eMOTION LV1 CLASSIC

User Guide

WAVES

Safety and Precautions

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.

Protect your mixing console (and yourself)

- Do not block any console ventilation openings.
- Do not block the console fan openings.
- Do not block the openings on the bottom of the console.
- Do not place the console on an unstable surface
- Do not use the console near water. Do not spill liquids on the surface or into the openings.
- Only plug the unit only into a grounded outlet that complies with local norms. Never defeat the ground pin.
- Avoid placing heavy objects on the control surface, scratching the surface or touchscreen with sharp objects, or rough handling and vibration.
- Cover the mixer when it is not being used for extended periods.
- Unplug the console during lightning storms or when it is not being used for extended periods.

Pay attention to the operating environment

- Do not place the console in direct sunlight
- Do not install the console near any heat sources such as radiators, heat resistors, stoves, or other equipment (including amplifiers) that produce heat.
- If the equipment has been stored in sub-zero temperatures, allow time for it to reach normal operating temperature before use at the venue. The recommended operating temperature for eMotion LV1 Classic is 5 to 35 degrees Celsius.

Keep your eMotion LV1 Classic looking good

- Clean the console only with a dry cloth.
- Do not use chemicals, abrasives, or solvents when cleaning the console.
- Clean the screen only with products approved for touchscreens.

Service

This unit contains no user-serviceable parts. Refer all servicing to a qualified service engineer through an authorized Waves dealer. Servicing is necessary if the console has been damaged in any way, such as when liquid has been spilled into the unit, objects have fallen into it, it has been exposed to rain or moisture, it fails to operate normally, or it has been dropped.

Waves assumes no liability for damage caused by maintenance, repair or modifications performed by unauthorized personnel.

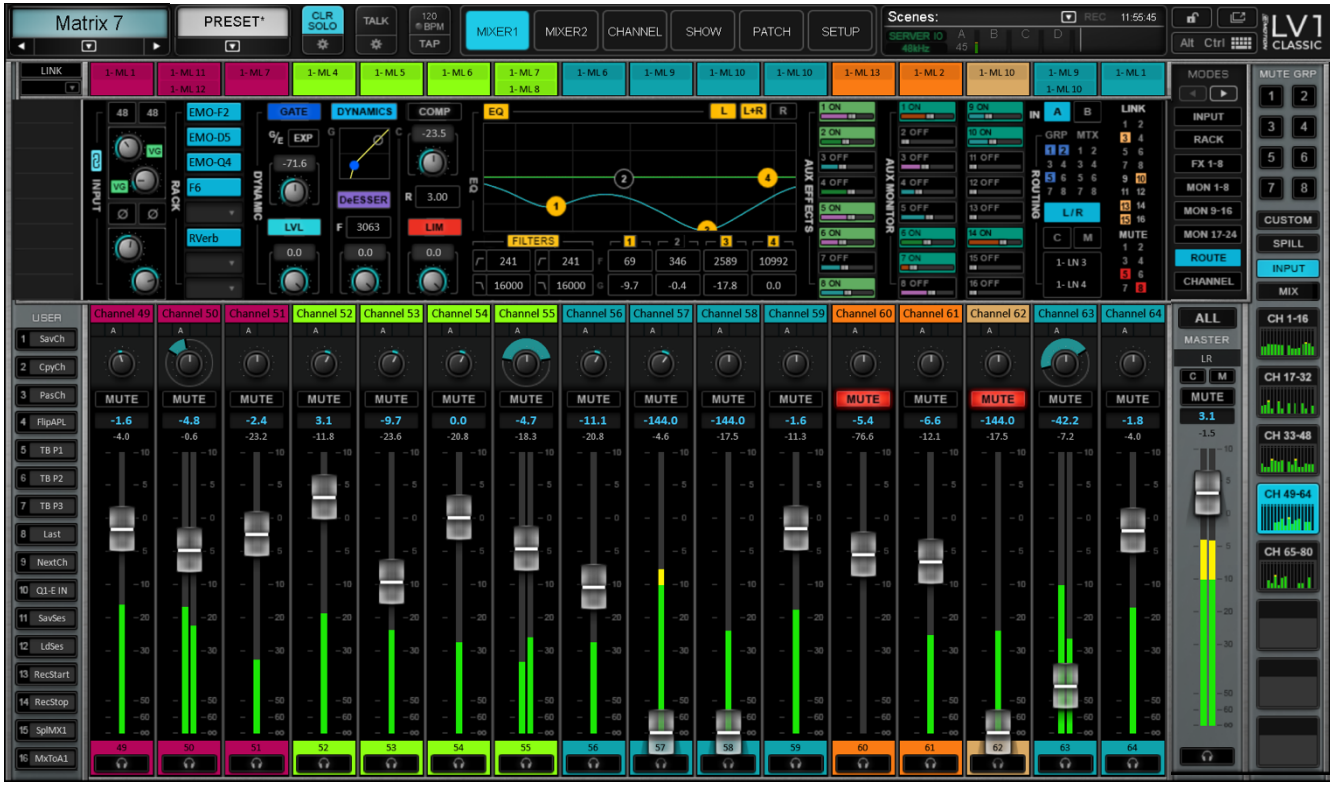
Contents

INTRODUCTION

Thank you for choosing the eMotion LV1 Classic mixing console from Waves. To work efficiently and quickly get the best results, please familiarize yourself with this user guide and keep it as a reference.

eMotion LV1 Classic is a mixing console designed for live sound, including front-of-house, monitor, and broadcast applications.

LV1 Classic provides industry-leading sound quality, seamless plugin integration, and all the functionality of a full-sized mixing console in a compact package. It can be expanded with stageboxes or other SoundGrid I/O devices. Servers can be added for extra processing power or redundancy. We recommend visiting the Waves support site: http://www.waves.com/support. There, you will find an extensive answer base, the latest technical specifications, detailed installation guides, troubleshooting help, and much more.



Main Features

- 64 stereo/mono input channels, 44 buss/return channels
- 16 DCA faders, 8 mute groups, 18 user-assignable shortcut keys
- 16 Waves Signature preamps, 12 line outputs
- 16 Monitor auxes and 8 FX auxes (stereo/mono), 8 audio groups, L/R/C/Mono, 8 matrices (stereo/mono)
- 16+1 motorized faders and multipurpose encoders
- Up to 8 SoundGrid compatible plugins can be inserted on each channel.
- Built-in processors include industry-leading EQ, dynamics, real-time vocal pitch correction, dynamic EQ, and internal low-latency Intel-based Waves SoundGrid DSP server.
- I/Os and servers can easily be added and integrated with other eMotion LV1 systems.
- Dugan Speech Automixer (optional)
- eMo IEM for enhanced, immersive in-ear monitoring (optional)
- Remote mobile/tablet applications are available.

80-Channel Option

An optional 80-channel configuration provides 80 input channels with two switchable buss options.

- 16 groups, 24 auxes, 3 main outs, 8 matrix channles, cue
- 8 groups, 32 auxes, 3 main outs, 8 matrix channles, cue

You can switch between these configurations, but changing from a session with many channels of a type to few channels of the same type (e.g. 32 auxes to 24 auxes) will remove session information from auxes 25–32. Save the session before changing the configuration

Visit waves.com/support for detailed specifications.

It's important to keep your eMotion LV1 Classic console up to date. You will periodically receive update notices from Waves with instructions. If you do not receive a notification, you can visit the Waves website for more information.

What's Included with eMotion LV1 Classic?

What's in the box?

eMotion LV1 Classic 64 channel mixing console
Power cables (2)
Documentation

eMotion LV1 Classic includes these processors:

Doubler
eMo D5 Dynamics
eMo F2 Filter
eMo Generator
eMo Q4 Equalizer
F6 Floating-Band Dynamic EQ
GEQ Graphic Equalizer
GTR3
H-Delay Hybrid Reverb
Magma Tube Channel Strip
Renaissance Bass
Renaissance Comp
Renaissance Reverb
Primary Source Expander
True Verb
Waves Tune Real-Time
X-FDBK

Additional plugins are available with Waves Live perpetual plugin bundles. The entire Waves plugin catalog is available with a Waves Creative Access subscription. Refer to www.waves.com for more information.

About This User Guide

This User Guide provides detailed information on all eMotion LV1 Classic functions and controls. Like the mixer itself, the User Guide is organized first by Window, then by Page or Tab, and finally by Section and Controls.

Naming Conventions:

Window	The most comprehensive view (e.g., Mixer window, Show window, etc.). Windows can be accessed using tabs at the top of each view.
Page	A subset of a window, usually accessed via a side tab (e.g., User I/O Settings, Channels Input A, Scenes, etc.).
Section	An area of a page, typically defined by function (Output section, Channel aux sends section, etc.).
Control	Any object used to change a parameter (fader, knob, button, etc.).
Value Box	A window that displays a parameter and is usually used to adjust parameter values.
Selected	(1) A control that is currently active. Touch a control to select it—it will change color or become highlighted. (2) A channel currently being controlled. To select a channel, click on its fader or its name on the channel strip, or use the navigation tools on the Top Bar.

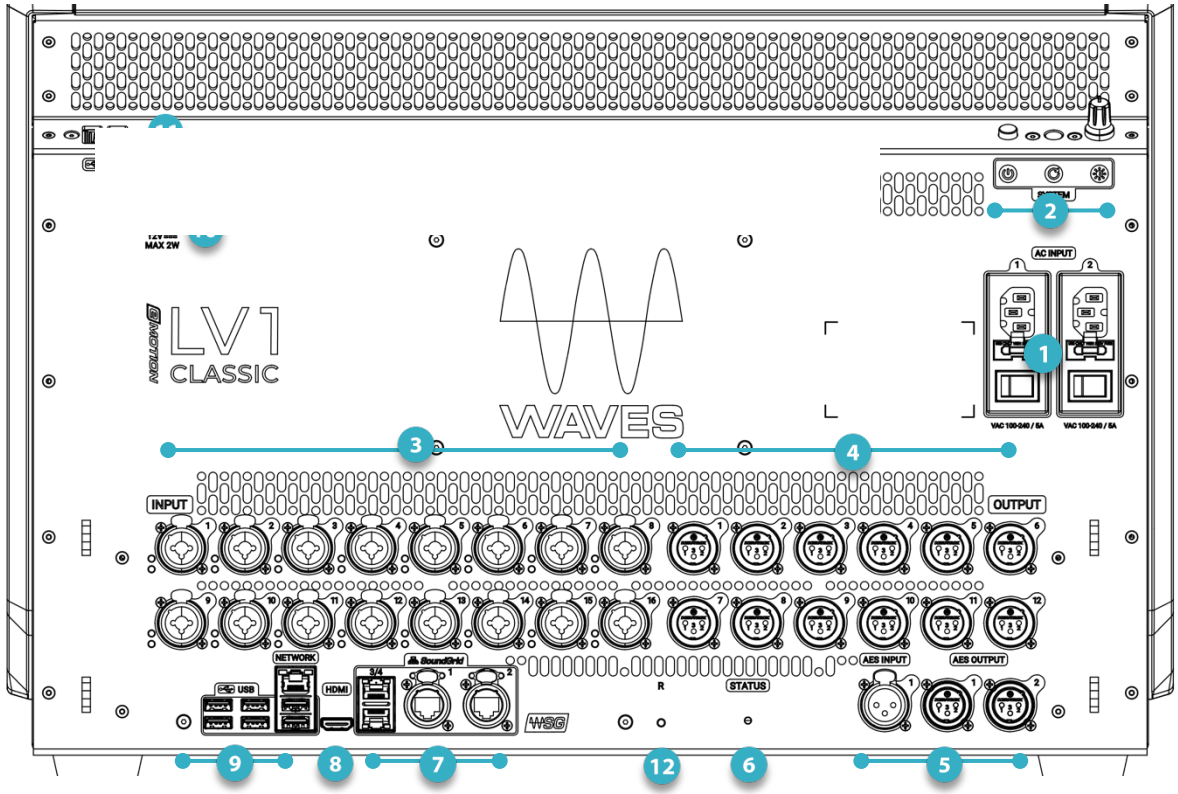
To keep things short, the eMotion LV1 Classic console is often referred to as "the console."

Most PDF readers allow you to open a sidebar with bookmarks that can be used to locate any topic, without returning to the table of contents.

Connections

Rear Panel

All connections, except headphones, are made on the rear panel.



1. Mains in: 115v/230v; 50/60 Hz, PSU on/off
2. Start/Quit, reset console, brightness
3. Mic/Line inputs x16
4. Analog outputs x 12
5. AES input/output
6. I/O status light (internal connections)
7. SoundGrid network ports (etherCON x2; RJ-45 x2)
8. HDMI for external display
9. USB ports x 6; network connection
10. XLR4 power connector for lamp
11. USB ports x 2
12. I/O Reset button

> **!** The **I/O Reset** is a recessed button that completely resets the Classic I/O device, rendering it temporarily inaccessible. **Use this button only under the guidance of Waves technical support.**

Front Panel

TRS 1/4" headphone jack x 1, TRS 1/8" headphone jack x 1; headphones volume control

Cables

In addition to the onboard Classic 16x12 I/O, LV1 Classic can assign and patch to up to 14 I/O devices, which can include any combination of hardware I/Os and drivers.

- A hardware I/O device can support up to 128 I/O channels, depending on the model.
- Computers using a SoundGrid ASIO/Core Audio driver can be configured for up to 128 driver channels.

When adding external devices, use a SoundGrid Ethernet switch and Cat 5e, Cat 6, or Cat 6a Ethernet cables to connect all hardware components. Cat 5 cables are not supported, and Waves does not recommend using Cat 6 etherCON connectors. Instead, use Cat 5e or Cat 6a etherCON connectors.

Use the SoundGrid network ports for SoundGrid only. Do not connect an Internet or other network connection to the Ethernet switch. Use a different port for those purposes.

Maximum Cable Lengths

Cat 5e/6/6a S/FTP

Node	Cable Length
Host computer to switch	up to 100 meters
Server to switch	up to 10 meters
Switch to switch	up to 100 meters
I/O device to switch	up to 100 meters

Joints, or cable extenders, can be used, but with care, since some models do not have electrically connected shielding. Using such extenders in areas with interference may be problematic. Total cable length with the joint may not exceed the above maximum cable length per node. Additional joints may limit the effective cable runs.

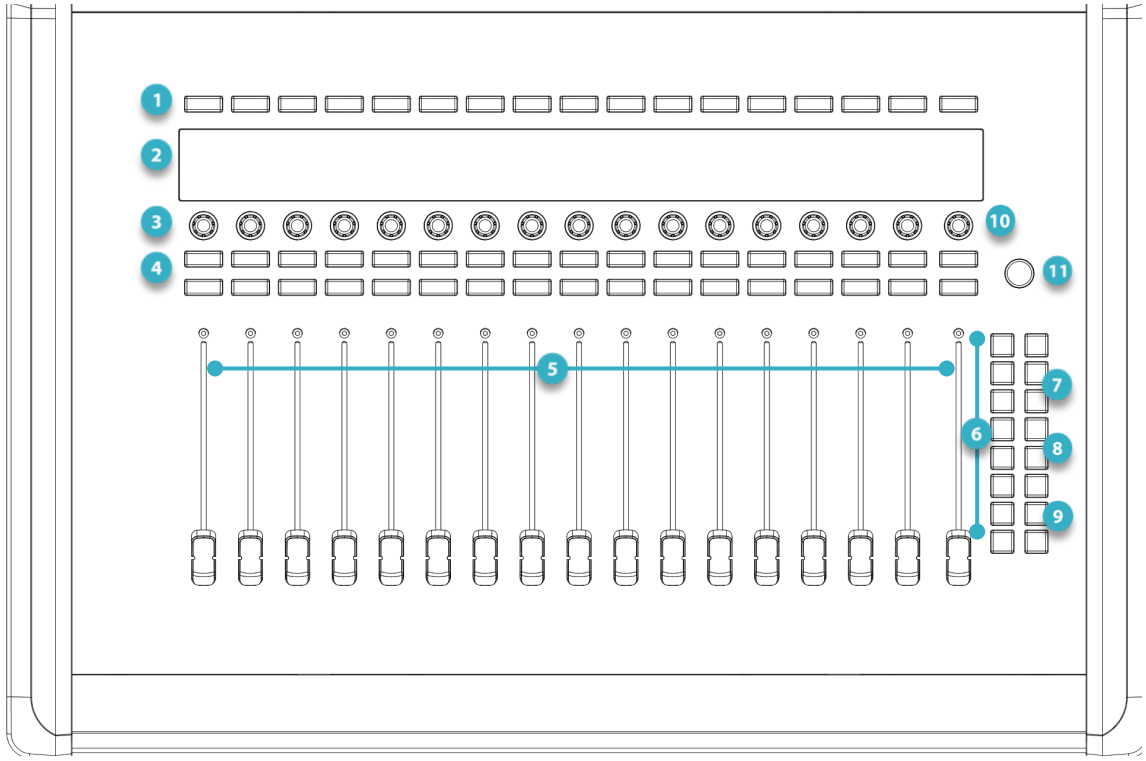
Startup/Shut Down

Power up LV1 Classic using the "soft" power switch at the top of the rear panel.

To safely shut down, hold the "soft" power switch for five seconds. Alternatively, click "Shut Down" in the Setup window's bottom left corner. It may take several seconds for all components to shut down completely.

The switch on each of the mains connectors turns the redundant power supplies on or off. It does not power up the console.

Fader Bank



1. **Channel Select Button**
   Click the User button to toggle between Channel (default) and User-Assigned Keys.
2. **Four-line Scribble Strip**
3. **Rotary Encoders**
   Control Pan, Gain, or Plugin edit mapping
4. **Solo/Mute**
5. **16+1 100 mm Motorized Faders**
6. **Mixer Layers 1–8 Selector**
7. **Encoders Mode**
   Select Pan, Gain, or Plugin edit mode
8. **Shortcuts** (user-assignable)
9. **Fader Alternative Modes**
   Custom/Spill/Sends on faders
10. **Touch and Turn**
    Maps to selected control for immediate access.
11. **Tempo Tap Pad**

Touchscreen

eMotion LV1 Classic's comprehensive control is built around its large touchscreen interface. The screen, like the LV1 workflow, is organized by windows, pages (tabs), and sections. Windows are the most fundamental level of organization, and each window provides specific processing, routing, or organization. The selected channel name and preset menu are on the left side of the Top Bar. Scene control and system status indicators are on the right. A mouse and keyboard can be added to compliment the touchscreen.

By default, eMotion LV1 Classic opens to the **Mixer 1** window. In this view you can adjust preamps, panning, channel gain, select Channel Strip modes, aux sends and routing, and access plugins processing. Other windows are selected with the **Top Bar** at the top of the window.

Navigating the Interface: The Top Bar

The Top Bar of the eMotion LV1 mixer is a navigation and management tool that is visible from all views. From here you can:

- Access all windows.
- Monitor network and processor status.
- Select a channel.
- Lock the mixer interface.
- Manage sessions and scenes.
- Engage talkback and clear all solos.

1. **Name:** Displays the selected channel
2. **Presets Menu:** Manages channel presets and sessions
3. **Clear Solo:** Clears all solos or cues / opens cue controls
4. **Talk:** Engages talkback / opens the TB control page
5. **BPM:** Displays BPM; tap to set tempo
6. **Window Select Tabs:** Navigates to all mixer windows
7. **Network Status:** Server, I/O, and sample rate status
8. **DSP Meters:** Displays average and peak processing loads
9. **Scenes:** Stores and recalls scenes
10. **Messages:** Shows status and errors / record status
11. **Record:** Shows record status (On/Off)
12. **Clock:** Displays time or current MTC position
13. **On-screen keyboard:** Activates keyboard and ALT/Ctrl keys
14. **Lock:** Locks mixer surface, I/O routing, and/or plugins rack
15. **Floating Window Menu:** Dock or focus floating windows.

Help (LV1 Classic logo): Shows version; opens user guides

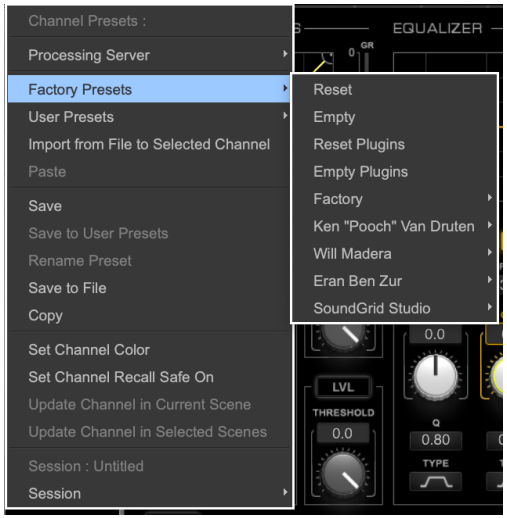
Top Bar Elements

1 Name

This box displays the name of the selected channel. The list is organized by category (e.g., Channels, Groups, Aux). Use the arrows beneath the channel name to move the channel selection higher or lower, one channel at a time. The down arrow opens a drop-down menu used to access and select any channel directly. The background color of the Name box matches the color of the selected channel.

2 Preset Menu

The Preset menu is divided into two sections that serve different purposes. Where needed for convenience, some menu items are multilevel.



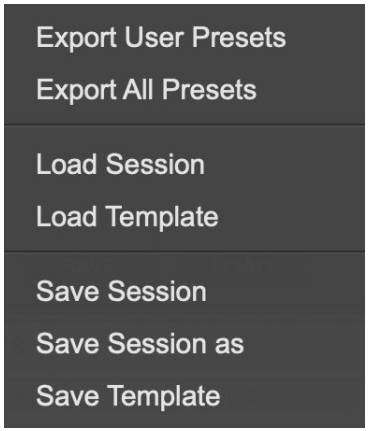
At the top is the **Channel Presets** menu section. Channel presets are snapshots of the current condition of the selected channel. These menu items are used to save, load, export, import, and manage presets. The Channel Recall-Safe status is also set here. Presets are saved as part of a session. To use presets from another session, select the **Import from File** menu item. The name of the current channel preset is displayed in the Preset box above.

Beneath the Channel Presets is the **Session** section. This provides quick access to sessions and enables you to save the presets for the entire current session as files.

The Preset menu is always visible from all windows.

Menu Item	Description
Factory Presets (load)	A library of presets supplied by Waves. A factory preset cannot be modified. To make changes, open a factory preset and save as a user preset.
User Presets (load)	A list of user-defined channel presets saved within the current session or imported from another. To delete a user preset, hold Ctrl before opening the Preset menu. When the User Preset menu opens, preset names will be preceded by a "Delete" option. Select the preset to delete it permanently. This action cannot be undone.
Import from File	Opens a navigation window to locate presets files that have been saved. Imported presets are added to the User Presets menu.
Paste	Pastes the copied channel condition to another channel. The Copy command copies all rack information. Paste enables you to choose what channel information will be replaced in the target track.
Save	Saves the current channel condition to the loaded channel preset, overwriting it.
Save to User Presets	Creates a new user preset. These are saved as part of the current session. Consider this a Save As function.
Rename Present	Changes the name of the current channel preset.
Save to File	Creates a file that is saved in a user-defined location, which can be imported to any session (the extension is .xps). Unlike user presets, these are not embedded in the session.
Copy	Copies the current channel preset. A copied preset can be pasted to any other channel in the current session. Several Paste options are available.
Set Channel Color	Enables custom coloring of any channel to improve organization.
Set Channel Recall Safe	Temporarily excludes all channel parameters from scene changes, even if those parameters are within the scope of the scene change. A small Safe indicator appears next to the channel name when it is in Recall-Safe mode.
Update Current Scene	Updates the loaded scene with the current mixer condition.
Update Scene from List	Updates the selected scene with the current mixer condition.
Update All Scenes	Updates all scenes with the current mixer condition.
Update Channel State to Scene(s)	The condition of the selected channel is updated in all selected scenes. Select target scenes in a pop-up window that appears when the menu item is clicked.

Session Menu Section



This menu section is used to manage presets for the entire current session. It is also used to save and load mixer sessions.

Export User Presets	Creates a file containing all user presets for the entire session, not just those of the selected channel. The exported presets are stored as one .xps file that can be saved to other media.
Export All Presets	Exports a file that contains the presets—not just the user presets—of all channels in the session.
Load Session	Presents a list of existing sessions. If the current session has not been saved, you will be prompted to save it before proceeding.
Load Session Template	Opens a navigation window to load a session template. Loading a template does not alter the current I/O inventory or external patching.
Save Session	Overwrites the currently loaded session file with the current mixer condition.
Save Session As	Saves the current mixer condition as a new session.
Save Session Template	Saves the current session as a session template.

Sessions and Templates are discussed in the *Show* chapter of this User Guide.

3 Clear Solo

Clears active solos or cues on all tracks.

Cues and solos are activated in the Mixer window. Configure Cue settings in the Cue control page, which is accessed with the Gear button below Clear Solo. For more information about the cue function, refer to *Channel > Cue Section*.

4 Talk

Activates talkback. Click on the Gear button to access the Talkback configuration page. For more details, refer to Channel>Talkback Section.

5 BPM

Displays the system tempo as a value in the box, accompanied by a flashing light. Tap repeatedly on the Tap button to establish a tempo. The taps are averaged to create a steady BPM. You can also click+drag on the BPM number to adjust it or edit the value directly.

6 Window Selection Tabs

Radio button tabs navigate between the six mixer windows.

Mixer 1 and Mixer 2	Touchscreen fader bank providing extensive control over multiple channels.
Channel	Provides complete control of a selected channel. This includes channel input, plugins, AUX Monitors and AUX FX sends, output assignments, and assignments such as matrix, linking, delay, and mute groups.
Show	Manages scenes and sessions and sets recall safe for functions, channels, and busses.
Patch	Sets patching to, from, and within the mixer. It also configures device connections on the SoundGrid network and sets up delay groups.
Setup	Establishes overall mixer settings and user preferences. The System Inventory page is where I/O devices and servers are assigned to the mixer.

7 SG Status Panel

Refer to this panel to monitor the status of the SoundGrid network and servers. The left side displays three overview indicators:

Server	Indicates server assignment. At minimum, one server must be present in Slot A. When the main server is not available for any reason, or is operating at a temperature higher than its limit, SERVER is red. If the main server is operating, but the extra servers are not, SERVER is yellow.
I/O	Indicates SoundGrid I/O device assignment. This provides the clock and audio throughput. Green indicates at least one I/O is present. Red indicates no I/O device is assigned to the system.
Sample Rate	Displays system sample rate.

8 DSP Meters

A server group consists of one active server and possibly a redundant server. There are four server groups. Each server group has a meter bar that displays the average and peak processing loads of the active server. The group's average processing load is displayed as a green bar and its peak as an orange line.

Red indicates that an audio drop has occurred. This may happen for two reasons:

Processing overload (momentary or constant) *Solution: Disable some plugins*
Some plugins exhibit a high average/peak ratio. This may cause temporary CPU overloads that result in audio drops. When adding many of these plugins, the peak and average indicators will drift apart. In such cases, some of these plugins may need to be disabled.

Network connection errors (channels over the network) *Possible solution: Increase server network buffer size.*

A red server group letter indicates a lost server connection or a server fault. The mixer can still be used in an offline mode with offline devices assigned in the inventory.

Go to Setup > System Inventory to investigate network problems.

9 Scenes Menu

The Scenes menu is used to quickly store and recall scenes within the current session. The name of the current scene is displayed in the box. If a scene has been modified since it was recalled, it is followed by an asterisk (*). The Scenes menu is accessible from any window.

Store New	Creates a new user-named scene based on the current condition.
Store	Overwrites the recalled scene with the current mixer condition.
Recall Scene	Directly recalls a scene based on its place in the scenes list. Type a number and the corresponding scene will be recalled.
Hot Scenes	Provides immediate access to up to eight high-priority Hot scene snapshots.
Scene 1–32 (scene select submenu)	Shows all scenes associated with the session in banks of 32 scenes (maximum number of scenes: 1000).

10 Messages

Reports network status. Messages may indicate a sample rate mismatch, a general change in network status, a buffer overload, etc. Troubleshoot network and device issues in the System Inventory page (Setup > System Inventory).

11 Record Indicator

A red REC button indicates that the onboard recorder is in record. Click the REC button to open a drop-down menu to start and stop record and to access the Media Player.

12 Clock

Displays the console's system time. Set the time in the Admin Configuration kiosk.

When MIDI control is used, this box can display MIDI time code.

13 On-Screen Keyboard

Click the keyboard icon to open the on-screen keyboard, which is useful when no external keyboard is available. Alt and Ctrl act as locking modifiers. When Alt is selected, click on a control to set it to its reset value.

14 Lock

Locks or unlocks the mixer surface, I/O routing, and/or plugin parameters to prevent unwanted changes during live events. The scope of the mixer lock is defined in the Setup window (Setup > Mixer Settings > Lock). A password can be assigned to this function

15 Floating Windows Menu

Brings a window to the front and docks all floating tabs and floating plugins. This menu is identified by a double window icon.

HELP PAGE (eMotion LV1 Classic logo)

Takes you to an information page displaying the eMotion LV1 Classic version number and provides links to the user guide and the quick start guide.

Floating Windows

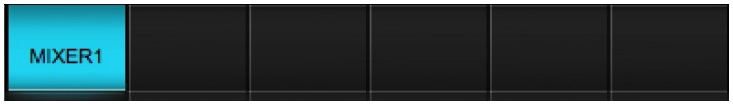
Many panels can be undocked from their original locations and then moved to another display.

Main Window Select Tabs

Each of the six main windows can be “torn off” from the original screen to use on other displays.

Original view: All tabs are available.

To create a secondary view, click/drag its tab downward, away from the Top Bar. The new floating window will appear on a secondary display.



This new secondary display will show the selected window only.

The main display can access all windows *except* the secondary view. To return to the complete view, close the floating windows.

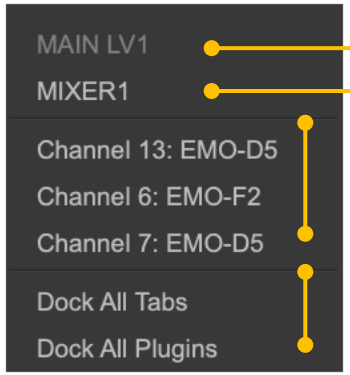
Device Control Panels The control panel for any I/O device, driver, server, or controller opens as a floating window. You can open a device control panel from the System Inventory page.

Plugin User Interfaces Click on a plugin icon in a rack to open its user interface. Click the Expand button in the upper-right corner to undock the interface into a floating window. When another plugin is undocked, the current plugin window will automatically be redocked. Pin a plugin window to keep it undocked. Floating plugin windows are set to remain "always on top" in relation to the main application windows. Up to five plugin windows can have their layouts changed with a scene change.

Routing View Panel Access the Undock Routing View panel In Setup > System Inventory to monitor network activity continuously.

Floating Windows Management Menu

This menu provides a list of all current floating tabs (e.g., Channel, Patch, Routing Panel) and floating plugin user interface windows. It's a quick way to keep track of your floating windows and to find those that may be hidden beneath other windows. Click on a window to bring it to the front.

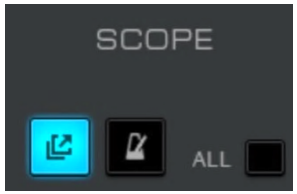


View from which a Window tab was "torn off."

A "torn-off" window tab that is now a floating window.

Floating plugin user interface windows.

Return all tags and/or plugins to their docks.



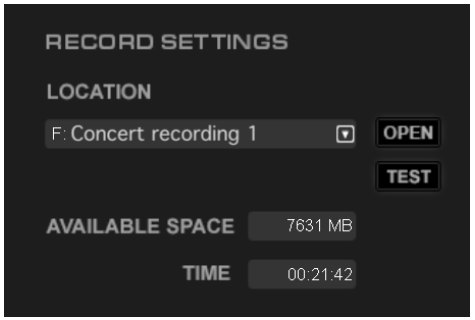
Floating windows configurations are part of a scene and will normally change when a scene is recalled. You can, however, choose to make floating windows recall safe or outside the scope of a scene change.

Set **Scope** and **Recall Safe** in the Show window.

Local Media Device

The local media device is useful for recording input channels, stems, and board mixes. Any channel or mix can be patched to the recorder from the Output Route section.

Set Up the Local Media Device

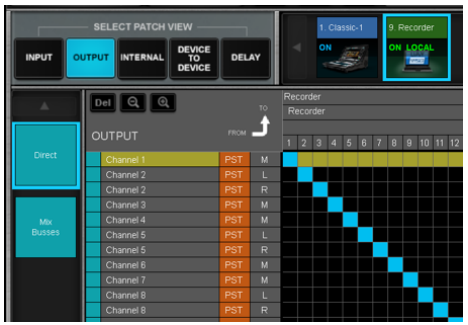


- Go to the Record Settings panel on the Mixer Settings page.
- Select a drive for recording or playback.
- Click Test to see if the drive is fast enough for the job. If a drive is not fast enough, it cannot be used.

  Once the drive is selected, the available space (in MB) and time will be indicated. This time is calculated based on the maximum potential record channels.

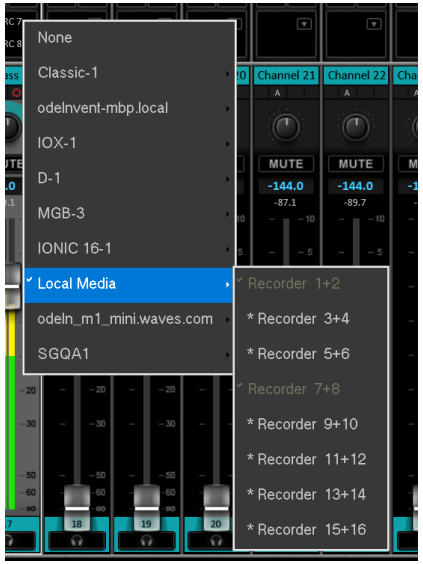
For best results, we recommend using drives formatted in the exFAT format. We do not recommend using drives formatted NTFS.

To Record Console Channel Output to the Local Media Device From the Patch Window



- Open the Patch Window/Output page.
- Select the recorder in the top panel.
- Patch up to 16 console outputs to the recorder. You can patch from console channel direct outs or mix busses.
- Use the REC menu on the Top Bar to start/stop recording and access the Media Center.

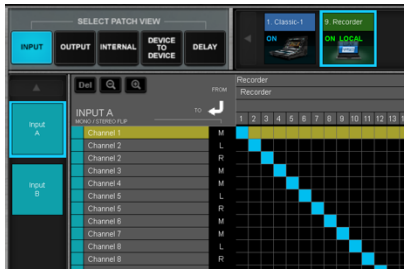
To record console channel output to the Local Media Device From the Mixer window



- Select a channel you wish to send to the Local Media recorder.
- Select Local Media.
- From the submenu, choose the recorder channel that you want to send the mixer channel to.

Each console output channel that is patched to a recorder channel displays a small red unfilled circle. This circle becomes solid red during recording. The recorder remains in standby whenever channels are patched to it.

Playback recorder channels to the console



- Open the Patch Window/Input page.
- Select the recorder in the top panel.
- Choose Input A or B on the left side. If you are using Input A for mixing, you will likely want to use input B for the recorder.
- Patch from the recorder to the console.
- Use the Media Player to manage playback.

If Local Media is not available in the Patch, its driver may not have been assigned. If the recorder icon does not appear in the Setup–>System Inventory–>I/O Device rack, use the Network Devices menu to assign it to a device rack slot.

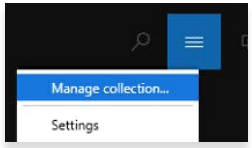
Media Player

The eMotion LV1 Classic console features a built-in media player. You can use it to play music directly from the console for walk-in music, cues, background music, and more, without the need for external audio playback devices.

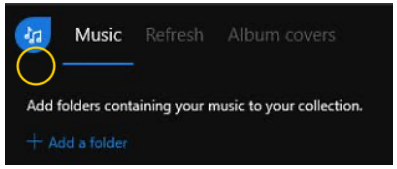
The media player is connected to the mixer using a SoundGrid ASIO device labeled **Recorder**, which is assigned in the mixer inventory by default.

Follow these steps to set up the media player and route the sound in the console.

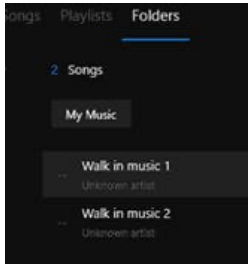
CONFIGURE THE MEDIA PLAYER



- Connect a USB storage device containing your media files to any of the console's USB ports.
- Cick the REC button on the right side of the Top Bar and select **Media Player** from the drop-down menu.
- In the Media Player, click the menu button and select **Manage Collection**.



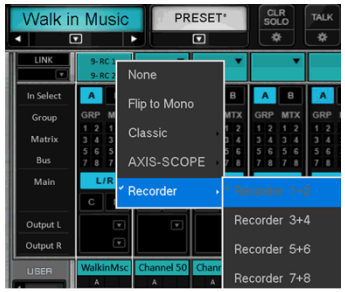
- Click **+ Add a folder**.
- Navigate to the folder containing your music files and click on **Select Folder**.



- At the top of the media player, click on **Folders**. The music folder and and its contents will appear will appear in the list.
- Select a music file.

ROUTING THE MEDIA PLAYER INTO THE MIXER

- Select the channel that you will use for the media player. You may want to rename the channel.
- Select **Flip to Stereo**.



- Open the Channel Input Assignment menu again, navigate to **Local Media**, and select **Player 1+2**.

Now you can play the media player through the console. Playback is controlled with the media player.

Console Updates

To ensure optimal performance, keep your eMotion LV1 Classic up to date. When a software update is available, you will receive a notification from Waves. You can also visit waves.com to see if updates are available. An internet connection is required for software updates.

To check for updates and to update eMotion LV1 Classic software, follow these steps:

1. Open the Admin kiosk from the button on the left side of the Setup window. This will quit the console.
2. In the Admin kiosk, open Waves Central and log in using your Waves credentials. In Waves Central, click Updates Available to update LV1 and any other Waves products for which updates are available.
3. To install specific plugins or plugin bundles, select All Plugins at the top of the page and choose from the list. Note that certain plugin bundles cannot be installed on Classic from Waves Central.
4. Occasionally, firmware updates may be required for I/O devices or servers. When the FW button on a device icon in the System Inventory is lights up, click it and follow steps to update.
5. You may need to restart the console after updates.

For detailed instructions, refer to this technical article on updating the console.

CHAPTER 1:
MIXER WINDOW

The Mixer window is inspired by traditional mixing consoles, so this is probably the most familiar view. It provides a broad, multichannel view of the entire mixer, including input, routing, plugins, assignments, and channel parameters. All its controls are mapped to other windows, where focused, more detailed views are available.

The Mixer window controls provide access to assignment and processing settings, such as those on the Channel and Patch windows, for up to 16 channels in a single window. The mixer consists of four main sections.

1. **Mixer Channels**
   Channels consist of channel strips that control individual channels, and Channel Strip modes that define how a channel or buss is controlled and viewed.
2. **Master Fader**
   The master fader controls the overall output level. In the sends on faders mode, it controls the output level of the aux channel.
3. **Mixer Layers**
   Mixer layers determine what populates different mixer channels—what is being viewed and controlled.
4. **Mute Groups and User-Assigned Keys**

Mixer Layer 1 is, by default, linked to the fader bank and can be controlled from the tactile surface or the touchscreen.

> The next several pages are an overview of what these sections do, followed by detailed descriptions of how to use them.

Mixer Window Overview

A Mixer's processing, routing, and control take place on **Mixer Channels**. To control these channels, two things are needed:

(1) A way to control channel input, panning, cue/solo/mute and other mixer functions (**Channel Strip).**

(2) A way to select and control the processing, routing, and settings applied to channels or busses (**Channel Strip Modes**).

1 Mixer Channels: Channel Strips

Touchscreen Channel Strip

Channel Input

Mode Section
Section used for input, routing, sends, etc. The view changes, depending on the Mode selection.

Channel name
Link, server, record, and Dugan status
Pan, rotate, immersive positioning
Mute
Meter values

Meter and faders

Channel ID
Cue/Solo

Fader Bank Channel Strip

Channel Select/User Keys

Scribble Strip
Channel name, channel meters and channel status. Changes by function

Rotary encoders
Pan, gain, edit plugin

Solo/Mute

Fader

Channel ID is on the scribble strip

Channel Strip Elements

The channel strips on the touchscreen and the fader bank are functionally identical, although some controls, by necessity, are presented differently. Fader bank channel strips are mapped to the touchscreen interface. They use the same logic and flow as the touchscreen channel strips.

Function	Fader Bank	Touchscreen
Channel Select	Select *Chan* on the *Chan/User* selector and choose a channel or touch a fader.	Touch the fader or the lower section of the channel strip. You can also use the Channel Navigator in the Top Bar.
Pan	Turn the encoder knob when the encoder panel is set to Pan.	Panner controls panning and imaging. On Aux busses, it may control immersive monitoring. Input gain and trim are controlled in the Input mode.
Input Gain	Select “Gain” on the Encoder selector. In this mode, preamp gain or trim is controlled, depending on the presence of a preamp.	Channel mode only. Controls preamp gain (if preamp is present on channel) or trim.
Scribble strip	Multipurpose display that changes by function: Channel/User, Plugin Edit, Flip.	N/A
Channel Name/Track ID	Displayed in the scribble strip.	Channel name is shown in the center of the channel strip. Track ID is shown at the bottom of the channel strip.
Fader	100mm ALPS fader mapped to touchscreen fader.	High-resolution. -60 dB to +10 dB

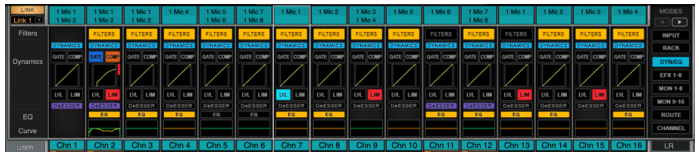
	Solo/Mute	Solo and Mute buttons are in the middle of the channel strip. A mute activated by the user for a specific channel will be solid red; a mute activated by a mute group or solo will flash when a Mute button on channel is flashing.	Solo/cue button is at the bottom of the channel strip. Mute is in the middle. A mute group is activated on the touchscreen.
	Channel Meters	Inside the scribble strip.	Under the faders.
	Shortcuts	Recall two programmable commands.	N/A
	Mode Selection The Mode selector is not part of a channel strip, but the mode choice influences the functionality of the strip.	Use the mode selector buttons on the touchscreen.	Use the mode selector buttons on the touchscreen.

Mixer Channels: Modes

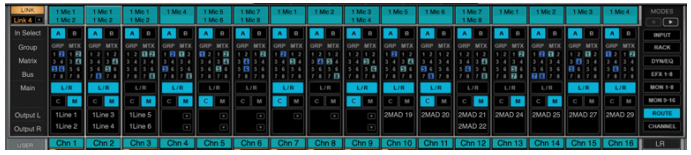
Channel Strip modes determine the processing, routing, and views for all channels in a layer. Modes are displayed in the large section in the middle of the mixer. They are selected via the panel on the right (highlighted in the yellow circle here). Toggle between the selector pages using the arrows above the panel.

Input: Select input source. Control preamp and digital trim.

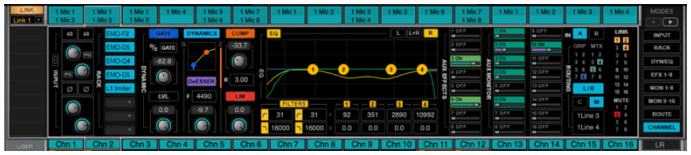
Rack: Insert up to eight plugins per channel. Plugins can be inserted on any layer, including mains, cue, and talkback.



Dyn/EQ: View and control dynamics and EQ plugins as assigned in the Channel window.



Route: Assign all input and output patching, as well as internal routing.



Channel: View and control details of the selected channel without leaving the Mixer. Gray if no channel is selected.

Dugan Speech: Control Automix behavior. If a Dugan Speech license is not present, the Dugan mode button will be grayed out.

eMo IEM: Provides immersive in-ear monitoring from any Aux mix.

Aux Modes: Eight Aux panels control FX sends—used primarily for processing sounds that will be sent to the mix or monitor busses—and the Mon busses, used to for artist monitor channels.

2 Master Fader

The master fader controls the overall output level. Like the channel strip faders, it includes a fader, meter, mute, and cue. When sends-on-faders is used, the master fader controls the Aux channel fader.

The Master fader on the fader bank controls the Master Fader in the touchscreen and is the same except for the layout and certain fader bank specific functions. Its meter is displayed in the scribble strip.

Touchscreen Master Fader

Master Fader
Main out L/R

Send on faders
AUX channel controlled
by Master Fader

Fader Bank Master Fader

Fader Bank
Master Fader

Channel Select/User Assignable Keys toggle
Sets the function of the button at the top of each channel.

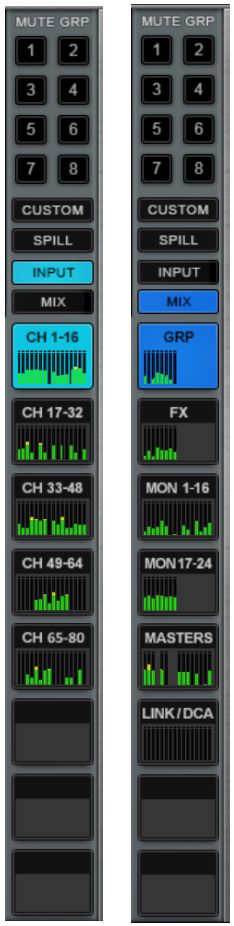
Touch and Turn
Quickly map this knob to one control for instant access.

3 Mixer Layers

Mixer Layers represent categories of channels. Layers address different types of channel types, and each layer has its own view. Mixer Layers can be selected from the touch surface or the fader bank.

When an 80 Channel mode is enabled, the factory channel layers will be split to two banks, INPUT and MIX. INPUT will map all the input channels (5 layers), MIX will map all the busses and outputs (6 layers). The MIX layer has its own color (deep blue), while Input uses the original factory color (light blue).

Touchscreen Layer Select



Input Layers

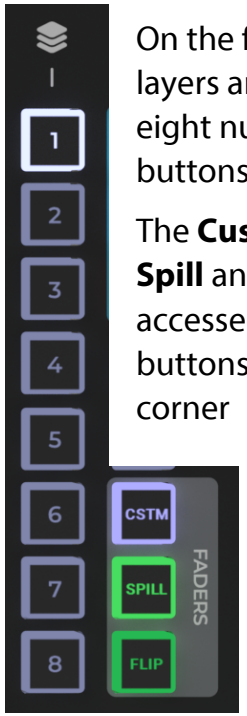
Mix Layers

Recall mute groups

User-defined custom layers
Spill Layer enable
Input/Mix Layers Select

Factory Layers

Fader Bank Layer Select



On the fader bank, factory layers are selected with the eight numbered layer buttons.

The **Custom** layer and the **Spill** and **Flip** functions are accessed using the three buttons at the bottom right corner

A touchscreen Layer selector includes small meters that indicate the levels of the channels in each layer. This is a quick way to determine if a channel—or layer—is receiving audio.The number of active Channel layers is determined by the size of the mixer, which is set in the Mixer Settings page. Certain layers are not available in smaller configurations, and a layer may not contain all 16 channels.

User-Assignable Keys

Many mixer actions can be assigned to sixteen keys in the Mixer window. Clicking on a key will trigger its corresponding action. Common assignments include loading and saving sessions and scenes, navigating between channels and views, and controlling channels and plugins. The name of an action is indicated on its assigned key.

User-assignable keys are assigned in the U/I Settings page. (Setup > U/I Settings > User-Assignable Keys). They are recalled from the left side of the touchscreen Mixer window (shown here on the left).

To trigger user-assignable keys from the fader bank, set the User Keys/Ch Select button to "User Keys." The scribble strip of each channel will display a user key name. Click the Channel Select button that displays the desired key name.

User-assignable keys are recalled in the mixer, but they can control actions in any layer or mode.

Activate Mute Groups

Mute groups are activated in the panel above the Layers panel.

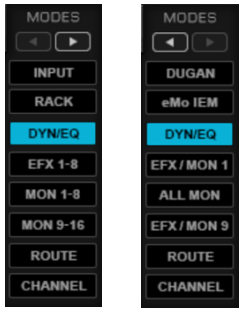
- All member channels of an activated mute group display a flashing Mute button.
- Any member of an active mute group can be unmuted by clicking its Mute button. Clicking it again mutes the channel beyond the scope of the mute group. It will remain muted even after the mute group is deactivated.
- A third click returns the channel mute to normal mute group behavior.

Mute group assignments are made in the Output Section of the Channel Strip mode, in the Channel window, and in the Patch window. Refer to *Channel > Output Section > Main Outs Assignment Panel.*

Mixer Window Details

Channel Modes

Mode Selector



Use the Mode Selector in the upper-right corner of the interface to choose a Channel Strip mode.

Left and right arrows toggle the view to control additional mode options.

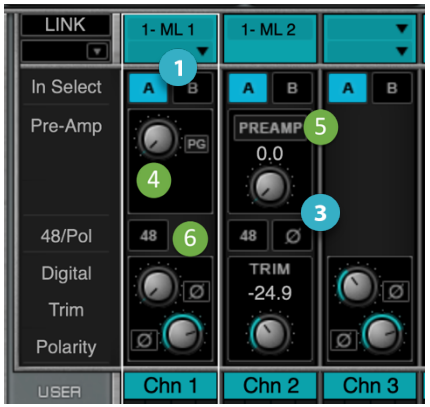
A channel's mode controls are in the center/top section of the channel strip. Each mode caries specific controls and views, and a mode selection affects all channels within the layer.

Input Layer Mode

The Input Channel Strip mode manages signals from I/O devices or internal busses. In this mode, each layer includes digital trim controls and pan/balance/rotation controls for each channel or buss. When a channel is patched to an I/O with a preamp, the Input Mode provides control over the preamp.

Input and Preamp Controls

On the touchscreen



Stereo Mono Mono, (no preamp)

Controls Available on Channels With or Without a Preamp

If there is no preamp on the channel, only the A/B Input selector, Trim, and Phase reverse are available.

1. **Input Selector** lets you choose between mixer inputs A or B.
2. **Channel Trim:** Trims channel input level digitally. Stereo channels/busses have independent left and right trim controls that can be linked. Range: -144 dB to +10 dB
3. **Input Polarity Reverse:** Reverses the polarity of an input channel. Each channel of a stereo input can be controlled separately. Note that the location of the polarity and 48V differ between mono and stereo channels. Options: On/Off; default: Off

Additional Controls Available on Channels When a Preamp Is Present

4. **Preamp Analog Gain Control:** Adjusts the analog level of an I/O device preamp. Knob position is displayed in the value box and with a blue ring around the knob. Stereo channels have independent L/R input controls or they can be linked. This is set in the which are set in the Channel window. Preamp control range varies depending on the I/O, and adjustments made in the I/O control panel are reflected here.
5. **Preamp/Local Select** (click the Preamp button to toggle) **Preamp** mode adjusts the preamp's analog gain, just like the preamp gain control in the device's control panel. **Local** is a digital gain stage that always delivers the user's requested input gain, regardless of the preamp's analog gain setting. Refer to refer to *Channel >Input Sections >.*
6. **48V Phantom Power:** Activates the microphone preamp 48V phantom power. Stereo channels have independent L/R 48v phantom controls. Options: On/Off; default: Off

On the Fader Bank

Use a channel's encoder knob to control the preamp and adjust channel trim. When the encoder knobs are set to control gain, they automatically map to the channel input's preamp-Gain or local-VGain. If there is no preamp, the encoder knobs control the channel trim. Gain value is shown in the scribble strip.

Dynamics/EQ Mode

The DYN/EQ mode displays the controls and graphics of plugins that have been assigned to Main Channel processing. It provides a single-page overview of the dynamics, EQ, and filter processing for an entire 16-channel layer.

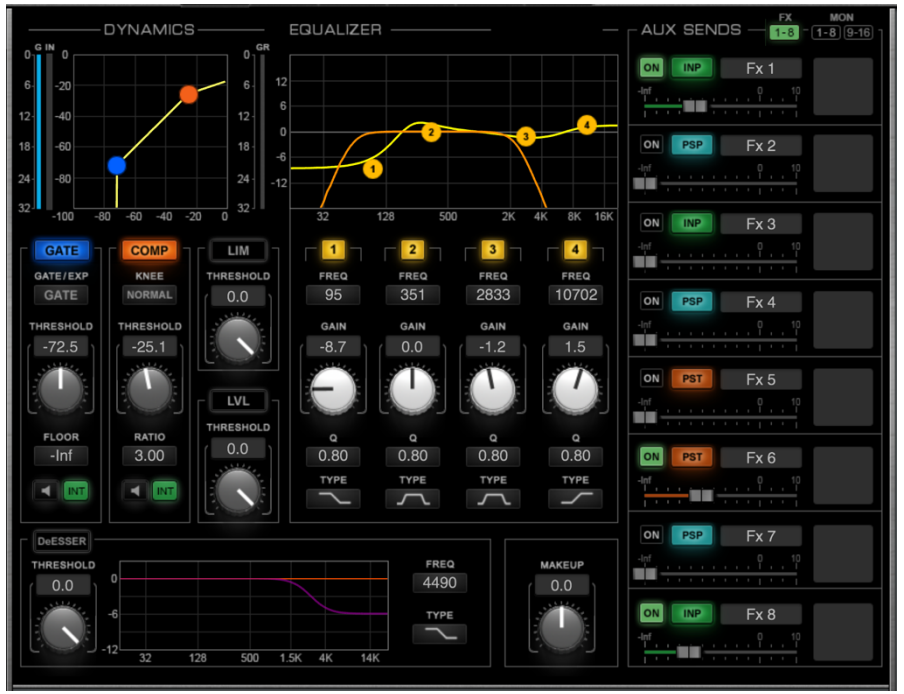
Each channel's mode section includes graphic displays of specific EQ and dynamics processors. Plugins can be bypassed with the display buttons. A selected plugin or section is bypassed when its indicator light is off.

Filters, EQ, and **Dynamics** buttons turn their respective processing sections on or off for the entire plugin. In addition, the specific dynamics sections (gate, compressor, leveler, limiter, de-esser) can each be bypassed. For further control of a plugin, click on its graphic display to open the plugin user interface in the Channel window.

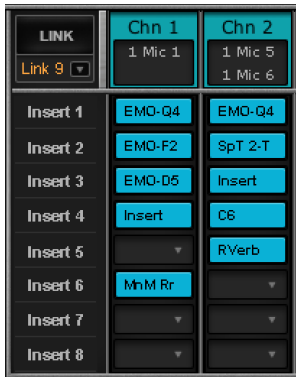
In this example, sections of a dynamics processor are mapped to the Channel window Main Control section. These controllers can be switched on and off in the Mixer DYN/EQ mode.

Mixer window in Dyn/EQ mode

Channel window Main section



Rack Mode

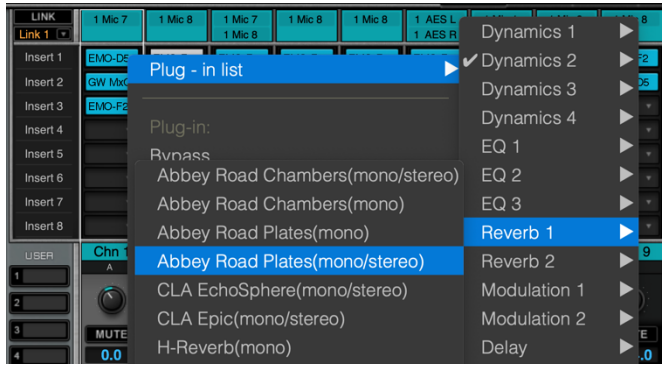


The Rack mode displays the plugins and external inserts for channels in the current layer. It provides an overview of the processors on each channel or mixer buss. In the Rack mode you can move and copy plugins between racks, re-sequence rack order, and bypass, disable, and remove plugins from racks.

Each channel rack can hold up to eight plugins.

Click on a plugin icon to open its user interface.

INSERTING A PLUGIN



To add a plugin to a rack, click the small arrow on an empty rack slot, or click+hold on the slot itself. This opens the Plugin menu. Go to the Plugin List sub-menu and choose from among the available plugins. Its name then appears in the rack slot. Click on the icon to access the plugin user interface.

The Plugin menu is also used to manage presets, copy parameters between plugins, and to monitor channel latency. These functions are described in detail in the Channel Window chapter of this manual (*Channel>Rack Section>Adding and Managing Plugins*).

Certain regularly used Plugin menu items are described in the next section of this manual.

Managing Plugins From the Rack

Bypass

Bypasses the plugin while keeping it in the processing chain. A disabled plugin appears light gray in the rack.

Disable Plugin

Removes the plugin from the processing chain without deleting it from the rack. Disabling plugins that are currently unused may reduce rack latency. Higher rack latency can result in an accumulated delay from the buss inputs. You can re-enable the plugin without losing its settings, controls, or automation assignments. When a plugin is disabled, its name will remain visible, but the slot will appear as gray.

Remove Plugin

Deletes the plugin from the slot. All parameter settings and control assignments are lost.

Adding and Deleting a Row of Plugins

Hold the Alt key while selecting Insert or Remove from the Plugins menu to extend the action across an entire row, throughout all channels in the session. The on-screen keyboard provides latching Alt and Ctrl modifier keys

Latency Compensation On/Off

Removes the plugin from plugin/buss latency compensation calculations. The plugin remains active, but its latency is no longer reported to the delay compensation engine. This prevents a plugin with a particularly long delay from delaying the entire buss.

Latency

Indicates the delay introduced by the plugin or external insert.

Rack Latency

Indicates the total latency of all plugins and inserts in the rack. If no latency is declared by any of the plugins in the rack, both sections will be grayed out.

Organizing Plugins in the Rack Channel Strip Mode

Rack signal flow is from top to bottom of the rack. Some plugins are designed to work together in parallel without regard for processing sequence. With these plugins, rack order is unimportant. Refer to the plugin's user guide for details.

Controlling Plugins From the Rack

> Moving, copying, and controlling the plugin icons is executed on the touchscreen. Take caution to avoid inadvertently touching an icon and changing its condition.

Single click: Opens the user interface of the plugin or external insert.

Single click + hold: Opens the Plugin menu.

Ctrl + Alt + click: Bypasses the plugin.

Ctrl + click: Disables and removes the plugin from the DSP processor.

Drag an icon off the left side of screen: Removes the plugin permanently.

Moving and Copying Plugins Using Their Icons

Click + drag icon: Moves a plugin and its presets to another rack slot.

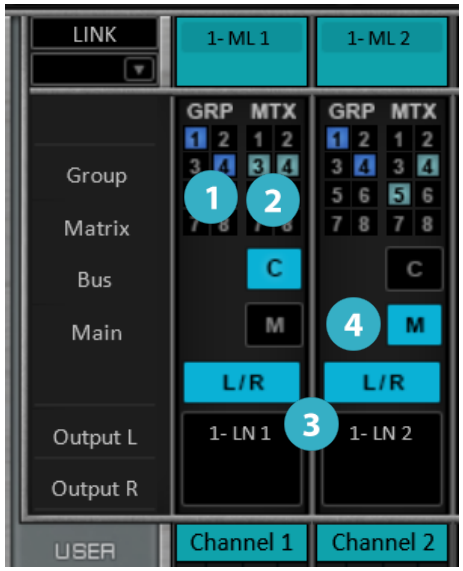
Alt + click + drag icon: Copies a plugin from one rack slot to another.

Drag a plugin to change its position in the rack. Drag to move a plugin or external insert to another channel or use Alt+drag to copy. Latching Alt and Ctrl keys are located on the on-screen keyboard. Move a mono plugin module to a stereo channel and the plugin becomes a stereo module. The mono plugin's parameters will be applied to both sides of the stereo module. If a stereo plugin is moved to a mono channel, then settings of the left stereo channel become the mono parameters.

Do not add, remove, disable, or move a plugin when an audio dropout is not acceptable. These actions change the structure of the plugin rack, which can result in a brief interruption. Bypassing a plugin or changing its parameters can be done at any time.

Route Mode

Use the Route mode to patch within the mixer and to I/O devices. It provides an overview of the internal and external patching in the mixer view.



1. **Group Assignments:** Assigns channel to up to eight mix groups. Groups are controlled on the GRP layer.
2. **Matrix Assignments:** Assigns channel output to up to eight matrix channels. They are controlled in the Masters layer. Each matrix channel can accept up to 12 sources.
3. **Main Outputs Assignments:** Assigns channel to the main mix.
4. **Channel Direct/Mix Outputs/Recorder** Assigns the output to an I/O or the local media recorder. Devices assigned to the mixer are available for patching from this menu. Grayed-out I/O channels are unavailable

Aux Sends Modes

FX busses are used primarily for effects processing. They can be sent post-processing to MON busses and to the main mix. Mon busses can be sent directly to an I/O. There are seven Aux modes on two layer pages.

Page 1

FX 1–8
Mon 1–8
Mon 9–16
Mon 17–24*

Because of their position in the signal flow, these busses can be sent to the main out or to other destinations. They can be sent to the monitor aux busses to provide common effects processing. EFX busses can also be sent other EFX busses that have higher index numbers (a later EFX buss).

Page 2

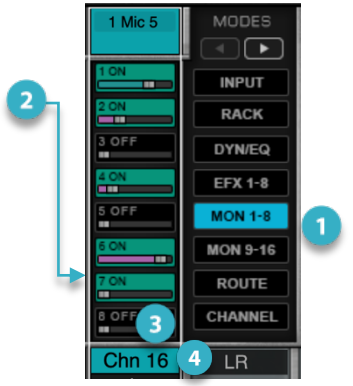
FX 1–8 and MON 1–8
MON 1–16
MON 17–24*

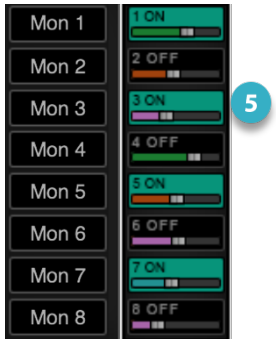
*An 80-channel license is required for more than 24 aux busses You can choose a configuration with 24 aux busses and 16 groups or 32 auxes and 8 groups. This is set in the Mixer Settings page.

When using an aux for monitoring, the aux channel is assigned directly to an I/O that feeds the monitor.

Aux channels are controlled in the AUX layer of the Mixer window. Refer to the eMotion LV1 signal flow diagrams (Chapter 6) for more information.

Adjusting an Aux Send





1. Select an AUX Channel Strip Mode (e.g., MON 1–8)
2. Select an aux that you want to send from the selected channel. Aux channel names are shown in the Sub Views panel on the left side of the Channel Strip mode section.
3. Turn an aux send on or off by double-clicking its cell.

4. Go to the *send's* channel in the Channel window. Select the source for each send. Ctrl+click on a cell to select the source for each send. The color of the fader bar indicates the aux source.

INP	Green	Before all processing, post-input gain
PRE	Purple	Pre-fader, post-processing
PST	Orange	Post-fader, post-processing
PSP	Blue	Post-fader, post-panner, post-processing*

5. Adjust the aux send level using the small horizontal fader. Fader value appears in the cell when the fader is touched. You can also set aux send levels in the Channel window.

Controlling Aux Sends on Small Faders

Use these key commands to control the small faders:

- Double-click anywhere in a fader cell — Turns the send on or off
- Click+Drag horizontally — Adjust send level
- Ctrl+clik — Change the send source.

Sends On Faders

In the If you send a mono input channel to a stereo AUX Channel (or IEM), post pan (PSP) the send panner is redundant and so will not be displayed. If, however, you created a session with an older LV1 version using that panner, the session will open in Legacy Send Pan mode ON

When Legacy Send Pan is *disabled*, all the values of mono PSP panners in a pre-v16 session will be reset, and the redundant panner control will be removed from the interface. This action cannot be undone.

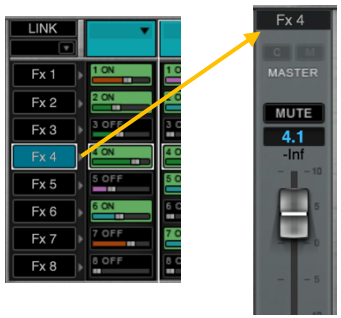
mode, the console is “flipped.” A channel fader controls the level it is sending to a selected aux channel. Select another channel to adjust what it is sending to the same aux. Select another aux (on the left) to choose another aux to send to. This provides more comfortable control of aux channels, with greater resolution.

Starting From the Touch Screen

1. Select an Aux layer mode (e.g., FX 1–8).
2. In the Sub Views section on the left, click the name of the aux channel you will be *sending to* (shown here, FX 7).
3. Select the channel you are *sending from*.

The interface changes color to indicate that the channel faders have flipped function. To remind you of the mode, “Send Level” appears next to each large fader. Large faders now control the send level from the selected channel to the selected aux.

The name of the selected aux channel appears above the master fader,and cue will be selected for that aux buss.



The Master fader now maps the aux output, and the buss name appears above the fader. Use the Master fader to adjust the aux buss output.

To return to normal faders, click on the aux send name, either on the left side of the panel or above the Master fader. You can select another AUX channel while the faders are flipped. This will remap the faders to the new aux sends

Starting From the Fader Bank

1. Press **Flip** on the right side of the fader bank. The top row of buttons (Select/User) turns green and starts blinking, as does the Flip button.
2. Use the **Layer** buttons on the right side of the fader bank to choose an aux layer (e. g., FX 1–8, MON 1–16).
3. Use the **Channel Select** buttons to select an aux to send to.
4. Once an Aux channel has been selected, its button turns white. Move between large faders to set which channel is being send to the selected aux.
5. Use the Channel Select buttons to choose another aux channel.

   While the mixer is in sends-on-fader mode, the master fader controls the output of the Aux channel. The name of the selected aux channel will appear above the master fader, and cue will be selected for that aux buss.
6. Once you have finished adjusting sends, click the Flip button to return to the normal channel faders.

> In Send on Faders mode, the channel encoder knobs default to Pan control, which serves as the send pan. Gain or Edit can also be selected. The default encoder control is Pan.

Channel Mode

The Channel mode provides comprehensive feedback and control over routing and processing for a selected channel or buss on the current layer. Detailed channel information and controls are displayed in the Modes section of the window, leaving panners, meters, mutes, and cues unchanged for all channels in the Layer. This mode is particularly well suited for single-display mixer setups.

Channel mode in the Mixer window

Channel window Main Control section

The Channel mode enables you to:

- Control all input settings.
- Access the Plugin menu to select and assign plugins.
- Access the plugin user interface.
- Control assigned dynamics, EQ, and filters plugins.
- Enable/disable key sections of mapped plugins (dynamics, EQ, and filters).
- Adjust FX and MON sends.
- Select input set (A/B) and assign channel to groups and the matrix
- Assign to DCA groups.
- Assign channel to L/R, center, or mono main mix.
- Assign channel direct outputs.

To set plugin parameters, click on the plugin icon in the Rack section. Channel mode is available when a channel is selected.

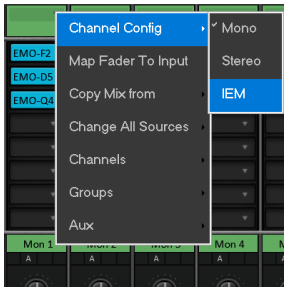
eMo Immersive In-Ear Monitoring

eMo IEM enables immersive 360-degree panning for in-ear monitors. This delivers a monitoring experience that is, for most musicians, more comfortable, especially during prolonged use. It is intended for MON aux mixes, but it can be used on any Aux channel (FX and Monitor).

> eMo IEM requires a separate license. The software must be installed and activated to be available to LV1 and Mobile apps. Use Waves Central to purchase and manage all Waves software products.

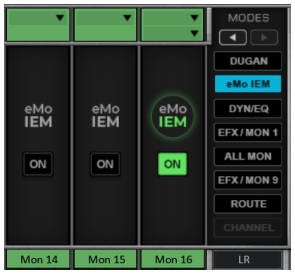
To select eMo IEM monitoring from Mixer window, follow the steps outlined below.

Mixer 1 or Mixer 2



METHOD ONE

- Select an AUX mode (FX or MON).
- Open the drop -down menu at the top of the aux mix and select Channel Config > IEM.
- All aux channels in this aux mix will switch to in the IEM immersive mode.



METHOD TWO

- While in GROUP/FX or a MONITOR layer, select eMo IEM mode.
- Click ON to enable eMo IEM on the desired mix.
- All aux channels in this aux mix will switch to the IEM immersive mode.

Immersive monitoring requires a stereo AUX channel. If you activate IEM on a mono AUX, the Channel will flip to stereo. eMo IEM can also be initiated from the Channel window.

There are several Waves on-stage monitoring tools for mobile devices. Learn how use your device with LV1. Refer to the user guide for your device or visit the Mixer and Racks section of the Waves user guide download page.

Dugan Speech Channel Strip Mode

The Dugan Speech Automixer controls a group of live microphones in multi-speaker environments. It turns up mics where someone is talking and turns them down where people are quiet. It's commonly used in roundtable discussions, talk shows, debates (and similar setups) and is based on the hardware Dugan Automatic Microphone Mixer.

For detailed instructions on using the Dugan Layer, please refer to the Waves Dugan Automixer User Guide, which can be found in the download section of the Waves web site. A Dugan Speech license is required to use this feature.

To access the Dugan Layer, click the arrow above the Modes buttons. The Dugan Speech mode button replaces the Input button.

1. Click the On button at the top of the Dugan channel strip control to activate Dugan Speech.
2. The automixer's position in the signal flow of a channel is after processing, after fader. Effective automixing depends on correct input gains for each channel. Adjust each channel's preamp or input gain so that the level display is green. If needed, lower the master fader to compensate for the sum level of several channels.
3. Click the Auto button to turn on the automixer for that channel.
4. Set the weight controls to balance the channel auto mix gain and establish the priority of one speaker over others. Weight levels can be changed by dragging the faders up or down, or by entering dB values in the value boxes below the faders.

Assign channels to Dugan groups. A group functions as a separate and independent automatic mixer. Each channel can be assigned to one of three groups: a, b, or c. Dugan groups control mutes in the same manner as LV1 mute groups.

Mixer Layers

A mixer layer is a collection of channels that share a common function. Layers differ from modes. A layer determines which channels you want to address, while modes determine what you want to do with the channels in the layer. There are layers that contain fixed channels, and custom layers that you can populate with any combination of channels. Select between layers with the selection buttons.

Input accesses factory input channels.

Mix accesses groups, all aux channels, master busses (master out, cue, and matrix), and Link/DCAs.

Use the two selector buttons at the top to open the **Custom** and **Spill** layers.

Use the ALL button located above the Master Fader to open the **All Mixer Overview.**

Factory Input Channel Layers

The factory mixer layers are accessed from the Input button on the right panel. These are the input channels that feed the mixer. An input channel can be mono or stereo, and this does not affect the total number of channels available. Input channels can control I/O preamps (depending on input device), and each input channel can have up to eight plugins. They can be routed to groups, matrix, main, and direct outs, and sent to AUX/FX and AUX/MON channels.

- Channels 1–16
- Channels 17–32
- Channels 33–48
- Channels 49–64
- Channels 65–80*

These Five layers share the same view and functionality. Only the channels change.

Groups

Groups are commonly used to down-mix several channels to a single buss—the "group." This allows for global control of the mix of these channels. Think of the group as being "downstream" from the channels. For example, a drum group may be fed from 16 drum channels and mixed to a group. This mixed group can then be further processed, faded, panned, etc., and sent to the Main outs.

Groups in and of themselves don't add latency, but when routing from one group to another, system latency is increased, and plugin latency (if there is any) will be added to the path. See *Appendix D* for more on latency and delay compensation. Mixer Input channels can be assigned to up to 16 stereo groups, depending on the license and selected Mixer Configuration. Channels are assigned to groups in a Channel Layer (Route Mode), from the output section of the Channel Window, or in the Internal page of the Patch Window.

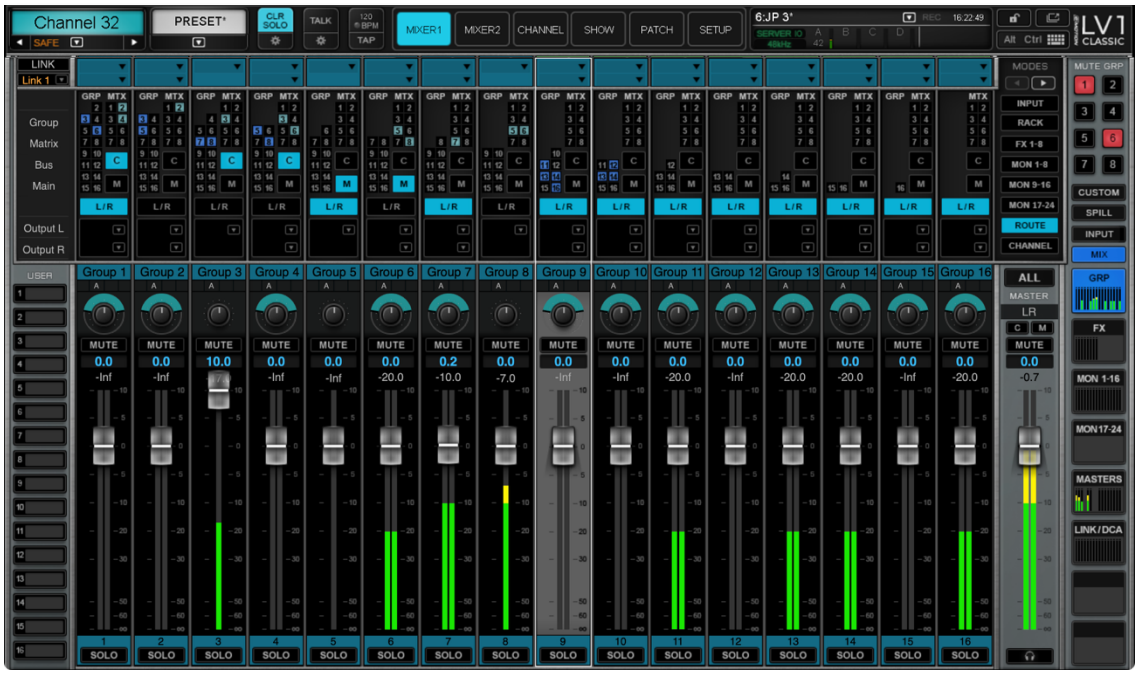
You can send groups to Aux FX and monitors and/or to the master busses. You can also send a group to another group that has a higher index. For example, Group 4 can be routed to Groups 5–8, but not to 1, 2, or 3. Groups can be set to process pre-FX or post-FX to create and process mix groups that include dry inputs with effects.

- Group busses are mono or stereo. The default mode is stereo. There are two ways to set the group buss to mono or stereo:
  - Use the MIX MODE: MONO / STEREO button in a group's input panel on the Channel window.
  - Use the input device menu in the GRP/FX layer of the Mixer window.

The eMotion LV1 Classic 80-channel configuration provides 40 channels of groups and axes. Depending on the needs of your show, you can allot 16 groups and 24 auxes or 8 groups and 32 auxes. The 64-channel configuration provides 8 groups and 24 auxes. You can change the configuration at any time. Mixer configuration is set in the Mixer Settings page. The 80-channel expansion requires a separate license.

Group Layer

Click the MIX button above the Layers to access the GRP FX, MONs, Masters, and Link/DCA layers.



A group can be routed to another group for additional processing. A low-numbered group can route to a group that is later in the signal flow, but not earlier. For example, Group 4 can be routed to Groups 5–8, but not to 1, 2, or 3. Groups can be set to process pre-FX or post-FX to create and process mix groups that include dry inputs with effects.

Group busses are mono or stereo. The default mode is stereo. There are two ways to set the group buss to mono or stereo:

- Use the MIX MODE: MONO / STEREO button in a group's input panel on the Channel window.
- Use the input device menu in the GRP/FX layer of the Mixer window.

Each Group buss can accommodate up to eight plugins.

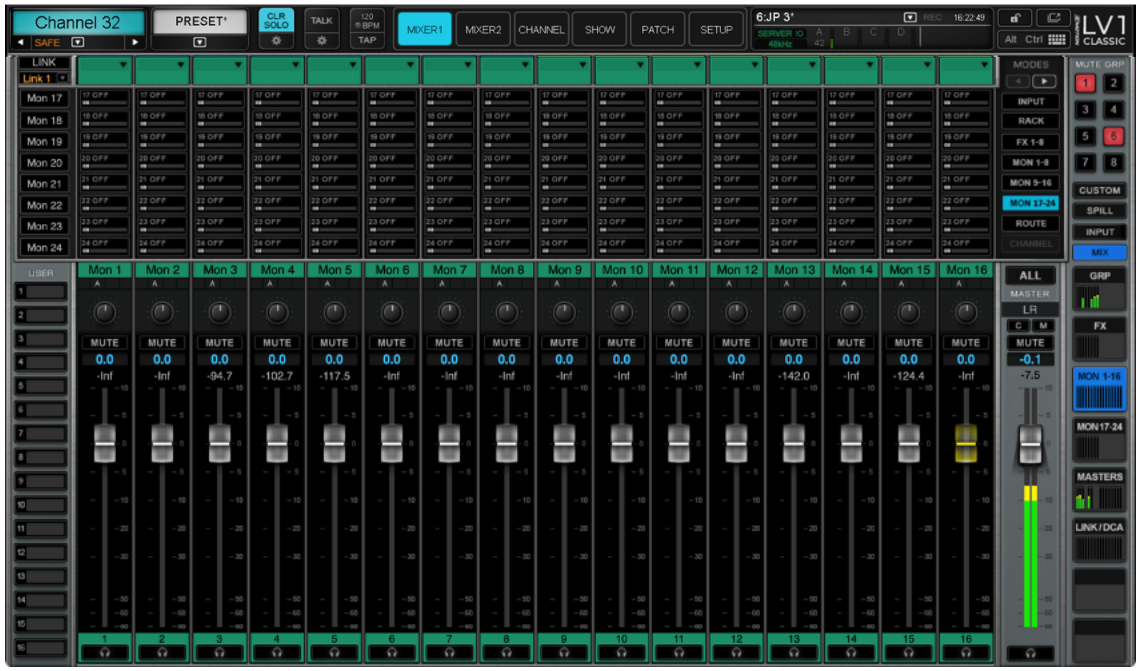
FX Layer

The eight **FX** busses are used to process signals that will be sent to monitor outs or other paths. You may choose to process an FX aux buss and then send it to one or more **MON** busses. This way you can efficiently perform effects processing that can be used over several monitor outs.

If needed, some FX busses can be used as monitor outputs (within limitations of available sources). In addition, monitor busses can be used for more effects processing and routed to the main mix rather than a monitor (IO device).

All AUX/MON and AUX/FX busses can be stereo or mono. This is determined by the format of the buss you are sending *to*, not the one you are sending *from*.

Monitor Layer



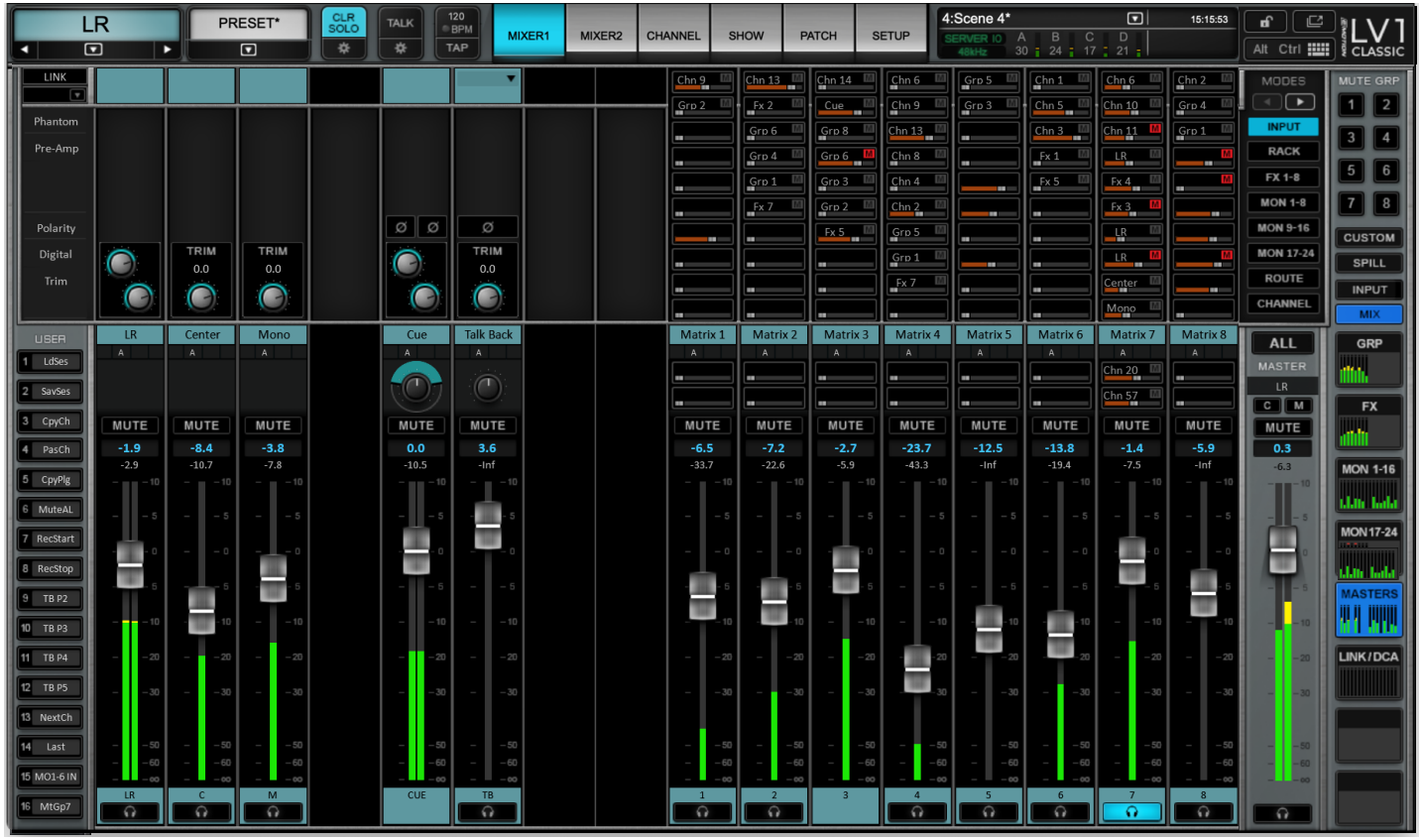
MON busses are typically used for monitor feeds. Signals are sent to the MON busses auxes from groups and FX. Each monitor aux can include up to eight plugins, so processing can be added to an aux buss before it is routed to an I/O. Monitor busses can be mono, stereo, or immersive.

If needed, some FX busses can be used as monitor outputs. In addition, monitor busses can be used for more effects processing and routed to the main mix rather than a monitor (directly to an I/O device).

Assigning aux sends is discussed later in this chapter.

Masters Layer

The Masters layer provides control over the Main mix and its distribution, as well as Matrix, Talkback, and Cue. The Main and Matrix busses each use up to 8 plugins to adjust the distribution properties of each mix output, such as the PA system, peripheral zones, or guest sends. The Layer is divided into two sections: Mix buss outs (Main outs, Cue, and Talkback), and a Matrix (12 stereo inputs per channel, with eight stereo outputs).



Main Outs

Main mix outs can be assigned from any mixer channel or buss, except Cue, Matrix, or Talkback. To quickly learn which busses are assigned to the Main out busses, check the Internal Patch page or open the Input list in the Channel window of a Main out.

- The Master fader on the right duplicates L/R fader position.
- In the Input mode, Center and Mono channels have input-independent trims.
- Hosts up to eight plugins.
- All Main mix busses can be assigned to the matrix.

Cue

When a channel's Cue button is engaged, assigned busses are sent to the cue buss. This section controls level, panning, and processing of the cue buss.

- Cue/solo mode can be activated from any channel (except Cue).
- Cue operating mode and sources are controlled in the Channel window. Click the Gear icon beneath the Clear Solo button in the Top Bar to access the Cue control panel. Buss and I/O assignments are also made from the Channel window.
- The Cue channel can host up to eight plugins.
- Refer to the *Channel* chapter for details about the Cue buss settings (*Channel > Cue Section*).

Talkback

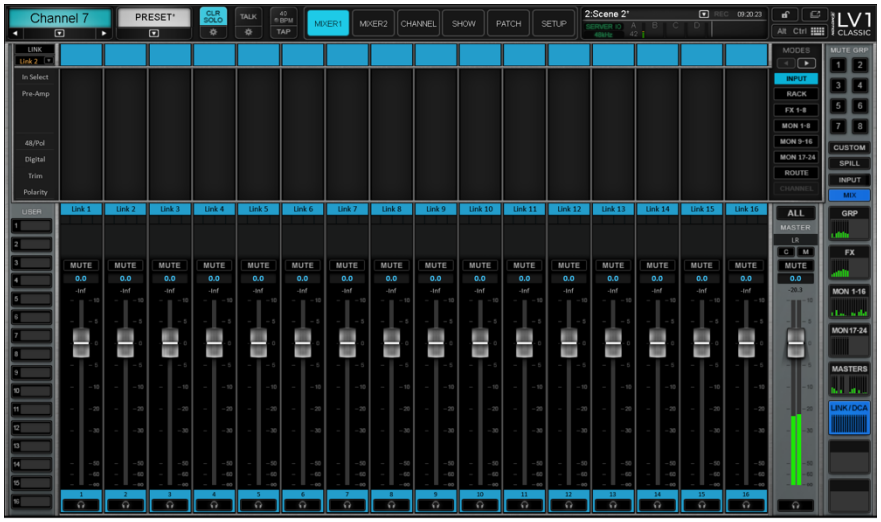
The Talkback section controls the level, panning, and processing for mixer talkback. It provides for input from an I/O and a preamp. It can accept up to eight plugins. Talkback routing and presets are controlled from a control panel in the Channel window. To access this window, select the Talkback channel and click on the Gear icon beneath the Talk button.

Matrix

The Matrix controls the input mix and output levels of the 12-input x 8-output matrix busses. It is typically used to send audio to PA systems, distribution, guests, and monitoring systems. Matrix channels can receive input from any channel or buss in the mixer and can output to any I/O device on the network. Each Matrix channel has an eight-plugin rack for dedicated processing.

Each Matrix channel accepts up to 12 assignments. Assignment levels can be controlled using the small faders on each Matrix channel (Input mode), or, more conveniently, in the Matrix channel page. To access this panel, select any Matrix channel and navigate to the Channel view.

Link/DCA Layer



The Link/DCA layer does not pass audio. Instead, it's a controller that's used to manage groups of channels.
While both Links and DCAs allow you to control a group of faders and adjust their gain together, they work in very different ways.
Channels are assigned to Links and DCAs in the Output section of the Channel window.

Link Group Controls

Links provide a way to globally control values across multiple channels. When channels are assigned to a Link, most of their controls move together. Adjusting one fader causes the other faders in the group move correspondingly. The Link button and menu are used to activate and deactivate linking and determine which Link group is currently active.

- Any mixer channel can be assigned to a Link group.
- There is no limit to the number of channels that can be assigned to a Link group.
- All mixer controls present in the Channel mode can be linked. Compressor sidechains, for example, are not linked.

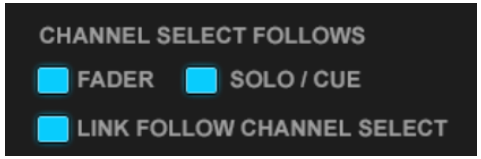
Relative offsets between controls are maintained when any group member moves.

Channels in the active Link group are identified by small numbers beneath the channel name. A Link group is active only when its group is displayed, so only one Link group can be active at a time.
A channel can be assigned to up to 16 Links. Channels in the active Link group are identified with small numbers near their panners. A Link group is active only when the Link button is On and its group is displayed, so only one Link group can be active at a time.

To change the value of a control with respect to other members of the Link group, turn off the Link button, make the adjustment, and then reactivate the Link group. Faders that are members of a Link group behave as do any other linked controls—move any fader in the Link group and the other faders follow.

Link Follow Channel Select

Selects link behavior when switching between link groups. (Links apply to faders, pans, and mutes).



On: When you have more than one link group, changing the channel select activates the new link. This is akin to selecting a new link in the Link drop-down menu. Only channels in the newly selected link are activated.

Off: When you select a channel in another link, the link selection will remain tied to the original channels, but the new and old channels can each be adjusted.

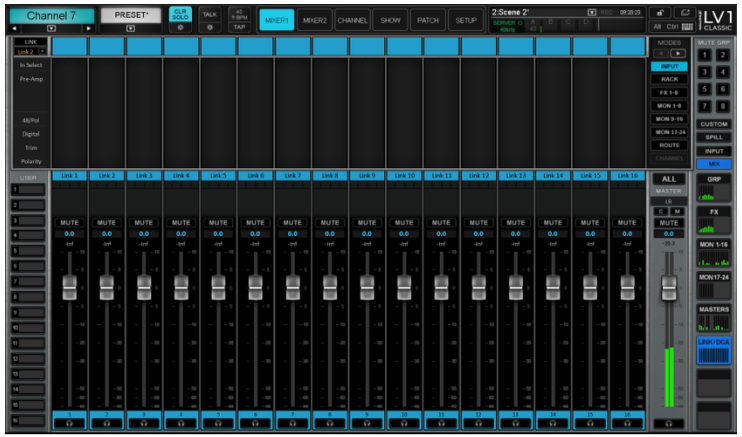
Temporary Link Group

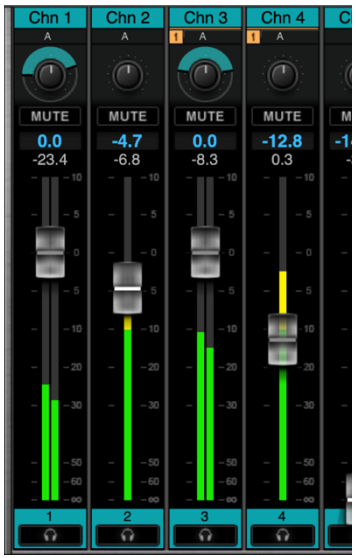
A Temporary Link lets you simultaneously adjust parameters on selected channels without setting up a formal Link group. You can gang together any controls that can be adjusted in the Channel Mode. Temporary Links are not stored in the session; they are active only until you stop the link. To create a temporary Link, follow these steps:

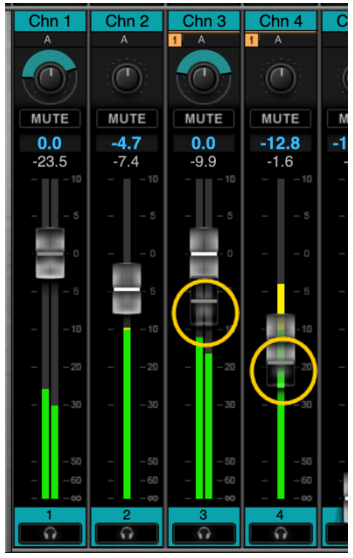
- Click the Link button to activate Link. The button will flash, and Temp will light up. Temp assignment is now active.
- Select the channels you want to group together. Channels in the Link group will display a "T."
- Once this temporary group is defined you can adjust any control that is displayed in the channel mode).
- While in this mode, you can remove or add channels from the Link group.
- To stop temporary linking, click the Link button again.

To quickly link numerous channels across many layers, use the All Mixer view for ad hoc group assignments.

DCAs







A digitally controlled amplifier (DCA) controls the volume levels of the channels assigned to it (the Link groups) without changing the fader positions. This allows you, for example, to remotely control channels as a group without affecting their individual processing. The DCA group control is from the Links/DCA layer faders rather than from individual faders on the mixer layer.

A DCA fader applies an even-gain offset to all the faders assigned to it. When the DCA fader is set to zero, the channel faders under its control are unchanged.

When a DCA fader moves, the linked faders do not physically move. Instead, a "ghost" fader indicates the combined gain achieved by a channel's faders and the DCA offset. This is similar to the behavior of analog VCA faders.

The DCA faders also provide a Mute function that behaves like a Mute group.

(Shown on the left) Channels 3 and 4 are assigned to Link 1. (right) When DCA 1 is moved on the Link/DCA Layer, the faders for channels 3 and 4 do not move, but "ghost" faders indicate the offset created by the DCA.

The Link button must be Off to use DCA mode.

Spill

The Spill layer displays all the channels in the selected Link Group, regardless of the channel types. Linked controls can be adjusted and a DCA can be used to trim all faders in the group.

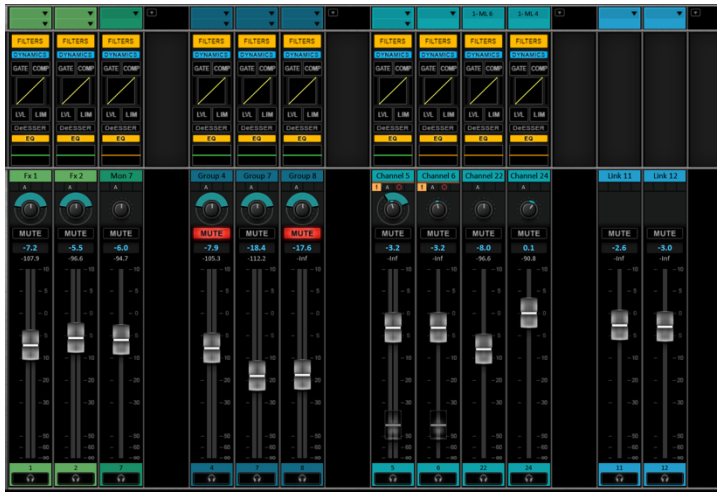
The Spill button is located on the Layers panel. Click the Spill button to access the view. Select a Link/DCA channel on the left side of the mixer to view its associated Spill pages.

Navigate between Spill pages with the Custom layer buttons on the right. Double-click on a button to rename it.

Each Spill page (shown below) has 16 channels: the DCA fader is on the left, and 15 linked channels are to its right. If a Link group has more than 15 channels, then multiple pages will be displayed.

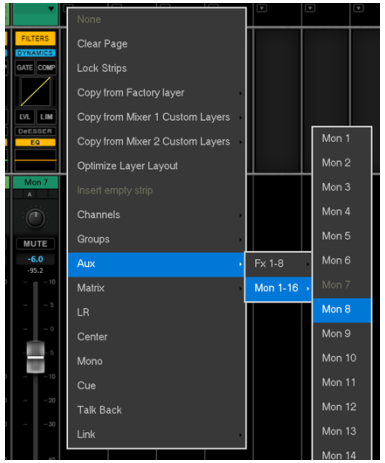
The Link On/Off button does not affect the Spill function. It only reflects the status of the Link group.

Custom Layers



Channels of any layer type can be combined in user-created Custom layers. This enables control of a specified assortment of channels in one view, without changing mixer layers. Channels can be organized in any order within a Custom layer. Each of the eight Custom layers can contain up to 16 channels.

To populate a Custom layer, click “Custom” and choose one of the eight Custom layer buttons. The layer will initially be blank.



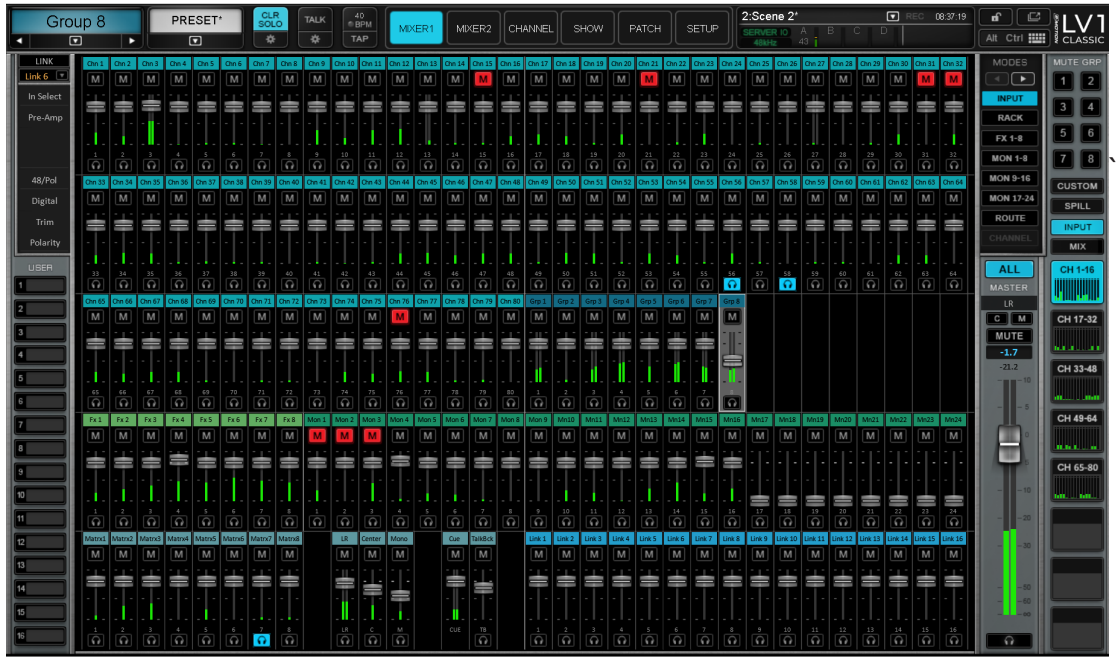
- Use the drop-down menu at the top of a channel strip to open the Custom assignment menu. Select the assignment.
- Click and drag on the channel to rearrange the channel strips.
- If a channel strip is already populated, Ctrl+click on the channel name (or use the arrow on the top-right corner of the strip) to access the Custom layer menu.
- To rename a Custom layer, Double-click on a Custom layer page button.
- Repeat the assignment process for up to eight Custom layers.

Use the menu items at the top of the assignment menu to populate and manage each Custom channel.

None	Removes the selected channel page from the custom layer.
Clear Page	Removes all channels from the custom layer.
Lock Strips	Prevents channel strips from being repositioned.
Copy from Factory Layer	Copies all channels of a mixer layer and pastes them to the custom layer.
Copy from Mixer 1 (or2) Custom Layer	Copies any page from a custom layer in either mixer and pastes it to the custom layer.
Optimize Layer Layout	Removes blank channels and moves all populated channels to the left.
Insert Empty Strip	Inserts a blank strip to the left of the selected populated strip.

ALL Mixer Overview

The Mixer Overview page provides basic control of all channels, busses, and links in a session. Each channel and buss has its own small channel strip that includes a cue control, fader, meter, and mute, so it's useful for confirming audio presence and level and making basic adjustments. Aux modes can be selected, and you can enter the sends-on-faders mode from the Overview. Other modes are not supported. The Overview's scope is determined by the Mixer Configuration setting in the Setup window.

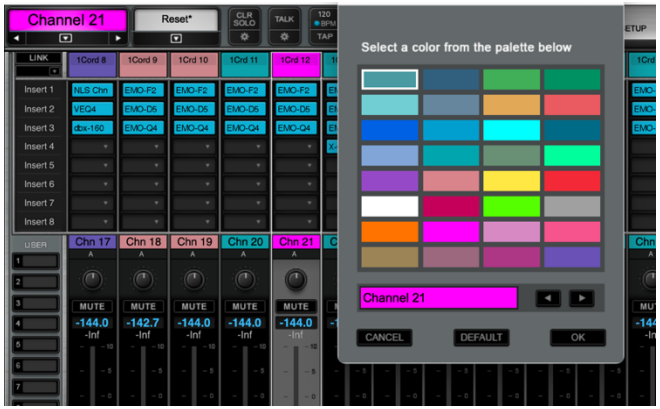


Click the ALL button above the Master Fader to toggle the Overview on or off. When you exit the Overview, you can return to the previous layer and mode (this functionally is set in the Mixer window in the Setup window). The ALL view is useful for single-display configurations, since you can easily go from an overview of all channels to a Channel or Mixer view, and back. It also enables you to work with two or more displays and see an overview of all channels on one display, while working on single-channel views on the others.

The layer types are color-coded for clarity.

Set Channel Color

By default, channels are color-coded based on their type (e.g., channels, groups, FX, monitors). You can also assign a custom color to any channel.



1. Select a channel and choose Set Channel Color from the Preset menu.
2. The name of the selected channel is shown.
3. Select a color. Colors are applied immediately (not upon clicking OK).
4. Use the left/right arrows to choose additional channels to customize.
5. Click Default to return to the factory channel color. Click OK to exit the window.

You can also assign channel colors from the Patch window. Click the colored button on the left side of a channel to open the Color Picker.

Precision Control

You can increase a control's resolution (that is, slow down the control) by holding the Control key while dragging. This applies to long faders, aux faders, preamp gain, channel trim, and pan. Release Control to return to regular resolution.

To return a control to its default position, hold Option and touch the control.

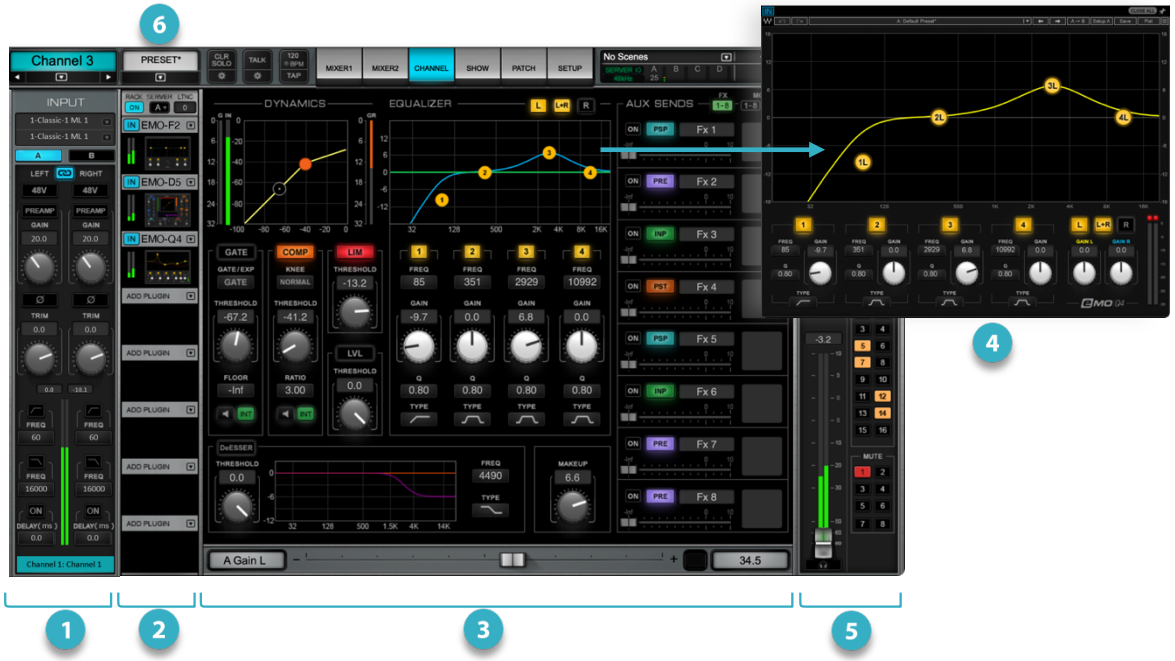
Chapter 2:

CHANNEL WINDOW

The Channel window provides a comprehensive view of a selected mixer channel and control over each channel parameter.

Channel Window Sections

The entire chain of the selected channel—input and preamp control, plugin processing, aux sends, routing, and outputs—is addressed in this window.



The Channel window is divided into sections that represent the signal flow through a selected mixer channel. Workflow from section to section generally progresses from left to right.

1. **Input** Manages channel input, including source, preamp control, digital input gain, high pass and low pass filters, and input delay.
2. **Plugin Rack** Assigns, removes, and controls up to eight plugins per rack.
3. **Main Control Section** Provides a consolidated view of principal channel controls. The section consists of two parts:
   - Centralized Plugins Section: Simultaneously view and control one assigned filter, one EQ processor, and one dynamics processor.
   - Aux sends: Control aux send level, panning, and send source. Includes 16 aux sends (8 effects and 8 monitor).
4. **Floating Plugin User Interface** A view of the entire interface of the selected plugin. In this example, the left channel of the EMO-Q4 is shown. Click on the plugin icon to open the panel. Click on the Expand button in the top-right corner to undock the panel.
5. **Output** assigns buss outs and controls:
   Channel outs: fader/mute/meter/cue — Direct outs to I/O devices
   Assignments: main, groups, matrix — Control: link, mute groups
6. **Presets** Manages channel presets.

Input Section

The Channel Input section is used to patch external sources to Input and internal busses (Group, Aux, Matrix channels). It is also used to link together mixer controls (Link/DCA). Input section function and appearance differ between input, mix, and control channels.

Input Section for Mixer Input Channels

1. Channel Name and Selector (Top Bar)
2. Input I/O Channel Select
3. A/B Input Select
4. Left/Right Link
5. 48V Phantom Power
6. Preamp Analog/Local Gain Adjust
7. Polarity Reverse
8. Channel Input Trim Controls
9. Peak Indicator
10. Meter
11. Filters
12. Input Delay
13. Channel Name and Sequence Number

1–Channel Navigation (Top Bar)

This is where you select the channel. Its name is displayed in the box and can be viewed form any menu. To select a channel on the fader bank, choose “Ch Select” above the master fader and select a channel. From the touchscreen, click the left/right arrows to navigate to adjacent channels. Use the drop-down menu beneath the name to navigate directly to any channel.

2–Device Channels - Select I/Os

The Device Channel selector sets the I/O source for a selected input channel. Choose an I/O source from the drop-down menu. The list is organized by device and then by I/O channel. Unavailable devices and channels are grayed out.

Flip to Mono or Flip to Stereo changes the mode of the channel. When a stereo channel is flipped to mono, the top (left) channel becomes the mono input. When flipping from mono to stereo, only the left channel will be patched. The right channel can then be assigned manually. Stereo input assignment of I/Os is usually in pairs. Ctrl + menu enables independent channel assignment for left or right sides.

Selected input channel: click to open I/O selection menu

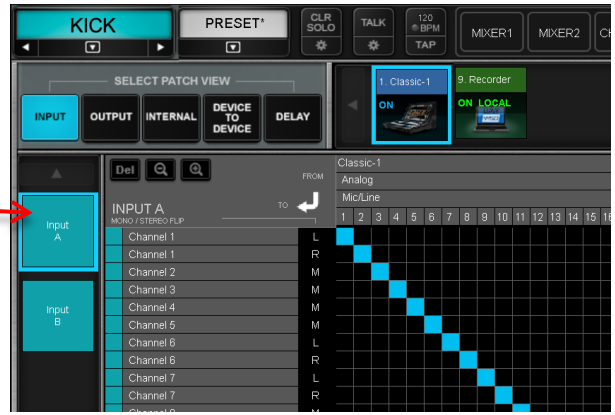
I/O devices list

I/O channels on the selected device

3–A/B Input Select

The mixer has two independent sets of inputs: A and B. These inputs can share the same I/O devices and channels or use different ones, as long as all I/O devices are in the system inventory of this eMotion LV1. Define input sets in the Patch page.
Refer to *Patch >Patching Mixer Inputs*
Options: Input A or B

Channel window
Input section



Patch window, Input view, Input A tab

t

4–Left/Right Link (stereo channels only)

Links the left and right channels for all Input section controls. Parameter value offsets between left and right are maintained when linked. Default: Off

Preamp Controls

I/O preamps can be controlled from the Input section. These controls are active only when a preamp is available.

5–48V Phantom Power

Activates the preamp 48V phantom power. Independent left and right controls.

Options: On or Off, default: Off

6–Preamp Analog Gain Adjust

The Preamp section is used to adjust the analog (hardware) gain and the digitally controlled output level of the I/O device's preamp. There are two modes for controlling preamp gain: **Preamp** and **Local.** Select a mode with the button above the preamp control knob.

Preamp mode (left) adjusts the preamp's analog gain, just like the preamp gain control in the device's control panel. Preamp analog gain value is displayed above the knob. Characteristics when sharing preamps in Preamp mode:

- All users operating in the Preamp mode have direct control over preamp analog gain.
- When preamp gain is adjusted on one system, it will change correspondingly on all systems.
- When a shared preamp is switched from Local mode to Preamp mode, its gain setting will take on the V-Gain level.

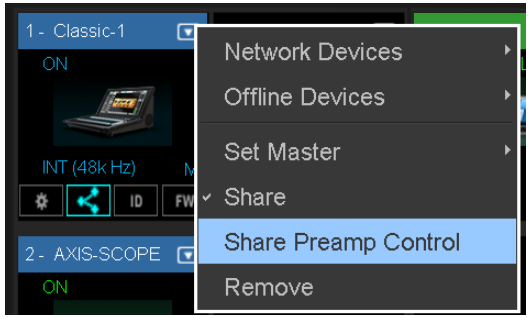
In **Local** mode, the **Gain** knob becomes the **V-Gain** knob (Virtual Gain). V-Gain is a digital gain stage that always delivers the user's requested input gain, regardless of the preamp's analog gain setting.

Characteristics when sharing preamps in Local mode:

- Changes to preamp analog gain (Preamp mode) will not affect the channel input gain of any user who is operating in Local mode.
- A channel set to Local mode can adjust its gain without changing the preamp analog gain; Local level is controlled by V-Gain.
- Local users will see a green ring around the V-Gain knob, indicating the difference between the Preamp analog gain and the V-Gain setting.

Preamp state (Preamp or Local) and Gain values are saved with the session and are recalled when the session is loaded. The Gain and V-Gain values can also be stored with scenes. When recalled, the value will be applied to Gain or V-Gain, depending on which mode is active. When moving from Local to Preamp mode, the V-Gain value is sent to the Preamp control, and the preamp takes on the V-Gain value.

I/O Sharing



Multiple eMotion LV1 systems can be connected through an Ethernet switch to create a networked "super system." Users throughout this super system can assign any available I/O device to their eMotion LV1 system. For details, refer to the Setup window chapter.

7–Preamp Polarity Reverse

Reverses the polarity of a preamp input channel. Independent left and right controls.
Options: On/Off, default: Off

8–Channel Input Trim Controls

Controls the channel's pre-fader digital input level. Independent left and right controls. Range: -INF to +10 dB

9–Input Meter Peak Indicator

Displays the meter's peak level. Red indicates that the user-defined clip threshold is exceeded. Click on the meter or value box to clear. Meter behavior is set at Settings>U/I Settings. Here you'll find:

- Metering point: pre- or post-digital trim
- Clip threshold indicator range: -9 to 0 dBFS
- Clip hold and peak hold range: 0 seconds to INF

10–Mono/Stereo Meter

Displays peak input level.
Range: -INF to 0 dBFS

11–Filter Section

Controls the HP/LP filter that has been assigned in the plugin rack.
Range (eMo F2): 16 Hz to 21357 Hz (values vary by plugin)
Refer to Channel window > Main Control Section > Controlling a Filter for more information.

12–Input Delay

Sets the user-defined delay between input sources. This is primarily used to align two or more microphones placed at different distances from a sound source. Input delay is not associated with plugin/buss delay compensation.
Options:
On/Off, default: Off, Range: 0–250 samples

13–Channel Name and Sequence Number

The Channel ID Box displays the user-defined name of the selected channel, as well its channel index number within the layer. This color-coding helps identify the selected channel, regardless of which layer is currently displayed.

Input Section for Mix Channels

A mix channel gets its input from its associated mix buss. The channels that route to this buss are mixed together and end up in the mix channel for processing and for further assignments or sends. eMotion LV1 provides different mix busses for different applications, such as Groups, AUX/FX, AUX/MON, Main LRCM, Matrix, and Cue.

The **Open List** button opens a panel for adding channels to the buss. Click **Add** to open a drop-down menu of assignable sources. The list of available channels and busses varies according to a channel's place in the signal flow.

Input section main view

Input section input select

Drop-down menu for choosing channels and busses

Use the **Mix Mod**e switch to toggle an AUX or Group buss between mono, stereo, or IEM immersive monitoring. All Groups default to stereo.

Mix Buss Select: FX/Mon Input Fader mode

Use the Mix Buss selector to set the behavior of the Aux channel.

Trim	The Trim knob controls the input gain of the channel. This behaves the same as with input channels.
Fader	The Trim knobs are replaced with a single input fader. When engaged, the Input Fader is mapped to the mixer fader of the selected buss, instead of the output fader. This allows for global control over the aux buss input, as required for specific effects such as a throw delay. When Fader is selected, the mixer fader background color changes to indicate the input buss mode.

This behavior can also be set in the Mixer Window.

Mix Buss: Trim

Mix Buss: Fader

Cue

Sources: Channel, Group, Aux, Main, Center, Mono, Matrix, and Alternate Input

This Input list reflects the Mixer channels whose Cue/Solo buttons are activated. Deactivating a channel strip Cue button removes it from the Cue Input list. “Alternate Input” provides a fallback source when no Cue channels are selected. The Cue section is discussed later in this chapter.

Matrix

The Matrix Input section allows for selecting up to 12 busses for each of the 8 Matrix channels. When this limit is reached, the ADD button is disabled until one or more source busses are removed. The Matrix is described later in this section.

Input Section for Links/DCAs

Links and DCAs control several channels together, although they do so in different ways. Note that link channels are for control only, not sound. So, there are no “audio inputs.”

To flip a Pan/Balance/Rotation Knob between mono and stereo, go to the channel’s Input section, click Add, and choose Flip to Stereo or Flip to Mono from the drop-down menu.

AUX, Group, and Matrix Busses Mix Mode

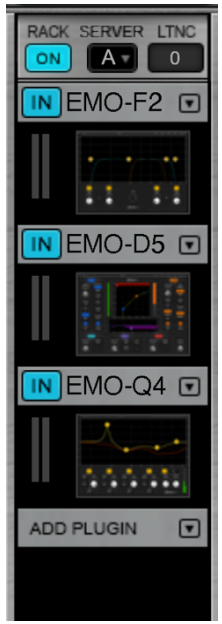
The channel status of an AUX buss (usually MON), Group, or Matrix buss is set with the Mix Mode button. FX busses can Groups and Matrix channels can be mono or stereo. Mix channels can additionally send immersive monitor signals to musicians on stage.

A Group buss (shown on the far right) can be mono or stereo. In addition, you can select the source between Pre-FX or Post-FX. The default is mono.

Plugins

Plugins are processors that shape the sound of a channel. Some plugins tame or enhance the dynamics of a sound, while others adjust frequencies. Some create reverb, and others create repetitions. There are plugins that control the sound within a space and others that tune a singer's delivery. If you want to process your mix, you need plugins.

eMotion LV1 Classic ships with a wide selection of plugins. Together, they cover most live sound mixing needs. To learn more about these plugins, visit waves.com and search for the plugin by name to access its dedicated plugin page



Three eMo plugins—which provide comprehensive filtering, EQ, and dynamics—are automatically inserted on the first three plugin slots. These will cover most of your regular mixing needs.

eMo Filters

eMo Dynamics

eMo EQ

Plugin Rack

The Plugin Rack is a chainer that hosts up to eight plugins per channel. Plugins inserted in this rack are also displayed in the Rack section of the Mixer window. Signal flow is from top to bottom of the rack.

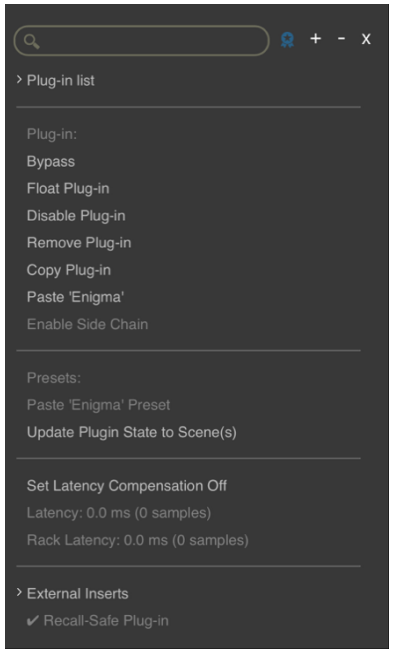
A plugin rack can be stereo or mono, depending on the channel state. If a mono-to-stereo plugin is added to a mono rack, the rack becomes stereo from that point on in the signal flow. You can drag a plugin up or down to change its position in the rack signal flow.

1. **Rack Top:** Rack processing On/Off; Server assignment menu for channel or buss; Total rack latency indicator.
   When rack processing is off, audio still streams. If the server group assigned to the rack goes offline, the on/off button will turn red until the sever is restored or you select a different server for the rack.
2. **Plugin Name**: Displays the name of the plugin inserted on the rack slot. Names longer than 14 characters are abbreviated.
3. **Plugin Icon**: Shows a thumbnail image of the plugin's interface.
4. **Plugin Menu Access**: Provides accesses (via a drop-down menu) to the plugin menu, which is used to insert and manage plugins.
5. **Plugin In/Out**: When deselected (dark), plugin processing is bypassed but the plugin remains active.
6. **Disabled Plugin:** A disabled plugin remains installed in the rack but is removed from processing in the server. The plugin will no longer display an icon, but rather the text "Disabled."
7. **Recall-Safe Plugin**: Prevents modifications during scene changes. An orange/brown SAFE notice in the rack slot indicates that the plugin is set to a recall-safe mode.
8. **External Insert**: A rack slot can send to and receive from an external device via specified I/Os.
9. **Empty Rack Slot**: "Add Plugin" appears in the plugin name cell.

Adding and Managing Plugins

Plugin Menu Introduction

The **Plugin** menu is used to insert, remove, assign, and manage the selected plugin. It is also used to copy plugins and plugin parameters between racks and between rack slots. Plugin menu settings affect only the selected plugin slot.



Plugin section

Presets section

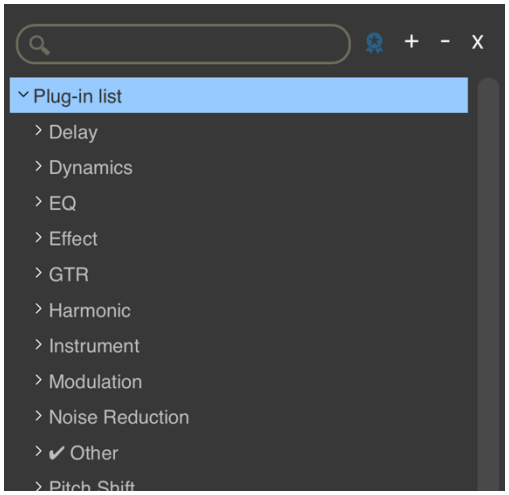
Latency section

External Inserts and Recall-Safe section

The Plugin menu is accessed with the arrow at the top of a rack slot. The menu is divided into four sections: plugin, presets, latency, and external inserts/recall safe.

To manage presets for an entire channel, use the **Channel Preset** menu in the Top Bar, which is described in the next section of this chapter.

Plugin Menu: Plugins Section



Locate and Instantiate Plugins

There are two ways to find and instantiate plugins.

Option One: Type in the Search Box. This will take directly to the plugin. Results are displayed below.

Option Two: Browse by category. Click on a category name to see its plugins.

There are four utility buttons next to the Search Box.

Show/Hide Unlicensed Plugins filters the displayed plugins list. Choose to see only plugins for which you have a license or all compatible Waves Plugins.

+ or **-** globally changes the hierarchy of the category lists.

X closes the window without a selection.

Bypass

Bypasses the plugin while keeping it in the processing chain. This serves the same function as the IN button on the rack slot.

Disable Plugin

Removes the plugin from the processing chain without deleting it from the rack. Disabling a plugin removes its latency from the rack. It also frees up processing power. You can re-enable the plugin without losing its settings, controls, or automation assignments. When a plugin is disabled, its name will remain visible above the slot and its icon will be replaced with DISABLED. You can also disable and enable a plugin by clicking its rack slot while holding down the Control key.

Remove Plugin

Deletes the plugin from the rack slot. All parameter settings and control assignments are lost.

Adding, removing, disabling, or moving a plugin changes the structure of the rack, which may result in a brief audio mute. Do not make these changes when an audio interruption is unacceptable.
Wait until there is a pause in the performance.

Copy

Copies the plugin and its parameters. This enables pasting the plugin and its current settings to another rack slot. There are two paste options: Paste [plugin name] and Paste [plugin name] Preset.

Paste [plugin name]

Pastes the copied plugin and its parameters to an empty slot or replaces the plugin that occupies the slot. In certain circumstances it is possible to paste a preset into an existing plugin. (See Paste [plugin name] Preset below.)

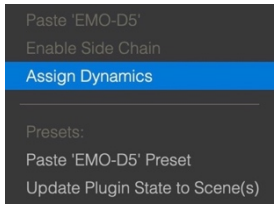
Stereo and Mono Plugins

- Adding or pasting a mono plugin module to a stereo channel converts the plugin to stereo. The mono plugin's parameters will usually be applied to both sides of the stereo plugin.
- If a stereo plugin is added to a mono channel, the settings of the left stereo channel become the mono parameters. The two-channel parameters will be restored if the plugin is returned to a stereo channel.
- Adding a mono-to-stereo plugin to a mono rack converts the rack to stereo from that point downward..

Enable Sidechain

Enables and disables the plugin's sidechain key input when an active sidechain is patched to an appropriate plugin. Sidechain sources are established in the Plugin user interface. Plugins with an active sidechain have a drop-down menu (S/C) that patches the sidechain source.

Assign/Unassign to the Main Control Section



eMo plugins can be assigned to the Main Control section, where a dynamics processor, a filter, and an EQ can be controlled on a single plugin user interface. Assigned plugins are also available in the Channel mode of the Mixer window.

The eMo plugins are assigned to the channel by default. Use the menu item to unassign one or more plugins.

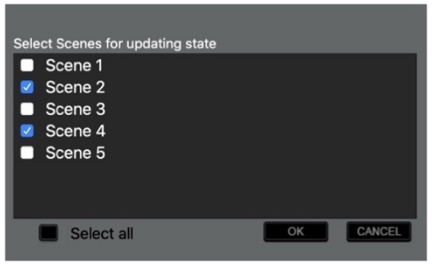
Plugin Menu: Presets Section

Paste [plugin name] Preset

Pastes presets from a copied plugin to another plugin in the same family (e.g., Q10 to Q6, or L1 Ultramaximizer to L1 Limiter). This does not replace the plugin, only the presets.

The Paste [plugin name] Preset option is not available when the source and destination plugins are not from the same family (e.g., Q6 to REQ 6, or H-Delay to SuperTap).

Update Plugin State to Scene(s)



Updates the current plugin's settings in selected scenes. Choose the scene(s) you want to update.

Channels and Presets

Selecting a Channel

The selected channel is focused in the Channel mixer. To name a channel, double-click on the box. The channel name can also be changed in the Mixer and Patch windows. The selected channel name is always shown in the Name box on the left side of the Top Bar.

A channel can be selected in several locations:

1. **Mixer Window**: Touch a channel strip on the screen. The channel strip becomes highlighted, indicating that the channel is selected.
2. **Fader Bank**: Use the Channel Select button at the top of a channel strip.
3. **Fader Bank or Screen**: Touch a fader (Channel Select Follow Faders must be On in the U/I Settings page).
4. **Fader Bank or Screen**: Touch a Solo button (Channel Select Follow Solo/Cue must be On in the U/I Settings page).
5. **Top Bar:** Use the Channel Navigation menu in the Top Bar to directly access a channel. You can also use the right/left arrows to move the selection up or down one channel at a time. This menu is always visible.

Channel Presets

Channel presets are managed in the Preset menu in the Top Bar. These presets allow you to immediately load all of a channel's settings (i.e., audio routing, assignments, plugins and their parameters, aux sends, and control groups) and then adjust its parameters. You can save these settings as a new preset.

Complete sessions can be created from channel presets, or you can copy/paste channels to use as starting points for other channels. You can copy all or part of a channel's parameters from one channel to another.

Note: Applying a preset with a plugin rack sequence that is different from the current one propagates the new preset to all scenes. Previously saved settings for this channel will be discarded.

Preset Menu Items

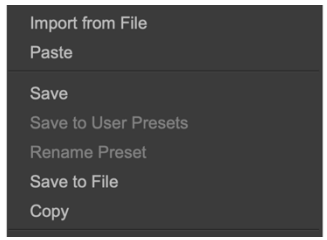
Factory Presets (load)	A library of presets supplied by Waves. A factory preset cannot be modified. Instead, open it and save it as a user preset.
User Presets (load)	A list of user-defined channel presets saved within the current session or imported from another. These presets load all channel parameters. To delete a user preset, hold Ctrl/Alt before opening the Preset menu—preset names will be preceded by a "Delete" option. Select the preset to delete it permanently. This action cannot be undone.
Import from File	Opens a navigation window to locate presets files that have been saved. Imported presets are added to the User Preset menu.
Paste	Pastes a copied channel preset to another channel. The Copy command copies all channel information, and Paste allows you to choose what channel information is replaced in the target track.
Save	Saves the current channel condition to the loaded channel preset, overwriting it.
Save to User Presets	Creates a new user preset. These are saved as part of the current session. Consider this a Save As function.
Rename Preset	Changes the name of the current channel preset.
Save to File	Creates a file that is saved at a user-defined location (file extension: .xps) and can be imported to any session. Unlike user presets, these are not embedded in the session.
Copy	Copies the current channel condition. A copied channel preset can be pasted to any other channel in the current session.
Set Channel Color	Enables custom coloring for any channel.
Channel Recall-Safe Off	Temporarily excludes all channel parameters from scene changes, even if they are within the scope of the scene change.

The remaining Preset menu items relate to sessions and templates. These are discussed in the *Introduction* and *Show* chapters.

Copy/Paste Channel Information

Use the Preset menu to copy an entire channel or specific channel settings to another channel.

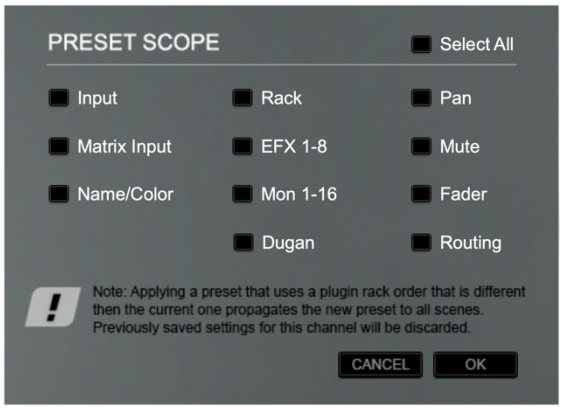
Copying channels within a session



1. Select a channel and choose **Copy** from the Preset menu.
2. Select the target channel and click **Paste**.
3. Select what to replace and what to leave unchanged. Choose **Select All** to paste all channel settings.
4. Select the import parameters and click OK. Parameters that are not selected in the list will not be altered in the target channel.

Channel names can be copied within a session. Channel names and colors cannot be imported from another session.

Preset Scope sets which functions to import.



Input	Trim, phase
Matrix Input	Matrix input faders
Name/Color	Channel name and color setting status
Rack	Plugin settings, rack structure and status
FX 1–8	Send levels, On/Off, pan, route
MON 1–16	Send levels, On/Off, pan, route
Dugan	Auto, weight fader, override, group
Pan	All pan/balance/rotate controls
Mute	Change state: On/Off
Fader	Change fader value
Routing	Internal routing: group, matrix, links, mute groups, main (L/R, C, M)

Name and color import options vary depending on the import type as follows:

- **Copy/Paste**: Name and color available.
- **User Presets**: Color is available, but not name.
- **Factory Presets and Files**: Name and color are not available.

Note: Scope does not modify input/output patching or preamp settings.

Copying channels between Sessions

Channel Copy/Paste is used to duplicate channel presets *within* a session. To copy channel settings *between* sessions, use **Save to File** to create a channel preset file. This file can be saved at any location, including removable media.

Select a target channel and choose **Import from File**. This replaces all channel parameters. It does not alter the number of input channels.

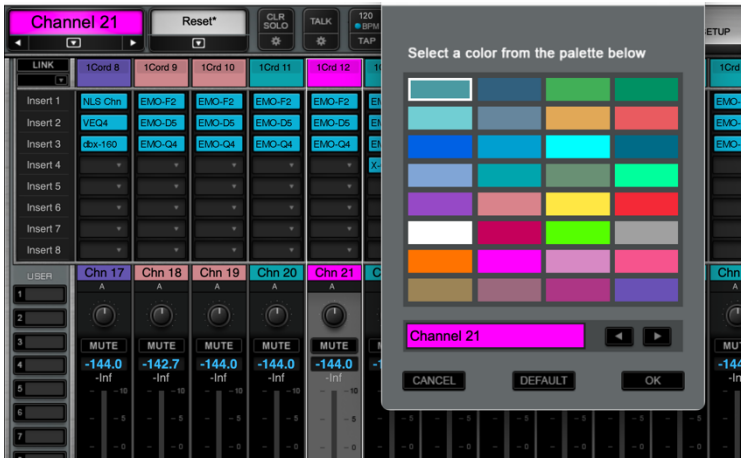
Copying and pasting channel parameters within a session is very similar to saving and importing files between them. There are, however, important differences:

- When pasting a copied channel to another channel in the session, you can choose which parameters to change.
- Importing a channel presets file replaces all current channel parameters.

The stereo/mono status of a channel is determined by the current state of the target channel, not by the pasted/imported channel parameters.

Set Channel Color

By default, channels are color-coded based on types of channels (e.g., channels, groups, FX, monitors). You can also assign a custom color to any channel.

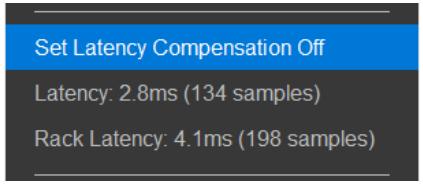


1. Select a channel.
2. Choose Set Channel Color from the Preset menu to open the Color Picker. The name of the selected channel is shown.
3. Select a color. Colors are applied immediately, not upon clicking OK.
4. Use the left/right arrows to choose other channels to customize.
5. Click OK to exit the window.

Plugin Menu: Latency Section

Latency

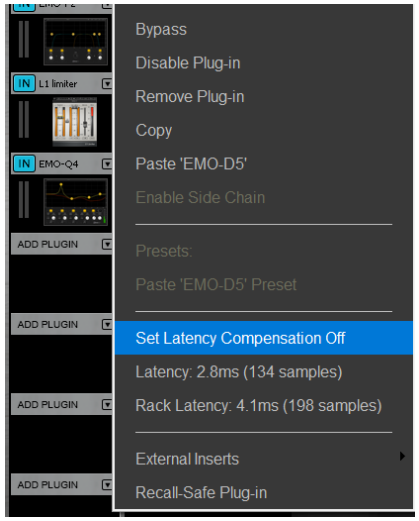
Indicates the delay introduced by the plugin or external insert.



Rack Latency

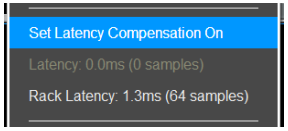
Indicates the total latency of all plugins and inserts in the rack. If no latency is declared by any of the plugins in the rack, both sections will be grayed out.

Set Latency Compensation On/Off



Disabling latency compensation removes the plugin from plugin/buss latency compensation calculations.The plugin remains active, but its latency is no longer reported to the delay compensation engine. This allows you to prevent plugins with particularly long delays from delaying the entire buss. Since the selected plugin is no longer delay compensated, it may not be synchronized with the rest of the channel.

Example (shown left): The selected plugin has a latency of 134 samples and the rack's total latency is 198 samples. When compensation is on, the channel reports a rack latency of 198 samples to the delay compensation engine.



When latency compensation for the selected plugin is turned off, the channel reports a delay of only 64 samples (i.e.,198 samples minus 134 samples).

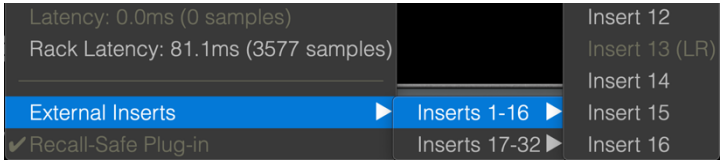
Total rack latency is also displayed at the top of the rack.

Warning: If the total rack latency exceeds 4000 samples, a red warning is displayed at the top of the rack, indicating the destination rack may not be able to compensate for such a large latency. eMotion LV1 latency compensation is discussed in detail in Appendix B.

External Inserts

You can add external inserts to a plugin rack. An external insert follows the same routing path as plugins and can be moved up or down the rack to change its position in the processing chain.

Follow these steps to add external inserts:



1. Choose a rack slot.
2. Select External Inserts from the Plugin Menu.
3. Choose an available insert from the menu. This opens the External Insert control page.
4. Select physical send and return I/Os using the drop-down menus.
5. Rename the insert using the Device cell, if desired. Use the Insert drop-down menu to move between inserts.

If no send is assigned, then the insert will be bypassed. It remains in the rack and its place in the processing chain is unchanged. If no return is assigned, then any other source assigned to this insert return will be heard.

A mono/stereo full-scale meter shows the level of the return signal This helps to maintain proper levels on sends and returns.

The Latency knob is used to adjust the amount of delay to and from the external insert device. Unlike a plugin, an external insert doesn't declare its delay to the plugin-buss latency compensation engine, so this must be done manually.

For more information, please refer to [www.Waves.com/support.](www.Waves.com/support)

External Insert Latency Calculation

The latency of an external insert is determined by its path, which depends on the type of processing being performed. The diagrams below illustrate how latency is calculated in three different situations.

1: Processing with an External Device

An external insert is sent to and from an external device, via one or more SoundGrid I/O devices.

Recall-Safe Plugin

Recall-safe prevents plugin parameter changes during scene recalls. In this mode plugin parameters are unaffected by scene changes, even if the plugin is within the scope of a scene change and has not been set as recall-safe in the Show window (see *Show window > Recall Safe*).

Set plugin safe status at the bottom of the Plugin menu. A plugin that is recall-safe is indicated with an orange/brown Safe indicator.

Scene changes do not alter rack structure (e.g., add, remove, or move plugin).

Mono-to-Stereo Plugins

Normally, a stereo plugin cannot be inserted into a mono rack. However, you can add a mono-to-stereo plugin to a mono rack. From that point in the rack's signal flow (below the mono-to-stereo plugin) the rack becomes stereo and only stereo plugins can be added below it. Mono plugins can still be inserted above the mono-to-stereo plugin.

Plugin User Interface

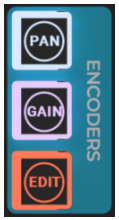
This view displays a plugin's standard user interface in a floating window and shows all plugin controls. Certain plugin interface graphics have been modified to fit the Plugin user interface.

To open the plugin user interface, click on its plugin icon in the rack.

Controlling Plugin Parameters

Assigned plugin parameters can be controlled from the touchscreen or from the fader bank.

Fader Bank

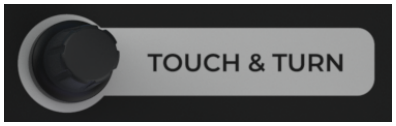


Select the "Edit" on the encoder panel. This maps each encoder to a parameter control on the plugin, which can be a variable control or a two-step switch. The control name and value appear in the channel's scribble strip.

Controls are organized in layers of twelve:

Encoder 1–12, page 1	Mapped to the first twelve controls on the plugin interface.
Encoder 1–12, page 2	Mapped to the next twelve controls.
Encoder 13	Returns you to the Main Control Section.
Encoders 14/15	Previous page/next page.
Encoder 16	Bypasses the plugin rack

Touch & Turn

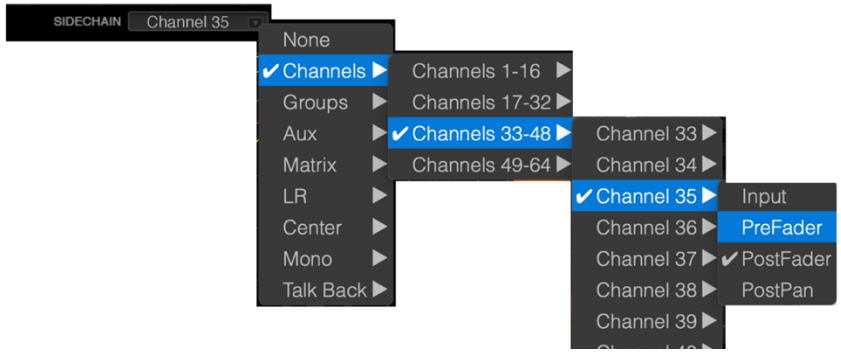


For immediate control of a specific assigned plugin, use the Touch & Turn knob. Select a control—whether with the touchscreen or fader bank—and turn the knob to adjust. You can instantly move the mapping from one control to another.

Touchscreen

Use the touchscreen to directly adjust controls in assigned plugins. Click on a control and slide the Touch & Slide control at the bottom of the window for quick, precise adjustment.

Assigning a Sidechain Source



A drop-down menu at the top of the plugin user interface is used to assign a sidechain source to the selected plugin. Once a valid sidechain is chosen, the plugin's sidechain functionality is activated. Sidechain assignments are specific to each plugin, not the rack.

Floating Plugin User Interfaces

You can undock the plugin interface and position it anywhere on your display.

Click the **Expand** button in the upper-right corner to undock the window. When another plugin interface is undocked, it becomes the front-most window. Click on a plugin's icon in the rack to bring its floating interface to the front.

Controls for the frame are at the top of the window.

IN Plugin bypass
SC Sidechain in/out
PIN Keeps the window in front of all other windows
SC menu Select SC source assignment
Close All Closes all floating windows

Close a floating window to return the plugin interface to its docked position. Up to five windows can be opened simultaneously.

Floating plugin window preferences (dock/undock and window location) are saved with scenes. Window settings are also part of a session. Floating windows recall safe and scope status and are set in the Show window.

Click "Back to Main" to return to the Main Control section.

Main Control Section

If you are in a plugin user window, click on the Back to Main button to open the Main Control Section.

The Main Control Section enables you to view and control important plugin parameters. A compatible dynamics processor, a multiband EQ, and an HP/LP filter can be assigned to these controls. Controls in the Main Control Section map to their plugin equivalents in the plugin user interface.

This is the primary mixer section for sending channels and busses to Aux channels. Send level, send source, and pan/rotation are controlled here.

1 **Dynamics**

Maps parameters of:

Gate/Expander

Compressor

Limiter

Leveler

De-Esser

Makeup Gain

2 **EQ**

3 **Aux Sends**

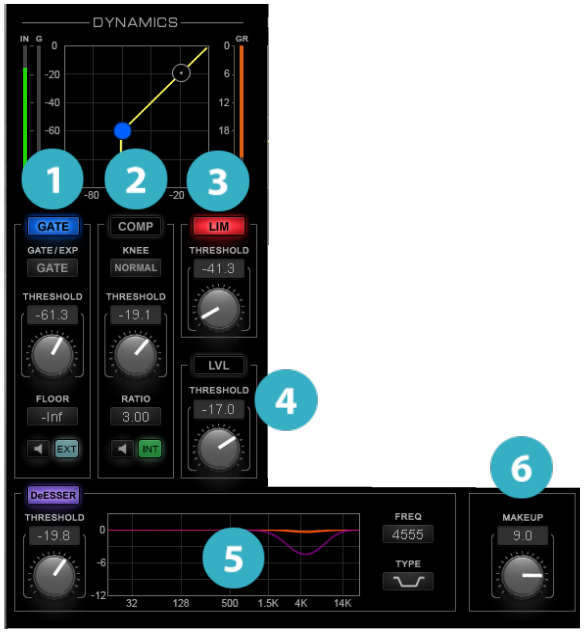
FX 1–8

MON 1-8

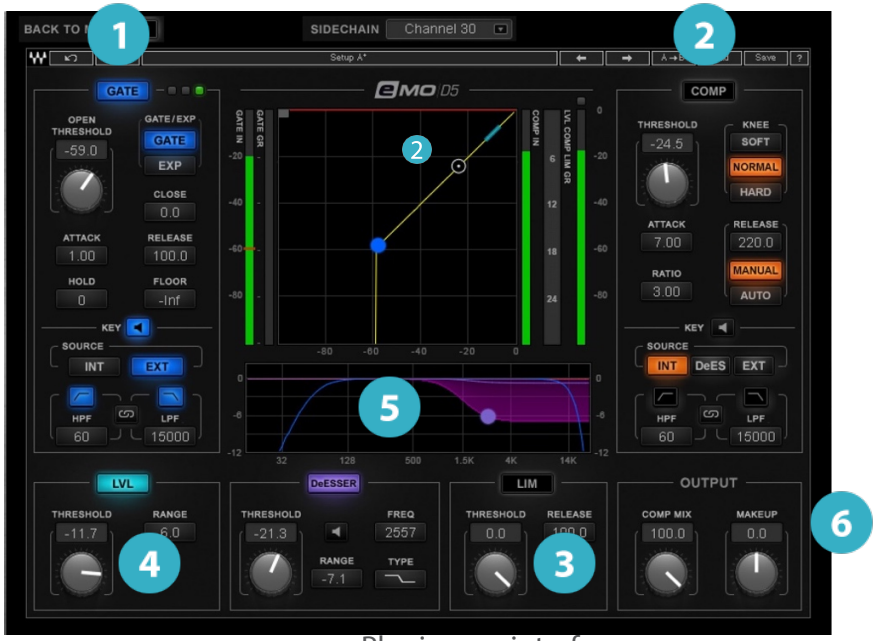
MON 9–16

Dynamics Mapping in the Main Control Section

The Main Control section provides control over each section of a dynamics plugin processor. Threshold, ratio, makeup, and other critical parameters are mapped to dedicated controls. Additional processing adjustments can be made in the plugin user interface. The display and controls vary by plugin. The example below shows an eMo D5 Dynamics processor mapped to the Main Control section.



Main Processing Section



Plugin user interface

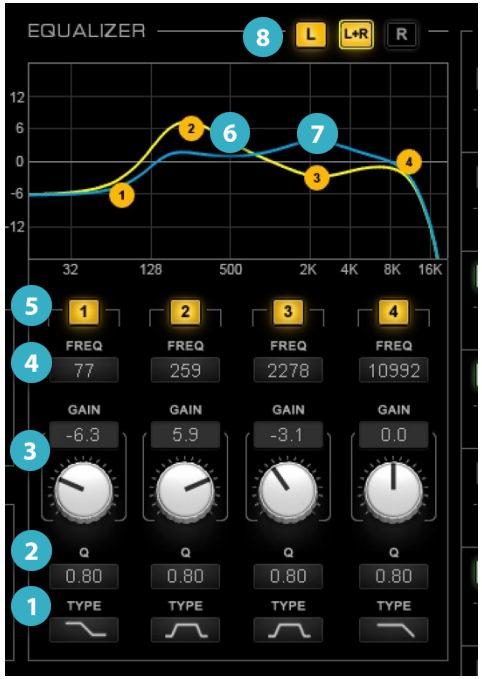
The Main Control Section maps up to six dynamics plugin sections:

1	Gate/Expander	On/Off, gate/expander, threshold, floor, gate sidechain, sidechain monitor
2	Compressor	On/Off; knee: soft, normal, hard; ratio; compressor sidechain, sidechain; monitor
3	Limiter	On/Off, threshold, release
4	Leveler	On/Off, threshold
5	DeEsser	On/Off, threshold, frequency, range, type (bell, notch, shelf)
6	Makeup Gain	Gain adjust

These controls are always available in the Main Control section as well as in the Channel Mode of the Mixer window. They can also be controlled by certain external control surfaces. For other adjustments, open the plugin user interface.

EQ Plugin Controls in the Main Control Section

Assigned EQ plugin controls are mapped to the Main Control section. Mapping may vary from one EQ plugin to another.



1. Filter Type Select
3. Q Adjust
3. Band Gain Adjust and Value Box
4. Frequency Adjust
5. Band On/Off
6. EQ graphic Display and Control (L)
7. EQ graphic Display and Control (R)
8. Left/Right Channel Linking

EQ Controls

1. Mapping varies depending on the plugin.
2. **Filter Type:** Selects between four filter types: high pass, resonant shelf, bell, and shelf.
3. **Q Value Box:** Displays the Q value for the band. To set Q, type a value into the box or click on it and slide vertically. Many plugins also allow you to adjust Q on the graphic display by holding ALT while sliding the band marker horizontally.
4. **Gain Adjust Knob and Value Box:** Set gain by clicking on the gain adjust knob and dragging vertically or by sliding the band marker vertically. The Main section maps four band gain controls.

1. **Frequency Adjust** Displays the center frequency of the band. Set gain by moving the graphic marker in the display, clicking on the value box and sliding vertically, or entering a number in the box.
2. **Band On/Off:** Toggles the band on or off. Depending on the band-linking setting, this affects the left channel, right channel, or both channels.
3. **EQ Curve and Markers (L):** Graphic display and control for the left channel.
4. **EQ Curve and Markers (R)**: Graphic display and control for the right channel.
5. **Left/Right Channel Linking:** With certain EQ plugins, left and right channels can be controlled separately or together. If L+R is enabled, any change made to one channel will be applied to the other. If L+R is disabled, the left and right channels can be controlled independently.

Filter Controls (Located in the Input Section)

An assigned filter is controlled from the Channel window Input section. In this example, an eMo F2 filter is mapped to the Input section and its graphic display is shown in the Main Control section. Mapping and graphics vary among plugins.

Filter Controls in the Input Section

1. Left Channel high-pass control
2. Left Channel low-pass control
3. Right Channel high-pass control
4. Right Channel low-pass control

Filter Graph in the Main Section

5. Left Channel high-pass display
6. Left Channel low-pass display
7. Right Channel high-pass display
8. Right Channel low-pass display
9. Input section channel link control

Input Section HP and LP Frequency

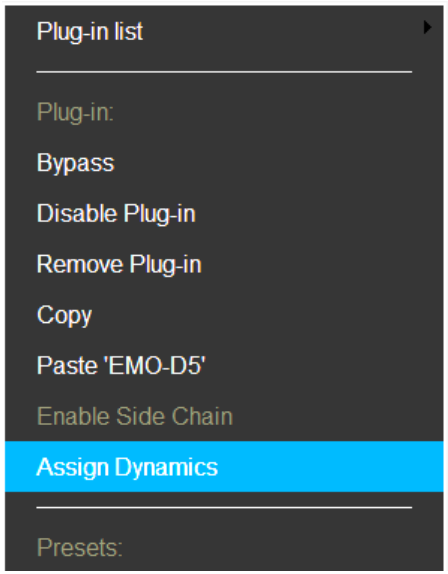
Controllers: High- and low-pass filters can be engaged/disengaged individually and controlled separately. Filter range depends on the assigned plugin.

Main Section Graphic Filter Displays: Channels are displayed together or separately, depending on the plugin and Link setting.

Filter Channel Link: Links left and right channels in the Channel Input section. When Link is on, both channels move in tandem, and any offset between left and right is maintained.

Assigning a Plugin to the Dynamics, EQ, and Filter Controls

Plugin assignments are made in the Plugin menu. If a plugin is already assigned to a set of controls, the menu item will display Unassign [category]. If no plugin is assigned, you can select Assign [category].



One plugin from each category (filter, EQ, dynamics) can be assigned at the same time:

- A plugin will be assigned automatically if no other plugin of its category is present in the rack.
- Assigning a new plugin will replace the existing plugin in that category.
- Unassigning a plugin does not affect its processing status. It can always be controlled from its Plugin user interface. Consult the Waves website for a current list of assignable plugins.

Assigned plugins can be controlled in several ways:

- Filters are controlled in the Channel Input section.
- EQ and dynamics processors are controlled in the Channel Main Control section.
- All Main section controls are available in the Mixer window (Channel Strip mode).

Sections of filters, EQ, and dynamics processors can be switched on and off from the Mixer window (DYN/EQ Channel Strip mode). These assignments are also mapped to external control surfaces.

AUX/FX and AUX/MON Sends Section

The Aux Sends section is used to send a channel's signal to an auxiliary buss while providing a dedicated set of gain and pan controls for that specific route. This is independent of the channel's main output and pan. These auxiliary busses converge in Aux channels, which can serve many functions, such as effects or monitor mixes.

- When using an aux for effects processing, the effect plugin is placed in the Aux channel, which is then routed back to the main out orsent to other destinations.
- When using an aux for monitoring, the Aux channel is assigned directly to an I/O that feeds the monitor.

In both cases, each source channel sent to an aux buss can have its own gain and pan settings. Aux channels are controlled in the AUX layer of the Mixer window.

1. Aux Channels Select (FX 1–8, MON 1–8, MON 9–16)
2. Send On/Off
3. Send Source Select
4. Aux Channel Name and Multipurpose Value Display
5. Pan/Balance/Rotate Control
6. Channel Send Fader

Aux Sends

1. Aux Channels Sends Select

Input Channel, Groups and FX/Monitor auxiliaries can send to the Aux FX/Monitor busses, with some exceptions, The Aux FX/Monitor can only send to a Aux bus with a greater index.

Aux FX / Monitor returns can be accessed in the Mixer GRP / FX and Monitor Layers.

2. Send On/Off

When the send is switched off and the send fader is set to minus infinity, moving the fader will turn the send on.

3. Send Source Select

INP	After input gain, before all processing
PRE	Pre-fader, post-processing
PST	Post-fader, post-processing
PSP	Post-fader, post-processing, post-panner

4. Aux Channel Name and Value Display

Displays the name of the Aux channel by default. When an aux send fader is touched, its value is displayed in the box until the control is released. Similarly, the aux send pan/balance/rotate value is displayed when its control is touched. Aux channels are named in the Mixer window (Mixer window > Aux layer) or in the Patch window.

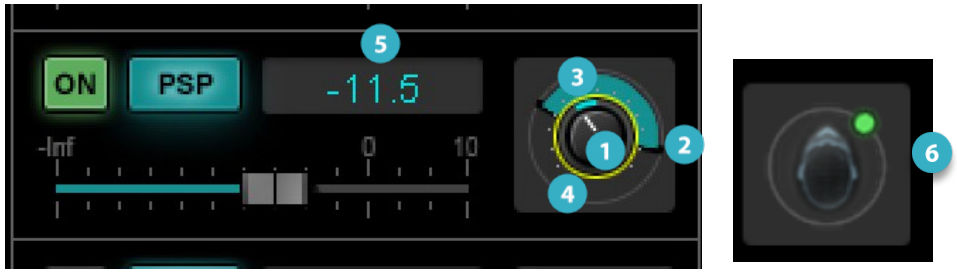
Aux faders and panners are color-coded to match the INP/PRE/PST/PSP source selection. The function of the aux panner depends on the format of the source channel and the aux channel, as well as the send source selection.

When the source fader is at minus infinity and the send is switched off, moving the fader will turn the send on once again. We assume that if you move the fader, you likely want to turn on the send. This saves a step.

Channel Mono/Stereo	Source Setting	Imager
Any source to mono aux buss	All	no imager
Mono channel to stereo aux buss	INP, PRE, PST	mono fader
	PSP	stereo balance/rotator
Stereo channel to stereo aux buss	All	stereo balance/rotator

The mixer surface can be “flipped” so that large faders are used to control send levels. This is called “Aux on Sends,” and it's a convenient way to accurately control what each channel or buss is sending to an aux channel. This is discussed in the Mixer chapter.

Aux Sends Pan/Balance/Rotate



1 Mono Panner/Stereo Balance Knob

When a mono signal is bussed to a stereo channel, rotating the panner causes a gain decrease in one channel and a corresponding increase in the other. This is classic panning. When the panner is used on a stereo channel, the source moves right or left, changing its internal balance and imaging.

2 Left and Right Panners

The panners set the pan values of the left and right channels independently. Adjusting the panners together is stereo rotation—moving a stereo image within a soundscape while retaining its image and width. Consider this the stereo equivalent of mono panning. Moving one panner widens or narrows the stereo image asymmetrically. Panners can “cross” each other, resulting in a reversed stereo image.

3 **Stereo Rotation/Stereo Width**

The colored area between the panners indicates the width and direction of the stereo image. Drag this area to rotate the image.

4 **Selected Control**

A yellow circle indicates whether the pan/balance knob or the rotator is currently being controlled.

5 **Value Box**

Indicates the value of the selected control. Left and right panners and rotation value are displayed on the left, mono panner or balance value is displayed on the right. When the fader is touched, this value indicates the send level to the aux channel.

6 **eMo 360° Panner**

Controls imaging for immersive IEM monitoring. Available when eMo IEM license is present.

Individual monitor mixes can be controlled by artists onstage with the MyMon monitor mix controller for mobile devices. Refer to the MyMon product page for details.

eMo Immersive In-Ear Monitoring

This enables immersive 360-degree panning for in-ear monitors. This results in a monitoring experience that is more comfortable for most musicians, especially after long exposure. eMo is intended for Aux Mon channels, but it can also be used It can be used on Aux FX channels.

eMo IEM can be selected in the Channel window or Mixer window.

In the Channel Window

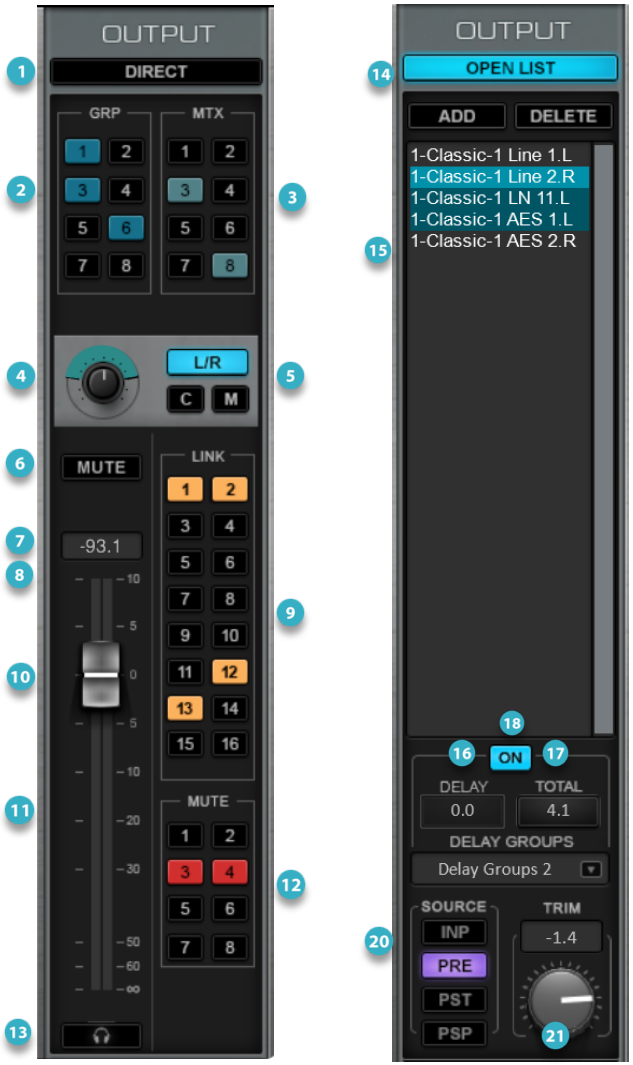
- Select an Aux channel.
- Select IEM Mix Mode in the Input section.
  This Aux mix now be in the IEM immersive mode. When a Mix is in IEM mode, all send pans on this mix will become 360 degrees.

IEM immersive monitoring is indicated by the “head” icon in the sends section of the AUX channel. The green dot indicates the orientation of immersive panning.

eMo IEM requires a separate license. The software must be installed and activated to be available to LV1 and Mobile apps. Use Waves Central to purchase and manage all Waves software products.

Channel Output Section

A channel can output to any of the main outputs and to all available I/Os. It can be assigned to mix groups, mute groups, matrix, and Link/DCAs. I/O properties, such as signal source, trim, and delay group assignment are set here. Output sections are similar for all channel types.



1. Access Direct Output Section
2. Assign Channel to Groups
3. Assign Channel to Matrix Channels
4. Channel Pan/Balance/Rotate Control
5. Main Outs
6. Channel Main Out Mute
7. Value Box
8. Peak Level Indicator
9. Link/DCA Assignments
10. Channel Fader
11. Meter
12. Mute Group Assignment
13. Cue/Solo Button
14. Direct Output Panel: Add and Delete I/Os
15. Assigned I/O List
16. User-Added I/O Delay
17. Total I/O Delay
18. Delay Group On/Off
19. Select Delay Group
4. I/O Source
21. I/O Trim

Main Outs/Internal Assignment Section

1. **Access Direct Output Section**
   The direct output section is used to assign I/Os to the channel. It is also used to assign selected I/Os to delay groups, trim each I/O, and select its source.
2. **Assign Channel to Groups**
   Use the Group Assignment panel to assign a channel to a group. This sends the post-pan output of the channel to the group buss. You can also send a group to another group that has a higher index. For example, Group 4 can be routed to Groups 5–8, but not to 1, 2, or 3.
   The group assignment also appears in the Mixer window (Mixer > Channel layer > Route mode) and in the Internal patch. Groups can be mono or stereo; the default is stereo. This is set in the group's input panel in the Channel window.
   Groups can be set to process pre-FX or post-FX to create and process mix groups that include dry inputs with effects.
3. **Assign Channel to Matrix Channels**
   A matrix is used to create alternate or zone-specific mixes and to apply independent processing per zone. The post-pan output of a channel or mix buss can be assigned to the Matrix busses, and each Matrix channel can be assigned up to 12 channels and busses. Matrix assignments are also found in the Mixer window > Route, and in the Internal Patch. Refer to *Matrix Section*, later in this chapter for more details.
4. **Channel Pan/Balance/Rotate Control**
   The channel panner is a multi-function imager for mono and stereo channels. It affects all post-panner source assignments. As a mono panner it moves a signal left and right. On a stereo channel, it can function as a balance control (increasing the gain of one side while decreasing that of the other). Or it can rotate an image using two independent panners.
5. **Main Outs**
   The L/R assignment sends the post-pan output of a channel to the I/O. Mono and Center send the post-fader output.

6. **Channel Main Out Mute**

Mutes outputs and sends to other busses or I/Os. The Cue buss send is not muted.

- When a mute group is activated, the Mute buttons of group members' channels flash. This indicates that the channel is muted as part of a group.
- A member of an active mute group can be unmuted by clicking its mute button. Click again on the button to mute it beyond the scope of the mute group. It will remain muted even after the mute group is deactivated.
- A third click returns the channel mute to normal mute group behavior.

7. **Value Box**

Indicates the value of the selected control.

Panner/Balance/Rotator control: mono panner position, stereo panners, stereo width, stereo rotation value.

Fader: Displays the position when the fader is touched.

8. **Peak Level Indicator**

Displays channel peak level and clipping. Clip threshold, clip hold, and peak hold are set in the U/I Settings page (Setup > U/I Settings > Peak and Clip).

9. **Link/DCA Assignments**

A channel can be assigned to up to 16 Link groups, each of which provides linked control over multiple channels. A Link group couples a channel's panner/balance/rotation, mute, cue/solo, trim, polarity, and preamp controls with equivalent controls in other channels. A Link/DCA fader remotely controls the trim value of a group of assigned faders (Refer to *Mixer > Link/DCA* Layer).

10. **Channel Fader**

Controls the channel gain main mix output—one fader controls mono and stereo channels. Faders under DCA control remain at their original position, while a ghost fader shows the current channel level (as determined by the Link group DCA fader). Post-fader and post-pan signal sources are both affected by this fader.

Range: -144 dB to +10 dB

11. Meter

Displays stereo or mono peak levels. Range: -INF to +10 dBFS
Infinite-hold peak indicator. Click anywhere on the meter to clear. Pre- and post-fader meter status is set in Setup > U/I Settings.

12. Mute Group Assignment

Assigns the channel to up to eight mute groups. Mute groups are recalled in the Mix window or from a control surface.

13. Cue/Solo Button

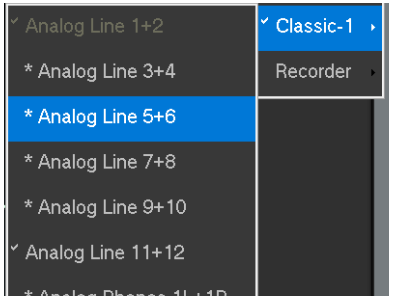
Activates Cue or Solo. When in the Cue mode, the Cue button sends selected channels and busses to the cue buss. In Solo mode, the Solo button activates Solo-in-Place mode for the channel, muting all other channels. Cue assignment stays active when the channel is muted.

Cue/Solo behavior is set in the Cue control page of the Channel window, which is easily accessed by pressing the gear icon under the “Clear Solo” button in the Top Bar. Cue configuration is discussed later in this chapter (Channel >Cue Section).

Channel Direct Out Section

14. Direct output panel: add and delete I/Os

This panel is used to assign I/Os to the channel's direct outputs. Hide or unhide the panel view by toggling the Direct button



Add opens a drop-down menu of available hardware I/Os and drivers that can be assigned to the channel. All I/Os that are assigned to the mixer inventory appear in the list. Click on an I/O to add it to the list of assignments. I/Os that are already assigned are grayed out.

Delete unassigns the selected I/O and removes it from the I/Os list, making it available for other mixer outputs or other systems, if I/O sharing is active.

15. Assigned I/O List

I/Os patched to the channel output are shown here. Click on an I/O to select it for delay group assignment or trim adjustment. This list is identical to the buss Direct Out drop-down menus on mixer channel strips. I/Os are listed in this manner:

Slot # / device friendly name / output type / device output channel /. L or R

16. User-Added I/O Delay Value

Displays any additional delay of the selected I/O that is added by the user. The delay value is displayed in samples. Refer to *Appendix B* for a detailed description of eMotion LV1 delay management.

17. Total I/O Delay

Displays the sum of user-defined delay and processing delay.

18. Delay Group On/Off

Enables/disables user-defined delay for a delay group or a single selected I/O.

19. Select Delay Group

Assigns a selected I/O to one or more of 16 delay groups. An I/O can be assigned to more than one delay group. To enable delay groups, the mixer must be set to Multiple Delay Groups in the Mixer Settings page (Settings > Mixer Settings).

20. I/O Source

Sets source send points for all I/Os assigned to this channel.

- INP Post-input gain, pre-processing
- PRE Pre-fader, post-processing
- PST Post-fader, post-processing
- PSP Post-fader, post-processing, after panning

21. I/O Trim

Adjusts the signal sent to the I/O device. Trim level is displayed in the value box. When no I/Os are selected, the knob is grayed out. Range: -144 dB to +10 dB

Cue

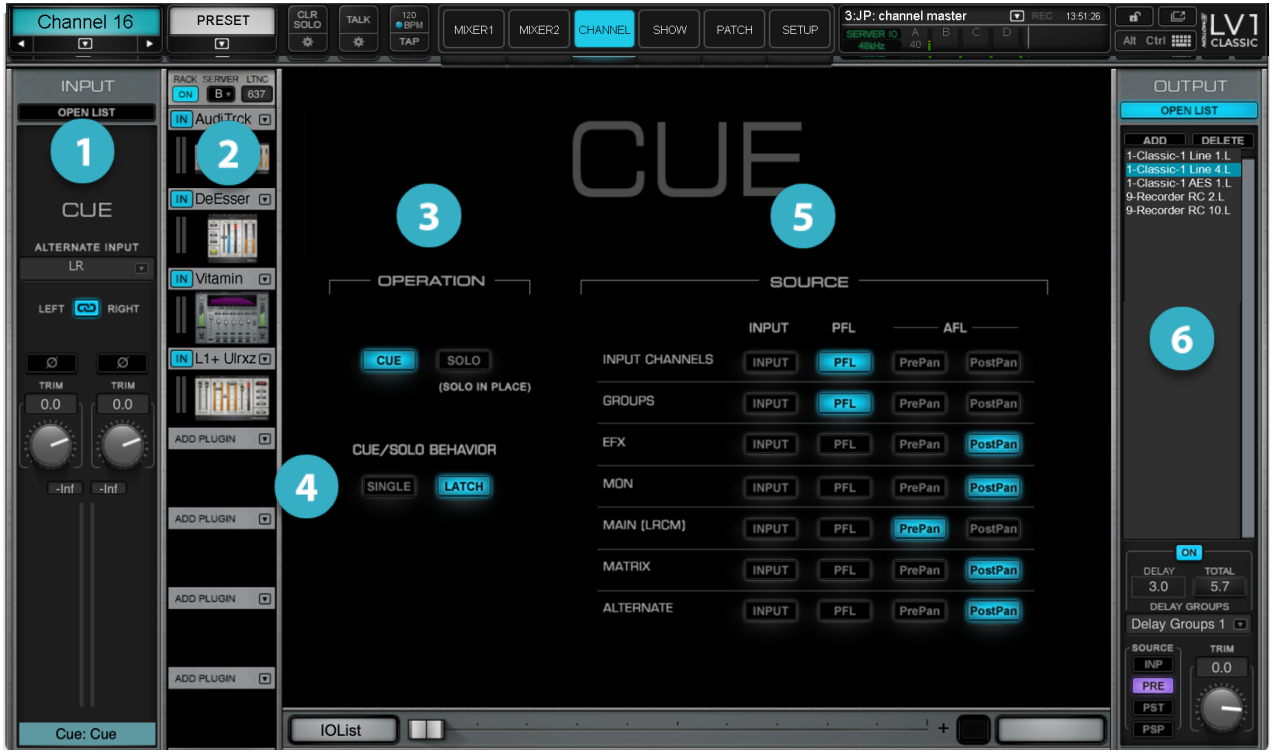
The Cue function enables auditioning/monitoring of a channel or buss. When the Cue/Solo button is pressed on a channel or buss, that source is sent to the cue buss, which can then be sent to an I/O for monitoring. When Cue is not pressed on any channel, the cue buss takes its input from an alternate source, typically the main buss. A muted channel will still send its signal to the cue bus.

The Cue channel provides all the functions of other mix busses, including a plugin rack. Its output is typically connected to the operator's headphones or monitors.

Cue Controls

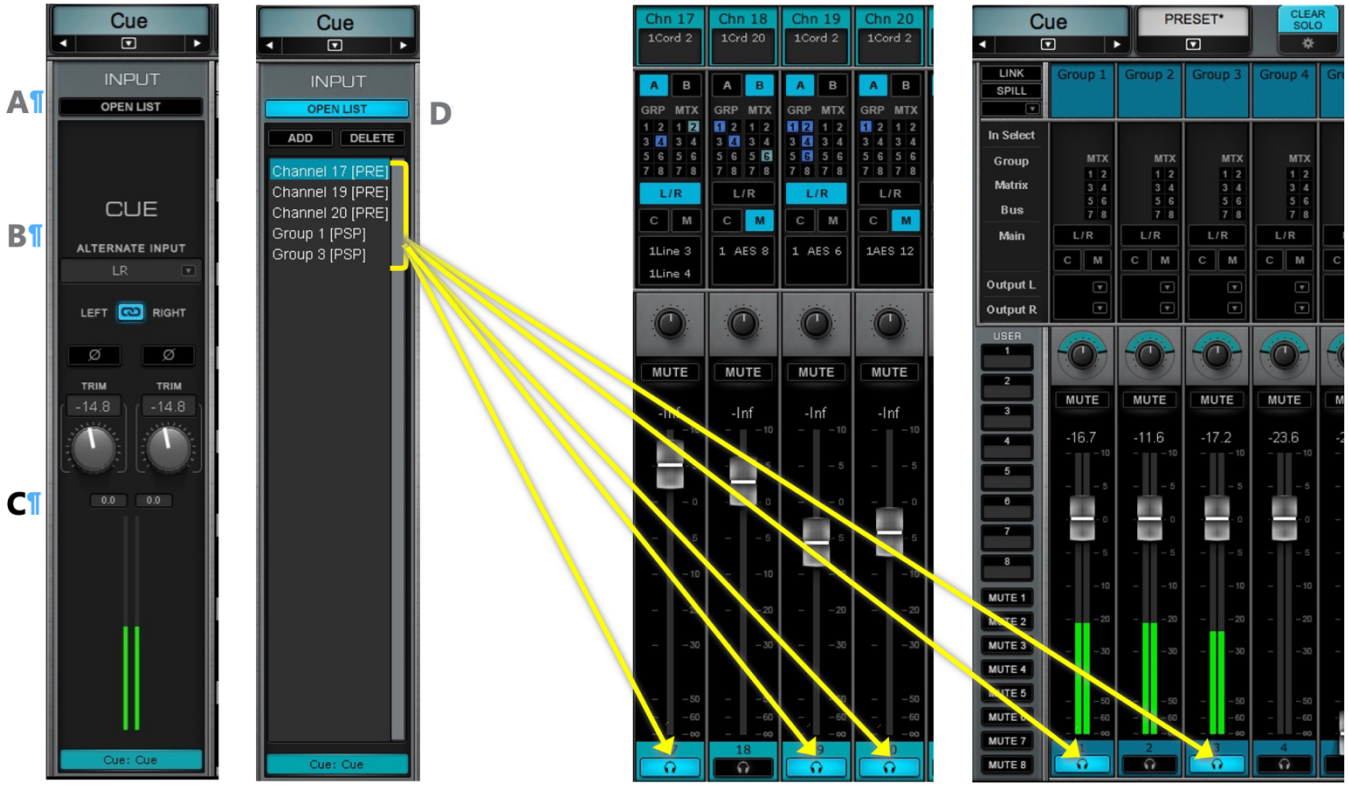
The Cue control panel is located in the Channel window. To access this page, click the Gear icon under the Clear Solo button on the Top Bar.

The Cue control panel consists of six sections.



1. Input Section
2. Plugins Rack
3. Cue/Solo Select
4. Button Behavior
5. Cue Source select
6. Output Section

1 INPUT SECTION



A. Open List: Opens the cue channel assignment panel. Any mixer channel or buss with an active Cue button appears in this list. Assignments can also be made from the Input List. Click Add to open a drop-down menu for input assignments.

B. Alternate Input: Serves as a fallback input to the Cue buss when no other busses are assigned. Any channel or buss can be selected as the alternate input. The default assignment is Main L/R.

C. Cue channel **Input Trim,** meter, and phase polarity reverse: Controls the level and phase of the Cue buss input.

D. Input Channel Assignments: Used to assign busses to the Cue channel. The Input source (INP, PRE, PST, PSP) is shown next to the assigned buss. Assignments can be made in this panel or on the Mixer window channel strips.

2 Cue Page Plugins Rack

The Cue plugins rack can hold up to eight plugins. There is no Main Control Section on the Cue Channel page; plugins are controlled directly from the plugin user interface. Refer to *Channel Window > Plugin Rack Section* to learn more about using the plugins rack.

3 Cue/Solo mode select

Toggles between Cue and Solo-in-Place modes.

Cue Mode: The cue signal is sent to the Cue buss for monitoring. Main mix outs are not affected.

Solo-in-Place Mode (Cue button becomes Solo button)**:** Setting a channel to Solo-in-Place will mute all other tracks when the Solo button is pressed. Tracks that are fed by the soloed channel, or those used as sources for the soloed channel will not be muted. Default: Cue.

4 Cue/Solo button behavior

In Single mode, only one channel at a time will be in a cue or solo state. Latch mode allows multiple selections. Click the button once again to deselect it.

5 Source

Selects cue source send points. Each channel category (input channels, groups, aux, etc.) can be assigned specific sources, and all member channels of that type will exhibit the same source behavior.

Options include: Input, PFL, AFL pre-pan, AFL post-pan.

6 Output section

Configures cue output assignments in the same manner as channel direct outputs on any channel. Select Open List and add output assignments. This section includes fader, pan/balance/rotate control, and mute, as well as direct output assignments. The Cue buss can also be sent to a Matrix channel.

Refer to *Mixer Window > Masters Layer* for further details.

Talkback

The Talkback function sends the signal of an assigned I/O to selected busses, which are then routed to I/Os. Talkback is used primarily to communicate between the operator and the artists or staff. It can also be used to distribute a reference signal for calibration or to check that stage equipment is working properly. Click the Gear icon under the Talk button on the Top Bar to access the Talkback channel page. This button is not latching.

1. Input Section
2. Plugins Rack
3. Talkback Routing
4. Talkback Routing presets
5. Output Section
6. Talkback Button

1 Input Section

The Input section of the Talkback channel patches to any hardware or software I/O that's assigned to the mixer. It can control preamp analog level, 48V phantom power, and phase in the same manner as Input channels. The Input section includes input meters and peak value indicators, as well as input trim controls, assigned filter adjustment, and delay control.

2 Plugins Rack

The Talkback channel accepts up to eight plugins. There is no Main Control section on this Channel page, so plugins are controlled directly on the plugin user interface. Refer to the Channel > Rack section to learn more about using the plugins rack.

3 Talkback Routing

This grid is used to determine which busses (Groups, FX, Mon, Matrix, Main Outs) the Talkback channel is patched to. The name of the buss is reflected in the corresponding button on the interface when you rename a buss. Its abbreviated name appears on the button. Selecting **All** patches Talkback to every buss.

4 Talkback Routing Presets

Up to eight Talkback routing configurations can be saved as presets.

a. Select a preset button.
b. Configure Talkback buss assignments.
c. Click Save.

The Clear button removes all patches visible on the grid. It does not affect saved presets.

5 Output Section

The Talkback buss can be routed to any available I/O. It can also be routed to mixer busses, including Main outs. The Output section of the Talkback page is identical to that of the Cue channel. elect Open List and add output assignments. A fader Section includes fader, pan/balance/rotate control, mute, and direct output assignments. For details, please refer to the *Channel Output* section introduced earlier in this chapter.

6 Talk Button (on the Top Bar)

Talkback is activated with the non-latching Talk switch. It must be held open to talk. When Talkback is On, the top part of the button is blue. Click the Gear icon below TALK to directly access the Cue channel page from any window.

Talkback On/Off can also be mapped to a control surface or assigned to user-assignable keys, which are set up in the U/I Settings window (Setup > U/I Settings > User-Assignable Keys).

Using Talkback to distribute a test signal

Since Talkback can be sent to any I/O or buss, it is a convenient way to broadcast a reference tone or other test signal. Insert a signal generator into the Talkback plugins rack. This signal will be distributed to all selected busses and I/Os.

Matrix

The matrix is used to create up to eight alternate or zone-specific mixes and to apply independent processing per zone. All mixer busses can be sent to Matrix channels, and each Matrix channel can support up to 12 channel assignments. Navigate to a Matrix channel to assign and control sources.

1. Input Section
2. Plugin Rack
3. Buss level Controls
4. Input Buss Name
5. Output Section

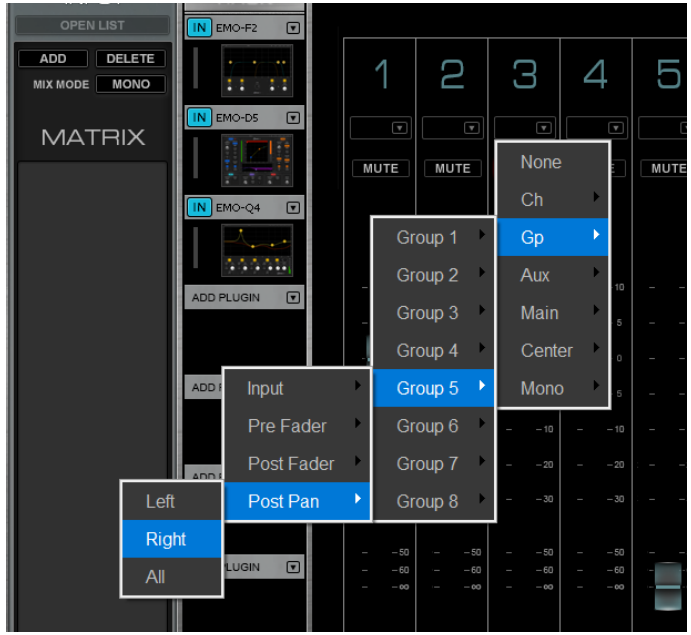
Each Matrix channel has its own control panel in the Channel window, which is used to adjust the busses assigned to it. The Matrix channel name (Top Bar) displays the name of the selected Matrix channel. The eight mixer channels are accessed from the Masters layer of the Mixer window, or by navigating directly with the Name cell in the Top Bar.

1 Input Section

Up to 12 channels or busses can be assigned to a Matrix channel. Matrix inputs can be assigned in three places within the mixer:

- A Channel's output section
- The Route mode of the Mixer window
- The Internal assignments page of the Patch window

- Assignments made from these sections default to the post-pan source, and the source of an assigned input is noted next to the channel name. Matrix inputs can also be assigned:
  - In the Input section of a Matrix channel
  - Directly on the Matrix fader strip



To add a source assignment directly on a fader strip, click the drop-down menu at the top. Choose an input channel and source. Input, pre-fader, post-fader, and post-panner sources are always available.

If the source channel and the Matrix channel are both mono, then post-pan allows you to choose between left, right, or a sum of both as the source. When the input channel is stereo, you have this choice with all sources.

2 Plugins Rack

Up to eight plugins can be added to each Matrix channel. There is no Main Control section on the Matrix page, so plugins must be adjusted in their respective plugins panes.

3 Buss Level Controls

Each buss has a strip with a fader, a peak level indicator, and a mute.

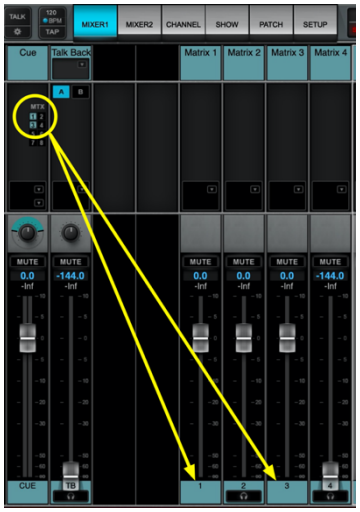
4 Buss Name on Fader

The name of each buss strip matches a name from the list in the Input section.

5 Output Section

This section is used to assign delay groups and patch to I/Os. **Add** opens a drop-down menu for selecting busses. When the limit (12 busses per Matrix channel) is reached, the Add button is grayed out.

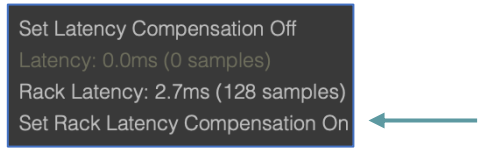
Sending Cue to Matrix



The Cue buss can be assigned to a Matrix channel. In this example, Cue is assigned to Matrix channels 1 and 3. Note that in these Matrix channels, Cue is not available for audition, as this would cause a loop.

Cue Buss to Matrix Latency

By default, Cue rack latency is not reported to the Matrix. When Cue latency compensation is off, no latency is reported to the Matrix.



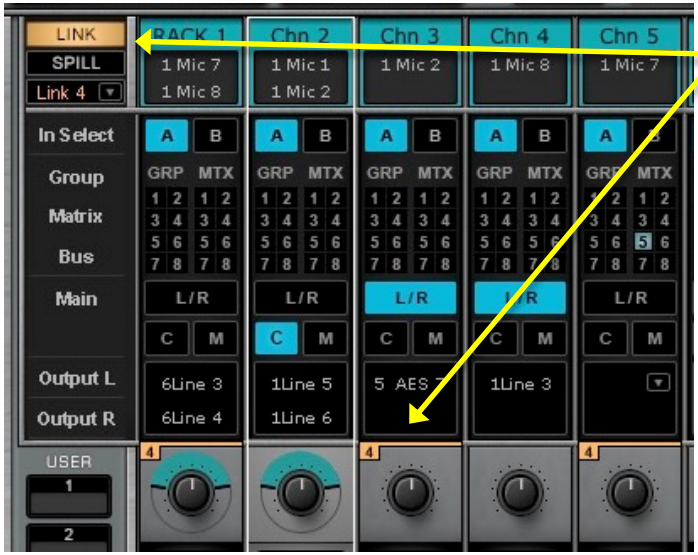
Rack latency for the Cue buss is turned on or off in the Cue Plugin Rack.

This latency is now reported to the Matrix.

Link Channel Controls (and DCAs)

Links allow for global control of fader levels and other mixer parameters across multiple channels. When channels are assigned to a link group, their controls move together. Changing one control automatically adjusts the corresponding controls of the other channels in the group. Existing offsets are maintained but can be changed.

The mixer supports 16 link groups, and a mixer channel can be assigned to any number of these groups. There is no limit to the number of channels that can be assigned to a link. Link assignments are made in the output section of the Channel window and in a Link channel's input section. Any mixer channel can be assigned to a link, except for Cue and Talkback.



The Link button is in the upper left corner of the Mixer window. When Link is on, activated links are identified by small numbers next to the panners.

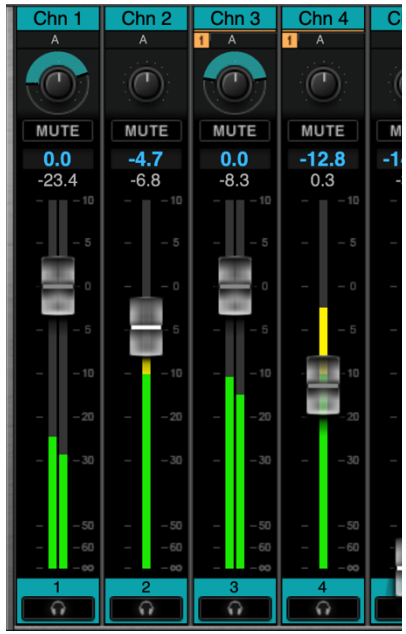
A drop-down menu allows you to select which link group will be used. A channel that is a member of more than one link group uses only the currently selected link. The Spill button displays all channels in the selected link.

Link button behavior

Only the selected link group is active. Deselecting the Link button disables all link groups. This action affects only links and does not impact DCAs. A DCA remains active regardless of the link group selection or the status of the Link button.

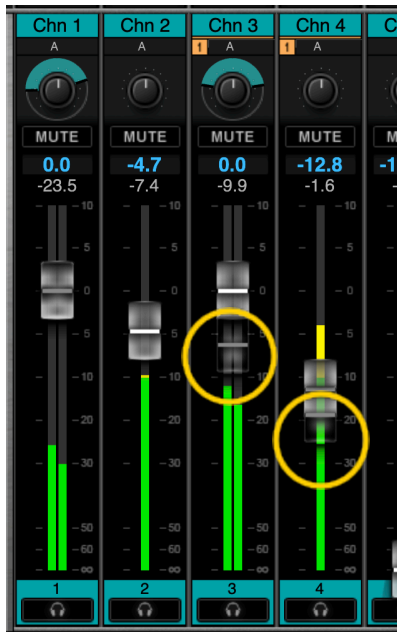
Links and DCAs are discussed in detail in the Mixer chapter of this user guide.

DCAs



A DCA is a tool for remotely controlling the trim values of a group of faders. A DCA is not an audio path like a group buss. Rather, it is a fader that trims other faders assigned to it. This concept is a development that originates from classic mixer VCAs.

When a DCA fader is moved, the controlled faders do not move; they stay in their original positions.



Ghost faders indicate the current level of each channel, reflecting the offset introduced by the DCA fader. So, if the DCA fader remains at zero, it has no effect on the controlled fader and the channel gain remains unchanged.

A DCA fader move of +5 dB (for example) will result in a corresponding +5 dB change in the position of the ghost faders. Still, the channel fader itself does not move. In this example, channels 3 and 4 are assigned to Link Group 1, so their levels change along with that Link fader. Channels 1 and 2 are not members of Link group 1, so they are not affected. DCAs are defined using the Link Group assignments buttons in the Channel window output section or the Internal section of the Patch window.

Chapter 3:

SETUP WINDOW

The Setup window provides the tools to configure the mixer and determine its behavior.

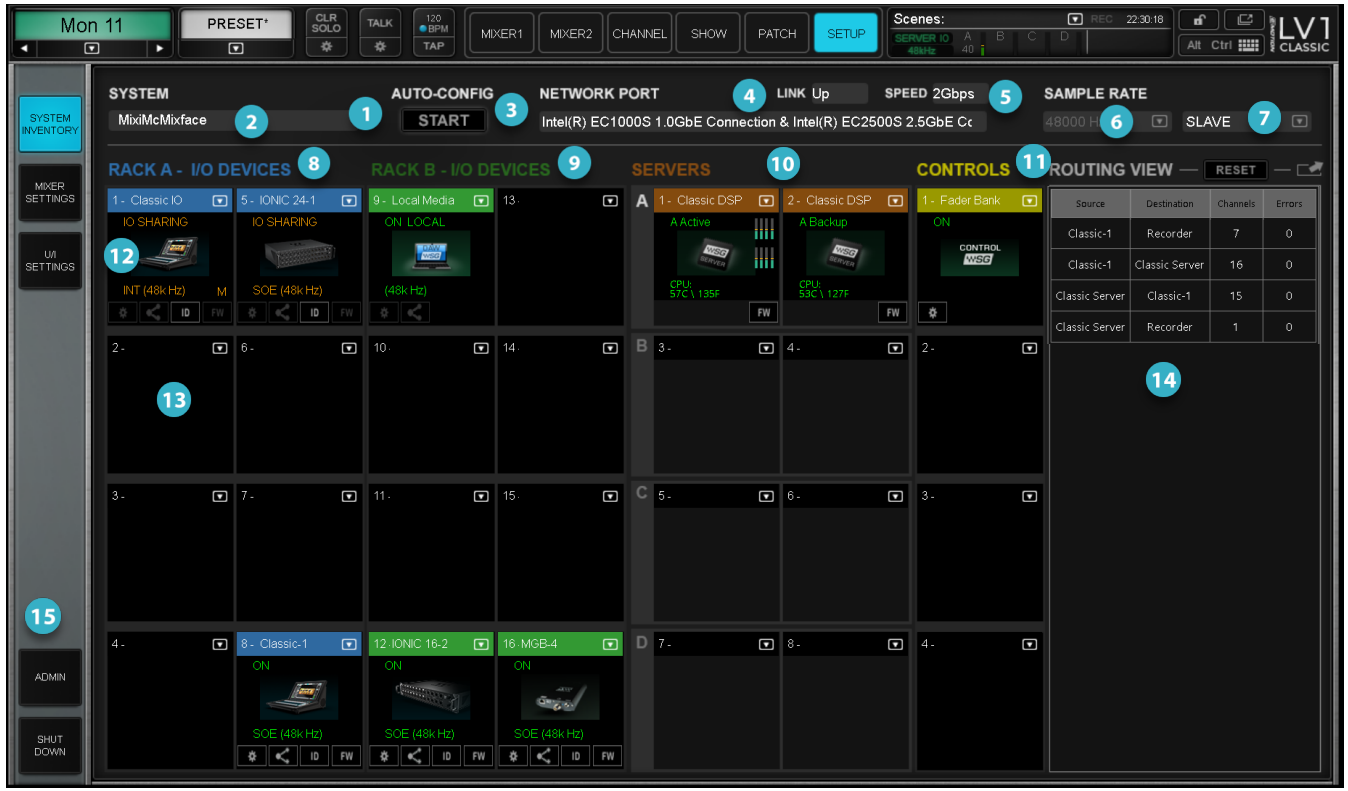
The window has three pages:

- **System Inventory**
- **Mixer Settings**
- **U/I Settings**

Use the tabs on the left side of the window to navigate between these pages

System Inventory Page

The System Inventory page is used to assign and manage I/Os, servers, drivers, and controllers. The top portion of the page deals with network status, while devices are assigned in the racks below.



1. Auto-configure start
2. LV1 system name
3. SoundGrid network port name
4. Ethernet link status indicator
5. Network speed indicator
6. System sample rate
7. Sample rate master/slave selector
8. I/O Racks A (hardware + software I/Os)
9. I/O Racks B (hardware + software I/Os)
10. Server Racks
11. Control Racks
12. Populated Rack slot
13. Empty Rack slot
14. Routing View panel
15. Quit application/open Kiosk

System Inventory Page Displays and Controls

This section describes the controls and menu items on the System Inventory page, followed by examples of how to use the System Inventory page in order to set up the mixer (*Setup > Configuring a Basic Mixer Setup*).

1 Automatic Configuration

When you start LV1 Classic, the 16-channel onboard I/O is automatically assigned. Additional external I/O devices, such as stageboxes, can be added manually or by using the Start Assignment routine:

- Connect external I/O devices to the Ethernet switch on the rear panel.
- Click **Start**, then **Add**. This maintains current connections, scans the SoundGrid network, and adds new devices:
  - New I/Os appear after existing ones in the patch.
  - New I/Os are initially slaves to the original I/O.

(*Setup > Using the System Inventory Page > Configuring a Basic Mixer Setup*).

2 **System** (View Only)

Identifies and displays the LV1 Classic system you are using. This is relevant if you are working on a multi-LV1 super system, where several LV1 Classics share a network. You can change the system name in the Admin Kiosk.

Internal Network

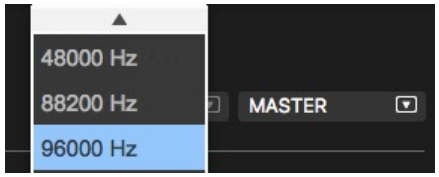
Shows the integrity of the internal network.

3 **Internal Network Port** (View Only)
Identifies the SoundGrid network port.

4 **Link** (View Only)
Reports the status of the internal Ethernet connection to the computer running the eMotion LV1 software.
Options: UP / DOWN / INVALID

5 **Speed** (view only)
Reports SoundGrid network speed. Options: 100 Mb/sec, 1 Gb/sec, N/A.

Sample Rate Controls



6 **Sample Rate Master/Slave Status Selector**
Controls whether the mixer is the sample rate master or a slave. As such, it determines how the sample rate of a system is established.

7 **Sample Rate Selector Menu**
Sets the system sample rate when the mixer is the sample rate master. The Sample Rate window displays the sample rate of the system. The menu is disabled when the mixer is a sample rate slave, since it can set the sample rate only when in the master mode.

The sample rate of the clock master device can always be set from its control panel, whether the mixer is in Sample Rate Master or Slave mode. Sample rate is discussed later in this chapter (*Setup > System Inventory > Sample Rate Master vs. Sample Rate Slave*).

Device Racks

8 **I/O Rack A**
Assign up to eight I/O devices. These can be hardware devices, software I/Os (drivers), or a combination of both.

9 **I/O Rack B**
Identical to Rack A for additional assignments.

10 **Servers Rack**
Assign SG server(s) to the rack. The first server assigned will be the primary server, while additional servers will be redundant and identified with "RSGS." A redundant server automatically takes over if the primary server malfunctions.

11 **Control Protocols Rack**
Assign control surface devices.

12 **Populated Device Slot**
When a device has been assigned to a slot, its icon appears here. The icon contains information about the device.

13 **Empty Device Slot**
A slot with no assignment is labeled "Add Device."

14 Routing View Panel

The Routing View panel displays the status of network connections. Each row represents a one-way patch between two devices or between a device and the main server. This panel can be floated and moved to any location.

15 Shut Down/Admin

There are two buttons for leaving the console:

- Click **Shut Down** to safely shut down LV1 Classic, click. It may take several seconds for all components to shut down completely. (This is the recommended way to quit LV1 Classic.)

Before shutting down, the mixer prompts you to save the current session.

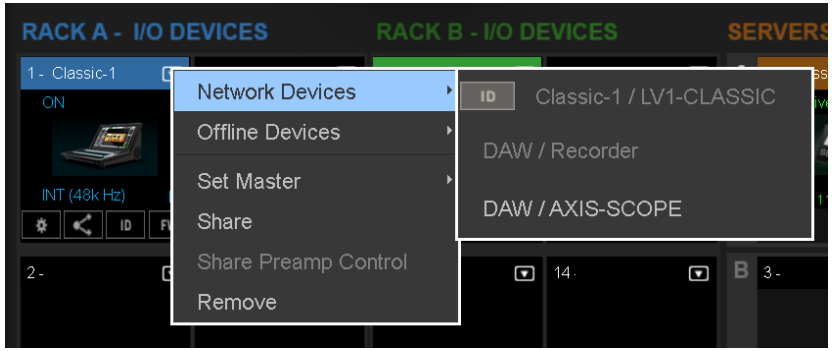
No: Saves the session based on the latest auto-save, as defined in the Mixer Settings page.
Yes: Saves the current mixer condition to a new file.

- Click **Admin** to quit LV1 and open the Admin kiosk. This is used for system configuration, updates, and troubleshooting.

Device Racks: Configuring and Managing Network Devices

Device Racks are used to assign and control the hardware and software I/Os, servers, and controllers available on the network. Use these racks to set up a new configuration or to modify an auto-configured setup.

Racks A and B—I/O Devices



Racks A and B assign hardware and software I/O devices to the mixer. Racks A and B can be used interchangeably and are separated only for convenience. For example, some engineers dedicate one rack to FOH and the other to monitoring.

A rack consists of eight slots, each of which can hold one I/O device. The arrow in the rack slot opens a drop-down list of devices that are part of the mixer's SoundGrid network.

There are three categories of assignable devices:

Network	Devices and SG Drivers available for assignment
Offline	Templates of devices for offline preparation

Available devices are shown in regular type. Devices that are not available for assignment are grayed out.
The rack slot number determines the device's order in the Patch window and in certain drop-down menus. While device sequence is not important, some engineers choose to dedicate one rack for PA devices and the other for monitoring.
The ID button next to the device name activates a changing-color LED on the device front panel to help identify the physical unit.

I/O Device Racks Displays and Controls

1. Slot Sequence Number
2. Device Name
3. Device Menu Access
4. Device On/Off Status
5. Clock Source
6. Sample Rate
7. Clock Master Indicator
8. Open Device's Control Panel
9. Enable Sharing
10. Identify Hardware
11. Firmware Status and Re-Flash
12. Offline Device
13. Shared Device
14. Shared Driver
15. Local Media Device

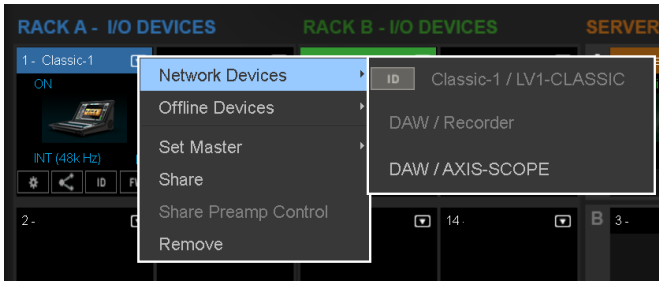
There are several status indicators and buttons on the icon itself and just below it. The color of the text in the slot indicates the master/ slave status of the device.

(Blue=Master, Green=Slave, Red=Device not available, Orange=Shared Device)

	Indicator	Possibilities	A
1	**Slot Sequence #**	Rack A 1–8; Rack B 9–16	Indicates the rack slot number. I/Os appear in the Patch window in this sequence.
2	**Device Name**	Text entry	The device product name followed by a number is the default name. Change the device name by double-clicking on its Name Box.
3	**Devices Menu**	Drop-down menu	Used to add and remove devices from the slot and to set the device as clock master.
		On	Device is active.
4	**Device Status**	NA	Device is unavailable. Likely causes: • Device is assigned to another system. • Device or firmware is incompatible with current SoundGrid Studio software. • Device was previously assigned to this user but is not currently connected.
		Offline	A virtual device is assigned to this rack slot for offline preparation of sessions without I/Os connected. All device patching will be maintained when the session is launched on a complete system.
5	**Clock Source**	INT, SOE, AES, WC	Clock source of this device. The SoundGrid network operates in a Sync on Ethernet network. Non-SEO devices can, in some instances, connect to an SOE device, and then join the SOE network.
6	**Sample Rate**	44.1, 48, 88.2, 96 kHz	Sample rate of device.
7	**Clock Master**	M (Master) / blank = slave	Identifies the device as the clock master of the SOE network.
8	**Control Panel Access**	Gear button	Click to access the device's floating control panel to adjust preamps, configure channels, and control clock. Refer to the I/O device manufacturer's user guide for more information. Up to five floating windows can be open at once.

9	**Enable Sharing**	On or Off	Permits this device to be shared with other LV1 systems.
10	**ID Hardware**	Locate hardware device	Activates lights on the front panel of the hardware device associated with the icon.
11	**FW**		Status of the device's firmware:
		Gray	Firmware is compatible with installed mixer software.
		Blue	Firmware is compatible with installed mixer software, but a newer version exists. It should be updated as soon as possible.
		Red	Firmware is not compatible or is out of date. Click the FW button to re-flash device.
12	**Offline device**	Red	Device is offline. It can be assigned to the console and configured. Settings will be applied to the hardware device when it is available.
13	**Shared Device**		Indicates that this device is shared from another LV1 system.
14	**Shared Driver**		Indicates that this driver is shared from another LV1 system.

I/O Devices Menu Items

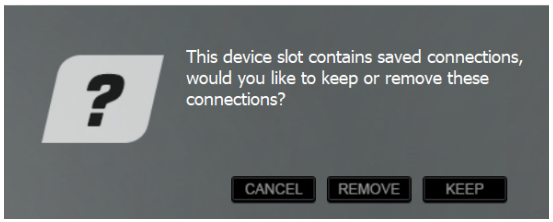


Once an I/O device has been assigned to a rack slot, additional menu items are available.

LV1 Classic appears in three places in the System Inventory.

- The Classic I/O appears in the I/O Devices rack.
- The Classic server appears in the Servers rack.
- The Fader Bank appears In the Controls rack.

Menu Item	Possibilities	Function
Set Master	A list of all devices that can be used as a clock source for the SoundGrid network.	Designates the device as the SOE network clock master and other devices as clock slaves. The letter "M" and the blue text in the slot indicate that the device is the master.
Share	Check/Uncheck	Allows sharing of I/O channels on this device with other systems.
Share Preamp Control	Check/Uncheck	Allows remote users to control the preamps of the shared device.
Remove		Releases the device, making it available to other drivers.

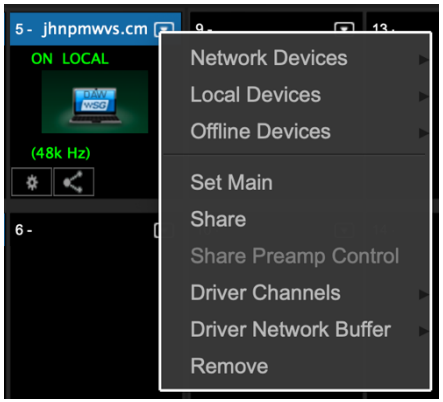


When you remove a device from a slot, you have two options concerning how to treat the existing patches for that slot.

Keep maintains the internal patching from any I/O that will be assigned to the slot.
Remove clears all patches for the slot.

This configuration is saved as part of the session.

I/O Devices Drivers Menu Items



Menu Item	Possibilities	Function
Set Main Driver	Assigns main driver.	Assigns this as the main driver. The second driver serves as a backup.
Driver Channels	Range: 32–128 channels Default: 32 channels	Sets the number of channels assigned to the SoundGrid ASIO/Core Audio driver. More driver channels can increase network load and may require additional buffering.
Driver Network Buffer	(Values in samples/milliseconds) 44.1 kHz and 48 kHz: 104/2.2; 288/6.0; 512/10.7; 1042/21.3 88.2 kHz and 96 kHz: 208/2.2; 288/3.0; 512/5.3; 1024/10.7 Note: If a driver is shared, network buffers for all drivers will be set to a minimum of 288 samples.	The network buffer helps the OS send synchronized information between the ASIO/Core Audio drivers and the I/Os through the network port. When many channels are going in/out of the driver(s) to several destinations, the Driver Network Buffer may need to be increased to reduce the possibility of audio drops or artifacts caused by overloading the network port driver.

All computers on the network should have the same up-to-date versions of eMotion LV1 and SoundGrid driver installed. Download the latest version from Waves Central.

LV1 Classic I/O

The Classic onboard I/IO provides 16 channels of mic/line input on XLR/TRS combo connectors and 12 line-level outputs on XLR connectors. There is also a stereo AES3 input and two stereo AES3 outputs on XLR connectors and two independent headphone ports. The specific I/O, including its preamps, is managed from the control panel.

Certain additional features, such as HMX and impedance selection, can only be accessed here.

Click the small Gear button at the bottom-left of the Classic I/O slot to open the control panel.

Control Panel Pages

The **Clock, Input,** and **Output** pages are used to configure and manage the unit. The **About** and **System Info** pages provide information about the unit, such as MAC address, SOE network master, firmware version, and more.

Input Page

The Input tab is used to configure the device's 16 analog mic/line inputs.

1. Preamp Controls
2. Input Meters
3. Preamp Input Gain Adjust
4. AES Input Meters
5. Power Supply Unit Indicator: 1 or 2
6. Presets: Load and Save
7. Device Name in Inventory
8. Device Status (when red, device is offline)
9. Clip Level Indicator Selector
10. Device ID

Preamp Controls

Mic/Line	Sets input level mode for mic or line inputs. Mic: Enables input level adjustment (-3 dB to +60 dB), for both XLR and TRS. Line: Gain is fixed. XLR is set to 0 dB, 7k ohms. TRS set to -6 dB pad, 14.6k ohms.
48V	Phantom power: on or off
Mic Impedance	Sets mic impedance: 2k ohms or 7k ohms. This enables proper pairing of the mic to the preamp. Some mics perform better at a lower impedance, while others excel at a higher setting. To a certain extent, 2k ohms was the standard impedance during the 1970s, 1980s, and 1990s. Since the 2000s, 7k ohms has become more prevalent as it is more linear and produces less signal loss, especially when performing analog splits before the preamp. However, the choice is not always straightforward as there is a subtle sound difference between the two impedances. Unless the impedance choice is obvious, experimenting with both options is recommended.
HMX	Turns Waves Harmonic Enhancer on or off. Harmonic enhancement usually results in a more natural-sounding, warmer sound, as found in classic analog equipment. Bypass HMX for a more neutral sound.

Note: The AES signal's sample rate is always converted to match the sample rate of the Classic device.

Input Level Adjust

Controls the gain of the Classic preamps. Small values are used for line inputs and large values are used for mic inputs. Range: -3 dB to 60 dB (in steps of 1 dB)

A setting of 0 dB allows a +24 dB input without clipping. A setting of +20 dB allows a +4 dB input without clipping. The channel number appears on the left of the control, and the current gain is indicated in the box above.

Clip Level Adjust

Use the Clip Level drop-down menu to set the level at which clipping will be indicated by the LED in the meter. This does not affect the audio level, only the point at which clipping is indicated.

Range: -6 dB to 0 dB

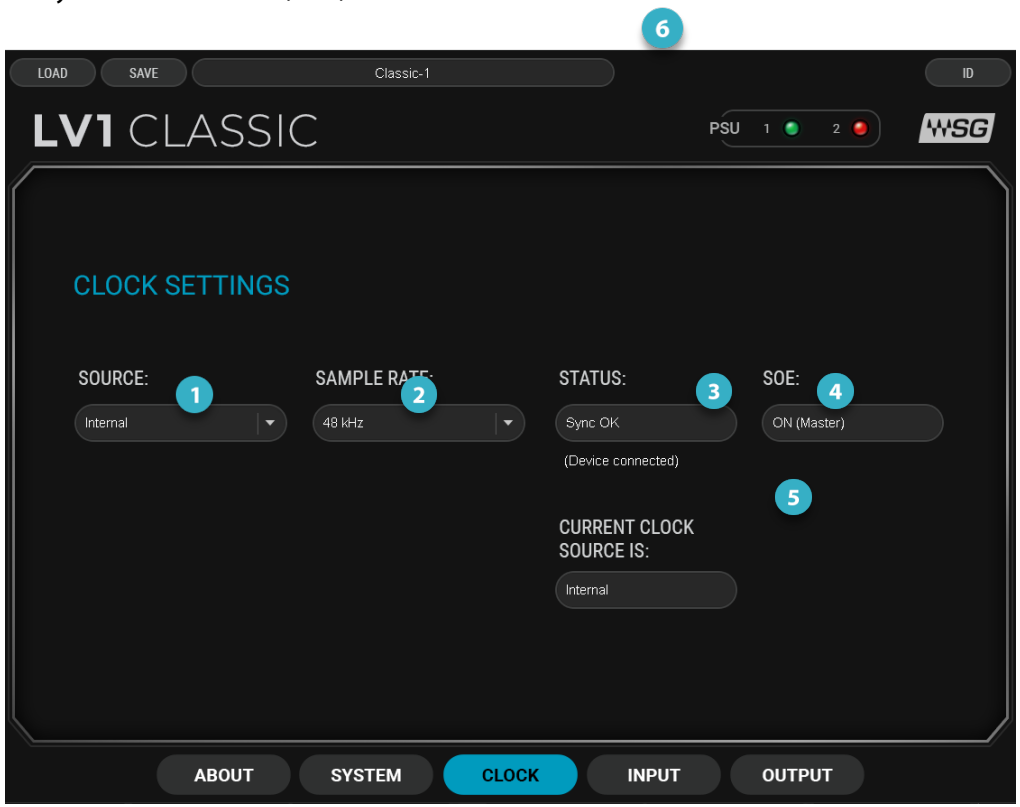
Output Tab

There are 12 line outputs, a stereo AES output, and 2 stereo headphone outputs.

1	Headroom Select	Select +18 dBu or +24 dBu mixer headroom.
2	Analog Output Meters (dBFS)	-60 dB to 0 dB, +18 dBu and +24 dBu full scale line output levels.
3	AES Output Meter	Level indication only; no input control.
4	Headphone Meters	One meter for each headphone channel.

Clock Tab

Use the **Clock** tab to manage the clock relationship between the Classic I/O and the SoundGrid network. The following image shows Classic locked to the SoundGrid network via Sync Over Ethernet (SOE). The device can also serve as the SoundGrid network clock master.

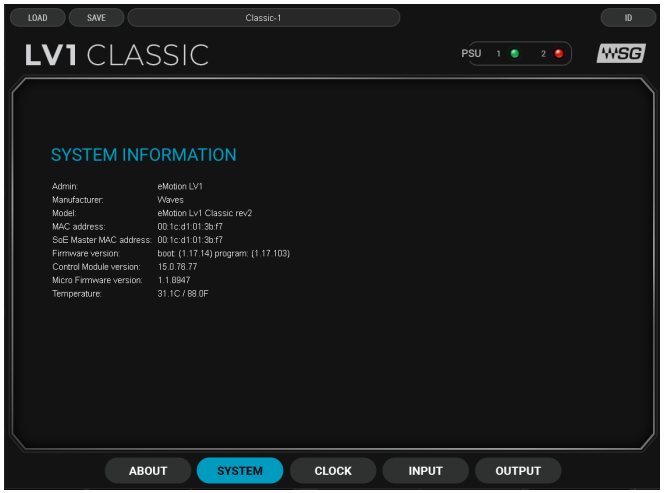


1	Source Select	Requests a clock source. If this source is unavailable, Classic will poll all other potential clock sources. If there are no available clock sources, Classic will default to internal clock.
2	Sample Rate	When Classic is the SOE clock master and is set to internal clock, this drop-down menu is used to set the device's sample rate (and hence the sample rate of the SOE network). When Classic is not the clock master, this window displays the SOE network sample rate.
3	Status	Displays the device network sync status.
4	SOE	Indicates SOE status (On/Off, SOE Master/SOE Slave)
5	Current Clock Source	Indicates the actual current clock source. If the device is unable to sync to the requested clock, this displays the fallback.

6	PSU	A dual power supply provides power redundancy. LEDs at the top indicate PSU status: when both LEDs are green, both PSUs are working properly. A red LED indicates a PSU that has been connected and is now malfunctioning or disconnected. A PSU that has not been connected will appear gray. When only PSU 2 (likely the redundant PSU) is operating, a white status light on the back of the console will blink. This means that PSU 1 is not working.

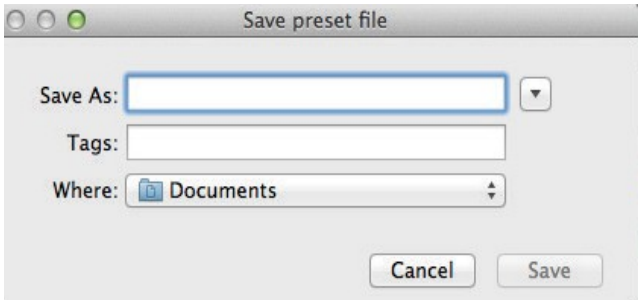
System Info Tab and About Tab

The **About** page contains a description of the device. The **System Info** tab contains technical details about the device, including MAC address, firmware version, and module version. This information is useful for troubleshooting. Please have this information handy if you contact Waves technical support concerning the device.



I/O Device Presets

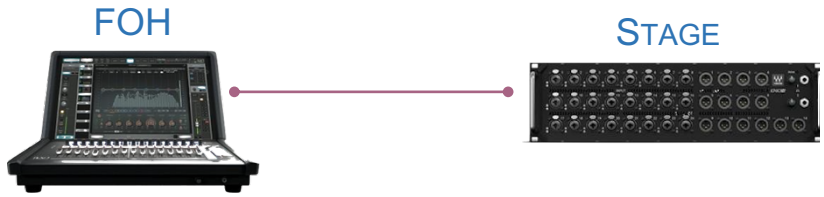
You can save and load presets of device settings. A saved preset includes all parameters in the Clock and Control panels. Save Classic presets to use in future sessions or copy them to another computer to duplicate a configuration.



I/O Sharing

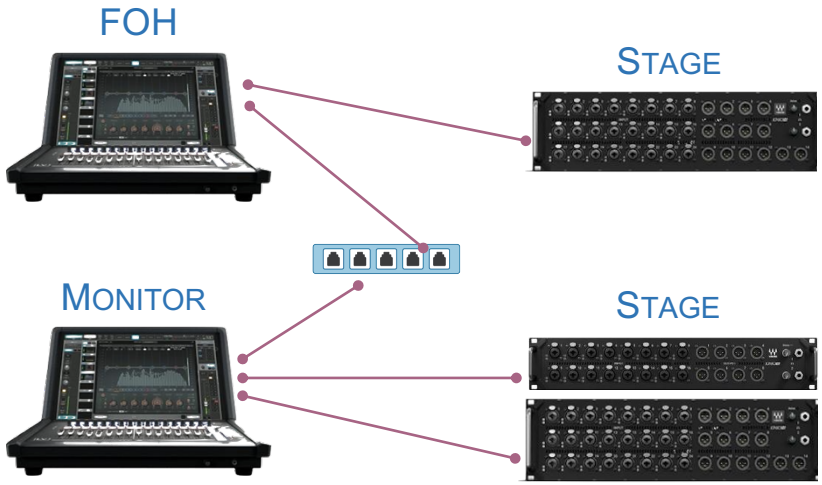
Device sharing enables networked LV1 Classic systems to share I/O channels with devices anywhere on a multi-user network.

Device sharing in a multi-LV1 system is best demonstrated with an LV1 Classic that becomes larger and, through device sharing, more flexible as needs increase.



Example One—FOH: LV1 Classic and One I/O On Stage (no sharing)This single-LV1 system consists of a Classic console with its internal Classic I/O and an Ionic 24 I/O. The Ionic is onstage and is used for mics, DIs, and monitoring. The onboard Classic I/O covers PA and other FOH needs. Because of Classic's 4-port 1 GB Ethernet switch, you do not need an external one. Connect the console's switch directly to the I/O devices.

Example Two—Device Sharing: Add a Monitor System

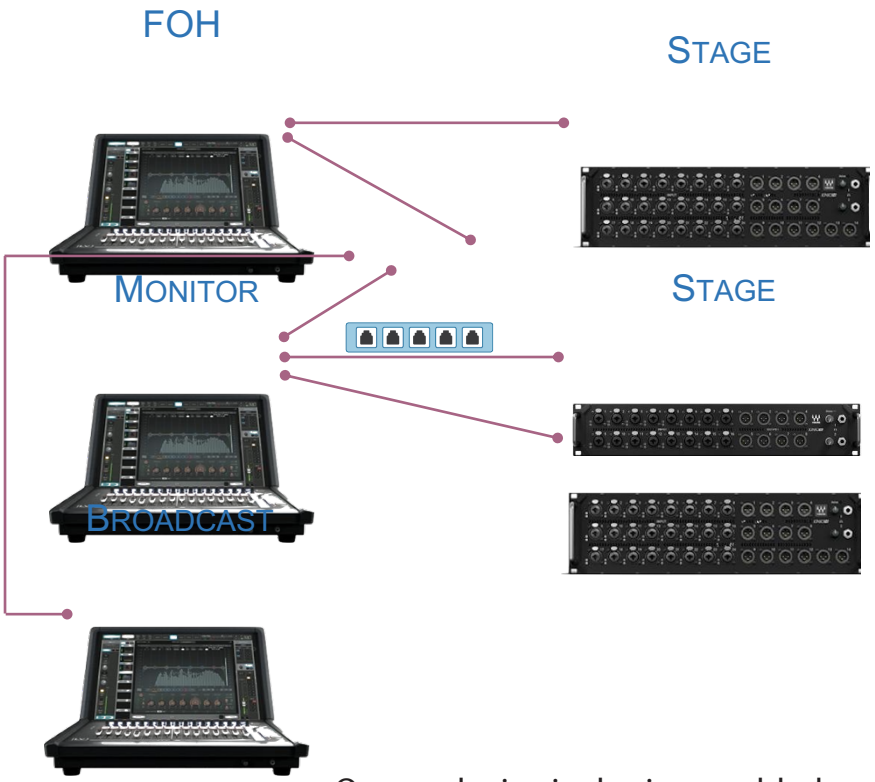


As your monitor needs become more demanding, you may want to add another Classic console that's dedicated to the monitor mix. Device sharing is enabled. The FOH console can share its I/O devices with the monitor system, and the monitor console can share its Ionic 16 and Ionic 24 with FOH.

The 64 onstage I/O channels can be shared with either systems.

Connect the consoles via a 1 GB Ethernet switch. Do not use the onboard Ethernet switch to connect systems.

Example Three—Add a Third LV1 System For Broadcast or Streaming



You can add a third console for purposes like broadcast or streaming. Since the streaming system has few I/O needs, you can likely assign I/O channels from other systems and use the 16-channel LV1 Classic I/O in this console.

This combined system now includes 136 I/O channels that can be assigned from any of the consoles.

Once a device is sharing enabled, any system can assign it to the inventory. The device appears in the device rack and behaves like an unassigned device—except that it can be anywhere on a multi-LV1 network.

The three-console network in example three has 136 assignable input channels that can be shared and used on any of the Classic consoles. Note that the actual number of shared I/Os may be less, due to network considerations.

Setup

An unshared device that is assigned to an LV1 Classic console's inventory and that is not share-enabled is available solely to that console. Once the device is available to other users for sharing, the console is the **manager of the device**. Other systems (**clients**) can now assign free I/O channels from the managed device. A client can assign free I/O channels to its inventory, but with less control.

Enable Sharing on an Assigned Device

To enable other systems to share from a drive that you have assigned to your system, follow these steps.

- Go to the System Inventory.
- Assign the device to your inventory (if not already assigned).
- On the assigned device you wish to share, click the Sharing icon. Other systems can now assign this I/O device to their inventories and patch available I/O channels.
- Sharing can also be enabled from the Device menu in the Mixer window and in the Patch window.

A shared device can have multiple clients (within the limits of the device's maximum output to the network). A device, on the other hand, can have only one master. Each destination establishes a direct connection from the shared IO device, increasing the total outputs to the network.

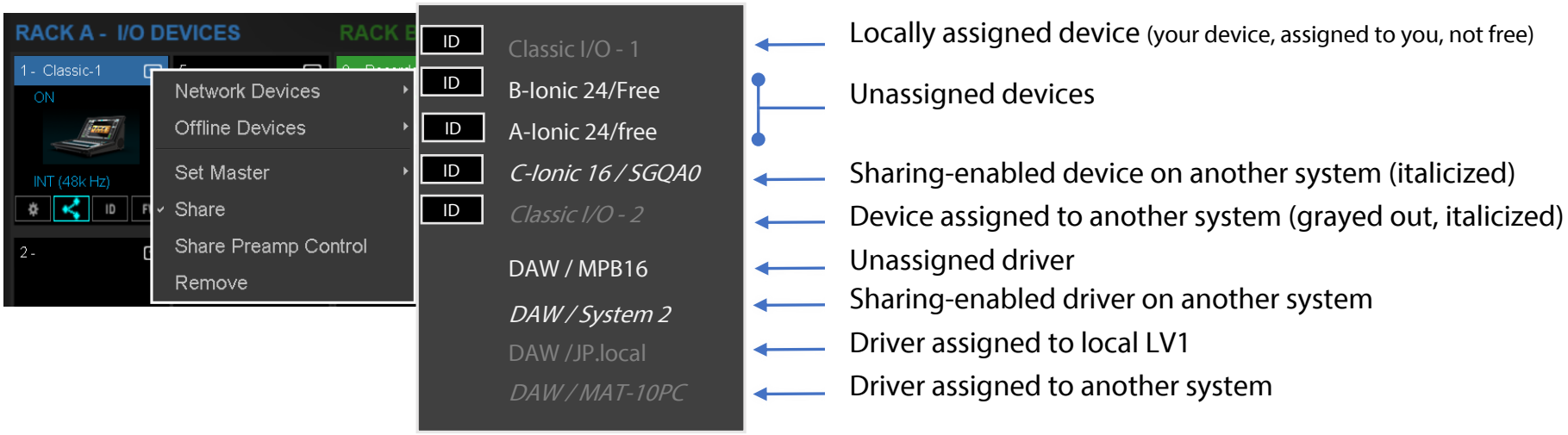
When an I/O device is removed from the manager's inventory, it becomes free and it can be assigned by any other LV1 system.

Assign a Shared Device to Your Inventory (client)

To share I/O channels from a sharing-enabled system, do this:

- Select a device slot in the System Inventory.
- Go to the Device menu and choose a network device whose name is in italics (remote system) and not grayed out (this device is available to you). All assets in the combined systems are shown in the System Inventory of all users (see below).

This is how a System Inventory might look in a large shared system. The font color (white or gray) and its type (roman or italic) indicates the status of the devices in the network.



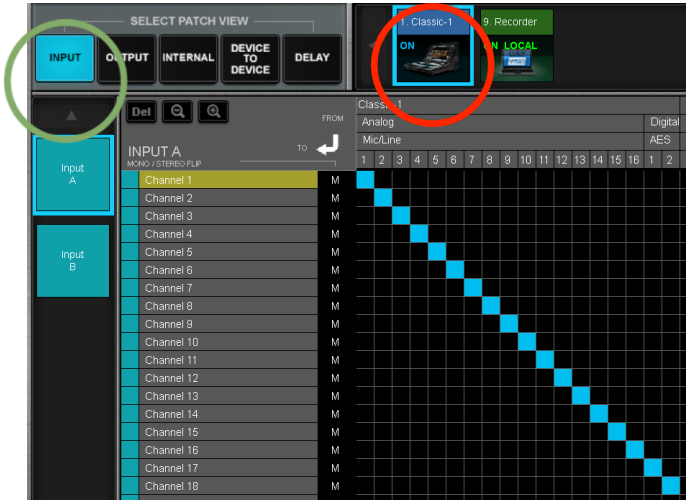
Share Preamp Control

When the device manager selects Share Preamp Control in the Device menu, any client can adjust the preamp gain for any I/O channel on the shared device. All users sharing this device have equal control of preamp gain in any patched I/O channel.

Controlling gain in multi-system environments and retaining gain structure while other users are controlling preamp gain is described on the next several pages.

Patching Shared Devices

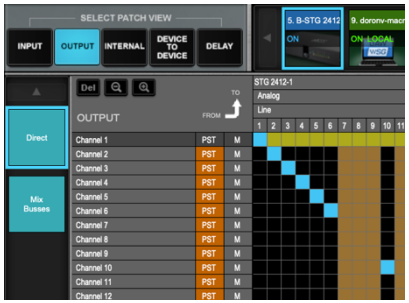
Patching Shared Input Devices



When a device is shared, its inputs are available to all users. Shared devices appear in the patch alongside non-shared devices.

Shared devices can also be patched in the Channel I/O menus of the Mixer window and Channel windows. In those windows, <share> indicates that the I/O channel is from a shared device.

Patching Shared Output Devices

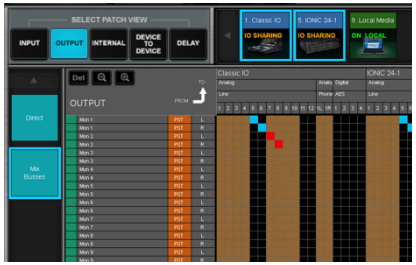


When patching a mixer output, remember that a mixer output channel can route to only one I/O channel (unlike an input, which can be sent to multiple mixer channels)

Once assigned, a shared I/O device appears in the client's Output Patch window. The label "I/O Sharing, Remote Device" is shown on its icon. Patching shared I/Os follows the same conventions as patching unshared SOE devices. There are, however, a few considerations when sharing devices.

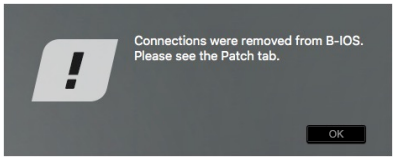
When an output patch is made in one system, the corresponding I/O channel in the other system is colored orange to indicate that the I/O channel is in use. Channels in the black field are available.

The same patching considerations apply to the Channel I/O menus in the Mixer and Channel windows.



If the manager of a device patches to an I/O channel that's already in use by a client, the preexisting client patch will turn red. The client is no longer patched to that I/O output channel.

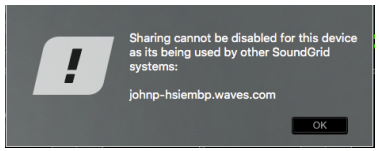
A manager can always disconnect any I/O channel by repatching.



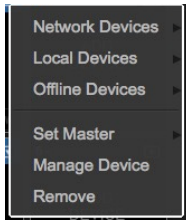
A notification alerts the client when the original patch is taken by the manager. Once the manager releases the patch, the connection will return to the client.

Removing Shared Devices

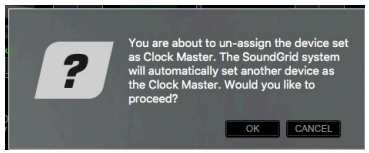
The manager of a shared device can remove the device from its inventory without interrupting sharing on the client devices by selecting **Unassign the Device**. The device will appear unchanged to the clients, and any client can become its master (if necessary). For the moment, the device is functioning, although it temporarily becomes orphaned (without a master). If the original system reassigns the device and reenables sharing, it will reestablish its master status.



If you choose to keep the device in your inventory but disable sharing, you will cut off existing clients from this device. Therefore, the manager cannot end sharing until all client devices are unpatched from the device.



Similarly, a client can remove a device by removing it from its inventory. Select **Remove** from the Devices drop-down menu. In most cases, this will not result in an audio dropout.



Even if the clock master has been removed from its owner's inventory, the device will continue to operate and distribute clock. Only if the owner of the device choses to assign a new clock master, or another user claims Master status of the device and changes the settings, will other devices be affected.

If the Sharing LV1 Becomes Unavailable

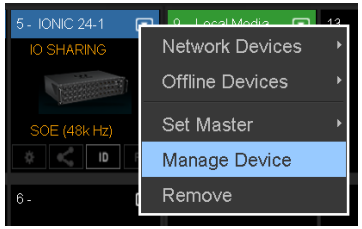
If the manager of a shared device is no longer available to the network, clients of the device can still use it, and the shared device will continue to function. Below is a common example.

There are two systems and an additional Ionic Stagebox.

- Classic A is managing the Ionic, which is shared.
- Classic B shares from the Ionic Stagebox as a client.

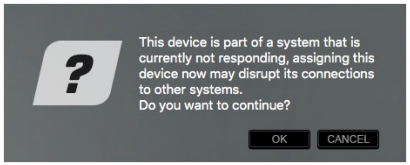
  If, for any reason, System A is removed, System B can continue using the Stagebox. As long as the Ionic device remains powered on and connected to the SoundGrid network, it will pass audio, and current settings will be maintained.

  The device is still owned by the missing System A, which means System B cannot access the device's control panel or establish preamp sharing. If System B had been granted preamp control privileges beforehand, it will still be able to control shared preamps. If System B was not assigned preamp privileges, it will need to take over as the master of the Ionic.



Select Manage Device from the client's Device menu and the device will appear in the client's inventory as a local SOE device. The device can then be assigned to the new system.

There may be situations where a device is not managed by *any* LV1 system. If a system outside of the current group assigns the drive and claims manager status, the unowned device will reset to its default state and sharing will be disabled. Old connections are lost, but new connections can still be established.

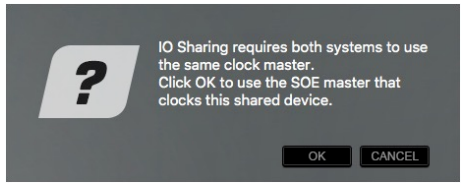


Should you get this prompt, check other connections to the system.

Device Management Overview

- When a free device is assigned to a system's inventory, the system becomes the manager of that device. The device manager can configure any of the device's parameters, such as clock settings, special device parameters, gain, phantom power, and more. Only the device manager can update firmware.
- An unshared device can only be used by its owner. Other users on the network will not be able to assign it.
- When sharing is enabled for a device, other systems can share its I/O channels. Clients have limited control over many device parameters.
- The manager can permit remote preamp control of any or all devices with which it is sharing.
- For a client to set these manager-privileged parameters, it must claim manager status of the device by going to the Manage Devices menu item. This does not affect any existing connections—it merely changes the permissions.

Clock in Shared Systems



When a device is shared by two or more systems, all systems must be locked to the same clock master. If a system enables sharing on a device that is part of another system, it must align with that system's clock. In such cases, the prompt shown (left) will appear. Click OK to set the clock of the shared device as your system's clock. This clock master then becomes the SOE clock master for all the devices in the shared SoundGrid network.

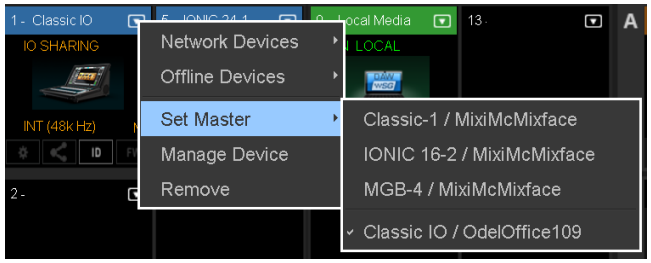
If the device that is being removed is serving as the SEO clock master, another device can assume that role.

A small "M" on the device icon of a shared device indicates that the device is the clock master for the entire super-network.

For example, let's say you begin with an unshared system of four devices. One of those devices is the master of the SOE network and this status is logged by LV1. When sharing is enabled, the system may designate a new clock master. As the network evolves, the clock master may change multiple times. Should you decide to disconnect from the shared system, simply deselect Sharing and your system's clock will be restored to its unshared configuration. eMotion LV1 Classic keeps a log of each device's clock master status, whether the device is an individual system or part of a multi-system network.

> **!** Note: Changing the master clock assignment may result in a clock reset for all associated systems. This can result in a short audio dropout.

Reassigning Clock Master



To become the new master of a device and adjust its parameters, go to Set Master in the Devices menu and select the device.

To become the new master of a device and adjust its parameters, go to Set Master in the Devices menu and select the device. If the clock source is removed from a multi-system network, the network you can assign another device as the clock master.

It's important not to confuse the clock master with the manager. Manager refers to the *system* that has admin privileges in a shared device. Clock master is the *device* providing clock for all devices in the network. Only the clock master can change the sample rate for the entire system.

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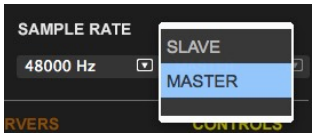
Sample Rate Master vs. Sample Rate Slave

The clock master device sets the sample rate for all devices in the system—everything locked to its clock adjusts to its sample rate. Although the clock master distributes clock at a specified sample rate throughout the system, it does not necessarily determine what that sample rate will be. This is fixed by the sample rate master, which could be the clock master, the mixer, or another system that provides clock. Almost any device with configurable sample rate settings can act as a sample rate master.

Sample Rate Slave/Master Window



1. **Slave**: The system will accept the new clock master and lock to the new sample rate. Devices that are unable to make this change will be removed from the sharing group.
2. **Master**: The system will refuse the request, and all devices locked to the previous master will be removed from the sharing group. This menu controls whether the mixer is the sample rate master or a slave. Consequently, it determines how the sample rate of a system is established

Mixer as Sample Rate Master

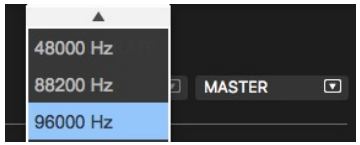
When set to Master mode, the Sample Rate menu setting instructs the clock master device to change its sample rate. This in turn changes the sample rate of all SoundGrid devices in the mixer system. The clock master supplies the requested sample rate from any of its available sources (e.g., AES, S/PDIF, Word Clock, Internal). The priority of clock sources differs according to the specific device. If none of these sources can switch to the desired sample rate, the clock master's icon will turn red, as will the sample rate indicator. Audio will mute. At this point, you can choose to stay at the previous sample rate or find another means of clocking the system. Or remove yourself from the network.

Mixer as Sample Rate Slave

When set to Slave mode, the mixer system sample rate is determined by another system. When the sample rate of the clock master device changes, the mixer automatically adjusts its sample rate to match.

The mixer system can receive clock from another system.

Sample Rate Selector Menu

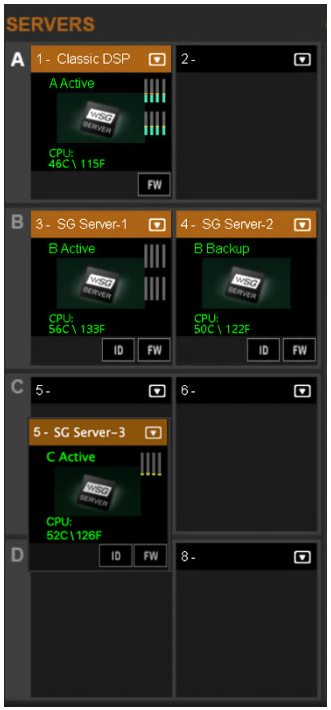


Sets the system sample rate when the mixer is the sample rate master. The Sample Rate window displays the system's sample rate.

The menu is disabled when the mixer is a sample rate slave, since eMotion LV1 can set sample rate only when in the master mode. The sample rate of the clock master device can always be set from its control panel, whether the mixer is in Sample Rate Master or in Slave mode.

Servers

LV1 Classic comes with a built-in server responsible for running the console and performing plugin processing. This server is automatically assigned to the console upon launching and must always be assigned to slot 1.



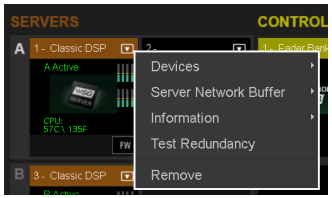
You can assign up to three more servers for additional processing and up to four servers as backups. And you can also replace main server. [1]

The Servers Rack is used to assign, remove, and configure SoundGrid servers. Servers are assigned and removed in the same way as I/O devices.

Servers are organized into groups of two: A, B, C, and D. These groups are assigned to specific channels for processing, with assignments configured in the Channel and Mixer windows.

The first server assigned to a group becomes the active server for the group and is labeled "Active." The second server assigned to the group acts as the redundant server and is labeled "Backup."

> The server in Slot A is used for running the mixer and handling plugin processing. Regardless of how many additional processors are added, there must be a server in this slot.



Servers are assigned and configured via the drop-down menu.

[1] You can replace the onboard server with a different one if needed. Unassign the Classic server and reassign the replacement in its place.

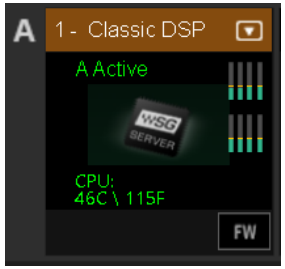
Menu Item	Possibilities	Function
Devices	Drop-down menu	Choose from the available servers on the SoundGrid network. A server that is already assigned to an LV1 and is not shared is unavailable and grayed out.
Server Network Buffer	(samples/milliseconds) 40/0.8 56/1.2 80/1.7 112/2.3 160/3.3 224/4.7	Sets the size of the internal server buffer, which influences the time it takes for audio to stream from the I/O to the server and back. This setting impacts the speed of real-time processing. Each mixer connection pair represents a server processing buffer, so the buffer size influences latency in routing where there are multiple connections. If you encounter pops or other errors, increase the buffer setting.
Information	(N/A)	Reports technical details about the server, including server link speed. When Server link speed is 100 Mbps or lower, the server name will appear in red text. This typically indicates a physical connection is broken.
Test Redundancy		Runs your session through the main and redundant servers separately to confirm that each can handle the session without failure. If the redundant server cannot meet the session's processing needs, the session may not perform effectively if the main server fails.
Remove		Releases the server from the local LV1, making it available to others.

Server Assignment Notes

- Server Groups B, C, and D are insert points to server A. Audio being processed in servers B, C, or D will be streamed round trip to/from the main server.
- This additional round trip introduces a minimum latency of 64 samples. The actual latency will depend on the Server Buffer Setting.
- The processing power of a server group is defined by the power of its active server. Since server A is the principal server, we recommend that you assign your strongest server to this slot.
- Additional servers should be placed as close as possible to the main server. Ideally, they should also be connected to the same network switch as the main server assigned to Group A.

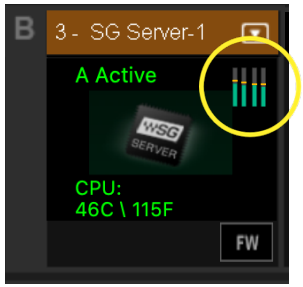
Server Indicators on the Icon

Server Status is indicated by the color of the text displayed on the server icon.



Green	The server is present and operational.
Gray	The server is assigned but is not available. "N/A" is displayed.
Red (Name only) Red (Temperature) Red (On and FW) Red (On only)	The server is unsupported. CPU is overheating. The device firmware is incompatible. Reduced link.

DSP Meters



The meter bars on a server icon indicate DSP usage of each of the server's cores. There is one meter per core.

The solid bar areas display **average** DSP use per core. The yellow lines indicate **peak** usage, which is also displayed as a percentage above the line. Certain plugins can exhibit a high average/peak DSP ratio. This may cause overloads (momentary or constant) that result in audio drops. When adding many of these CPU-intensive plugins, the peak and average indicators will drift apart. In such cases, you may need to disable or remove certain plugins.

Average	Peak	Status
Green	DSP peak value: 1% to 84%	System is stable. You can add more plugins.
Yellow	DSP peak value: 1% to 84%	Monitor the meter status and be prepared to remove some plugins and/or increase the network buffer size.
Yellow	DSP peak value: 85% to 99%	Monitor the DSP meter status. Remove some plugins and/or increase the network buffer size.
Red		DSP load is beyond the limit. Remove heavy-load plugins immediately.

CPU Temperature

Indicates the temperature at the server's core, displayed in Celsius and Fahrenheit. Refer to the device's user guide for temperature limits.

Operating ranges: ambient temperature is 0–35°C; Server CPU working temperature is less than 80°C.

Using a Backup Server

Assign a second server to provide redundancy in case the primary server fails. The switchover to the second server occurs automatically and the switchover time depends on the session size. During this period, sound is muted. Redundant servers are labeled "Backup" in the Inventory.

The second server in a server group is used only for redundancy. A server group can have only one active server.

Test Redundancy

This test runs your session through the main and backup servers separately to confirm that each can handle the session without failure. If the backup server cannot meet the session's processing needs, the session may not perform effectively if the main server fails.

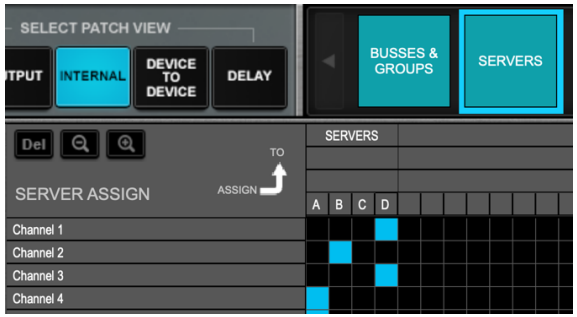
The result of this test is either pass or fail. If the redundant server passes, then all is well. If it fails, you must upgrade to a faster redundant server or reduce the number of plugins in the session.

Redundancy with Multiple-Server Systems

- If the active server in Server Group B, C, or D fails, its redundant server will take over, as described above.
- If there is no redundant server in the group, the plugins in racks assigned to that server group will be bypassed, but the audio will keep flowing. When the server reconnects, there will be a short sync and the channels that are patched to that server group will start processing the plugins again.
- Should the redundant server fail, audio will not be completely lost. Rather, rack processing will be bypassed and the audio will remain unprocessed until the disconnected server is back online. In such cases, any added plugin latency will remain calculated, unless rack processing is assigned to Server Group A.

Multi-Server Operation

A server group can be assigned to any mixer channel—all plugin processing on that channel will take place on the designated server. This allows you to distribute your DSP load between servers to get optimal performance from them. DSP-heavy plugin racks can be assigned to different server groups to balance the load. You can assign these DSP-heavy channels to stronger servers, while assigning lighter racks to older or less powerful servers.

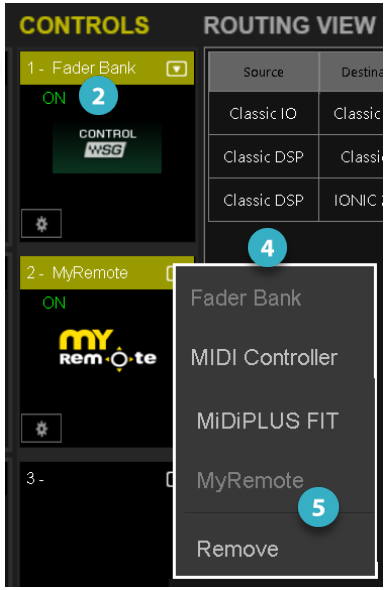


Server groups are assigned in the Patch Window internal Patch View (shown here at the left), which provides an overview of all or the server group assignments.

You can also assign a server group to the selected channel using the server-assign drop-down menu at the top of the plugin chainer in the Channel Window.

In the Mixer windows, the assigned server group is displayed beneath the channel's name. You cannot set the server group assignment from the Mixer windows.

External Control Devices



Use the Controls Rack to assign external controllers to the mixer. Choose between protocols for Classic Fader Bank, MIDI Controller, and MIDIPLUS FIT, as well as mobile app remote controllers. Assigning controllers is very similar to assigning I/O devices and servers.

There are two common reasons for adding controllers:

1. Add Control surfaces to increase the number of channels that can be controlled simultaneously. This essentially gives you a wider console, or lets you control both Mixers at the same time.

2. Enable artist-adjusted monitoring and remote-controlled LV1 adjustment away from the FOH. These applications for mobile devices are all managed via the MyRemote controller.

	Possibilities	Function
1 Assigned Control Name		Displays selected control protocol.
2 Controller Device Status	Displays presence and status of the device	N/A >Device corresponding to the selected protocol is not present or is not functioning properly. On > Device is present and operational.
3 Access Control Panel (Gear Button)	Momentary switch	Opens the control panel of the selected controller.
4 Controls Drop-Down Menu	List of available control protocols.	All available controller categories are listed, whether the associated device is connected or not.
5 Remove Control		Unassigns the current control protocol.

Controller Menu Items

To access a controller's control panel, assign the controller and click the gear button.

Fader Bank is a control panel for the onboard tactile controller. It provides a classic workflow with faders, knobs and toggles. Learn more about the fader bank in Appendix A in this user guide. This is the default controller.

MIDI Controller is an interface for remote control of functions using MIDI protocol. Refer to Appendix B for

MIDIPLUS FIT is an external controller for LV1 that can be added to extend the tactile control options. Refer to the MIDIPLUS FIT user guide for details.

MyRemote is a control panel that is enables global control over the mobile applications used to remote control all or parts of LV1 Classic and produce onstage-controlled monitor mixes.

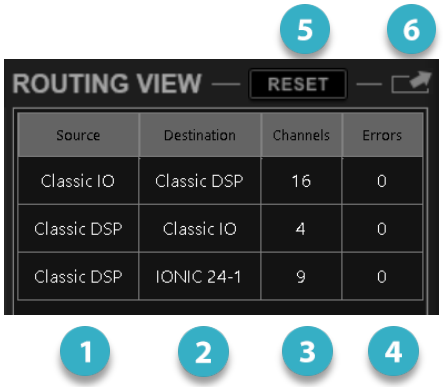
Refer to the Waves Mobile Apps Startup Guide to learn about MyRemote and the following mobile apps that it runs.

MyFOH	Enables the FOH engineer to remotely adjust critical LV1 controls from anywhere in the venue when listening from a static FOH position is inadequate.
MyMon	A personal monitor mixing app for musicians.
MRecall	Allows remote loading of LV1 scenes from the stage or elsewhere in the venue.
MixTwin	Mirrors LV1 to enable remote control away from FOH. Refer to the MixTwin product page for details.

Routing View Panel

The Routing View panel displays the status of network connections, showing how audio streams from one device to another. Each row represents a one-way patch between two devices or between a device and the main server. Note that a round trip between a server and a device is reflected in two one-way streams.

Routing View Columns



1. **SOURCE DEVICE**
   The origin of the network connection (I/O, server, driver).
2. **DESTINATION DEVICE**
   The destination of the network connection (I/O, server, driver).
3. **CHANNELS**
   The number of SoundGrid channels in the connection. A SoundGrid network channel reflects a one-way trip between a device and the server or between two devices. This includes patches made in the Device-to-Device page in the Patch window, something that is not visible in the Rack or Overview windows.
4. **ERRORS**
   Displays the count of the network packet errors for the connection. When an error occurs, the display flashes, and the count is increased by one. Click Reset to clear the error counts.

Troubleshooting Network Error

- A high CPU average load value means that the network line carrying the connection may be reaching its limit, potentially causing dropouts. Reduce the number of channels on this connection to lower the network load.
- A low CPU load, combined with audio drops, on a connection from a server might indicate that the server is causing the drops. If the server's peak CPU is high, reduce the server load.
- A low load and low SoundGrid server CPU might indicate a faulty cable.
- Widespread audio drops can indicate that the switch or a cable may be faulty.

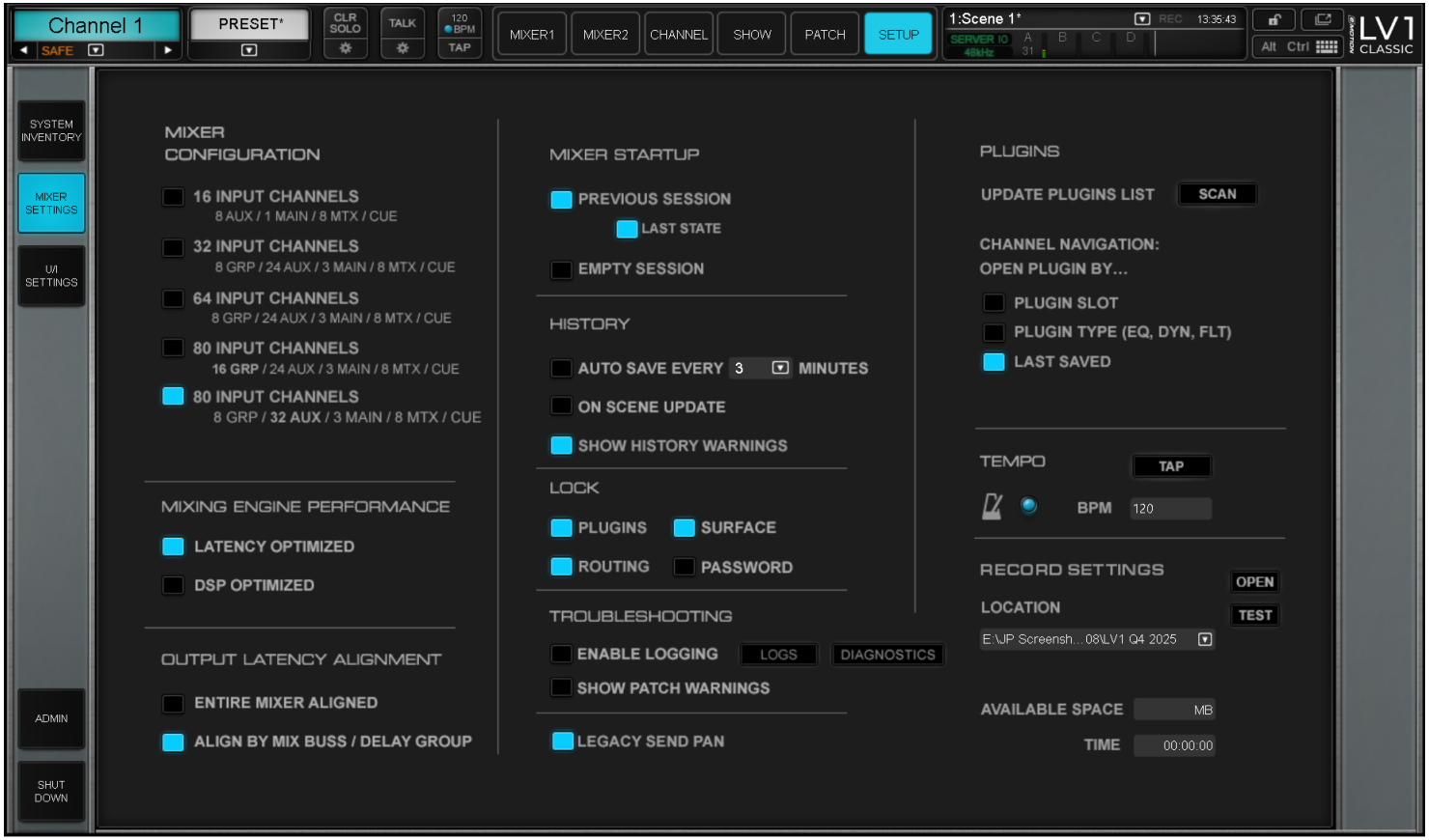
Other Controls

5 **Reset**
Clears the Error count.

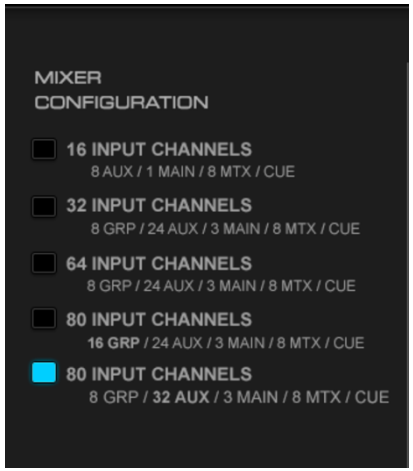
6 **Float**
Un-docks the Routing View window

Mixer Settings

Use the Mixer Settings page to establish system-wide parameters and define how new sessions are configured.



Mixer Configuration



The Mixer Configuration Panel sets the size and configuration of the mixer. The mixer can have 16, 32, or 64, or 80 or channels, and up to 16 stereo groups, 32 stereo aux channels, an L/R/C/M main buss, and an 8-channel stereo matrix channel, depending on the selected configuration. The maximum mixer size depends on your license.

If you are using an LV1 Classic, add an 80-channel license to enable two additional configurations. They are basically the same, except for these differences.

Option1: 80 input channels, 16 groups, 24 monitor aux mix busses

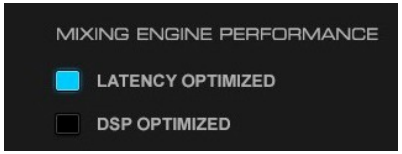
Option2: 80 input channels, 8 groups, 32 monitor aux mix busses.

Each configuration provides an L/R/C/M main buss, and an 8-channel stereo matrix channels

Changes made in the 80-channel configurations may be reflected in the Channel mode, Channel, window, navigation menus, side chain, user keys, and scope and recall safe panels.

Mixer size is normally established when a session is created, but you can change the mixer configuration of an existing session. Please note that if you reduce the number of channels in a session, the parameters in channels that are no longer part of the session will be discarded. Save a session under a revised name before you reduce its size. Mixer Layers without any channels are unavailable and their buttons are grayed out.

Refer to Appendix A of this manual for details concerning mixer licenses and configurations.



The **Mixing Engine Performance** panel sets the mixer's internal processing priority, which affects DSP performance.

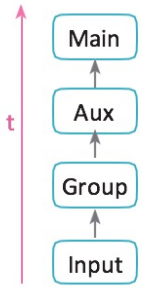
In the **Latency Optimized** mode, a processing cycle must include all signal processing paths, so there is no internal routing latency. However, processing in this mode can be less DSP efficient with certain plugin processors. In the **DSP Optimized** mode**,** processing can spread across several buffer cycles, regardless of signal path position. This parallel processing provides greater DSP efficiency, with increased latency on certain signal paths.

Setting Maximum Latency: Server Network Buffer (*located on the Server menu in the Inventory)*

The network buffer is the amount of time it takes for audio to stream from the I/O to the server and back. This determines the maximum latency for a processing route. Set the Server Network Buffer size in the Server rack of the System Inventory page.

Internal Routing	**Server Network Buffer**
40–56 samples	0–32 samples
80–112 samples	0–64 samples
160–224 samples	up to 128 samples

Latency Optimized



t = Determined by Server Network Buffer

Example (Latency Optimized Mode)

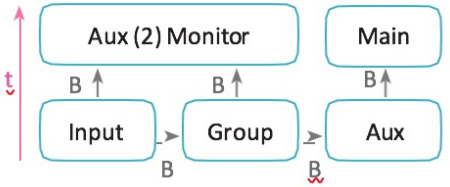
I/O ➤ Input ➤ Group ➤ Aux Monitor ➤ I/O

Latency = 0 samples

In the Latency Optimized mode, processing takes place in a linear manner. All processing must be completed within one buffer cycle. There is no added latency in mixing, but plugins that exhibit large processing spikes can delay the entire processing chain beyond the limits of the network buffer. This is indicated on the DSP meter as a large average/peak DSP ratio ("B" in the image below).

The green area displays average DSP use. The orange line shows peak use. If this ratio is especially large, the processor may overload. A solid yellow meter ("C") indicates that peak DSP load has reached 85%. To avoid audio drops, adjust your DSP use: (1) rebalance server assignments if you have more than one active server, and (2) remove or disable whatever plugins you can. If this doesn't help, switch to the DSP Optimized mode.

DSP Optimized



t = Server Network Buffer + sum of all B paths

Example (DSP Optimized Mode)

I/O ➤ Input ➤ Group ➤Master ➤ Aux Monitor ➤ I/O

Latency = 16 samples

In the DSP Optimized mode, latency is determined by mixer internal routing. There's better CPU headroom and efficiency, but processing paths spanning several buffer cycles can result in greater latency.

Certain paths will have zero latency, even in the DSP Optimized mode.

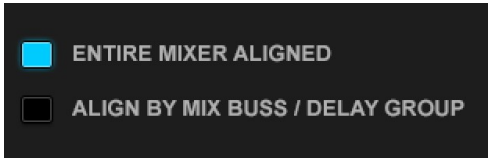
Example (DSP optimized Mode)

I/O ➤ Input ➤ Aux Monitor ➤ I/O

Latency = 0 samples

> The DSP meter displays the audio processing use in proportion to the DSP resources devoted to audio processing only.

Output Routing Latency

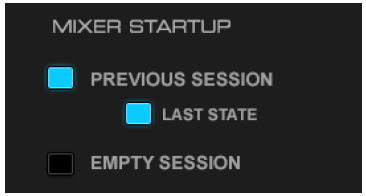


Sets alignment behavior of output I/Os.

Control	Action
Entire Mixer Aligned	Aligns the entire mixer to one common delay. There will be no separate delay groups.
Align by Buss/Delay Group	Enables up to 16 user-definable delay groups, each of which can have separate delays.

Plugin/buss delay compensation is calculated automatically per group. *See Appendix B* for more on delay compensation.
Individual plugins can be excluded from compensation (*Channel > Plugins Rack and Channels > Delay Groups*).

Mixer Startup



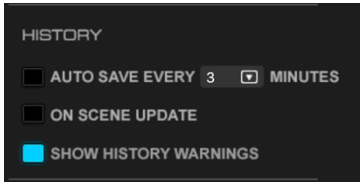
Determines the startup condition of the mixer.

Previous Session Loads the last session to its most recent user save.

Last State Loads the most recent session to its last state before quitting. This is the file created by the auto-save routine, as described below

Empty Session Mixer opens with a blank session.

History



Sets the rules for automatic saving.

Auto-save Options

Every "X" Minutes Auto-save (on/off) at a defined save interval (3–30 minutes).

On Scene Update Auto-save each time a scene is stored, recalled, or modified.

History files are recalled in the Show window.

The mixer stores an unlimited number of auto-saved files. All eMotion LV1 session files use the emo extension. These files are the same format as user-saved sessions but are stored in a separate folder. Access History files from the LV1 Admin section. Sessions and History files are stored here: Windows: Users\Public\WavesAudio\eMotion\sessions

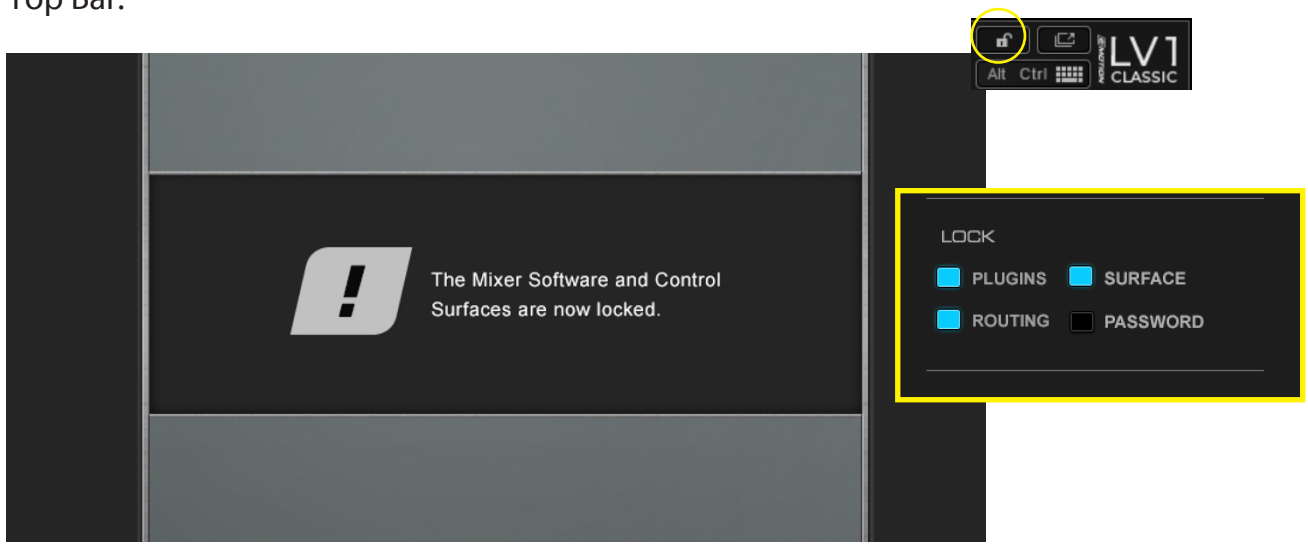
Show History Warnings

Deselecting this button triggers a “Do not ask me again” selection for History Warnings.

The maximum size of the History folder is 17 GB. Once that size is reached, the oldest files will be deleted in 2 GB increments. Oldest files will be removed first. If Show History Warnings is selected, LV1 will alert you when the History folder has reached 10 GB. This provides ample time to save history files you want to keep. Manually delete History files using the Kiosk.

Lock Mixer

The entire mixer surface—or selected mixer actions—can be locked to prevent unintended structural changes in a session, such as adding, removing, or copying plugins, or changing external patches. Locking these controls does not affect parameters or internal routing. Activate the selected lock options with the Lock button on the right side of the Top Bar.



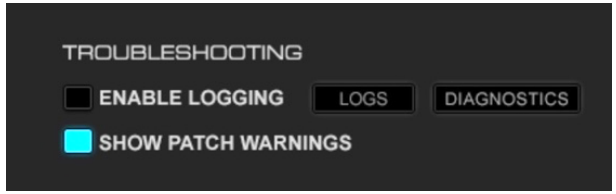
When Surface is selected and Lock is engaged, there are two ways to unlock the surface:

1. Fader bank: activate a user key that is mapped to the lock key.
2. Touch screen: press the Lock button.

You can also lock the application interface, with or without a password. This does not affect the mixer application, only the user interface. Locking the surface also prevents quitting the eMotion LV1 application.

Troubleshooting Section

Enable Logging



eMotion LV1 constantly logs its activity. Select **Enable Logging** to provide verbose logging for troubleshooting purposes. Click the **Logs** button to view or copy the log files. Send these files to Waves technical support if requested.

If more information is needed, a technical support representative may ask you to create and send a comprehensive diagnostics report of the SG operating environment, including certain details of your computer. To scan your computer and create a report, click **Diagnostics**. You will be presented with a privacy notice. If you agree to its conditions, a diagnostic report will be generated and saved to your desktop. When requested, send this file to Waves technical support.

There is a second tier of troubleshooting in the Admin kiosk

Show Patch Warnings

When selected, a warning is issued whenever any routing changes are made in the Patch window.

Legacy Send Pan

If you send a mono input channel to a stereo AUX Channel (or IEM) post pan (PSP), the send panner is redundant and so will not be displayed. If, however, you created a session with an older LV1 version using that panner, the session will open in Legacy Send Pan mode ON

When Legacy Send Pan is *disabled*, all the values of mono PSP panners in a pre-v16 session will be reset, and the redundant panner control will be removed from the interface. This action cannot be undone.

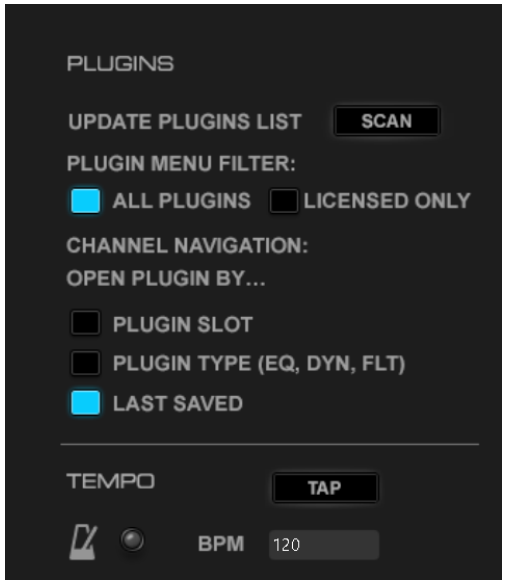
Plugins

Update Plugins List

Scans the system for new plugins.

Plugin Menu Filter

Sets which plugins are displayed in the Plugins drop-down menu: all Waves plugins or only those for which you hold a license.



Channel Navigation determines which assigned plugin will open when moving from one channel to another.

- **Plugin Slot**
  The plugin slot number is maintained, regardless of the plugin. So, if you're working on a plugin in slot 3 of channel 5 and you select channel 6, then any assigned plugin in channel 5/slot 3 will open.
- **Plugin Type**
  The type of the assigned plugin being edited will open, regardless of the slot number. So, if you are working with an eMO D5 and you move to another channel, the first instance of eMO D5 will open, regardless of the slot number.
- **Last Saved**
  Remembers the last plugin viewed on each channel. This information is stored in the session

Tempo

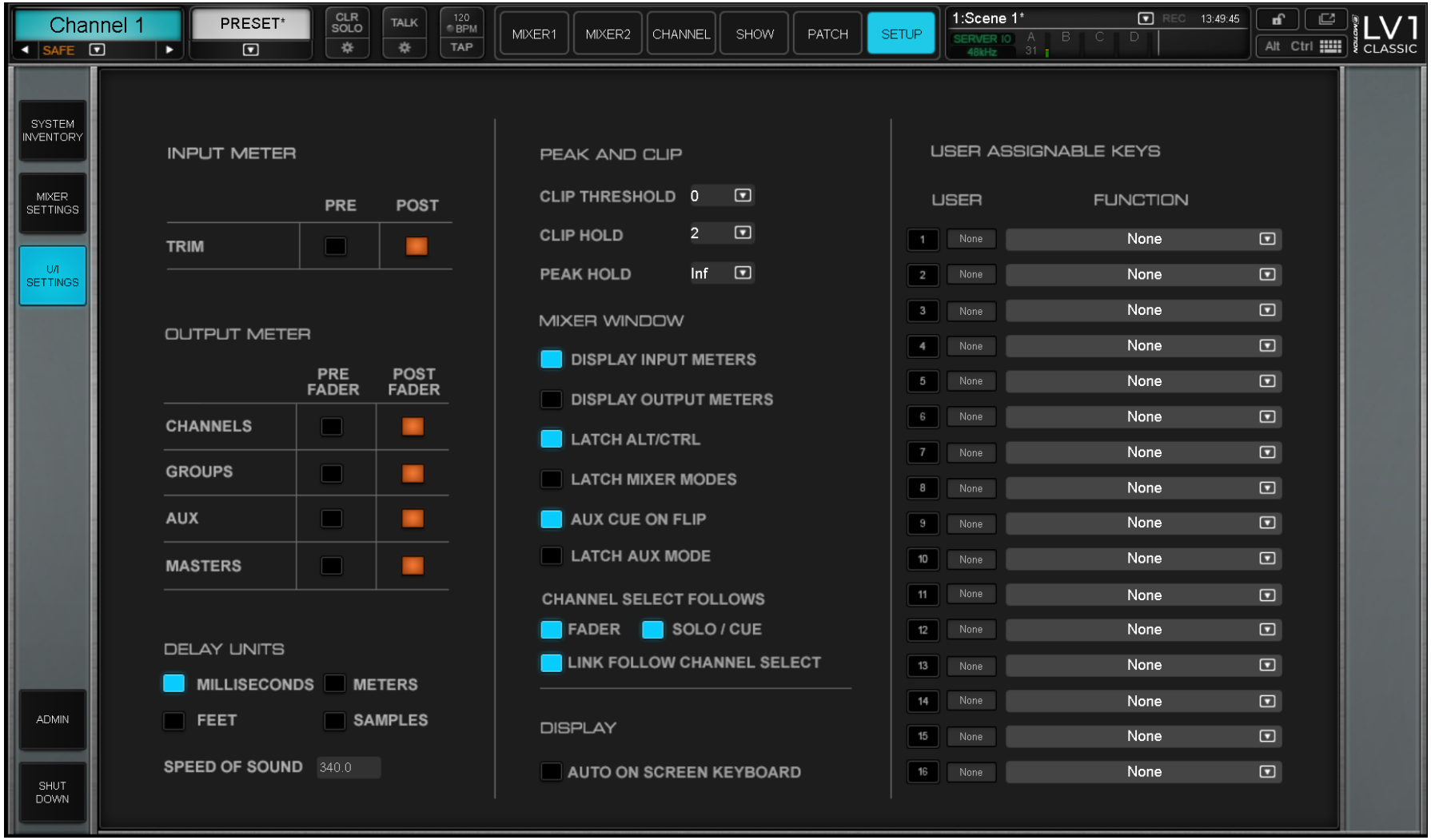
Sets the tempo for all relevant plugins in the mixer. By default, tempo-based Waves plugins are in a "tempo listen" state. Their tempo rates will fix to this value. Adjust by tapping the tempo pad or Ctrl + T on the keyboard. These taps are averaged to create a tempo value. You can also enter a numeric tempo value. The flashing tempo light helps to determine if the setting is correct.

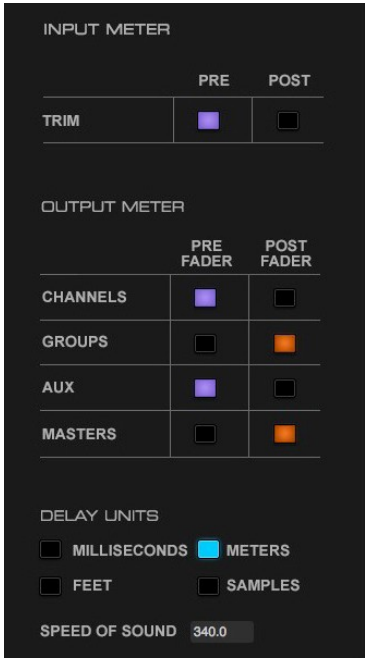
Default tempo: 120 bpm

The Tempo button and light also appear on the Top Bar.

User Interface Settings Page

The U/I Settings page is used to control meter behavior and to create assignable shortcut keys.





Input Meter

Selects the metering point at which the input level will be measured. Options: pre-digital or post-digital trim

Output Meter

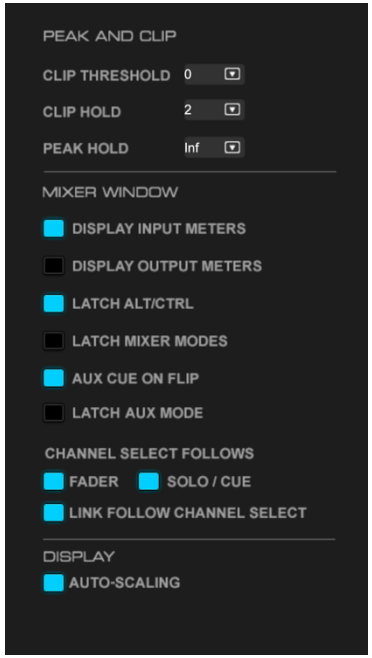
Separately selects output metering points for channels, groups, aux, and masters. Options: Pre-fader or post-fader for each category

Delay Units

Sets the unit of measurement for delay-related displays. This setting is provided for convenience only and does not affect delay processing. Delay Units: milliseconds, feet, meters, samples

Speed of Sound

User-determined speed of sound measurement for use in delay-related calculations, displayed in meters. Default: 340 meters/second



Peak and Clip Settings

Clip Threshold determines the level at which a peak light turns red, indicating clipping. Setting the Clip Threshold below 0 dBFS provides a warning before clipping occurs. This setting does not affect the behavior of the peak level indicator. Clip and peak hold sensitivity are set in here.

Clip Threshold: 0 to -28 dBFS, Clip Hold: 0 to 5 seconds, Peak Hold: 0 to 5 seconds

Mixer Window

Display Input or **Output Meters** Determines the meter source of the channel strip meters in the Mixer window. Options: Input or output.

Latch Alt/CTRL Keeps the onscreen keyboard Alt or Ctrl keys latched on until they are clicked off. When selected, the ALT and CRTL switches on the Mixer keyboard are in latched mode. Once clicked on, they remain engaged until clicked off. When not selected, these switches are momentary.

Latch Mixer Modes Prevents a Channel mode from changing when the Layer selection changes.

Aux Cue on Flip

Sets the behavior of the Aux mix track Cue buss when the mixer is in the Aux Fader Flip mode.
On: If you cue a different channel while in flip and then un-cue the source channel, the cue will return to the aux master channel.
Off: The cue will be cancelled upon returning to flip—resulting in the L/R mix.

Latch Aux Mode allows you to move from Aux Flip to other windows or modes and return Flip without interrption.
On: Flip remains active when you return to it after accessing other channels or more.
Off: Flip automatically turns off when returning from other channels or modes.

Channel Select Follows

Sets what user action will select a channel.

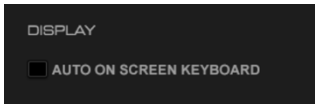
When **Fader** is selected, touching a fader in the Mixer window will select the channel. When Fader is deselected, touching a fader will not select its channel.

When **Solo/Cue** is selected, clicking solo or cue will also select the channel.

Link Follow Channel Select

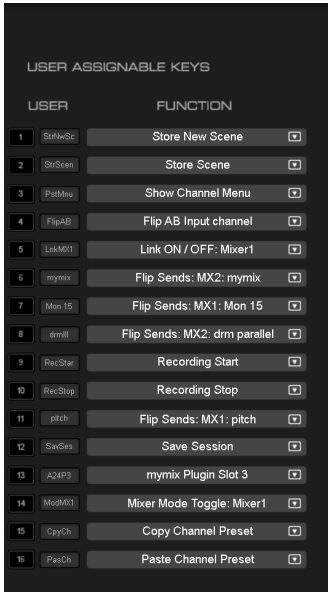
Selects link behavior when switching between link groups. (Links apply to faders, pans, and mutes).
On: When you have more than one link group, changing the channel select activates the new link. This is akin to selecting a new link in the Link drop-down menu.
Off: When you select a channel in another link, the link selection will remain tied to the original channels, but the new link will be operative. This enables you to adjust linked channels together without needing to select another link.

Auto On Screen Keyboard



When Auto On Screen Keyboard is On, the onscreen keyboard appears when any dialog box that expects text entry is opened.

User-Assignable Keys



UI Settings

Mixer

Frequent actions can be assigned to 16 user-assignable keys. Assignments are made from the drop-down menu associated with each key. User key assignments are organized by category. You can change the abbreviated name that appears on the recall button by double-clicking it. Use the on-screen keyboard, which is enabled in the Top Bar, if needed. The abbreviated name is stored with the session and will be cleared if the assignment is changed.

To recall a user-assigned key, select a number from the buttons on the left side of the Mixer window. User-assigned buttons are visible in every mode and layer of the Mixer window. You can also trigger user-assigned keys with the buttons to the left of the assignment menu.

User-assigned keys are triggered only in the Mixer window, but they can be used to trigger actions in other windows. They can also be assigned to dedicated buttons on external control surfaces.

User-Assignable Menu Items

Menu Item	Section	Function
Alt/Ctrl	Channel/Mixer windows	Activates Alt or Ctrl modifier keys on the onscreen keyboard.
Aux Flip Mixer 1 Aux Flip Mixer 2	Mixer window	The specified aux channel is placed in "Sends on Faders" mode. Sends level is controlled by the channel's large fader and the master fader controls the aux channel level.
Clear Solos	Mixer window	Clears solos in all mixer layers
Copy Channel Preset	Session/Preset menu	Copies channel preset to clipboard.
Copy Main Mix to Aux	Session/Preset menu	Sends the main mix to a specified aux channel.
Custom Layer 1 Custom Layer 2	Mixer window	Opens Custom Layer view on a selected Custom Layer.
Flip A/B Input channel	Channel/Mixer windows	Switches globally between Inputs A and B. This flips all channels in the session. The prompt, "Are You Sure?" is displayed before you confirm the change.
Keyboard Launch	Channel/Mixer windows	Calls up the onscreen keyboard.
Last Track	Channel/Mixer windows	Selects the most recently selected channel.
Link	Mixer windows	Turns linking on or off.
Mixer Modes Mixer Modes (Direct)	Mixer windows	Toggles between Mixer 1 and Mixer 2. Moves to selected mode in the selected mixer (e.g., direct to Route mode in Mixer 2).
Mute All	Mixer windows	Mutes the entire console. The prompt, "Are You Sure?" is displayed before you confirm the change.
Mute Channel	Channel/Mixer windows	Mutes/unmutes a specified channel.
Next Channel	Channel/Mixer windows	Selects the channel to the right (higher) of the currently selected channel.
Next Mode	Mixer windows 1 & 2	Moves to the next Channel Strip mode.
Next Scene	Top Bar/Show window	Recalls the next scene from the scenes list.
Open Session File	Session menu	Opens a navigation panel for selecting a session file to load.
Paste Channel Preset	Session/Preset menu	Pastes copied preset information and presents a list of channel preset paste options.

Menu Item	Section	Function
Plugin Bypass	Channel/Mixer windows	Bypasses/un-bypasses a specified plugin.
Previous Channel	Channel/Mixer windows	Selects the channel to the left (lower) of the currently selected channel.
Previous Scene	Top Bar/Show window	Recalls the previous scene from the scenes list.
Recording Start	Top Bar/all views	Starts recording on the local media recorder.
Recording Stop	Top Bar/all views	Stops recording on the local media recorder.
Recall Scene	Scene menu	Recalls one scene. Scene select by name.
Save Channel Preset	Session/Preset menu	Opens a navigation for saving a preset.
Save Session	Session menu	Saves the current mixer condition and overwrites the existing session.
Scene Undo	Show > Scenes page	Reverts to previously loaded scene.
Show Preset Menu	Session/Preset menu	Opens the Preset menu.
Show Scene Menu	Scene menu	Opens the Scene menu on the Top Bar.
Spill	Mixer window	Opens the Spill view
Store New Scene	Top Bar/Show window	Creates a new scene based on the current mixer condition.
Store Scene	Top Bar/Show window	Stores the current mixer condition to the selected scene.
Talk	Top Bar	Activates the Talk key.
Tap Tempo	Setup > Mixer Settings	Tap the recall button at the desired tempo. Result is displayed in the Tempo section of the Mixer settings page.
TB Preset	Talkback page	Selects one of eight talkback presets.
Toggle All VGain	Channel/Mixer windows	Toggles all channels between Preset and Local preamp modes.
Toggle View	Top Bar	Provides direct access to the six mixer windows.
View Channel	Channel window	Navigates to a channel to open its Channel window. Use the multi-level drop-down menu to select a channel.

Menu Item	Section	Function
View Plugin	Channel window	Navigates to a channel to locate a specified plugin. Assigned plugins will open the Main Control Section of the Channel window. Non-assigned plugins will be highlighted in the Channel window's plugin rack. One of each plugin category (EQ, filter, dynamics) per channel can be assigned a shortcut key.

Admin Controls

The Admin kiosk is used for maintenance, troubleshooting, file access, system recovery, and accessing the media player. It can be accessed from any page in the Setup window.

Admin quits LV1 and opens the Admin kiosk. You can reopen LV1 from the kiosk. The Admin kiosk is organized into two tabs: Basic and Advanced.

Click **Shut Down** to completely turn off the console. It will take a few seconds for all components to stop.

Basic Admin Kiosk Panel

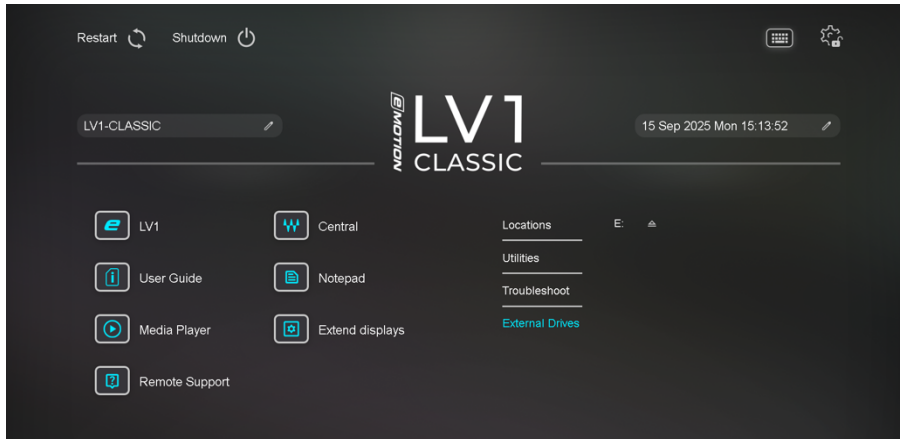
To change the session name, click the pencil icon at the top-left side.

To set the time and date, use the pencil on the top-right side. This is important, for example, when you are renting a Classic console and the license is time limited.

1	LV	Relaunches the console.
2	User Guide	Opens a PDF user guide that you can read on a browser or PDF viewer.
3	Media Player	Opens a media browser that enables playback through the console. The source can be a local file or a streaming service. This is commonly used for “walk on” music before an event begins. Patch the driver to an LV1 input channel.
4	Remote Support	Opens a utility that enables Waves technical support to troubleshoot your LV1 remotely.

5	Central	Takes you to Waves Central, the application for installing Waves software and licenses. Check in with Waves Central regularly for software updates.
7	Notepad	Provides a space to create notes.
8	Extend Displays	Takes you to the display configuration control panel.
9	Restart	Shuts down and relaunches the console.
10	Shut Down	Completely shuts down the console.
11	Keyboard	Opens an on-screen keyboard.
12	Advanced	Opens advanced ADMIN panel
13	External Drives	Displays all external USB drives connected to the system. Use this to eject removable media. Do not remove an external drive without first ejecting it, as this may damage the drive and compromise the data on it.

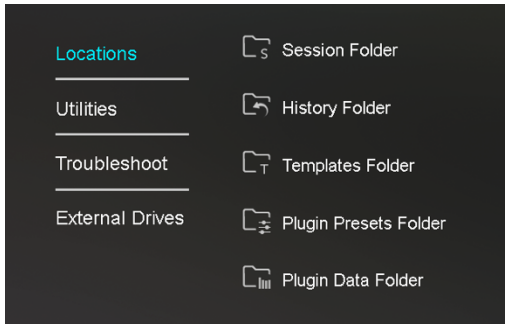
ADVANCED ADMIN KIOSK PANEL



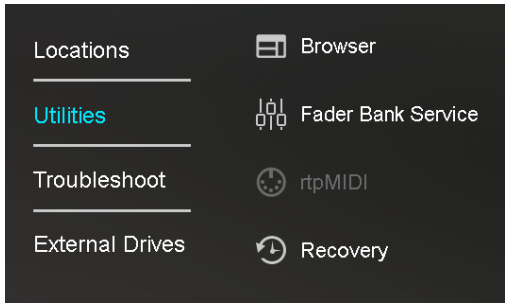
Click the gear icon on the right to enter the advanced admin mode. You will receive an "Are You Sure?" confirmation prompt. The Advanced controls are on the right. There are four tabs.

Going to the Advanced section takes you out of the console. Your session information will be saved, and it will be restored when you click "LV1."

The name of this system is shown in a box on the left side. This is useful when several LV1 systems are members of a SoundGrid network.



Locations takes you to the default folders where your LV1 files are stored. Open these folders to delete or copy session information.



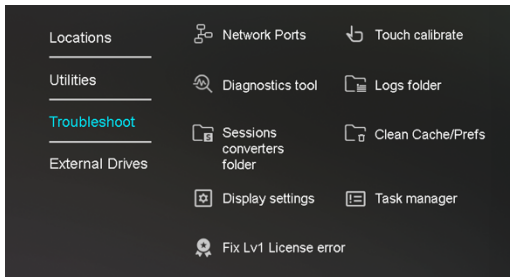
Utilities consists of four functions:

(1) **Browser** takes you to the internet browser.

(2) **Fader Bank Service** provides a firmware update and/or fader calibration. Full restart required.

(3) **rtpMIDI** is the bridge that lets Classic interact with MIDI. When rtpMIDI is installed, the indicator is lit.

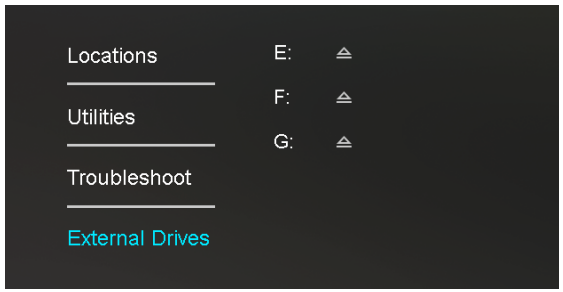
(4) **Recovery** returns the console to factory settings from a disk image built on your current software version. This will not affect your saved files (sessions, templates, history, plugin presets, and plugin data).



Troubleshoot provides maintenance and service utilities. Some are intended for skilled users and administrators, while others are used when troubleshooting with Waves technical support.

Troubleshoot Tab

Network Ports	Opens the Windows Network Connections panel. The Network connection is usually the internet connection. The SoundGrid network connects all internal Classic components as well as external devices.
Diagnostics Tool	Waves technical support may request a comprehensive assessment of your Waves system. This procedure scans the relevant sections of the console's computer.
Sessions Converters Folder	Sessions converters enable you to preserve a session when the software version changes. Normally this is transparent, but if you have a problem loading a session after a software update, check that the version of the session converter matches the version of the eMotion LV1 Classic software. If necessary, load the correct session converter from Waves Central.
Display settings	Opens the Windows Display control panel.
Fix LV1 license error	If LV1 Classic does not load, the kiosk will open and there will be a message regarding the license. To resolve the issue, select Advanced Admin options/Troubleshooting and choose "Fix LV1 License Error." This resyncs the license with the Classic console that you are using, regardless of who operates or owns it. If, for example, you encounter a license error on an LV1 Classic that you rented, you can connect the console to the internet, resync the license, and continue working without logging in to Waves Central. This requires an internet connection.
Touch Calibrate	Opens the Windows touch-screen calibration tool, used to coordinate touch controls on two or more displays. This is needed only when using an additional external display.
Logs Folder	A list of all technical logs. This is used primarily when consulting Waves technical support.
Clean Cache/Prefs	Clear these folders when you encounter unusual issues when instantiating plugins (such as loading old plugin versions or taking longer than expected to load). Clearing the preferences will require you to reset certain configurations.
Task Manager	Opens the Windows Task Manager.
Reset Network Ports	Use if the Network port in the System Inventory page is not properly reporting or cannot find the right port.



External Drives is a file browser that lets you access your connected drives.

Chapter 4:

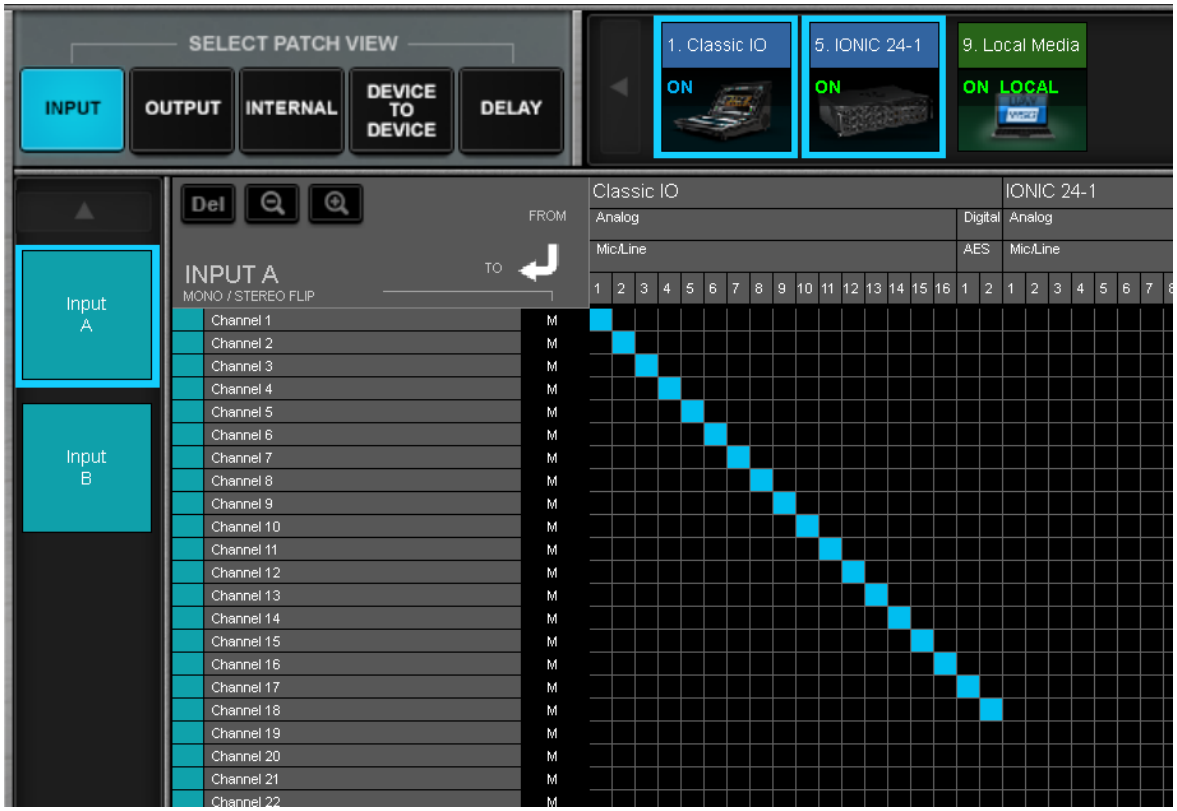
PATCH WINDOW

The Patch window establishes connections within the mixer, between the mixer and I/O devices, and between assigned devices on the SoundGrid network. It provides a comprehensive, detailed tool for patching the mixer and presents a wide overview of the mixer's condition so that engineer can quickly understand its configuration.

Patch Window Sections

The Patch window is divided into two functional sections that help you patch channels, busses, I/Os, delay groups, servers, and mute groups.

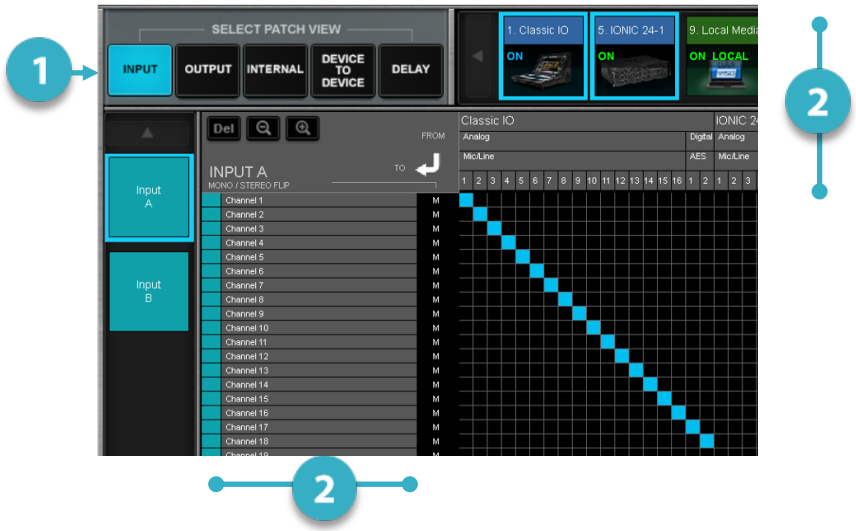
Frame for Filtering Tools: The frame on the left and top determines which channels and devices are needed grid to execute a particular patch.



Patch Grid: Patching takes place in the central grid. The function of the patch grid changes, depending on the patch view and filtering.

Filtering Tools

Since the Patch window can connect “anything to anything” within the mixer and between any assigned devices on the SoundGrid network, the number of potential patches is very large. To make patching manageable, sources and destinations are filtered according to the purpose of the patch.



In this example, the source I/O channels (the LV1 Classic) appear at the top of the grid, alongside the recorder. On the left side you see the Console input channels. Here, the recorder is not selected for display, so it does not appear in the patch.

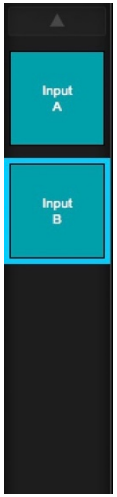
1. A view is established using the Patch View selector. This filter creates a framework that shows the correct category of channels or devices needed to make a patch, based on its purpose. For example, to patch microphones to the mixer, choose the Input view. This displays a grid of I/Os and mixer input channels. To stream audio between I/Os, use the device-to-device view, which displays only the I/O device channels.
2. Grid filters (top and left side) are then used to determine which specific I/O channels, mixer channels and busses, or delay, link, servers, and mute group controls will be available to patch from one point to another.

Patch Views

The Patch View selector filters the types of channels to display, based on what kind of patch is to be performed. Once a patch application is chosen, the Selector presents a patch grid with the correct categories of sources and destinations needed to execute those patches. There are five patch views:

Input	Patch between an assigned I/O device and one or more mixer channels.
Output	Patch between channel outputs and any assigned I/O device.
Internal	Assign channels to mix busses. Assign control groups, such as links/DCAs and mute groups.
Device to Device	Patch between assigned network devices.
Delay	Assign I/Os to delay groups and set delay group timing.

Grid Filters



Each patch view has buttons above and to the left of the patch grid. These buttons select the filters that determine the specific sources and destinations that can be patched in that grid. Grid filters are subsets of the patch views. The **Mix Busses** filter is, for example, part of the **Output** Patch View.

The grid filters on the left define the channels that make up the rows of the grid. These are usually mixer channels (except in the Device-to-Device and Delay views).

Columns of channels are defined by the top filters. These are almost always used to select I/O devices (except in the Internal view, where mixer busses are shown).

All I/O devices that have been assigned in the System Inventory page, including both hardware and software I/Os, are displayed on the filter frame. Their position—left, top or both—depends on the patch's purpose.

Navigating the Grid Filters

The scrolling arrows on each grid filter bar make for easier navigation within a long list of channels or devices.

Patch Direction

An arrow indicates whether patch signal flows from top to left or from left to top.

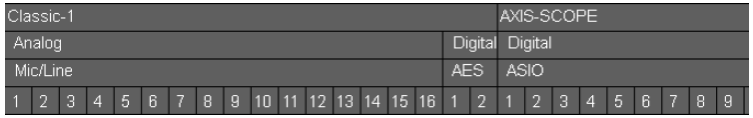
The Patch Grid

Once a Once a patch view and a grid filter are selected, the relevant channels are displayed in rows and columns. This (the Patch Grid) is where filtered channels, busses, and control information are patched.

Patch Grid Zoom Tools

Zoom in and zoom out buttons enable detailed views or broad overviews of the patch grid.

Grid Row and Column Information



Row and column names and other information are displayed in the row and column headings.

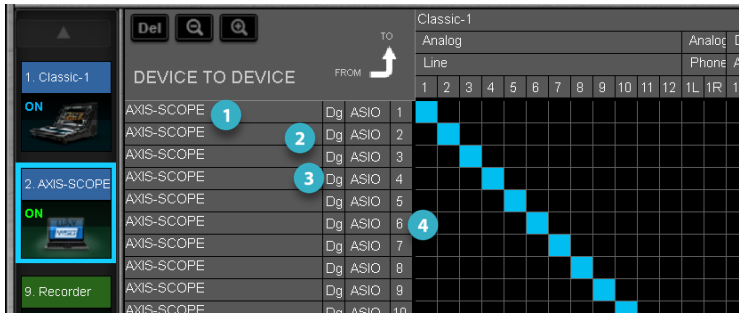
There are two types of information displayed here, depending on the view:

- I/O devices (hardware and software)
- Mixer channels, busses, and control groups (link, group, delay, servers)

Row and column names are shown in all views

I/O Device Channels

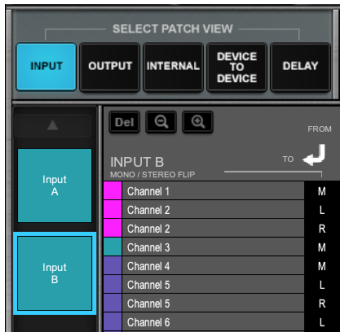
Hardware and software I/Os are represented by icons, which appear in the horizontal and/or vertical grid filter bars, depending on the patch view. Click on a device icon to display its I/O channels, and additional applicable information. Any number of available I/Os can be expanded simultaneously to reveal their channels.



1. Name of I/O device or driver. Matches the device icon in the Inventory.
2. Format: Analog or digital.
3. Connector: Mic, line, phones, AES, S/PDIF, ADAT, MADI, ASIO, etc.
4. Channel Number

Next to the device name is a series number. This indicates the device's slot number in Device Rack A (1–8) and Device Rack B (9–16) (Setup > System Inventory > Device Racks).

Mono and Stereo Channels



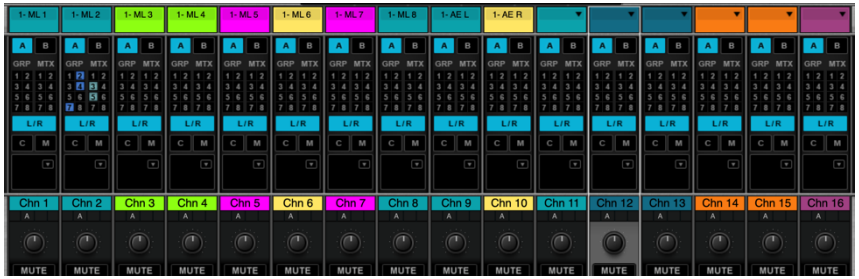
- Input channels can be changed from mono to stereo by double-clicking on the M or L/R buttons. When a mono channel is flipped to stereo, its name appears on both the left and the right sides.
- When a channel is flipped from stereo to mono, the left channel patch becomes the mono patch.
- Mono/Stereo status reflects the current state of the channel and can be changed only on Input channels.

To change a channel's name, double-click on its Name field and type up to 12 characters. The name is also displayed, and can be changed, in the Mixer channel strip and in the Top Bar. Use tab to move to the next channel when renaming, and shift-tab to move to the previous channel name cell.

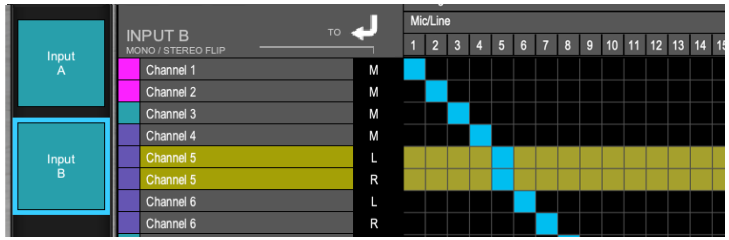
Customize View

You can color-code the channels to better organize the view. Channel coloring is reflected in all views.

1. In the Preset menu, select Set Channel Color or click the colored cell to the left of the mixer channel name in the patch. This opens the Color Picker.
2. Select a color from the palette.
3. Use the left/right arrows to apply colors to additional channels.



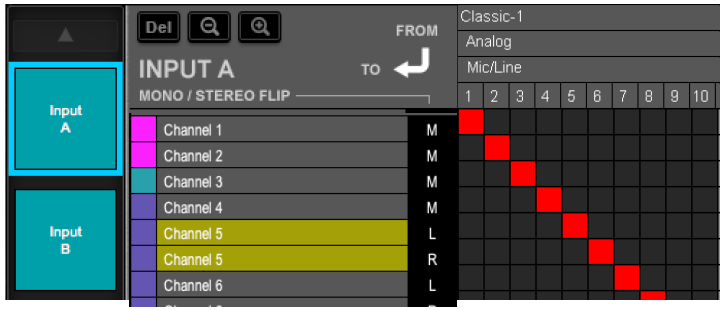
Patch Point



A patch is created at the intersection of horizontal and vertical grid lines.

Select patch points individually or draw a straight line vertically, horizontally, or diagonally. Click again on a patch to remove it.

- A valid patch is blue.
- A yellow highlight identifies the selected channel
- A stereo channel can accept signals from two independent mono sources.
- A red patch indicates that the patch point was taken from you, most likely by the manager.
- Shared I/O channels are shown as yellow columns.



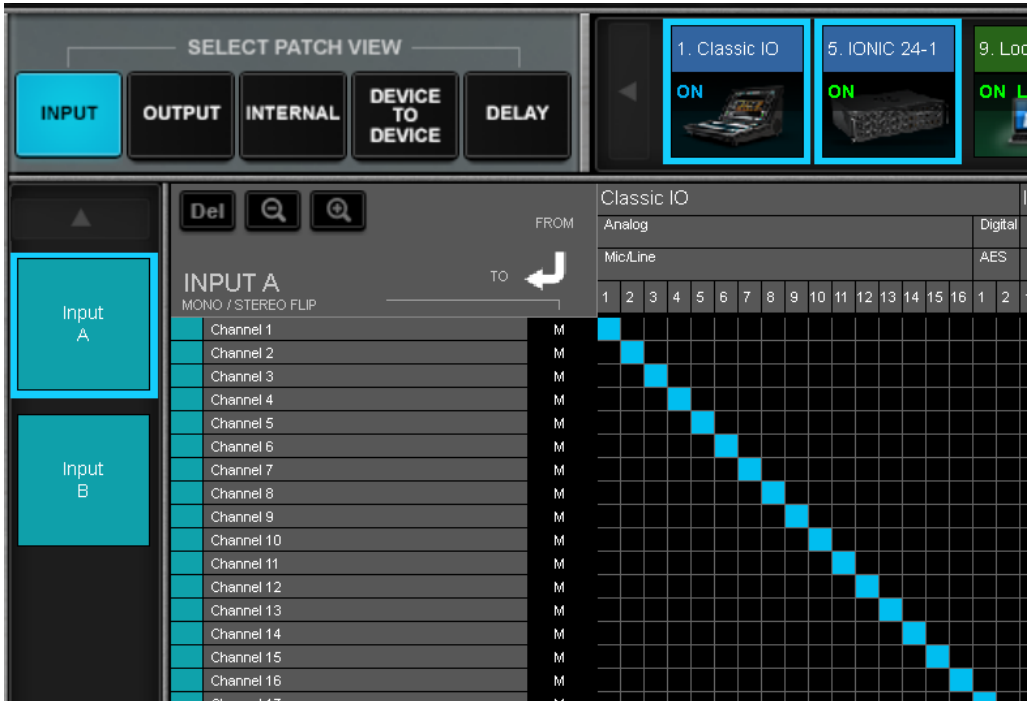
Remove all patches using the **Delete** button. This deletes the patches for all channels in the displayed Patch View, without affecting other Patch views.

Mixer Inputs

This is the only patch view where signal flow is from top to left (I/Os on top to input channels on the left). To avoid confusion, it is convenient to name the channels before patching. You can create and save templates to streamline setup. Templates can store all channel, I/O, patching and processing information, which can later be modified if needed. Refer to the *Show*chapter of this user guide to learn about templates.

Input Patch Behavior

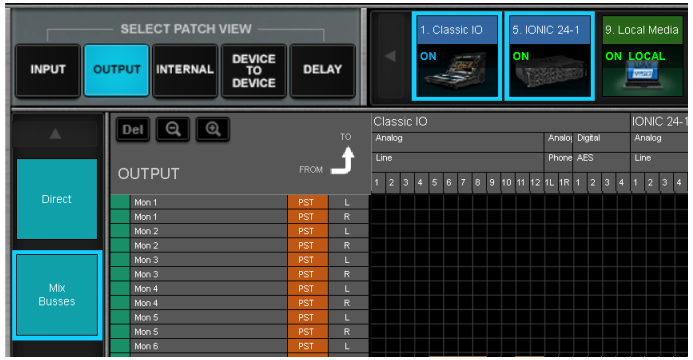
- Inputs A and B can patch to the same I/O channels or to different I/Os.
- An I/O device channel can be patched to more than one mixer input channel.
- A stereo channel appears as two independent channels (L and R) with the same name.
- The two sides of a stereo channel are patched separately, whether from a single stereo I/O channel or from two different mono channels.



Mixer Outputs

A mixer channel or buss can be patched to any available I/O that has been assigned to eMotion LV1.
The Output view has two grid filters: Channel Direct outs and Mix Busses out. Mixer outputs are displayed on the left and assigned I/O device channels are displayed along the top.

Each channel or buss can output from one of four sources, indicated by the multi-colored buttons.
To select a source, click on its button:



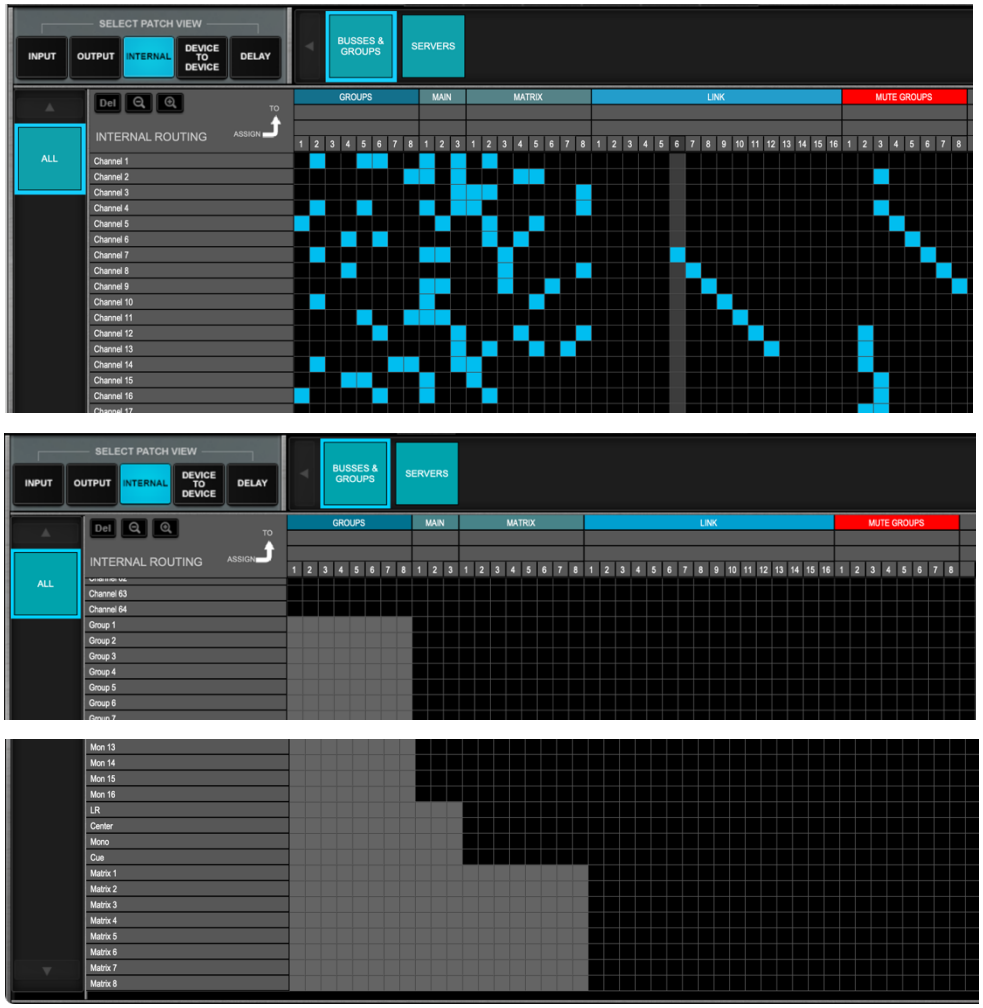
INP	Green	Before all processing, post input gain
PRE	Purple	Pre-fader, post-processing
PST	Orange	Post-fader, post-processing
fader	Turquoise	Post-fader, post-processing, post-panner

On a stereo buss, source settings apply to both left and right channels. An I/O device can receive only one source signal.

.

Internal Routing

The Internal Routing view patches within the mixer; there is no patching to external devices. Each of these patches can be made on a channel-by-channel basis in other windows. The Internal Routing view, however, provides an overview of mixer assignments and lets you quickly establish many patches at once. There are two patching frames: (1) Busses & Groups and (2) Servers.



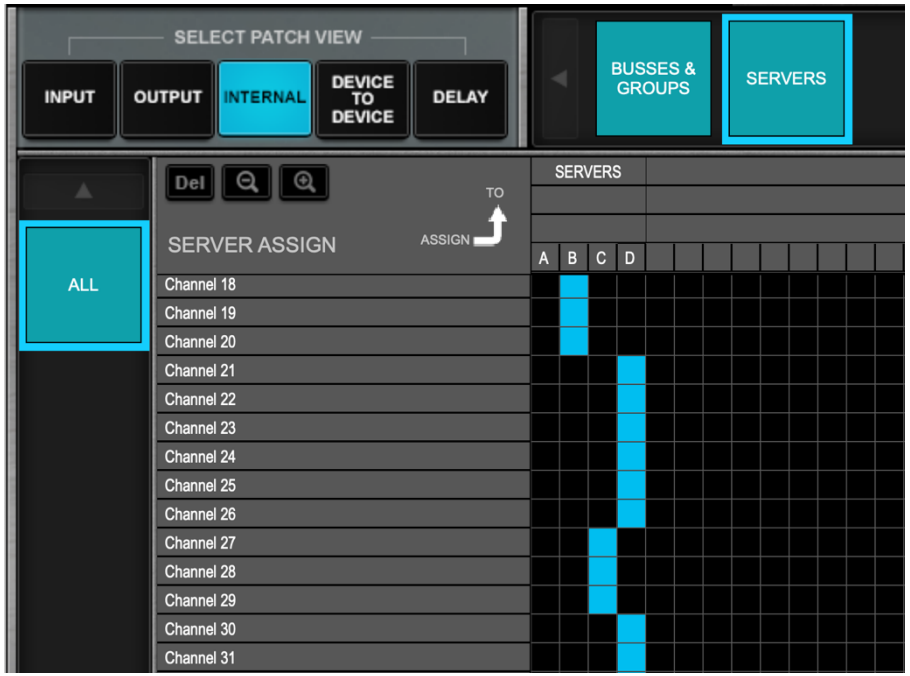
Busses & Groups patches these mixer channels (Channels, Groups, FX, Mon, Main, and Matrix) to busses (Groups, Main, Matrix, Link, and Mute Groups).

The scope of these internal assignments is set in the Mixer Configuration window (Setup > Mixer Settings > Mixer Configuration). Larger mixer configurations include more groups, aux channels, and busses.

A channel can patch to any buss, but a buss cannot patch to itself or to any buss that is earlier in the signal flow.

Illegal patch possibilities are grayed out in the grid.

Assigning Servers

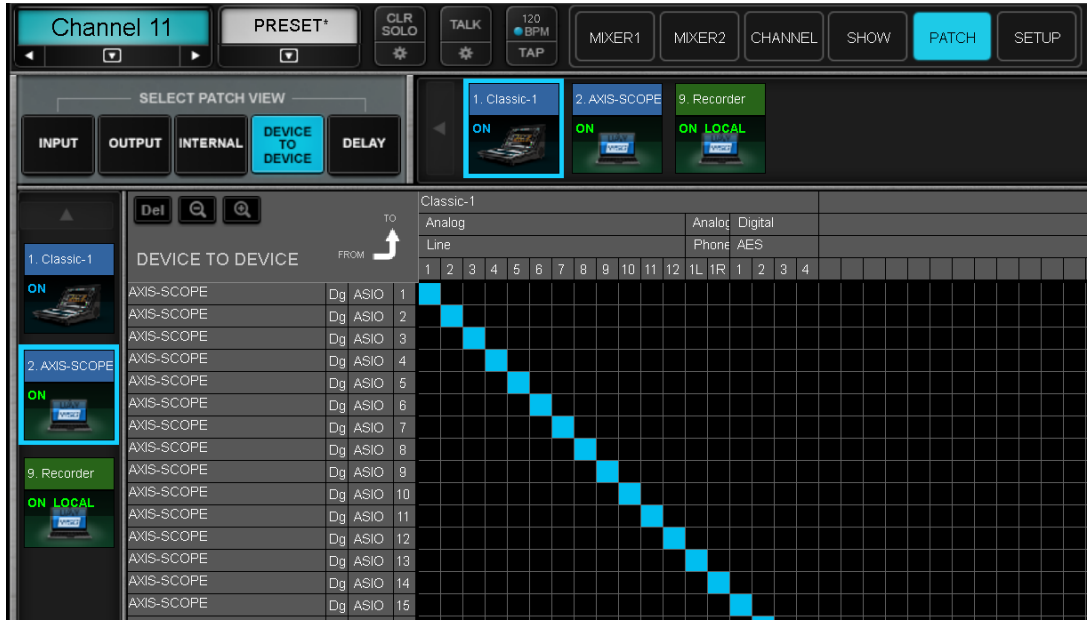


Servers provides an overview of server group assignments.

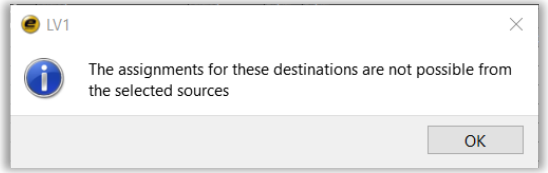
This is a convenient way to patch a server to multiple channels at once, as shown here. This is a quick way to understand how servers are assigned in the mixer and to rebalance server distribution for maximum DSP power.

Device-to-Device

The Device-to-Device patch view is like a network patch bay. It enables all devices assigned to the mixer to patch with one another. This view does not allow patching to or from the mixer.



Device-to-Device Patch Behavior



All I/O devices that are assigned to the LV1 inventory appear in the Device-to Device view. A device can patch to any other assigned device, but not to itself.

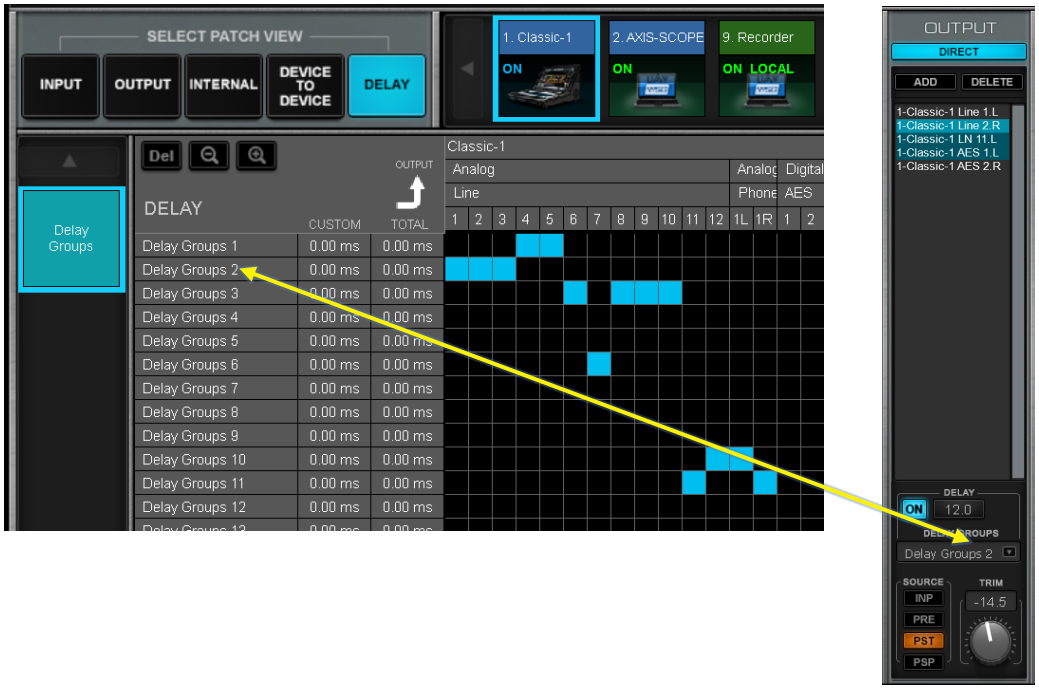
Delay Groups

Delay groups are collections of I/O device channels whose timing can be controlled as a unit. These are not audio busses, but rather a means of managing the delay of one or more grouped I/Os. A delay group typically consists of several I/Os. An individual I/O can belong to only one delay group.

DELAY GROUPS SERVE TWO FUNCTIONS:

- Coordinate plugin and buss latency compensation to busses routed to selected I/Os.
- Apply the same delay to all I/Os in a group.

The mixer's 16 delay groups are listed on the left side of the patch grid, along with their user-defined (Custom) delays. The total latency of the delay group (processing delay + custom delay) is also shown.

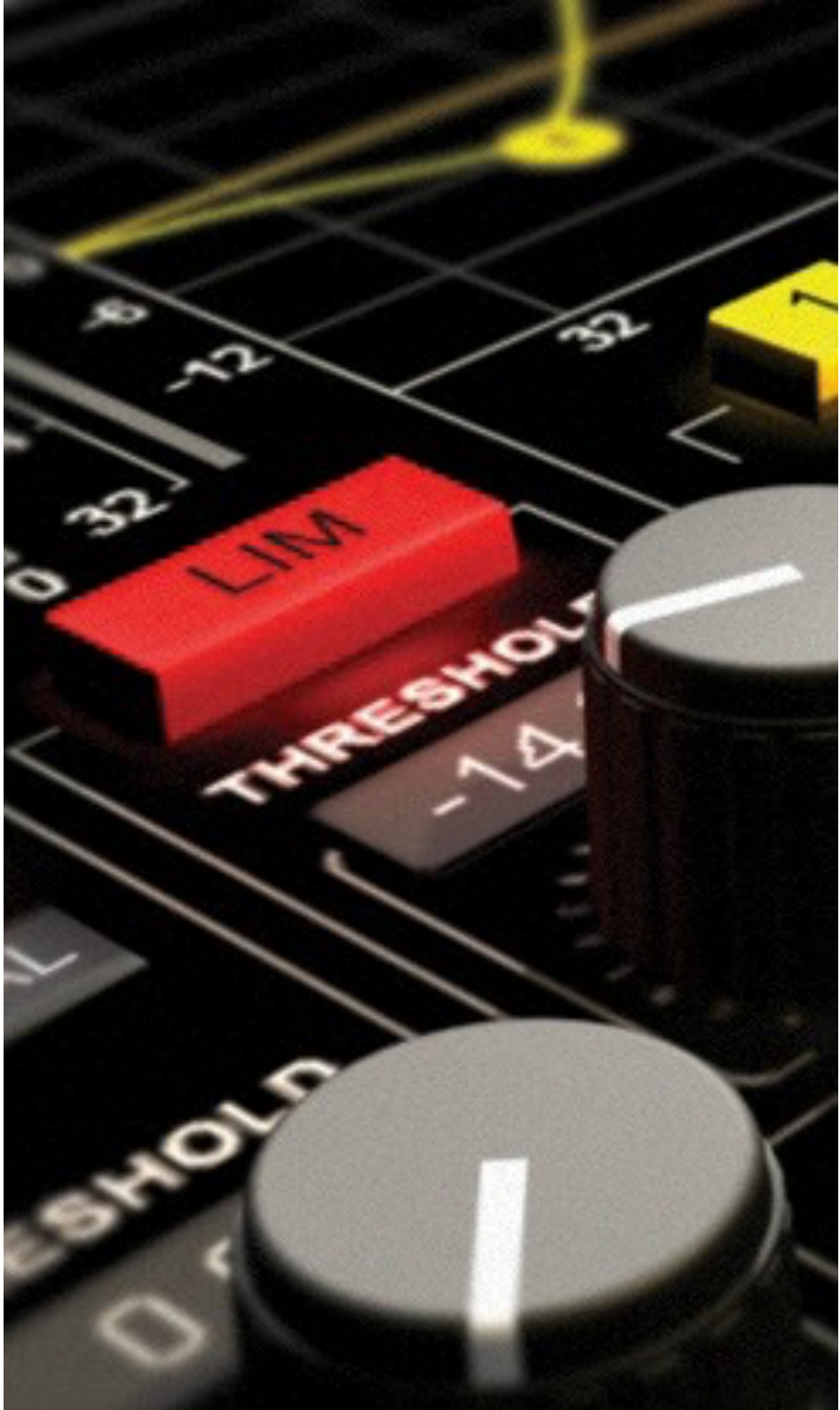


Delay groups can also be established in the Channel window. Please refer to *Appendix D* of this user guide for a detailed description of eMotion LV1 delay management.

Chapter 5:

SHOW WINDOW

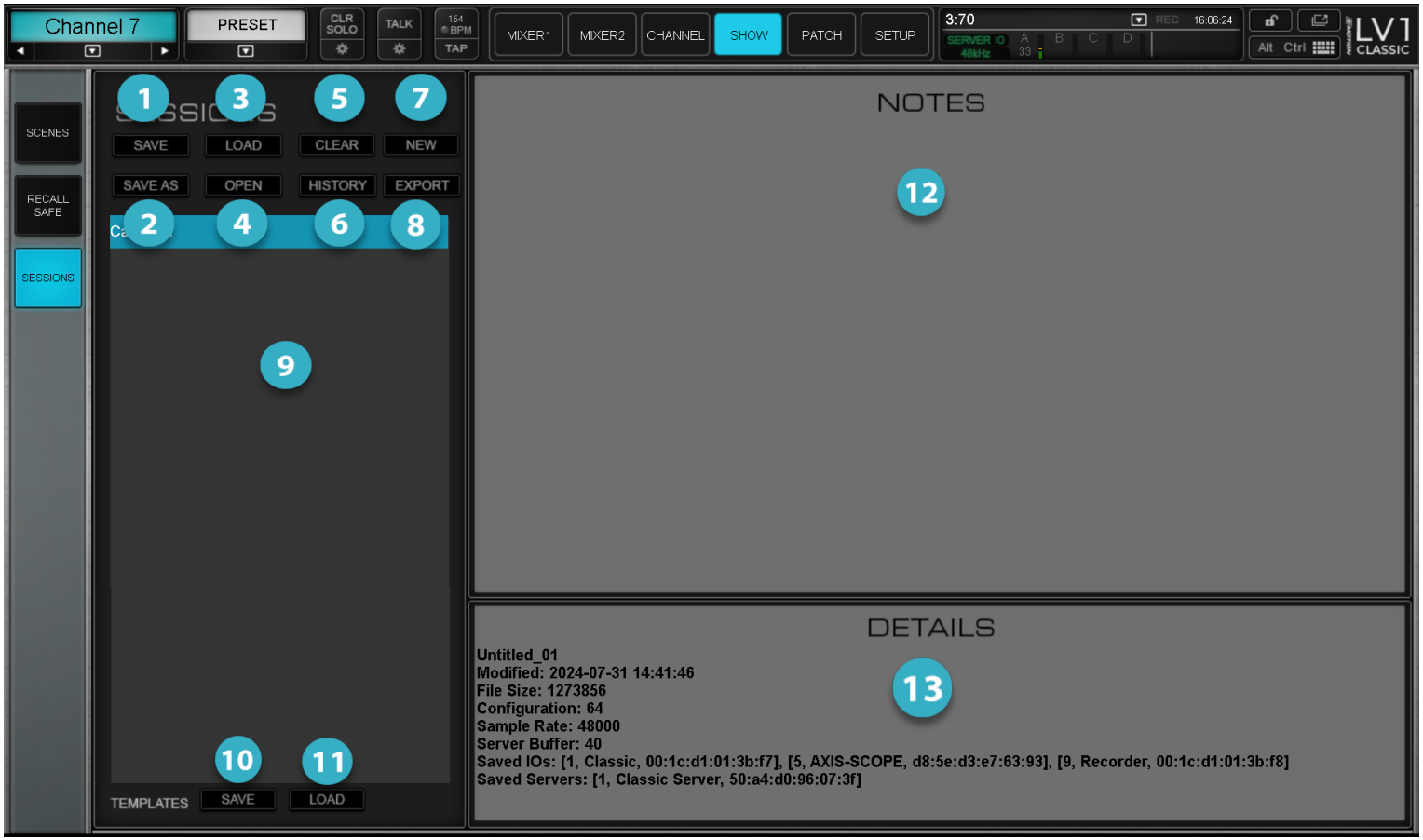
Sessions, scenes, and recall- safe parameters are managed in the Show window. Overall mixer parameters, snapshots of specific program changes, scene scope and recall safe are all set here.



Sessions Page

The Sessions page is where you save, load, and name the session files that contain all mixer settings. This includes:

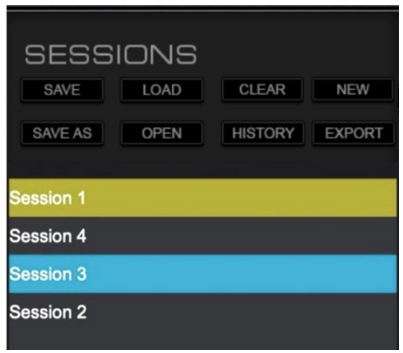
- Inventory
- External patching
- Channel presets and rack configuration
- Plugin presets
- System preferences
- Internal mixer patches
- Faders, panners, and aux sends



Sessions Page Elements

1 Save	If a file has not been saved previously, Save creates a new file. Otherwise, it replaces the existing file. A session is normally saved in the default folder, but a navigation window enables it to be placed anywhere. See *File Organization*, later in this chapter. If a session includes offline devices, those devices and their settings will be saved with the session. These settings will be applied to the relevant device when it comes online.
2 Save As	Saves a new copy of the current session. The new file becomes the current session.
3 Load	Loads the selected session displayed in the Sessions list.
4 Open File	Opens a session from an external location. If the file is opened from a USB drive, it will be copied to the internal drive, and all consequent saves will be to the internal drive. To save a session to the USB drive, use the export function.
5 Clear	Clears the Sessions List. This does not delete the sessions. Cleared sessions can be re-loaded and added to the Sessions list using the Open button.
6 History	Opens a browser that shows all auto-saved session files.
7 New	Opens a new blank session.
8 Export	Exports the selected session (as a copy) to an external USB thumb drive. This lets you, for example, move a session to another LV1 Classic.
9 Sessions List	Displays a list of all sessions created since the last Clear, or those that have been opened from other locations.
10 Save Template	Saves current session as a template. Templates are stored in the Templates folder.
11 Load Template	Loads a factory or user-made template. When a template is loaded, its contents are loaded, and the resulting session is named “Untitled.” Use Save As to save and name the session. Templates are a good starting point for building a new session.
12 User Session Notes	A large notepad used for entering details about the session, the venue, or anything else you want to write.
13 Session File Details	Displays session information including: • Session name, modification date and time, and size, as reported by the operating system • Configuration, sample rate, server buffer • Saved I/Os, saved servers

Sessions List



The Sessions list shows the sessions that LV1 has loaded, not necessarily all the sessions in the Sessions folder. It is used to select, copy, and load sessions.

If you clear the list, all the sessions will be removed from the panel, but they will remain in the Sessions folder.

> An example: Let's say you hire an LV1 Classic from a sound rental company. When you open the Sessions page, the list is filled with sessions that mean nothing to you—session names that you don't want to clutter up your list. Clear the list and it will be empty. Copy your sessions from your thumb drive. When you load a session, it will populate the Sessions list. The previous user's sessions reside safely in the Sessions folder.

Color codes indicate a session's status as follows:

- A selected session is highlighted blue (whether it is the recalled session or not).
- A highlighted session is not active until it is loaded.
- If the current session is not selected, it will be highlighted yellow, and the selected session will be highlighted blue.

Notes associated with the selected session are shown in the Notes section.

Loading a Session

Load a session from the Sessions list or from the Preset menu.

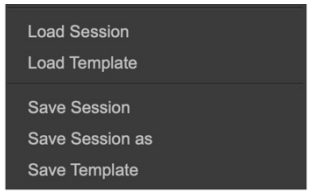
Loading a Session From the Sessions List

The **Load** command loads a session from the selected session in the Sessions list. **Open** loads a session not currently in this list. Opening the session from a USB drive copies the session to the Sessions folder on your console's internal drive, after which LV1 will not search the USB drive. You cannot run a session from a USB drive.

> **Important:** Loading a session can result in a dropout or click. Do not load a new session when this is not acceptable.

Loading a New Session

Click the **New** button to open a blank session. This loads the three EMO plugins with their default values. Patching, inventory, and any other information that is stored with a session is not removed. The new session will not appear in the Sessions list until it is saved. Use **Save** to save the session and assign a name.



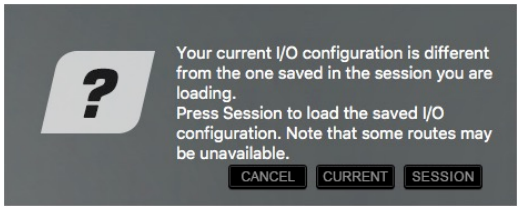
Loading Sessions from the Preset Menu

The Preset menu is located on the left side of the Top Bar. It is used primarily to manage channel presets, but it also provides a quick way to load and save sessions and templates.

Resolving Load Errors

If there are differences between the session being loaded and the current mixer size or inventory, the mixer must reconcile this mismatch.

Example 1

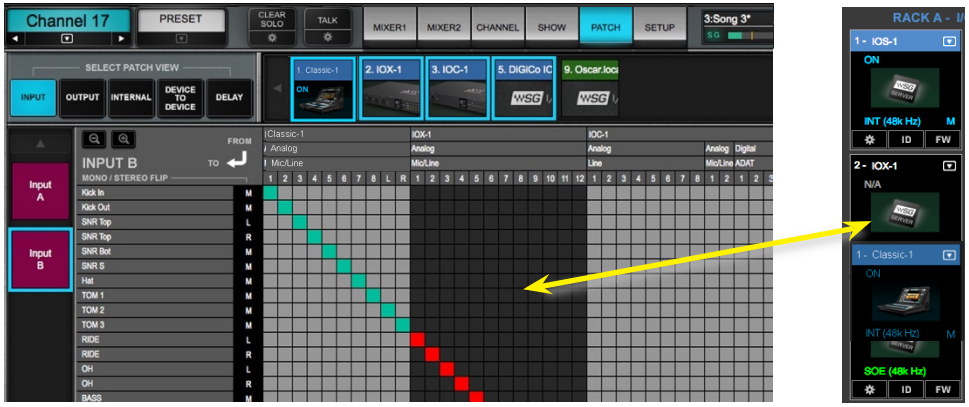


The I/O inventory of the saved session does not match the current mixer inventory.

Whenever the saved session's I/O inventory is not the same as that of the mixer, there is a chance that certain channels cannot be supported. If, for example, the session calls for a 128-channel MADI device while the I/O in the same slot is an Ionic 16, it will be difficult to provide the session with the channels it needs.

The Session Load routine provides two strategies for loading sessions onto mixers that are mismatched.

Option A: Session – The session loads completely, even though the device inventory does not match the session. Devices called for by the session and missing from the rack slot will appear as not available (N/A). The session's patching does not change, but the I/O channels of unavailable devices are not accessible and are colored red.

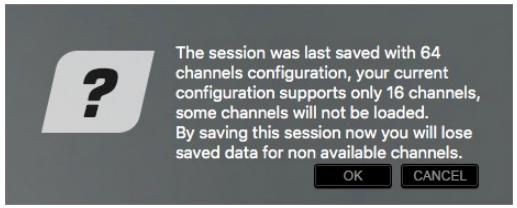


Option B: Current – The saved session loads into the existing I/O inventory. The saved session is replaced with a new one that reflects the current device inventory. The mixer searches each rack slot for an assigned device that will match the needs of the session. The device in the slot does not need to match precisely what the session requests, but it must have sufficient I/O channels.

System Inventory is catalogued by slot, not by rack, so an appropriate device must be found in the same slot specified by the session. The original session's patches for the I/O in a specific slot will be patched depending on the current channel count. For example:

- The session calls for an Ionic 24 device in slot 1 and another in slot 2 (16 I/O channels each).
- The current inventory has 64-channel I/Os in slots 1 and 2.
- When you load the session into this inventory, all patches will be intact. The first 12 I/O channels from each interface will be patched, but the remaining channels are unused.

Example 2



The saved session has more channels than does the current mixer configuration. In this case, the session calls for 64 channels, while the system inventory has only 32. If the mixer can be enlarged to 64 channels, the session will load without incident. Otherwise, the last 32 channels will be deleted and the settings associated with those channels will be lost. In either case, it's important to save a copy of the session before proceeding.

Missing Server

If you load a session that requires a server that is not present in your inventory, you will be asked to reconcile the session with the inventory. The server may be disconnected, off, or not in working order. Check these possibilities and return the server to its slot in the Servers Rack. If the original server is not available, replace it with a comparable server, in the same slot.

Session Will Not Load—Session Converters

If a session will not load, there's a good possibility that the session converters are not aligned with the session that's being loaded. To remedy this problem, follow these steps:

- Enter the Kiosk.
- Launch Waves Central and log in, if necessary.
- Go to Install Products and click on All Products at the top.
- In the Search field, type Session Converter and choose Session Converter.
- Click Install.
- Re-launch eMotion LV1 Classic and load your session.

If your session still does not load, contact Technical Support.

Templates

A template is a mixer session based on a previous session or a factory preset. It loads all mixer parameters (except the I/O inventory), which facilitates moving projects between mixer systems whose inventories are not identical.

A loaded template does not appear in the Sessions list. It will initially be named “Untitled.” Once loaded, a template should be saved as a session under the desired name. It will then appear in the list.

Use the Templates/Save button to create a session template from the current session.

Templates are filed in the Templates folder:

Mac: Users\Shared\Waves Audio\eMotion\templates
Windows: Users\Public\Waves\eMotion\templates

Saving a Session

If a file has not been saved previously, **Save** creates a new file. Otherwise, it replaces the existing file.

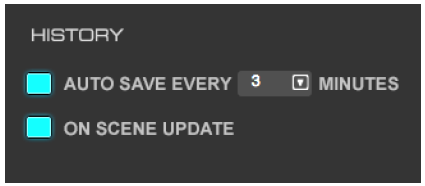
A session is normally saved in the console's D drive folder, which is accessed in the Kiosk (Users\Public\Waves\eMotion\sessions).

A navigation window enables you to store the file anywhere.

The Sessions folder includes two sessions: "CurrentLV1.emo" and "CurrentLV1.emo-journal." These are the recovery files. Do not delete or move them.

See *File Organization*, later in this chapter, for more details.

Auto-Saving Sessions



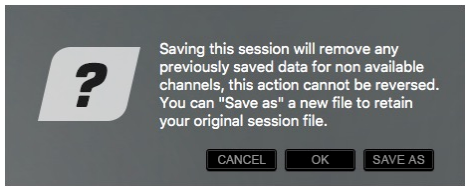
The mixer can save sessions automatically, either at user-defined intervals or each time scenes are saved or recalled. Auto-save settings are managed in the Mixer Settings page (Setup > Mixer Settings > History). To prevent mishaps, eMotion LV1 does not delete auto-saved files. This can result in a large number of files, but it provides access to all session information saved throughout a project.

There are three Auto-Save settings

No Auto-Save	No automatic saves; no History files are created.
Auto-Save	New History files are created at user-defined time intervals.
On Scene Update	A new History file is created each time a scene is recalled or stored.

Click the History button above the Sessions list to open a browser that shows all History files. They are named with the session name and a date/time timestamp. Locate a session and open it. These files are stored in the History folder on the console's D drive and can be accessed via the Kiosk (Users\Public\Waves\eMotion\history).

Saving a Session After Mixer Configuration Has Changed



It's possible to change the number of mixer channels at any time, depending on the scope of your license. If the number of channels in the session has been reduced since the last time it was saved, this prompt will appear when you save.

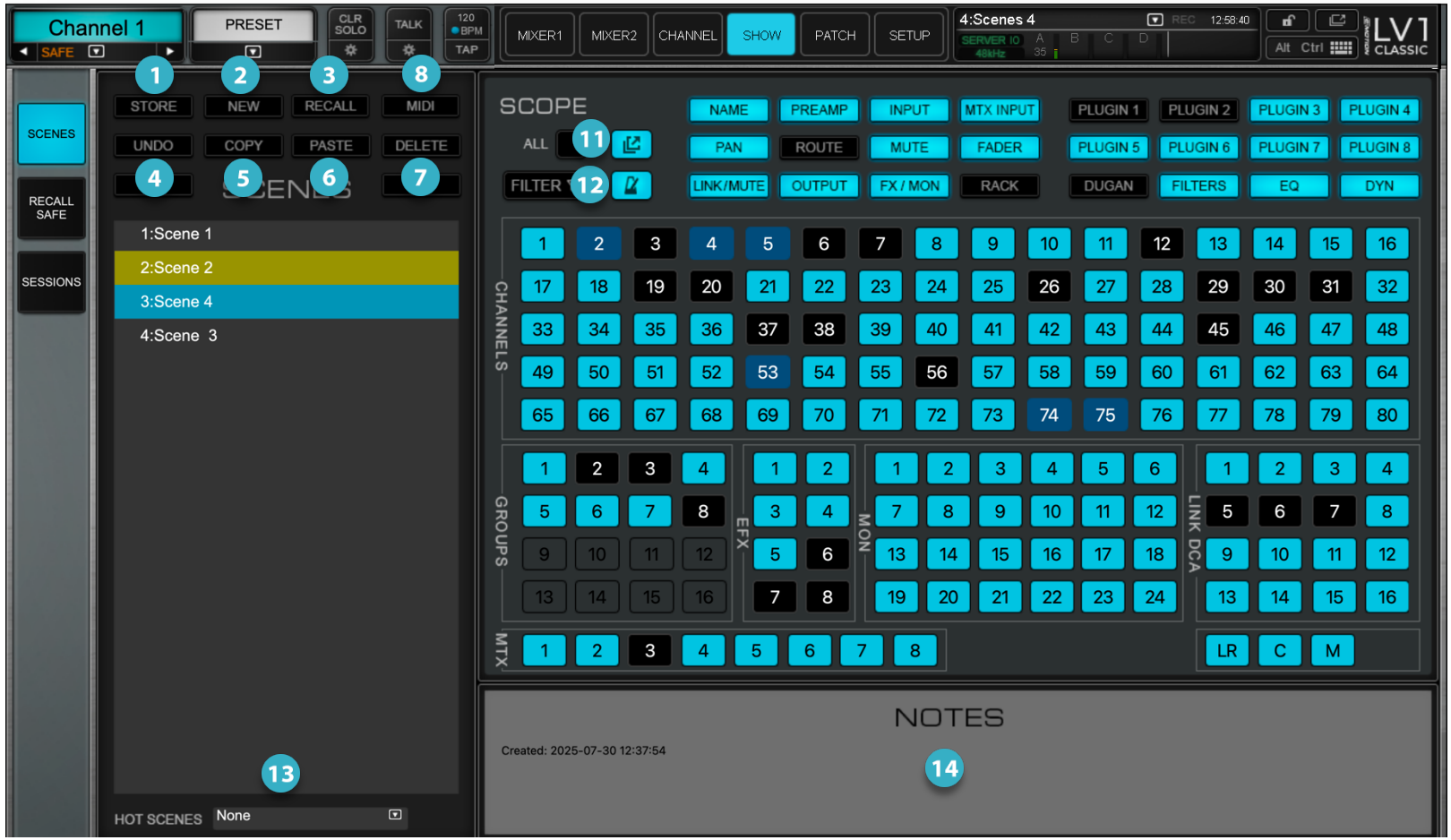
Removing channels clearly results in a loss of channel information. A normal Save at this point would eliminate all settings from the removed channels, since it overwrites the session file. To preserve that information, save the session under a different name—before you change the configuration—unless you are absolutely certain that you want the mixer to be set to a smaller size.

If the new session has the same number of tracks and calls for the same, or similar, I/O inventory, the new session will load immediately. When working on the same mixer repeatedly, this is usually the case.

Set mixer size via Setup > Mixer Settings Page > Mixer Configuration

Scenes Page

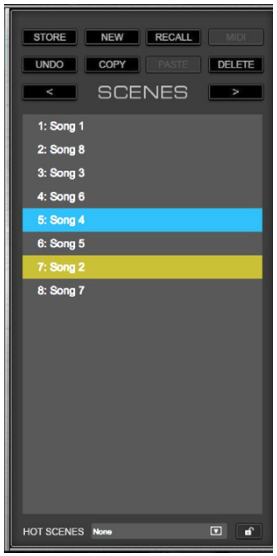
A scene is a snapshot within a session, used to change presets during a performance. Use the Scenes page to create, recall, and save scenes in a session. A session can contain up to 1000 scenes.



The types and number of selector buttons on the Scope and Recall Safe panels reflect the Mixer configuration, which is set in the Mixer Settings page. In the example above, the mixer is configured to 80 input channels, 8 groups, 32 auxes, 3 main outs, 8 matrices, and a cue, so most selections are available. With smaller configurations, some buttons will be grayed out.

1 Store	Updates the current snapshot and scope parameters with the current mixer condition. Replaces the existing stored scene.
2 New	Creates a new scene, based on the current preset and scope settings. This makes a new scene from the current one and serves as a "Save as" function.
3 Recall	Recalls the selected scene. The name of the recalled scene is displayed in the Scenes section of the Top Bar.
4 Undo	Undoes the previous change. One level of undo is available.
5 Copy	Copies the selected scene to the clipboard. This can then be pasted back to the Scenes list as a copy.
6 Paste	Pastes the copied scene to the Scenes list.
7 Delete	Deletes the selected scene (which is not necessarily the current scene). A deleted scene can be recovered using the Undo function.
8 MIDI	Enables "scene follow program change" events for remote-controlling scene changes. A red lamp indicates that MIDI program changes are enabled.
9 Scenes List	A list of all scenes associated with the current session.
10 Scope Selectors	Sets which functions, channels, and busses will be affected when a scene is recalled.
11 All/None Selector	Selects or deselects all functions, channels, and busses in the Scope list.
12 Channel Parameters Selectors	Specify which channel parameters can be altered by a scene change. If a control is not included in the scope of the scene, its parameters will not change on any channel. Certain selectors provide more options via popup windows.
13 Input Channel, Buss, and Link Selectors	Specify the channels, busses, and control groups included in the scope of the scene. If a channel, buss, or link is not included in the scope of the scene, then no parameters will change for that channel.
14 Hot Scenes List	User-assigned snapshots that are quickly accessible for recall. Up to eight Hot Scenes can be recalled from the Scenes menu and user-assigned keys.
15 Notes	Each scene has a dedicated notes section.

The Scenes list behaves in the same manner as the Sessions list as follows:



- A selected scene is highlighted blue (whether it is the recalled scene or not). A highlighted scene is not active until it is recalled.
- Notes associated with the selected scene are shown in the Notes section.
- If the current scene is not selected, it will be highlighted yellow, and the selected one will be highlighted blue.

Above the Scenes list are two arrows. Use them to recall scenes lower or higher than the current one in the Scenes list. Clicking an arrow loads the scene immediately.

Storing Scenes in the Scenes List

This saves the mixer condition to a scene. Typically, the current mixer settings are stored to the current scene. However, if a scene other than the current one is selected, you will be given two options:

- Store the parameters in the current scene.
- Store the parameters in the selected scene. This replaces the contents of the selected scene.

Scenes, unlike sessions, are not separate files. They are embedded in the sessions, so there is no "Save as" function. Use **New** to create a new scene, which you can then save.

Recalling Scenes From the Scenes List

Select a scene and click Recall.

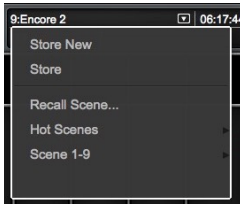
Changing the Order of the Scenes List

A scene's place in the Scenes list determines its recall number, so it's important to be able to change its position. There are two ways to do this. Change its position by:

- Dragging the scene to a new location.
- Copying the scene with the Copy button and pasting it in the desired position using the separator line. If the separator line is not used, the copy will be added to the bottom of the Scenes List. Double-click on the scene to change its name.

Top Bar Menu

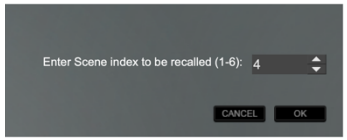
Storing a Scene with the Top Bar Scenes Menu



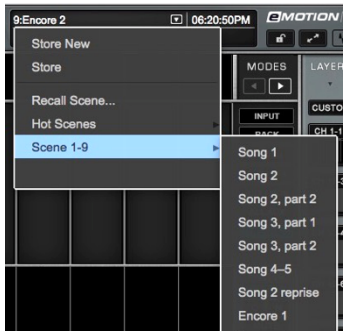
The Top Bar Scenes Menu is located on the right-hand side of the Top Bar. Here you can store the current mixer condition to the current scene. Choose Store New to create and name a new scene. New scenes are stored at the end of the Scenes list.

Recalling Scenes with the Top Bar Scenes Menu

Scenes can be recalled from the drop-down Scenes menu on the Top Bar. Unlike the Scenes list, a scene selected in this menu is recalled immediately.



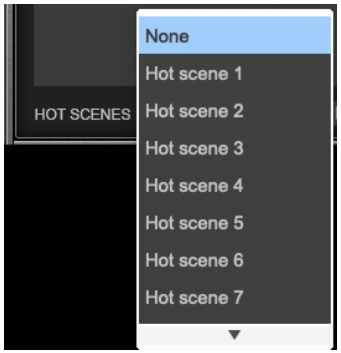
Recall Scene recalls a scene based on its position in the Scenes List. Use the up/down arrows to navigate the list or enter the index number directly.



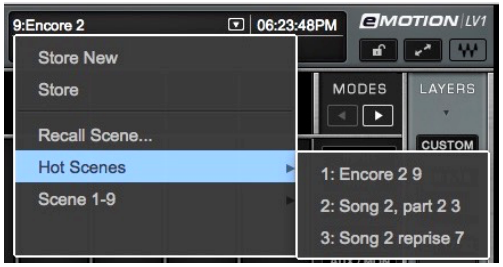
Scene 1–32, etc. is a drop-down menu of all scenes in the session. Scenes are displayed in the order of the Scenes list. Selecting a scene opens it immediately. A session can have up to 1000 scenes.

Hot Scenes

Hot Scenes are user-selected scenes that are quickly accessible for recall.



At the bottom of the Scenes list is a menu of Hot Scene assignment positions. Use this menu to assign the selected scene a Hot Scene position.

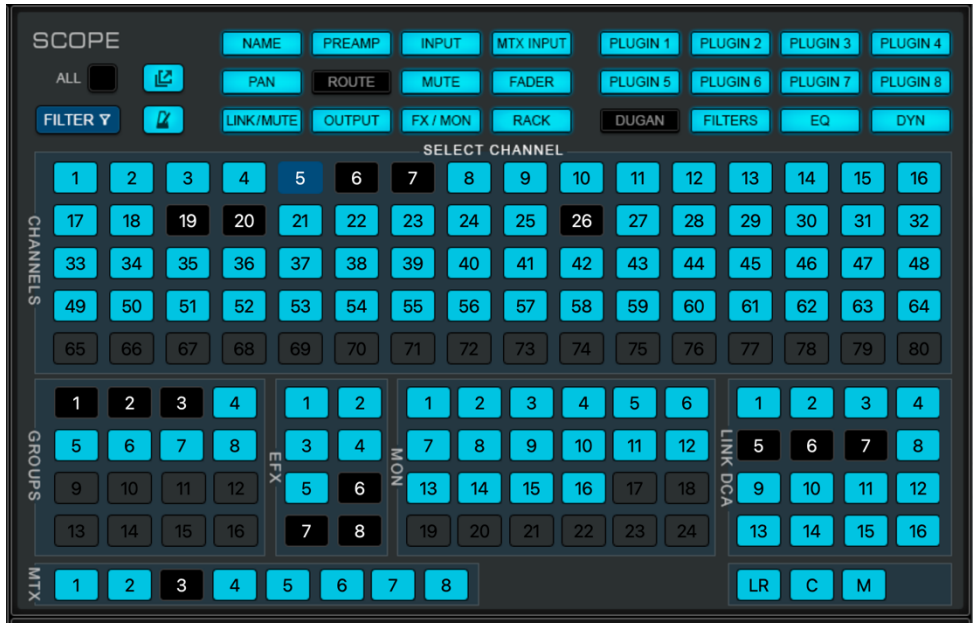


Hot Scenes are recalled from the Scenes menu on the Top Bar. The scene's name and Hot Scene position are shown. The scene is recalled immediately.

The Scenes list on the Top Bar can be controlled with MIDI program changes. Use the MIDI control panel to set up Follow Program Change or Generate Program Change commands (Setup > System Inventory > Controls > Device Control Panel). The MIDI button is illuminated when scene recalls are under MIDI control.

Scope Section

The Scope section sets which functions, channels, busses, and control groups will be affected by scene changes. Scope is set for each scene, not by session. Scope selections are divided into three categories:



Channel parameter selectors

Input channel selectors

Buss and link selectors

The color of a button indicates the channel's scope status.

- A light blue button represents a parameter that is within the scope of the scene.
- A black button represents a parameter that is not within the scope of the scene.
- A dark blue button indicates that the parameters within that specific channel have been edited.
- A gray button represents a channel whose parameters have been edited but is currently not in the scope.

This example shows a configuration of 64 input channels, 8 groups, 32 auxes, and 8 matrices. When an 80-channel license is activated, all 80 input channel buttons are available, as are a greater number of auxes and groups. The distribution of auxes and groups depends on the selected 80-channel configuration.

Channel Parameters

Sets channel parameters that are within the scope of a scene. These settings apply equally to all selected channels.

Name	Channel name
Preamp	48V, preamp level
Input	Trim, phase
MTX Input	Matrix input faders
FX/MON	Send levels, on/off, pan, route Click the XF/MON button to open a panel for selecting any FX or MON buss.
Pan	All pan/balance/rotate controls
Mute	Change state: on/off
Fader	Change value
Mute GRP	Mute group assignments
Output	Delay (channel out, not group), on/off delay, gain
Windows	Floating window configuration and content
Tempo	System tempo
Plugins	Plugins (including assigned dynamics, EQ, and filters processors) can be included or excluded from the scope of the scene.
Dugan	Auto, weight fader, override, group

Input Channels: Sets which input channels are included in the scope of the scene. A deselected channel does not change with a scene recall, regardless of the Function settings. The number of channels in the Scope section reflects the current mixer size.

Busses and Links: Sets the busses and control groups that will or will not be included in the scope of the scene. Selections include Input channels, Groups, Auxes, Matrix, and Main Outs. Links/DCAs can also be included in the scope of the scene.

All/None Select: Resets the Scope selection to "all parameters/channels are within the scope of this scene" or "no parameters/channels are within the scope of this scene."

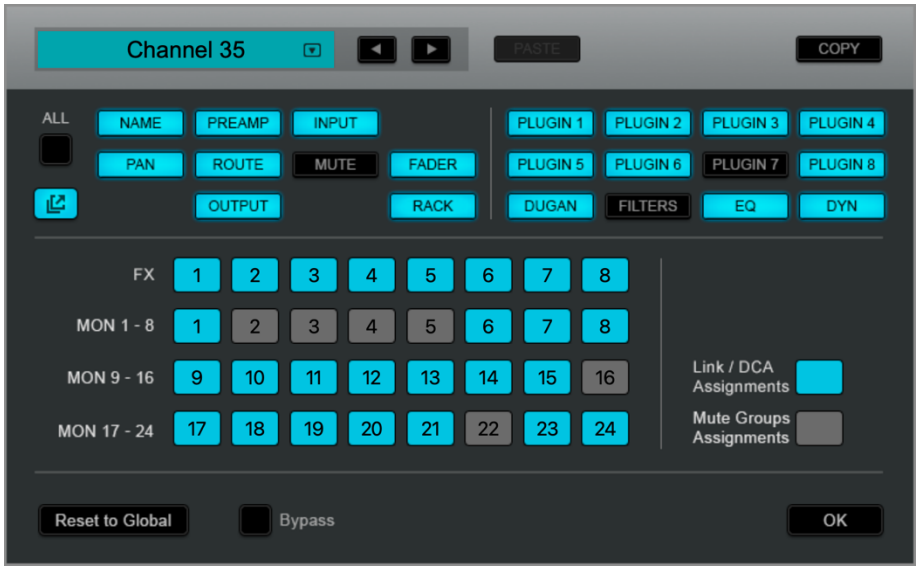
Rack: When On, rack processing on/off is in the scope of the scene change.

Dyn/EQ/Filters: When selecting a Dyn/EQ/FLT state in Scene or Recall Safe, it will override the state in Plugins 1-8. Example: If EQ is set to Off, it will be out of scope, even if Plugins 1-8 are set to On (in scope), and vice versa.

Note: **Channel A/B Select** does not change with a scene change.

Filter Within Channels

You can set the scope of all parameters, per channel. The **Channel Filter** lets you select a channel, buss, or control and then define the scope *within* that channel. When a selected channel changes with a scene change, specific parameters are executed or ignored. This provides much more detail when defining scope.



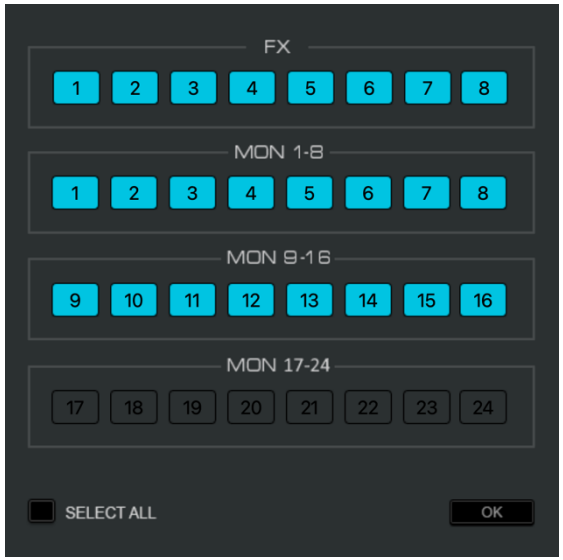
To filter the scope of a channel, follow these steps:

1. Click on the Filter button at the top-left corner to enable per-channel filtering.
2. Select the channel for which you want to allow detailed filtering. The Filtering panel appears.
3. Use the selection buttons to set the scope of FX/MON busses, Channel Parameter controls, Link/DCAs, and Mute Group assignments. Only parameters that are logically assignable are shown in the window.
4. Use the left/right arrows or the channel menu next to the channel name to navigate among the channels.
5. Use the Bypass button to temporarily deselect all choices within the window.
6. Once you have made any changes in the window, the **Reset to Global** button will appear. Click the button to clear all selections you have made in the panel.

Click OK to return to the main Scope window.

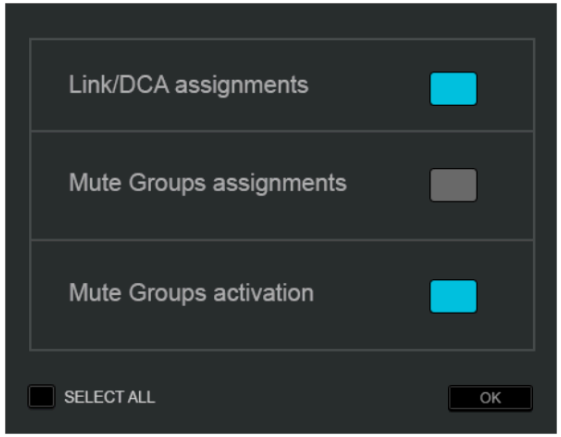
Select Scope of Aux Channels, Link/DCAs, and Mute Groups

Click the FX/MON selector button to open an extended Scope panel.



This enables you to select specific FX/MON sends.

Click the Link/Mute button to set the scope of Link/DCA and Mute Groups assignments and Mute Group activation.



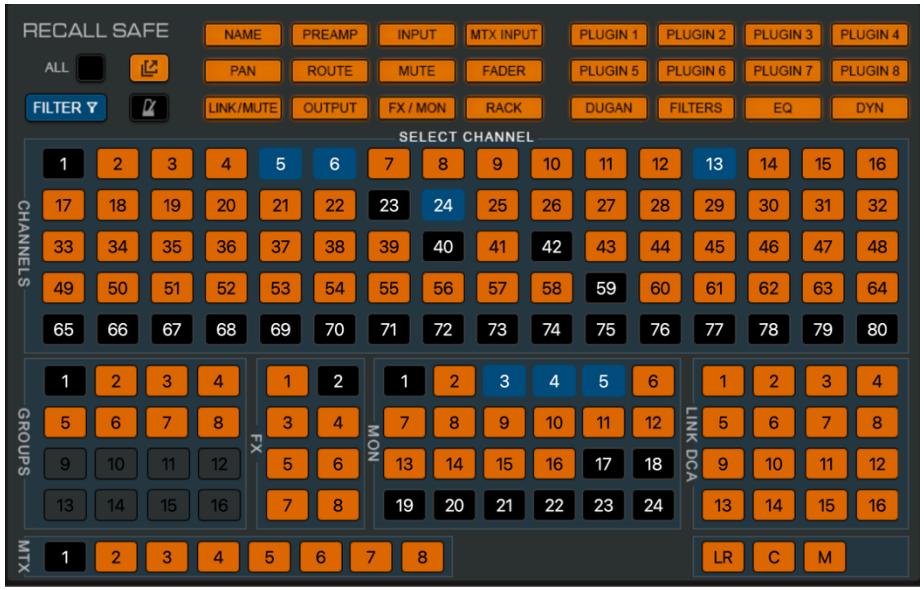
Scope of Changes: Session vs. Scene

Sessions define the architecture of a setup, which includes I/O configuration, racks, patches, and all parameters. Scenes, on the other hand, define only the parameters.

	Category	Description
SESSION	External Patching	Assigned with session, not scene
	Inventory	I/O, server, and controller inventory
	Rack slots	Plugins inserted and rack sequence
	System preferences	Mixer and U/I settings
SCENE	Internal mixer patches	Patches within the mixer
	Channel condition	Plugin settings and other channel parameters
	Faders, panners, and aux channels	All mixer levels
	Individual plugin settings	Parameters for each plugin

Scenes are an integral part of a session. They are not stored as separate files.

Recall Safe Page



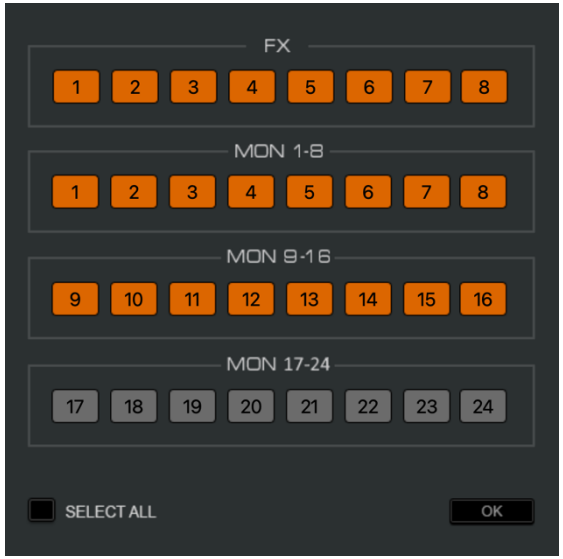
The **Recall Safe** page prevents changes to specified channels, busses, and functions during a scene change. An item in Recall Safe mode is exempt from changes. Recall Safe is set for an entire session, not by scene.

Once Recall Safe is set for the parameters and channels of a session, scene recalls will not affect their settings. The controls in the Recall Safe panel are identical to the Scope section controls. Selections are organized by channel functions and plugins, input channels, groups and controls.

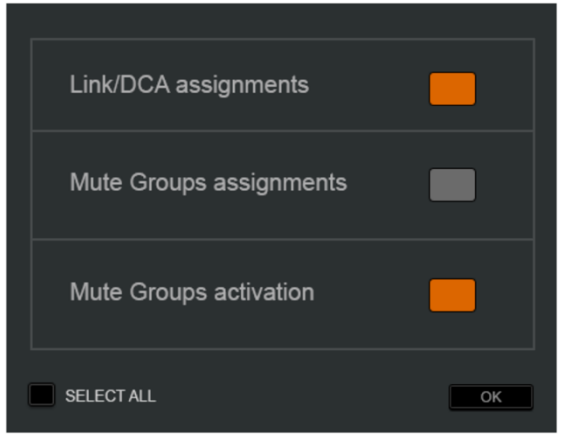
Audio channels and busses can be set to Recall Safe from this panel, as well as from the drop-down Preset menu for that channel. As with the Scope page, there is an All/None button that selects and deselects all parameters and channels.

Select Scope of Specific Aux Channels, Link/DCAs, and Mute Groups

Click the FX/MON selector button to open an extended Scope panel. This enables you to select specific FX/MON sends.



Click the Link/Mute button to set the scope of Link/DCA and Mute Groups assignments and Mute Group activation.



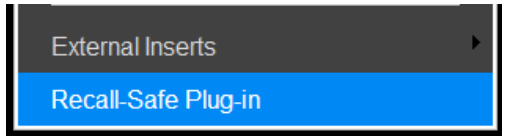
Channel Recall Safe

Individual channels can also be set to Recall Safe from their Preset menu. This is the same as selecting the channel in the Recall Safe section, but may be more convenient at times. These selections are indicated in the Recall Safe page and the Session Name field in the Top Bar.

Preamp Recall Safe

To ensure that I/O device preamp parameters are not changed when a scene change occurs, select Preamp in the Recall Safe page. This is a global command that protects all preamps on Recall Safe selected channels.

Recall Safe for Specific Plugins



The Recall Safe page determines if specific plugin rack positions on specified channels will change when scene changes occur.

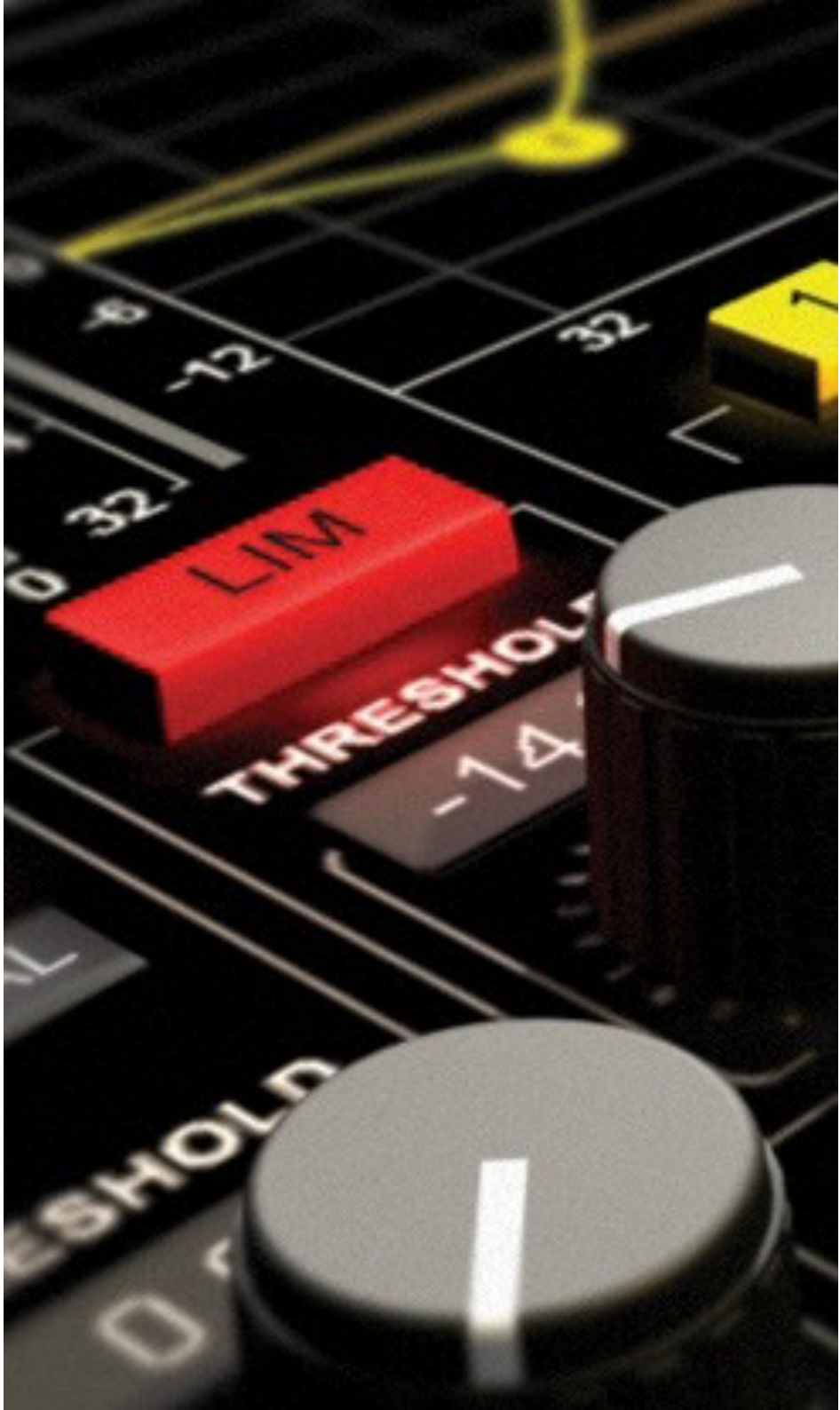
Recall Safe Plugin On/Off, on the other hand, prevents a specific instance of a plugin from changing. This drop-down menu item is located at the bottom of the Plugin menu of a specified plugin. The menu item indicates if the plugin is set to Recall Safe.

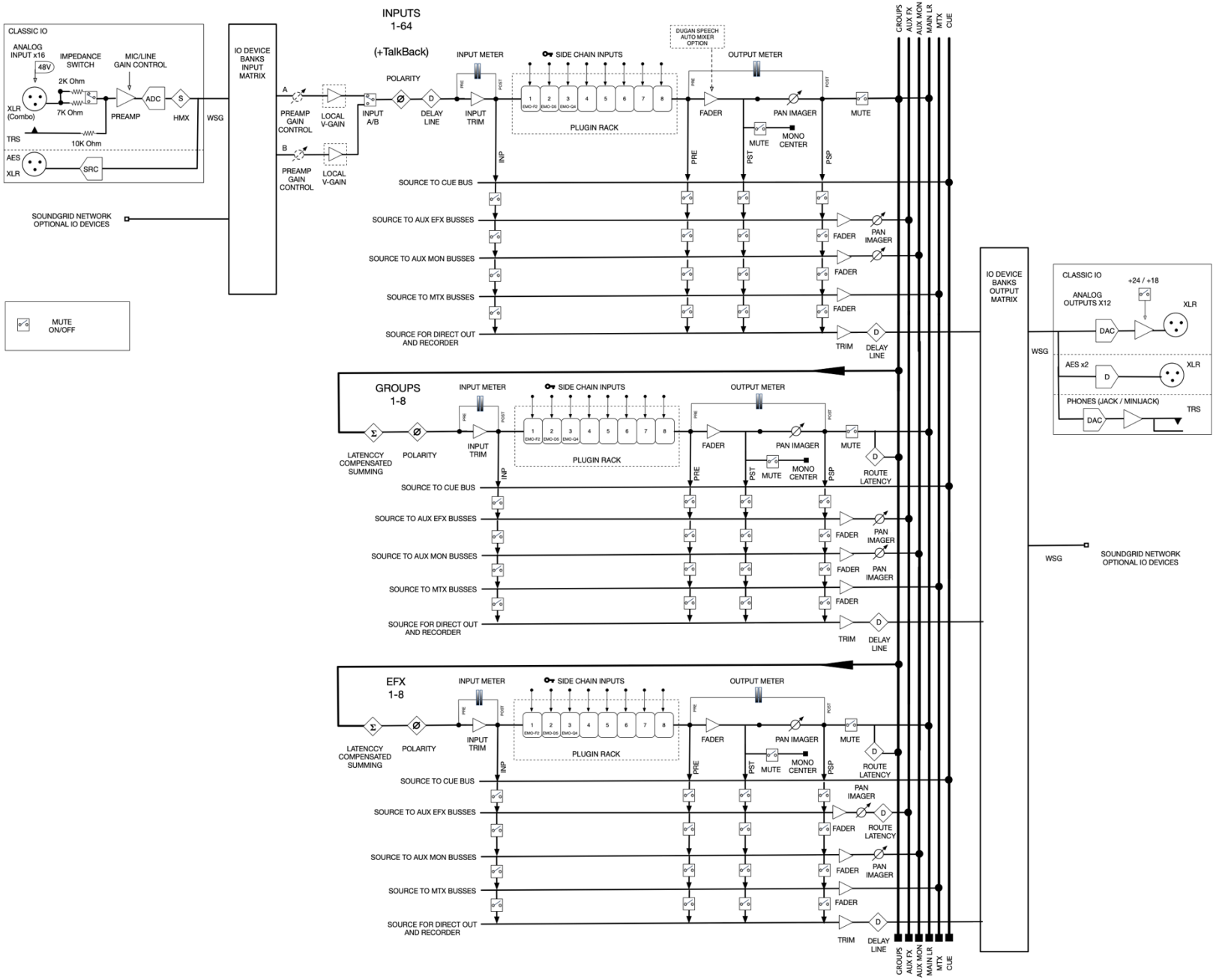
There is also a small “Safe” indicator on the plugin icon.

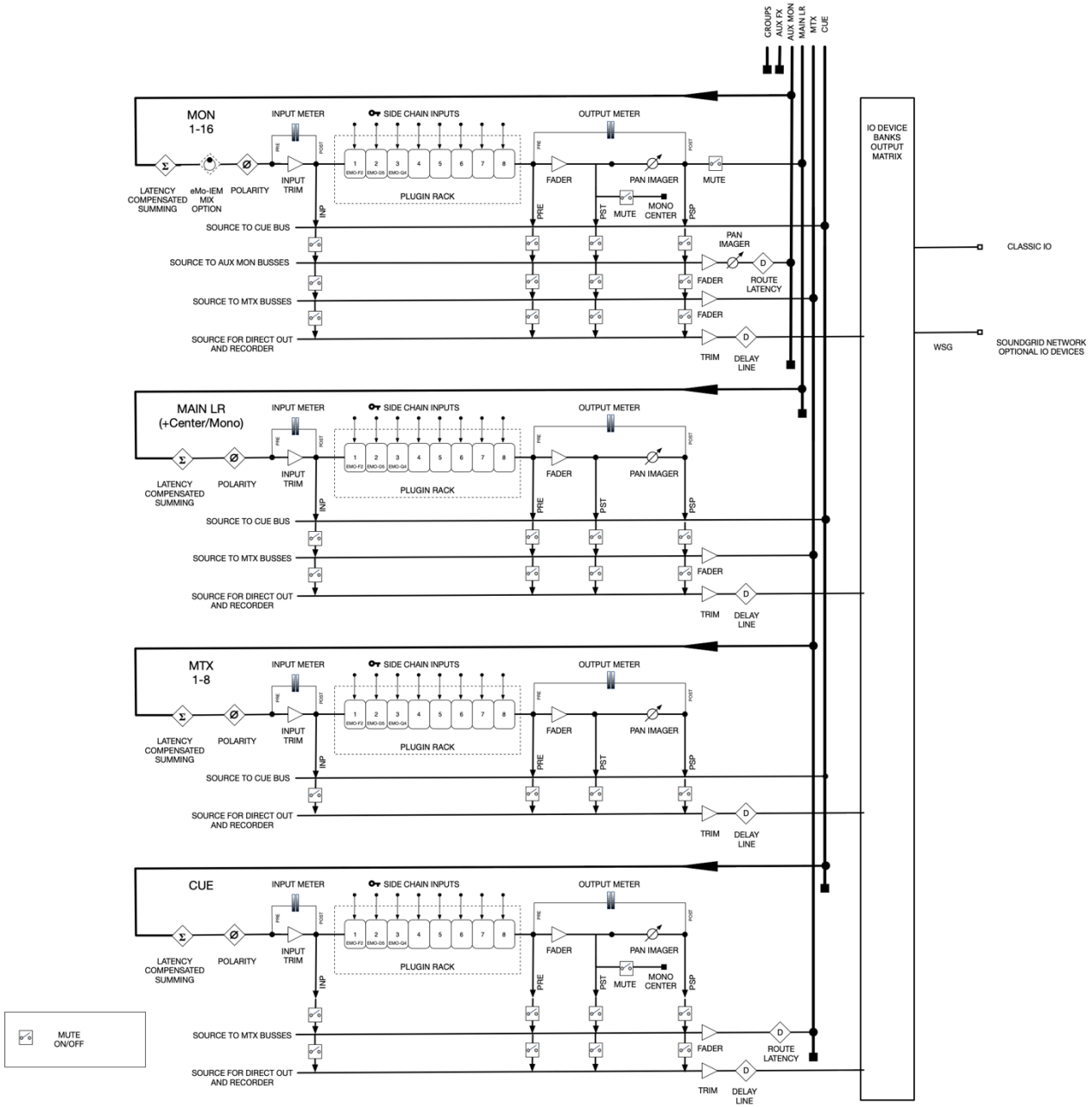
Other plugins in the rack are unaffected and can be set individually to Recall Safe.

Chapter 6:

SIGNAL FLOW

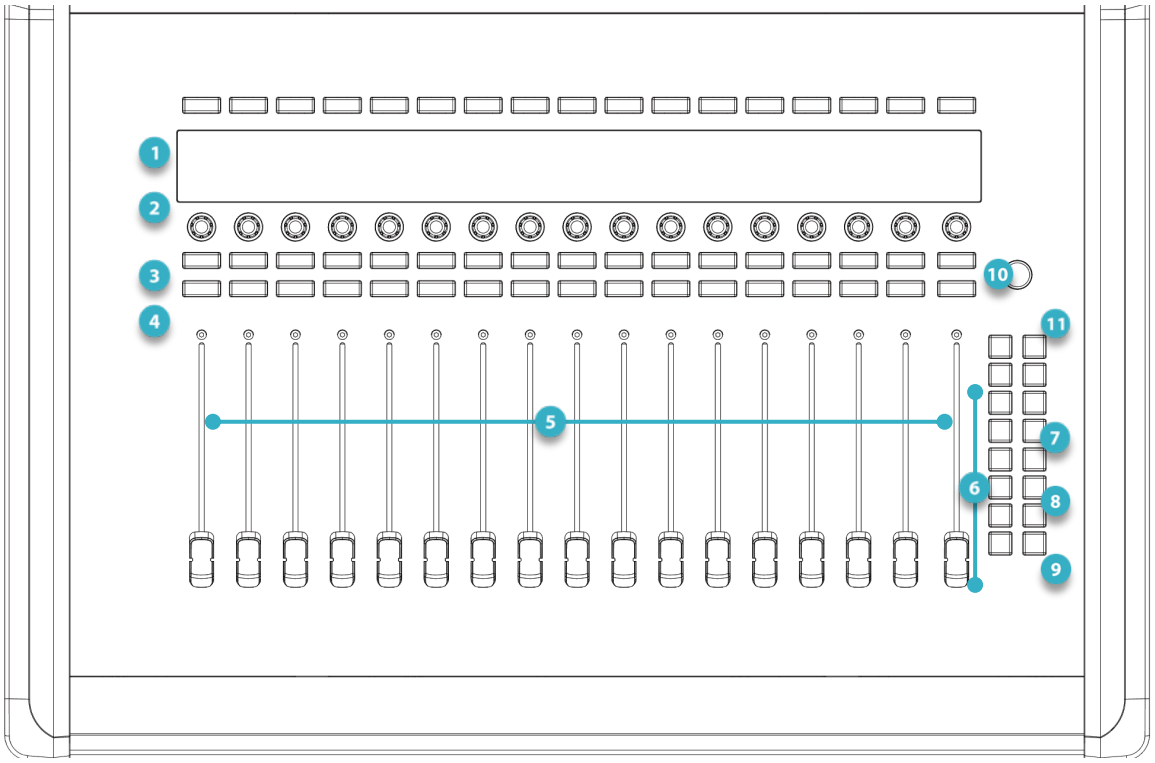



CLASSIC IO
ANALOG INPUT x16
48V
IMPEDANCE SWITCH
2K Ohm
7K Ohm
MIC/LINE GAIN CONTROL
XLR (Combo)
TRS
10K Ohm
PREAMP
ADC
S
HMX
WSG
AES XLR
SRC
SOUNDGRID NETWORK OPTIONAL IO DEVICES
IO DEVICE BANKS INPUT MATRIX
INPUTS 1-64
(+TalkBack)
A
B
PREAMP GAIN CONTROL
LOCAL V-GAIN
INPUT A/B
POLARITY
DELAY LINE
INPUT METER
INPUT TRIM
SIDE CHAIN INPUTS
PLUGIN RACK
DUGAN SPEECH AUTO MIXER OPTION
OUTPUT METER
FADER
PAN IMAGER
MUTE
MONO CENTER
INP
PRE
PST
PSP
SOURCE TO CUE BUS
SOURCE TO AUX EFX BUSSES
SOURCE TO AUX MON BUSSES
SOURCE TO MTX BUSSES
SOURCE FOR DIRECT OUT AND RECORDER
TRIM
DELAY LINE
GROUPS
AUX FX
AUX MON
MAIN LR
MTX
CUE
MUTE ON/OFF
GROUPS 1-8
LATENCCY COMPENSATED SUMMING
ROUTE LATENCY
EFX 1-8
IO DEVICE BANKS OUTPUT MATRIX
CLASSIC IO
ANALOG OUTPUTS X12
+24 / +18
DAC
XLR
AES x2
PHONES (JACK / MINIJACK)
TRS
WSG
SOUNDGRID NETWORK OPTIONAL IO DEVICES


GROUPS
AUX FX
AUX MON
MAIN LR
MTX
CUE
IO DEVICE BANKS OUTPUT MATRIX
MON 1-16
INPUT METER
SIDE CHAIN INPUTS
OUTPUT METER
LATENCY COMPENSATED SUMMING
eMo-IEM MIX OPTION
POLARITY
INPUT TRIM
PLUGIN RACK
FADER
PAN IMAGER
MUTE
MONO CENTER
SOURCE TO CUE BUS
SOURCE TO AUX MON BUSSES
SOURCE TO MTX BUSSES
SOURCE FOR DIRECT OUT AND RECORDER
ROUTE LATENCY
TRIM
DELAY LINE
CLASSIC IO
WSG
SOUNDGRID NETWORK OPTIONAL IO DEVICES
MAIN LR (+Center/Mono)
MTX 1-8
CUE
MUTE ON/OFF

APPENDIX A: FADER BANK

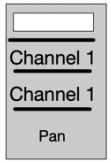
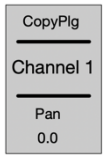
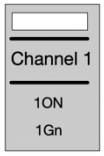
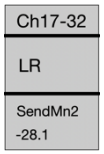
The eMotion LV1 Classic fader bank maps to the LV1 touchscreen control surface. The 16+1 motorized faders and multipurpose encoders provide control over mixing functions and plugins parameter contorls.

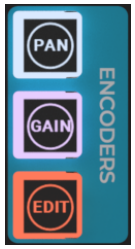
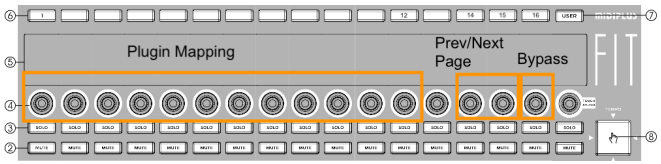


1. **Channel Select Button**
   Click the User button to toggle between Channel (default) and User-Assigned Keys.
2. **Four-line Scribble Strip**
3. **Rotary Encoders**
   Control Pan, Gain, or Plugin edit mapping
4. **Solo/Mute**
5. **16+1 10mm Motorized Faders**
6. **Mixer Layers 1–8 Selector**
7. **Encoders Mode**
   Select Pan, Gain, or Plugin edit mode
8. **Shortcuts** (user-assignable)
9. **Fader Alternative Modes**
   Custom/Spill/Sends on faders
10. **Touch and Turn**
    Maps to selected control for immediate access.
11. **Tempo Tap Pad**

FADER BANK CONTROLS

1 Channel select buttons (Function changes with controller mode)	**Channel Select Mode** (default) Click to select a channel. An unselected channel's button is the same color as the corresponding channel on the LV1 touch screen. **User Mode** (User button on) The 16 channel buttons are mapped to the 16 user-assignable keys. **Edit** mode maps channel faders and encoders to the controls of the selected channel's plugins. **Flip Mode** The Select buttons and the first row of scribble strips are used to select the aux destination. (Flip button on): Buttons 9–11: select destination layer (FX 1–8, MON 1–8, MON 9–16) Buttons 1–8: select destination channel within an Aux layer Once you select an aux destination, the faders flip. Large faders are sending to the selected aux. The blinking Flip light indicates the mode.

2	Scribble strip (Display changes with controller mode)	The Scribble Strip is a four-line display that provides feedback about channel condition.  In **Channel Select** Mode: Selected channel is indicated with a white bar. Channel name, default or user-named Channel input source Function of the rotary encoder (preamp gain or channel pan, or plugin edit)  In **User** Mode, the user-assigned function is shown at the top of the scribble strip. Use the channel button to apply the key.  In **Edit** Mode, the encoders are mapped to the controls of the selected plugin. When a control has a has a discrete switch (e.g., on/off, mode, bypass) and a variable control (e.g., gain, frequency, threshold), the variable control is on the bottom row. Plugin controls are arranged in pages. Use the layer buttons to move between controls.  In **Flip** Mode, Aux destination channels are identified on the top row.
3	Rotary Encoders	 A rotary encoder controls the channel's pan or input. It also maps to a specific plugin control when in the Edit mode. In the Edit mode, the Encoder buttons to toggle between gain or pan (default). This toggle affects all channels in the layer. The value and label of this control are displayed on the scribble strip above. The encoder's function is set in the Encoder section.
4	Solo/Mute	Activates CUE or SOLO, depending on LV1 Cue channel settings / activates MUTE
5	Channel Faders / Master Fader	16+1 touch-sensitive motorized faders Master fader mapping is set in the Fader Bank contol panel.
6	Mixer Layers selectors	Click a button to select a mixer layer.

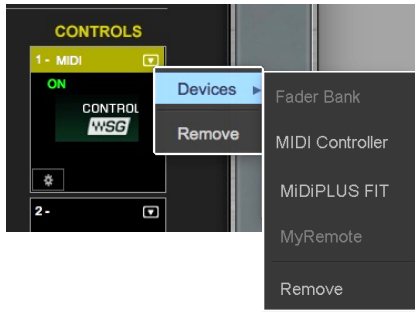
	Encoder Modes	Selects function of the rotary encoders. **Pan** (lavender) **Input Channel Gain** (blue) **Plugin Edit** (orange)  By default, the encoder knobs are mapped to channel pan. When the knobs are set to control the gain, they automap the channel input's preamp-Gain or local-VGain.* If there is no preamp, the encoder knobs will control the channel trim. When knobs are set to Edit mode, selecting a plugin on-screen will map all its parameters to the FIT knobs. Rotary knobs are mapped to continuous controls (turn) and to a toggle control (push).  Channel 13: unused Channels 14–15: previous/next page *V-Gain is a digital gain stage that always delivers the user's requested input gain, regardless of the preamp's analog gain setting. Refer to *Mixer>Input Section*
8	Shortcuts	Recalls two user-assigned actions as defined in the Fader Bank control panel.
9	Fader Alternative Modes	 1. You can create up to eight **Custom** mixer layers, combining any channel, buss, or DCA. This lets you organize layers to suit your circumstances. 2. **Spill** displays all the channels in the selected Link group, regardless of the channel types. Linked controls can be adjusted and a DCA can be used to trim all faders in the group. 3. **Flip** mode uses the channel faders, rather than the small aux send faders to adjust aux levels. To set up "sends on faders," follow these steps:

	4. Press the Flip button; the button blinks to confirm Flip mode. 5. Select a channel whose sends you want to adjust. 6. Choose an FX or Monitor layer mode. In the panel on the left side of the LV1 display and select the aux buss you want send. 7. Now, use the channel fader to the aux. When finished, press the Flip to return to normal faders.
10 Touch & Set	One LV1 or plugin control can be assigned to this knob. **Assign:** Click Touch & Set knob, touch any LV1 or plugin control, click Touch & Set to confirm. **Control**: Turn the knob to adjust the selected continuous control. Press the encoder to control switches. Touch & Set mapping and values are shown on the Master section scribble strip.
11 Tempo Tap Pad	**Tap repeatedly to set the tempo**. This value is broadcast to all plugins in the session that can receive tempo data.

Click the Gear button on the Fader Bank icon in the Controls rack to access the Fader Bank control panel.

APPENDIX B: **INCORPORATING MIDI**

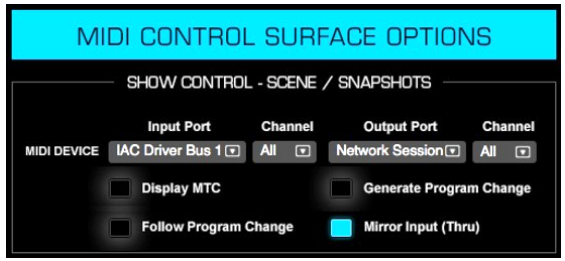
Program change messages can be sent from a MIDI controller to the mixer or from the mixer to a MIDI controller. Additionally, mixer faders, panners, and mutes can be remote-controlled.



Open the Controls menu and select MIDI Controller.

Click on the Gear button on the MIDI control icon to open the MIDI control panel.

Show Control Section



This section sets the MIDI port and channel used for triggering Scenes using MIDI program change messages.

Select a MIDI Device: Select an Input and Output port from the drop-down menu, where all available MIDI ports are listed. The selected device appears in the Port Name box.

The Classic console can receive MIDI from virtual MIDI protocols (such as rtpMIDI) over the console's network port. Do not connect MIDI to a SoundGrid port. Download and install the driver. An rtpMIDI icon on the Kiosk's Utilities tab indicates that the driver is installed and running.

Choose a MIDI Channel: Select a MIDI channel for Input and Output.

Assigning a Specific (single) channel (when applicable) means that all data from other channels are filtered out from the incoming stream. Messages that are part of the stream and are common to all channels will remain in the stream.

Select the **All Channels** option and all the channels will remain in the stream; none will be filtered. The incoming stream is unchanged.

Follow Program Change: When selected, scene changes can be controlled by MIDI program change commands from the device on the selected input port and channel. Scenes changes are based on the Scene index numbers. The Scene index number reflects its position in the Scenes List (on the Show window).

For example:

Program A: MIDI control change messages 0–127 > Scenes 1–128

Program B: MIDI control change messages 0–127 > Scenes 129–256

Program C: MIDI control change messages 0–127 > Scenes 257–384

Program D: MIDI control change messages 0–127 > Scenes 385–512

The mixer supports up to 1000 scenes.

When Follow Program Change is selected, the MIDI indicator in the Scenes window is illuminated. Follow Program Change can be activated from either window.

Generate Program Change: Selecting this option for the MIDI output sends a Program Change command whenever a Scene is recalled. The program change number follows the Scene index number.

Display MTC: When selected, the time window in the Top Bar displays MIDI timecode. When deselected, the window displays time from the console's computer.

Mirror Input (Thru): When selected, the input stream is sent directly to the selected output port without changes.

Mixer Remote

This section sets the port that the MIDI controller will use to map the mixer. The 16 faders in each layer are mapped to standard MIDI mapping: volume, pan, and mute controls for each fader.

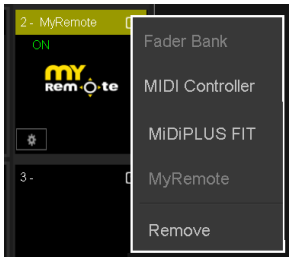
Input Port/Output Port: Select MIDI Ports. Selection can be set for a specific port only.

Follow Mixer Window: When Follow Mixer Window is selected, the MIDI faders will map the faders of the selected Layer, as displayed in the Mixer window. For example, when Mixer Layer 17–32 is selected, MIDI channel 1 will control mixer channel 17. When AUX/FX is selected, MIDI Channel 1 will control AUX/MON 1.

When Follow Mixer Window is off, the mixer and the controller are independent of each other.

Using a SoundGrid I/O device as a MIDI port: A SoundGrid I/O device with a MIDI port can be assigned to the SoundGrid MIDI driver. This device can then be used as a MIDI port for the mixer, and as an I/O.

APPENDIX C: **MyRemote**



Waves mobile apps enhance flexibility and efficiency when setting up and managing live sound events. These apps connect to eMotion LV1 Classic via a private, dedicated Wi-Fi network. Open the mobile apps in the MyRemote control panel. Click the Gear icon to open it.

WAVES MOBILE APPS

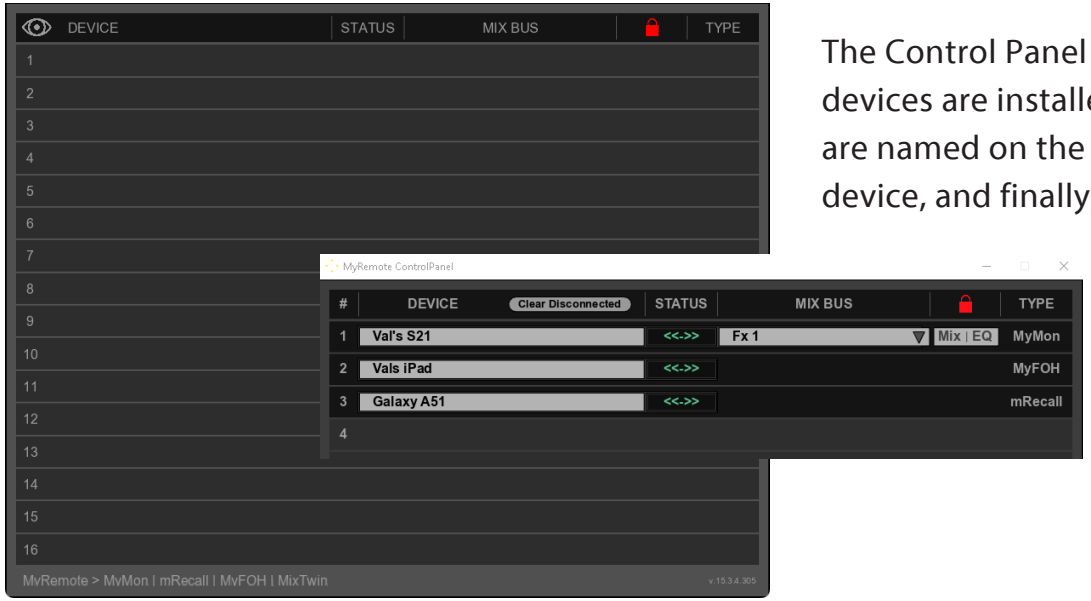
MyMon	Allows each musician to control a dedicated aux mix. Compatible with eMotion LV1 and SoundGrid Studio. Compatible with phones and tablets.
MyFOH	Allows basic remote control over eMotion LV1 mixer by FOH engineer. Compatible with eMotion LV1. Compatible with tablets only.
mRecall	Allows remote recall of preprogrammed Scenes and Snapshots. Compatible with eMotion LV1 and SuperRack. Compatible with phones and tablets.
MixTwin	Efficiently mirrors and optimizes your mixer window onto your tablet device. * Currently supports iPad only.

Setting up eMotion LV1 Setup (do this first)

1. Run a dedicated Ethernet cable from the LV1 host computer to the Wi-Fi router. This connection provides control information for the mobile apps Wi-Fi network. No audio passes over it. Do not run the mobile apps network over the SoundGrid network. If the host computer does not have a second Ethernet port, use a USB-to-Ethernet (or other) adaptor. While it is possible to place the Wi-Fi router at the FOH position, we recommend placing it near the mobile clients.
2. Launch eMotion LV1 and go to Setup Window > System Inventory Page > Controls column.
3. Click on an empty Control slot and select MyRemote from the menu. The MyRemote icon will appear in the slot. Open the MyRemote control panel by clicking on the Gear button. A single MyRemote Control module provides simultaneous communication between the host and all four mobile apps.

Mobile Apps Network Setup

1. Install the Mobile Apps of choice (MyMon, MyFOH, mRecall, MixTwin [iPad only]). These apps can be installed for free from the following sources:
    - Android phone/tablet users: Google Play
    - iPhone/iOS tablet users: App Store
2. Establish a Wi-Fi name and password protect your Wi-Fi network. Share the Wi-Fi network name and password with all mobile clients. All users can now connect to the mobile apps Wi-Fi network in their mobile devices and launch the app.
3. The app will automatically detect the Host computer. Select the host and click Connect.
4. The MyRemote control panel on the host displays the name of the newly connected mobile device and the app used to connect to the mobile apps network.



The Control Panel presents a blank table. When mobile devices are installed, the table becomes populated. Devices are named on the left, then the mix bus being sent to the device, and finally, the mobile device name.

A grid enables the FOH to select specific mix buss channels and lock them to prevent the artist from adjusting them.

APPENDIX D: **DELAY GROUPS**

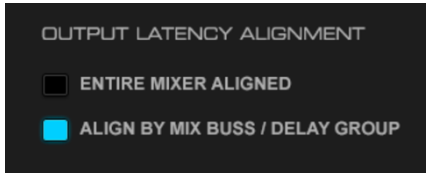
eMotion LV1 can host plugins on every channel and buss. Different channels will likely use different plugins, each of which can impose different delays. At points where channels or busses are summed, they must be aligned with each other as a group. Those with the least delay are aligned to those with the greatest delay. Summing to a buss does not add delay but adding plugins to the buss may introduce delay. When these busses are again summed, delay adjustment may again be needed. This is latency compensation.

The output to the Main L/R will have a certain delay (compared to the input) because of A>D converters, network buffers, and the latency compensation introduced by plugins latencies throughout the Main L/R mix. However, busses routed to different I/Os do not necessarily need to be aligned with all other busses. Their delay alignment can be controlled as separate groups. These are Delay groups.

To create multiple delay groups, the mixer must be set to Delay Groups. This is done on the Mixer Settings page (Settings > Mixer Settings > Delay Compensation). Delay groups are assigned in the External Assignments section of the Channel window or in the Patch window. Refer to the Setup chapter of this manual or further details.

Set Mixer Delay Behavior

When using the mixer to produce latency critical outputs (e.g., for a monitor mix), it is advisable to use Delay Groups mode. This provides output compensation per mix buss, so high latency busses will not affect low latency ones.



The Output Delay Behavior Box determines how delay compensation will be managed.

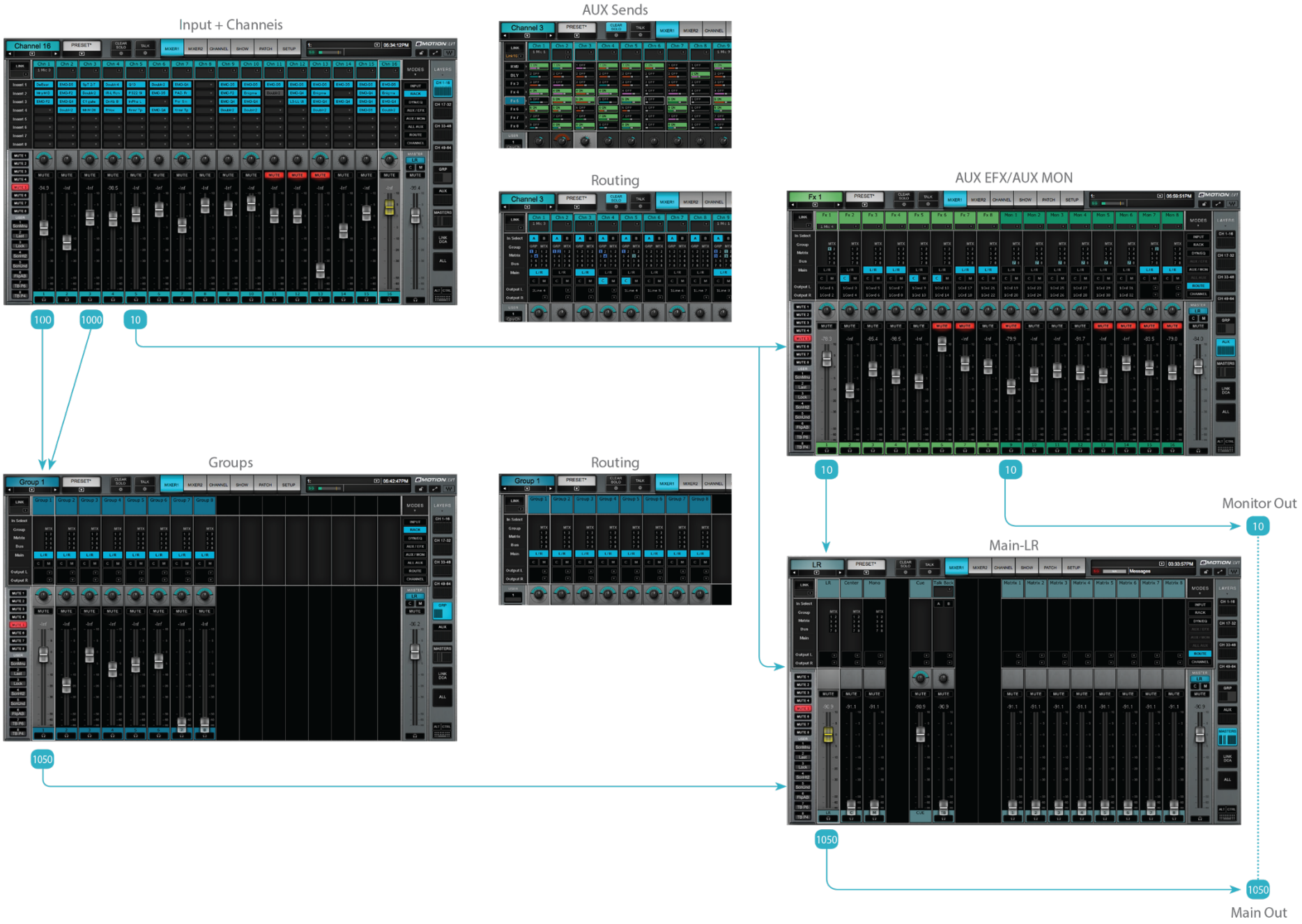
1. **Entire Mixer**:Total delay is the same throughout the mixer. All I/Os are aligned to the buss with the greatest delay. The user cannot create separate delay groups in this mode.
2. **Multiple Delay Groups**: Enables I/Os to be assigned to separate delay groups. The I/Os that make up a delay group will be aligned and delayed together.

Latency, Delay Compensation, and Delay Groups

The delay added by the delay compensation function is determined by the various paths its signal can take. In the example below, Channels 1, 3, and 5 have plugins with different latencies. (Channel 1 = 100 samples; Channel 3 = 1000 samples; Channel 5 = 10 samples)

- Channels 1 and 3 are summed on the group buss and aligned to match the channel with the greatest latency (in this case, Input Channel 3). The group buss has its own plugins, which add another 50-sample delay. Buss latency is now 1050 samples.
- Channel 5 is routed to Main L/R, AUX/FX 1, and AUX/MON 1.
- AUX/MON 1 is sent directly to an I/O. No plugins are used on the buss. Since the signal is not summed with another buss having higher latency, its latency remains 10 samples when it reaches the I/O. AUX/FX 1 is routed to Main L/R.
- Three busses are sent to the Main L/R: AUX/FX 1, Group 1, and Input Channel 5. These busses must be delay compensated to match the delay of the buss with the greatest latency. So, the L/R output has a latency of 1050 samples.
- There are two I/Os, one with a latency of 1050 samples and the other with a latency of 10 samples. If you want to align these two I/Os, you can do so manually or by adding them to the same delay group.

It is important to take into consideration plugins of different latencies when planning a signal flow.
Some groups of I/Os will need to be time aligned Proper planning can help avoid unnecessary delay compensation.


Input + Channeis
AUX Sends
Routing
AUX EFX/AUX MON
100
1000
10
10
10
Monitor Out
Groups
Routing
Main-LR
1050
1050
1050
Main Out

Assigning an I/O to a Delay Group: Channel Window

Delay groups are assigned in the Output section of the Channel window. If you have not already done so, assign I/Os to the channel outs.

1. Use the drop-down Delay Groups menu to assign the selected I/O channel to a delay group.
2. Use the On/Off button to temporarily disengage a channel from the delay group. This does not remove the I/O from the delay group. Instead, it removes the plugin from plugin/buss latency compensation calculations.
3. Drag up and down over the Delay value box to add delay. The box indicates the group's delay value. Outputs that do not need to be assigned to a delay group can be set to None in the Delay Group menu. These outputs can be independently delayed by a user-defined value.

There is no limit to the number of I/Os that can be assigned to a delay group.

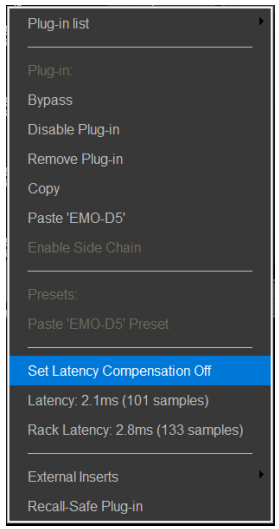
When the mixer is set to Entire Mixer latency compensation mode, the delay group menu will show "Entire Mixer." This mode automatically adds all the assigned output I/Os to a single delay group, so that all mixer outputs will always be aligned.

Assigning an I/O to a Delay Group: Patch Window

You can also use the Patch window to assign I/Os to delay groups and set the delay value. Patch a delay group to any number of I/O channels. The group's delay is noted in its value box and can be adjusted as in the Channel window.

This delay value matches the value in the Channel delay section

Turning Off Plugin Compensation on Specific Plugins



You can turn off delay compensation for specific plugins in a rack. This can be useful when one or more plugins have very high latencies and you don't want to delay the entire rack to compensate. When the source for a plugin is not time-critical (e.g., audience or ambience input), you can exclude this plugin from the delay compensation function by selecting Latency Compensation OFF in the Rack plugin menu. The plugin remains active, but its latency is no longer reported to the delay compensation engine.

eMotion LV1 Classic KEYBOARD SHORTCUTS

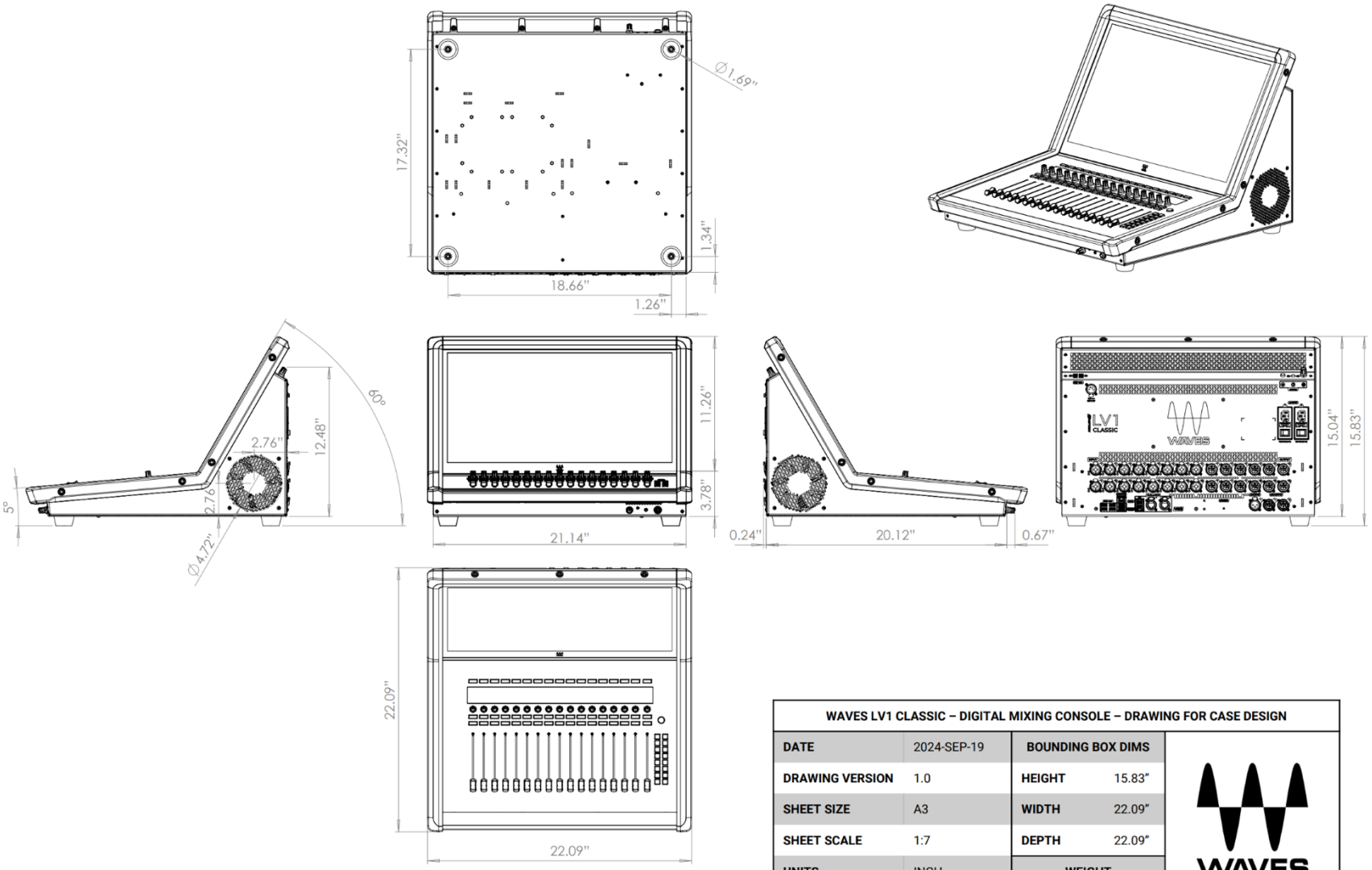
Window	Mode or Section	Keystroke	Action
All	All	Alt+click on a control	Returns most controls to default value. This is also true with most plugins.
Mixer	Rack	Alt+right click/insert a plugin	The selected plugin is inserted in the same rack insert position on all channels in the layer.
Mixer	Rack	Alt+right click/bypass a plugin	Bypasses all plugins in the same rack insert position on all channels in the layer. This affects the chosen rack position, regardless of the plugin type.
Mixer	Rack	Alt+right click/disable a plugin	Disables all plugins in the same rack insert position on all channels in the layer. This affects the chosen rack position, regardless of the plugin type.
Mixer	Rack	Alt+right click/remove a plugin	Removes all plugins in the same rack insert position on all channels in the layer. This affects the chosen rack position, regardless of the plugin type.
Mixer	Rack	Ctr+click on plugin icon	Disable plugin.
Mixer	Rack	Ctrl+Alt+click on plugin icon	Bypass plugin.
Mixer/Channel		Ctrl+move image rotator vertically	Changes width of image without rotating.
Mixer	Aux	Ctrl+click on mini aux send above bar	Switches between aux sources.
Channel/Rack		Ctrl+click on plugin icon	Disables plugin.
Channel/Rack		Ctrl+Alt+click on plugin icon	Bypasses plugin.

eMotion LV1 Classic SPECIFICATIONS

Sample Rate	44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz
Processing	SoundGrid DSP server Double Precision 32 Bit Float
Microphone / Line input	• Input Gain: adjustable from -3 dB to +60 dB in steps of 1dB, default +20 dB • Frequency response: (+18 dBu input) +/- 0.1 dB, 20 Hz to 20 kHz +/ -1.0 dB, 10 Hz to 40 kHz • Dynamic range: >110 dB (20 kHz BW, 0 dB Gain) • EIN -130 dBu (gain 60 dB, 0 ohms source, A-weighted) • THD+N -100 dB (997 Hz, +18dBu source, 0 dB Gain, 20kHz BW) • Input impedance: XLR: 2k ohms / 7k ohms, selectable per input TRS: 14.6k ohms • Input Sensitivity: XLR: -33 dBu to +27 dBu, adjustable in 1 dB steps TRS: -27 dBu to +33 dBu, adjustable in 1 dB steps • CMRR: 50 dB (20 Hz to 1 kHz, 0 dB gain) • Crosstalk: > 90 dB (20 Hz to 20 kHz, +27 dBu input, 0 dB gain) • 48V phantom power switchable per input • HMX - Harmonic Enhancer, switchable per input • Back panel signal presence and clip indicator, per channel
Line output	• Maximum output level: +18 dBu or + 24 dBu, switchable per output • Frequency Response: +/- 0.1 dB, 20 Hz to 20 kHz @ 48 kHz SR +0.1 / -1.0 dB, 10 Hz to 40 kHz @ 96 kHz SR • THD+N: -100 dB @ +24 dBu, -105 dB @ +18 dBu (997 Hz, 20 kHz BW) • Crosstalk: > 90 dB (20 Hz to 20 kHz) • Residual output noise: -87 dBu (A-Weighted) • Output impedance: 150 ohms

Phones output	• Adjustable output gain • Frequency Response: +/- 0.1 dB, 20 Hz to 20 kHz @ 48 kHz SR +0.1 / -1.0 dB, 10 Hz to 40 kHz @ 96 kHz SR • THD+N: -80 dB (3V @ 30 ohms load, 997 Hz, 20 kHz BW) • Output impedance: 20 ohms
AES3	• Input / Output impedance: 110 ohms • Input SR with auto conversion (SRC) • Output SR support: 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz
Faders	• 100 mm motorized faders
SoundGrid	• 1 Gbit Ethernet switch (4 ports)
Network	• 1 Gbit Ethernet
USB	• USB2 (6 ports) USB3 (2 ports)
Display	• Internal: HD 1920x1080 (Brightness control 100-1000 Nit) • External: HDMI port supporting HD 1920x1080
Lamp	• 12V 2W max (pin 1, 2= NC, pin 3= GND, pin 4= +12V)
Power	• 110V/220V 3A/1.5A auto-switching power supply units
Operating Temperature	• 0 to 35 degrees Celsius (32 to 95 degrees Fahrenheit)

Dimensions



WAVES LV1 CLASSIC – DIGITAL MIXING CONSOLE – DRAWING FOR CASE DESIGN			
DATE	2024-SEP-19	BOUNDING BOX DIMS	
DRAWING VERSION	1.0	HEIGHT	15.83"
SHEET SIZE	A3	WIDTH	22.09"
SHEET SCALE	1:7	DEPTH	22.09"
UNITS	INCH	WEIGHT	
TOLERANCE	±0.02"	38.14LBS	
NONCONFIDENTIAL			