WAVES

eMOTION | LV1

Contents

INTRODUCTION

Thank you for choosing the eMotion LV1 live mixer from Waves. In order to efficiently set up and use the mixer, please become familiar with the eMotion LV1 manual, which is divided into two parts:

- A Quick Start Guide that explains navigation, workflow, and basic controls. It provides what you need for initial setup and basic use.
- This User Guide is a complete inventory of the mixer's controls and displays, along with in-depth instructions.

We suggest that you visit the Waves support site: http://www.waves.com/support. There you will find an extensive answer base, the latest tech specs, detailed installation guides, software updates, and much more.

About Waves eMotion LV1

Waves eMotion LV1 is a software mixer that provides real-time audio mixing and processing for front-of-house, monitor, broadcast, and recording studio applications. A mixer system consists of the eMotion LV1 application, a SoundGrid server, and one or more SoundGrid I/Os. There are three mixer configurations—64, 32 or 16 channels—with up to 8 stereo groups, 16 stereo auxes, L/R/C/M Main busses, and an 8 stereo channel matrix. The mixer is very scalable, and it provides a complete solution for live mixing, from the smallest gig to the largest production.

The mixer is compatible with Windows and Mac operating systems. It supports industry-standard control surfaces and multi-touch devices and can run on multiple screens in both wired and wireless networks. This allows you to design your work environment however you want. Whether you're using a single laptop with a mouse or multiple touchscreens and control surfaces, the eMotion LV1 user interface will feel familiar and intuitive.

Powered by low-latency Intel-based Waves SoundGrid DSP servers, eMotion LV1 utilizes the SoundGrid network for connecting multiple mixers, stage boxes, I/O interfaces, playback/recording hosts, and all other SoundGrid-compatible devices. This provides for flexible configurations with standard network components.

eMotion LV1 is a one-stop shop for all your live mixing needs. With eight inserts on each channel for SoundGrid-compatible Waves and third-party plugins, eMotion LV1 saves you the need to use outboard gear for top-tier processors. eMotion LV1 also lets you share plugin presets and rack processing chains between your studio and any other platforms or consoles that run MultiRack, SuperRack, or StudioRack.

> eMotion LV1 is continuously evolving and improving. Occasionally we will introduce a new feature or slightly change the way a control works. To stay up to date with eMotion LV1 modifications, bug fixes, and features, please refer regularly to the LV1 product page and support notes.

About This User Guide

This User Guide provides detailed information on all eMotion LV1 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 (Mixer window, Show window, etc.). Windows are accessed with tabs at the top of each view.

Page   A subset of a window, usually accessed by a side tab (User I/O Settings, Channels Input A, Scenes, etc.).

Section   An area of a page, usually 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.

eMotion LV1 supports several input devices: touchscreen monitor, touchscreen panel, external controller, and mouse. These devices may use different terms for input action, so for simplicity, we use the term "click" to describe all such actions.

Throughout the manual there are references to other sections of the mixer.
- When a control or function is discussed more comprehensively elsewhere in this user guide, there is a reference to that section. A name set in italics refers to a place in this manual where more detailed information can be found (e.g., see *Patch chapter > Channel Direct Outputs*).
- References in roman type refer to a window, page, or section of the mixer interface.

To indicate the location of a control or menu, the manual uses this notation: Window > Page > Section (e.g., Setup window > System Inventory page > Device Racks section).

To keep things short, the eMotion LV1 mixer is usually referred to as "the mixer."

> 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.

Installation and Setup

Setting up the mixer consists essentially of these steps. Relevant mixer views are noted here in parentheses:

• Set up hardware

• Download and install software. Activate licenses for eMotion LV1 and plugins (via the Waves Central application)

• Create a session based on templates from previous sessions, or use a blank session template (Show > Sessions)

• Assign and configure all I/O devices (Setup > System Inventory)

• Patch audio between devices and within the mixer (Patch > Input)

Once you've created a session, configuring the mixer is similar to setting up other digital consoles:

• Set mixer preferences (Setup > Mixer Settings > U/I Settings)

• Adjust preamps and other inputs (Mixer, Channel)

• Assign groups, links, and adjust sends (Mixer, Channel)

• Assign matrix and mute groups (Mixer, Channel)

• Configure plugins (Channel)

• Create scenes (Show > Scenes)

eMotion LV1 can mix multiple inputs in multiple mix busses and process a large number of plugin instances. To make this possible, all processing is carried out on one or more high-speed servers, rather than on the host computer. This server is part of a Waves SoundGrid network, so the first step in setting up the mixer is to set up the network.

A SOUNDGRID NETWORK CONSISTS OF AT LEAST THESE FOUR ELEMENTS:
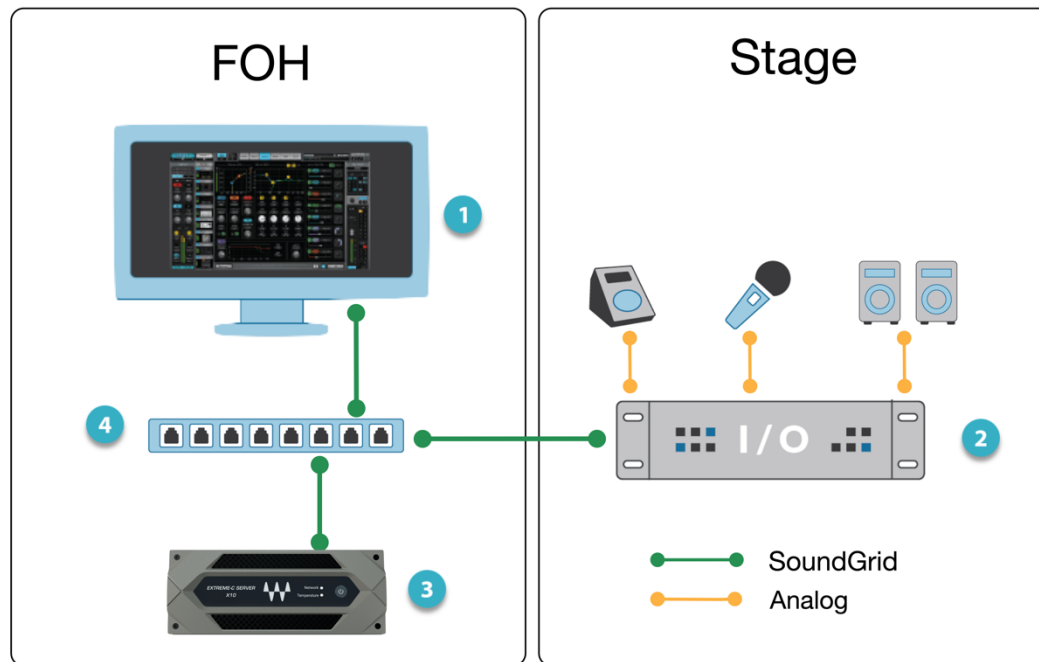
1 HOST COMPUTER: Controls the mixer as well as the SoundGrid network that connects all devices. The eMotion LV1 application, plugins, and preset files are located here. However, audio is not processed here. The mixer application and the SoundGrid network software run on both Mac and Windows and can support multiple displays.

2 AT LEAST ONE SOUNDGRID I/O DEVICE: All I/O devices are connected via Ethernet, regardless of the number of channels. I/Os range from 2-channel preamps to 128-channel MADI interfaces.

3 SOUNDGRID SERVER: The mixer's "number cruncher." All plugin processing is offloaded from the host computer to one or more server. The model of the server has a direct impact on the number of plugin instances. There are several server configuration options, and eMotion LV1 can use up to four main servers and four redundant servers.

4 SOUNDGRID 1GB ETHERNET SWITCH: Links the I/O devices, server, and host computer. There is a growing list of SoundGrid-approved third-party Ethernet switches. Note the model and version of the switch you purchase: some versions work well, others don't. To ensure compatibility, we advise that you obtain Ethernet switches through Waves.

Visit www.waves.com/hardware for up-to-date specifications and system requirements.

ENLARGING A SOUNDGRID SYSTEM

A SoundGrid system is modular. It can grow according to your needs. Adding servers increases the number of plugins that eMotion LV1 can run simultaneously. This is expecially important when sunning several instances of "DSP-heavy" plugins. Each server can be paired with a redundant server as a backup service.

Adding I/O devices increases the potential number of channels for stage, FOH, and monitor. In this example, and second switch is placed onstage, to which all I/O devices are connected in a star configuration.

This system also includes a second computer display. One system can include up to four displays, depending on the host computer video capabilities. Control surfaces, such as FIT controllers, can be added to the system, as can a DAW for recording and playback.

In this diagram, an extra computer is added for recording and playback.

1	Host computer with LV1 app
2	Main SoundGrid Server
3	Redundant SoundGrid Server
4	SG Ethernet switches
5	SoundGrid I/O devices
6	DAW for recording/playback
7	Extra display for LV1
8	External controllers
9	Ethernet connection to other SG systems
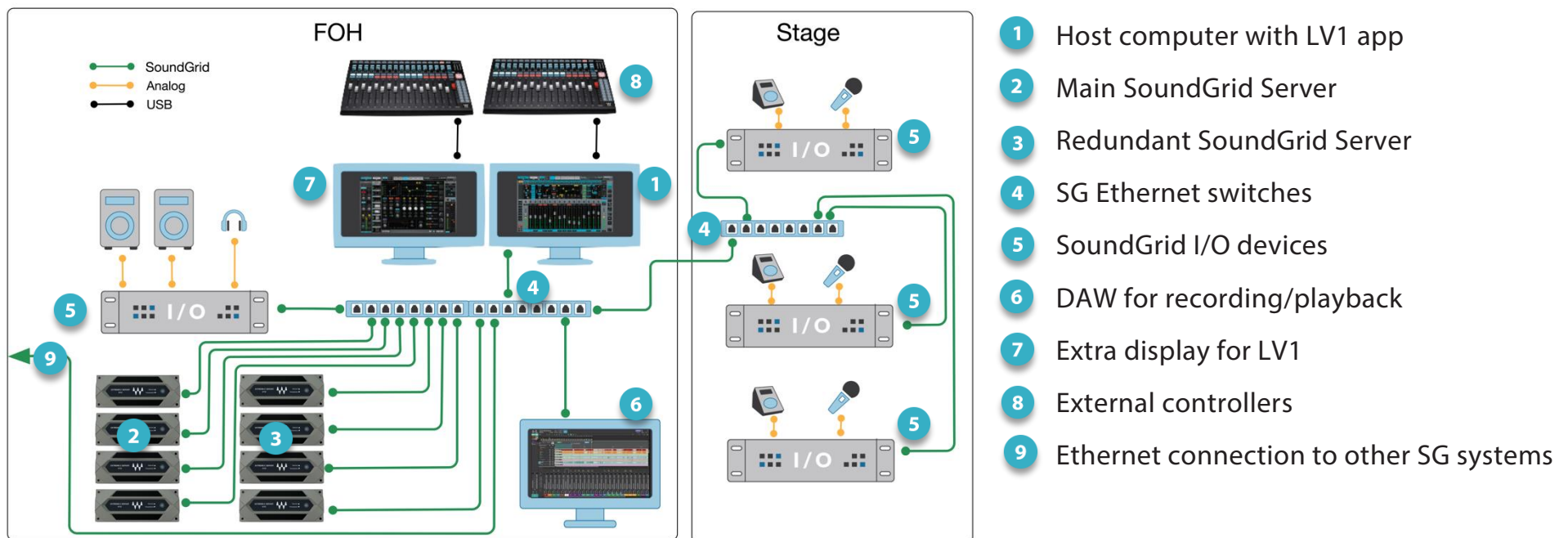
Sharing I/Os Between LV1 Systems

Several eMotion LV1 systems can be networked together to enable sharing of I/O devices. Entire I/O devices can be assigned to users anywhere in a network and indivdual preamp channels can be shared and contoled by remote users.

In this example, the FOH and monitor mixers are sharing resources. The bulk of the I/Os are connected to the FOH's system switch, alongside the monitor mixer's switch port. This joins the two systems, providing the monitor mixer with access to any I/O on the network.
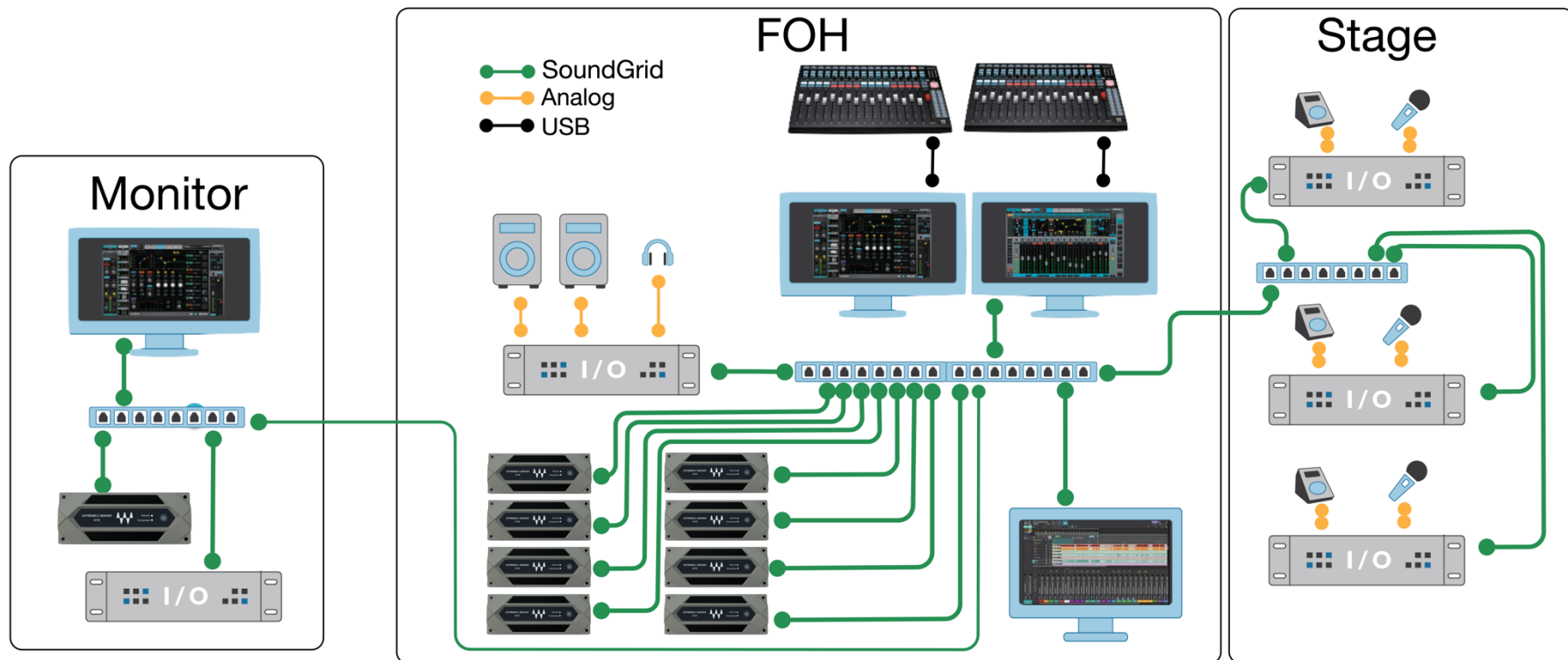
Host Computer Minimum Requirements

Mac OS	Windows
Model/CPU: MacBook Pro / iMac / Mac Mini with Intel i5 CPU or higher	**CPU**: Intel i3 or higher
RAM: 8 GB	**RAM**: 8 GB
Screen Resolution: 1280x768 32-bit	**Screen Resolution:** 1280x768 32-bit

Sample Rate Support

The eMotion LV1 mixer supports sample rates of 44.1 kHz to 96 kHz.

All Waves plugins support sample rates of up to 96 kHz; many support higher sample rates.

System minimum requirements and sample rate specifications are constantly changing. For up-to-date inormation, please refer to the eMotion LV1 Knowledge Base.

Text Entry

Text can be entered in any language that is supported by the host operating system (FIT controller text entry can be in English only).

Connections

LV1 can assign and patch to up to 16 I/O devices: any combination of hardware I/Os and drivers.

• A hardware I/O device can have 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.

Use a SoundGrid Ethernet switch and Cat 5e, Cat 6, or Cat 7 Ethernet cables to connect all hardware components. Note which of the host computer's Ethernet ports is being used for the SoundGrid network. This port can be used only for the SoundGrid network. Do not attach an Internet or other network connection to the Ethernet switch. Use another port for these purposes.

Maximum Cable Lengths

Cat 5e/6/7 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

Cat 5 cables are not supported.

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 reduce the effective cable runs.

Server Requirements

All SoundGrid-approved servers will work with the eMotion LV1 mixer. Server performance has a direct impact on processing power and on the number of mixer channels that can be played simultaneously. Check Waves.com or contact customer support to determine which server best suits your needs.

Display Resolution

eMotion LV1 supports display resolutions from 720p to 4K, and can accommodate one, two, or more computer displays. For details, please refer to *Appendix B: Using Multiple Displays* and consult the manufacturer of your video card and displays. The LV1 window can be re-scaled to accommodate displays with different resolutions, or the window can remain the same size on all displays. This behavior is set with the Auto-Scale button in the U/I Settings page.

Auto-Scaling On—Each LV1window automatically rescales to match the resolution of its display.
Auto-Scaling Off—LVI windows maintain the same resolution on each display.

The **Full Screen** button on the right side of the Top Bar toggles between regular view and Full Screen view.

When Auto-Scaling is On, the Full Screen mode follows this behavior:

Full Screen On—Fits the LV1 window to 100% of the resolution set for the display, while maintaining the aspect ratio. Click again or tap ESC to exit Full Screen mode.
Full Screen Off—The window occupies 90% of the resolution set for the display.

When Auto-Scaling is Off, the LV1 windows are masked in Full Screen mode, but do not resize to fill the screen.

For details, please refer to Appendix B: Using Multiple Displays and consult the manufacturer of your video card and displays.

Control

eMotion LV1 can be controlled in any of these methods:
- 5-point (or more) multi-touch interface
- Control surface supporting Mackie Control™ and MIDIPLUS FIT protocols
- Mobile apps (e.g., MyRecall, MyFOH, MyMON, MixMirror), via MyRemote
- MIDI controller
- Mouse/keyboard

Installing Software

Create a free Waves account if you don't already have one (www.waves.com/create-account). This account is used to manage your Waves products and licenses.

1. Register your Waves Products in your Waves account under "Register New Products." The product serial number (also called a license number) can be found on your purchase invoice, in an email from your dealer, or in an envelope containing the registration form. Once your registration is complete, a product license will be deposited in your license cloud.

2. Download Waves Central from the Waves website. Waves Central is an application for downloading, installing, and managing the licenses of Waves software.

3. Download and install the eMotion LV1 mixer and any selected plugins. Next, move your licenses from your license cloud to the computer you are using or to a USB flash drive.

4. If the host computer on which you'll be running eMotion LV1 is not connected to the Internet, you can create an offline installer. Learn more about Waves Central at www.waves.com/support.

5. Launch eMotion LV1.

WINDOWS USERS:

The Windows Power Plan must be set to "High Performance."

Open the **Control Panel\Hardware and Sound\Power Options** window. Select the High Performance plan and re-launch eMotion LV1.

STARTUP WARNING

Session-Converter module was not found or is not up to date, and does not support the database-version required by this application (3.22).

Please verify that the latest version of the Session-Converter is installed.

For more information please contact Waves support

OK   DIAGNOSTICS
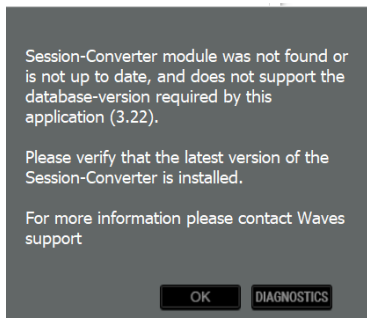
Upon launch, LV1 checks that sessions will load properly with the current software. This reduces the chances of file corruption when loading. This is carried our by the Session Converters. If the installed converters do not match the LV1version, you will see this prompt during launch.

Top Bar

The Top Bar of the eMotion LV1 mixer is a navigation and management tool 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.

Name: Displays the selected channel

Presets Menu: Manages channel presets and sessions

Clear Solo: Clears all solos or cues / opens cue controls

Talk: Engages talkback / opens the TB control page

BPM: Displays BPM; tap to set tempo

Window select tabs: Navigates to all mixer windows

Network Status: Server, I/O, and sample rate status

DSP meters: Displays average and peak processing loads

Scenes: Stores and recalls scenes

Messages: Reports status and errors / Record status

Clock: Displays time or current MTC position

On-screen keyboard: Activates keyboard and ALT/Ctrl keys

Lock: Locks mixer surface, I/O routing, and/or plugins rack

Full screen mode: Fits the mixer window to full-screen view

Help (Waves logo): Shows version; opens user guide

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 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 Name box background color is the same as the color of the selected channel.

2 Presets 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. Channel Recall Safe status is also set here. Presets are saved as part of a session. To use presets from another session, choose the **Import from File** menu item. The name of the current channel preset is shown in the Preset box above.

Beneath the Channel Presets is the **Session** section of the menu. It provides quick access to sessions and it enables the presets for the entire current session to be saved to files.

The Presets 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. Instead, open it and save as a user preset.
User Presets (load)	A list of user-defined channel presets that is saved from within the current session or imported from another. To delete a user preset, hold Ctrl before opening the Preset menu. When then opening the User Preset menu, preset names will be preceded by "Delete." Select the preset and it will be deleted. This 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 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 at a user-defined location and 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. There are several Paste options.
Set Channel Color	Enables custom coloring of any channel.
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 selected scene with current mixer condition.
Update All Scenes	Updates all scenes with the current mixer condition.
Update Channel State to Scene(s)	Condition of 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

Export User Presets
Export All Presets

Load Session
Load Template

Save Session
Save Session as
Save Template

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 with 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 is not saved, you will be prompted to do so.
Load Session Template	Presents a navigation window for loading a session template. Loading a template does not alter the current I/O inventory and external patching.
Save Session	Overwrites the 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
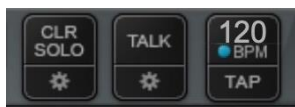
Clears active solos or cues on all tracks.

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

④ TALK

Activates talkback. Click on the gear button to access the Talkback configuration page. Refer to Channel>Talkback Section for more about the Talkback function.

⑤ BPM

The value in the box and flashing light indicate the system tempo. 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 number to change the BPM or edit the value directly.

⑥ WINDOW SELECTION TABS

Radio button tabs that navigate to the six mixer windows.

Mixer 1 and 2	Two multi-mode, multi-layer mixing interfaces.
Channel	A detailed view of a selected channel. A channel's inputs and outputs, aux sends, and plugin processing can be controlled here.
Show	A workspace for managing sessions and scenes.
Patch	A patch bay for connections between the mixer and I/Os, within the mixer, and between devices.
Setup	Assigns I/O devices, servers, and controllers. Manages mixer, network, and interface settings.

7 SG STATUS PANEL

Refer to this panel to monitor the status of the SG network and servers. On the left side of are three overview indicators:

Server	At least one server is assigned. At minimum, there must be a server 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	At least one SG I/O device is assigned. This provides clock and audio throughput. Green indicates that at least one I/O is present. Red indicated that there is not at least one I/O assigned to the system.
Sample Rate	Shows system sample rate.

8 DSP METERS

A server group consistes of one active server and possibly a redundant server. There are four server groups. Each server group has a meter bar that displays 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 a large number of these plugins, the peak and average indicators will drift apart. In such cases, some of these plugins may need to be disabled.

High network usage (channels over the network) *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 available from any window.

Store New	Creates a new user-named scene based on current condition.
Store	Overwrites the recalled scene with 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, buffer overload, etc. Troubleshoot network and device issues in the System Inventory page (Setup > System Inventory).

11 CLOCK

When MIDI control is used, this box can display MIDI time code. Otherwise it displays the time from the host.

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12 **ON-SCREEN KEYBOARD**

Click the keyboard icon to open the host computer's on-screen keyboard, which is useful when you don't have an external keyboard. ALT and Ctrl are locking modifiers.

13 **LOCK**

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

14 **FULL SCREEN MODE**

The **Full Screen** button on the right side of the Top Bar toggles between regular view and Full Screen view. Full Screen behavior is determined by the Auto-Scale setting (Setup > U/I Settings > Display).

When Auto-Scaling is On, the Full Screen mode follows this behavior:

Full Screen On—Fits the LV1 window to 100% of the resolution set for the display, while maintaining the aspect ratio. When Click again or tap ESC to exit Full Screen mode.
Full Screen Off—The window occupies 90% of the resolution set for the display.

When Auto-Scaling is Off, the LV1 windows are masked in Full Screen mode, but do not resize to fill the screen.

15 **HELP PAGE (WAVES LOGO)**

Takes you to a get info page that shows the eMotion LV1 version number and provides links to the user guide and quick start guide.
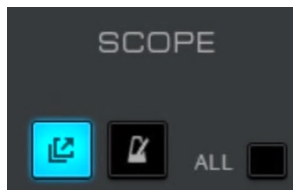
Floating Windows

Some Panels can be undocked from their original locations and then moved to anywhere on the screen or to another display:

System Inventory The control panel for any I/O device, driver, server, or controller open as a floating window.

Plugin Control Panes Click on a plugin icon in a rack to open its control pane. Click the Expand button in the upper-right corner to undock the pane in a floating window. When another plugin is undocked, the current plugin window will be redocked. Pin a plugin window to keep it undocked. Floating plugin windows are set to "always on top" in relation to the main application windows. Up to five plugin windows can change layout with a scene change.

Routing View Panel Undock the Routing View panel to continuously monitor network activity.

Main Window Tabs Each of the six main windows can be "torn off" and floated. Close the app window to return the tab to the main tabs section. The arrangement of the Main window tabs is saved with the eMotion LV1 preferences.

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.

With Auto-Scaling On, floating windows will re-scale when moved from one display to another display with a different resolution.

Chapter 1:

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 choose 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. Devices are assigned in the racks below.

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

System Inventory Page Displays and Controls

This section describes the controls and menu items of the System Inventory page. It is 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 **System**

Identifies the host computer of the local LV1.

NETWORK CONTROLS
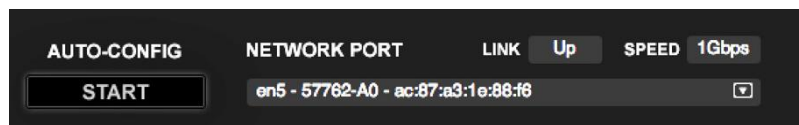
2 **Auto-Configure / Start**

A mixer system can be configured manually or with the aid of an auto-configure tool. This tool inventories all devices in the SoundGrid network and then sets up a mixer system based on available assets. The resulting session includes device assignment and patching, as well as mixer configuration. Auto-configure is discussed later in this chapter (*Setup > Using the System Inventory Page > Configuring a Basic Mixer Setup*).

3 **Network Port ID and Selector**

Shows all detected network ports on the host computer. Choose the port that connects to the SoundGrid devices or network switch. We recommend that this port is used exclusively for SoundGrid devices.

4 **Link**

Reports the status of the Ethernet connection to the computer running the eMotion LV1 software.
Options: UP / DOWN / INVALID

5 **Speed**

Reports the speed of the SoundGrid network. Options: 100 Mb/sec, 1 Gb/sec, N/A.

HOST COMPUTER DISCONNECT

If the host computer is disconnected from the SoundGrid network, you will see this prompt:

This computer is disconnected from the
SoundGrid network

OK

This condition likely indicates a disconnected Ethernet cable.

- If the network speed in the Network Control section is "N/A," it is likely that the host computer's cable is disconnected from the switch.
- If this is not the case, check that the devices are conneted to the switch.

Once the host computer connection is re-established, the prompt will close.

Sample Rate Controls
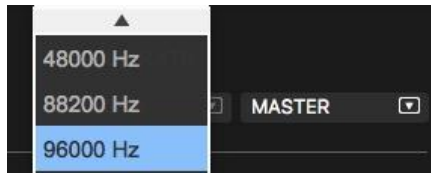
6 **Sample Rate Master/Slave Status Selector**

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 these.

9 **I/O Rack B**
Assign up to eight I/O devices. Racks A and B are identical.

10 **Servers Rack**
AssignSG server(s) to the rack. The first server assigned will be the primary server; other servers will be redundant and identified with "RSGS." A redundant server automatically takes over should the primary server malfunction.

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 shows the status of network connections. Each row represents a one-way patch between two devices or between a device and the main server.

15 Quit

Closes the session and quits the application. When the mixer is in full-screen mode, use this button to exit the application. When it is not in full-screen mode, closing the application windows will quit the mixer.

Before quitting, the mixer prompts whether or not to save the current session.

No: The session is saved based to the latest auto-save, as defined in the Mixer Settings page.

Yes: The current mixer condition can be saved to a new file.

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 to set up a new configuration or to modify an auto-configured setup.

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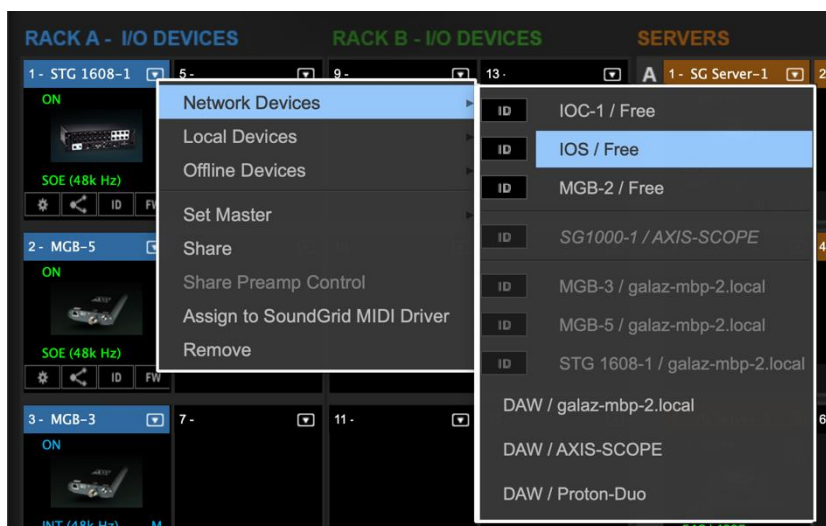
Racks A and B assign hardware and software I/O devices to the mixer. Racks A and B can be used interchangeably; they are separated only for convenience. For example, some engineers dedicate one rack to FOH and the other to monitor.

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:

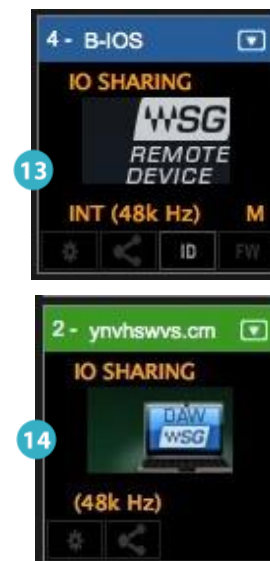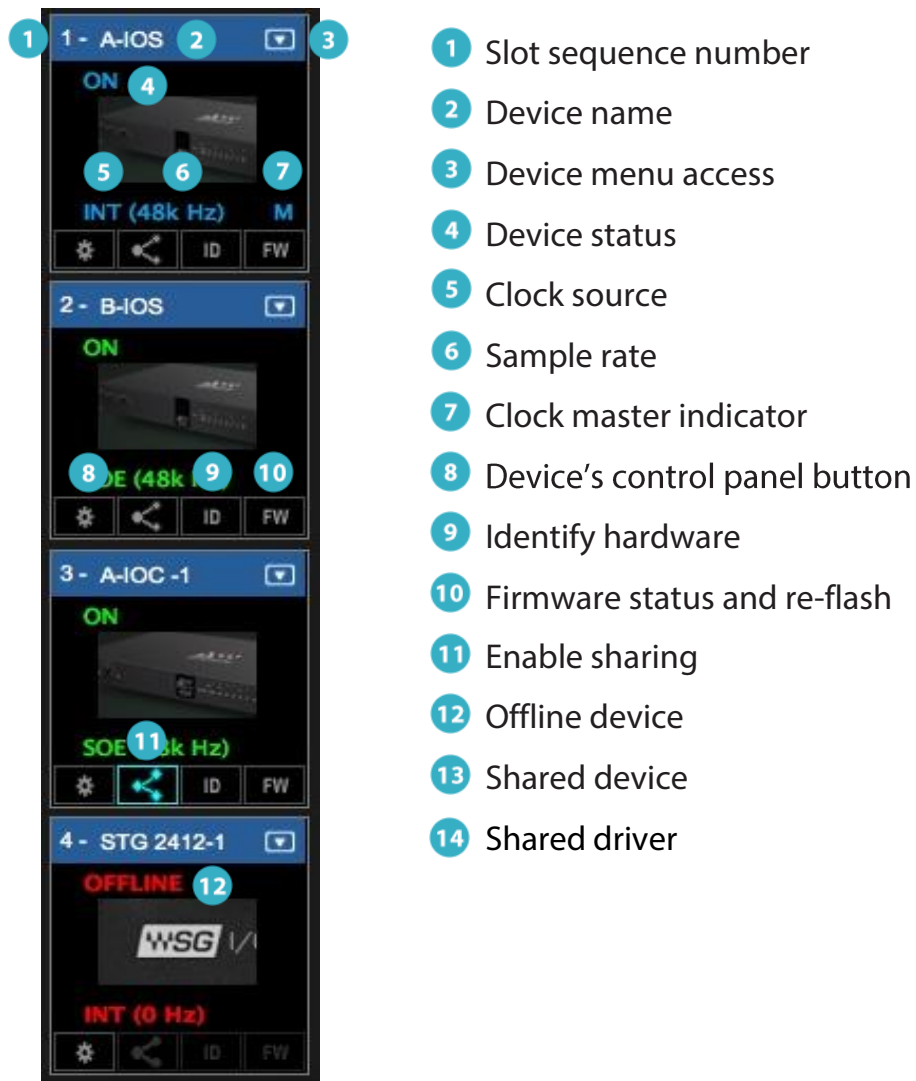|	
Network	Devices and SG Drivers available for assignment
Local	Local ASIO/Core Audio drivers for third- party devices. Only one local device can be assigned.
Offline	Templates of devices for offline preparation

Available devices are shown in black. Devices that are not available for assignment are gray.
The rack slot number determines the device's place in the Patch window and in certain drop-down menus. Device sequence is not important, but some engineers choose to use 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 status
5. Clock source
6. Sample rate
7. Clock master indicator
8. Device's control panel button
9. Identify hardware
10. Firmware status and re-flash
11. Enable sharing
12. Offline device
13. Shared device
14. Shared driver

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
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.
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.
Devices Menu	Drop-down menu	Used to add and remove devices from the slot and to set the device as clock master.
Device Status	On	Device is active.
	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.
Clock Source	INT, SOE, AES, WC, DigiLink	Clock source of this device.
Sample Rate	44.1, 48, 88.2, 96 kHz	Sample rate of device.
Clock master	M (Master) / (blank = slave)	Identifies the device as the clock master of the SOE network.
Control Panel Access	Gear button	Click to access 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.
ID Hardware	Locate hardware device	Activates lights on the front panel of the hardware device associated with the icon.
FW		Status of 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.
Offline device	Red	Device is offline.

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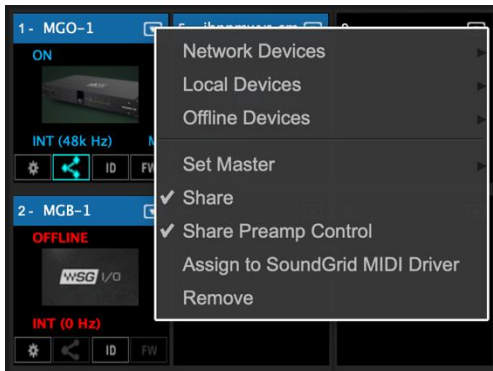
Once an I/O device has been assigned to a rack slot, additional menu items are available.

> Some SoundGrid devices include I/Os as well as a server (e.g., IOS). These devices will appear as two separate units. One will appear in Racks A or B as an I/O under its own name. The other will appear as server SGS-1, SGS-1, etc.

Menu Item	Possibilities	Function
Set Master	A list of all devices that can be used as a clock source for the local SOE 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.
Assign to SoundGrid MIDI Driver	Check/Uncheck	Assigns any MIDI-port-equipped I/O device to the SoundGrid MIDI driver. The device can then serve as a port for other MIDI devices. The assigned device appears to MIDI controllers as "SG Device I/O." Refer to Appendix 2.
Remove		Releases the device from the local host. It will then be available to other drivers.
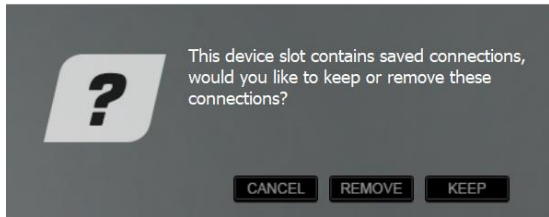
If you attempt to remove a device that has connections that are saved in the session, you will see this warning.

These menu items apply only to drivers.

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 more 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
	If a driver in the host 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 as a result of 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.

I/O Sharing

An eMotion LV1 system consists of a host computer, an Ethernet switch, at least one SoundGrid server, and a least one I/O. These elements communicate through a SoundGrid SOE network. All connected I/O devices within this system can be assigned and patched to the eMotion LV1 host.


Single freestanding eMotion LV1 system: All I/O devices, servers, and local drivers in this SOE network are seen in the System Inventory.

CONNECTED SYSTEMS

Multiple eMotion LV1 systems can be linked by connecting their Ethernet switches. This enables hosts within this "super system" to build private networks from all connected I/Os, servers, and drivers. These assignments are exclusive; devices assigned to a host are available only to that host until they are un-assigned. Other users will see the devices in their System Inventories, but they will be grayed out and unavailable.

An eMotion LV1 system does not need the permission of other systems to assign an available device to its Inventory.
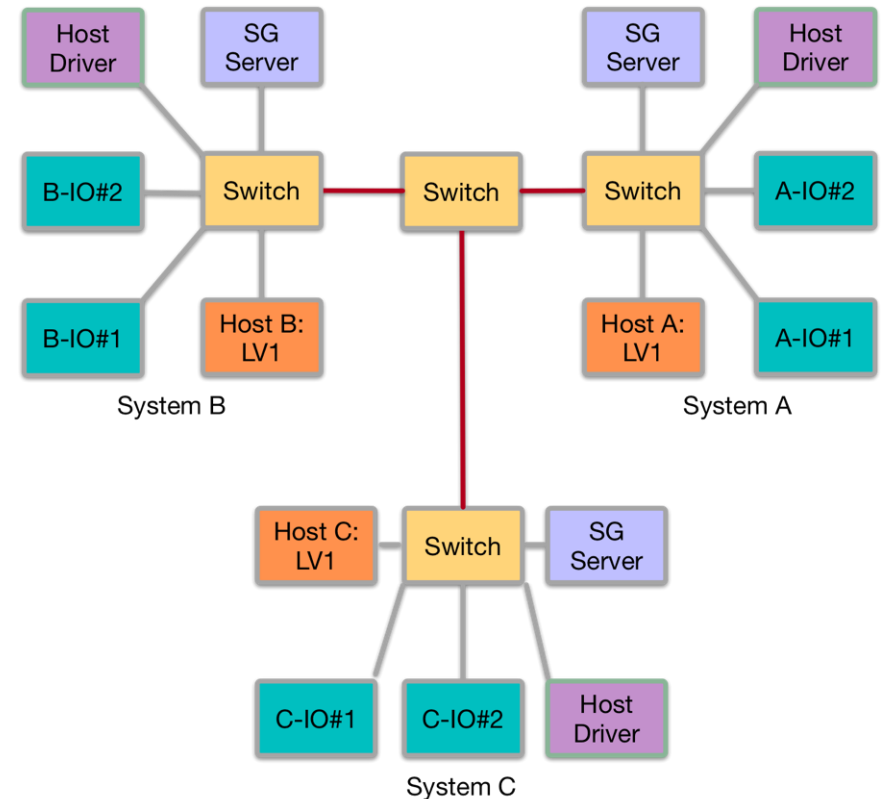
System Inventory in Super Systems

A-IOC / Free
A-IOS / Free
B-IOS-1 / Free
C-STG-1608 / Free
C-STG-2412 / Free

DAW / SGQA-1064LAP

DAW / johnp-hsiembp.local

DAW / MBP15-HS

All devices in a super system—whether assigned to a host or not—are displayed in the Device menu of each independent system's Inventory (left). There are five I/O devices, none of which have been assigned to a system. Each connected host's local driver is also shown.

A device assigned to a host's inventory is the **manager of the device**. When a device is removed from a host, it becomes Free and it can be assigned by any other host, which in turn becomes its manager.

Sharing a Device

Device sharing enables hosts to assign devices that are already claimed by other hosts and patch available device I/O channels. A host that patches I/O channels from a device that's been assigned to another host (the manager) is called the **client of that device**. A host can be a manager of some devices and a client of others. A device can have several clients, within the limits of the device's maximum output to the network. Each destination establishes a direct connection from the shared IO device, so the total outputs to the network increase.

For example, a 128-input MGB patched to four hosts will use up the 1 Gb network capacity of the SoundGrid network. In this case, the device will output 128 x 4 channels=512 channels (at 48 kHz).

This Device menu illustrates numerous device assignments, unshared and shared. Font style and shading indicate the type of assignment. Italics indicates that the device is share enabled.
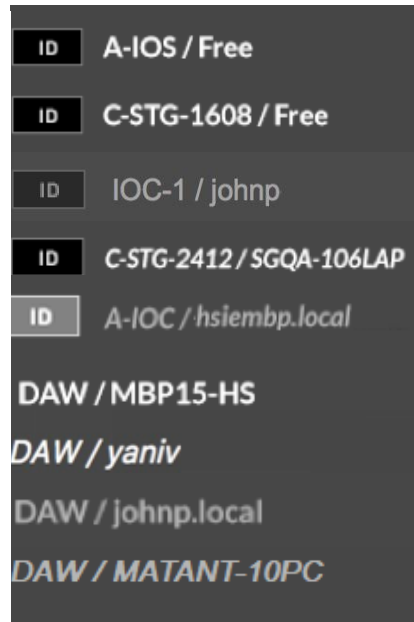
Unassigned devices

Once a device is assigned, its name is followed by the name of the host to which it is assigned.

Locally assigned device (grayed out)

Sharing-enabled device on another system (not grayed out, italics)

Device assigned to another system (grayed out, italics)

Unassigned driver

Sharing-enabled driver on another system

Driver assigned to local host

Driver assigned to another system

SETTING UP DEVICE SHARING
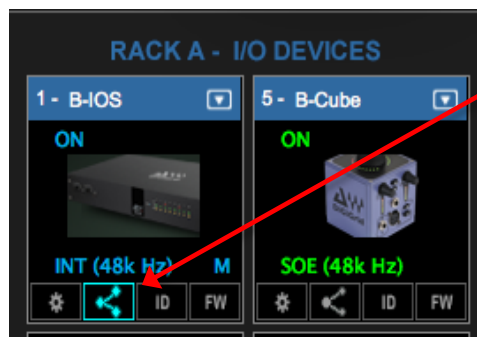
Select the assigned device you wish to share. Click the device's Sharing icon. The device is now sharable. Sharing can also be enabled from the Device menu. Only the manager of a device can activate its sharing.

Other systems can now assign the I/O device to their Inventories and patch available I/O channels. Output I/O channels patched by the manager cannot be shared with other systems until the device's manager releases the patches or removes the device from its inventory.

CLOCKING CONSIDERATIONS IN SHARED SYSTEMS
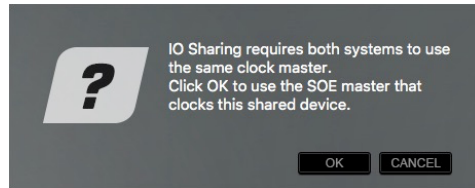
When a device is shared by two systems. both systems must be locked to the same clock master. If a client system assigns a shared device that's part of a system with a different clock source, something must be done to rectify the difference.

When assigning a shared device whose clock source is not the same as that of the client system, this prompt will appear. Click OK to set the clock of the client system as your system's clock. The shared device, or its master clock, is now the local SOE clock master for all the devices in your local SoundGrid network.

Cancel to explore other ways to provide a clock common to both systems.

In this example, device **A**-IOS is shared with eMotion LV1 system **B**. This means that the device is now assigned to two independent systems (A and B) that must be synchronized to the same master clock device. In this example, A-IOS becomes the clock master of system B—all other devices become SOE slaves.

It is possible to assign another device as the clock master while using a shared device, as long as all devices share the same clock.

Use each system's **Set Master** menu to re-assign clock masters. Select the same device in both systems, if possible, and the clock will be common to both systems.

The shared device can now be a slave in the client system.

If the shared device cannot synchronize to the new clock, it will be unavailable for sharing by that host. Other eMotion LV1 hosts in the super system may be able to sync to the shared device if they can adjust their clocks accordingly.

A shared device can be a slave or the clock master of in its *own* SOE network, indicated by the **M** on the shared device's icon (left). On the right, the device is still the SOE master of the system it's being shared with but is a slave within its own system.

When devices from more than two systems are assigned to a system's inventory, all systems must be locked to the same master clock device.

> ❗ Note: Changing the master clock assignment in a system that includes shared devices will result in a clock reset in all associated systems. This results in a short audio dropout.

Patching Shared Devices

PATCHING SHARED INPUT DEVICES
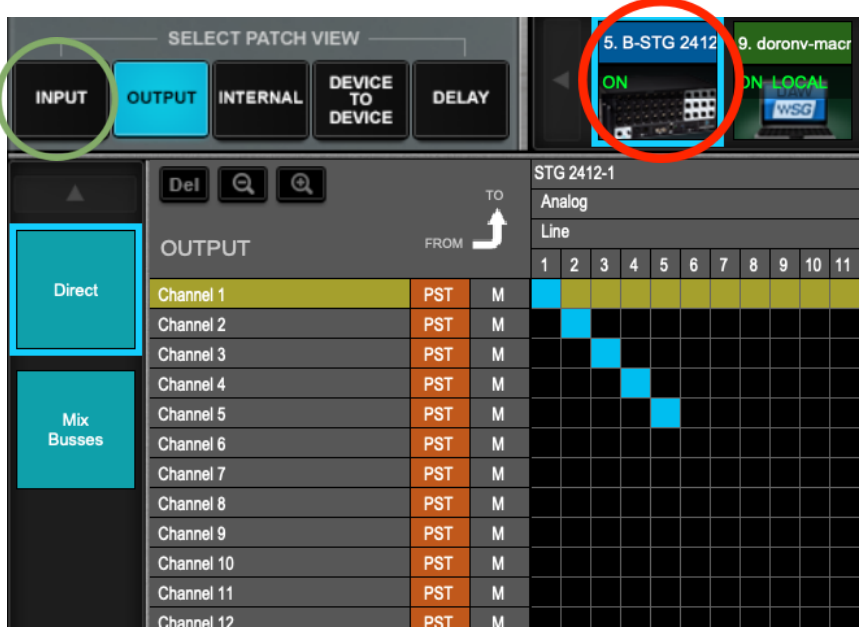
When a device is shared, all of its inputs are available to all users. The shared device appears in the Patch window with the non-shared devices.

PATCHING SHARED OUTPUT DEVICES

Once assigned, a shared I/O device appears in the client's Output Patch window. "IO 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. In the example on the next page, the device "B-IOS" is owned by LV1-FOH and is being shared by LV1-STG.

SHARED AND UN-SHARED DEVICES IN THE PATCH

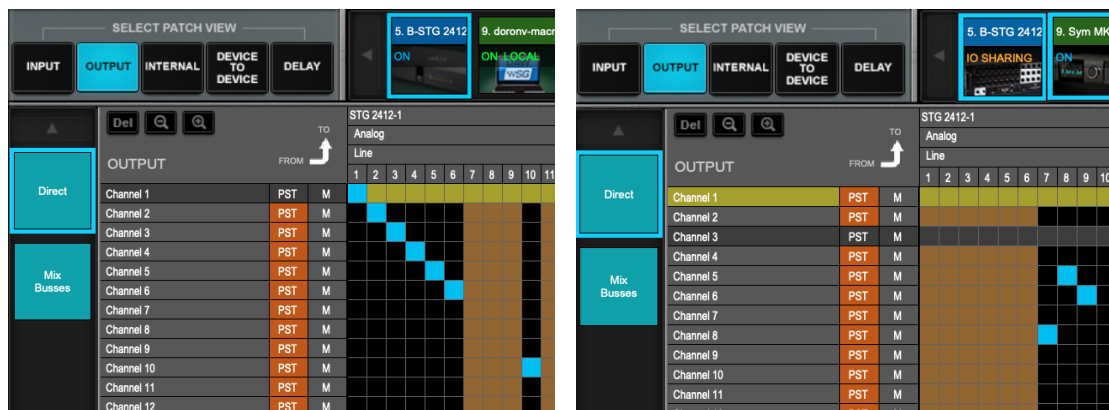B-STG 2412, owned by LV1 #1   LV1 #2, using shared device B-STG 2412
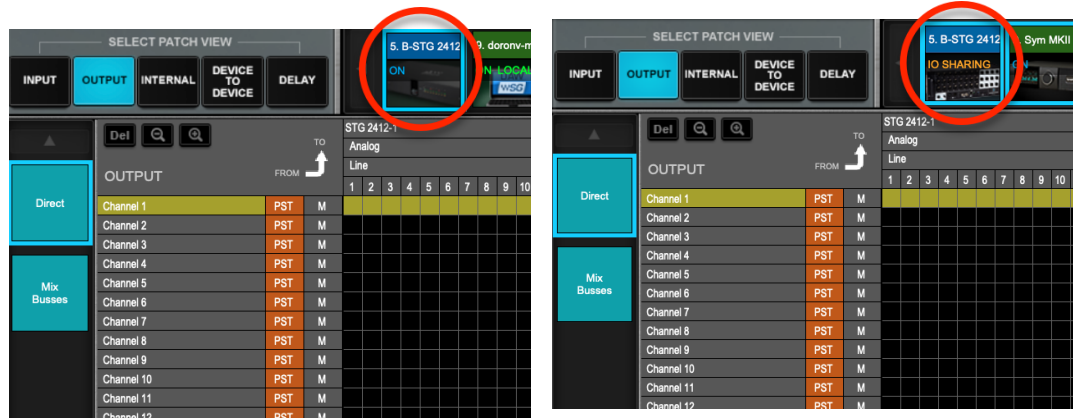
Device STG-2412 appears as an assigned device in the output patch of LV1 #1 (left) and as a shared remote device in LV1 #2 (right).

e

When an output patch is made in either system, the corresponding I/O channel in the other system is colored orange to indicate that the patch is in use.

LV1 #1 (left): Analog line outs 6 and 8 are orange, indicating that those channels have been claimed by another system, in this case, LV1 #2. Local patches are shown in blue.

LV1 #2 (right): Analog line outs 1, 2, 4, and 5; headphones 2L and 2R; AES 1 and 2 are patched by LV1#1, the device manager, so they are unavailable for patching by other systems

A manager can always disconnect an I/O channel and establish its own connection.
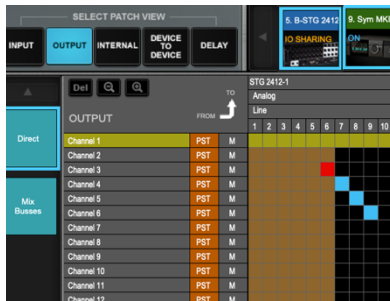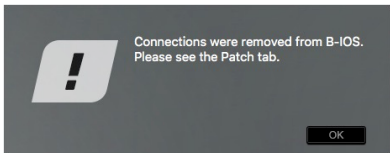
If the manager of a device patches to an I/O channel that's already taken by a client, the preexisting client patch will turn red. The client is no longer patched to that I/O output channel.

Patching shared outputs in the Mixer and Channel windows follows the same rules as in the Patch window.

Devices shared by other system in the super system are indicted with <shared>.

A warning alerts the client that the original patch has been disabled. When the manager releases the patch, it will return to the client.

REMOVING SHARED DEVICES
Client
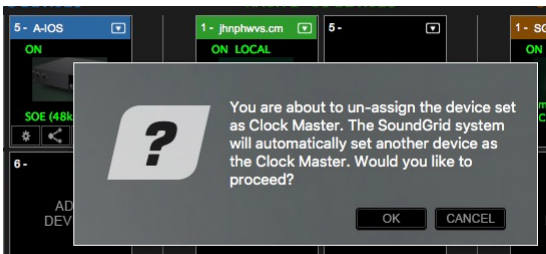
Select **Remove** from the Devices drop-down menu. Since the remote device is, by necessity, the local clock master, removing it will result in another device becoming the clock master. This prompt will appear. Once the device is removed, SOE clock will return to the previous master. This may result in a short audio drop.

Manager

Deselect the Sharing icon, or uncheck Share in the Device menu, to end sharing for a device. If you attempt to remove a device that is being used by another system, this prompt will appear. You will not be able to un-share the device until it is not patched by other clients.

If the Sharing Host Becomes Unavailable

If the manager of a shared device fails (e.g., Ethernet connection is broken, computer stops working, computer is taken away), the shared device will continue to function. As long as the device is powered up and is connected to the manager's SoundGrid network, it will pass audio. The device, however, is still owned by the missing host, so a client cannot initially access the device's control panel.

Any user on the supersystem can claim Manager status of the "orphan" devices. Select "Manage Device" from the device's menu and the device will appear in the client's inventory as a local SOE device. It can be designated as a clock master or slave of the SOE network.
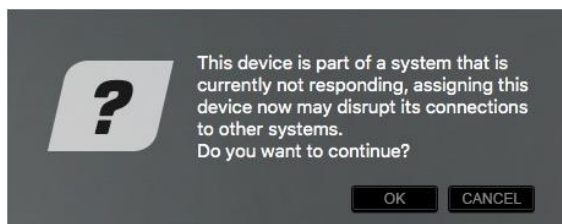
If the absent manager system is sharing devices with yet other systems, this operation may interfere with some connections.

Device Management Persistence

A SoundGrid host's session includes a full description of each device in its inventory (e.g., MAC address, clock, preamp settings). When a device is shared, the session also records whether or not this host manages it. The host sessions in a super system each keeps track of its own saved device management status. Together, these sessions recall the management status of the entire system at the last working super session.
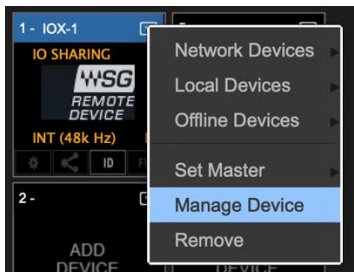
A session loads with its devices in their management settings just as they were at the last save. A managed device will remain managed and a shared unmanaged device will remain unmanaged, regardless if its manager is online or not. In case of conflicts, or if a change of management is required, any member of the group can later claim management of a device by selecting **Manage Device** in the Device drop-down menu.

There may be situations where a device is not managed by any host. It will continue to stream audio and can be used and patched, however its specific settings cannot be modified until one of the hosts claims full management of this device.

Normally, reassigning the management of a device will not affect the audio. In certain situations, however, changing the device management can resulting in routing changes.

SHARE PREAMP CONTROL

A device manager can enable all clients in a super system to adjust the preamp gain for a shared device. When Share Preamp Control is selected, any client host can adjust the preamp gain of any I/O channel of the device. All users sharing this device have equal control of preamp gain in any patched I/O channel.

For more information on how to control gain in multi-client environments and how to retain your gain structure while other users are controlling preamp gain, refer to *Channel > >Input Sections >Controlling Preamp Gain on Shared Devices*.

Servers

The Servers rack is used to assign, remove, and configure SoundGrid servers. They are assigned and removed in the same manner as I/O devices.
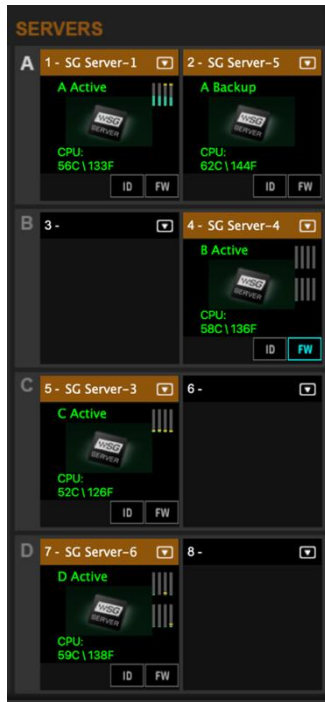
> **IMPORTANT**
> Server Group A powers the mixer's internal processing. *There must always be a server assigned to the left slot in Group A,* even if no other servers are assigned.

You can assign up to eight servers to an Motion LV1 system: four main (active) servers and four redundant servers. Servers are organized into groups of two: A, B, C, and D. These groups are assigned to specific channels for provessing; assignment takes place in the Channel and Mixer windows.

The first server assigned to a server group will become the active server for the group, and will be labeled "Active." The second server assigned to the group will be the redundant server, and will be labeled "Backup."

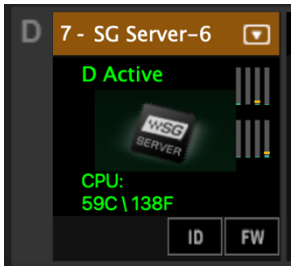Servers are assigned and configured from the drop-down menu.

> Some SoundGrid devices include an I/O as well as a server (e.g., IOS). One will appear in Racks A or B as an I/O under its own name. The other will appear as server SGS-1, SGS-1, etc. Treat these devices as two separate units.

Server Drop-Down Menu

Menu Item	Possibilities	Function
Devices	Drop-down menu	Choose from among the servers on the SoundGrid network. A server that is assigned to another host 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 amount of time it takes for audio to stream from the I/O to the server and back. This influences the speed of real-time processing. Each mixer connection pair represents a server processing buffer, so the buffer size will affect latency in routing where there are several connections. If you encounter pops or other errors, increase the buffer setting.
Information	(N/A)	Reports technical details about the server. Server link speed is indicated here. When Server link speed is 100 mps or lower, the server name will display red text. This likely indicates that 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 deliver the sessio n's processing needs, the session may not perform effectively if the main server fails.
Remove		Releases the server from the local host. It will then be available to other hosts.

Server Indicators on the Icon

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

Green	The server is present and operational.
Gray	The server is assiged but is not available. "N/A" is displayed
Red	The server is in an error state. Possible reasons include: • Device crashed • Device not in sync • Device firmware is incompatible with current SoundGrid Studio software.

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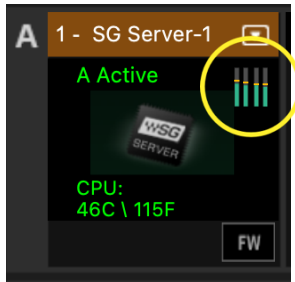
The meter bars on a server icon indicate DSP usage of each of the server's cores. There is one meter per core.

The solid bar areas display **average** DSP use per core. The yellow lines show **peak** use, as indicated in the percentage display 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 a large number of these CPU-hungry 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%	The networkpproaching its limit. 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%	Network load is excessive. Monitor the meter status. Remove some plugins and/or increase the network buffer size.
Red		DSP load is beyond the limit. Remove heavy-load plugins immediately.

Using a Redundant Server

Assign a second server to provide redundancy in the event that the primary server fails. Switchover to the second server is automatic. Switchover time depends on the size of the session. During this period, sound is muted. Redundant servers are labelled "Backup" in the Inventory.

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

Test Redundancy

This test 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 deliver 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, then you need to get 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 falls, 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 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.

Notes About Using Multiple Servers: Read This

- The Active server in Server Group A is the principal server for the eMotion LV1 system, so there must be a server in that slot.
- 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 latency of at least 64 samples. 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. Moreover, additional servers should—if possible—be connected to the same network switch as the main server that's assigned to Group A.

CPU Temperature

Indicates the temperature at the server's core. Measured in Celcius and Farenheit. Consult the user guide of the device for temperature limits.

> Some SoundGrid devices include an I/O as well as a server (e.g., IOS). One will appear in Racks A or B as an I/O under its own name. The other will appear as server SGS-1, SGS-1, etc. Treat these devices as two separate units.

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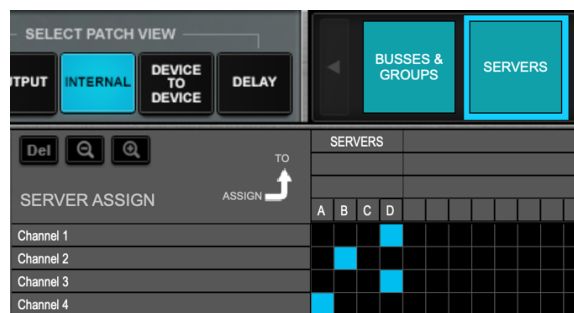
A server group can be assigned to any mixer channel—all plugin processing on that channel will take place on the designated server. This allows you to distribute your DSP load between servers to get the best performance from them. DSP-hungry plugin racks can be assigned to different server groups to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

Server groups are assigned in the the Patch Window internal patch view (above left), which provides an overview of all or the server group assignments. You can assign a server group to the selected channel with a drop-down menu at the top of the plugin chainer in the Channel Window (right).

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
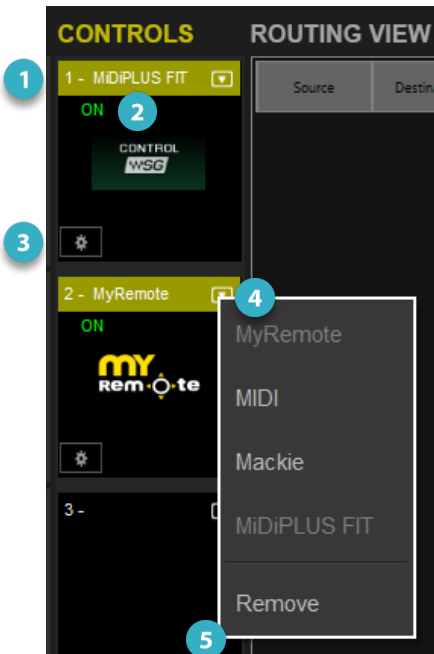
Use the Controls rack to assign external controllers to the mixer. Assigning controllers is very similar to assigning I/O devices and servers. Choose between protocols for MIDI, Mackie Contol, and MIDIPLUS FIT, a hardware controller optimized specifically for LV1.

MyRemote is a protocol that enables remote control of LV1 using IOS and Android apps on mobile devices. Among the apps are:

MyFOH	Enables the FOH engineer to remotely adjust critical LV1 controls from throughout 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.
MixMirror	Provides comprehensive remote mirroring of the LV1 interface.

To use an LV1 mobile device app, select "MyRemote" in the Controls menu and assign the app. Consult the user guides of the remote controller apps to learn more.

		Possibilities	Function
1	Selected Control Category		Displays selected protocol.
2	Controller Device Status	Displays presence and status of device	N/A > Device corresponding to the selected protocol is not present or 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	Drop-down menu listing 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.

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 must adjust 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 can be the clock master, or the mixer, or another system that provides clock. Almost any device whose sample rate can be set can be a sample rate master.

There are two drop-down menus that control how sample rate is set.

1. Sample Rate Master/Slave Status Selector
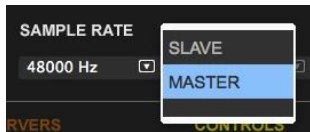
This menu controls whether the mixer is the sample rate master or a slave. As such, it determines how the sample rate of a system is established.
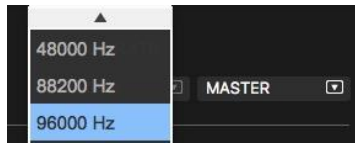
Mixer as Sample Rate Master
When set to Master mode, the Sample Rate menu setting instructs the clock master device to change its sample rate. This in turn changes the sample rate of all SoundGrid devices in the mixer system. The clock master supplies the requested sample rate from any of its available 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.

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, for example, receive clock from another system, such as a hardware mixing console. If the hardware mixing console is the clock and sample rate master of its system and the SoundGrid system is locked to that, then eMotion LV1 must assume the role of sample rate slave.

2. 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.

Routing View Panel

The Routing View panel shows the status of network connections—the sreaming of audio 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
Origin of the network connection: I/O, server, driver.

2 DESTINATION DEVICE
Destination of the network connection: I/O, server, driver.

3 CHANNELS
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 evident in the Rack or Overview windows.

4 ERRORS
A count of the network packet errors on the connection. When an error occurs, the
display flashes, and the count is increased by one. Click Reset to clear the error counts

OTHER CONTROLS

5 RESET
Clears the Error count.

6 FLOAT
Un-docks the Routing View window
.

Use the Routing View Panel, in conjunction with the CPU and Memory indicators in the Top Bar, to isolate connection problems stemming from errors or too much traffic. If you're experiencing audio drops, or you see CPU overs in the Top Bar indicator, check here to troubleshoot the problem. Some examples:

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

Using the System Inventory Page

This section demonstrates how to set up a basic mixer system and how to work offline without a server or I/Os.

Configuring a Basic Mixer Setup

Below is an example of an eMotion LV1 mixer setup. This configuration provides two I/Os for stage and one I/O for FOH and PA. There is no real difference between configuring a small system or larger one. It's just a matter of scale. Refer to the eMotion LV1 Quick Start Guide for an overview of system setup.

**1. Configure Hardware**

Use Cat 5e, Cat 6, or Cat 7 cables to connect all devices to the network switch.

FOH   **Stage**
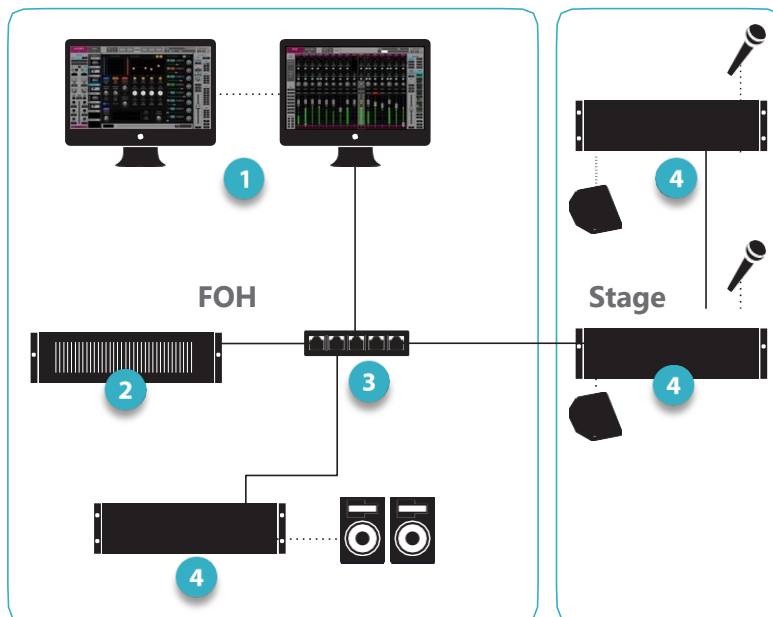
1. Host computer + eMotion LV1 software
2. SoundGrid server
3. 1 GB Ethernet switch
4. 3 I/O devices

Confirm that all connectors are well seated and that cables are secured. A damaged or poorly seated cable can be difficult to diagnose or repair during a live event.

2. Open Network Connection
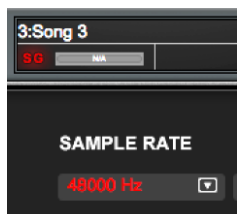
Open the System Inventory page. Use the Network Port drop-down menu to select the host computer Ethernet port that is connected to the SoundGrid network. It is important that this port is used by the SoundGrid network only. When the correct port is selected, the Network Link will read **Up** and the Speed will be **1Gbps**. Since there are not yet any I/O devices assigned to the mixer, the **SG** and **Sample Rate** indicators will be red, indicating that the mixer is not yet locked.

3. Assign I/O Devices

There are two ways to configure SoundGrid I/Os and servers.

Auto Config	Automatically scans the network Assigns devices Patches inputs Patches one pair of outs to each device (channels 1 and 2 to Cue out) Automatically updates Firmware Does not patch driver-to-driver
Manual	Device assignment and patching is carried out by the user.

Using Auto-Config

a. Select the host computer network port connected to the SoundGrid network.

b. Click Auto-Config to reconfigure the network or to add devices to an existing configuration. eMotion LV1 will scan the network and assess device status.

c. If a device's firmware is out of date, Auto-Config will automatically update it to match your current version of the eMotion LV1 application software.

d. When the process is complete, click Done.

ASSIGNING I/O DEVICES MANUALLY

a. Click the arrow in the upper right corner of an I/O device rack slot to open the Devices menu. All devices available to this LV1 are displayed here. Devices that are currently unavailable are grayed out.
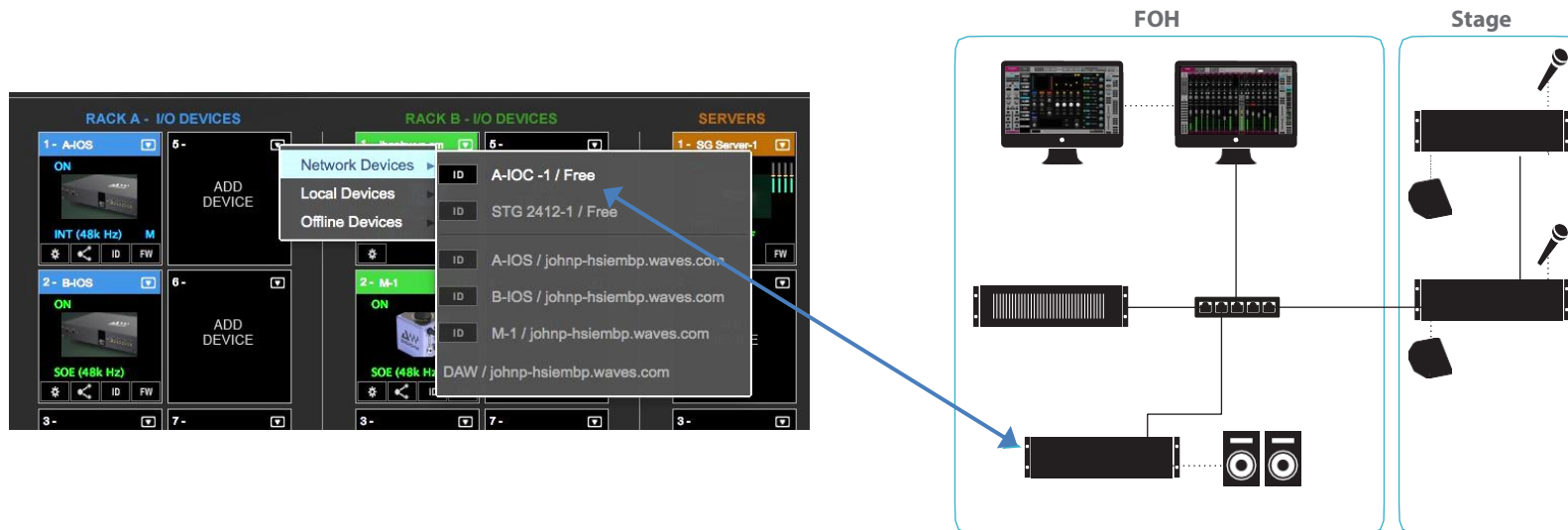

Assign hardware and software devices to any slot in Racks A or and B. The sequence is unimportant.

b. Select an available device and it will appear in the rack. If this is the only device in the rack, it is by default the clock master and its icon text is blue. Devices on the SoundGrid network are clocked over Ethernet. This form of synchronization is called "Sync over Ethernet," or SOE, so the clock master device in the Device Rack is the SOE master. Now that there is a master clock for the SOE network, the Network Link and Speed indicators in the Top Bar are no longer red.

Once an I/O has been assigned to a computer, no other computer can access it until it is released by that user. To release an I/O from your computer, select **Remove** from the menu.

c. Add more devices in the same manner. They will be defined as clock slaves and their icon text will be green. To designate one of these added devices clock master, choose **Set Master** from that device's drop-down menu. The original clock master becomes a slave. In our example, the IOX (I/O #2) is the clock master and the other I/Os are slaves whose clocks are synchronized over SOE. Once an I/O has been assigned to a computer, no other computer can assess it until it is released by that computer.

FOH   Stage

I/O #1 SOE clock slave

I/O #2 SOE clock master

I/O #3 SOE clock slave
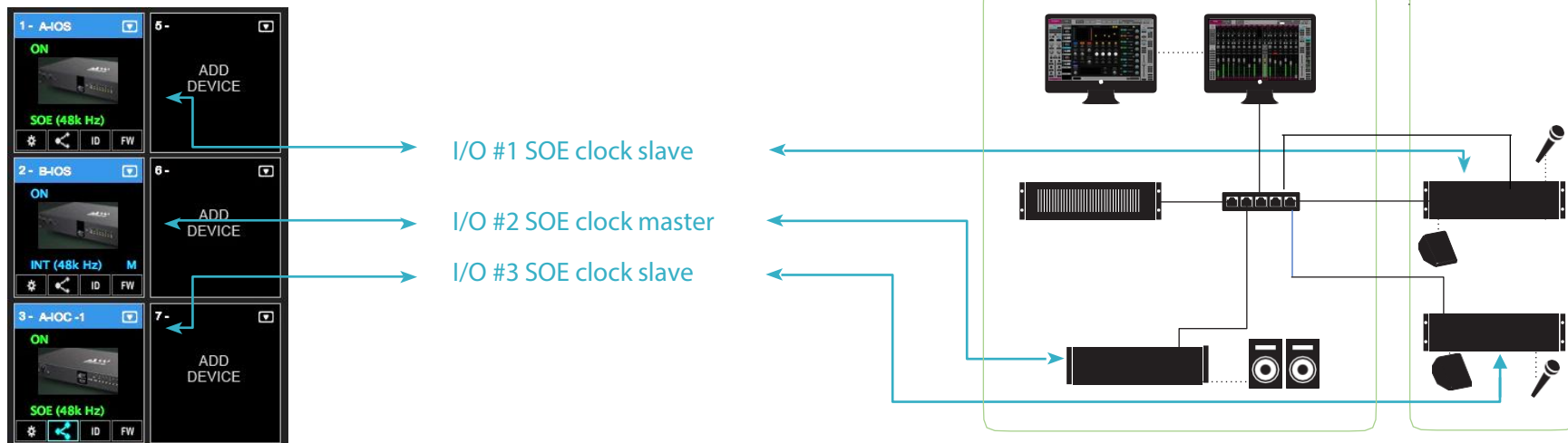
d. If you need to adjust preamps or otherwise configure the I/O, click the **gear button** beneath the icon to open the I/O device's control panel. The control panel of any assigned device (i.e., hardware I/O device, driver, external controller) will open in a floating window, which can be repositioned. Up to five floating windows can be displayed simultaneously. Close the window to close the control panel.

The SOE master can be locked to a system outside the SOE network (such as a mixing console). Use the device'scontrol panel to configure its sync with the outside device or system. Even though this device is a slave to an outside source, it remains the SOE master. Refer to the SoundGrid studio User Guide for a thorough description of system clocking. Control panels differ by make and model of I/O.

e. I/O channels of all assigned devices—hardware and software—will appear in the Patch, Channel, and Mixer windows.

Working Offline

The mixer can be completely pre-configured or modified offline. Virtual devices can be assigned to the racks, allowing for detailed preparation of patching, channel settings, plugins presets, mixer configuration—the entire system—without the hardware. A session prepared offline—whether on the host computer, a laptop, or a tablet—is a complete session and is fully operational when a server and I/Os are added.

a) Load the session you wish work with, or start with a blank session.

b) From the Offline Devices drop-down menu, select the device you wish to use "virtually." It will appear in the I/O Devices racks like any hardware device. Its text will appear red and the icon will read "Offline."

c) Set up your session. Offline device inputs and outputs are available in the Patch menu and in any mixer window where devices can be routed.

d) Configure all channels, auxes, internal routing, and plugins in the same manner as devices that are physically present.

When the session is opened on a mixer system with I/Os and a server, the devices that were configured offline will maintain all settings, even those dependent on external connections that were not present during offline configuration.
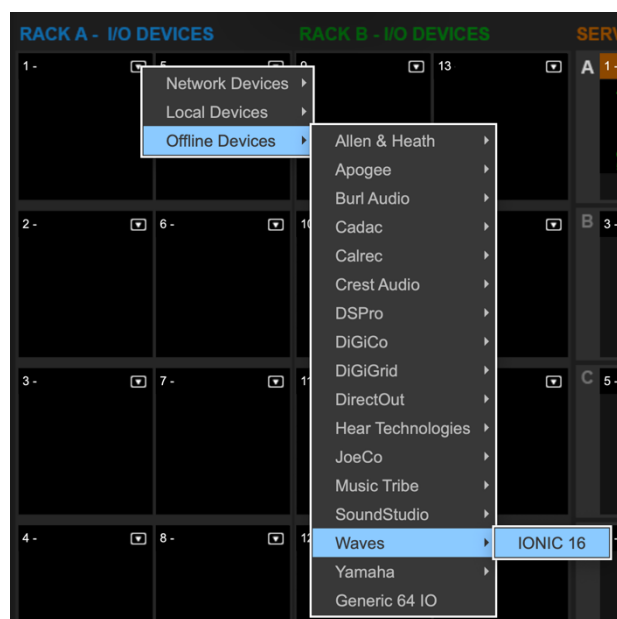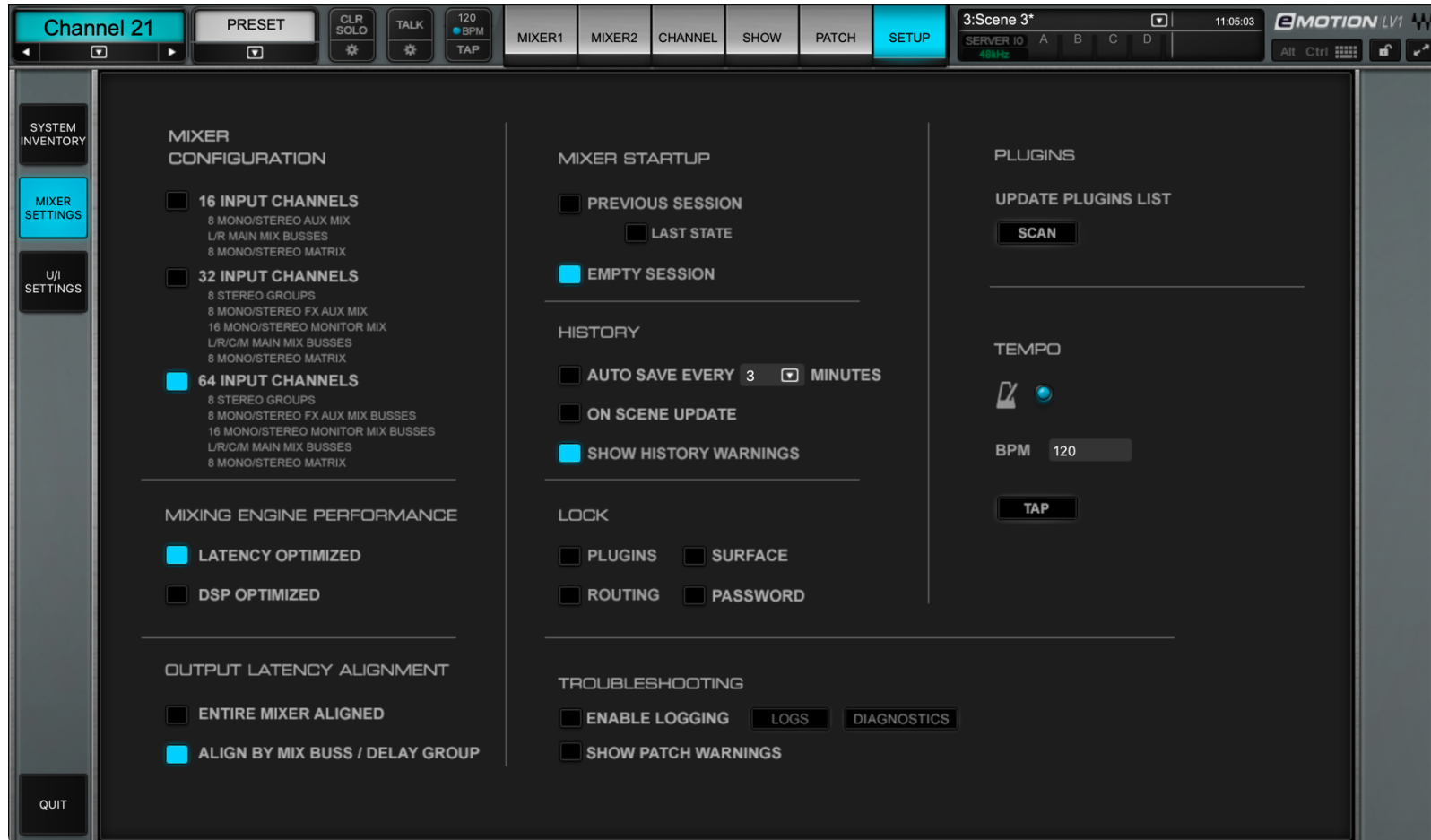

You can rename an offline device. Once the offline device is assigned, double-click on the device icon name and type the friendly name. Press Enter. When the corresponding hardware device is connected, the new name will be preserved.
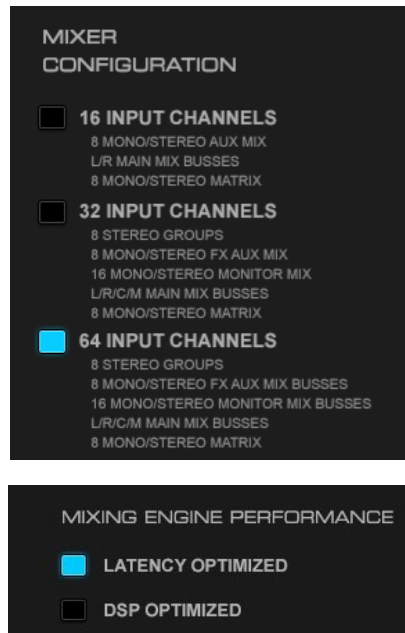
Mixer Settings Page

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. he mixer can have 16, 32, or 64 channels, with 8 stereo groups, 16 stereo aux channels, an L/R/C/M main buss, and an 8-channel stereo matrix (depending on the selected configuration). The maximum mixer size is license dependent.

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

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.

The **Mixing Engine Performance** panel sets the mixer's internal processing priority, which affects DSP performance. This is demonstrated on the next page.

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*)
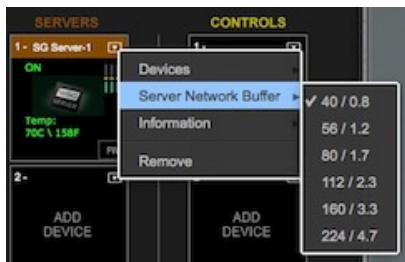
The network buffer is the amount of time it takes for audio to stream from the I/O to the server and back. This determines the maximum latency for a processing route. Set the Server Network Buffer size in the Server rack of the System Inventory page.
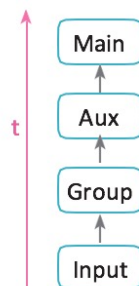
Internal Routing	Server Network Buffer
0–32 samples	40–56 samples
0–64 samples	80–112 samples
up to 128 samples	160–224 samples

Latency Optimized

= Determined by Network Server Buffer only

Example (Latency Optimized Mode)

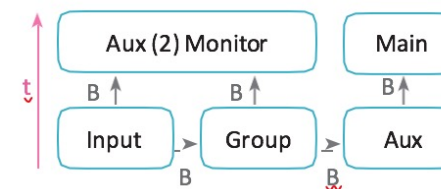I/O ➤ Input ➤ Group ➤ Aux Monitor ➤ I/O

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%. Adjust your DSP use or you may encounter drops: rebalance server assignmets if you have more than one active server; remove or disable whatever plugins you can. If this doesn't help, then 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.

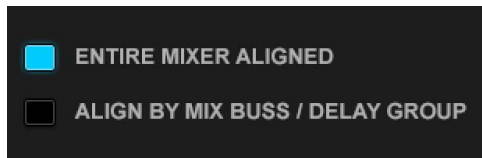Certain paths will have zero latency, even in the DSP Optimized mode.

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. *See Appendix E* for more on delay compensation.

Individual plugins can be excluded from compensation. Refer to *Channel > Plugins Rack and Channels > Delay Groups*.

Mixer Startup
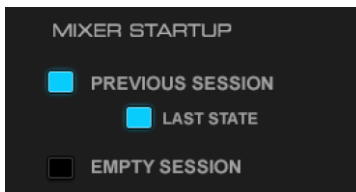
Determines the startup condition of the mixer.

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
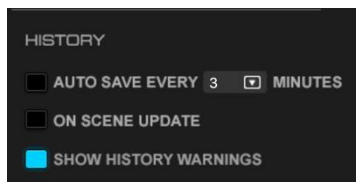
Sets the rules of automatic saving.

Auto-save Options

Every X Minutes   Auto-save on/off, 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 fi
are the same format as user-saved sessions, but are stored in a separate folder:

Windows: Users\Public\WavesAudio\eMotion\history   Mac: /User/Shared/Waves/eMotion/history

Show History Warnings

Deselecting this button serves 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, older 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 host computer.

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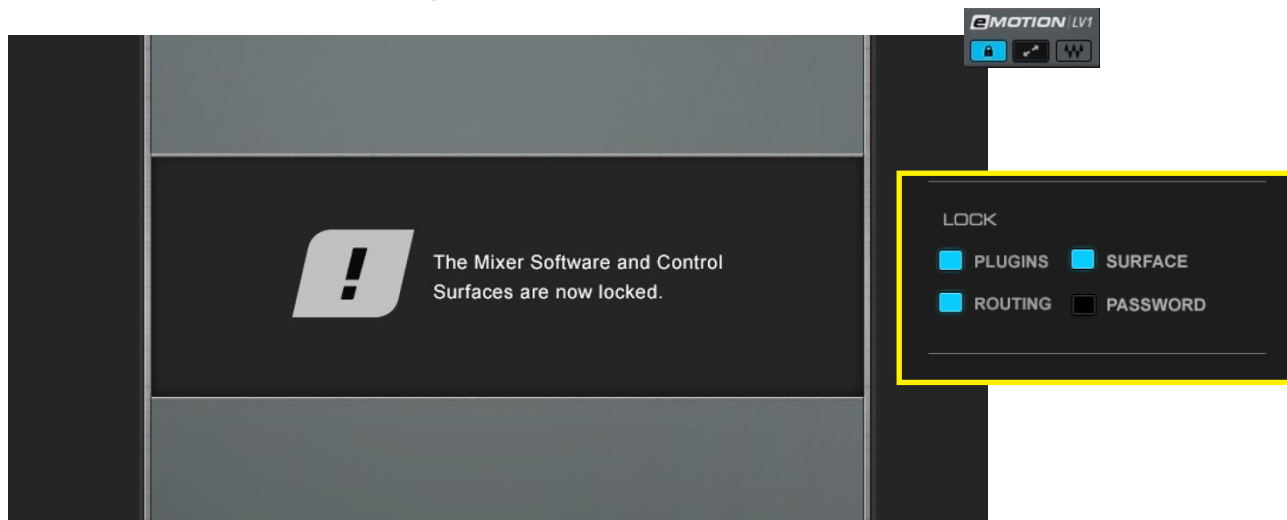
You can also lock the application interface, with or without a password. This does not affect the mixer application, only the user interface. Locking the surface also prevents quitting the eMotion LV1 application.

TROUBLESHOOTING SECTION

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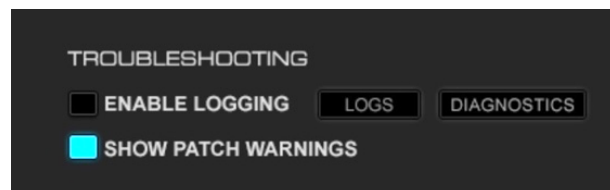
eMotion LV1 constantly logs its activity. Select **Enable Logging** to provide verbose logging for troubleshooting purposes. Click the **Logs** button to view or copy the log files. Send these files to Waves technical support if requested.

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 a privacy notice. If you agree to its conditions, a diagnostic report will be created and placed on your desktop. When requested, send this file to Waves technical support.

Show Patch Warnings
When selected, a warning is issued when any routing change is made in the Patch window.

Plugins
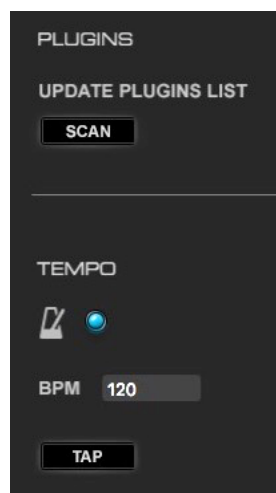
Update Plugins List

Scans the system for new plugins.

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. Tap the tempo pad or Ctrl + T on the keyboard. These taps are averaged to create a tempo value. You can also enter a numeric 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.
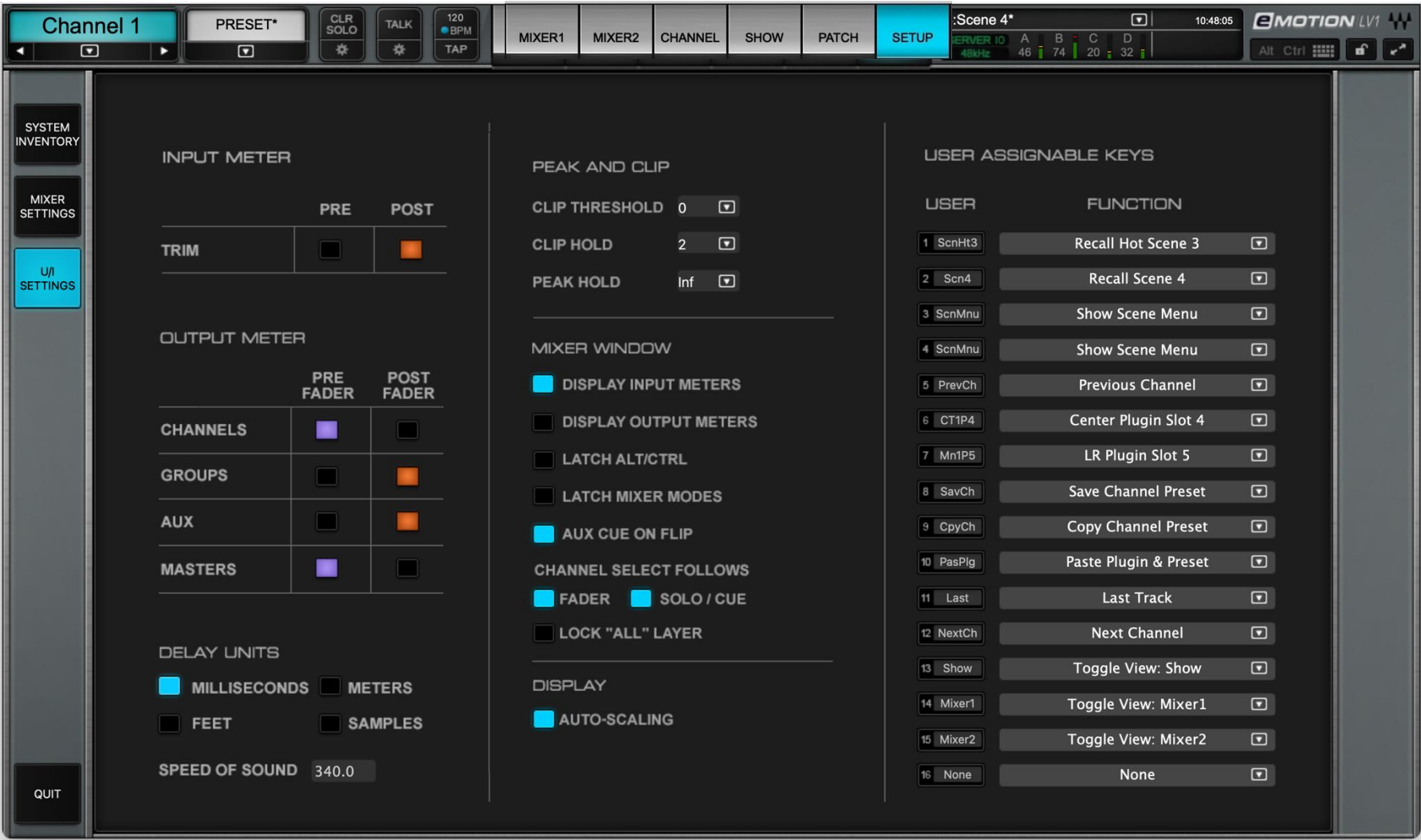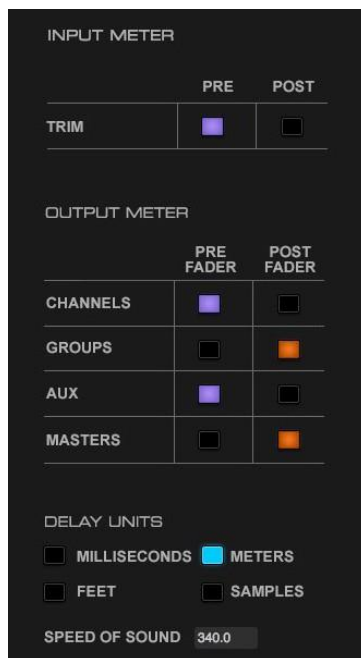
Input Meter

Selects the metering point at which 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 measure for delay-related displays. This choice 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. Display is in meters. Default: 340 meters/second
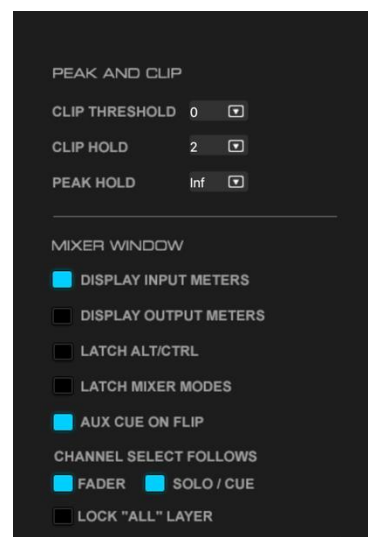
Peak and Clip Settings

Clip Threshold determines the level at which a peak light turns red, indicating clipping. Setting the Clip Threshold setting 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 Mixer mode from changing when the Layer selection changes.

Aux Cue on Flip

Sets the behavior of the Aux mix track Cue output when the mixer is in the Aux Fader Flip mode.
On: The Aux mix output is assigned to the Cue buss for quick monitoring of the Aux mix.
Off: No automatic Cue assignment.

Channel Select Follows 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.

Lock "ALL" Layer

Keeps the ALL layer of the current mixer visible; other layers of this mixer cannot be selected. When Lock ALL is activated, a lock symbol appears on the ALL layer button. Click the button again to lock the layer. This is useful when you are working with two or more displays and you always want to have an overview of your mixer handy.

Display Auto-Scaling
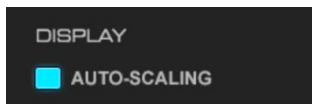
When **Auto-Scaling** is selected, eMotion LV1 window will automatically rescale to occupy 90% of the resolution set for each display. When Full Screen mode is selected, LV1 windows will rescale to 100% resolution on each display.

User-Assignable Keys
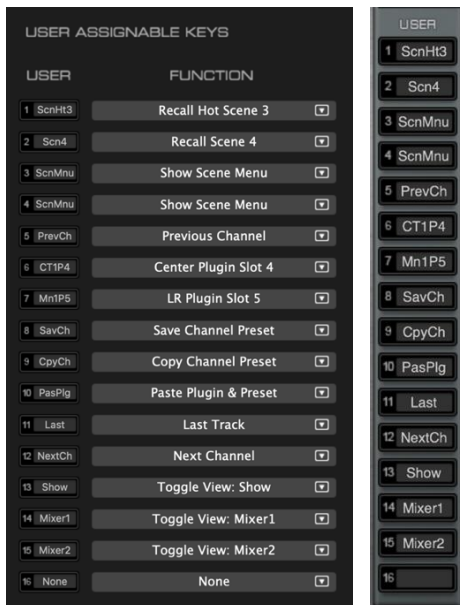
Frequent actions can be assigned to eight user-assignable keys. Assignments are made from the drop-down menu associated with each key. User key assignments are organized by category.

To recall a user-assigned key, select a number from among the buttons on the left side of the Mixer window. User-assigned buttons are visible in every mode and layer of the Mixer window.

User-assigned keys are visible 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.

UI Settings   Mixer

User-Assignable Menu Items

Menu Item	Section	Function
Save Session	Session menu	Saves current mixer condition. Overwrites existing session.
Load Session	Session menu	Opens a navigation for selecting a session to load.
Save Channel Preset	Session/Preset menu	Opens a navigation for saving a preset.
Copy Channel Preset	Session/Preset menu	Copies channel preset to clipboard.
Paste Channel Preset	Session/Preset menu	Pastes copied preset information. Presents a list of channel-preset paste options.
Scene Undo	Show > Scenes page	Reverts to previously loaded scene.
Recall Hot Scene	Scene menu	Recalls a hot scene that was created in the Show > Scene page. Hot scenes are recalled by their number in the Hot Scenes list.
Recall Scene	Scene menu	Recalls one scene. Scene select by name
Show Scene Menu	Scene menu	Opens the Scene menu on the Top Bar.
View Channel	Channel window	Navigates to a channel to open its Channel window. Use the multi-level drop- down menu to choose a channel.
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.
Previous Channel	Channel/Mixer windows	Selects the channel to the left (lower) of the currently selected channel.
Next Channel	Channel/Mixer windows	Selects the channel to the right (higher) of the currently selected channel.
Toggle View	Top Bar	Provides direct access to the six mixer windows.
Last Track	Channel/Mixer windows	Selects the most recently selected channel.
Show Preset Menu	Session/Preset menu	Opens the Preset menu.
Surface Lock	Top Bar	Activates Lock. Parameters of Lock are defined in Setup > Mixer Settings.

Menu Item	Section	Function
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.
Mute Channel	Channel/Mixer windows	Mutes/unmutes a specified channel.
Plugin Bypass	Channel/Mixer windows	Bypasses/un-bypasses a specified plugin.
Flip A/B Input channel	Channel/Mixer windows	Switches globally between Inputs A and B (This flips all channels in the session. You will see prompt: "Are You Sure?" before you confirm the change.)
Talk	Top Bar	Activates Talk key.
TB Preset	Talkback page	Selects one of eight talkback presets.
Mute All	Mixer window	Mutes entire console. The prompt "Are You Sure?" is displayed before mute.
Aux Flip Mixer 1 Aux Flip Mixer 2	Mixer window	The specified aux channel will be placed in "Sends on Faders" mode. Sends level is controlled by the channel's large fader. The master fader controls the aux channel level.
Copy Main Mix to Aux	Session/Preset menu	Sends main mix to a specified aux channel.
Store Scene	Top Bar/Show window	Stores the current mixer condition to the selected scene.
Store New Scene	Top Bar/Show window	Creates a new scene based on the current mixer condition.
Next Scene	Top Bar/Show window	Recalls the next scene from the scenes list.
Previous Scene	Top Bar/Show window	Recalls the previous scene from the scenes list.
Custom Layer	Mixer window	Opens Custom Layer view
Spill	Mixer window	Opens Spill view
Clear Solos	Mixer window	Clear solos in all mixer layers
Alt/Ctrl	Channel/Mixer windows	Activates Alt or Ctrl modifier keys on the onscreen keyboard.
Keyboard Launch	Channel/Mixer windows	Calls up the onscreen keyboard.
Next mode	Mixer windows 1 & 2	Moves to the next mixer mode.
Toggle All VGain	Channel/Mixer windows	Toggles all channels between Preset and Local preamp modes.

Chapter 2:

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 an 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.
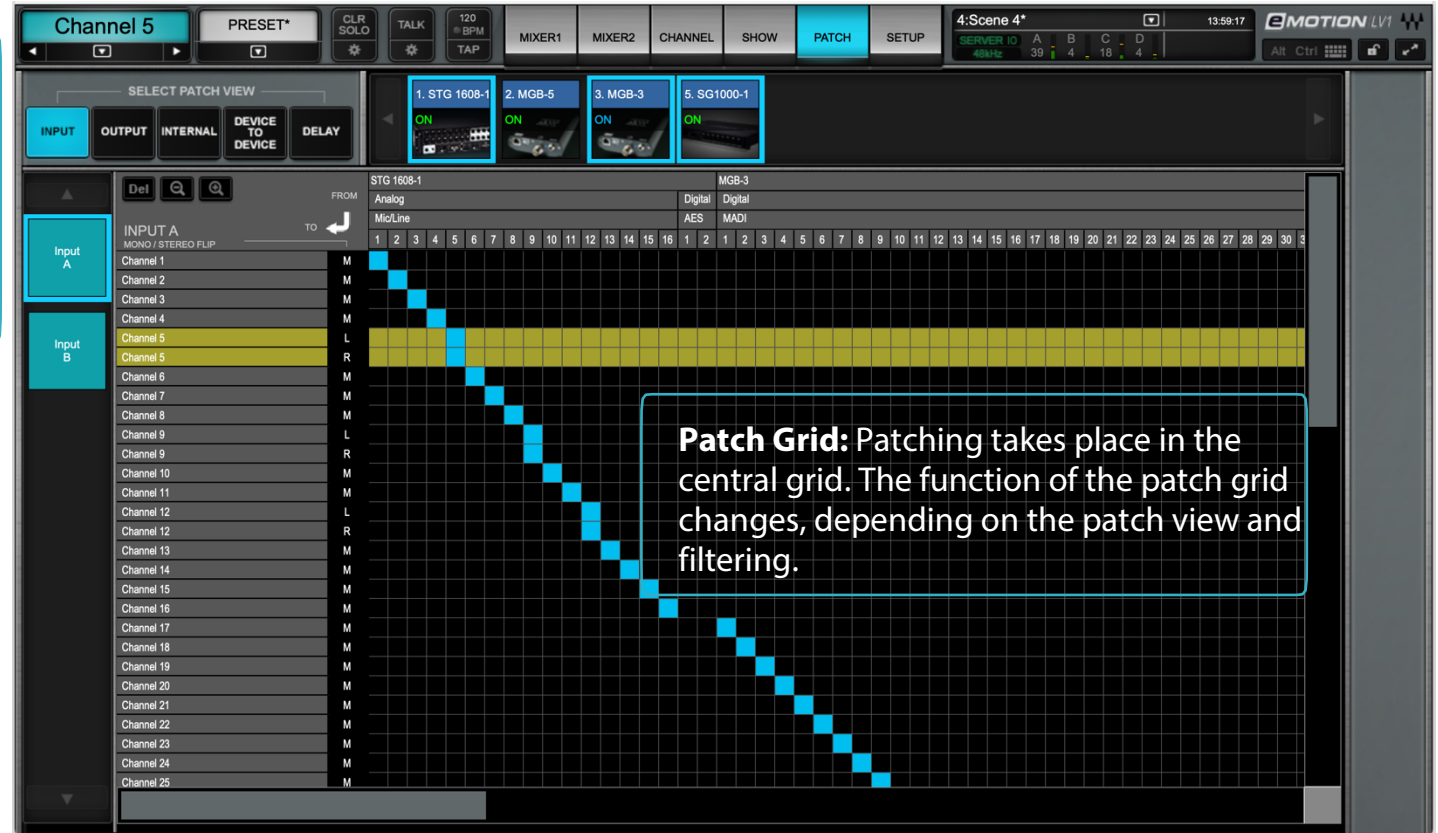
Filtering Tools

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.
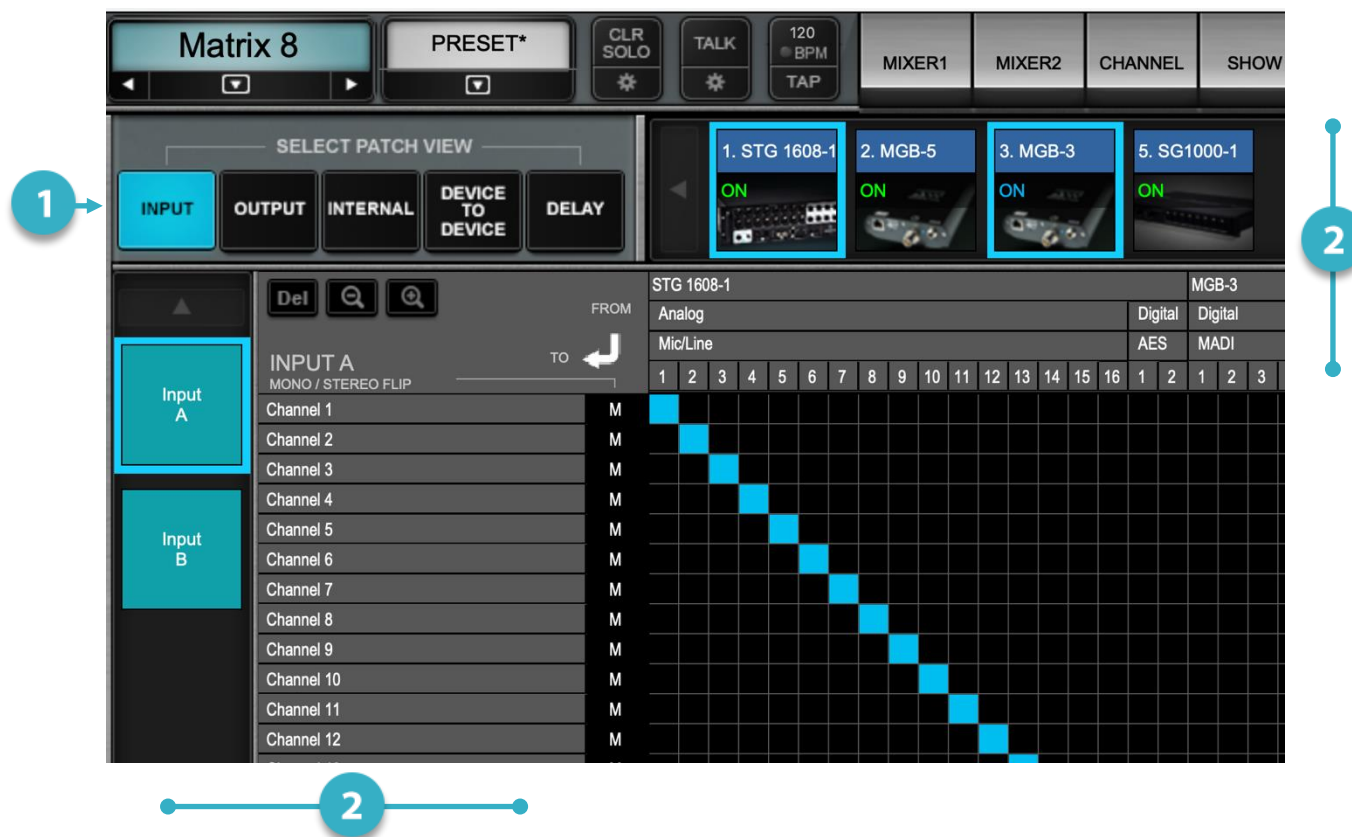
① A view is established using the Patch View selector. This filter creates a framework that shows the correct category of channels or devices needed to make a patch, based on its purpose. For example, to patch microphones to the mixer, choose the Input view. This displays a grid of I/Os and mixer input channels. Or, to stream audio between I/Os, use the device-to-device view. This view displays only the I/O device channels.

② Grid filters 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:

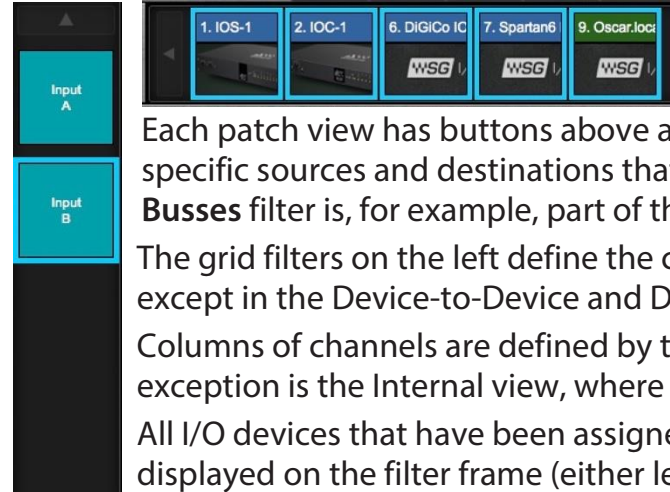|	
Input	Patch between an assigned I/O device and one or more mixer channels
Output	Patch between channel outputs and any assigned I/O device
Internal	Assign channels to mix busses Assign control groups, such as links/DCAs and mute groups
Device to Device	Patch between assigned network devices
Delay	Assign I/Os to delay groups; 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. The only exception is the Internal view, where instead mixer busses are shown.

All I/O devices that have been assigned in the System Inventory page—both hardware and software I/Os—are displayed on the filter frame (either left or top or both, depending on the purpose of the patch).

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 patch view and a grid filter are selected, the relevant channels will be 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, along with other applicable information. Any number of available I/Os can be expanded simultaneously to reveal their channels.
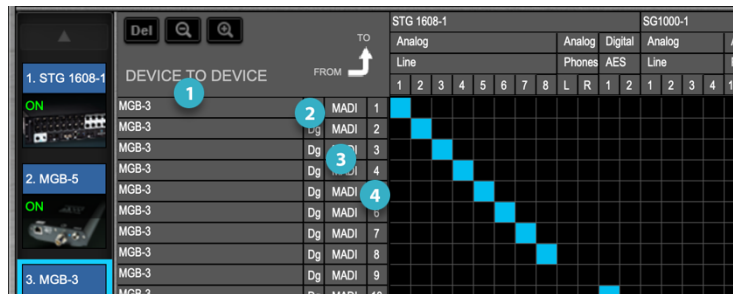
①   Name of I/O device or driver: same as shown on the device icon in the Inventory

②   Format: analog vs. digital

③   Connector: mic, line, phones, AES, S/PDIF, ADAT, MADI, 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).

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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 is shown in 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 the Top Bar.

PATCH POINT
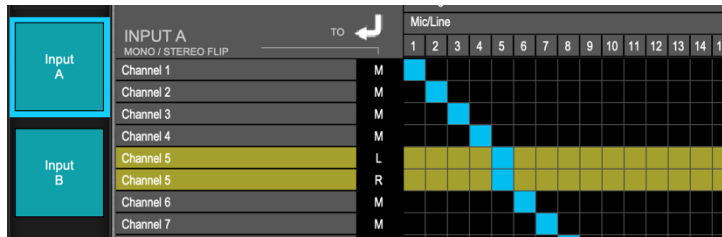
A patch is created at the intersection of horizontal and vertical grid lines. Select patch points one by one, or draw a straight line vertically, horizontally, or diagonally. Click again on a patch to remove it.

- 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 indicate that the device is not available.
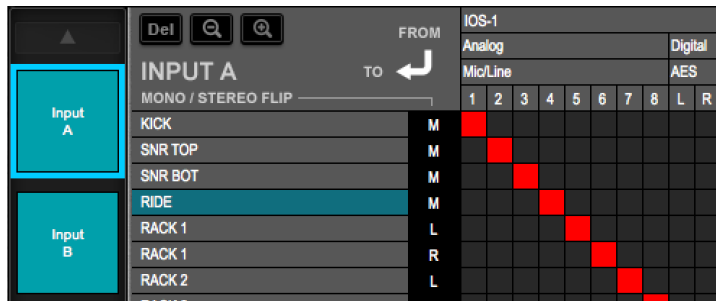
Remove all patches using the **Delete** button. This deletes the patches for all channels in the displayed Patch View. Delete does not affect other Patch views.

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.
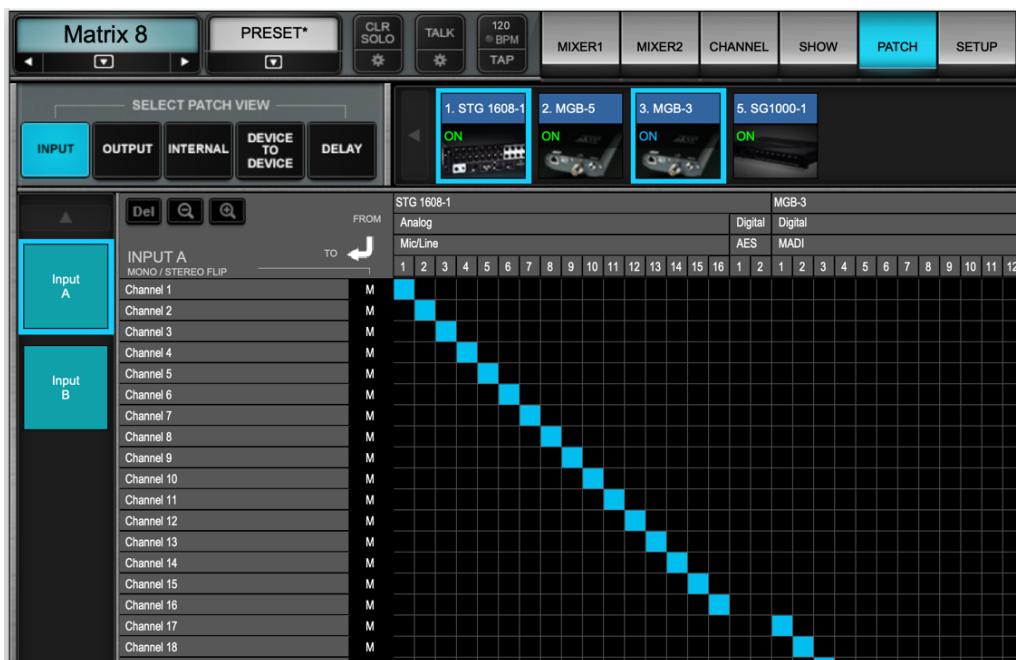
Mixer Outputs

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, assigned I/O device channels 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
PSP	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.

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Internal Routing

The Internal Routing view patches within the mixer; there is no patching to outside 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: Bussses, and Groups and Servers.
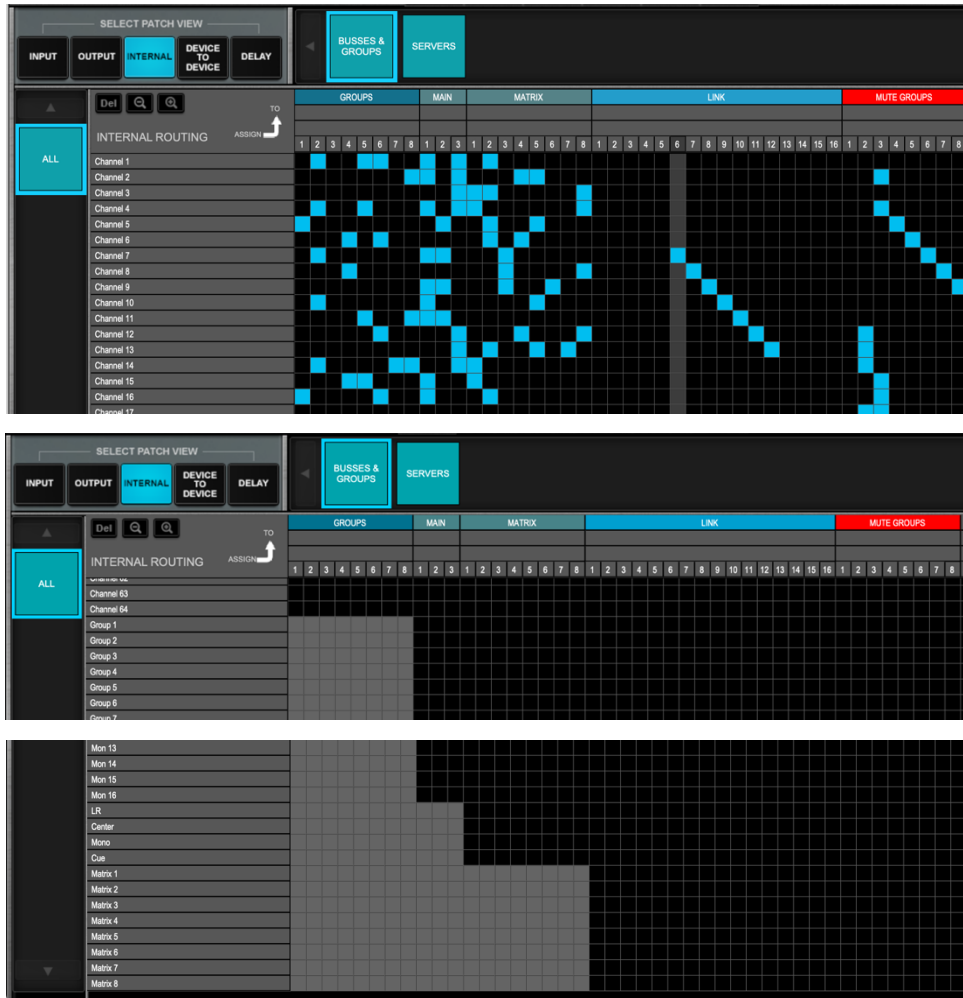
Busses and Groups patches these mixer channels:
Channels, Groups, FX, Mon, Main, and Matrix
-to these busses-
Groups, Main, Matrix, Link, and Mute Groups.

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
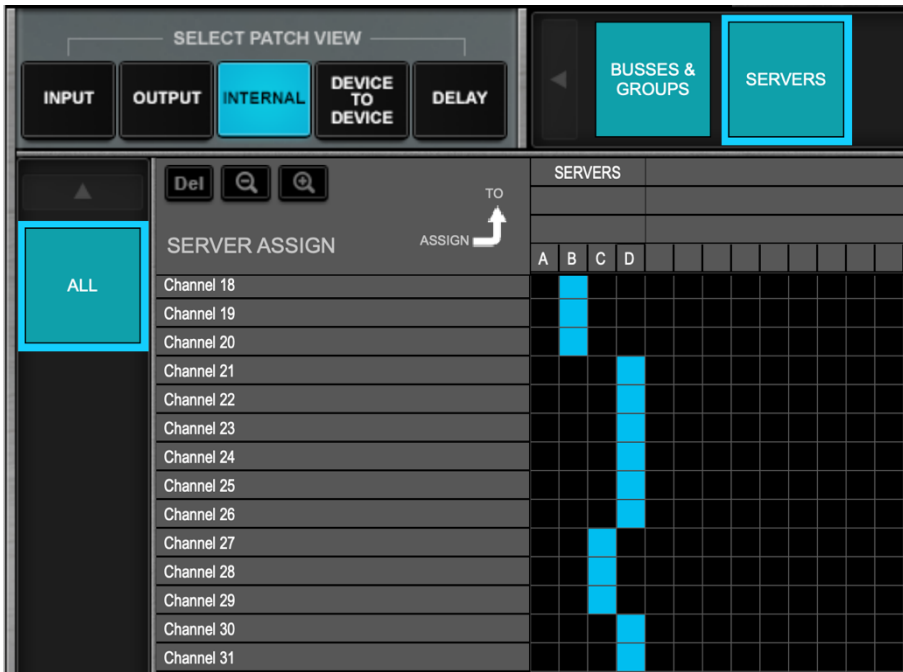
Server provides an overview of of the server group assignments.

This is a convenient way to patch a server to a number of 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 between each other. There is no patching to and from the mixer.

DEVICE-TO-DEVICE PATCH BEHAVIOR
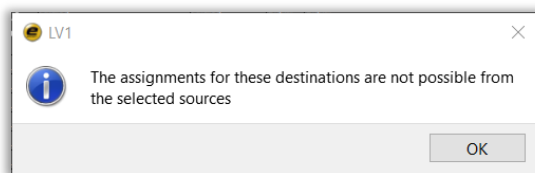
All I/O devices that are assigned to the LV1 inventory appear in the Device-to Device view. A device can patch to any other assigned device, but not to itself. For example, device IOX-2 can patch to IOX-1, but not back to IOX-2

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 a group of I/Os.

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 (peocessing delay + custom delay) is also shown.
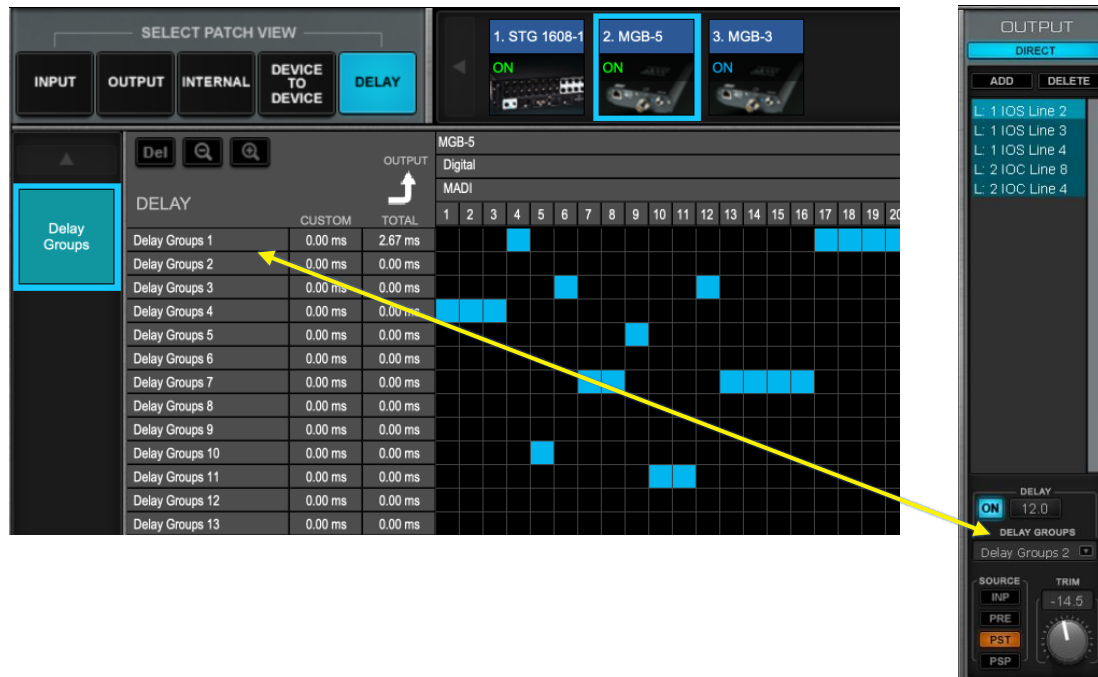
Delay groups can also be established in the Channel window. Please refer to *Appendix E* of this user guide for a detailed description of eMotion LV1 delay management.

Chapter 3:

CHANNEL WINDOW

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

CHANNEL WINDOW OVERVIEW

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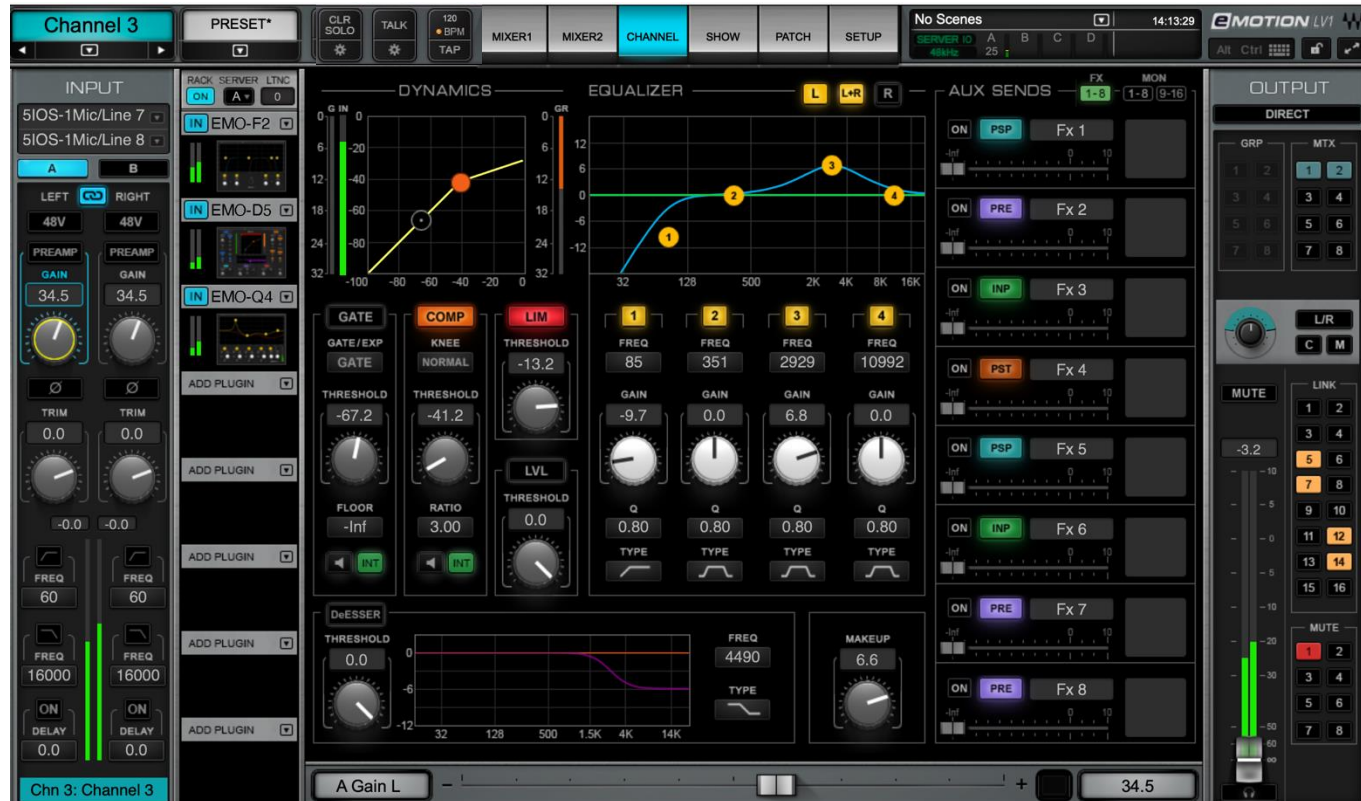
Channels and Presets

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

A channel can be selected in two ways:

1. **Mixer window**: Touch a fader or channel strip. The channel strip becomes highlighted, indicating that the channel is selected.

2. **Any window:** Use the Channel Name drop-down menu in the Top Bar to directly access a channel. You can also use the right/left arrows to move the selection up and down one channel at a time. This menu is always visible.

CHANNEL PRESETS

Channel presets are powerful tools for setting up a channel.
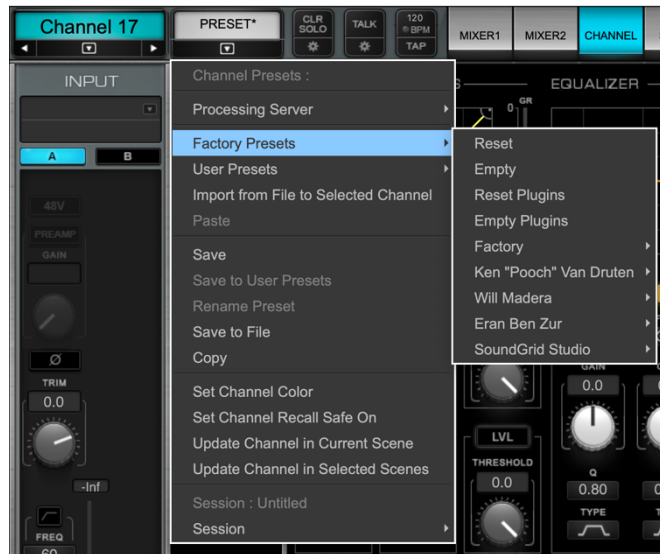
They are managed with the Preset menu, which is accessed from the Top Bar. The menu affects the selected channel only. Channel presets enable you to immediately load all of a channel's settings—audio routing, assignments, plugins and their parameters, aux sends, and control groups—and then adjust its parameters, if needed. You can then 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. All, or part, of a channel's parameters can be copied from one channel to another. Many mixer setups have a lot in common, so using channel presets for session building can save a lot of time.

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

Factory Presets (load)	A library of presets supplied by Waves. A factory preset cannot be modified. Instead, open it and save as a user preset.
User Presets (load)	A list of user-defined channel presets, saved from 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 "Delete." Select the preset and it will be deleted. This 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 the copied channel preset to another channel. The Copy command copies all channel information. Paste enables you to choose what channel information will be replaced in the target track.
Save	Saves the 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 and 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 condition. A copied channel preset can be pasted to any other channel in the current session.
Set Channel Color	Enables custom coloring of any channel.
Channel Recall Safe Off	Temporarily excludes all channel parameters from scene changes, even if those parameters 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.

Copying Channel Information

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

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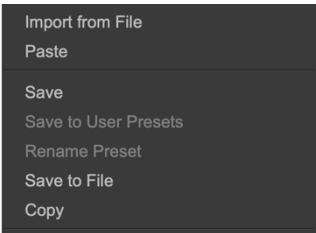
1. Select a channel and choose **Copy** from the Preset menu.
2. Select the target channel. Click **Paste**.
3. Select what to replace and what to leave unchanged. Choose **Select All** to paste all channel settings.
4. Select the import parameters and click OK. Parameters that are not selected in the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

The Preset Scope function can modify these settings:
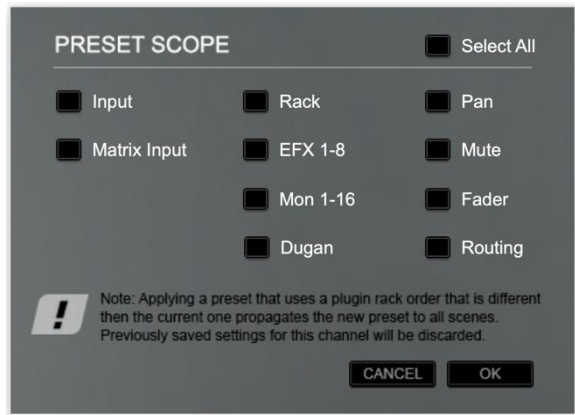
Input	Trim, phase, A/B switch
Matrix Input	Matrix input faders
Rack	Plugin settings, rack structure and status
EFX 1–8	Send levels, on/off, pan, route
MON 1–16	Send levels, on/off, pan, route
Dugan	Auto, weight fader, override, group
Pan	All pan/balance/rotate controls
Mute	Change state: on/off
Fader	Change value
Routing	Internal routing: group, matrix, links, mute groups, main (L/R, C, M)

Scope does not modify input and output patching and 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.

Channel Window Sections

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

1 **Input** Manages channel input: source, preamp control, digital input gain, high pass and low pass filters, input delay.

2 **Plugin Rack** Assigns, removes, and controls up to eight plugins per rack.

3 **Main Control Section** 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: 16 aux sends (8 effects and 8 monitor). Control aux send level, panning, and send source.

4 **Floating Plugin Panel** A view of the entire interface of the selected plugin. 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

Input Section

The Channel Input section patches outside 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 NAME AND SELECTOR (TOP BAR)

The channel name is displayed here. Double-click on the name to change it. The name can also be changed on its channel strip in the Mixer window or in the Input page of the Patch window. Use the side arrows to move between adjacent channels or the drop-down menu (down arrow) to select a channel directly. Since the name box is part of the Top Bar, it can be viewed from all mixer views.

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
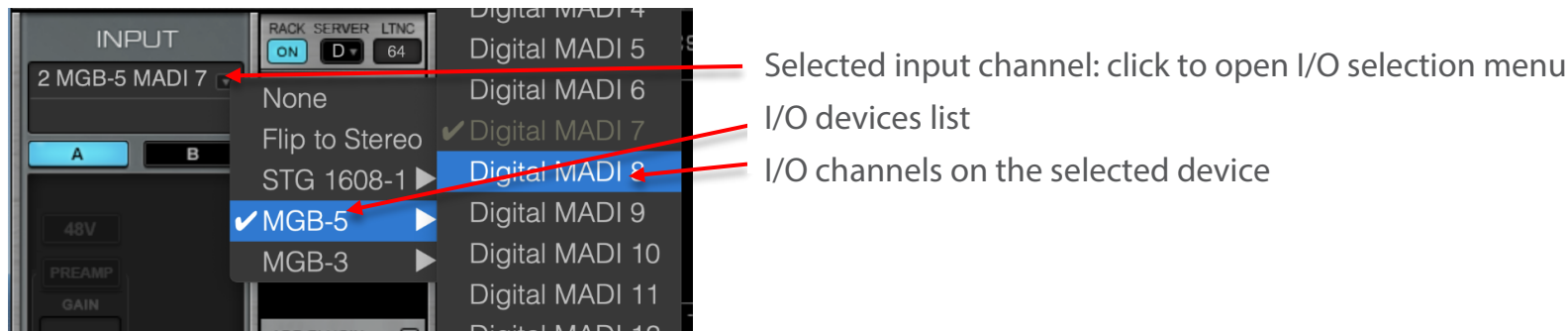
3–A/B INPUT SELECT

The mixer has two independent sets of inputs: A and B. These inputs can use 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
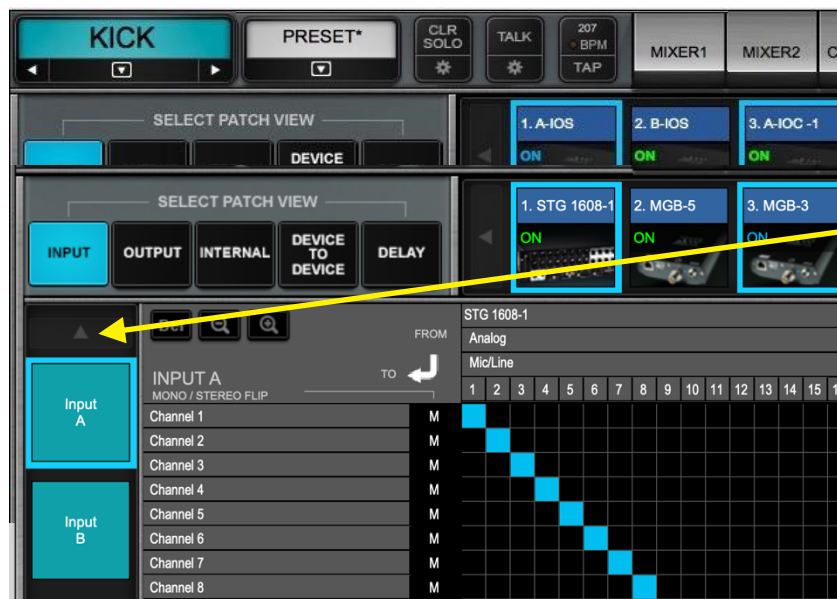
Channel input choices made in this menu are reflected in the Patch window.

Patches made in the Patch window appear here.

Channel window
Input section

4–LEFT/RIGHT LINK (STEREO CHANNELS ONLY)

Links 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

Adjusts the analog level of a digitally controlled preamp. Unlinked stereo L/R channels can be controlled separately, as can two mono inputs from different sources. Knob position is displayed in the value box. Preamps can also be controlled from their respective control panels, which are accessed from the System Inventory page. There are two preamp gain control modes: Preamp, which controls the preamp analog gain, and Local, which delivers the same level from the preamp, regardless of the preamp gain setting. Refer to the next section of this chapter, *Controlling Preamp Gain on Shared Devices*.

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 meter 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:

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

Peak input level
Range: -INF to 0 dBFS

11–FILTER SECTION

Controls an HP/LP filter that has been assigned in the plugin rack.

Range (eMo F2): 16 Hz to 21357 Hz (values vary depending on 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. Primarily used to align two or more microphones that are 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. The color of this box matches the mixer layer type of the selected channel.

- Light Blue   Input layers
- Dark Blue   Groups
- Light green   EFX sends (aux 1–8)
- Dark green   Monitors sends (aux 9–16)
- Blue/green   Masters
- Bright Blue   Links
- All colors   All

This color-coding helps to identify the selected channel, regardless of which layer is currently displayed.

Controlling Preamp Gain

The Preamp section is used to adjust the analog (hardware) gain and the digitally adjusted 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.

In **Local** mode (right), 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. Using V-Gain, you can adjust channel input without affecting the preamp's analog gain structure. Your input level will not change, even if you adjust the hardware gain. See the next page for details. Preamp and Local modes share the scale of the current preamp gain. The offset between preamp analog Gain and V-Gain is shown by a green ring around the V- Gain knob.

Preamp state (Preamp or Local) and Gain values are saved with a 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.

Save a session in Local mode and you can later open it with the same gain, regardless of the current preamp analog value (e.g., someone changed the analog gain settings since the last time you used the system).

I/O Sharing

Several eMotion LV1 systems can be connected via 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. Once a device is assigned, it is no longer available to other users, unless the device is shared. I/O sharing allows several mixer systems to share the same I/Os.

To enable I/O sharing of an assigned device, go to the device's menu and select "Share," or click the network symbol on the device icon.

All users will see the preamp gain value but will not be able to change it. To allow users on a super system to control preamp gain on shared devices, the manager of the device (the person who initially assigned the device), must select "Share Preamp Control." Refer to Chapter 1 > Setup Window > I/O Sharing to learn about I/O sharing.

BEHAVIOR IN PREAMP AND LOCAL MODES ON SHARED DEVICES

Preamp Mode
- Every user operating in the Preamp mode has direct control of 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.

Local Mode
- Changes in 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.

Basic FOH/MON Preamp Workflow

Shared Preamp Control is flexible–there are many ways to manage preamp controls shared by several users. A system can range from a "manager-based" arrangement in which one user controls preamps and other users do not have access to them; to fully open systems, where each user can always set preamp gain. Usually, a working system falls between the two and is based on an understanding among the users.

1) One System Controls the Preamps

1. Decide who will be the "manager" of the device. The manager is the system that initially assigns the device in the System Inventory and initiates sharing and enables others to share it and control its preamps. In this example, Monitor is the manager.
2. Share the device and do not select "Share Preamp Control."
3. Assign I/O channels from the shared device to all eMotion LV1 inputs (Patch, Channel, or Mixer windows).
4. The manager sets the preamp analog gain for each preamp. This gain is established for all users of that preamp channel.
5. All users will set input to Local mode to track and compensate for preamp changes and to control their input level.

2) Preamps Set Up by the FOH; Control is Provided to All Users

1. Select a manager. In this example, it's the FOH.
2. Allow device sharing of the I/O device and select "Share Preamp Control."
3. FOH and another user, say, the monitor mixer, now assign I/O channels from the shared device to eMotion LV1 inputs.
4. Set up basic gain structure for all inputs using Preamp mode. Leave enough headroom to avoid overloading the analog circuitry.
5. Both FOH and Monitor can adjust the analog preamp gain of each channel—these changes will affect both FOH and Monitor.
6. Once analog preamp gain is set for each channel, switch both systems from Preamp mode to Local mode. Each system can now make local gain adjustments. If preamp analog gain needs to be adjusted later on, any system (but likely the FOH) can do this from the Preamp mode without affecting any other system.

Using Local Mode With Non-Shared Device

Local mode is not only for using IOs that are shared between users. It can help when moving between setups (as described above) or used to maintain a preamp sweet spot in critical recordings while adjusting gain for monitoring.

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: Groups, AUX/EFX, 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 and stereo. Groups default to stereo.

MixBuss Select: FX/Mon Input Fader mode

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

Trim   The Trim knob conrols the input gain of the channel. This is same behavior as you see with with input channels.

Fader   The Trim knobs are replaced with a single input fader. When engaged, the Input Fader will be mapped to the mixer fader of selected buss, instead of the output fader. This allows for global control over the aux buss input, as needed for a throw delay effect, for example. 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.

Channel Window   Mixer Window   Channel Window   Mixer Window

Mix Buss: Trim   Mix Buss: Fader
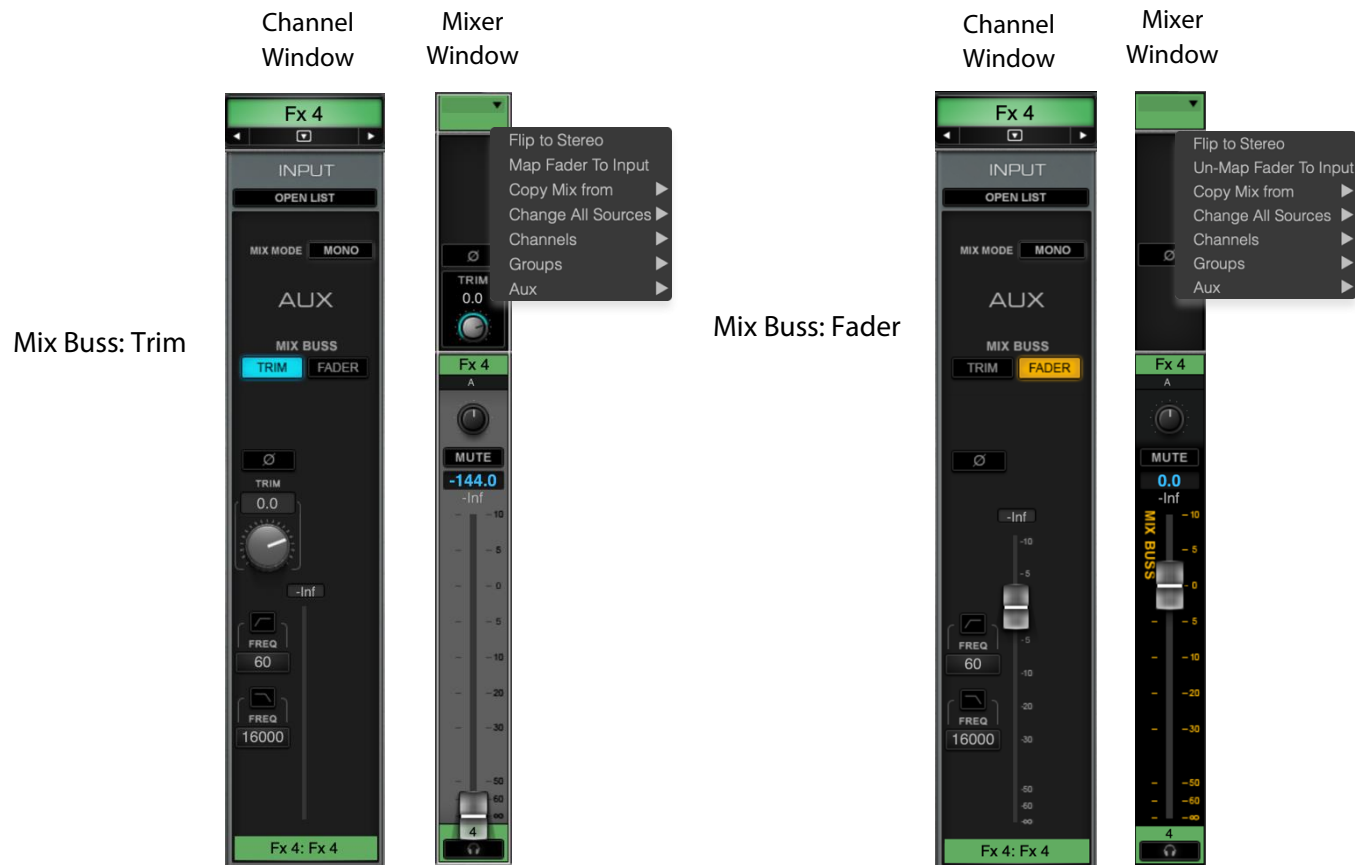
AUX/EFX AND AUX/MON BUSSES

Sources: Input channels, groups, and mix copies

An aux channel input can accept a mix as an input, whether from any Main mix channel or from another aux channel. Select **Copy Mix From** to add that mix to the input of the EFX or Mon aux channel.

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 selects 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 is removed. The Matrix is described later in this section.

INPUT SECTION FOR LINKS/DCAS
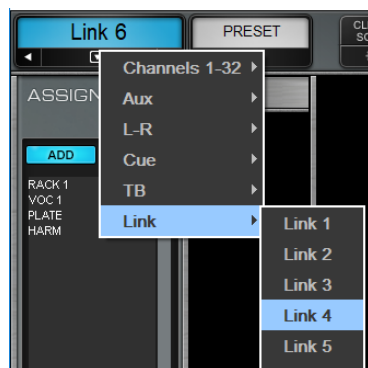
Links are control groups used to link a set of channels for global control. A Link group can have an unlimited number of channels, and a channel can be a member of several Link groups. DCAs enable a group of assigned faders to be controlled remotely from a DCA fader. DCAs are assigned using the Link assignment box.

STEREO/MONO FLIP

To toggle a channel or buss between mono and stereo, open the Input List panel in the Input section.

Click Add and choose "Flip to Stereo" or "Flip to Mono" from the drop-down menu.

You can also toggle a mixer channel between mono and stereo by clicking the input selector at the top of its channel strip in the Mixer window.

STEREO/MONO ON AUX AND GROUP BUSSES

The mono/stereo status of an AUX or Group buss is set with the Mix Mode button. This does not affect the mono/stereo status of the channles feeding the AUX or Group, but rather the buss itself. In this sense, it functions like a matrix.

A Group buss can be either mono or stereo (far right). Use the Mix Mode button to select which. The default is mono.

Plugin Rack Section

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

A plugin rack is stereo or mono, according to the channel state. If a mono-to-stereo plugin is added to a mono rack, the rack will be stereo from that point on in the signal flow. Drag a plugin up or down to change its position in the rack signal flow.
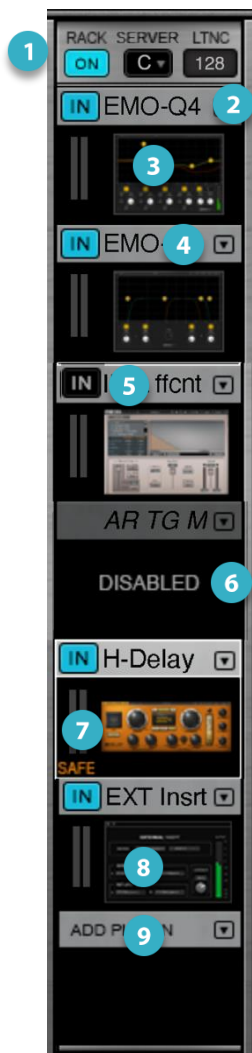
1 Rack Top: Rack processing on/off; Server assignment menu for channel or buss; Total rack latency indicator.

When rack processing is off, audio still streams. If the server group assigned to the rack goes offline, the on/off button will become red until the sever returns to service or you select a different server for the rack.

2 Plugin name: Displays the name of the plugin inserted on the rack slot. Plugin names longer than 14 characters are abbreviated.

3 Plugin icon: A thumbnail image of the plugin's interface.

4 Plugin menu access: This drop-down menu accesses 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 is still 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: A plugin can be put into a "Recall Safe" condition to prevent 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 be used to send to and from an external device via specified I/Os.

9 Empty rack slot: "Add Plugin" appears in the plugin name cell.

Adding and Managing Plugins

> ⚠ 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.

The Plugin Menu

The **Plugin** menu is used to insert, remove, assign, and manage a 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. 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.

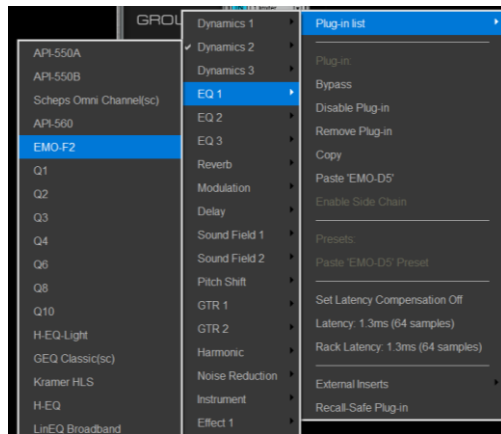| Plug-in list ▶ |
| --- |
| Plug-in: |
| Bypass |
| Disable Plug-in |
| Remove Plug-in |
| Copy |
| Paste |
| Enable Side Chain |
| Unassign Dynamics |
| Presets: |
| Paste Preset |
| Set Latency Compensation Off |
| Latency: 0.0ms (0 samples) |
| Rack Latency: 0.0ms (0 samples) |
| External Inserts ▶ |
| Recall-Safe Plug-in |
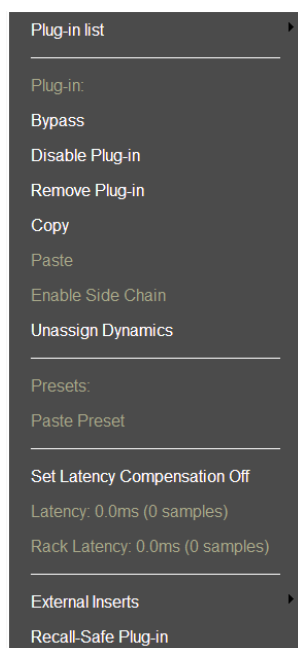
Plugin section

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.

Plugin Menu: Plugins Section

These menu items add, remove, and manage plugins.

PLUGIN LIST

The Plugins List is a multi-level drop-down menu that lists all available plugins. Plugins are organized by category. If there are many plugins in a category (typically EQ or Dynamics), the plugin list will be divided into pages. This avoids scrolling through long submenus. Click on a plugin name, and its icon will appear in the selected rack slot. Unauthorized plugins are not displayed.

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.

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-to-Mono Copy/Paste

Copy 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 plugin, unless the stereo plugin has provision for split/linked processing. In such a case, the mono plugin parameters will be the settings for the left channel.

If a stereo plugin is moved to a mono channel, then 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.

When a mono-to-stereo plugin is pasted to a mono rack, the rack becomes stereo from that point in the signal flow onward.

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 Pane. Plugins with an active sidechain have a drop-down menu (S/C) that patches the sidechain source.

Assign/Unassign to the Main Control Section
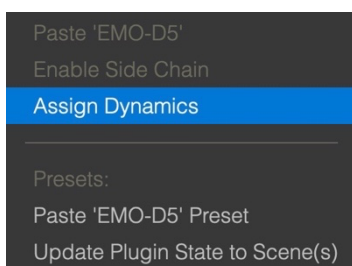
Any plugin, whether from Waves or another manufacturer, that supports the LV1 Channel Main Control section can be assigned to dynamics, EQ, or filter controls. Assigning a plugin to the Main Control provides quick access from the Channel and Mixer windows. One plugin of each category (dynamics, EQ, filter) can be assigned to the main Control section at the same time. An added plugin will be assigned automatically if no other plugin of its category is present in the rack. Plugin assignment is described in more detail later in this chapter.

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, etc.). This does not replace the plugin, only the presets.
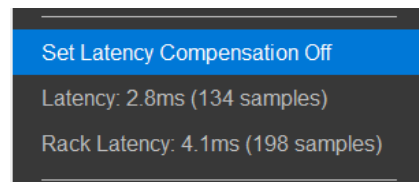
The "Paste [plugin name] Preset" option is not available when the source and destination plugins are not of the same family (e.g., Q6 to REQ 6, or H-Delay to SuperTap).

UPDATE PLUGIN STATE TO SCENE(S)
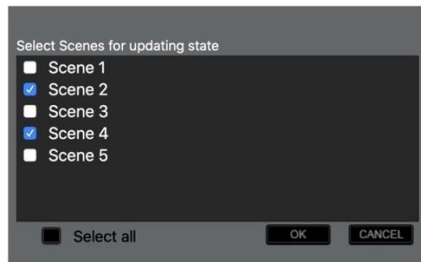
This updates the current plugin's settings in selected scenes. Choose the scene(s) you want to update.

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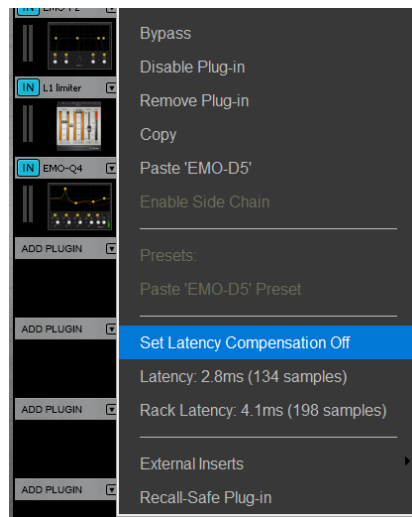
Setting latency compensation off removes the plugin from plugin/buss latency compensation calculations. The plugin remains active, but its latency is no longer reported to the delay compensation engine. This allows you to prevent a plugin with a particularly long delay from delaying the entire buss.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

Example: In the example on the left, the selected plugin has a latency of 134 samples and total rack latency is 198 samples. When compensation is on, the channel reports a rack latency of 198 samples to the delay compensation engine.
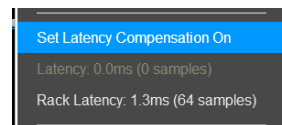
When latency compensation for the selected plugin is turned off, the channel reports a delay of only 64 samples (198 samples minus 134 samples.

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

If the total track latency exceeds 4000 samples, a red warning is displayed at the top of the rack. The destination track may not be able to compensate for such a large latency.

eMotion LV1 latency compensation is discussed in detail in Appendix E.

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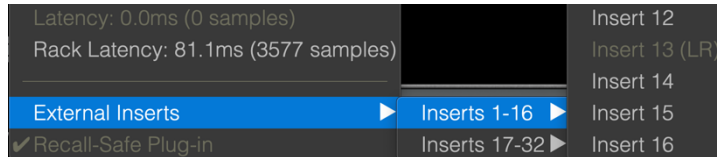
You can add external inserts to a plugin rack. An external insert follows the same routing path as plugins and can be moved up or down the rack to change its position in the processing chain.

Follow these steps:

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. Use the Device cell to rename the insert, 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 the External Insert Plugin User Guide, which can be found on the Waves Downloads page.

EXTERNAL INSERT LATENCY CALCULATION

The latency of an external insert is determined by its path, which depends on the kind of processing carried out. 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.

| Rack Slot EXT Insert | → | SG I/O Device | → | HW Device In | → | HW Device Out | → | SG I/O Device | → | Rack Slot EXT Insert |

Server Latency **+** SG I/O (D>A) or (D>D) **+** External Processing **+** SG I/O (A>D) or (D>D)
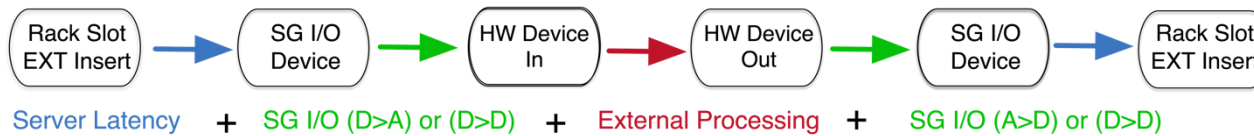
2: SENDING TO A DAW FOR PROCESSING

A DAW, which is typically used for playback, can be in the LV1 host computer or in another host.

| Rack Slot EXT Insert | → | SG Driver | → | ASIO/Core Audio In | → | ASIO/Core Audio Out | → | SG Driver | → | Rack Slot EXT Insert |

Driver Network Latency **+** **2x** ASIO/Core Audio Buffer **+** DAW Processing

3: SEND TO SUPERRACK SOUNDGRID FOR ADDITIONAL PROCESSING

You can stream audio processing to a SuperRack SoundGrid for additional power.

| Rack Slot EXT Insert | → | SG I/O Device | → | SuperRack In | → | SuperRack Out | → | SG I/O Device | → | Rack Slot EXT Insert |

Server Latency **+** **2x** SG I/O (D>A) or (D>D) **+** **2x** SG I/O (A>D) or (D>D) **+** SuperRack Server Latency **+** SuperRack Processing
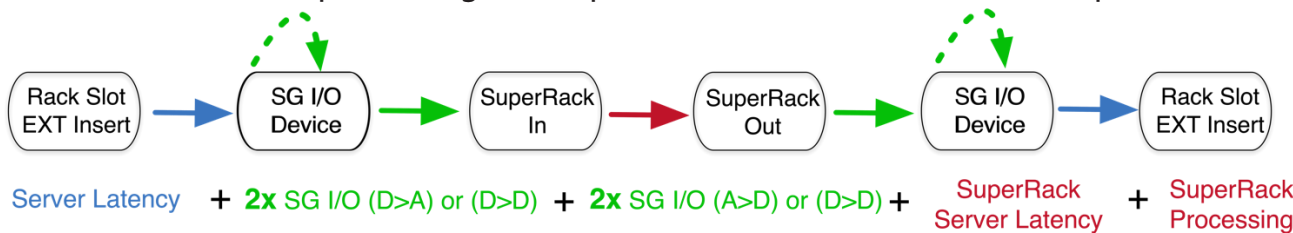
In a typical example, an LV1 channel is sent to an MGB, port 1. MGB port 2 is sent to SuperRack SoundGrid for processing. Signal returns to MGB port 2, and then from MGB port 1 to LV1.

Recall-Safe Plugin
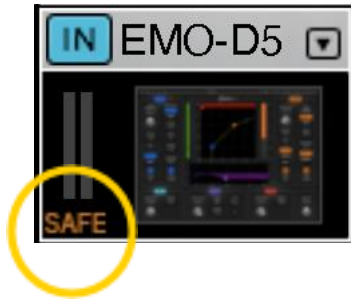
Prevents plugin parameter changes during scene recalls. In this mode plugin parameters are unaffected by scene changes, even if the plugin is within the scope of a scene change and has not been set as recall-safe in the Show window (see *Show window > Recall Safe*).
Set plugin safe status at the bottom of the Plugin menu. A plugin that is recall-safe is noted 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 will be stereo and only stereo plugins can be inserted. Mono plugins can still be inserted above the mono-to-stereo plugin.

Plugin Pane

This view shows a plugin's regular user interface in a floating window. All plugin controls are displayed here and can be accessed by mouse or touch. Certain plugin interface graphics have been modified to fit the Plugin Pane.

Open the Plugin Pane by clicking on its plugin icon. Use the Touch-and-Slide bar at the bottom of the window for easier manipulation of a selected control.

Floating Plugin Pane Windows

You can undock the plugin pane window. It can then be positioned anywhere on your displays.

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

2 **Pin** the window to keep it in front of all other windows.

3 **IN** bypasses or unbypasses the plugin.

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

Floating plugin window preferences (dock/not doc and window location) are saved with scenes. Window settings are also part of a session. Floating window recall safe and scope status are set in the Show window.

Assigning a Sidechain Source
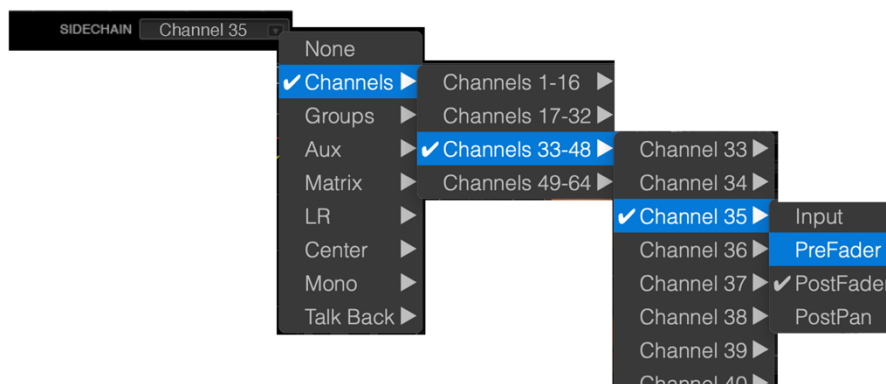
A drop-down menu at the top of the plugin pane is used to assign a sidechain source to the selected plugin. Once a valid sidechain is chosen, the plugin's sidechain functionality is activated. Sidechain assignment is per plugin, not per rack.

Main Control Section

If you are in the Plugin Pane view, 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 pane.

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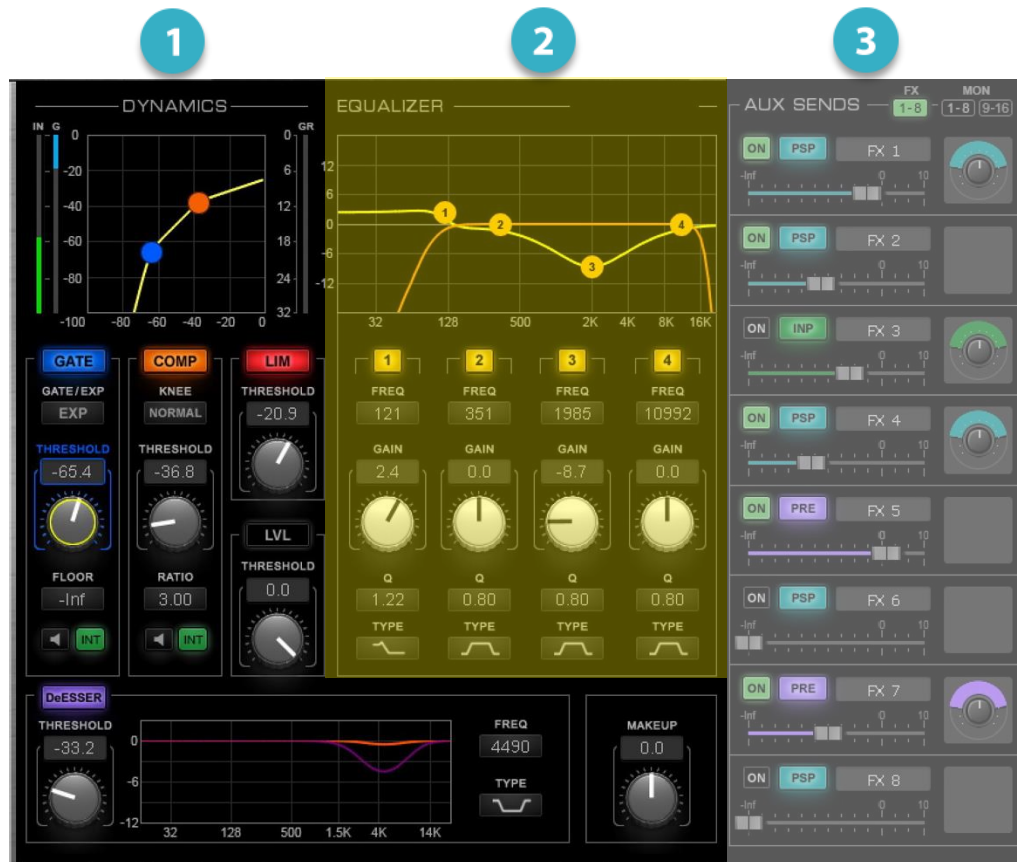
1 **Dynamics**

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

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, then the menu item will read "Unassign [category]." If a plugin is not assigned, select "Assign [category]."

One plugin of each category (filter, EQ, dynamics) can be assigned at the same time:
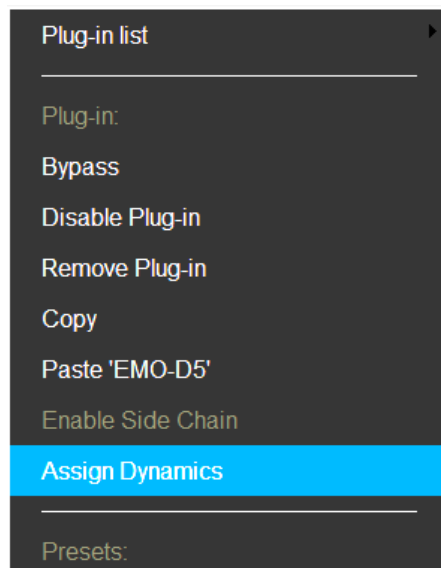
- A plugin will be assigned automatically if no other plugin of its category is present in the rack.
- Assigning a new plugin will unassign the existing plugin of that category.
- Unassigning a plugin does not affect its processing status. It can always

  be controlled from its Plugin Pane. Consult the Waves website for a

  current list of assignable plugins.

Assigned plugins can be controlled in several ways:

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

Sections of filters, EQ, and dynamics processors can be switched on and off from Mixer window (DYN/EQ layer mode).

These assignments are also mapped to external control surfaces.

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. Other processing adjustments are made in the plugin pane. Display and controls vary by plugin. This example shows an eMo D5 Dynamics processor mapped to the Main Control section.
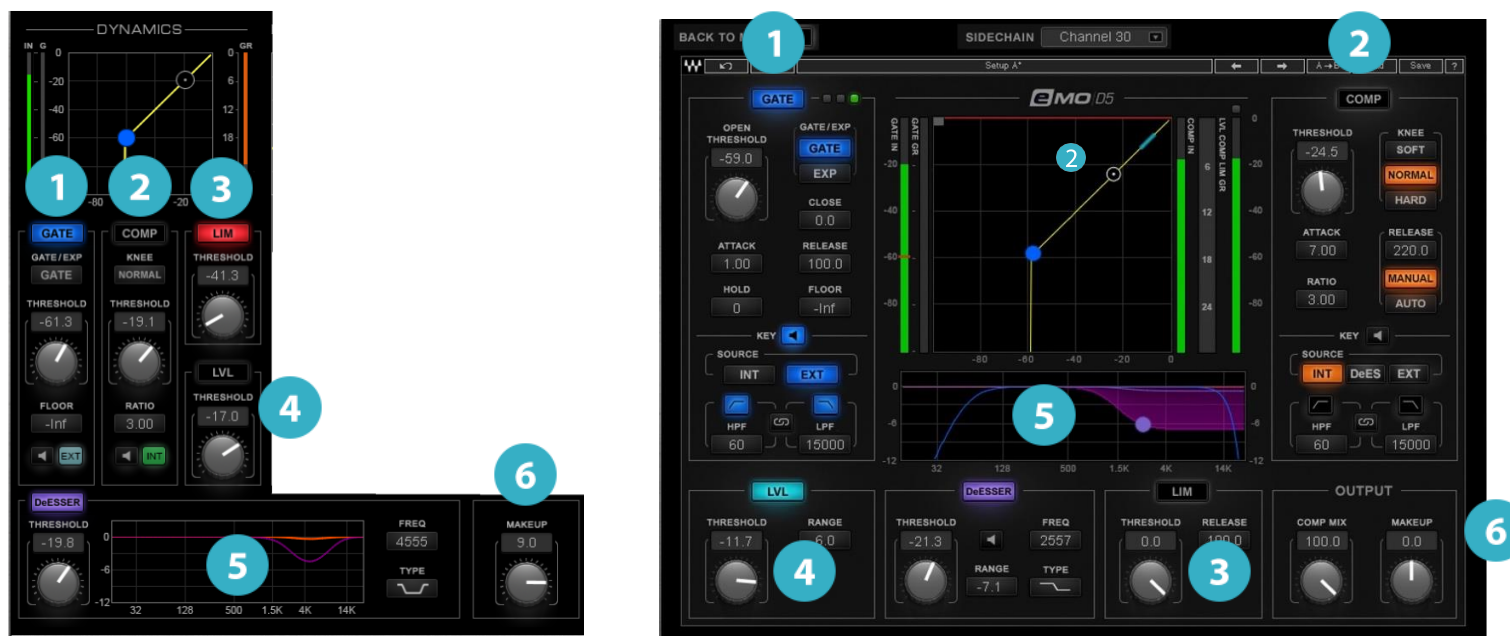
The Main Control Section maps up to six dynamics plugin sections:

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 the Channel Mode of the Mixer window. They can also be controlled by certain external control surfaces. For other adjustments, open the plugin pane.

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.
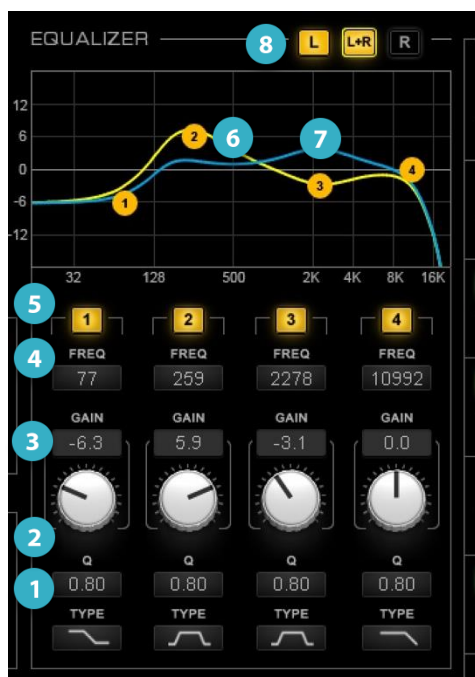
1. Filter type select
2. Q adjust
3. Band gain adjust and value box
4. Frequency adjust
5. Band on/off
6. EQ graphic display and control (L)
7. EQ graphic display and control (R)
8. Left/right channel linking

EQ Controls

Mapping varies by plugin.

1. Filter Type: Selects between four filter types.
   Options: high pass, resonant shelf, bell, shelf

2. 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 allow you to adjust Q on the graphic display by holding ALT while sliding the band marker horizontally.

3. 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.

4. 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.

5. Band On/Off: Depending on the band-linking setting, this on/off toggle affects the left, right, or both channels.

6. EQ Curve and Markers: Graphic display and control, left.

7. EQ Curve and Markers: Graphic display and control, right.

8. Left/Right Channel Linking: With certain EQ plugins, left and right channels can be controlled separately or together. If L+R is on, then any change made to one in channel will affect the other. If L+R is not on, then the left or right channel 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 ON THE MAIN SECTION

5 Left Channel high-pass display

6 Left Channel low-pass display

7 Right Channel high-pass display

9 Right Channel low-pass display

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 plugin and Link setting.
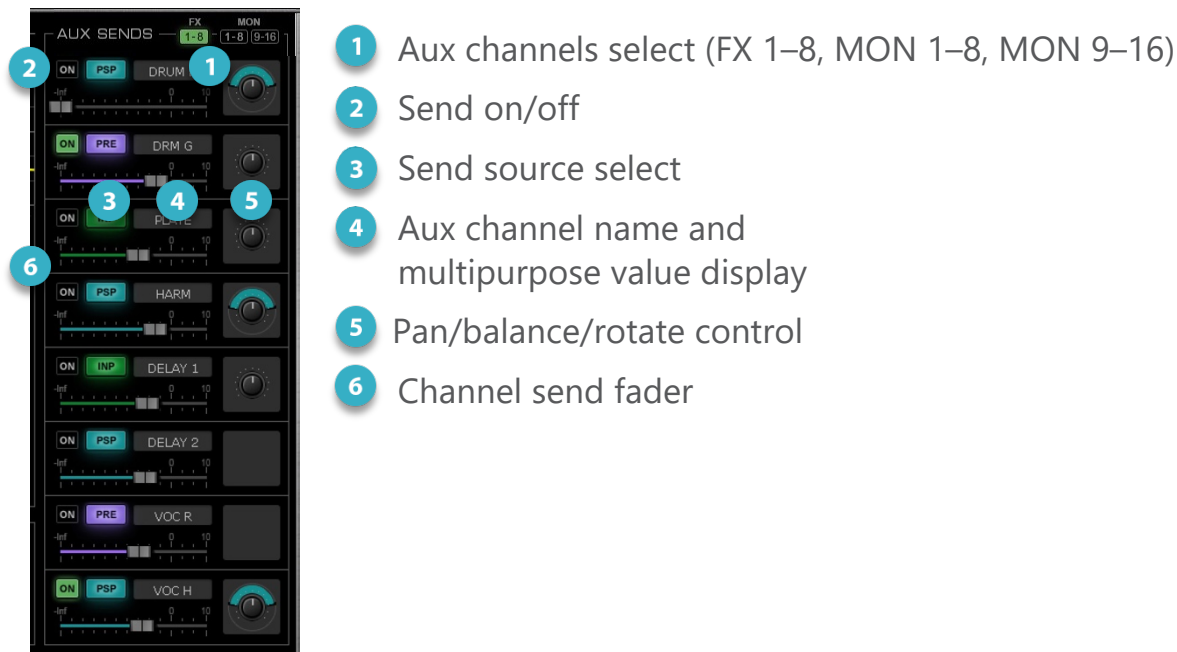
Filter channel link: Links L/R channels in the Channel Input section. When Link is on, both channels move in tandem, and any offset between left and right is maintained.

AUX/EFX 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 main out or sent 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 Signal Flow

Whether or not a channel or a buss can be sent to an aux channel depends on its position in the signal flow. All Input channels and groups can be sent to aux channels, since they are at the beginning of the chain. The EFX aux channels can be sent to the MON aux channels, which they precede in the signal flow. MON aux channels cannot be sent to the EFX busses. You can also send an AUX/FX buss to another AUX/FX buss that has a higher index number.
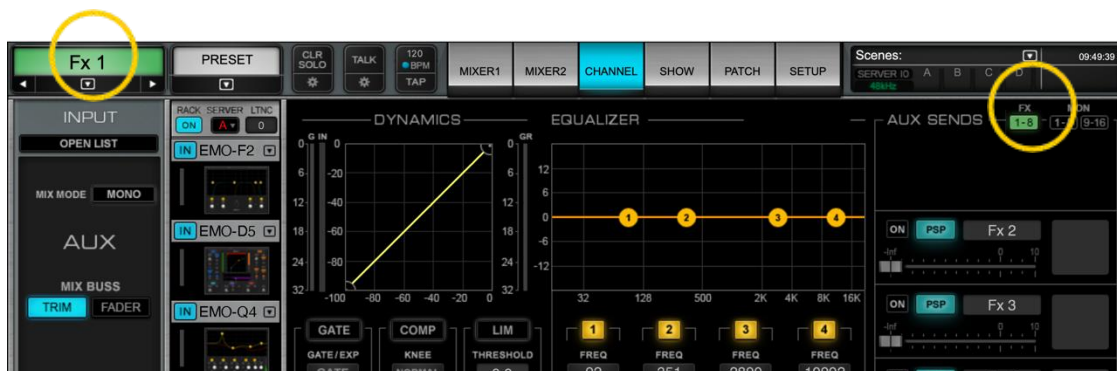
In this example, you are controlling the FX1 buss and sending to AUX/FX 2–8. Note that the send for AUX/ FX 1 is not available, since buss FX1 cannot send to itself or to an earlier index (i.e., to AUX/FX 1). However, you can send FX2 to any higher index: AUX/ FX 3, 4, 5, etc. This rule is the same for AUX/MON– AUX/MON sends.

When sending signals within one buss (e.g., FX to FX or MON to MON), latency increases in the Aux buss that you are sending *to* (not the one you are sending *from*). The added latency on this buss will be either 8, 16, or 32 samples per route, depending on server settings. Check buss latency in the Rack Latency menu item on the FX buss rack

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, after processing

PST   Post-fader, after processing

PSP   Post-fader, after processing, post-panner

4. Aux channel name and value display

Normally displays name of the aux channel. 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
Any source to mono aux buss Mono channel to stereo aux buss

Stereo channel to stereo aux buss

Source Setting	Imager
All	no imager
INP, PRE, PST	mono fader
PSP	stereo balance/rotator stereo
All	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.

CONTROLLING AUX MIXES, AND MORE, FROM THE STAGE

On-stage musicians can control their own personal monitor mixes from iOS and Android mobile devices over Wi-Fi, using the **MyMON** mobile app. MyMON is linked to LV1 using the **MyRemote** protocol, which is assigned in the System Inventory page.
Other mobile device apps provide additional eMotion LV1 control from IOS or Android devices.

MyFOH	Enables the FOH engineer to remotely assess and adjust critical LV1 controls from throughout the venue, in cases when listening from a static FOH position is inadequate.
MRecall	Allows remote loading of LV1 Snapshots, from the stage or venue.
MixMirror	Provides comprehensive remote mirroring of the LV1 interface.

Consult the user guides of the respective remote controller apps for more information.

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 on the right. When the fader is touched, this value indicates the send level to the aux channel.

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
20. 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**

   A group is used to create a submix of several channels into one. It can be processed and mixed with other channels before being sent to the main mix. Select GRP 1–8 to establish an assignment. This sends the post-pan output of a channel to the buss. 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.

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.

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. (This control is discussed in detail in the previous section.)

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. 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:

   Position is shown then 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. (See *Mixer* > *Link/DCA* Layer)

10. **Channel fader**

    Sets channel gain main mix output—one fader for mono or stereo channel. Faders under the control of a DCA do not move. They stay 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**

    Stereo or mono peak meter. Range: -INF to +10 dBFS

    Infinite-hold peak indicator. Click anywhere on the meter to clear. Pre- and post-fader meter status is set at 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*).

EXTERNAL ROUTING SECTION

14. **Direct output panel: add and delete I/Os**
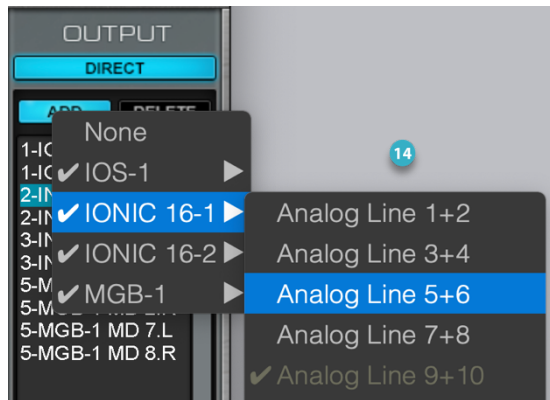
    This panel is used to assign I/Os to the channel's direct outputs. Hide/unhide the panel view by toggling the Direct button.
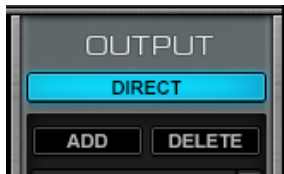
    • **Add** opens a drop-down menu of available hardware I/Os and drivers that can be assigned to the channel. All I/Os that are assigned to the mixer inventory appear in the list. Click on an I/O to add it to the list of assignments. I/Os that are already assigned are grayed out.

    • **Delete** un-assigns the selected I/O and removes it from the I/Os list. Once released, the I/O is 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, added by the user. Delay value is displayed in samples. Refer to *Appendix E* 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, whether a delay group or a single selected I/O.

19. Select delay group

Assigns a selected I/O to one 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 after input gain, before processing
- PRE pre-fader, after processing
- PST post-fader, after processing
- PSP post-fader, after 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 and then can 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.
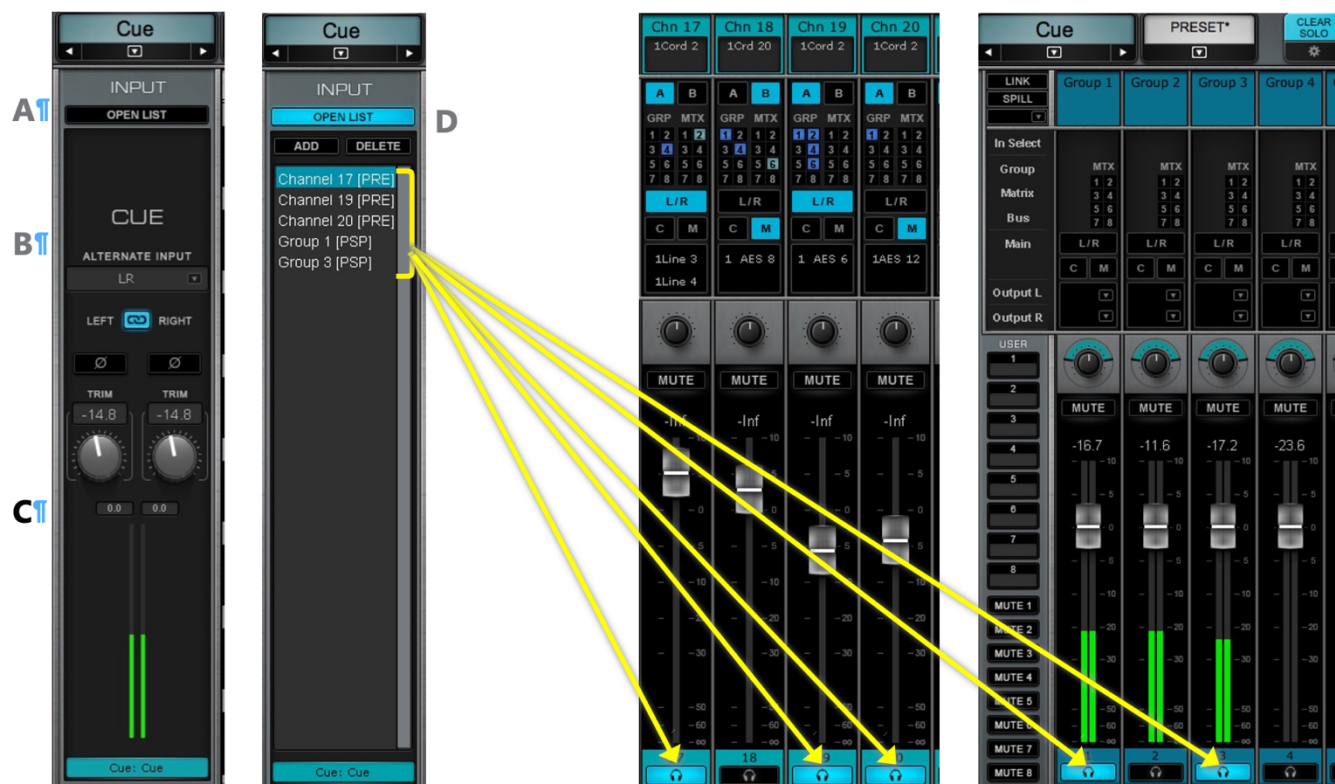
CUE CONTROLS

The Cue control panel is 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.
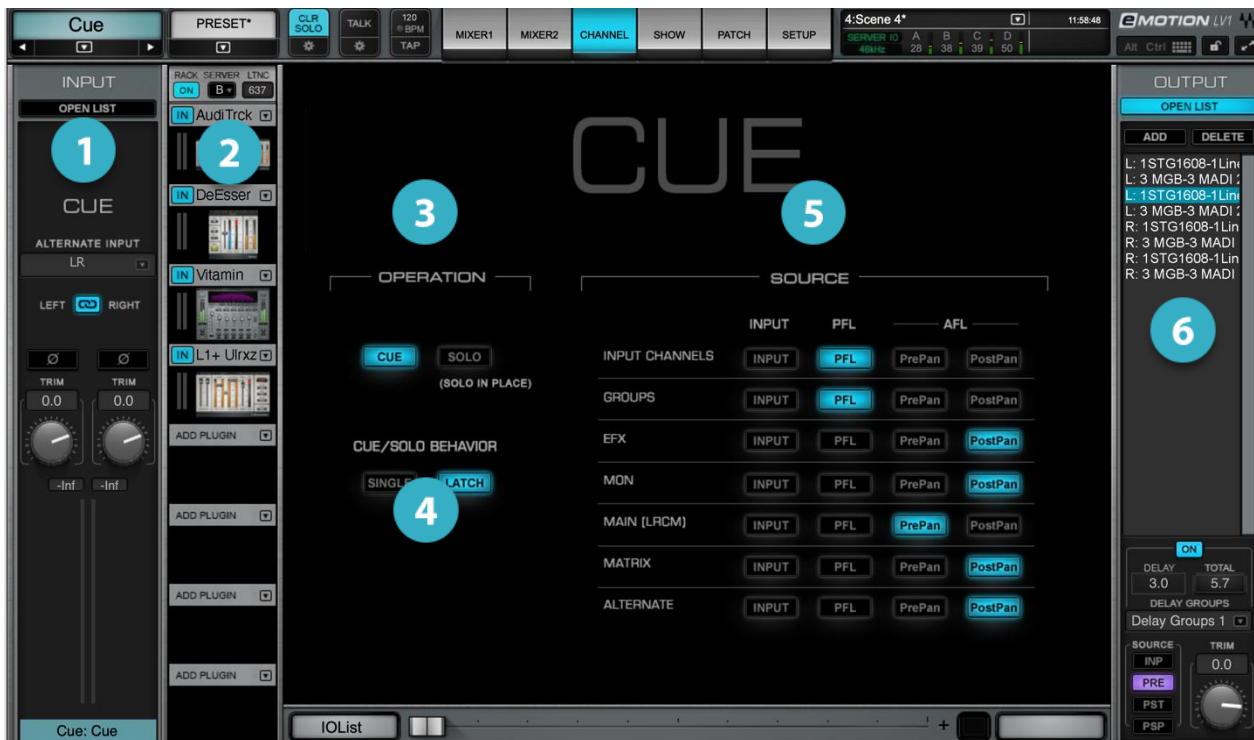
1. Input section
2. Plugins rack
3. Cue/Solo select
4. Button behavior
5. Cue source select
6. Output section

1 INPUT SECTION

A. **Open List:** Opens the cue channel assignment panel. Any mixer channel or buss whose Cue button is activated 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:** This 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. 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.

➋ Cue Page Plugins Rack

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

➌ 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, or used, as sources for the soloed channel will not be muted. Default: Cue.

➍ 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.

➎ Source

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

Input, PFL, AFL pre-pan, AFL post-pan.

➏ Output section

Configures cue output assignments in the same manner as channel direct outputs on any channel. Select Open List and add output assignments. 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.

For details, please refer to *Mixer Window > Masters Layer*.

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, and phase in the same manner as Input channels. The 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 pane. 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 the Talkback channel is patched to: Groups, FX, Mon, Matrix, and Main Outs. The name of the buss is reflected in the corresponding button on the interface when you rename a buss, its name abbreviated name appears on the button. If **All** is selected, Talkback is patched 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. Select Open List and add output assignments. A fader Section includes fader, pan/balance/rotate control, and mute, as well as direct output assignments. For details, please refer to the *Channel Output* section (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 in 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 have up to twelve 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. All mixer busses can be sent to Matrix channels.

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 a number of places in the mixer:

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

Assignments made from these sections default to the post-pan source. 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
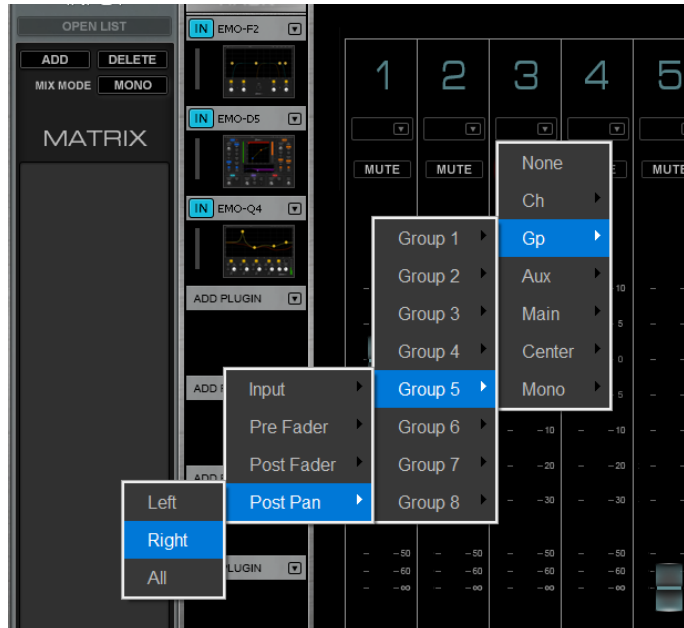
To add a source assignment directly on a fader strip, click the drop-down menu at the top. Choose an input channel and source. Input, pre-fader, post-fader, and post-panner sources are always available. If the source channel and the Matrix channel are both mono, then post-pan allows you to choose between left, right, or a sum of both as a 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 in 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 patch to I/Os and assign delay groups. **Add** opens a drop-down menu for selecting busses. When the limit of 12 busses per Matrix channel is reached, the Add button is grayed out and inactive

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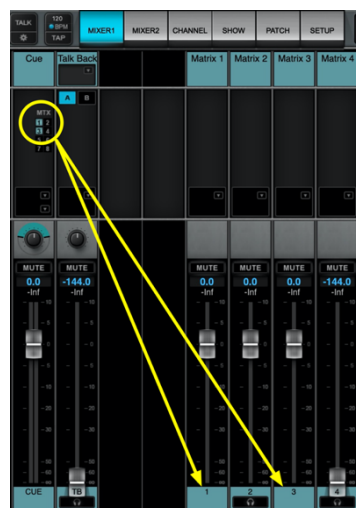
The Cue buss can be assigned to a Matrix channel. In this example, Cue is assigned to Matrix channels 1 and 3. Note that in these Matrix channels, Cue is not available for audition, as this would cause a loop.

Cue Buss to Matrix Latency

By default, Cue rack latency is not reported to theMatrix. When Cue latency compensation is off, no latency is reported to the Matrix.
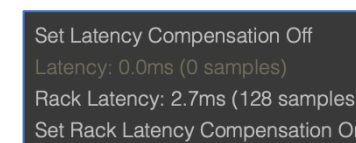
Rack latency for the Cue buss is turned on or off in the Cue Plugin Rack.

This latency is now reported to the Matrix.

Link Channel Controls (DCAs)

Links are a way to globally control fader levels and other mixer parameters across several channels. When channels are assigned to a link group, their controls move together. Changing one control moves the corresponding controls of the other channels in the group. Existing offsets are kept and can be changed.

The mixer has 16 link groups, and a mixer channel can be assigned to any number of them. Also, 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 Cue and Talkback).


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

A drop-down menu selects 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 group.
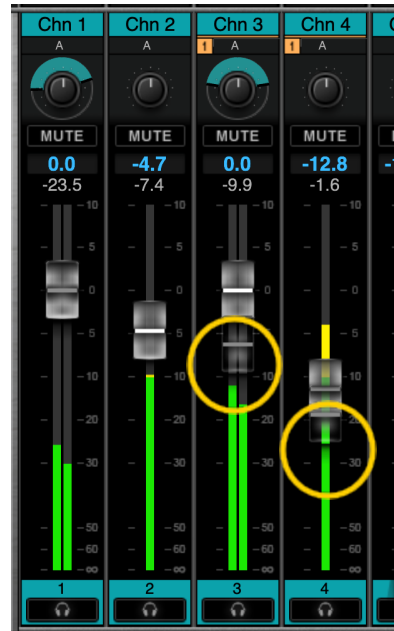
DCAs
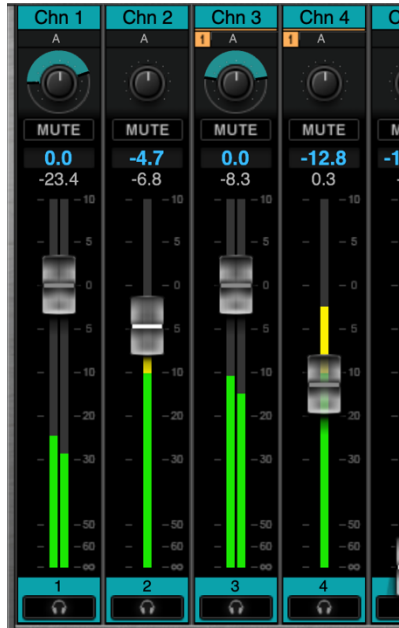
A DCA is a means of remotely controlling the trim values of a group of faders. A DCA is not an audio path like a group buss. Rather, it is a fader that trims other faders that are assigned to it. This is an outgrowth of classic mixer VCAs.

When moving a DCA fader, the controlled faders do not move; they stay at their original position.

"Ghost faders" show the current level of each channel, as determined by the offset introduced by the DCA fader. So, if the DCA fader remains at zero, then there is no effect on the controlled fader and no change in channel gain.

A DCA fader move of, say, +5 dB will be indicated by a +5 dB change in the position of the ghost fader. Still, the channel fader does not move. In this example, channels 3 and four are assigned to Link Group 1, so their level changes with that Link fader. Channels 1 and 2 are not members of Link group 1, so they are not affected. DCAs are defined with the Link Group assignments buttons in the Channel window output section and the Internal section of the Patch window.

LINK BUTTON BEHAVIOR

Only the selected link group is active. Deselecting the Link button disables all link groups. This affects only links, not DCAs. A DCA is always 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.

CHAPTER 4:
MIXER WINDOW

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

Mixer Window Overview

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 Layers   **2** Mixer Channels   **3** Master Fader   **4** Utility Sections

       a.   Channel Strips

       b.   Layer Modes

MIXER WINDOW SECTIONS

Mixer Layers

Mixer Layers represent categories of channels. Nine layers address different channel types, and each layer has its own view.

Mute Groups

User-defined custom layers
Spill layer enable
Channels 1–16

Channels 17–32

Channels 33–48

Channels 49–64   Factory Layers

Groups/FX Aux

Monitor Aux

Masters

Link / DCA fader

All mixer layers in one view
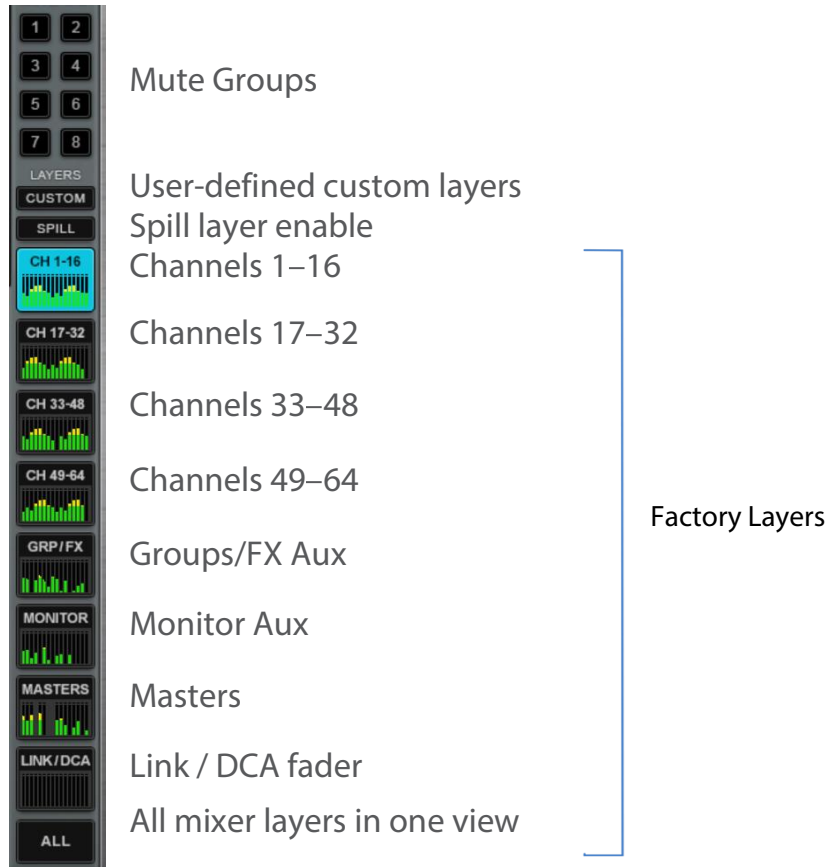
① **MIXER CHANNELS**

There are two aspects to a mixer channel:

• A means of controlling the busses or controls assigned to the channel (Channel Strip)

• Processing and routing tools that can be applied to the channel (Modes)

②ₐ **CHANNEL STRIPS**

A channel strip is organized in keeping with industry norms of digital mixing consoles. The bottom section of each channel strip is the same in most views: pan/rotation, mute, fader/meter, and cue/solo. The top section of a channel strip controls input, routing, and processing. It changes with the Layer Mode selection to reflect its current function. The selected channel is highlighted and its name appears in the Top Bar.

Channel inputs are at the top of a channel strip and I/O device preamp controls are shown in the Input mode when I/Os are assigned to the mixer. Channel strips in all layers and modes have faders with peak meters, as well as multipurpose pan/ balance/rotate controls and mute and cue buttons.

2b LAYER MODES

A Layer Mode determines the actions that affect the channels in the currently selected layer. There are two pages of Mode selectors. Toggle between the pages with the arrows above the panel.

Input: Select input source. Control preamp and digital trim.
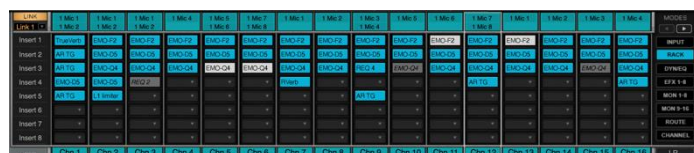
Rack: Insert up to eight plugins per channel. Plugins can be inserted on any layer, including mains, cue, and talkback.
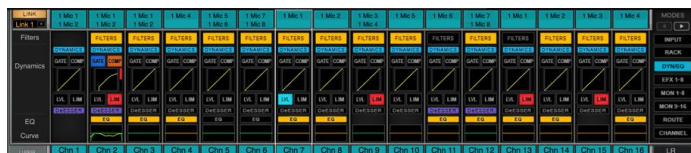
Dyn/EQ: View and control dynamics and EQ plugins as assigned in the Channel window.

Route: Assign all input and output patching, as well as internal routing.
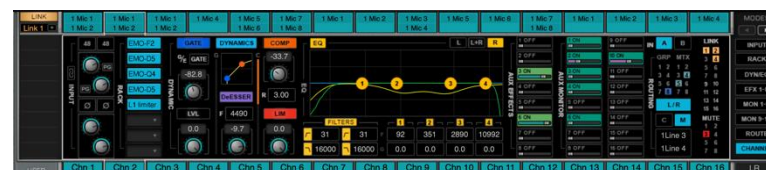
Channel: View and control details of the selected channel without leaving the Mixer. Gray if no channel is selected.

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

Aux Layer Modes

There are six AUX send modes. Channels and busses can send to auxes based on their position in the signal flow.
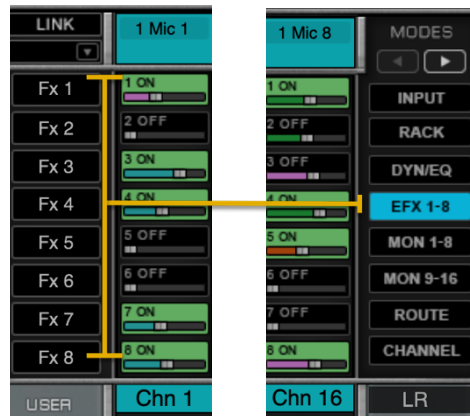
EFX 1–8: Send channels and busses to EFX 1–8.
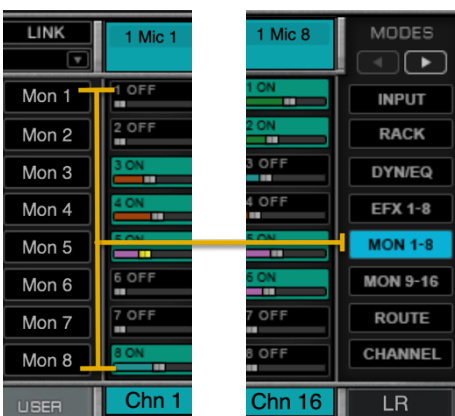
MON 1–8: Send channels and busses to MON 1–8.
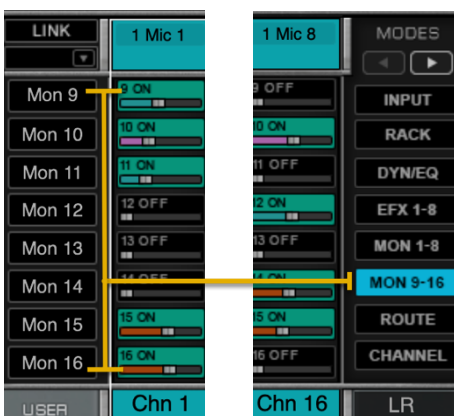
MON 9–16: Send channels and busses to MON 9–16.
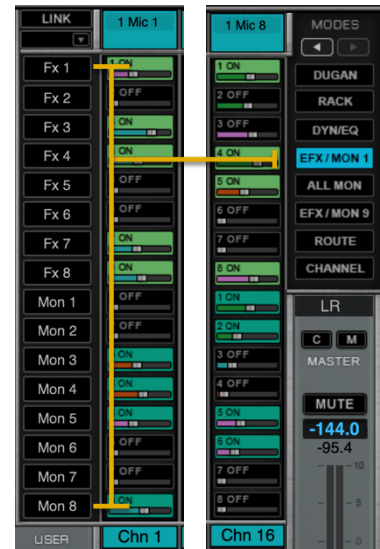
EFX–MON 1: Send to AUX/EFX and MON1-8. Small faders.

All Mon: Send to all Monitor Auxes. Small faders.
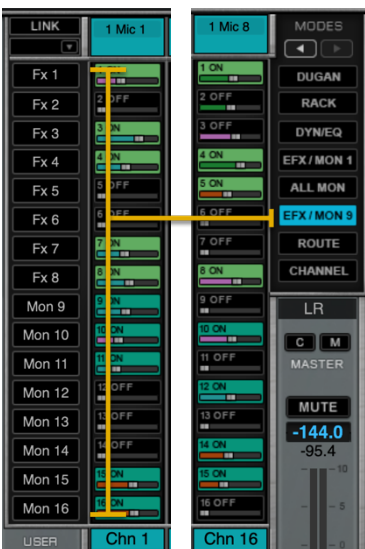
EFX–MON 9: Send to AUX/EFX 1–8 and Monitor 9–16   Small faders.

Layer Modes are described in detail in the Modes section (Mixer Window) and Aux/EFX and AUX/MON section (Channel Window) of this user guide.

3 **MASTER FADER**

The Master fader controls output levels, mutes, and cue/solo for the Main Outs: L/R, Center, and Mono. When the mixer is in the "Aux Sends on Faders" mode, the Master fader becomes the output fader for the selected FX or MON buss.
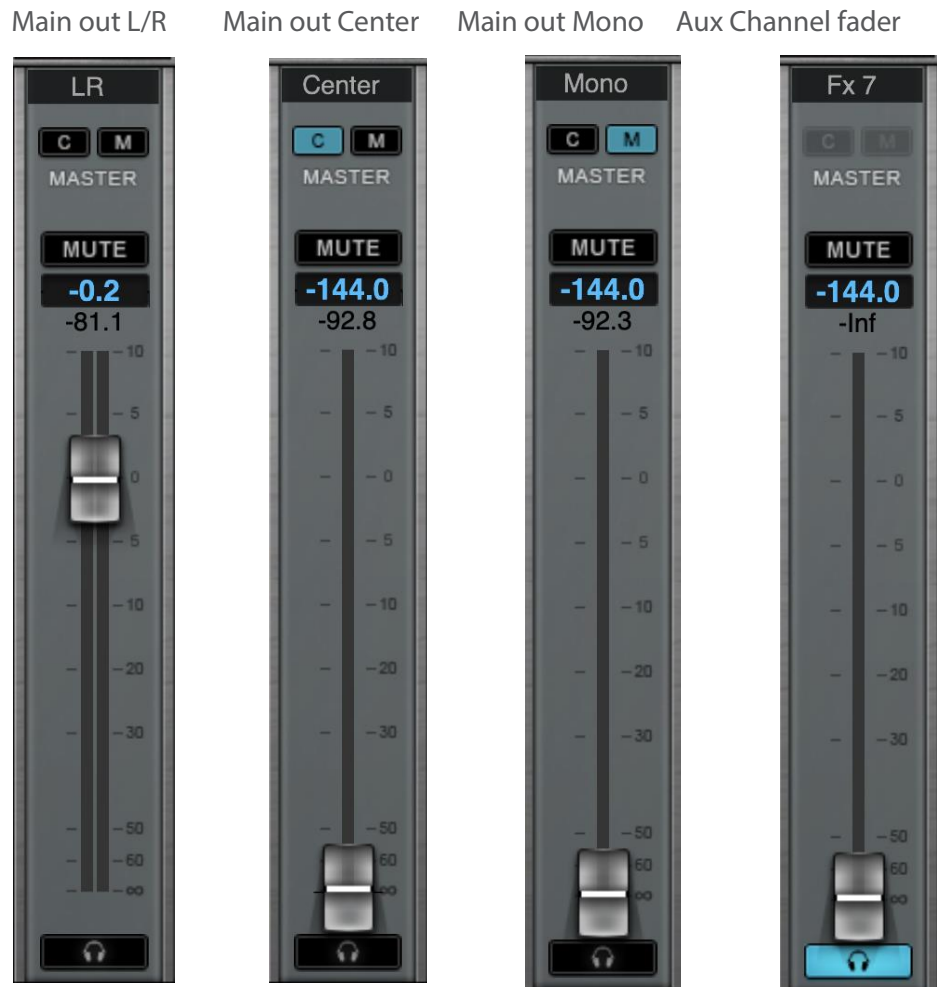
Main out L/R   Main out Center   Main out Mono   Aux Channel fader

4 **UTILITY SECTIONS**

Utility sections provide quick access to favorite or regularly used commands:

User-Assignable Keys Triggers the action displayed in the value box
Mute Groups Activates mute groups
Keyboard Opens a keyboard for text entries; includes modifier keys
Links Selects and enables Link groups

Top Bar

The Top Bar is a navigation and management tool available at the top of all views. From this control strip 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
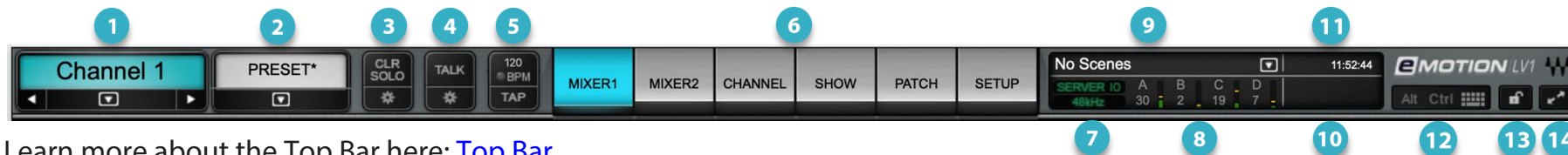
Learn more about the Top Bar here: Top Bar.

1 **Name:** Displays the selected channel

2 **Presets Menu:** Manages channel presets and sessions

3 **Clear Solo:** Clears all solos or cues / accesses cue controls

4 **Talk:** Engages talkback / accesses the TB control page

5 **BPM:** Displays BPM; tap to set tempo

6 **Window select tabs:** Navigates to all mixer windows

7 **SoundGrid Status:** Displays presence of I/O and server

8 **DSP meters:** Displays average and peak processing loads per server

9 **Scenes:** Stores and recalls scenes

10 **Messages:** Reports status and errors

11 **Clock:** Displays current time from host, or MTC position

12 **Clock:** Onboard keyboard access with Alt and Ctrl modifiers

13 **Lock:** Locks mixer surface, I/O routing, and/or plugins rack

14 **Full screen mode:** Fits the mixer window to full-screen view

Factory Mixer Layers and Custom Layers

A mixer Layer is made up of channels of the same type: input channels, busses, and link controls. Selecting a layer determines what kind of channels are viewed and controlled. The Layers panel, next to the master fader, is used to choose among them.

A Layer selector button contains 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. These meters also have clip indicators.

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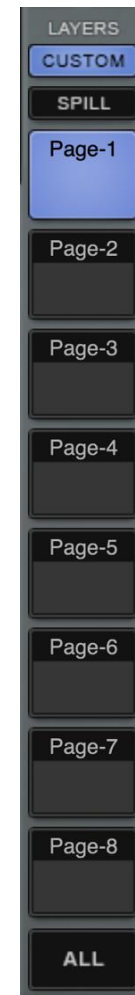
Channels of any layer type can be combined in user-created Custom layers. This enables control of a specified assortment of channels in one view, without changing mixer layers. Channels can be organized in any order within a Custom layer. Each of the eight Custom layers can contain up to 16 channels.

Channels Layer

These are the input channels that feed the mixer. Any 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/EFX and AUX/MON channels.

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

- Channels 1–16
- Channels 17–32
- Channels 33–48
- Channels 49–64
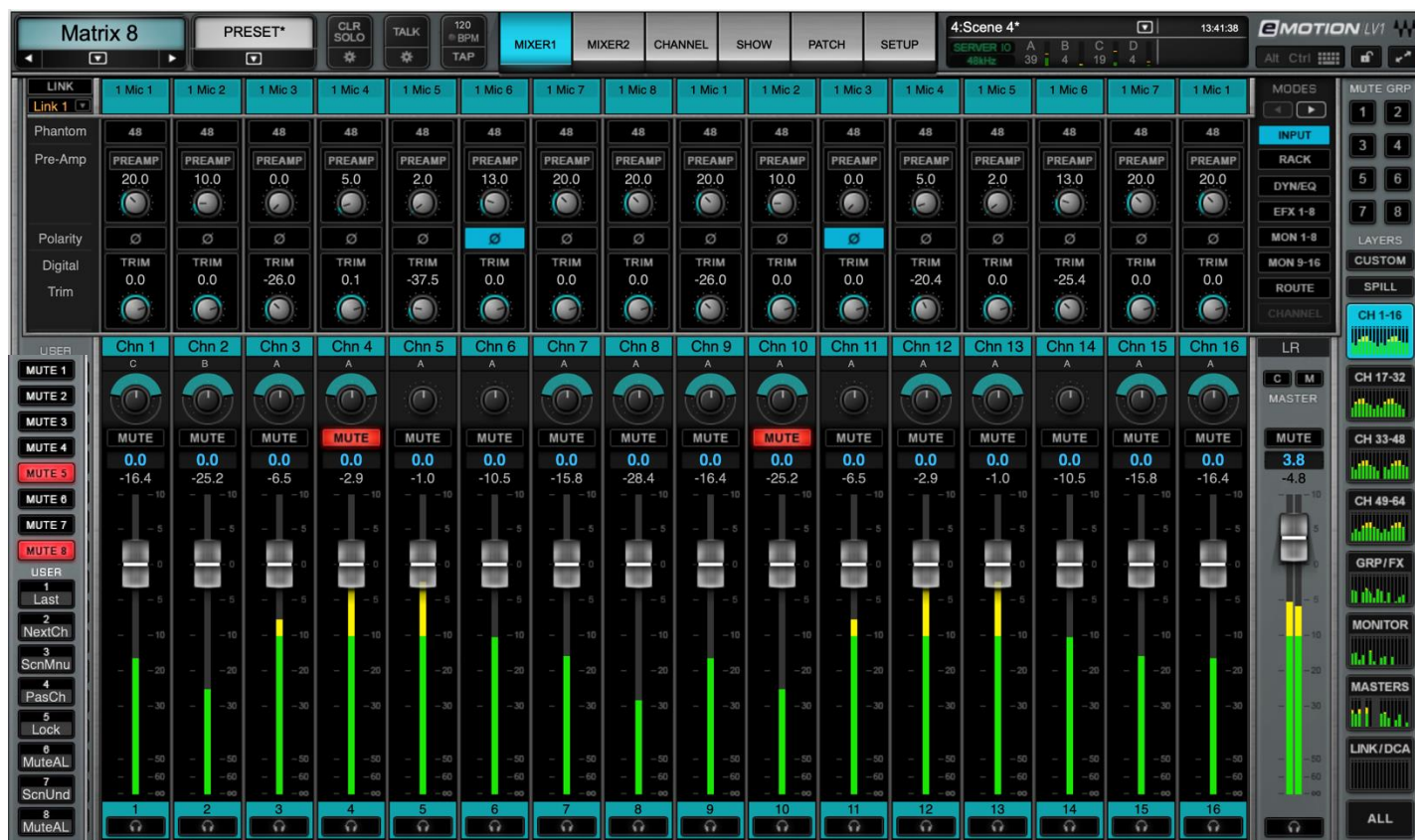
Groups / FX Layer

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 don't add latency. However, plugin latency (if there is any) will be added to the path. See *Appendix E* for more on latency and delay compensation. Mixer Input channels can be assigned to up to eight stereo groups, which are controlled in the Groups layer.

Channelss 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.

• Up to 8 plugins per group.

• Send groups to Aux EFX and monitors and/or to the master busses.

• 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.

EFX busses are used primarily for processing signals that will be sent to monitor outs or other paths. You may choose to process an EFX 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 EFX 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/EFX 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*.
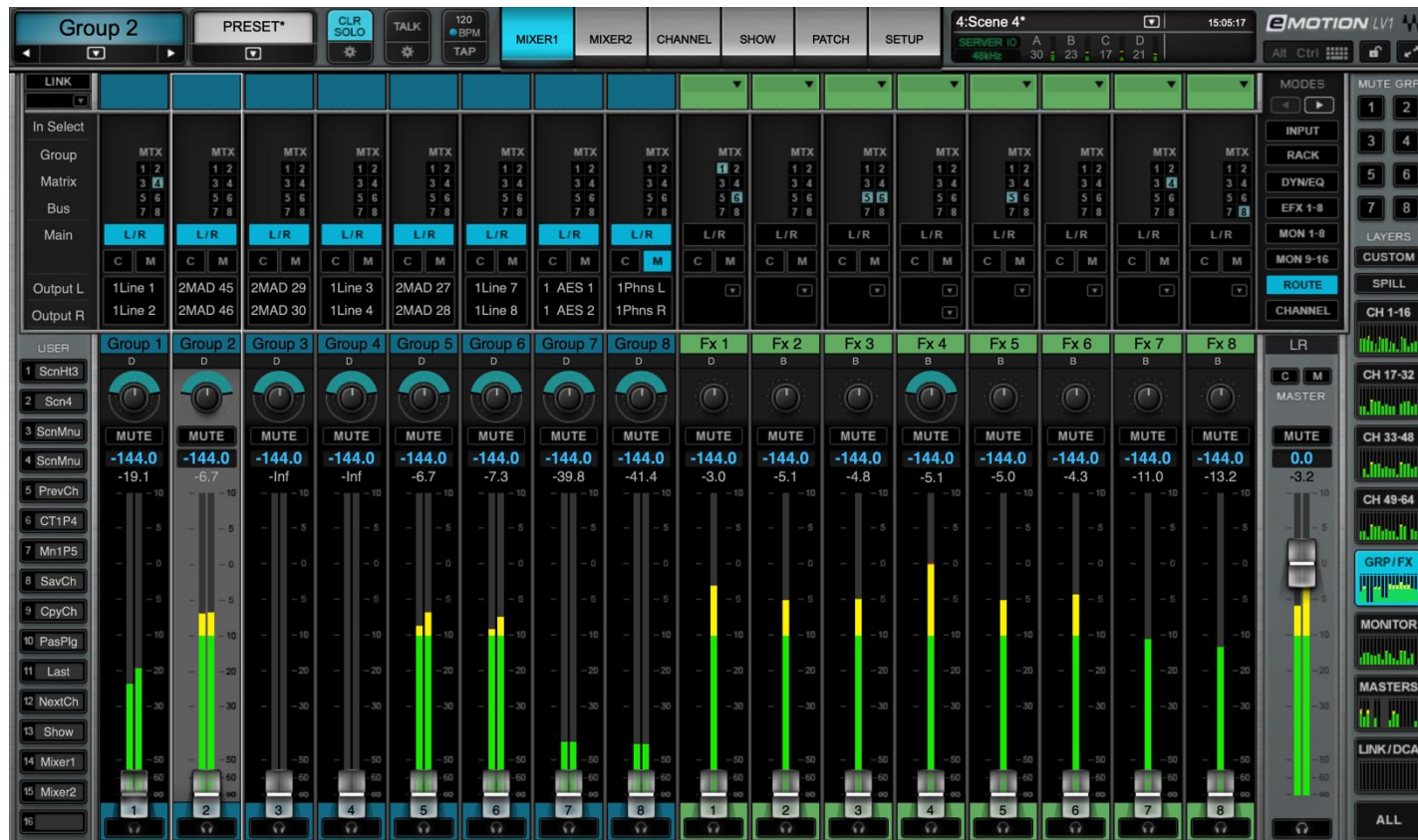
Groups/FX Layer

Effects and Monitor busses are very similar in most Layer Modes, but their signal flows differ slightly. **MON** busses are typically used for monitor feeds. Signals are sent to auxes from channels and busses. These aux busses will be mixed and then assigned directly to outputs. Each monitor aux can have up to eight plugins, so effects such as reverb, delay, or other processes can be added to an aux buss before they are routed to an I/O.

Monitor Layer

Effects and Monitor busses are very similar in most Layer Modes, but their signal flows differ slightly. **MON** busses are typically used for monitor feeds. Signals are sent to auxes from channels and busses. These aux busses will be mixed and then assigned directly to outputs. Each monitor aux can have up to eight plugins, so effects such as reverb, delay, or other processes can be added to an aux buss before they are routed to I/O
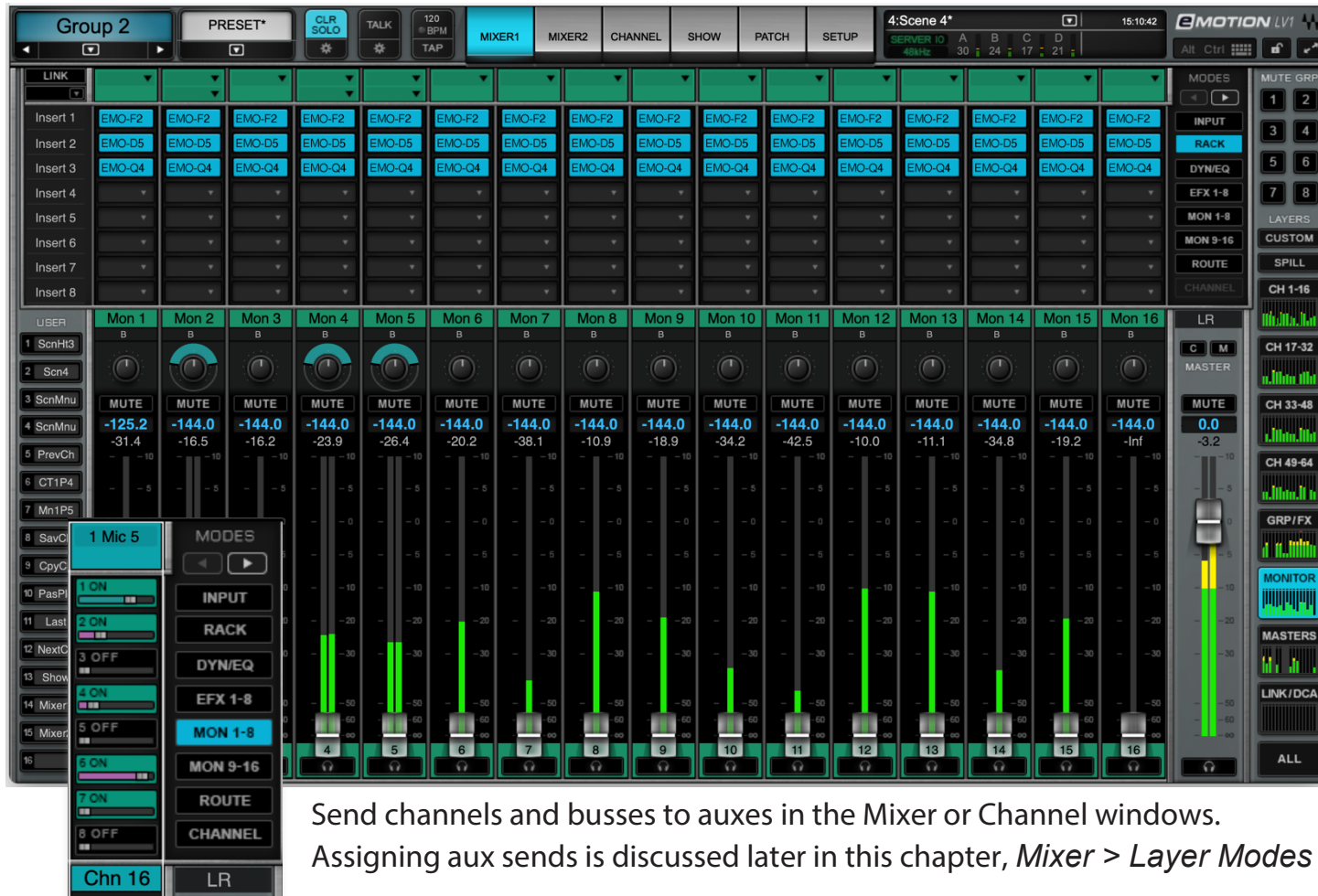
Send channels and busses to auxes in the Mixer or Channel windows.
Assigning aux sends is discussed later in this chapter, *Mixer > Layer Modes > Aux Mode*.

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

If needed, some EFX 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/EFX 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*. Use the Mix Mode switch on the input panel of any AUX buss to select mono or stereo.

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).
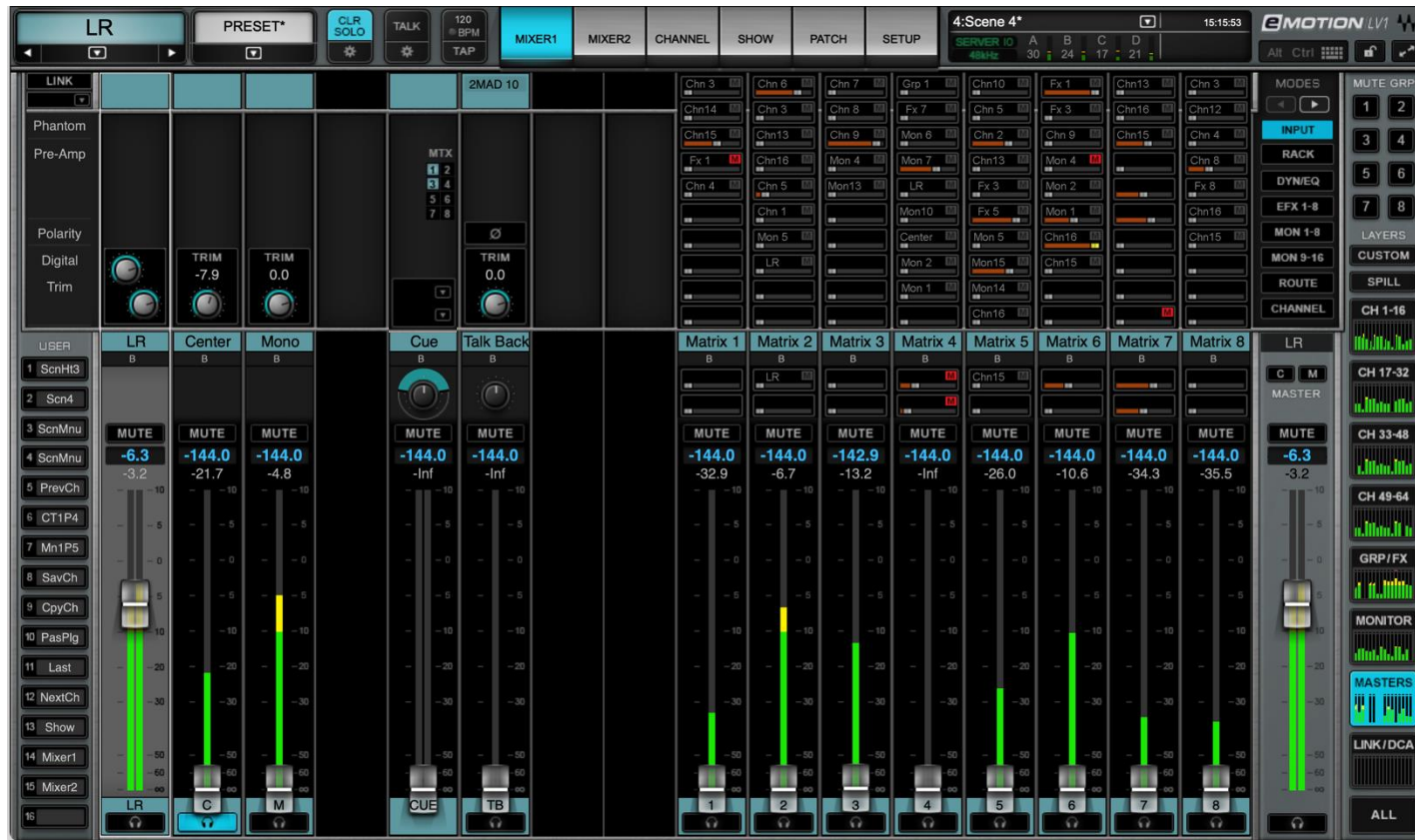
Buss Outs

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 *Channels* 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

This page controls the input mix and output levels of the 12-input x 8-output matrix busses. A matrix is typically used to send 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 has an eight-plugin rack for dedicated processing.

Channel Window > Channel Output Section.

Each Matrix channel accepts up to 12 assignments. Assignment levels can be controlled with 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 go to the Channel view.

Link/DCA Layer

Assigning channels to a Link will coordinate their movement. Move any fader within a link group and the other faders move correspondingly. Temporarily turn off the group to change the relative positions of the faders. You can also control the faders in the group from the Link/DCA layer.

A DCA remotely controls the trim values of a group of faders. Any channel except Talkback can be assigned to a DCA channel. Moving the DCA fader changes the gain offset of all the faders under its control. When you move a DCA fader, the controlled faders don't move. They stay at their original positions, while "ghost faders" show the current channel level, as determined by the offset introduced by the DCA fader. This is similar to analog VCA faders.

Links and DCAs use the same assignment panel in the Channel window. You can also make these assignments in the Internal Patch page.

• 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.
• Link assignments are made in the output section of the Channel window and in the Patch window.
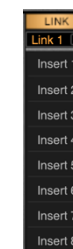
Links are activated in the Link menu on the left side of the Mixer.

The Link/DCA layer provides access to the 16 DCA faders that control the channels and busses assigned to Link groups. A DCA fader also provides a Mute function that behaves as a Mute group.

A DCA Cue/Solo button controls cue or solo in all assigned channels.

DCAs are discussed in greater detail in the Link Group Controls section.

ALL Layer

This layer provides an overview of all of the channels in a session. Each small channel strip includes a cue control, fader, meter, and mute. Touch a channel number to open its channel view. This is particularly useful for single-display configurations, since you can easily go from a wide view of all channels to a focused Channel window.
Layer types are color-coded for clarity. There are no modes in the ALL layer.
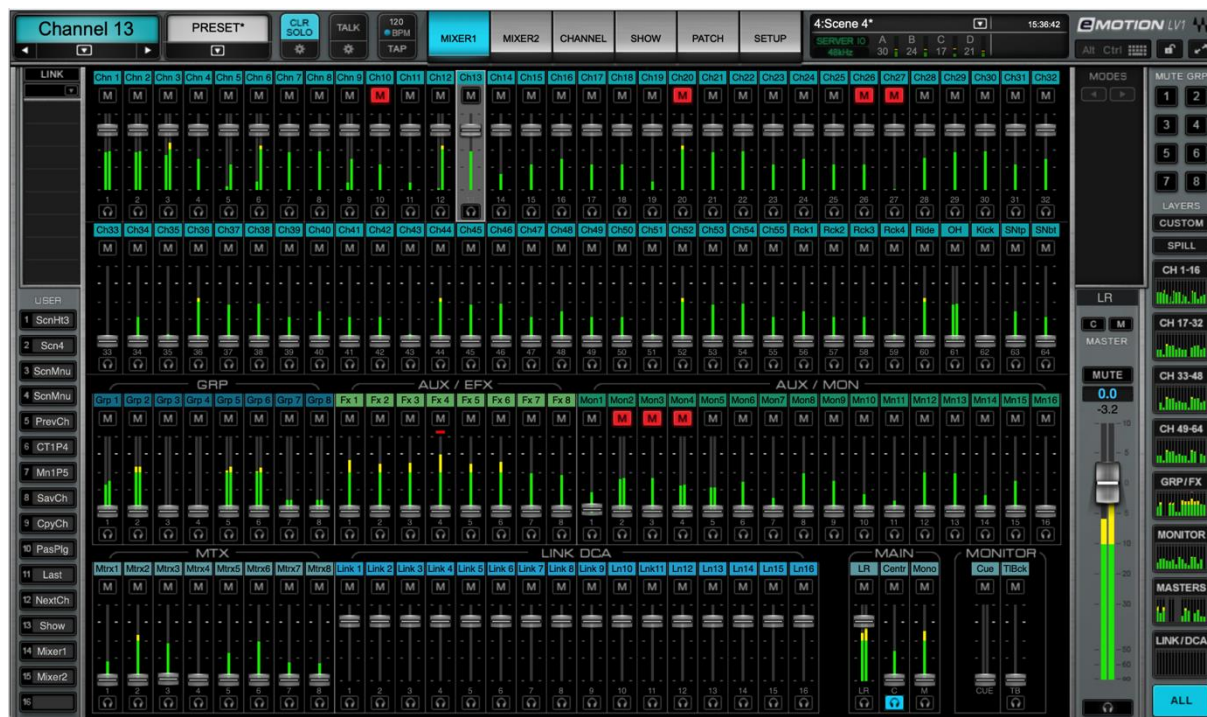
The ALL layer can be locked so that other layers in the mixer (Mixer 1 or 2) cannot be selected. This is useful when you are working with two or more displays and you want to see an overview of all channels at all times. It is enables you to see and control two FIT controllers working in tandem, in a single display.

Enable "Lock ALL Layer" in the UI Settings page.

Click the ALL button when "Lock ALL Layer" is enabled. An open lock icon appears on the ALL layer button.

Click the ALL button once again and the layer is locked and you cannot select other layers in this mixer. Click on the ALL button again to unlock the layer.

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 (right).
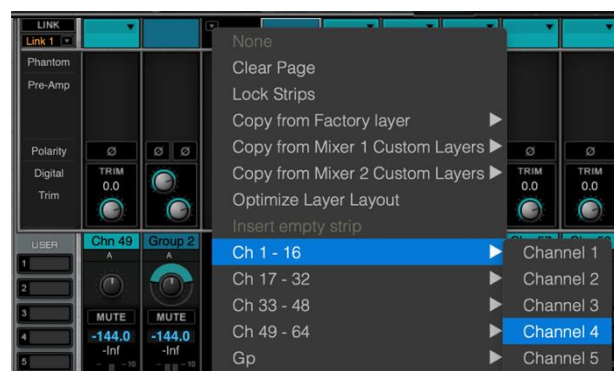
- Use the drop-down menu at the top of a channel strip to open the custom assignment menu. Select the assignment.
- Click and drag on the channel to rearrange the channel strips.
- If a channel strip is already populated, ctrl+click on the channel name (or use the arrow on the top-rightr of the strip) to access the Custom layer menu.
- Double-click on a Custom layer page button to change its name.

Other items in the drop-down menu

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.

Dugan Layer

The Dugan Speech Automixer is a way to control 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 situations such as roundtable discussions, talk shows, debates (and the like) 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 needed to access this feature.

BASIC OPERATION

To access the Dugan Layer, click the Modes arrow above the Layers 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.

5. 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 Channels

A Mixer's processing, routing, and control take place on channels and busses. To control these channels, two things are needed:
(1) A means of selecting and controlling the processing, routing, and controls applied to a layer of channels or busses (Layer Modes)
(2) A mechanism for controlling channel input, panning, cue/solo/mute and other traditional mixer functions (Channel Strip)

Channel Strip

eMotion LV1 channel strips are laid out in a manner customary for digital mixing consoles. Signal flows from top to bottom: an input section, a processing/routing section that changes with the Layer Mode selected, and a section for channel parameters (input gain, panner, fader, etc.).
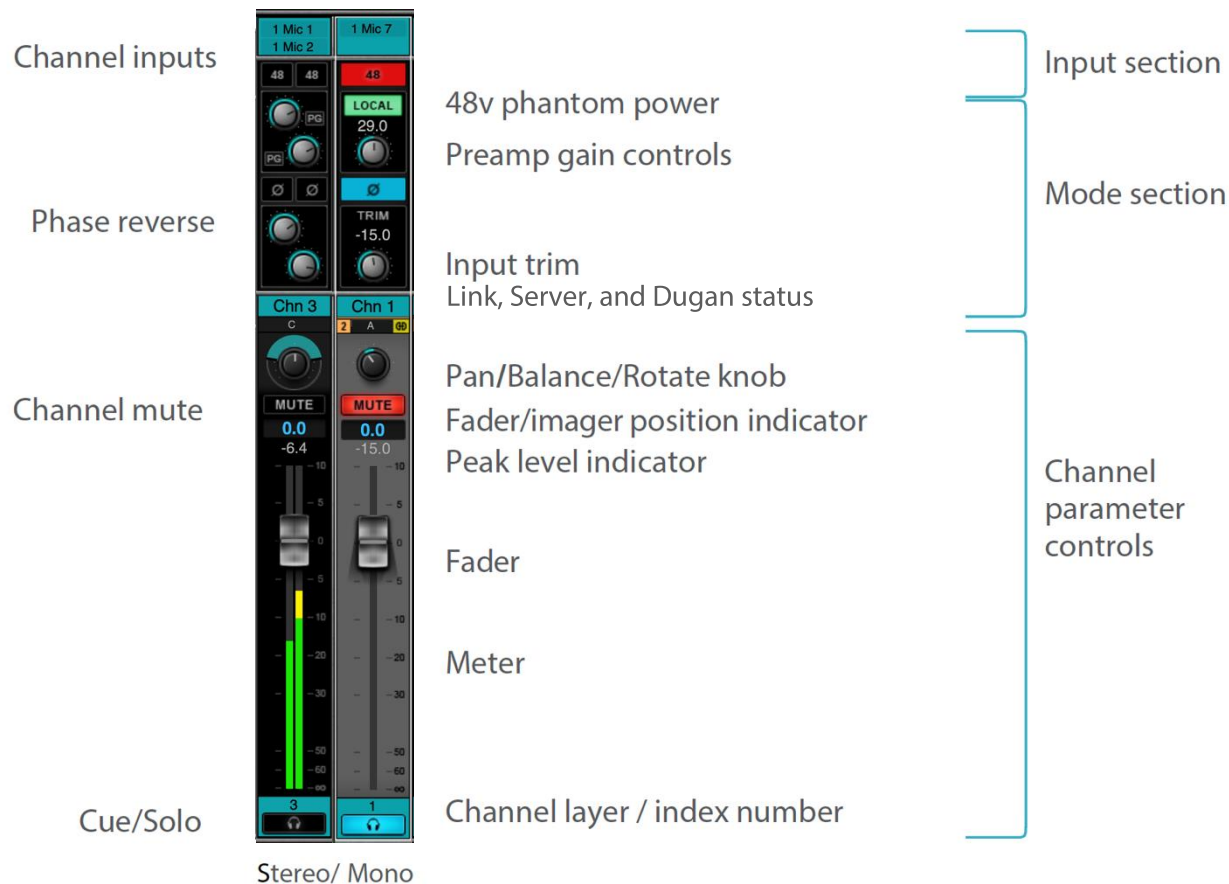
Assigning a Server To a Channel

You can assign a specific server group to a channel. This enables you to balance your processing load. Click on the Server ID letter, just beneath the channel name, and select a server group from the drop-down menu.

You can also assign a server to a channel in the Channel or Patch windows.

Two other indicators share this panel. The number on the left displays the channel's link group. This number is visible only when linking is active.

The icon on the right indicates that Dugan Spech is active on that channel.

Channel Input

Channels 1–64 are input channels that patch to I/O devices, including shared devices. The number of inputs available for patching is determined by your LV1 license the devices assigned to the mixer.

- Drop-down menus at the top of each channel strip show available I/O device channels.
- An I/O channel can patch to several mixer input channels. Unavailable I/O Once an I/O channel is selected, its name appears in the channel input name box just below the channel name.
- To change the input mode of the channel, select "Flip to Mono" or "Flip to Stereo." When converting a stereo track to mono, the top (left) channel will become the mono input. When flipping from mono to stereo, only the left channel is patched.

MODE CONTROLS SECTION

This section is reserved for the Layer Mode controls. Each Layer Mode has its own graphic interface. Please refer to *Layer Modes* later in this chapter.

CHANNEL PARAMETERS

The bottom section of a channel strip is the same for all input and buss channels.

PAN/BALANCE/ROTATION KNOB

Pans mono channels between left and right when sent to a stereo buss. Controls the balance of a stereo signal or moves the image without changing its internal balance. This multifunction controller is discussed in the next section.

CHANNEL MUTE

A user-selected Mute for a specific channel will be solid red. A Mute activated by mute group, a DCA fader, or solo will flash red.

- When a mute button on a channel is flashing, click it again unmute it.
- Click one more time to keep the channel muted even if the mute group is deactivated.
- Click a third time to return to mute group behavior.

In the Solo-in-Place mode, mute indicators on all channels (*except* the soloed channel) will flash red until solo is cancelled

PAN/FADER VALUE

When the panner or fader is touched, its value is displayed in this value box. Panner values are displayed in blue and fader values in yellow.

PEAK LEVEL INDICATOR

Located just below the Fader/Panner value box, this indicator displays peak level and clipping. Peak hold, clip hold, and clip indicator threshold are set at Setup > U/I Settings > Peak and Clip. Click anywhere on the meter to clear holds.

FADER

Touch a fader to select it. Usually, selecting a fader also selects the channel. At times it's desirable to disconnect the fader from channel selection. Deselect "Channel Select Follow Fader" in the U/I Settings page (Setup > U/I Settings > Mixer Window).

When under the control of a DCA, the fader stays in its original position, while the DCA offset value is shown as a "ghost fader."

On a multi-touch display, you can touch several faders simultaneously to control level of multiple channels. However, only one channel at a time can be selected.

Return a fader to its default position with ALT+click.

Range: -144 dB to +10 dB

METERS

• Stereo or mono peak meter
• Input and output meter selections are made at Setup > U/I Settings. Range: -INF to +10 dB
• Cue/Solo switch and indicator

•

CUE/SOLO SWITCH AND INDICATOR

Activates a send to the Cue or Solo busses for channel monitoring. Clear all instances with the Clear Solo button on the Top Bar.

• Cue mode or Solo in Place
• Latch or Single Solo

Using Cue/Solo is discussed later in this chapter.

CHANNEL INDEX

Lists the channel's index number within its layer type (channel, group, aux, etc.).

Stereo/Mono Mix Channels

Many channels can be either stereo or mono.

Toggle a mixer channel between mono and stereo by clicking the input selector at the top of its channel strip in the Mixer window.

You can also do this in the Channel window. Go to the channel's Input section, click Add, and choose "Flip to Stereo" or "Flip to Mono" from the drop-down menu.

Pan/Balance/Rotate Functions

Multi-function pan/balance/rotate knobs provide mono panning and stereo balance and rotation.
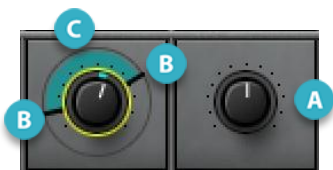
A—Mono Panner/Stereo Balance Knob:
When a mono signal is bussed to a stereo channel, rotating the panner causes a gain decrease in one channel and a corresponding increase in the other. This is classic panning. When the panner is used on a stereo channel, the source moves right to left.

B—Left and Right Panners
The panners set the pan values of the left and right channels to the destination independently. Adjusting the panners together is stereo rotation—moving a stereo image within a soundscape while retaining its image and width. Consider this to be the stereo equivalent of mono panning.

Moving one panner widens or narrows the stereo image asymmetrically. Ctrl+drag to widen or narrow the stereo image evenly. The image can be summed to mono (width=0) or panned beyond mono to reverse the stereo image (rotation indicator turns brown).

C—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.

D—Value
Indicates the value of the selected control.

Layer Modes

Input Layer Mode

The Input layer mode controls the signals from I/O devices or internal busses. In this mode, each layer has 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 layer mode provides control of the preamp.

PREAMP CONTROLS

When a channel is patched to an I/O preamp, the following preamp controls are available:

1 **48v Phantom Power:** Activates the microphone preamp 48v phantom power. Stereo channels have independent L/R 48v phantom controls. Options: on/off; default: off

2 **Preamp/Local select: 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 >Controlling Preamp Gain on Shared Devices.*

3 **Preamp Analog Gain Control:** Controls 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. Preamp control range varies depending on the I/O, and adjustments made in the I/O control panel are reflected here.

4 **Input Polarity Reverse:** Reverses the polarity of an input channel. Each channel of a stereo input can be controlled separately. Options: on/off; default: off

5 **Channel Trim:** Trims channel input level digitally. Trims buss input on buss channels. Stereo channels/busses have independent left and right trim controls. Range: -144 dB to +10 dB

Dynamics/EQ Mode

The DYN/EQ mode displays the controls and graphics of plugins that have been assigned for 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. This opens the plugin pane 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
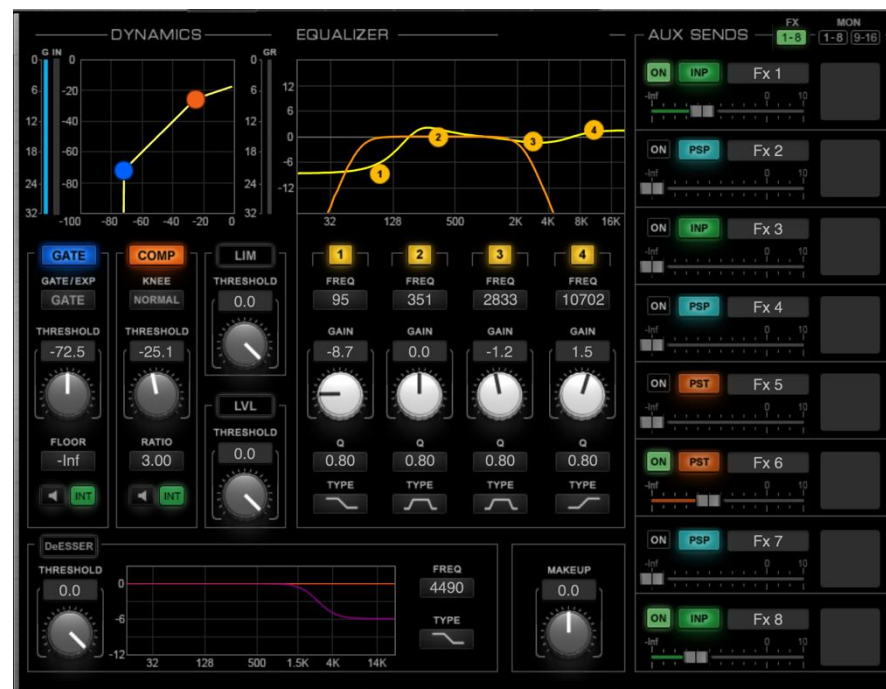
Rack Mode
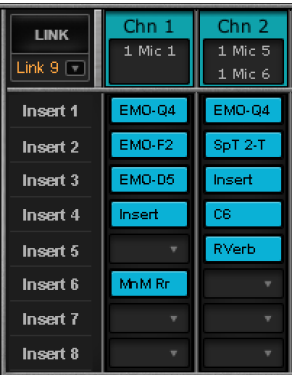
The Rack mode displays the plugins and external inserts for the channels in the current layer. This provides an overview of the processors on each channel or mixer buss, as well as quick access to a plugin's control pane. In the Rack mode you can move and copy plugins between racks, re-sequence rack order, and bypass, disable, and remove plugins from racks.

Each channel rack can hold up to eight plugins.

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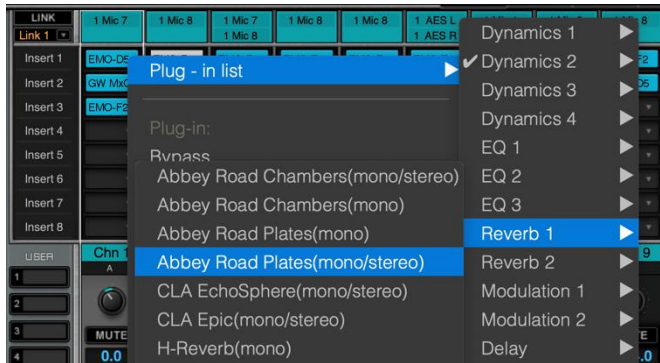
To add a plugin to a rack, click the small arrow on an empty rack slot, or click+hold on the slot itself. This opens the Plugin menu. Open the Plugin List sub-menu and choose from among the available plugins. Its name then appears in the rack slot. Click on the icon to access the plugin pane.

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 below.

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 be solid 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 grayed out.

ORGANIZING PLUGINS IN THE RACK LAYER 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

Single click: Opens the plugin pane of the plugin or external insert.
Single click + hold: Opens the plugin menu.
Ctrl + alt + click: Bypasses the plugin.
Ctrl + click: Disables the plugin. Removes the plugin from the DSP processor.
Drag an icon off the left side of screen: Removes the plugin. This cannot be undone.

MOVING AND COPYING 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 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 of the mixer view.
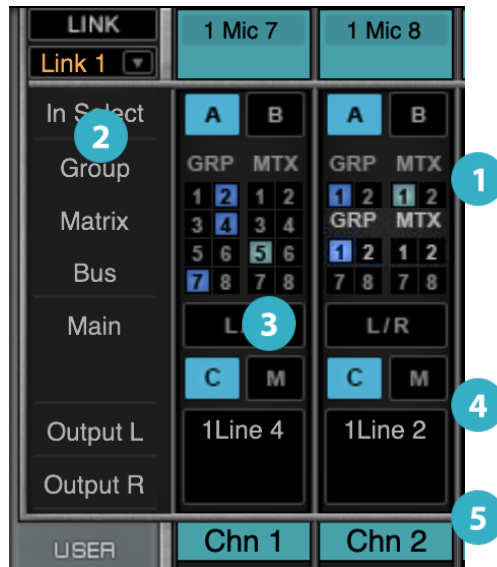
1   **Input Select:** Lets you choose between two sets of I/O device input channels, A or B. Each set can be patched to any device that is assigned to the mixer. Each channel has two inputs.

2   **Group Assignments:** Assigns channel to up to eight mix groups. Groups are controlled on the GRP layer.

3   **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.

4   **Main Outputs Assignments:** Assigns channel to the main mix.

5   **Channel Direct Outputs:** Assigns channel to direct or mix outputs. Devices assigned to the mixer are available for patching from this menu. Grayed-out I/O channels are unavailable.

Aux Layer Modes

All Input channels and groups can be sent to Effects and Monitor aux busses. Each aux buss can have up to eight plugins and can be assigned directly to I/Os, to the main outs, or to the matrix. Effects busses can also be sent back to later effects busses. Effects busses can be sent to Monitor busses.

EFX busses can be sent post-processing to MON busses and to the main mix. Mon busses can be sent directly

There are six Aux modes on two pages.

Page One
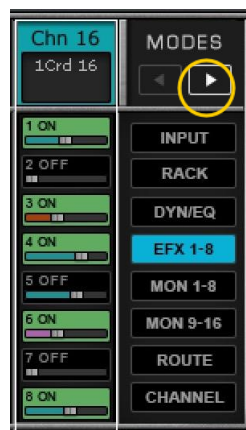
EFX 1–8	The eight EFX busses are used for primarily for effects processing, with up to eight plugins per aux channel. Because of their position in the signal flow, these busses can be sent to the main out or to other destinations. They can be sent to the monitor aux busses to provide common effects processing. EFX busses can also be sent other EFX busses that have higher index numbers (a later EFX buss).
MON 1–8 and **MON 9–16**	Displays the MON channels in sets of eight. When using an aux for monitoring, the aux channel is assigned directly to an I/O that feeds the monitor.

Page Two
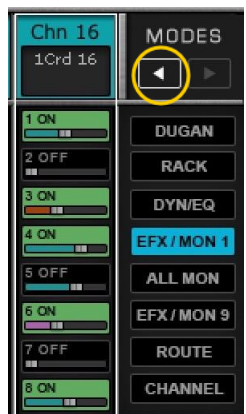
EFX/MON1	Displays 16 channels: EFX 1–8 and MON 1–8
ALL MON	Displays all 16 MON channels
EFX/MON 9	Displays 16 channels: EFX 1–8 and MON 9–16

Each source channel sent to an aux bus can have its own gain and pan settings.

to an I/O device. Aux channels are controlled in the AUX layer of the Mixer window.

Refer to the eMotion LV1 signal flow diagrams for more information (Chapter 6).

ADJUSTING AN AUX SEND
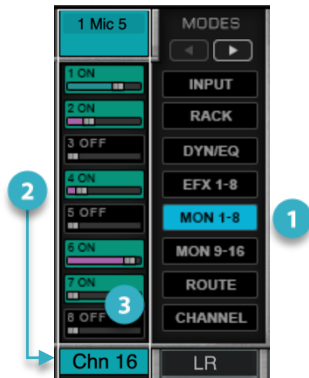
1. Select an AUX Layer mode.

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 layer mode section.

3. Turn an aux send on or off by clicking its cell.

4. Select the source for each send. Ctrl+click on a cell to choose its source. The color of the fader bar indicates the aux source:

   INP   Green   Before all processing, after input gain

   PRE   Purple   Pre-fader, after processing

   PST   Orange   Post-fader, after processing

   PSP   Blue   Post-fader, post-panner, after processing

5. Adjust the aux 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.

Sends on Faders

In the "Sends on Faders" mode, the channel faders control the level of the aux send, not channel level. The master fader controls the level of the aux channel rather than that of the main out.

Controlling Aux sends with Large Faders

1 Select Select an Aux layer mode.

2 In the Sub Views section on the left, click the name of the aux channel whose sends you wish to adjust. The interface changes color to indicate that channel faders have flipped function. The name of the selected aux channel will appear above the master fader, and cue will be selected for that aux buss.

3 Use the large faders to adjust send levels for all channels in the current layer. Each send has a pan/balance/rotate control.

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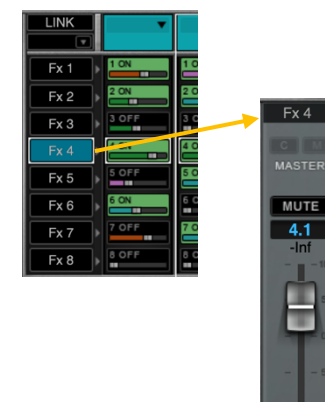
To return to normal faders, click on the aux send name, either on the left side of the panel or above the Master fader. You can select another AUX channel while the faders are flipped. This will remap the faders to the new aux sends.

Channel Mode

The Channel layer mode provides comprehensive feedback and control of 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 layer mode in the Mixer window
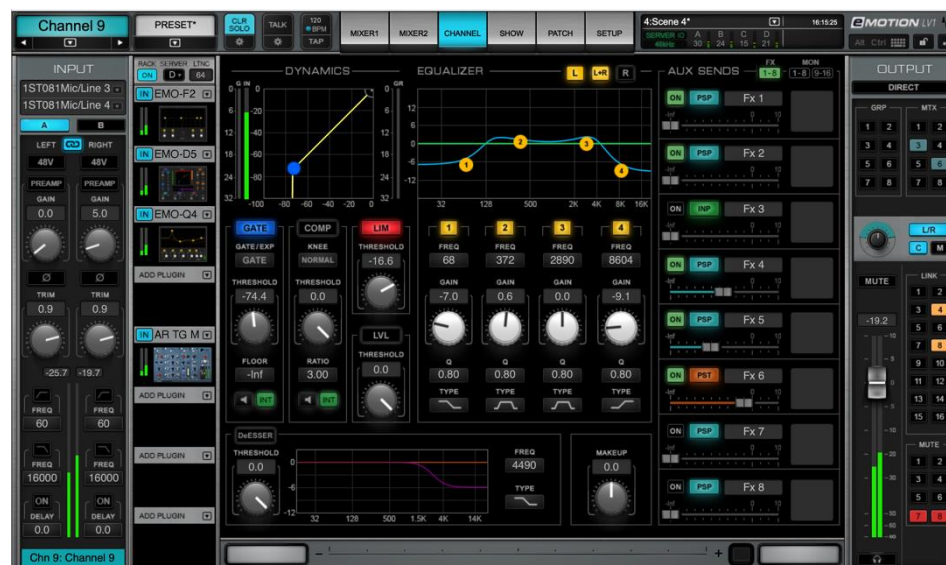
Same channel in the Channel window Main Control section

The Channel mode enables you to:

- Control all input settings
- Access the plugin menu to select and assign plugins
- Access the plugin pane
- Control assigned dynamics, EQ, and filters plugins
- Enable/disable key sections of mapped plugins (dynamics, EQ, and filters)

- Adjust EFX and MON sends
- Select input set (A/B), assign channel to groups and 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.

Master Fader
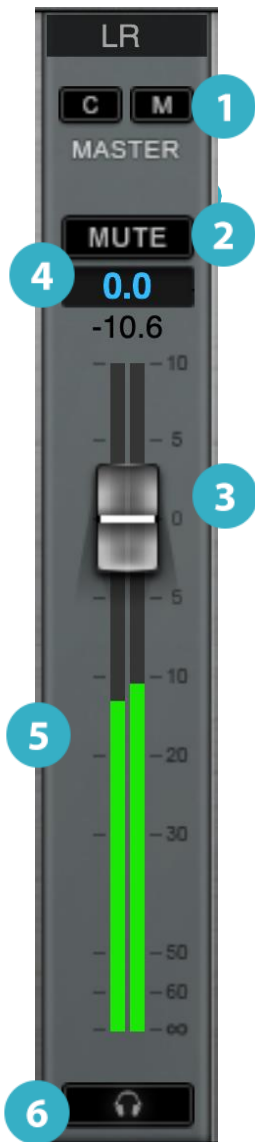
1   **Master Fader Selection:** Determines which output is controlled by the master fader (L/R, Center, or Mono). In the "Sends on Faders" mode, the master fader controls the selected aux channel output level. The name of the aux channel that is being controlled is shown in the L/R value box.

2   **Master Fader Mute:** Mutes the master channel that the fader is controlling.

3   **Master Fader:** The Maser Fader controls the master buss and can be assigned to the L/R main mix, Center, and Mono. When the mixer is in the "Sends on Faders" mode, the fader maps the AUX/EFX or AUX/MON output and the buss name appears above the fader. The Master Fader is visible from all windows, and its position is not affected by layer or layer mode selection.
Fader position is shown above the peak indicator. Range: -144 dB to +10 dB

4   **Peak Level:** Indicates peak level of the master output. When peak level exceeds the clip threshold setting, the value box is red. Meter behavior is set in the User Interface page (Settings > U/I Settings).
Click the value box or anywhere on the meter to reset the indicator.

5   **Master Output Meter:** Peak meter in dBFS. Range: -144 to 0 dBFS.

6   **Cue/Solo:** Activates send to Cue or Solo busses for channel monitoring. Clear all instances with the Clear Solo button on the Top Bar.

Utility Sections

Utility sections provide quick access to favorite or regularly used commands.

USER-ASSIGNABLE KEYS

Many mixer actions can be assigned to sixteen keys in the Mixer window. Clicking on a key triggers the 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 set in the U/I Settings page. (Setup > U/I Settings > User Assignable Keys)

Although user assigned keys are recalled in the mixer, 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. Click again on the button to mute 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 layer mode, in the Channel window, and in the Patch window. Refer to *Channel > Output Section > Main Outs Assignment Panel* for details.

KEYBOARD BUTTON

The keyboard button opens the operating system's on-screen keyboard for text entry on touchscreen displays. The button is located on the right side of the Top Bar.

Alt and Ctrl modifier keys are located above the keyboard icon. Use these keys when a mixer action, such as "Alt+drag" or "Ctrl+Insert Plugin," requires a modifier. Certain mixer functions are unavailable when Alt or Ctrl are engaged. If you find a familiar mixer function not working, check that the these keys are not on.

When a dialog box requires text entry, the keyboard icon is present. Click the icon to open the on-screen keyboard.

Text can be entered in any language that is supported by the host operating system.

LOCK MIXER

The Lock Mixer button is next to the keyboard buttons in the Top Bar.

The Lock function prevents 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, such as aux sends, or group or matrix assignments. There are three mixer lock categories: plugins, surface, and routing. You can apply a password.

Locking does not affect the mixer, only the user interface. Locking the surface prevents the eMotion LV1 application from quitting.

For further details, refer to *Setup > Mixer Settings Page > Lock Options*.

Link Group Controls

Links are a way to globally control mixer parameters across several channels. When channels are assigned to a Link, their controls move together. The Link button and menu are used to 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.
- All mixer controls except routing and 48v can be linked.

Link assignments are made in the output section of the Channel window and in the Patch window. A channel can be assigned to up to 16 Links.Channels in the active Link are identified with small numbers near their panners. A Link group is active only when its group is displayed, so only one Link group can be active at a time.

The controls move together, and their parameter offsets are maintained. 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.

DCAs
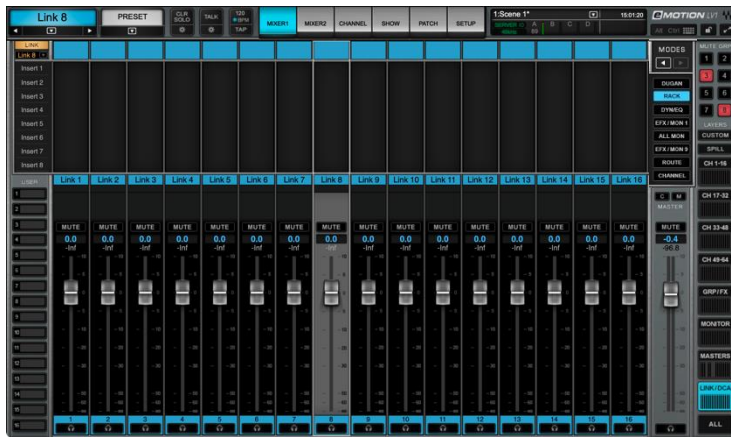
Link group assignments are also used to establish DCA groups. When a channel is assigned to a Link group, its faders can be remote-controlled from a DCA fader in the Link/DCA Layer. A DCA fader imposes an even-gain offset to all the faders assign ed to it. When the DCA fader is set to zero, the channel faders under its control are unchanged.

When a DCA fader moves, the linked faders do not move. Instead, a "ghost" fader indicates the total 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 as a Mute group.
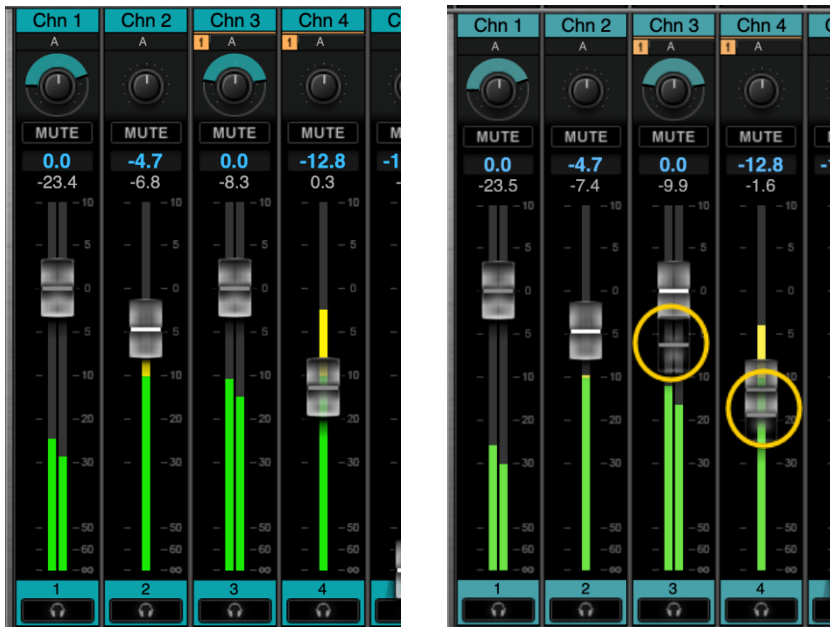
(left) Channels 3 and 4 are assigned to Link 1.

(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.

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 Layres 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 (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.

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:

- 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 on line.

2 Save As — Saves a new copy of the current session.

3 Load — Loads the selected session displayed in the Sessions list.

4 Open — Loads a session file that is not displayed in the Sessions list.

5 Clear — Clears the Sessions List. This does not delete the sessions. Sessions can be re-loaded and added to the Sessions list using the Open button.

6 History — Click the History button to open a browser that shows all auto-saved session files.

7 New — Opens a new blank session.

8 Sessions List — Shows all sessions created since the last Clear, or those that have been opened from other locations.

9 Save Template — Saves current session as a template. Templates are stored in the Templates folder.

**10** Load Template — Loads a factory or user-made template. When a template is loaded, its contents will be loaded and the resulting session willl be named "ntitled". Use Save As to save and name the session. Templates are a good starting point for building a new session.

11 User Session Notes — This large notepad is used for notes about the session, the venue, or anything else you want to write.

12 Session File Details — Displays session information:
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
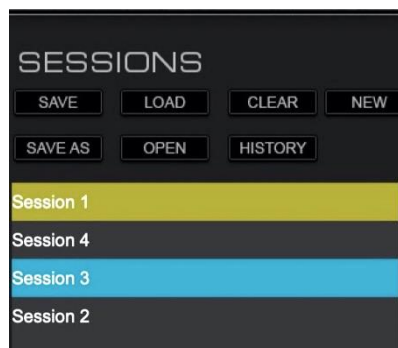
The Sessions list shows the sessions that have been created or modified in the Sessions window or opened from another location. It is used to select, copy, and load sessions. The color with which a session is highlighted indicates its status.

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 one will be highlighted blue.

Notes associated with the selected session are shown in the Notes section.

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 default folder, but a navigation window enables it to be placed anywhere.

eMotion LV1 sessions use the emo extension.
   Mac: Users/Shared/Waves Audio/eMotion/sessions Windows: Users\Public\Waves\eMotion\session

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.

SAVING A SESSION AFTER MIXER CONFIGURATION HAS CHANGED
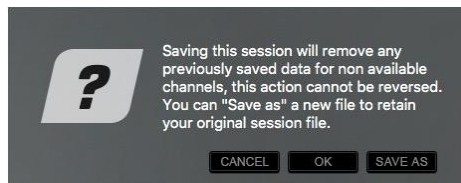
It is possible to change the number of mixer channels at any time, depending on the scope of your license. If the number of channels in the session has been reduced since the last time it was saved, this prompt will appear when you save.

Saving this session will remove any previously saved data for non available channels, this action cannot be reversed. You can "Save as" a new file to retain your original session file.

CANCEL   OK   SAVE AS

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, do a **Save As** under a different file name— before you change the configuration—unless you are absolutely certain that you do indeed want the mixer to be set to a smaller size.
Mixer size is set at Setup > Mixer Settings Page > Mixer Configuration.

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 Sessions list. **Open** loads a session that is not in this list. Regardless of the file's location, the Load/Open prompts whether or not to save the existing session, and then it loads the new one. If the new session has the same number of tracks and calls for the same or similar I/O inventory, then the new session will load immediately. When working on the same mixer repeatedly, this is usually the case.

> **Important:** Loading a session can result in a dropout or click. Do not load a new session when this not acceptable.

LOADING A BLANK SESSION
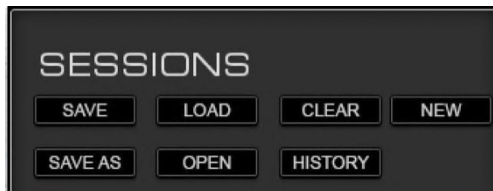
Click the **New** button to open a new blank session. This clears plugins (EMO plugins are not removed, but their values are cleared), patching, inventory, and any other information that is stored with a session. The new session will not appear in the Sessions List until is is saved. Use **Save** to save the session and assign a name.

LOADING SESSIONS FROM THE PRESET MENU
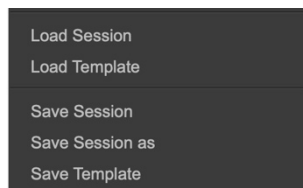
The Preset menu is located on the left side of the Top Bar. It is used primarily to manage channel presets, but it also provides a quick way to load and save sessions and templates.

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
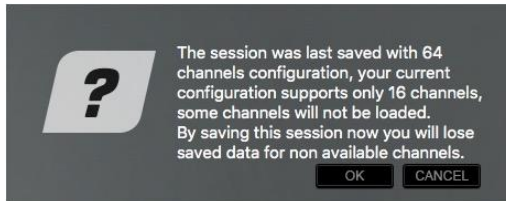
The saved session has more channels than does the current mixer configuration.

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.

Example 2
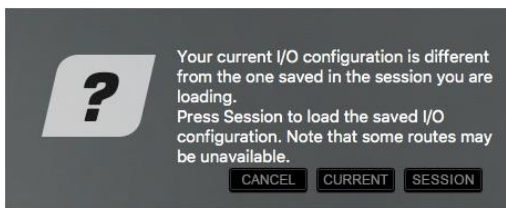
The I/O inventory of the saved session does not match the current mixer inventory.

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 mixer hardware in the same slot is an 8-channel I/O, 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 1: 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 2: 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 needn't be 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 as the session calls for. 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 a DiGiGrid IOX device in slot 1, and another in slot 2 (12 I/O channels each).
- The current inventory has DiGiGrid MGBs in slots 1 and 2 (up to 128 I/O channels each).
- When you load the session into this inventory, all the patches will be intact. The first 12 I/O channels from each MGB DiGiGrid interface will be patched, but the remaining channels are unused.

Templates
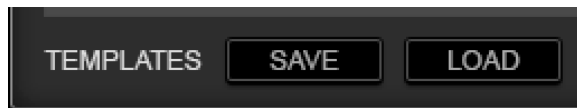
A template is a mixer session based on a previous session or a factory preset. It loads all mixer parameters (except the I/O inventory), which facilitates moving projects between mixer systems whose inventories are not identical.

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

Auto-Saving Sessions
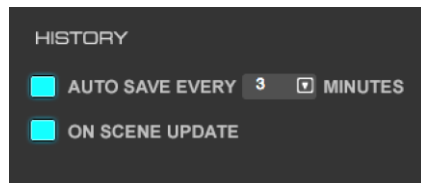
The mixer can save sessions automatically, either at user-defined intervals or each time scenes are saved or recalled. Auto-save settings are controlled in the Mixer Settings page (Setup > Mixer Settings >History). To prevent mishaps, eMotion LV1 does not delete auto-saved files. This can result in a very large number of files, but it provides access to all session information saved throughout a project.

There are three settings for Auto-Save:

No Auto-Save There are no automatic saves. No History files are created.

Auto-Save New History files are created in 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 by session name and a date/time timestamp. Locate a session and open it. These files are stored in the History folder:

    Mac: Users/Shared/WavesAudio/eMotion/history

    Windows: Users\Public\Waves\eMotion\history

Delete History files manually in the computer's file system.

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.

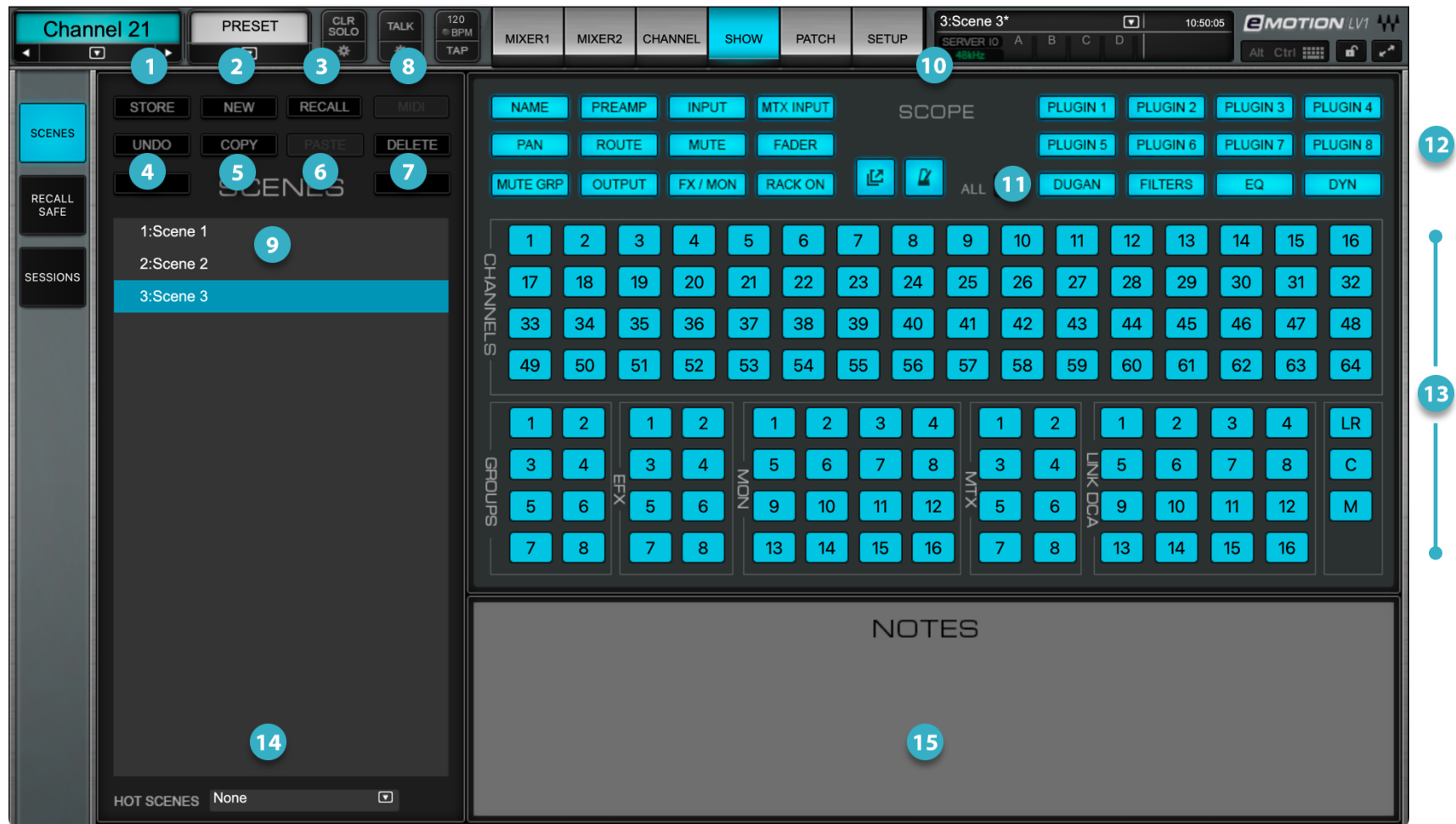|		
1	Store	Updates the current snapshot and scope parameters with the current mixer condition. Replaces the existing stored scene.
2	New	Creates a new scene, based on the current preset and scope settings. This makes a new scene from the current one and serves as a "Save as" function.
3	Recall	Recalls 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 with 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/deselects all functions, channels, and busses in the Scope list.
12	Channel Parameters Selectors	Determine which channel parameters can be altered with a scene change. If a control is not in the scope of the scene, its parameters will not change on any channel.
13	Input Channel, Buss, and Link Selectors	Determine the channels, busses, and control groups included in the scope of the scene. If a channel, buss, or link is not 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 its own notes section.

The Scenes list works in the same manner as the Sessions list.
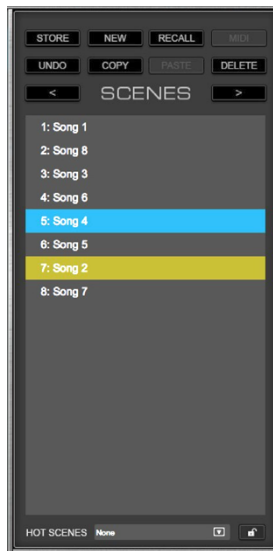
- A selected scene is highlighted blue, whether it is the recalled scene or not. A highlighted scene is not active until it is recalled.
- Notes associated with the selected scene are shown in the Notes section.
- If the current scene is not selected, it will be highlighted yellow, and the selected one 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 choices:
- 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:

- Drag the scene to a new location.
- Copy a scene with the Copy button. Use the separator line to choose where the pasted scene will be located in the list. If the separator line is not used, then the copy will be added to the bottom of the Scenes List. Double-click on the scene to change its name.

STORING A SCENE WITH THE TOP BAR SCENE 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 SCENE 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.
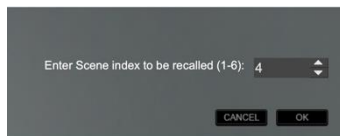
Recall Scene recalls a scene based on its position in the Scenes List. Use the up/down arrows to navigate the list or enter the index number directly.
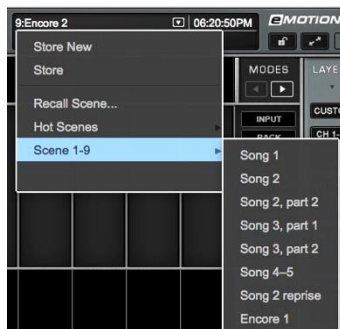
Scene 1–32, etc. A drop-down menu of all scenes in the session. Scenes are displayed in the order of the Scenes list. Selecting a scene opens it immediately. A session can have up to 1000 scenes.

Hot Scenes

Hot Scenes are user-selected scenes that are quickly accessible for recall.
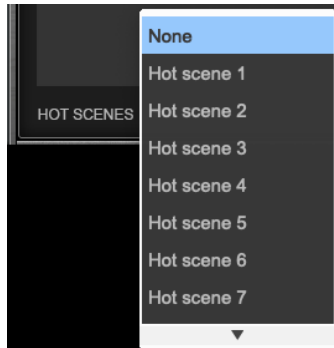
At the bottom of the Scenes list is a menu of Hot Scene assignment positions. Use this menu to assign the selected scene a Hot Scene position.
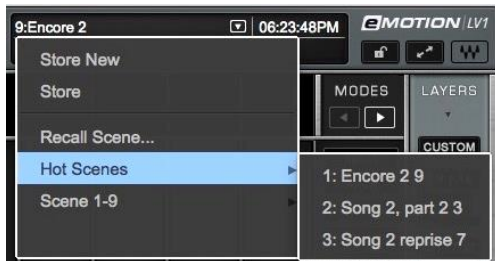
Hot Scenes are recalled from the Scenes menu on the Top Bar. The scene's name and Hot Scene position are shown. The scene is recalled immediately.

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. Items selected (blue) are included in the scene and will change to follow the parameters of the scene being loaded. Items not selected will remain in their current state.

Scope selections are divided into three categories:

Channel parameter selectors

Input channel selectors

Buss and link selectors
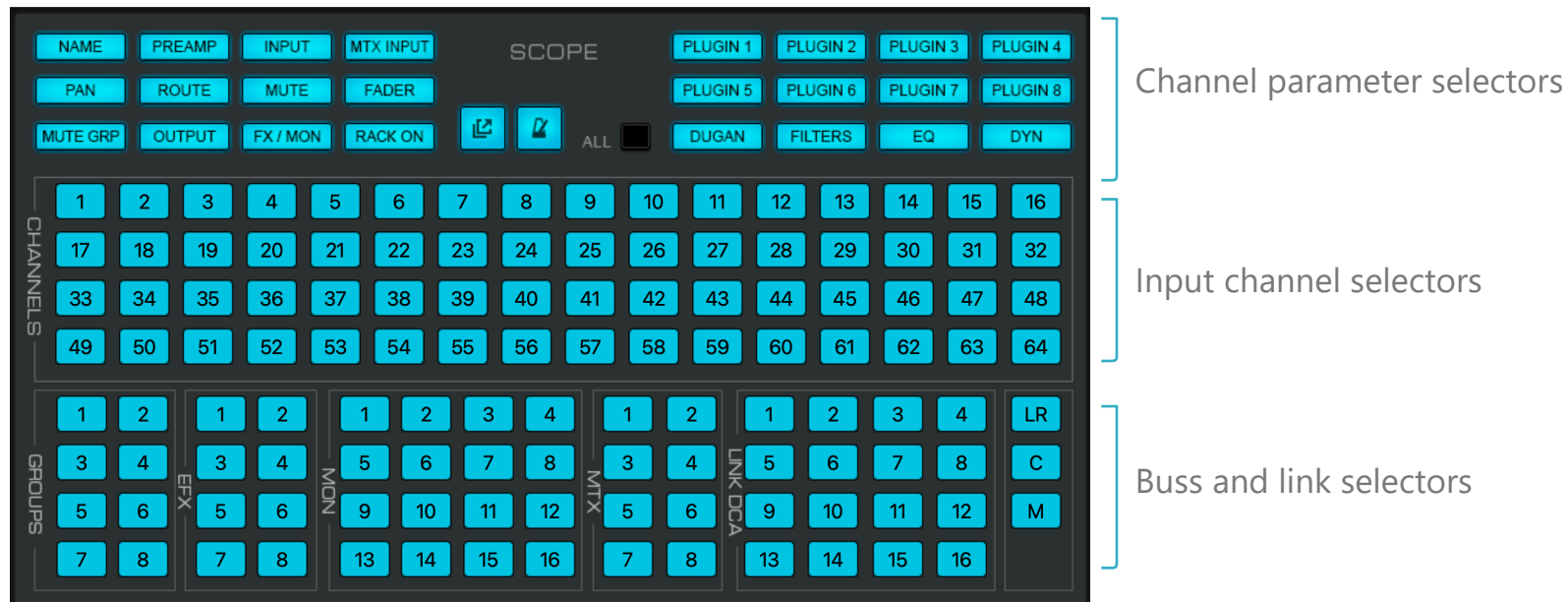
EXPANDED FX/MON SCOPE SELECTION
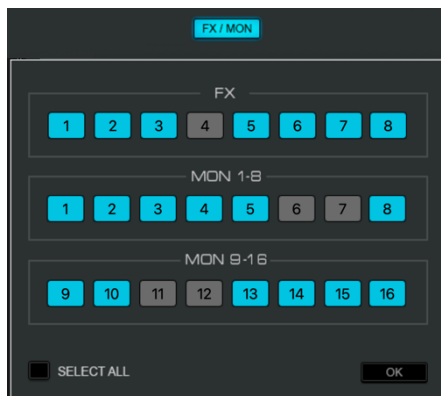
Click the FX/MON selector button to open an extended scope panel. This panel enables you to select specific FX/MON send channels.

The same selection feature appears in the Recall Safe page.

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　　　　48 v, preamp level

Input　　　　　Trim, phase, A/B switch

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 de-selected 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 overrule the state in Plugins 1-8, If, for example, EQ is set Off it will be indeed be off (out of scope) even if Plugins 1-8 are set On (in scope), and vise versa.

Scope of Changes: Session vs. Scene

Sessions define the "architecture" of a setup: I/O configuration, racks, and patches, as well as 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 that is in Recall Safe mode is exempt from changes. Recall Safe is set for an entire session, not by scene. So once Recall Safe is set for the parameters and channels of a session, scene recalls will not affect their settings. The Recall Safe panel is identical to the Scope section in the Scene page. Selections are organized by channel functions and plugins, input channels, groups and controls. Audio channels and busses can be made 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 de-selects all parameters and channels.
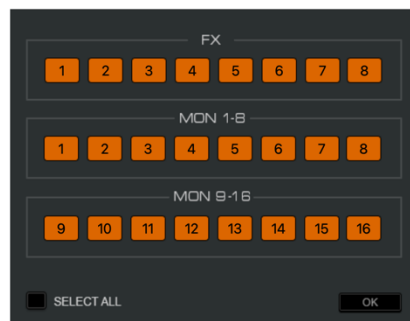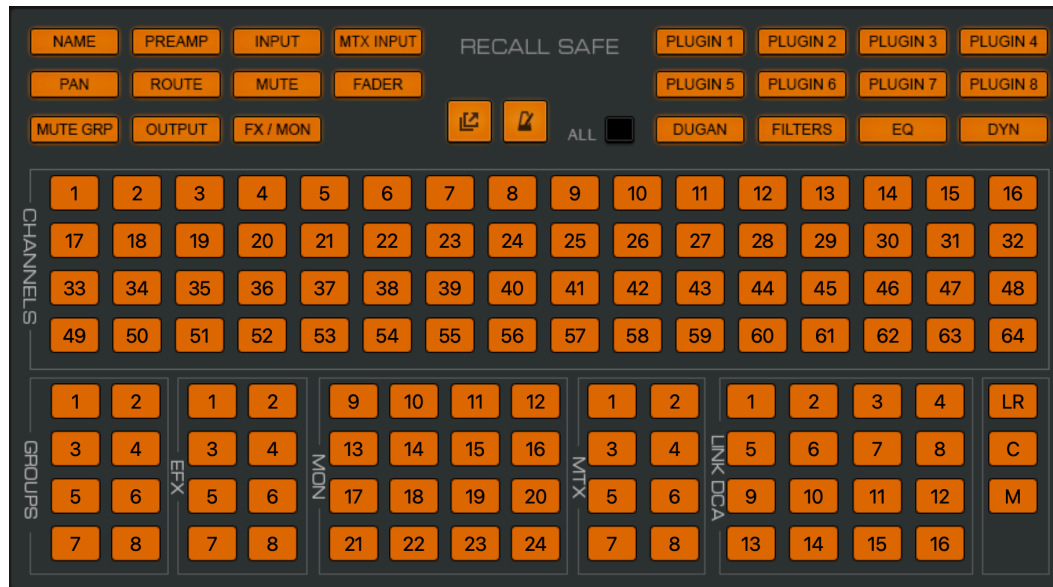
Click the FX/MON selector button to open an extended Recall Safe panel. This enables you to select specific FX/MON sends for recall safe.

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 at times this may be more convenient. 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 with a scene change, 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
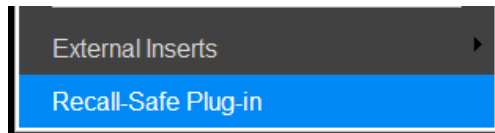
The Recall Safe page determines if specific plugin rack positions on specified channels will change with scene changes.

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 the specified plugin. The menu item indicates whether or not the plugin is recall-safe.

There is also a small indicator on the plugin icon that says "Safe."

Other plugins in the rack are unaffected and can be set individually to Recall Safe.

Chapter 6:
eMotion LV1 SIGNAL FLOW DIAGRAMS

Block Diagram
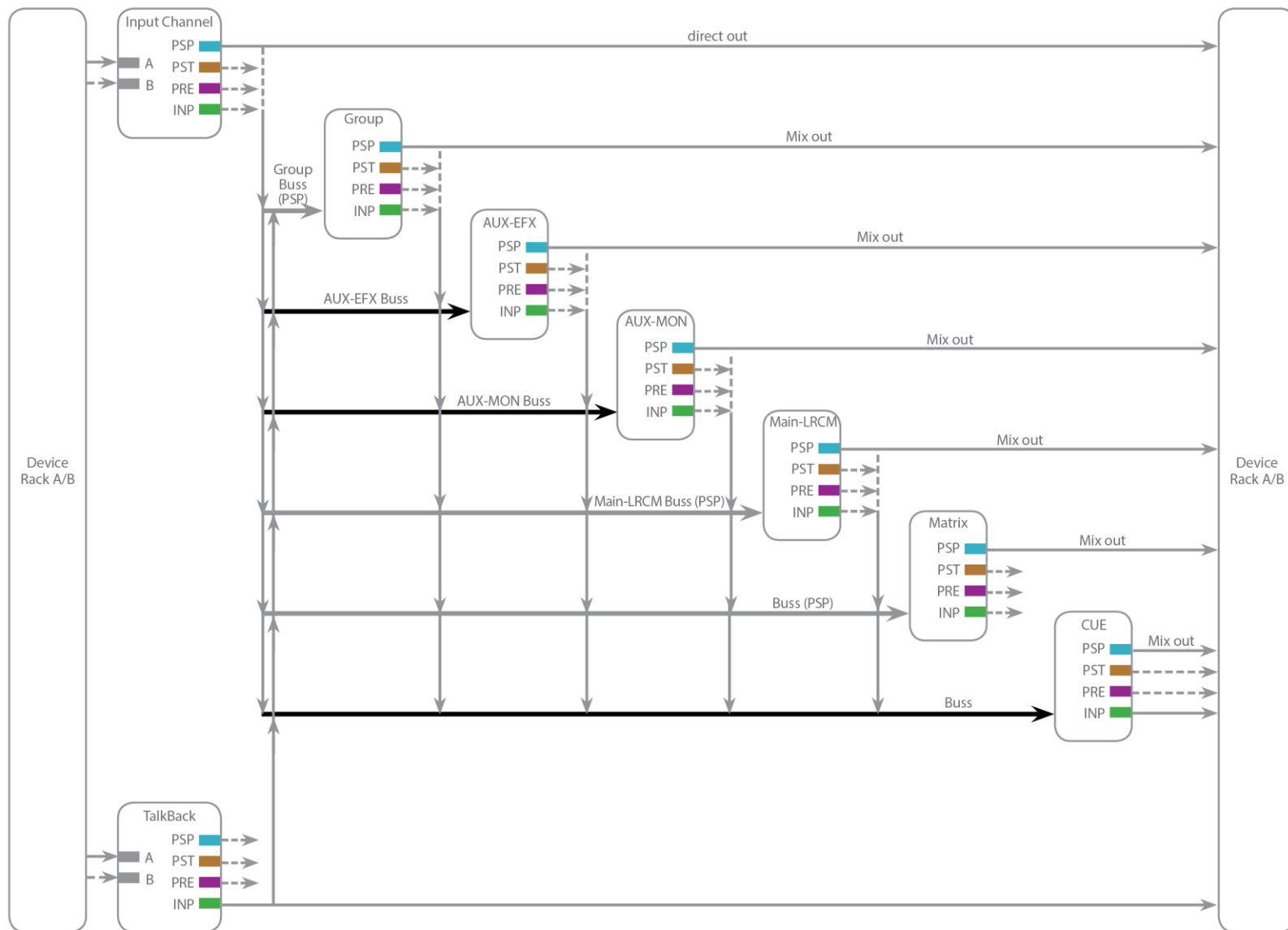
Input Channel Signal Flow
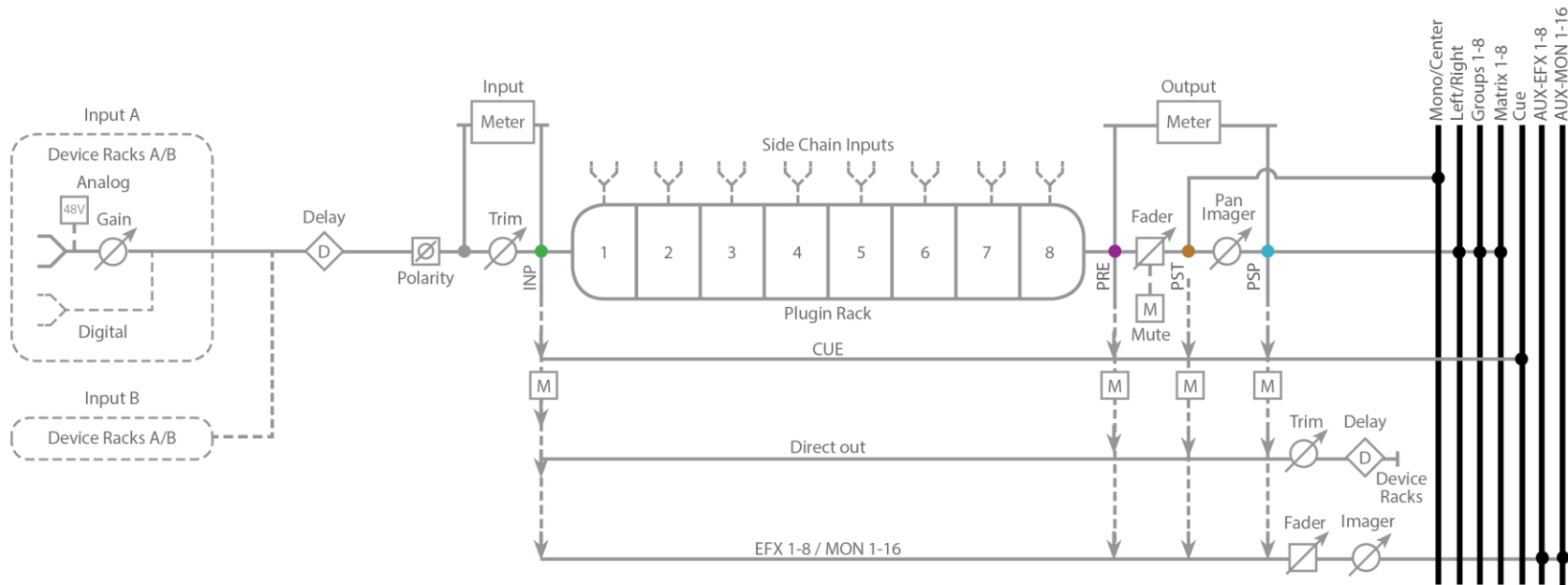
Group buss master/return Signal Flow
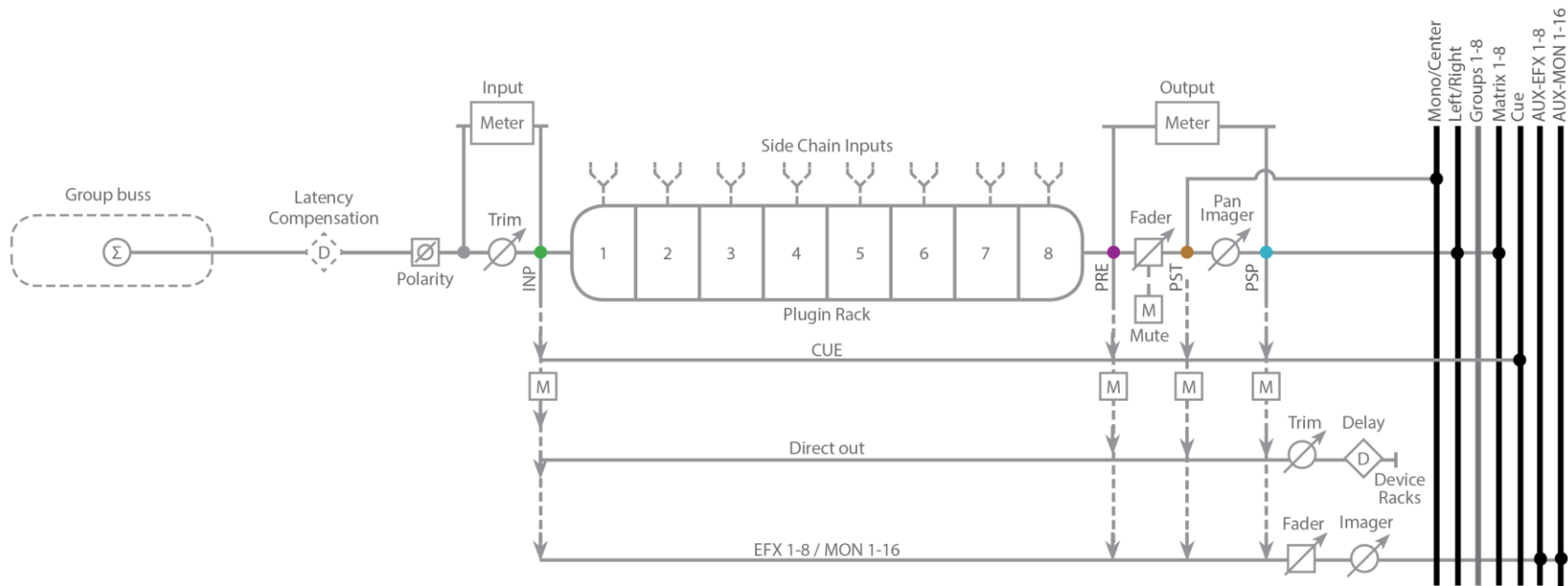
Auxiliary - EFX buss master/return Signal Flow
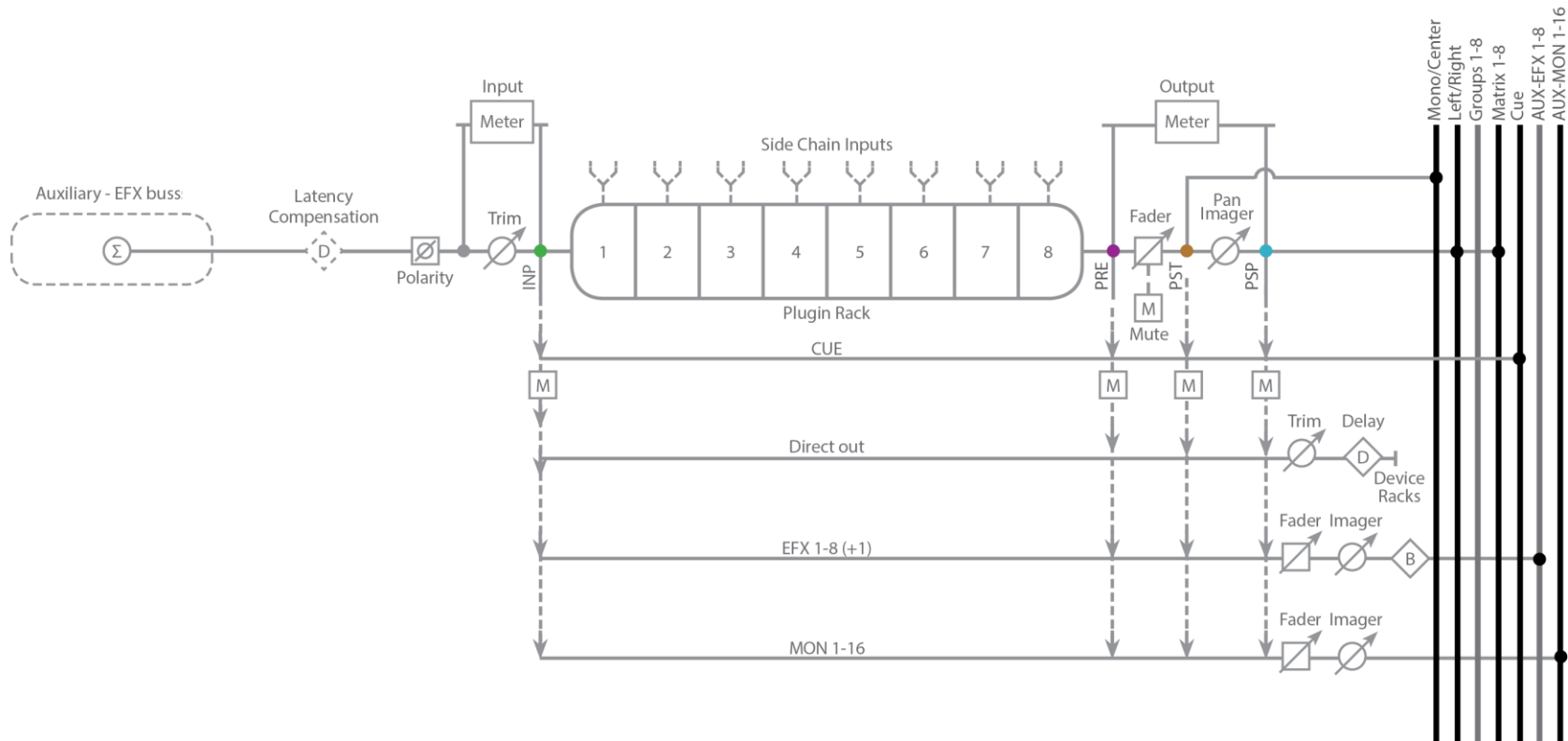
Auxiliary - MON buss master/return Signal Flow
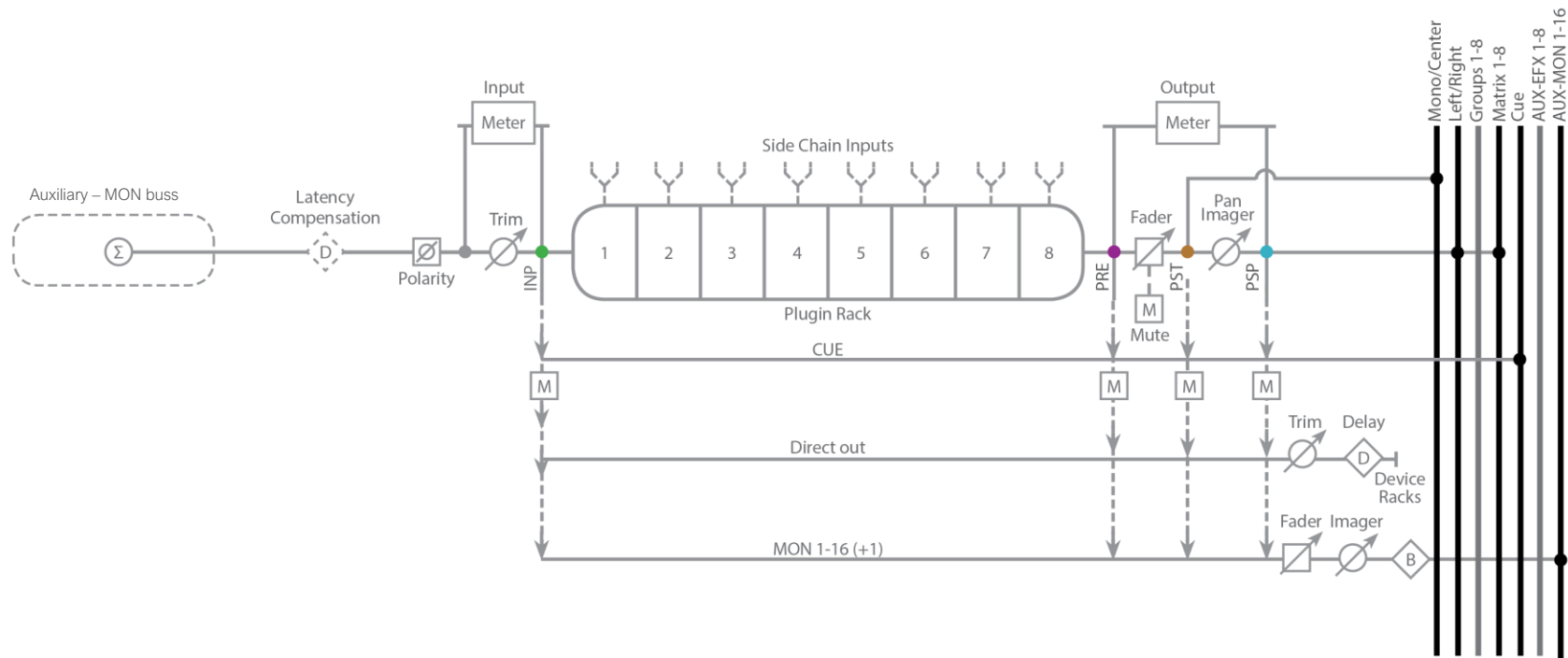
Main - Left/Right busss master/return Signal Flow

Main - Center/Mono busss master/return Signal Flow

Input Meter

Side Chain Inputs

Output Meter

Mono/Center
Left/Right
Groups 1-8
Matrix 1-8
Cue
AUX-EFX 1-8
AUX-MON 1-16

Main - Center/Mono buss

Latency Compensation

Trim

Polarity

INP

Plugin Rack

1 2 3 4 5 6 7 8

PRE

Fader

Pan Imager

PST

PSP

Mute

M

CUE

M

M M M

Direct out

Trim Delay

Device Racks
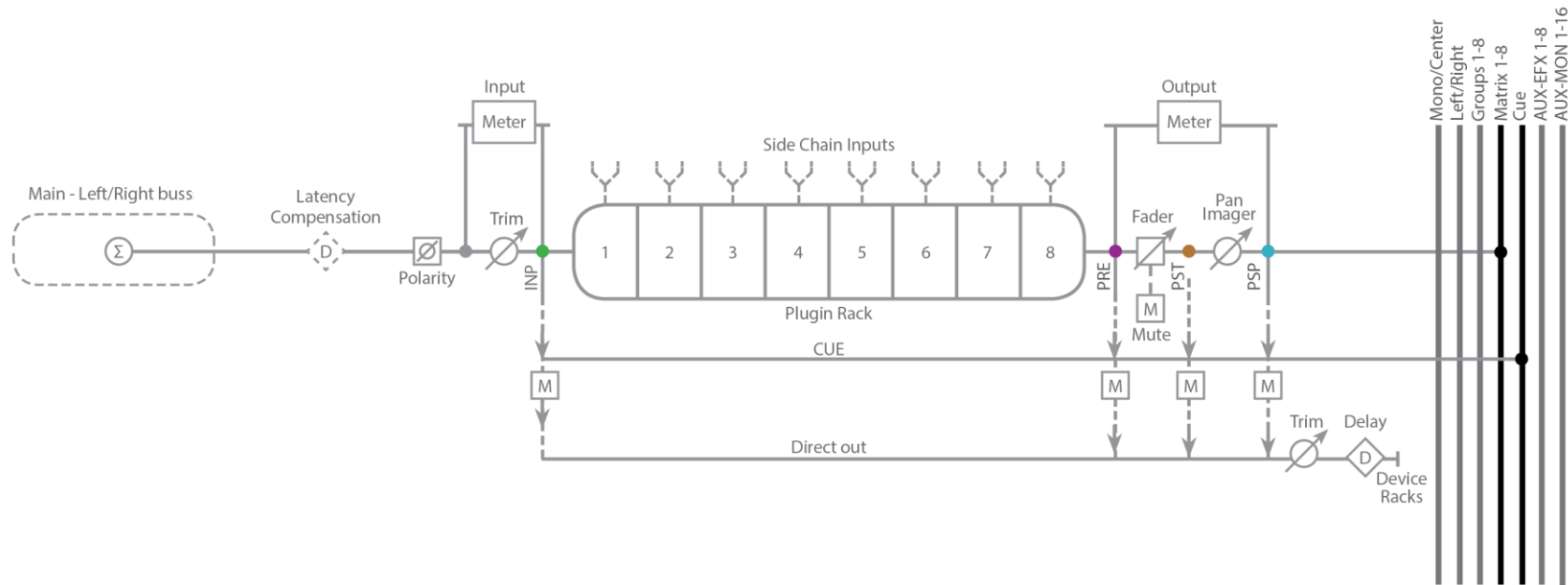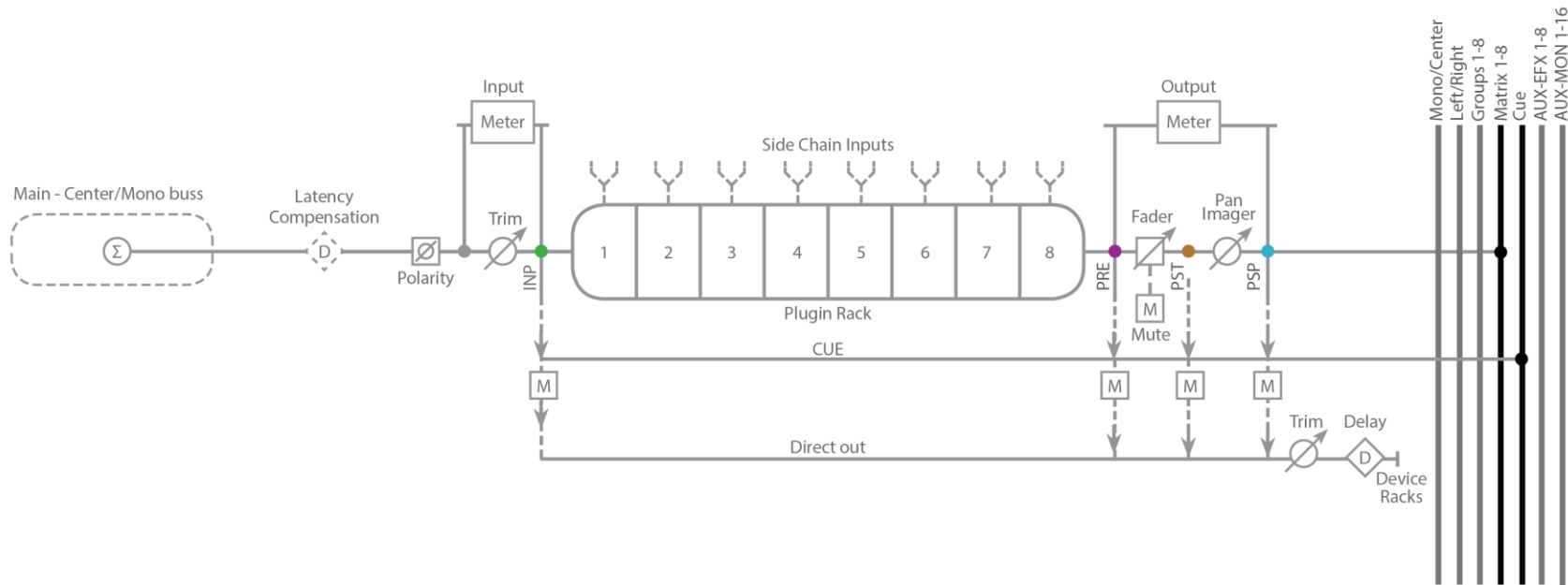
Matrix busss master/return Signal Flow
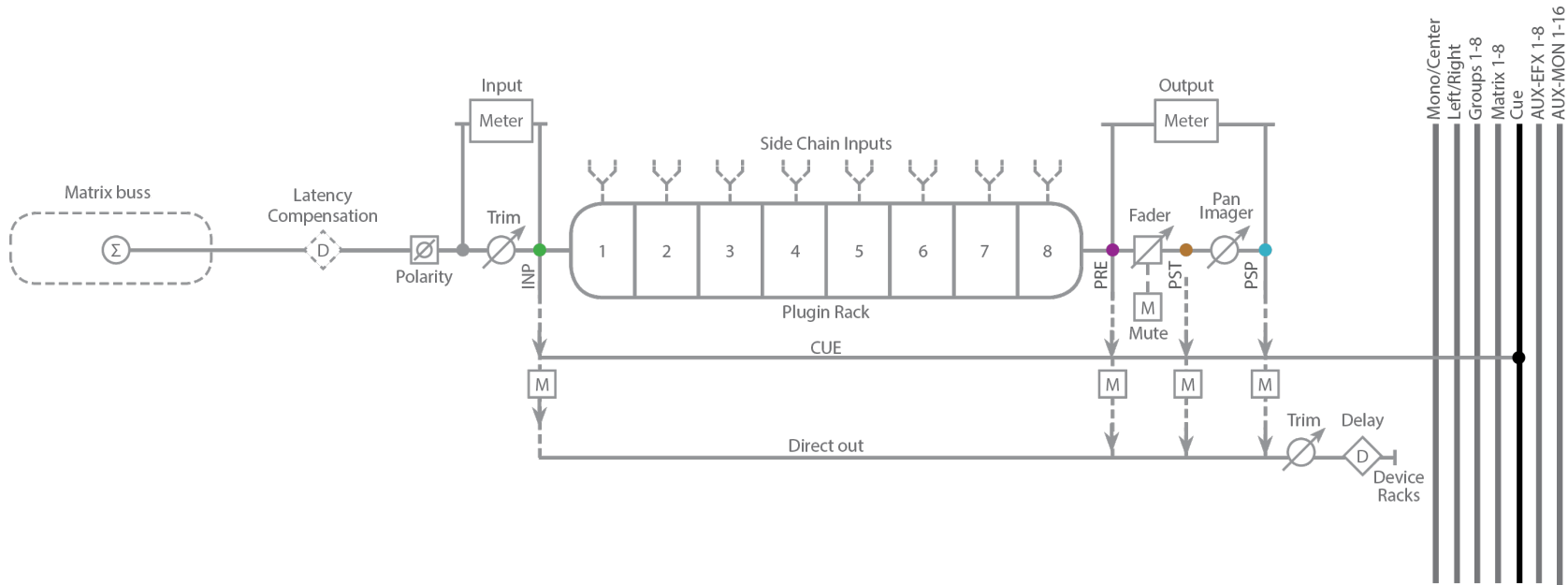
Cue busss master/return Signal Flow
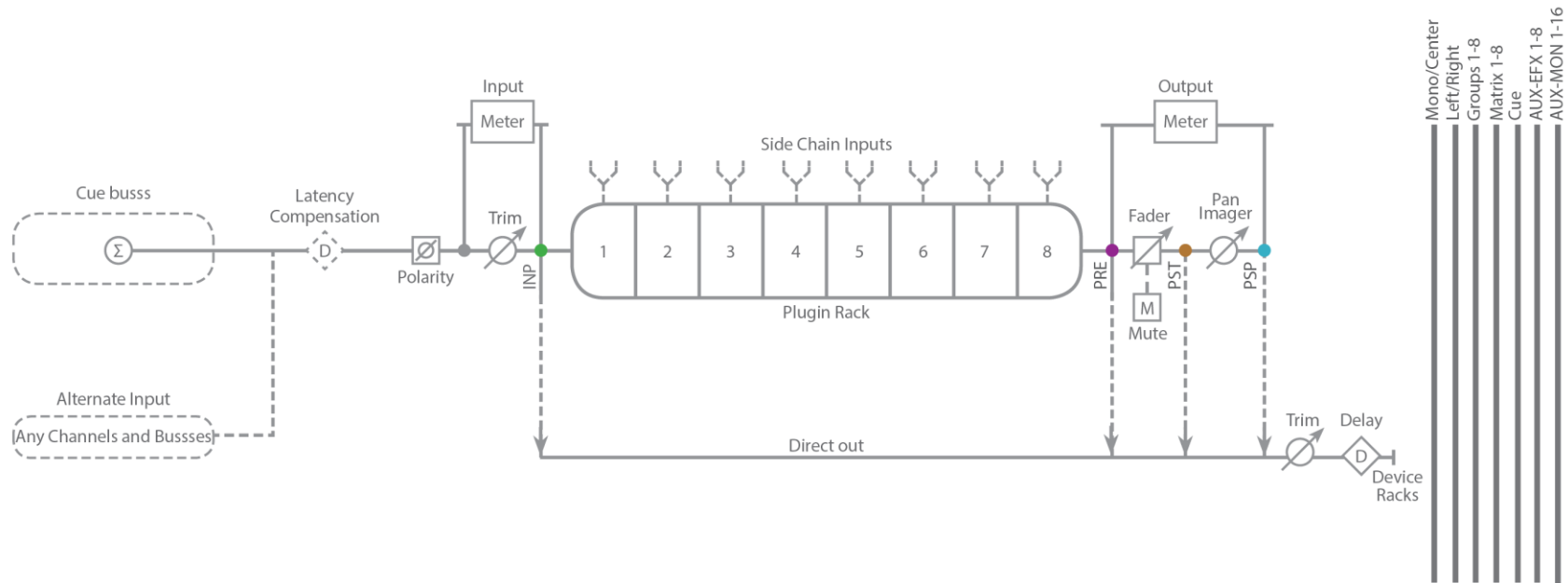
APPENDIX A: **eMOTION LV1 MIXER CONFIGURATIONS**

There are three eMotion LV1 configurations. Select mixer size on the Mixer Settings page of the Setup window (Setup > Mixer Settings> Mixer Configurations).

Changing the configuration depends on your license (64, 32, or 16 channels). A Mixer Layer with no tracks is unavailable (its Layer button is gray). Routing Menus do not display unavailable tracks. The mixer configuration is saved in an eMotion LV1 session file.

16 CHANNEL MIXER
16 mono/stereo input channels
8 Stereo AUX/EFX buss/returns
8-buss stereo matrix
L/R Main buss

32 CHANNEL MIXER
32 mono/stereo input channels 8
stereo group buss/returns
8 stereo AUX/EFX buss/returns
16 stereo AUX/MON buss/returns
8-buss stereo matrix
L/R/C/M Main buss

64 CHANNEL MIXER
64 mono/stereo input channels 8
stereo group buss/returns
8 stereo AUX/EFX buss/returns
16 stereo AUX/MON buss/returns
8-buss stereo matrix
L/R/C/M Main buss

All configurations include Cue, Talkback, 16 Link/DCAs, and 8 Mute Groups.

When loading a session that was created on a large mixer configuration to a system with a smaller configuration, the higher channels from the original session become unavailable. All mixer data associated with these unavailable channels will be lost. This action cannot be undone. If this "smaller" session is saved and reloaded on a larger system, the missing channel information will not be recovered.

Before opening a sessions smaller mixer system, it is advisable to make a copy of the session in its original configuration so that it can be reopened on the larger system.

APPENDIX B: **USING MULTIPLE DISPLAYS**

eMotion LV1 is a software mixer, so it can be configured to suit many ways of working, and it can quickly adapt to various venues and conditions. You can change the size of a mixer itself by adding I/Os or changing the configuration. You can also change the visual layout of the mixer to suit your way of working. Create additional display views by "tearing off" tabs from the original screen display.

Original view: All tabs are available.

To create a secondary view, click/drag its tab downward, away from the Top Bar. A new floating window will appear on the new screen. Position it as needed.
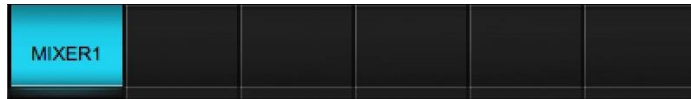
This new display will show the selected window only.

The main display can access any window except the secondary view. Repeat the procedure for additional displays. Close the floating window to return it to the main Top Bar.

The current tabbed windows layout is stored in the eMotion LV1 preferences.

Display Specifications

- Supported screen resolution: 720p to 4k. Windows can be re-scaled to accommodate displays with different resolutions, or the window can remain the same size on all displays. Auto scaling is enabled by default.
- Recommended resolution with scaling disabled: 1280x768 / 1360x768.
- Multi-Touch 10 points and up.
- eMotion Lv1 supports up to four displays. We recommend that all displays use a single graphics card/driver with multiple outlets.

Single Display

You can use the mixer with a single display, such as an all-in-one or tablet. This is useful for small projects or where there is little space. It also provides for very quick setup.

Since display space is limited when using one monitor, there is a mixer view—the Channel layer mode—that enables you to observe and control most aspects of a channel without leaving the mixer surface. The Channel layer mode combines the view of all other mixer sections.

You can use user-assignable keys to help navigate to essential locations throughout the mixer.

Refer to *Mixer window > Dynamics/EQ Mode* for details.

Two Displays: One for the Mixer Window, One for Other Windows

This a classic two-display view. One display provides uninterrupted access to a Mixer window. The other display is used for all other views. It closely resembles a hardware digital mixing console, where a multi-level channel controller (eMotion LV1 Mixer window) is accompanied by a display for focused channel control (Channel window). Logically, the bottom display is dedicated to the mixer. All mixer layers and modes are accessed from this screen. The top display usually shows the Channel window, since that's where most channel controlling takes place. Almost every mixer functions can be controlled from these two windows—internal and external routing, managing sessions and scenes, setting plugin parameters, accessing layers and modes, and of course using faders and panners.

Three Displays: Mixer, Show, and Patch/Setup/Channel Windows

Adding a third, perhaps smaller, display provides constant access to the Show window. This configuration is ideal for live events with a large number of scene changes.

Two Displays: One Continuous Mixing Desk

Two monitors are placed side by side to create a 32-channel mixer interface. The primary display (right side in this example) can be switched between other Mixer window layers as well the Control, Setup, and Patch windows. The secondary monitor (left) is fixed to one of the Mixer windows. It offers complete control of its mixer view. Plugins selected here will open in the main display, leaving the Mixer window undisturbed.

Three Displays: One Continuous Mixing Desk and a Large Control Section

For quick access to two Mixer windows and a dedicated surface for the Patch, Show, Setup, and Channel windows, add a third large monitor. The two front displays are dedicated to Mixer windows 1 and 2, and they have complete control over all Mixer window controls.

The two mixer windows have inputs that and be identical or completely different, so one window can be the extension of the other, or it can show entirely different channels.

With so many faders visible, you may want to de-select "Channel Select Follows Fader" (*Setup > U/I Settings > Mixer Window*). This way, you can move a fader without selecting the channel. The selected channel remains focused in the main display.

Single Large Display, Tiled Mixer Windows

You can tile windows on one screen to access several views. This allows you to focus one view while keeping the others handy. This single-display configuration is appropriate for large multi-touch monitors.

Four displays: One Continuous Mixing Desk, Two Control Monitors

Four displays provide a dedicated 32-channel mixing surface, and let you dedicate a display to the important Channel window. The fourth display can toggle between Setup, Patch, and Show. The two front displays are dedicated to Mixer windows 1 and 2, and they have complete control over all Mixer window controls.

APPENDIX C: **INCORPORATING MIDI**

MIDI devices can be assigned to the mixer for remote control of certain functions. Program change messages can be sent from a MIDI controller to the mixer or from the mixer to a MIDI controller. Also, mixer faders, panners, and mutes can be remote-controlled.

Control protocols are assigned and removed in the Control rack of the System Inventory page. Select the MIDI protocol from the drop-down menu.

Click on the Gear button to open the MIDI Control Surface Options panel.
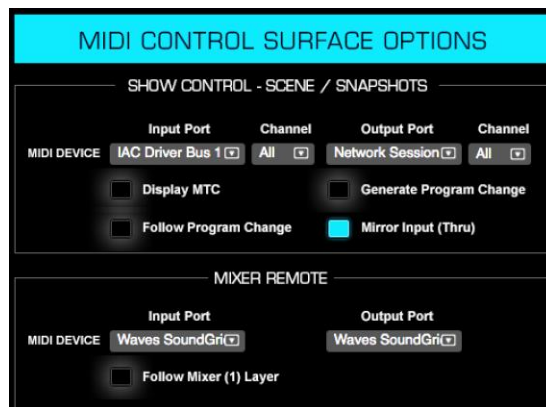
Show Control Section

This section sets the MIDI port and channel used for triggering Scenes using MIDI program change messages.
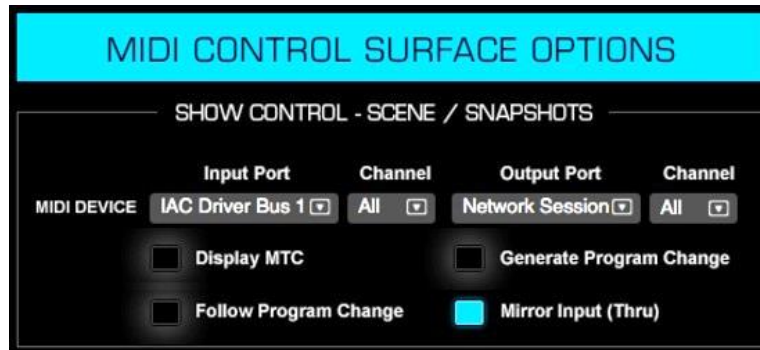
Select a MIDI Device: Select an Input and Output port from the drop-down menu. All available MIDI ports are listed. The selected device appears in the Port Name box.

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 data 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 in 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 host computer.

Mirror Input (Thru): When Mirror Input is selected, the input stream is sent directly, unchanged, to the selected output port.

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 per fader.

Input Port/Output Port: Select MIDI Ports - selection can be set 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/EFX is selected, MIDI Channel 1 will control AUX/MON 1.

When Follow Mixer Window is off, the mixer and the controller work independent of each other.

Using a SoundGrid I/O device as a MIDI port: A SoundGrid I/O device that has a MIDI port can be assigned to the SoundGrid MIDI driver. This device can then be used as a MIDI port for the mixer, as well as an I/O.

APPENDIX D: **MACKIE CONTROL PROTOCOL**

The mixer can be controlled with any control surface device using a Mackie Control® protocol option. Some controllers support several protocols, so it's important to confirm that the device is set to the Mackie Protocol Mode. There are also tablet applications that emulate controllers using Mackie Control protocol. Consult the user guide of your control surface.

Control protocols are assigned and removed in the Control rack of the System Inventory page. Select the Mackie protocol from the drop-down menu. Click on the Gear button to open the Mackie Control Surface Options panel.
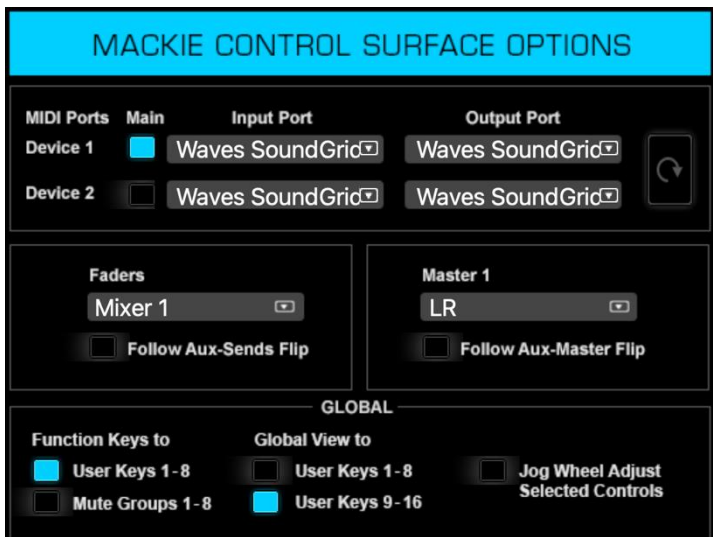
The eMotion LV1 / Mackie protocol provides for two control devices. For each, select an input and output port. The selected device appears in the MIDI devices/port window.

A single MIDI port will map eight faders at a time; using two ports will allow for 16 faders at a time.

LINKING LAYERS AND FADERS

Both the Mixer window and the controller can be used to select between layers. The "Faders" drop-down menu establishes the relationship between the controller and the Mixer window when selecting layers. In some circumstances you will want layer selections made in one interface to be reflected in the other. Doing this moves the active layer to the front in both interfaces, and fader moves in one device are reflected in the other. This is akin to a "Mirror Displays" mode of a computer monitor. At other times it's useful for an external controller and the mixer interface to function independently.
There are three control surface modes that set the rules of layer selection.

Standalone
Here there is no correlation between the layer selected by the controller and the layer selected in the Mixer window. Both can access all layers and control faders, but one's actions are independent of the other. Only if both interfaces are addressing the same layer will they display and affect each other's fader moves. Otherwise it's like sitting at two positions of large mixing desk. Selecting a channel from any surface, whether screen or hardware, will cause the main "selected channel" to be displayed on the channel window.

Follow Software Mixer 1 Window
In this mode layers can be toggled for both hardware and Mixer window from either the Mixer window layer control or the hardware bank controls. This layer is visible in the mixer window and its channel names are displayed on the hardware channel strips. As long as Mixer 1 is the selected mixer, the window and the control surface govern the same layers and faders.
In this mode the relationship between Mixer 2 and the control surface is akin to the Stand-Alone mode. Mixer 2 layer choices are not reflected in the controller, so layer choices must be made locally. This allows you to access various layers from the control surface without changing the Mixer's layer view.

Follow Software Mixer 2 Window
This mode is identical to "Follow Software Mixer 1 Window," expect that the roles of Mixer 1 and Mixer 2 are reversed.

The "Follow Software Mixer 1 or 2 Window" modes are well suited for multi-display configurations. Display One may display the primary mixer, where faders/channels decisions are linked between mixer and controller. Display Two can be switched between an unlinked Mixer window and other mixer views.

Note that when using one device (8 faders), the Bank control will first toggle from the lower 8 channels to the higher 8 channels in the 16-channel layer. The next toggle opens a new layer.

FADERS: FOLLOW AUX-SENDS FLIP

In the "Sends on Faders" mixer mode, the channel faders control the level of the aux send, not the channel itself. Select "Follow Aux- Sends Flip" to enable controller faders to follow this behavior. Refer to Mixer > Aux Modes > Sends on Faders for more about using large faders to control aux sends.

MASTER 1

Use this drop-down window to assign which channel the master fader is controlling. This can be the Main L/R mix or any other channel or buss in the mixer.

Master 1: Follow Aux-Master Flip

When in the "Sends on Faders" mode, the master fader controls the aux channel. This setting determines if the control surface master fader exhibits this behavior.

GLOBAL CONTROLS

Function Select 1–8 Mapping
Assigns the Mute Group 1–8 recall buttons or User Assignable keys 1–8 to the eight function buttons on the MC controller (these controls are not available in some controllers). Refer to Setup > U/I Settings for setting up user-assignable keys control functions.

Global View Controls (Function Select 9–16) Mapping
Assign User Assignable Keys 1–8 or User Assignable Keys 9–16 to the "Global View" buttons on the MC controller (these controls are not available with some controllers, or are labeled function 9–16 in others). Refer to Setup > U/I Settings for setting up user-assignable keys control functions. MC commands for these functions can be found in the table on page 229.

Jog Wheel Selected Controls
Assigns any continuous control to the controller's Jog Wheel. Selected mixer buttons are assigned to the Scrub button next to the Jog Wheel. A Mackie Control tablet application can be configured to work with eMotion LV1 over WiFi or USB. Refer to the application's user guide to create a MIDI device that will be available in the MIDI device menu. Select this device as you would with any hardware controller.

eMotion LV1 – Mackie Control Implementation

Switch ID	Function	LV1 mapping
0x8-0x0F	Solo	Channel strip Solo
0x10-0x17	Mute	Channel strip Mute
0x18-0x1F	Select	Channel strip Select
0x28	Track (Vpot Assign1)	Preamp and Trims per Channel Strip
0x29	Send (Vpot Assign2)	Aux sends per Channel Strip
0x2a	Pan (Vpot Assign3)	Channel Name and Pan/Imager per Channel Strip
0x2b	Plugins (Vpot Assign4)	Selected Channel's Plugin Rack - select a plugin, and map a plugin
0x2c	EQ (Vpot Assign5)	Selected Channel's Assigned EQ / FLT Controls
0x2d	Inst / Dynamics (Vpot Assign6)	Selected Channel's Assigned DYN Controls
0x2e	Bank Left	Previous Layer
0x2f	Bank Right	Next Layer
0x30	Channel Left	Vpot Mapping Page Previous
0x31	Channel Right	Vpot Mapping Page Next
0x32	Flip	Flips the Faders with Knobs - for any Vpot function
0x33	Global View	Open Channel view
0x36-0x3d	Function 1-8	Mute Groups 1-8, User Assignable keys 1-8
0x3e-0x45	Function 9-16 (Global View)	User Assigned Keys 1-8, User Assignable keys 9-16
0x50	Save	Save Session
0x51	Undo	Undo Scene actions
0x54	Marker	Open Scene Menu
0x59	Click	Tap Tempo
0x5a	Solo	Clear Solo/Cue

Switch ID	Function	LV1 mapping
0x60	Arrow up	Navigate (Scene) Menu
0x61	Arrow down	Navigate (Scene) Menu
0x62	Arrow left	Navigate (Scene) Menu
0x63	Arrow Right	Navigate (Scene) Menu
0x64	Zoom	Navigate (Scene) Menu - Enter - select item
0x65	Scrub	Selected control Toggle
0xb0, 0x3c, 0xRR	Jog Wheel	Mapped to touch and slide control, any selected control can be adjusted by the jog.

Assignment	Notes	Page	Vpot Knob 1	Vpot Press 1	Vpot Knob 2	Vpot Press 2	Vpot Knob 3	Vpot Press 3	Vpot Knob 4	Vpot Press 4	Vpot Knob 5	Vpot Press 5	Vpot Knob 6	Vpot Press 6	Vpot Knob 7	Vpot Press 7	Vpot Knob 8	Vpot Press 8
EQ (0x2c) Selected channel	EQ	1	Band 1 - Freq	Band 1 - Type	Band 1- Gain	Band 1 - On/Off	Band 2 - Freq	Band 2 - Type	Band 2- Gain	Band 2 - On/Off	Band 3 - Freq	Band 3 - Type	Band 3- Gain	Band 3 - On/Off	Band 4 - Freq	Band 4 - Type	Band 4- Gain	Band 4 - On/Off
		2	Band 1 - Q	Band 1 - Type	Band 1- Gain	Band 1 - On/Off	Band 2 - Q	Band 2 - Type	Band 2- Gain	Band 2 - On/Off	Band 3 - Q	Band 3 - Type	Band 3- Gain	Band 3 - On/Off	Band 4 - Q	Band 4 - Type	Band 4- Gain	Band 4 - On/Off
	FLT	3	EQ Control L / R parameters	EQ Link L+R			HP Freq	HP On/Off	LP Freq	LP On/Off		Link L/R (R)	HP Freq (R)	HP On/Off (R)	LP Freq (R)	LP On/Off (R)		
Inst / Dynamics (0x2d) Selected channel	Gate page	1	Threshold	Gate / Exp	Floor		Key Type	Key Listen	on/off	on/off							Makeup Gain	
	Comp page	2	Threshold	Knee	Ratio		Key Type	Key Listen	on/off	on/off							Makeup Gain	
	Leveler page	3	Threshold						on/off	on/off							Makeup Gain	
	DeEsser page	4	Threshold	Type	Freq			Key Listen	on/off	on/off							Makeup Gain	
	Limiter page	5	Threshold						on/off	on/off							Makeup Gain	
Plugins (0x2b) Selected channel	Plugin select	1	Toggles Rack Inserts 1-8 Selection	open plugin GUI and map to Vpot		Selected Insert on/off (bypass)												
	Selected Plugin	1	Per plugin mapping	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
Track (0x28) Per fader		1	Preamp Gain	Phantom 48v	Preamp Gain	Phantom 48v	Preamp Gain	Phantom 48v	Preamp Gain	Phantom 48v	Preamp Gain	Phantom 48v	Preamp Gain	Phantom 48v	Preamp Gain	Phantom 48v	Preamp Gain	Phantom 48v
		2	Preamp Gain - R	Phantom 48v - R	Preamp Gain - R	Phantom 48v - R	Preamp Gain - R	Phantom 48v - R	Preamp Gain - R	Phantom 48v - R	Preamp Gain - R	Phantom 48v - R	Preamp Gain - R	Phantom 48v - R	Preamp Gain - R	Phantom 48v - R	Preamp Gain - R	Phantom 48v - R
		3	Trim	Polarity	Trim	Polarity	Trim	Polarity	Trim	Polarity	Trim	Polarity	Trim	Polarity	Trim	Polarity	Trim	Polarity
		4	Trim - R	Polarity - R	Trim - R	Polarity - R	Trim - R	Polarity - R	Trim - R	Polarity - R	Trim - R	Polarity - R	Trim - R	Polarity - R	Trim - R	Polarity - R	Trim - R	Polarity - R

Waves eMotion LV1 User Guide | **Appendix D: Mackie Control**

| Assignment	Notes	Page	Vpot Knob 1	Vpot Press 1	Vpot Knob 2	Vpot Press 2	Vpot Knob 3	Vpot Press 3	Vpot Knob 4	Vpot Press 4	Vpot Knob 5	Vpot Press 5	Vpot Knob 6	Vpot Press 6	Vpot Knob 7	Vpot Press 7	Vpot Knob 8	Vpot Press 8
Pan (0x2a) Per Fader		1	Pan / Balance	"Channel Name"	Pan / Balance	"Channel Name"	Pan / Balance	"Channel Name"	Pan / Balance	"Channel Name"	Pan / Balance	"Channel Name"	Pan / Balance	"Channel Name"	Pan / Balance	"Channel Name"	Pan / Balance	"Channel Name"
		2	Rotation	"Channel Name"	Rotation	"Channel Name"	Rotation	"Channel Name"	Rotation	"Channel Name"	Rotation	"Channel Name"	Rotation	"Channel Name"	Rotation	"Channel Name"	Rotation	"Channel Name"
		3	Width	"Channel Name"	Width	"Channel Name"	Width	"Channel Name"	Width	"Channel Name"	Width	"Channel Name"	Width	"Channel Name"	Width	"Channel Name"	Width	"Channel Name"
		4	Pan L	"Channel Name"	Pan L	"Channel Name"	Pan L	"Channel Name"	Pan L	"Channel Name"	Pan L	"Channel Name"	Pan L	"Channel Name"	Pan L	"Channel Name"	Pan L	"Channel Name"
		5	Pan R	"Channel Name"	Pan R	"Channel Name"	Pan R	"Channel Name"	Pan R	"Channel Name"	Pan R	"Channel Name"	Pan R	"Channel Name"	Pan R	"Channel Name"	Pan R	"Channel Name"
Sends (0x29)		1	Aux 1 Send	Aux 1 On/off	Aux 1 Send	Aux 1 On/off	Aux 1 Send	Aux 1 On/off	Aux 1 Send	Aux 1 On/off	Aux 1 Send	Aux 1 On/off	Aux 1 Send	Aux 1 On/off	Aux 1 Send	Aux 1 On/off	Aux 1 Send	Aux 1 On/off
		2	Aux 1 Pan	Aux 1 Sources	Aux 1 Pan	Aux 1 Sources	Aux 1 Pan	Aux 1 Sources	Aux 1 Pan	Aux 1 Sources	Aux 1 Pan	Aux 1 Sources	Aux 1 Pan	Aux 1 Sources	Aux 1 Pan	Aux 1 Sources	Aux 1 Pan	Aux 1 Sources
		3	Aux 2 Send	Aux 2 On/Off	Aux 2 Send	Aux 2 On/Off	Aux 2 Send	Aux 2 On/Off	Aux 2 Send	Aux 2 On/Off	Aux 2 Send	Aux 2 On/Off	Aux 2 Send	Aux 2 On/Off	Aux 2 Send	Aux 2 On/Off	Aux 2 Send	Aux 2 On/Off
		4	Aux 2 Pan	Aux 2 Sources	Aux 2 Pan	Aux 2 Sources	Aux 2 Pan	Aux 2 Sources	Aux 2 Pan	Aux 2 Sources	Aux 2 Pan	Aux 2 Sources	Aux 2 Pan	Aux 2 Sources	Aux 2 Pan	Aux 2 Sources	Aux 2 Pan	Aux 2 Sources
		5	Aux 3 Send	Aux 3 On/Off	Aux 3 Send	Aux 3 On/Off	Aux 3 Send	Aux 3 On/Off	Aux 3 Send	Aux 3 On/Off	Aux 3 Send	Aux 3 On/Off	Aux 3 Send	Aux 3 On/Off	Aux 3 Send	Aux 3 On/Off	Aux 3 Send	Aux 3 On/Off
		6	Aux 3 Pan	Aux 3 Source	Aux 3 Pan	Aux 3 Source	Aux 3 Pan	Aux 3 Source	Aux 3 Pan	Aux 3 Source	Aux 3 Pan	Aux 3 Source	Aux 3 Pan	Aux 3 Source	Aux 3 Pan	Aux 3 Source	Aux 3 Pan	Aux 3 Source
		Etc.	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
		31	Aux 16 Send	Aux 16 On/Off	Aux 16 Send	Aux 16 On/Off	Aux 16 Send	Aux 16 On/Off	Aux 16 Send	Aux 16 On/Off	Aux 16 Send	Aux 16 On/Off	Aux 16 Send	Aux 16 On/Off	Aux 16 Send	Aux 16 On/Off	Aux 16 Send	Aux 16 On/Off
		32	Aux 16 Pan	Aux 16 Source	Aux 16 Pan	Aux 16 Source	Aux 16 Pan	Aux 16 Source	Aux 16 Pan	Aux 16 Source	Aux 16 Pan	Aux 16 Source	Aux 16 Pan	Aux 16 Source	Aux 16 Pan	Aux 16 Source	Aux 16 Pan	Aux 16 Source

APPENDIX E: **USING THE MIDIPLUS FIT CONTROLLER**

The FIT controller is a fully integrated fader bank for the eMotion LVl. It features 16 touch-sensitive motorized channel faders and a touch-sensitive motorized master fader. Each fader has a clickable rotary encoder. One or two FIT controllers can be mapped to LV1.

Hardware Setup

Connect the host computer and the FIT controller(s) with a USB cable. Start LV1 and then the FIT controllers. The controllers will launch in the LV1 mode.

Software Configuration
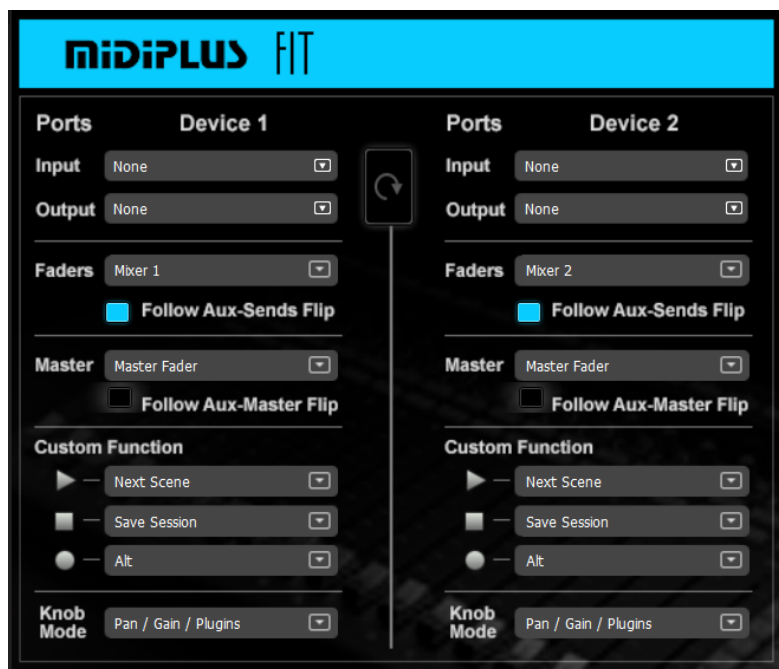
Ports: Choose input and output MIDI ports from the drop-down menus.

Faders: Select which LV1 mixer window will be controlled by the MIDIPLUS FIT device. This can be LV1 Mixer 1 or 2. The controller can also work in a standalone mode. If you are using a second FIT controller, you can select "Follow Device 1." The second device will then serve as an extension of the first device. This expands control to the next LV1 layer, providing a total of 32 consecutive faders.

Follow Aux-Sends Flip: In the eMotion LV1 "Sends on Faders" mixer mode, the channel faders control the level of the aux send, not the channel itself. Select Follow Aux-Sends Flip to enable controller faders to follow this behavior.

Refer to Mixer > Aux Modes > Sends on Faders for more about using large faders to control aux sends.

Master: Determines the FIT master fader mapping, either following the LV1 master fader or mapping to a specific channel. It can also follow the Aux flip master when aux is flipped.

The three **Custom Function** drop-down menus map actions to the controller's Record, Stop, and Play buttons. By default, these three buttons are assigned to Next Scene, Save Session, and Alt. Use the drop-down menus to assign other functions to the buttons.

KNOB MODE
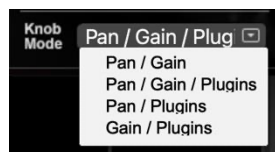
The Knob Mode menu sets the mapping of the FIT rotary encoder knobs to either pan, gain, or plugin control. It also sets the sequence of toggling between mapping modes.

MAPPING

Pan (no color) By default, the knobs are mapped to channel pan.

Input Channel Gain (turquoise) When the knobs are set to control the gain, they automap the channel input's preamp-Gain or local-VGain (depending on the current setting). If there is no preamp, the knobs will control the channel trim.

Plugin Edit (orange) When knobs are set to Plugin 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).

Two lines in the top display indicate continuous and toggle parameters. Some plugins have several control pages; the navigation controls can be used to toggle between the pages.
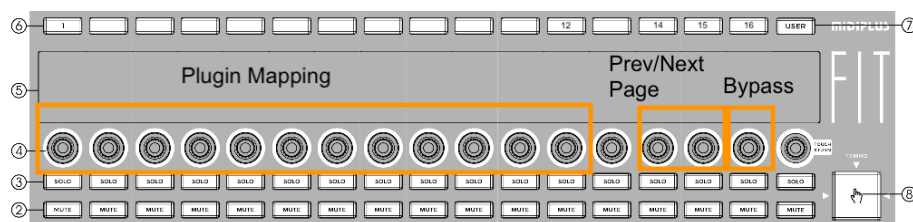
Controlling User-Assigned Keys and Mute Groups

Press the FIT "USER" toggle, to access the 16 user-assigned keys. The FIT top row of select buttons 1-16 will now map the user keys. The display below them indicates their corresponding assignments labels.

Mute groups are activated through user-assigned keys. If a user key is assigned to control a mute group, then pressing the corresponding user key button will engage the mute group. The button will glow red and the member channels of the group will flash red.

FIT HARDWARE CONTROLS

Channel Strip   Master Section

1	Channel faders	Touch-sensitive motorized faders
2	Mute	Mutes the corresponding channel's output signal.
3	Solo	Activates CUE or SOLO, depending on LV1 Cue channel settings.
4	Rotary encoder	A rotary encoder controls the channel's preamp gain or pan. Click utility button #1 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.
5	Scribble strip (display changes with controller mode)	The Scribble Strip is a five-line display that provides feedback about channel status. Specific information changes depending on the controller mode. **Channel Select mode** • Function of the channel select button (mapping) • Channel name (Only English characters can be displayed.) • Channel input source • Channel type and ID • Function of the rotary encoder (preamp gain or pan) In **User** mode, the display identifies mute groups and user assignments. In **Flip** mode, Aux destination channels are identified on the top row.
6	Channel select (function changes with controller mode)	**Channel select mode** (default) Press to select a channel. Its button will turn white and the function of the button will be shown at the top of the scribble strip. An unselected channel's button is the same color as the corresponding channel in the LV1.
		User mode (User button on) The 16 buttons are mapped as mute groups (1–8) and user assignment keys (9–16).
		Flip mode (Flip button on) In Flip mode, the Select buttons and the first row of scribble strips are used to select the aux destination. Buttons 9–11: select destination layer (EFX 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.

|		
7	User button	Engages user-assigned keys mode. Toggle the switch for channel select.
8	Touch and Turn control	One LV1 or plugin control can be assigned to this knob. **Assign:** Click Touch & Turn knob, touch any LV1 or plugin control, click Touch & Turn to confirm. Assignment appears in the scribble strip. **Control**: Turn knob to adjust selected continuous control or switch. Press to increase encoder resolution. Touch and Turn mapping and values are shown on the Master section scribble strip.
9	Tempo pad	Tap repeatedly to set the tempo.
10	Layer select	Selects one of eight layers.
11	Utility section (eight buttons)	1. Toggle the rotary encoder on a channel to selectsbetween preamp gain and pan control. Knob mode is indicated by color: 2. Assignable button (set in control panel) 3. Assignable button (set in control panel) 4. Assignable button (set in control panel) 5. Stores current condition as new scene. 6. Custom layers mode. When Custom is selected, the eight numbered buttons are used to select a custom layer. There is no custom mapping in the Standalone faders mode. 7. Enables Flip mode, which uses the faders to adjust sends to EFX 1–8, MON 1–8, MON 9–16. Press once on the Flip button. The button will light and the buttons at the top of the channels will be used to select the Flip destination. Use the buttons to select destination aux layers and channels. Once and aux destination is selected, the Flip button blinks. Map to destination. Button 10—EFX 1-8. 11-MON 1-8. 12: MON 9-16 / 8. Enable Spill mode, which 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. Choose a DCA group on the LV1 display.

APPENDIX F: **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 each point where channels or busses are summed, they must be aligned with each other as a group. Those with the least delay are aligned with those with the greatest. Summing to a buss does not add delay but adding plugins on the buss may. 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. But 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 in 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.

Set Mixer Delay Behavior

When using the mixer to produce latency critical outputs, for a monitor mix, for example, it is advisable to use Delay Groups mode. This provides per-mix-buss output compensation, so that high latency busses will not affect low latency ones.
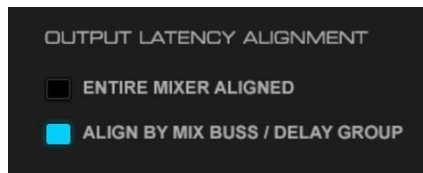
The Output Delay Behavior Box determines how delay compensation will be managed.

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/EFX 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 with higher latency, its latency remains 10 samples when it reaches the I/O. AUX/EFX 1 is routed to Main L/R.

- Three busses are sent to the Main L/R: AUX/EFX 1, Group 1, Input Channel 5. These busses must be delay compensated to equal 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, the other with 10. 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

Groups

Routing

Main-LR

Monitor Out

Main Out

100 1000 10

1050

10 10

10

1050

1050

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 ouputs 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 mixer is set to the 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 the 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
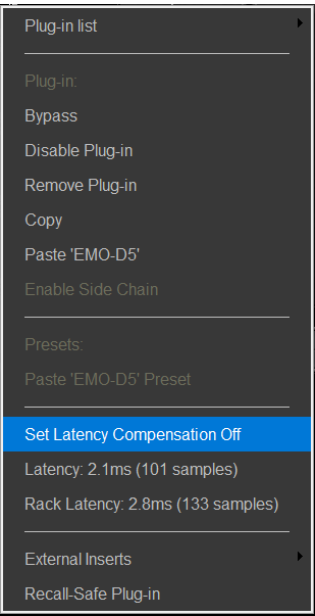
You can turn off delay compensation for specific plugins in a rack. This can be useful when one or more plugins in a rack have very high latencies and you don't want to delay the entire rack to compensate. When the source for plugin is not time critical (audience or ambience input for example), you can 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. This prevents a plugin with a particularly long delay from delaying the entire buss.

eMotion LV1 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 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 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 the plugin type.
Mixer	Rack	Ctrl+click on plugin icon	Disable plugin
Mixer	Rack	Ctrl+Alt+click on plugin	Bypass plugin
Mixer/Channel		Ctrl+move image rotator vertically	Changes with 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