



PRO 2.4 BT
+ AUDIO

Processor
Controlled
via App and
Bluetooth
Connection
+Audio



The installation of this product must be carried out by a qualified professional.

Index

- 01 • Introduction
 - Package Contents
- 02 • Safety Requirements
 - Important Recommendations
 - Safety
- 03 • Processor Overview
- 04/05 • Product Usage
- 06 • App Home Screen
- 07 • Audio Menu
 - Input / Output Routing
 - Input Graphic Equalizer
- 08 • Input Parametric Equalizer
- 09 • Crossover
- 10 • Alignment (Delay)
 - How to Set the Alignment Parameter Value
 - Phase
- 11 • Limiter
- 12 • Output Levels
 - Output Parametric Equalizer
- 13 • Audio Generator
- 14 • Settings / Presets
- 15 • Product Name
 - Password
 - Information
- 16 • Player
 - Online Radio
 - Voltmeter
- 17 • Processor Input and Output Connections
- 18 • BOB Box Mode Connection
- 19/20 • Technical Specifications
- 21 • Warranty Terms
 - Technical Support

Introduction

Read this manual carefully before making any connections or using the product. If you have any questions, please contact our technical support: **+55 (18) 3266-4050** or **www.taramps.com.br**

The **PRO 2.4BT + AUDIO** is a digital audio processor that includes Bluetooth connectivity, allowing full control of all settings via Smartphone or Tablet through a dedicated app. The app presents information in an intuitive way, enabling simple and real-time adjustments. It features a wide range of adjustments, configurations, and precision through a 24-bit/48kHz DSP. It includes crossover filters, alignment, gain control, phase inversion, limiter, routing, graphic and parametric equalizers, among other features to enhance the performance of your audio system. With the convenience of Bluetooth A2DP connection for audio streaming between the smartphone and the processor, in addition to the voltmeter function.

Package contents

- 1 PRO 2.4BT + AUDIO Processor
- 1 Power Connector (4-pin)
- 1 Wired Signal Input Connector (4-pin)

Safety requirements

- To ensure proper use, read this manual before using your processor. It is important that you are aware of the **CAUTIONS** contained herein.
- The installation of this device must be carried out by a qualified professional.
- Use appropriate tools to install this device.
- This device must be used with 12V batteries. Always check the voltage before installation.
- This device must be installed in a secure location and away from heat sources.
- Never install in locations exposed to dust, moisture, or water. Ensure it is installed away from the fuel tank, fuel lines, heat sources, and other parts of the vehicle.
- Make sure to install a protection fuse or circuit breaker close to the battery. Follow the current rating specified in this manual. Using an incorrect fuse or circuit breaker may result in overheating, smoke, damage to the product, injury, or burns.
- Avoid routing wires over or through sharp edges. Use rubber or plastic grommets to protect any wires passing through the vehicle's body.
- The car audio system can produce high sound pressure levels. Avoid continuous exposure to levels above 85 dB to prevent permanent hearing loss.

Important recommendations

The recommended wire gauge is 1.5 mm² for the positive/negative wires and 0.50 mm² for the remote wire.

As protection, a fuse (1A) must be installed near the positive terminal of the battery. See more details on page 16 of this manual.

- 1 - ● Power Ground (Negative): Connect to the negative terminal of the battery.
- 2 - Remote Input: Connect to the remote output of the CD/DVD player.
- 3 - Remote Output: Used to trigger the amplifier(s).
- 4 - ● Power Positive: Connect to the positive terminal of the battery (12V).

The product has an internal antenna. Metallic surfaces, cables, and/or other equipment installed in the same location may interfere with and reduce the Bluetooth connection range.

Safety

While reading this manual, pay attention to the safety symbols.

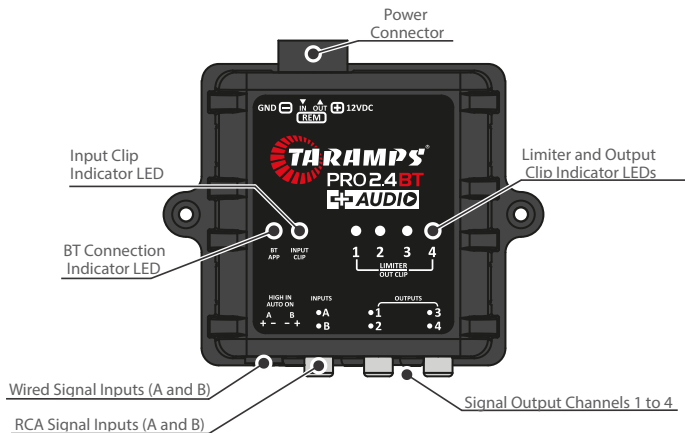


This symbol, indicated as "**CAUTION**," is intended to alert the user to important instructions. Failure to follow these instructions may result in risks to the user or damage to the product.



Taramps reserves the right to modify the content of this manual without prior notice and without obligation to apply such modifications to previously manufactured units.

Processor overview



RCA Signal Input: Input for low-level / high-impedance signals (RCA).

Wired Signal Input: Input for high-level / low-impedance signals (from speaker outputs of players or multimedia head units).

It features a turn-on function via the input signal, eliminating the need to use the REMOTE IN wire of the power connector when this input is used.

Note: The system is designed for use with virtually all players and multimedia head units on the market. However, in some players, the turn-on function may not work due to the type of audio output circuit. In this case, use the turn-on via the REMOTE wire as usual.

Input Clip Indicator LED: Indicates that the signal is reaching the maximum input level of the processor, which causes signal distortion. If it lights up, reduce the source volume and properly readjust the system gains.

Limiter / Clip Indicator LEDs: They have a dual function: they indicate that the signal of the respective output has reached the maximum level (when the limiter is off) or the limiter is acting (when the signal reaches the threshold set in the limiter).

Bluetooth Connection Indicator LED: Indicates that the product has been paired with a Smartphone/Tablet device.

Power Connector: See page 17.

Additional features (via App)



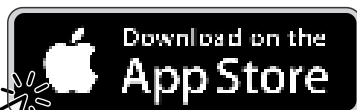
Product usage

1- Install your processor according to the example on page 16.

2- Install the PRO 2.4BT + AUDIO app on your Smartphone or Tablet. It is available in the official Android and iOS app stores. Check your device compatibility (minimum Android 8.1 and iOS 17).



CLICK TO BE
REDIRECTED



3- Turn on the processor; after initialization, the "BT APP" LED will start blinking:



4- Open the PRO 2.4BT + AUDIO app. The two operating modes are: "Connect," to start Bluetooth pairing with the device, or "Demo Mode," to use the app without connecting to the device, i.e., in demonstration mode.



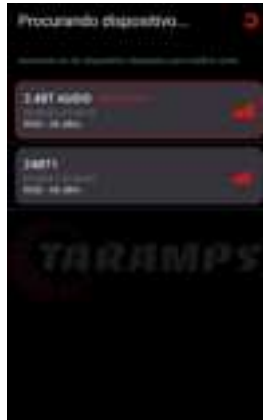
Attention:

Grant the permissions required by the app to ensure its proper operation.

The next screen will display the available devices. Click “Connect” to proceed. When there is more than one processor, this helps identify which device will be connected at that moment:

a) Bring the Smartphone/Tablet closer to the device you want to connect to. The message “Closest” will appear below the name, or keep only the processor you want to connect powered on.

b) The processor names can be changed after connection, for better identification when using more than one device connected to the same Smartphone/Tablet.



Stay preferably close to the processor to facilitate pairing. The BT APP LED remains steadily lit once the connection is established. The next step is to enter the connection password, which by default is 1234.

We recommend changing the password in the app (Password / Lock menu – see page 15) for security.



On the first connection, the product will be in **OFF MODE**.
To enable the functions, click the ON/OFF button.
Red = Off
Green = On

App home screen



1-) App connection management, allows saving/loading PRESETS and accessing general settings/information. See page 14;

2-) BT Audio: Allows enabling/disabling the Bluetooth audio connection*;

3-) ON/OFF: Allows turning the processor on/off. (BOB box mode – see page 18);

4-) Master Level: Overall signal volume of the processor;

5-) Mute Icons: Allow muting the audio on each output;

6-) Processor Input Clip Indicator;

7-) Voltmeter: Indicates the voltage, i.e., how many volts are present in the audio system;

8-) Bluetooth: Indicates the Bluetooth connection status;

9-) Output LIMITER Activity or Output Signal CLIP Indicators;

10-) Favorites Icons: Create shortcuts for the parameters you use most;

11) Screen Lock: Prevents accidental operation (slide to the right to enable/disable);

12) Main menu for audio adjustments and other product options. Due to its responsive design, the app can be used in both portrait and landscape orientations. Some screens may provide a better user experience in landscape mode due to improved information layout (e.g., Graphic Equalizer and Crossover).

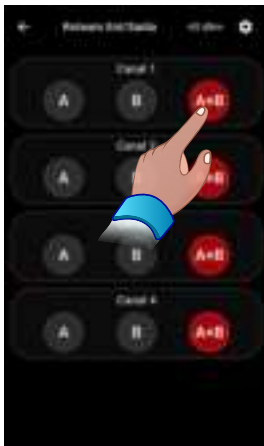
***Requires pairing to be done outside the app, with the TARAMPS_AUDIO device.**

Audio menu



-Input/Output Routing: Defines the internal connections between inputs and outputs. Available options: A, B, or A+B (sum of both inputs).

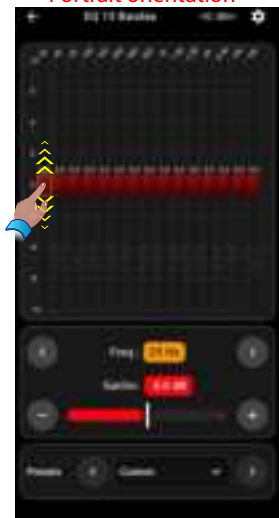
For example: by setting output OUT 1 to A, its signal will come from input A.



-Input Graphic Equalizer: 15-band graphic equalizer, where each band can be adjusted from -12 to +12 dB, in precise 0.1 dB steps. Adjustments can be made by dragging the desired band's knob or by selecting each band and its parameter at the bottom of the screen.

EQ PRESETS: If desired, select an equalization preset from the list.

Portrait orientation



Landscape orientation

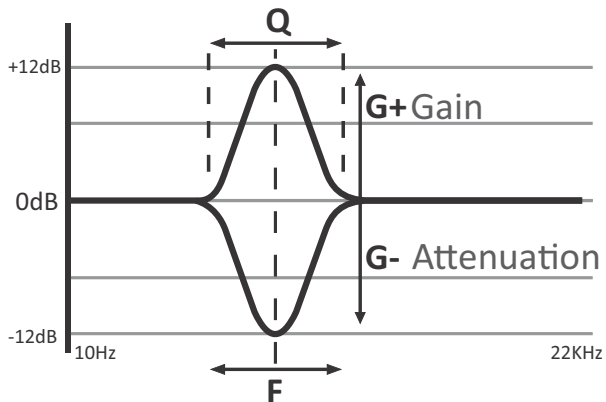
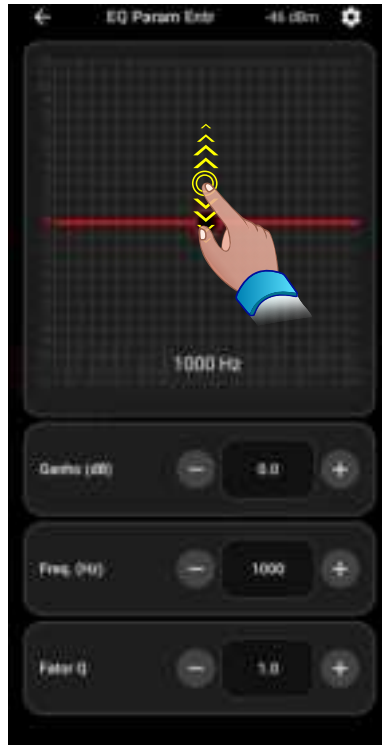


Note: The app allows you to view information in both screen orientations: **Portrait** and **landscape**. Use whichever you find more comfortable.




-Input Parametric Equalizer: Input parametric equalizer that allows precise adjustments of Frequency, Gain, and Q Factor.

Drag the point on the graph to adjust the Gain; the other parameters can be set by entering the value or adjusting them using the side buttons (+ and -).





-Crossover: Defines the filters to be applied to the processor outputs for frequency cutoffs: HPF (High Pass) and LPF (Low Pass), with slopes up to -48 dB/octave, in Linkwitz-Riley (LR) and Butterworth (BT) types.

- a) Select the desired output using the colored tabs at the top (Channel 1, Channel 2, Channel 3, Channel 4) or the 1~4 buttons on the product.
- b) Drag the points on the graph (the circle on the left is the HPF cutoff point, and the one on the right is the LPF cutoff point);
- c) It is also possible to enter the HPF and LPF frequencies, as well as increase/decrease them (fine adjustment) using the + and – buttons;
- d) Select the type of each filter; the curve will be updated on the screen according to the attenuation of each filter;
- e) It is possible to view the curves of the other channels, which will be shown in their respective colors, by selecting the checkboxes at the bottom of the response curve graph;
- f) The limiter LEDs for each output are displayed just below the graph;
- g) The buttons  allow disabling outputs 1 to 4 (MUTE function)..



OFF: Crossover off

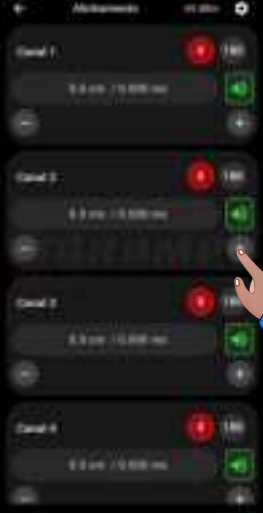
- LR12** Linkwitz - Riley c/ -12dB/octave
- LR18** Linkwitz - Riley c/ -18dB/octave
- LR24** Linkwitz - Riley c/ -24dB/octave
- LR30** Linkwitz - Riley c/ -30dB/octave
- LR36** Linkwitz - Riley c/ -36dB/octave
- LR42** Linkwitz - Riley c/ -42dB/octave
- LR48** Linkwitz - Riley c/ -48dB/octave

OFF: Crossover off

- BT6** Butterworth c/ -6dB/octave
- BT12** Butterworth c/ -12dB/octave
- BT18** Butterworth c/ -18dB/octave
- BT24** Butterworth c/ -24dB/octave
- BT30** Butterworth c/ -30dB/octave
- BT36** Butterworth c/ -36dB/octave
- BT42** Butterworth c/ -42dB/octave
- BT48** Butterworth c/ -48dB/octave



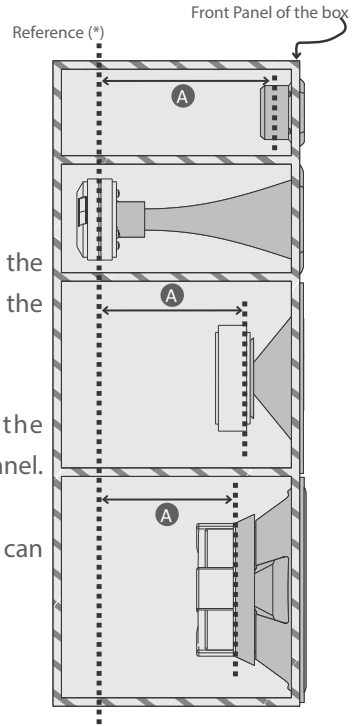
-Alignment (Delay): Defines the delay to be applied to the channel, according to the physical position of the transducer in the system's speaker enclosure.



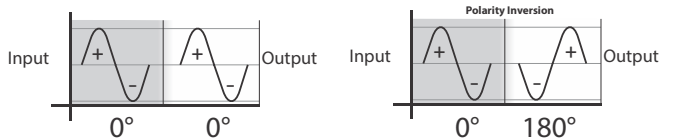
Since the voice coils of different transducers (speakers, drivers, and tweeters) are not aligned, delays are generated that impair accurate sound reproduction. The **Alignment** feature allows electronic alignment of the voice coils by applying delays relative to the channel with the deepest voice coil (measured from the front panel of the enclosure)

How to set the alignment parameter value (in cm)

- 1 Define the reference voice coil (*) as the one farthest from the enclosure's front panel (in our example, the reference was the center of the horn's voice coil).
- 2 Measure the remaining channels and determine the distance **A**. Adjust to the nearest value (in cm) for each channel.
- 3 Repeat the procedure for the other channels (the channel can be selected using the buttons for each channel).



Phase: Allows inverting the output signal phase of the channel by selecting the [180] option.






-Limiter: Configures the limiter, which acts as a maximum output signal level limiter, preventing the defined power limit for each channel from being exceeded


Limiter Parameters:

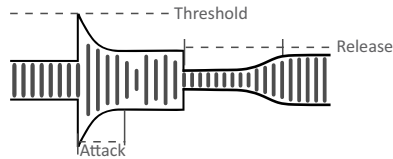
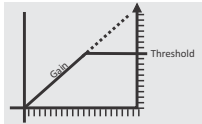
Auto: Automatically sets the Attack and Release parameters according to the channel's frequency cutoff (HPF).

Threshold: The point at which the limiter starts to act (indicated by the LEDs of each channel on the product and the on-screen indicator in the limiter/out clip section). To disable the limiter, press the  button until [OFF] appears in the threshold value.

Attack (Attack Time): The time the limiter waits before reducing the gain after the signal exceeds the threshold.

Release (Release Time): The time the limiter takes to return to the original gain after the signal falls below the threshold.

You can select the desired output channel using the colored tabs located at the top of the screen, and also mute each output channel using the buttons .





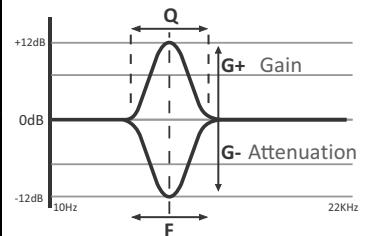
-Output Levels: Allows adjusting the Master (overall) volume, as well as the volume of each output, by dragging the point or more precisely using the + and - buttons.

Note that the volume or gain is only updated after releasing your finger from the screen. Each output channel has its own limiter/clip LED indicator.



Output Parametric EQ: Output parametric equalizer that allows precise adjustments of Frequency, Gain, and Q Factor. Drag the point on the graph to adjust the Gain; the other parameters can be set by entering the value or adjusting them using the side buttons (+ and -).

Select the desired output using the colored tabs at the top (Channel 1, Channel 2, Channel 3, Channel 4) or the 1-4 buttons on the product.





-Audio Generator: Utility for audio system adjustment and testing, with 4 operating modes (Fixed Frequency, Slow Sweep, Medium Sweep, and Fast Sweep).

ON/OFF: Turns the generator on or off.

Fixed Frequency Mode: Adjust the desired amplitude (by spreading or pinching two fingers vertically—only with the generator turned on), using the Gain (dB) field or the rotary control.

Sweep Modes (3 modes): It is possible to define the start and end frequencies by dragging the dashed vertical lines, as well as increase/decrease the signal amplitude by spreading or pinching two fingers on the graph screen. Activate the generator in sweep mode by selecting one of the three available sweep speeds (slow, medium, and fast).

More precise adjustments can be made in the fields using the keyboard or the + and - buttons.





-Settings / Presets: Allows saving settings for later retrieval or backup, as well as exporting/importing adjustment presets. There is also a sharing option, where the configuration file can be sent to another person via instant messaging apps (e.g., WhatsApp).

Settings can be saved in two ways: in the processor's internal memory (up to 3 presets) and on the Smartphone/Tablet (up to 15 presets).

By swiping the memory name horizontally (left to right or vice versa), the options will appear (Load, Export, Rename, Delete). For internal memory, only the Load option will be available.

A new configuration can be saved by clicking on +New.

Imported settings saved on the Smartphone/Tablet can be applied using the button.

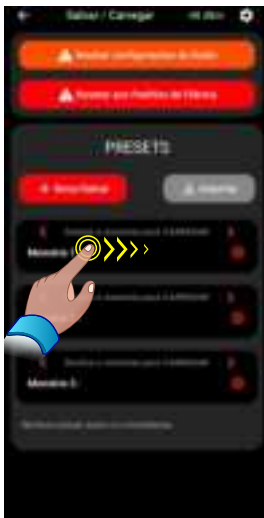


On this screen, it is also possible to delete the product's

settings in two ways, by sliding the RESET / RESTORE button located at the bottom of the screen:

-) Reset Audio Settings: Restores the audio settings to the original factory conditions while preserving other settings (presets, password).

-) Factory Reset: Restores the product to its factory state, **completely erasing all settings, presets, and password. Make sure before performing this operation, as it cannot be undone.**



Note: The factory reset can also be performed directly on the device, without using the app (via the internal RESET switch). Press and hold the RESET button while powering on the product, and release it when the BT APP and INPUT CLIP LEDs start flashing alternately.

Caution, this operation is irreversible and will return the product to its factory state.



-Product Name: Allows changing the product name.

-Password: Allows changing the current password; this procedure is recommended after pairing the Smartphone/Tablet with the product. The default password is 1234.

This password is used to prevent other Smartphones/Tablets from connecting improperly to your processor. Access to the app is protected by the device's native security methods (unlock pattern, Face ID, fingerprint, PIN, etc.); therefore, whenever the device is unlocked, access to the app will be available.

In case the password is lost, you can perform a factory reset to restore the default password and then reload the settings saved on the Smartphone/Tablet.



-Information: Displays the product/app software version, as well as other useful features:

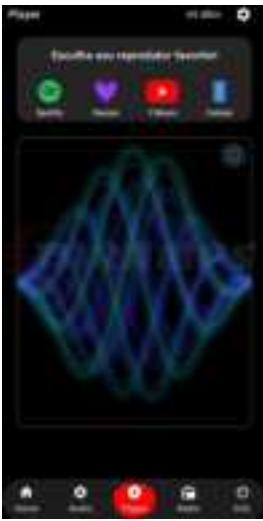
Access to the User Manual;
Portuguese – English – Spanish



Access to the Taramps website;

Phone support;

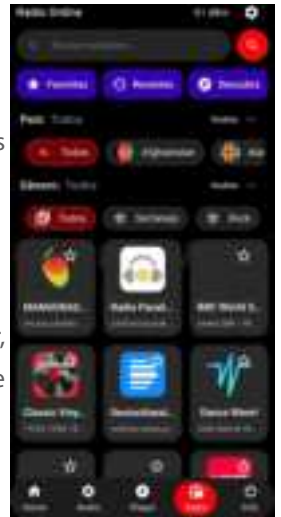
WhatsApp chat support.



-Player: Access to the most popular online music streaming apps (internet connection required), such as Spotify, Apple Music, Deezer, YouTube Music, among others.

Important: To stream audio from the smartphone to the processor, the BT AUDIO option must be enabled and the smartphone must be paired with the TARAMPS AUDIO device.

-Online Radio: Provides access to numerous internet radio stations (internet connection required), categorized by genre and country.

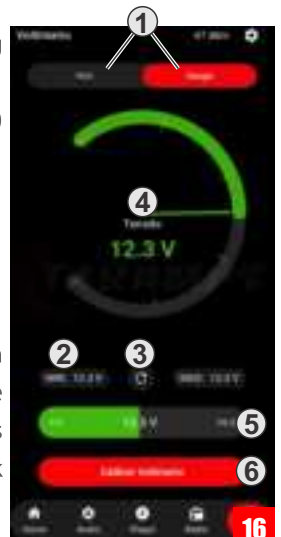


Important: To stream audio from the smartphone to the processor, the BT AUDIO option must be enabled and the smartphone must be paired with the TARAMPS AUDIO device.

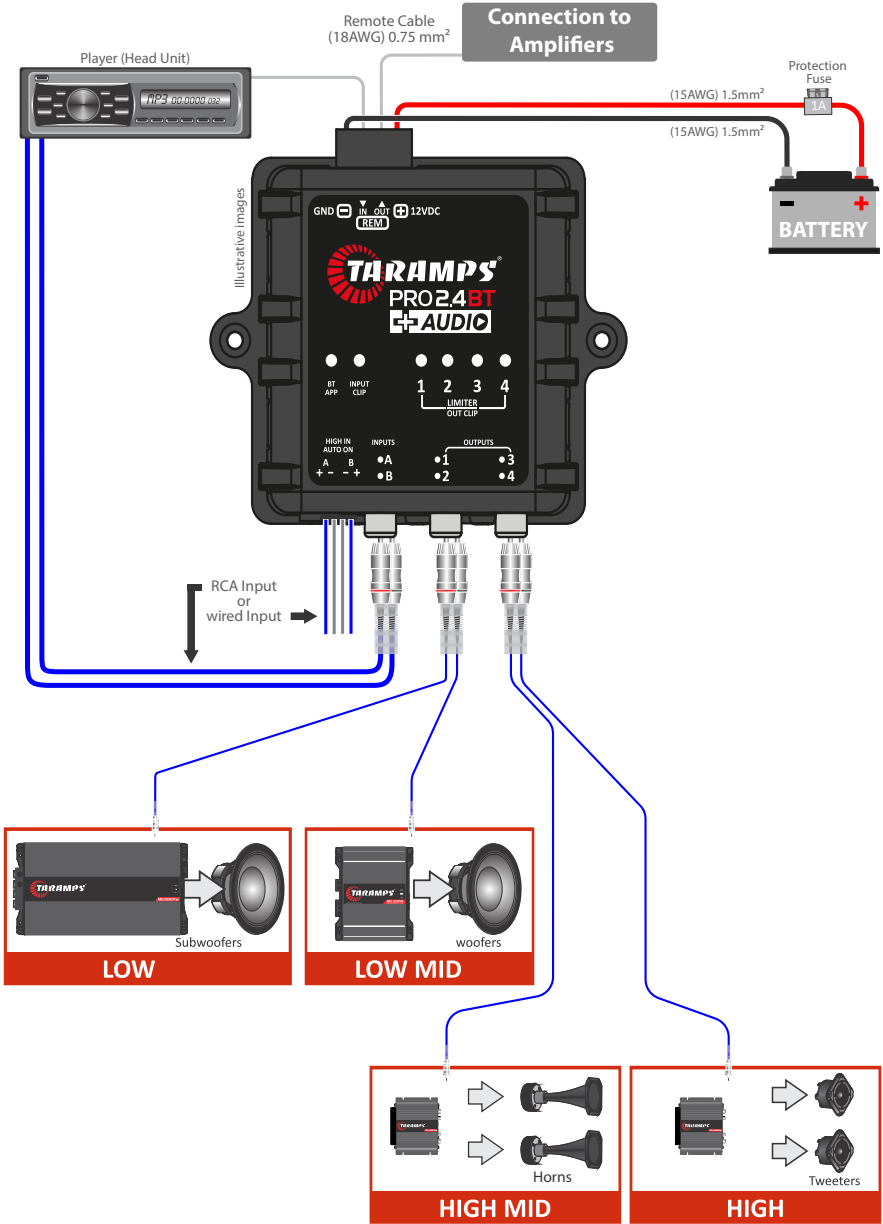


-Voltmeter: Allows real-time monitoring of the battery voltage.

- 1-View in history mode or gauge (needle) mode;
- 2-Current Voltage (MIN and MAX);
- 3-Resets the MIN and MAX values;
- 4- Real time Voltage;
- 5- Enables the low battery alert;
- 6- Voltmeter Calibration: Connect a multimeter to the battery, measure the value, and adjust it using the + and - buttons to match the multimeter reading, then click save.

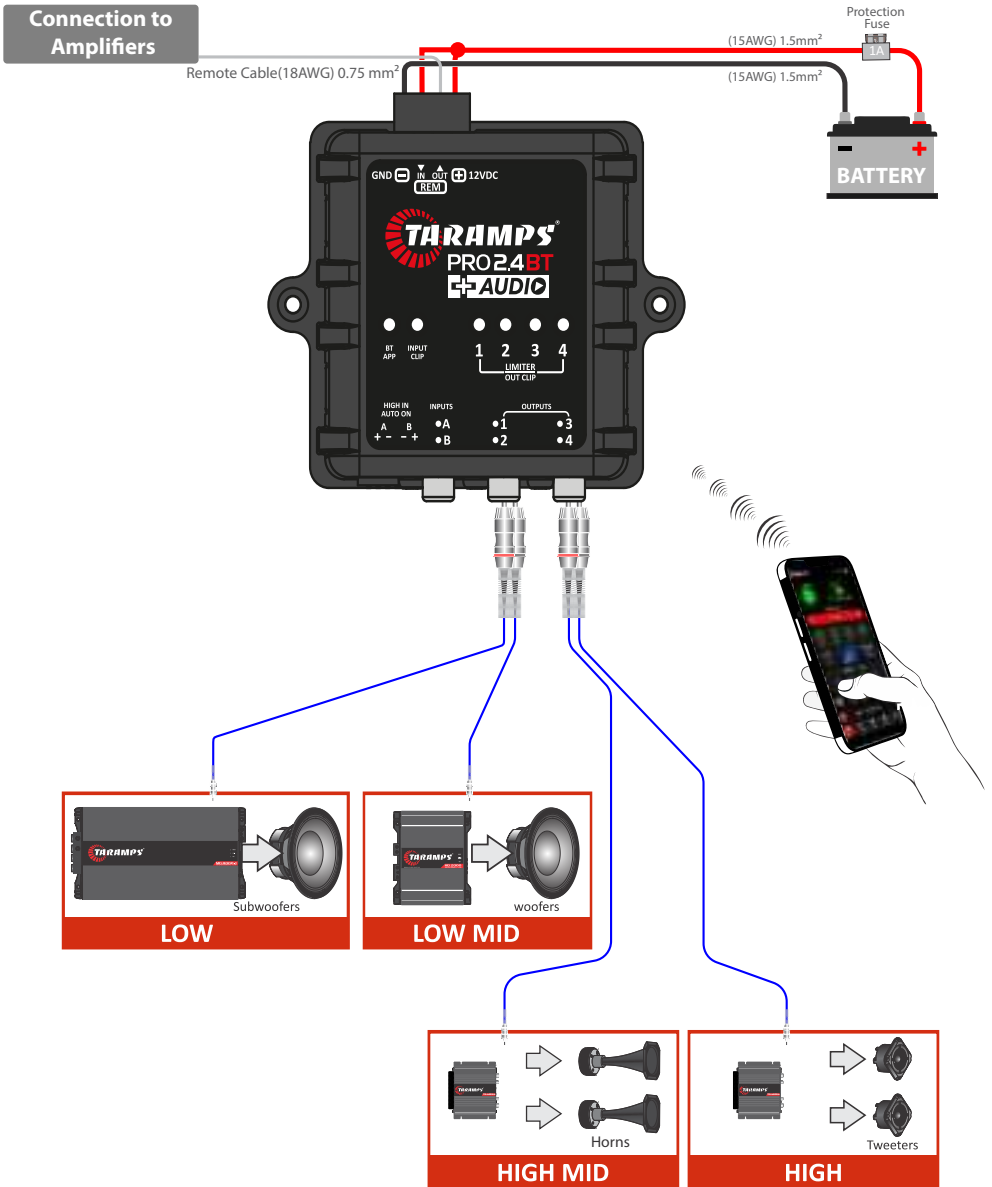


Processor input and output connections



CAUTION Check the power supply polarity and the recommended wire gauge. We recommend installing a 1 Amp fuse on the positive power line.

BOB box mode connection



For this BOB Box mode, a player is not required.

- 1- Connect the **REM IN** wires together with the **+12V**.
- 2- Turn the system **ON** and **OFF** using the button on the app's main screen.

CAUTION Check the power supply polarity and the recommended wire gauge. We recommend installing a 1 Amp fuse on the positive power line.

Technical specifications

Processing:

Resolution.....24bits
Sampling rate.....48KHz

Inputs and Outputs:

Number of input channels.....2
Number of output channels.....4
Input / output routing:.....A, B, A+B
Master gain adjustment:.....-80 to 0dB
Output gain adjustment:.....-45 to +15dB
Input impedance (RCA):.....10K ohms
Input impedance (wire input):.....50 ohms
Output impedance:.....47 ohms
Maximum input level (RCA):.....5.9Vpp (2.1V RMS)
Maximum input level (wire input):.....28Vpp (10V RMS)
Maximum output level:.....5.9Vpp (2.1V RMS)
Frequency response (-1 dB).....10Hz a 22KHz
Total Harmonic Distortion.....0.01%
Signal to noise/ratio:.....>90dB
Crosstalk (channel separation).....>80dB

Input graphic equalizer, 15 bands, 2/3 octave, and 12 presets:

Frequencies:.....25,40,63,100,160,250,400,630,1K,1.6K,
2.5K,4K,6.3K,10K,16KHz
Attenuation / Gain:.....-12dB to +12dB

Input parametric equalizer:

Center frequency:.....variable 10Hz to 22KHz
Attenuation / Gain:.....-12dB to +12dB
Q factor adjustment:.....0.4 to 10

Crossover (HPF and LPF):

Cutoff frequency:.....variable 10Hz to 22KHz
Linkwitz Riley filters.....-12,-18,-24,-30,-36,-42,-48dB/octave
Butterworth filters.....-12,-18,-24,-30,-36,-42,-48dB/octave

Alignment (Delay):.....8.0mS (272cm)

Phase:.....0 / 180°

Adjustable Limiter:

Threshold:.....-48 to 0dB
Attack:0.1mS to 100mS
Release:1mS to 1600mS

Parametric Output Equalizer:

Center Frequency:.....Variable 10Hz to 22KHz
Attenuation / Gain:.....-12dB to +12dB
Q Factor Adjustment:.....0,4 to 10

Mute Function.....Individual on the outputs

Audio generator (Sine Waveform)

Frequency range.....Variable 10Hz to 22KHz
Gain:.....-60 to 0dB
Modes:.....Fixed Frequency / Sweep in 3 Speeds

Adjustment memory positions:.....Factory default + 3 customizable positions

Access Protection:.....4 digit password (customizable)

Connectivity: 5.4 BLE (Low-Energy) APP Bluetooth Classic (A2DP - AUDIO)

Typical range, line-of-sight, no obstacles:.....25m

App Compatibility:.....Android 8.1 / iOS 16 and above

Languages:.....Portuguese / English / Spanish

Supply Voltage:.....9 to 16VDC
Nominal Consumption (12.6 V):.....70mA
Power Consumption (Off) (in BOB Box mode):.....20mA
Dimensions (W x H x D):.....110 x 42 x 98mm (4.33" x 1.65" x 3.86")
Weight:.....0.11Kg (0.24lb)

- The name Bluetooth, as well as its logo, are the property of Bluetooth SIG, Inc.

- The name Android, as well as its logo, are the property of Google LLC.

- The name iOS, as well as its logo, are the property of Apple Inc.

- The names Spotify, Apple Music, Deezer, and YouTube Music are registered trademarks and are the property of their respective owners.

- Typical range in line-of-sight conditions, with no obstacles, in an open environment. The actual range of the product depends on the installation environment and may be affected by obstacles such as metal surfaces, walls, and other electronic equipment operating in the area.

- The product application may undergo periodic updates. Taramps reserves the right to update, add, remove, or improve functionalities without prior notice.

Warranty terms

TARAMPS, located at Júlio Budisk highway, SN, KM 30 – Alfredo Marcondes, SP - Brazil, ZIP CODE 19180-120, warrants this product against any defects on terms of project, making, assembling, and/or with solidarity, due to project vices which cause it improper or inadequate to its original use within 12 months from the date of purchase. In case of defect during the warranty period, TARAMPS responsibility is limited to the repairing or replacement of the device of its own making.

This warranty excludes:

- Damaged products by improper installation, water infiltration, violation by unauthorized individuals;
- Tamper or torn warranty seal;
- Cases in which the product is not used in adequate conditions;
- Defects caused by accessories, modifications or features attached to the product;
- The product with damage from falling, bumps or nature related problems (flooding, lightning, etc);
- Warranty card is not properly filled or torn;
- Costs involving uninstallation, reinstallation of equipment as well the shipment to the factory;
- Damage of any kind, due to problems in the product, as well as losses caused by discontinued use of the product.

Technical assistance


For international support, check on our website:

www.taramps.com.br/en/rede-de-assistencias-tecnicas or contact direct the factory support:

Phones: +55 18 3266-4050 / +55 18 99749-3391

E-mail: service@taramps.com.br

Declaration of conformity

Declaration of Conformity	
	TARAMPS ELECTRONICS LTDA Alfredo Marcondes - SP Brazil
Declares that the PRO 2.4BT + AUDIO product is in compliance with Directive 2014/30/EU, in accordance with the following technical standard:	
<i>Electromagnetic compatibility (EMC) - -EN 50498:2010 Product family standard for aftermarket electronic equipment in vehicles</i>	
The full text of the EU Declaration of Conformity is available on the product page on the Internet:	


2BQGR-XXXXXXXX

See the FCC statement on the next page



At the end of its useful life, this product must not be disposed of with household waste. Take it to an electronic equipment collection or recycling center for proper disposal.

FCC Warning

This device complies with Part 15 of the FCC Rules. Its operation is subject to the following two conditions:

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

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in residential installations.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note: The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications may void the user's authority to operate the equipment.

The device has been evaluated to meet the general RF exposure requirements.

To maintain compliance with the FCC RF exposure guidelines, the distance between the radiator and your body must be at least 20 cm, and must be fully supported by the operation and installation configuration.



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