



DSI-3

OWNER'S MANUAL

INTRODUCTION



Thank you for purchasing the DD Audio DSI-3. The DSI-3 is a feature rich audio signal processor that will allow you to precisely tune the acoustics of a vehicle's audio system for maximum listening pleasure. It can be used in conjunction with aftermarket systems or integrated into factory systems to realize the full potential of the connected audio components. To ensure ease of use and proper setup please take a moment to thoroughly read through this operation manual. We hope you thoroughly enjoy this product, and if you have any questions regarding the installation or setup please contact the DD Audio technical support team.

DESIGN FEATURES

- PC and Smartphone Graphic User Interfaces
- 31 band Parametric / Graphic Equalizer, Crossovers, and Time Alignment
- Bluetooth Compatible
- Remote Controllable (w/ optional DSI-3RMT)
- 6 Customizable EQ Presets
- 6ch High-level Inputs
- 6ch Low-level RCA inputs
- Input Summing
- 12ch Low-level RCA outputs
- Aluminum Chassis

ACCESSING THE DSI-3 SOFTWARE:

1. Go to the DSI-3 product page at ddaudio.com for links to download the DSI-3 interface software. Install the DSI-3 app on a PC and/or smartphone.*
2. Connect the DSI-3's PC Control Port to a computer using a USB cable, or link the DSP to a smartphone via Bluetooth
3. From the PC's desktop or the smartphone app screen select the DSI-3 app icon.**

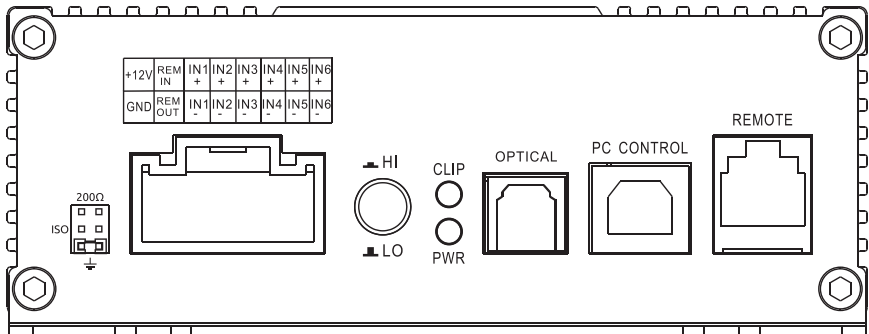
*PC - Windows compatible, Smartphone - Android and iOS compatible

**When opening the DSI-3 PC Windows app for the first time your computer may display a security warning stating the publisher could not be verified. It is safe to run the DSI-3 application without causing any harm to the computer. Uncheck the "Always ask before opening this file" box to avoid this message in the future.

TECHNICAL SPECIFICATIONS

DSI-3	
Operating Voltage	8.7V-16.5V
High-Level Input Impedance	240Ω
RCA Input Impedance	≥20KΩ
RCA Output Impedance	≥50Ω
RCA Output Voltage	0.2V-5V
High-Level Input S/N	≥105 dBA
RCA Input S/N	≥115 dBA
High-Level Input THD	0.02%
RCA Input THD	0.01%
REM OUT Output Current	12V ≤500 mA
SPK Input Sensitivity Max	20V(CH1-CH4) / 40V(CH5-CH6)
RCA Input Sensitivity @ Max Volume	3.2V (CH1-CH4) / 6.4V (CH5-CH6)
Turn-On	>10V(REM), >1.3V(SPK/DC), >15mV(RCA)
Turn-On Time	3 Seconds
Input Channels	6
Output Channels	12
Parametric / Graphic EQ	31 Bands
Sampling Frequency	192 kHz
Bit Depth	32bit
Processing Speed	295 MHz
Idle Current	0.46A
Dimensions mm / in (LxWxH)	191 x 107 x 39 / 7.5 x 4.2 x 1.5

INPUT CONNECTION



AUDIO SIGNAL GROUND JUMPER:

Occasionally alternator whine may appear in a system due to audio components using different signal grounding. In some installations switching the signal grounding method from Chassis to Isolated or 200Ω will help eliminate the unwanted noise. The DSI-3 default setting is Chassis and will work for most applications. Make sure your system is turned OFF before you move these jumpers.

+12V:

Connect to a constant positive power supply within the operating input voltage range. Direct connection to the vehicle's battery is preferred.

-GND:

Connect to a verified chassis ground. Run a separate ground wire vs connecting it to a factory ground wire. Factory ground wires usually have multiple devices connected to them and are not recommended because this can lead to ground loop issues.

REM IN:

Connect to a switched +12V turn-on source to turn the DSI-3 on and off. No connection is required if using auto turn on. Remove the internal Turn On Selection Jumper to disable auto turn on when this turn on method is desired.

REM OUT:

Provides a >500mA 12v switched turn-on signal for connected amplifiers. May require an additional relay for multi amp turn-on.

IN1-IN6:

Connect to source unit signal outputs. These inputs can be connected to LO/RCA Level outputs or HI/Speaker Level outputs. The DSI-3 comes factory equipped for connection to LO/RCA outputs if HI/Speaker Level connection is needed, cut the RCA connectors off and use the + and - wires to connect directly to the corresponding speaker lead + and - wires.

HI/LO BUTTON:

Use to select the DSI-3 input sensitivity that corresponds to the input connection type. Set the button to the In position when connecting to a HI/Speaker Level signal source. Set the button to the Out position when connecting to a LO/ RCA Level signal source.

PWR LED:

When illuminated indicates the unit is powered on.

CLIP LED:

When illuminated indicates the DSI-3 has reached its maximum undistorted output level. If the CLIP light is flashing, turn the source unit or the DSI-3's main volume down until the clip light is no longer illuminated.

OPTICAL:

Used to connect an SPDIF source signal.

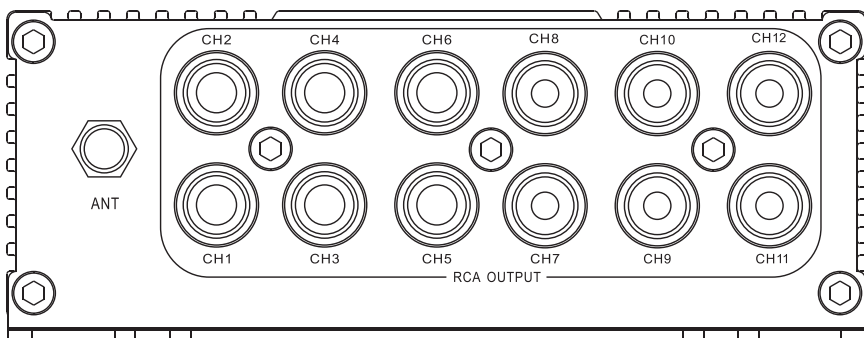
PC CONTROL:

USB (type B) Port for connecting a PC to the DSI-3 via USB Cable.

REMOTE:

Port for connecting the optional DSI-3RMT remote control via modular cable.

OUTPUT CONNECTION



ANT:

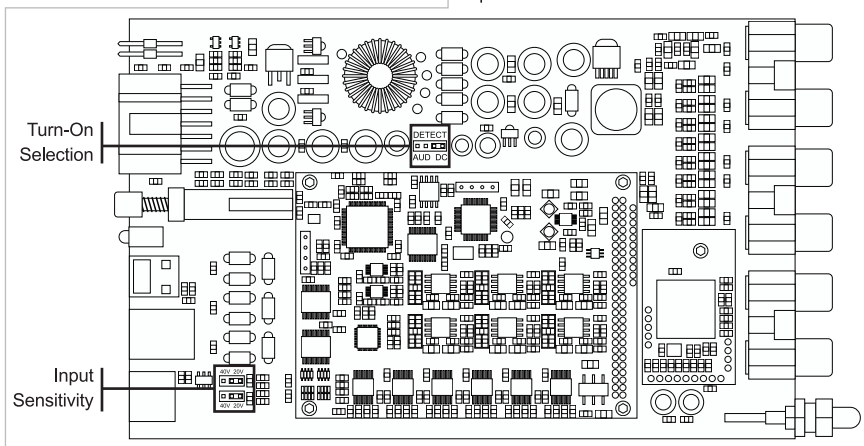
Bluetooth Wireless Antenna for connecting a Smartphone or other Bluetooth enabled devices.

RCA OUTPUT CH1-CH12:

DSP processed LO/ RCA Level signal outputs.

INTERNAL JUMPERS:

To access the internal jumpers remove the four corner screws on the output connection panel and carefully slide the DSI-3's PCB out of the chassis. Once you have completed your configuration carefully slide the PCB back into the chassis and replace the screws.



TURN ON SELECTION JUMPER:

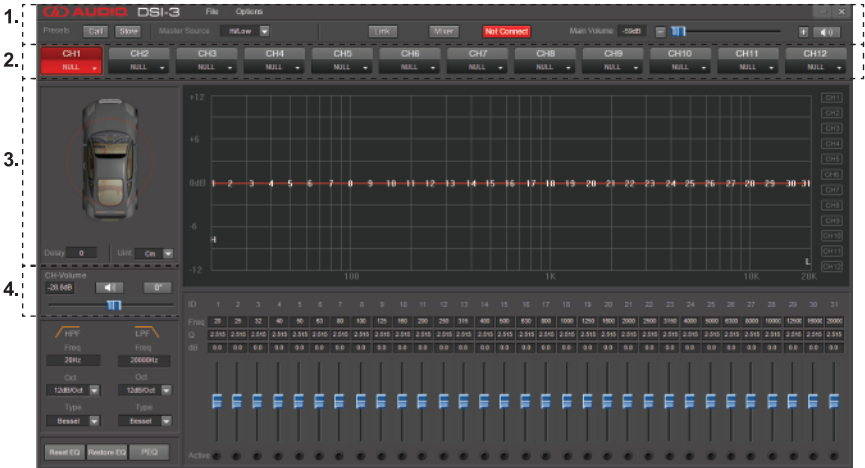
Use this jumper to select the turn on mode for your application. The DSI-3 will be set to DC from the factory.

- Remove the jumper if your source unit provides a switched +12V turn on signal.
- SE (Audio Signal Sense) Can be used with the HI INPUT or LINE INPUT to turn the BSI on and off if there is no switched +12V turn on signal available.
- DC (DC Offset Sense). Use with speaker level inputs to turn the BSI on and off if there is no switched +12V turn on signal available. DC Offset is the preferred auto turn on method when using the HI INPUT.

CH5-CH6 INPUT SENSITIVITY JUMPERS:

In certain applications the input sensitivity ranges for the HI/ Speaker Level inputs will need to be adjusted to properly accommodate the incoming signal voltage. To increase the maximum input voltage from the default 20V setting to 40V place the jumpers in the 40V position. Input voltage that ranges over 20v is most commonly encountered on the subwoofer speaker lead of premium factory sound systems. To determine the proper jumper setting it is recommended you test the HI/ Speaker Level inputs for peak voltage under normal listening conditions.

PC INTERFACE CONTROLS



1. Control Bar:

- **File:** Use to Load or Save EQ settings to your PC as a preset.
- **Options:** Use to install firmware updates, access available help menus, and to determine the current software version.
- **Minimize/ Exit:** Use to minimize the DSI-3 app window or to exit the program.
- **Presets Call/Store:** Use for calling, storing, and deleting customized EQ presets stored on the DSI-3.
- **Master Source:** Use to select the type of source unit you will use to send audio signal to the DSI-3. The selected source type will automatically be selected in the Input Mixer.
- **Link:** Use to Link Left and Right pairs of output channels together when they are set to matching speaker types. When speaker pairs are linked they will share Crossover and EQ settings.
- **Mixer/EQ :** Use to switch between the EQ and Input Mixer screens.
- **Connected/Not Connected:** Indicates the connection status between the interface and DSI-3.
- **Main Volume:** Use to control the main output volume of the DSI-3. This will adjust all output channels evenly.
- **Mute:** Use to mute all channels.

2. Output Channel and Speaker Type Selector:

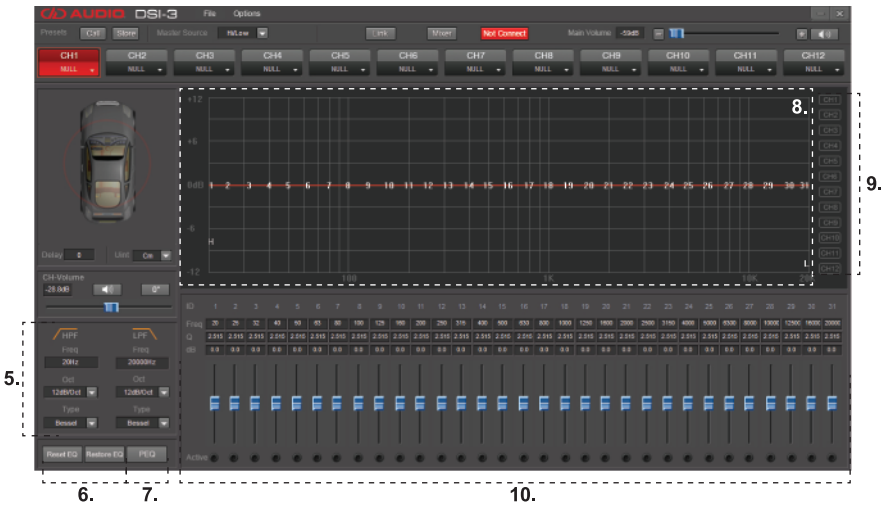
Use to select an output channel for tuning. Once a channel is selected you can use the dropdown box to see the available speaker types. When set to NULL no speaker type has been selected. When a speaker type is selected the DSI-3 will automatically assign standard Crossover and EQ settings to the channel. These settings can be customized. Only pairs of channels set to matching Left and Right speaker types can be linked. When speaker pairs are linked they will share Crossover and EQ settings.

3. Time Alignment Settings:

To compensate for various speaker locations and listening positions, time delay adjustments can be made to the output channels. By doing this you can make every speaker's musical playback reach the listener's ears at the same time to create a realistic, "concert-like" sound stage. When a channel has been assigned a speaker type it will be graphically displayed in this window. Below the graphic display you can input the desired amount of delay for that channel and select the desired unit of duration for the delay; Milliseconds(Ms), Centimeters(Cm), or Inches(Inch). See page 10 for detailed Time Alignment Instructions.

4. CH-Volume:

Use to set the volume for the selected output channel. From here you can also mute the channel or change the phase.



5. Crossovers:

Use to set the desired crossover frequency, slope, and type for the selected channel.

- **High-pass filter:** Attenuates all frequencies below the crossover frequency.
- **Low-pass filter:** Attenuates all frequencies above the crossover frequency.
- **Crossover Slope:** Sets the steepness/ rolloff rate of the low-pass or high-pass filter.
- **Crossover Type:** Choose the filter type based on the equipment configuration and design goals. Different types of filters possess different phase alignment, dampening, and Q factor characteristics.

6. Reset EQ, Restore EQ, Bypass EQ:

- **Reset EQ Button:** Resets all EQ adjustments for the selected output channel.
- **Bypass EQ/Restore EQ Button:** Allows you to momentarily bypass then restore EQ adjustments for the selected output channel.

7. PEQ/GEQ:

Indicates what equalizer type the selected output channel is set to. You can use this button to select from PEQ (Parametric EQ Mode) or GEQ (Graphic EQ Mode).

- **(PEQ Mode)** You can boost or cut a range of frequencies around a selectable center frequency. Each PEQ band has three controls:
 - **Frequency:** The center of the frequency range to be cut or boosted.

- **Q:** The "sharpness" of the boost or cut, higher Q, means a narrower range of frequencies will be affected.
- **dB:** The amount of boost or cut.

- **(GEQ Mode)** The center frequency and Q for each band is preset and you cannot adjust them, you can adjust the dB to control the amount of boost or cut of the frequency.

8. EQ Window:

This window displays a visual representation of the current EQ settings for the selected channel. You can click on an EQ band and set its center frequency by dragging it to the desired frequency. Adjustments can also be made to the Q Factor and dB Level of each EQ band from this window.

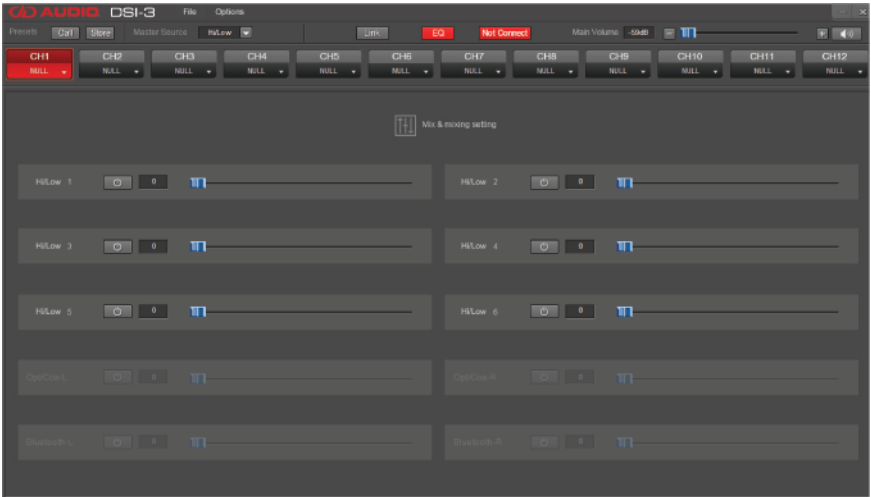
9. Multi Channel EQ Curve Display:

Use to select multiple channels and display their EQ curves. This is helpful for visualizing your overall EQ settings across the entire bandwidth. The selected output channel will be highlighted.

10. EQ Settings:

Use to adjust the selected band's center frequency, Q Factor, and dB level when in PEQ Mode and the selected band's dB level when in GEQ Mode. You can use the slider to control the dB setting and type the desired Freq and Q into the corresponding field.

INPUT MIXER SCREEN



Use the Input Mixer Screen to mute or adjust the level of each input channel for the selected output channel. You will need to adjust the input levels for each output channel.

The Input Mixer will automatically activate the input level adjustments associated with the selected Master Source type from the control bar. Optical and Bluetooth will only have Left and Right input adjustments.

Channel Summing:

The DSI-3 has the ability to internally sum together input channels. This feature is used when integrating with a factory system that has multiple, actively crossed-over signals from the OEM source unit or amplifier. For example, in some vehicles there are actively crossed-over tweeters and woofers in the front of the vehicle. The DSI-3 lets you take those signals and sum them together to get a high-quality, full-range preamp signal. To sum Hi or Low level input channels 1-6, activate all input channels that need to be summed and set them to the desired level to create a balanced full range signal.

SMARTPHONE INTERFACE CONTROL SCREENS



1.

2.

3.

4.

5.

1. Home Screen:

- The hamburger menu in the top right corner will expand giving you options to Share, Save, and Open EQ settings to or from your phone's memory.
- **Volume:** Use to control the main output volume of the DSI-3. This will adjust all output channels evenly.
- **Main Source:** Use to select the type of source you will use to send audio signal to the DSI-3. The selected source type will automatically be selected in the Input Mixer
- **Presets:** Use to select from the available presets stored on the DSI-3
- **Advanced Settings:** Access the Delay, Output, EQ, and Mixer screens.

2. Delay Screen:

- From this screen set the unit of duration and amount of desired delay for each output channel when time aligning the audio system. You must first assign a speaker type to each channel from the Output Screen to unlock the delay settings. See page 10 for detailed Time Alignment Instructions.

3. Output Screen:

- From this screen adjust the output level, mute outputs, switch phasing, select speaker types, set crossovers, reset crossovers, and link left and right channels.

4. EQ Screen:

- This screen displays a visual representation of the EQ settings for the selected output channel. The selected channel will be highlighted at the bottom of the screen.
- Use the center sections to adjust the dB Level, Q Factor and center frequency of each EQ band.
- **Reset EQ:** Resets all EQ adjustments for the selected channel.
- **Bypass EQ/Restore EQ:** Allows you to momentarily bypass and restore EQ adjustments for the selected channel.
- Tap on the desired output channel to select.
- **PEQ/GEQ:** Use to select PEQ (Parametric EQ Mode) or GEQ (Graphic EQ Mode). The selected EQ mode will be displayed.

5. Mixer Screen:

- Adjust the signal input levels from this screen. You will need to set the input levels for each output.
- **Channel Summing:** The DSI-3 has the ability to internally sum together input channels. This feature is used when integrating with a factory system that has multiple, actively crossed-over signals from the OEM source unit or amplifier. For example, in some vehicles there are actively crossed-over tweeters and woofers in the front of the vehicle. The DSI-3 lets you take those signals and sum them together to get a high-quality, full-range preamp signal. To sum Hi or Low level input channels 1-6, activate all input channels that need to be summed and set them to the desired level to create a balanced full range signal.

TIME ALIGNMENT INSTRUCTIONS

1. Measure and record the distances in inches or centimeters from the listening position in the vehicle to each speaker.
2. The speaker distance that is the farthest away from the listening position will be the 0 delay reference, because no delay will be needed for this speaker.
3. Subtract each speaker distance from the 0 delay reference to determine the amount of delay to input into the DSI-3 software.

Delay Calculation Formula: 0 Delay Reference - Speaker Distance = Delay Duration

Example: Measured from the front left listening position, the farthest speaker is 100 inches from the listening position. Notice that the speakers closest to the listening position will have more delay and the speakers that are farther away will have less delay. This enables the sound to arrive at the listening position at the same time.

Front Left Position	0 Delay Reference	Speaker Distance	Delay Duration
CH1	100 in.	30 in.	70 in.
CH2	100 in.	45 in.	55 in.
CH3	100 in.	30 in.	70 in.
CH4	100 in.	45 in.	55 in.
CH5	100 in.	35 in.	65 in.
CH6	100 in.	50 in.	50 in.
CH7	100 in.	75 in.	25 in.
CH8	100 in.	100 in.	0 in.

TIME ALIGNMENT WORKSHEET

Left Front Position	0 Delay Reference	Speaker Distance	Delay Duration
CH1			
CH2			
CH3			
CH4			
CH5			
CH6			
CH7			
CH8			
CH9			
CH10			
CH11			
CH12			

DSI-3RMT REMOTE CONTROL (OPTIONAL)

The optional remote control allows for installation flexibility, and easy operation of the Main Volume, CH 11/12 Volume, and the preset selection functions without having a PC or smartphone connected.

Master Volume:

Rotate the control knob clockwise to turn the main volume up and counterclockwise to turn the master volume down.

CH 11/12 Volume:

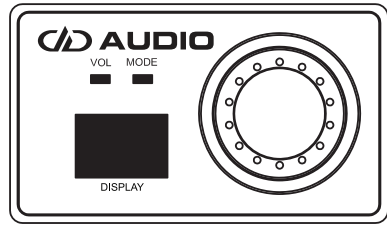
For direct control of CH 11/12 volume long press the control knob until the LCD display begins flashing. If no activity is detected for 3 sec the remote will automatically revert to main volume mode. This function can be used to control the volume of a subwoofer amplifier independent of the master volume. Master volume mode will still affect CH 11/12.

Preset Selection:

To select a preset short press the control knob. The LCD display will change to display the preset numbers. Turn the knob until the desired preset is displayed, short press the knob again to select the preset. If no activity is detected the remote will automatically revert to master volume mode.

Disconnecting the remote Control from the attached cable:

1. Remove the four screws on the backside of the remote
2. Remove the backplate.
3. Carefully unplug the cable connector from the control board.



If you have any questions regarding setup, installation or warranty please contact the DD Audio technical support team by email at service@ddaudio.com or by phone at **(405) 239-2800**.

DD AUDIO

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