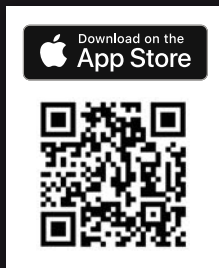
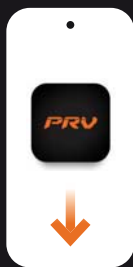
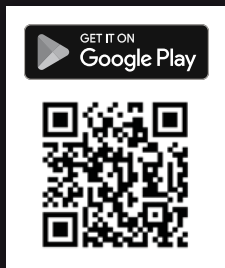




Scan QR Code to download the App



DSP 2.4X BT

Bluetooth Digital Signal Processor

USER'S GUIDE

Introduction

Thank you for choosing **PRV Audio Brazil**!

The **DSP 2.4X BT** was designed to enhance your audio experience by modernizing the well-known **DSP 2.4X**.

Now featuring Bluetooth technology and a dedicated app for Android and iOS, it offers full control of the processor directly from your smartphone — no need for physical access to the device.

The new DSP brings advanced professional features, allowing precise, customized fine-tuning, making it ideal for any sound system project, whether automotive or home audio.

It also includes three dedicated outputs for the sequencer feature, which enables multiple devices to be powered on or off in sequence. This function can be configured either on the processor itself or via the app.

Features

The processor includes **2 input channels (A and B)** and **4 independent output channels (1, 2, 3, and 4)**, as follows:

INPUTS	MAIN IN: Connection RCA (A e B)
	HIGH-IN: Connection FIO (A e B)
OUTPUTS	OUT 1: RCA (L + R)
	OUT 2: RCA (L + R)
	OUT 3: RCA (L + R)
	OUT 4: RCA (L + R)

INPUT CONNECTIONS



HIGH CONNECTION (WIRE)
Common in factory head units and original vehicle audio systems.



RCA INPUT (LINE)
Common in aftermarket head units and audio equipment.

The digital signal processing features allow precise audio adjustments through a variety of integrated functions and tools:

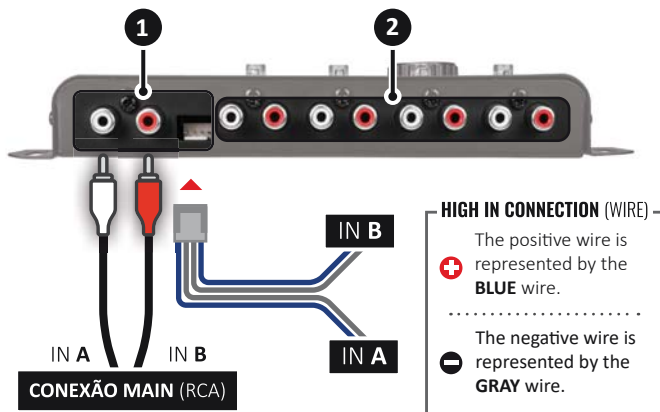
- **AUDIO ADJUSTMENTS DIRECTLY ON THE PROCESSOR OR THROUGH THE MOBILE APP;**
- **RCA & HIGH-LEVEL (WIRE) AUDIO INPUTS;**
- **GRAPHIC EQUALIZER;**
- **PARAMETRIC EQUALIZERS** for both input and output;
- Flexible input-to-output **ROUTING**;
- High-precision **CROSSOVER** (with Butterworth, Linkwitz-Riley, and Bessel filters);
- High-precision **DELAY**;
- **PHASE INVERSION**;
- **LIMITER** with adjustable Threshold, Attack, and Release;
- **MASTER VOLUME, GAIN, and MUTE** control for each output;
- **CHANNEL LINK** for simultaneous parameter adjustments across linked channels;
- **AUTOMATIC SAVE** and **LOAD** for storing and retrieving audio settings;
- **SECURITY PASSWORD** to prevent unauthorized parameter changes;
- **FREQUENCY GENERATOR** and sweep function;
- Integrated **SEQUENCER** for remote triggering with configurable timing.

Before Installing

Please read this manual carefully before using the product.

- All product connections must be made with the unit turned **OFF**.
- Installing a fuse between the product and the battery is mandatory for protection against overload. The fuse must match the product's current draw and be installed as close to the battery as possible.
- Use the wire gauges recommended in this manual to prevent cable overheating and ensure maximum performance.
- Keep the cables as short as possible to increase sound fidelity and avoid potential power loss.
- Route the installation cables as far as possible from the vehicle's original wiring to minimize interference and noise in your audio system.
- Connect the Bluetooth antenna to the designated connector on the processor, making sure it is firmly attached for optimal signal reception.
- For best performance, install the processor in a location with minimal metal obstructions to avoid signal dampening inside the vehicle.
- Install in a secure, well-ventilated, and dry area.
- Installation should be performed by a qualified professional.

Processor Overview



1. INPUT: The processor features two types of input connections: **RCA** and **HIGH (WIRE Input)**. Both share the same input channels (**A and B**), so you can use them according to your needs..



Using both **RCA** and **HIGH INPUT** connections at the same time may cause unwanted noise.

2. OUTPUT: Features **4 independent RCA outputs (L+R)** for connecting amplifiers and other audio equipment. These outputs are processed according to the audio parameters set by the user.

3. LCD DISPLAY: Allows for viewing and interacting with the processor's system.

4. INPUT CLIP INDICATOR:

Indicates that the incoming audio level is too high, which may cause distortion. Adjust the source volume to prevent damage and ensure better sound quality.

5. REMOTE OUT (SEQUENCER): The processor features three dedicated outputs for the sequencer function, allowing multiple devices to be powered on or off in sequence. These connections can be configured directly on the processor or via the mobile app. Use cables with a minimum gauge of **18 AWG** to ensure a safe and efficient connection.

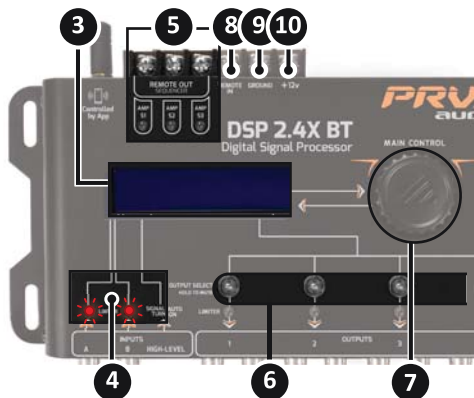
6. HOTKEY BUTTONS: Dedicated buttons for selecting the channel to apply parameters or for activating the **MUTE** function.

PRESS AND RELEASE:

Press to quickly select the channel where audio parameters will be applied.

PRESS AND HOLD:

Hold to **ENABLE** or **DISABLE** the channel's **MUTE** mode.



BLUE LED

Indicates the output channel is active.



RED LED

Indicates the output channel is muted (OFF).

7. MAIN CONTROL: Used to navigate through the system features and adjust parameters.

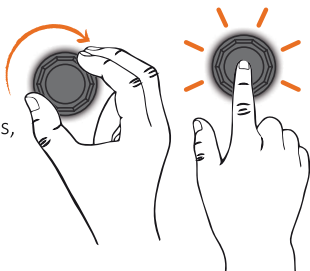
OPERATING MODES:

PRESS AND RELEASE:

Used to enter functions, make selections, and skip to the next parameter.

PRESS AND HOLD:

Returns to the previous screen or main menu.

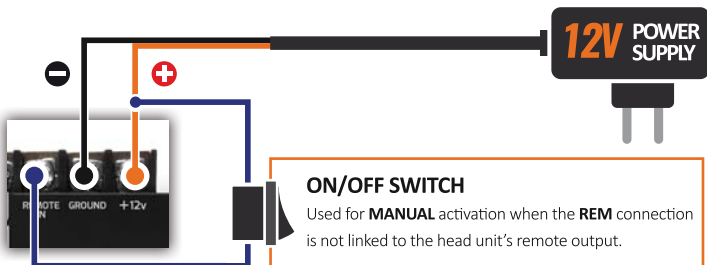


8. REMOTE TURN-ON CONNECTOR (REM): Activates the processor when this connection is powered. Connect the remote output from the head unit/player using an **18 AWG** wire, or use a manual on/off switch connected to a **12V** power source.

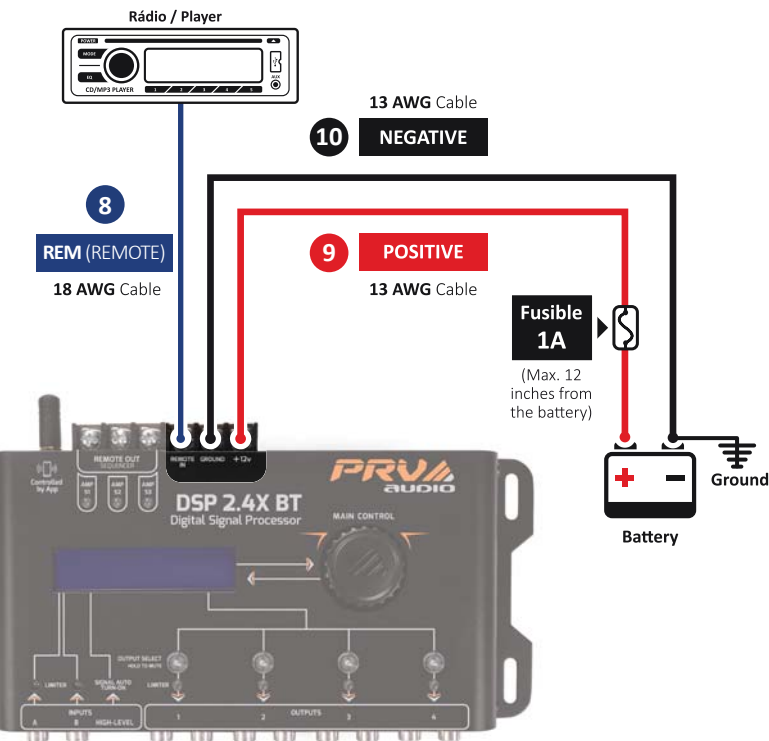
9. POSITIVE CONNECTOR (+) : Connect to the positive terminal of the battery or a 12V power supply using a cable with a minimum gauge of **13 AWG**. If using the vehicle's battery, install a **1A** fuse for electrical protection no more than **12 inches** from the battery.

10. NEGATIVE/GROUND CONNECTOR (-) : Connect to the negative terminal of the battery or power supply using a **13 AWG** wire.

USING THE PROCESSOR DIRECTLY WITH A 12V POWER SUPPLY.



12V Battery Power Supply Diagram



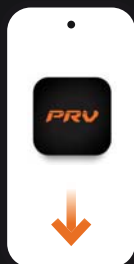
INSTALLATION MUST BE PERFORMED ONLY BY QUALIFIED PROFESSIONALS AND WITH THE UNIT TURNED **OFF**. A FUSE IS MANDATORY TO PROTECT THE SYSTEM FROM SHORT CIRCUITS AND OVERLOADS.
INSTALL IT AS CLOSE TO THE BATTERY AS POSSIBLE.

App Installation

Before connecting the DSP 2.4X BT to your smartphone, make sure it meets the minimum requirements to properly install and operate the app.

MINIMUM REQUIREMENTS

- Devices running Android 8.0 or higher
- Devices running iOS 15 or higher



Install the App on Your Device

Download and install the app to explore all its features. In the app store, search for **"PRV DSP"** or use the shortcuts below to access it directly.



Click on the store that matches your device to be redirected, or scan the **QR code**.



Pairing the Product with the App

With the app installed and the product powered on, open the app on your smartphone to begin the pairing process.



You must **ALLOW** all permissions requested by the app to ensure it functions properly.

On the app's pairing screen, wait for the **DSP 2.4X BT** to appear in the list of available devices.

DEMO MODE: Allows you to explore all the app's features without needing to connect to the processor, operating with limited functionality and simulated data.

CONNECT: Searches for devices via Bluetooth to initiate pairing.

INFO: Displays product information, including the user manual and software version, available whether or not the processor is connected to the app.



Next, tap the **CONNECT** button below the name and image of your product.

**IF PROMPTED,
ENTER THE DEFAULT
PASSWORD: 1234.**

The connection process will start automatically and should take only a few seconds to complete.



IN SETTINGS, YOU CAN ENABLE OR DISABLE THE AUTOMATIC CONNECTION MODE. TO ENSURE YOUR SECURITY, CHANGE THE DEFAULT PASSWORD IN THE SETTINGS MENU.

PRV DSP App Overview

Discover some of the features and tools available in the app. With an intuitive interface and simple navigation, it allows you to configure and control your audio system quickly and easily.

SETTINGS MENU

**MASTER LEVEL
CONTROL, LIMITER
OPERATION, AND
CLIP INDICATOR**

**INPUT CLIP
INDICATOR, AND
SEQUENCER**

**INPUT
GRAPHIC
EQUALIZER**

**CONNECTION
STATUS &
SIGNAL LEVEL**



**AUDIO
SETTINGS**

**INPUT
ROUTING**

**LEVEL
CONTROL**

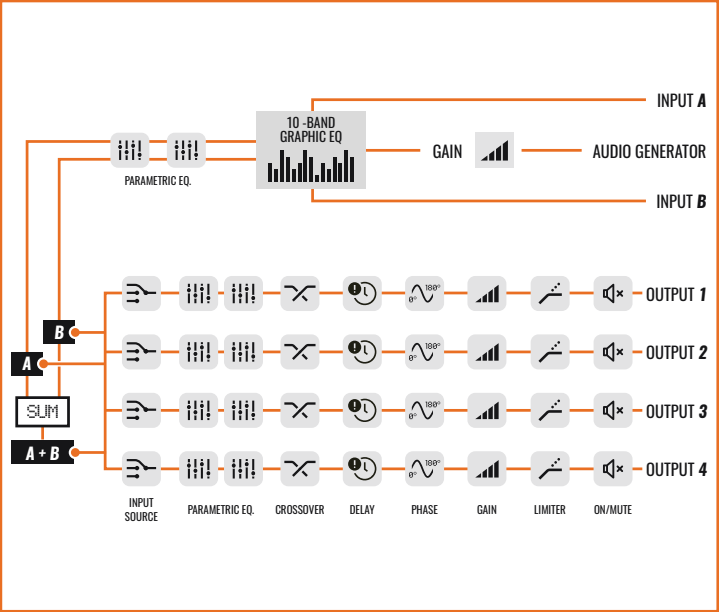
CROSSOVER

**PARAMETRIC
EQ**

SETTINGS

Processor Flowchart

The illustration below shows the complete audio path within the system - from the input stage to the final adjustments at the outputs.



MAIN MENU ► AUDIO

> INPUT GRAPHIC EQUALIZER

The input graphic equalizer features 10 bands with frequencies equally spaced at 2/3 octave intervals, ranging from 31Hz to 16kHz. It allows gain adjustment of ± 12 dB in 0.1dB steps.

Graphic EQ
f: 63 Hz +2.6 dB

The graphic equalizer affects both input channels simultaneously.

> GRAPHIC EQ PRESETS

The processor offers 12 preset graphic EQ settings plus one customizable option, labeled **Custom**. These can be selected directly on the processor or through the app via the **Graphic Equalizer** option in the audio menu.

AUDIO INPUTS
Graph EQ Presets



GRAPH EQ PRESETS
FLAT

LIST OF PRESETS AVAILABLE ON THE PROCESSOR OR VIA THE APP:

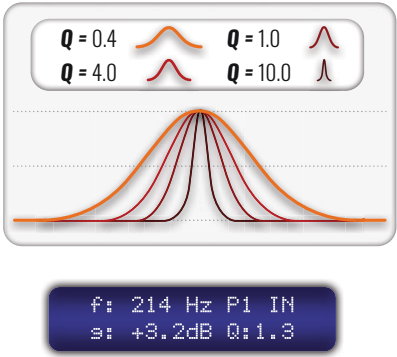
- FLAT • LOUDNESS • BASSBOOST • MID BASS • TREBLE BOOST • POWERFUL
- ELECTRONIC • ROCK • HIP HOP • VOCAL • POP • PANCADAO



FINE ADJUSTMENT: Dedicated controls for selecting the frequency and precisely adjusting the gain.

> INPUT AND OUTPUT PARAMETRIC EQUALIZERS

Choose to boost or attenuate a specific frequency, and set the bandwidth of the equalization using the “Q” factor. The lower the “Q,” the wider the bandwidth, affecting a broader range of neighboring frequencies.



> INPUT ROUTING

Defines the signal source for each system output, with the following options: **A**, **B**, or **A+B (sum of signals A and B)**.

On the processor, selection is done by rotating the **MAIN CONTROL** on the desired output. To switch between output channels, use the **HOTKEY** shortcut button.



In the app, the configuration is displayed separately for each output channel, with A, B, and A+B buttons, allowing quick and visual selection of the desired audio source.



> CROSSOVER

The Crossover feature applies frequency filtering to the audio signals, directing each frequency band to its corresponding system output.

On the processor, rotate the **MAIN CONTROL** to adjust the selected parameter, such as filter type, cutoff frequency, slope, or topology, and use the **HOTKEY** to switch between output channels during adjustment.



AVAILABLE FILTERS AND SLOPES:

Butterworth: 12/18/24/30/36/42/48 dB/8^a

Linkwitz-Riley: 12/18/24/30/36/42/48 dB/8^a

Bessel: 12/18/24/30/36/42/48 dB/8^a



The app configuration allows you to set the cutoff frequencies for both **H.P.F** and **L.P.F**, as well as select the slope and topology for each filter.

> ALIGNMENT / DELAY

Digitally correct the arrival time of each frequency band at the listener's position, improving sound fidelity and preventing frequency cancellations.

On the processor or in the app, you can adjust delay values per channel, with display options in either centimeters or milliseconds.

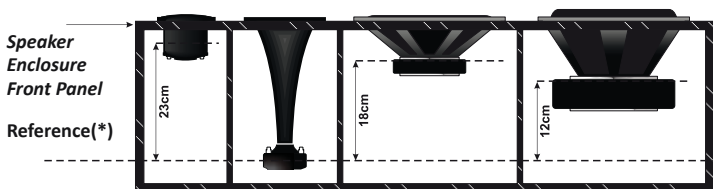
DELAY OUT1
12.0cm 0.349ms



THE ADJUSTMENT CAN BE MADE AS FOLLOWS:

1. Identify the voice coil that is farthest from the front panel of the speaker enclosure and use it as a reference point.
2. Measure the distance of the other voice coils relative to the reference. Enter these distances into the delay settings for each channel.

MEASUREMENT EXAMPLE:



> PHASE

This function helps resolve frequency cancellation issues.

On the processor, rotate the **MAIN CONTROL** to switch the phase of the selected output between 0° and 180°.



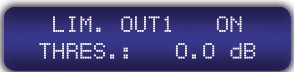
In the app, simply select the channel you want to adjust to change the phase.

> LIMITER

Works like a compressor, reducing the signal level based on the RMS value. This function is essential for protecting amplifiers and speakers, ensuring the audio does not exceed safe levels for continuous operation.

On both the processor and the app, the limiter parameters are:

THRESHOLD: Sets the signal level limit. When this value is exceeded, the limiter is automatically activated.



ATTACK: Controls how quickly the limiter responds after the signal surpasses the threshold.

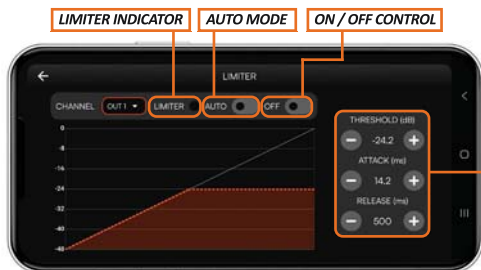


RELEASE: Determines how long the limiter takes to return the signal to its normal level after gain reduction is no longer needed.



> LIMITER

Limiter behavior adjustment screen: allows you to configure the **THRESHOLD**, **ATTACK**, and **RELEASE** parameters, which determine how the signal is controlled when reaching peak levels.



In addition to manual **Attack** and **Release** adjustments, you can enable **AUTO** mode, where these parameters are dynamically controlled in real time by the **Automatic Dynamic Limiter** system, ensuring greater sound fidelity and effective protection for your equipment.

