OPER.TIME: 8h15m SN: 41P1234 MODEL: P14-10K HW: v1 FW: v0.1.21		BACKLIGHT DIMMER [] []		AUTO OFF AUTO LOCK OFF ON	
SNAPSHOT AMPLIFIER PASSWORD ETHERNET RESET					
		CH1	CH2	CH3	CH4
GAIN		32dB	32dB	32dB	32dB
BRIDGE		A - B		C - D	

5.2 AMPLIFIER Tab:

GAIN: to select amp gain (26dB to 44dB)

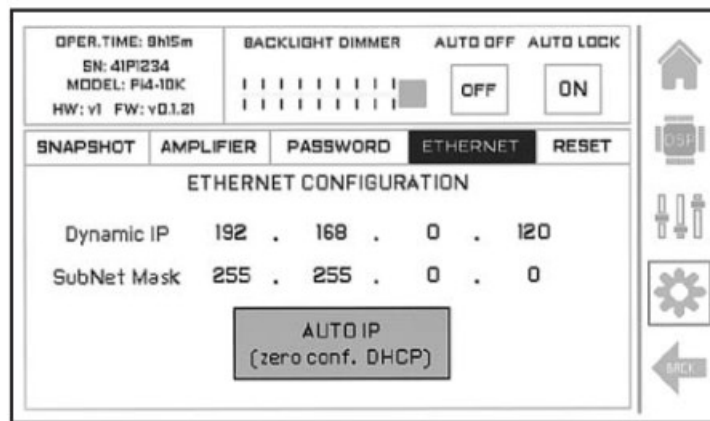
BRIDGE: to configure a pair of channels in Bridge mode 0dB FS IN (optional): to adjust the input digital reference

OPER.TIME: 8h15m SN: 41P1234 MODEL: P14-10K HW: v1 FW: v0.1.21		BACKLIGHT DIMMER [] []		AUTO OFF AUTO LOCK OFF ON	
SNAPSHOT AMPLIFIER PASSWORD ETHERNET RESET					
PROTECTION DISABLED					
GENERAL PASSWORD					

5.3 PASSWORD Tab:

GENERAL PASSWORD: to enable/disable the general password.

When enabled you have to introduce a 4-digits password and confirm it. When it is the active user will limit access to the amp through the screen and RAM_OCS PC software

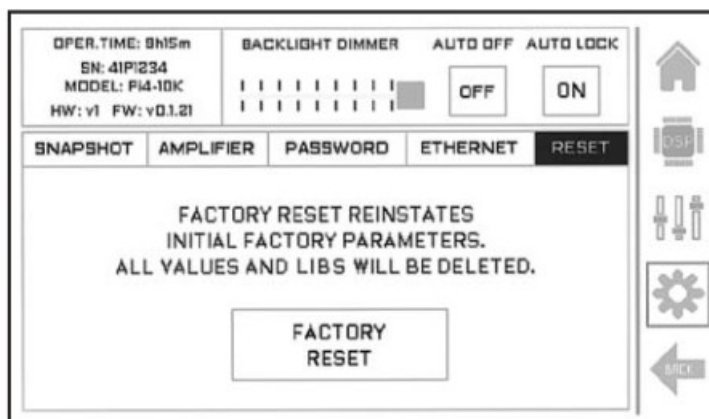


5.4 ETHERNET Tab:

Dynamic IP / SubNet Mask: information of the current IP address

AUTO IP: to enable/disable the dynamic IP function:

- When Auto IP is enabled, the amp will receive an IP from an external DHCP server. When no DHCP server is present in the network, the amp will self-designate an IP with the Zero config protocol.
- When Auto IP is disabled, you have to manually configure IP selecting each IP number and changing it with the encoder. To finish press the button APPLY IP.



5.5 RESET Tab:

FACTORY RESET: to reinstate initial factory parameters.

Caution! All the amp configurations and libraries will be lost.

Protection Systems

PMS EVO™- Power Management System

This is a complete set of protections that monitors the main amp parameters (load status, signal input, temperature, current, etc.) in order to draw from the power supply only the precise amount of current required to maintain safe operation during hazardous or extreme working conditions.

This system controls the amount of power that the amp delivers under three basic circumstances:

1. The power-on sequence, where output is inhibited until the amp circuits are ready to operate. This routine is repeated at every restart, not just when the power switch is activated.
2. When internal temperatures rise to near thermal shutdown point due to unfavorable operating conditions. Here the system takes control, restricting current so as to maintain operational continuity at the precise power level which the amp is capable of withstanding at that particular moment.

3. Excessive current consumption. This event usually occurs under laboratory conditions (long-term sinusoidal signal testing with dummy loads) or, for example, in field applications in conditions of prolonged acoustic howl-round. Here PMS EVO™ system takes control to avoid any damage to the speakers and to prevent the mains breaker from tripping or the fuses blowing.

ICL2™ -Intelligent Clip Limiter

The RAM Audio ICL2™ is an antislip system to avoid speaker failure and provide a more acceptable sound quality even when clipping occurs. With the ICL2™ system, you don't lose the music "punch" but the speakers are kept under control.

SSP™ – SOA Sentry Protection

SOA Sentry protection effectively limits the power that the amp could deliver into an incorrect load or to a direct short-circuit.

This avoids power transistor failure.

Technical Specifications

Data

	Pi2-3K	Pi2-5K	Pi4-6K	Pi4-10K
Number of channels	2	2	4	4
Total output power	3000 W	5000 W	6000 W	10000 W
Output Power* (All ch.'s driven/single channel)				
2 ohms	2x 1450 W 2 1x 1450 W2	2x 2500 W 2 1x 2500 W 2	4x 1450 W 2 1x 1450 W 2	4x 2500 W 2 1x 2500 W 2
4 ohms	2x 1500 W 1x 1750 W	2x 2500 W 1x 2800 W	4x 1500 W 1x 1900 W	4x 2500 W1 1x 3000 W
8 ohms	2x 1100 W 1x 1150 W	2x 1600 W 1x 1700 W	4x 1100 W 1x 1200 W	4x 1600 W 1x 1800 W
4 ohms Bridged	2900 W 2	5000 W 2	2x 2900 W 2	2x 5000 W 2
8 ohms Bridged	3000 W	5000 W	2x 3000 W	2x 5000 W 1
Hi-Z 70V	2x 1500 W	2x 2500 W 2	4x 1500 W	4x 2500 W 2
Hi-Z 100V	2x 800 W	2x 2500 W	4x 800 W	4x 2500 W 1
Max output voltage	144 Vpeak	176 Vpeak	144 Vpeak	176 Vpeak
Max output current	38 Apeak	50 Apeak	38 Apeak	50 Apeak
Total Harmonic Distortion	<0.05%			
Crosstalk (20Hz-1kHz), typical	>70dB			
Voltage Gain	26dB to 44dB (1dB step)			
SNR	106 dBA	107.5 dBA	106 dBA	107.5 dBA
Required AC Mains	170V-265V AC / 90V-140V AC			
Operating Voltage (50Hz-60Hz) 1/8 Rated Power (@230V, 4 ohms)	7 A	8 A	15 A	16 A
Dimensions W x H x D (mm)	483x89x320			
Weight Net (kg-Lbs)	6-13.2	8.5-18.7	8.5-18.7	8.5-18.7

Protections: Soft-start, Turn-on Turn-off transients, Muting at turn-on, Over-heating, DC, RF, Short-circuit, Open or mismatched loads, Overloaded power supply, ICL2™, PMS EVO™, and SSP™

*IEC filtered pink noise signal (40Hz-5kHz, 12dB crest factor). 230V AC mains.

1. PMS can limit output to prevent excessive current draw tripping the mains breaker.
2. SSP can limit output to prevent excessive heat

Dante™
AES67




Manufactured in the EEC by C.E. Studio-2 s.l.
Pol. Ind. La Figuera – C/Rosa de Luxemburgo, nº 34
46970 Alaquas – Valencia – SPAIN

Phone: +34 96 127 30 54 Fax: +34 96 127 30 56

<http://www.ramaudio.com> e-mail: support@ramaudio.com

Documents / Resources

	<p>RAM Audio Pi Series Professional Power Amplifiers [pdf] User Manual Pi Series, Pi2 3K-5K, Pi4 6K-10K, Pi Series Professional Power Amplifiers, Professional Power Amplifiers, Amplifiers</p>
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