StudioLive™ RM-Series Mixers with UC Surface Control

Touch-Software-Controlled, Rack-Mount Digital Mixers

Owner's Manual

PreSonus®

www.presonus.com

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1.0   Overview

1.1   Introduction

Thank you for purchasing the PreSonus® StudioLive™ RM-series Active Integration™ digital mixer. PreSonus Audio Electronics has designed the RM32AI and RM16AI utilizing high-grade components to ensure optimum performance that will last a lifetime.

The powerful, scalable, and compact, StudioLive RM32AI and RM16AI 32x16x3 rack-mount mixers combine the all new, battle-ready UC Surface touch-control software for Windows®, Mac®, and iOS®, with 32 or 16 remote, fully recallable XMAX™ Class A preamps; 32 internal channels; 25 buses; a 52x34 FireWire recording interface; 96 kHz operation; and extensive Fat Channel signal processing.

Based on the StudioLive AI-series engine, the StudioLive RM series' Active Integration™ technology provides direct Wi-Fi and Ethernet networking, along with a tightly integrated software suite that includes Capture™ recording software with virtual soundcheck and Studio One® Artist DAW software for Mac and Windows. You also get a Nimbit® Free account for online promotion and distribution. This combination provides a complete "riff to release" solution for live-sound mixing and studio recording.

(*See Section 8.1: Minimum System Requirements* for complete hardware and software compatibility information.)

We encourage you to contact us with questions or comments regarding this product. PreSonus Audio Electronics, Inc., is committed to constant product improvement, and we value your suggestions highly. We believe the best way to achieve our goal of constant product improvement is by listening to the real experts: our valued customers. We appreciate the support you've shown us through the purchase of this product.

For technical support, *please visit http://www.presonus.com/support*.

1.2   About This Manual

We suggest using this manual to familiarize yourself with the features, applications, and setup procedures for your mixer before trying to connect it to your computer or iOS device. This helps avoid problems during installation and setup. This manual covers hardware functions for StudioLive RM32AI and RM16AI mixers; when functional differences are called out, the RM32AI will be mentioned first, followed by the RM16AI.

Note: All illustrated examples use images of the StudioLive RM32AI.

This manual includes information for installing and using UC Surface; however, separate documentation is also available for the StudioLive Software Library.

Throughout this manual you'll find Power User Tips, providing mixing tricks, some of which are unique to the StudioLive RM32AI and RM16AI, as well as explanations of various audio terms. Additionally, to help you get the most from your mixer, you'll find an assortment of audio tutorials at the back of this manual that cover everything from microphone placement to equalizer and compression-setting suggestions.

1.3   Meet the StudioLive RM32AI and RM16AI

The RM32AI and RM16AI mixers offer the following hardware and software features:

- Fully recallable mixer
- 32/16 locking XLR inputs with recallable XMAX™ Class A mic preamps and +48V phantom power
- 16/8 XLR line outputs on the front, mirrored on rear-panel DB25 jacks
- 3 XLR main outputs (left, right, mono/center) with analog trim pots
- 32/16 LED meter grid
- 32 internal channels
- 25 mix buses
    - 16 aux mix buses
    - 3 main mix buses (left, right, mono/center)
    - 4 internal FX buses (2 reverb, 2 delay)
    - Stereo solo bus
- • Dual Fat Channel signal processing on all input channels and all buses, with 4-band parametric EQ, compressor, gate, limiter, and more
- • 52x34 direct digital FireWire recording interface
- • UC Surface™ battle-ready, live mixing and control software
    - Designed specifically for live sound mixing
    - Multiplatform support for Mac, Windows, and iPad (***See Section 8.1: Minimum System Requirements***.)
    - Windows 8 multi-touch-compatible for large touchscreen mixing
    - Contextual-based navigation for quick, intuitive access to all mixing functions
- Compatible with free QMix™-AI personal monitoring control app for iPhone®/iPod® touch
- Complete solution: Includes Capture™ live-recording software, Studio One® Artist DAW for Mac and Windows, and Nimbit® Free account for online music promotion and distribution.
- USB jack and included Wi-Fi LAN adapter provides wireless control
- 2 FireWire s800 ports, 1 Ethernet control port, and S/PDIF digital output
- Option card slot for future expansion (AVB, Dante, and Thunderbolt cards coming soon)

- Up to 96 kHz operation

- Front-panel Mute All button

- Stereo tape input (RCA jacks)

- Headphone output with volume knob and selectable source

- +48V Meters button to display phantom power assignment on the meter grid

- 1x1 MIDI interface (for future implementation)

- 4U/3U rack-mount

Note: *UC Surface, Capture, and Studio One Artist and for Windows and Mac are available via download once you've set up and/or logged into your My PreSonus account at https://my.presonus.com and registered your mixer.*

UC Surface for iPad and QMix-AI for iPhone/iPod touch, are available for download from the Apple App Store.

1.4   What's In the Box

Your StudioLive RM-Seres package contains the following:

- PreSonus StudioLive RM32AI or RM16AI digital recording and performance mixer

- 5-foot (1.5 meter), 9-pin-to-9-pin FireWire s800 cable
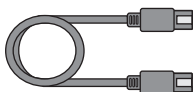
- Ethernet cable
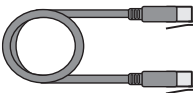
- IEC power cord
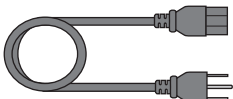
- USB Wi-Fi LAN adapter

- Product registration and software authorization card

- StudioLive RM-series Quick Start Guide

2.0   Hookup

This section covers hardware connections and controls for both RM32AI and RM16AI mixers. Whenever differences in certain features are called out, the RM32AI will be mentioned first, followed by the RM16AI.

2.1   Front-Panel Connections and Controls
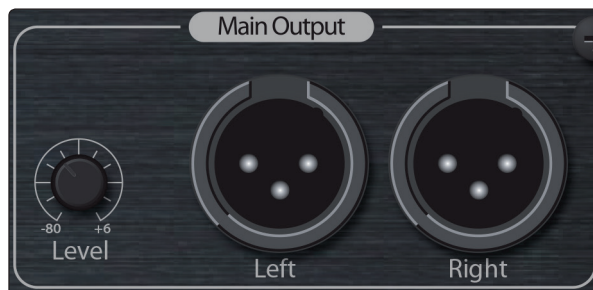
Main Outputs (Left and Right). The StudioLive RM features two XLR main outputs that are parallel to each other and the mono output.

Main Output Level. This knob controls the maximum output level of the XLR main outputs. The signal can be attenuated to -80 dB and boosted up to +6 dB.

Mono/Center Output. This balanced XLR output carries a mono bus output for driving subwoofers or a center channel for LCR mixing.

Mono/Center Output Level. This knob controls the maximum level of the Mono/Center Output signal. The signal can be attenuated to -80 dB and boosted up to +6 dB.

Power User Tip: StudioLive RM-series main outputs (XLR stereo and XLR mono) let you use Left/Center/Right panning (LCR). If you want to use LCR panning, select LCR as the Pan mode in the settings in UC Surface, and bus the channel to both the main L/R and Center outputs. If you want it to use normal LR stereo panning on a channel, just route it to the L/R outputs.

On the other hand, if you want to use a subwoofer in addition to the speakers that are connected to the Main L/R outputs, leave the panning mode in LR and route the channels you want sent to the subwoofer to the Mono bus (Mono output). You can then use the Low Pass Filter that's available on the Mono bus Fat Channel to dial in your desired high-frequency cutoff point.

Tape Input. These RCA inputs accept audio signals from consumer devices such as an mp3 player, tape deck, or CD player. You'll find a corresponding stereo channel strip in the Aux Inputs channels in UC Surface for controlling the signal level to the main mix or aux mixes.
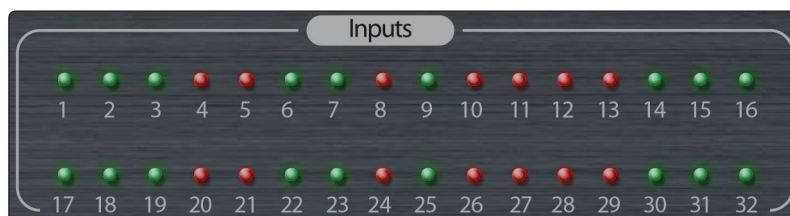
Input Meters. The StudioLive RM mixers offer 32/16 3-color LED input meters that illuminate in green whenever a signal is present on the corresponding input. The color turns red when the channel's input signal reaches 0 dBFS, and you'll start noticing that the sound is clipping (distorted).

Each of these LEDs turns yellow to indicate that phantom power (+48V) is enabled on the corresponding channel.

These meters also display the progress during firmware recovery updates, illuminating in yellow to show the progress and green when complete.

+48V Meter Button. This button is used for changing the mode of the input meters so you can see which inputs are using +48V phantom power.

In its default state, the button is off, and the meters display the signal levels. If you press and release the button, it will illuminate in yellow, and the meters will display the +48V status (yellow = On) for each input until the button is pressed and released again.

Pressing and holding the +48V Meter button causes it to illuminate in yellow and switches the Input Meters to +48V mode until you've released the button.

Headphone Cue Button. Whenever this button is pressed, it illuminates in yellow and reroutes the mix assigned in the settings to Cue to the headphone output. (By default this is set to the Solo bus.) The Headphone Cue and Main buttons are radio buttons: Only one can be selected at a time, and selecting Cue will deselect Main, while selecting Main will deselect Cue. Pressing and holding the Cue button while Main is selected will temporarily select Cue until the button is released.

Headphone Main Button. Pressing and releasing this button, causes it to illuminate in yellow and sends the Main mix to the headphone output. The Headphone Cue and Main buttons are radio buttons: Only one can be selected at a time, and selecting Cue will deselect Main, while selecting Main will deselect Cue. Pressing and holding the Cue button while Main is selected will temporarily select Cue until the button is released.

Headphone Level. This knob controls the volume of the headphone output.

Headphone Output. This ¼-inch TRS connector is where you connect headphones to your mixer.

Mute All Button. Pressing and releasing this button causes it to illuminate in red and mutes all of the inputs and outputs until it's pressed a second time. Holding down the button does the same thing until it's released.

Power/Status Indicator. This displays the current state of your RM mixer as described below:

- **Off:** The mixer is switched off.
- **Solid Blue:** Powered up, connected to a control network, and functioning properly.
- **Flashing Blue:** In the process of booting up or loading a firmware update.
- **Solid Red:** On and functioning correctly but with no control device connected.
- **Flashing Red:** Boot or update failure.

USB. The USB port is for use with the included USB Wi-Fi module when connecting your StudioLive RM AI-series mixer to a wireless network and controlling it remotely using UC Surface, and QMix-AI.

It can also be used for installing firmware updates.

Recallable Microphone Inputs. Your StudioLive RM mixer is equipped with 32/16 PreSonus recallable XMAX microphone preamplifiers for use with all types of microphones.

Each of these solid-state preamplifiers has a Class A input buffer, ultra-low noise, and wide gain control, allowing you to boost signals without increasing unwanted background noise.

48 Volt Phantom Power. These inputs also provide 48V phantom power for the microphone input on each channel, when activated. This feature can be individually enabled for each channel, using the UC Surface touch control software.

WARNING: Phantom power is required for condenser microphones but can severely damage some dynamic mics, especially ribbon mics. Therefore, switch phantom power off for all channels where it is not required.

Power User Tip: Dynamic and ribbon microphones are generally lower-output devices that require no external power source. In fact, unless a ribbon microphone calls specifically for phantom power, sending phantom power to it can cause severe damage. Condenser microphones are generally more sensitive than dynamic and ribbon microphones and typically require external +48V phantom power. Always review your microphone's documentation to ascertain the manufacturer's recommended operating practices.

XLR connector wiring for phantom power:
Pin 1 = GND   **Pin 2** = +48V   **Pin 3** = +48V
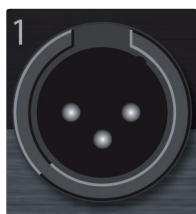
Line Outputs. StudioLive RM32AI offers 16 XLR line outputs and the RM16AI offers 8 XLR line outputs that are fixed to the aux mixes and mirrored on the rear panel with DB25 output connectors.

2.2   Rear-Panel Connections and Controls
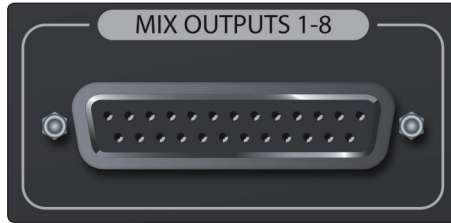
Line Outputs. These balanced line outputs on DB25 connectors mirror the front-panel outputs.

This comes in handy if you want to connect to wireless in-ear transmitters located in the same rack. You can use these connections, rather than snake cables, from the front of the mixer around to the back of the rack for your wireless transmitters.

Balanced DB25 fan-out snakes (breakout cables) can be obtained in various configurations at most recording and live-sound retailers. Common fan-out configurations are DB25 to (8) XLRM and DB25 to (8) ¼-inch TRS.
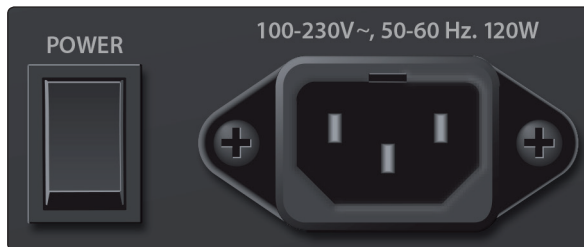
Power Switch. Push the top part of the switch (|) to turn on your StudioLive RM. Push the bottom part of the switch (O) to turn it off.

Power Cable Input. This is where you plug in the provided IEC power cable.
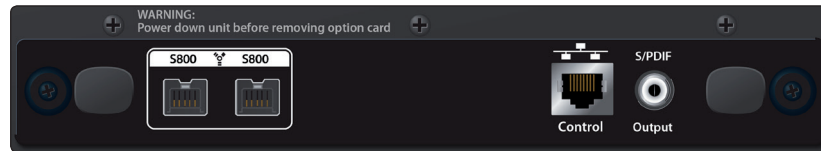
Option card slot. Your StudioLive RM-series mixer comes with a FireWire s800 option card for digital input and output, network control, and digital S/PDIF output. Additional option cards will be available soon, including AVB, Dante, and Thunderbolt.

FireWire s800 Ports. There are two standard 9-pin FireWire s800 ports on the included option card that can be used for connecting to your computer. You can use the second FireWire s800 port to connect additional s800 devices (such as external hard drives) to your computer.

Note: While connecting your StudioLive RM-series mixer to a FireWire 400 connection on your computer and daisy chaining a FireWire 400 device to the secondary s800 port are supported, this will reduce the bus speed of your mixer to 400 Mbps, and you may experience reduced performance. To experience the full power of your StudioLive RM AI-series mixer, we highly recommend connecting to a true FireWire s800 connection or to a Thunderbolt connection, using an adapter.

Ethernet Port. This standard RJ45 port allows you to connect your StudioLive to a wired LAN network.

S/PDIF Output. This digital output can be routed and assigned using UC Surface touch-control software. By default the Main Left/Right mix is assigned to this output.

MIDI Input and Output (I/O). These inputs and outputs allow connection to, and communication with, external MIDI equipment for triggering mixer functions and events.

Note: The MIDI I/O feature will be activated as part of an upcoming firmware update.

2.3   Typical Band Hookup

wireless mic   backup vocal mics   lead vocal   acoustic guitar/DI   keyboard/DI

DI Box

sax

DI Box

wireless in-ear (bass)   wireless in-ear (keys)   wireless in-ear (lead vocals)   wireless in-ear (lead guitar)

AI Mixer Option Card

FireWire-equipped laptop running Capture 2.0

electric guitar amp (rhythm)

electric guitar amp (lead)

bass/DI

drum kit

DI Box

9 10 11 12 13 14 15 16

MIC INPUTS

25 26 27 28 29 30 31 32

MIX OUTPUTS

music source

main speakers and subwoofers

mo' bass

Phones

Cue

Main

Tape In

Mono Ou

Main Output

Level   Level

9 10 11 12 13 14 15 16

MIC INPUTS

25 26 27 28 29 30 31 32

MIX OUTPUTS

9 10 11 12 13 14 15 16

drum monitor

side fill

floor wedges

floor wedges

headphones

Wi-Fi

iPad running UC Surface

iPhones running QMix-AI

2.4   Typical Church Hookup

hanging choir mics

podium mic

backup vocal mics

lead vocal

keyboard/DI

acoustic guitar/DI

piano

DI Box

wireless in-ear (bass)

wireless in-ear (keys)

wireless in-ear (lead vocals)

wireless in-ear (lead guitar)

AI Mixer Option Card

FireWire-equipped laptop running Capture 2.0

12

electric guitar amp (rhythm)

electric guitar amp (lead)

bass/DI

drum kit

DI Box

Phones

Cue

Main

Tape In

Mono Output

Main Output

9   10   11   12   13   14   15   16

MIC INPUTS

25   26   27   28   29   30   31   32

MIX OUTPUTS

9   10   11   12   13   14   15   16

dvd player

Phones

Cue

Main

Tape In

Level

Mono Out

Level

Main Output

Level

9   10   11   12   13   14   15   16

MIC INPUTS

25   26   27   28   29   30   31   32

MIX OUTPUTS

9   10   11   12   13   14   15   16

front of sanctuary speakers

cry room

subwoofers

floor wedges

floor wedges

headphones

Wi-Fi

iPads running UC Surface

iPhones running QMix-AI

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3.0   Installing the UC Surface Touch-Control Software

Before you do anything else, please register your StudioLive RM-series mixer online at **https://my.PreSonus.com** so you can download and authorize the included software, manuals, and video guides.

Your StudioLive RM series is more than a mixer; it's a powerful suite of integrated hardware and software solutions that take you from stage to studio to fans. The following software is included with the StudioLive RM32AI and RM16AI.

- UC Surface battle-ready mix-control application
- QMix-AI personal monitor control
- Capture™ multitrack recording with virtual soundcheck
- Studio One Artist professional DAW
- Nimbit Free publishing and marketing account

3.1   Minimum System Requirements

General

- Wireless or wired network connection
- Internet connection
- For Capture and Studio One:
    - FireWire s800 (IEEE 1394b) port
    - Internal or external 7200 RPM storage drive highly recommended
    - Monitor with 1280x800 resolution

Windows

- Windows 7 32-bit/64-bit or Windows 8 32-bit/64-bit
- Intel® Core® i3 (Core i5 or faster recommended)
- 4 GB of RAM or more

Mac

- Mac OS X 10.8 64-bit or later
- Intel Core i3 (Core i5 or faster recommended)
- 4 GB of RAM or more

iOS Devices

- iOS 7.03 or higher
- iPad Air
- iPad mini with Retina display
- iPad (4th generation)
- iPad mini
- iPad (3rd generation)
- iPad 2

3.2   Downloading UC Surface for iPad and QMix-AI

PreSonus' UC Surface mix-control app for iPad and QMix-AI aux-mix control app for iPhone/iPod touch are free downloads from the Apple App Store. You'll need this software to control your StudioLive RM-series mixer, so please download it now.

3.3   Wired Ethernet Control Setup
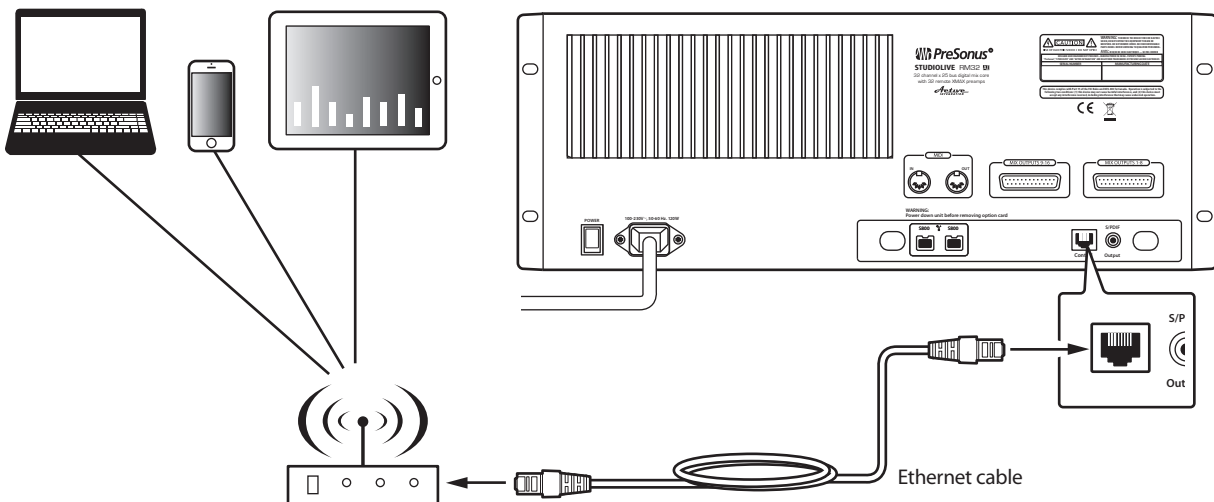
Ethernet cable

Your StudioLive RM32AI and RM16AI can be set up for control with a wired Ethernet connection in seconds. Simply connect the included Ethernet cable to the Ethernet control port on the back of the mixer and to a network router that is also connected to your computer or iPad.

Power User Tip: When you launch UC Surface with the computer and StudioLive RM32AI or RM16AI connected to the same network, the software will automatically see the mixer.

3.4   Wireless Control Setup
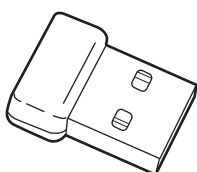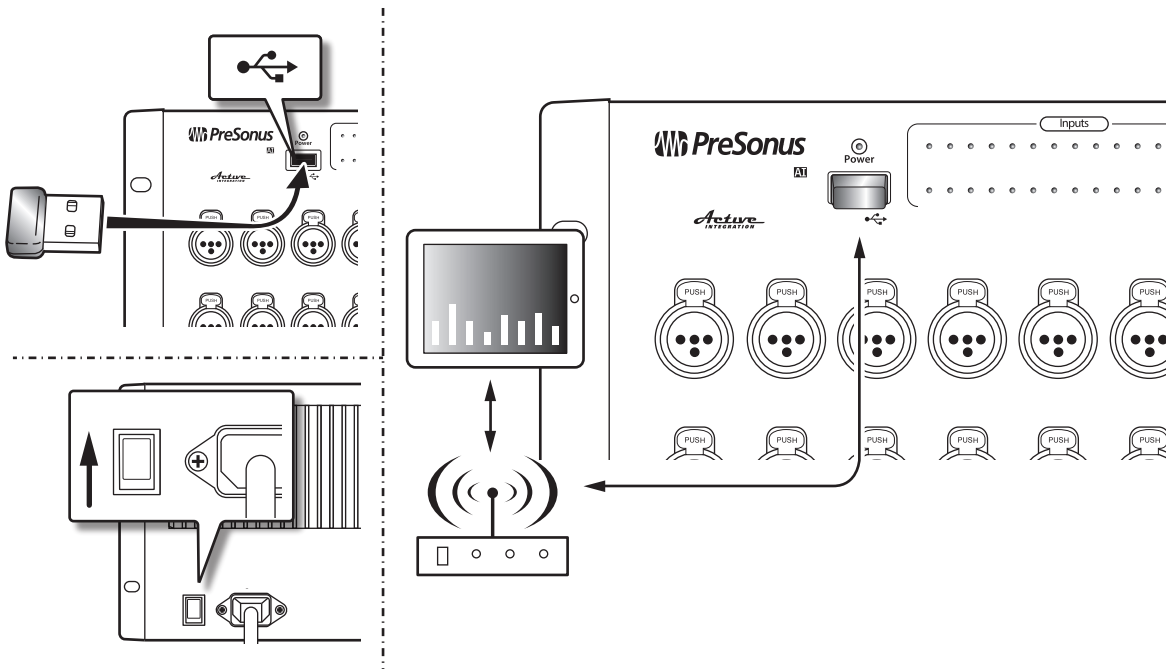
StudioLive AI mixers do not support hot-swapping the Wi-Fi LAN adapter so you must have the adapter plugged into the front-panel USB port before turning on your mixer.

By default, StudioLive mixers are configured to automatically connect to a wireless network using the following username and password:

- Wireless network name: StudioLive

- Wireless network password: StudioLive

To connect to a custom wireless network, you first need to connect to the mixer with a wired connection and configure the wireless network preferences.

1. Connect to a wired control network, as described in Wired Ethernet control setup.

2. Launch UC Surface on a Mac or Windows computer or iPad that's connected to the same network.

3. Open the Settings page.
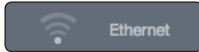
4. At the top of the settings page, select the wireless connection icon.

5. Choose the wireless network you would like to use from the list shown.

6. If a password is required you will be prompted to enter it.

7. You are now configured to connect to the new wireless network for control.

Every time you turn on your StudioLive AI mixer, if there is no wired Ethernet connection, and the USB Wi-Fi dongle is plugged in, the mixer will look for this network and attempt to connect to it.

Note: *StudioLive AI only supports WPA and WPA2 security. Please be sure that your router is configured using one of these security protocols.*

3.5 Computer Recording Setup
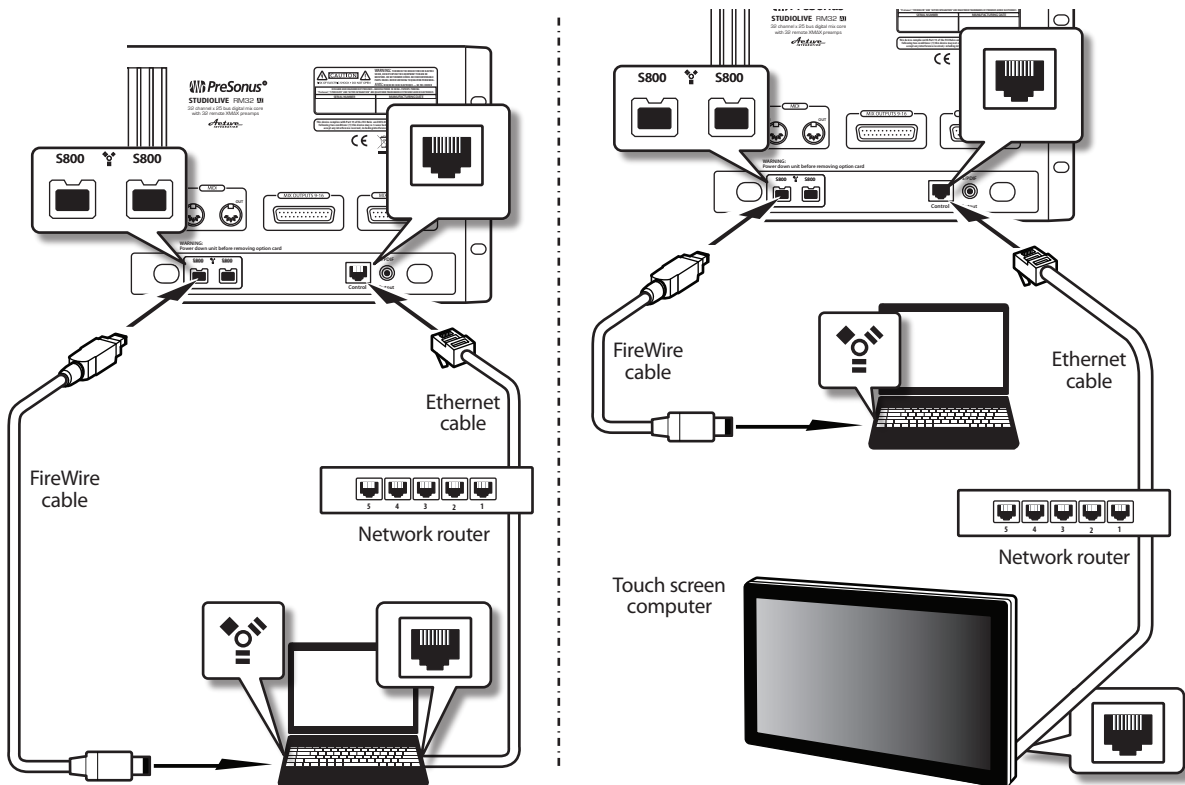
StudioLive RM32AI and RM16AI have been designed for tight integration with the included Capture and Studio One Artist software. You can record a live show quickly and with confidence to Capture, save the StudioLive AI mixer scene with the Capture Session, and then open that recording, complete with mixer scene, in Studio One.

The Studio One mixer will be set to match your StudioLive AI mixer scene, including fader values, mutes, pan, and effects-send mixes. Fat Channel settings will be loaded into Studio One's Fat Channel Native Effects™ plug-in.

You can also use the StudioLive RM mixer as an audio
interface and monitor mixer for studio recording.

1.   After registering your StudioLive RM mixer, download the Universal Control
     installer for Windows or Mac from your My PreSonus account. This installer
     includes the UC Surface mix-control software and necessary drivers.

2.   Launch the installer and follow the onscreen instructions. When the
     installer is finished, reboot your computer to complete the installation.
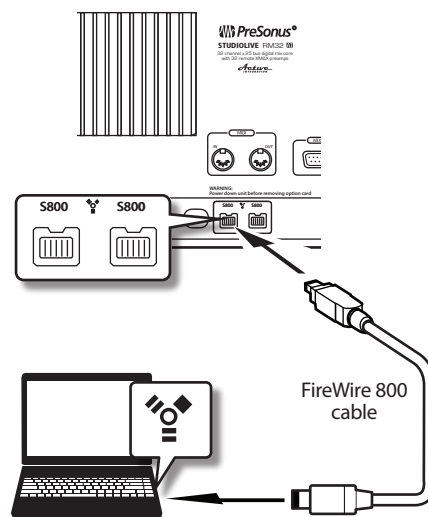
FireWire 800
cable

3.   When the installation is complete, connect your StudioLive mixer to your computer
     with the included FireWire cable for audio and via Ethernet or Wi-Fi for control.

3.6   Computer Hookups

3.6.1   Command and Recording – FireWire-equipped computer – Wireless via Ethernet

AI Mixer Option Card

FireWire-equipped
Control and Recording Computer
UC Surface™ + Capture™ or Studio One®
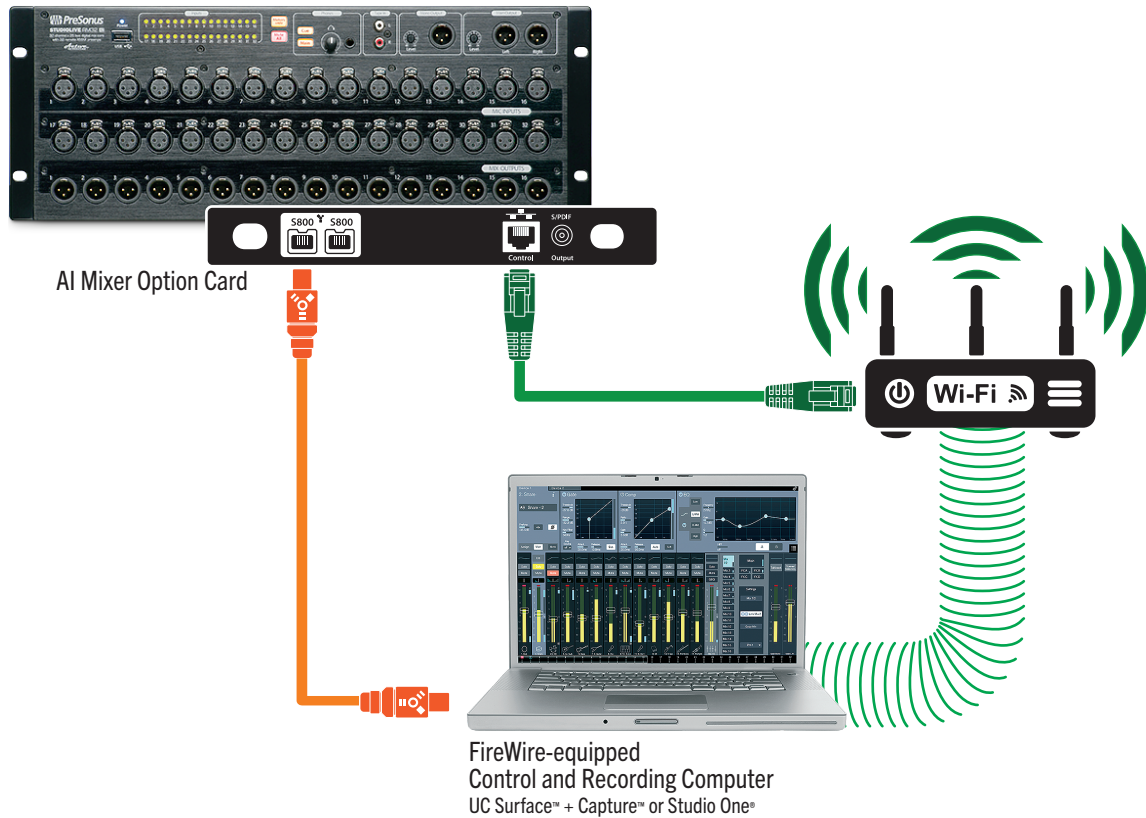
3.6.2   Command and Recording – FireWire-equipped computer – Wireless with dongle

FireWire-equipped
Control and
Recording Computer
UC Surface™ + Capture™
or Studio One®

AI Mixer Option Card

3.6.3   Command and Recording – FireWire-equipped computer – Wired

AI Mixer Option Card

FireWire-equipped
Control and Recording Computer
UC Surface™ + Capture™ or Studio One®

3.6.4   Separate Command and Recording – Wireless via Ethernet

AI Mixer Option Card

FireWire-equipped Recording Computer
Capture™ or Studio One®

Control Computer
UC Surface™
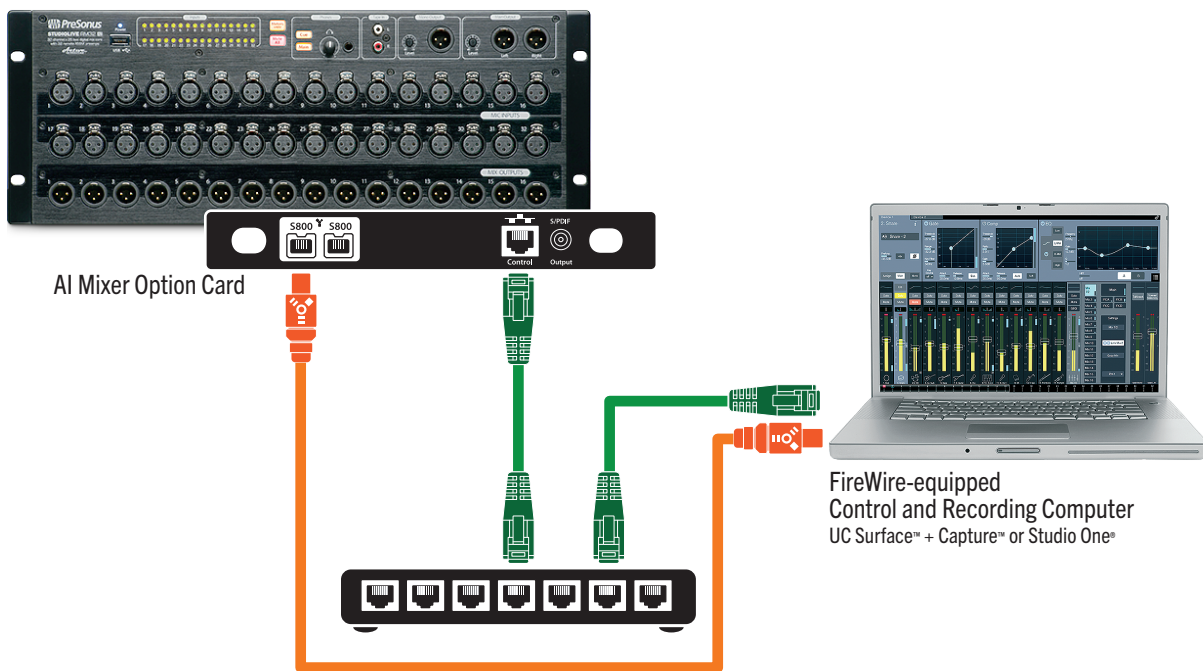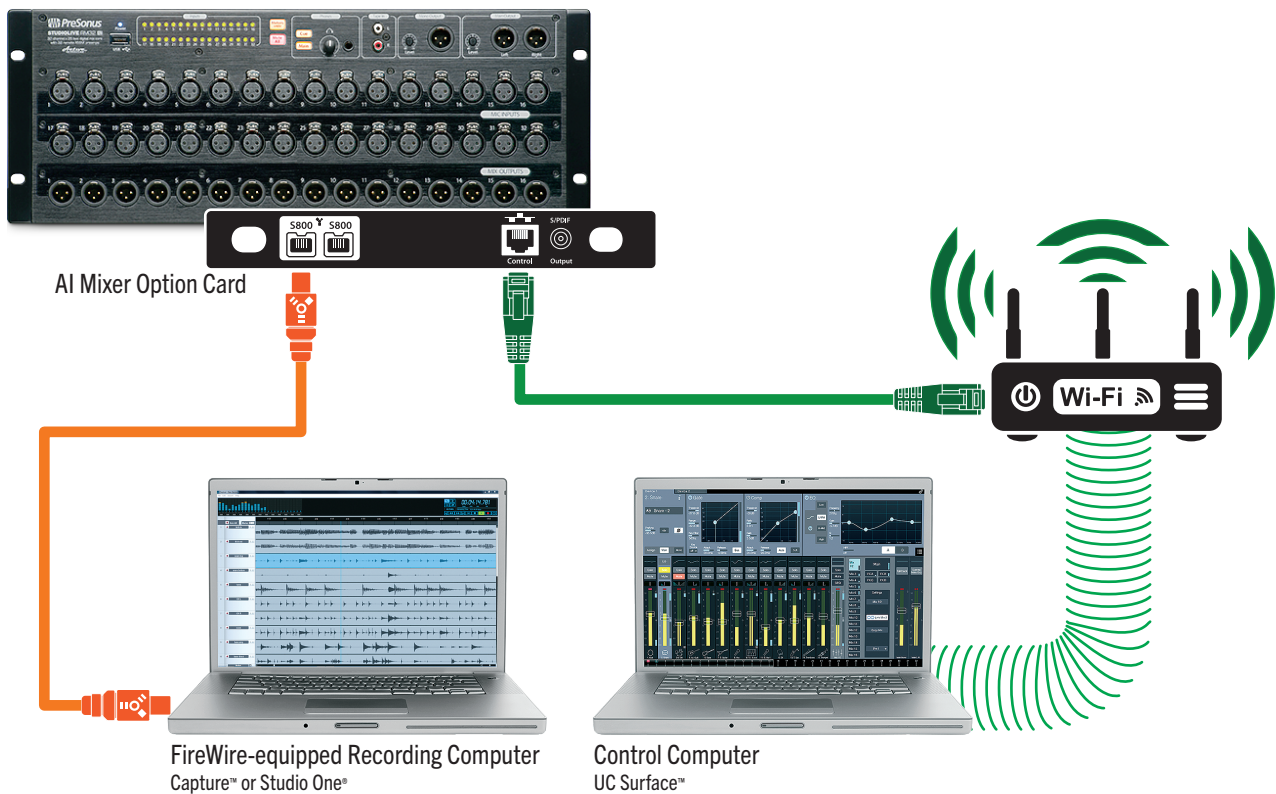
3.6.5   Separate Command and Recording – Wireless with Dongle
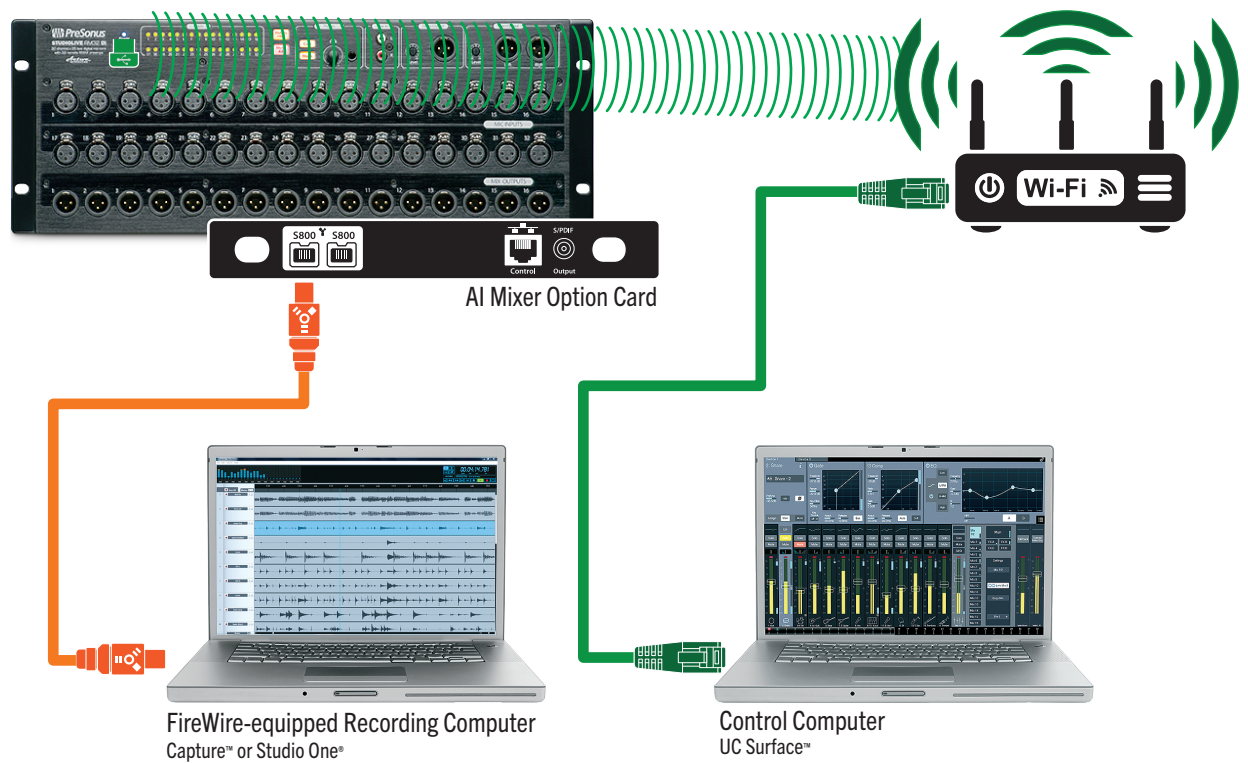
AI Mixer Option Card

Wi-Fi

FireWire-equipped Recording Computer
Capture™ or Studio One®

Control Computer
UC Surface™

3.6.6   Separate Command and Recording – Wired

AI Mixer Option Card

Control Computer
UC Surface™

FireWire-equipped Recording Computer
Capture™ or Studio One®

3.6.7   Separate Touch Screen Command and Recording – Wireless via Ethernet

AI Mixer Option Card

FireWire-equipped Recording Computer
Capture™ or Studio One®

Control Touchscreen Computer
UC Surface™
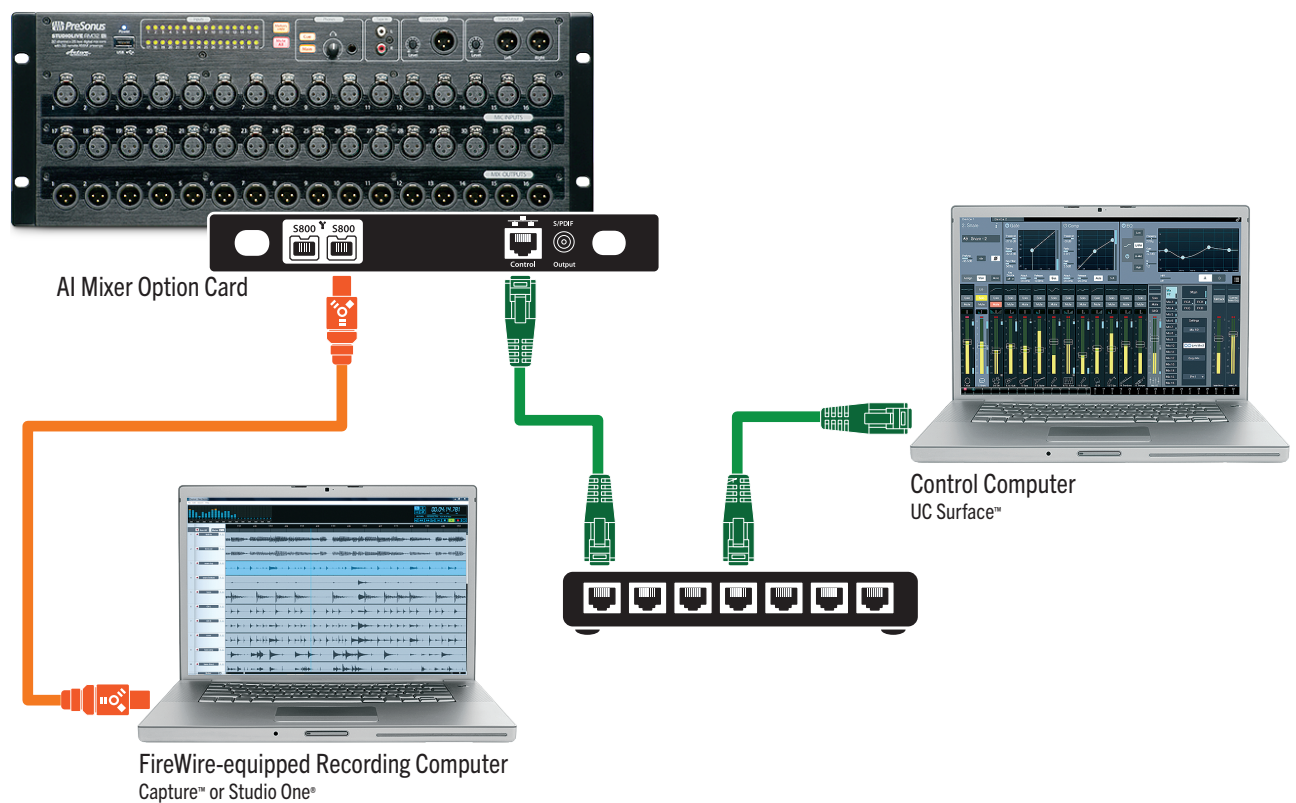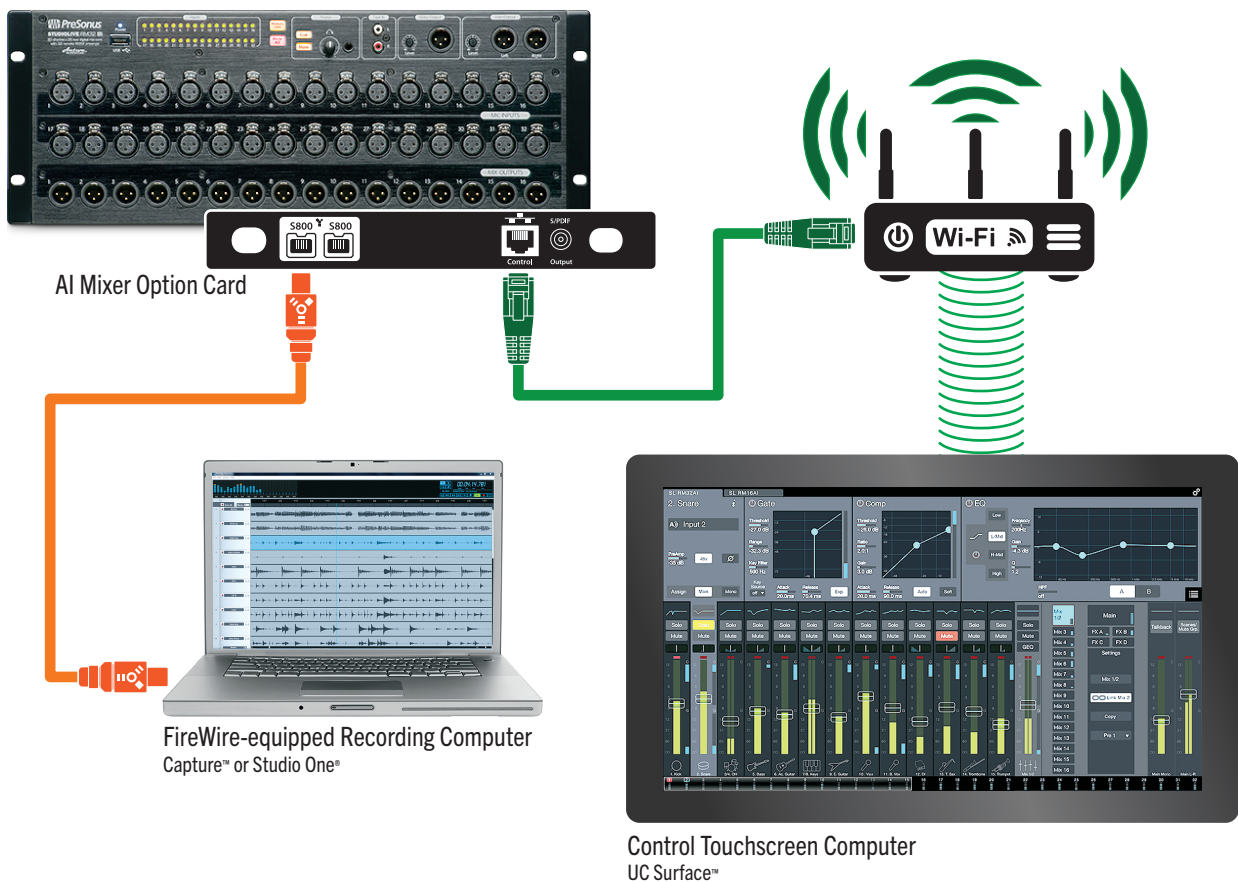
3.6.8   Separate Touch Screen Command and Recording – Wireless via Dongle

AI Mixer Option Card

FireWire-equipped Recording Computer
Capture™ or Studio One®

Control Touchscreen Computer
UC Surface™

3.6.9   Separate Touch Screen Command and Recording – Wired

AI Mixer Option Card

Control Touchscreen Computer
UC Surface™

FireWire-equipped Recording Computer
Capture™ or Studio One®
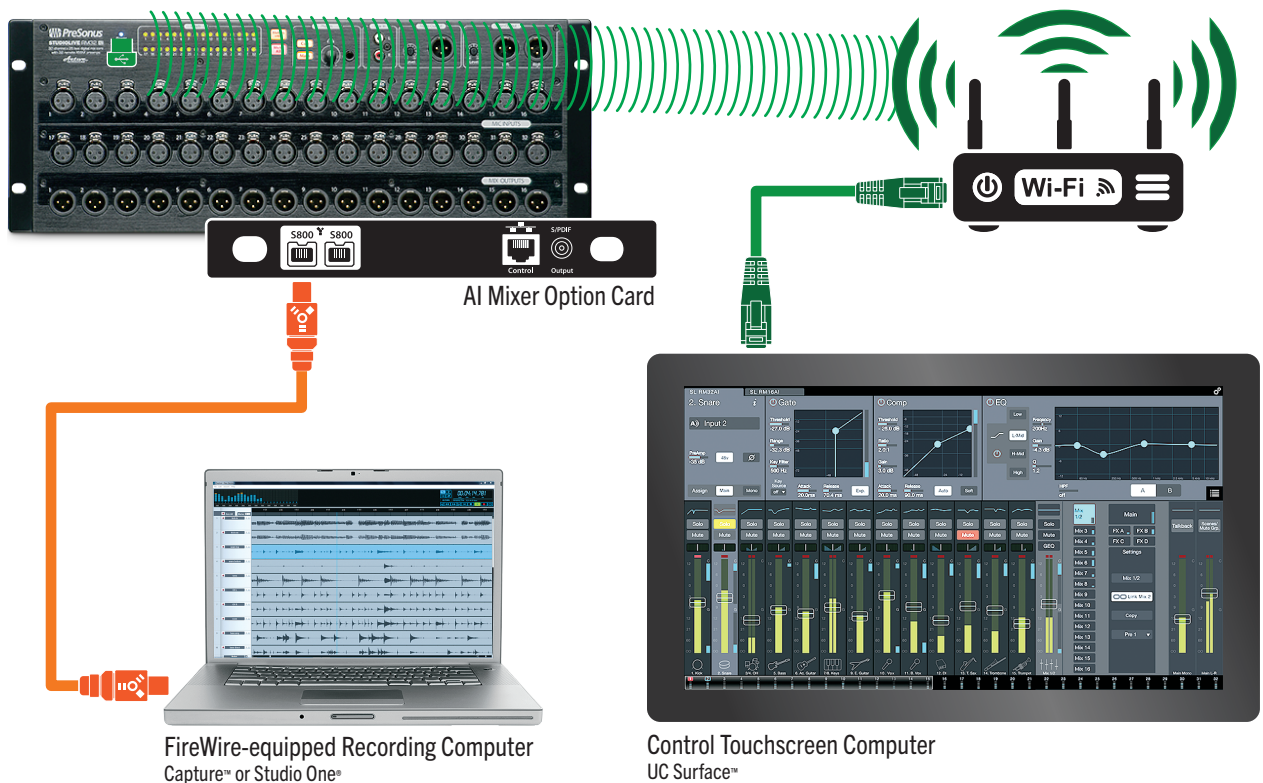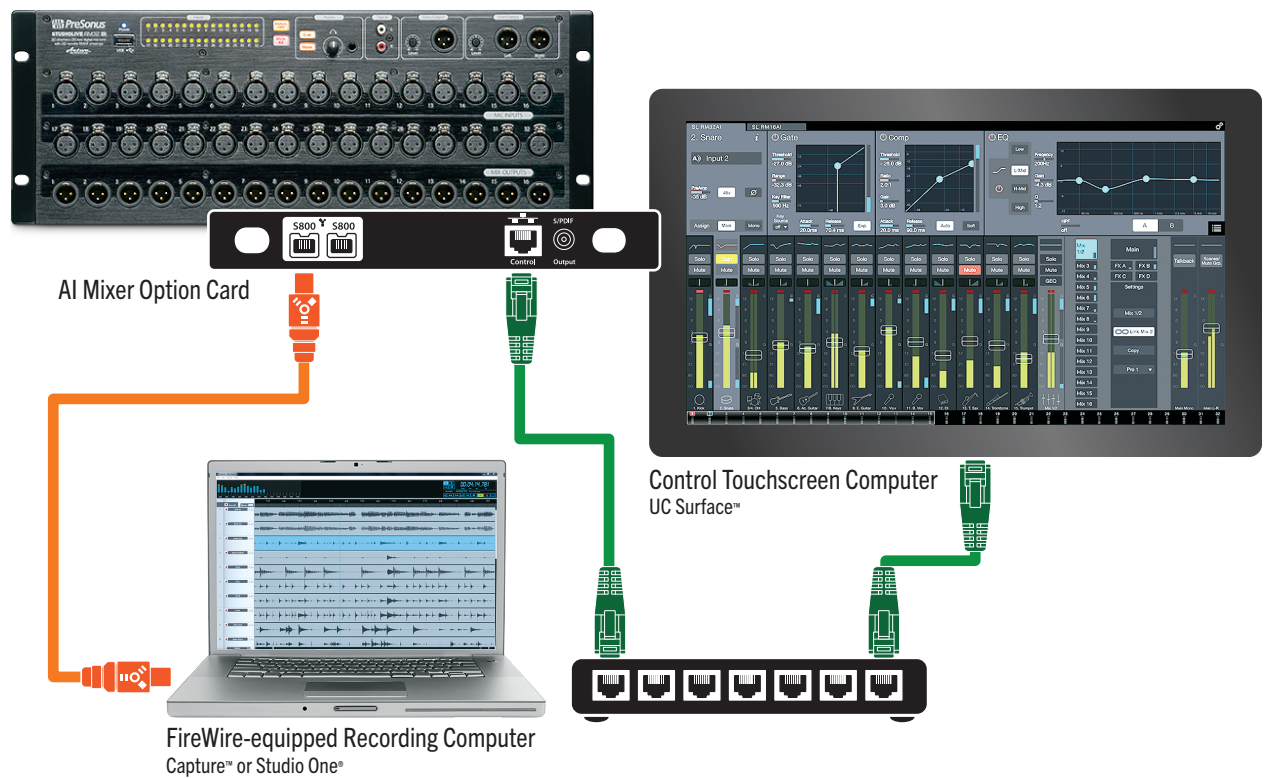
3.6.10   UC Surface iPad and QMix-AI iPhone Connections for Any of These Hookups

RM Mixer Option Card
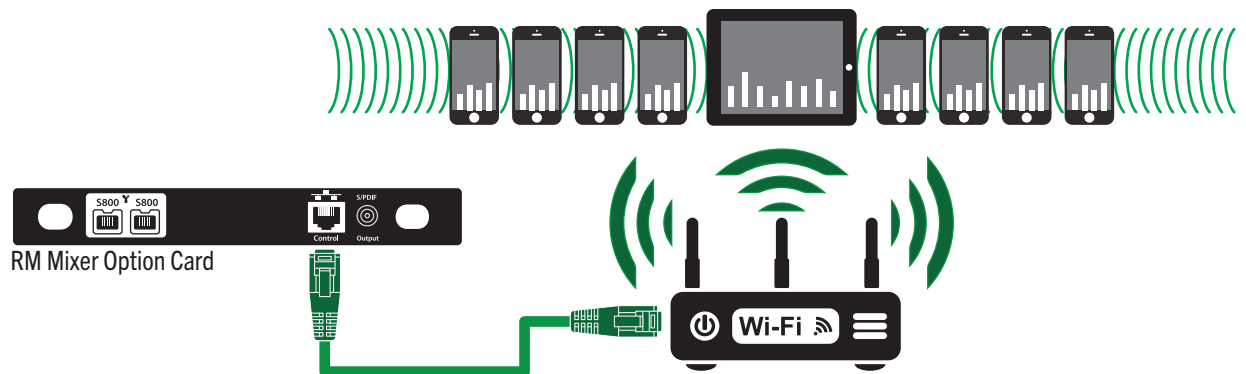
4.0   Getting Started

Before you begin, here are a few general rules of thumb:

- Always press the Mute All button on the mixer front panel or turn down the Main faders in UC Surface and the Phones knob on the front panel before making connections.

- Before plugging or unplugging a microphone while other channels are active, mute the channel you're connecting to or disconnecting from.

- Do not allow your inputs to clip. Watch the level meters on your RM mixer; when the LEDs near the Clip mark, the input LED will illuminate in red, indicating that the analog-to-digital converters are in danger of being overdriven. Overdriving the converters will cause digital distortion, which sounds terrible. The XMAX™ preamps in your StudioLive provide plenty of headroom; take advantage of it.

Your PA and studio equipment should be powered on in the following order:

1. Sound sources (direct boxes, microphones, etc.) connected to the StudioLive RM inputs

2. StudioLive RM-series mixer

3. Computer (if applicable)

4. Power amplifiers or powered monitors

When it's time to power down, your system should be turned off in the reverse order. Now that you know what not to do, let's get some audio going!

4.1   Level-Setting Procedure

This section assumes that you've already installed and configured UC Surface on your computer or iPad and connected your StudioLive RM mixer as described in the previous chapter.

1. Grab a microphone and a mic cable and plug them into the StudioLive RM's Channel 1 mic input.

2. Connect the Main outs of your StudioLive RM to your power amplifier or powered monitors.

3. If you're using passive speakers, connect them to your power amplifier using speaker cables.

4. Plug your StudioLive RM hardware into a power outlet and turn it on.

5. Power on your speakers or speaker amplifier.

6. Launch the UC Surface software and select your mixer for control.

7. Go to Channel 1 of the UC Surface mixer and open the Fat Channel by clicking or tapping the EQ Micro View.

8. If your microphone requires phantom power, engage the Fat Channel +48V button.

9. Speak or sing into your microphone at approximately the same volume you expect during the performance.

10. Move the Fat Channel Preamp slider up while watching the input meter on the Channel Strip and adjust the input gain until the meter reaches a little more than halfway up. The meter should never go into the red area at the top.

11. Raise the Channel 1 fader until it reaches 0 dB (unity gain).

12. Bring up the Main Output fader until you can comfortably listen to your microphone through your speakers.

13. Use the Fat Channel to add dynamics processing and EQ as needed.

5.0   A Tour of UC Surface Features

StudioLive RM32AI and RM16AI are controlled with the UC Surface mix-control application, which is designed specifically for live mixing. All primary mixing functionality is at your fingers without navigating complex views or deep menus.

5.1   UC Surface Settings

Connected Device Tabs. These tabs switch between different mixers available for control on the network. Selecting a tab opens the associated mixer control.

     Settings Button. This button opens the Mixer Settings screen, where you can configure global mixer settings such as sampling rate, permissions, wireless network settings, and more.
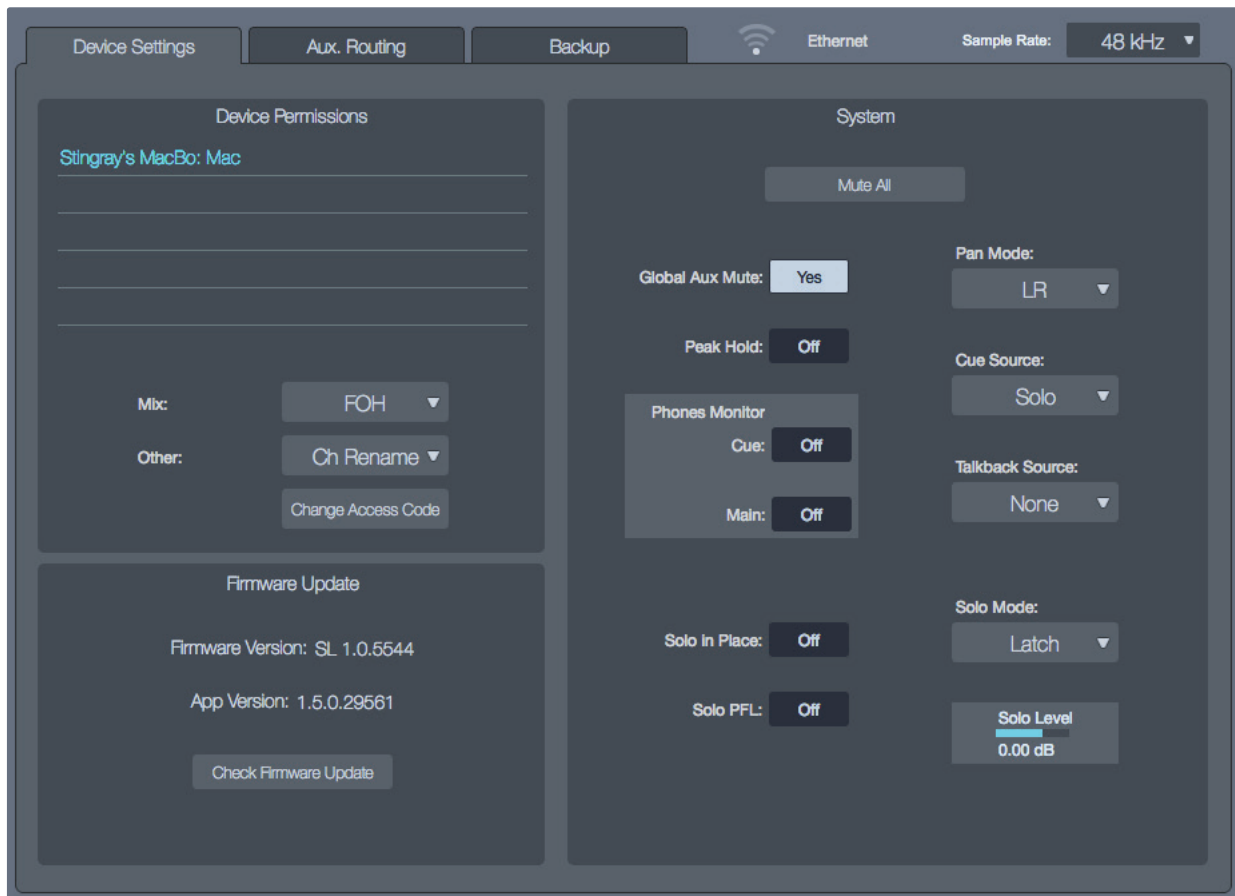
Device Settings tab. This tab contains all device settings, such as Global Aux Mute, Talkback Input Source, Headphone Cue Source, and Permissions.
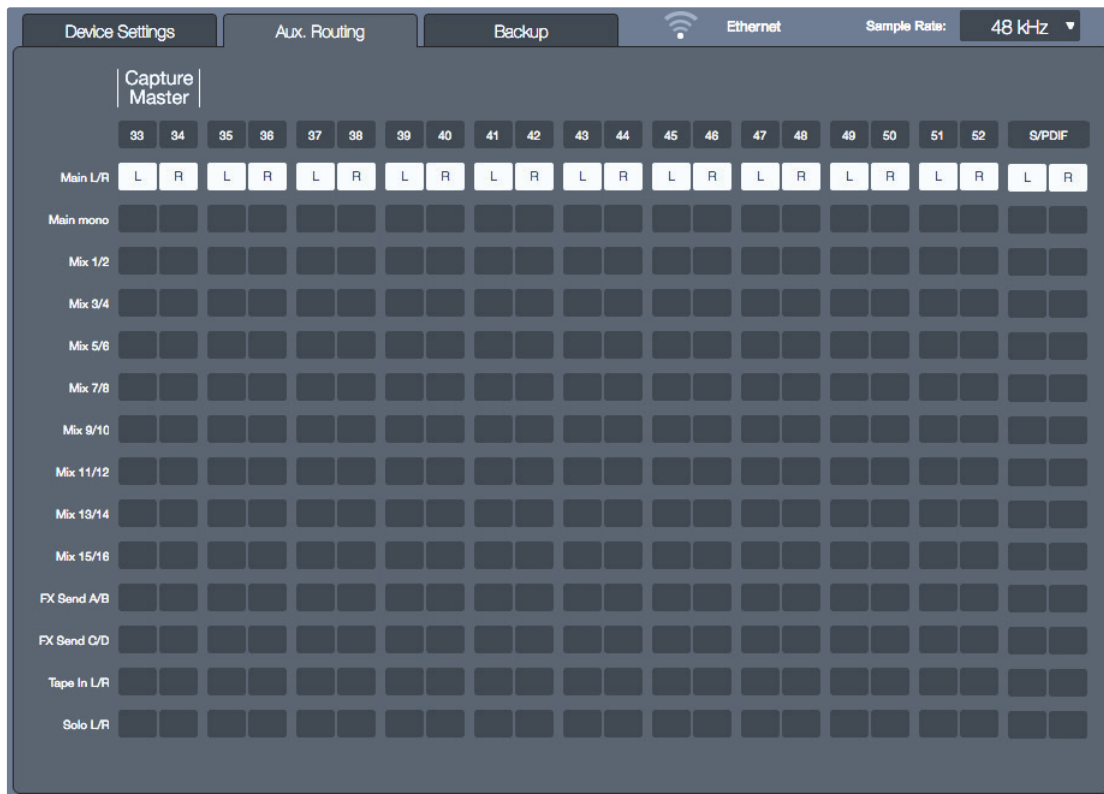
Aux Routing tab. This tab displays the routing options for the auxiliary digital outputs on the installed option card.
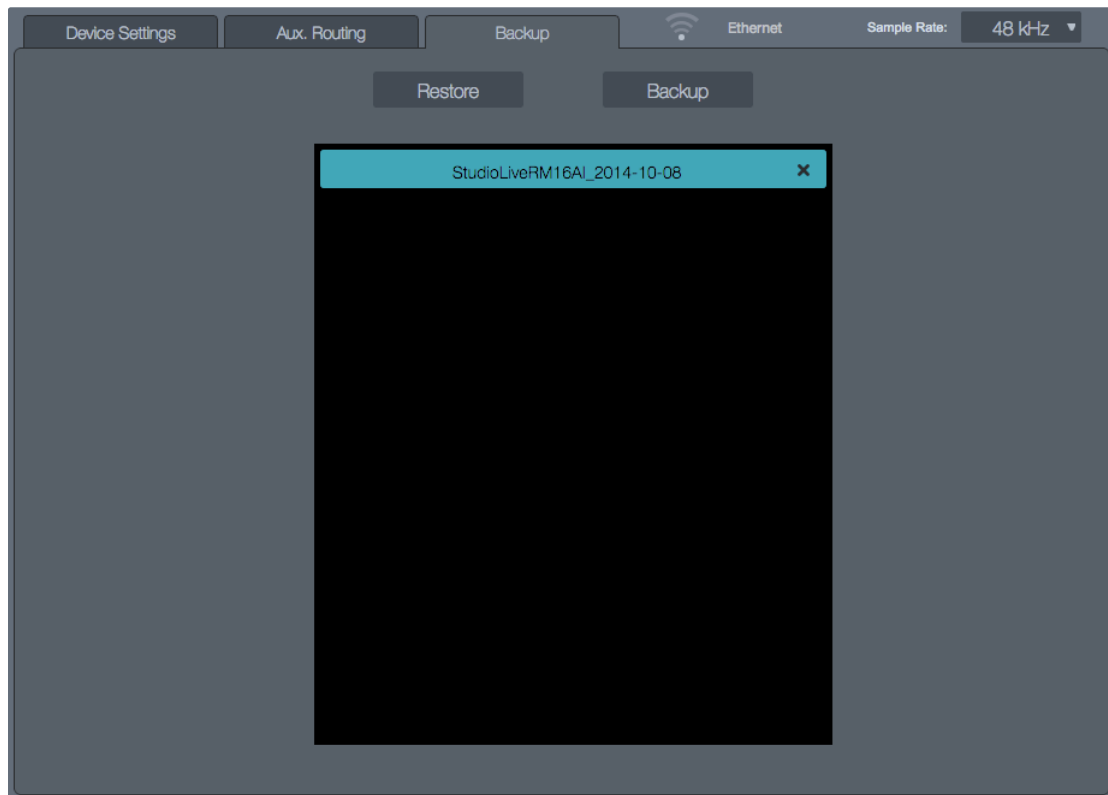
Backup tab. This is where you can backup and restore all the scenes and presets on your mixer to the local drive of your computer.

Wireless Connection. This is where you go to change the network and password for wireless control of the mixer.
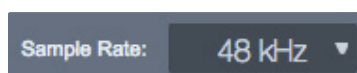
Sampling Rate. Go here if you need to change the sampling rate.

Note: The Fat Channels for the output mixes and the FX B reverb and FX D delay are not available at the 88.2 kHz and 96 kHz sampling rates.

5.2   Mix Scroll View
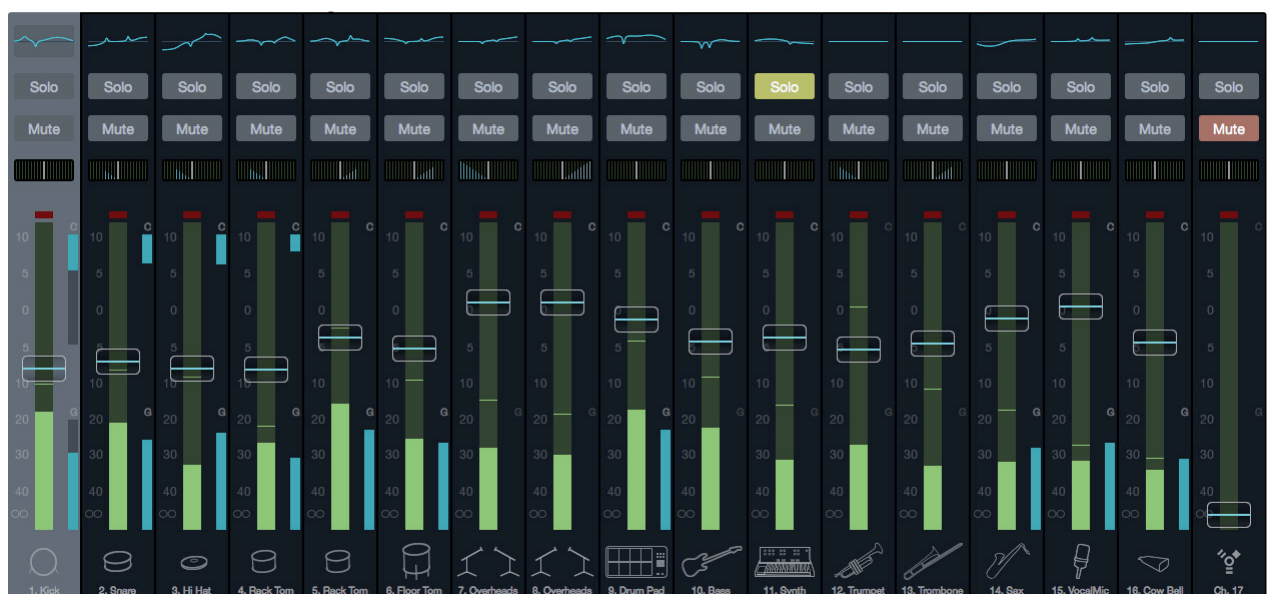
Mix Channel Area. This is where all the input channel strips for the selected RM mixer are located.

EQ Micro View. This section of the channel strip displays the EQ curve that's applied to the channel. It will also display the current value for the channel fader or Pan control whenever they're moved. This display reverts to the EQ curve after you've finished interacting with the fader or Pan control.

Solo Button. When activated on a channel this button illuminates and routes the channel to the Solo bus.

Soloed channels are routed to the solo bus by default and don't affect the main outputs. However, this can be changed to SIP (Solo In Place) in the settings.

Mute Button. This button illuminates when active and mutes the channel it belongs to.

Pan. This adjust the position of the sound within the stereo "field" by placing it to the left, right, or center.

When using LCR Panning mode the pan functionality will work as follows:

- Assign a channel to the Main L/R bus only: Stereo pan operates normally.

- Assign a channel to both the Main L/R and Center: Pan operates in LCR.

  - Full left is left channel only.

  - As you move toward the center on the pan control, the signal begins to fade from the left only to the center.

  - At the center pan position, the signal is only routed to the center bus.

  - As the pan control is moved toward the right, the signal begins to fade into the right channel and out of the center channel.

  - At the full right position, the signal is in the right channel only.

- Assign a channel to the Main Center only: Pan has no affect and the signal is routed only to the center channel.

Input Meter. This meter displays the level for the input signal for the channel.

Compressor Gain Reduction Meter. This meter displays a letter C when a Fat Channel Compressor is active and provides a visual representation of the amount of gain reduction applied to the input signal.

Noise Gate Gain Reduction Meter. This meter displays a letter G when a Fat Channel Noise Gate is active and provides a visual representation of the amount of gain reduction applied to the input signal.

Fader. The fader adjusts the signal level for the channel.

The fader will be blue when controlling the Main mix, yellow when controlling Aux mixes, and purple when controlling FX mixes.

Channel ID Icon. This displays the channel number along with the channel name and Channel Type image.

Clicking or tapping this part of the Channel Strip also selects the channel.

*Note: The Channel Type Image and a default type name are set when you choose the Channel Type. For more information, **refer to Channel Type on page Page 37**.*

5.3   Meter Bridge

Meter Bridge. This area contains the level meters for all input channels. The selected channel will be shown with a blue box around the channel number. If an input clips, a red box will appear behind the channel number.

Scroll Bar. This is used for quickly navigating through the input channels by dragging it to the left or right. However, you can also scroll by swiping left or right in the mix channel area.

5.4   Flex Fader and Mix Selection Area

Flex Fader Channel Strip. Flex Faders are used for controlling the send for the selected Aux mix or FX mix. When an Aux or FX mix is selected, the fader will display the master send fader for that mix. In addition, when working with Filter DCA groups, the Flex fader will be the master control fader for the selected Filter DCA group.

For details on working with Filter DCAs, *please see section 5.5 Filter DCAs*.

The following Flex fader features are available based on the selected Channel Type:

EQ Micro View. When a Flex Fader is controlling a Mix or FX bus, this section displays the EQ curve that's applied to the channel.

Solo Button. When activated on an Aux or FX send, this button illuminates and routes the send to the Solo bus.

Mute Button. This button illuminates when active and mutes the associated send.

GEQ/Edit Button. When controlling a Mix bus, this button opens the graphic EQ. When controlling an FX bus, it opens the FX Editor.

Level Meter. This meter displays the output level for the associated send.

Compressor Gain Reduction Meter. This meter displays a letter C when a Fat Channel Compressor is active and provides a visual representation of the gain reduction applied to the send signal.

Noise Gate Gain Reduction Meter. This meter displays a letter G when a Fat Channel noise gate is active and provides a visual representation of the amount of gain reduction applied to the send signal.

Fader. The fader displays and adjusts the signal level for the selected mix.

This Fader is yellow when controlling a Mix bus, and purple when the channel strip is controlling an FX bus. When the Main mix is selected, no fader is shown, since the Main mix faders are always present to the right of the Mix Selection area.

Channel ID Icon. This displays the name and "type" image for the Flex Fader (Mix or FX).

Mix Selection Area. This is where you select the mix that's currently being controlled by the channel faders. This is also where you'll find the Mix Settings area, which provides contextual information about the selected mix.

> **Mix Selection Buttons.** These buttons select one of the 16 Aux Mix buses and display the master send-level meter for the associated mix.

> **Main Mix Select Button.** This is used for selecting the Main Mix bus.

> **FX Mix Select Buttons.** These buttons open their corresponding FX Bus (A, B, C, or D).

Mix Settings. The Mix Settings view offers the following settings and functions for configuring the selected Mix bus.

> **Mix Name.** Displays the name of the selected Mix bus. You can change the name by clicking this area and typing the new one.

> **Stereo Link.** This button is used for linking two adjacent Mix buses, which creates a new stereo Mix bus.

> **Copy/Paste.** This is for copying and pasting the current Mix bus settings to other Mix buses.

> To do this:

> 1. Click the Copy button on the selected Mix bus. This enters Paste mode.

> 2. Click the Mix Selection button for the Mix bus you're going to paste the settings into. See Mix Selection Buttons for more information.

> 3. Click the Paste button to paste to the selected mixes.

> **Mix Position.** This drop-down menu lets you select one of the following three signal routing options for the aux mixes: Pre 1 (pre-Fat Channel), Pre 2 (post-Fat Channel and pre-fader), and Post (post-fader).
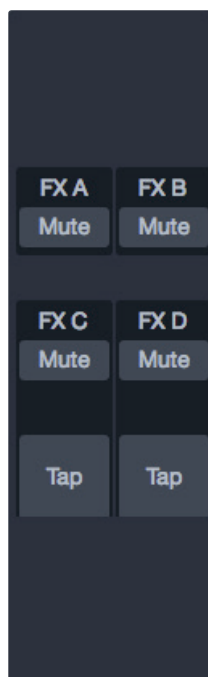
FX Settings. This area provides quick access to all FX mutes and Tap Tempo buttons for the delay effects on the selected FX mix bus. Refer to Flex Fader Channel Strip for information about the available features for FX mix buses.

5.5   Filter DCAs

Filter DCAs are a new breakthrough for navigating and controlling a mix. A Filter DCA group can contain any combination of the available input and effects-return channels.

Selecting a Filter DCA changes the context of the channel view to only show the channels belonging to that group. When a filter group is selected, the Flex fader changes context to act as a DCA (Digitally Controlled Amplifier) that adjusts the relative level of all channels in the group.

Filter DCAs stay active until exited, allowing the user to address the group independently across different mixes. Users can also flip between groups on the fly to change the view of a selected mix.

Creating Filter DCAs.

There are two ways a Filter DCA can be created.

Automatically-created Filter DCAs. When channels are identified using Channel Type icons, UC Surface automatically creates a Filter DCA group based on that information. For example, if a channel is identified using a kick-drum icon, a Drum group will be added to the Filter DCAs list that includes that channel. Any other channels identified with Channel Types in the Drums category will be added to the Drums Filter DCA. Auto Filter DCAs are displayed with a "~" in front of their names and will appear at the bottom part of the Filter DCA list.

User-created Filter DCAs. You can create new filter groups from scratch or by editing an existing Auto Filter DCA. Any number of channels can be added to a group, and you can create as many groups as you wish. User-created groups will always be shown at the top of the Filter DCA list above the automatically generated groups.

"+" button. This button will add a new Filter DCA to the system with Edit mode enabled, which allows you to add channels to the group.
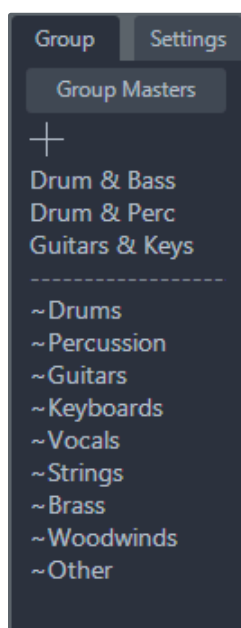
Group Edit Mode.

Name. Selecting this area will allow you to rename the group's default name.

Channel Selection. Select any channels you wish to add to the group. Channels that are not in the group will display as dark in the scroll view. Channels added to the group will display normally.

When all the desired channels are added to the group, press the Done button to exit Group Edit mode. The group will be applied, and only the channels that belong to that group will be shown.

Delete Group. To delete a group, enter Group Edit mode and select the Delete Group button. You'll be asked to confirm the deletion; once confirmed, the selected group will be removed from the Filter DCA list.

Using Filter DCAs.

To access Filter DCAs, select the Groups tab in the mix-selection area. All groups that have been created will appear in the Filter DCA list. When you select the name of a group in this list, only channels that belong to the selected group will be seen in the Mix view.

The group list area and Flex fader will change context to address the selected group in the following ways.

Active Group Area.

Group name. Displays the name of the selected group.

"< >" buttons. These buttons allows you to navigate between groups while the filters are still applied to the mix view.

Edit. This button enters Group Edit mode, allowing you to add channels to, or remove channels from, the selected group. If an automatically created group is selected, UC Surface will make a copy of the group and add it to the group list, leaving the original group unedited.

Exit Filter. Exits Filter DCA mode and returns to the full 32-channel Mix view.
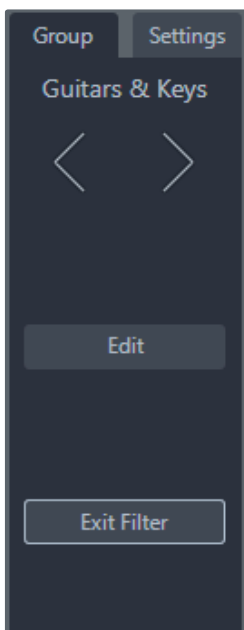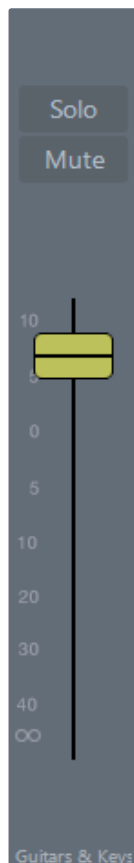
Flex DCA Fader.

When a Filter DCA is selected, the Flex fader controls the relative level of all channels in the group. Changes made using the Flex fader are only applied to the currently selected mix and will not affect other mixes in the system.

For example, let's say you want to add more drums to the main mix and turn down the drum in the drummer's monitor wedge:

1. Select the Drums Filter DCA

2. Select the main mix

3. Use the Flex fader to turn up the all drum channels in the main mix

4. Select the aux mix that is feeding the drummers monitor; the Flex fader will change to reflect the current level of the Drums group in the aux mix

5. Move the Flex fader to turn the drums all the way down

Notice that the drums in the main are not affected but they are now out of the drummers mix.

Flex DCA Mute. This button mutes all channel in a Filter DCA group.

Flex DCA Solo. This button routes all channels in a Filter DCA group to the solo bus.
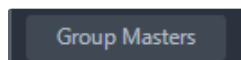
Group Masters. This button will replace the contents of the current mix view and display the Flex DCA fader for each Filter DCA group that has been created. In this mode you can mix multiple Filter DCA groups at the same time. Turning this button off will return the previous mix view.

Group Spill. This button will spill, or unpack, the group that belongs to the Flex fader, showing all channels that belong to that Filter DCA. Exiting the Filter DCA will return you to the Group Masters view.

Flex DCA Mute. This button mutes all channel in a Filter DCA group.

Flex DCA Solo. This button routes all channels in a Filter DCA group to the Solo bus.

5.6   Main Mix Area
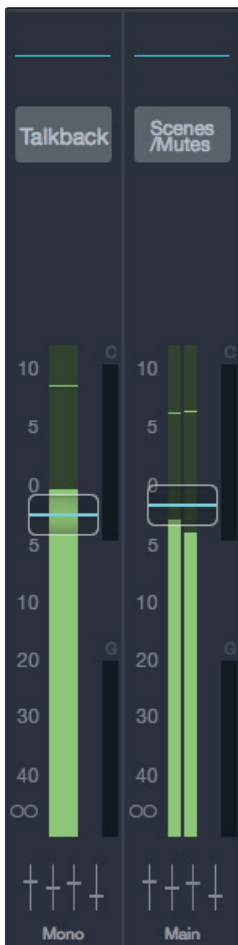
Main Mix Bus. This area contains the channel strips for the Mono/Center and Main Left and Right outputs, which offer the following features and functions.

EQ Micro View. This displays the current EQ curve and opens the Fat Channel for the mix bus.

Talkback Button. Switches the Talkback feature on and off. Refer to Talkback for more information.

Scenes/Mutes. Displays the Mix Scenes and Mute Groups in the Fat Channel area.

Main Mono/Center Channel Strip. Displays the fader and level meter for the Main Mono mix bus.

Main Left/Right Channel Strip. Displays the fader and level meter for the Main Left/Right mix bus.

John IEM	Main	
Bass	FX A	FX B
Noah	FX C	FX D
Declan IEM		
Ray		
Scott	Select Talkback Routes	
Brian		
Jim		
John IEM		
Rick IEM		
Delay Fill		
Mix 16		
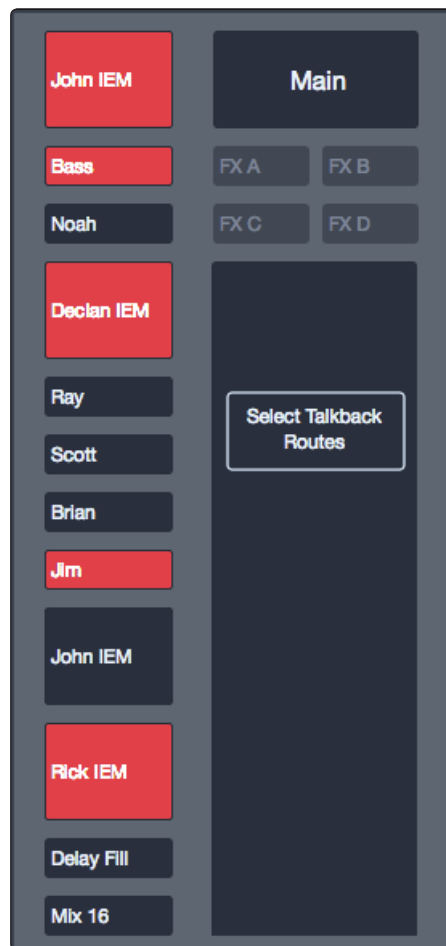
Talkback. This feature lets you communicate with the performers on stage or in the studio, and offers the functions listed below for configuring and operating it:

> **Talk.** Holding this button down enables Talkback and highlights the mixes that are receiving the signal until the button is released. Clicking or tapping this button does the same thing until it's clicked or tapped a second time.
>
> When Talkback is active, you can click on any of the Mix Select buttons to choose the Talkback routing.

5.7 Fat Channel

The UC Surface Fat Channel offers a noise gate/expander, compressor, limiter, and EQ, as well as input settings, A/B settings function (for the EQ, noise gate/expander, and compressor), and access to the Fat Channel presets.

This section explains the various functions and settings offered by the Fat Channel.

A Note for iPad Users: The iPad version of the Fat Channel is arranged so that the noise gate/expander and compressor are on the Dynamics page (DYN), while the EQ is on a page of its own (EQ). You can switch between the pages by tapping the EQ and DYN tabs, located on the right edge of the Fat Channel.

Parameter Boxes. UC Surface features a better way of viewing adjusting parameters compared with traditional knobs that mimic hardware controls. Its Parameter Boxes display the parameter name, a meter with the current setting, and numeric value. When you touch or click and hold on a Parameter Box, a slider will appear under your finger or mouse that is centered on the current value position. Move you finger or mouse to adjust the parameter and then release to snap the slider back and view the full Parameter Box again.

You can also open the slider by pressing and releasing the Parameter Box. When done this way, you can then move the slider value in relation to where you touch in the slider area. Pressing outside the slider area will close the slider and return to the full Parameter Box view.

5.7.1 Channel Settings

Channel Name. This is the name of the mixer channel you're working with and is based on the name of the icon you've selected when setting the Channel Type or the custom name you've given the channel. (See Channel Type in the next section.)

Channel Info. This opens the Channel Options view, which is where you can configure the following information for the selected mixer channel:
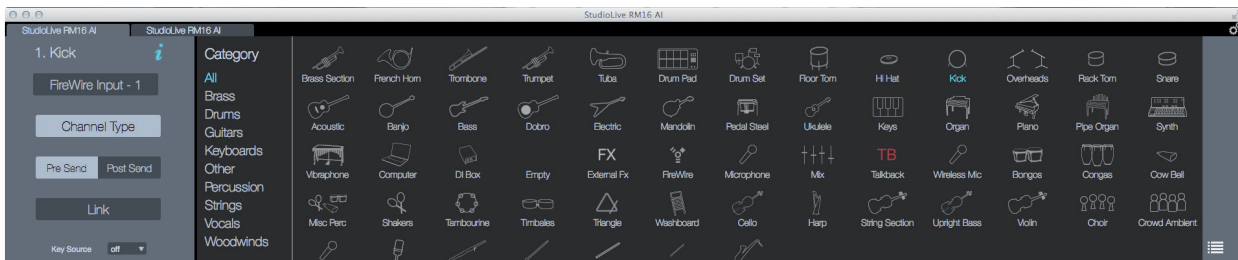
Channel Type. The Channel Type enables you to choose an icon to help you visually identify the instrument or signal type that's on the selected channel: Snare, Kick Drum, DI Box, Piano, etc.

The name of the icon is displayed as the Channel Name, which can be edited at any time.

Selecting a Channel Type will "tag" that channel with the associated category type (Drums, Guitars, Other). This tagging will filter the Fat Channel presets to only show what's relevant to the selected Channel Type. It will also automatically create a Filter DCA or add the channel to the automatically created Filter DCA for that category type.

Channel Tagging. In addition to setting the channel icon and name, selecting a Channel Type "tags" the channel, which lets you filter things like presets so that only common or relevant channel types are shown.

Source Select. This is used for selecting the (input) signal source. For example, you can choose the local analog mic input, or a digital input from the FireWire card.

Digital Pre/Post Send. This selection switches the digital send for the selected channel between pre-and post-Fat Channel.

Channel Link . This feature gives you the ability to link the selected channel to an adjacent channel. If the selected channel is an odd-numbered channel (1, 3, 5…), linking will occur with the next even-numbered channel. If the selected channel is an even channel (2, 4, 6…), linking will occur with the previous odd channel.

Key Input Source. This drop-down menu selects the available sound source that will trigger the sidechain input and open the gate.

Note: *Once you've set up the Channel Options, the information is saved within the StudioLive RM mixer hardware and is made available to any software application that's controlling the mixer.*

5.7.2   Channel Input

Preamp. This adjusts the preamp level (input gain) for the selected channel.

+48V Button. When active, this button provides 48V phantom power for the microphone input on the selected channel.

⚠ **WARNING:** Phantom power is required for condenser microphones but can severely damage some dynamic mics, especially ribbon mics. Therefore, switch phantom power off for all channels where it is not required.

Power User Tip: *Dynamic and ribbon microphones are generally lower-output devices that require no external power source. In fact, unless a ribbon microphone calls specifically for phantom power, sending phantom power to it can cause severe damage. Condenser microphones are generally more sensitive than dynamic and ribbon microphones and typically require external +48V phantom power. Always review your microphone's documentation to ascertain the manufacturer's recommended operating practices.*

Polarity Button. Push this button to invert the polarity of the selected channel's signal (that is, to alter the polarity by 180°). The button will illuminate, indicating that Polarity Invert is active. This button can be used to correct audio signals that are out of phase and are canceling/reinforcing each other.

Power User Tip: *When recording with more than one open microphone, use the polarity invert to combat phase cancellation between them.*

Bus Assignment. This section has buttons for routing the channel to the Main (L/R) and Mono (Center) output channels, using On or Off settings for each of them.

Power User Tip: *StudioLive RM-series main outputs (XLR stereo and XLR mono) let you use Left/Center/Right panning (LCR). If you want to use LCR panning, select LCR as the Pan mode in the settings in UC Surface, and bus the channel to both the main L/R and Center outputs. If you want it to use normal LR stereo panning on a channel, just route it to the L/R outputs.*

On the other hand, if you want to use a subwoofer in addition to the speakers that are connected to the Main L/R outputs, leave the panning mode in LR and route the channels you want sent to the subwoofer to the Mono bus (Mono output). You can then use the Low Pass Filter that's available on the Mono bus Fat Channel to dial in your desired high-frequency cutoff point.

5.7.3   Fat Channel Processing

Noise Gate/Expander. The noise gate/expander offers the following features:
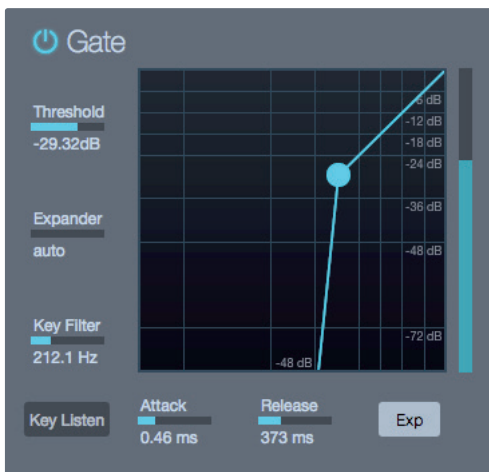
On/Off Button. This turns the gate on and off for the selected channel.

Threshold . This slider sets the level at which the gate opens. Essentially, all signals above the threshold setting are passed through unaffected, whereas signals below the threshold setting are reduced in level by the amount set by the range control. If the threshold is set all the way to the left, the gate is turned off (always open), allowing all signals to pass through unaffected. You can set the threshold from 0 to -84 dB.

Range. This adjusts the amount of gain reduction the gate produces. The range can be set from 0 to -84 dB.

The Range control is not available when using the expander.

Key Filter. This slider adjusts the frequency at which the gate will open. Setting a specific frequency, in addition to a specific decibel level, provides more sonic shaping.

The key filter can be triggered by the selected channel or bus's signal or by sidechaining a channel and using its signal as the source.

Power User Tip: *A properly set key filter on a gate can greatly improve the overall sound quality of a mix. For example, if you are inserting a gate on a snare-drum mic, you may get enough bleed from the kick drum to open the gate. This is where a key filter can come in handy. By setting the key filter to remove some of those low frequencies, the gate won't be as apt to open for the kick drum.*

Key Listen. This button engages and disengages the Key Listen function, which lets you hear how the gate Key Filter is set.

Attack. This adjusts the rate at which the gate opens on the selected channel or output. You can set the attack time from 0.02 to 500 ms.

Power User Tip: A fast attack rate is crucial for percussive instruments. Slow-rising signals such as vocals and bass guitar require a slower attack; with these signals, a faster attack can cause an audible click. All gates have the ability to click when opening but a properly set gate will never click.

Release. Adjusts and displays the rate at which the gate closes on the selected channel. The release time can be set from 0.05 to 2 seconds.

Power User Tip: Gate-release times should typically be set so the natural decay of the instrument or vocal is not affected. Shorter release times help clean up noise in a signal but may cause "chattering" with percussive instruments. Longer release times usually eliminate chattering and should be set by listening carefully for the most natural release of the signal.

Expander Button (Exp). Turns the noise gate into an expander.

Power User Tip: In practice, expanders and noise gates are used almost identically. The main difference is that an expander is smoother and more gradual so that it is easier to set the attack and release times correctly.

Interactive Graph. This graph provides a visual representation of the settings and current activity of the gate. You can also adjust the setting by moving the blue dots to adjust the Threshold and Range.

5.7.4 Compressor

The Compressor offers the following controls:
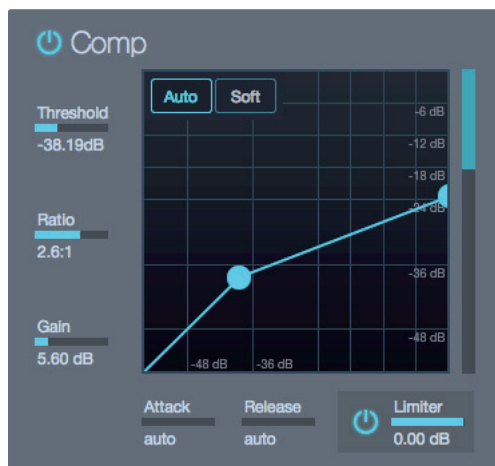
On/Off Button. This turns the compressor on and off on the selected channel.

Threshold. This slider adjusts the compressor threshold for the selected channel. The compressor engages as soon as the signal level (amplitude) exceeds the threshold value. Moving this control to the left lowers the threshold so that compression begins at a lower amplitude value. The threshold can be set from -56 to 0 dB.

Ratio. This slider adjusts the compression ratio (or slope) for the selected channel. The ratio is a function of the output level versus the input level.

For example, if you have the ratio set at 2:1, any signal levels above the threshold setting will be compressed at a ratio of 2:1. This means that for every 2 dB of level increase above the threshold, the compressor's output will only increase 1 dB. The ratio can be set from 1:1 to 18:1 or "limit" which is the equivalent of infinity:1.

Attack. This adjusts the speed at which the compressor acts on the input signal. A slow attack time (moving the slider to the right) allows the beginning component of a signal (commonly referred to as the initial transient) to pass through, uncompressed, whereas a fast attack time (fully to the left) triggers compression immediately when a signal exceeds the threshold. You can set the attack from 0.2 to 150 milliseconds.

Release. This determines the length of time the compressor takes to return the gain reduction back to zero (no gain reduction) after crossing below the compression threshold. Release can be set from 2.5 to 900 milliseconds.

Power User Tip: Very short release times can produce a choppy or "jittery" sound, especially when compressing low-frequency instruments such as bass guitar. Very long release times can result in an over-compressed, or "squashed," sound. All ranges of release can be useful, however, and you should experiment to become familiar with different sonic possibilities.

Makeup Gain. This sets and displays the makeup gain of the compressor for the selected channel.

Compressing a signal usually results in an overall reduction in level (gain reduction), and the Makeup Gain control lets you increase the volume to make up for this gain loss, if desired. You can adjust the Makeup Gain from 0 dB (no gain adjustment) to +28 dB.

Auto Mode Button. This enables Automatic Attack and Release mode.

When Auto mode is active, the Attack and Release controls become inoperative, and a preprogrammed attack and release curve is used that sets the attack to 10 ms and the release to 150 ms. Meanwhile, all other compressor parameters can still be adjusted manually.

Soft Knee Button. This engages soft-knee compression. In normal operating mode, the compressor is set for hard-knee compression, meaning the gain reduction applied to the signal occurs as soon as the input signal level exceeds the threshold value. When the Soft Knee button is engaged, the ratio increases gradually as the signal reaches the threshold.

Interactive Graph. This graph provides a visual representation of the settings and current activity of the compressor. You can also adjust the setting by moving the blue dot to change the Threshold and Ratio values.

5.7.5   Limiter

The limiter stops the signal from passing above a set threshold. This can help prevent clipping or allowing a channel to get too loud in the mix.

On/Off Button. This turns the limiter on and off on the selected channel.

Threshold. Sets and displays the threshold of the limiter on the selected channel.

This slider adjusts the limiter threshold for the selected channel. The limiter engages as soon as the signal level (amplitude) exceeds the threshold value. Moving this control to the left lowers the threshold so that limiting begins at a lower amplitude value. The threshold can be set from -28 to 0 dB.

5.7.6   Parametric EQ

The Fat Channel EQ offers the following features:

On/Off Button. This button globally switches all EQ bands on or off and illuminates to indicate that the equalizer is active.

High/Low Shelf Button. This button turns Shelving mode on or off for the High and Low bands. When the Shelf button is engaged, the associated High or Low frequency section is switched from being a parametric EQ to a shelving EQ.

Low, L-Mid, H-Mid, High Band Buttons. These buttons select which EQ band is being controlled by the Frequency, Gain, and Q Parameter Boxes.

Frequency. This slider selects the center frequency of currently selected band.

You can adjust the center frequency in the following ranges for each band:

Low Band: 36 to 465 Hz

Low-Mids: 90 Hz to 1.2 kHz

Hi-Mids: 380 Hz to 5 kHz

Highs: 1.4 to 18 kHz

Gain. This slider boosts and attenuates the selected frequency with a range of -15 to +15 dB.

Q. This adjusts the Q value for the selected frequency band.

The Q is the ratio of the center frequency to the bandwidth. When the center frequency is constant, the bandwidth is inversely proportional to the Q, so as you raise the Q, you narrow the bandwidth. Hence, the smaller the number, the wider the curve.

HPF (High-Pass Filter). This slider sets the High-Pass Filter frequency, with a range of 24 Hz to 1 kHz. You can switch the filter off by setting it all the way to the left.

The High-Pass Filter's slope is -12 dB/octave.

LPF (Low-Pass Filter) – Mono/Center Channel. This slider sets the Low-Pass Filter frequency for the Mono/Center channel, with a range of 100 Hz to 20 kHz. You can switch the filter off by setting it to the far left.

The Low-Pass Filter's slope is -12 dB/octave.

Interactive Graph. This graph provides a visual representation of the current settings. You can change the settings by moving the blue dots to adjust the frequency and gain at the same time.

The first time you touch a dot, the associated band will automatically turn on. Tapping or clicking a dot will turn the band on and off.

EQ/Dyn A/B Button. This button is used for switching between, or comparing two different Fat Channel settings. When you first switch from A to B, the B version will have the same settings as A. Once the settings are changed you will have two different Fat Channel settings to switch between.

Note: *On the iPad, the A/B button can be found in the Channel Presets view. See Preset List/Editor Button for more details.*

5.7.7   Preset List/Editor Button

This button lets you access the Fat Channel presets, as well as the features for loading, saving, auditioning, and copying them.

For more information about how these tasks are performed, *refer to **Working With Presets** in section 5.8*.
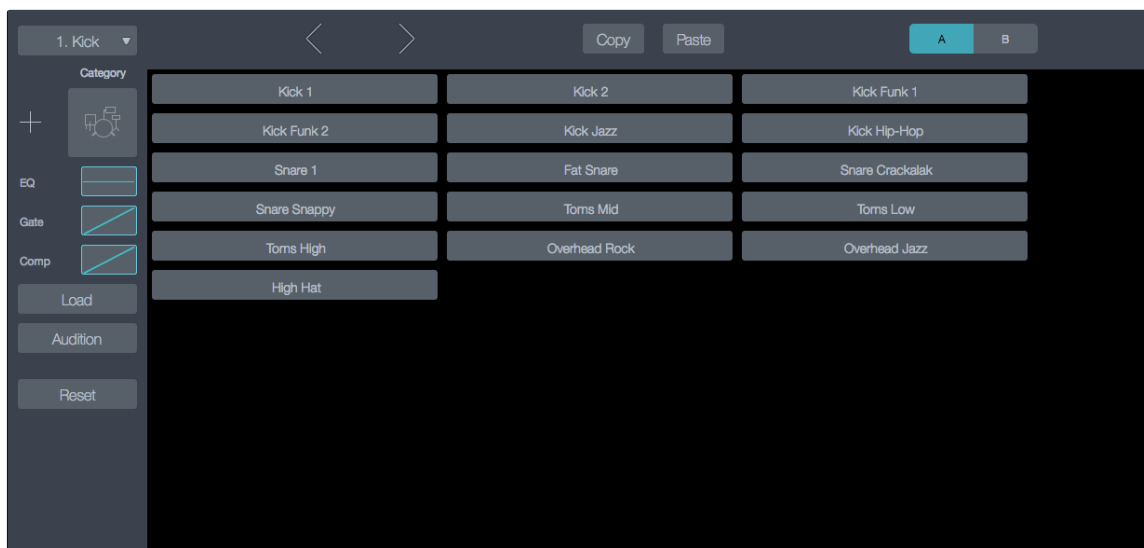
Selected Channel. The currently selected channel will be displayed on the left of the Preset view. This makes it easy to make quick adjustments as you're changing presets.

Channel Selection. Displays the currently selected mixer channel. Click or touch this area for a list of channels that you can select and "jump" to.

Previous/Next Channel Buttons. These select the previous or next channel.

Copy. Copies the current settings.

Paste. Pastes the copied settings to the currently selected channel.

A/B Button. This button is used for switching between, or comparing, two different Fat Channel settings. When you first switch from A to B, the B version will have the same settings as A. Once you have changed the settings, you can switch between the two different Fat Channel settings.

Close Button. Closes the Preset Editor.

Category Icon. This filters the preset list based on the Channel Type categories. The list will automatically filter based on the selected Channel Type. You can also manually change the category to view a different type, or to view all presets, by selecting the icon and choosing a new option from the list.

Add Preset +. Saves the current settings to the selected preset slot.

EQ Micro View. Switches the Load Filter for the EQ on and off, which determines whether or not the current EQ setting will be overwritten.

Gate Micro View. Switches the Load Filter for the noise gate on and off, which determines whether or not the current gate setting will be overwritten.

Compressor Micro View. Switched the Load Filter for the compressor on and off, which determines whether or not the current compressor setting will be overwritten.

Load Button. This button loads a preset that you've chosen from the Preset List.

Audition Button. This lets you audition (try out) a preset before loading it and overwriting the current settings. While in Audition mode, selecting a preset will immediately change the Fat Channel settings to reflect the preset. If you like what you hear, press Load to write the preset to the channel. If you want to change a setting, simply change it in the Fat Channel and then press Load to load the preset with your changes. If you don't like what you hear, press Audition again to exit Audition mode and return to your previous Fat Channel settings.

Reset. This resets the select Fat Channel to the factory default settings.

Preset List. Displays the list of available presets.

5.7.8   Graphic EQ
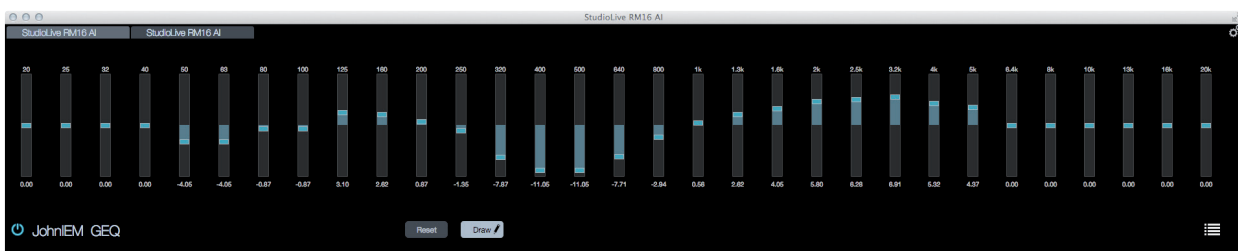
UC Surface offers graphic EQs for the first 12 mix buses, the Main Left/Right bus, and the Mono output bus.

To open a graphic EQ (GEQ), click or tap the GEQ button in the Flex Fader for the selected Mix bus.

Note: *the Main L/R and Mono GEQs are both located in the same GEQ view. A button for Main and Mono switches between the GEQs for the Main L/R and Main Mono buses.*

On/Off Button. This turns the GEQ on and off for the selected channel.

Name. This displays the Channel Name for the GEQ.

31 Bands. Each instance of the GEQ offers 31 bands, ranging from 20 Hz to 20 kHz that are boosted or cut using a slider for each band.

Gain Value. Each slider has its own Gain Value display located immediately below, which displays the current value in decibels (dB).

Reset. This flattens the EQ curve by resetting all the sliders to 0 dB.

Draw. This switches the graphic EQ to Draw mode, which lets you draw an EQ curve using your mouse, or finger.

Preset List/Editor Button. This button lets you access the list of graphic EQ presets, as well as the features listed below for loading, saving, auditioning, and copying them.

For more information about how these tasks are performed, *refer to refer to* **Working With Presets** *in section 5.8.*

Mix Selection. Displays the currently selected mix. Click or touch this area for a list of mixes that you can select and "jump" to.

Copy. Copies the current settings.

Paste. Pastes the copied settings to a selected channel.

Close Button. Closes the Preset Editor.

Add Preset +. Saves the current settings to the selected preset slot.

Load Button. This button loads a preset that you've chosen from the Preset List.

Audition Button. This lets you audition (try out) an existing preset before loading it and overwriting the current settings. While in Audition mode, selecting a preset will immediately change the GEQ settings to reflect the preset. If you like what you hear, press Load to write the preset to the channel. If you want to change a setting, simply change it in the GEQ and then press Load to load the preset with your changes. If you don't like what you hear, press Audition again to exit Audition mode and return to your previous GEQ settings.

Preset List. This displays the current or active preset and provides a list of other available presets.

5.7.9 Effects
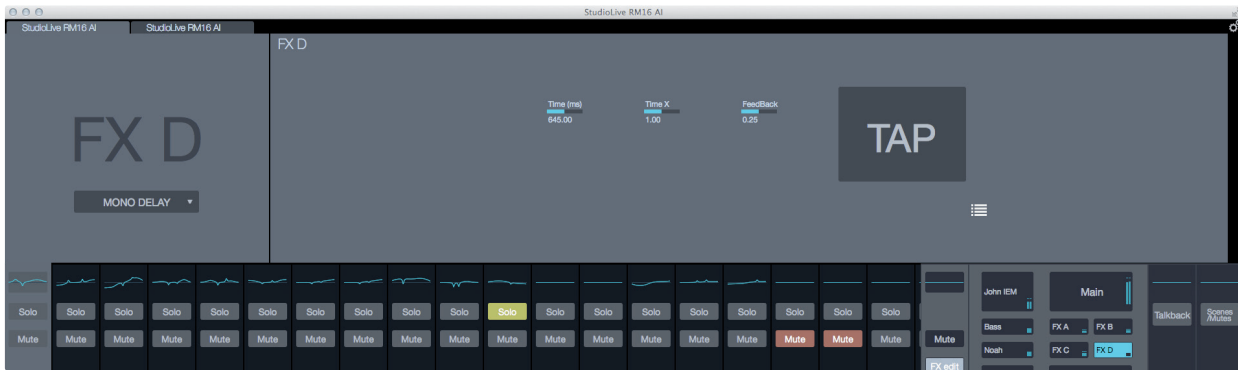
Effects (FX) Editor. UC Surface offers two reverbs and two delays, which can be accessed and edited using the FX Editor by clicking or tapping the FX Edit button in the selected FX Flex Channel.

When the FX Editor opens, you'll find the following features functions:

FX Label. This displays the current Effects Label (A, B, C, or D).

You'll find the reverbs under FX A and B and the delays under FX C and D.

FX Type Menu. This displays the current Effect Type, and lets you choose from the list of available options:

REVERBS	DELAYS
Ambiance	Mono Delay
Small Room	Filter Delay
Bright Room	Stereo Delay
Small Hall	Ping Pong Delay
Bright Hall	
Warm Hall	
Gated Hall	
Large Hall	
Plate	

FX Parameters. The following parameters are available based on the type of effect you've selected from the Preset list:

Reverb Parameters

Decay. The time (in seconds) required for the reflections (reverberation) to die away.

Predelay. This is the time (in milliseconds) between the end of the initial sound and the moment when the first reflections (reverb) are heard.

Adjusting the predelay changes the apparent size of the room without having to change the overall decay time. This gives your mix a little more transparency by leaving space between the original sound and its reverb.

Early Reflections. Early reflections are those that reach the listener a few milliseconds after the direct signal, and your brain uses them to identify the size of the room you're in.

If you're trying to simulate a specific type of room, this parameter is extremely important because it lets you set the level (in decibels) of the early reflections. The louder the early reflections, the smaller the room will seem.

The following list shows the available parameters for different reverb types:

Gated Halls and Plate reverbs: Decay and Predelay

General Halls and Rooms: Decay, Predelay, and Early Reflection

Ambience: Decay

Delay Parameters

Time. The amount of time (in milliseconds) between the source signal and its echo.

The simplest delay effect is a single repeat. A short delay between 30 and 100 ms can be used to create slap-back echo, while longer delay times produce a more distant echo.

Delay times that are too short to hear as distinct echoes can be used to create thickening effects. Whether these echoes are timed with the tempo is a matter of stylistic choice.

Tap Tempo (TAP). This lets you adjust the delay time to match the song tempo by tapping it in time to the music.

Time X. The value of the beat (note length) you're using as a tempo reference.

The basic note value is a quarter note, so for example, if the beats you're tapping represent quarter notes in the music, you would set Time X to 1.00. If they are eighth notes, you would set Time X to 0.50, half notes would be 2.00, and so on. In this way, you can precisely synchronize or syncopate the delay echoes to the music in real time.

Note: The Stereo Delay offers two Time X controls. With the Ping Pong delay, the Pong X parameter serves the same purpose.

Feedback. This produces multiple decaying repeats. Increasing the feedback value increases the number of echoes, as well as the resonance that is created as one echo disappears into another.

F_Frequency. Sets the center frequency in Hz for the Filter Delay.

F_Gain. Sets the boost at the center frequency for the Filter Delay.

F_Q. Sets the Q for the Filter Delay, which is the ratio of the center frequency to the bandwidth. When the center frequency is constant, the bandwidth is inversely proportional to the Q, so as you raise the Q, you narrow the bandwidth.

Left-Right (L-R) Spread. This set the width of the stereo image taken up by the repeats when using a Stereo or Ping Pong delay.

The following list shows the available parameters for different delay types:

Mono Delay: Time (ms), Time X, and Feedback

Filter Delay: Time (ms), Time X, Feedback, F_Frequency, F_Gain, and F_Q

Stereo Delay: Time (ms), Time1 X, Time2 X, Feedback1, Feedback2, F_Frequency, L-R Spread

Ping Pong Delay: Time (ms), Pong1 X, Pong2 X, Feedback1, Feedback2, F_Frequency, L-R Spread

[Image: UC-Surface_FXPresets]

Preset List/Editor Button. This button lets you access the list of FX presets, as well as the features listed below for loading, saving, auditioning, and copying them.

For more information about how these tasks are performed, *refer to Working With Presets in section 5.8*.

Mix Selection. Displays the currently selected mix. Click or touch this area for a list of mixes that you can select and "jump" to.

Copy. Copies the current settings.

Paste. Pastes the copied settings to a selected effect.

Close Button. Closes the Preset Editor.

Add Preset +. Saves the current settings to the selected preset slot.

Load Button. This button loads a preset that you've chosen from the Preset List.

Audition Button. This lets you audition (try out) a preset before loading it and overwriting the current settings. While in Audition mode, selecting a preset will immediately change the FX settings to reflect the preset. If you like what you hear, press Load to write the preset to the channel. If you want to change a setting, simply change it in the effect and then press load to load the preset with your changes. If you don't like what you hear, press Audition again to exit Audition mode and return to you previous FX settings.

Preset List. This displays the current or active preset and provides a list of other available presets.

5.8   Working With Presets

To help simplify things, UC Surface uses common workflows for saving, loading, auditioning, and copying Fat Channel, FX, and graphic EQ presets, as described below.

Saving Presets

To save a preset:

1.   Select the preset slot to which you would like to save.

2.   Click or tap the Add Preset button (+).

Loading Presets

To load a preset:

1.   Select a preset from the Preset List.

2.   If you're loading a Fat Channel preset, and you want to prevent the current noise gate, compressor, or EQ settings from being changed, click or tap the corresponding Micro View button.

3.   Click or tap the Load Preset button.

Auditioning Presets

To audition a preset:

1.   Click or tap the Audition button.

2.   Select the preset you would like to audition.

You can exit Audition mode by doing one of the following things:

A.   Clicking or tapping the Audition button again. This returns the parameters to their "pre-Audition" values.

B.   Clicking or tapping the Load button. The Audition button is deactivated, and the Preset will be loaded.

Copying and Pasting Presets

To copy and paste a preset:

1.   Click or tap the Copy button.

2.   If you're copying a Fat Channel preset, and you want to prevent the current noise gate, compressor, or EQ settings from being pasted, click or tap the corresponding Micro View button.

3.   Select a destination channel for the copied preset by clicking or tapping the Previous or Next button or by selecting another channel from the Channel Selection list.

4.   Click or tap the Paste button.

5.   Repeat steps 3 and 4 as needed.

5.9   Mix Scene Quick Recall

UC Surface touch-control software lets you create and store up to eight snapshots of your mix. These mix scenes include each Fat Channel parameter for every input and bus, the position of every fader, the aux and effects mixes, channel mutes, solos, and input selection (analog input or digital playback stream).
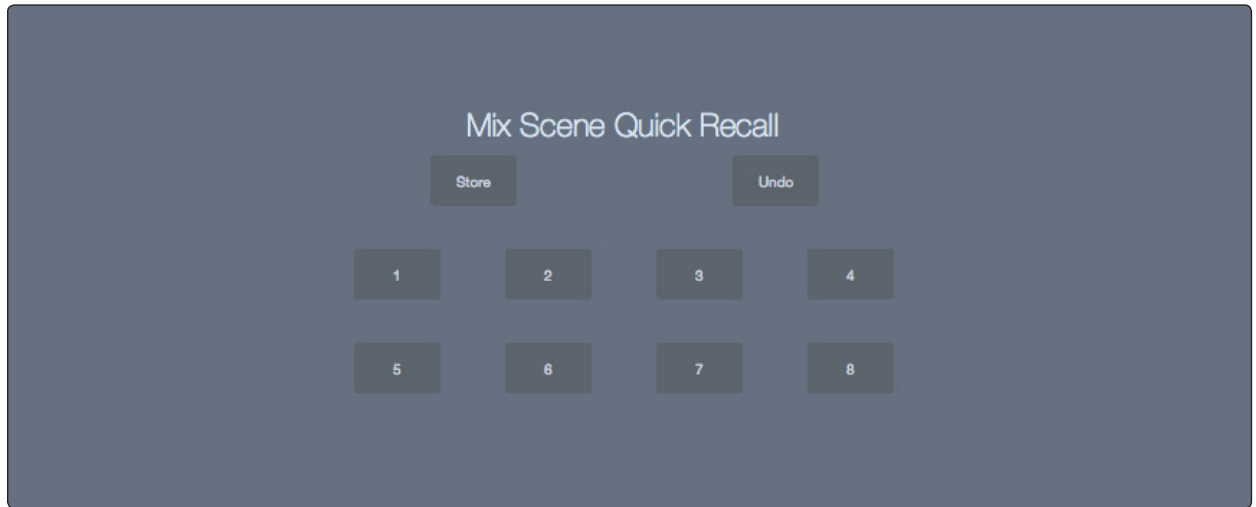
Mix Scene Quick Recall Functions. The Mix Scene window includes the following functions for creating storing and recalling your mix scenes:

Store. This button allows you to store the current mixer settings as a mix scene.

Undo. Reverses the last mix scene recall.

Mix Scene Buttons. These buttons represent the memory locations where mix scenes are stored, and recalled from.

[Image: UC-Surface_ScenesManager]

Scene Manager Button. This button lets you access the list of scenes, as well as the features listed below for loading, saving, and filtering them.

Add Scene. Saves the current mixer scene to the scene slot currently selected in the scene list. If the slot is empty, you'll be prompted to name the scene. If a scene is already there, you'll be presented with options to overwrite the scene or cancel.

Load Scene. Loads the currently selected scene from the scene list.

Scene List. Displays the available scenes and empty scene slots for the mixer.

Scene Filters. These buttons allow you to filter what is overwritten when loading a scene. If the button is on, those items will be loaded. If the button is off, they will be filtered out and not loaded.

Close Button. Closes the Scene Manager.

Creating a Mix Scene. Once you have mixer settings that you'd like to keep and recall later, you can store them by following the steps listed below:

1. Click or tap the Store button.

2. Choose the Mix Scene location you'd like to store the scene in by clicking or tapping one of the Mix Scene buttons.

To recall (or load) a mix scene, click or tap the corresponding Mix Scene button.

5.10   Mute Groups

A Mute Group mutes and unmutes multiple channels and buses with the press of a single button.
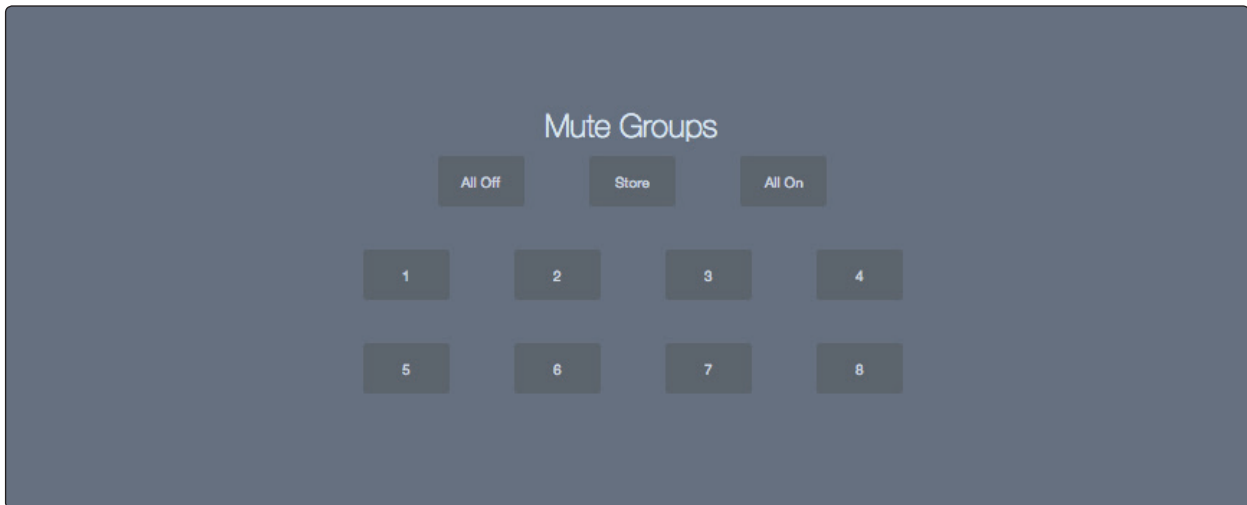
With the eight Mute Groups in UC Surface, you could, for example, assign the drum mics to Mute Group 1, the instrumentalists to Mute Group 2, the background vocalists to Mute Group 3, all the aux buses to Mute Group 4, and FX buses to Mute Group 5.

Then you can mute all of the drum mics with one button. When the lead singer is introducing the band, you can mute all effects assigned to his vocal. If the band goes on break, you can mute all channels at once. And when it's time to break down the stage and start unplugging things, you can just lower the main fader and mute all stage monitors with one button.

Mute Group Functions. The Mute Group window includes the following functions for creating storing and recalling Mute Groups:

> **All Off Button.** This button turns off all Mute Groups, and all muted channels become "unmuted."

> **Store Button.** This button allows you to store the current mute selections as a Mute Group.

> **All On Button.** This button mutes every channel and bus with a Mute button. Pressing it again "unmutes" them.

Creating a Mute Group. Once you've muted the channels and buses you'd like to save as a Mute Group, you can store this configuration by following the steps listed below:

1. Click or tap the Store button.

2. Choose the Mute Group location you'd like to store the scene in by clicking or tapping one of the Mute Group buttons.

To recall (or load) a Mute Group, click or tap the corresponding Mute Group button.

6   Resources

6.1   Stereo Microphone Placement

The following are a few recording applications to help you get started with your StudioLive. These are by no means the only ways to record these instruments. Microphone selection and placement is an art. For more information, visit your library or local bookstore, as there are many books and magazines about recording techniques. The Internet is also a great source of recording information, as are instructional videos. Some of these microphone-placement suggestions can be used in live applications, as well as for studio recording.

Grand Piano
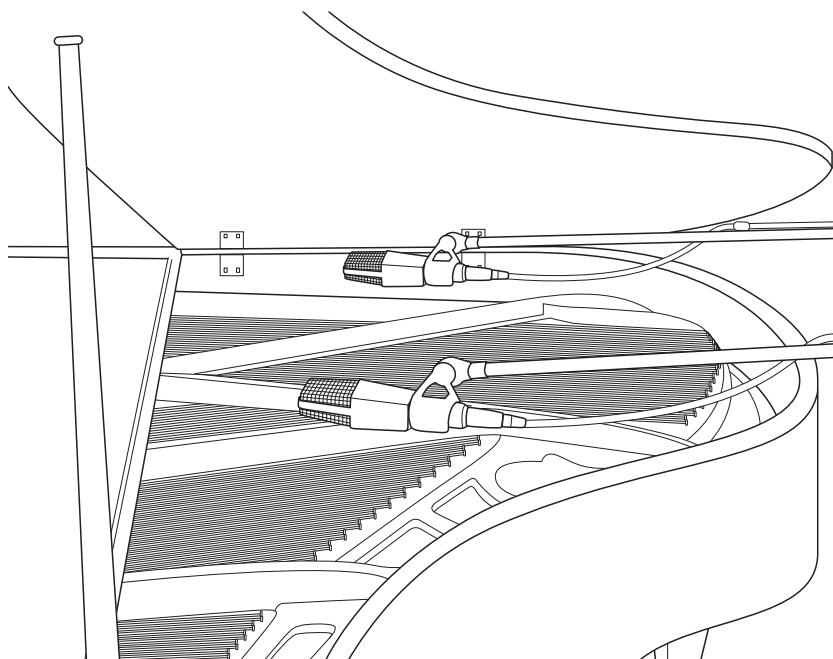
Place one microphone above the high strings and one microphone above the low strings. Experiment with distance (the farther back the more room you will capture). This technique can be used for live and studio applications.

Electric Guitar
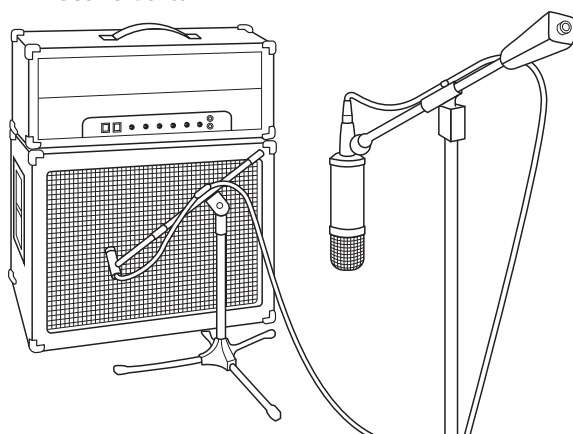
Place a dynamic microphone an inch or two away from the speaker of the guitar amplifier. Experiment with exact location. If you are recording an amp with multiple speakers, experiment with each one to see if one sounds better than the others. Place a condenser microphone approximately six feet away, pointed at the amp. Experiment with distance. Also experiment with inverting the phase of the room microphone to check for phase cancellation and reinforcement. (Select the "fuller"-sounding position.) To use this technique in a live application, omit the condenser microphone.

Acoustic Guitar
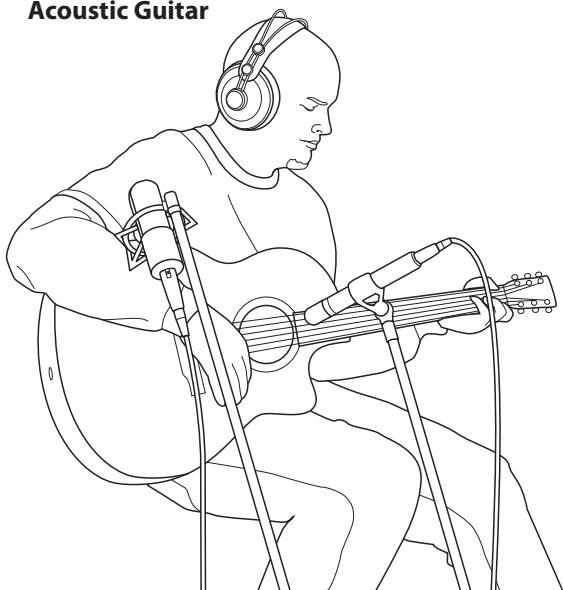
Point a small-diaphragm condenser microphone at the 12th fret, approximately 8 inches away. Point a large-diaphragm condenser microphone at the bridge of the guitar, approximately 12 inches from the guitar. Experiment with distances and microphone placement. Another popular method is using an XY microphone placement with two small-diaphragm condenser microphones. (See drum-overheads picture on the next page.)

Bass Guitar (Direct and Speaker)
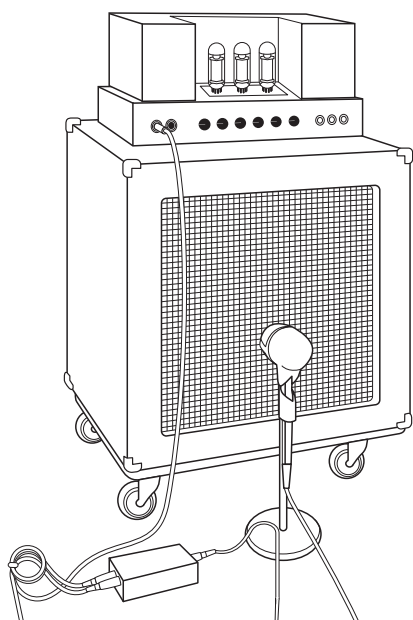
Plug the electric bass guitar into a passive direct box. Connect the instrument output from the passive direct box to a bass amplifier. Place a dynamic microphone an inch or two away from the speaker and connect it to a StudioLive microphone input. Connect the line output from the passive direct box to a line input on a different channel of the StudioLive. For recording, place these signals on separate tracks. During mixing, you can blend the direct and amplifier signal to taste. This technique can also be used in live applications.

Drum Overheads (XY example)
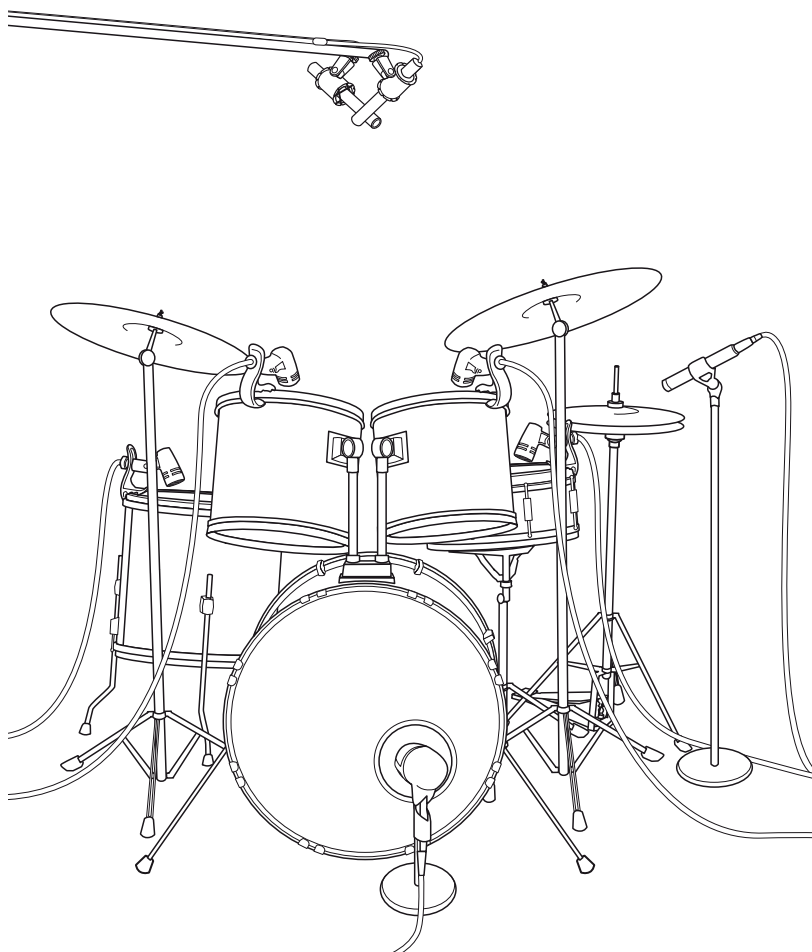
Place two small-diaphragm condenser microphones on an XY stereo-microphone holder (bar). Position the microphones so that each one is at a 45-degree angle, pointed down at the drum kit, approximately 7 or 8 feet above the floor or drum riser. Experiment with height. This technique can be used in live applications as well.

Snare Drum (top and bottom)
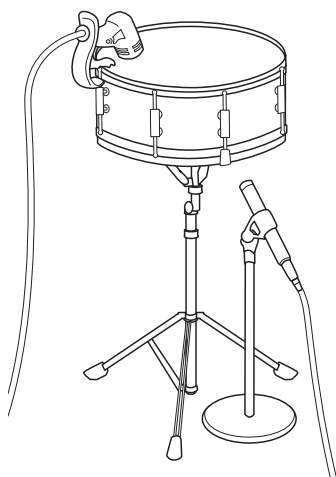
Point a dynamic microphone at the center of the snare, making sure it is placed so that the drummer will not hit it. Place a small-diaphragm condenser microphone under the drum, pointed at the snares. Experiment with the placement of both microphones. Also experiment with inverting the phase of the bottom microphone. This technique can be used in live applications.

6.2   Compression Setting Suggestions

The following are the compression presets that were used in the PreSonus BlueMax. We have included them as a jumping-off point for setting up compression on the StudioLive.

Vocals

Soft. This is an easy compression with a low ratio setting for ballads, allowing a wider dynamic range. It's good for live use. This setting helps the vocal "sit in the track."

THRESHOLD	RATIO	ATTACK	RELEASE
-8.2 dB	1.8:1	0.002 ms	38 ms

Medium. This setting has more limiting than the Soft compression setting, producing a narrower dynamic range. It moves the vocal more up front in the mix.

THRESHOLD	RATIO	ATTACK	RELEASE
-3.3 dB	2.8:1	0.002 ms	38 ms

Screamer. This setting is for loud vocals. It is a fairly hard compression setting for a vocalist who is on and off the microphone a lot. It puts the voice "in your face."

THRESHOLD	RATIO	ATTACK	RELEASE
-1.1 dB	3.8:1	0.002 ms	38 ms

Percussion

Snare/Kick. This setting allows the first transient through and compresses the rest of the signal, giving a hard "snap" up front and a longer release.

THRESHOLD	RATIO	ATTACK	RELEASE
-2.1 dB	3.5:1	78 ms	300 ms

Left/Right (Stereo) Overheads. The low ratio and threshold in this setting gives a "fat" contour to even out the sound from overhead drum mics. Low end is increased, and the overall sound is more present and less ambient. You get more "boom" and less "room."

THRESHOLD	RATIO	ATTACK	RELEASE
-13.7 dB	1.3:1	27 ms	128 ms

Fretted Instruments

Electric Bass. The fast attack and slow release in this setting will tighten up the electric bass and give you control for a more consistent level.

THRESHOLD	RATIO	ATTACK	RELEASE
-4.4 dB	2.6:1	45.7 ms	189 ms

Acoustic Guitar. This setting accentuates the attack of the acoustic guitar and helps maintain an even signal level, keeping the acoustic guitar from disappearing in the track.

THRESHOLD	RATIO	ATTACK	RELEASE
-6.3 dB	3.4:1	188 ms	400 ms

Electric Guitar. This is a setting for "crunch" electric rhythm guitar. A slow attack helps to get the electric rhythm guitar "up close and personal" and gives punch to your crunch.

THRESHOLD	RATIO	ATTACK	RELEASE
-0.1 dB	2.4:1	26 ms	193 ms

Keyboards

Piano. This is a special setting for an even level across the keyboard. It is designed to help even up the top and bottom of an acoustic piano. In other words, it helps the left hand to be heard along with the right hand.

THRESHOLD	RATIO	ATTACK	RELEASE
-10.8 dB	1.9:1	108 ms	112 ms

Synth. The fast attack and release on this setting can be used for synthesizer horn stabs or for bass lines played on a synthesizer.

THRESHOLD	RATIO	ATTACK	RELEASE
-11.9 dB	1.8:1	0.002 ms	85 ms

Orchestral. Use this setting for string pads and other types of synthesized orchestra parts. It will decrease the overall dynamic range for easier placement in the mix.

THRESHOLD	RATIO	ATTACK	RELEASE
3.3 dB	2.5:1	1.8 ms	50 ms

Stereo Mix

Stereo Limiter. Just as the name implies, this is a hard limiter, or "brickwall," setting—ideal for controlling the level to a two-track mixdown deck or stereo output.

THRESHOLD	RATIO	ATTACK	RELEASE
5.5 dB	7.1:1	0.001 ms	98 ms

Contour. This setting fattens up the main mix.

THRESHOLD	RATIO	ATTACK	RELEASE
-13.4 dB	1.2:1	0.002 ms	182 ms

Effects

Squeeze. This is dynamic compression for solo work, especially electric guitar. It gives you that glassy "Tele/Strat" sound. It is a true classic.

THRESHOLD	RATIO	ATTACK	RELEASE
-4.6 dB	2.4:1	7.2 ms	93 ms

Pump. This is a setting for making the compressor "pump" in a desirable way. This effect is good for snare drums to increase the length of the transient by bringing the signal up after the initial spike.

THRESHOLD	RATIO	ATTACK	RELEASE
0 dB	1.9:1	1 ms	0.001 ms

6.3   EQ Frequency Guides

Table 1

Instrument	What to Cut	Why to Cut	What to Boost	Why to Boost
Human Voice	7 kHz	Sibilance	8 kHz	Big sound
	2 kHz	Shrill	3 kHz and above	Clarity
	1 kHz	Nasal	200-400 Hz	Body
	80 Hz and below	Popping P's		
Piano	1-2 kHz	Tinny	5 kHz	More presence
	300 Hz	Boomy	100 Hz	Bottom end
Electric Guitar	1-2 kHz	Shrill	3 kHz	Clarity
	80 Hz and below	Muddy	125 Hz	Bottom end
Acoustic Guitar	2-3 kHz	Tinny	5 kHz and above	Sparkle
	200 Hz	Boomy	125 Hz	Full
Electric Bass	1 kHz	Thin	600 Hz	Growl
	125 Hz	Boomy	80 Hz and below	Bottom end
String Bass	600 Hz	Hollow	2-5 kHz	Sharp attack
	200 Hz	Boomy	125 Hz and below	Bottom end
Snare Drum	1 kHz	Annoying	2 kHz	Crisp
			150-200 Hz	Full
			80 Hz	Deep
Kick Drum	400 Hz	Muddy	2-5 kHz	Sharp attack
	80 Hz and below	Boomy	60-125 Hz	Bottom end
Toms	300 Hz	Boomy	2-5 kHz	Sharp attack
			80-200 Hz	Bottom end
Cymbals	1 kHz	Annoying	7-8 kHz	Sizzle
			8-12 kHz	Brilliance
			15 kHz	Air
Horns	1 kHz	Honky	8-12 kHz	Big sound
	120 Hz and below	Muddy	2 kHz	Clarity
String section	3 kHz	Shrill	2 kHz	Clarity
	120 Hz and below	Muddy	400-600 Hz	Lush and full

Table 2
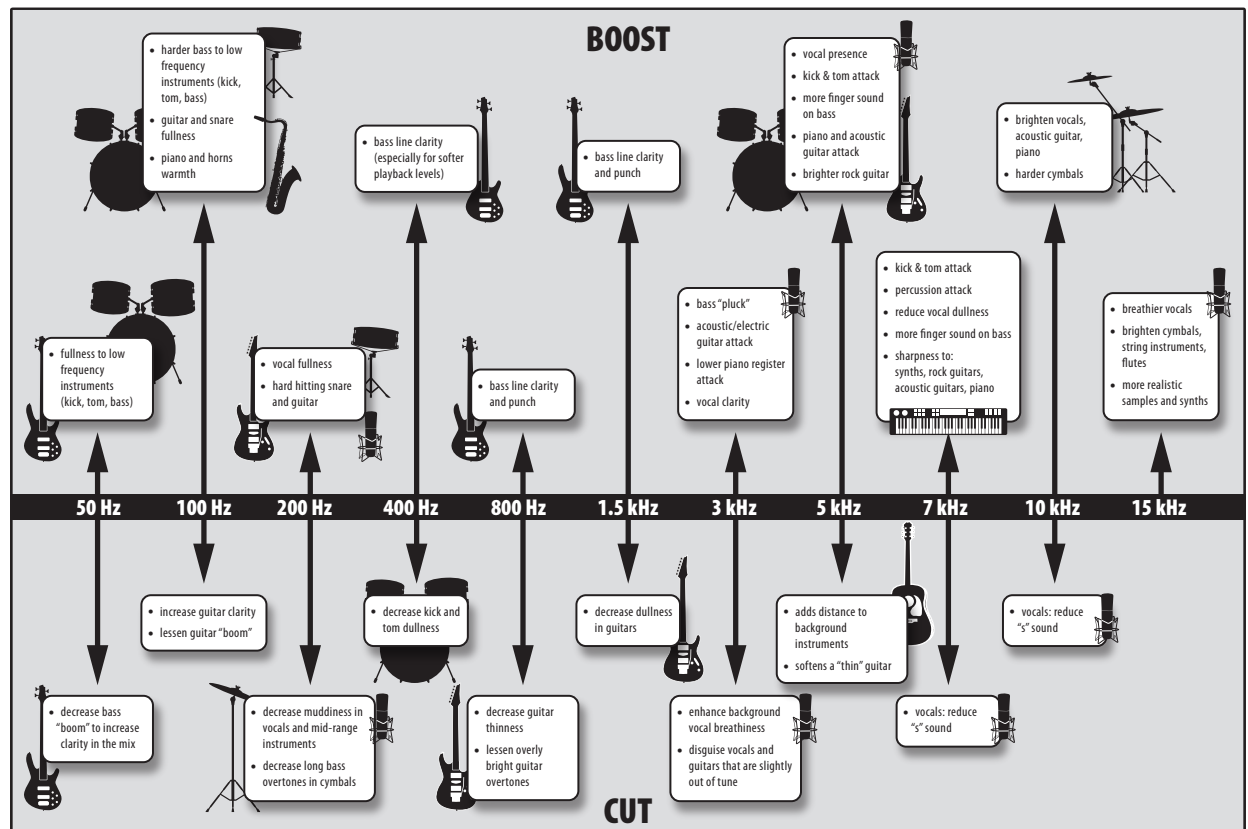
6.4   EQ Setting Suggestions

Studio One Artist includes several EQ plug-ins. For an idea of where to start, check out the following generic EQ settings for several different instruments. The right EQ setting for any given instrument will depend upon the room and the tonality of the instrument.

Vocals

Pop Female Vocals

LOW ON/OFF	LOW SHELF	LOW FREQ (Hz)	LOW Q	LOW GAIN	LOW MID ON/OFF	LOW MID FREQ (Hz)	LOW MID Q	LOW MID GAIN
ON	OFF	130	0.6	-2	ON	465	0.6	-2

HIGH MID ON/OFF	HI MID FREQ (kHz)	HIGH MID Q	HIGH MID GAIN	HIGH ON/OFF	HIGH SHELF	HIGH FREQ (kHz)	HIGH Q	HIGH GAIN
ON	2.4	0.4	+2	ON	OFF	6.0	0.3	+8

Rock Female Vocals

LOW ON/OFF	LOW SHELF	LOW FREQ (Hz)	LOW Q	LOW GAIN	LOW MID ON/OFF	LOW MID FREQ (Hz)	LOW MID Q	LOW MID GAIN
ON	ON	155	N/A	+4	ON	465	0.4	+6

HIGH MID ON/OFF	HI MID FREQ (kHz)	HIGH MID Q	HIGH MID GAIN	HIGH ON/OFF	HIGH SHELF	HIGH FREQ (kHz)	HIGH Q	HIGH GAIN
ON	1.4	0.6	+6	ON	OFF	4.2	0.5	+2

Pop Male Vocals

LOW ON/OFF	LOW SHELF	LOW FREQ (Hz)	LOW Q	LOW GAIN	LOW MID ON/OFF	LOW MID FREQ (Hz)	LOW MID Q	LOW MID GAIN
ON	OFF	225	0.3	-2	ON	960	0.3	0

HIGH MID ON/OFF	HI MID FREQ (kHz)	HIGH MID Q	HIGH MID GAIN	HIGH ON/OFF	HIGH SHELF	HIGH FREQ (kHz)	HIGH Q	HIGH GAIN
ON	2.0	0.6	+2	ON	OFF	7.2	0.5	+4

Rock Male Vocals

LOW ON/OFF	LOW SHELF	LOW FREQ (Hz)	LOW Q	LOW GAIN	LOW MID ON/OFF	LOW MID FREQ (Hz)	LOW MID Q	LOW MID GAIN
ON	OFF	155	0.5	+2	ON	265	0.3	-6

HIGH MID ON/OFF	HI MID FREQ (kHz)	HIGH MID Q	HIGH MID GAIN	HIGH ON/OFF	HIGH SHELF	HIGH FREQ (kHz)	HIGH Q	HIGH GAIN
ON	2.4	0.6	-2	ON	ON	7.2	0.6	+4

Percussion

Snare

LOW ON/OFF	LOW SHELF	LOW FREQ (Hz)	LOW Q	LOW GAIN	LOW MID ON/OFF	LOW MID FREQ (Hz)	LOW MID Q	LOW MID GAIN
ON	OFF	130	0.6	-4	ON	665	0.5	+4

HIGH MID ON/OFF	HI MID FREQ (kHz)	HIGH MID Q	HIGH MID GAIN	HIGH ON/OFF	HIGH SHELF	HIGH FREQ (kHz)	HIGH Q	HIGH GAIN
ON	1.6	0.3	+4	ON	ON	4.2	N/A	+4

Left/Right (Stereo) Overheads

LOW ON/OFF	LOW SHELF	LOW FREQ (Hz)	LOW Q	LOW GAIN	LOW MID ON/OFF	LOW MID FREQ (Hz)	LOW MID Q	LOW MID GAIN
ON	OFF	108	0.6	-2	ON	385	0.6	-2

HIGH MID ON/OFF	HI MID FREQ (kHz)	HIGH MID Q	HIGH MID GAIN	HIGH ON/OFF	HIGH SHELF	HIGH FREQ (kHz)	HIGH Q	HIGH GAIN
ON	2.9	0.3	0	ON	ON	8.0	N/A	+4

Kick Drum

LOW ON/OFF	LOW SHELF	LOW FREQ (Hz)	LOW Q	LOW GAIN	LOW MID ON/OFF	LOW MID FREQ (Hz)	LOW MID Q	LOW MID GAIN
ON	OFF	108	0.4	+4	ON	265	2.0	-4

HIGH MID ON/OFF	HI MID FREQ (kHz)	HIGH MID Q	HIGH MID GAIN	HIGH ON/OFF	HIGH SHELF	HIGH FREQ (kHz)	HIGH Q	HIGH GAIN
ON	1.6	0.6	0	ON	OFF	6.0	2.0	+4

Fretted Instruments

Electric Bass

LOW ON/OFF	LOW SHELF	LOW FREQ (Hz)	LOW Q	LOW GAIN	LOW MID ON/OFF	LOW MID FREQ (Hz)	LOW MID Q	LOW MID GAIN
ON	ON	36	N/A	-8	ON	130	0.4	+4

HIGH MID ON/OFF	HI MID FREQ (kHz)	HIGH MID Q	HIGH MID GAIN	HIGH ON/OFF	HIGH SHELF	HIGH FREQ (kHz)	HIGH Q	HIGH GAIN
ON	2.0	0.6	+4	ON	ON	4.2	N/A	+1

Acoustic Guitar

LOW ON/OFF	LOW SHELF	LOW FREQ (Hz)	LOW Q	LOW GAIN	LOW MID ON/OFF	LOW MID FREQ (Hz)	LOW MID Q	LOW MID GAIN
ON	OFF	155	0.4	+4	ON	665	2.0	+2

HIGH MID ON/OFF	HI MID FREQ (kHz)	HIGH MID Q	HIGH MID GAIN	HIGH ON/OFF	HIGH SHELF	HIGH FREQ (kHz)	HIGH Q	HIGH GAIN
ON	2.0	0.3	0	ON	ON	6.0	N/A	+4

Distorted Electric Guitar

LOW ON/OFF	LOW SHELF	LOW FREQ (Hz)	LOW Q	LOW GAIN	LOW MID ON/OFF	LOW MID FREQ (Hz)	LOW MID Q	LOW MID GAIN
ON	OFF	320	0.5	+6	ON	960	0.4	0

HIGH MID ON/OFF	HI MID FREQ (kHz)	HIGH MID Q	HIGH MID GAIN	HIGH ON/OFF	HIGH SHELF	HIGH FREQ (kHz)	HIGH Q	HIGH GAIN
ON	3.5	1.0	+4	ON	ON	12	N/A	0

Keyboards

Piano

LOW ON/OFF	LOW SHELF	LOW FREQ (Hz)	LOW Q	LOW GAIN	LOW MID ON/OFF	LOW MID FREQ (Hz)	LOW MID Q	LOW MID GAIN
ON	ON	108	N/A	-2	ON	665	0.2	+2

HIGH MID ON/OFF	HI MID FREQ (kHz)	HIGH MID Q	HIGH MID GAIN	HIGH ON/OFF	HIGH SHELF	HIGH FREQ (kHz)	HIGH Q	HIGH GAIN
ON	2.9	0.4	+2	ON	OFF	7.2	0.6	+4

7.0   Technical Specifications

7.1   Computer system requirements:

Below are the minimum computer-system requirements for UC Surface.

Apple iPad

- iPad Air, iPad mini with Retina display, iPad (4th generation), iPad mini, iPad (3rd generation), or iPad 2

- iOS 7.03 or later

Mac

- Mac® OS X 10.8 64-bit or later

- Intel® Core 2 Duo processor (Intel Core i3 or faster recommended)

- 4 GB RAM (8 GB or more recommended)

Windows

- Windows® 7 x64/x86 SP1, Windows 8 x64/x86

- Intel Core 2 Duo processor (Intel Core i3 or faster recommended)

- 4 GB RAM (8 GB or more recommended)

Mac and Windows Systems

- Wired or wireless network connection

- Internet connection

- For Capture and Studio One:

- FireWire S800 (IEEE 1394b) port

- Internal or external 7200 RPM storage drive highly recommended

- Monitor with 1280x800 resolution

Note that the speed of your processor, amount of RAM and size and speed of your hard drive will greatly affect the overall performance of your recording system. Also, a more powerful system (faster processor with more RAM) will allow for lower latency (signal delay) than you might experience while monitoring audio or MIDI signals.

7.2   RM16 AI and RM32 AI Technical Specifications

	RM16AI	RM32AI
Microphone Preamp		
Input Type	XLR Female, balanced, locking	XLR Female, balanced, locking
Frequency Response to Direct Output (at unity gain)	20-40 kHz, ±0.5 dBu	20-40 kHz, ±0.5 dBu
Frequency Response to Main Output (at unity gain)	20-20 kHz, ±0.5 dBu	20-20 kHz, ±0.5 dBu
Input Impedance	1 kΩ	1 kΩ
THD to Main Output (1 kHz at unity gain)	0.005%, +4 dBu, 20-20 kHz, unity gain, unwtd	0.005%, +4 dBu, 20-20 kHz, unity gain, unwtd
S/N Ratio to Main Output (Ref = +4 dB, 20 kHz BW, unity gain, A-wtd)	94 dB	94 dB
Common Mode Rejection Ratio (1 kHz at unity gain)	65 dB	65 dB
Gain Control Range (±1 dB)	0 dB to +65 dB	0 dB to +65 dB
Maximum Input Level (unity gain)	+22 dBu	+22 dBu
Phantom Power (±2 VDC)	48 VDC, switchable per channel	48 VDC, switchable per channel
Tape Inputs		
Type	RCA Female, unbalanced (stereo pair)	RCA Female, unbalanced (stereo pair)
Maximum Input Level	+12 dBu	+12 dBu
Main Outputs		
Type	XLR Male, balanced	XLR Male, balanced
Rated Output Level	+24 dBu	+24 dBu
Output Impedance	100Ω	100Ω
Mix Outputs		
Type	XLR Male, balanced	XLR Male, balanced
Rated Output Level	+24 dBu	+24 dBu
Output Impedance	100Ω	100Ω
Headphone Output		
Type	¼" TRS Female, active stereo	¼" TRS Female, active stereo
Maximum Output	120 mW/ch. @ 60Ω load	120 mW/ch. @ 60Ω load
Frequency Response	20 Hz – 20 kHz (± 0.5 dB)	20 Hz – 20 kHz (± 0.5 dB)
THD+N	0.01%, 1 kHz, max gain, 20 Hz BW, unwtd	0.01%, 1 kHz, max gain, 20 Hz BW, unwtd
S/N Ratio	96 dB, 1 kHz, max gain, 20 Hz BW, unwtd	96 dB, 1 kHz, max gain, 20 Hz BW, unwtd
System Crosstalk		
Input to Output	-90 dB (Ref = +4 dBu 20 Hz-20 kHz, unwtd)	-90 dB (Ref = +4 dBu 20 Hz-20 kHz, unwtd)
Adjacent Channels	-87 dB (Ref = +4 dBu 20 Hz-20 kHz, unwtd)	-87 dB (Ref = +4 dBu 20 Hz-20 kHz, unwtd)
Noise Gate / Expander		
Threshold Range	-84 dB to 0 dB	-84 dB to 0 dB
Attack Time	0.02s to 500 ms / 0.5 ms	0.02s to 500 ms / 0.5 ms
Release Time	0.05s to 2s	0.05s to 2s
Expander Attenuation Range	2:1 (fixed)	2:1 (fixed)
Noise Gate Attenuation Range	-84 to 0 dB	-84 to 0 dB
Key Filter	2nd-order, resonant bypass; Q=0.7	2nd-order, resonant bypass; Q=0.7
Key Listen	Off, 40 Hz to 16 kHz	Off, 40 Hz to 16 kHz

	RM16AI	RM32AI
Compressor		
Threshold Range	-56 dB to 0 dB	-56 dB to 0 dB
Ratio	1:1 to 14:1	1:1 to 14:1
Attack Time	0.2 ms to 150 ms	0.2 ms to 150 ms
Release Time	40 ms to 1,000 ms	40 ms to 1,000 ms
Auto Attack and Release	Attack = 10 ms, Release = 150 ms	Attack = 10 ms, Release = 150 ms
Curve Types	hard and soft knee	hard and soft knee
Limiter		
Threshold	-56 dB to 0 dB / -28 dBFS	-56 dB to 0 dB / -28 dBFS
Ratio	∞:1	∞:1
Attack	20 ms	20 ms
Hold	10 ms	10 ms
Release	20 ms	20 ms
Parametric EQ		
Type	2nd-order shelving filter	2nd-order shelving filter
Low (Lowpass or Bandpass)	36 to 465 Hz, ±15 dB	36 to 465 Hz, ±15 dB
Low Mid (Bandpass)	90 Hz to 1.2 kHz, ±15 dB	90 Hz to 1.2 kHz, ±15 dB
High Mid (Bandpass)	380 Hz to 5 kHz, ±15 dB	380 Hz to 5 kHz, ±15 dB
High (Highpass or Bandpass)	1.4 kHz to 18 kHz, ±15 dB	1.4 kHz to 18 kHz, ±15 dB
Physical		
Height	5.25" (13.34 cm)	7" (17.78 cm)
Width	19" (48.26 cm)	19" (48.26 cm)
Depth	10.5" (26.67 cm)	10.5" (26.67 cm)
Weight	19 lbs. (8.62 kg)	22 lbs. (9.98 kg)

8.0   Warranty

8.1   Warranty Information

PreSonus's warranty obligations for this hardware product
are limited to the terms set forth below:

How Consumer Law Relates To This Warranty:

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY HAVE OTHER
RIGHTS THAT VARY FROM STATE TO STATE (OR BY COUNTRY OR PROVINCE). OTHER
THAN AS PERMITTED BY LAW, PRESONUS DOES NOT EXCLUDE, LIMIT OR SUSPEND
OTHER RIGHTS YOU MAY HAVE, INCLUDING THOSE THAT MAY ARISE FROM THE
NONCONFORMITY OF A SALES CONTRACT. FOR A FULL UNDERSTANDING OF YOUR
RIGHTS YOU SHOULD CONSULT THE LAWS OF YOUR COUNTRY PROVINCE OR STATE.

PreSonus Products And EU Statutory Warranty:

When you purchase PreSonus products, European Union consumer
law provides statutory warranty rights in addition to the coverage
you receive from the PreSonus limited warranty. A summary of the EU
Statutory Warranty and the PreSonus Limited Warranty is below:

	EU Consumer Law	PreSonus Limited Warranty
Repair or Replacement Coverage For	Defects present when customer takes delivery	Defects arising after customer takes delivery
Warranty Period	2 years (minimum) from original date of purchase (unless superseded by PreSonus)	1 year from original date of purchase (unless superseded by PreSonus)
Cost of Coverage	Provided at no additional cost	Included at no additional cost
Who to contact to make a claim	The seller	PreSonus technical support for your region

What This Warranty Covers:

PreSonus Audio Electronics, Inc., ("PreSonus") warrants defects in material and
workmanship in PreSonus-branded products under normal use. This Limited
Warranty applies only to hardware products manufactured by or for PreSonus that
can be identified by the PreSonus trademark, trade name, or logo affixed to them.

Exclusions and Limitations:

This warranty does not cover the following:

1. Damage caused by accident, abuse, improper installation, failure to
    follow instructions in the applicable owner's manual or improper
    operation, rental, product modification, alteration, or neglect.

2. Damage from improper grounding, faulty wiring (AC and signal),
    faulty equipment, or connection to a voltage range outside
    published specifications (see applicable owner's manual).

3. Damage to drivers or diaphragm assemblies found to have burnt voice
    coils from over/under driving or signal surge from another device.

4. Damage occurring during shipment or improper handling.

5. Damage caused by repair or service performed by
    persons not authorized by PreSonus.

6. Products on which the serial number has been altered, defaced, or removed.

7. Products purchased from an un-authorized PreSonus dealer (products
    that have transferable warranties are excluded from this provision
    provided the customer and the product are registered with PreSonus).

Who This Warranty Protects:

This Warranty protects only the original retail purchaser of the product (products that have transferable warranties are excluded from this provision provided the customer and the product are registered with PreSonus)

How Long This Warranty Lasts:

The Warranty begins on the original date of purchase from the retail purchaser and the duration is as follows:

1-Year Limited Warranty		
Product Category	**Model**	**Transferable**
Recording Interfaces	AudioBox iOne, AudioBox iTwo, AudioBox Stereo, AudioBox Studio, AudioBox USB, AudioBox VSL (1818, 44, 22), FireStudio Project, FireStudio Mobile, FireStudio Mobile Studio, Music Creation Suite	No
Preamplifiers	ADL 600, ADL 700, BlueTube DP V2, DigiMax D8, Eureka, RC 500, Studio Channel, TubePre V2	No
StudioLive Mixers	StudioLive 16.4.2, 24.4.2, 16.0.2, 16.4.2AI, 24.4.2AI, 32.4.2AI, RM32AI, RM16AI	No
Monitoring & Controlling	Eris, Central Station Plus, FaderPort, HP4, HP60, Monitor Station, Monitor Station V2, Sceptre, Temblor	No
Signal Processing	ACP88	No
Accessories	Covers, Dolly, PRM1 mic, Sub Pole, Breakout Cables, Power Supplies, M10 Kit	No
3-Years Limited Warranty		
Product Category	**Model**	**Transferable**
Live Sound	StudioLive 312AI, 315AI, 328AI, 328i, 18sAI	Yes

What PreSonus Will Do:

PreSonus will repair or replace, at our sole and absolute option, products covered by this warranty at no charge for labor or materials. If the product must be shipped to PreSonus for warranty service, the customer must pay the initial shipping charges. PreSonus will pay the return shipping charges.

How to Get Warranty Service (USA):

1. You must have an active user account with PreSonus and your hardware must be on file with your account. If you do not have an account, please go to: http://www.presonus.com/registration and complete the registration process.

2. Contact our Technical Support Department at (225) 216-7887 or log a support ticket at: http://support.presonus.com. TO AVOID THE POSSIBILITY OF SENDING IN A PRODUCT THAT DOES NOT HAVE A PROBLEM, ALL SERVICE REQUESTS SHALL BE CONFIRMED BY OUR TECH SUPPORT DEPARTMENT.

3. The return authorization number as well as shipping instructions shall be provided after your service request is reviewed and confirmed.

4. The product should be returned for service in the original product packaging. Products may be shipped in a manufactured "flight" or "road" style cases but PreSonus will NOT cover any shipping damage to these cases. Products that are not shipped in the original product package or a manufactured case may not receive a warranty repair, at PreSonus's sole discretion. Depending on the product model and the condition of your original packaging, your product may not be returned to you in the original packaging. The return shipping box may be a generic box that has been fitted for that model tested if the original gift box is not available.

How to Get Warranty Service (outside of USA):

1. You must have an active user account with PreSonus and your hardware must be on file with your account. If you do not have an account, please go to: http://www.presonus.com/registration and complete the registration process.

2. Contact the Technical Support/Service Department for your region at http://www.presonus.com/buy/international_distributors and follow procedures provided by your PreSonus contact.

Limitation of Implied Warranties:

ANY IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE LENGTH OF THIS WARRANTY.

Some states, countries, or provinces do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Exclusion of Damages:

PRESONUS'S LIABILITY FOR ANY DEFECTIVE PRODUCT IS LIMITED TO THE REPAIR OR REPLACEMENT OF THE PRODUCT, AT PRESONUS'S SOLE OPTION. IF PRESONUS ELECTS TO REPLACE THE PRODUCT, THE REPLACEMENT MAY BE A RECONDITIONED UNIT. IN NO EVENT WILL PRESONUS BE LIABLE FOR DAMAGES BASED ON INCONVENIENCE, LOSS OF USE, LOST PROFITS, LOST SAVINGS, DAMAGE TO ANY OTHER EQUIPMENT OR OTHER ITEMS AT THE SITE OF USE, AND, TO THE EXTENT PERMITTED BY LAW, DAMAGES FOR PERSONAL INJURY, OR ANY OTHER DAMAGES WHETHER INCIDENTAL, CONSEQUENTIAL OR OTHERWISE, EVEN IF PRESONUS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Some states, countries, or provinces do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

If you have any questions about this warranty or service received, please contact PreSonus (USA) at (225) 216-7887 or one of our authorized international distributors at: http://www.presonus.com/buy/international_distributors.

Product features, design, and specifications are subject to change without notice.

Added bonus: PreSonus' previously Top Secret recipe for…

Chicken and Andouille Gumbo

Ingredients:

- 1 C All-Purpose flour
- ¾ C Vegetable Oil
- 1 large onion (diced)
- 1 small onion (quartered)
- 6 celery stalks (diced)
- 1 large green bell pepper (diced)
- 3 cloves garlic (2 minced, 1 whole)
- 1 lb link Andouille sausage
- 4 Chicken leg quarters
- 4 qt water
- 4 bay leaves
- 1 tsp thyme
- 1 tsp Old Bay seasoning
- 1-2 C frozen okra, sliced
- ¼ C fresh parsley, minced
- 6-8 eggs (optional)

Cooking Instructions:

1. In a large pot, combine whole chicken leg quarters, water, quartered onion, Old Bay, 2 bay leaves and 1 whole clove garlic. Cover and bring to a low boil. Simmer stock until chicken is falling off the bone. Remove the chicken and set aside. Discard the onion, bay leaves, and garlic, reserving the liquid.
2. In a heavy saucepan, heat 1 Tbsp of the oil on medium high heat and brown the andouille until it is cooked through. Set aside sausage for later.
3. In the same saucepan, add and heat remaining oil. Slowly add flour 1-2 Tbsp at a time, stirring continuously. Continue cooking and stirring the roux until it is a dark brown (it should look like melted dark chocolate). Be careful to not to get the oil too hot or the flour will burn and you'll have to start over.
4. Once roux has reached the correct color, add diced onion, celery, green pepper, and minced garlic. Cook until vegetables are very tender. Do not cover.
5. Slowly add 1 quart of chicken broth and bring to a low boil, stirring constantly.
6. Transfer roux mixture to a soup pot and bring to low boil. Do not cover, the roux will settle on the bottom of the pot and burn.
7. Add remaining chicken broth, bay leaves, and thyme. Simmer for 30 minutes.
8. While gumbo is simmering, debone and shred chicken and slice the andouille.
9. Add chicken and andouille to gumbo and return to a simmer. Simmer for 30-45 minutes.
10. Stir in frozen okra and parsley and bring to a rolling boil.
11. **Optional:** Crack one egg into a teacup and quickly pour into the boiling gumbo. Repeat with the other eggs being careful not to cluster them too closely. After all the eggs have risen back to the surface, reduce heat and simmer.
12. 12. Correct seasoning with salt and pepper (red, white and/or black) if necessary.
13. Serve over rice with potato salad.

Serves 12

StudioLive™ RM-Series Mixers with UC Surface Control

Touch-Software-Controlled, Rack-Mount Digital Mixers

Owner's Manual

Part# 820-WLV0046-B