



4 x 8 DSP DIGITAL SIGNAL PROCESSOR FOR HOME AND CAR AUDIO

Model: DSP-408 User Manual

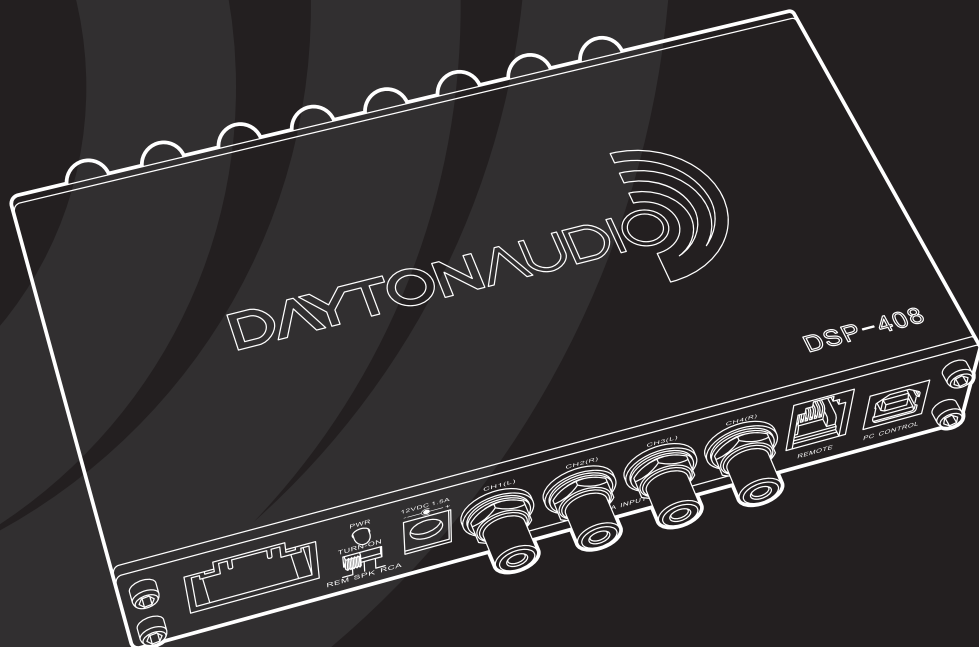


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Product Overview

The Dayton Audio DSP-408 is a feature-rich 4 input/8 output digital signal processor that was designed to give you the tools to contour your audio system to fit your tastes. The DSP-408 allows the user to choose the application of their device. With two methods of powering the DSP, this processor is the perfect addition to your home or car audio system. The DSP-408 can be controlled via a Windows PC, Android device, or an iOS device, unlike most mobile apps for DSPs, the DSP-408 app offers the user full control over the DSP features.

Features:

- 4-channel high-level inputs with signal sensing turn-on
- 4-channel low-level RCA inputs
- Bluetooth 4.0 input for wireless connectivity and aptX audio streaming are available when paired with the Dayton Audio DSP-BT4.0 (Purchased separately)
- 8-channel 3.5V RCA low-level outputs
- Real time signal processing control
- 80 bands of parametric EQ adjustment (10 bands per channel)
- DSP-RC multi-function wired remote allows for preset select and volume control (Purchased separately)
- DSP-408 mobile tuning app for Android phones/tablets which features full control of the DSP-408's features
- Dimensions (WxHxD): 6.53" x 1.02" x 4.55" (165.9 x 25.91 x 115.6 mm)

Box Contents:

- 1 x DSP-408 processor
- 1 x Power adapter — Input: (100~240V, 50/60 Hz, 1A) Output: (12V, 1.5A)
- 1 x High-level input harness
- 1 x USB cable
- 2 x Mounting brackets
- 4 x Mounting screws
- 1 x Introduction card

Important Safety Instructions

To reduce the risk of electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified personnel. To reduce the risk of fire and shock do not expose unit to rain or moisture. The unit should be connected to an earth grounded AC electrical socket. The unit should be operated in a well ventilated area. Minimum clearance is 2 inches from the ventilation openings.



DSP Features and Technical Specifications

Inputs

- 4 RCA preamp inputs
- 4 channel high-level inputs
- 1 USB A for PC control
- 1 USB B for DSP-BT4.0 connection
- 1 RJ11 for DSP-RC connection
- 1 12V DC power input jack

Outputs

- 8 RCA preamp outputs

Bluetooth Functionality

- Real time DSP configuration over Bluetooth with the mobile app for Android and iOS devices
- Audio streaming from a Bluetooth device (utilizing aptX when supported)

USB Connection Functionality

- Real time DSP configuration using Windows PC software

APP/Software Features

- 10 band parametric equalizer per channel
- Variable crossovers: High/Low/Band-Pass slopes 6/12/18/24 dB, Linkwitz/Butterworth/Bessel/Riley
- Time delay: 0 to 277 cm or 8.1471 ms adjustable in 1 cm steps
- Input/Output mixing to customize signal path
- Preset files can be loaded, saved, recalled, or deleted
- Software controllable level attenuation on preamp and high-level inputs
- Customizable name/ID for each preset

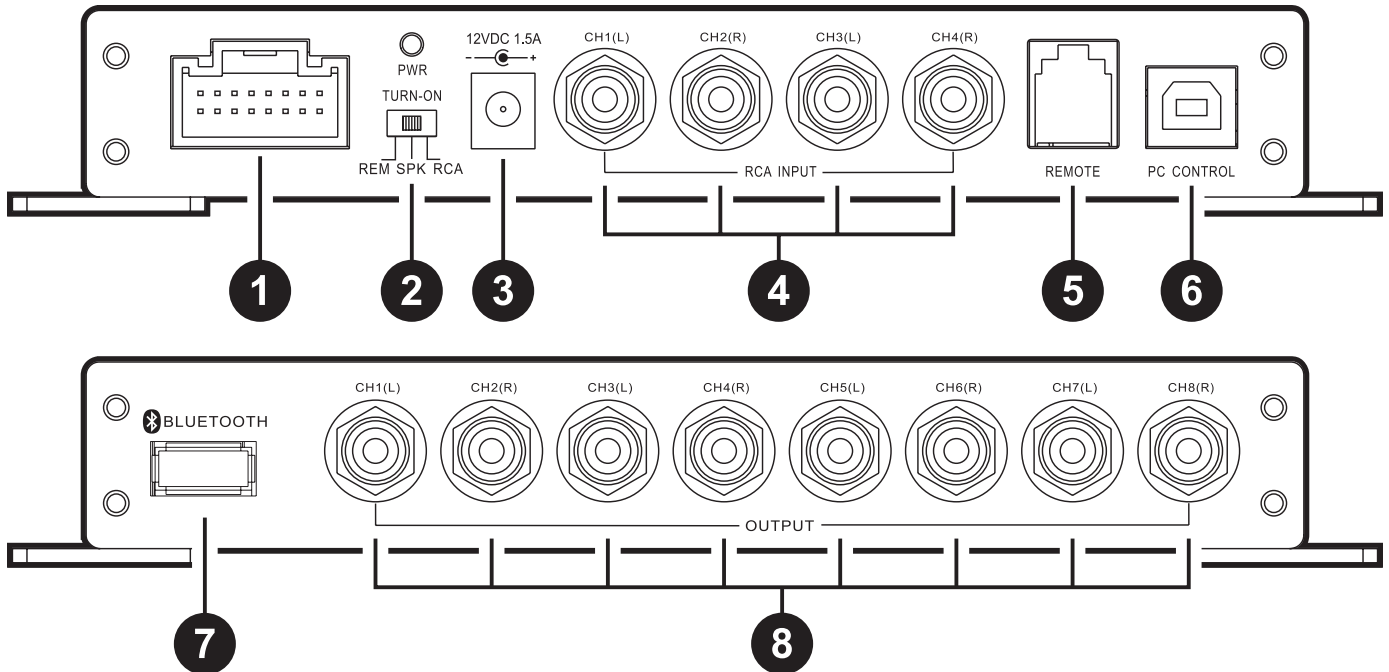
DSP Features

- Analog Devices ADAU1701 SigmaDSP 28-/56 Bit Audio Processor
- Minimum/maximum voltage protection
- Reverse voltage protection
- Mute circuit and delay

Technical Specifications

- High level input impedance: .. 180 ohms
- RCA input impedance: ≥20K ohms
- Frequency response: 20Hz-20KHz
- Output impedance:..... <50 ohms
- Maximum input level: ≤3.2V
- Signal to noise ratio:..... ≥115dB.
- Remote out current: >500mA
- Operating voltage:..... 9-17V

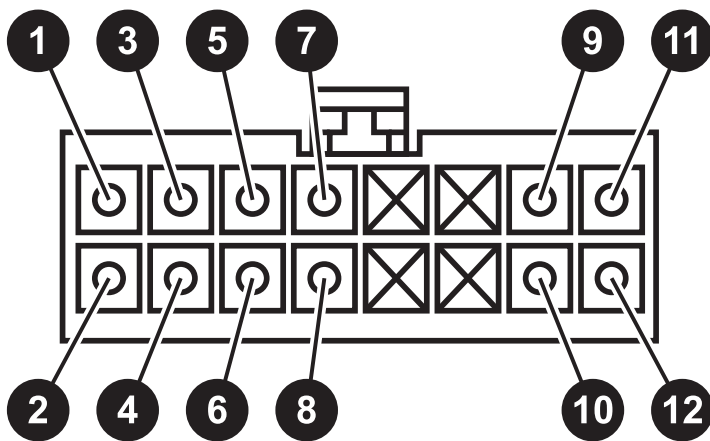
Device Connections



DSP-408 Callouts

1. 12V wiring harness
2. Turn-on selector
3. 12V DC jack input
4. RCA inputs
5. Remote input
6. PC control input (use with DSP-RC)
7. Bluetooth dongle input (use with DSP-BT4.0)
8. RCA outputs

12V Wiring Harness

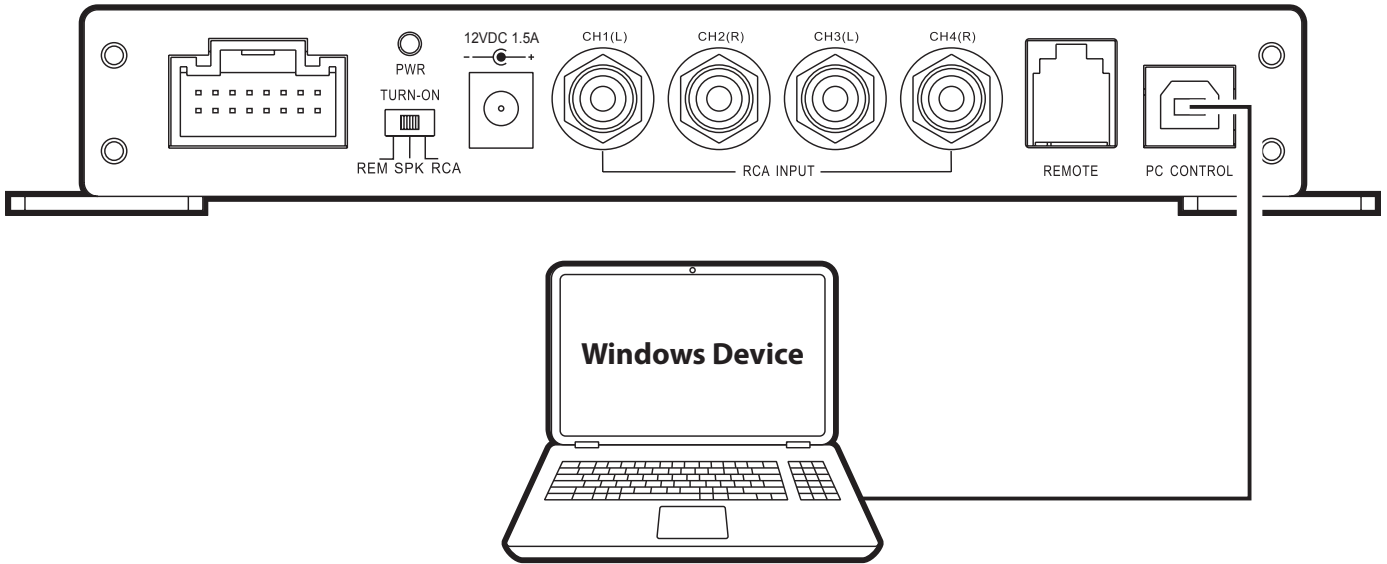


PIN	COLOR	FUNCTION
1	WHITE	CH 4 +
2	WHITE/BLACK	CH 4 -
3	GRAY	CH 3 +
4	GRAY/BLACK	CH 3 -
5	GREEN	CH 2 +
6	GREEN/BLACK	CH 2 -
7	PURPLE	CH 1 +
8	PURPLE/BLACK	CH 1 -
9	RED	REMOTE IN
10	BLUE	REMOTE OUT
11	YELLOW	12V+
12	BLACK	GROUND

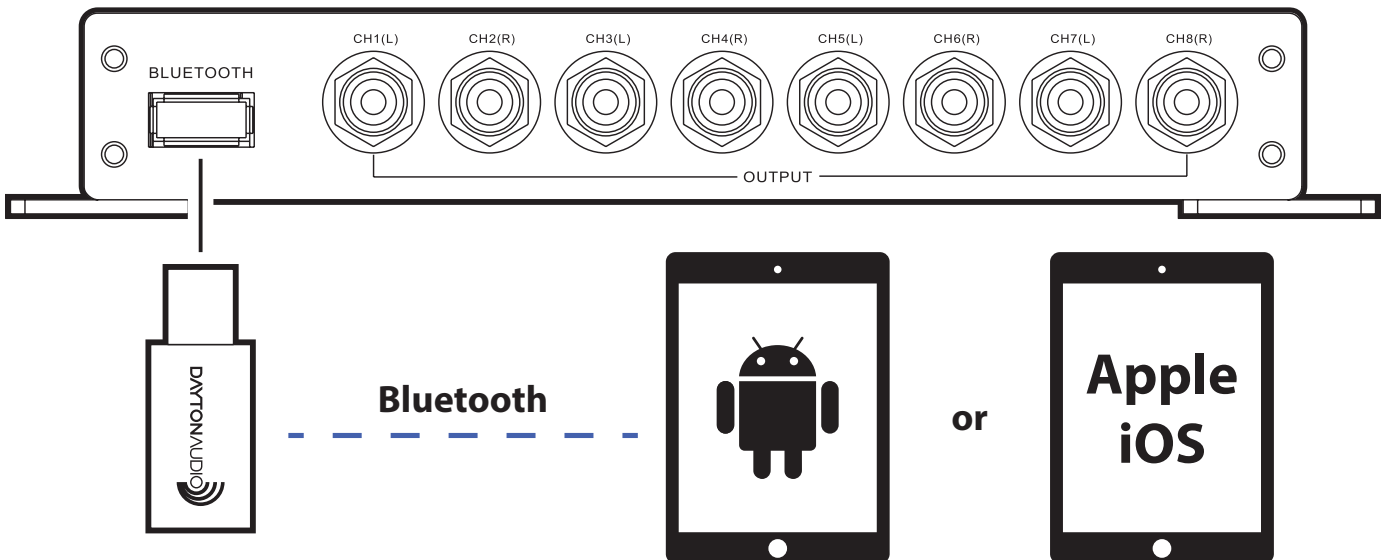
Note: When using the DSP in the "SPK" mode there may be a pop after turn off. Because of this, we recommend the user installs a capacitor inline with their tweeters to prevent any sort of damage.

Controlling the DSP

Connecting via USB to a Windows PC



Connecting via Bluetooth to an Android Device



Connecting to Audio Sources

Analog Inputs:

RCA Inputs: The DSP-408 features 4 RCA inputs which can easily be connected to an aftermarket car head unit, a receiver output in a home, or any audio device with RCA output. When using the DSP in a car audio application where the source is an aftermarket head unit with remote out, switch the turn-on selector to “REM” mode. When using the DSP in a home audio application where an RCA source is being used, switch the turn-on selector to “RCA” mode.

High-level Inputs: The DSP-408 features 4 high-level inputs which are most commonly used in car audio applications from a stock radio. When using the DSP for this application, switch the turn-on selector switch to “SPK” mode.

Digital Input:

Bluetooth Input: Utilizing the DSP-BT4.0, you can connect your Android or iOS device to the DSP-408 and stream audio content via aptX Bluetooth.

Installing the Software and Apps

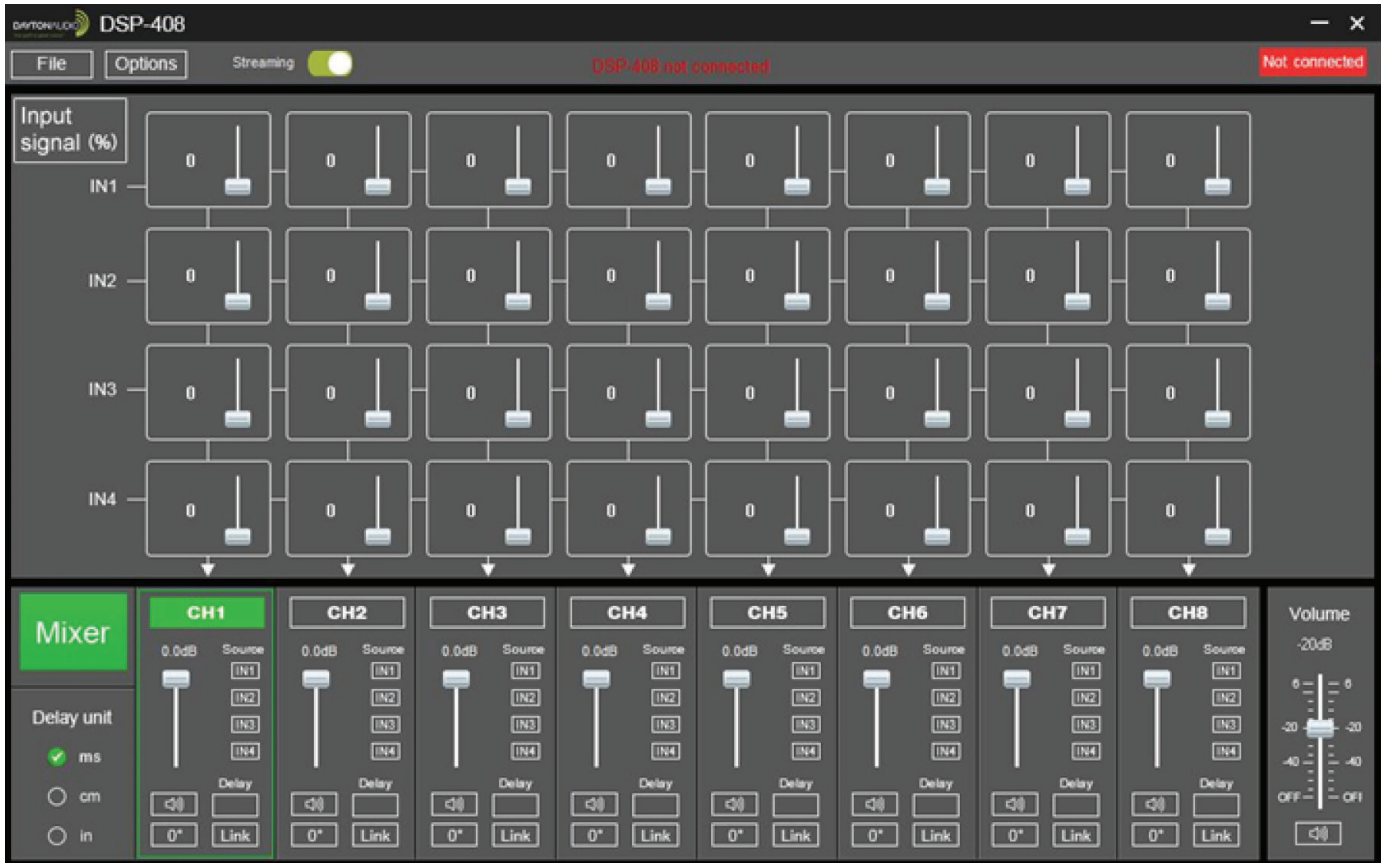
The DSP-408’s mobile and desktop software and associated links can be found or downloaded directly from the Dayton Audio website <http://www.daytonaudio.com/dsp-408>

Android: Download the Dayton Audio DSP Control app directly from the Google Play Store, simply search Dayton Audio DSP Control in the search bar and choose the app developed by Dayton Audio. This app will allow you to control the DSP via your mobile device and allow you to stream audio content directly to the DSP when used with the optional Bluetooth dongle.

iOS: Download the Dayton Audio DSP Control app directly from the iTunes Store, simply search Dayton Audio DSP Control in the search bar and choose the app developed by Dayton Audio. This app will allow you to control the DSP via your mobile device and allow you to stream audio content directly to the DSP when used with the optional Bluetooth dongle.

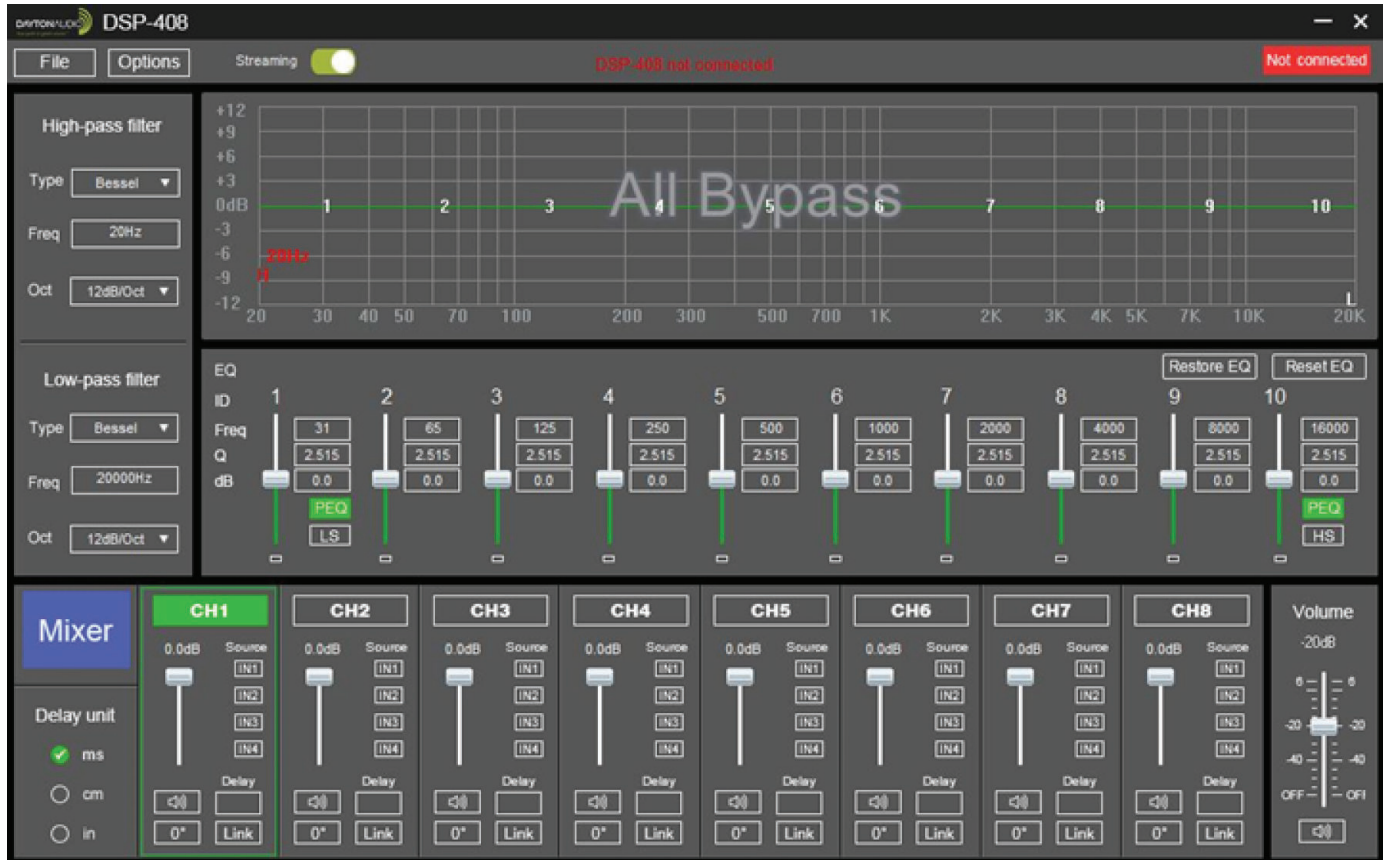
Windows: Download and install the DSP-408 software directly from Dayton Audio’s website.

Operating the PC Application



1. **Mixer:** The user can select what percentage of each input is routed to each output simply by using the sliders.
2. **Master Volume:** The user can control the volume of the system by moving the slider up or down
3. **Channel Level:** The user can control the level of each channel by moving the slider up or down
4. **Mute:** The user can mute a channel by pressing the speaker button, to undo, press again.
5. **Time Alignment:**
 - a. **Unit of Measure:** At the bottom of the screen, you can select either “ms”, “cm”, or “in” as the unit of measure. **Note: Switching between unit of measurements will erase all values.**
 - b. **Controlling Delay:** Click on the desired channel, then on the “Delay” box, and either enter a number or use the up key to increase the delay, and the down key to decrease the delay. **Note: Only whole number increments can be entered so the shortest delay is 1 cm which equals 0.294 ms or 0.394 in.**
6. **Phase Adjustment:** The 0° button can be pressed to invert the phase 180°, to revert back, press the 180° button.
7. **Linking:** The user can choose to link multiple channels together which allows for grouped control over the EQ and crossovers. To create a link between channels, click the “Link” button below each channel that you would like linked. To start a new set of linked channels, double click the “Link” button for the channel you would like to start the new link with.

Operating the PC Application Continued



1. High-pass/Low-pass filters:

- Type:** The user can select between 3 different crossover types; Linkwitz Riley, Bessel, and Butterworth.
- Frequency:** The user can choose a crossover frequency 20-20,000 Hz.
- Slope:** The user can choose between 6/12/18/24 dB per octave slopes

2. Equalizer:

- Center Frequency Selection:** The user can change the center frequency that will be the focus of the equalization by typing into the dialog box.
- Q Selection:** The user can change the Q by typing a number to the dialog box. The Q adjusts the effective width of your equalization.
- Level Adjustment:** The user can move the EQ slider to adjust the amplitude of equalization.
- Restore/Bypass EQ:** The user can click the “Restore EQ” button to bypass the EQ for the selected channel. To restore the EQ, simply click the same button again, which is now labeled “Bypass EQ”.
- Reset EQ:** The user can clear the EQ for the selected channel, this action cannot be undone, so be cautious when using this feature.
- Shelf Filters:** The user can choose to use shelf filters or PEQ on channels 1 and 10.

3. **Graph:** The graph at the top shows the overall response curve of all 10 PEQ filters.

4. **Streaming Switch:** Turn the streaming option on or off. When not streaming, the recommended position for this switch is off (the left position).

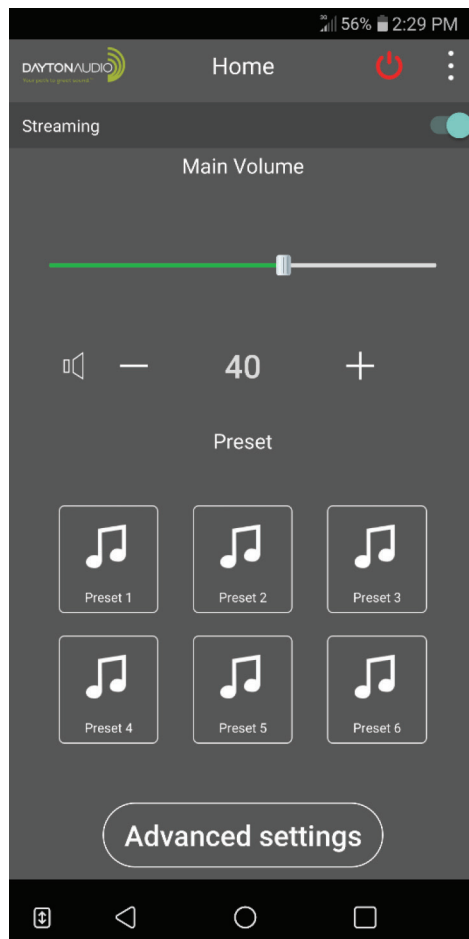
5. **Connection Status:** This status display will inform the user if the PC is connected to a DSP-408.

Operating the Mobile App

There are 5 menu screens for the DSP-408's mobile app (Dayton Audio DSP Control)

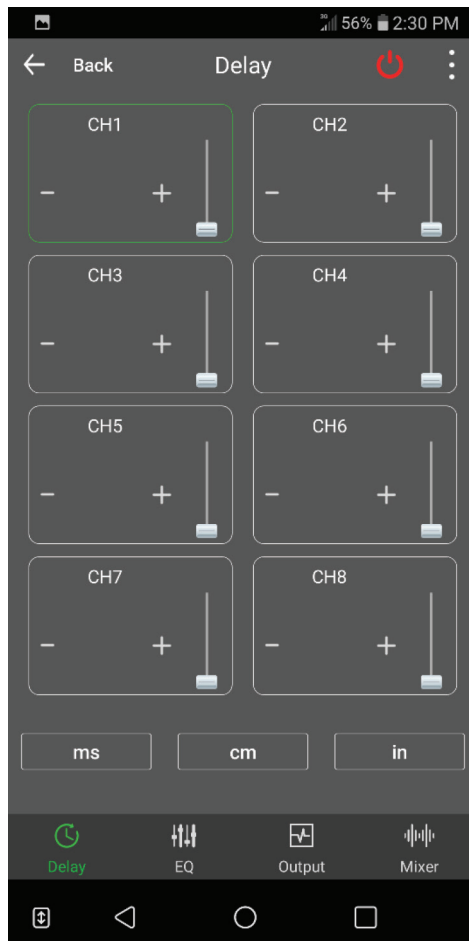
- **The Main Menu**

To return to the Main Menu, simply press the back button at the top left of any sub-menu.



1. **Streaming Control:** Turn the streaming option on or off. When not streaming, the recommended position for this switch is off (the left position).
Note: When controlling the DSP-408 with the bluetooth off, while utilizing analog inputs, if the streaming option is turned on, the audio will cut in and out.
2. **Volume Control:** The main volume can be controlled via the slider or via the "+" sign to increase and the "-" sign to decrease.
3. **Preset Selection:** Select a saved preset by touching one of the 6 preset buttons.
4. **Access to Other Menus:** Touch the "Advanced settings" button.

- **Advanced Settings - Set Delay Menu**
Each channel 1-8 features its own delay control.

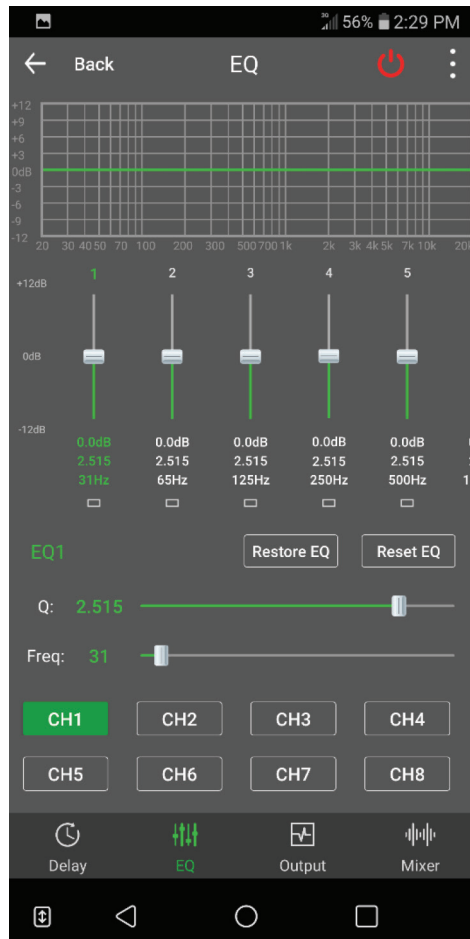


1. **Controlling Delay:** Select either “ms”, “cm”, or “in”, then use the “+” sign to increase the delay, and the “-” sign to decrease the delay. Alternatively, you can use the slider to increase or decrease the delay as needed. **Note: Only whole number increments can be entered so the shortest delay is 1 cm which equals 0.294 ms or 0.394 in. Also, switching between unit of measurements will erase all values.**

- **Advanced Settings - The Equalizer Menu**

Each channel 1-8 features its own independent 10-band parametric EQ.

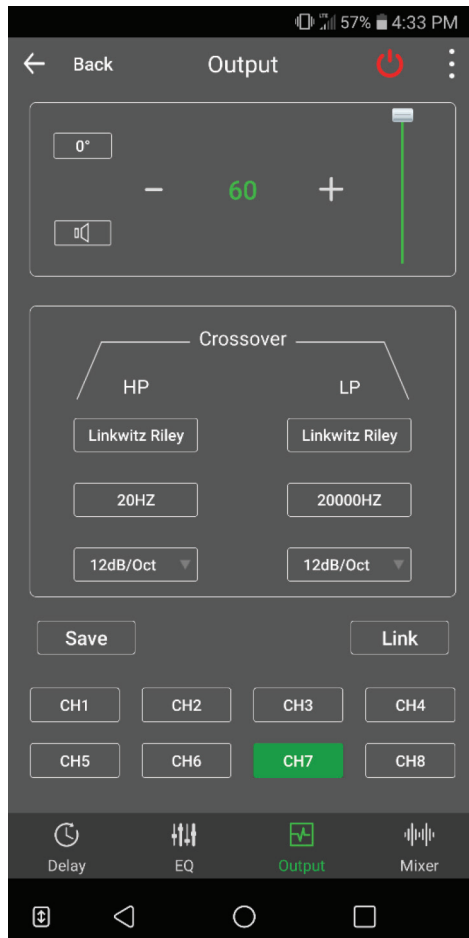
Parametric EQ provides parametric filters, each of which can be set for a peaking filter. The graph at the top shows the overall response curve of all 10 PEQ filters.




1. **EQ Band Selection:** The user can touch the small, white-outlined box below the level control of the desired EQ band. To reveal the remaining EQ bands, gently swipe left on the level adjustment sliders.
2. **Center Frequency Selection:** The user can move the slider to choose the center frequency that will be the focus of your equalization.
3. **Q Selection:** The user can move the slider to adjust the effective width of your equalization.
4. **Level Adjustment:** The user can move the slider for each EQ band to adjust the level of equalization.
5. **Restore/Bypass EQ:** The user can touch the “Restore EQ” button to temporarily bypass the EQ for the selected channel. To restore the EQ, simply touch the same button, which is now labeled “Bypass EQ”.
6. **Reset EQ:** The user can clear the EQ for the selected channel, this action cannot be undone, so be cautious when using this feature.

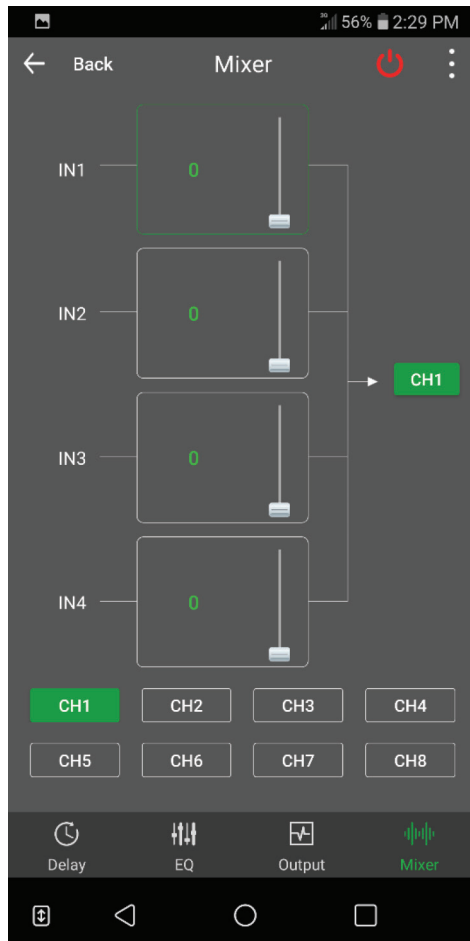
- **Advanced Settings - The Output Menu**

Each channel 1-8 features an output menu that allows the user to select a desired crossover, output level, and phase of that channel.



1. **Phase Control:** The “0°” button can be pressed to invert the phase 180°, to revert back, press the same button again, which is now labeled “180°”.
2. **Muting:** The user can mute a channel by pressing the  button, to undo, press again.
3. **Level Control:** The user can increase the level of a channel by pressing the “+” sign or decrease the level by pressing the “-” sign. Alternatively, the user can also use the slider to adjust level.
4. **Crossover Type:** The user can select between 3 different crossover types; Linkwitz Riley, Bessel, and Butterworth. **Note: To disable the crossover, change the slope to 6dB/Oct and move the frequency to the limit (20 Hz for HP, 20,000 Hz for LP).**
5. **Crossover Frequency:** The user can choose a crossover frequency between 20 and 20,000 Hz.
6. **Crossover Slope:** The user can choose between 6/12/18/24 dB per octave slopes
7. **Saving:** The user can save the tune they are working on to any of the 6 presets by clicking the “Save” button and then selecting a preset number and hitting save. Additionally, the user can delete or recall tunes in this menu as well.
8. **Linking:** The user can choose to group multiple channels together which allows for grouped control over the EQ and Output menus. To create a group, click the “Link” button, then the channels to be grouped, and then press the “Grouping” button. To add channels, click the “Group” you would like to add to and then the designated channel, then click the “Join” button. Groupings can also be deleted by selecting the “Group” and pressing “Delete” button.

- **Advanced Settings - Mixer Menu**
Each channel 1-8 features a mixing control



1. **Input/output Configuration:** The user can select what percentage of each input is routed to each output simply by using the sliders.

5-Year Limited Warranty
See daytonaudio.com for details



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