



MPX5.4DSP

4-Channel DSP Power Amplifier

USER'S MANUAL
MANUALE D'USO



ENGLISH
ITALIANO

96MAN0217-REV.28/26



This page is intentionally left blank.

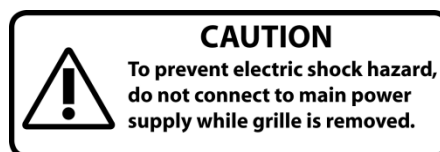
IMPORTANT SAFETY INSTRUCTIONS

Watch for these symbols:



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

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer’s instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Warning: to reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
16. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
17. To completely disconnect this apparatus from the ac mains, disconnect the power supply cord plug from the ac receptacle.
18. The mains plug of the power supply cord shall remain readily operable.
19. This apparatus contains potentially lethal voltages. To prevent electric shock or hazard, do not remove the chassis, input module or ac input covers. No user serviceable parts inside. Refer servicing to qualified service personnel.
20. The loudspeakers covered by this manual are not intended for high moisture outdoor environments. Moisture can damage the speaker cone and surround and cause corrosion of electrical contacts and metal parts. Avoid exposing the speakers to direct moisture.
21. Keep loudspeakers out of extended or intense direct sunlight. The driver suspension will prematurely dry out and finished surfaces may be degraded by long-term exposure to intense ultra-violet (UV) light.
22. The loudspeakers can generate considerable energy. When placed on a slippery surface such as polished wood or linoleum, the speaker may move due to its acoustical energy output.
23. Precautions should be taken to assure that the speaker does not fall off a stage or table on which it is placed.
24. The loudspeakers are easily capable of generating sound pressure levels (SPL) sufficient to cause permanent hearing damage to performers, production crew and audience members. Caution should be taken to avoid prolonged exposure to SPL in excess of 90 dB.





This marking shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources. Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling. Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.

FEDERAL COMMUNICATIONS COMMISSION (FCC) STATEMENT

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 not installed and used in accordance with the instruction manual, 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 their own expense.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

DECLARATION OF CONFORMITY



The product is in compliance with:

EMC Directive 2014/30/EU, LVD Directive 2014/35/EU, RED Directive 2014/53/UE, RoHS Directive 2011/65/EU and 2015/863/EU, WEEE Directive 2012/19/EU.



The product is in compliance with:

S.I. 2016/1091 Electromagnetic Compatibility Regulations 2016, S.I. 2016/1101 Electrical Equipment (Safety) Regulations 2016, S.I. 2017/1206 Radio Equipment Regulations 2017, S.I. 2012/3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012.

WARNING EN 55032 CISPR 32

This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference. Under the EM disturbance, the ratio of signal-noise will be changed above 10 dB.

LIMITED WARRANTY

Proel warrants all materials, workmanship and proper operation of this product for a period of two years from the original date of purchase. If any defects are found in the materials or workmanship or if the product fails to function properly during the applicable warranty period, the owner should inform the dealer or the distributor about these defects, providing receipt or invoice of date of purchase and defect detailed description. This warranty does not extend to damage resulting from improper installation, misuse, neglect or abuse. Proel S.p.A. will verify damage on returned units, and when the unit has been properly used and warranty is still valid, then the unit will be replaced or repaired. Proel S.p.A. is not responsible for any "direct damage" or "indirect damage" caused by product defectiveness.

- This unit package has been submitted to ISTA 1A integrity tests. We suggest you control the unit conditions immediately after unpacking it.
- If any damage is found, immediately advise the dealer. Keep all unit packaging parts to allow inspection.
- Proel is not responsible for any damage that occurs during shipment.
- Products are sold "delivered ex warehouse" and shipment is at charge and risk of the buyer.
- Possible damages to unit should be immediately notified to forwarder. Each complaint for package tampered with should be done within eight days from product receipt.

CONDITIONS OF USE

Proel do not accept any liability for damage caused to third parties due to improper installation, use of non-original spare parts, lack of maintenance, tampering or improper use of this product, including disregard of acceptable and applicable safety standards. Proel strongly recommends that this loudspeaker cabinet be suspended taking into consideration all current National, Federal, State and Local regulations. The product must be installed by qualified personal. Please contact the manufacturer for further information.



INDEX

IMPORTANT SAFETY INSTRUCTIONS	3
FEDERAL COMMUNICATIONS COMMISSION (FCC) STATEMENT	4
DECLARATION OF CONFORMITY	4
LIMITED WARRANTY	4
CONDITIONS OF USE	4
INTRODUCTION	6
DESCRIPTION	6
FEATURES	6
WHAT'S IN THE BOX	7
FRONT PANEL	7
1. ON/OFF BUTTON/LED	7
2. WIFI LED	7
3. SIGNAL/LIMIT LED	8
REAR PANEL	8
4. NETWORK RJ45 CONNECTOR	8
5. WIFI SMA-CONNECTOR	8
6. GPIO CONNECTOR	8
7. CH1-4 RCA INPUTS	8
8. CH1-4 BALANCED INPUTS	8
9. CH1-4 OUTPUTS	8
10. AC~ MAINS LINE	8
11. VENTILATION SLOTS	8
INSTALLATION	9
SIGNAL FLOW	10
WIFI: SINGLE UNIT / FIRST CONNECTION	11
ETHERNET: FIRST CONNECTION	12
SETUP INTO AN EXISTING NETWORK	13
SETUP INTO A STAND-ALONE NETWORK	15
WIRING ANALOG INPUTS CH1-4	17
WIRING POWER OUTPUTS 1-4	18
WIRING GPIO	20
1. STANDBY / MUTE SCHEMATIC	21
2. TRIGGER IN, TRIGGER OUT SCHEMATIC	21
3. OUTPUT CHANNEL VOLUME SCHEMATIC	22
DSP WEBGUI:	23
1. HOME PAGE	23
2. INPUT PAGE	23
3. OUTPUT PAGE	27
4. SETTING PAGE	35
PROEL LTX PRESET	39
EXAMPLE	39
TECHNICAL SPECIFICATIONS	40



INTRODUCTION

Thank you for choosing a PROEL product. Please take some time to read this manual to understand all the features of your system and take advantage of all its performance capabilities. All PROEL products are CE approved and designed for continuous use in professional applications.

DESCRIPTION

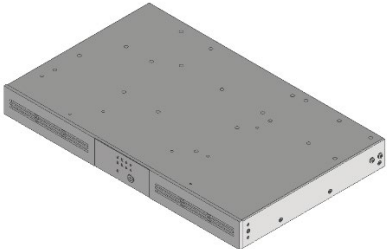
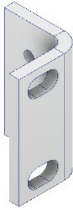
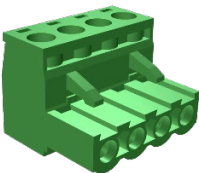
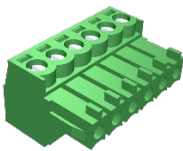
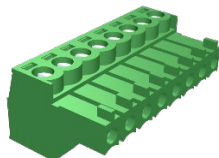
MPX5.4DSP power amplifier is designed to provide configurable, consistent and reliable high performance audio power amplification for residential, commercial and entertainment applications.

MPX5.4DSP combines full matrix DSP, many power & channel variants, speaker presets, intuitive control software, fast installation, scalable Hi-Z/Lo-Z power sharing, customizable control via external potentiometer and switches.

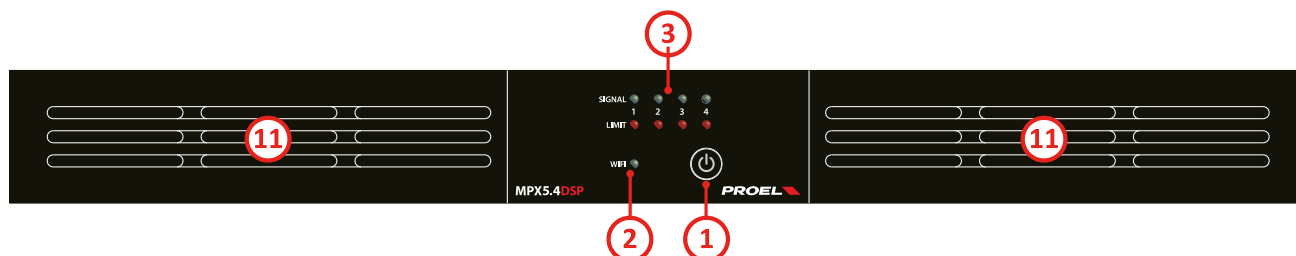
FEATURES

- Configuration and control using WebGUI, WebGUI is a graphical interface that allows to control MPX5.4DSP from any Internet browser running on any computer, tablet or smartphone.
- Monitoring and control over TCP/IP
- Programmable GPIO (general purpose input/output) control port
- Four fully configurable signal inputs
- Four fully configurable power outputs
- 48kHz signal processing
- Digital signal processing (EQ Filters, crossover, delay, limiter, FIR)
- Import/Export Speaker PRESET
- Backup/Restore full Device configuration file
- Power saving mode
- 70V/100V direct drive
- Each channel independently configurable for low Z or high Z operation
- Advance protection circuits

WHAT'S IN THE BOX

		
MPX5.4DSP (1x)	Rack adapters (2x)	M4 screws for rack adapters (4x)
		
Adhesive rubber foot (4x)	WiFi Antenna (1x)	Mains cable (1x)
		
Euroblock 5.08mm 4pin (2x)	Euroblock 3.5mm 6pin (2x)	Euroblock 3.5mm 8pin (1x)

FRONT PANEL



1. ON/OFF BUTTON/LED

Press and hold for 2 seconds to turn the unit on or off: the corresponding LED will light up or off.



NOTE: If the LED is flashing, the unit is in standby mode. Refer to the Power Management and GPIO chapters to set up standby operation and properly define how the unit will return to operation.

NOTE: When the power line is restored after a temporary or intentional interruption, the MPX5.4DSP will power up, after which the power management system will take control of the unit.

NOTE: Amplifiers will not switch on from Standby Mode unless an input signal is present, a network 'ON' command is received, or an external standby switch (or 12 V trigger) is operated. Standby behaviour can be configured via the Power Management menu of the Settings Tab.

2. WIFI LED

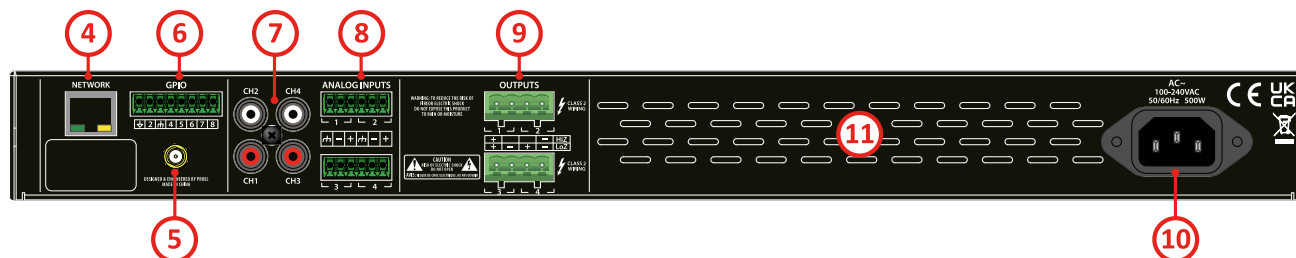
This LED indicates that the unit's internal WIFI is turned on.

3. SIGNAL/LIMIT LED

The SIGNAL LEDs indicate the presence of the signal at the corresponding input (about 40dB before the nominal level).

The LIMIT LEDs indicate the LIMITER power activation of the corresponding output channel.

REAR PANEL



4. NETWORK RJ45 CONNECTOR

Connect this RJ45 port to a network for monitoring and controlling the amplifier over CAT 5e wiring via the WebGUI. The integrated LEDs in this Ethernet port will light as follows:

- Yellow LED: This LED light when a network connection is established with the computer or network and will flash to indicate network activity.
- Green LED: This LED indicates network speed and will light when connected to a 100Mb network or not light when connected to a 10Mb network.

5. WIFI SMA-CONNECTOR

Connect the supplied SMA Antenna to this port, this is the antenna of the internal WIFI.

Note: The internal WIFI allows you to connect the WebGUI and configure and control each MPX5.4DSP amplifier separately, see the further chapter for more details.

6. GPIO CONNECTOR

This is a 8-pin block connector that enables remote control of volume, standby, mute and trigger functions. See WIRING GPIO chapter for further information on configuring and using this port.

7. CH1-4 RCA INPUTS

These RCA connectors are unbalanced inputs of the corresponding channel.

8. CH1-4 BALANCED INPUTS

These are two 6-pin block connectors, these are the balanced input of the corresponding channel. See WIRING INPUTS chapter for information on wiring these connectors.

9. CH1-4 OUTPUTS

These are two 4-pins block terminal block per channel pair. Accepts up to 12 AWG wire. See WIRING OUTPUTS chapter for information on wiring these connectors.

10. AC~ MAINS LINE

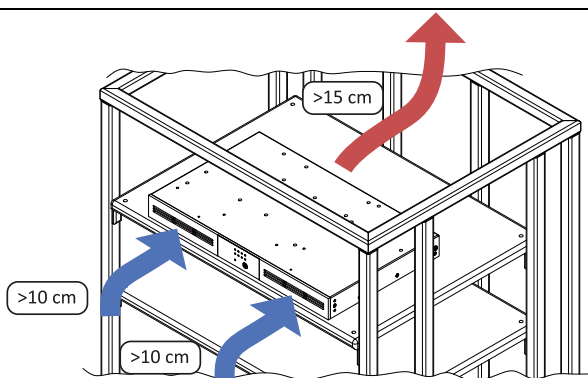
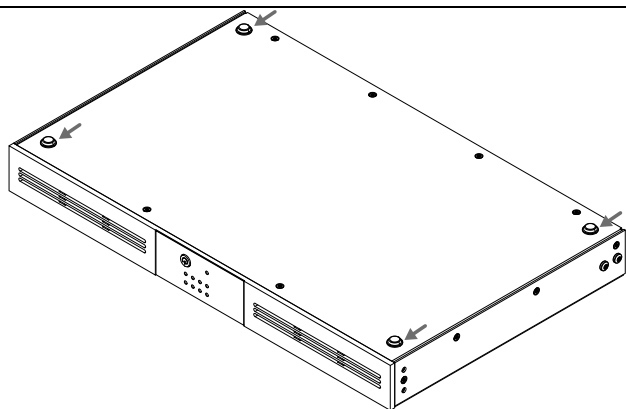
Here's where you plug in your mains supply cord. You should always use the mains cord supplied with the device.

11. VENTILATION SLOTS

Provides cooling air flow. Do not block or cover these vents.

INSTALLATION

Housing on a shelf or on a table:



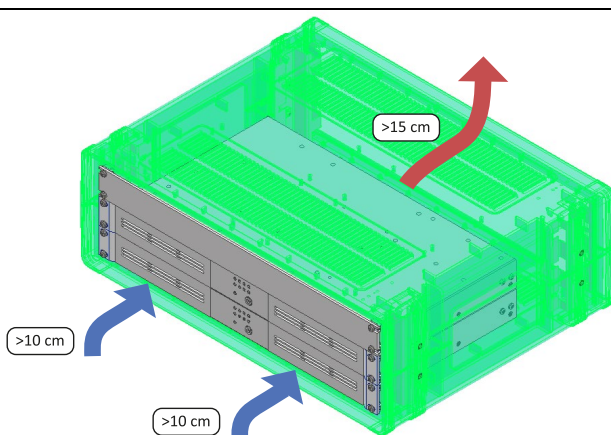
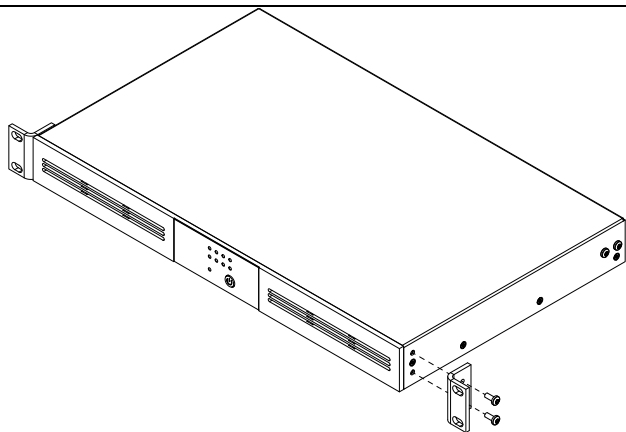
Attach the supplied four adhesive rubber feet to the bottom of the unit.



Place it on a shelf or table, ensuring proper ventilation, with no obstructions to the front (at least 10 cm from any object) or to the rear (at least 15 cm from any object).

Air flow is front to back as illustrated in Figure.

Housing in a 19-inch (48.3 cm) equipment rack:



Mount the supplied rack adapters to the sides of the unit using a T20 Torx screwdriver.



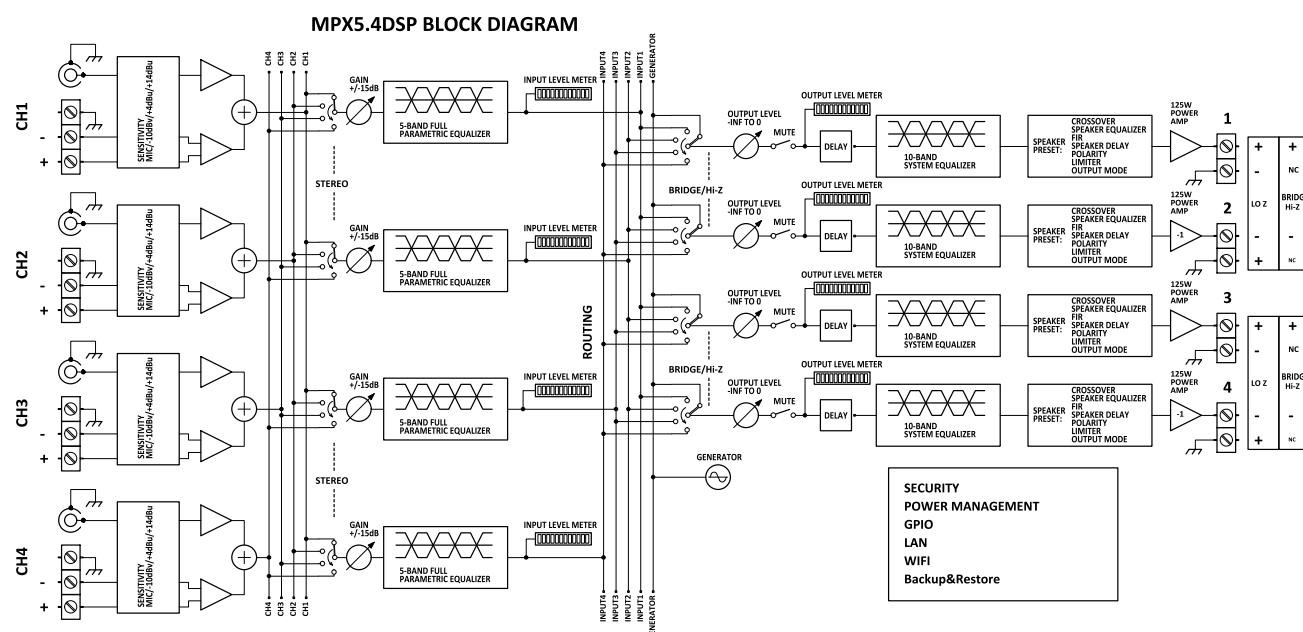
When using an equipment rack, mount the units directly above each other. Close any open spaces in the rack with blanking panels. (Open spaces reduce cooling efficiency.)

DO NOT block the front or rear air vents; leave a clear space of at least 10 cm at the front and 15 cm at the rear.

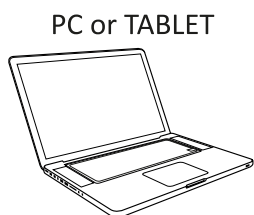
Airflow is from front to back, as shown in the figure.

SIGNAL FLOW

The following figure shows the internal audio signal flow; from left to right, the signal is processed by the DSP: gain, equalizer, routing, level, mute, system eq, speaker preset, power amp, bridge, low-Z, high-Z.

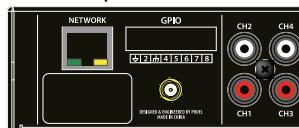


WIFI: SINGLE UNIT / FIRST CONNECTION



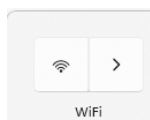
MPX5.4DSP single unit WIFI
SSID: MPX5.4DSP_xxxxxx

web ip: 192.168.4.1

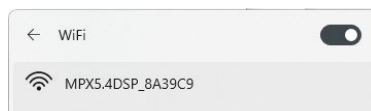


- Turn on the MPX5.4DSP and wait for the green Wi-Fi LED to light up.
- Connect your PC to the Wi-Fi network created by the MPX5.4DSP's hotspot. The default SSID is the same as the device name, for example, **MPX5.4DSP_8A39C9**, where 8A39C9 is the device's unique identifier.

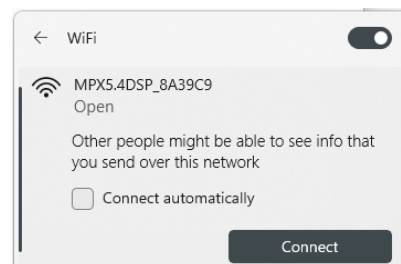
Choose WIFI.



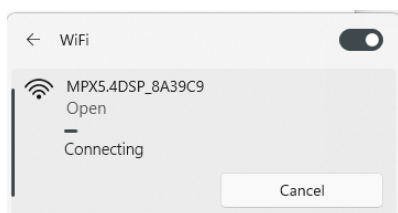
Choose MPX5.4DSP_xxxxxx.



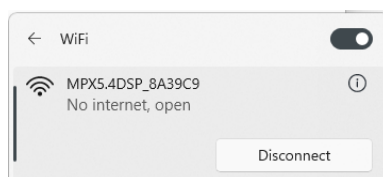
Choose Connect.



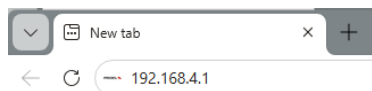
The connection start.



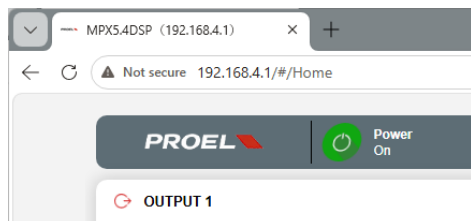
The connection is established.



- In your PC's browser, type the IP address **192.168.4.1**



- The MPX5.4DSP web application will open in your browser, allowing you to modify all the amplifier's parameters.



This is also the best and easiest way to control a single unit if your audio system only has one MPX5.4DSP.



Note: Each MPX5.4DSP has its own unique hotspot and SSID, so only one device can be controlled at a time. If you want to control multiple devices, the only way is to create a wired Ethernet connection as described below.

Note: The MPX5.4DSP Wi-Fi hotspot does not have a default password, but to secure your Wi-Fi connection, you can change the SSID name and specify a new password as described below.

ETHERNET: FIRST CONNECTION

PC or TABLET



web ip: 192.168.66.123



manual ipv4: 192.168.66.1

subnet: 255.255.255.0

- Turn ON the MPX5.4DSP and wait for the WIFI green LED to light up.
- Set up a manual IP on your PC Ethernet configuration page as:

IPv4 address

192.168.66.1

Subnet mask

255.255.255.0

Gateway

192.168.66.1

Edit IP settings

Manual

IPv4

On

IP address

192.168.66.1

Subnet mask

255.255.255.0

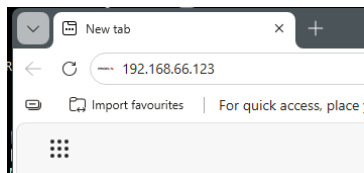
Gateway

192.168.66.1

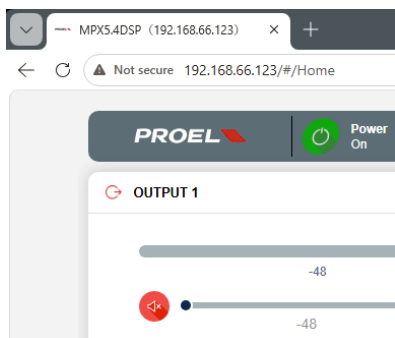
Preferred DNS

192.168.66.1

- Connect the MPX5.4DSP Ethernet port to the PC Ethernet port directly.
- In the PC browser type in the IP address **192.168.66.123**



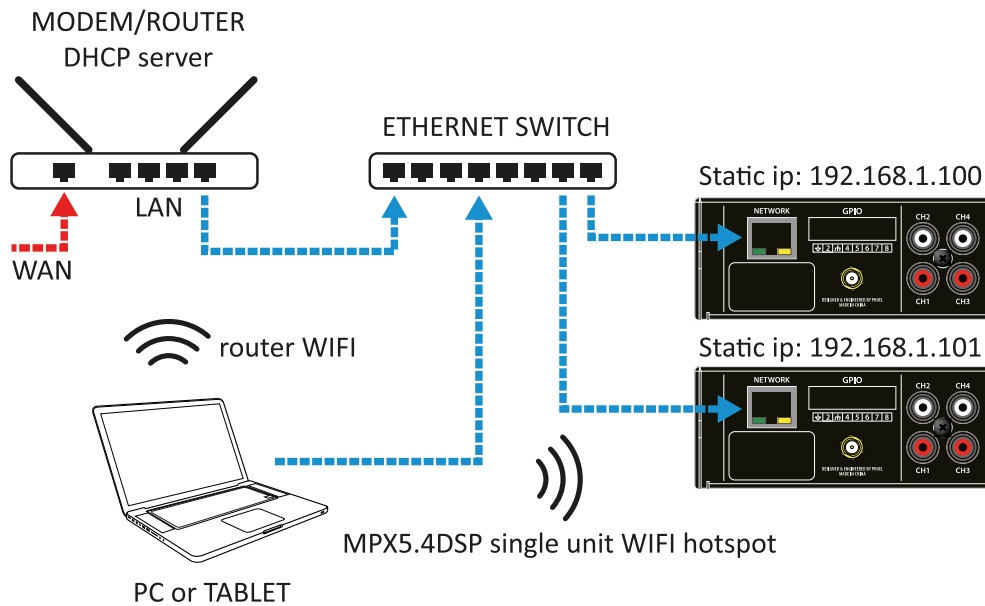
- The MPX5.4DSP web application will open in your browser, allowing you to modify all the amplifier's parameters.



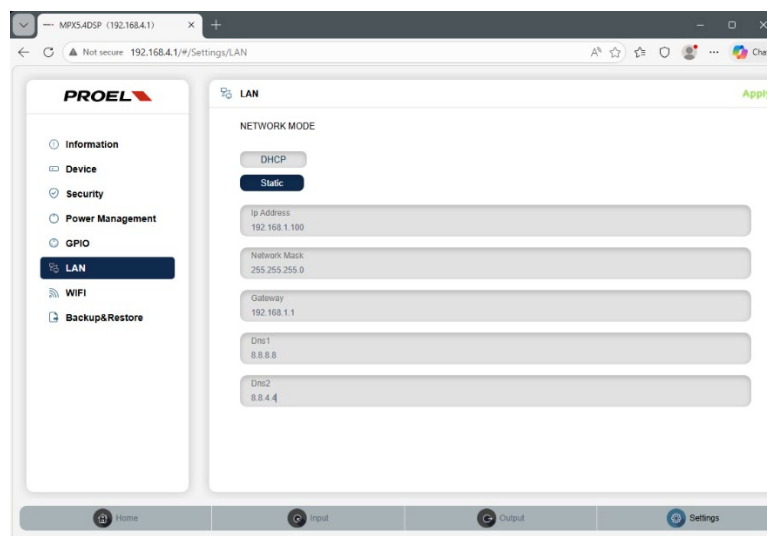
This is an alternative method for connecting an MPX5.4DSP for the first time; it is typically only used to change the internal LAN settings and connect the device to an existing local network, as specified below.

SETUP INTO AN EXISTING NETWORK

A typical existing network is represented in the following figure:



- Check on your router what is the range of LAN addresses automatically assigned by the DHCP server of your router, in most routers the router address is 192.168.1.1 and the assignable addresses vary from 192.168.1.2 to 192.168.1.256, while the subnet is usually 255.255.255.0, the gateway is usually the same address as the router i.e. 192.168.1.1, Dns1 is 8.8.8.8 and Dns2 is 8.8.4.4, take note of these settings.
- Access the MPX5.4DSP using one of the two methods mentioned in the previous paragraphs (preferably via WIFI hotspot).
- In the Setting / LAN page of the MPX5.4DSP set the parameters you have taken note of, for example in this case NETWORK MODE: STATIC with IP chosen arbitrarily for the MPX5.4DSP IP Address 192.168.1.100 the subnet the same Network Mask 255.255.255.0 the gateway remains that of the router i.e. 192.168.1.1 as well as Dns1 and Dns2.
- Click Apply on the top left corner of the screen, then connect the net cable to the ETHERNET SWITCH.



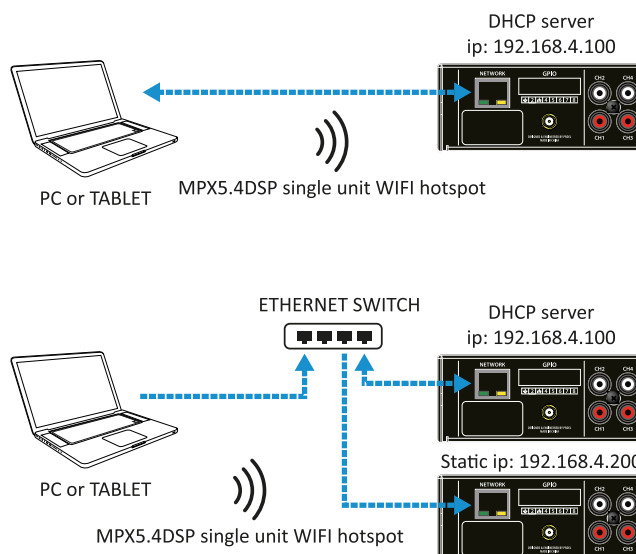
*Note: If you are unsure whether the IP address you want to assign to the MPX5.4DSP is already occupied by another device on the Internet, there are several free utilities that allow you to scan the addresses currently occupied on the network, or simply use the **PING** command from a terminal emulator.*



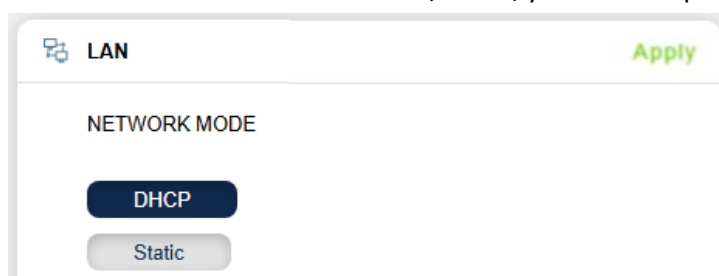
Note: Please note that many programs that scan the network also allow you to know the MAC address of the device's network card, for example 88:57:21:8A:39:CB. Some routers in the advanced options allow you to reserve a specific IP address for a specific MAC address, therefore reserving 192.168.1.100 for the MAC 88:57:21:8A:39:CB of the MPX5.4DSP prevents the router from using this IP for a different device in the event of abnormal network device reboots.

Note: Many installers will ask if it is possible to access the device remotely, i.e. via the Internet. In theory, this is possible, but only by installing a VPN (Virtual Private Network) on the modem/router, which is beyond the scope of this manual. Since this is a specific configuration of the modem/router and the VPN server, it is not recommended to use free VPNs. Typically, a quality VPN requires a paid subscription.

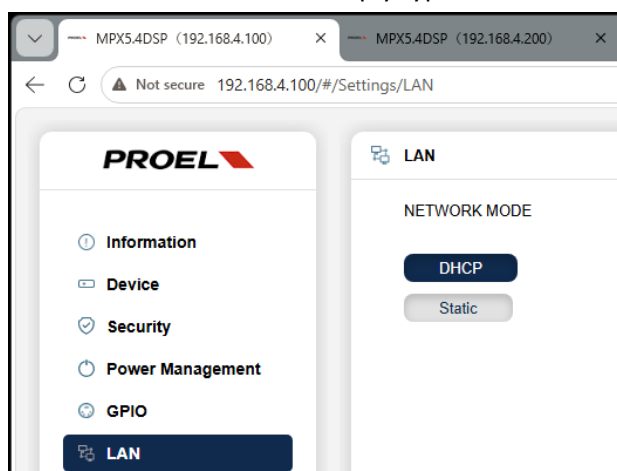
SETUP INTO A STAND-ALONE NETWORK



- If you want to set up the connection of one or more MPX5.4DSP units on a standalone Ethernet network without an external router/server, you can set up an MPX5.4DSP as a DHCP server:



- In this case the MPX5.4DSP set as DHCP server will have the IP address 192.168.4.100 and will assign subsequent numbers to any other devices.
- To connect a PC or Tablet via cable, simply set the device's Ethernet connection to automatic or dynamic.
- To access the MPX5.4DSP simply type the address 192.168.4.100 in the browser:



- Any other MPX5.4DSPs belonging to the same network will require static IPs which can be set via WIFI, for example::



	MPX5.4DSP DHCP server	2° MPX5.4DSP Static IP	3° MPX5.4DSP Static IP
IPv4 address	192.168.4.100	192.168.4.200	192.168.4.201
Subnet mask	255.255.255.0	255.255.255.0	255.255.255.0
Gateway	192.168.4.100	192.168.4.100	192.168.4.100

- Once the MPX5.4DSPs have been configured on the same wired network, it will be possible to disable the WIFI on each of them in order to make the system closed and possibly modifiable only via a wired Ethernet connection.

WIRING ANALOG INPUTS CH1-4

MPX5.4DSP has 4 available inputs that's accept signals from microphones or line level source devices.

RCA (7) and Balanced (8) inputs are connected in parallel and each one can be wired internally to the 4 DSP input.

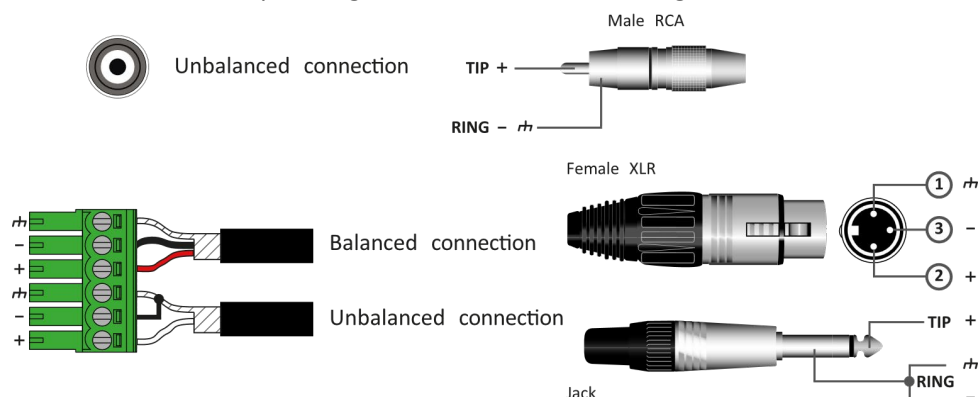
For better results it is recommended to use pre-built or professionally wired balanced cables (two-conductor plus shield). Balanced wiring provides better rejection of unwanted noise and hum, However, unbalanced line may also be used.

Use 6-pin plug-in cable ends at the amp input connectors. A male connector is supplied for each input of your model of amplifier.

List of some Proel recommended cables:

PROEL Code	Description
HPC300	Unbalanced 2 individually shielded conductors (2 x 0,14 mm ²) cable with flexible PVC overall jacket Black color.
HPC80	Balanced installation cable (2 x 0,22 mm ²) with small diameter aluminum foil shielded overall jacket Black color.
HPC80WH	Balanced installation cable (2 x 0,22 mm ²) - with small diameter aluminum foil shielded overall jacket White color.
HPC210BK	Balanced microphone cable (2 x 0,22 mm ²) with flexible overall jacket Black color.
HPC210HF	Balanced microphone cable (2 x 0,25 mm ²) with flexible LSZH flame retardant overall jacket Black color.

The figure below shows connector pin assignments for balanced wiring and for unbalanced wiring.



WIRING POWER OUTPUTS 1-4



IMPORTANT: The amplifier output mode (Lo-Z, Lo-Z Bridge, Hi-Z 70V, Hi-Z 100V) must be properly configured for the application before connecting the speakers. By default, all outputs are configured as OFF. See "Configuring Output Mode" for more information.

CAUTION: Never use shielded cable for output wiring.

CAUTION: Never connect the speaker return to the chassis of the amplifier or ground, serious damage to the amplifier may result.

CAUTION: Custom wiring should only be performed by qualified personnel. Class 2 output wiring is required.

Before making any output connections, ensure the power cord is disconnected from the amplifier and carefully review the total impedance for loudspeakers connected to each amplifier output. If multiple loudspeakers are connected to an output in Low Z mode (i.e., in series, parallel, or series-parallel), be certain the total system impedance is within allowed specification for the output. When multiple loudspeakers are connected to one output in High Z mode, be certain total tapped power is below the rated power output for the channel. See "Technical Specification" for supported load specifications.

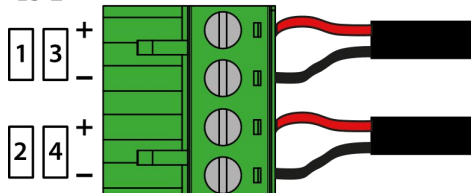
PROEL recommends using professionally constructed, high quality, two-conductor, heavy gauge speaker wire and connectors. Use 4-pin EUROBLOCK 5.08mm type connectors (included with the amp).

Suggested below are guidelines to select the appropriate size of wire based on the distance from amplifier to speaker for low-impedance loads.

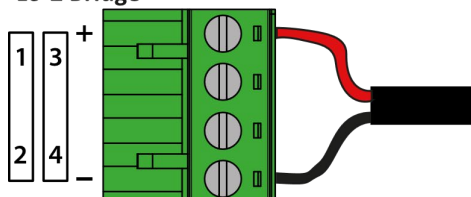
Cable Gauge Table for Lo-Z speakers with 0.5 dB loss.

Distance	Wire Size	PROEL recommended cables	Flame retardant cables
< 10 m / 30 ft	1.5 mm ² / 16 AWG	HPC610BK	-
10 – 18 m / 30 – 50 ft	2.5 mm ² / 14 AWG	HPC620BK	HPC620HF
> 18 m / 50 ft	4.0 mm ² / 12 AWG	HPC624BK	HPC624HF

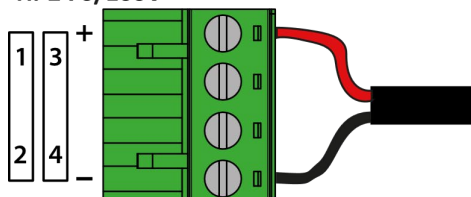
Lo-Z



Lo-Z Bridge

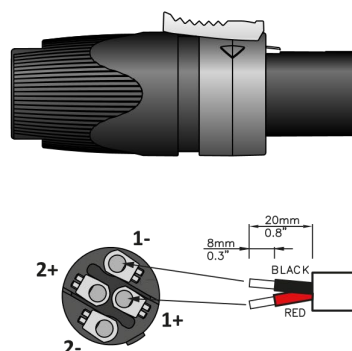


Hi-Z 70/100V



SPEAKER

Neutrik NL4FX Speakon Cable Connector

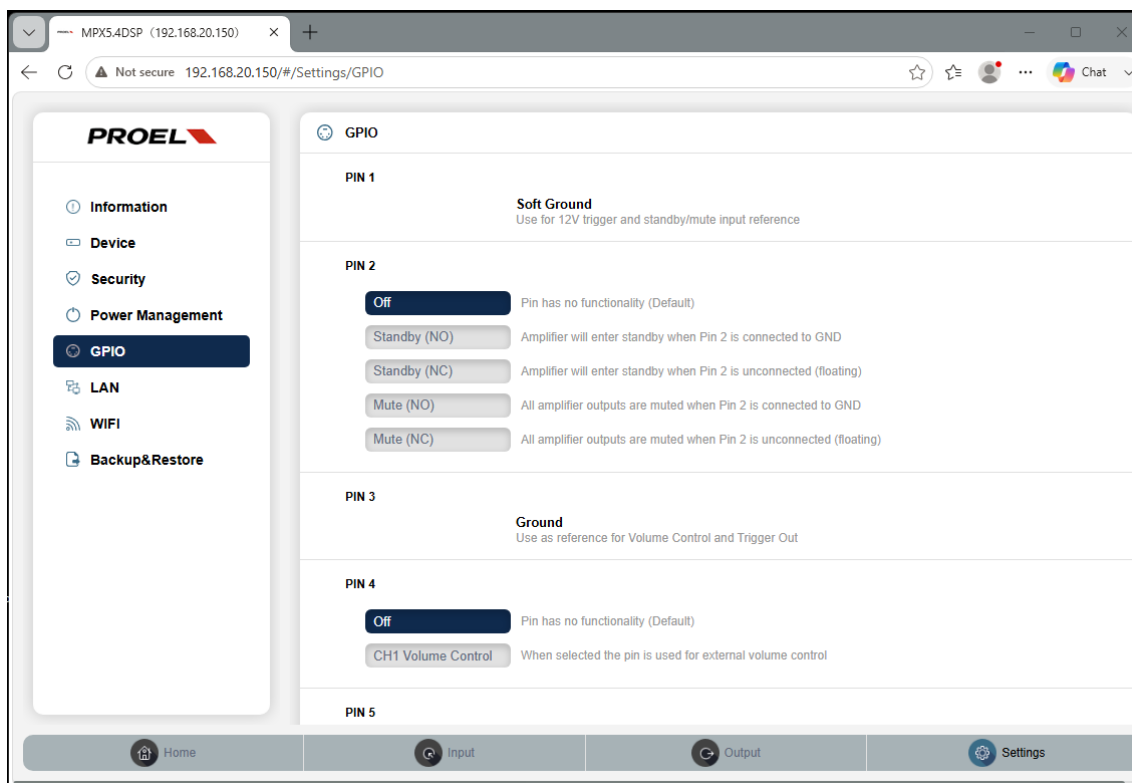




Cable Gauge Table for Hi-Z installations with 20 evenly spaced speakers with 1.0 dB loss.					
Cable Cross Section mm ²	Cable Gauge AWG	70V line max length in meters		100V line max length in meters	
		125W channel	250W channel	125W channel	250W channel
0.75	18	90	45	190	90
1.5	16	180	90	< 250	180
2.0	14	< 250	150	< 250	< 250
Note: Cable length should not exceed 250m.					

WIRING GPIO

The amplifier provides a GPIO socket that enables remote control of volume, standby, mute and trigger functions. The GPIO must be configured using the DSP WebGUI in Setting/GPIO page:



A description of each GPIO pin configuration setting:

Pin	Description
1	SOFT GROUND: Use this pin as reference ground for TRIGGER IN (Pin7), MUTE, STANDBY operation. See also the note below.
2	Off: the pin is not operative. Standby (NO): Amplifier will enter standby when connected to ground. Standby (NC): Amplifier will enter standby when it is floating (unconnected to ground). Mute (NO): All amplifier outputs are muted when connected to ground. Mute (NC): All amplifier outputs are muted when it is floating (unconnected to ground). <i>Note: The Mute state activated by pin 2 is not displayed in the WebGUI.</i> See schematic below.
3	CHASSIS GROUND: Use this pin as reference ground for TRIGGER OUT (Pin6), CH1-4 VOLUME CONTROLS. See also the note below.
4	Off: the pin is not operative. CH1 Volume control: connected to the potentiometer wiper to control the CH1 signal intensity, see schematic below.
5	Off: the pin is not operative. CH2 Volume control: connected to the potentiometer wiper to control the CH2 signal intensity, see schematic below.



6	Off: the pin is not operative. CH3 Volume control: connected to the potentiometer wiper to control the CH3 signal intensity, see schematic below. 12V Trigger In: Amplifier will operate when +12V continuous is applied to Pin 6 - will enter standby when it is floating. See also Setting/Power Management page in DSP WebGUI.
7	Off: the pin is not operative. CH4 Volume control: connected to the potentiometer wiper to control the CH4 signal intensity, see schematic below. 12V Trigger Out: When amplifier operates a +12V continuous is present to Pin 7 – when the amplifier goes in standby this pin is floating. See also Setting/Power Management page in DSP WebGUI.
8	Power 3.3V: +3.3V continuous voltage used for the CH1-4 volume controls. <i>Note: GPIO Pin 8 has a low output impedance and it can supply a maximum current of 10 mA</i>



Note: Shielded cables must be used when connecting standby switches and potentiometers via GPIO, especially for long run. The Shield must be connected at pin 1 or pin 3, see schematics.

Note: The GPIO connector must not be be used for any unintended purpose. Amplifier damage may result from incorrect use of GPIO.

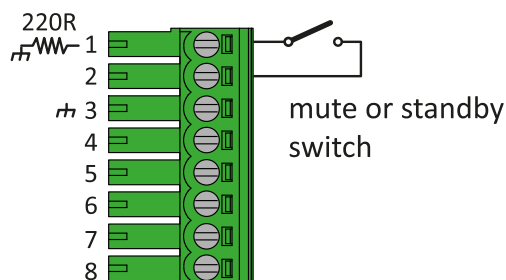
Note: GPIO Pin 1 and Pin 3 both offer ground connections:

Pin 1 is connected directly to the amplifier chassis.

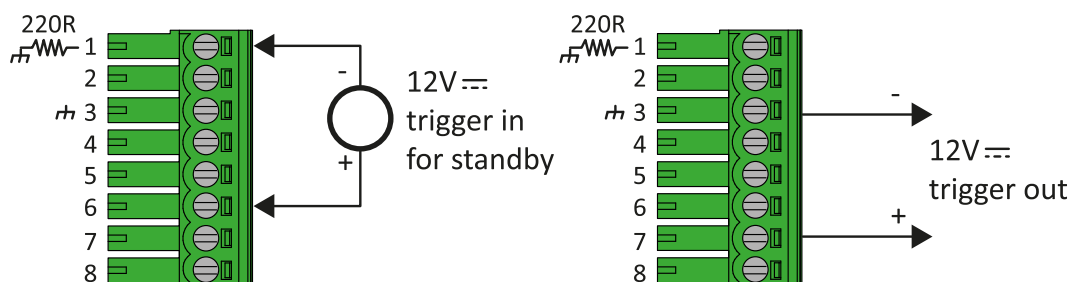
Pin 3 is connected to the chassis via a 220 Ohm resistor.

The “soft ground” connection of Pin 3 is potentially useful for managing ground loops that may cause audible hum.

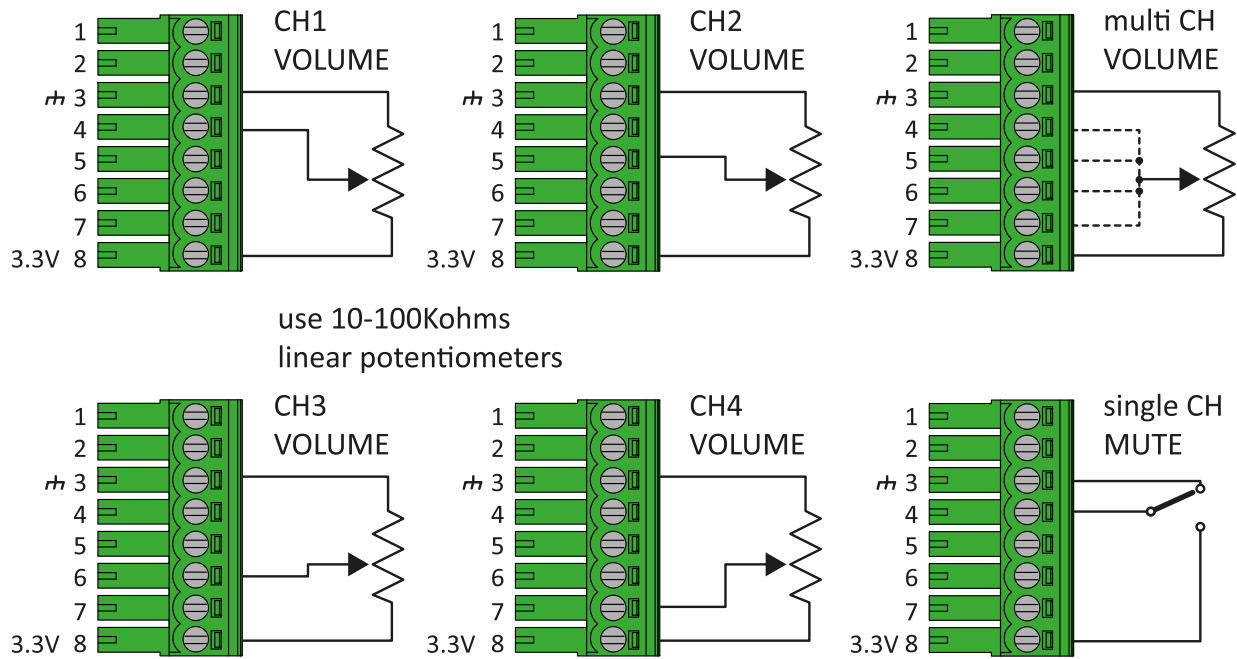
1. Standby / Mute schematic



2. Trigger IN, Trigger OUT schematic



3. Output Channel Volume schematic



DSP WebGUI:

Open a web browser and on its address bar specify the ip address of the MPX5.4DSP that is network connected; after some seconds the web browser displays the WebGUI dashboard of the amplifier. The initial dashboard is the 'Home' page from which all other configuration options can be accessed.

1. Home Page

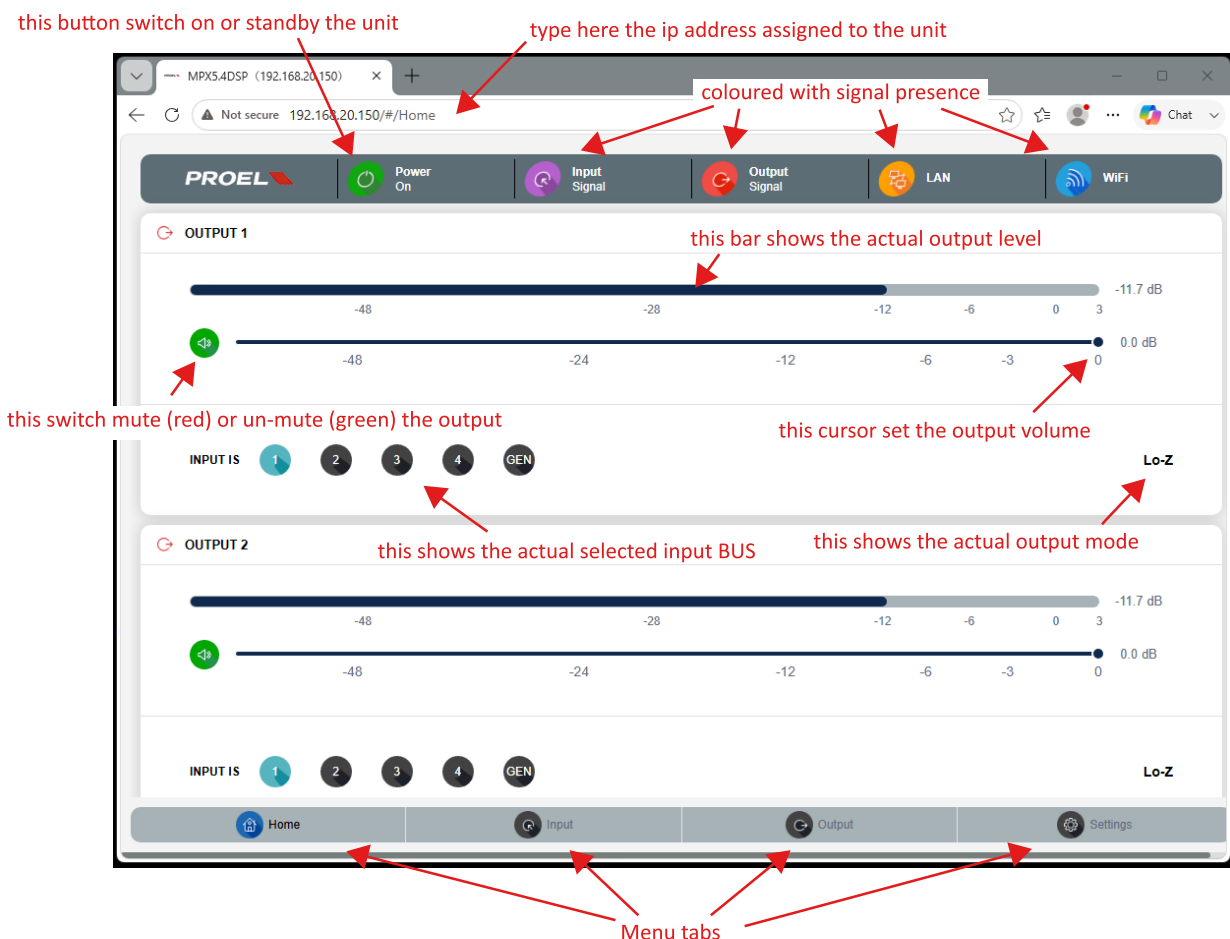
The Home page displays the amplifier status, output channels and the configuration menu tabs on the bottom of the page.

It also enables immediate access to some basic features:

- Switch on & standby.
- Output channel mute.
- Output channel volume control.

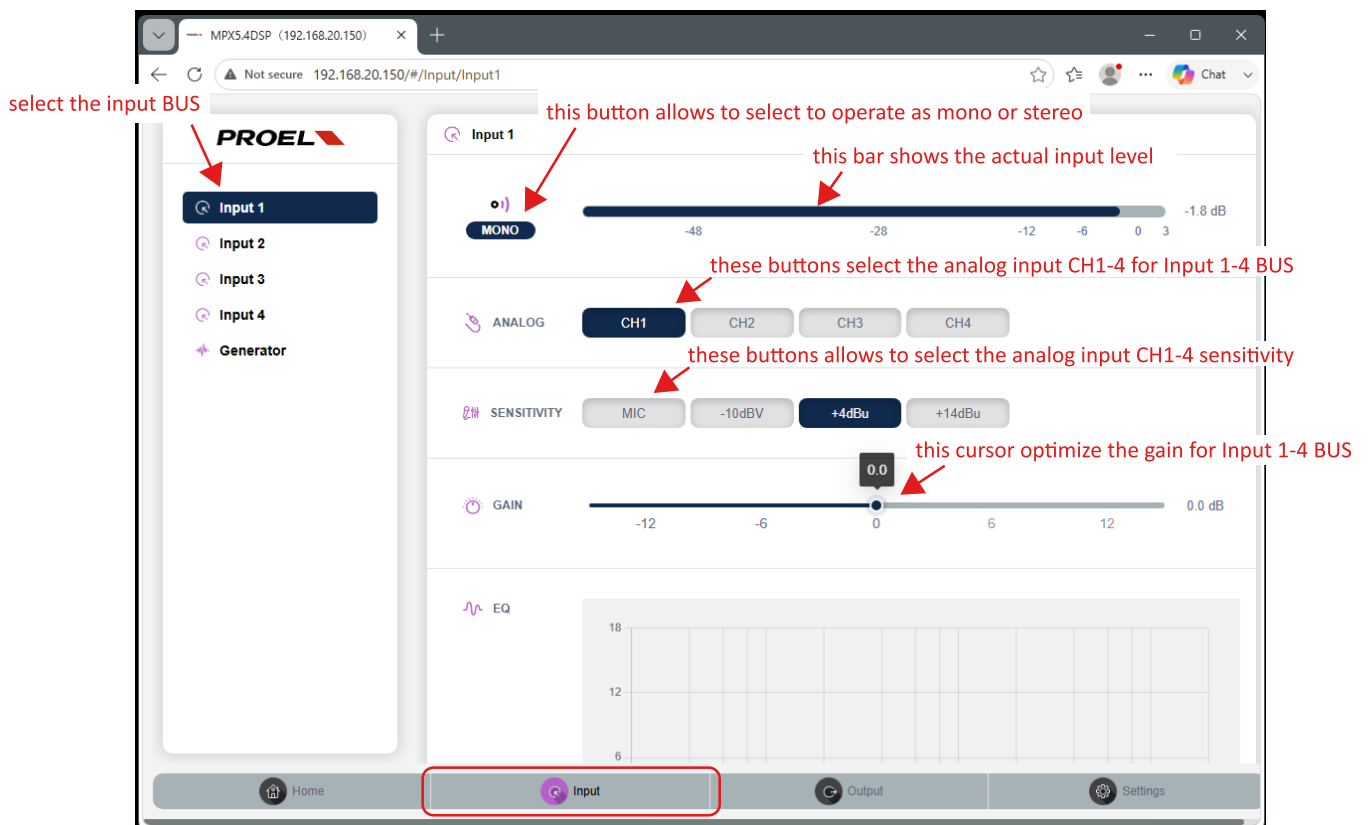
And it also shows immediately some basic information:

- Output signal level.
- Input and output signal presence.
- Selected input channel or generator.
- Selected output mode.



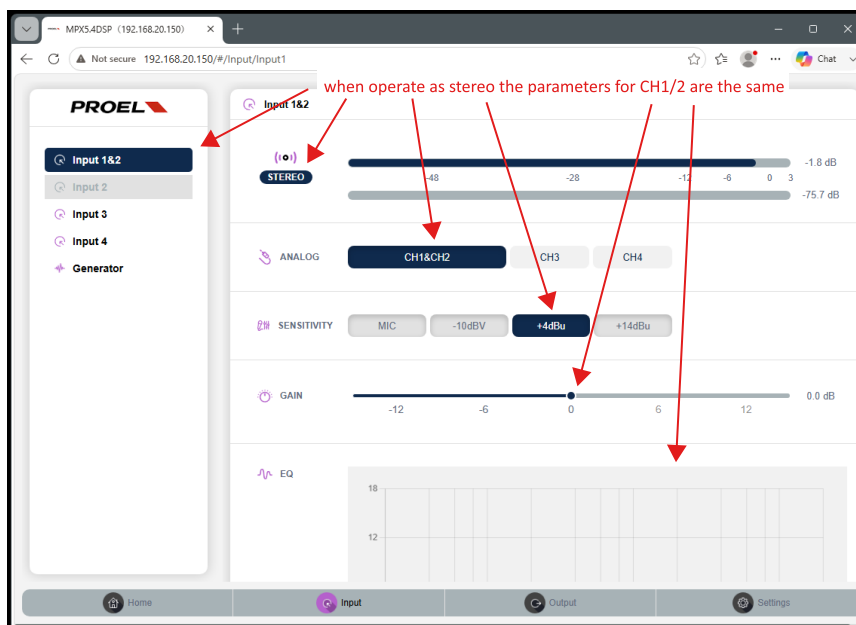
2. Input Page

The input page allows you to correctly configure the analog inputs CH1-4 and route them to the input BUS 1-4.



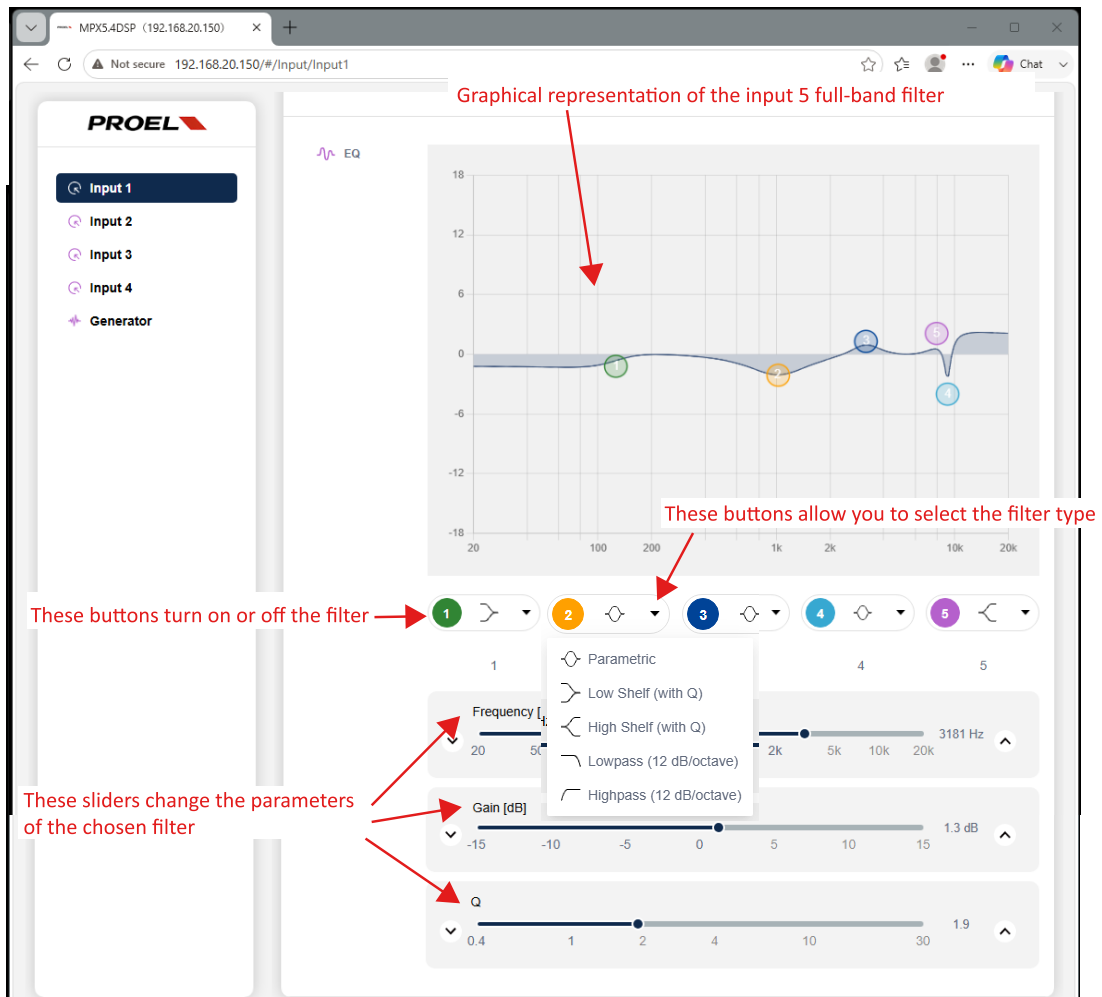
How to set properly the inputs:

- Select the input bus you want to use or modify on the left.
- Select whether this is a mono or stereo channel; with stereo mode enabled, Input 1 is connected to Input 2 and all parameters are linked together. CH1 and CH2 are also linked and send the signal to Input 1 and Input 2 respectively. Typically, Input 1 / CH1 is the LEFT channel of a sound source and Input 2 / CH2 is the RIGHT channel of the same source. Inputs 3 and 4 can also be linked in stereo mode.



- If the input bus is mono, select the analog input between the CH1 and CH4 inputs.
- Send a signal to the input then set sensitivity and gain.

- Consider optimizing the sound quality using the 5 full band filter.



The drop-down menu selects the type of filter used, filter types available are: Parametric, High and Low variable slope Shelving, Highpass and Lowpass (12dB/oct.).

- Frequency**

Set the frequency for the equalizer filter, in the range from 20Hz to 20000Hz.

For shelf filters the frequency is referred to "Gain dB/2" point, in order to obtain a slope-variable shelving filter from 6dB/oct to 12dB/oct. with a "pivot" point at the reference frequency.

The frequency can be edited using the slider or clicking in the arrows at the sides.

- Gain**

Gain of equalizer filter varies from +15dB to -15dB in 0.1dB steps.

This parameter is not available in Highpass and Lowpass filter types.

- Q**

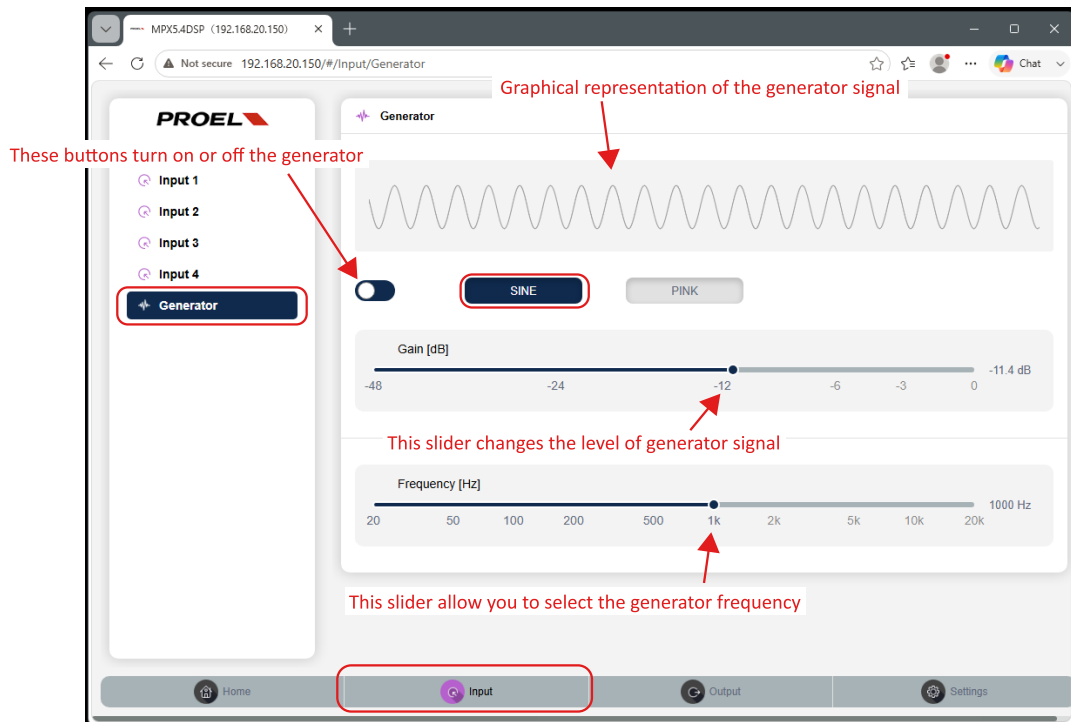
For Parametric filter type the parameter assume the meaning of "width of the bell shape" of the filter, usually defined as "Q" or "Bandwidth":

Q (Quality factor).is the ratio of the center frequency (Frequency parameter) of the filter and the bandwidth measured at the -3 dB points.

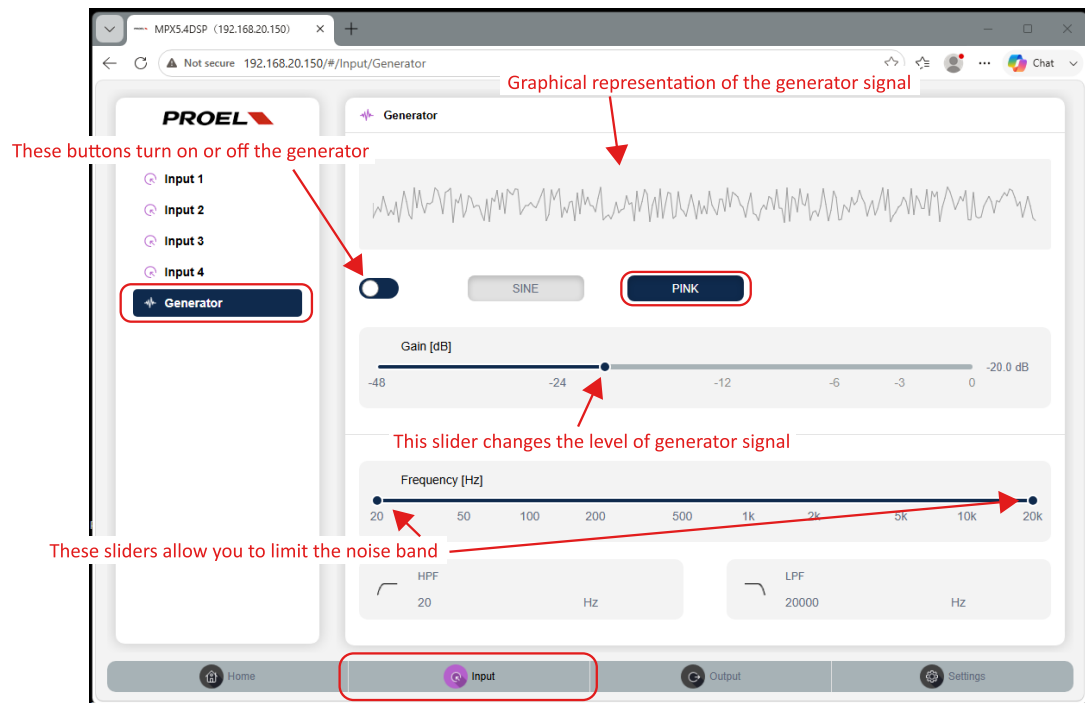
A resonant shelf filter boosts the signal at the cut-off frequency in order to emphasize the lowest or highest frequency range.

You can use this shape whenever a shelf is called for, but you also want to have a boost and a cut very close to the cut-off frequency.

- From the input menu it is also possible to generate a signal to carry out checks on the lines, on the connected speakers, and on the acoustic emission in the various rooms.
- The generator is able to produce sinusoidal signals whose intensity and frequency can be controlled:

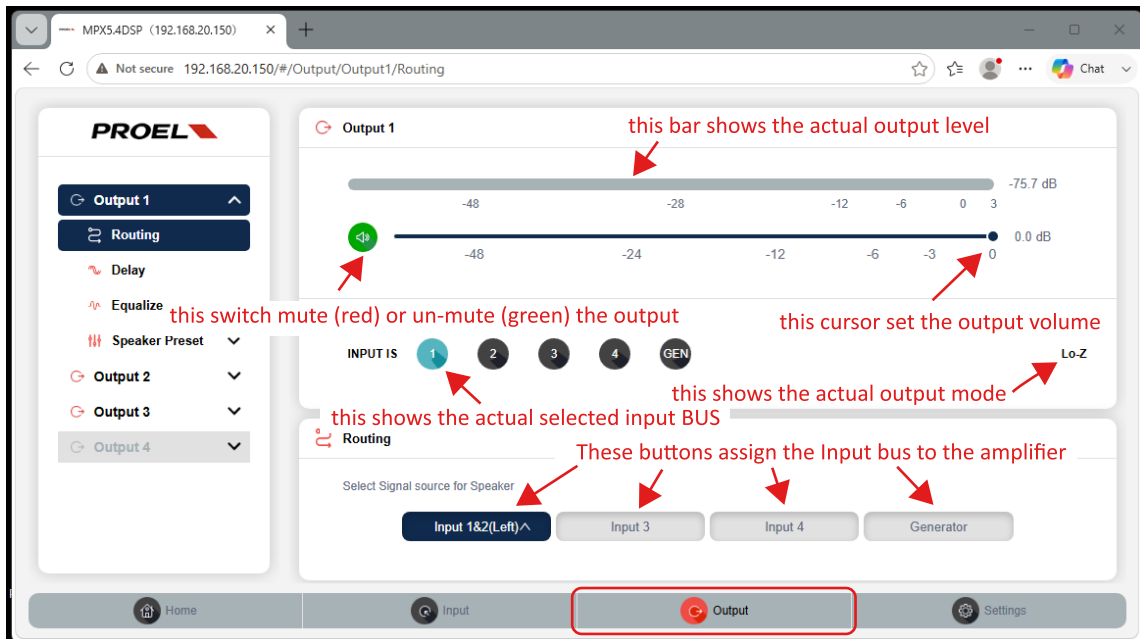


or a pink noise signal typically used for acoustic measurements, this noise can be controlled both in intensity and by limiting its bandwidth using a high-pass filter and a low-pass filter:



3. Output Page

The output page allows you to configure the Output 1-4 amplifiers, their main parameters (Routing, Delay, Equalizer), their speaker presets (Preset, Crossover, Speaker Eq, FIR, Speaker Delay, Polarity, Limiter, Output Mode).



How to set the outputs:

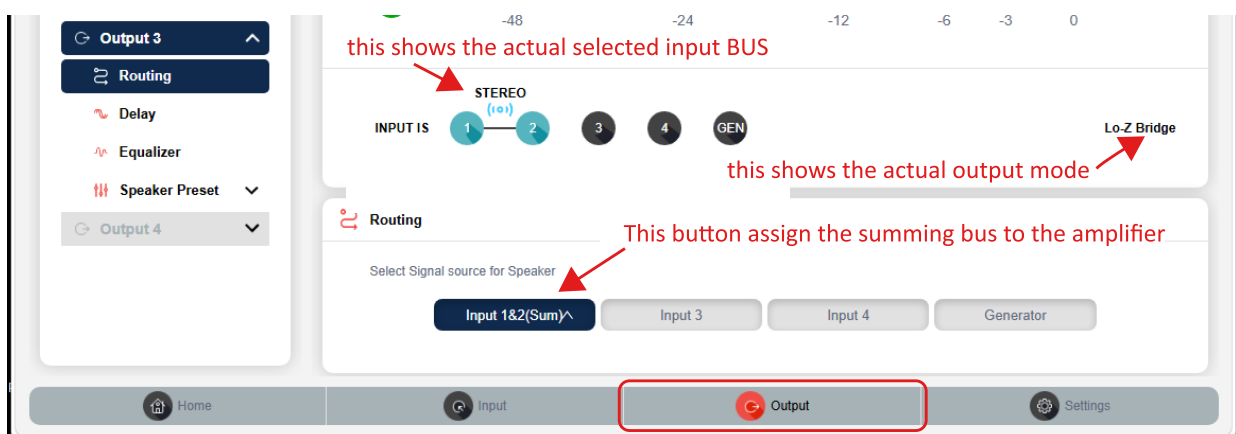
- Choose the Output you want to configure at the left of the screen and then select Routing.
- At the bottom of the screen choose the Input Bus (in this example Input 1&2 Left).
- Just above it shows which is the selected Input Bus.

Note: configuring Input 1 and 2 as stereo we have three choices:

"Input 1&2(Left)" that corresponds to channel left signal connected to CH1.

"Input 1&2(Right)" that corresponds to channel right signal connected to CH2.

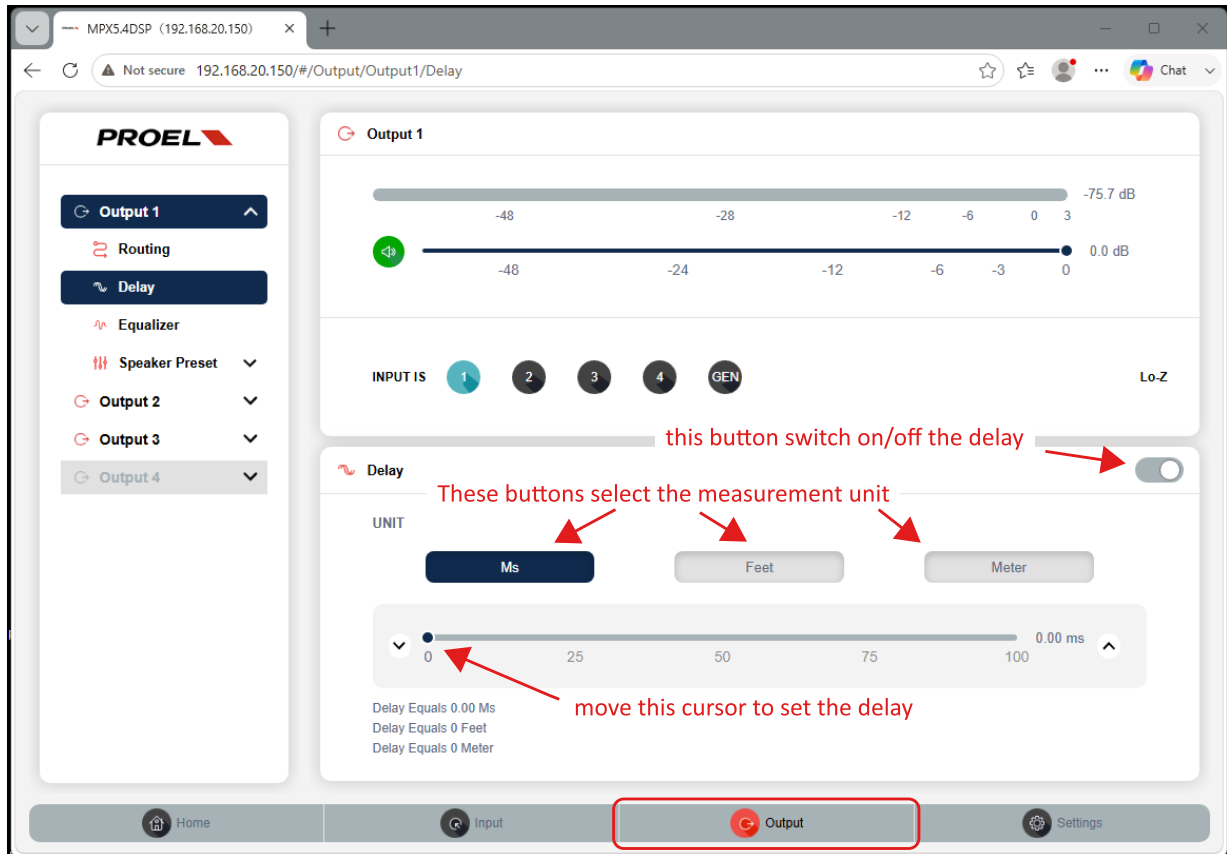
"Input 1&2(Sum)" that corresponds to channel left signal summed with channel right signal.



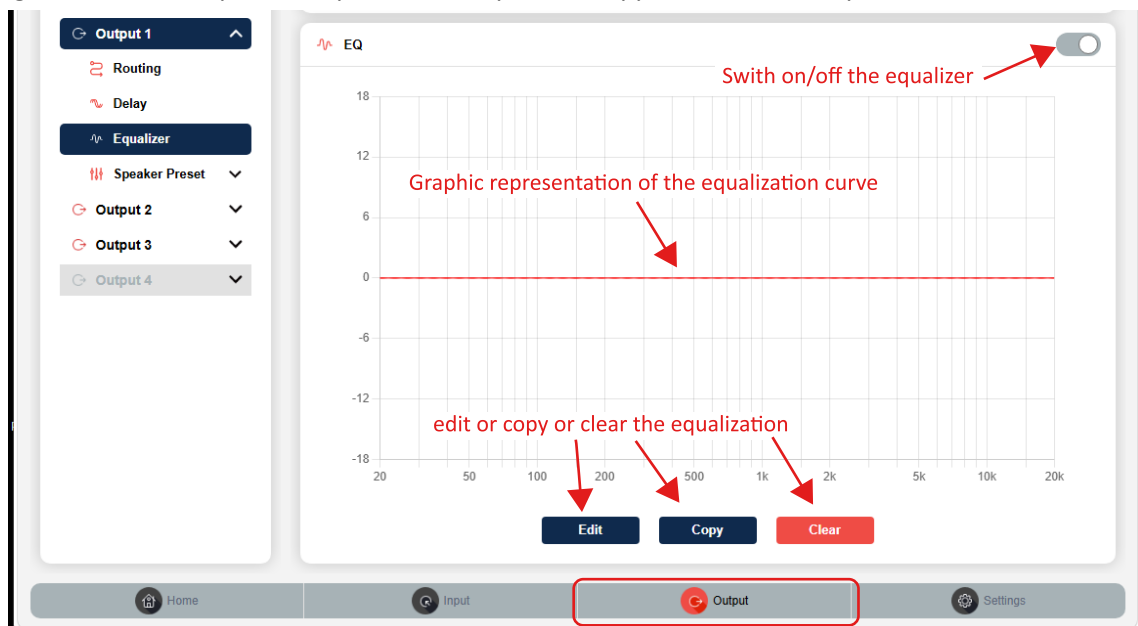
The **Delay menu** allows you to apply a delay to individual amplifier outputs; the delay can be specified in terms of time (milliseconds ms) or distance (feet or meters):

- Choose the unit.
- Use the slider or click the arrows on the sides to change the delay.
- Use the switch at the top right to apply the delay.

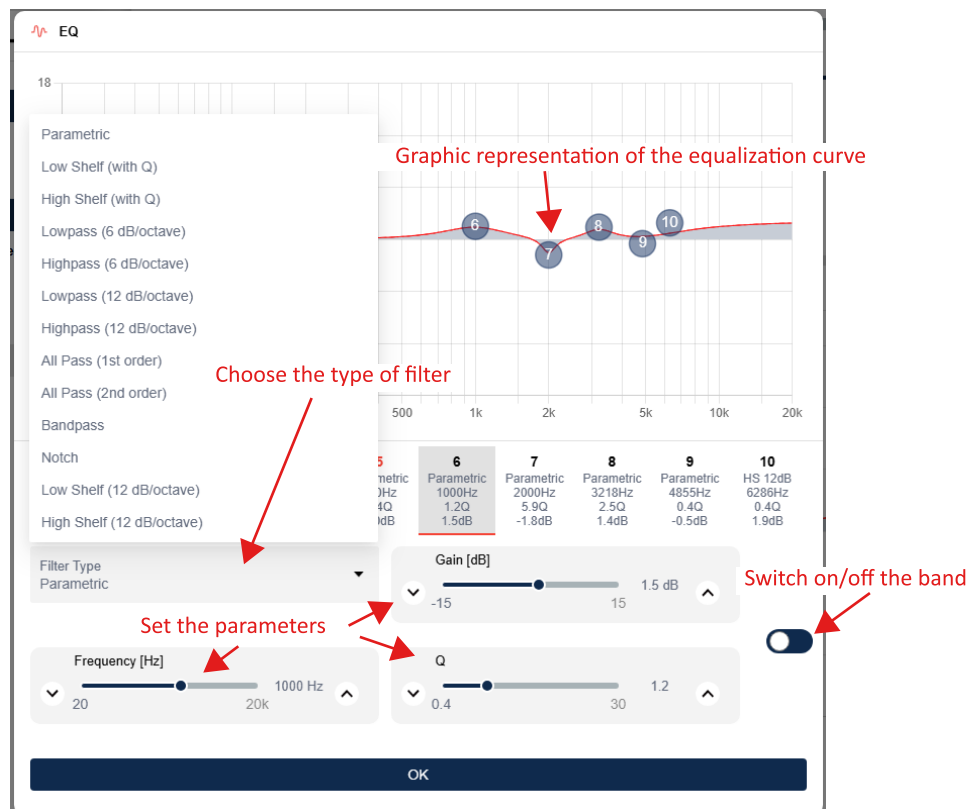
Note: Toggling delay on/off is useful for aligning different outputs and testing whether applying delay actually provides benefits, either with an instrument or simply by listening.



The **Equalizer menu** allows you to apply equalization to individual amplifier outputs. Equalizer settings configured for one amplifier output can be copied and applied to other outputs.

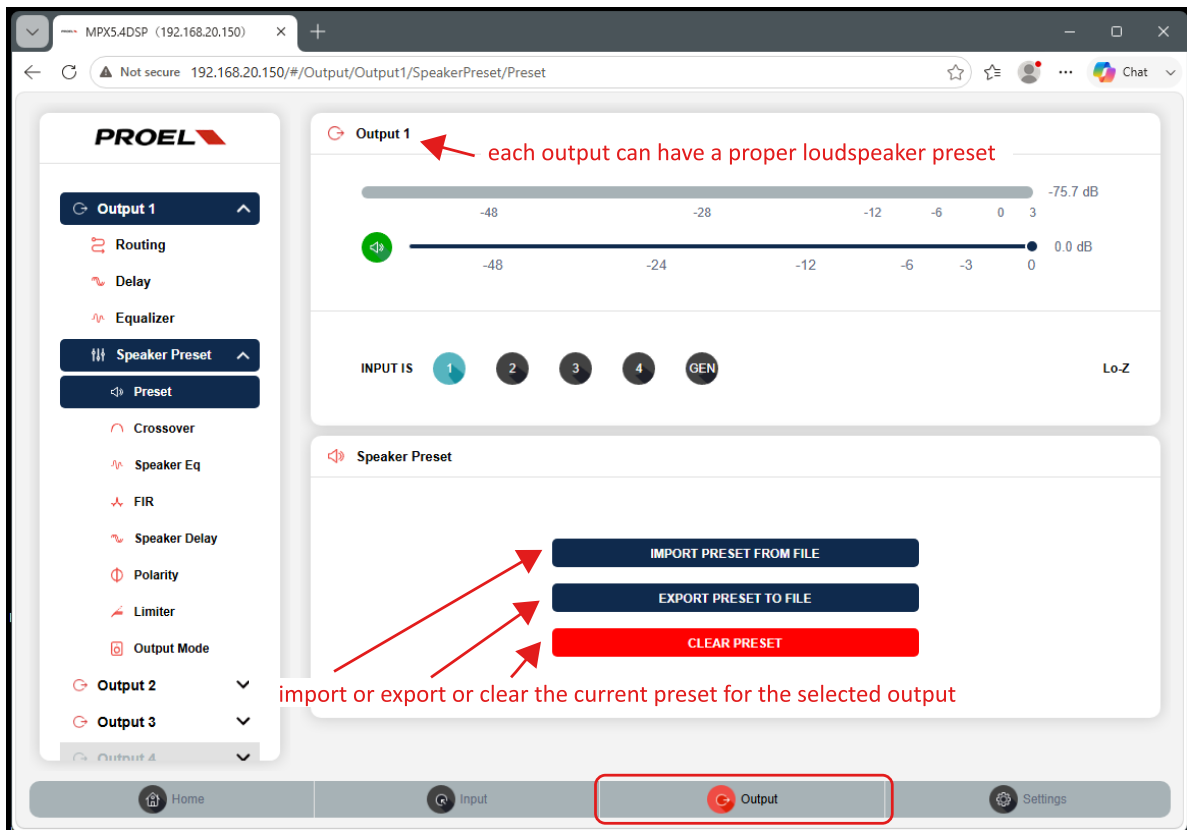


The output equalizer has ten adjustable bands, like the input equalizer described above, with the addition of several features.

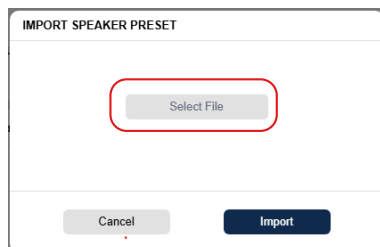


Speaker Preset allows you to recall a profile for a specific loudspeaker, it can be your custom loudspeaker or a PROEL LTX model that can be downloaded from our website.

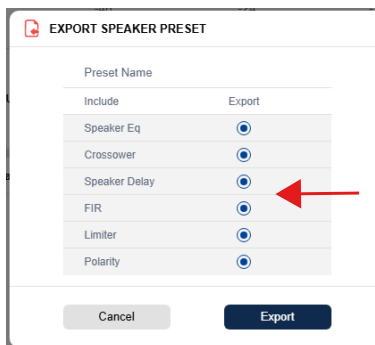
The following instructions show how you can make a custom preset.



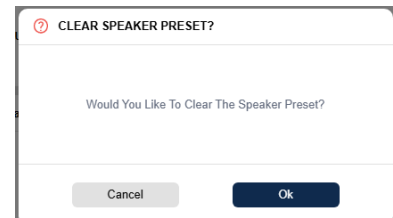
Select the file containing the speaker parameters you want to use; the file has the .PEG extension.



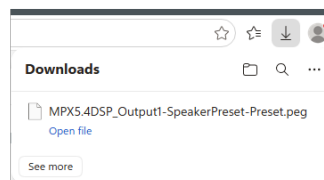
Select the parameters for the speaker actually used and store them in the current output; the file will be saved with a .PEG extension.



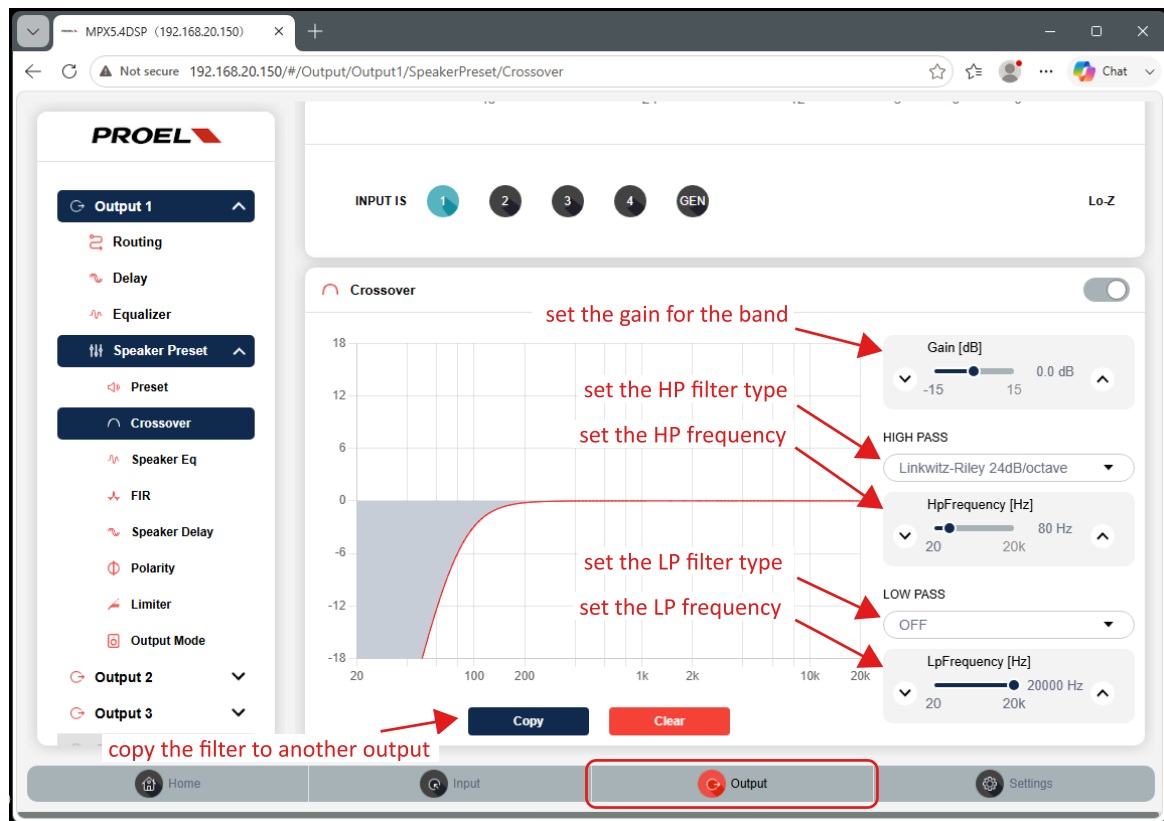
Clears all speaker parameters loaded in the current output.



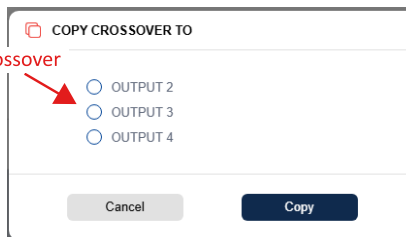
The .PEG file will be saved in the download folder specified in the browser you are currently using.



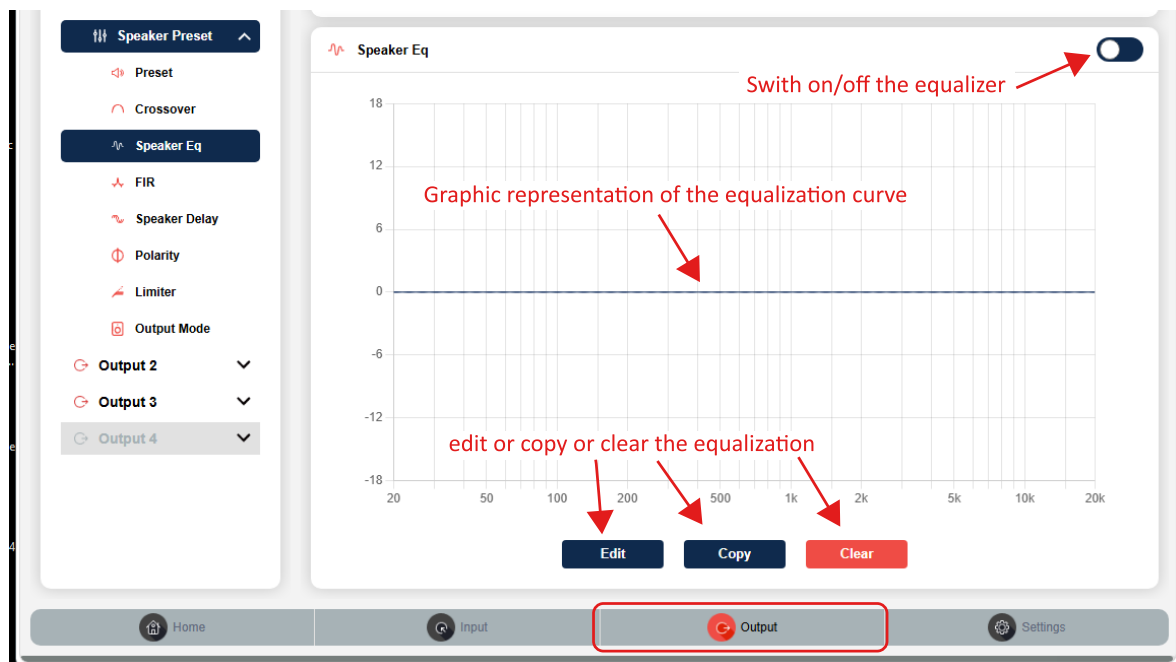
The **Crossover** page allows you to set a crossover filter for each output, typically used for Subwoofer-Satellite separation, for a bi-amped speaker, or to limit the bandwidth of a particular speaker, such as multiple horns connected in parallel on a high impedance line.



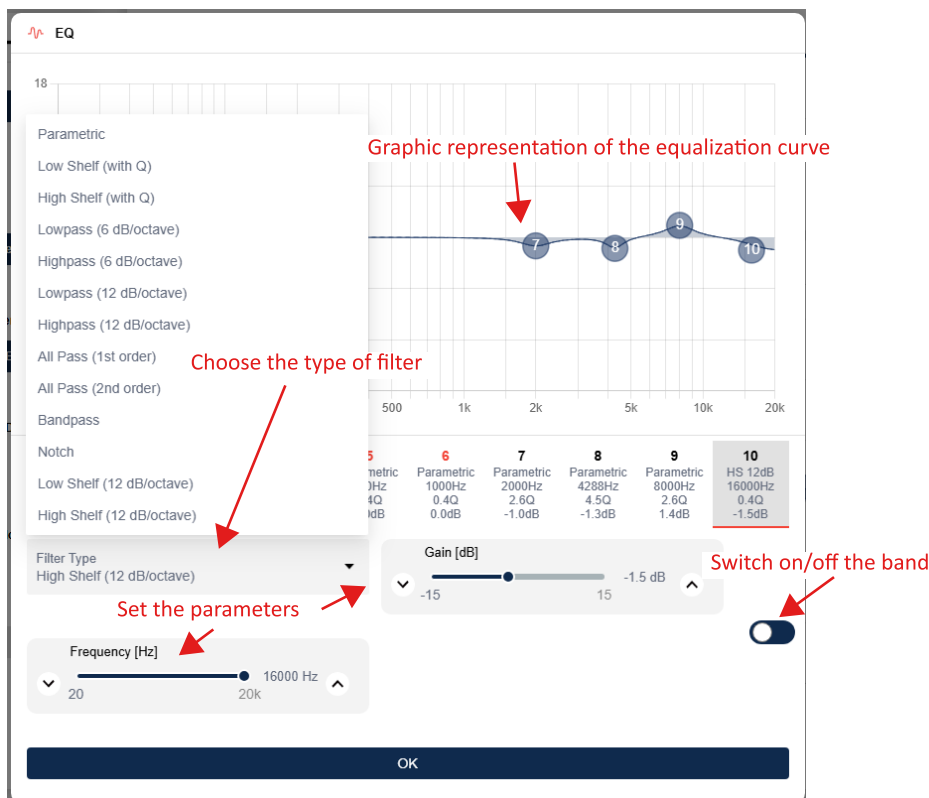
select the output where to copy the crossover



The **Speaker Equalizer** menu allows you to apply equalization to a speaker type. Equalizer settings configured for one amplifier output can be copied and applied to other outputs.

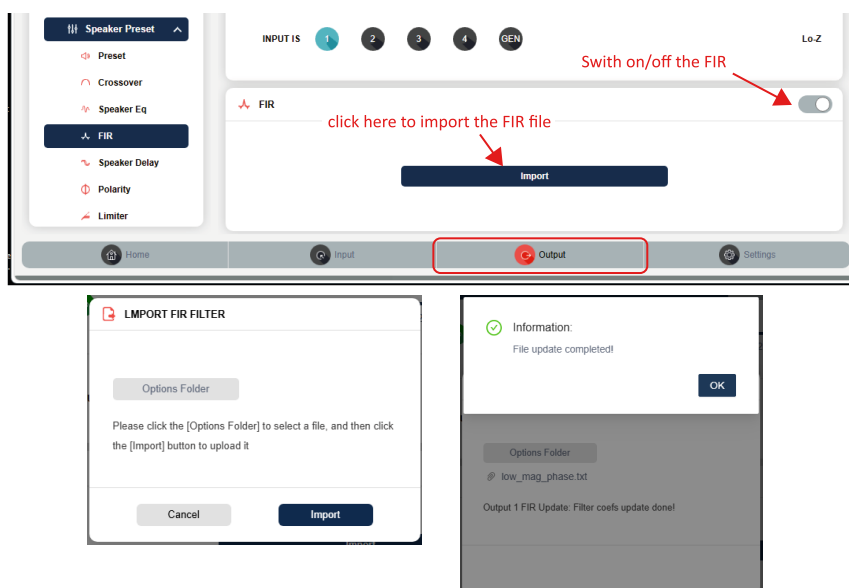


Like the output equalizer described above, the speaker equalizer has ten adjustable bands. The real difference is that it can be stored along with the other speaker parameters. The output equalizer, on the other hand, can be used for specific situations, such as room equalization or equalization based on music genre.

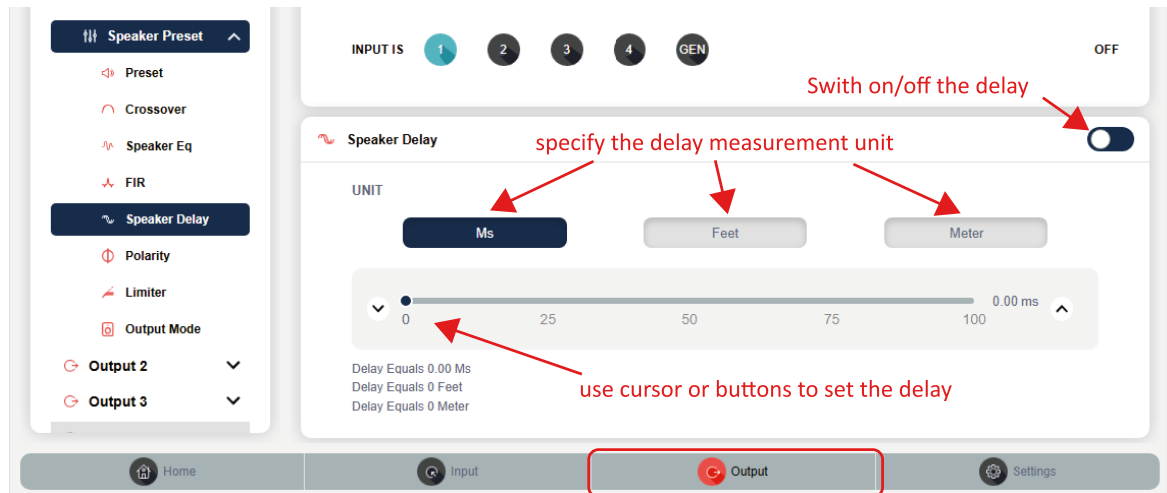


The internal DSP allows you to import **FIR filters**. How to create appropriate FIR filters for a speaker is beyond the scope of this manual.

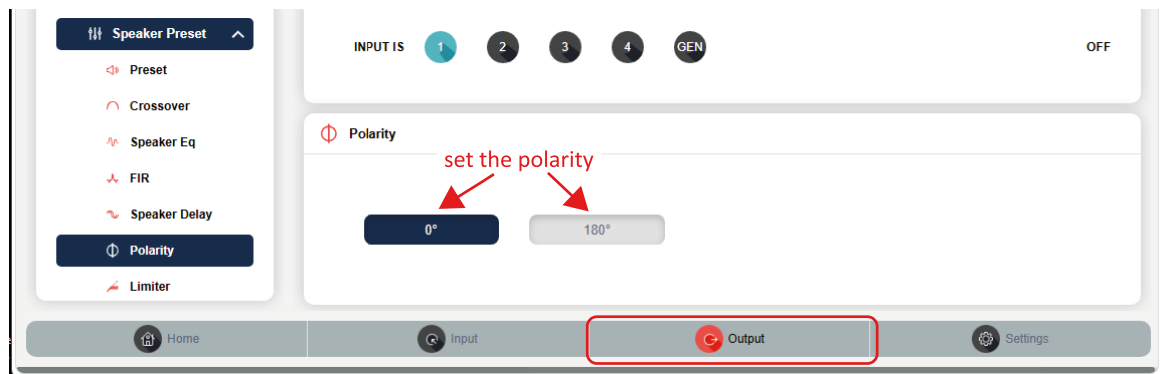
Note: Once you import a FIR file it will not be saved in the speaker preset, only the on or off state is saved in the preset, the FIR filter will need to be re-imported if used.



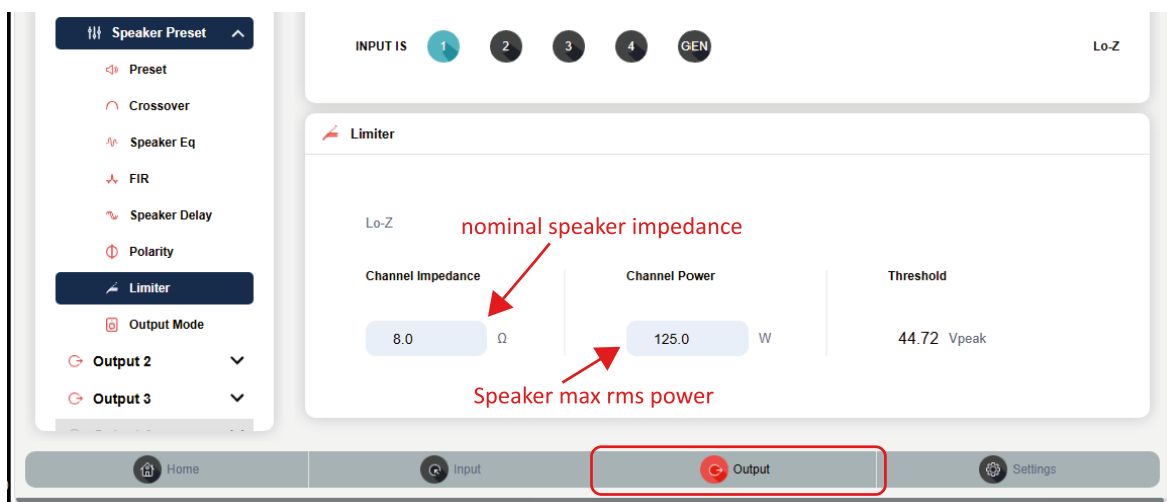
The **Speaker Delay** menu allows you to apply a delay to a speaker preset, specifying it in time (ms) or distance (feet or meters), assuming a sound speed of 343 m/s. In this case, the delay is stored in the speaker preset and is primarily used to set a delay for each way in a multi-way system, unlike the Output Delay, which is primarily used to set a delay for multiple speakers placed in the same room.

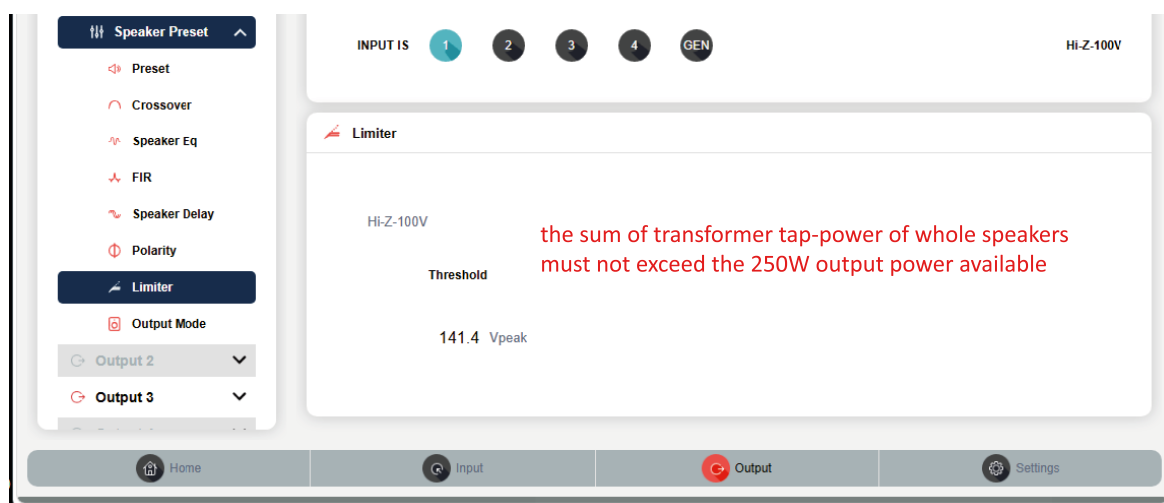
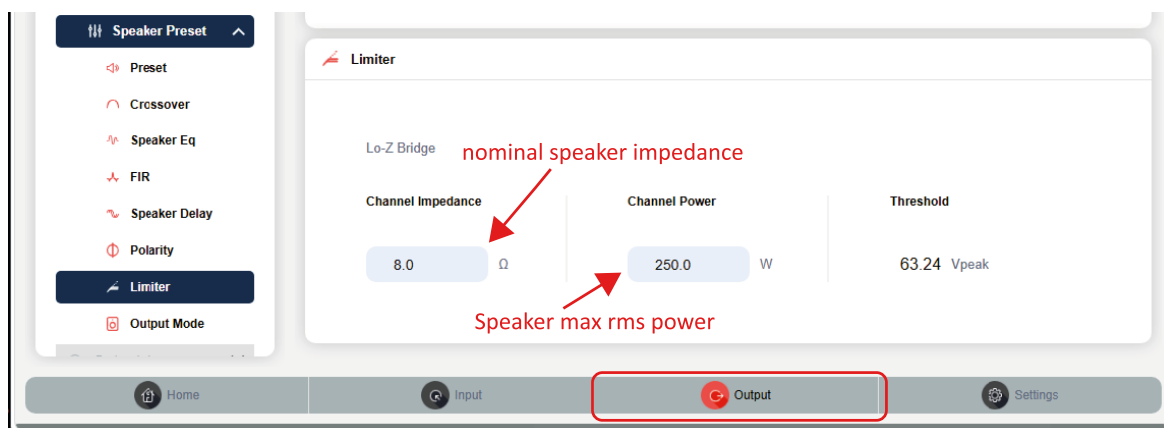


The **Polarity** menu allows you to set the polarity of the speaker connected to the output.



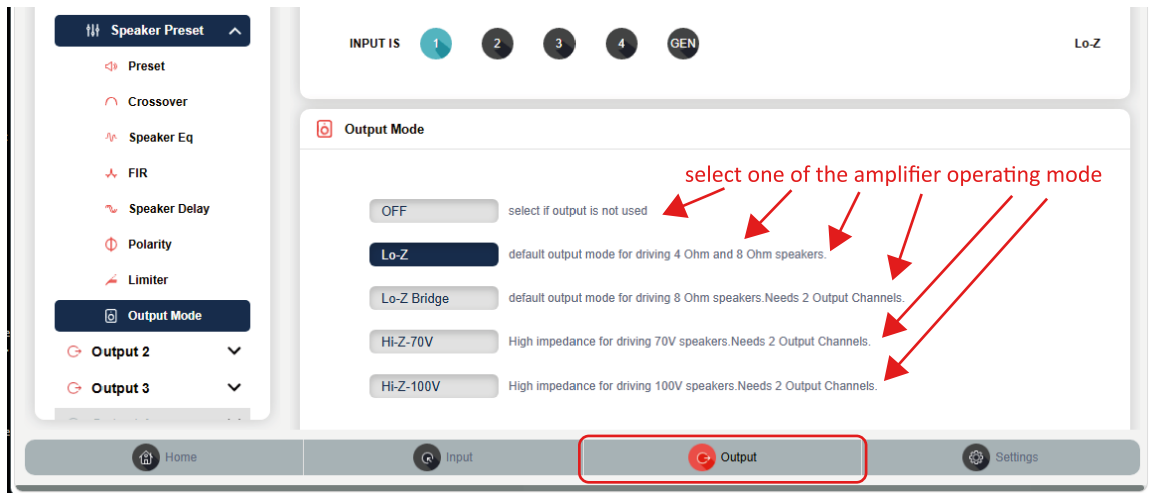
The **Limiter** menu allows you to limit the output power for a specific speaker. For Lo-Z speakers specify the nominal impedance and the rms power it can drive. For Hi-Z speakers the power is limited by transformer tap inside of each speaker, and in any case the sum of the speaker power has not to exceed 250 W.





The **Output power menu** allows you to set how the amplifiers have to work, you can choose between:

- OFF, the amplifier is turned off
- Lo-Z, the amplifier is connected to a low impedance speaker with typically nominal impedance of 4 or 8 ohm, in this configuration the amplifier can deliver up to 125 W.
- Lo-Z Bridge, the amplifier works in bridge mode together the next amplifier (1-2 or 3-4), it is connected to a low impedance speaker with typically nominal impedance of 8 ohm, in this configuration the amplifier can deliver up to 250 W.
- Hi-Z 70V, the amplifier works in bridge mode together the next amplifier (1-2 or 3-4), it is connected to a high impedance 70V speaker line, the amplifier can deliver up to 250 W, the sum of the power tap of whole speakers' line have not to exceed the maximum delivered power of 250 W.
- Hi-Z 100V, the amplifier works in bridge mode together the next amplifier (1-2 or 3-4), it is connected to a high impedance 100V speaker line, the amplifier can deliver up to 250 W, the sum of the power tap of whole speakers' line have not to exceed the maximum delivered power of 250 W.

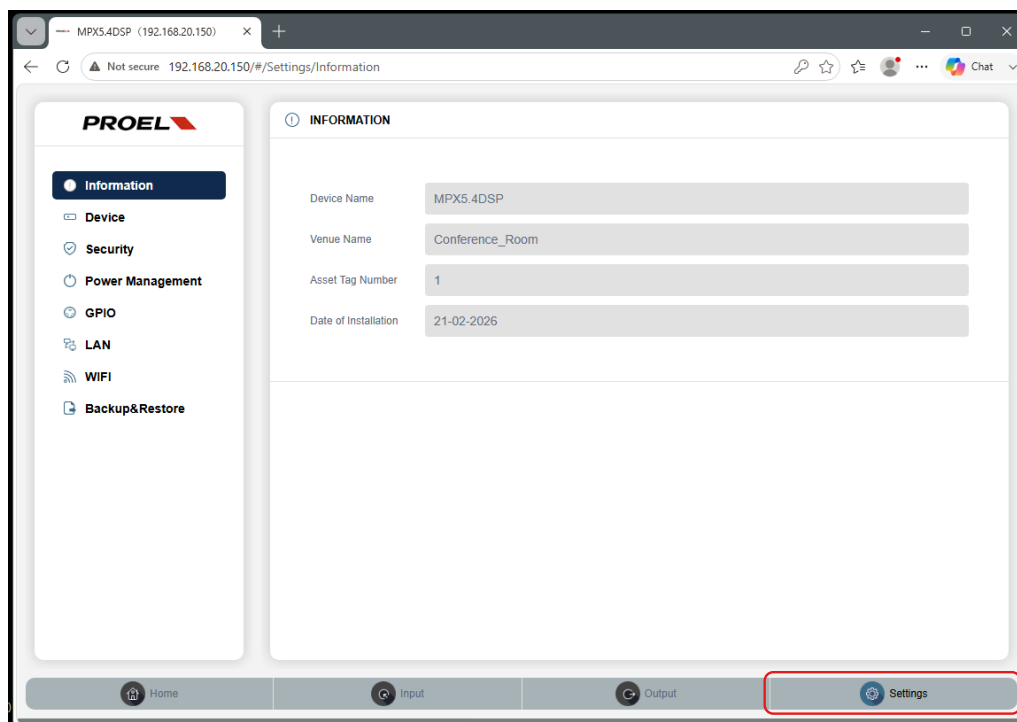


4. Setting Page

The setting page allows you to configure the MPX5.4DSP general parameters (Information, Device, Security, Power Management, GPIO, LAN, WIFI, Backup & Restore).

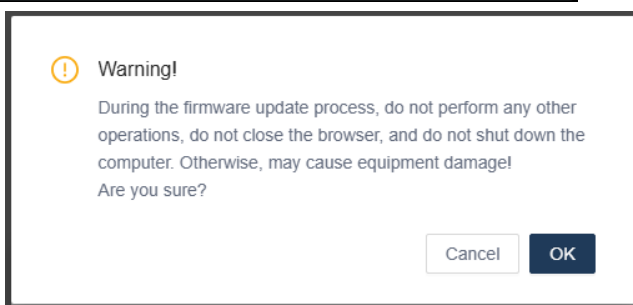
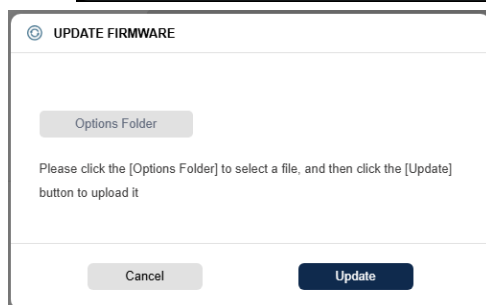
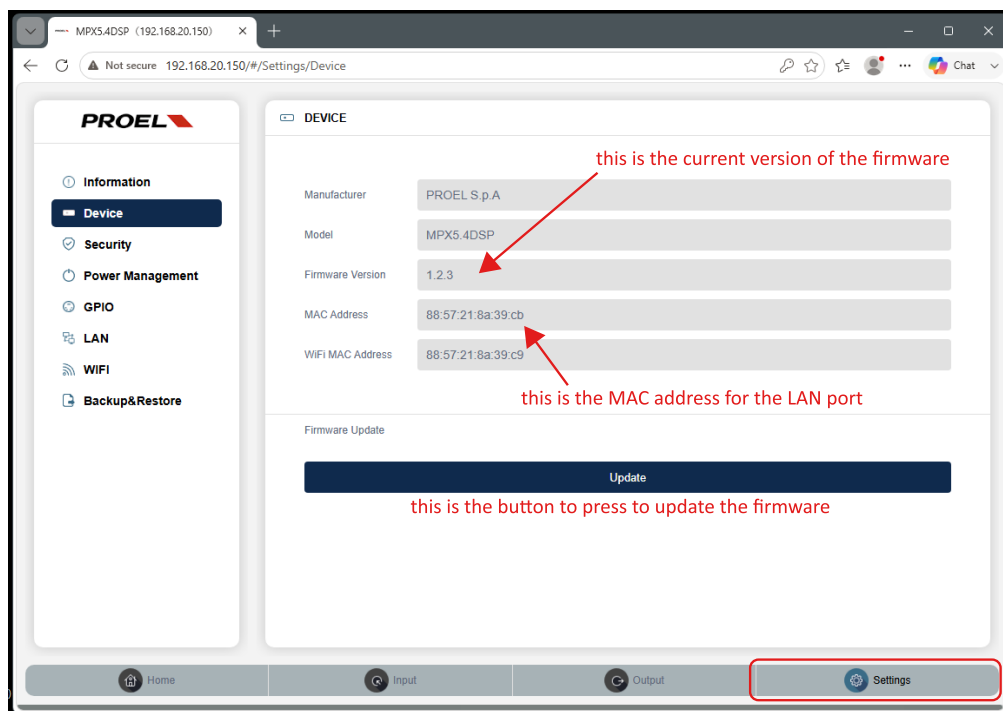
The **Information Page** allows you to memorize in the unit some information that are useful to identify which unit you edit in a complex system.

Note: the Venue Name doesn't accept a space character using the underscore instead of it.

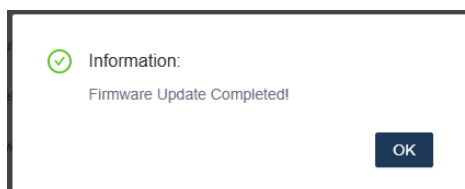


On the **Device** page:

- It shows the current firmware version.
- The LAN MAC address is a unique address of the LAN interface within the MPX5.4DSP that can be used by an Ethernet router to reserve a specific TCP/IP address for this unit.
- The button that allows you to load a new firmware version inside the unit, it will show a dialog box where you have to choose the .dat file download from the PROEL website.



WARNING when you update the firmware a warning message appears, do not perform any other operation and wait until the following message appears:



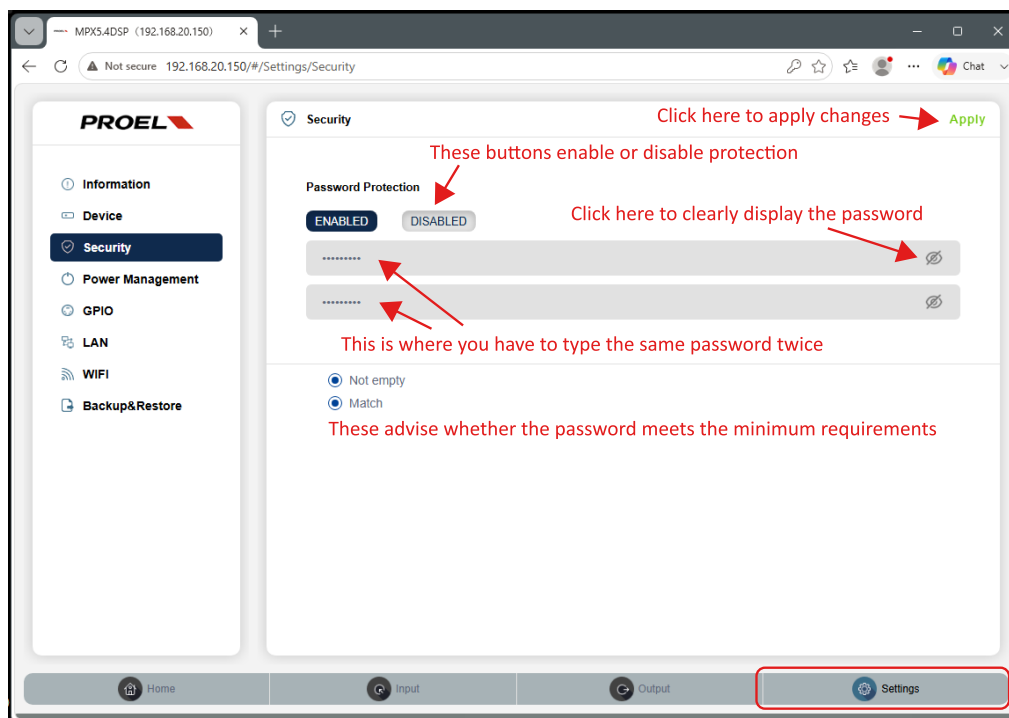
Note: Press OK and the unit will restart maintaining where it is possible the same previous configuration. In any case is highly recommended before update the firmware to make a Backup of the entire unit.

In the Security page is possible to specify a password to access at the MPX5.4DSP WebGUI.



WARNING: If you forget your password, there is no way to recover it or reset the MPX5.4DSP without performing service.

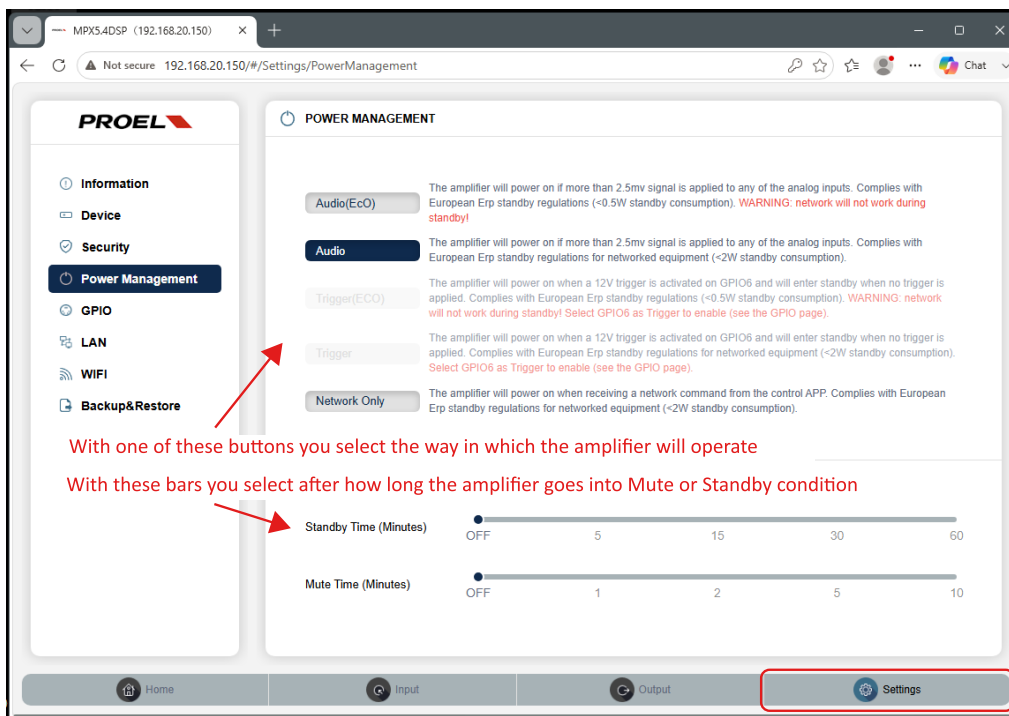
For this reason, using a generic password for protection is not recommended.



Power management page allows you to set how long it takes for the amplifier to go into Mute or Standby mode and how it reverts to operation.



NOTE: When the power line is restored after a temporary or intentional interruption, the MPX5.4DSP will power up, after which the power management system will take control of the unit.



Audio (ECO): The amplifier will power on if more than 2.5mv signal is applied to any of the analog inputs. Complies with European Erp standby regulations (<0.5W standby consumption).



WARNING: network will not work during standby!

Audio The amplifier will power on if more than 2.5mv signal is applied to any of the analog inputs. Complies with European Erp standby regulations for networked equipment (<2W standby consumption).

Trigger (ECO) The amplifier will power on when a 12V trigger is activated on GPIO6 and will enter standby when no trigger is applied. Complies with European Erp standby regulations (<0.5W standby consumption).



WARNING: network will not work during standby!

Select GPIO6 as Trigger to enable (see the GPIO page).

Trigger The amplifier will power on when a 12V trigger is activated on GPIO6 and will enter standby when no trigger is applied. Complies with European Erp standby regulations for networked equipment (<2W standby consumption).



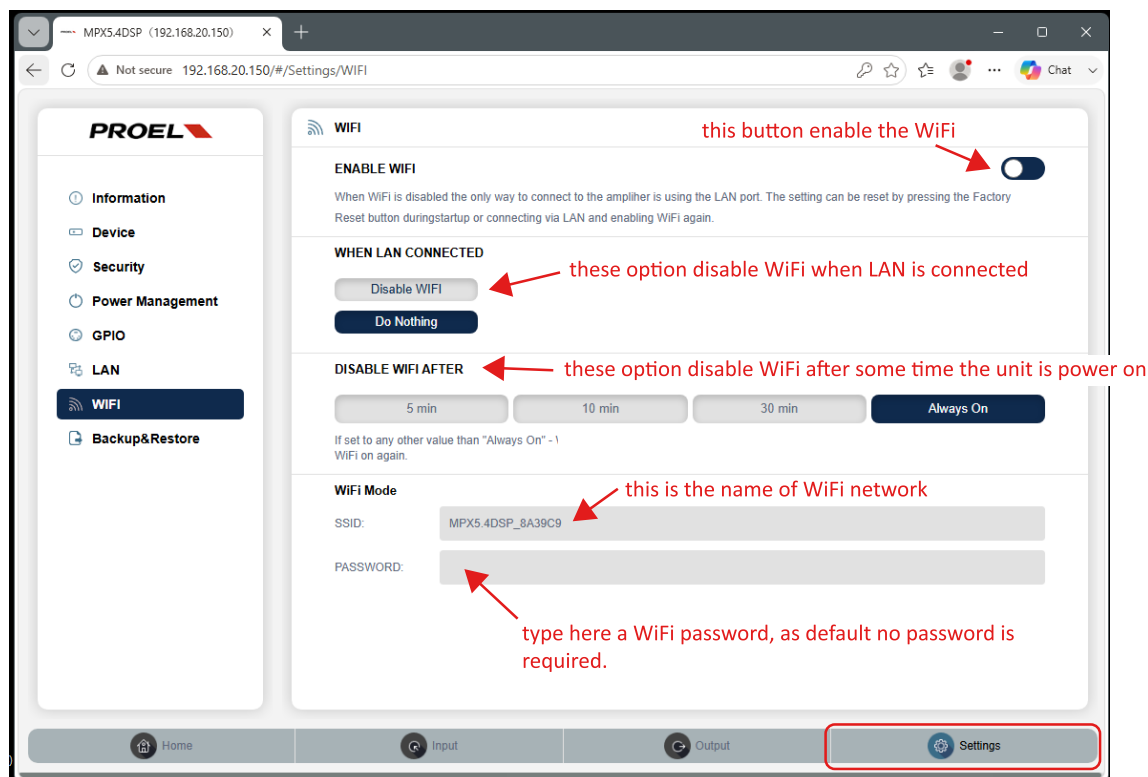
Select GPIO6 as Trigger to enable (see the GPIO page).

Network Only The amplifier will power on when receiving a network command from the control APP. Complies with European Erp standby regulations for networked equipment (<2W standby consumption).

GPIO page is explained in detail in the beginning of this manual in the WIRING GPIO chapter.

LAN page is explained in detail in the beginning of this manual in the SETUP INTO AN EXISTING NETWORK chapter.

WiFi page allows you to set the WiFi connection



ENABLE WIFI: enable or disable the WiFi connection.

WHEN LAN CONNECTED: allow to disable the WiFi connection when a LAN is connected.

Note: disable WiFi connection when LAN is connected is a simple method to deactivate and reactivate

WiFi simply connecting or disconnecting the rear LAN cable.

DISABLE WIFI AFTER: allow to disable the WiFi connection after some time the unit is turned on.

Note: this is an alternative method to disable WiFi connection after some time the unit is turned on using the ON/OFF button on the front panel.

WiFi Mode: This displays the WiFi network SSID of each MPX5.4DSP unit, which is different for each unit. Below, you can enter a password to access the WiFi network.

Tip: To protect your unit from unwanted connections, it's best to use one of the above methods and avoid setting a password that's easy to forget.

Backup and Restore page allows you to save the unit's current configuration to a file with the following name: MPX5.4DSP_20260701171231675.pegall, where .pegall identifies the file type. The name consists of the model name followed by the date and time. The file is automatically saved to your browser's Downloads folder. You can rename the file as desired, keeping the .pegall extension.

BACKUP SETUP TO FILE allows you to save the file.

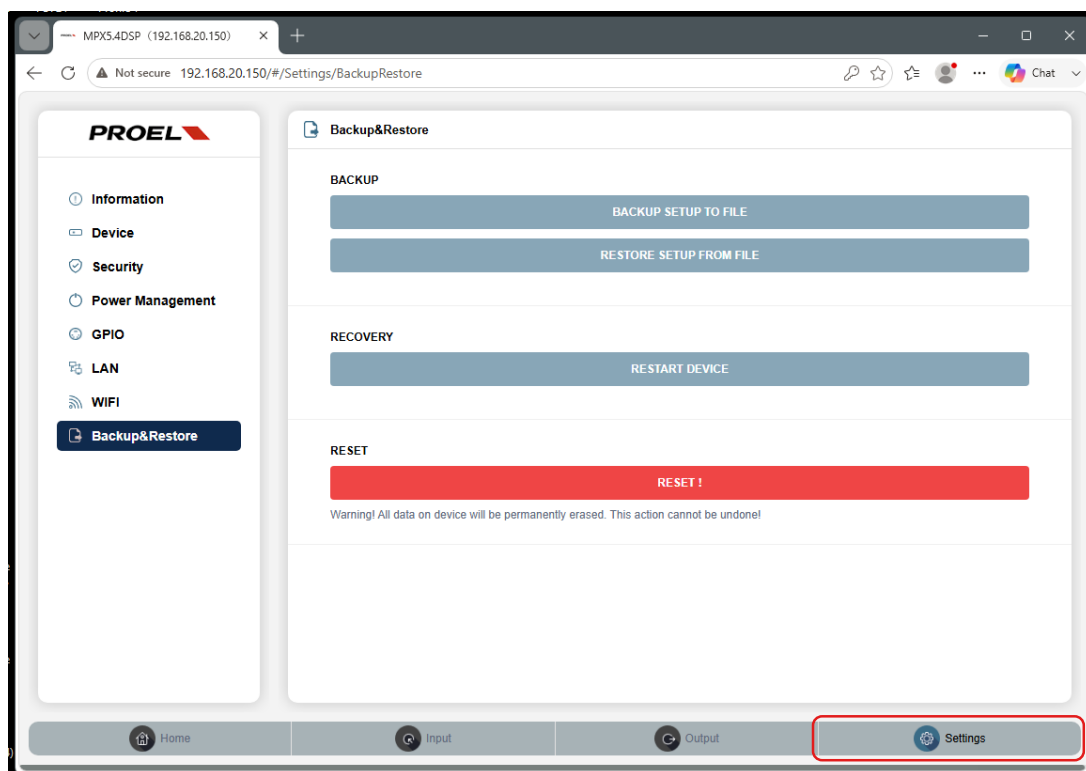
RESTORE SETUP FROM FILE allows you to load a configuration.

RESTART DEVICE allows you to restart the device with the current configuration.

RESET allows you to reload the factory default settings.



WARNING! All data on device will be permanently erased. This action cannot be undone!



PROEL LTX PRESET

A selection for PROEL LTX passive speakers will follow soon.

EXAMPLE

Some generic example will follow soon.



TECHNICAL SPECIFICATIONS

<i>Input Sensitivity</i>	MIC / -10dBv / +4dBu / +14dBu
<i>Analogue Inputs</i>	4x Female RCA / 2x Euroblock 3.5mm 6pin
<i>GPIO port</i>	Euroblock 3.5mm 8pin
<i>DSP control</i>	Internal WebGUI
<i>LAN control</i>	WiFi / Ethernet tcp/ip
<i>Channels</i>	4x Lo-Z / 2x Hi-Z
<i>Output Power @ 4 Ω</i>	4x 125W (SE)
<i>Output Power @ 8 Ω</i>	4x 125W (SE) 2x 250W (BTL)
<i>Output Power @ 70 V</i>	2x 250W (BTL)
<i>Output Power @ 100 V</i>	2x 250W (BTL)
<i>Total System Power</i>	500 W
<i>Output Voltage</i>	70 Vp / 140 Vpp (unloaded) // Bridged 140 Vp / 280 Vpp (unloaded)
<i>Output Connectors</i>	2x Euroblock 5.08mm 4pin
<i>Signal to Noise-Ratio</i>	> 100 dB (A-weighted, 20 Hz ÷ 20 kHz, 8 Ω load)
<i>THD+N (typical)</i>	< 0.05% (20 Hz ÷ 20 kHz, 8 Ω load, 3 dB below rated power)
<i>Frequency Response</i>	20 Hz ÷ 20 kHz (+/- 0.5 dB, 8 Ω load, 3 dB below rated power)
<i>Protection Circuits</i>	Short circuit, DC, Undervoltage, Temperature and Overload protection
<i>Operating temperature</i>	0 ÷ 40 °c
<i>Operating Voltage</i>	100V ÷ 240V, 50 / 60 Hz
<i>Standby Consumption</i>	< 0.5 W
<i>Rack Unit</i>	1 RU





PROEL S.p.A.

(World Headquarters - Factory)

Via alla Ruenia 37/43

64027 Sant'Omero (Te) – Italy

Tel: +39 0861 81241

Fax: +39 0861 887862

<https://soundsystems.proel.com/>