



DSP 2.4X

Digital Signal Processor

USER'S GUIDE

Introduction

The **DSP 2.4X** is a digital audio processor that offers a huge range of high precision settings and configurations to improve the performance of your audio system. It has a Digital Signal Processor (DSP) that realizes equalizations, crossover filters, alignment, gain control, phase inversion, limiter, digital routing of inputs and outputs, among other treatments. Its new exclusive sequencer feature makes it possible to configure the programmed activation and shutdown of up to 3 products from the remote activation connections (REM).

Before installing

Please read this manual carefully.

- All product connections must be made with the product turned OFF.
- Use gauges recommended in this manual to avoid the overheating of the cables to obtain maximum power.
- Keep the cables as short as possible to increase sound fidelity and avoid potential power losses.
- Route the installation cables as far away as possible from the original vehicle wiring as it may cause interference and noise in your audio system.
- Perform the installation in a firm, ventilated and dry place.
- Installation must be done by a qualified professional.

If you have questions, contact the store where the purchase or installation was made.
For more information please contact: support@prvaudio.com

Resources

The **DSP 2.4X** has 2 inputs and 4 independent outputs that allow adjustments to the audio individually for each output through several functions and features integrated into the processor:

- Graphic input equalizer (15 bands and equalization presets)
- Parametric input equalizer (frequency, gain, Q factor)
- Parametric equalizer per output (frequency, gain, Q factor)
- Routing between inputs and outputs
- High precision crossover with Butterworth and Linkwitz-Riley filters and attenuations up to 48 dB/8th
- High precision alignment/delay
- Phase inversion
- Limiter with Threshold, Attack and Release adjustment
- Independent gain and mute per output and master volume
- Working memory with automatic saving of settings
- Allows you to save and load the settings made by the user
- Security password to block parameter modification
- Frequency generator, frequency sweep and pink noise generator
- Screen saver with rotating text
- Outputs for remote activation with configurable sequencing.

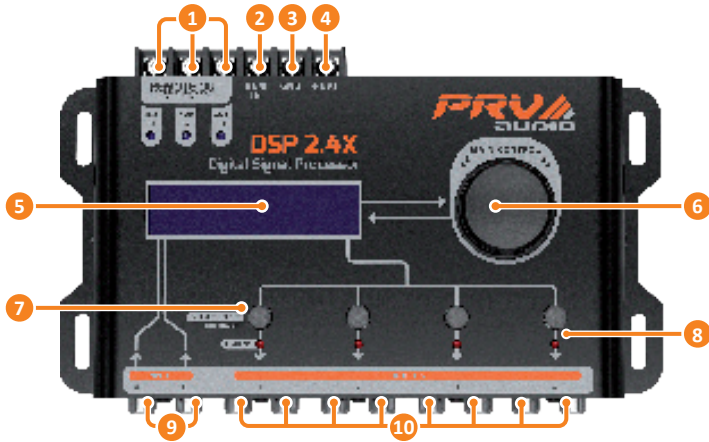


Any updates made in this manual will be available for customers to consult without any charge on the brand's site.

It is recommended that the updated manual be consulted whenever needed.

Images contained in this manual are merely illustrative and may differ from the actual product.

Overview



- 1. SEQUENCER:** It allows sequential activation of other products through the remote activation (REM) connection. Use a cable of at least **AWG 20**.
- 2. REM IN:** Allows automatic activation of the amplifier when turning on the radio/player. Connect to the remote output of the radio/player minimum of **AWG 20**.
- 3. NEGATIVE POWER CONNECTOR (GND):** Connect to the negative terminal of the battery using a cable minimum of **AWG 13**.
- 4. POSITIVE POWER CONNECTOR (+BAT):** Connect to the positive terminal of the battery using a cable minimum of **AWG 13**. It is recommended to use a fuse for external protection of **1A**.
- 5. DISPLAY LCD:** It allows visualization and interaction with the processor system.
- 6. MAIN CONTROL:** Rotary control that allows interaction with the processor system functions and resources:
 - **ENTER function:** Short press on the encoder.
 - **RETURN function:** Long press on the encoder.

7. HOTKEYS: Shortcut keys for selecting output channels:

- **Short press:** Selects the channel for applying the parameters.
- **Long press:** Allows you to turn the selected output channel on or off.

HOTKEY on blue: output channel on.

HOTKEY lit red: output channel off.

8. LED LIMITER: The LEDs will light when the “LIMITER” of the channel in question is acting, they are also used as indicators of output saturation.

9. AUDIO INPUT (INPUT): RCA type connectors with independent actuation (A and B). Connect to the radio/player via quality shielded RCA cables to prevent noise.

10. AUDIO OUTPUT (OUTPUT): RCA connectors, provide the audio processed according to the settings made on the processor.

Navigation keys

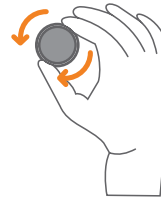
Navigation and control of the **DSP 2.4X** are made via the **MAIN CONTROL** knob and the **HOTKEYS** hotkeys.

MAIN CONTROL

ROTATION: Navigation, increase and decrease in values.

SHORT PRESS: Enter, select, skip parameter.

LONG PRESS: Return to the previous screen.



HOTKEYS

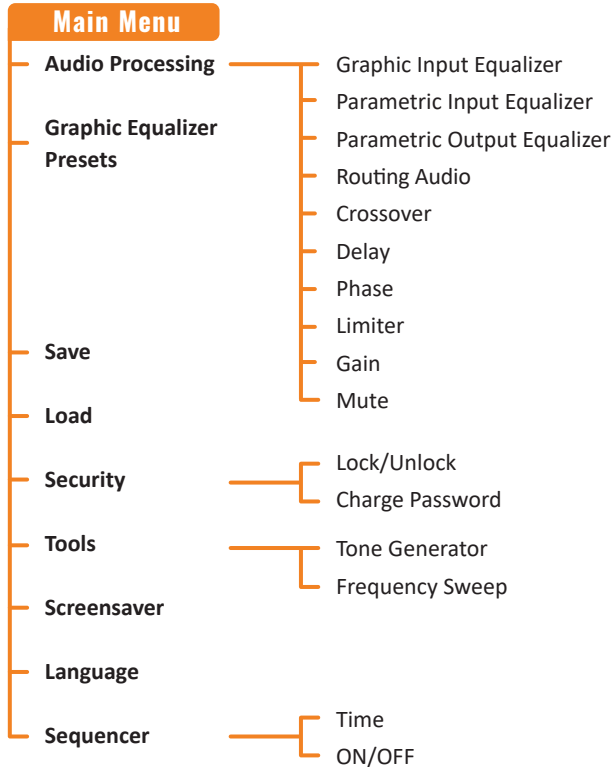
SHORT PRESS: Select output channel.

LONG PRESS: Output ON/OFF.



Settings map

Find the desired configuration from the illustration below with all configurations and processor features:



Processor features

• Graphic Input Equalizer

The input graphic equalizer has 15 bands, allowing a variation of ± 12 dB per band, with a pitch of 0.1 dB, with frequencies equally spaced in 2/3 octave, in the range of 25 to 16 kHz in accordance with ISO requirements. The graphic equalizer acts on the two inputs simultaneously.

GRAPHIC EQ
f: 63 Hz +2.6 dB

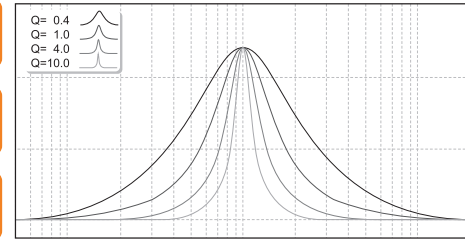
• Parametric Input/Output Equalizer

The parametric equalizer allows you to choose a gain / attenuation at a specific frequency, as well as the bandwidth of that equalizer by means of the Q factor, the smaller the Q the greater the width of that equalization band, affecting to a greater extent the neighboring frequencies. The **DSP 2.4X** has 5 parametric equalizers distributed as follows, 1 for the inputs and 4 for the outputs (1 for output).

PARAMETRIC EQ
freq.: 214 Hz

PARAMETRIC EQ
gain: +3.2 dB

PARAMETRIC EQ
Q: 1.4



• Input and Output Routing

The purpose of the routing option allows you select the audio source A, B or A + B (sum) for each output. Turning the **MAIN CONTROL** dial moves the audio source to the selected route. To select another channel, quickly press the corresponding **HOTKEY**.

ROUTING
IN A+B ---> OUT1

• Crossover

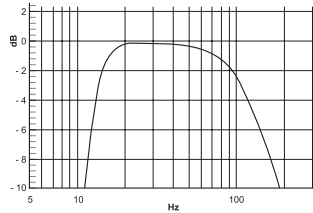
This function allows precision definition of the cutoff frequencies for the high-pass filter and the low-pass filter, as well as filter attenuations and topology individually by output. The available filters and attenuations are:

HPF: Butterworth 12/18/24/36/48 dB/8ª
Linkwitz-Riley 12/18/24/36/48 dB/8ª

LPF: Butterworth 12/18/24/36 dB/8ª
Linkwitz-Riley 12/18/24/36 dB/8ª

HPF OUT
f: 12 Hz LR48

LPF OUT1
f: 107 Hz BT12



In the **“CROSSOVER”** menu, each short press on the **MAIN CONTROL** changes the parameter being edited, between output, filter type, frequency and attenuation/topology. To select another output channel for editing, short press the **HOTKEY** key on the corresponding output.

• Balance / Delay

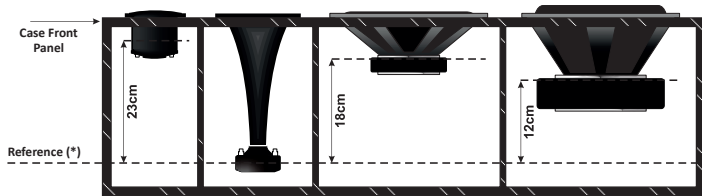
This function allows for the digital alignment of transducers (speakers) via the time correction performed by the DSP, and ensures that the sound from all the speakers arrives at the listener with improved audio fidelity while avoiding frequency cancellations.

The adjustment can be carried out as follows:

DELAY OUT1
12.0cm 0.349ms

1. Identify the coil farthest from the listener or the front panel of the box. This coil will be used as a reference;

2. Measure the distance from the other coils to the reference coil. These are the distances used in configuring the delay of each output channel.



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• Phase

This function is used for resolving problems caused by canceling frequencies. From this screen you can reverse the phase of all outputs individually. Turning the “Encoder” dial changes the phase (0° ou 180°) of the corresponding output. To select another channel, quickly press the corresponding **HOTKEY** shortcut.

PHASE
OUT1: 180

• Limiter

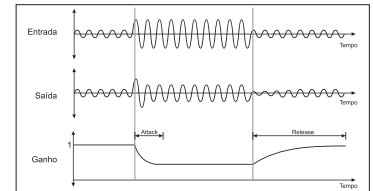
To protect your amplifiers and speakers, the **DSP 2.4X** has a limiter with an integrated **“Dynamic Attack-Release”** system for each of the 4 outputs. Use this function to attenuate and prevent damage to the system caused by signal peaks.

The Threshold (-24 to 0dB) setting defines a threshold for the Limiter’s activation: the Limiter kicks in when this threshold is exceeded.

The Attack parameter (0.1 to 100 ms) defines how fast the Limiter reacts / acts when the signal exceeds the Threshold.

The Release parameter (1 to 1600 ms) controls the recovery time elapsed between the time the signal falls below the Threshold and deactivation of the Limiter.

In addition to manual adjustments of Attack and Release values, it is possible to enable the **“AUTO”** mode, where the Attack and Release parameters are controlled in real time by the **“Dynamic Attack-Release”** system, providing ideal conditions for sound fidelity.



L I M I T E R
THRES. : -9.5 dB

L I M I T E R
ATTACK: 0.1 ms

L I M I T E R
RELEASE: 500 ms

L I M I T E R OUT1
AUTO: OFF [ON]

• Gain

This menu allows you to adjust the gains of the individual outputs within a range of -45 to +15 dB, as well as to increase the master volume from 0 to 100%.

MASTER LVL: 82%
OUT1 GAIN: +3dB

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• Mute

The outputs can be switched individually on and off quickly by holding down the **HOTKEY** key that corresponds to the output. The LED color indicates the status of the output.

BLUE LIGHT: OUTPUT ON / RED LIGHT: OUTPUT OFF (MUTE)

In the **"MUTE"** screen, you can still turn off and on all the output channels simultaneously using the **MAIN CONTROL** go to the output field and select **"ALL-ENTER"** or **"ALL-ENTER ON"**. Then fast touch on **MAIN CONTROL**. You can also turn the input graphic equalizer on or off.

OUT1: ON
GRAPH EQ: ON

MUTE ALL (ENTER)
GRAPH EQ: ON

ON ALL [ENTER]
GRAPH EQ: ON

• Graphic Equalization Presets

The **DSP 2.4X** offers 12 graphic equalization presets that are selected from the **"GRAPH EQ PRESETS"** in the main menu:

- FLAT
- LOUDNESS
- BASSBOOST
- MID BASS
- TREBLE BOOST
- POWERFUL
- ELECTRONIC
- ROCK
- HIP HOP
- POP
- VOCAL
- PANCADAO (Heavy Beat)

MAIN MENU
Graph EQ Presets

GRAPH EQ PRESETS
Loudness

• Save / Load / Factory Reset

The **DSP 2.4X** has 5 memory slots available for saving personalized settings, accessed via the **"SAVE"** function. Saved settings can be named with titles up to 15-characters long. Besides the memory space available to the user, there is autosave, where all parameters and settings are saved in a separate working

memory. Or rather, if there is a drop in power or the product is turned off during configuration, the settings will not be lost. This function cannot be disabled.

To load previously saved settings use the **"LOAD"** function. This function also allows the factory presents to be loaded via the **"DEFAULT"** memory.

SAVE MEMORY1
Memory1

LOAD
Default t

FACTORY RESET
NO [YES]

If you want to restore all of the **DSP 2.4X** factory settings, simultaneously hold down the **HOTKEY** shortcut keys for outputs 1, 2 and 3 while turning on the device. This procedure will erase all internal settings and saves.

• Security

This function locks the ability to edit settings, including blocking the save and load settings. Via the **"SECURITY"** menu you can lock or unlock (**"LOCK/UNLOCK"**) and change the password (**"CHANGE PASSWORD"**).

The function on/off the output channels is not blocked.

Default password: PRV1 (all caps)

SECURITY
Lock/Unl ock

ENTER PASSWORD

SECURITY
Charge Password

CHARGE PASSWORD
Current PW: _____

• Tools

The audio processor has tools to aid in the regulation of your sound system, **TONE GENERATOR, FREQUENCY SWEEP and PINK NOISE GENERATOR**. These tools are signal sources for all outputs, that is, during their use as inputs.

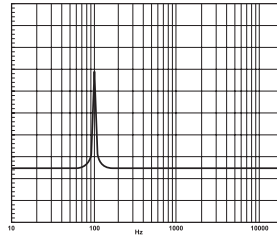
Tone Generator: Generate a specific frequency with gain control.

Each press on the **MAIN CONTROL** parameter is edited between frequency, gain and ON/OFF. With the generator on it is still possible to change the frequency and gain in real time, and even modify other audio parameters of the processor.

TONE GENERATOR
freq: 100 Hz

TONE GENERATOR
gain: -45.0 dB

TONE GENERATOR
OFF [ON]



Frequency Sweep: Allows you to perform a frequency scan, with the option of selecting the initial and final frequency, gain, scanning speed and ON/OFF. When activating the sweep enters a continuous cycle, to close it simply press any of the **HOTKEYS** or move the **MAIN CONTROL**.

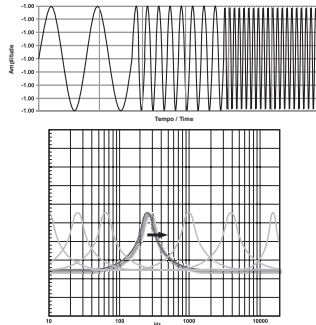
FREQUENCY SWEEP
start: 10 Hz

FREQUENCY SWEEP
end: 22000 Hz

FREQUENCY SWEEP
gain: -45.0 dB

FREQUENCY SWEEP
speed: medium

FREQUENCY SWEEP
OFF [ON]



• Screensaver

The audio processor has a screensaver function, which allows the user to define a 15-character scrolling text.

SCREENSAVER
PRV DSP2. 4X

• Language

You can select from the following operating languages: English, Spanish and Portuguese.

LANGUAGE
<< ENGLISH >>

• Sequencer

This feature allows you to activate several products sequentially. The sequencer has three outputs (**S1, S2 and S3**) that are activated and deactivated sequentially according to the input signal of the remote input (REM IN).

The activation interval between each output can be configured from 0s to 4s. When the configured time is 0s, the three outputs will be enabled and disabled at the same time, after 3s of the absence of the remote signal at the input (REM IN). To connect the remote signals, use cables of at least **20 AWG**.

It is possible to turn ON/OFF each sequencer output independently. When the output is turned off, it will not trigger when the processor is turned on again.

MAIN MENU
Sequencer

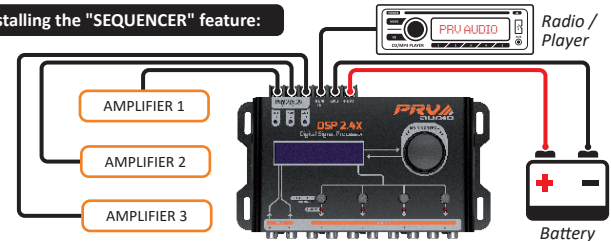
SEQUENCER
Time

SEQUENCER
Time : 2.0 s

SEQUENCER
ON/OFF

SEQUENCER
S1: ON

Example of installing the "SEQUENCER" feature:



Technical specifications

Number of Channels:	Input: 2 / Output: 4
Graphic Equalizer:	15 Bands (gain $\pm 12\text{dB}$)
Graphic Equalization Presets:	12
Parametric Equalizer:	1 Input + 1 per Output (gain $\pm 12\text{dB}$, Fator Q 0.4 ~ 10.0)
Crossover with Variable Frequency:	Butterworth: 12/18/24/36/48 dB/8^a Linkwitz-Riley: 12/18/24/36/48 dB/8^a
Routing between Inputs and Outputs:	A, B or A+B
Alignment:	0 ~ 8ms (275cm)
Phase Inversion:	0° ~ 180°
Limiter:	Threshold: -24 ~ 0dB / Attack: 0.1 ~ 100.0ms and Release: 1 ~ 1600ms (manual/automatic)
Master Level and Gain:	0 ~ 100% (Gain -45 ~ +15dB per output)
Memory Positions Save/Load:	Autosave + 5 slots
Security:	Password with 4 digits
Frequency Generator:	10Hz ~ 22kHz, Level -60 ~ 0dB
Frequency Sweep:	Freq. initial and final 10Hz ~ 22kHz (Level -60 ~ 0dB and Speed control)
Pink Noise Generator:	10Hz ~ 22kHz and Level -60 ~ 0dB
Screensaver:	Editable text with 15 characters
Languages:	Portuguese, English and Spanish
Latency:	1.08ms
Input Impedance:	10 kΩ
Output Impedance:	47 Ω
Max. Input and Output Voltage:	5.6 Vpp (+8,2 dBu)
Max. Output current (SEQUENCER):	180 mA per output
Saturation Indicator:	1 per input + 1 per output (linked to the Limiter)
Signal-to-noise ratio:	>90dB
Total Harmonic Distortion (T.H.D):	<0,01%
Channel Separation:	>80dB
Frequency Response:	10Hz ~ 22.5kHz @ -1dB
Power supply:	9V ~ 16V DC
Max. Current Consumption:	350mA @ 12.6V DC
Dimensions (W x H x D):	37 x 200 x 101 mm
Weight:	455g

Warranty Term

PRV Audio products are guaranteed for a period of ONE (1) YEAR from the date of original purchase against any manufacturer's defects in material and workmanship under normal use. This warranty protects only the original purchaser of PRV Audio products purchased from an Authorized PRV Audio Dealer. This warranty is non-transferable.

When a product is sent to PRV Audio for warranty claims, it is assumed that the original purchaser has read and fully understands the PRV Audio warranty policy. In no event shall PRV Audio be liable for incidental or consequential damages including, without limitation: injury to persons, property or loss of potential income.

Product must be repacked in original packaging or equivalent, with padding to avoid damages during transportation. The purchaser is responsible for expenses to return the product to PRV Audio Brazil for a Warranty Claim. Please DO NOT return your amplifier to a retailer, all warranty claims must be sent to PRV Audio. Upon receipt of the item, PRV Audio will notify claimant within THREE (3) business days. At this time, PRV will let claimant know: (a) if the item qualifies for a warranty claim; (b) the expected turn-around time to receive the item back; (c) the proper procedure to follow to ensure minimal delays. If an item does not qualify for warranty, then claimant is responsible for ALL freight, shipping, and repair costs. The purchaser may decide if he/she wishes to repair the amplifier for a fee. Please keep in mind all guidelines presented to you before sending your amplifier! PRV Audio Brazil is NOT responsible for any return without an authorized number. If you have any questions concerning what voids a warranty, please do not hesitate to ask. We do this to protect our customers and our retailers. We want you to enjoy the best performance possible from PRV Audio Amplifiers. Purchasing PRV Audio products from an authorized retailer means you are guaranteed.

RA Request Precess

Access the website: www.prvaudio.com/warranty and fill up the form in order to receive a RA # (Return Authorization Number) prior to returning your item.

ATTENTION – Product is NOT eligible for warranty if serial number and/or warranty seal have been removed or tampered with.

This warranty does NOT extend to damage resulting from, but not limited to:

- Improper installation
- Product modification
- Misuse and neglect
- Abuse (items returned repeatedly for the same damage may be considered abuse)
- Damage resulting from attempted repairs by unauthorized repair centers or individuals
- Damage incurred during shipment
- Product damaged in an accident
- Damages due to criminal activity
- By 'acts of God' (lightning, flooding, etc.)
- Blown outputs or power supplies in amplifiers from overdriving or under voltage due to ignoring the LED Clipping Indicator
- Using an aluminum wire and/or any other wire that is not recommended in the owner's manual on a high-current amplifier
- We will not honor any warranty claim(s) on amplifiers purchased from internet sellers.
- Excessive vibration damage in amplifiers due to improper installation
- Installation and removal costs of the products associated with obtaining a warranty claim
- Products with the serial number and/or warranty seal removed or damaged

Amplifier must NEVER operate with the clipping LED ON !! Abuse may cause damage to amplifier or speakers.

For any products not qualified for warranty protection, PRV can still repair it for a cost determined by the damages occurred to the unit. Thank you for choosing PRV!

We'll contact you as soon as possible once your Return Authorization (RA) request is processed. We will return your request with an RA number via e-mail. Thank you!



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