TL-8.8DSP

8-Channel Digital Signal Processor

Owner's Manual

4545 EAST BASELINE RD.
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INTRODUCTION

Congratulations on the purchase of your new MTX gear. For over 50 years MTX remains an American family-owned manufacturer full of passionate enthusiasts just like you. Thank you for counting on us to help you "Amplify The Ride"!

For best performance and longevity of your audio gear, we recommend you have your new MTX product installed by an Authorized MTX Dealer. Their installation knowledge and expertise will ensure you get the most out of your new equipment while safeguarding against potential issues. Also, please read your product warranty carefully and retain your receipt and original carton for possible future use.

We're here to help with any installation or technical support. Visit www.mtx.com to chat, call 1-800-225-5689 to speak with an MTX Technical Support representative, or visit www.youtube.com/user/MTXAudioUSA to view product videos.

Don't forget to register your new MTX product. Visit www.mtx.com/productregistration or scan the QR code below.

Model # _____

Serial # _____

Dealer's Name _____

Date of Purchase _____

SAFETY

- Please read and follow these instructions to prevent injury and damage to the unit.
- If you are unsure about installing the system by yourself, please have it installed by a qualified MTX technician.
- Whenever working on the vehicle, it is recommended to disconnect the battery prior to starting work. Failure to do so may lead to a risk of electric shock or equipment damage.

  When connecting power and ground wires ensure that the red power wire is fused at the point where it is connected to the vehicle's battery. Failure to do so can result in damage to the vehicle if a short circuit develops between the vehicle connection point and the product.

⚠ **WARNING:** This symbol with "WARNING" is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

⚠ **CAUTION:** This symbol with "CAUTION" is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

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FEATURES

- BT / PC Adjustable DSP Powered by ADAU1452 DSP Chip
- Tuned via Windows PC, controlled via iOS and Android
- 8-Channel High / Low Level Input
- High Level Input Up To 16V
- 31 Band Parametric EQ
- Selectable Crossover Type: Butterworth, Linkwitz-Riley, Bessel
- Variable Crossover Slope: 12 / 18 / 24 / 48dB per Octave
- Adjustable Time Alignment: 0 – 20ms
- 6 Presets for Custom Tunes

PACKAGE CONTENTS

- 8-CH Digital Signal Processor
- USB Cable
- (2) 16-Pin RCA Wire Harnesses
- QR Code Insert
- Accessories Pack
  (4) Washer Head Screws ST4X20
  (1) 4-Pin Phoenix Connector
  (1) Slotted Screw Driver 45mm

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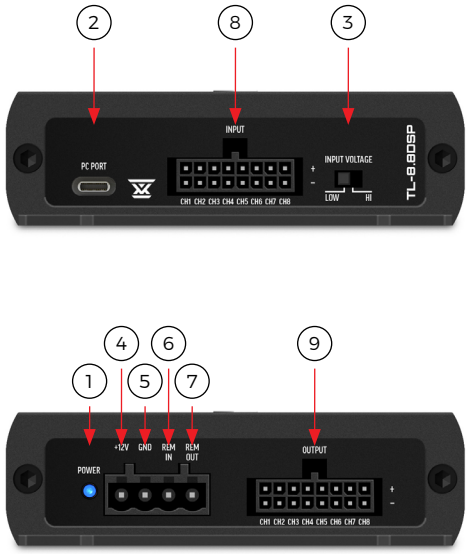
CONTROL FUNCTIONS



1. **Power LED** - The Power LED illuminates blue when the line output converter is powered on and operating in the normal battery voltage range. The under / over voltage protection activates if the battery voltage drops below 9V, or exceeds 16.5V, and the Power LED will flash blue. The Power LED will also flash blue when connecting to a Bluetooth compatible device or when connected to a PC via USB cable indicating it is in programming mode.

2. **PC Port** - Use the USB-C port to connect the TL-8.8DSP to a PC in order to adjust audio settings, load firmware, save or load presets, or extract logged data. Audio settings (EQ, crossovers, time alignment) are changed via PC software.

3. **Input Voltage Switch** - This switch is used to configure the TL-8.8DSP for either Low level (RCA) inputs from an aftermarket source unit or High Level (Speaker) inputs from a factory source unit.

4. **Power Terminal (+12V)** - This terminal is connected to +12V battery power with 14 AWG wire and dedicated fuse, typically where the amplifier or source unit is powered depending on the installation.

5. **Ground Terminal** - This terminal is connected to chassis ground with a 14 AWG wire, typically where the amplifier or source unit is grounded depending on the installation.

6. **Remote In Terminal** - This terminal is connected to the "remote" wire from the source unit or a vehicle's switched power wire, and is used to turn the digital signal processor on.

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7. **Remote Out Terminal** - This terminal connects the TL-8.8DSP remote output to your amplifier's remote input, and must to be used to avoid unwanted noise or pops when the audio system is turned on or off.

8. **Low Level RCA Inputs** - These RCA inputs connect to the line level outputs of your source unit. Use the included 16-pin RCA wire harness. For High Level signal input, it is recommended to use ThunderLink model TL1SPK to adapt the speaker line to RCA.

9. **RCA Outputs** - The RCA outputs are connected to the inputs of your amplifier. Use the included 16-pin RCA wire harness.

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GUI DOWNLOAD

Visit the TL-8.8DSP webpage on mtx.com to download the ThunderTune GUI. Simply unzip / extract and install on your PC.

CONFIGURATION MENU

The Configuration Menu allows you to assign / route the TL-8.8DSP Inputs to the desired output channels and adjust the input levels. The Input channels are listed on the left side of the menu in red, and the Output channels are listed across the top of the menu in blue. Each Input and Output Channel has its own signal level indicator that cascades from blue to violet as the signal level changes.

Input & Output Configuration - The default configuration is shown above, with all 8 input channels routed directly to the corresponding output channel. **Note:** Output Channels 7&8 are combined for subwoofer applications.

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Channel Selection - Select or deselect the desired channel assignment by pressing the corresponding checkbox in the configuration table. When selected, a check mark is displayed in the checkbox and the corresponding signal level indicator will become active.

Configuration Examples - The example below represents a typical aftermarket source unit with front and rear stereo RCA outputs connected to Input Channels 1-4, and separate subwoofer RCA outputs connected to Input Channels 7&8. Channels 5&6 are not being used in this configuration.

The example below uses the same Input Channel configuration shown above, but the signal from Input Channels 3&4 is also routed to Channels 5&6.

Input Level Adjustment - Once the Input & Output channels are configured, the Input Level for each channel can be adjusted between 1 and 100. To make adjustments, select and highlight the displayed value next to the checkbox, then use the up and down arrows on the keyboard to increase or decrease the level. Alternatively, enter the desired input level with the keyboard, then press Enter.

CROSSOVER MENU

Crossover Curves Display - The top section of the Crossover Menu displays the Equalizer Curve and the High-Pass and Low-Pass crossover points for the selected pair of channels. In the example below, Channels 3/4 are selected, and both High-Pass and Low-Pass crossovers are configured.

Crossover Configuration - For each pair of DSP Channels, the Filter Type, Crossover Slope, and Crossover Frequency can be configured independently.

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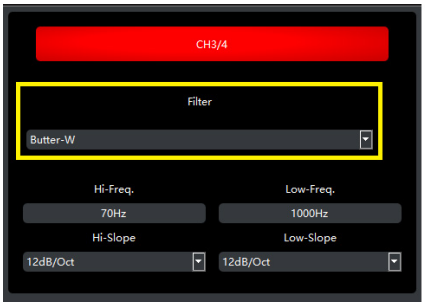
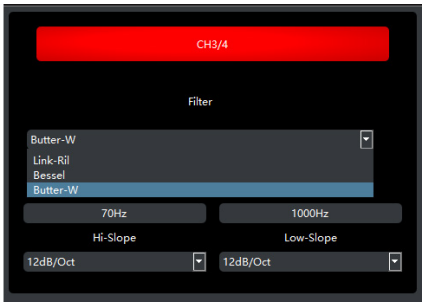
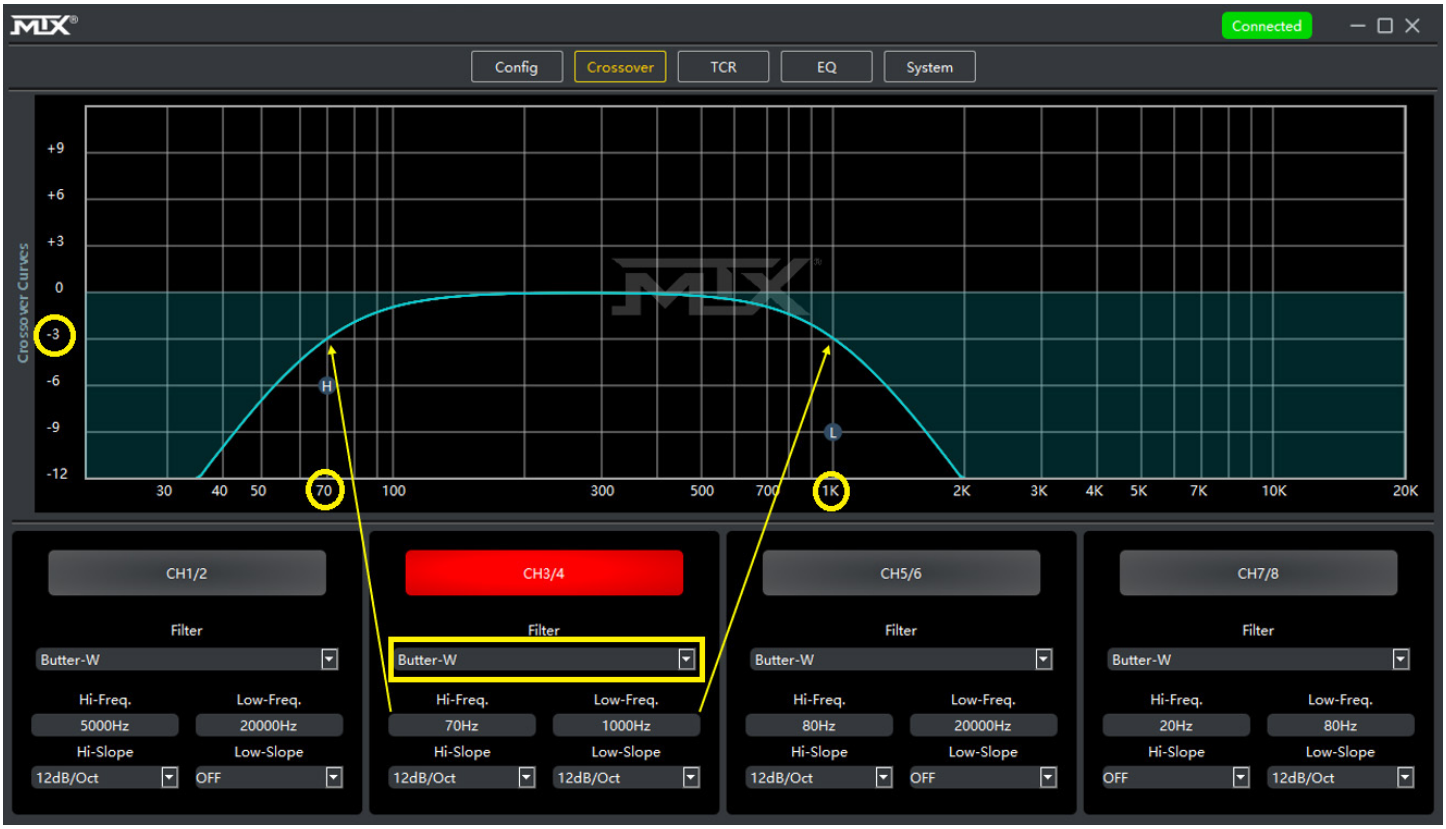
Filter Type - Choose the desired Filter Type for the channel pair by selecting from the drop-down Filter list. Butterworth, Linkwitz-Riley, and Bessel filters are the available options.





The displayed Crossover Curve updates to reflect the filter type that has been chosen. Two examples shown below of the more commonly used Butterworth and Linkwitz-Riley Filter types for reference.

Butterworth Filter - Flat Frequency Response and roll off, 3dB down at the selected crossover frequency.



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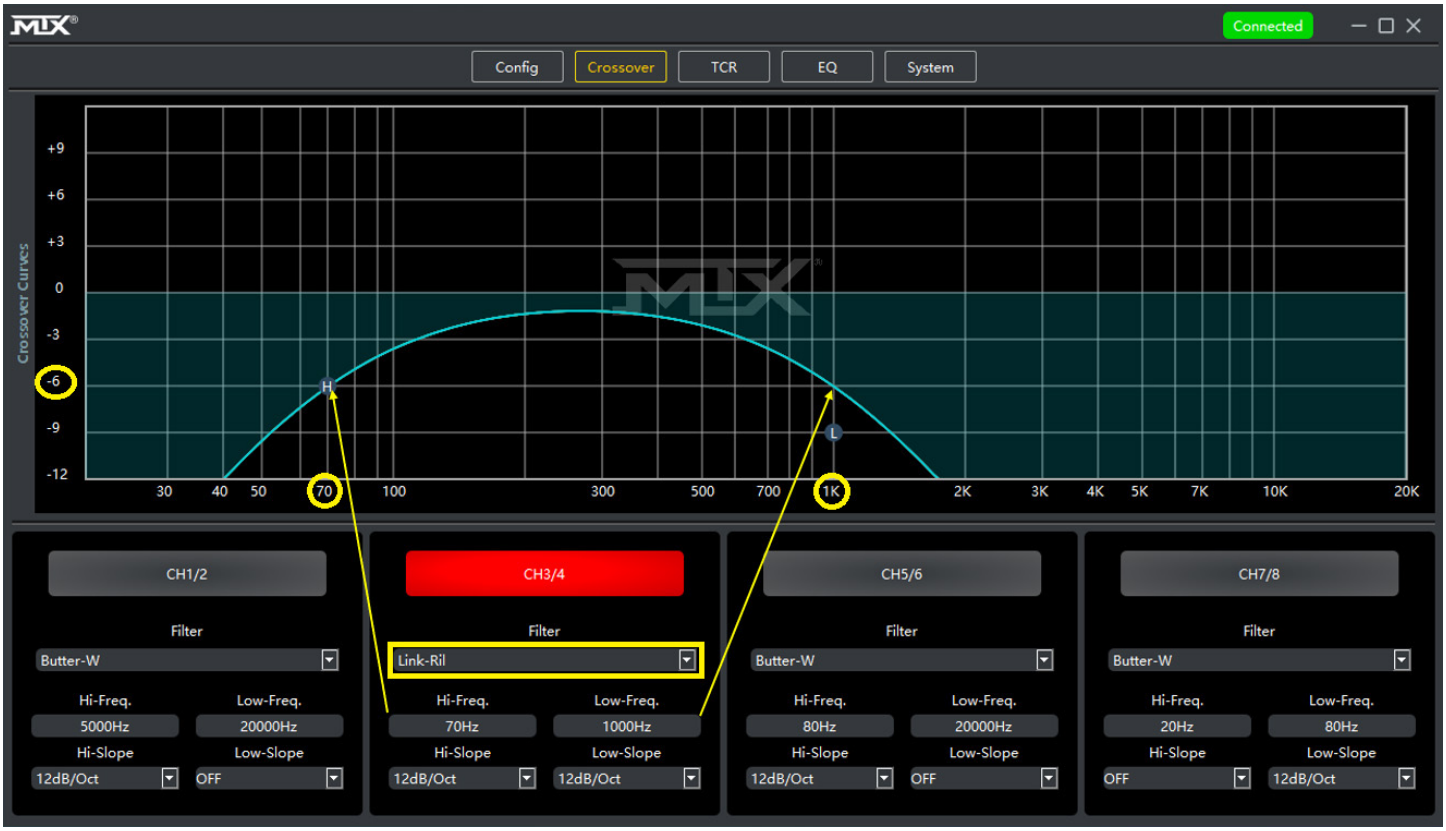
Linkwitz-Riley Filter - Steeper roll off, -6dB down at the selected crossover frequency.



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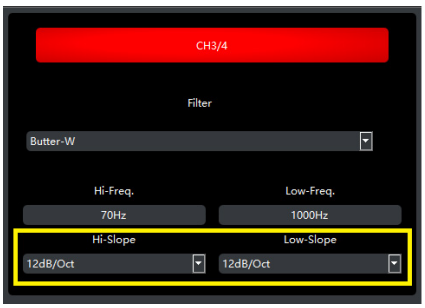
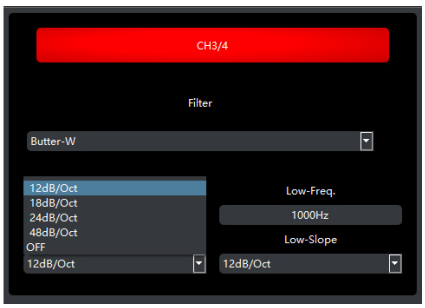
Crossover Slope - Choose the desired Crossover Slope by selecting from the Hi-Slope or Low-Slope drop-down lists. The available Slope options are 12, 18, 24, and 48db/Oct. To defeat the High-Pass or Low-Pass Crossover for the selected set of DSP Channels, select OFF from the drop-down menu.





The displayed Crossover Curve updates to reflect the Crossover Slope chosen. In the example below the High-Pass Slope is set to the default 12dB/Oct, but the Low-Pass Slope has been set to 48dB/Oct to illustrate the different Crossover Curve shape.

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Crossover Frequency - Set the Crossover Frequency by selecting either the High-Pass or Low-Pass Crossover point displayed in the Crossover Curve, then click and drag to the left or right to the desired frequency. Alternatively, the desired crossover frequency can be entered directly into the Hi-Freq. or Low-Freq. Fields below.

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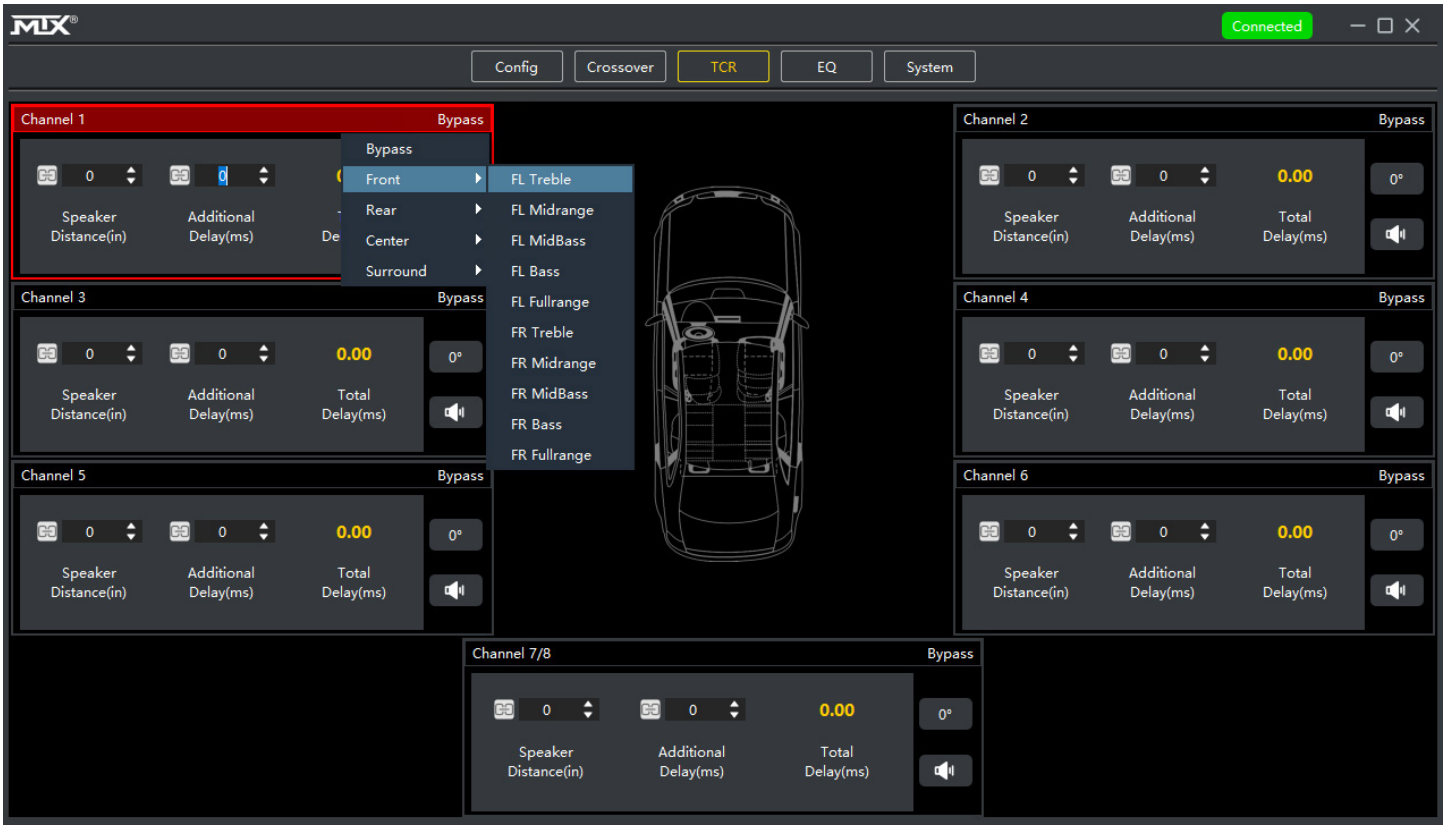
TIME CORRECTION MENU

Channel Configuration - Assign the speaker type for each DSP channel by clicking the channel header and then selecting the appropriate label from the drop-down menu. Channels 1 - 6 can be configured for Front, Rear, Center or Surround speakers, while Channels 7 - 8 are intended for Subwoofers.



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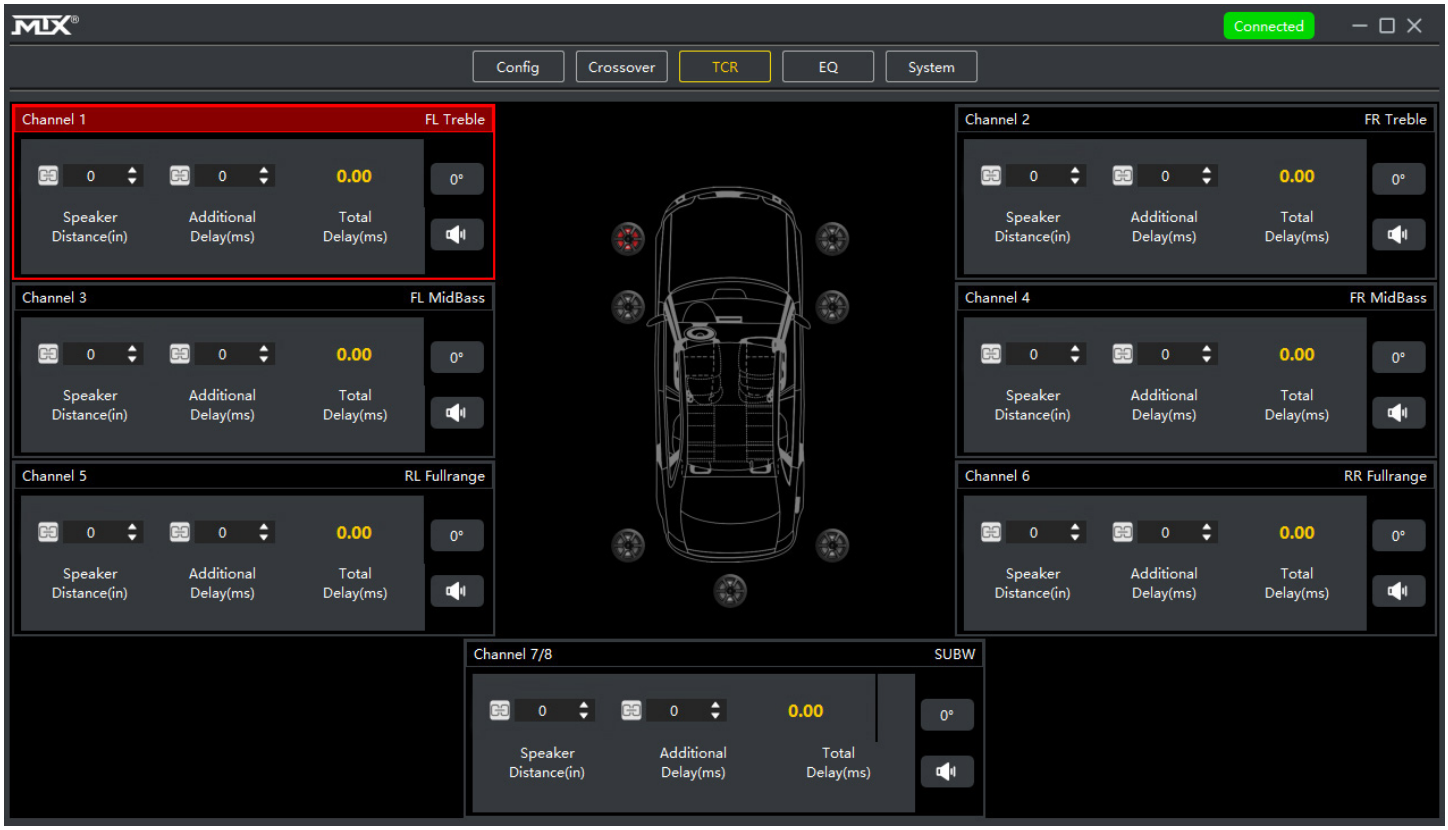
A speaker icon is displayed in the vehicle diagram as each channel is configured. The Channel and corresponding speaker icon remain highlighted red during adjustment.



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Setting Speaker Distance - Measure the distance of each speaker / channel from the intended listening position, which is typically the center of the driver's side headrest. Enter the distance into the Speaker Distance field for each active DSP channel.

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The TL-8.8DSP calculates the correct amount of Time Delay for each channel based on the distance of the speaker / channel that is the greatest distance from the intended listening position. In the example below, the Right Rear speaker is the greatest distance from the intended listening position, therefore the Time Delay is 0.

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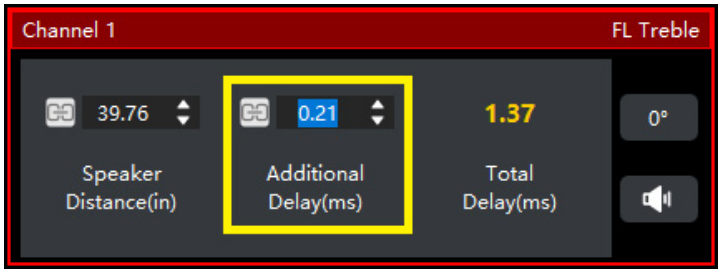
Time Delay Adjustments - Incremental Time Delay adjustments can be made to an individual DSP channel by pressing the up and down arrows in the Additional Delay field.



Incremental Time Delay adjustments can be made to a group of DSP channels simultaneously as well. First link the desired channels by selecting the link buttons to the left of the Additional Delay Fields. The Link buttons will remain highlighted green when selected. Press the up and down arrows in the Additional Delay field of any of the linked channels to increase or decrease the Time Delay.

Note: The example above shows the 3 Left Channels linked, but any combination of channels can be linked together for simultaneous Time Delay adjustments.

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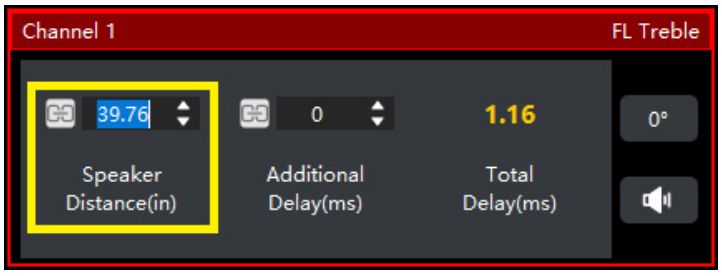
Speaker Distance Adjustments - Incremental Speaker Distance adjustments can be made to an individual DSP channel by pressing the up and down arrows in the Speaker Distance field.



Incremental Speaker Distance adjustments can be made to a group of DSP channels simultaneously as well. First link the desired channels by selecting the link buttons to the left of the Speaker Distance Fields. The Link buttons will remain highlighted orange when selected. Press the up and down arrows in the Speaker Distance field of any of the linked channels to increase or decrease the Speaker Distance.

Note: The example above shows the 3 Left Channels linked, but any combination of channels can be linked together for simultaneous Speaker Distance adjustments.

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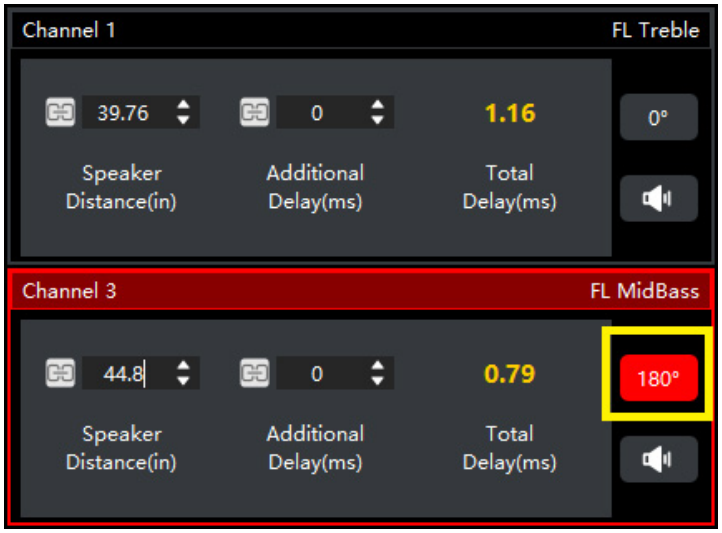
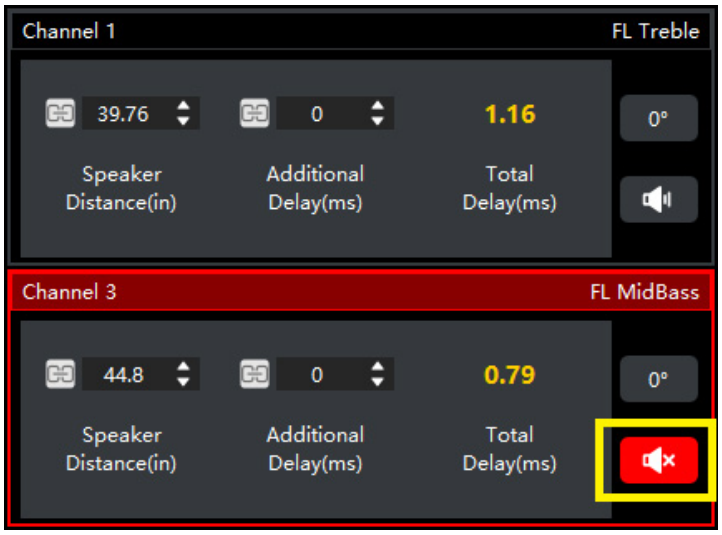
Phase Control - The Phase of each DSP Channel can be toggled between 0 Degrees (In Phase) and 180 Degrees (Out of Phase) by pressing the Phase button.



Channel Mute - Each DSP Channel output can be muted independently during adjustment by pressing the Mute button. Press once to mute the output, press again to unmute.



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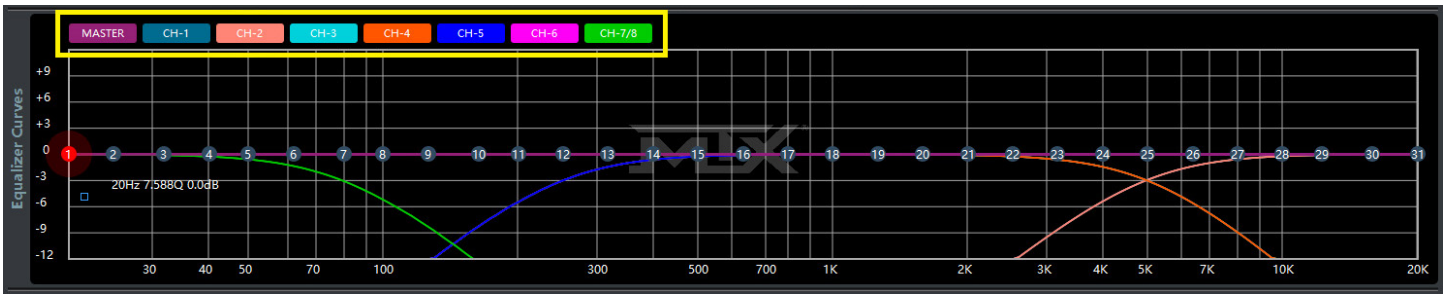
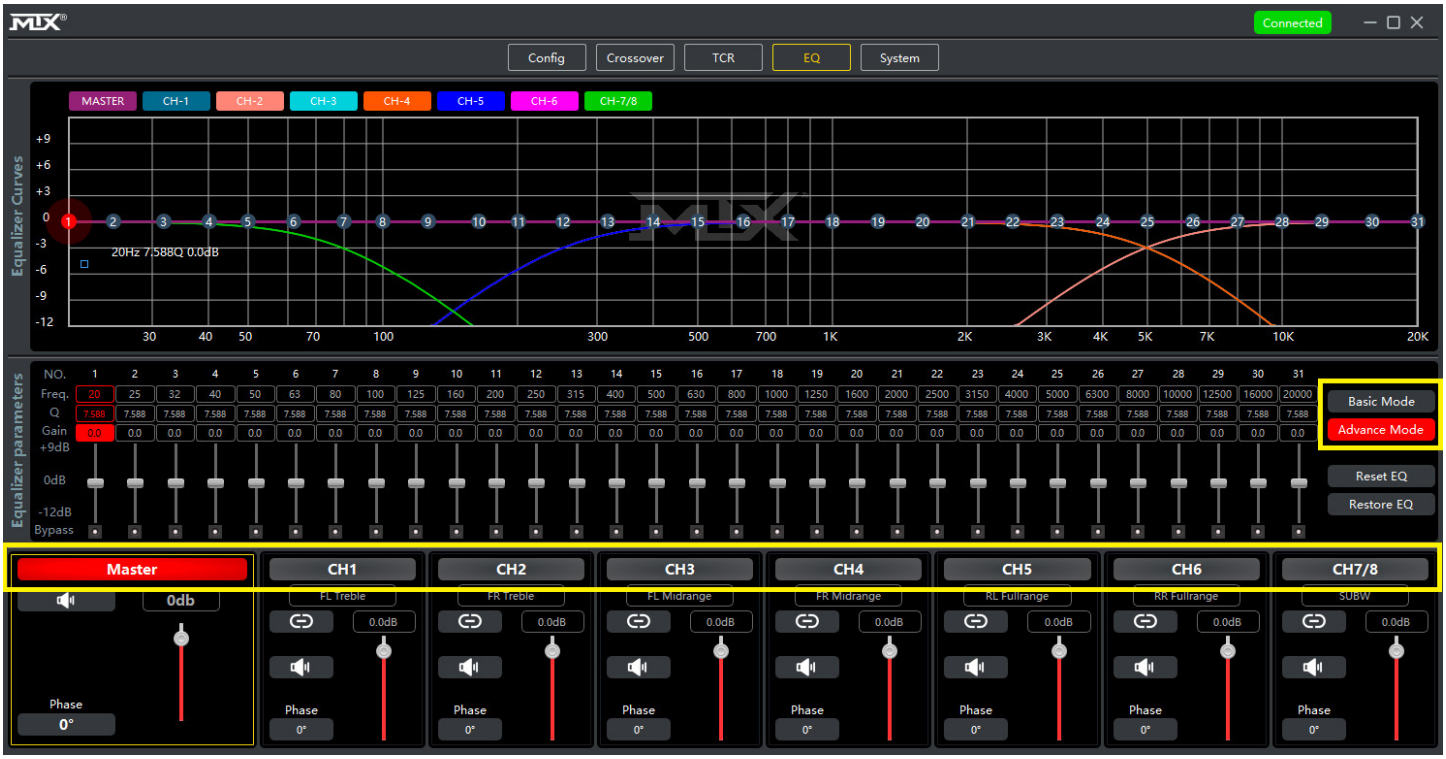
EQUALIZER MENU

Equalizer Curves Display - The top section of the Equalizer Settings Tab displays the Equalizer Curve for each channel. The displayed EQ curve for each channel can be toggled on or off by selecting the respective channel buttons above the chart.



Equalizer Modes - Equalizer Adjustments can be made in either Basic or Advanced Mode for each channel independently. Select the desired channel in the lower section of the Equalizer Settings Tab, then select Basic Mode or Advanced Mode by pressing the corresponding button on the right side of the Equalizer Parameters section of the Equalizer Settings Tab.



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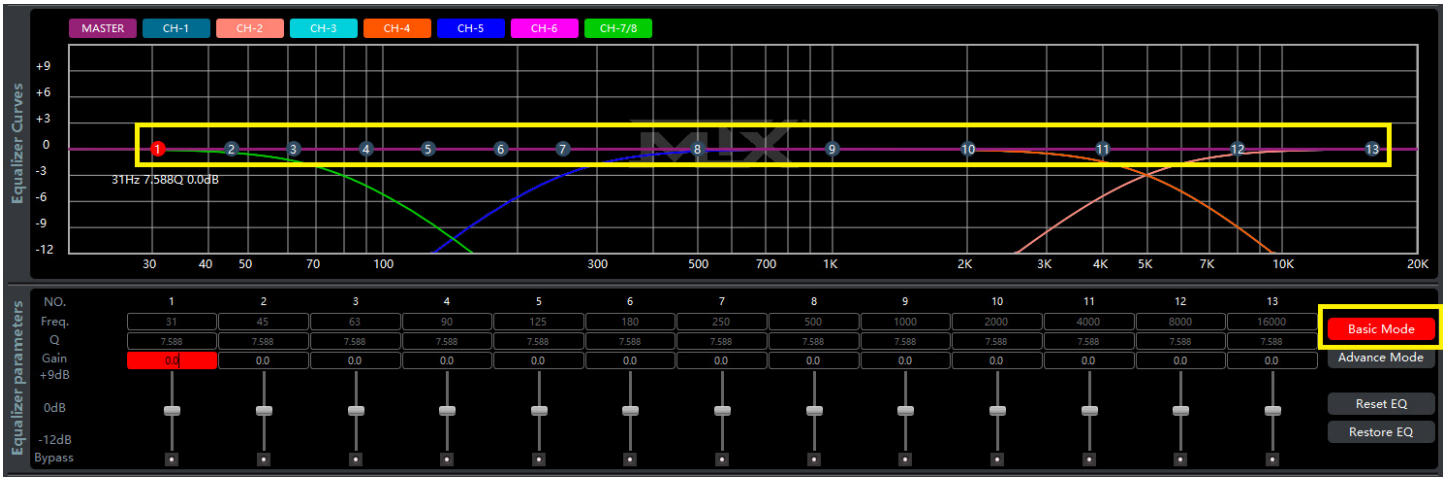
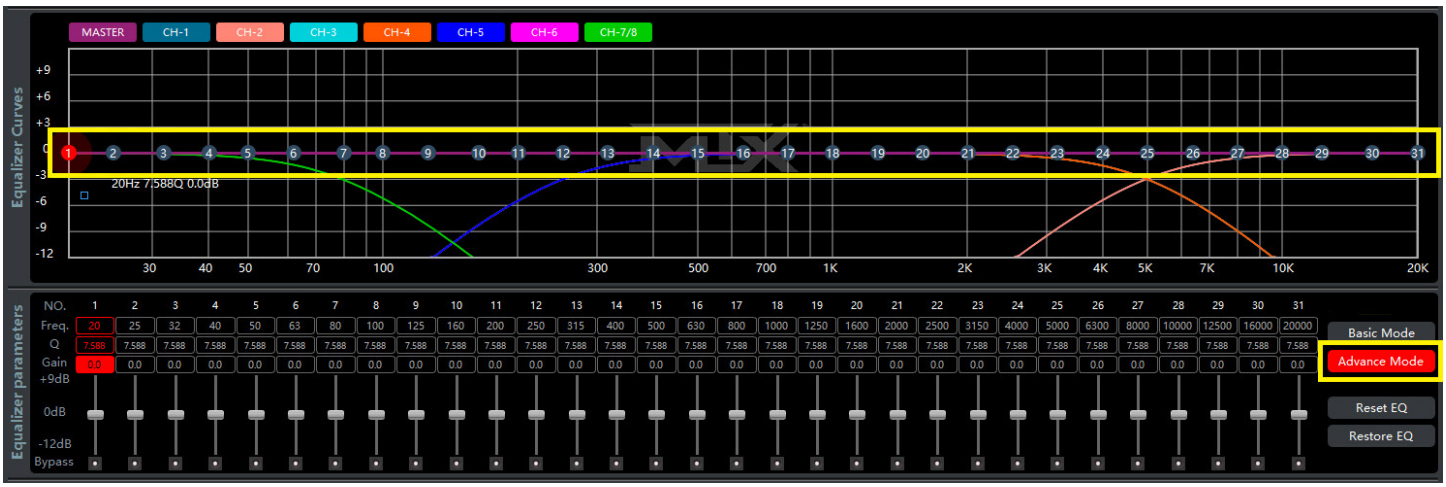
In **Basic Mode**, 13 Bands of Equalization are available for each channel. The gain for each band is adjustable, but the default frequency and Q values are fixed.



In **Advanced Mode**, 31 Bands of Equalization are available for each channel. The gain, frequency, and Q values for each band are all adjustable.



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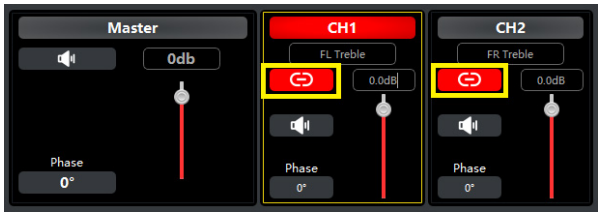
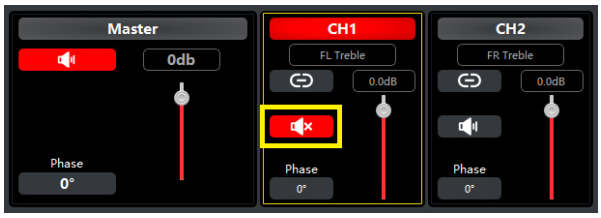
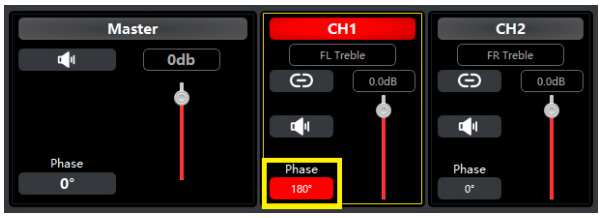
Equalizer Channel Linking - Each Equalizer Channel can be adjusted independently or linked together with other channels by pressing the Link buttons. Press once to link, press again to unlink.



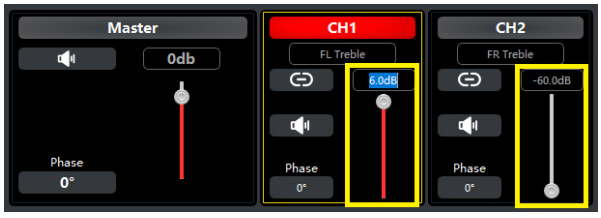
Equalizer Channel Mute - Each Equalizer Channel output can be muted independently during adjustment by pressing the Mute button. Press once to mute the output, press again to unmute.



Equalizer Channel Phase Control - The Phase of each Equalizer Channel can be toggled between 0 Degrees (In Phase) and 180 Degrees (Out of Phase) by pressing the Phase button.



Equalizer Channel Level Control - The Output Level of Each Equalizer Channel can by adjusted between -60dB and +6dB by either using the slide control or by manually entering in the desired level in the level field. The default level for each channel is 0dB.



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Equalizer Gain Adjustments - In Basic and Advanced Modes, each Equalizer Band has independently adjustable Gain between -12dB and +9dB for precise adjustments at the desired frequency. To adjust the Gain for a specific band, click and drag the slider controls in the Equalizer Parameters section up or down to either Boost or Cut to the desired level. When adjustments are being made to an Equalizer Band, the parameters and the data point in the Equalizer Curve shown above will remain highlighted red.

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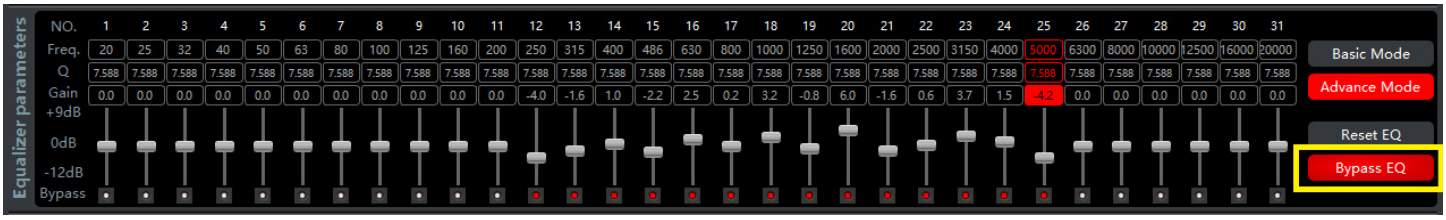
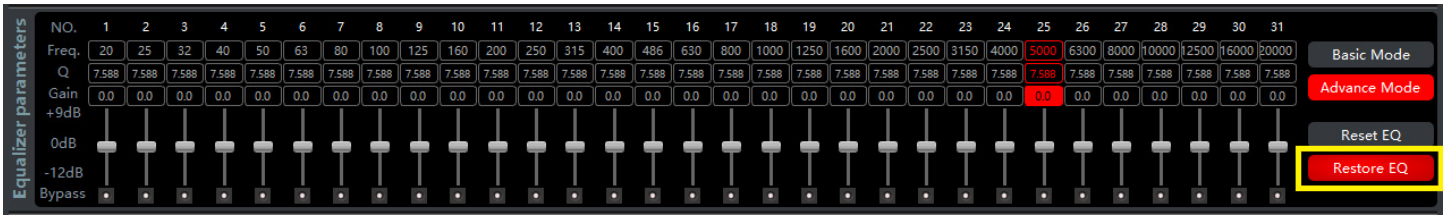
In the example below, Gain adjustments (only) have been made to bands #12 - 25 (250Hz - 5kHz). The gray "Bypass" buttons below the slider controls change to red to indicate when the gain has been adjusted from the default 0.0dB. Press the Bypass buttons to toggle the gain adjustment on or off for a specific band.

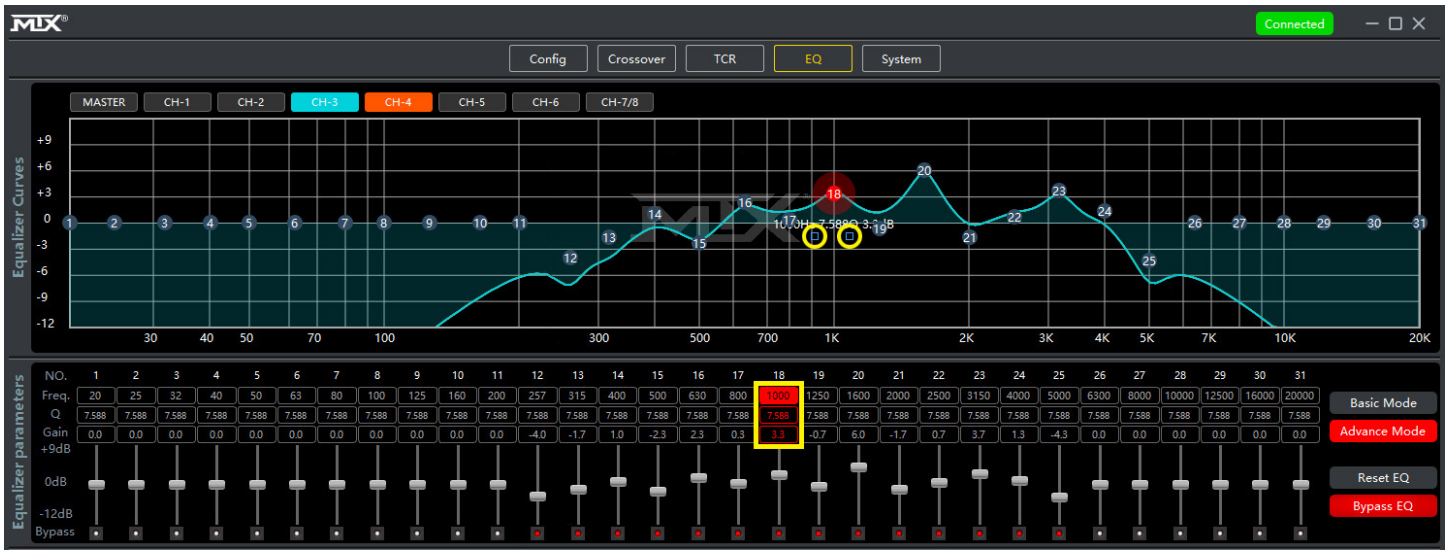
Equalizer Bypass & Restore - To Bypass the gain adjustments made to all bands in a specific Equalizer Channel at once, press the "Bypass EQ" button.



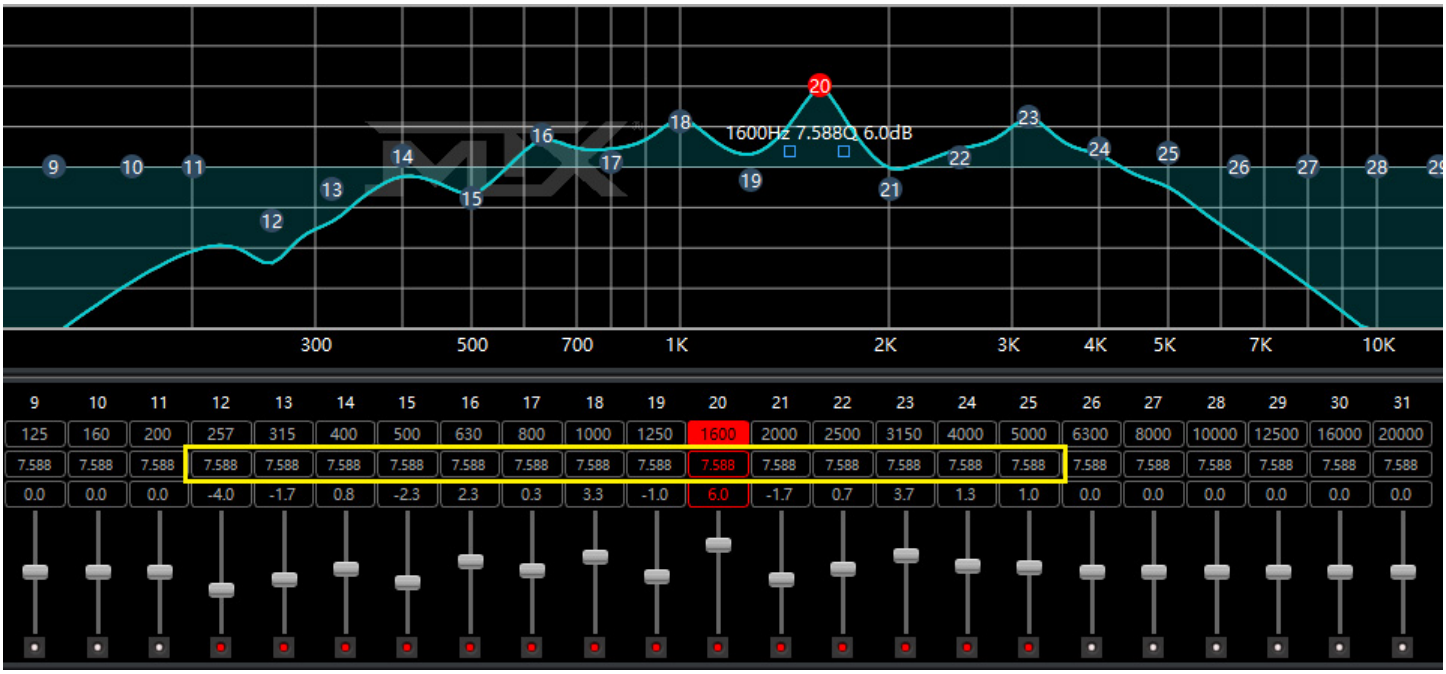
To Restore the gain adjustments made to all bands in specific Equalizer Channel, press the "Restore EQ" Button.



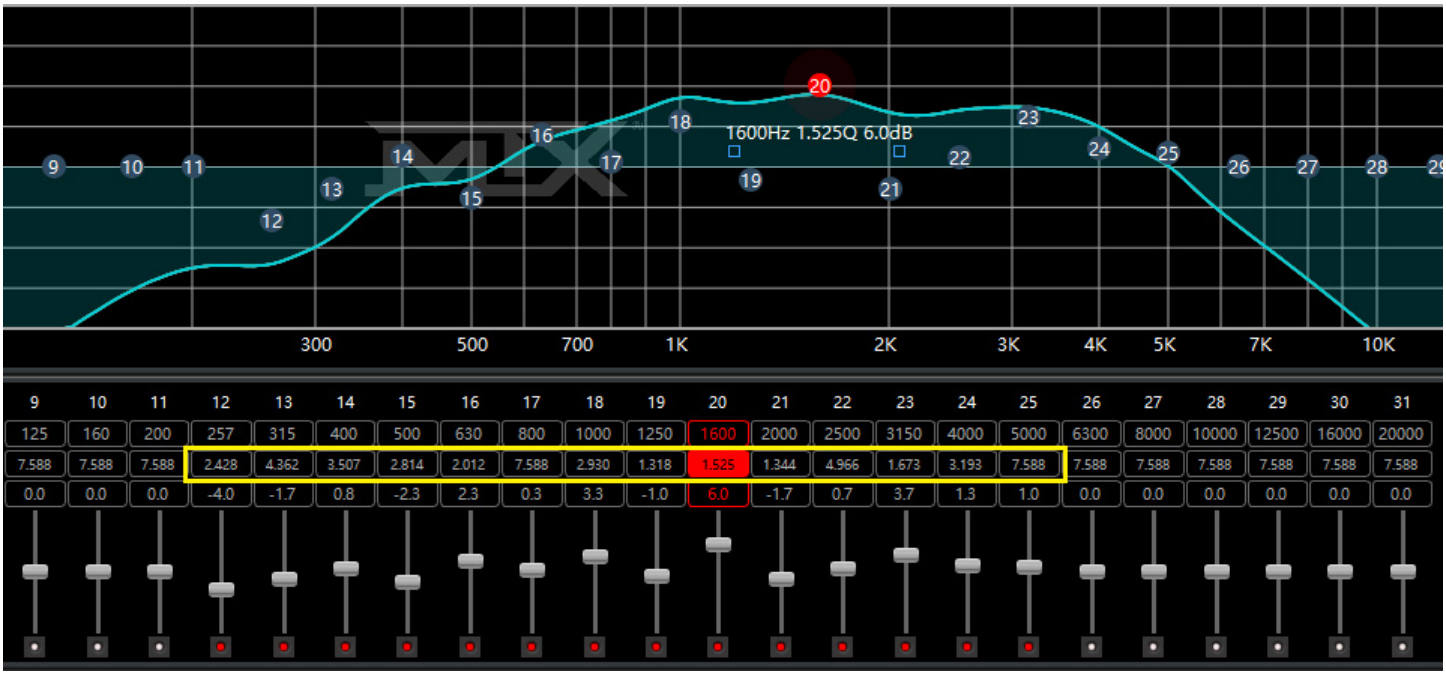
Equalizer Q Adjustments - In Advanced Mode only, the Q Value for each Equalizer Band is independently adjustable between 0.404 (Wide) and 28.852 (Narrow) to either smooth or sharpen the Equalizer Curve. The Q Value is displayed in the Equalizer Parameters, and in the Equalizer Curve when the specific band is selected. To adjust Q Value, select the desired Equalizer Band, then click and drag the blue squares in the Equalizer Curve to the right or left to increase or reduce the Q Value. Alternatively, Q Values can be entered directly in the Q Fields in the Equalizer Parameters section.



In the example below, the default Q value of 7.588 is used for bands #12 – 25 (250Hz – 5kHz). A Q value of 5 or higher is typically used for precise adjustments to specific frequencies.



In the example below, the Q Values have been reduced / widened for these same bands to to smooth the EQ Curve.



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Equalizer Frequency Adjustments - In Advanced Mode only, the default Equalizer Bands can be adjusted and customized to allow for more precise adjustments at desired frequencies. To adjust the frequency, select the desired Equalizer Band, then click and drag the highlighted data point in the Equalizer Curve to the left or right. Alternatively, the desired frequency can be entered directly in the Frequency Fields in the Equalizer Parameters section.

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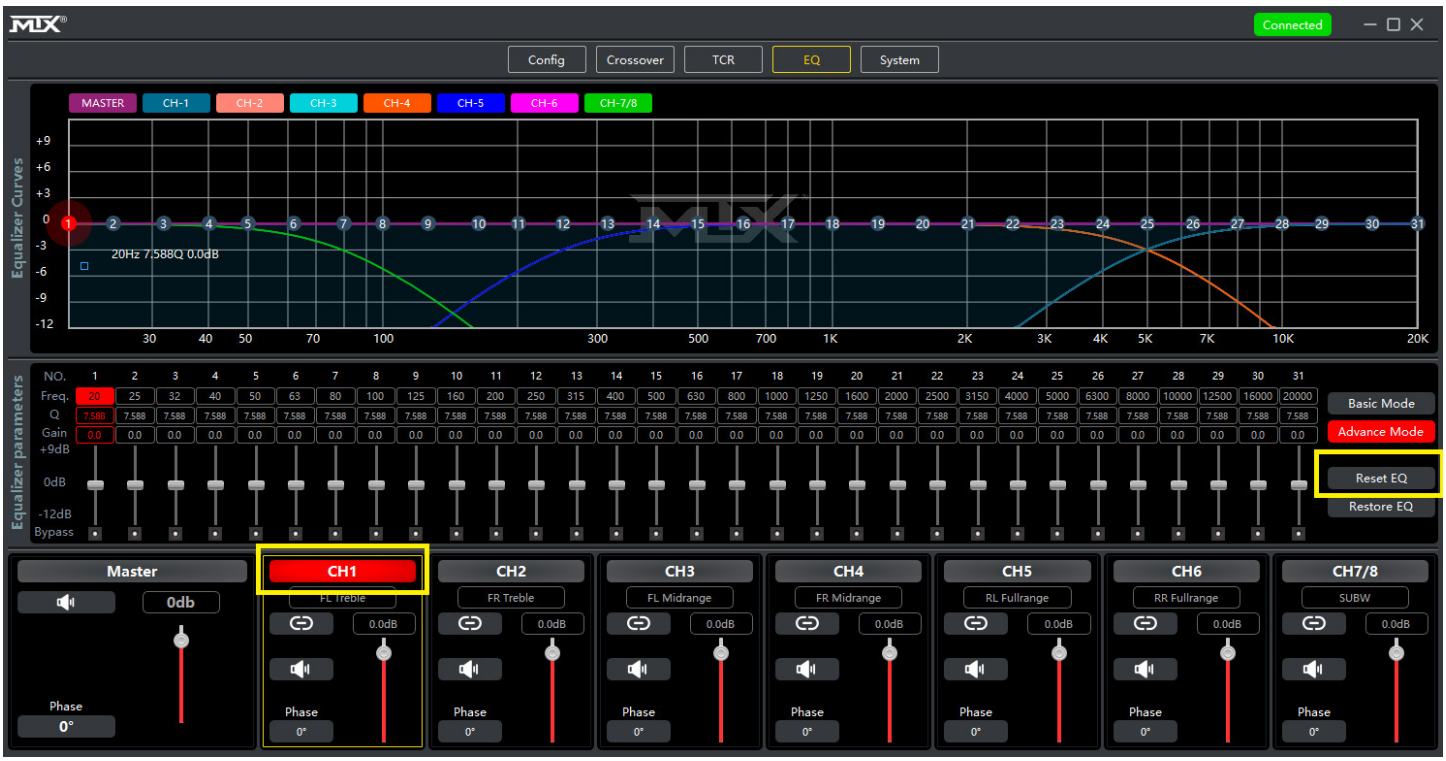
Equalizer Reset - All Equalizer settings can be reset for each channel independently by first selecting the desired channel in the lower section of the Equalizer Settings Tab, then pressing the "Reset EQ" button to the right of the Equalizer Parameters Section.



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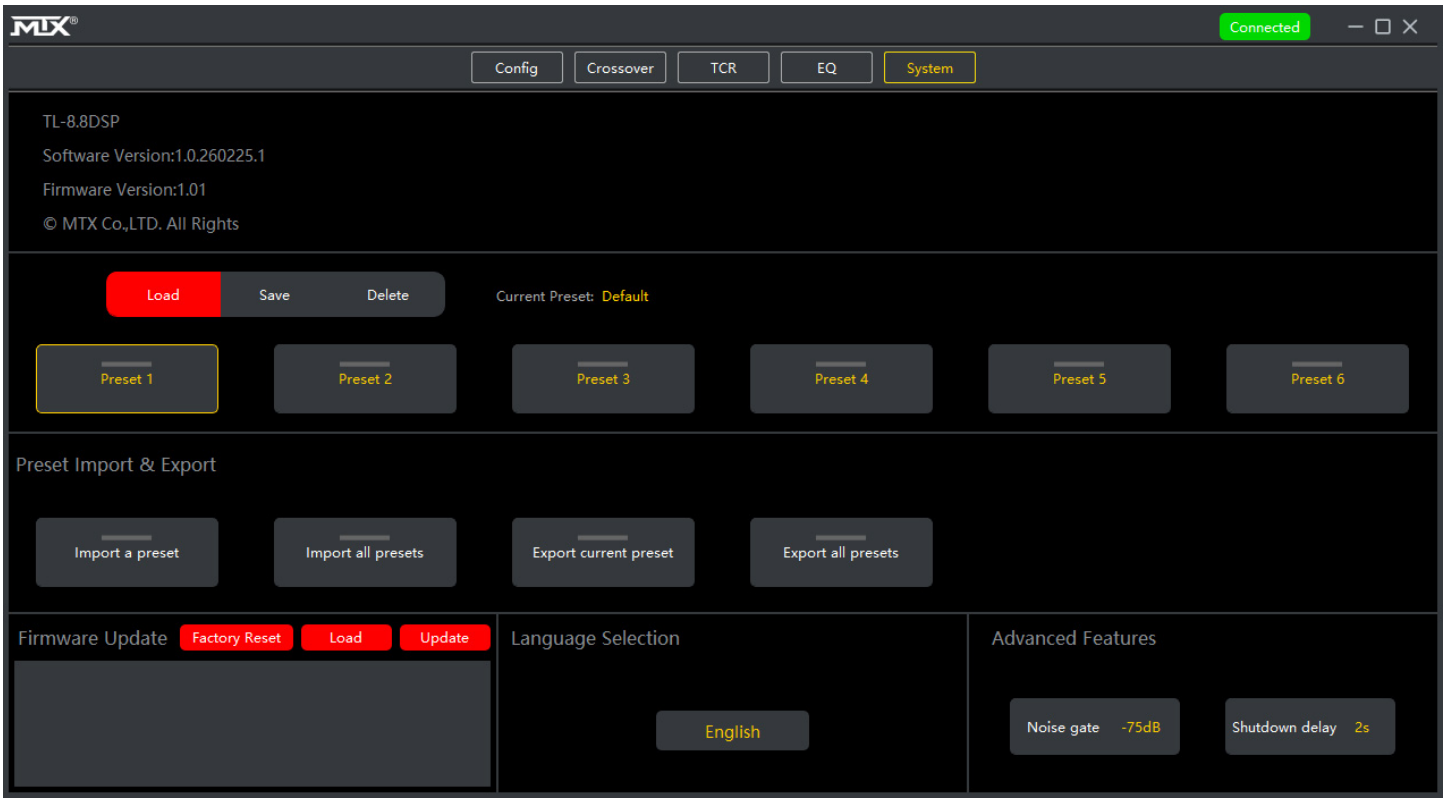
SYSTEM MENU

The System Menu allows you to save and manage Presets, manage the device Firmware, and manage the Advanced Features of the TL-8.8DSP. Language Selection is limited to English at this time.



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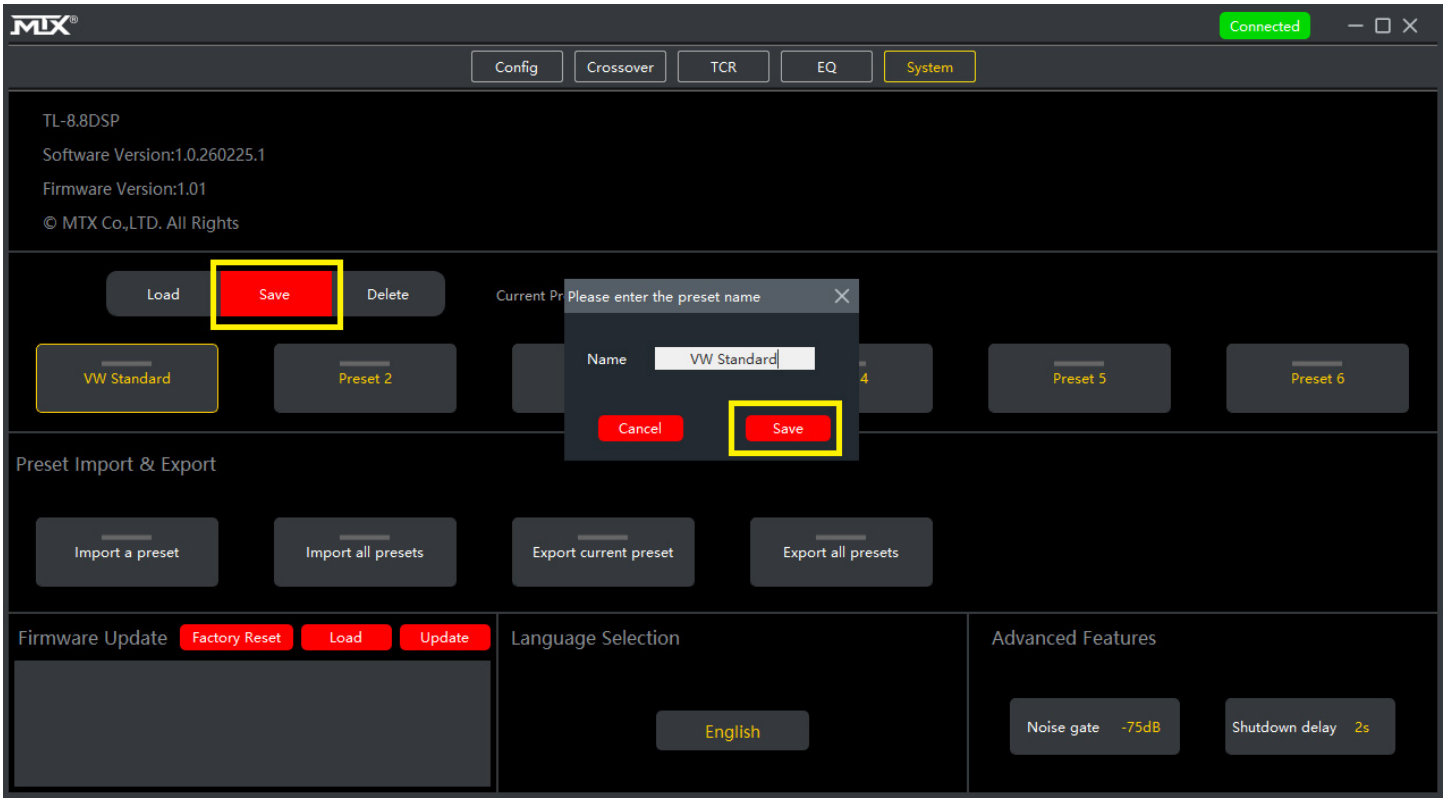
Saving Presets - To Save the adjustments made to any of the TL-8.8DSP settings as a Preset, first select the Save button in the center section of the System Menu, then select the desired preset 1-6. You will then be prompted to enter the name for the preset, then press the Save button in the Preset Name window to confirm. **Note:** It is very important to save the changes to settings as a preset before disconnecting the USB or turning off the device. Similar to working with files on a computer, it is recommended to save changes as you go to avoid losing them unintentionally.



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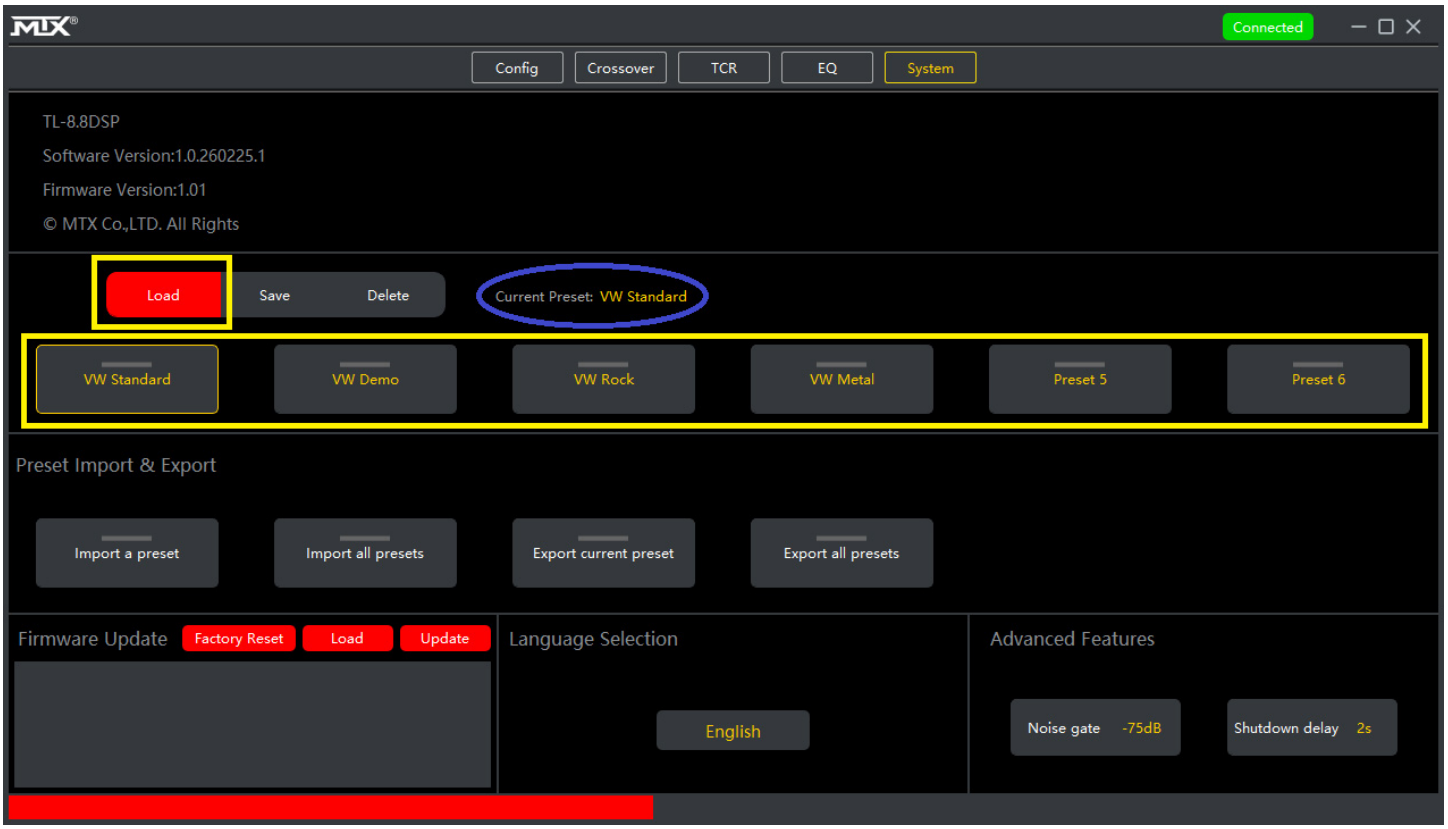
Loading Presets - To Load a saved Preset, first select the Load button in the center section of the System Menu, then select the Preset to be loaded. The red status bar at the bottom of the window shows the progress while the preset is being loaded, and the preset name will be displayed as the Current Preset in the center of the System Menu.



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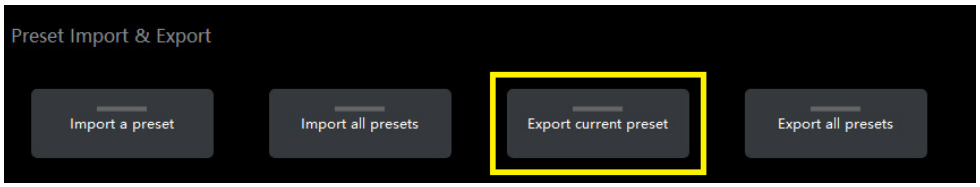
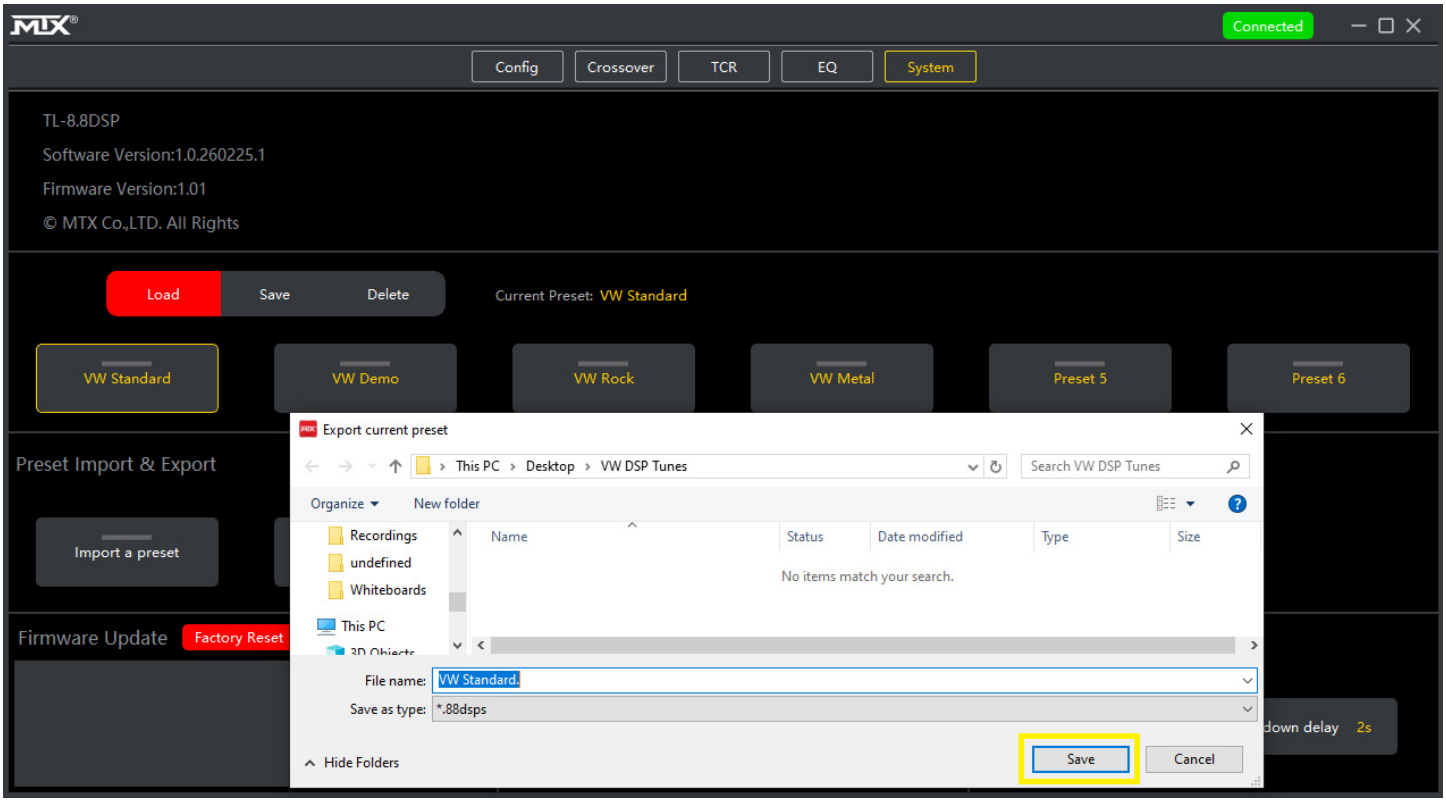
Exporting Current Preset - To Export a single saved preset on the TL-8.8DSP to your PC, first confirm the preset to be exported is displayed as the Current Preset in the center of the System Menu, then press the Export Current Preset button. Follow the prompts to name and save the preset file to the desired storage location on the PC. **Note:** The file extension for a single preset is .88dsps.





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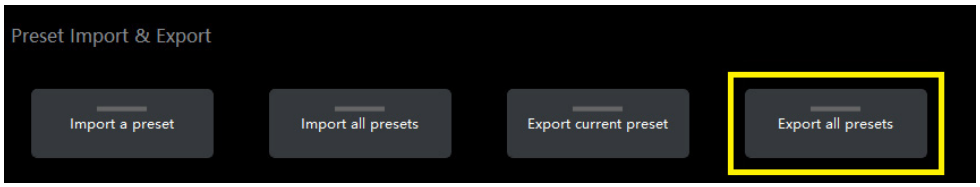
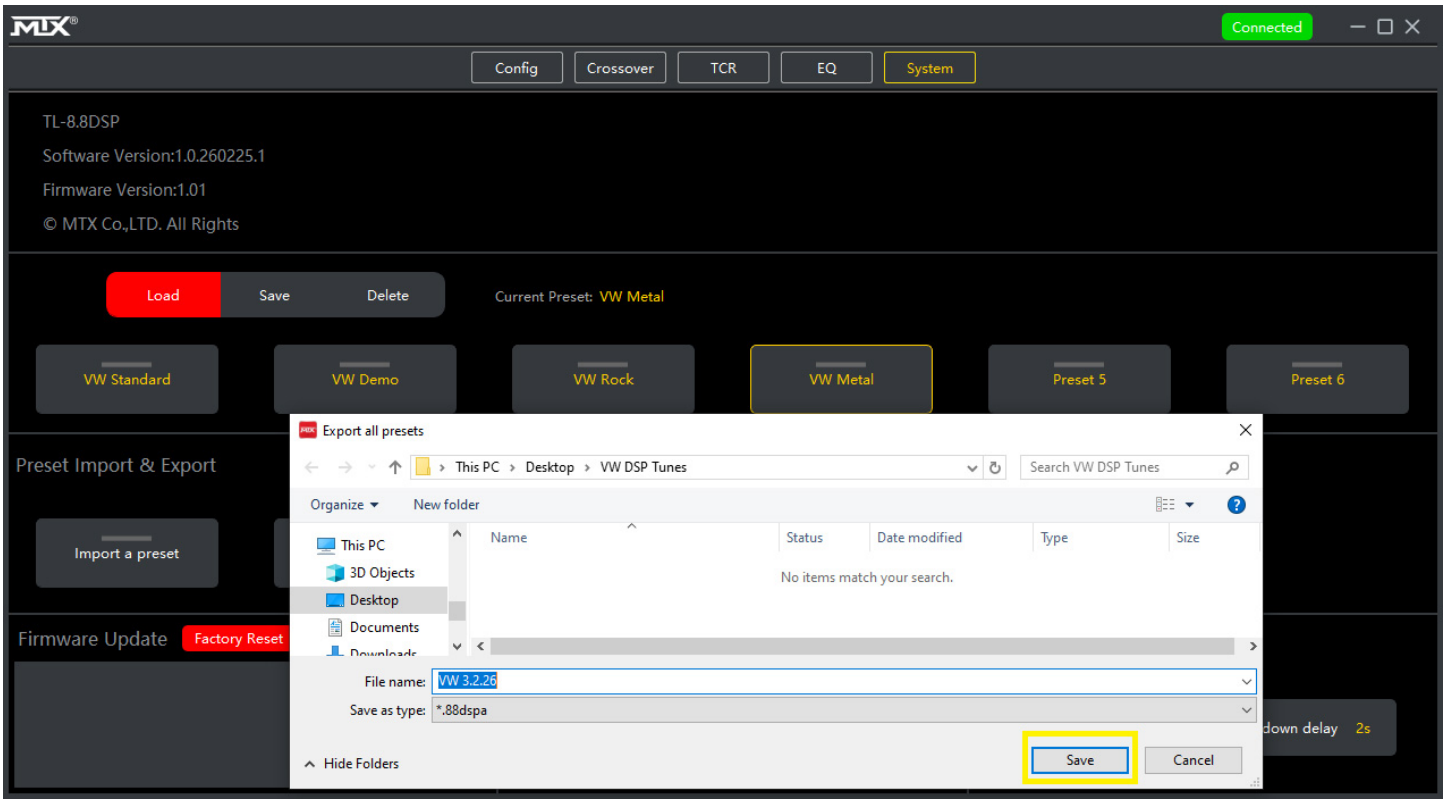
Exporting All Presets - To Export all saved presets on the TL-8.8DSP to your PC, first press the Export All Presets button, then follow the prompts to name and save the preset file to the desired storage location on the PC. Note: The file extension for all presets is .88dspa.





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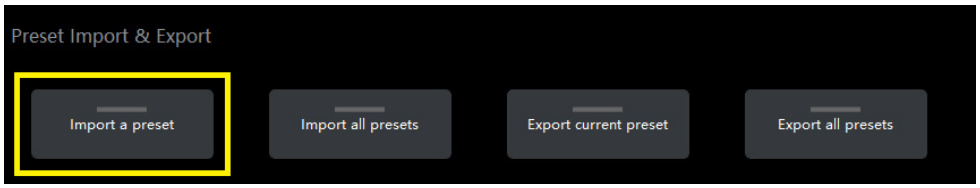
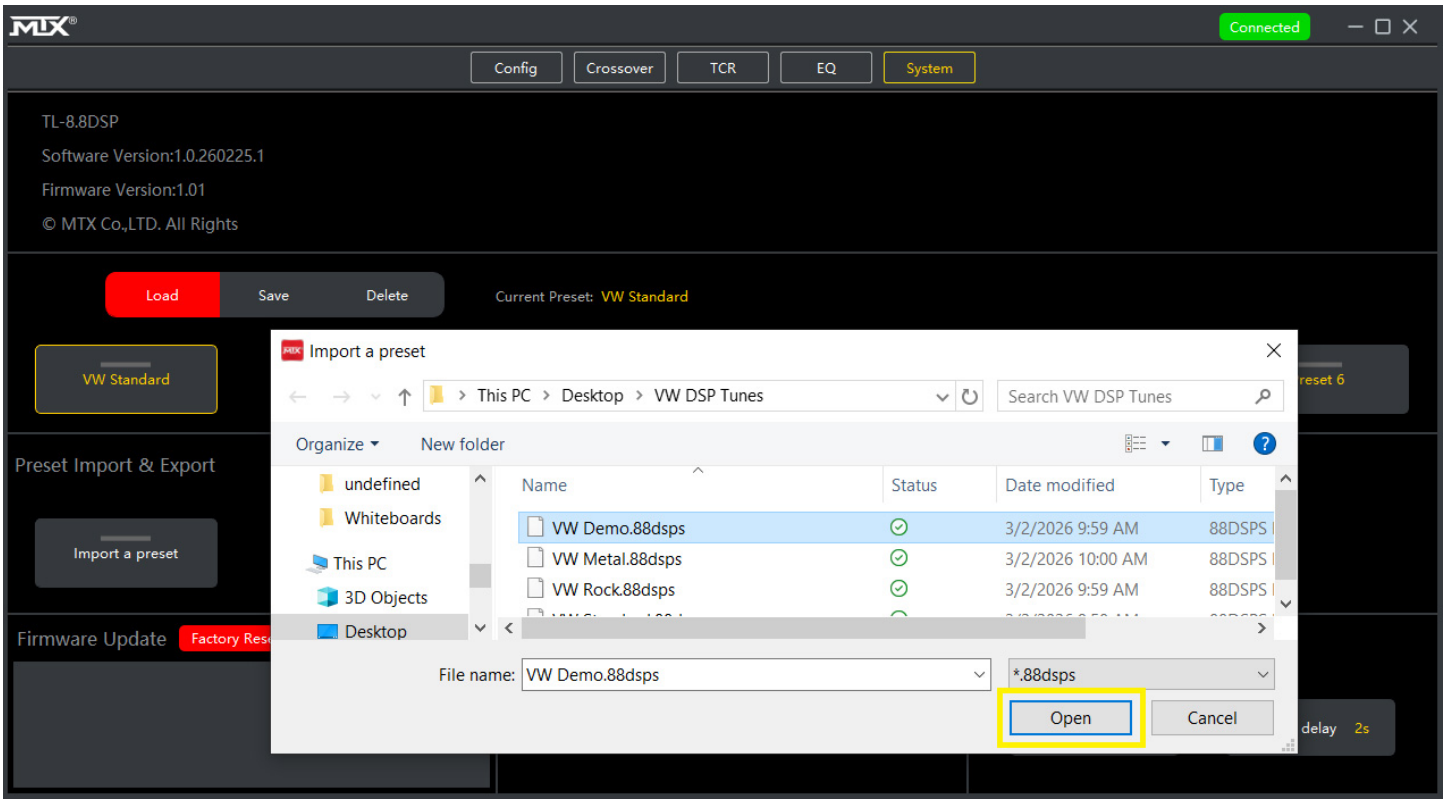
Import a Single Preset - To Import a single saved preset from your PC, press the Import a Preset button, then follow the prompts to locate the saved .88dsps file on the PC. Select the desired file then press the Open button. The red status bar at the bottom of the window shows the progress while the preset is being imported.

Important! When importing a single preset, it must be saved immediately before importing or loading a different preset. Follow the **Saving Presets** steps outlined above before proceeding with any other changes.





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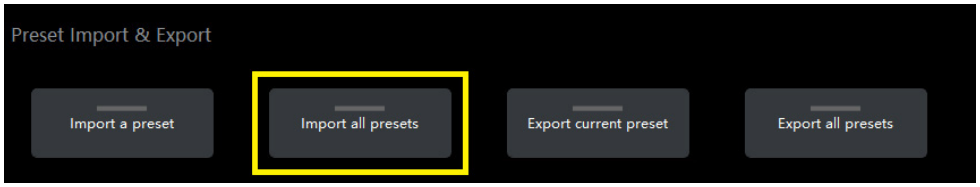
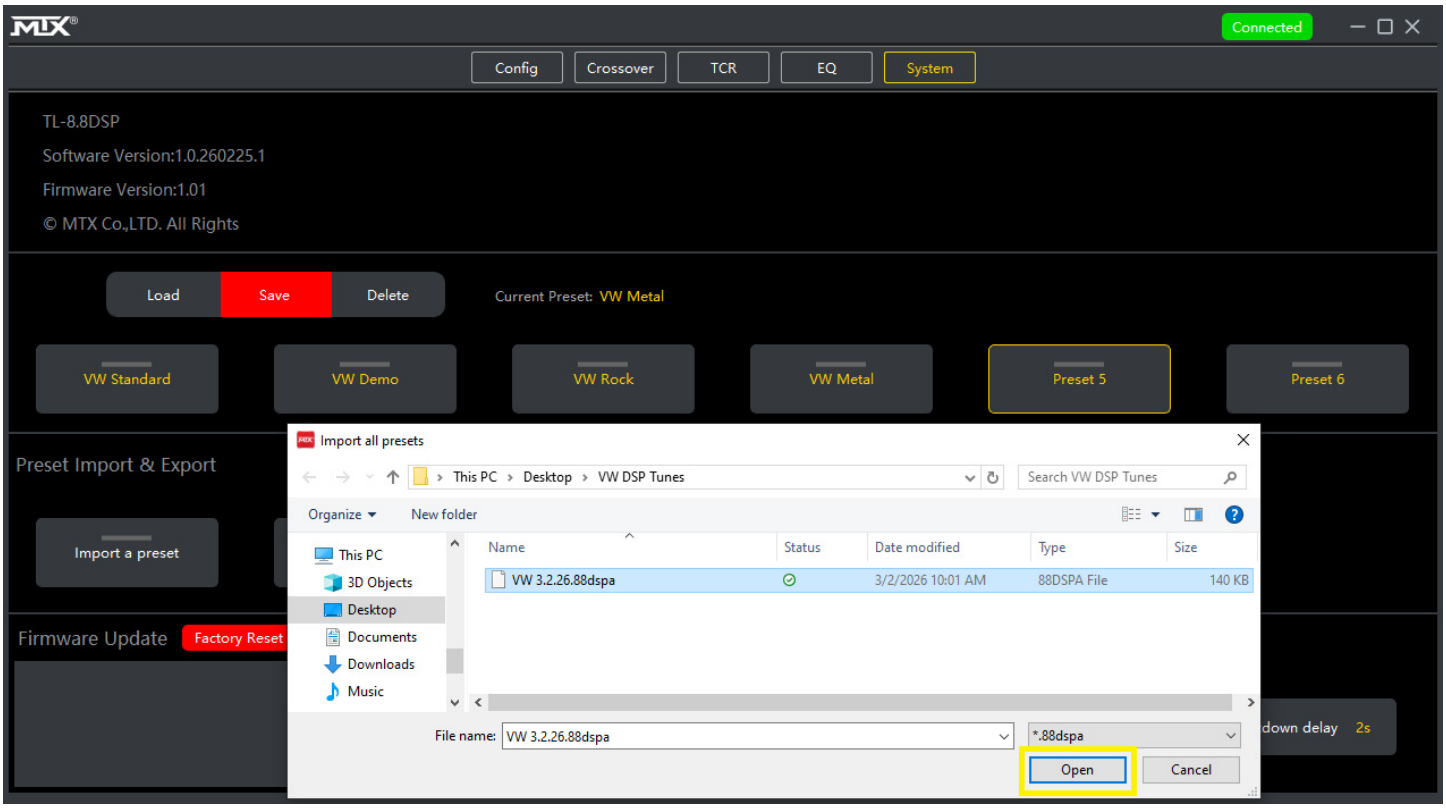
Import All Presets - To Import all saved presets from your PC, first press the Import All Presets button, follow the prompts to locate the saved .88dspa file on the PC, then press the Open button. The red status bar at the bottom of the window shows the progress while the presets are being imported.





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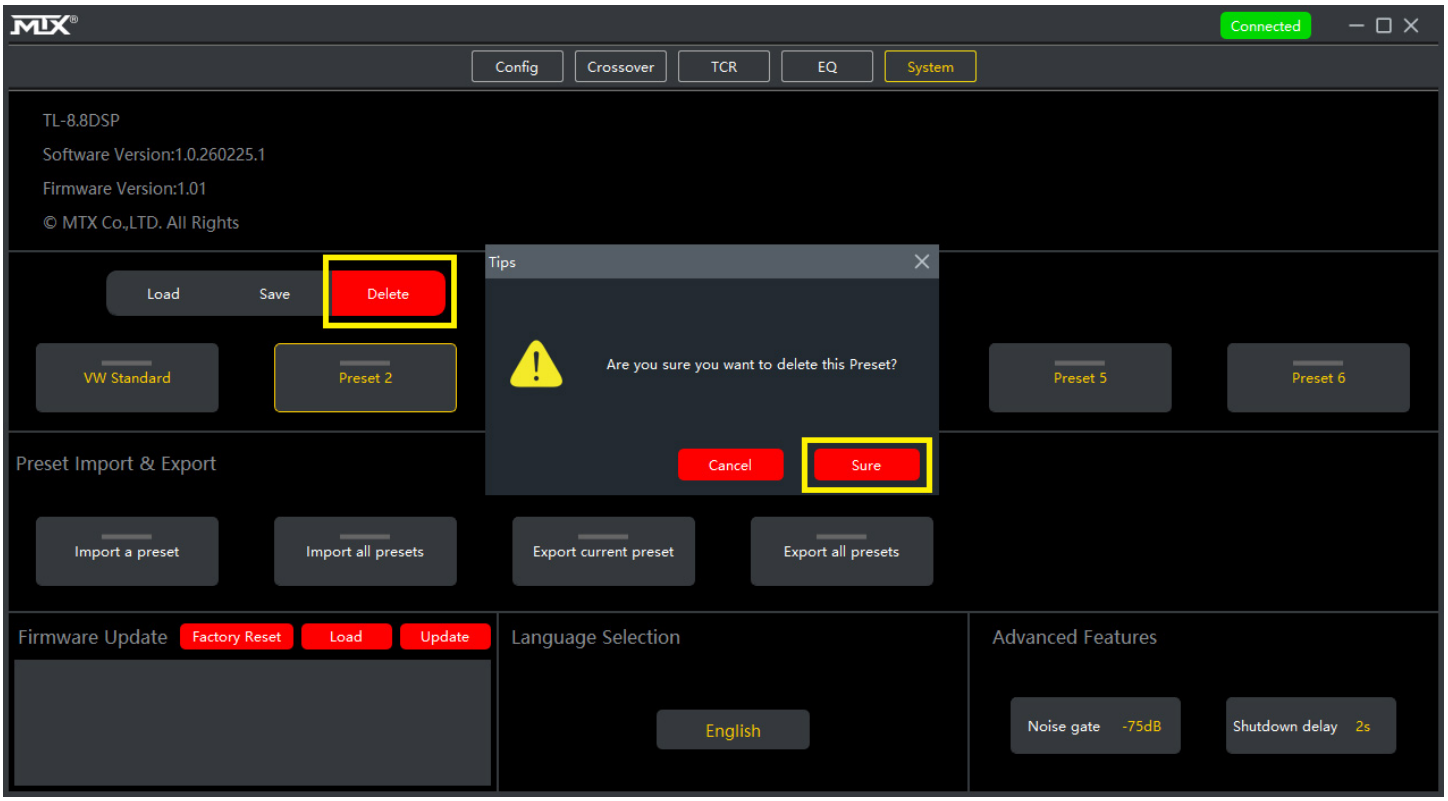
Deleting Presets - To Delete a saved preset, first press the Delete button in the center of the System Menu, then select the Preset to be deleted. A confirmation prompt will appear, then press the Sure button to confirm.



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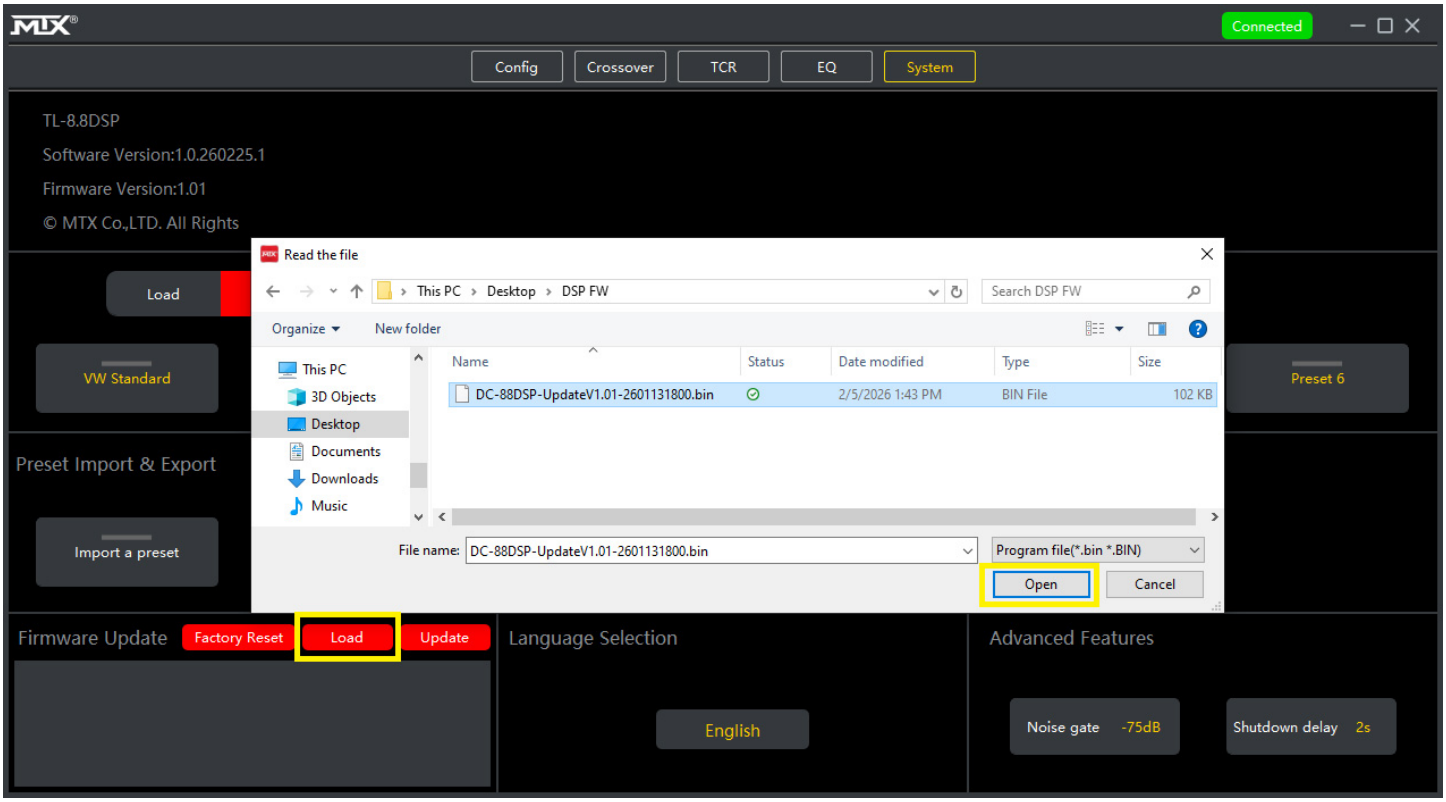
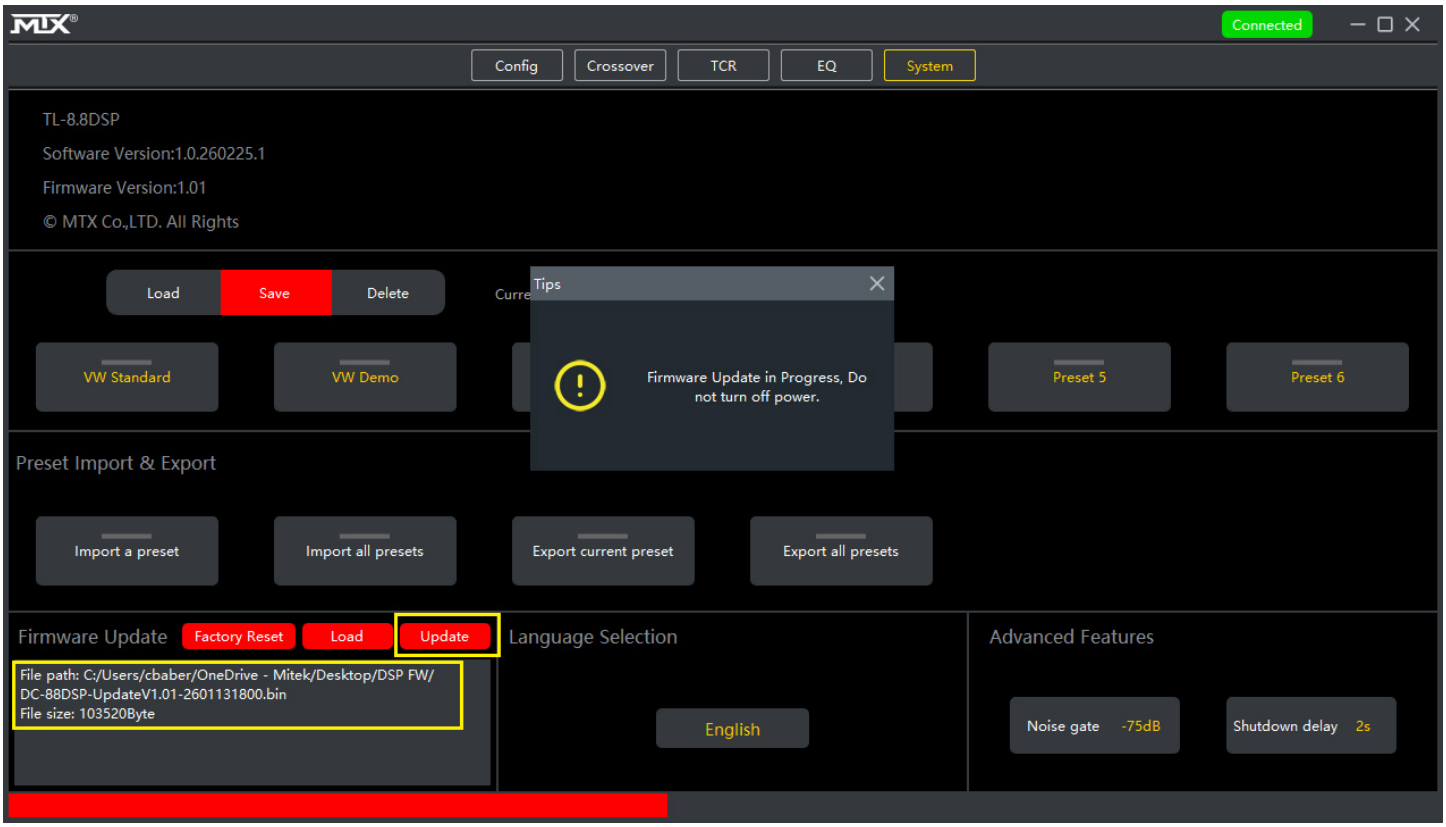
Firmware Updates - Visit the TL-8.8DSP webpage on mtx.com to download the latest device firmware. To Update the device firmware, first press the Load button in the lower left corner of the System Menu, locate the saved .bin file on the PC, then press the Open button.



The firmware file path will be displayed in the Firmware Update window for visual confirmation before being updated. Once this file has been confirmed, press the Update button. The device will shut down briefly and then automatically begin the firmware update process. The red status bar at the bottom of the window shows the progress while the firmware is being updated.

Important!: Do not disconnect power from the TL-8.8DSP during the Firmware Update process, or damage to the device may occur.



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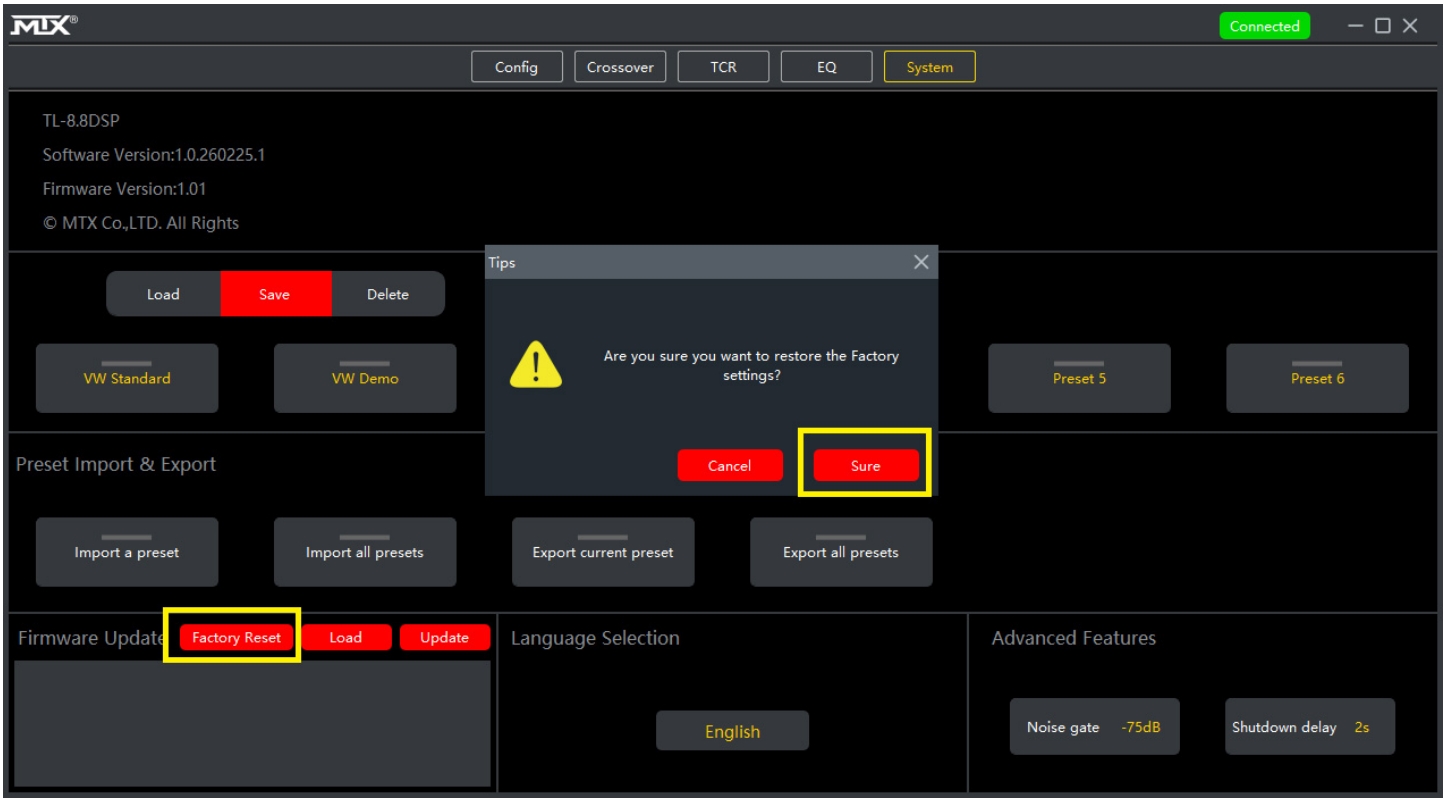
Factory Reset - To Erase all stored settings and restore the TL-8.8DSP to the factory configuration, first press the Factory Reset Button in the lower left corner of the System Menu, then confirm by pressing the Sure button when prompted.

Important!: Do not disconnect power from the TL-8.8DSP during the Factory Reset process, or damage to the device may occur.



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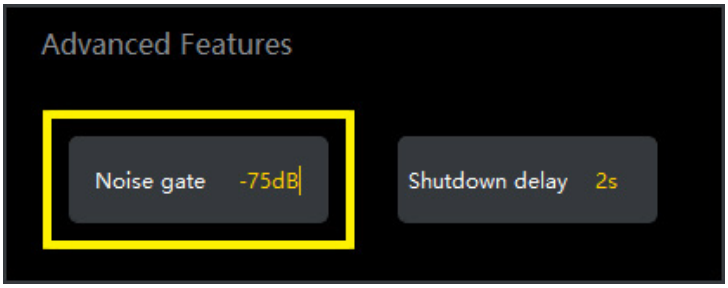
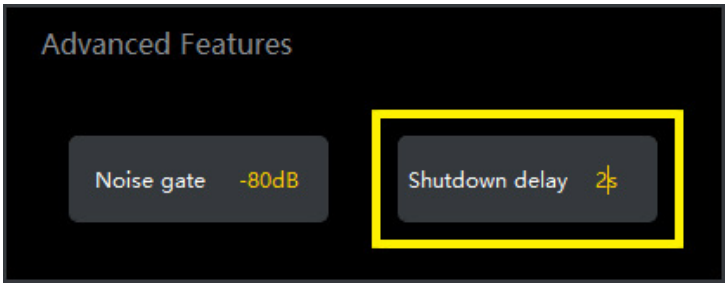
Noise Gate - The TL-8.8DSP Noise Gate is used to mute the signal outputs below a set volume level / threshold if there is unwanted noise when the volume is turned all the way down or between music tracks. The default Threshold is -75dB and adjustable between -120dB (Off) and +10dB. To make adjustments select and highlight the displayed threshold value, then use the up and down arrows on the keyboard to raise or lower the threshold. Alternatively, the desired threshold value can be entered using the keyboard.



Shutdown Delay - The TL-8.8DSP Shutdown Delay is used to eliminate unwanted noise, pops, etc. as the audio system is shutting down. The default Delay is 2 seconds and is adjustable between 0 seconds (Off) up to 60 Seconds. To make adjustments select and highlight the displayed Shutdown Delay value, then use the up and down arrows on the keyboard to increase or decrease the delay. Alternatively, the desired shutdown delay timing can be entered using the keyboard.



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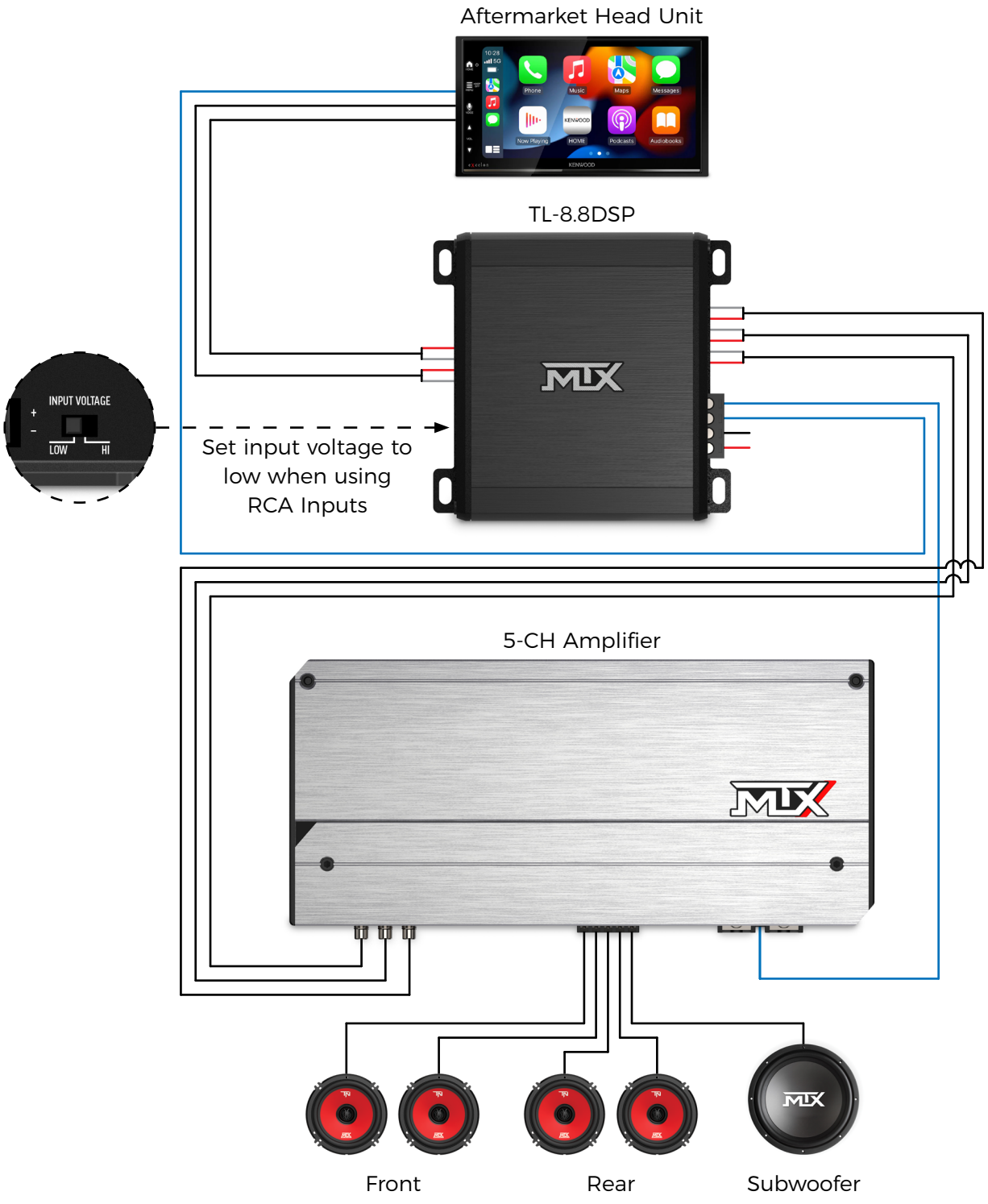
WIRING

Example 1 - Aftermarket head unit using Low Level (RCA) Inputs.



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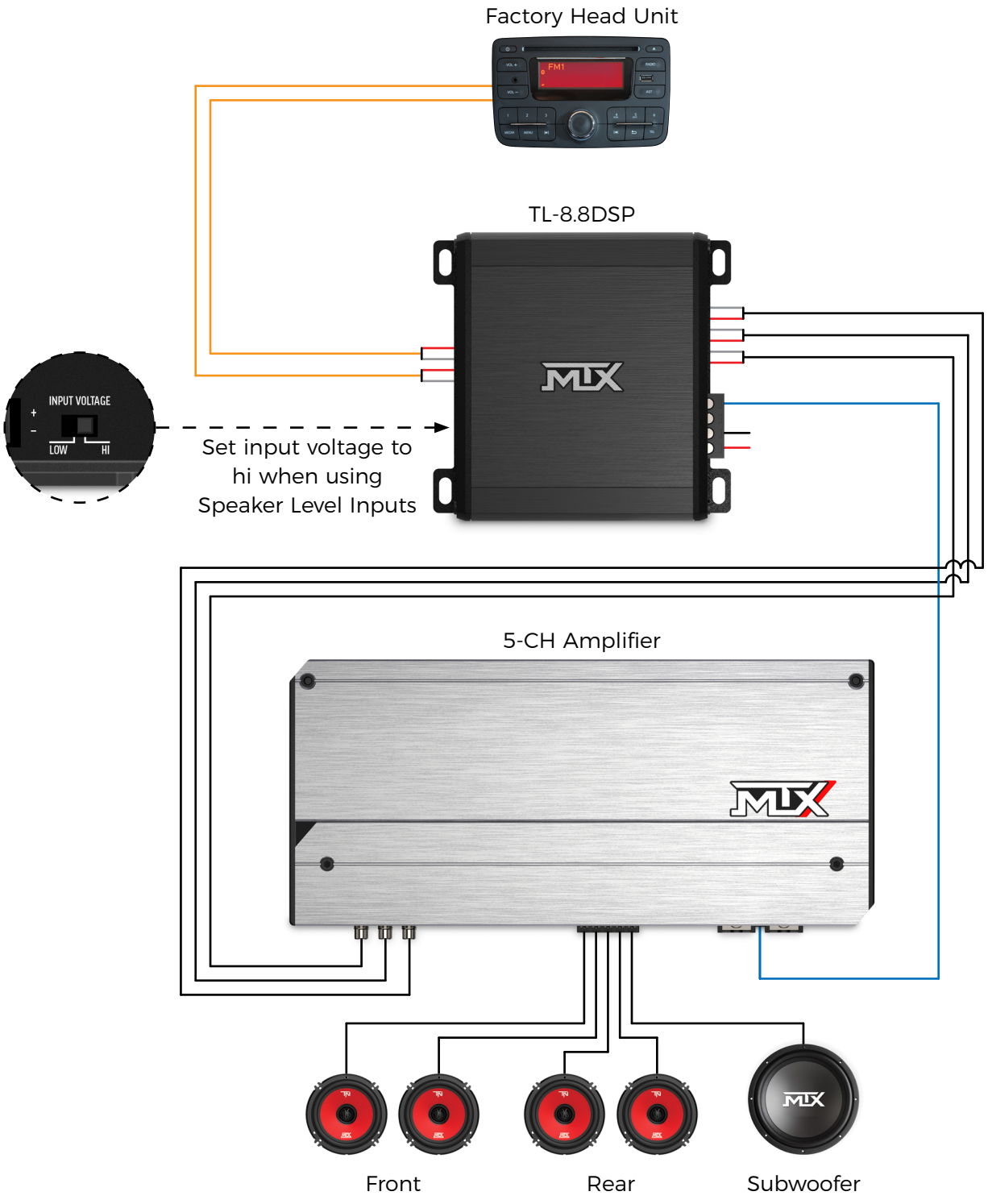
WIRING

Example 2 - Factory head unit using High Level (Speaker) Inputs and TL1SPK speaker wire to RCA converter.



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SPECIFICATIONS

PARAMETERS	
Type	8-CH Digital Signal Processor
Maximum Speaker Level Input	Low Range: 2.1V / High Range: 8.4V
Input Impedance	2kΩ
Preamp Outputs	8
Maximum Output Level	4.5Vrms
Output Impedance	100Ω
Total Harmonic Distortion	0.21%
Signal to Noise Ratio	>90dB
Frequency Response	20Hz - 20kHz
Recommended Fuse Rating	2A

PHYSICAL	
Product Dimensions (HxWxD)	1-1/8" x 4" x 3-7/8" (28.00mm x 100.50mm x 97.20mm)

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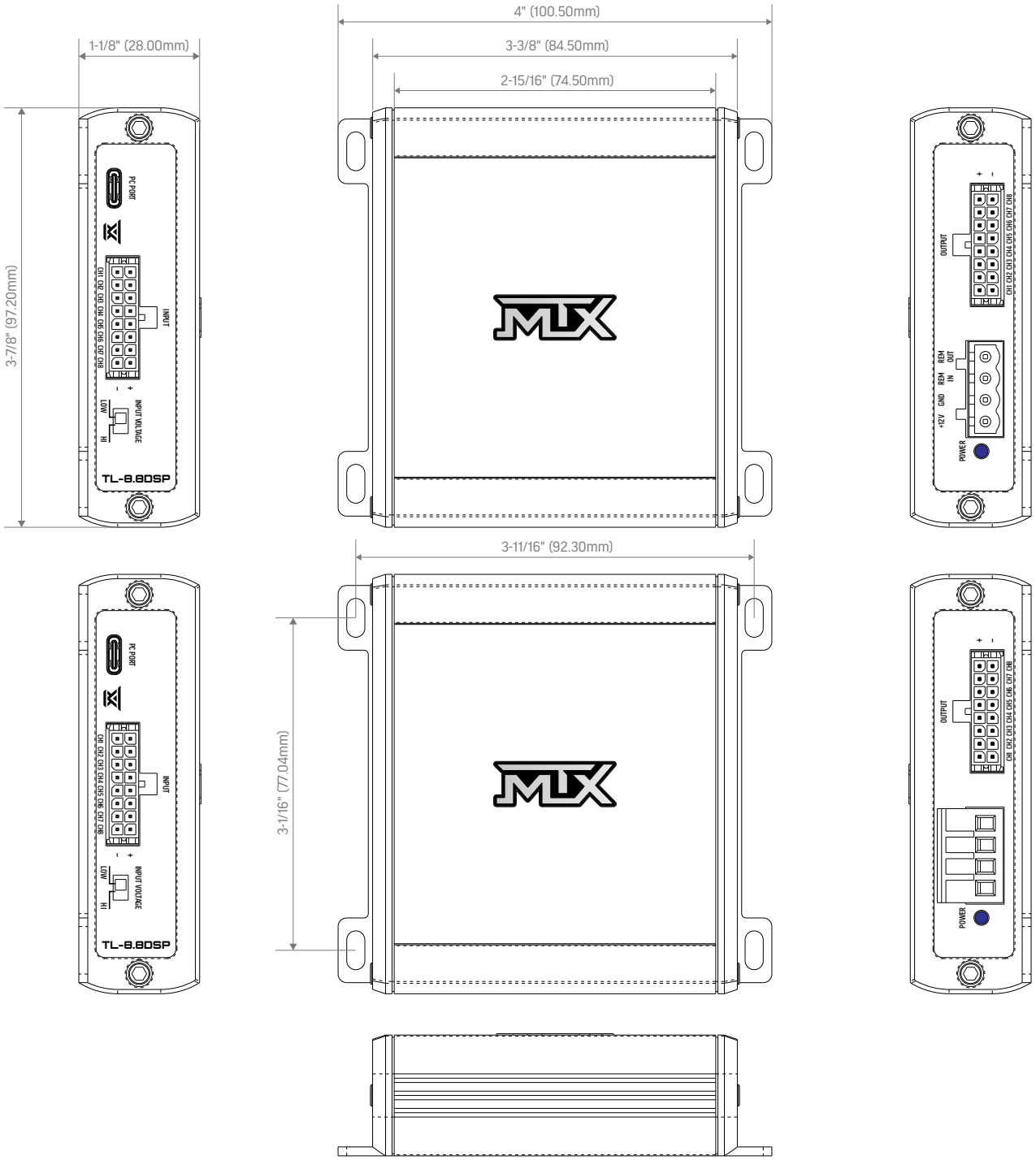
DIMENSIONAL DRAWINGS



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TL-8.8DSP

8-Channel Digital Signal Processor

Owner's Manual

MITEK WARRANTY

MiTek Mobile products (including, but not limited to: MTX, ThunderLink, ThunderWire, Coustic, Streetwires, Xtant, BassSlammer, and Thunder Marine) purchased in the USA from an AUTHORIZED MITEK DEALER are guaranteed against defects in material and workmanship for two years. The warranty period begins the day the product is purchased by the end user, and this warranty is limited to the original retail purchaser of product. Products found to be defective during the warranty period will be repaired or replaced with equivalent product by MiTek at no charge. This warranty is void if it is determined that unauthorized parties have attempted repairs or alterations of any nature, and the warranty does not extend to cosmetics or finish. MiTek disclaims any liability for other incurred or consequential damages resulting from product defects. MiTek's total liability will not exceed the purchase price of the product.

We're here to help! If you experience an issue with any of our products, please contact our customer service technical line at 1-800-CALL-MTX to help troubleshoot your issue. If after speaking with our technical experts it is determined that your product is defective, the technician will provide you with a Return Authorization number and all relevant details you'll need to process your claim quickly.

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