

# Networked AoIP Television Broadcast Console

For WheatNet-IP Systems (AES67- & ST 2110-30-compatible)



Designed and built in the U.S.A.  
by Wheatstone Corporation

Wheatstone p/n 083272

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## **Strata User Manual (p/n 011799)**

### **Revision History**

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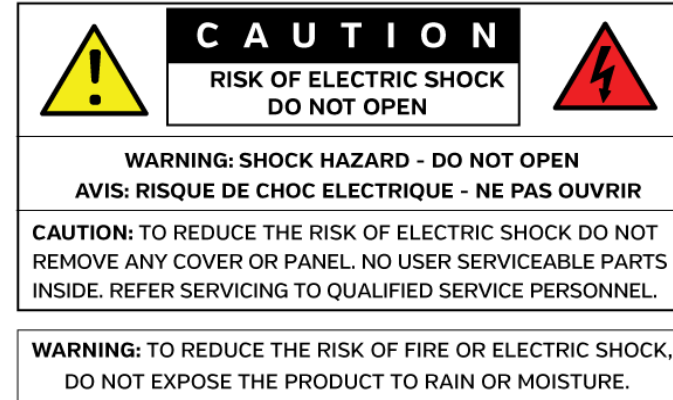
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# Safety Instructions

- 1. Read All Instructions.** Read all safety and operating instructions before operating the product.
- 2. Retain All Instructions.** Retain all safety and operating instructions for future reference.
- 3. Heed All Warnings.** You must adhere to all warnings on the product and those listed in the operating instructions.
- 4. Follow All Instructions.** Follow all operating and product usage instructions.
- 5. Heat.** This product must be situated away from any heat sources such as radiators, heat registers, stoves, or other products (including power amplifiers) that produce heat.
- 6. Ventilation.** Slots and openings in the product are for ventilation. They ensure reliable operation of the product and keep it from overheating. Do not block or cover these openings during operation. Do not place this product into a rack unless proper ventilation is provided and the manufacturer's recommended installation procedures are followed.
- 7. Water and Moisture.** Do not use this product near water such as a bathtub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool or the like.
- 8. Attachments.** Do not use any attachments not recommended by the product manufacturer as they may cause hazards.
- 9. Power Sources.** You must operate this product using the type of power source indicated on the marking label and in the installation instructions. If you are not sure of the type of power supplied to your facility, consult your local power company.
- 10. Grounding and Polarization.** This product is equipped with a polarized AC plug with integral safety ground pin. Do not defeat the safety ground in any manner.
- 11. Power Cord Protection.** Power supply cords must be routed so that they are not likely to be walked on nor pinched by items placed upon or against them. Pay particular attention to the cords at AC wall plugs and convenience receptacles, and at the point where the cord plugs into the product.
- 12. Lightning.** For added protection for this product, unplug it from the AC wall outlet during a lightning storm or when it is left unattended and unused for long periods of time. This will prevent damage to the product due to lightning and power line surges.
- 13. Overloading.** Do not overload AC wall outlets, extension cords, or integral convenience outlets as this can result in a fire or electric shock hazard.
- 14. Object and Liquid Entry.** Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short out parts, which could result in a fire or electric shock. Never spill liquid of any kind on the product.
- 15. Accessories.** Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult and serious damage to the product. Any mounting of the product must follow manufacturer's installation instructions.
- 16. Product and Cart Combination.** Move this product with care. Quick stops, excessive force, and uneven surfaces may cause the product and the cart combination to overturn.
- 17. Servicing.** Refer all servicing to qualified servicing personnel.
- 18. Damage Requiring Service.** Unplug this product from the wall AC outlet and refer servicing to qualified service personnel under the following conditions:
  - When the AC cord or plug is damaged.
  - If liquid has been spilled or objects have fallen into the product.
  - If the product has been exposed to rain or water.
  - If the product does not operate normally [following operating instructions].
  - If the product has been dropped or damaged in any way.
  - When the product exhibits a distinct change in performance. This indicates a need for service.
- 19. Replacement Parts.** When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or that have the same characteristics as the original parts. Unauthorized substitutions may result in fire, electric shock, or other hazards.
- 20. Safety Check.** Upon completion of any repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
- 21. Cleaning.** Do not use liquid or aerosol cleaners. Use only a damp cloth for cleaning.

# Hazard and Warning Label Identification



The **Exclamation Point symbol**, within an equilateral triangle alerts the user to important operating and maintenance [servicing] instructions in product literature and instruction manuals.



The **Lightning Flash With Arrowhead symbol**, within an equilateral triangle, alerts the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

**NOTE:** The Strata 32 Surface, Mix Engine, and Stagebox have been tested and found to comply within the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

## 1 - INTRODUCING THE STRATA CONSOLE

**T**hanks for joining the growing ranks of broadcasters employing Wheatstone products. Throughout our long history we've endeavored to provide the finest quality products, documentation, and after-sale support. To obtain maximum benefit from the Strata console's capabilities, and prior to installing your Strata console, please read through this introduction chapter along with Chapters 2 and 3. For those in a rush, a **Strata Quick Start Guide** presents an overview of the console's connections and the Surface's controls and features.

Each Strata console has these main components:

**Strata Surface** – Commonly referred to as the "console," it has all of the board operator controls using three types of plug-in Panels: Fader; Touchscreen; and Master. Figure 1-1 identifies the major parts of the Strata Surface.

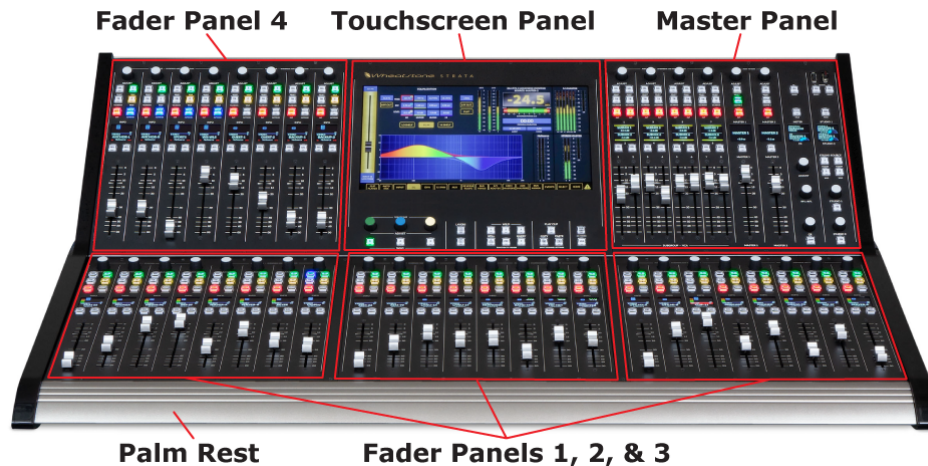


Figure 1-1 Strata Surface

- **Fader Panels** – There are four identical Fader Panels (*Fader Panels 1 – 4* in Figure 1-1) on the Strata. Each panel consolidates the controls for eight physical fader channel strips into a single field-replaceable Fader Panel. Each Fader Panel plugs into a Host board using a CAT5 cable. The four Fader Panels give the Strata its thirty-two physical fader channels.

Each fader channel strip has:

- A 100 mm conductive-plastic motorized plug-in fader
  - Eight illuminated push buttons, some with multi-color LEDs, to select: PFL (Pre-Fade Listen); AFL (After-Fade Listen); Cut (channel on/off); Auto (Automix on/off); Talkback; Select; and two Wild buttons with user-assigned functions
  - One color OLED (Organic Light Emitting Diode) display (Info) graphically shows whether the channel is on-air along with the channel's source name for both the current Layer and the alternate Layer; the active source's input levels and signal format; whether EQ and/or Dynamics processing is active; the Master bus assignments; any VCA group assignments; and other source or channel-specific information
  - An Adjust control, a rotary encoder with push-to-take button, is used for channel source selection and for input level control of the current source
- **Master Panel** – Divided into eight columns of controls, the left-most four columns have eight fader control strips for controlling the eight Submix or eight VCA Groups. The middle two columns have the Master output controls. The two right-most columns have the monitor controls for the Control Room and two studios. There are eight OLED displays across the panel: four to show the status of the eight Submix or VCA groups; two for the Master 1 and Master 2 outputs; and two split displays for the CR and the two Studio monitors.
  - **Touchscreen Panel** – A 13.3" (33.78 cm) 16x9 1080p touchscreen monitor is mounted into the upper 2/3 of this panel. The monitor is divided into eight sections to display various signal meters and/or audio controls depending upon the active **View**, which is selected using the fifteen **View Select buttons** arranged across the bottom of the monitor.
- The Master 1 and Master 2 level displays, along the right side of the monitor, are always shown while the Loudness Display, showing LKFS (Loudness, K-weighted, relative to Full Scale) for a selected source, along with Program Duration, Mode, and LKFS reference level, is also shown in most Views. The main **Home View** also shows meters for the eight stereo Submixes; sixteen mono Mix Minus buses; sixteen stereo Aux Masters; sixteen stereo Track outputs (either tracks 1 – 16 or 17 – 32), and the Control Room's wild meter source. Selecting one of the other Views brings up different windows to show and/or set equalization, dynamics, the 5.1 surround balance, the mix minus bus levels, etc., in lieu of the secondary meter displays.
- Various global controls are located on the panel just below the touchscreen monitor. At the left are three **Color-Coded Rotary Encoders** and **Numbered Select buttons** which are used as "hardware" con-

trols to adjust or switch the most commonly used on-screen control settings in various Views, rather than having to rely completely on using your finger to adjust a touchscreen control.

To the right of the hardware controls are two **Fader Panel Layer Select buttons**. Pressing the upper **Layer 1** button (it turns red) allows control over fader channels 1 - 32. Pressing the lower **Layer 2** button (it turns blue) allows control over fader channels 33 - 64.

To the right of the two **Layers buttons** are six grouped buttons. The top row has **three Wild buttons** with no factory-defined functions (they are user-defined). The lower three are dedicated buttons for: **Spill**; **Function to Fader (FTF)**; and **Query (?)**. Using these buttons will affect the OLED display on multiple fader channels.

When a channel **Select button** is lit, pressing **Spill** sends the selected channel's audio to adjacent faders for individual audio channel level adjustment using two fader channels for a mono or stereo signal or six fader channels for a 5.1 surround signal.

The **FTF button** becomes active when the EQ, DYN, or AUX View is active. Pressing FTF switches the upper half of multiple fader channel OLEDs, on channels adjacent to the channel with the lit SEL button, to show various EQ, dynamics, and Aux master levels which can then be adjusted using the channel Adjust encoders. The FTF button color indicates which function is currently active (blue = EQ; green = Dynamics; and yellow = Aux Masters).

The **Query/? button** is used to show the Delay, Submix, Aux bus, and Mix Minus bus settings for each channel. Press it once, at any time, and the button turns green and the upper half of every channel OLED shows each channel's Delay setting. Press it again, it turns blue, and the Submix bus Assignments are shown. Another button press and the button turns yellow, and the Aux bus assignments are shown. Another press and it turns magenta, and the mix minus bus assignments are shown. Press the button one more time to turn off the LED and return the OLED displays back to their normal view.

The next three grouped buttons are used to bring up the **Clip Player View** and to copy and paste channel settings from one input channel to another (**Copy and Paste buttons**). The last two dedicated buttons toggle the Master panel group faders between showing Submix or VCA fader Groups (**SUB GRP** and **VCA buttons**).

**Gibraltar IP Mix Engine** – The 4RU Mix Engine (Figure 1-2) has the DSP, signal mixing, and AoIP (Audio over IP) interface functions for the Strata. It has these main features:

- **QAT Interface card**—Right-most card (when viewed from the rear in Figure 1-2) links the Surface and IP Mix Engine together using two crossover CAT5 cables plugged into Ports C and D. If the

IP Mix Engine needs to be located over 330 feet (100 meters) from the Surface, an optional QOT fiber interface card is required.

- **GBR Network Card**—Its single RJ45 jack connects the Mix Engine to the rest of the WheatNet-IP (WNIP) network using a CAT5e/6 patch cable (straight-thru). The GBR card converts the outgoing internal console signals into WNIP system audio streams and logic commands and converts the incoming audio streams and logic commands into the signals that are used internally in the Strata console.
- **EQ DSP Card**—Has the DSP for the 64 fader channels in the Strata Surface. This card has no rear panel connections.
- **Mix DSP Cards**—Two Mix cards are used for all of the various mixing that occurs within the Strata. These cards have no rear panel connections.
- **CPU**—One CPU card is standard but a second CPU card can be installed for redundancy (as shown in Figure 1-2). Each has an RJ45 jack to connect that CPU to the WNIP system for communications and control. Two DARS (Digital Audio Reference Signal) BNC jacks are available, if needed, to connect a digital clock reference signal, but for most users these will not be used or connected.



Figure 1-2 Gibraltar IP Mix Engine

- **DC Power Supply**—One supply comes standard (a second supply can be ordered for redundancy, as shown in Figure 1-2). Each supply has its own IEC AC jack input so the two supplies can be powered off different AC circuits.
- **Fan module**—A 1RU fan module must be mounted below the IP Mix Engine to provide airflow up through the rack to keep the cards and power supply cool even in a full rack. At least 1RU above the Mix Engine must be left open to allow hot air an unrestricted exit out of the rack frame.

**Surface Power Supply** – A separate rackmount +32-volt supply powers the Strata. The SPS-180R (Figure 1-3) is the standard supply. When redundant power is ordered (an optional feature) a PSR Rack Mount Unit with two slide-in SPS-432 power supplies is supplied. The SPS-180R and the PSR are each 2RU. Mount the supply in a convenient out of the way location within 10 to 15 feet of the rear of the Surface since the supply comes with a 16-foot DC cable with locking connectors at each end.



**Figure 1-3 SPS-180R Surface Power Supply**

**Strata Installation Kit** – A USB flash drive, with PDF documentation files and the Wheatstone application installer programs ships with the Strata.

## STRATA OVERVIEW

The Strata is the “little brother” to Wheatstone’s IP64 television console. It incorporates the same IP audio innovations but, unlike the IP64, which is available in various frame sizes, the Strata packs all of its control power into a single-size compact 40” (102 cm) wide frame. The console’s three main hardware components: **Strata Surface**, **Gibraltar IP Mix Engine**, and **Surface Power Supply**, along with the optional **Stagebox I/O Interface**, are all FCC and CE certified.

The **Strata Surface** is a compact audio-for-video controller. It has 32 physical fader channel strips mounted in four Fader Panels. Each channel strip has a motorized fader, eight control buttons, and one color OLED display. The channel strip controls, along with the controls on the Master and Touchscreen Panels, control the operation of the Gibraltar IP Mix Engine’s DSP, which contains the mixing and signal processing power for the Strata’s 64 input channels, its two Master outputs, eight Submix groups, and eight VCA groups, with EQ and Dynamics available on every channel along with monitoring controls for the control room and two broadcast studios.

The Strata was designed for newsrooms, production suites, remote vans, and sports venues. It has dedicated faders for Submix and VCA groups using layer control, with two master outputs and 32 physical channel faders. The channel faders are layered into two banks of 32 so an operator can easily control up to 64 audio inputs by toggling between layers using dedicated Layer 1 and 2 buttons to instantly switch layers. The faders are motorized so their physical positions quickly jump as one switches from showing channels 1 - 32 to showing channels 33 - 64.

The Strata integrates seamlessly with all major production automation systems since it’s powered by Wheatstone’s award-winning WheatNet-IP (WNIP) audio network, an AES67-compatible IP audio ecosystem with online mixing, audio processing, and virtual development tools which also support direct connection of SIP/VoIP and codec appliances.

The Strata has access to all of the resources connected to the WNIP network using channel controls and the touchscreen monitor, which uses intuitive View Select buttons to instantly display various status and control screens. The touchscreen monitor can be used to adjust EQ and Dynamic, set up talkbacks, configure mix-minus feeds and bus matrices, assign mic mute and Automix groups, and manage console sources and destinations. Each Fader Panel channel has an OLED display to show relevant status and operating functions at a glance. The Master Panel has eight OLED displays to show the status and levels for the sub mix and VCA groups, the master outputs status, and monitor sources and levels and Wild Meter status.

The Strata’s I/O is managed through the WNIP network so there are no limitations in regards to fixed connection points on the console chassis itself since there are none! The Strata has access to any source on the network, and any channel can connect to any audio source or destination, using any preferred audio format, at any time—regardless of whether it’s HD/SDI, AES, MADI, AoIP, TDM, or even analog. Unrestricted routing means any source can be assigned to any channel, as needed. The days of having to block out channels, based on input type, is a thing of the past, as is having to repurpose inputs because of physical chassis limitations.

The **Gibraltar IP Mix Engine** can be mounted within the control room or in any convenient rack within 330’ (100 m) of the Strata Surface (an optional Fiber Interface allows for much longer connection distances). Two Mixer Links (primary & secondary) connect the Surface to the IP Mix Engine. The IP Mix Engine incorporates a WheatNet-IP (WNIP) interface, with a gigabit Ethernet jack on a GBR card, to stream audio between the Strata and the other WNIP devices on the network.

The IP Mix Engine’s CPU includes DARS I/O to synchronize the mix engine with an in-house 48 kHz reference, although these days more often the network will have a PTPv2 master clock, networked with the WNIP system, to synchronize the Strata to a 48 kHz sample rate to synchronize with your video equipment and other AES67-compatible devices.

The Strata ships standard with a single output **Surface Power Supply** (SPS-180R, shown in Figure 1-3). It includes an IEC AC cord and a 16-foot DC cable with locking connectors to connect the supply to the rear panel DC IN jack on the Strata Surface.

The Strata console ships with a factory default configuration so it can be powered up and used straight out of the shipping boxes. The default settings are easily changed once the console is physical installed and networked with one or more Wheatstone Blades, or the Stagebox I/O Interface, to supply audio I/O for the console. The Strata can then be

configured for use in a newsroom, production suite, remote van, sports venue, or any number of other applications, using the two Windows PC apps included with the console (Strata Surface Setup and Navigator) and/or by using the touchscreen controls. Chapter 3, starting on page 15, covers how to use the supplied apps to configure the Strata.

## Strata Accessories

Most WheatNet-IP (WNIP) system peripheral devices can be networked with the Strata console. Here's a sampling of the type of devices available: WNIP Talent stations (TS-4 for guests and TS-22 for hosts), WNIP button control panels, like the SS-series of rackmount panels with scriptable buttons and color OLED displays, Wheatstone GP (General Purpose) control panels, Vorsis audio processors, WNIP-compatible peripherals available from Tieline, Eventide, and other vendors, and any PC or audio server running the WNIP AoIP audio driver.

Several WNIP system apps (PC-XY, MeterApp, and Screenbuilder) can also be used with the Strata console since it supports ACI (Automation Command Interface). Wheatstone's Screenbuilder can also be used to build custom screens to remotely control the Strata's fader channels and monitor console signals.

**Stagebox I/O Interface** (4RU, FCC and CE certified) – Designed for use in sports venues, newsrooms, and other applications where quick reconfigurations of mic and line inputs and outputs may need to occur. Each Stagebox has 32 mic/line inputs on XLR jacks, eight AES inputs on BNC jacks, 16 analog line outputs on XLR jacks, and eight AES outputs on BNC jacks, along with one 15-pin D-Sub LIO Logic jack with 12 GPIO logic ports. These are all on the front panel, along with two Gigabit Network ports using latching RJ45 jacks, for redundant networking of the Stagebox with a WNIP network.

**WheatNet IP Blades** (1RU, FCC and CE certified) – Any WNIP Blade-3 blade can be networked with the Strata console to add rackmount I/O anywhere in a facility. There are dozens of Blade models available to interface just about every audio format including: all or mixed analog and AES, MADI, and SDI (one SDI Blade can de-embed up to four SDI inputs). Most Blades have I/O for 8 x 8 stereo audio signals and 12 GPIO logic ports on two RJ45 jack.

## WNIP Network

Strata consoles use the WheatNet Audio-over-Internet Protocol (AoIP) commonly shortened to WNIP network. This protocol allows dozens, or even hundreds, of devices: Strata consoles, Stagebox I/O Interfaces, Blades, and other WNIP-compatible devices like PCs and audio servers using the WNIP audio driver, to share their resources over an AoIP network that's both AES67- and ST 2110-30-compatible.

The Strata Surface's Host Controller, the IP Mix Engine's CPU and GBR cards, and all of the Blades and Stageboxes used for audio and logic I/O, are networked together using one or more AoIP-compatible gigabit Ethernet switches. Each device connects to a network switch port using a straight-thru CAT5e/6 cable which can be up to 330 feet (100 meters) in length. Multiple network switches can be trunked together to expand the network's range or to use a star topology to consolidate each studio's connections on local in-studio switches into trunk cables going to one or more main switches in the Technical Operations Center (TOC).

Contact Wheatstone sales or support for a list of recommended network switches and for configuration settings for AoIP networking for the most common models. Appendix A also provides additional details on creating your WNIP network.

Because Strata consoles support **WNIP ACI** (Automation Control Interface), remote control and monitoring of the console, and just about any point in the WNIP network, allows one to use various 3rd party devices on tablets and PCs, using various software apps, to integrate a new Strata with existing equipment from various vendors.

Strata consoles also support **WNIP SLIO** (Software Logic I/O) which allows playback systems, talent panels, script engines, and GPIO ports to send/receive logic commands over Ethernet. This also allows one to interface external "old school" GPIO devices, which don't support WNIP SLIO, using the hardware LIO (Logic Inputs/Outputs) ports available on each Blade and the Stagebox (most Blades have 12 LIO ports).



## STRATA SPECIFICATIONS

All dimensions: Height x Width x Depth

### Surface Dimensions

12" (30.5 cm) x 40 3/16" (102 cm) x 26" (66 cm)

### Rack-mounted Device Dimensions

Gibraltar IP Mix Engine (4RU): 7" (17.8cm) x 19" (48.3 cm) x 16" (40.6cm). Allow for 18" (45.7cm) of rear clearance for cabling. Allow 2RU to mount the fan module below the Mix Engine and to mount a blank panel above the Mix Engine.

SPS-180R Supply (2RU): 3.5" (8.9 cm) x 19" (48.3 cm) x 8" (20 cm)  
Allow for 3" (7.6 cm) of rear panel clearance for AC and DC cables.

PSR Rack Case (2RU): 3.5" (8.9 cm) x 19" (48.3 cm) x 16.5" (42 cm)  
Allow for 3" (7.6 cm) of rear panel clearance for AC and DC cables.

Stagebox (4RU): 7" (17.8 cm) x 19" (48.3 cm) x 11" (28 cm)  
Allow for 3" (7.6 cm) of rear panel clearance for the IEC AC cord.

### Power Supplies

*Type:* Switching

*AC input:* Detachable IEC cords

*AC input:* 90-240 VAC, 50/60 Hz

*Surface Supply Output:* +32 VDC @ 3 amps

*Gibraltar Supply:* Slide-in, field replaceable

### Power Requirements

*Gibraltar IP Mix Engine:* <90 watts at 120 VAC / 60 Hz

*Strata Surface & Supply:* <80 watts at 120 VAC / 60 Hz

*Stagebox:* <60 watts at 120 VAC / 60 Hz

### Environment

*Ambient Operating Temperature:* > 104°F (40°C)

*Cooling:* Strata Surface and Stagebox I/O Interface are convection cooled. The Gibraltar IP Mix Engine comes with a 1RU fan module which must mount directly below the IP Mix Engine. The SPS-180R and SPS-432 power supplies each have a built-in cooling fan.

We recommend leaving at least one rack space open above the power supply, IP Mix Engine, and Stagebox to allow for heat radiation from those units.

Wheatstone reserves the right to change specifications without notice or obligation.

## WARRANTY STATEMENT

### LIMITED WARRANTY BY WHEATSTONE CORPORATION

1. All equipment sold and shipped to final destinations within the USA and its possessions are warranted for one (1) full year from the date of purchase against defects in material and workmanship. All equipment sold and shipped to final destinations outside the USA and its possessions are warranted for one (1) full year from the date of purchase against defects in material and workmanship.

All repairs to maintain the unit at original specification will be made at no charge to the original purchaser except for shipping and insurance costs which are to be prepaid by the owner to the factory in the event the unit cannot be serviced by an authorized Wheatstone Corporation dealer.

2. This Warranty is subject to the following restrictions and conditions:

- a) The owner must have filled out the enclosed Warranty Card and returned it to Wheatstone Corporation; or, at the time of servicing, the owner must provide proof of purchase from an authorized Wheatstone Corporation distributor or dealer.
- b) This Warranty is valid for the original purchaser on the unit. Parts used for replacement are warranted for the remainder of the original warranty period. Repair or replacement is at the discretion of Wheatstone Corporation and is the exclusive remedy hereunder.
- c) This Warranty DOES NOT apply to damage or defects resulting from abuse, careless use, misuse, improper installation, electrical spikes or surges, or alteration, repair, or service of the unit or equipment by anyone other than Wheatstone Corporation or its authorized distributor or dealer.
- d) This Warranty is void if the serial number has been removed, altered, or defaced.
- e) This Warranty DOES NOT cover loss or damage, either direct or indirect, arising out of the use, or inability to use this unit, or for shipping or transportation costs to Wheatstone Corporation or its authorized distributor or dealer.
- f) Wheatstone Corporation reserves the right to modify or change any unit in whole or in part at any time prior to return delivery in order to incorporate electronic or mechanical improvements deemed appropriate by the Wheatstone Corporation but without incurring any responsibility for modifications or changes of any unit previously delivered or to supply any new equipment in accordance with any earlier specifications.
- g) THERE ARE NO OTHER WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IF, FOR ANY REASON, AN IMPLIED OR STATUTORY WARRANTY CANNOT BE DISCLAIMED, SAID WARRANTY IS LIMITED TO THIRTY (30) DAYS FROM THE DATE OF PURCHASE. WHEATSTONE CORPORATION IS NOT RESPONSIBLE FOR ELECTRICAL DAMAGE, LOSS OF USE, INCONVENIENCE, DAMAGE TO OTHER PROPERTY, OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGE, WHETHER DIRECT OR INDIRECT, AND WHETHER ARISING IN CONTRACT, TORT, OR OTHERWISE. NO REPRESENTATIVES, DEALERS, OR WHEATSTONE PERSONNEL ARE AUTHORIZED TO MAKE ANY WARRANTIES, REPRESENTATIONS, OR GUARANTIES OTHER THAN THOSE EXPRESSLY STATED HEREIN.

# Attention!

## Federal Communications Commission (FCC) Compliance Notice: Radio Frequency Notice

**NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



**This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.**

This equipment must be installed and wired properly in order to assure compliance with FCC regulations.

**Caution! Any modifications not expressly approved in writing by Wheatstone could void the user's authority to operate this equipment.**



## 2 – STRATA HARDWARE INSTALLATION

The **Strata Surface** sets on the countertop. Its footprint is 40.19" (102 cm) wide by 26" (66 cm) deep from the front of the palm rest to a point below the top of the angled section of the Surface. The top of the Surface's angled section is 12" (30.5 cm) above the countertop using a rear support member. The Surface Power Supply requires 2RU of rack space. Two supplies are available for the Strata Surface. Each has a built-in cooling fan so no extra vent or blank panels are required. A DC cable connects each supply to the Surface.

The **Gibraltar IP Mix Engine** requires 6RU (10.5") of rack space: 4RU for the Mix Engine, plus 1RU for the separate fan module, which mounts directly below it, and another 1RU for a blank or vented panel above the Mix Engine. It connects to the Strata Surface using two *crossover* CAT5 cables allowing the Mix Engine to be rack mounted up to 300' (100 m) from the Surface. There are no audio or logic connections on the Mix Engine so its mounting location is non-critical. Two *straight-thru* CAT5e/6 cables (three, with the optional redundant CPU card) connect the Mix Engine to ports on a WheatNet IP (WNIP) system network switch.

### CONTROL SURFACE PLACEMENT

The Strata Surface is designed to set on the countertop on seven rubber feet (four on the chassis and three on the rear support member). These rubber feet can be removed to fasten the Surface to secure it to the countertop—certainly a consideration for remote truck applications.

All Surface wiring connects on a vertical section of the lower chassis, directly below the angled part of the Surface (Figure 2-1). Making these connections is covered in later sections of this chapter. This section covers how to prepare the countertop for running cables to these connectors prior to setting the Surface into its permanent position.

The angled part of the Surface hides these connecting cables—even if they're just draped over the rear of the countertop, but cutting one or two cable access holes thru the countertop will result in a much cleaner installation.

Figure 2-2 shows the chassis dimensions and cable access area. A dashed rectangle outlines an area below the angled part of the Surface where one or two small holes can be drilled for DC power and CAT5 cable access thru the countertop.

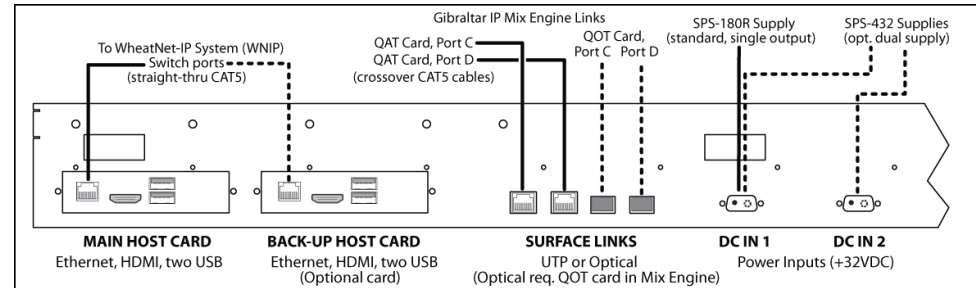


Figure 2-1 Surface Cabling, rear chassis, partial view

The vertical section of the lower chassis (detailed in Figure 2-1) is 14" (35.6 cm) behind the front of the palm rest. Since the DC cables are much stiffer than the CAT5 cables that will also pass thru the countertop, we recommend drilling one 1.5" or 2" hole about 6" to 8" to the right of the DC In 2 jack (as viewed from the rear). This allows the DC cable, which has a right-angle connector, to easily be brought up thru the countertop and fastened to the DC IN 1 jack. Alternately, drill two smaller access holes (3/4" or 1"), as shown in Figure 2-2, using one for the DC cable(s) and the other for three CAT5 cables (one Ethernet & two Link cables).

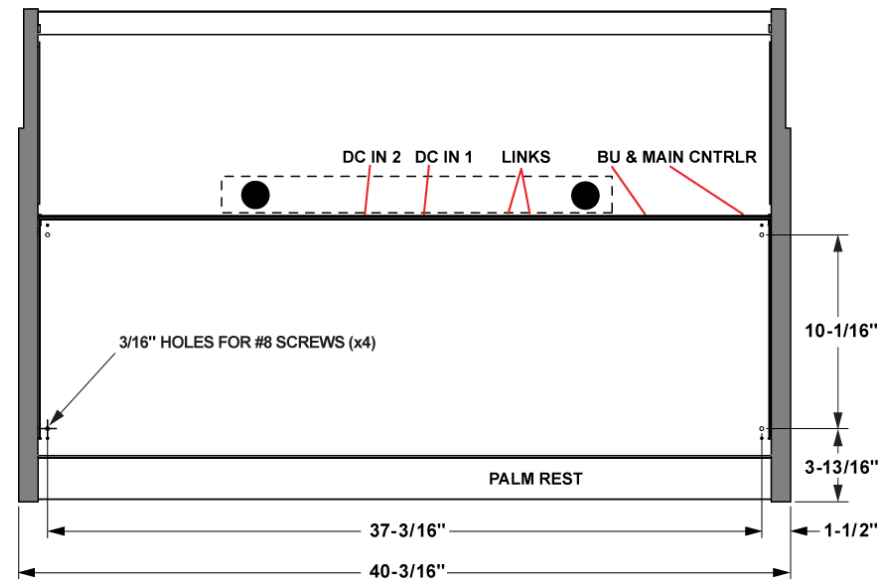


Figure 2-2 Surface, Lower Chassis (showing cable access and countertop mounting holes)

If the Surface will be fastened to the countertop, remove and set aside the rubber feet using a #2 Phillips screwdriver, then set the Surface into position. Remove Fader Panels #1 and #3 (eight #1 Phillips screws and

unplug one CAT5 cable per panel) to access the four threaded chassis holes so you can mark the countertop for drilling four thru-holes.



**Note:** Be sure to keep track of which Fader Panel is #1 and which is #3 since the Fader panels appear identical (they're identified by board-mounted DIP switch settings). If Panel #3 is inadvertently installed where Panel #1 should go, the lower left panel's channel numbers will be 17 - 24, not 1 - 8, which will now be on the lower right panel. A minor oops, just unplug the CAT5 cables and swap the two Fader Panel's physical positions.

With the four holes marked, move the Surface safely out of the way and use a #16 drill bit to drill completely thru the countertop and supporting substrate. If the countertop surface material is laminate, use a new 1/4" drill bit to drill just thru the laminate to ensure the mounting screw threads won't touch the laminate as they are fastened to prevent future laminate cracks from forming.

Use a lock washer and one or more oversize washers to support the four #8 machine screws or bolts that will extend up thru the substrate and countertop material to fasten into the four threaded holes in the chassis. Dry fit a machine screw/bolt into a hole and make sure the end does not extend more than 3/8" (9.5mm) above the countertop.

Set the Surface into position and evenly tighten the four #8 machine screws/bolts. Tighten them only enough to firmly hold the Surface to the countertop. Reinstall the two Fader Panels (set them onto the front rail and plug in their CAT5 cable then fasten the eight #1 Phillips screws).

## Power Supply

The Strata Surface is powered by a separate 2RU (3.5") rack-mount 32 VDC supply. The SPS-180R is the standard supply for the Strata.

Mount the supply in a 19" equipment rack located near the Surface. A 16-foot (4.88 m) DC cable is supplied to connect the supply to the Surface. Avoid locating any high gain audio equipment adjacent to the power supply to avoid magnetic interference into that equipment.



Figure 2-3 Rear View, SPS-180R Supply

Once the supply is mounted, plug in the factory-supplied DC cable to the DC OUT jack and fasten the 8-pin connector's screws to secure it place. The other end of the cable has a two-pin right-angle connector. Route it to, and plug it into, the DC IN 1 jack on the rear of Surface. Tighten its mounting screws to securely fasten that end of the DC cable.



**Note:** Since the power supply does not have a power switch, *do not plug in its AC cord* until advised to do so, once all other cabling has been connected to the Surface, as outlined in the **Energizing the Strata** section on page 14.

The power supply comes with a 3-wire grounded IEC AC cord (with USA power plug). Only plug this cable into a "clean" or isolated AC circuit used to power the control room audio gear. In the USA it is recommended to plug it into an orange-colored AC outlet, which indicates an outlet with an isolated AC ground. Use of a UPS is also recommended.

If this type outlet is not available, the power supply should only be plugged into a circuit which is separate from those powering lighting, air-conditioning, and other non-audio equipment or machinery.

Regardless of the type AC circuit used, the ground wire for the AC outlet must always be tied to the central AC system's technical ground.

## Redundant Supply Installation

When the redundant power option is ordered a PSR rack housing with two SPS-432 slide-in DC supplies is supplied along with two DC cables and two IEC AC cords (same as supplied with the SPS-180R supply). Follow the same mounting procedure as used for an SPS-180R supply.

Once the supply is mounted, connect the two DC cables to the DC OUT jacks on the two SPS-432 supplies and tighten their mounting screws. Route the cables to the Surface and plug them in, and fasten them to, the DC IN 2 jack and then the DC IN 1 jack (which supply connects to which DC IN jack non-critical). If available, the two supplies should plug into AC outlets using different circuits so that power may not be lost simultaneously to both units. Use of a UPS is always recommended.



Figure 2-4 Rear View, SPS-432 DC Supplies in a PSR rack

## GIBRALTAR IP MIX ENGINE

The Gibraltar IP Mix Engine has no audio or logic I/O. It connects to the Surface using two CAT5 crossover cables (up to 300 feet in length), so it can be mounted into a 19" rack in a convenient location. Mount the fan module immediately below the Mix Engine and add at least one blank panel immediately above the Mix Engine for proper hot air venting.

There are no user controls on the Gibraltar Mix Engine. Its front panel is hinged for access to its plug-in cards. Figures 2-5 and 2-6 show the front view and rear panel on the Gibraltar IP Mix Engine.

The Mix Engine also connects to a WheatNet IP network Gigabit Ethernet switch using straight-thru CAT6 cables. The GBR port carries the streaming audio to/from the Strata to other WNIP devices on the network. The CPU card, and optional redundant CPU, must also be networked (CAT5 or CAT6 cable) for Ethernet communications. Ports C and D on the QAT card connect to the two Surface Link jacks using *crossover CAT5 cables*. Figure 2-8, on the next page, outlines all of these cable connections.



Figure 2-5 Gibraltar IP Mix Engine, Front View



Figure 2-6 Gibraltar IP Mix Engine, Rear Panel

When the IP Mix Engine must be located over 300 feet from the Surface, optical fiber must be used to connect the two devices. A QOT fiber interface card is used in lieu of the QAT card. A QOT card has fiber rather than “copper” (RJ45) connectors. If this is done in the field, board mounted switches on the Surface Host card, to switch from the RJ45 jacks to the fiber jacks, must be changed. The Service chapter has details on the Host card switch settings. If the Strata was ordered with the QOT card the switches are already set to use the fiber jack rather than the RJ45 jacks.

## STAGEBOX

The Stagebox is an optional I/O Interface available for use with the Strata (Figure 2-7). It’s networked, along with the IP Mix Engine and Strata, on one or more Gigabit Ethernet switches. The Strata, and the Stagebox, can also be networked with any Wheatstone Blade in a facility-wide WNIP network in order to share resources.

The Stagebox has 32 mono mic/line inputs, eight stereo AES inputs, sixteen mono analog, and eight stereo AES outputs so it can function as a complete audio I/O interface for the Strata when used in a stand-alone

application like in a remote truck or at a venue. When this is done a small Gigabit Ethernet switch would be used to network the Stagebox, the IP Mix engine, and the Surface together.

The Stagebox outputs can be used to drive powered monitor speakers and headphone amps while the mic-line inputs can be configured for a mix of mic inputs and line-level inputs. Inputs and outputs can be reconfigured for any mix of mono, stereo, or 5.1 surround signals.



Figure 2-7 Stagebox Audio & Logic I/O, Front Panel

## FINAL SURFACE CONNECTIONS

The DC IN and Surface Link connections were covered in the **Power Supply** and **Gibraltar IP Mix Engine** sections, so there is one final Surface connection to be made: networking the Surface’s Main Host Card to a port on a WNIP system Ethernet switch. A summary of the standard connections on the Strata components is shown in Figure 2-8 on the next page.

If the optional Backup Host Card is present then it’s also networked to a WNIP switch port. The Host card connections allow the Surface to be remotely configured using the *Strata Surface Setup* app which typically runs on a system admin PC which is also networked with the WNIP system. The HDMI and USB ports on the Host cards are not used.



**Note:** There are two USB ports: CLIP and USER located at the top of the right-most column of controls on the Master Panel. These are available for board operator use to plug in a USB flash drive, containing 48 kHz audio files in .WAV format and M3U playlist files, to play audio on any channel using the **Clip Play View** controls on the touchscreen. The second port allows a board operator to save and load console Events to reconfigure the Surface for a specific show or application by using the **Events View** on the touchscreen.

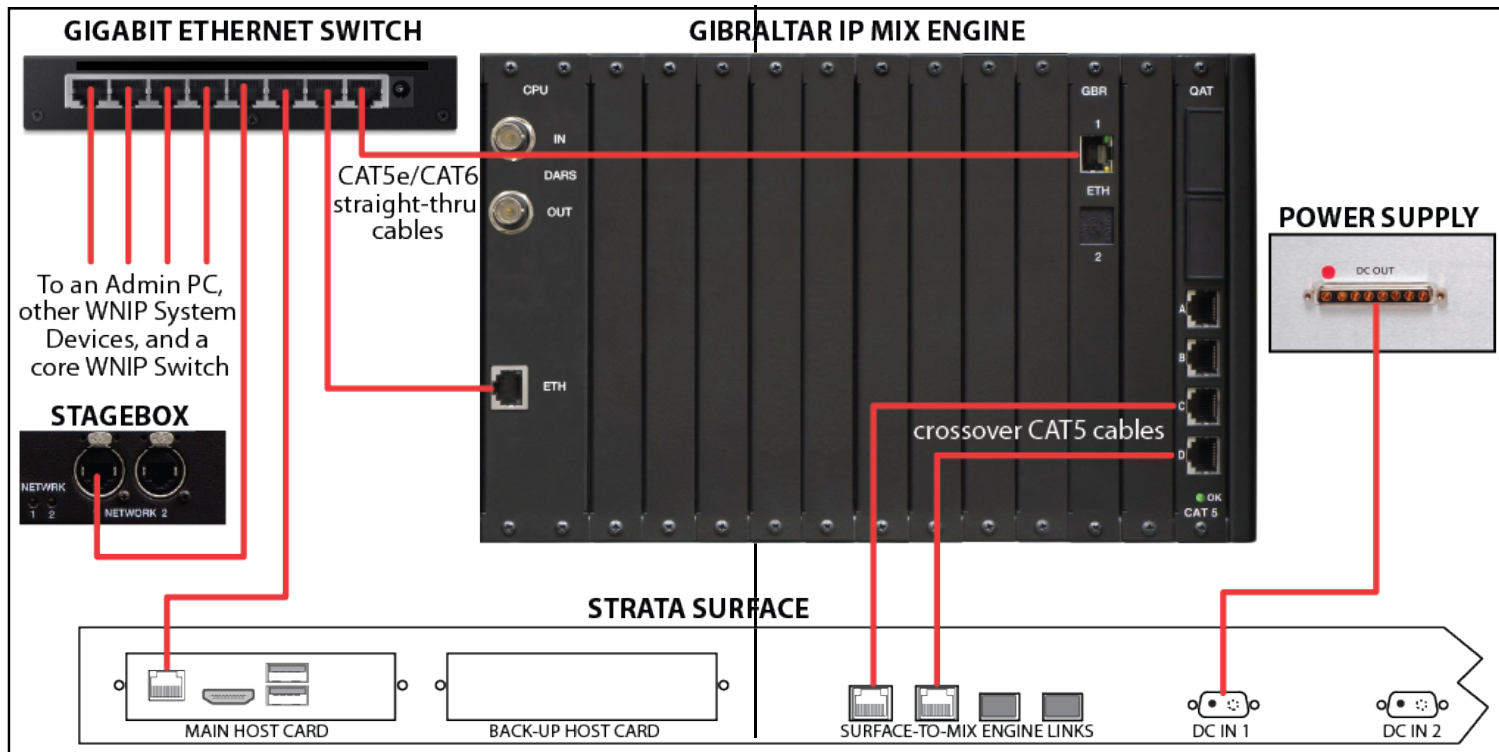


Figure 2-8 Surface Cabling, left-side, rear chassis view

## ENERGIZING THE STRATA

Assuming the Strata Surface is set into position, its power supply is mounted and its DC cable is fastened to the connectors on the power supply and Surface, and the IP Mix Engine is mounted and linked with the Surface, you can now plug in the IEC AC cords to energize the Surface power supply, IP Mix Engine, and the Stagebox and other Blades.

It takes about two minutes for the Surface and Mix Engine processors to complete booting and load the current configuration settings into the Surface. During this time the Surface's touchscreen monitor and OLED displays show various screens as the Host controller and the other boards within the Surface, and the DSP and other cards within the Mix Engine, come up.

The faders will all travel to full off when the Surface is energized. Once the Surface and Mix Engine complete booting, the faders jump to the positions they were in, on that Layer, when the Surface was powered down (on a new console this may leave most or all at full off). The channel OLED displays show their current input sources (**NoSource** on every channel on a new console). The Strata is now ready for use.



**Note:** To de-energize the Strata Surface, unplug the power supply's AC cord (or cords) from the supply or from the AC mains. **DO NOT** de-energize the Surface by disconnecting the DC cable from the Surface or power supply.

After the Surface completes start up, a Surface Information window will be left open in the middle of the touchscreen. To close that window tap once on the ? button, in the lower right corner of the touchscreen monitor. The ? button's yellow background turns black. When the ? button has a black background, tapping it opens the Surface Information window listing firmware revisions for the Strata. In this window tap the **Alarms** button to show Surface and Mix Engine alarms or tap the **Stats** button to show the Touchscreen's CPU Statistics window.

When any alarm is detected an Alarms window appears on the touchscreen and the ? button changes to a yellow triangle with an !. Tapping that button closes the Alarms window but the ! button remains shown as a yellow triangle until the alarm condition is cleared, at which time it returns to a rectangular ? button.

### 3 - STRATA APPS AND CONSOLE CONFIGURATION

The Strata console's factory-default settings allow it to be powered up and used straight out of the box. Many common channel settings can be viewed and changed using the Surface's touchscreen controls, but to change console-wide settings, and to rename the generic source names with useful signal names requires using two software apps: **Strata Surface Setup** and **Navigator**, both included on a USB flash drive which ships with the console. These apps are installed onto any Windows® PC that's networked with the Strata and its I/O interfaces (Blades and/or Stageboxes). Both apps can alternately be downloaded from a Wheatstone file download site. Email Wheatstone Tech Support for the download links ([techsupport@wheatstone.com](mailto:techsupport@wheatstone.com)).

Here's a list of the default IP addresses, device names, and ID numbers, assigned at the factory, for the standard cards (in **black** type) and the optional cards (in **blue** type) used in the Strata Surface, the Gibraltar IP Mix Engine, and the Stagebox:

**Stagebox (Blade 50): 192.168.87.50**

**GBT card: 192.168.87.69**

**GBT Secondary card: 192.168.87.70**

**IP Mix Engine Main CPU (Blade 68): 192.168.87.168**

**IP Mix Engine Backup CPU: 192.168.87.169**

**Strata Main Host Controller: 192.168.87.196**

**Strata Backup Host Controller: 192.168.87.197**



**Note:** To prevent having duplicate IP addresses and Device ID numbers, and the subsequent network communications issues this causes, prior to networking any new WNIP device with an existing WNIP network verify that device's IP address and ID number are not already being used by another WNIP device.

Strata components can be changed to use another Class C subnet but we recommend leaving them set to their default 192.168.87.0 subnet. This simplifies system troubleshooting, and future system expansion, since all Wheatstone AoIP devices are assigned fixed IP addresses in this subnet at the factory. When a WNIP system is set to use another subnet, every default IP address on every Strata component must be changed to fall within the new subnet before they can be networked with an existing system.

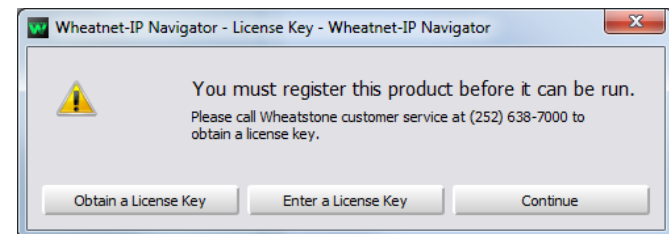
The two main Strata software apps (**Strata Surface Setup** and **Navigator**) are typically installed on an **admin PC** running Windows® (WinXP to Win10 are supported). The admin PC must be networked with the IP Mix Engine, the Strata Surface, and the Stageboxes and/or Blades with the console's audio and logic I/O, each using fixed IP addresses within the same subnet. We recommend setting the admin PC to **192.168.87.21** with a subnet mask of **255.255.255.0**. Connect the PC's NIC to a port, configured for *switchport mode access*, on any Gigabit Ethernet switch used to network the Strata devices together.

To insure the Wheatstone apps are properly installed the PC should be networked with the WNIP system prior to installing the apps. To then install each app right-click on the installer icon, or on its file name, and select *Run as Administrator*. Accept the default installation settings. If a previous version of either app was installed the installer automatically uninstalls the previous version prior to installing the new version while maintaining licensing and other app configuration settings. A shortcut icon for each app is added to the desktop. In the Windows Start menu, the Wheatstone app shortcuts are found within a *Wheatstone* folder. On Win7 PCs, Navigator is in a *WheatNet IP* folder and the Strata Surface Setup app is in a *WheatNet IP Strata* folder. On a Win10 PC both apps are found under the *Wheatstone* category.



**Note:** Both apps communicate with WNIP devices using multicast messaging. If you find the apps do not see any WNIP devices—especially if they were installed prior to networking that PC with the WNIP system, turn off Windows Firewall on the NIC connected to the WNIP system or add Navigator and the Surface Setup apps to the programs allowed thru the Firewall.

Navigator is a licensed application. A *Navigator* license is thus required to be purchased to unlock all of Navigator's features. Basic functions like making crosspoints, editing signal names and their formats, and logic setup can all be done in an unlicensed copy of Navigator. You'll just see a lot of "nagging pop-ups."



The section on using **Navigator** begins on the next page. Using the **Strata Surface Setup** app is covered in its own section, beginning on page 31.

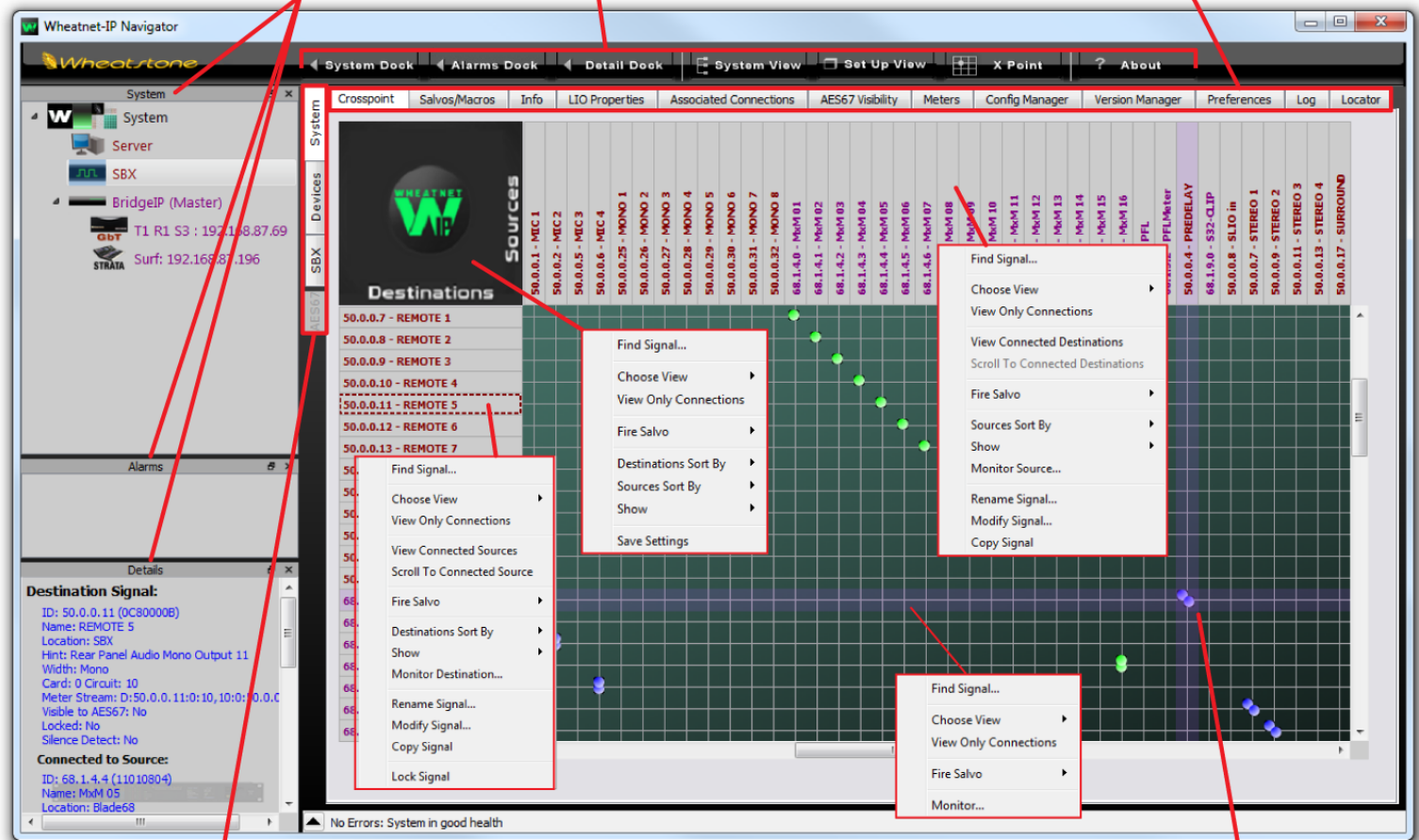
## NAVIGATOR

Navigator is initially going to be used to name and configure the signals on the Stageboxes and Blades networked with the Strata and its Mix Engine. All of these functions can be done without licensing Navigator, but to access all Navigator features, like installing updated operating system code on your WNIP Blades, a Navigator license must be purchased. Contact your Wheatstone dealer or sales person, for pricing.

Here are Navigator's main features or operations:

- View and update the WNIP operating system on the networked Mix Engines, Stageboxes, and Blades
- Backup and restore system configuration files
- Set system-wide settings like: system sample rate, date and time, device colors used in the app, etc.
- Assign logic functions to the 12 "hard" and 128 "soft" LIOs (Logic Inputs/Outputs) which are available on each Blade and Stagebox
- Connect system signals using an X-Y Crosspoint Grid. Save the crosspoints to files for later recall.
- Create Salvos to connect multiple signals simultaneously from an ACI command or a spare button
- Set Associated Connections for controlling audio and logic connections based on system activity
- Evaluate and troubleshoot the WNIP system including monitoring the audio at any input or crosspoint, and on most destinations.

System, Alarm, Detail Docks    Dock & Window Selectors    Tabs—set by the selected System Dock item



Page Tabs

Four context menus (right-click on the Logo; a Source Name; a Destination Name; or in the Crosspoint Grid)

Crosspoint Target

Figure 3-1 Wheatstone Navigator Controls Overview

To start Navigator double-click its desktop icon or, from the Start Menu, select All Programs > Wheatstone > WheatNet IP Navigator on Win 10 PCs. On a Win 7 PC, select All Programs > Wheatstone > WheatNet IP > WheatNet IP Navigator.



The app opens showing the *System Crosspoint Grid* (Figure 3-1). A Login popup also appears. When first using the app, just click *OK* to close the popup since no password is set by default. We do recommend setting a password—especially when Navigator is run on a studio PC, since an unauthorized user could cause unexpected audio connection changes and make other undesirable system changes.



## System Tabs

The **System > Crosspoint tab** is shown when the app starts. Clicking on a Blade, a Surface, or another icon in the System Dock changes what's displayed, as will clicking on a different **System tab** or on a different **Page tab**. To re-display the Crosspoint Grid, click the System icon in the System Dock or the **System Page tab** then click the **Crosspoint tab**. A separate Crosspoint Grid floating window can also be opened by clicking the *X Point* window selector.

The Crosspoint grid shows system sources on the horizontal axis and system destinations on the vertical axis along with icons indicating connected signals in an XY grid. The signal name colors match the device icon colors in the System Dock. These can be updated using the *Blade Preferences* section of the **System > Preferences tab**.

Connected audio signals are shown by round dots with the dot colors normally indicating signal level (purple = no or low signal, green = normal level signal, red = high level signal). A single small dot indicates a mono source-destination connection. Two dots at a 45° angle indicate a stereo source connected to a stereo destination. If there are two dots stacked vertically the source is mono but the destination is stereo. Likewise, two horizontal dots indicate a stereo source connected to a mono destination. A large circle indicates a connection between a 5.1 source and a 5.1 destination.

A small green square indicates a logic-only crosspoint. A horizontal red line indicates a destination that's locked. This can be done manually using a destination context menu item (*Lock Signal*) but it can automatically occur when a channel is turned on and the option *Lock Destination When On* is checked in the Strata Surface Setup app (**Surface Options > General page tab**).

## Connecting Signals

As you mouse over the grid, purple X-Y crosshairs point to a source and a destination for easy identification of which signals will be connected if that crosspoint is "clicked" on in the grid. Clicking on a crosspoint adds an icon to indicate that connection is now active. To disconnect a signal, click on an active crosspoint to silence the destination on an audio connection or turn off the logic on a logic crosspoint.

As a safeguard to prevent accidental connections or disconnections you can require that the CTRL key be pressed when clicking in order to make or break a connection. This is set in the *General* section of the **System > Preferences tab**.

Destinations with a horizontal red line across the grid indicate they're locked from change since they're actively in-use. However, a locked signal can be unlocked by right-clicking on the Destination name and selecting *Unlock Signal* from the context menu.



**Note:** Use caution when unlocking fader channel destinations. Locking typically indicates those channels are currently turned on.

## Monitoring the Audio

Right-clicking on an active crosspoint connection, on a source name, or on a destination name, brings up various context menus (shown in Figure 3-1 on the previous page). Selecting *Monitor*, *Monitor Source*, or *Monitor Destination* opens a pop-up Monitor window (Figure 3-2) which shows the Source levels and, if that signal is connected to an output, the Destination levels. A drop down list in the Listen section allows you to choose which PC audio destination to use to listen to the signal. Click *Listen to Source* to listen to the audio. Use the *Volume* control to adjust your listening level.

This feature allows one to remotely monitor the system audio by installing a remote access app (like TeamViewer) on the admin PC—and having a second NIC on that PC that's connected to the internet.

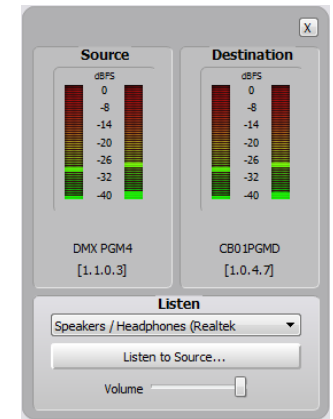


Figure 3-2 Signal Monitor Pop-Up Window

## Salvos/Macros Tab

Clicking the **System > Salvos/Macros tab** opens a display that looks like an unpopulated Crosspoint grid. The difference is that this grid is not "live." In the Salvo grid (Figure 3-3 on the next page) you're connecting signals needed for a future show, an event, or console application. These connections are saved as a Salvo, which means that all of these connections get taken when the Salvo is later "fired."

Dozens of audio and logic crosspoint connections can be set and saved in dozens of Salvos. Each Salvo begins life as a number (Salvo 1, Salvo 2, and so on) which doesn't mean much so you'll want to rename any Salvos you create (select the Salvo in the drop down list then click *Rename*) so you can enter a name so you'll remember why each Salvo was created.

Even though you can enter a name with an almost unlimited number of characters, only about 25 characters are shown in the Salvo drop down list. However, when selecting a salvo to assign to a Spare button in the LIO tab, only the first eight characters are shown so it's best to limit the Salvo name to eight characters, like: MorngRMT, SuperPre, or GrdnShow.

Click *New* to create a new Salvo with the name **Salvo X (empty)**, with **X** being the next unused Salvo number. Any existing connections from the previous Salvo are removed so you have a clean slate. As soon as you make a connection "(empty)" is removed from the name indicating that

Salvo is active. There is no Save Salvo button since the active Salvo is updated with every edit you make.

When you subsequently select a Salvo from the drop down list, its connections are shown in the Salvo Edit Screen in read-only mode. The **Details Dock** also lists that Salvo's connections using their destination and source names. To make further changes, checkmark the *Editable* option to allow connections to be added or removed.

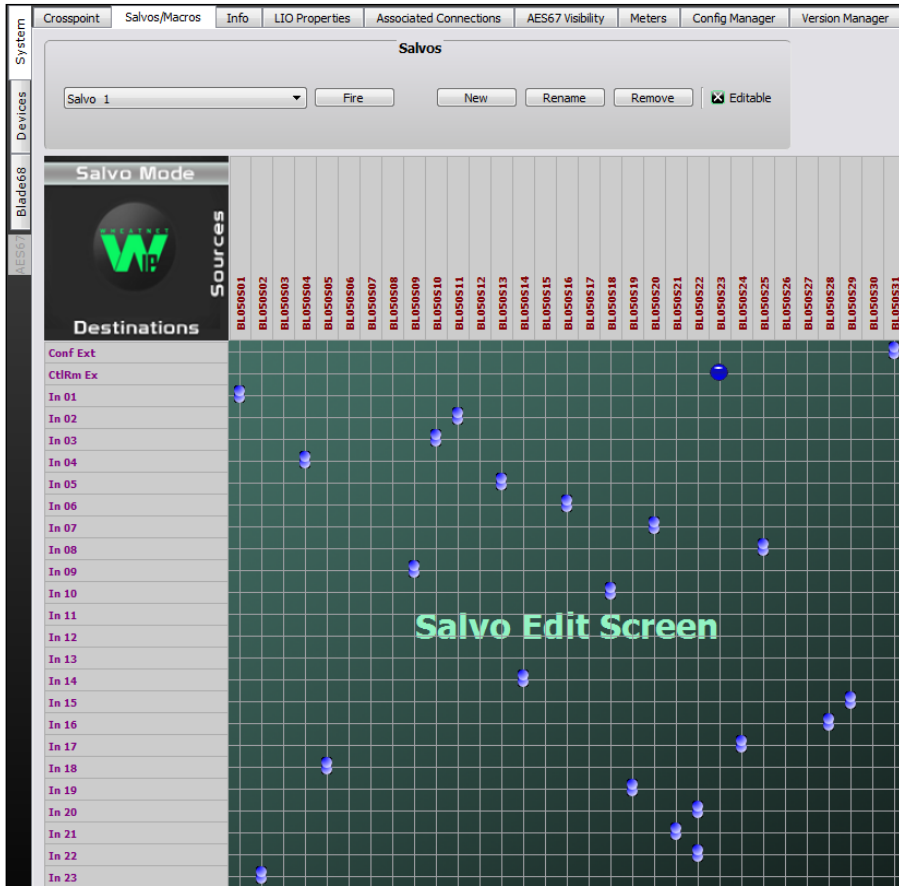


Figure 3-3 Salvo/Macro Tab

To take the Salvo, select it from the drop down list then click *Fire*. The crosspoints in the Salvo are all immediately connected—except for any on locked destinations (like channels that are currently on). Their connections are not made. To make those connections, turn off those channels or unlock the destinations and fire the Salvo again. You can also assign any of the sixteen Spare buttons to fire a salvo.

## Info Tab

This tab's main use is to set the Clock Master's sample rate, which can be set to 44.1 or 48 kHz. For TV applications select 48 kHz. The other section's settings are typically left at their default settings unless any AES67 devices will be networked with the Strata. This tab is where the AES67 master clock source is set and whether the AES67 sources and/or destinations should be shown in the System Dock.



**Note:** Navigator requires a separate AES67-PTP License (gratis) in order to network AES67 devices with the Strata console. Click the "? About" Window Selector to open the *About Window*. Click on *Request AES67-PTP License* to get the Seed ID number to email Wheatstone Tech Support to obtain an AES67 license. Needless to say, Navigator must first be licensed in order to access this enhanced Navigator feature.

## LIO Properties Tab

This tab allows the default configuration of the User-set logic functions (User 1–User 500) in their unconnected state, to be set between High, Low, or leave it in the Last State. The default setting is Low (Figure 3-4). This tab also shows the settings for the pre-assigned logic but it does not allow any of those settings to be changed. The preset logic settings can be individually set for high or low states when unconnected by selecting *Invert* in the **LIO Settings** window when assigning LIO or SLIO logic.

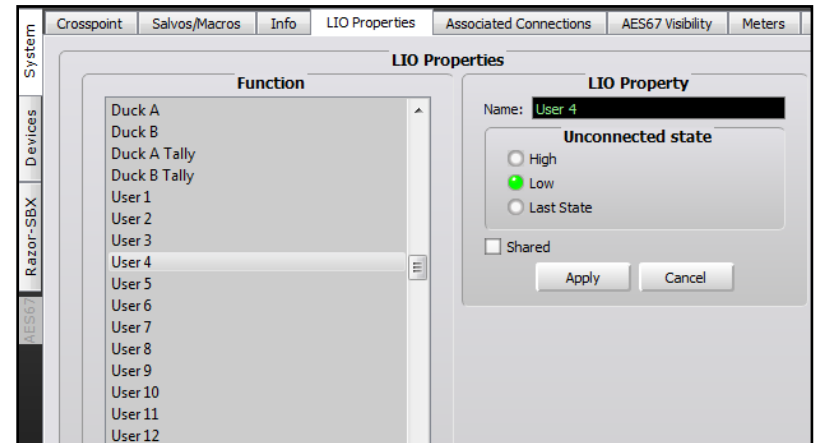


Figure 3-4 System Info Tab Details

## Associated Connections Tab

This tab is used to create, view, and edit Associated Connections, which are used to automate console or system operations. An Associated Connection consists of two parts: a Triggered Connection and one or more Associated Connections. When the triggered connection is made, the

system responds by automatically making all of the specified Associated Connections. This can automate many complex system operations. For example, in a shared talk studio when the studio host mic is taken on a particular studio console channel (the trigger), the other mics and the studio monitor and logic connections are then connected to that console (the Associated Connections). By far the most common use for Associated Connections is with phone and remote signals to ensure the correct bus-minus or mix-minus signal is connected back to that Telco or remote device when it's taken on a fader channel. This is shown in Figure 3-5.

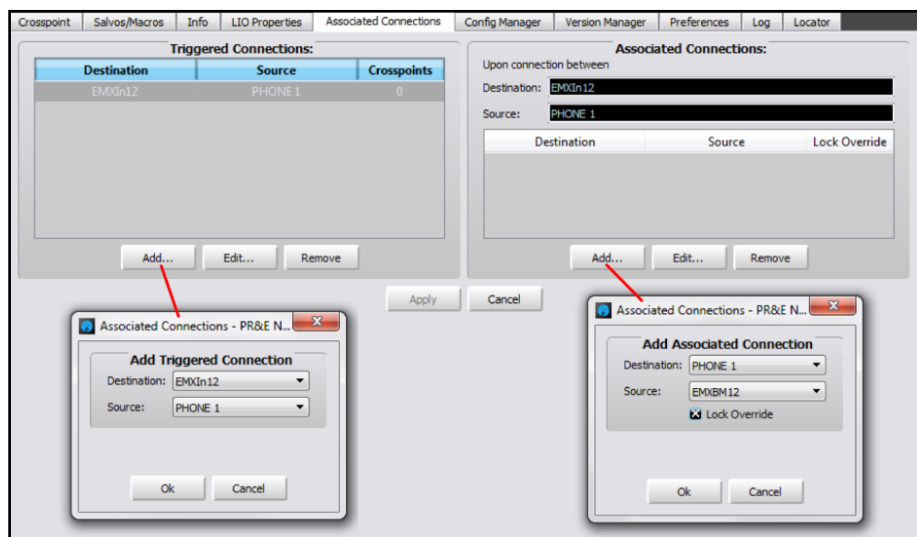


Figure 3-5 Associated Connections Tab

A Trigger Connection is assigned by clicking *Add...* in the **Triggered Connections:** section of the tab to open the *Add Triggered Connection* dialog box where a source and destination are selected. In the example PHONE 1, when taken on channel 12, is the trigger. Click *OK* to add that entry to the Triggered Connections list.

With that triggered connection highlighted, click the *Add...* button in the **Associated Connections:** section to open the *Add Associated Connection* dialog box. Select the source and destination to be connected in response to the trigger connection being made. In most cases you'll want to checkmark the *Lock Override* option. When checked, and the trigger connection is detected, the selected source will be connected to the destination even if another signal is connected and the destination is locked. When *Lock Override* is not checked, the Associated Connection would not be made if that destination is locked.

Multiple Associated Connections can be assigned to occur with a single trigger connection. Once all Associated Connections are assigned, click the all-important *Apply* button to tell the Blade with the Triggered Destination

to monitor the system waiting for the triggered connection to occur. When it's made (e.g., PHONE 1 is taken on channel 12) all of the Associated Connections assigned to that triggered connection are connected.

## AES67 Visibility

This tab sets which WNIP signals will be transmitted to AES67 devices and which ones can receive an AES67 device stream. Needless to say, this tab is not used unless you have obtained an AES67 License for Navigator and have AES67-compatible devices connected to your WNIP network. Signals are selected like in the Visibilities tab in the Strata Surface setup app (page 43 has signal selection details).



Figure 3-6 AES67 Visibility Tab

When a source is set as visible, their audio is then transmitted to the AES67 translation Blade in preparation for being streamed to the AES67 devices. Thus, checking a lot of signals could cause audio streaming traffic issues since normally audio is only transmitted when a source is connected to at least one destination. When a lot of sources are selected, even when the network is properly configured, one could run out of bandwidth. The bottom line: select only those signals which you plan on connecting.

## Meters Tab

This tab allows up to 64 meters to be selected to show levels for WNIP system sources and/or destinations. The only signals which can't be metered in this tab are the Mix Engine's destinations, like the console fader channels and external monitor inputs, and AES67 signals.

The meters are shown in up to eight rows of eight meters. Mono and stereo signals take up one meter space while a 5.1 signal meter takes up three meter spaces, as shown in Figure 3-7. The meter order is set by the order of their selection so it's best to group your selections between Source Signals and Destination Signals. Also, when meters are removed, by unchecking a signal in the Source and Destination Signals list, the other meters are not rearranged so you'll need to checkmark another signal to fill in any gaps in the meter rows.

Setting up meters in this tab can be especially useful when accessing the system remotely since you can see all of the selected signal levels at a glance, as opposed to selecting a Blade and the Sources or Destination tab to view signal levels.

This tab can also be set as a Floating Window by clicking the Float button in the upper right corner. To re-dock the tab, click the Unfloat button.



Figure 3-7 Meters Tab

## Config Manager Tab

This tab (Figure 3-8) is used to backup or restore the entire system's configuration, a selected configuration setting for one Blade, or the crosspoints. It's important to periodically save a system backup (especially after finishing setting up a new system) so that all of your system settings are saved in case they need to be restored due to a catastrophic system failure where the system could not recover system information from any WNIP Blade. In normal conditions, each Blade has the configuration information for all of the other Blades to allow the system to recover the configuration automatically when a Blade is replaced, but having an off-

line backup is a good insurance policy on recovering the system when the "automatic recovery" does not work properly.

The choices available in this tab are affected by a setting in the **Preferences tab: Enable Advanced Controls**. When it's unchecked you have the selections shown in Figure 3-8. When that option is checked the **Current Crosspoint** section adds a *Save* button so all of the current Crosspoint connections can be saved to a file for later recall. Press *Restore* to select one of the crosspoint settings files. The crosspoint connections are saved in: Documents > Wheatstone > Navigator > Connections. Clicking *Restore...* opens up a dialog box to select a saved crosspoint connection file.

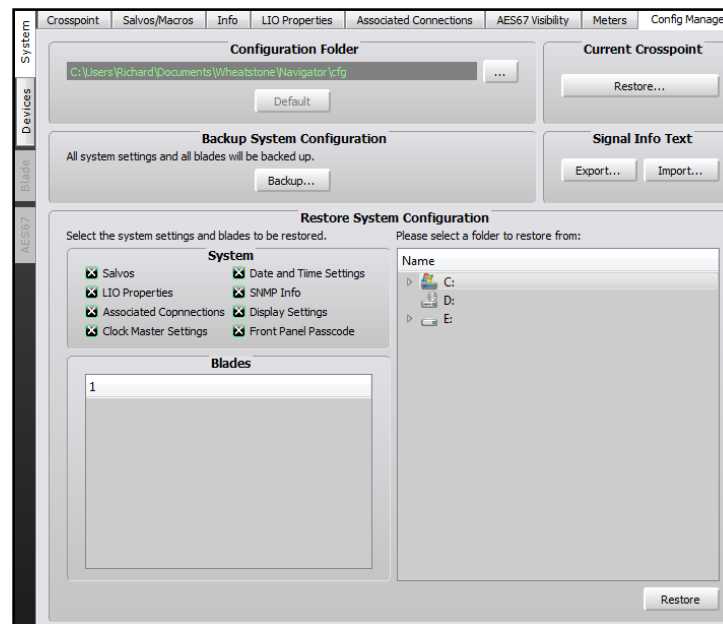


Figure 3-8 Config Manager Tab

When you save the current crosspoints, the file is named by the saved date and time. Not very useful in the long term, so click on *Restore* to open up the list of saved crosspoint files and edit the name by an activity or daypart so that the *Restore* function can then be used as an alternative to using a salvo with one very important caveat: using *Restore Crosspoint* overwrites locked signals—including ones locked because that signal is currently on-air, so the channel source could suddenly change if it's different than what's currently connected, whereas taking a salvo will not change sources on locked destinations (like on-air channels).

The **Configuration Folder:** section sets the folder path for saving configuration files. The default is: Documents > Wheatstone > Navigator > cfg. Clicking the ... button opens up a save dialog box where the path can

be changed. Clicking the *Default* button restores the save to folder to use the default path.

The **Backup System Configuration:** section allows all system settings to be backed up by clicking *Backup...* A pop-up warning box appears listing the filename, which includes the date and time. Clicking *Yes* saves a separate Blade Config file for each blade within a main folder. The saved configuration folders are listed in the **Restore System Configuration:** section of the tab when *Enable Advanced Controls* is checked, allowing each of the folders to be expanded to view the saved file names.

The **Restore System Configuration:** section is used to restore a saved configuration. The check boxes, in the **System** and the **Blades** sections, allow you to select which system settings will be restored when the *Restore* button is clicked. Click on the name of a saved configuration folder and then click *Restore* to restore the configuration settings held in that saved configuration folder. Once the settings are restored, any Blade that was restored must be rebooted to use the restored settings.

## Version Manager Tab

This tab (Figure 3-9) is used to update the operating system code on the Mix Engine, and any Stagebox and Blade networked with the Mix Engine. The operating system code files are typically downloaded as part of the Navigator app installation, so if Navigator is updated there may also be a new version of operating system code included. It can also be made available as a separate .tgz archive file. More information about using this tab to update the Blade code is in the Service chapter (page 69).

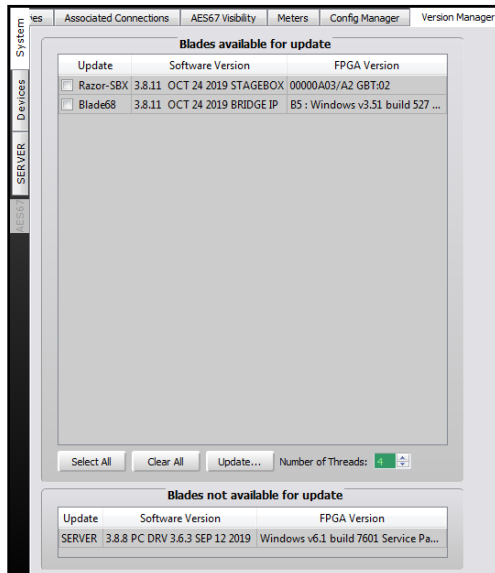


Figure 3-9 Version Manager Tab

## Preferences Tab

This tab (Figure 3-10) affects Navigator’s functionality and appearance. The **General** section sets whether the default Crosspoint view or a custom view is shown when Navigator opens (the **Default View**). **Default Grid Labels** sets how the source and destination names are listed, as names only, names and location, name and signal format, or signal ID and name. The **Default Sort Order** section sets the order in which the Source and Destination names are displayed and how the Blades they’re on are listed in the grid.

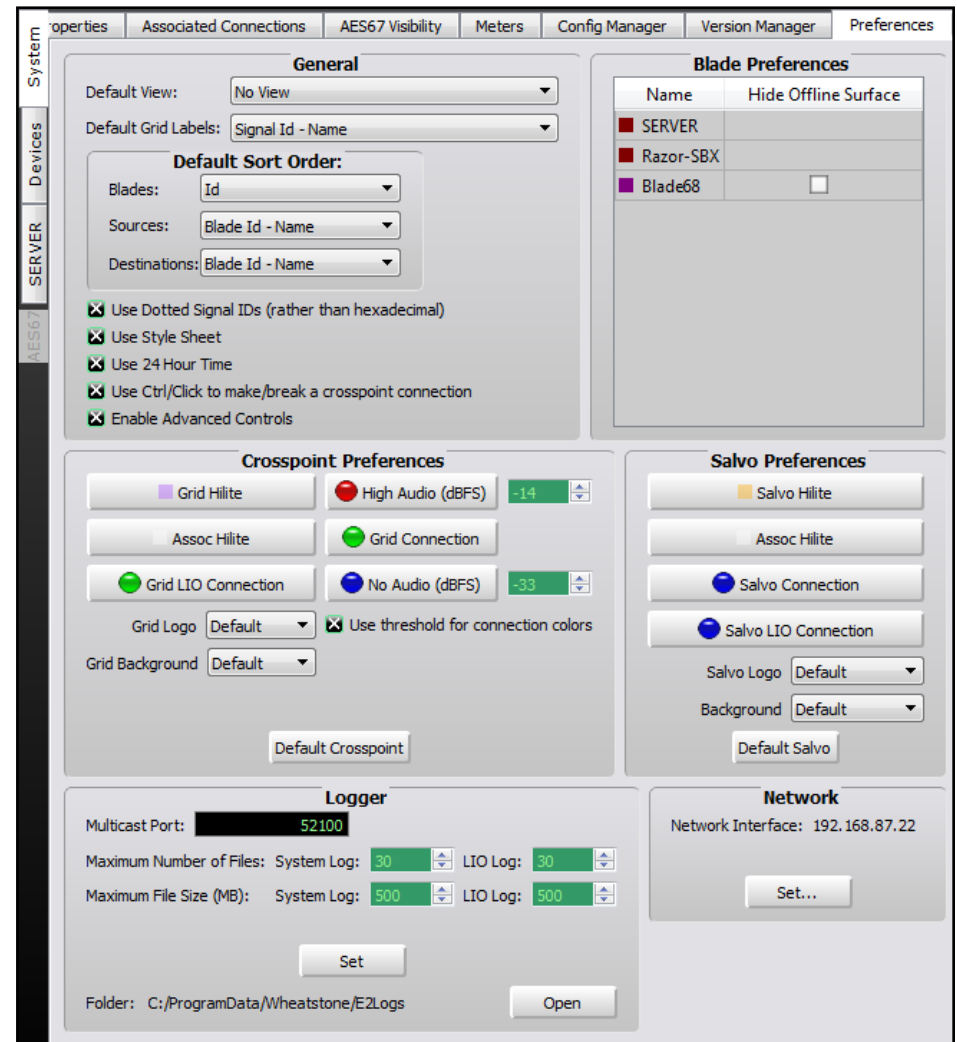


Figure 3-10 Preferences Tab

The five check boxes at the bottom of the **General** section set how Source and Destination signal ID numbers are shown (**Use dotted Signal IDs rather than hexadecimal**); set the overall look of the Navigator app (**Use Style Sheet**); set whether 12-hour or 24-hour is used by Navigator (**Use 24 Hour Time**); sets how a crosspoint connection is made or broken (**Use CTRL+click to make/break a crosspoint connection**); and sets whether to show the **Logger** section and the other advanced controls on other tabs (**Enable Advanced Controls**).

The **Blade Preferences** section allows a Blade's color to be edited. Double-clicking on a Blade Name opens a *Select Color* window so a new color can be assigned to that Blade. This sets the color of the Blade name in the System Dock, the signal names in the crosspoint and salvo tabs, and that Blade's log entries. Since System Announcer log messages are black we don't recommend assigning that color to any Blade.

The **Crosspoint Preferences** section allows one to customize how the Crosspoint grid looks. The color of the normal pointer crosshairs (**Grid Hilite**); the color of the crosshairs when over a crosspoint with Associated Connections (**Assoc Hilite**); the color of the audio connection dots from their default purple, green, and red; and the color of LIO-only connections (default green) can also be changed. The **Grid Background** selection allows the background color to be removed (*None*) or a photo or other graphic file can be set as the background (*<custom>*). The **Grid Logo** setting allows the WNIP logo with Sources and Destinations, in the upper left corner of the Crosspoint, to be set to *None* or set for a photo or graphic file (*<custom>*). Fortunately, clicking *Default Crosspoint* returns all of the settings in this section back to their defaults. The Grid logo and background can be individually returned to their default setting by selecting *Default* in the **Grid Logo** and **Grid Background** selection in case you realize "customizing" the crosspoint didn't work out the way you thought it would.

Similar control over the appearance of the Salvo crosspoint display is done using the controls in the **Salvo Preferences** section. You can customize it as well knowing there's a *Default Salvo* button that will return the Salvo tab back to its "stock" settings.

The **Logger** section is shown if *Enable Advanced Controls* is checked in the **General** section. These settings affect the System Log operations and the **Log** tab. We recommend using the default settings, but if a change is made, clicking *Set* applies the updated settings. Click *Open* opens up the E2Logs folder where the various types of log files (which are text files) can be viewed in Notepad.

The **Network** section shows the Network Interface (NIC) IP address for the WNIP system. If no devices appear in the System Dock, make sure it shows the correct IP address. If not, click *Set...* to open a dialog box which lists the NICs detected on that PC so the correct NIC (an IP address in the 192.168.87.0 subnet, typically) can be selected.

## Log Tab

The Log tab (Figure 3-11) shows messages sent by the WNIP devices. Its main purpose is as a troubleshooting tool, although you can get a good sense of network communications by observing the log as the system is used for normal operations.

When Navigator was installed, the E2Logger service was also installed. It captures all system log messages, saving them into daily log files, regardless of whether Navigator is running. When Navigator is started, the log tab displays new messages generated since it was opened. The maximum number of lines to shown in the log tab can be set from 1,000 to 1,000,000 lines, from the default 10,000 lines, by clicking the *Set...* button to edit the Max Lines entry. You can also add a mark into the log file by clicking *Mark...* and entering any alphanumeric text then clicking *OK*.

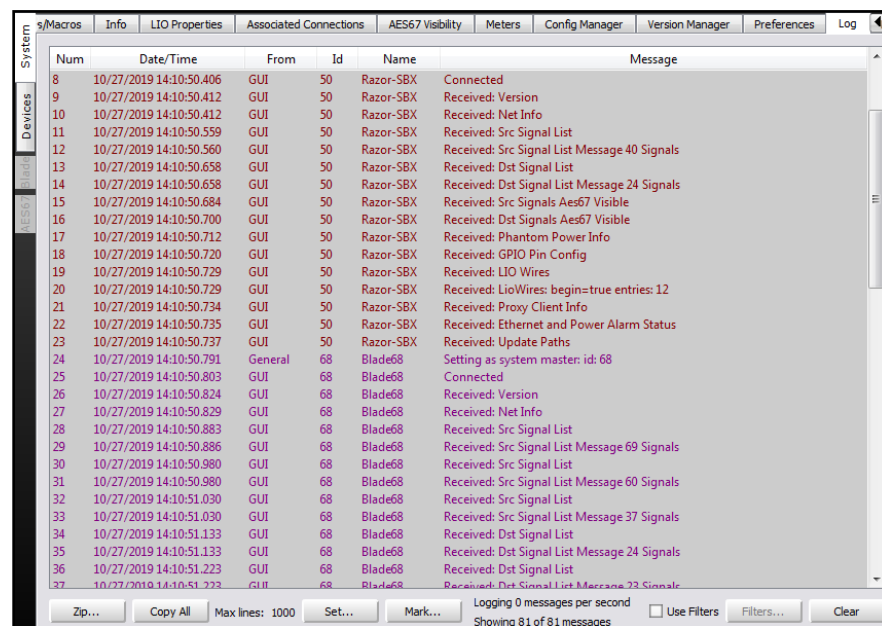


Figure 3-11 Log Tab

While troubleshooting an on-going issue you can click *Clear* to clear out the log tab display so you'll only see new messages. You can also check the *Use Filters* box and then click *Filters* to open the System Log Filter window to select which Blades to filter by and which messages and columns to display. None of these affect the actual log files being saved.

To email log files to Wheatstone tech support, click the *Zip...* button to open a Zip Log Files window. Select how many days of log files to include in the zipped archive. On very active systems the log files can be very large, hence this process to zip them up into an archive so they can be

emailed to tech support. The archive folder is saved in the Program Data > Wheatstone > E2Logs folder with a .tar.gz suffix.

Click on *Copy All* to copy all of the current log entries so that they can be pasted into a blank text doc or into Excel for easier viewing.

## Locator Tab

This tab (Figure 3-12) lists the network details for all Blades and Surfaces detected by Navigator. It is only shown if *Enable Advanced Controls* is checked in the **General** section of the **Preferences** tab. Click *Refresh* to rescan the system to refresh the list of devices. Note that a similar view is obtained by clicking on *System View*, however in that view the Surfaces are shown under a separate tab from the Blades.

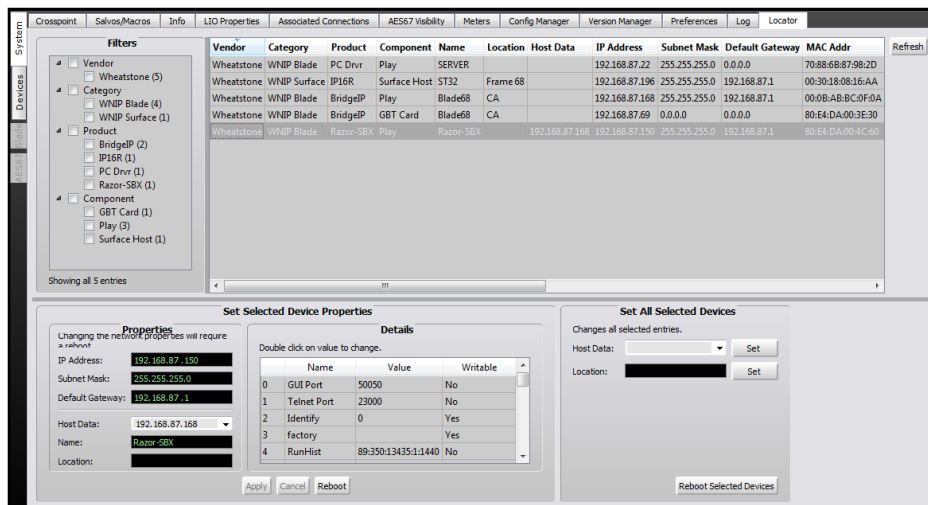


Figure 3-12 Locator Tab

Clicking on a device highlights its row, like the Stagebox shown in Figure 3-12. That device's properties are then shown in the **Set Selected Device Properties** section. The settings can be manually edited to change the IP Address and, in the case of a Stagebox, the Host's IP Address (Host Data), its system Name, and location. The other entries are not normally changed using this tab.

## Blade Tabs

When any Blade—which includes the IP Mix Engine, the Stagebox, and PCs running the WNIP audio driver, is selected in the System Dock, the tabs switch from those shown while *System* is selected to show these Blade tabs: **Sources**; **Destinations**; **Wire info**; **LIO Info**; **Blade Info**; and **Config Manager**. Some Blades have additional features so they'll also have additional tabs. Here's a quick summary of the standard Blade tabs:

- **Sources tab**—used to edit the Blade's input signals by: editing the signal names and signal format; adding associated logic to the audio signal; creating audio signal aliases
- **Destinations tab**—used to edit that Blade's output signals by: editing the signal names and signal format; adding LIO-only logic outputs
- **Wire Info tab**—shows the input and/or output connection information and allows it to be saved to a .csv file so one can create wire lists using Excel or similar editor that can import a .csv format file
- **LIO Info tab**—used to view the settings and verify operation of the LIO and SLIO logic and the Spare buttons (when the Blade is hosting a Surface). Depending upon the type of Blade selected, one may only see Software LIOs (a PC running a WNIP audio driver); only see Blade LIOs (a Stagebox); or see Software LIOs, Functional LIOs, and Surface Spares (IP Mix Engine).
- **Blade Info**—used to view the version of code running on that device and edit the Blade's Name. Depending upon the type of Blade selected, other settings may be shown and edited including the network settings; the Clock Master or Route Master Preference settings; settings unique to that type device (for a Stagebox whether there's a redundant Ethernet link and power supply); and a Factory Reset option.

## Sources Tab & Destination Tab

These two tabs are identical with the Sources tab showing the inputs on that Blade while the Destinations tab shows the outputs on that Blade. Each tab has four sections: **Source Signals** or **Destination Signals**, **Details**, **Free Resources**, and **Meters**. Figure 3-13, on the next page, shows a Blade's **Destinations** tab.

To edit a signal's name, click on a name in the *Name Column* then type in a new name of up to eight characters. The *Location Column* allows the location name to be edited. This can be used to better define a signal since using Location is one method of ordering the signals in the Crosspoint grid. A right-click context menu allows the edited Location name to be copied and then pasted into one or more entries to update their Location names.

The **Source Signals** and **Destination Signals** sections have four buttons: *Add...*; *Add Alias...*; *Edit...*; and *Delete*. Clicking *Add* opens up the

Edit Signal window (shown in Figure 3-14 on the next page) so you can add a new signal. The other three buttons require one to first select a signal and then click *Edit...* to edit that signal; *Delete* to delete the selected signal to free up resources; or *Add Alias...* to create a new signal based upon the selected signal.

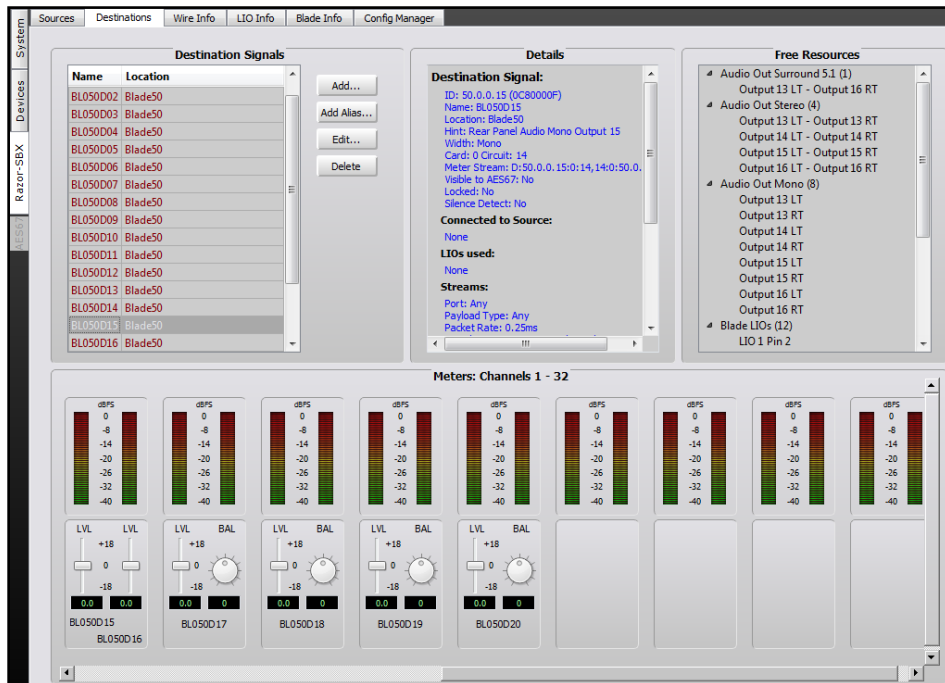


Figure 3-13 Blade - Destinations Tab

Clicking the *Edit* button also opens up the Edit Signal window (Figure 3-14) where the signal name and format (*Signal Type*) can be edited and where LIO or SLIO commands can be assigned to that audio signal. The steps to accomplish common actions like renaming signals, changing the signal type, and assigning logic, are covered in their own sections over the next several pages.

Selecting a signal and clicking *Delete* removes that signal from the Signals list. This would be done to free up its signals in order to add new signals with a different signal type (i.e., changing a stereo signal into two mono signals or combining two mono signals into a stereo signal). The **Free Resources** section lists how many signals of each type are currently available when signals have been deleted. For example, in Figure 3-13 the last four stereo outputs were deleted and the Free Resources section lists what resources are then available. In this case, one can add one Surround 5.1 output; four stereo outputs; or eight new mono outputs (or some combination of mono and stereo outputs).

The logic resources are similarly updated when an audio signal with logic or a logic-only resource is deleted: the Blade LIOs or Software LIOs number increases by the number of logic signals deleted. Of course, when logic is assigned to an audio signal these numbers then decrease as the LIOs are used.

The **Details** section lists information about the selected signal including its system ID number; the Name that appears on-screen, on channel displays, and in Navigator; its Location; its Width (mono, stereo, Surround 5.1); and various technical details about its physical connection and audio streams. It also lists any logic assigned to that signal and whether the signal is currently cross-connected. This same information is also shown in the **Details Dock** when one clicks on a Source or Destination name in the Crosspoint tab.

The bottom half of the tab is the **Meters** section showing the levels of the physical Blade inputs (on the Sources tab) or Blade outputs (on the Destinations tab). Note that the Mix Engine (its default name is Blade68) does not have any metering. The Level & Balance Control section on the next page covers how to use the meters and their controls.

### Naming Signals

Each input and output signal, on every Blade, has a default name. When an external signal is actively connected to an input or an output, the default name should be edited to identify the peripheral device or the signal that's connected. Unused inputs and outputs can be left using their default names to indicate they're not active since the default name does identify the signal by Blade ID and the input or output number. The Mix Engine's signal names, which identify its various internal buses and the Surface's fader channels, are typically left set using their default names.

As an example of how to edit a name, the Stagebox has the default source names of BL050S01, BL050S02, and so on to identify its Source signals. BL050 or BL50 identifies the signal as being on Blade 50 (the default Blade number for a new Stagebox) while S01 and S02 indicate the physical connection. In this case: Mic/Line Input 1 (S01) and Mic/Line Input 2 (S02).

These default names can be replaced with any name of up to eight characters. Most users use all upper case but both upper and lower case letters are supported and are shown in the channel displays. Input signals are edited using the **Sources tab** and output signals are edited on the **Destinations tab**. To edit the name, click on the name in the *Source Signals* (or *Destination Signals*) section of the tab then type in a new name of up to eight characters.

You can alternately click once on the name then click *Edit...* to open the *Edit Signal* window to edit the name, which is automatically highlighted when the window opens, as shown in Figure 3-14 on the next page.



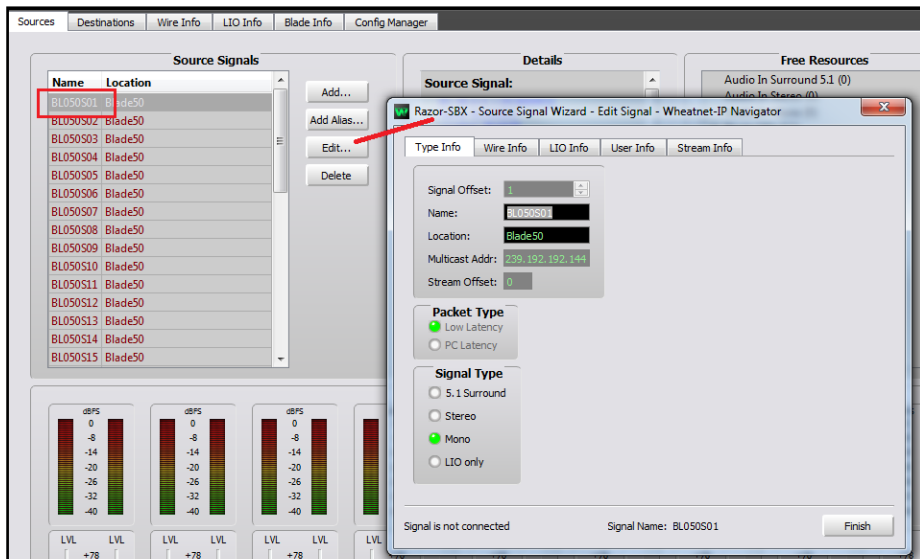


Figure 3-14 Edit Signal Window

### Changing the Signal Type

On a Stagebox each analog input and output is factory-set as a mono signal while each AES input and output is set as a stereo signal. These default formats, or signal types, can be changed, as required, using the Edit Signal window. To combine two mono signals into a single stereo input you must first click on the signal name for the signal that will be the right channel then click *Delete* to free up that signal's resource.

For example, to set the first two Stagebox inputs (BL050S01 and BL050S02) as a stereo input rather than two mono inputs, click on BL050S02 to highlight it, then click *Delete* to remove that signal—after clicking Yes on the "Are You Sure?" pop-up box. The Free Resources section will then show "Audio In Mono (1)" indicating there is one free mono signal available.

Click on BL050S01 and click *Edit...* to open the Edit Signal window (Figure 3-14). Change the **Signal Type** selection from Mono to Stereo. You can then edit the name to STEREO 1 to indicate that Mic/Line In 1 and Mic/Line In 2 are now a stereo input. If you know what stereo device will connect to those inputs enter that device name in the *Name* entry box. Click *Finish* to close the Edit Signal window.



**Note:** You can't edit a source or a destination signal when it's connected in the Crosspoint grid. When the Edit Signal window opens (Figure 3-14) look at the bottom of that window and verify it shows "Signal is not connected." If "Signal is connected" is shown you won't be able to make any changes to that signal, other than editing its name, until you disconnect its crosspoints.

### Creating Aliases

A source or destination signal might need to have different names depending upon where or how that signal is being used. To do this an *Alias* can be created for a signal. An Alias might be used with mic inputs so that generic signal names, like MIC 1, MIC 2, MIC 3, and so on, can be used to identify the source, but each mic could have multiple Aliases created so that the "talent's name" appears in the Surface's channel displays rather than the generic MIC 1, MIC 2, MIC 3 names assigned to the mic inputs.

To create an Alias, click on a Source name or a Destination name then click *Add Alias...* and enter a name. For example, if you want to create an Alias for MIC 1, click on that name in the Signals list then click *Add Alias...* which opens up the *Add Alias* window (which is very similar to the *Edit Signal* window). Type in the "talent's name" in the *Name:* entry box. Click *Finish* to close the *Add Alias* window. The Alias name is now added as a completely new "source" to the Source Signals list.

Once you add Alias names and complete editing the source and destination names use the Strata Surface Setup app to run a new System Scan (see pages 31 & 32). This action updates the Surface Setup app with the changes you've made in Navigator, updating the signal names and adding an Alias category to the Visibilities lists.

Even though each Alias is associated with a specific source or destination signal, each Alias is treated as a completely separate signal by the system so that it can have logic assigned which differs from the original signal. It can also have different channel Visibilities and different VDip settings from the original source or destination signal.

### Level & Balance Controls

The bottom half of both the **Sources** and the **Destinations** tabs is labeled **Meters** (Figure 3-15). There is one meter for each input and output on the Blade. For most Blades this means there are sixteen meters since most Blades have eight stereo/16 mono inputs and eight stereo/16 mono outputs. On the Stagebox, there are 48 input meters and 32 output meters. The IP Mix Engine does not have any meters.

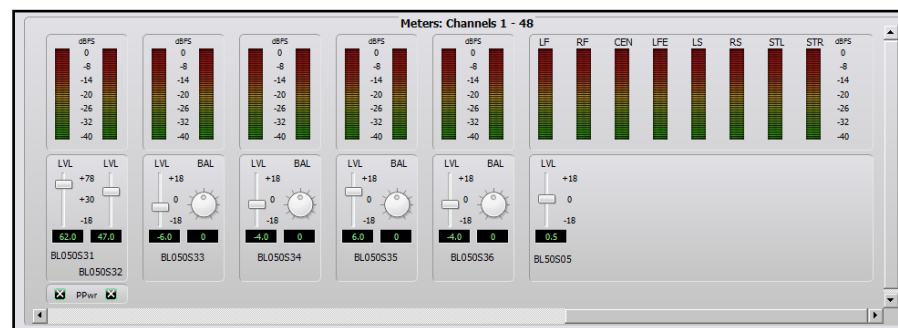


Figure 3-15 Meters section of the Blade - Sources and Destination tabs

The level controls on most Blades allow each signal level to be adjusted by up to +/-18 dB from nominal, but the Stagebox analog inputs, which can be used with mic level or line level signals, have an adjustment range of -18 dB up to +78 dB. Each analog input also has Phantom Power switch (PPwr) to power condenser mics. Phantom power is active when PPwr is checked.



**Note:** To use Phantom Power we recommend connecting the microphone physically to the Stagebox input prior to checking the PPwr box. When a phantom powered mic will be unplugged, uncheck the PPwr box prior to unplugging the microphone to prevent damaging the mic preamplifier.

Each mono input and output has a fader-type level (**LVL**) control just below its meter as shown on the left-most two meters in Figure 3-15 on the last page. Stereo inputs and outputs, like the middle four signals in Figure 3-15, have a level and a round balance (**BAL**) control. Surround 5.1 signals, like that shown at the right in Figure 3-15 have a single fader-type level control. The level and balance controls are prior to the meters so changing the level or balance is reflected in the meter displays when audio is present on that input or assigned to that output.



**Note:** The level and balance controls affect the audio in real time so use caution when adjusting levels on a live console.

Levels are adjusted using these methods:

- Click/drag the level control up (for gain) or down (for trim)
- Click above/below the level control to add/subtract .5 dB per click
- Click/hold on the BAL control and drag around the control to pan the signal left/right
- Enter the amount of gain/trim or balance by highlighting the number below the level or balance control and entering a new number. For levels, numbers from -18.0 up to +18.0 (up to +78 for Stagebox analog inputs) are valid. For balance control, numbers from -100 (full left) to +100 (full right) are valid. Enter 0 to center the balance control. Press *Enter* to set the new number.

The meters show both the average and peak signal levels in dBFS (dB Full Scale). The top of the average level bar graph should be near the -20 mark while the peak LED should be bouncing around the -8 mark to allow for some headroom.

### Balanced vs. Unbalanced Inputs & Outputs

One common use for the input level control is to boost the gain of signals coming from an unbalanced device. Although many "Prosumer" devices use 1/4" connectors, most are unbalanced TS (Tip-Sleeve) not balanced TRS (Tip-Ring-Sleeve) jacks. Their nominal output level may also

be the same as on consumer unbalanced "RCA" jacks: 300 mV rather than the 1.2 V nominal levels found on balanced output devices.

An unbalanced device's hot signal is connected to the + input and, on a TS connector, the - input will end up being connected to ground. This will cause the input signal to be 6 dB lower since it's unbalanced, but since it often has a lower output level to begin with, typically the level control must be used to add from +12 dB to +18 dB of gain to compensate for the lower level from the unbalanced device. Doing this eliminates having to use a level match box on that unbalanced input signal.



**Note:** A Blade's balanced output cannot directly connect to an unbalanced device—even though the output gain can be lowered to an appropriate output level, because there is no ground reference on the Blade's RJ45 output jacks. Thus, you must use a balanced-to-unbalanced match box or a balanced-to-unbalanced transformer to properly connect any Blade's analog output to an unbalanced device.

### Logic Control

Blades have twelve "hardware" LIO (Logic Input or Output) ports which are on two RJ45 Logic jacks. Navigator lists these LIO ports by their RJ45 connector (LIO 1 or LIO 2) and by their RJ45 pin (pins 2-7 have six I/O signals while pin 1 has GND and pin 8 has +5 volts).

A Stagebox also has twelve logic signals, but they're on one 15-pin female d-sub connector. However, Navigator lists the Stagebox LIO signals using the standard Blade format, as if the signals were on two RJ45 jacks, so Figure 3-16 shows the pin out for the DB15 male mating connector and a chart to cross the Navigator logic signal names to the DB15 pins.

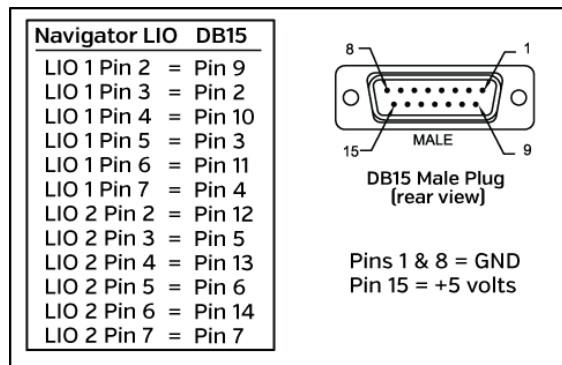


Figure 3-16 Stagebox LIO Connector & Navigator LIO Numbering

These LIO connections are used to connect legacy devices which use hardware GPIO (General Purpose Input/Output logic) like Henry Superelays, CD players with start logic, low-voltage Hot Studio warning lights, etc.

In addition to the twelve “hard” LIO signals, Blades, the Mix Engine, and Stageboxes have 128 “Soft” or SLIO signals which can be used to carry logic between the Strata and networked WNIP-compatible devices like Wheatstone talent panels and all major newsroom automation systems.

Both the LIO and the SLIO logic are set using the same *Edit Signal* window, as was used to set the audio format (stereo/mono) and to name the audio signals, if the logic is associated with an audio input signal. For example, if the first Stagebox input (BLO50S01) needs to have logic assigned to it, select that audio input name (it highlights) in the Source Signals list then click *Edit* to open the Edit Signal window (the process shown in Figure 3-14 on page 25). Click the **LIO Info** tab (Figure 3-17) to show any logic settings already set for that audio signal. Click *Add* to add new logic signals. If a logic setting has already been added, click on the signal row then click *Edit* to open the edit window to change the setting, or click *Delete* to remove that logic entry.

Figure 3-17 shows the typical settings used with a WheatNet Talent Station (TS). It uses two logic signals to carry Remote On and Remote Off commands from the TS to a console channel, and two logic return signals to carry the On and Off Tally logic back to the TS to light up the On and Off buttons. These are assigned using Soft LIOS since the TS is a networked device. Figure 3-17 shows the **Assign LIO** window, opened by clicking *Add*.

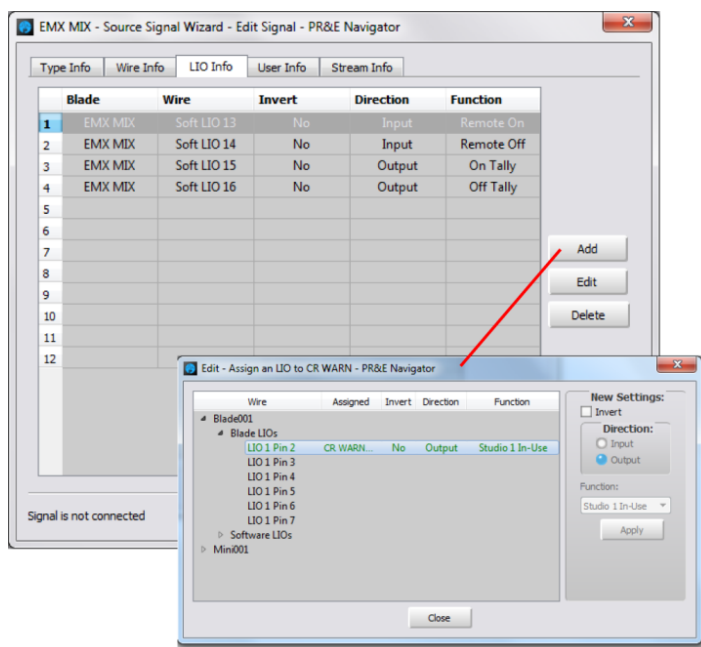


Figure 3-17 Logic Assignment tab

## Logic-Only Signals

Logic signals, which are not associated with a particular audio signal, can also be created. These are called logic-only signals and they can be setup as either a Source signal or as a Destination signal. One example of why you’d create a logic-only signal is to connect control signals to “Hot Mic” or “Hot Studio” warning lights, which would be triggered when mics are live on-air.

The Strata has eight **Studio In-Use commands** which are all carried within a source signal named **Tally**. To trigger logic outputs the Tally signal, which is a source, must cross-connect to a destination. Thus, we need to create a Logic-Only Destination signal which we would then cross-connect to the Surface’s Tally signal.

To create a Logic-only Destination, select the Blade which will physically connect to the Hot Studio warning light then click on its Destinations tab. Click *Add...* to open the *Add Signal* window. In the **Signal Type:** section, select *LIO only*. A default name, like BL050D33 is assigned to this new signal, so change that name to something more useful, like HOT STU or STU WARN, by editing the default name in the **Name:** entry box.

Click the *LIO Info* tab to view the **Logic Assignments** window then click *Add...* to open the **Assign LIO** window (Figure 3-17). To add output logic, select Output as the *Direction:* then select a *Function:* from the drop down list of selections. To create a STU WARN command for Studio 1, select *Studio 1 In-Use*. For a Studio 2 HOT STU light, select *Studio 2 In-Use*. If the Control Room needs a warning light output, select *Studio 3 In-Use*. Note the LIO connector number and pin number for each signal since that identifies which pin you’ll connect the different logic signals to on the LOGIC 1 or LOGIC 2 connector on that Blade (or to the single LOGIC connector on the Stagebox). Click *Apply* to set that logic command. To control multiple hot studio lights you would repeat this process to add multiple logic signals. Once you’re done click *Close* to close the Assign LIO window then click Finish to close the Edit Signal window.

Switch to the Crosspoint grid (**System > Crosspoint tab**) and locate the logic source: Tally. That signal carries all the internal logic commands from the Strata so it must connect to the new HOT STU or STU WARN destination you created by clicking (or CTRL+click) on its crosspoint. A green square indicates it’s a logic-only connection.

In the example in Figure 3-17, when a STU 1 mic channel is on-air, there will be a contact closure between pin 2 (STUDIO 1 IN-USE) and pin 1 (ground). With a second LIO assigned to pin 3, and labeled STUDIO 2 IN-USE, when a Studio 2 mic channel is on-air, they’ll be a contact closure between pin 3 (STUDIO 2 IN-USE) and pin 1 (ground). These logic outputs are then physically connected to a hot studio warning interface or directly to a low-voltage LED warning light. If the logic is coming from a Stagebox, follow the chart in Figure 3-16 on page 26 to determine the correct DB15 pin for each of the LIO pin numbers listed in Navigator.

## Wire Info Tab

This tab allows one to view technical details about each physical input and output. The information can also be exported to a .csv file so that Excel or other app can be used to create wire lists for the physical I/O wiring to the various Blades and Stageboxes in the system. Separate .csv files can be created by clicking the *Save Source Info...* and *Save Destination Info...* buttons. Clicking the *Save Wire Info...* button puts both sources and destinations into a single file

## LIO Info Tab

This tab can be used to setup and see the current logic states of LIOs and the Spare Buttons, if available. What's shown depends upon the Blade type. Figure 3-18 shows a console Blade which has all of the sections that may be shown: **Blade LIOs** for the hardware LIOs; **Software LIOs** for the SLIOs; **Functional LIOs** for Blade status; and **Surface 1 Spares** when that Blade hosts a Surface.

On a Strata this tab will mainly be used to assign Spare buttons to fire a Salvo, make a momentary connection, and/or Take a Blade Processor Preset, as shown in Figure 3-18. The sixteen Spare buttons are listed under *Surface 1 Spares* as *Spare Btn 1 – Spare Btn 16*.

Pin Name	Input	Output	Function	Signal	Fire Salvo	Momentary Connection	Take Preset
<b>Blade LIOs</b>							
LIO 1 Pin 2			Remote On	BL01MIC1	<none>	<none>	<none>
LIO 1 Pin 3			Remote Off	BL01MIC1	<none>	<none>	<none>
LIO 1 Pin 4			On Tally	BL01MIC1	<none>	<none>	<none>
LIO 1 Pin 5			Off Tally	BL01MIC1	<none>	<none>	<none>
LIO 1 Pin 6			<none>	<none>	<none>	<none>	<none>
LIO 1 Pin 7			<none>	<none>	<none>	<none>	<none>
<b>Software LIOs</b>							
<b>Functional LIOs</b>							
<b>Surface 1 Spares</b>							
Spare Btn 1					No BrdOp	<none>	<none>
Spare Btn 2					AM Show	<none>	<none>
Spare Btn 3					Syndicat	<none>	<none>
Spare Btn 4					<none>	<none>	<none>
Spare Btn 5					DST CB01CR => SRC BL01MIC1	<none>	<none>
Spare Btn 6					<none>	<none>	<none>
Spare Btn 7					<none>	<none>	<none>

Figure 3-18 Blade > LIO Info tab

To setup a Spare button to make a momentary connection, double-click on <none> in the **Momentary Connection** column for the desired *Spare Btn* to open the dialog box shown in Figure 3-19, left. Click the checkbox to activate the Source and Destination signal selections. In the example, the source is MIC1 (the board operator mic) and the destination is the call screener's output (CALLSCNR in this example). Clicking *OK* closes that dialog box and adds the entry to the Momentary Connection column for *Spare Btn 5* (Figure 3-18). Pressing that Spare button switches the board

operator mic into the call screener's speaker. When the Spare button is released the normal monitor audio is reconnected to the speakers.

To assign a spare button to fire a Salvo, double-click <none> in the **Fire Salvo** column for the Spare Btn you want to use to fire a salvo. The Fire Salvo window opens (Figure 3-19, right). Check the Fire Salvo checkbox to activate the Salvo drop down list. Choose a salvo to fire then click *OK* to close the window. The salvo name is shown in the LIO Info window (like NoBrdOp, AM Show, and Syndicat, shown in Figure 3-18).

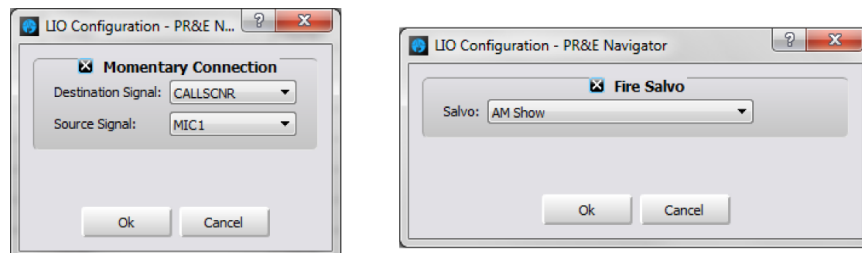


Figure 3-19 LIO Dialog Boxes



**Note:** Even though most users assign a spare button to perform only one action, they can be setup to do any combination of: Fire Salvo, Momentary Connection, Take Preset, and send out an LIO and/or an SLIO command. This allows a spare button to be set up to accomplish very complex actions with the press of one button.

## Blade Info Tab

Figure 3-20 (on page 29) shows the Blade Info tab for a standard Blade. The tab's sections will differ by Blade type so refer to the Blade-3 manual for details about other sections not covered here.

The entries in the **Info** and **Network Info** sections with black backgrounds (*Blade Name, IP Address, Subnet, and Gateway*) can be edited. The **Route Master** and **Clock Master Preference** sections allow one to change the default settings to favor one or more Blades to always be the Route Master or Clock Master. Most devices will also have a **Factory Reset** section to return that device back to its original factory default settings following a reboot.

The **Support** section is only found on Blades which support the Utility Mixer function. It allows that Blade to be set as an "AES67 translation Blade." Blades with this section have *Utility Mixer Support* selected, but when the system is networked with AES67 devices the processing power used by the Utility Mixer can be repurposed to instead be used as an AES67 Stream Translator, when *AES67 1ms Support* is selected. This sets that Blade to translate eight WNIP system audio streams, using .25 ms packet timing, into eight AES67 1 ms packet timing streams, and vice versa. Any number of Blades can be set for this function to allow for additional AES67 streams into and out of the WNIP system.

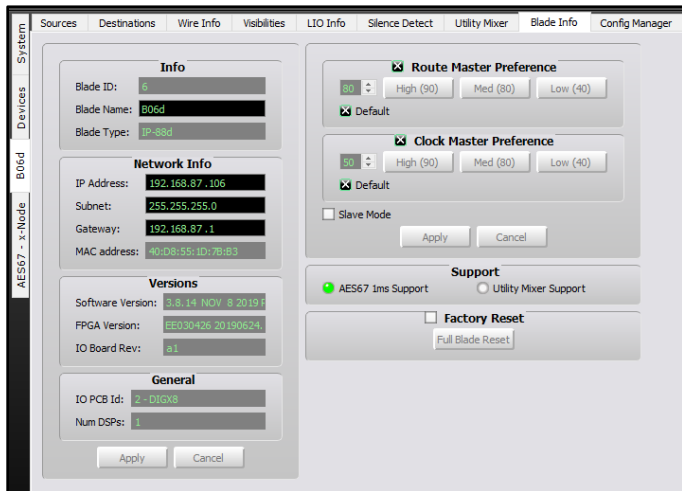


Figure 3-20 Blade Info Tab

## Config Manager Tab

Figure 3-21 shows the Config Manager tab where the selected Blade's configuration settings can be saved to a backup folder. A system backup can also be selected to reconfigure the selected Blade. One or more folders, with configuration data for one or more Blades (the entire configuration for each Blade can be saved using the System > Config Manager tab) are listed by their device number. The folder which has the configuration backup folders is shown or edited in the **Configuration Folder** section at the top of this tab.

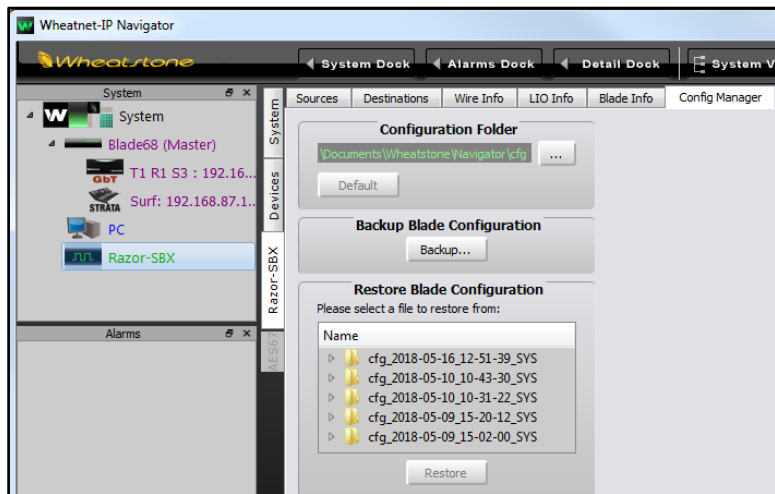


Figure 3-21 Config Manager Tab

## Visibilities Tab

Figure 3-22 shows the Visibilities tab. Neither the IP Mix Engine nor Stagebox have this tab since it's used on regular Blades to set the source selection for local Blade destinations like the front-panel headphone jack and for local control over the rear panel Blade outputs.

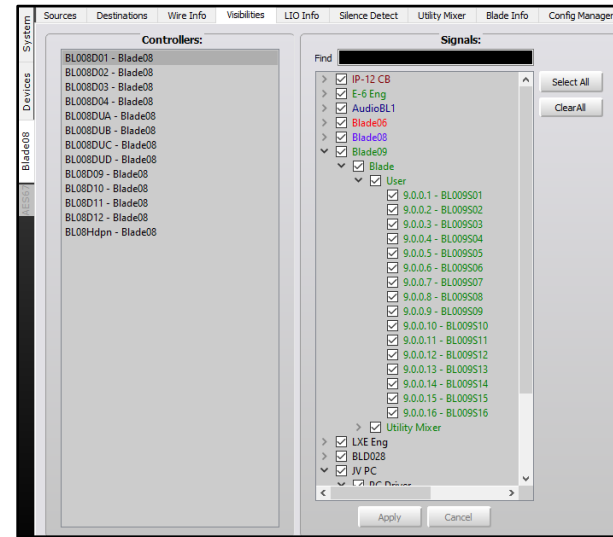


Figure 3-22 Visibilities Tab

## Silence Detect Tab

Figure 3-23 shows the Silence Detect tab. It's used to automatically recover from a loss of audio by switching to an alternate source when silence is detected. Refer to the Blade 3 User Manual for more details on using the Silence Detector.

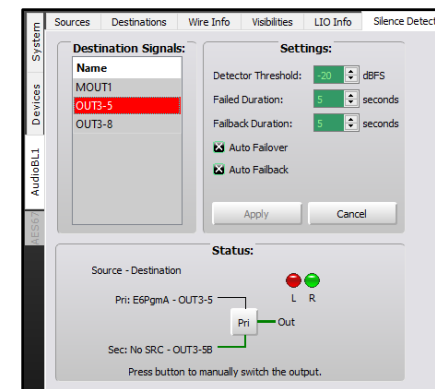


Figure 3-23 Silence Detect Tab

## Utility Mixer Tab

Figure 3-24 shows the Utility Mixer tab. Blade-3 blades (those with two OLED displays on the front) each have two Utility mixers (Mixer 1 and Mixer 2). When the Strata system is used with AES67 devices, at least one Blade-3's Utility Mixers will need to be repurposed to use that Blade's DSP for "AES67 stream translation" to convert AES67 streams into WNIP system streams and vice versa. When this is done in the **Blade Info** tab, the top of the **Utility Mixer** tab will have this note: *Utility Mixer is disabled when AES67 1ms Support is enabled*. Refer to the Blade 3 User Manual for more details on using the Utility Mixers and on using AES67 devices with your WNIP system.



Figure 3-24 Utility Mixer Tab

## Audio Player Tab

Figure 3-25 shows the **Audio Player** tab, which is similar to the Clip Player built into the Strata Surface. It can be used to play test signals or other audio to test routing and as a confidence feed source. In radio applications it's often used as the alternate source for Silence Detectors so that when silence is detected some audio will continue to feed the transmitter. Refer to the Blade 3 user manual for details on using this tab.

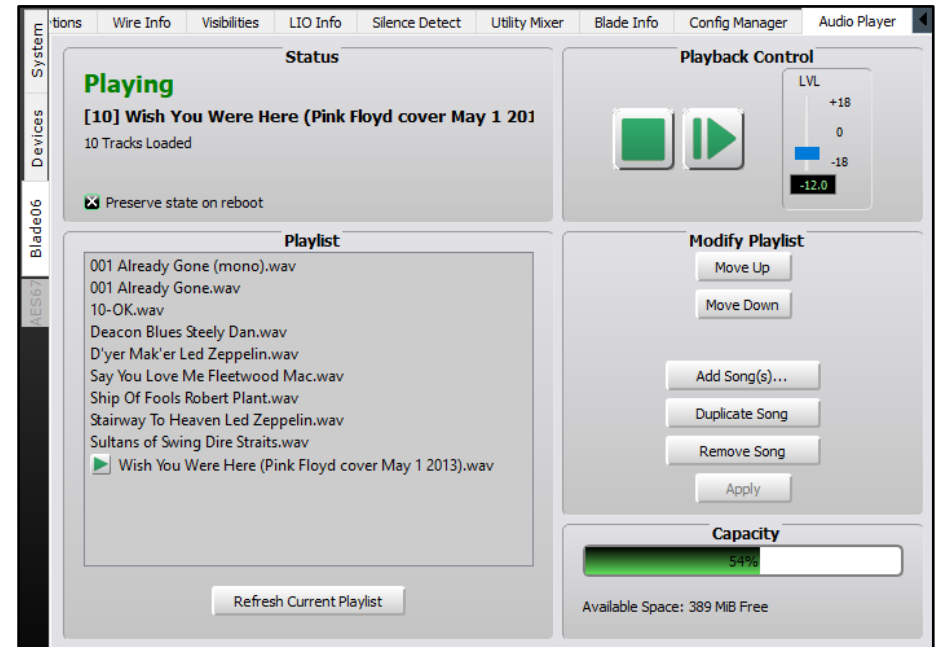


Figure 3-25 Audio Player Tab

## STRATA SURFACE SETUP

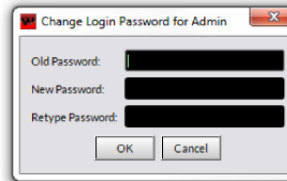
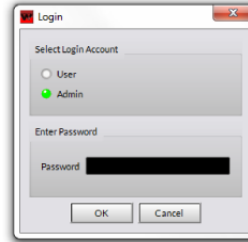
To start the Surface Setup app double-click on the desktop icon (shown at right) or open the app from the Start menu (Wheatstone > Wheatstone IP Strata folder in Windows XP or Win7 or the Wheatstone category in Win10).



The app opens with a login screen. Select **Admin** or **User** to log into the app. Since the User account has limited abilities (pretty much limited to editing Events) most log in as the Admin which is password protected (default password = *Admin*). The User account has no password. Click *OK* to open the app.



**Note:** When the Admin is logged in, an extra *File* menu item: *Change Password...* is available to change the default Admin account password. You cannot leave the *New Password* and the *Retype Password* entries blank hoping to use the app without a password. It doesn't work—the old password simply remains in effect.



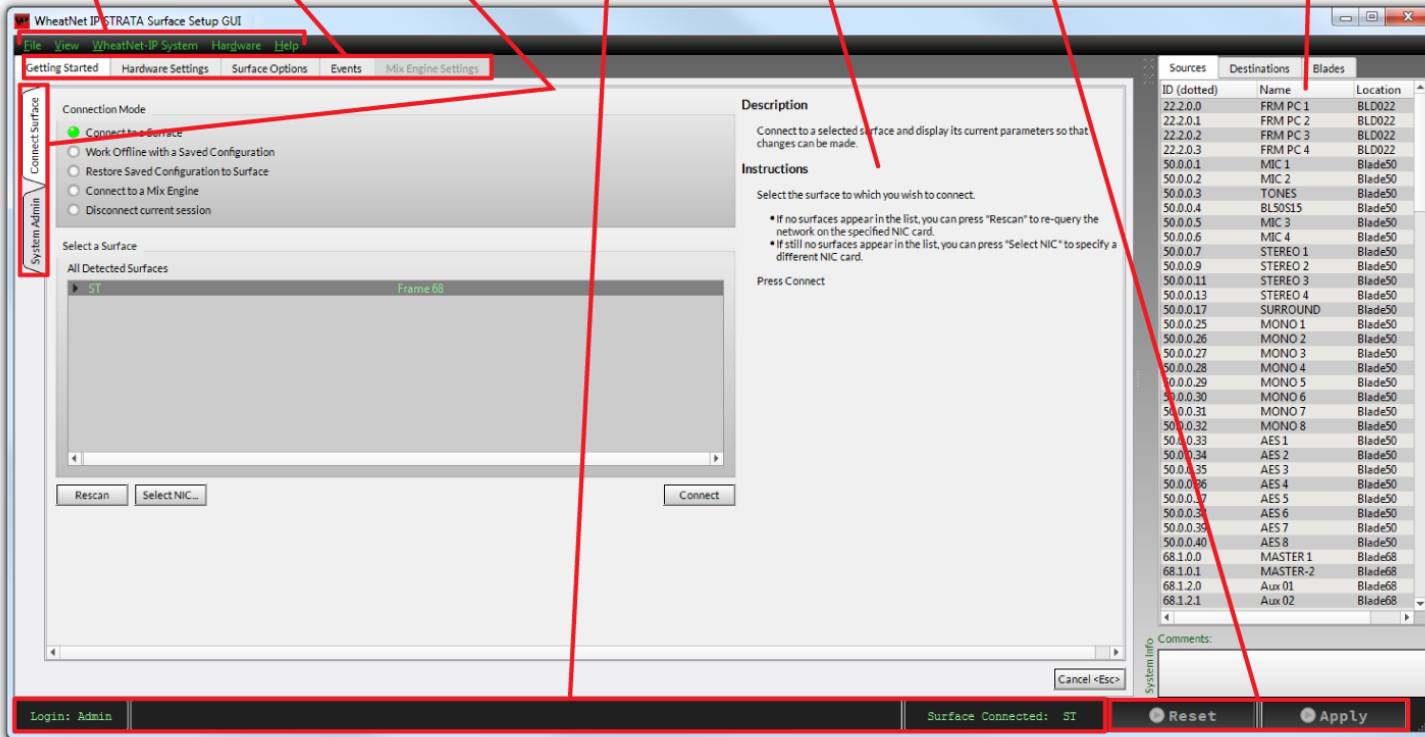
**Login & Change Password Windows**

Figure 3-26 shows the Surface Setup App's main navigation controls and features on the **Getting Started** tab, shown when the app opens. There are five *Menu Items*, each with a drop-down list, and five *Main Tabs* of categories, each with their own set of vertical *Page Tabs*. Along the bottom the *App Status* bar lists who's logged in and the app's status (Inactive, Connecting, Connected to a Surface, or the name of a configuration file being edited). Two Surface action buttons (*Reset* and *Apply*) are at the right end of the App Status bar. Many of the page tabs also have a Help/Info area with helpful information about that page tab's features and controls.

A **System Info** pane can also be displayed along the right side of the window, as shown in Figure 3-26. Whether it's shown is set by the menu item: *View > System Info*. When that option is checked the System Info pane is shown. The pane has three Tabs: *Sources*, *Destinations*, and *Blades*, which list the WNIP system signals and devices. When the Surface Setup app is first run these tabs are empty until a **System Scan** is run to populate the System Info pane.

To run a **System Scan**, select the menu item *WheatNet-IP System > System Scan*. A pop-up System Scan window opens (Figure 3-27 on the next page). If the *Host Blade IP* address is not populated enter the Mix Engine's CPU IP address: 192.168.87.168 then click the *Start Scan* button. This operation queries the Mix Engine CPU and every other Blade connected in the WNIP system. Various messages are shown in the status window as it runs. When the scan completes, the *Cancel* control turns into a *Finish* control. Click *Finish*. A "save system info?" dialog pops up. Click *Yes* to save the system info, then

Menu Items    Main Tabs    Page Tabs    App Status    Help/Info Area    Action Buttons    System Info Pane



**Figure 3-26 Strata Surface Setup app, initial view**

click *Save* and *Yes* to overwrite the default data file so the next time the Surface Setup app is opened it shows your system's information.

The System Info pane, if open at the right side of the app window, will now be populated with the *Sources* names like those shown in Figure 3-26 on the last page. Clicking the *Destinations* tab lists the destination names. Clicking the *Blades* tab lists the Mix Engine (which is a type of Blade) along with any Stageboxes and regular Blades networked with the Strata.



**Note:** Source and Destination names are edited using Navigator. Edited names are automatically updated on the Strata displays but you'll need to run a new **System Scan** to update the names which appear in the Strata Surface Setup app.

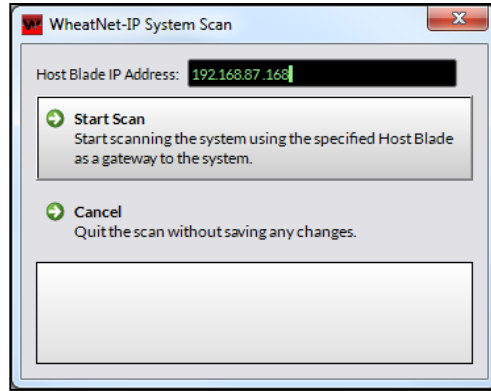


Figure 3-27 System Scan Pop-up

## Menu Items

The Surface Setup app has five menu items: **File**, **View**, **WheatNet-IP System**, **Hardware**, and **Help**.

### File Menu

- ❖ *Surface Configurations*—has a submenu with two to four selections depending upon whether the app is connected to a Surface or is viewing a saved configuration file.
  - *Delete Saved Configuration...*—opens a Delete Configuration window which lists configurations. Select a configuration, click *OK* and *Yes* on the "Are you sure?" popup to delete that configuration.
  - *Save Configuration as...*—saves the app's current configuration settings to a Projects folder. The Project folder is in Documents: `\Documents\Wheatstone\WheatNetIp_STRATA_Gui\projects`
  - *Send Configuration to Surface...*—same action as clicking the *Apply* button or pressing CTRL+P: uploads the settings to the Surface.
  - *View Configuration Folders...*—opens the Projects folder which holds the saved configurations. Each configuration consists of a main folder with a **mix\_engine** and a **surface** folder inside which hold the .xml files that make up a configuration.

- ❖ *Change Login...*—opens the Login window shown in Figure 3-25 on the last page
- ❖ *Change Password...*—opens the Admin Password change window shown Figure 3-25 on the last page.
- ❖ *Exit*—closes the app. Same as clicking the X app close button in the upper right corner of the window

### View Menu

- ❖ *Output*—when checked, an Output panel listing what actions the app is undertaking, including any error messages. The panel opens just above the Status bar, but it can be set as a "floating window" by clicking the Float button, just below the X (panel close) button at the left upper corner of the panel.
- ❖ *System Info*—when checked, opens the System Info panel which is normally attached to the right side of the app. Click the Float button to separate the panel from the app to turn it into a floating window.
- ❖ *Stylize*—normally checked, for a modern 3D look. Uncheck this option if you like your apps to have a flat 2D Windows 95 appearance.
- ❖ *Differences...*—opens a window listing the differences, if any, between the app's current settings and the settings last sent to the Surface, or the settings on the Surface when the app is first opened. The shortcut CTRL+D also opens this window.

### WheatNet-IP System

This menu has system info file controls. System info files use a .wnsi3 suffix. The first two selections are typically only used when the Setup app is being used offline or when the PC will connect to multiple WNIP systems, each with their own system files.

- ❖ *File Open...* opens the folder holding the system info files, which are in `C:\Users\Public\Documents\Wheatstone\SysInfo`, so that a system info file can be selected and loaded into the Surface setup app. Used when using the app off-line.
- ❖ *File Save...* opens up the system info folder so that the Setup app's current settings can be saved. If the Setup app is on a laptop, which may connect to different systems, save each system's info file using a unique file name so you can open the appropriate file when either working with the app off-line or when connecting to another system.
- ❖ *System Scan...* opens the window shown in Figure 3-27 so that a new system scan can be run to update the system info file. When the System Scan finishes you typically save the system info, writing over the generic sysinfo.wnisi3 file in the SysInfo folder. If the app will connect to multiple systems, the SysInfo file name should be edited so every system has a unique system info file name.



## Hardware

- ❖ *Network Interface...*—opens a window showing the IP address of the NIC connected to the WNIP system which must be on the same subnet as the WNIP devices. Typically this IP is 192.168.87.21.
- ❖ *Surface Versions...*—shows the code version running on the Host card, each control panel, the touchscreen, the CPU's operating system, and DSP code version. This information can be given to Wheatstone technical support to verify you're running the latest code release.
- ❖ *Reboot Surface Host*—reboots the entire Surface, much like pulling the power from the power supply. It will take roughly the same amount of time to reboot and be ready to use once again.
- ❖ *Reset Surface Host App*—restarts the Surface app so it is faster than rebooting all of the Surface components.
- ❖ *Failover Surface CPU*—switches the Surface to use the redundant or failover Host board. You get a pop-up error message if there's no redundant Host CPU detected.
- ❖ *Update Surface...*—used to upload new operating system code to the Surface. The code is contained in a .tar file which may update any combination of the different items listed in *Surface Versions*.

## Help

- ❖ *About...*—opens a window which lists the version number of the Strata Surface Setup Tool along with where the various files used by the app are saved.

## Getting Started Tab

This tab has two page tabs: **Connect Surface** and **System Admin**. The Strata Surface Setup app opens showing this tab with the **Connect Surface** page tab active.

## Connect Surface Page Tab

This is the default page tab (Figure 3-28) where you select how you want to use the app, either on-line, by being connected to a Surface or the a Mix Engine, or off-line, by editing a previously saved configuration file. The Connection Mode section selection determines how the app is used.

### Connect to a Surface

This default option is *Connect to a Surface*. If multiple Surfaces are in the WNIP system, you then select which Surface to connect to in order to view, edit, and upload its configuration. The page tab's **Select a Surface** section lists all Surfaces detected when the app started. If none are listed, click *Rescan* to rescan the network. If no Surfaces appear, click *Select NIC...* to verify the app is using the NIC connected to the WNIP system (typically, 192.168.87.21) as the app might have attached to another NIC

connected to your facility LAN or the internet. This can occur when the app is installed prior to the admin PC being networked with the WNIP system.

Once your Surface is listed click on its row to highlight it and then click *Connect*. The Status area at the bottom of the app window changes to show **Connecting** followed shortly by **Surface Connected: ST** (ST is the default name for a Strata Surface).

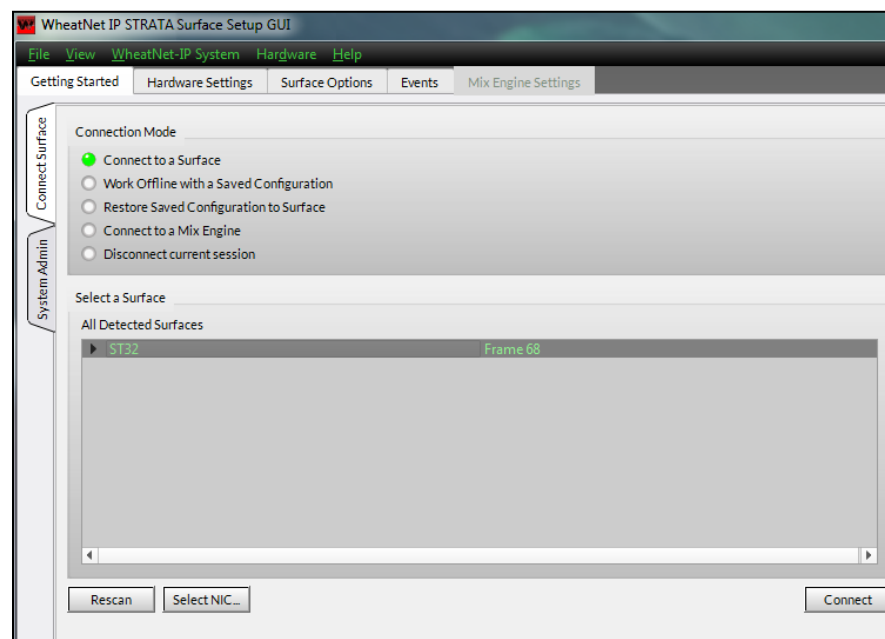


Figure 3-28 Getting Started tab - Connect to a Surface

The Surface's current configuration settings are read, and compared, with the app's configuration settings. If the app detects any differences, the *Apply* button turns red so that the console's settings can update the setup app's settings. This will occur on a new Surface since the app settings most likely won't match a new console's settings.



**Note:** The Surface Setup app only reads in the Surface configuration data when the app connects to the Surface. The Surface does not update the app when configuration changes are made using the Surface controls. To update the app's settings, either disconnect your Session or close the app. When you reconnect to the Surface, press **CTRL+D** to see what differences there are between the Surface's and app's configuration settings.

Once the Surface has been used for a while, one common way the configurations will differ is in the channels' Wild button function settings. The button colors, and certain functions, are assigned using the Surface Setup app and then applied to the Surface. But, operators can use the

**Input View** touchscreen controls to change the function assigned to a channel Wild button. When the Surface Setup app is again connected to the Surface, the settings on the Surface will differ from the app's settings, thus the *Apply* button will be red. In this condition, click *Apply* to update the app settings with the Surface changes. *Apply* goes gray indicating the Surface and app settings once again match.

### **Saving a Configuration File**

While the app's connected to the Surface you can save the current Surface configuration settings using the menu selection: *File > Surface Configurations > Save Configuration as...* The default folder location is *Documents > Wheatstone > WheatNetIp\_STRATA\_Gui > projects*.

If you save your configuration settings, prior to making any changes when you first connect to a new console, and name the saved file **Default Configuration**, you can easily return a Surface to the factory default settings by selecting the option *Restore Saved Configuration to Surface* to upload the saved Default Configuration file to the Surface.

### **Work Offline with a Saved Configuration**

The Surface setup app can be used without being connected to a Surface by selecting this option. You must be logged in as an Admin to work with a saved configuration and there must be at least one configuration file saved into the Strata "Projects" folder.

This option allows one to edit any saved configuration. When this option is selected, the lower section changes to show *Select a Saved Configuration*. In the *Existing Configurations* section click on the Configuration's name then click *Connect*. The app loads the settings and automatically switches to the **Surface Options tab** for further editing.

### **Restore Saved Configuration to Surface**

Once you've saved one or more configuration files you can select this option to upload one of the saved configurations to reconfigure a Surface or to configure a new Surface with an existing configuration.

Two selection boxes are shown: *Select a Surface* and *Select a Saved Configuration*. Select the Surface to update and then select the configuration file to upload to that Surface. Clicking *Connect* downloads the selected configuration file's settings to the selected Surface.

### **Connect to a Mix Engine**

This option is used when you want to view and/or edit the configuration settings for the Gibraltar IP Mix Engine. A list of all Mix Engines in the network is shown in the *Select a Mix Engine* section. Selecting a Mix Engine and clicking *Connect* switches to the **Mix Engine Settings tab** which lists the current configuration settings. Typically, this option is only used to edit the IP addresses assigned to the Mix Engine cards when a different class-C subnet is used or when multiple Strata consoles will be

networked together. Changing the default settings will allow a future Mix Engine to be networked without causing an IP address conflict.

### **Disconnect Current Session**

Select this option to close your current session. Click *Disconnect* to close the session. This option can be used after saving a configuration so that you can disconnect and reopen that configuration to confirm that all settings are correct without having to close and reopen the app itself (saving you from having to again enter your password...). It can also be used when Surface changes were made and you want to update the app to incorporate those changes, without having to close and reopen the app.

## **System Admin Page Tab**

This page tab allows the Admin remote access to any Surface or Mix Engine in the system. All detected Surfaces and Mix Engines should be listed. If not, click *Re Scan* to scan the network for each type device. Click on a device row to select one device. This activates the action buttons for the selected Surface or Mix Engine.

### **Surface Actions**

Clicking one of these buttons affect the selected Surface's operations so they should be used with caution. Always confirm you're connected to the correct Surface prior to selecting an action.

**Update...** This opens a File Find dialog box so the Surface operating code can be manually uploaded. The operating code will be in a Wheatstone-supplied archive file using a .tar suffix.

**Full Reboot...** Reboots the selected Surface, which means the Host card, the control panels, the touchscreen processor, and the Surface processor are all rebooted. You will get a momentary loss of audio as it restarts.

**Reset Surface App...** Restarts the Surface app on the selected Surface. It doesn't reboot any processor or the control panels.

**Surface Failover...** This option is only available if a redundant Host card is detected in the Surface. Selecting it causes that Surface to switch to use the redundant or back-up Host card for operations. This would be called for if there was a failure with the Main Host card.

### **Mix Engine Actions**

Clicking one of these buttons affect the selected Mix Engine's operations so they should be used with caution. Always confirm you're connected to the correct Mix Engine prior to selecting an action.

**Reboot...** Reboots the selected Mix Engine, which is almost equivalent to power cycling the Mix Engine. All of the frame cards (CPU, DSP, EQ, and WNIP Interface) are rebooted. This does result in the loss of audio going thru the Strata while it reboots.

**Factory Reset Surface Info...** Resets the selected Mix Engine and the Surface signals back to their default settings. The Mix Engine reboots which means all three devices (Bridge IP, card frame, and Surface) will have yellow ? over their icons in the System Dock until the Mix Engine completely restarts, which can take several minutes to complete.

**Mix Engine Failover...** This option is only available when a redundant CPU is detected in the Mix Engine. Selecting it causes that Mix Engine to switch to use the redundant or back-up CPU for operations. This would be called for if there was some type of failure with the Main CPU.

## Hardware Settings Tab

This tab has three Page tabs: **General**, **Surface Config**, and **Programmable Buttons** used to set various hardware-related settings including one of the most important: “marrying” an IP Mix Engine to a Surface.

### General Page Tab

There are four sections on this page tab (Figure 3-29): **Mix Engine Blade Info**, **Display Brightness**, **Miscellaneous**, and **Connected Surface Network Settings**.

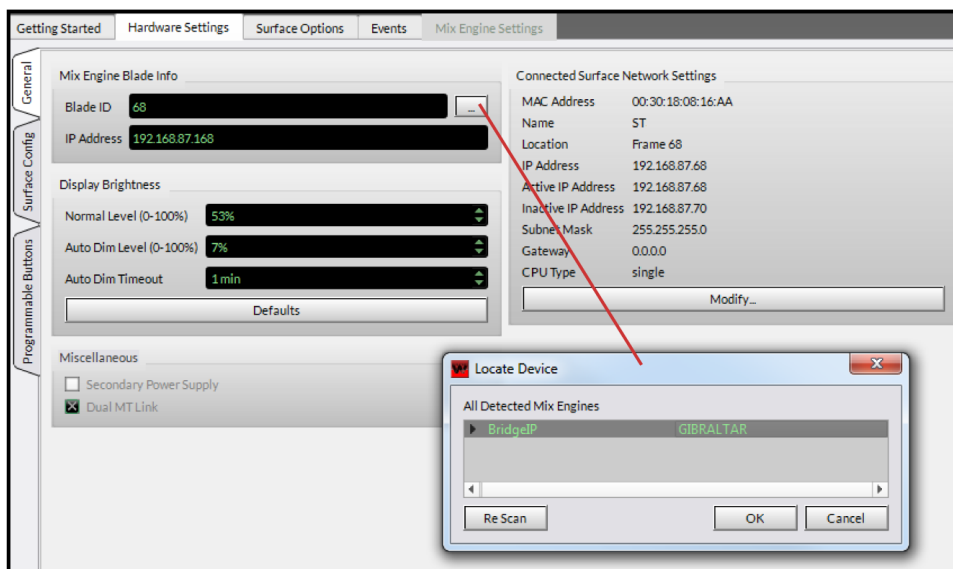


Figure 3-29 Hardware Settings tab – General Page Tab

### Mix Engine Blade Info

This section is where the Mix Engine, linked to the currently connected Surface, is assigned as the Surface Host or parent device. On a new console these two entry boxes are empty until the IP Mix Engine is set as the host Blade for the Strata Surface.

Click the *Picker* icon, the small rectangular icon to the right of the Blade ID entry box, to open the **Locate Device Picker** (shown overlaid on Figure 3-29). It lists any Mix Engines that it detected. If none are listed, click *Re Scan*. For a new Surface and Mix Engine using the default settings double-click on the **Bridge IP** row to select that Mix Engine and transfer its Blade ID and IP address to the *Mix Engine Blade Info* entry boxes. This action sets that Mix Engine as the host device for the Strata that the app is currently connected to.

### Display Brightness

The *Normal Level*, *Auto Dim Level*, and *Auto Dim Timeout* entries (Figure 3-30) control the brightness of the OLED displays across the Strata Surface. The *Normal Level* and *Auto Dim Level* set the OLED’s brightness from 0% (very dim display) to 100% (maximum brightness). The *Auto Dim Timeout* can be set from Off up to 60 minutes in one minute increments. Read the Display Brightness note in the app about OLED displays and the effects of using higher brightness levels on their life span. The default *Normal Level* is 60% but the lowest setting—which still yields easy-to-read displays, should be used. In a control room with dim lighting a setting of 33% may be bright enough, giving you plenty of room to increase brightness as the OLEDs age with years of use.

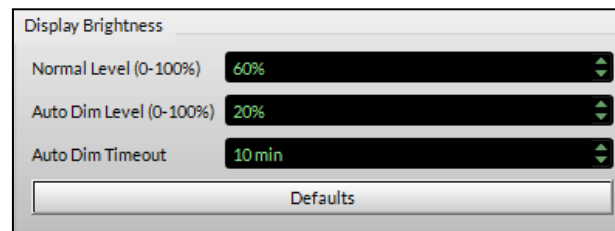


Figure 3-30 Display Brightness Settings

To further maximize OLED display life their brightness should be automatically dimmed down to a low level while the console is unattended. The *Auto Dim Level* (default setting 20%) sets the dimmed level for the OLED displays after the *Auto Dim Timeout* period is reached (default setting is 10 minutes). The *Auto Dim* function monitors the Surface controls for human activity (i.e., moving a fader, turning a rotary encoder, or pressing a button). After no control has been touched for the length of time set in the *Auto Dim Timeout* entry all Surface OLED displays dim down to the *AutoDim Level*. They remain at this dimmed level until a Surface control is touched. This causes the OLED displays to immediately brighten to their *Normal Level* setting.

To change the entry settings, click or click/hold the up or down arrow in an entry box. Once you've made your changes click the red *Apply* button to transmit the new settings to the Surface. If the Normal level was changed, and the displays are not showing the Auto Dim level, the OLED display brightness will immediately update.



**NOTE:** Setting the *AutoDim Timeout* function to *OFF* defeats the Auto Dim function and the displays always use the *Normal Level* setting. This may be desirable for console configuration but it's not recommended for normal operations—especially when set to higher brightness levels, as this will cause the OLED displays to burn in and/or fade out within a couple years.

### Miscellaneous

This section's check boxes indicate whether redundant connections are being used. When neither box is checked the system assumes only a single power supply is connected and only one Link cable is connected between the Surface and the Mix Engine. If both boxes are checked then the system has detected a redundant power supply and redundant Link. If these settings do not match the physical connections on the Surface you'll get touchscreen Alert messages about a power supply fault and/or Link communications error.

### Connected Surface Network Settings

This section displays the network settings for the Surface's Host board (and Backup Host board, if installed). These settings can be edited to change the Surface's IP Address, Name, Location, etc. by clicking *Modify...* Once you finish making changes click *Okay* to close the edit window then click *Apply* to update the Surface. Editing these settings, other than Name or Location, requires that the Surface be rebooted to use the new settings.

### Surface Config Page Tab

This tab (Figure 3-31) is view-only. It shows how the internal connections for the Strata Mix Engine were configured at the factory. In the standard console the last four faders are set as Surround faders with Master 1 and the Control Room both set as surround sources. There's a mono bus-minus signal for each fader plus sixteen mono mix-minus buses plus 16 stereo Aux Sends, 32 stereo tracks, and eight stereo Submix buses. If the console was specially ordered, the numbers may differ from these default internal mix connections since the Mix Engine's internal "wires" (the virtual connections between sources and destinations within the Mix Engine) will have been allocated differently.

This page tab has two sections: *Destinations* and *Sources* (the Destinations section is shown in Figure 3-31). Each section lists how the *Wires* and *Signals* are connected within the Mix Engine's DSP cards.

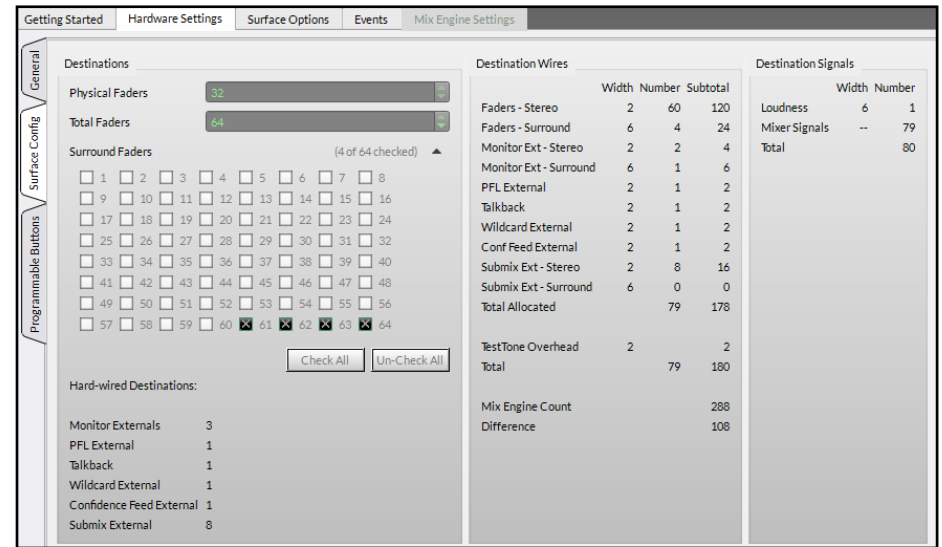


Figure 3-31 Hardware Settings > Surface Config Page Tab

### Programmable Buttons Page Tab

This page tab (Figure 3-32 on the next page) has two tabs: **Wild Buttons** and **Spare Buttons** used to initially assign functions and LED colors to the various user-defined *Wild* buttons since the board operators can change the assigned Wild button functions on any fader channel thru using touchscreen selections on the **Input View**.

Every fader channel has two wild buttons (Wild 1 and Wild 2). The Master Panel has a Wild button (Master 1 and Master 2) for each master fader. The Touchscreen panel has three Wild buttons (1, 2, and 3). Up to sixteen of these Wild buttons can be assigned to function as *Spare buttons*. The sixteen Spare buttons have different capabilities from the functions available to be assigned to "regular" Wild buttons.

### Wild Buttons Tab

The fader panel Wild buttons are listed as Input Fader xx - Wild 1 and Input Fader xx - Wild 2 in the Wild Buttons tab. Each can be set to one of sixteen functions using a **Button Attributes Function** drop down list. Additional functions are available using the touchscreen controls when the SEL button is lit on an input channel. The two Wild buttons on the Master Panel have seven functions available. The three Touchscreen panel Wild buttons can be set to function as a Hot Clip Play button or assigned as a Spare button.

Figure 3-32 shows the Wild Buttons tab with overlays of the two drop down lists used to select the Wild button functions for the fader channels and the colors for the Wild button LEDs that indicate when the function is active (the *On LED color*) or inactive (the *Off LED color*).

From the factory *none* is set as the Function for all Wild buttons with black (indicating an unlit button) set as the *Off LED Color*. On Wild buttons with multi-color LEDs, like the Input Faders, red is the default *On LED color*. The two Master Wild buttons have a single color LED so their Off LED color is black and their On LED color is green.

Right-clicking on a Wild button row brings up a context menu, shown in Figure 3-32. This menu allows a button's assignments to be copied and then pasted into another Wild button. Other options include pasting the copied setting to all buttons of the same type (Wild 1 or Wild 2) on the fader channels. A clone option allows this to be done in one step: it copies and pastes the settings assigned to one button onto all of the other Wild buttons of the same type (e.g., cloning a fader Wild 1 button sets all of the fader Wild 1 buttons to those same settings).

### Page Buttons

Page is **Layer Switching** applied to individual fader channels so you don't need to switch all 32 fader channels between layers when you only need to check on, or adjust, the settings for one or a handful of channels. Page *Off* is the default **Mode** setting. Selecting either *On-Wild 1* or *On-Wild 2* and clicking *Apply* sets the selected fader channel Wild button to **Page** allowing any channel to be toggled between showing its Layer 1 settings and its Layer 2 settings. This does mean that the fader channels now only have one Wild button. This is indicated by the Page's Wild

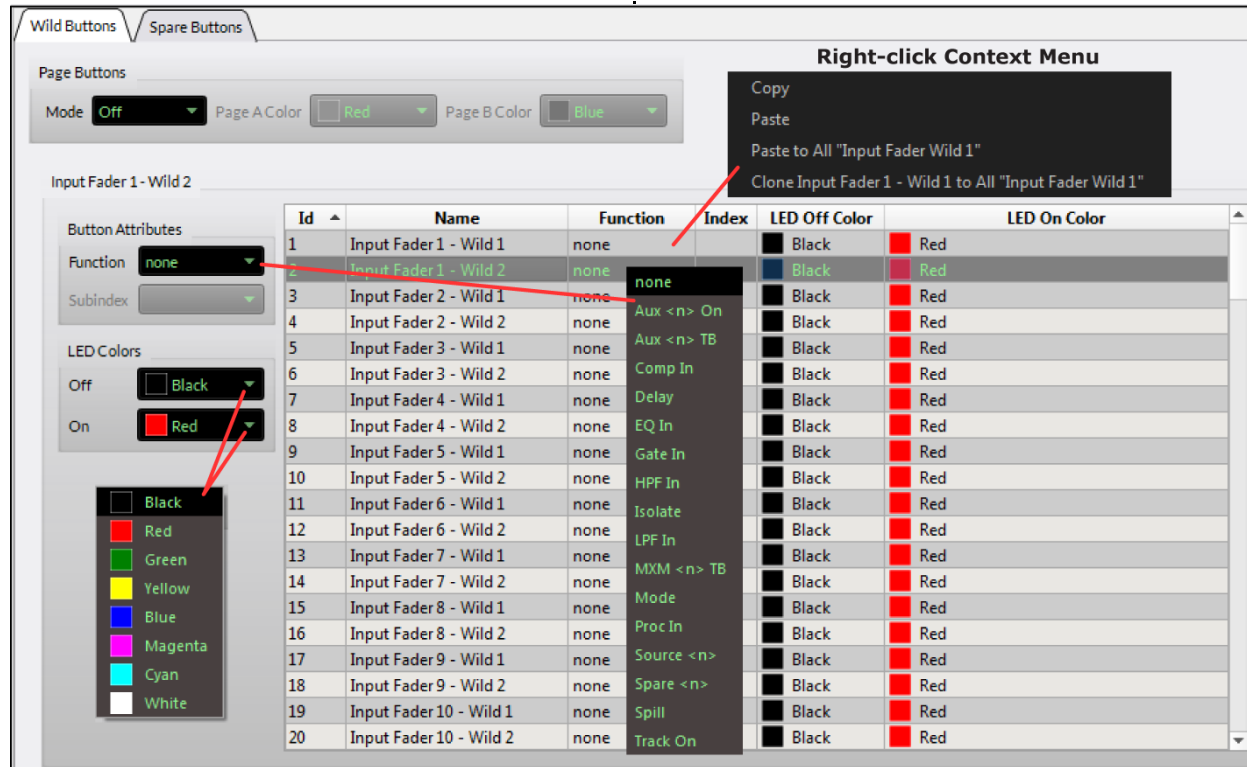


Figure 3-32 Programmable Buttons Page Tab - Wild Buttons

*Delay*, *EQ In*, *Gate In*, *HPF In*, *LPF In*, *Isolate*, and *Track On*: each sets up a Wild button to control that function with the Wild button's On/Off LED color identifying when that feature is on/in or off/out. The Function *Proc In* controls both Gate and Compressor in/out. *Mode* is a multi-press function which steps thru the five audio modes available on each fader channel (six on the 5.1 fader channels).

Five Input Fader functions have an <n> symbol which indicates a function that requires a *Subindex* selection. For example, selecting **MXM <n> TB** or **Aux <n> TB** sets up a Wild button to function as a talk button to a specific mix minus or Aux bus. The *Subindex* setting is used to assign which bus (from 1 up to 16) that the talkback mic audio is going to while that Wild button is pressed.

The **Aux <n> On** function sets the button to control whether that channel is feeding a particular Aux bus (as identified by the assigned *Subindex* number 1 - 16). When assigned, the On LED color is shown. When unassigned the Off LED color is shown.

Selecting the function **Source <n>** sets up the Wild button as a "Hot Source Selector." Its *Subindex* selection only has two choices: 1 and 2,

buttons being removed from the Input Fader Wild Buttons list. Since this also removes any previous Wild button settings, there's a warning pop-up when you change the Page Mode setting.

The default Page button colors match the Layer 1 and Layer 2 button colors, but drop down menus allow the default colors to be changed to any of the colors shown in the LED Colors drop down list.

### Button Attributes

Most of the button functions are fairly self-explanatory: selecting *Comp In* allows a Wild button to control the Compressor in/out on a channel. Same thing for *Delay*, *EQ In*,

since you can assign one or both fader channel Wild buttons to function as a “Hot Source Selector.” When both buttons are set as Source Selectors, Wild 1 must be set to *Index 1* and Wild 2 must be set to *Index 2*.

To assign the “Hot Source” the Surface channel controls are used. Take the source you want to assign to a Hot Source button. Overpress that Wild button—press/hold the button for about four seconds, until the button’s color changes from the Off LED color to the On LED color, which indicates the current channel source is now set as the Hot Source on that button. Take a different source on that channel then tap the Wild Source button to retake the Hot Source. To update the Hot Source, take a new channel source and again overpress the Wild button.

Selecting the function **Spare <n>** sets up the Wild button as a Spare button. Any Wild button can be assigned to be one of the Spare buttons using the *Subindex 1–16* selections. The Spare button attributes are assigned in the **Spare Buttons tab**.

### Spare Buttons Tab

This tab (Figure 3-33) assigns button functionality to the sixteen Wild buttons, identified as *Spare 01 – Spare 16*, in the Wild Buttons tab. Any Wild button can have its Function set as a Spare button by selecting **Spare <n>** and selecting an Index number. Once the Spare buttons are assigned this tab is used to set the attributes for each Spare Button and its LED. The actual control function which occurs when the button is pressed is assigned using Navigator.

To assign the Spare Buttons’ attributes click on a row to highlight one Spare button then use the **Button Attributes** selection (*Momentary* or *Toggle*) and the **LED Attributes** selection (*LIO LED* or *Surface LED*) to set how that Spare button operates and how its LED lighting is controlled.

Setting the **Button Attributes** to *Momentary* allows the button to be used to take a Salvo or to do a sustained function, like talkback to a producer, where the button is pressed and held for as long as is needed. Setting the Button Attribute to *Toggle* sets the button to function as a latching button with a steady closure and a steady open. Toggle on sets the logic condition as true and the On LED Color is shown. Toggle off sets the logic condition as false and the Off LED Color is shown. Navigator is used to set how the toggled logic is used.

Setting the **LED Attributes** to *LIO LED* sets the LED lighting to be controlled via remote logic. When the remote logic is active the On LED color is shown. When the remote logic is not active the Off LED color is shown. Setting the LED Attribute to *Surface LED* sets the spare button lighting to be controlled by the Surface. When the function is not active the Off LED color is shown. When the function is active the On LED color is shown. When the Button Attribute is Toggle, the LED color follows the toggle action (the off LED color is shown when the button is open; the on LED color is shown when the button is latched closed).

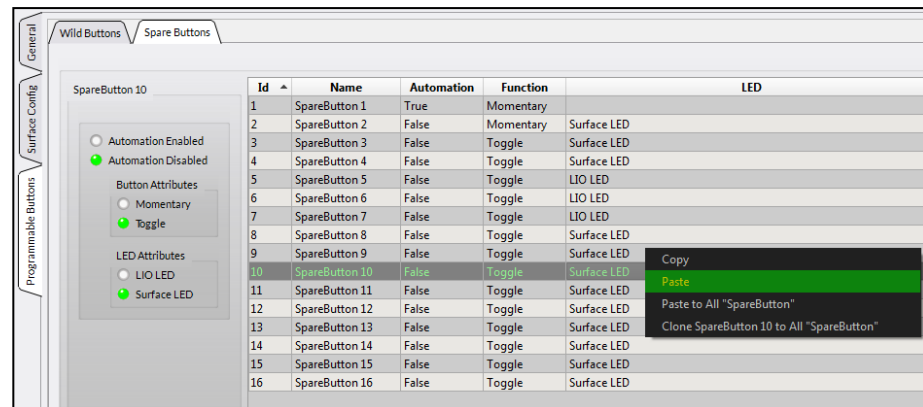


Figure 3-33 Programmable Buttons Page Tab – Spare Buttons Tab

One Spare button can also be set to function as an automation system control enable/disable switch by selecting a row then clicking the **Automation Enabled** option. This automatically assigns Automation as True; Function as Momentary; and removes any entry in the LED column, as shown by the Spare 1 button settings in Figure 3-33. This is typically assigned to a Touchscreen Panel’s Wild Button.

Figure 3-33 also shows various combinations of Button and LED attributes assigned along with the functions available in a right-click context menu. The context menu allows one button’s settings to be copied and pasted to one or more buttons using standard Windows item selection techniques: click on one row then Shift+click on another row to select multiple consecutive rows or click on one row then use Ctrl+click to select non-consecutive rows. Selecting *Clone* applies the selected button’s settings to all of the other Spare Buttons.

### Spare Button Control Assignment

Navigator is used to assign the actual logic control functions for the Spare buttons. The sixteen Spare buttons are shown in Navigator’s crosspoint as logic-only Sources: *Spare01* to *Spare16*. Each button and LED is pre-assigned the same control Functions: Switch 1 and Switch LED 1, which are not changed.

In Navigator select **Bridge IP > LIO Info tab** and then expand the Surface 1 Spares (Figure 3-34 on the next page). This tab is where a Spare button can be set to **Fire a Salvo**; to **Make a Momentary Connection**; or **Take a Mic Processor Blade Preset**. When setting a Spare button to these actions, set the Spare Button’s *Button Attributes* to Momentary and the *LED Attributes* to Surface LED (in the Spare Buttons tab in the Surface Setup app) prior to setting the command functions in the LIO Info tab.

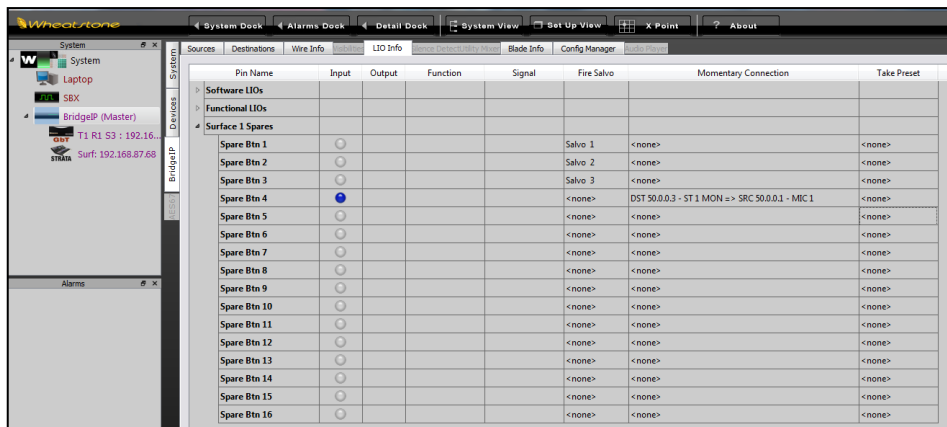


Figure 3-34 Programmable Buttons Page Tab - Spare Buttons

A Spare button can also be set to control hardware logic outputs (LIO) or software outputs (SLIO). The LED can be set to respond to input logic from either LIO or SLIO as well. Select the Blade or Stagebox with the LIO or SLIO you want to use and create a new LIO-only destination. Select the **Blade > Destinations** tab in Navigator then click *Add* to add a new destination. Set it as *LIO-only* then add the Output logic Function you want to send when the button is pressed. Add an Input logic Function to control the LED (if that Spare button was set for LIO LED). Cross connect that Spare button to your LIO-only destination to activate the logic. Page 27 goes into more detail on using the Navigator app to assign logic.

## Surface Options Tab

There are six page tabs under this tab: **General**, **VDips**, **Visibilities**, **Operator Access**, **Monitor Config**, and **Master Faders**, used to setup general or overall Surface functions.

### General Page Tab

This tab has eight sections (Figure 3-35).

#### Fader On/Off

These five checkboxes set global fader channel functions. When checked, the function is active. When unchecked, the function does not affect operation.

- ❖ *In Events Remember Channel On/Off State*—sets whether saving an event also saves the channel on/off states. When checked, the Event saves the on/off states and taking the Event turns the channels on or off. When unchecked, the on/off status is not saved so taking an event does not affect any channel on/off states. Default is unchecked.

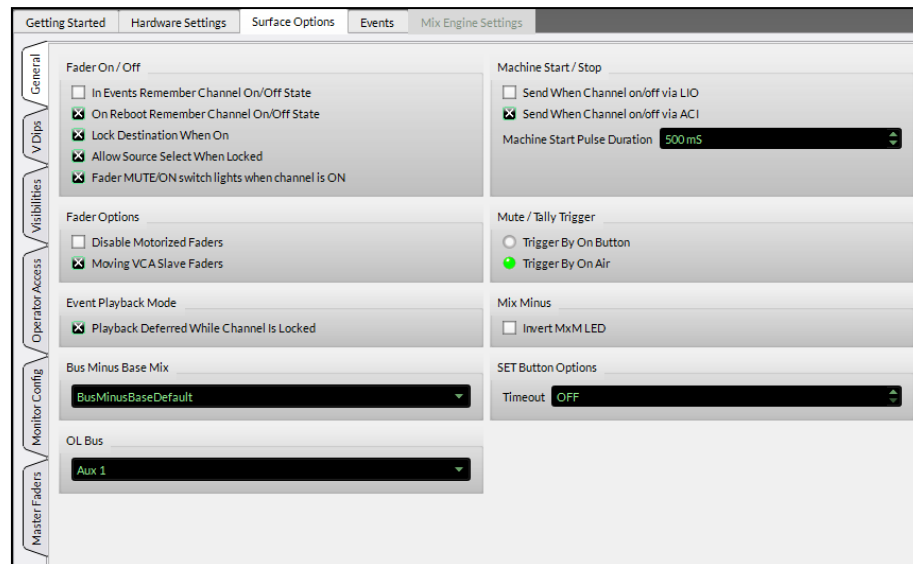


Figure 3-35 Surface Options - General Tab Sections

- ❖ *On Reboot Remember Channel On/Off State*—sets whether the console remembers the channels' on/off status. When checked the channels come back up in the same state they were last in (either on or off). When unchecked, all channels come up in the off state. Default is checked.
- ❖ *Lock Destination When On*—sets whether a destination lock indication is added to the Navigator crosspoint (a horizontal red line on that destination) while a channel is on. When checked the destination is locked. When unchecked, channels are not locked when on. Default is checked.
- ❖ *Allow Source Select When Locked*—sets whether channel source selection is active while a channel is on, and Lock Destination When On is checked. When this option is also checked, an alternate source can be selected on a channel that's on. When unchecked, an alternate source cannot be selected while the channel is on. Default is unchecked.
- ❖ *Fader MUTE/ON switch lights when channel is On*—sets whether the Cut/On button is lit when a channel is on (checked) or the button lights when a channel is off (unchecked). Default is checked.

#### Fader Options

- ❖ *Disable Motorized Faders*—sets whether the fader motors are active. Checking this option stops the faders from moving when switching between Layers. It also stops faders from moving to show the current levels when using the Spill or VCA Group functions. Checking this

option does not affect the actual channel levels when switching Layers but the fader positions no longer show the actual fader levels when switching between Layers so console operation will be very confusing. Needless to say the default setting is unchecked so that the faders are motorized to indicate Layer, Spill, and VCA levels.

- ❖ *Moving VCA Slave Faders*—sets what happens when one or more fader channels are assigned to a VCA Group and the VCA Group Fader is adjusted. When checked, adjusting the VCA Group Fader moves all of the input channel faders in that VCA group. When unchecked, adjusting the VCA Group Fader does not adjust the input channel faders.

### **Event Playback Mode**

- ❖ *Playback Deferred While Channel is Locked*—sets what happens when an Event is taken. When unchecked (the default setting) taking an Event changes all channels regardless of whether they're on or off. When checked, channels which are on and locked do not change until they are turned off, then the channel settings for that Event are applied to that fader channel.

### **Bus Minus Base Mix**

This setting selects which bus to use as the base mix for all Bus Minus signals. The BusMinusBaseDefault selection sets the Base Mix to use the default internal bus. Other choices for the bus minus base mix are the two Master outputs, any Aux bus, or any Mix-Minus bus.

### **OL Bus**

This setting sets up which bus is used as an Off Line (OL) bus. It can be set to any Aux bus, Mix Minus bus, or Submix bus. Default is Aux1. The VDips tab allows individual sources to be set to feed this OL bus pre-Fader and/or Pre-On switch.

### **Machine Start/Stop**

The two checkbox options setup whether machine start and stop commands are sent out when a channel receives channel on/off commands from an LIO, an SLIO, or an ACI command. Any combination of *Send When Channel on/off via LIO* and *Send when Channel on/off via ACI* can be checked. Default for both is unchecked.

The *Machine Start Pulse Duration* can be set from 50 ms (milliseconds) up to 2000 ms (two seconds). You can change the setting by clicking on or click/holding the up or down arrow to ramp the amount up or down. You can also directly enter a duration using the number keys on a keyboard after highlighting the entry. The setting affects the local LIO machine start and stop commands as well as those generated when either start/stop checkbox is selected. The default setting is 50 ms.

### **Mute/Tally Trigger**

These two radio buttons set how the eight tallies and the three room mutes are triggered. Selecting *Trigger by On Button* turns the assigned tallies on, and mutes a studio, when the source's channel is on, regardless of whether it's feeding a Master bus. Selecting *Trigger by On Air* means a tally or mute is only generated when the channel is feeding a Master bus, is turned on, and the fader is up. This setting basically follows the red On Air indication shown in the channel OLED. Default is *Trigger by On Air*.

### **Mix Minus**

This option controls how the mix minus channel assignment indicators on the touchscreen and OLEDs are lit. When unchecked the mix minus numbers are lit when a channel is assigned to that mix minus and unlit when not assigned. When checked, the indicators are inverted so that you can quickly see which mix minus buses a channel is not assigned to since they're lit, while the ones they are assigned to are unlit. Default is unchecked.

### **Select Button Options**

*Timeout* sets how long a Select (SEL) button remains active before it automatically turns off. The timeout can be set from Off (a lit SEL button never automatically turns off) up to 60 minutes in one minute increments. The default setting is 2 minutes.

### **VDips Page Tab**

The VDips (Virtual DIP switches) page tab (Figure 3-36 on the next page) is where logic attributes are assigned to specific audio sources like microphones. Any audio source signal can have control logic attributes associated with it. To set the attributes signals are first added to the *Signals* list. Once one or more sources are shown in the signal list, clicking on a signal row highlights that source and the current logic attribute settings for that source are shown in the four sections in the right half of the page tab. Its logic settings can then be viewed and edited, as required. When the *Apply* button is clicked, to update the Surface, these entries immediately affect all audio signals—even those currently on-air.

### **Default Settings**

In Figure 3-36, the **Default row** is shown highlighted with the Options *PFL/Cue Dropout*, and *Fader Cue* checked. This means those two options will automatically be set for every new signal subsequently added to the Signals list. Any combination of the **Options, Monitor Mutes, Monitor Tallies**, and **Bus Minus Base Mix** selections can be set as a Default setting. These settings are then applied to Sources subsequently added to the Signals list.

Prior to adding sources to your Signals list and assigning their logic settings, read through the descriptions of the various attributes to determine whether any settings should be set as Default Settings.



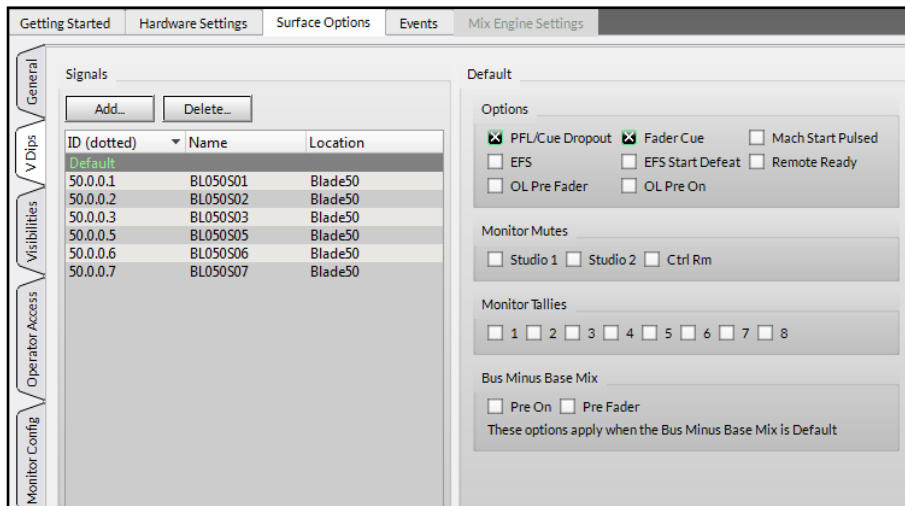


Figure 3-36 VDips Page Tab Sections

Once you've set up your Default settings click *Add...* to then select one or more signals to add to the Signals list. Each newly added signal will have the Default settings automatically checked. To change the default selections, click on the **Default row** in the Signals list then edit the selections, as required.

Assigning Default settings comes in handy when adding a number of similar signals like microphones. By setting the Default selections to EFS, OL Pre Fader, OL Pre On, Monitor Mute Studio 1, and Monitor Tally 1, you could add all of the Studio 1 mic inputs to the Signals list and not have to edit their VDip settings. Before adding the microphone inputs for Studio 2, change the Default selections for Monitor Mute to Studio 2 and the Monitor Tallies to 2. Now when you add in the Studio 2 mics they would have the correct settings already assigned.

For the Live Remote inputs you might uncheck EFS, the monitor mutes and tallies, and then check PFL/Cue Dropout and the two Bus Minus Base Mix selections (Pre On and Pre Fader). When you click *Add...*, and select all of the Remote inputs, when they are added to the Signals list they all have the correct VDip settings.

Of course, any Default setting applied to a source can subsequently be edited once the signal is in the Signals list by clicking on its row, to highlight its name, and then editing the settings, as required.

### Adding Sources to the Signals List

Sources must be manually added to the Signals list to initially populate it. For the best results you should name your signals using Navigator first since it's a lot easier to select signals from names like Mic 1, Mic 2, and so on than BL050S01, BL050S02, and so on.

Figure 3-37 shows that four signals (Mic 1, Mic 2, Mic 3, and Tones) have already been added to the list. Clicking the *Add...* button opens the *Add Signal* pop-up selector. Use standard Windows selection techniques to select one or more signals from the list to add to the Signals list. Clicking *OK* both adds the sources to the Signals list and closes the *Add Signal* dialog box.

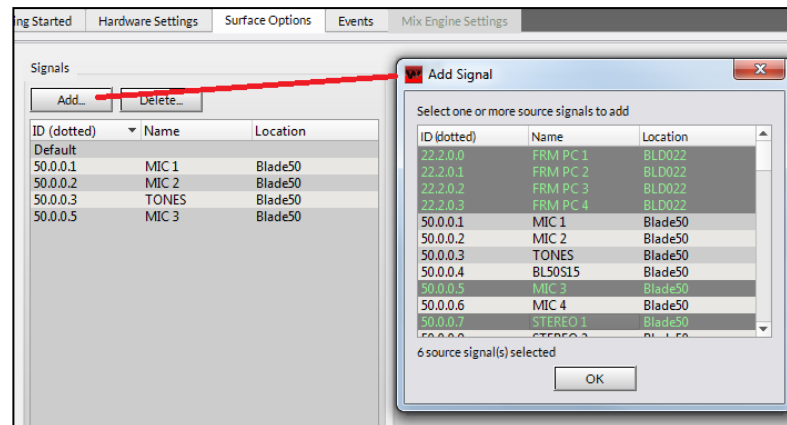
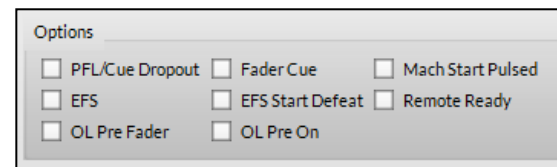


Figure 3-37 Add new Sources to the Signals List

If any Default settings were assigned, those settings are automatically set on each of the selected signals. Clicking on a signal name highlights its row so its settings can be viewed and edited, as required. You can also right-click on a signal to bring up a context menu to copy and paste the settings from that signal to other signals. One use for this would be to update a group of microphone inputs so they all have the same settings.

### Options Settings

These eight selections allow a source to have control over the listed Surface operations and channel functions. The selected source name, or Default, is shown just above this section to identify which source's selections are currently being displayed and edited.



*PFL/Cue Dropout*—sets whether turning the source's channel on affects PFL (Pre-Fader Listen). When checked, PFL is turned off when the source's channel is turned on. When unchecked, PFL on/off is not affected by the source channel state. Note: PFL can also be turned off if *Fader Cue* is checked and the fader is moved up from full off.

*Fader Cue*—this setting is similar to *EFS* in that fader movement affects channel state. When checked, moving the fader to full off turns on PFL and moving the fader away from full off turns off PFL. This action emulates a feature found on old analog consoles with rotary channel volume controls which put the channel into cue when the pot was turned to full off activating the PFL or cue on switch.

*Machine Start Pulsed*—sets the type of logic command sent to that source’s remote control logic output when the channel is turned on. When checked, a momentary closure (pulsed logic) is sent. When unchecked, a sustained logic closure (tally logic) is sent.

*EFS (Electronic Fader Start)*—controls whether moving the source’s channel fader affects channel on and off. When checked, moving the fader to full off turns the channel off and moving the fader away from full off turns the channel on. When unchecked, fader movement does not affect channel on/off status. This command is typically assigned the same for all sources, although some users enable this feature on microphones.

When *DFS* and *PFL/Cue Dropout* are both enabled PFL would be turned off when the fader is moved up from full off because the channel turned on and PFL/Dropout was active.

*EFS Start Defeat* – When the *EFS* option is checked, checking this option stops sending out a Start Pulse when the source’s channel is turned on by moving the fader up from full off. When unchecked, and *EFS* is checked, a start pulse is sent each the fader is moved up from full off.

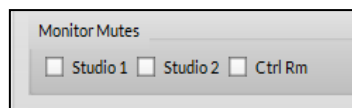
*Remote Ready*—this feature has no application on the Strata since the channels don’t have a separate Off button and LED. Remote Ready is used to control the Off button lighting to indicate device status.

*OL Pre Fader*—when checked, the source feeds the Off Line (OL) bus without any fader level control. When unchecked, the channel fader affects the signal level going to the Off Line bus so that levels can be adjusted. This setting is normally set the same for all sources.

*OL Pre On*—when checked, the source is always feeding the OL bus—if it’s assigned to the Off Line bus that was defined in the General tab. When unchecked, the source only feeds the Off Line bus when the channel is turned on. Typically, this setting would be checked for all sources that should feed the Off Line bus so the channel does not have to turned on to feed the OL bus.

### Monitor Mutes

There are three room mute locations: Studio 1, Studio 2, and the Control Room. Any combination of room mutes can be assigned on any signal, but typically only microphones are setup to mute monitor speakers. For example, a mic in Studio 1 would have Studio 1 checked so

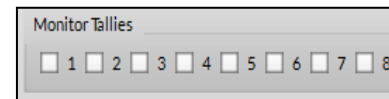


that turning that microphone’s channel on then mutes the monitor speakers in Studio 1.

Studio 1 is typically the main Air studio while Studio 2 would be a production or alternate studio. When the board operator has a microphone to do slates and for talkback, then that mic could have Ctrl Rm checked to mute the Control Room monitor speakers while it’s in use.

### Monitor Tallies

Eight Monitor Tallies are available to control “Hot Mic” or “Live Studio” indicators in the main and production studios as well as at other facility locations which may have a hot mic. The tallies can alternately be used to control other types of indicators and relays which need to be controlled when a source channel is turned on.



Tally 1 is typically used to indicate that the main studio is hot. Thus all mics in that studio would have Studio 1 Monitor Mute and Monitor Tally 1 checked. Likewise, Monitor Tally 2 is typically used to indicate a production or alternate air studio is hot and the mics in that studio would typically have Studio 2 Monitor Mute and Monitor Tally 2 checked.

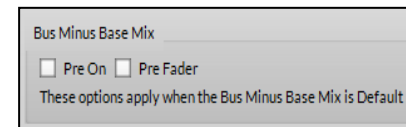
The Control Room often does not use a Monitor Tally since the control room mic typically does not feed air, being mainly used for talkback and for slating takes. Thus, the remaining Tallies: 3 thru 8 are available to trigger logic outputs to identify when a particular mic is turned on to control hot mic tallies at facility locations like announce booths, newsrooms, and sports bullpens.

The Monitor tally commands are output logic. Their signals are named: *Studio 1 In-Use* up to *Studio 8 In-Use*. All eight tallies are carried in a Strata source signal labeled **Tally**. The Tally signal must be cross-connected to one or more destinations to connect these logic controls to a Stagebox or Blade with an LIO (Logic Input/Output) jack. The Blade or Stagebox Logic jack outputs are then physically connected to the Hot Mic/Live Studio indicators either directly, when low voltage lights are used, or by using an interface like a Henry Superelay to control 120VAC lights.

The *Studio 1 In-Use* up to *Studio 8 In-Use* commands can also be used to drive SLIO (software LIO) commands to trigger WNIP devices that are networked with the Strata. See Logic Control and Logic-Only Signals (pages 26 and 27) for details on assigning LIO and SLIO output logic.

### Bus Minus Base Mix

In the **Surface Options > General page tab**, if the Bus Minus Base Mix is set to use the *BusMinusBaseDefault* bus these two selections are active and control how the source will be



sent to the base mix. If both are unchecked the audio feeding the base mix is controlled like the audio feeding a Master output: both the channel on switch and the channel fader level affect the audio feeding the base mix. If both are checked then the audio feeds the base mix more like a PFL signal: it's sent pre-on switch and pre-fader control.

When only Pre On is checked, the audio always feeds the base mix but its level is still controlled by the channel fader. When only Pre Fader is checked, channel on controls whether that channel feeds the base mix, at a fixed level (like PFL). The channel fader has no effect on the level.

## Visibilities Page Tab

The Strata has various source selectors, including the encoder at the top of every fader channel; the wild meter; CR, Studio 1, and Studio 2 external monitor sources; and several touchscreen X/Y Controllers. Each of these selectors has its own **Visibilities List** to set what sources or destinations are displayed while using the various selectors.

The default Visibility setting for all selectors is to display all sources. This is desirable for installing the console since it allows any source to be "dialed up" or taken on any selector. However, for daily console operation, it's essential that the Visibilities lists—especially for the input channels, be edited to remove signals which should not be available for selection, like the Master outputs and other internal signals, like logic-only signals.

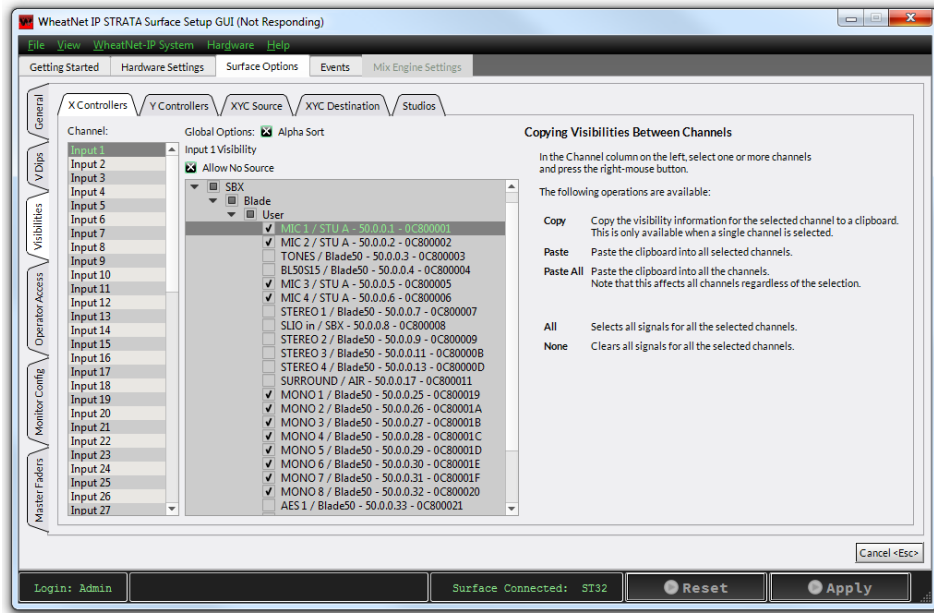


Figure 3-38 Visibilities Page Tab Settings

Taking the signal **NoSource** silences a channel, monitor, or meter. Each source selector has a checkbox: *Allow No Source* to set whether NoSource is listed. When unchecked, NoSource does not appear in the list of visible source names, which is typically done on monitors and wild meter lists. Leaving NoSource checked for input channels allows a user to silence that channel by selecting NoSource.

The *Global Option: Alpha Sort* is typically checked so that names are shown in alphanumeric order regardless of which Blade has that source. When Alpha Sort is unchecked names are listed by Blade ID number, which is something most board operators could care less about. They just want to find a source by its name, thus having everything in one alphanumeric order makes the most sense.

## Setting the Visibility

Select the **X Controllers tab** to set the visibility lists for the sixty-four input channels, the Loudness meter, and the Wild Meter. Select the **Y Controllers tab** to set visibilities for the various buses (Master 1 and 2, Mix Minus, Aux, Submix, Bus Minus, Tracks, Studio 1, Studio 2, and Control Room). Select the **XYC Source** to set the sources shown on the touchscreen source controllers and select **XYC Destination** to set the destinations shown on the touchscreen controllers. Select **Studios** to set the signals available to assign as the External Monitor Input on the three monitors: Studio 1, Studio 2, and Control Room. The active selector name (e.g., Input 1 Visibility as in Figure 3-38) is shown above the current *Visibility Selection* settings for that selector.

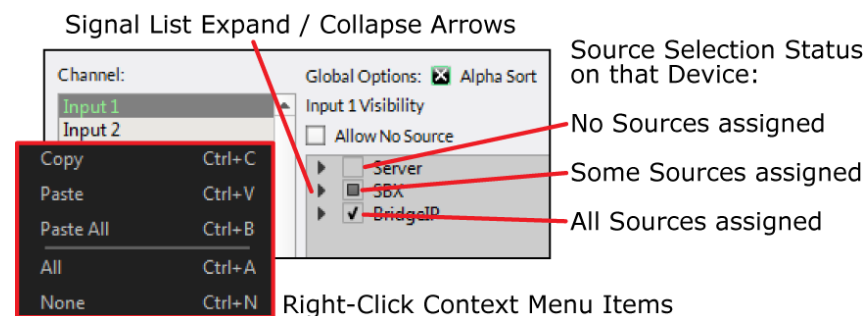


Figure 3-39 Visibilities Controls

When the *Visibilities page tab* is first opened, all devices are shown collapsed. A check box next to each Device Name indicates whether any sources are selected on that device (Figure 3-39). An empty box means no signals are selected; a filled box indicates at least one signal is selected; and a checked box indicates that all signals are selected (the default setting for a new Strata console). Click on a right-facing arrow to expand that device tree (the arrow then points down). Sub-categories (Blade, User, Alias, Surface, etc.) are expanded in like manner until you reach the actual source names, as shown in Figure 3-38. The sub-categories and

device tree can be selectively collapsed by clicking the down-facing arrows, which then point right again. The current view for each selector is maintained while using the Surface Setup app. When the app is closed and reopened, all device trees will again be shown collapsed.

### Visibility Selection List

Figure 3-38, on the last page, shows the signals for a Stagebox whose tree is fully expanded showing the individual signal checkboxes. If checked, that signal is visible on that selector (in the Figure 3-38 example, Input 1 is selected). When unchecked, that signal will not appear on that selector. The *Allow No Source* selection is checked by default so that **NoSource** can be taken to silence a channel. Un-checking *Allow No Source* is typically only done on the monitor and meter selectors.

The *Channel*: selectors have a right-click context menu (shown in Figure 3-39 on the last page) which allows the visibility setting from one selector to be copied and pasted to another selector. After setting a selector's visibility list, right-click on its highlighted selector name and select *Copy* then right-click on another selector and select *Paste* to update that selector's settings.



**Note:** There's a *Paste All* selection in the context menu. Selecting this pastes the copied list of sources to every selector in that Channel list.

Once the signal visibility is set, whether for one channel or for all channels, click *Apply* to transmit the changes to the Surface. The source selectors are instantly updated with the new visibility lists.

## Operator Access Page Tab

This page tab (Figure 3-40) has three sections: *Events*, *Bus Assignments*, and *Miscellaneous*. During console configuration all settings are typically checked, but these settings may be selectively unchecked—prior to releasing the console for daily operations, to prevent unauthorized access. This can be especially important when it comes to saving events and having access to change the Master bus assignments.

*Allow Modify Events* is typically disabled once console events are assigned during console configuration. Likewise, *Allow Bus Assign to Master 1* and *Allow Bus Assign to Master 2* are also typically unchecked to prevent a board operator, without the requisite knowledge, from changing those settings.

### Events

These three checkboxes control access to the very powerful **Event controls**. An event saves the current monitor settings, the current channel sources and other settings, including EQ and Dynamics, so that these can be recalled to setup the console for a specific show or application.

When *Allow New Events* is checked anyone can save a new event. When unchecked, a new event cannot be saved. This selection is typically **unchecked** once the events are saved by engineering during console configuration.

When *Allow Modify Events* is checked anyone can modify an event. When unchecked, events cannot be modified. This selection is typically **unchecked** once the events are saved by engineering during console configuration.

When *Allow Take Events* is checked, the board operator can take any event. When unchecked, the Take Event function is not active. For most applications *Allow Take Events* is left **checked** when events have been saved so the board operators can subsequently take events.

### Events Display on the Touchscreen

The Events View button brings up the Events display on the touchscreen. This is where a new event can be saved and named.

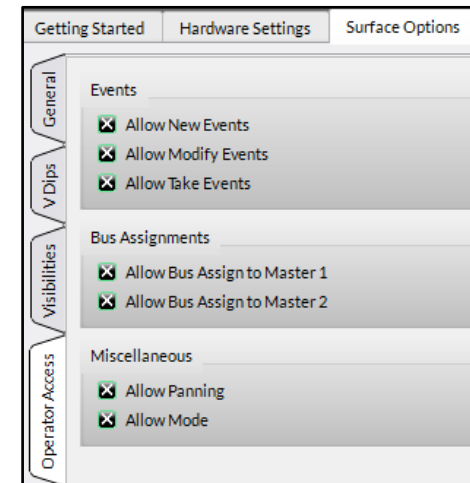


Figure 3-40 Operator Access Page Tab

### Bus Assignments

These two selections set whether the board operator can change the bus assigned to Master 1 and Master 2. For most applications the buttons are left checked so the board operator can change assignment, as required.

To use this feature, set the Master 1 and Master 2 bus assignments on the console then uncheck the Allow Bus Assigns. Click *Apply* to update the Surface with the new setting. The buses are now fixed and board operators cannot change the bus assignments for the unchecked Master.

## Miscellaneous

When the SEL button is pressed on an input fader the Input View is opened. Each fader channel includes access to a number of advanced channel features where one can change the channel mode, adjust audio panning, assign EQ & Dynamics settings, and control how each channel feeds the Aux and bus minus buses. This section sets whether the Mode and Panning controls are accessible by the board operators.

*Allow Mode*, when checked, allows the board operator to set the fader channel's audio mode between 5.1, Stereo (the default setting), Left only, Right only, Mono sum, or Blend. When unchecked, this feature is locked out from board operator use.

*Allow Panning*, when checked, allows left-right panning of a mono signal or balance control of a stereo signal on a fader channel. When unchecked, this feature is locked out from board operator access.

## Monitor Config Page Tab

The Monitor Config page tab sets whether any monitor destination should have its level locked. When *Level Locked* is checked, and *Apply* is clicked, the current level setting for that output (Studio 1, Studio 2, or Control Room) is fixed at that output level. Rotating the Master panel encoder for the checked monitor output no longer affects the output level.

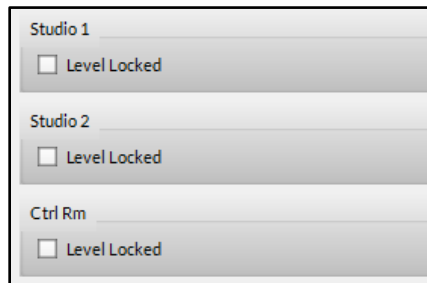


Figure 3-41 Monitor Config Page Tab Settings

Level Locked is typically not checked for the Control Room. Level Locked might be checked for a Studio to allow a producer or floor manager to control the monitor speaker levels in the studio. Level Locked would also be used if the studio output was feeding a Headphone amp or an in-ear monitor amplifier where the talent has their own volume controls.

## Master Faders Page Tab

This tab allows the names shown in the Master 1 and Master 2 OLED displays to be edited. Any name of up to eight characters can be entered.



Figure 3-42 Master Fader Names

## 4 - STRATA BOARD OPERATIONS

This chapter covers Strata Surface operations from the board operator perspective, which includes descriptions of each control on the Fader, Master, and Touchscreen Panels; how to use the advanced features like adjusting channel EQ and Dynamics, setting up and using Automix, and using Submix groups and VCA groups; and using the Strata to accomplish specific tasks and everyday operations.

### STRATA CONSOLE OPERATION

The Strata may look intimidating at first glance but four of its six control panels are identical so there are only three types of control panels you'll need to learn—the three panels set at an angle to the operator: Fader Panel, Touchscreen Panel, and Master Panel (Figure 4-1). This chapter covers each of the controls and operational features with the first mention of each control or feature in the text being listed in **Bold**.

Figure 4-1 identifies the main components of the Strata Surface: its four identical Fader Panels; one Touchscreen Panel; and one Master Panel, along with its palm rest. Whenever you enter the control room to work on the Strata, we recommend momentarily touching the palm rest prior to touching any panel control. This helps dissipate static electricity build-up, generated by just walking thru the facility, so that it goes into the chassis rather than into the first control you touch.

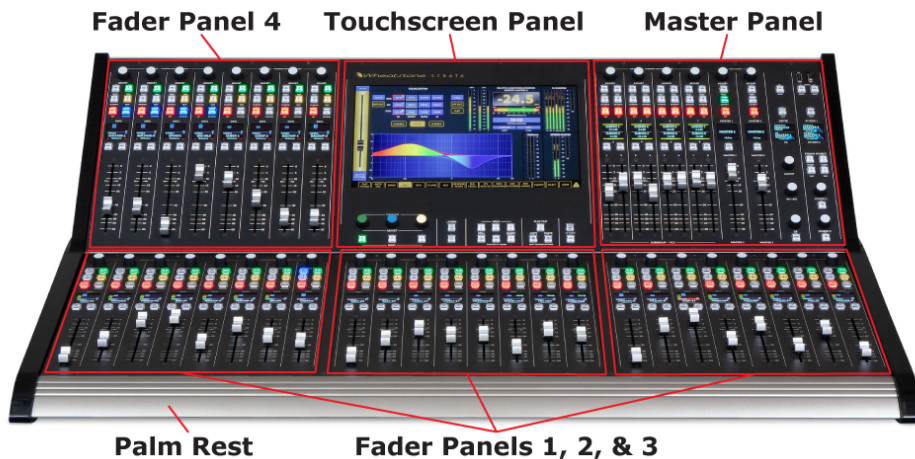


Figure 4-1 Strata Surface Overview

### Fader Panels

The four Fader Panels have thirty-two identical **channel strips**. Figure 4-2 identifies the controls and user features on each channel strip.

Since the Strata has the ability to control up to 64 audio channels—but has only thirty-two physical faders, the Fader Panel channel strips have two control **Layers** to allow each channel strip to independently control two audio sources.

While **Layer 1** is active, the channel strips control audio channels 1 to 32. When **Layer 2** is active, the channel strips control audio channels 33 up to 64. Two buttons on the Touchscreen Panel: **Layers 1 & 2** (Figure 4-3) switch the Fader Panels between showing the Layer 1 channels and showing the Layer 2 channels.

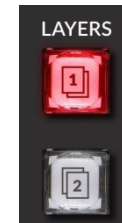


Figure 4-3 Layer 1 & 2 Buttons

The Strata uses motorized faders to show the current level set on the channel strips as one switches between Layer 1 and Layer 2. Faders may jump to new positions, reflecting the fader settings for the current layer. All button assignments and the **Channel Info** displays are also immediately updated to show the active Layer's channel settings.

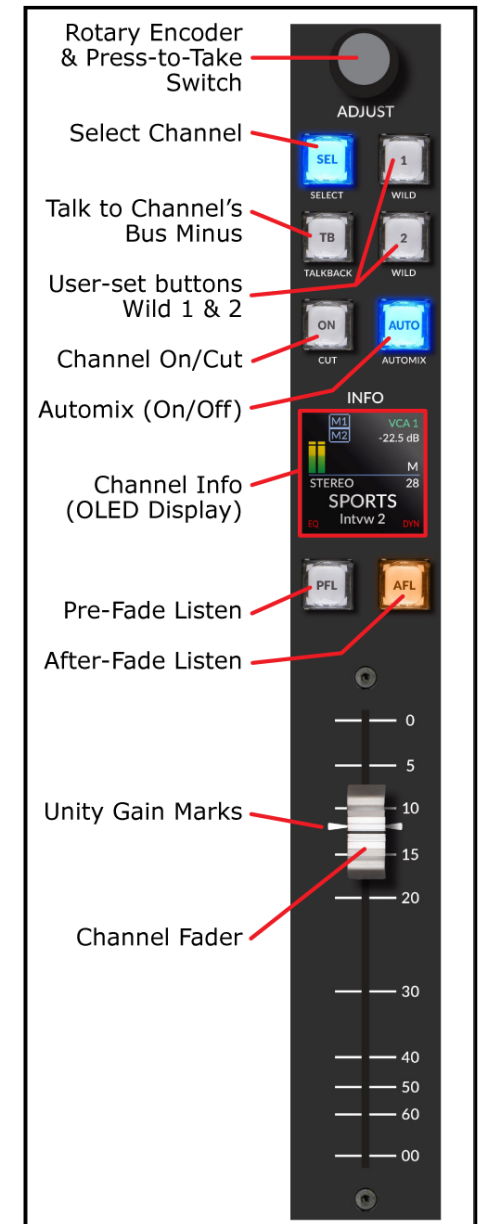


Figure 4-2 Channel Strip Controls

All button assignments and the **Channel Info** displays are also immediately updated to show the active Layer's channel settings.

## Channel Info Display

The Channel Info display is split, by a horizontal blue line, into two sections (Figure 4-4). Below the line, the current source's signal format (stereo or surround) is shown at the left and that fader's channel number is shown at the right. In Figure 4-4, three channel displays on Layer 1 (which has channels 1-32) are shown. The channel source names: MIC 1, MIC 2, and ClipPlay, are shown using large characters. The other Layer's source names are shown using smaller characters (NoSource is set for all three channels). In Figure 4-4 those are the sources for fader channels 33, 34, and 40 on Layer 2.

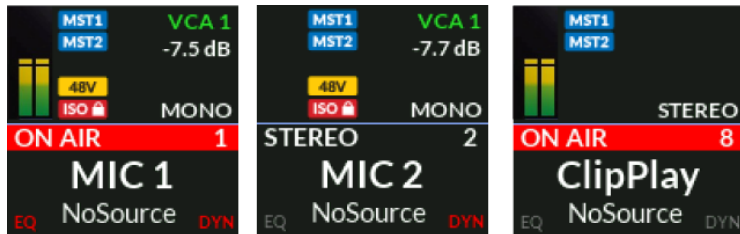


Figure 4-4 Channel Info Displays

**EQ** (Equalization) and **DYN** (Dynamics) icons, in the lower corners of the display, indicate that feature's status on that channel: red means it's active; gray means it's inactive. Both EQ and Dynamics are active on CH 1; Dynamics is active on CH 2 while CH 8 has neither active (Figure 4-4).

Above the left end of the blue line is an **Input Meter** to show the incoming level for that channel's current source: both mono and stereo signals show two bars while six bars indicate a 5.1 surround signal.

The rest of the area above the blue line displays various icons indicating which buses and VCA groups that channel is assigned to. Figure 4-4 shows that all three channels are assigned to both **Master outputs** (the **MST1** and **MST2** icons). Channels 1 and 2 are assigned to a **VCA group** (VCA 1). The channels' levels feeding the VCA group is shown numerically below the icons (-7.5 dB and -7.7 dB). The signal output format is shown just above the blue line (Mono, Stereo, 5.1). Additional icons are shown when a mic input has phantom power turned on (**48V**). Channels can also be put into Isolation which means they do not toggle when the Layers buttons are used to switch Layers. In Figure 4-4, channels 1 and 2 are in Isolation since they both have a red **ISO** icon.

When a channel is turned on; its fader is above full off; and it's assigned to Master 1 or Master 2, and that master fader is on and its fader is above full off, a red ON AIR bar is shown across the display (shown on channel 1 and channel 8 in Figure 4-4). Depending upon the mute and tally settings for that signal this may cause monitor speakers to mute and a tally to be triggered.

## Channel Buttons

Six of the eight buttons on each channel strip have dedicated functions which are etched onto the panel and/or into the button cap (Figure 4-5). The **Wild 1** and **Wild 2 buttons** are user-set. This means their functions must be identified by your engineering staff since each button, on each channel strip, can be unassigned or set to one of over a dozen functions like: EQ in/out; Processor in/out; or it can be a Hot Source Selector.

Many users assign the same set of functions to the Wild buttons on all fader channels, but the console can be configured so that channels with similar classes of signals, like channels dedicated to microphones, have the same commands assigned to their two Wild buttons, while channels assigned for remotes could have completely different commands assigned to their two Wild buttons. The operator can also easily update these settings using touchscreen controls in the Input View.

The **PFL button** (Pre-Fader Listen) allows any monitor output be switched to monitor one or more channels prior to fader level control but post EQ and dynamics processing. The console can be setup so that PFL auto-switches into the control room speakers or either Studio monitor speaker by activating that monitor's **PFL Insert** option (a touchscreen setting). PFL can also be setup to feed separate powered monitor speakers. Any number of channels can be assigned to PFL, but it's most often used on one channel at a time to either verify the correct signal is on that channel or to verify the audio processing is set correctly.

The **AFL button** (After-Fader Listen) allows the operator to monitor one or more audio channels and hear the effect of adjusting the fader level and adjusting the channel balance by either using the **Spill function** or the touchscreen balance controls to the balance the signal. This function is really helpful when mixing in 5.1 surround. AFL allows the signal to be monitored as if it were feeding a master bus without the channel being on so that you can also adjust the fader level to ensure your audio stays balanced. The control room and/or studio speaker audio can be set to automatically switch to the AFL audio (**AFL Insert** option is active) when any channel's AFL button is lit. An AFL source can also connect to a separate set of powered monitor speakers.

The PFL and AFL buttons blink while active.

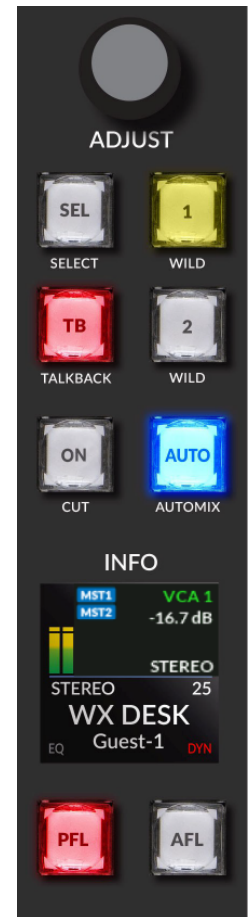


Figure 4-5 Channel Strip Buttons



**Note:** If one or more PFL and AFL buttons are blinking on the Surface, and you switch Layers, the now-hidden channels remain set in that mode. An **AFL/PFL button** on the Master Panel's CR column blinks when either mode is active. Pressing it allows one to cancel both PFL and AFL on every fader channel, turning off all channels' PFL and AFL buttons and, if active, switching the monitor audio back to the selected monitor source. There is an AFL/PFL cancel touchscreen button as well.

The **Cut/ON button** normally lights up solid red to indicate that channel is on and connected to its assigned buses. If the On button blinks, it indicates that channel is assigned to one or more VCA Groups, and one or more of the VCA Group master fader channels that it's assigned to are turned off. There is also a console configuration setting which reverses the Cut/On button LED so that it's red when the channel is cut off. With this option active, there is no channel indication for a VCA Group Master fader channel being turned off.

A red On-Air bar appears across the middle of the Info display (as shown on two of the channels in Figure 4-4) with the channel number shown at the right end whenever the channel is on and feeding the Master 1 and/or Master 2 outputs, and both the channel fader and at least one of the assigned Master faders are above full off.

The **Automix/AUTO button** sets whether that channel's source is feeding any of the four available Automix circuits. Automix (popularized by Dan Dugan back in the early 1970s in the analog domain) uses an algorithm to automatically adjust multiple live input signals, which are part of an Automix group, so that the mixed output level stays consistent regardless of how many of the input signals are active at any given moment. Each channel's input to the Automix group is given a "weight" using a fader-type on-screen control in the **Automix View**. This weight is used to automatically keep the overall group volume at a constant level, regardless of how many inputs are active by adjusting the group channel levels as the input volumes rise and fall.

Automix is often used with talk, news, sports, and game shows where multiple live microphones are open. Assigning the mics to an Automix group, and then adjusting their weights, means the board operator won't have to "ride gain" on the guest and host mics to ensure a consistent level and to ensure the host can always be heard over the guests. The show moderator's mic is typically set with the highest weight so that even if every guest is talking, when the moderator begins speaking all of the guest mics are ducked, according to their weight settings, to ensure the moderator can be clearly heard over the guests, without increasing the overall level of the group. Each of the four Automix groups can be assigned to a Submix Group or to a Master, as needed.

The **Talkback/TB button** allows the board operator to talk to a host, a producer, a live remote, a caller, etc. that's using a bus minus signal for

their in-ear or speaker monitor. To use this function, the engineering staff must connect a talkback mic for the Strata board operator which is then cross-connected to the console's Talkback destination. The fader channel's bus minus signal must also be cross-connected to feed the talent's in-ear monitor, the producer's monitor, a caller, or remote.

The **Select/SEL button** is used to show channel-specific settings for the active channel. When pressed it typically activates the **Input View** on the touchscreen monitor so that channel-specific settings for that fader channel can be seen and adjusted. Pages 61 and 62 have details on the controls in the Input View. In operation, pressing the channel SEL button lights up the button and, depending upon which View is currently active on the monitor may change that view to show that channel's settings or it may bring up Input View. Only one SEL button is active at a time, thus pressing SEL on another channel switches the View to show the new channel's settings, in whatever View Mode was active on the previous channel, while canceling SEL on the previous channel.

The **Adjust Control** is a multipurpose rotary encoder with a press-to-take select button. Its main use is to select the channel source. Rotating the encoder displays alternate source names, in alphanumeric order, in the Channel Info display and in a pop-up window on the touchscreen (the touchscreen or the three Touchscreen panel controls) can alternately be used to locate a new source.

When the desired source name is shown, the channel Adjust control can be "clicked" (firmly press and release the button once) to assign that source to the channel. Alternately, one can use the Touchscreen Panel controls (touching the screen or using the color-coded panel controls) to select the source. The selected signal's name, format, and input levels are then shown in the channel's display.



**Note:** The list of alternate source names displayed on any given channel is not under board operator control. The lists were set during console configuration by engineering, but are easy to update, as required.

The Adjust control can also be put into **Gain Mode** to adjust the input level of the current source. To enter Gain Mode, press/hold Adjust for about five seconds ("overpress" the control). The source name for the other Layer is replaced by a level display showing the current level in dB. Rotating the Adjust control clockwise raises the source's input gain; rotating it counterclockwise lowers the input gain. On a line input the gain control can range from -18 dB to +18 dB. On a mic input it can range from -18 dB up to +78 dB. Overpress the Adjust control again to cancel Gain Mode and return to Source Select Mode.



**Note:** Use caution when adjusting the input gain since the adjustment affects the level going to every destination that's using that audio signal.

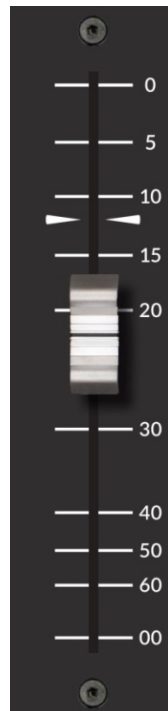


## Fader Level

The Strata uses motorized 100 mm faders so that the input channels faders are accurately positioned when switching between Layers. This is also the case for the eight faders in the Groups section of the Master Panel, as the SUB GRP and VCA buttons are pressed to switch between showing Submix Groups and VCA Groups.

The faders are calibrated in dB, from 0 dB down to  $\infty$  (infinity) or full off. In an ideal world, the fader knob lines will roughly align with the unity gain marks: two arrows which indicate -12 dB. Aligning the fader knob with these marks means the audio passes thru the channel without any change in its level (i.e., unity gain).

If the input audio is low, moving the fader above those marks adds up 12db of gain to the signal. On loud signals, moving the fader below the unity gain marks decreases the level. Typically, when a channel fader has to be consistently set lower than nominal the audio input level (shown in minimal detail in the channel OLED, or with greater detail by using PFL to view the input level on the Touchscreen monitor) should be decreased so that the fader can be set closer to unity gain. It's always better to use the Adjust level control in Gain Mode, to raise or lower the input gain, than to have to set the fader way above or below the unity gain marks.



## Master Panel

The Master Panel (Figure 4-6) has eight columns of controls arranged into three sections: Groups; Masters; and Monitoring.

The left half of the panel, labeled Subgroup - VCA, has eight **control strips**, each with a fader, half of an OLED display, four select buttons, and a shared rotary encoder with a push-to-take switch. These eight control strips are layered like the Fader Panel channels so that one set of controls independently control both **Submix Groups** and **VCA Groups**. The Touchscreen panel has dedicated **SUB GRP** and **VCA buttons** to select, and indicate by the lit button, which set of controls are active in the Groups section. The control strip OLED displays also indicate the active group by name, showing either Submix 1 - 8 or VCA group 1 - 8.

The middle two columns (Master 1 and Master 2) have the controls for the two Master outputs: default OLED names **MASTER 1** and **MASTER 2**. Each column has the same set of controls: a master fader; a PFL button; an OLED display; three select buttons; and a rotary encoder with a push-to-take switch.

The right-most two columns have the controls for the Control Room (labeled CR) and for two Studios (labeled as Studio 1 and Studio 2) with

monitor source selectors and various level controls along with two monitoring OLED displays which are split to show the CR, Studio 1, and Studio 2 monitor levels and the **Wild Meter** source. The Wild meter is to the left side of the Master 2 meter on the touchscreen.

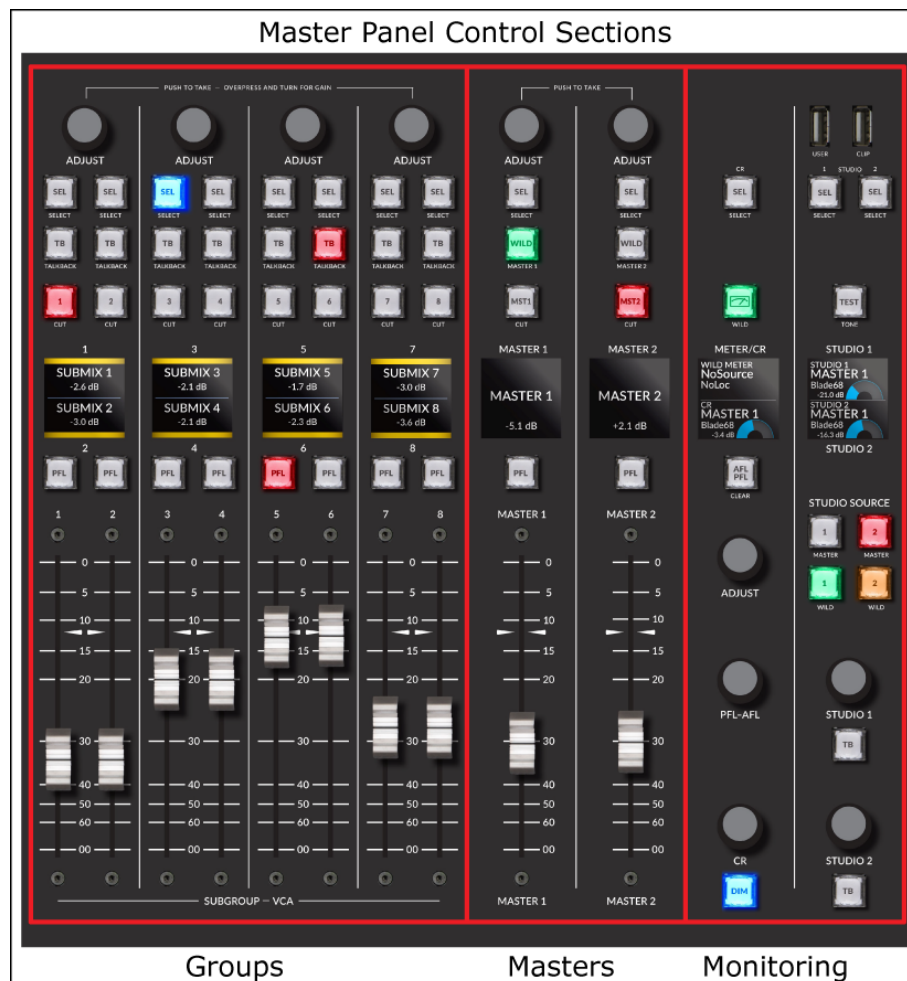


Figure 4-6 Master Panel Sections

At the very top of the Studio column are two USB ports: **User** and **Clip**. The User port is available for a board operator to use a USB flash memory stick to save and load **Events** (console configuration settings). This is especially useful for an operator who only periodically uses the console. Console setups can be saved as Events which can be uploaded to the flash memory stick so that when that operator returns they can load their saved Events to reconfigure the console for their show or application.

The Clip port is used with USB flash memory sticks which have Playlist files, stored in the .m3u format, and/or 48 kHz .wav audio files (a show's open and close music, bumpers, sound FX, etc.). The **Clip Player View**, on the touchscreen, has controls to select and play the music cuts. The Clip port audio is a source named **ClipPlay** which can be brought up on any fader channel which has that signal set as visible.

Clip player settings can be saved as part of an Event allowing a selected audio track to be loaded with the Event so that one could recall the 5PM NEWS event with the "open" music track already loaded and ready to play. The Clip Player can also be controlled over the network using Wheatstone's ACI (Automation Control Interface).

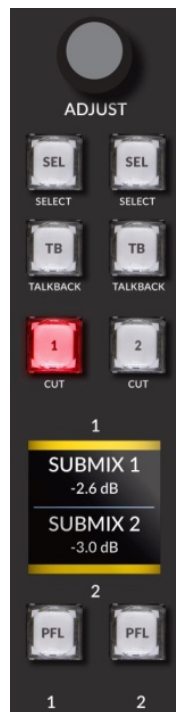
## Group Controls

Input channel signals and the mix minus bus can be assigned to feed any combination of the eight Submix groups. The eight VCA groups can be fed by any combination of input channels. This allows multiple signals to be controlled as a group using one Group or VCA fader. Whether these controls affect Submix Groups or VCA Groups is set by the lit SUB GRP or VCA button on the Touchscreen Panel, just to the left of the Group controls.

The **eight faders** control the overall levels of the channels assigned to a Submix Group (when SUB GRP is lit) or to a VCA Group (when VCA is lit). The active Submixes (default source names are Submix01 to Submix08) are typically assigned to the eight fader channels on Fader Panel 4 which are then set to feed a Master or other output. The VCA Group faders do not control levels to any output but rather control the input channel fader levels on those channels assigned to each VCA group. The channel faders then follow the group fader as it's adjusted to control that VCA group's overall level. Typically the VCA group faders are first set at maximum and then the individual channel faders are adjusted. The VCA group fader can then bring down the levels of all channel faders assigned to that group.

A **PFL button**, just above each fader, allows one or more Submix Group's audio to be monitored prior to group fader control. The PFL buttons are not active with the VCA Groups.

The **OLED display** shows which group is active: SUBMIX 1 thru SUBMIX 8 or VCA 1 thru VCA 8. The group fader levels are shown in dB below the names. When Submix Groups are active the dB levels are referenced from unity gain (0.0 dB) on the faders whereas when the VCA groups are active the faders are referenced to full on, which appears as 0.0 dB.



The **Cut/1 - 8 buttons** normally light up solid red to indicate the group fader channel is on. When VCA groups are active, if the VCA Group fader channel is off but the VCA group input fader channels are on, then their Cut/On buttons blink to indicate the VCA Group fader channel is off. Note that there's a console configuration setting which reverses the Cut/# button LED (it's red when the group and input channels are cut off).

The **Talkback/TB button** allows the board operator to talk to each Submix group. The TB button is not active when VCA Groups is active.

The **Select/SEL button** is used to show channel-specific settings for the active group channel. When lit, it causes the EQ, DYN, and 5.1 PAN views to become active. Note that only one SEL button can be active at a time, whether on an input channel, a group channel, a master, or a monitor.

## Master Controls

The two Master outputs have identical functions although typically Master 1 is configured as a 5.1 surround output while Master 2 is typically configured as a stereo output.

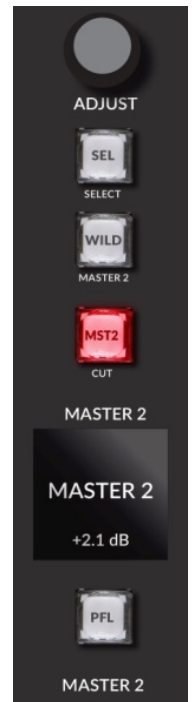
The Master faders control the overall output level of the Master 1 and Master 2 outputs. A PFL button, above each fader, allows the master signal to be monitored prior to fader control (the Master can be turned off and the fader down).

The OLED display shows the name of the Master Output (default names are MASTER 1 and MASTER 2). The fader position, in dB, is referenced from unity gain (0.0 dB).

Just above the OLED display is the Master Cut/MSTR# button. Typically, this button is lit red when the Master is on, but a Strata Surface Setup app configuration setting can reverse this so that a lit button indicates the Master is cut off. If this is the case, then all input fader channels and Group channels would operate in like fashion.

The Wild button is a user-set button which engineering defines in the Strata Surface Setup app, so they'll have to let you know what action the button is set to perform. Some of the actions include turning on a preset amount of delay, setting EQ in/out, or setting processing in/out. The button lights green when the Wild function is in or active.

The Select (SEL) button is used to adjust the Master output settings in various touchscreen views.



## Monitoring Controls

The right-most two columns of controls on the Master Panel affect the control room outputs and the two studio outputs.

At the top of these two columns are three **Select/SEL buttons**. Each brings up a Monitor Select View (Figure 4-7) on the touchscreen which is a multi-purpose window used to both assign and then take four Studio Source button sources (called Monitor Hot Buttons on-screen) and twelve External Hot button sources. Each View also has a Source and Destination selector to route additional signals to the monitor and other destinations.

This View also allows each Monitor's Mode, Dim level, Delay time, and whether PFL and/or AFL is inserted into each monitor, to be set or adjusted.

The six Touchscreen Hardware Controls (the three color-coded rotary encoders and buttons below the left side of the touchscreen) can be used to adjust the Dim level (green encoder); the Delay time (blue encoder); turn PFL Insert on/off (green button); turn AFL Insert on/off (blue button) and step thru the Monitor Modes (yellow button).

To assign a source to the sixteen Hot and External Buttons, select a Source to assign by tapping the blue source name box to open a Source Selector to take a source (note that source will then feed that monitor). Overpress one of the sixteen buttons to assign that Source to that button. Repeat this to set additional buttons. To later take one of these preset sources, tap on a button to set that source as that monitor source. That button lights up and its name appears in the blue Source box. While one of the three SEL buttons is lit you can alternately press one of the Studio Source buttons to take the Monitor Hot Button 1 – 4 source.

### Control Room Column Controls

The Wild/Meter button, when lit, allows the source feeding the Wild Meter to be changed using the **Adjust encoder**. Rotating the Adjust



encoder shows the list of sources available, in red, in the upper half of the METER/CR OLED display. Once you find the desired source click the Adjust encoder to select that source. Its name turns white in the OLED and appears above the Wild meter. You can continue to select different sources while the Wild button is lit. To stop selecting sources press the Wild Meter button to turn it off.



**Note:** When PFL or AFL is active (the AFL/PFL button is blinking red), that signal takes over the Wild Meter and PFL or AFL is listed on the Wild Meter rather than your selected source. Pressing the AFL/PFL button cancels that mode and the selected Wild source name reappears above the Wild meter and its level is shown in the Wild meter.

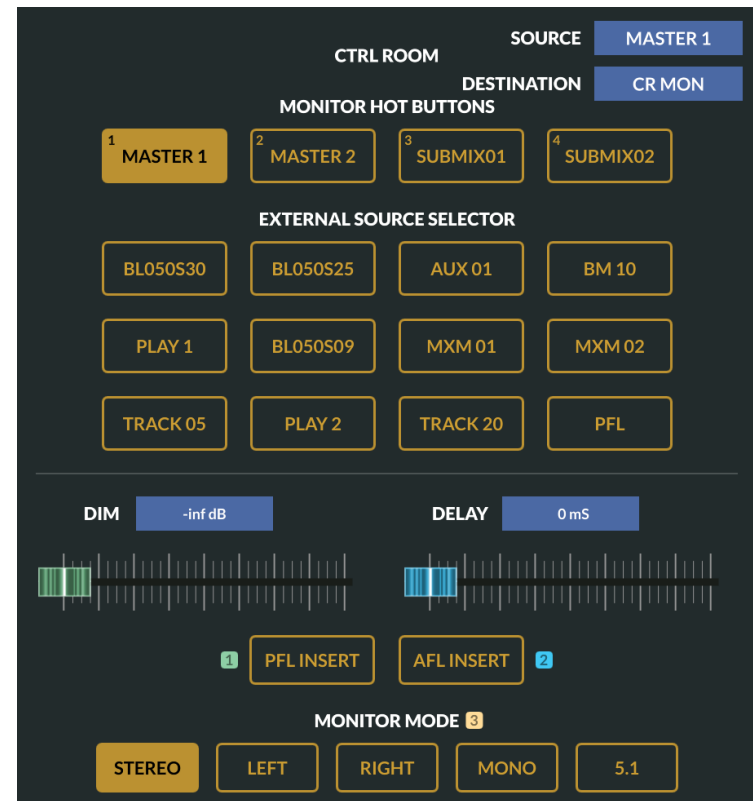


Figure 4-7 Monitor Select View

The lower half of the CR OLED display shows the current CR monitor audio source name along with a graphic and dB indication showing the setting of the **CR level encoder** at the bottom of the column. Pressing the CR SEL button allows the Adjust encoder to manually select the monitor

source (shown in red). Pressing the Adjust encoder selects that source and the name changes to be shown in white lettering.

The **PFL/AFL level encoder** adjusts the level of PFL and AFL audio which may feed separate powered monitor speakers or the main CR monitor output, depending upon the settings in the Monitor Select View. It also brings up a Talkback and PFL/AFL Level window on the touchscreen. Use the Adjust control to adjust the level of talkback.

The **DIM button** is a latching button. When lit the CR monitors are dimmed by the amount set in the Ctrl Room Monitor Select View.

## Studios

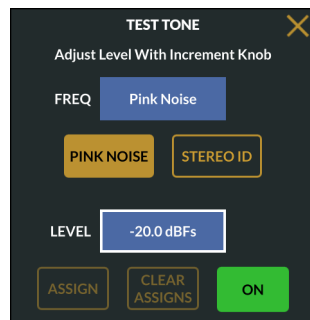
Pressing the Studio 1 or Studio 2 SEL button brings up the Monitor Select view shown in Figure 4-7 on the last page. While the Studio 1 SEL button is lit, the STUDIO 1 encoder can be rotated to manually choose a new source for the Studio 1 output. The source names are shown in the upper half of the Studio OLED display in red. Clicking the Studio 1 encoder selects that source and its displayed name turns white. Likewise, when the Studio 2 SEL button is lit the STUDIO 2 encoder is used to manually select a source for the Studio 2 output. The source names are shown in red, in the lower half of the Studio OLED display, as the Studio 2 encoder is used. Selecting the source by clicking the Studio 2 encoder turns the name white and assigned that source to the Studio 2 output.

When the Studio SEL buttons are off the two Studio encoders control the level of the studio monitor outputs.



**Note:** The output level for the CR and either Studio output can be set to a fixed level using the Strata Surface setup app. This would prevent the CR, Studio 1, and/or Studio 2 encoder from controlling the output level of that monitor.

The **TONE/TEST button** shows the Test Tone View on the touchscreen. The button blinks while this view is on-screen. The Test Tone View allows one to select between three types of test tones: 1 kHz tone, Stereo ID with 400 Hz on the left channel and 1 kHz on the right, and Pink Noise. Tap the on/off button to turn on the Test Tone generator (On is displayed). Tap the blue Levels display and then use the CR Adjust encoder to adjust the test tone output level from its default -20 dBFS level. The source name for the test tone generator is TestTone. It can be set Visible on any input fader channel. To close the Test Tone window tap the X button or press the Test Tone button. The generator will continue to run until the window is again



opened and the On button is tapped to turn off the generator (Off is displayed).

If a talkback mic is connected, the board operator can talk to either Studio output by pressing the **TB button** just below the Studio 1 and Studio 2 encoders. When the CR SEL button and the WILD Meters buttons are off the talkback level can be adjusted by turning the CR Adjust control which opens a window which also shows the PFL/AFL level control.

## Touchscreen Panel

A 16x9 1080p touchscreen monitor takes up about 2/3 of the Touchscreen Panel (Figure 4-8). It normally displays the console bus meters and the Program Loudness Monitor, however, since it's a touchscreen monitor, there are various **Views** which can be displayed to access Strata's advanced features, like setting EQ and Dynamics, assigning input channels to the various buses, adjusting input channel settings, and adjusting monitoring settings.

Recognizing that many common operations, like adjusting on-screen rotary controls, are easier done using hardware controls, just below the left side of the monitor are color-coordinated **Hardware Encoders** and **Select Buttons** which duplicate commonly-used controls in various Views so that you don't always have to be adjusting settings using on-screen faders and rotary controls.



Next to these hardware on-screen controls are the two **Layers buttons** which are used to toggle the 32 fader channels between showing the settings and controls for Layer 1 (normally fader channels 1 - 32) and Layer 2 (normally fader channels 33 - 64). Their operation was detailed on page 45.

To the right of the Layer buttons are six grouped buttons. The top row has three **Wild buttons** which have no factory-defined functions being user-defined so engineering will have to let you know what their actual functions are).



The three lower buttons' functions all affect multiple fader channels. This is what each of these buttons does when active:

- ❖ **Spill** — When a channel's SEL (Select) button is lit, pressing this button "spills" the selected fader channel's audio onto adjacent fader channels to allow for individual audio channel level adjustment. Two fader channels are used for a mono or stereo signal; six fader channels to adjust a 5.1 surround signal.
- ❖ **Function-to-Fader (FTF)** — This button is active while the **EQ**, **DYN**, or **AUX View** is active and one channel has its Select button lit up. Pressing FTF switches the upper half of multiple fader channel OLEDs, on channels adjacent to the selected channel, to show various EQ, dynamics, or Aux master levels which can then be adjusted using the channel encoders, rather than having to use the on-screen controls. The FTF button color indicates which function is active (Blue for EQ; Green for Dynamics; and Yellow for Aux master).
- ❖ **Query (?)** — This button is always active. Pressing it affects all fader channel OLEDs by changing the upper half of the OLED displays to show channel settings. Tap the button once and the button turns green. All channel OLED displays show the channel **Delay** settings: *Delay time* and *Delay in/out* status. Tap the button again (it turns blue) and the **Submix buses** are shown indicating which bus each channel is assigned to. Tap the button again (it turns yellow) and the sixteen **Aux buses** indicate which each channel is feeding. Tapping the button again (it turns magenta) and it shows the **Mix Minus buses** that each channel is connected to. Pressing the button once more turns the button LED off and returns the OLED displays back to normal view.

To identify which Submix, Aux, and Mix Minus bus a channel is feeding: white channel numbers indicate assigned buses while gray numbers indicate unassigned buses. The Mix Minus bus assignments can also be displayed reversed so that unassigned buses are white and assigned buses are gray, following a Surface configuration setting.

The next three grouped buttons are used to bring up the Clip Player screen and to copy and paste channel settings from one input channel to another (Copy and Paste buttons).

The last two dedicated buttons toggle the Master panel group faders between showing **Submix** (**SUB GRP** button lit) or **VCA Fader Groups** (**VCA** button lit).

## Touchscreen Monitor Views

There are **fifteen touchscreen Views** plus multiple pop-up windows which may be displayed on the monitor. To select a View tap an active **View Select button** along the bottom of the monitor (Figure 4-8). The touchscreen View can also get changed by pressing a Select button (SEL) on an input channel or on the monitor panel. An active SEL button is lit blue (only one can be active) and, when activated, typically switches the touchscreen View and may also activate inactive View buttons.

Not all View buttons are active in all Views. For example, in Figure 4-8 the **INPUT**, **EQ**, **DYN**, **5.1 PAN**, and **AUX** View buttons are inactive, indicated by their dark backgrounds and brown outlines. View buttons which are active and available to select have a yellow outline. The active View button has a yellow background (in Figure 4-8 the **Home View** is active). Pressing a SEL button on a fader channel will activate the **INPUT**, **EQ**, **DYN**, and **5.1 PAN** buttons. It also typically switches to the **Input View**. Pressing the SEL buttons on the Master panel activates the **EQ**, **DYN**, and **5.1 PAN** buttons.

### Home View

The touchscreen can be divided into eight sections, as identified by the numbers in Figure 4-9 on the next page. Here's a description of each section in the Home View:

1. *Master 1 Meters* — Master 1 is the upper right meter which is typically configured for 5.1 surround as shown in Figure 4-9, so it has six meters for the various surround signals plus a Gain Reduction (GR) meter. This meter is always shown, regardless of which View is active.
2. *Master 2 Meters* — Master 2 is typically a stereo output so it shows two meters along with its Gain Reduction meter. This meter is also always shown, regardless of which View is active.
3. *Program Loudness Monitor* — Details on the Loudness Monitor features are on pages 64 - 66. The Loudness Monitor is shown in all but two views (the **Auto Mix** and **Input Views** cover it up).
4. *Wild Meter* — The Control Room has a *Wild Meter button* and an *Adjust* encoder to select the source that appears on this meter, which is to the left of the Master 2 meter. This meter also shows PFL or AFL levels when PFL or AFL is active. It's shown in all but two views (the **Auto Mix** and **Input Views** cover it up).



Figure 4-8 Touchscreen View Select Buttons



Figure 4-9 Touchscreen Sections

5. *Aux Masters Meters* — the sixteen stereo Auxiliary Send bus meters show the bus output levels in the **Home View** only. They are covered up in every other View. The Aux Masters View shows these same meters.

6. *Track Meters* — there are 32 stereo Tracks but there's only room to show sixteen at a time. Tap the page button—the small yellow right-facing arrow to the right side of these meters, to show Tracks 17 – 32. These meters are only shown in **Home View**. The *Aux Master* and *Track* meters are covered up in all other Views by graphs showing EQ, Dynamics, and Surround panning,

plus a table showing which Aux Sends are assigned for whatever signal or bus is selected using the Select View or using the control panel SEL buttons.

7. *Submix Meters* — The eight stereo Submix bus levels are shown on these eight meters. They are only shown in the **Home View**.

8. *Mix Minus Meters* — These meters show the sixteen mono mix minus buses. They are only shown in the **Home View**.

The various Views, shown when each View button is active, are shown over the next several pages.

## Select View

This view is an alternate way to select an input channel, Submix Group, or Master (just like pressing the SEL button). It also allows an Aux or Mix Minus bus to be selected. When an Aux or Mix Minus bus, a Submix, or a Master is selected, the fader control at the left side of the window becomes active. It both shows, and allows one to adjust, the master level for that bus or signal, moving the hardware fader for that signal. When Master 1 or Master 2 is selected the Master mode and destination for that Master can be selected.

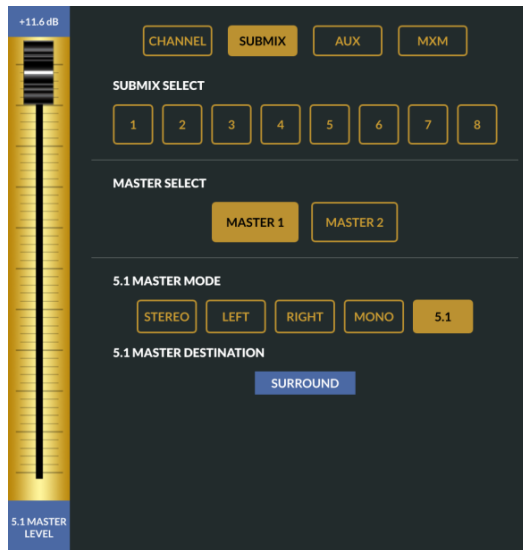


Figure 4-10 Select View

## Events View

This view allows console Events to be saved and later taken. A console Event saves how the console is setup, typically for a specific show or application, so that the Event can later be taken to instantly switch the console settings back to those used by that show or application.

Events are named and saved to an **EVENTS list**. Four saved Events are shown in Figure 4-11. Events are saved to the Surface Host card memory when the **LOCAL** button. Events can also be saved and taken directly from a USB flash drive plugged into either USB port on the Master panel. Tap the **USB** button to light it up and show the Events on the USB flash drive.



**Note:** Before Events can be saved to a USB flash driver the drive must have a folder named **Events** at the top level of the flash drive. Use a Windows PC to create an Events folder then plug the USB flash drive into the Strata. The USB button becomes active when an Events folder is detected on a flash drive plugged into either USB port on the Master panel.

The **Event Recall Section** is used to take an Event using a three step process: 1. Tap on an Event name to highlight it (like Roundtable in Figure 4-11); 2. Tap **ARM** to read the Event and load the settings into the Host card; 3. Tap **TAKE** to load the settings into the Surface.

This process allows one to separately arm an Event well in advance of actually taking it during a pause in the action or during a final commercial prior to the start of the next show. Separately arming and taking an Event is more often used in radio than in TV production which typically will press the ARM and TAKE buttons, in sequence, at the same time. If the wrong Event is taken tap the **UNDO** button to return the console settings to their settings prior to taking the last Event. No Event will then be shown in the Current Event display.

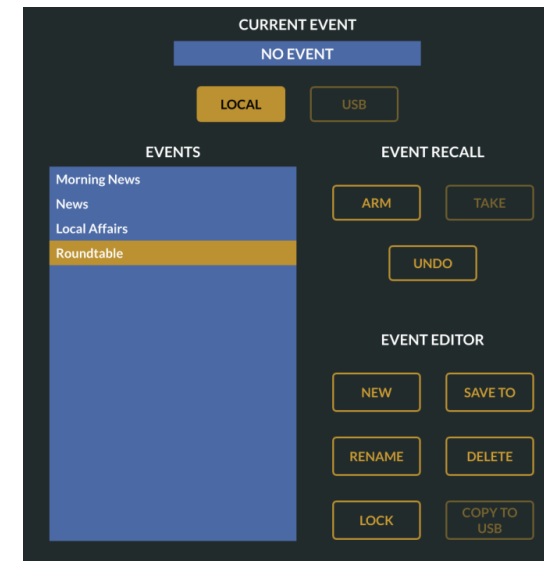


Figure 4-11 Events View

The **Event Editor Section** has controls to edit an existing Event and to create a new Event. Tap on an Event name in the Event list to highlight/select it. Tap **RENAME** to edit that Event's name; tap **DELETE** to remove that Event from the list (after tapping Ok in the Are you sure? pop-up); tap **COPY TO USB** to copy that Event to a USB flash drive, with an Events folder, plugged into the Master panel; to update the Event with the current console settings, tap **SAVE TO**.

To create a new Event, set up the console for that Event then tap **NEW**. This opens an on-screen keyboard to name the new Event. Tap OK to add it to the Events list.

Events can also be locked out from being changed by tapping its name to highlight/select it then overpress **LOCK** (tap and hold for about four

seconds until the button lights). A lock symbol appears after the name. Board operators cannot unlock an Event unless they have access to the Strata Surface Setup GUI. The Events tab must be used to select a locked Event and unlock it.

### Bus Assign View

This view (Figure 4-12) allows one to assign input channels to Submix Groups, Mix Minus buses, VCA Groups, and to the Master 1 and 2 outputs. When Submix is tapped, and a Submix Group (1 – 8) is tapped (the Submix Group SEL button then lights), that Submix Group can then be assigned to any combination of the Mix Minus buses and the two Master outputs. Figure 4-12 shows that input channel 32 is active and it has been set to feed Mix Minus bus 5 and to go to Master 1 and Master 2.

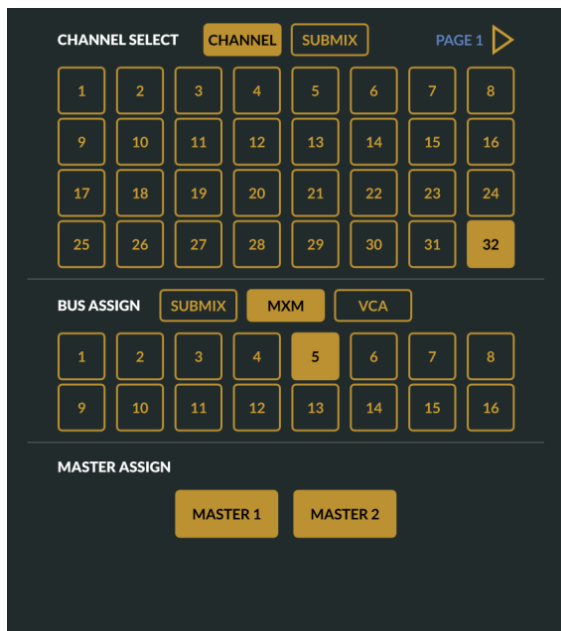


Figure 4-12 Bus Assign View

### Aux Masters View

This view (Figure 4-13) has the controls for the sixteen master Auxiliary buses, which are Mix Engine sources: **AUX 01–AUX 16**. Each Auxiliary bus has a numbered rotary control to control its level. It's also how one selects a specific Aux bus to control. Tap on a numbered rotary control (in Figure 4-13 Aux Bus 10 is selected). A blue ring appears around that control to indicate it's the selected bus. The bus name is also shown below the fader control. The sixteen stereo meters shown in the bottom half of this view are Meters #5 on the Home View (Figure 4-9).

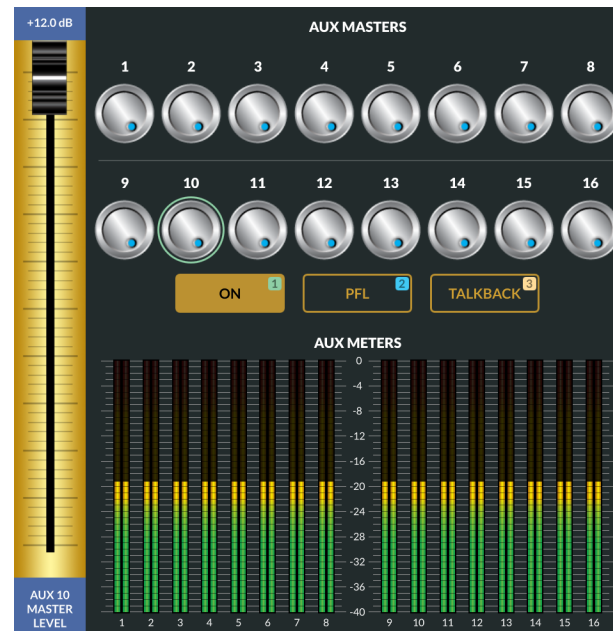


Figure 4-13 Aux Masters View

The **ON**, **PFL**, and **TALKBACK** button status, for the selected Aux bus, is then shown. Note the colored numbers on these buttons which indicate that the “hardware controls” are active, thus Button 1 (with a green LED) would be lit since Aux 10 is on. Pressing button 2 would turn on PFL (and its button would be lit blue). Pressing button 3 (it would light yellow) would cut off the Aux 10 output audio, inserting talkback into the Aux 10 output. Note that all three buttons are latching controls. The left-most hardware encoder (green button cap) can also be used to adjust the bus fader level (which also adjusts the rotary level control) in .2 dB steps with each “click” of the stepped encoder.

### MXM Masters View

This View (Figure 4-14 on the next page) has the controls for the sixteen mono **Mix Minus Master outputs**, which are Mix Engine sources **MxM 01 – MxM 16**. The **METERS** button determines what's shown in the bottom half of the View. When lit, the sixteen Mix Minus meters (same as Meters #8 in the Home View in Figure 4-9) are shown, as shown in Figure 4-14, left. When the METERS button is unlit, the Confidence Feeds controls are shown (Figure 4-14, right).

As in other views with rotary controls, a bus is selected by tapping one of the sixteen rotary controls. In Figure 4-14, left, bus 3 is selected. In Figure 4-14, right, bus 5 is selected. A blue ring appears around the control to indicate it's the selected bus. The bus name is also shown below the fader control. The **ON**, **PFL**, and **TALKBACK** button status for that Aux



bus is then shown along with the colored numbers allowing those buttons to be set using the “hardware controls.” The left-most hardware encoder (green button cap) can be used to adjust the bus fader level (which also adjusts the rotary level control) in .2 dB steps for each “click” of the stepped encoder.



Figure 4-14 MXM Masters View

### MXM Confidence Feed

Confidence audio is a known audio source, such as the station’s master control program audio (the signal PREDELAY is shown in Figure 4-14), to be automatically routed to all Mix Minus destinations whenever the audio control room is not On-Air. This allows remote truck engineers and talent to confirm audio connectivity with the station’s audio feed (the mix-minus signal) and to monitor commercial breaks without the need for audio operator intervention.

The Confidence audio signal gets routed to all 16 MXM outputs when the console is not feeding master control. When Master Control takes the console audio, the confidence audio feed is switched off and the normal Mix Minus audio is again connected to the mix minus destinations.

### Confidence All Button

**CONF ALL** – When lit, changes the audio source feeding all sixteen mix minus destinations to the Confidence audio feed. When unlit the normal mix minus audio is fed to each mix minus destination. Control over this switching is typically remotely controlled by a contact closure from the Master Control switcher. The bank of sixteen buttons allows for individual override of the confidence feed audio to any MXM output. This is useful when recording an offline interview, etc.

### X/Y Router View

This View allows any source to be connected any destination. And that Destination can then be locked, as required. These are functions which can also easily be done using the Navigator app, but if that is not available in the control room then this View can be used in lieu of Navigator. Signals are ordered by **SIGNAL ID** or by **NAME** by tapping the appropriate button. Typically NAME is selected so the signals appear in alphanumeric order. Tap **TAKE** to connect the select Source to the selected Destination (or Destinations since multiple destinations can be selected). Tap **DEST LOCK** to lock the selected destination to prevent it from being easily changed (a Navigator user can override the red Lock indication which this feature adds to the destination).

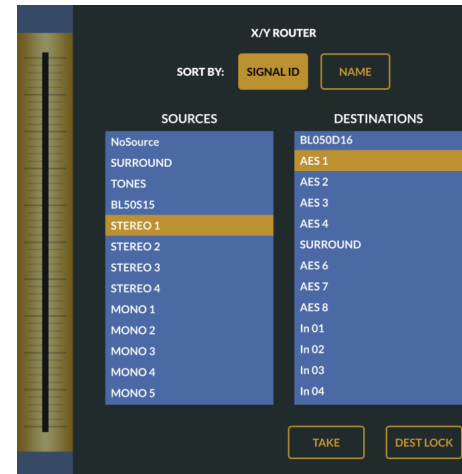


Figure 4-15 X/Y Router View

### Reverse Route View

This View (Figure 4-16 on the next page) allows one to assign multiple sources to specific buses rather than having to select each source and assign it individually to the same bus. Select a bus in the **ALL MIXES list** by tapping on a name to highlight/select it. The inputs which are currently assigned to that bus appear in the **DIRECT CONTRIBUTORS list**. Signals which are not feeding the selected bus are listed in the **NOT CONTRIBUTING list**.

The four buttons along the bottom of the View allow one to **REMOVE** a selected signal from the DIRECT CONTRIBUTORS list. Tapping **REMOVE ALL** removes every signal from the DIRECT CONTRIBUTORS list. Select one or more signals in the NOT CONTRIBUTING list then tap **Add** to add the selected signals to the DIRECT CONTRIBUTORS list. Tap **ADD ALL** to add all of the signals in the NOT CONTRIBUTING list to the DIRECT CONTRIBUTORS list.

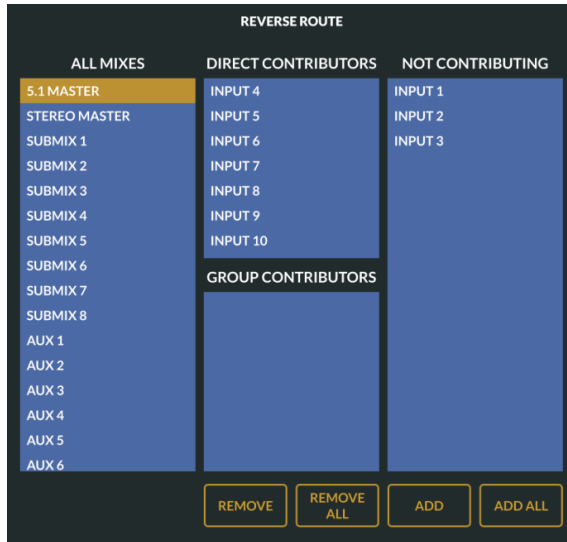


Figure 4-16 Reverse Route View

### Aux View

This View becomes active when any input channel has a lit SEL button. Figure 4-17 shows that Input channel 1 is active (its name is below the on-screen fader). The controls are then used to setup how that channel feeds the sixteen Auxiliary Send buses. Tap on a rotary control to select the Aux Send bus. In Figure 4-17 Aux 1 is selected. The blue ring around the control plus the box around the four controls, and the signal name below the fader, all indicate which Aux Send bus is active.



Figure 4-17 Aux View

The colored numbers next to the **ON**, **PRE FDR**, and **PRE ON** buttons indicate those buttons can be set using the three “hardware buttons.” The left-most “hardware encoder” (green button cap) can be used to control the fader level (which also adjusts the rotary control) in .2 dB steps for each “click” of the stepped encoder. When the PRE FDR button is lit, that Aux Send bus signal is at a fixed level (it’s not affected by the channel fader). When PRE ON is lit the Aux Send bus is being fed regardless of whether the channel is on or off. Note that the fader level would still affect that Aux Send level if PRE FDR was unlit.

### 5.1 Pan View

This View button becomes active when a SEL button is active on any input channel. It can then be selected so show how that channel’s signal is currently panned when feeding a 5.1 Surround output like Master 1. Figure 4-18 shows the various controls in this View.

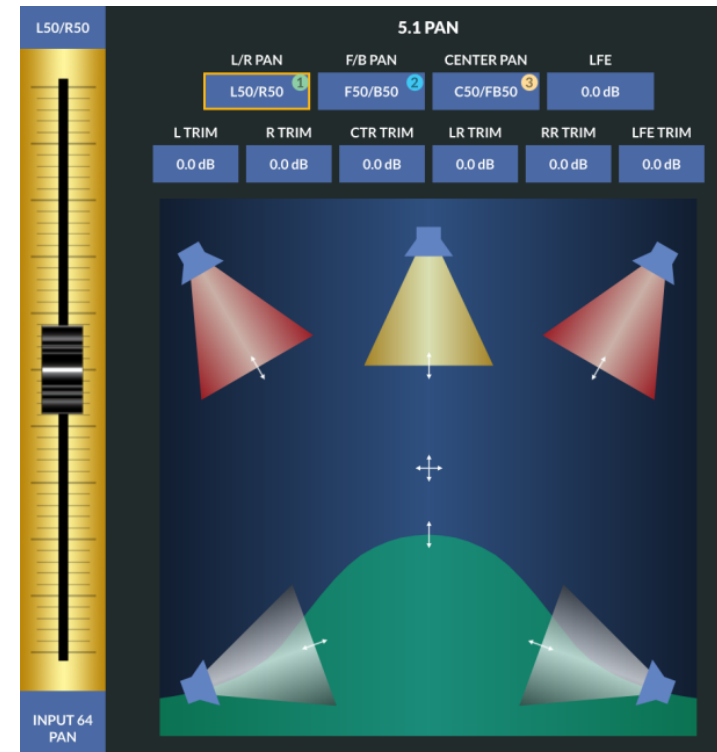


Figure 4-18 5.1 Pan View

The five speakers are pretty self-explanatory: the yellow speaker audio icon represents the center channel level; the two red speaker audio icons represent the left and right front channel audio levels; and the two gray speaker audio icons are the levels of the left and right rear channels. The

green “bulge” icon represents the level of the LFE (Low Frequency Effects) signal.

The audio signal can be balanced using several methods: drag the crosshairs, or one of the arrows, to manually adjust the signal balance on-screen; tap one of the ten buttons at the top (its box highlights in yellow) then use the on-screen fader to adjust the pan or trim setting; or use the three “hardware” encoders to adjust three controls at a time. In Figure 4-18, L/R PAN is selected thus the three controls adjust left/right pan (green, left encoder), adjust the front/back pan (blue, middle encoder), and adjust the center pan (yellow, right encoder). If L TRIM was selected then the three encoders would control L TRIM, R TRIM, and CTR TRIM.

### Dynamics (DYN) View

This View button becomes active when an input channel, Submix Group channel, or Master channel SEL button is active. It’s used to view and adjust the Gate and Compressor functions available for the selected input or bus. The **GATE IN** and **COMP IN** buttons, when lit, turn on each function. When the button is unlit, that function is off.



**Note:** If you plan on making any equalization (EQ) adjustments to the signal, we recommend adjusting it prior to adding compression or gating since adjusting the EQ can change how previously set compression and gate settings sound, requiring them to then be readjusted.

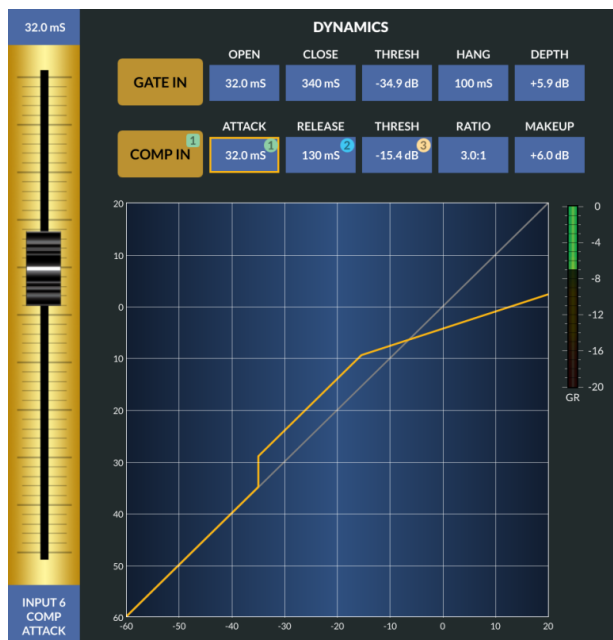


Figure 4-19 Dynamics DYN View

### Gate Functions

The five Gate controls set how an automatic attenuator, controlled by the **DEPTH** setting either ducks or gates the audio signal once its level falls below a threshold point, set by the **THRESH** setting. The Gate settings can be used to automatically control inactive mics on a talk show set and used to decrease the background noise on remotes by ducking the audio when the remote talent stops talking and their mic level passes the THRESH setting.

How fast this ducking or gating occurs and how fast it’s released as the audio level hits the threshold setting, which also affects how audible this feature is, are controlled by the **OPEN** (1.00 mS up to 100 mS), **CLOSE** (50 ms up to 3.00 S), and **HANG** (0.00 mS up to 1.00 S) settings.

The DEPTH control sets whether the Gate is ducking or gating the audio as the signal level hits the threshold setting. At 0.0 dB no ducking of the audio occurs which mean the Gate is effectively turned off. Using settings of +10 to +25 dB causes noticeable signal level ducking. Using the highest settings, +25 to +40 dB, creates an audio gate which virtually mutes the audio as its level drops below the threshold setting. The GR (Gain Reduction) Meter shows the amount of gain reduction being applied to the signal. In Figure 4-19 it shows that the Gate has been triggered and the gain is being reduced by 5.9 dB.

A graphic of how the Gate settings affect the audio appear in the lower half of the orange line which is shown diagonally across the Dynamics display when either Gate or Compression is active. The grid shows the relationship input signal level and output signal level. It’s a 45° line when Gate In is active and the Depth setting is 0.0 dB and Compression is either turned off or its Ratio is set to 1.0:1. As the DEPTH is increased the lower half of the line will drop down at the THRESH setting by the amount of the DEPTH. In Figure 4-19, THRESH is set at -34.9 dB and the DEPTH is set for 5.9 dB

### Compressor Functions

The five Compressor controls affect the loudness of the audio signal, from adding “just a bit” of compression on mics or a remote to even out their audio, to applying hard limiting in order to obtain the maximum volume possible from a mic or other signal. The compressor is called a “soft knee” compressor which means its operation is less noticeable at most settings. Of course, setting the controls to their extremes in order to get a “loud and in your face” volume, right on the edge of audio distortion, will make compression control artifacts much more apparent.

To begin adjusting the compressor, set the RATIO to 1.0:1 (for no compression) and set the MAKEUP level to 0.0 dB. The Threshold (THRESH) point, which is the level where the compressor begins to affect the audio, can be set from -40 dB up to 10 dB, but a good level to start with is 0 dB.

As the audio gets louder than the THRESH setting the compressor begins to clamp down on the audio output level according to the RATIO setting, which ranges from 1.0:1 (no compression) up to 20:1 (it effectively functions as a signal limiter). For light to medium compression, set the RATIO in the 2.0:1 to 6.0:1 range. For these ratios, when the incoming signal level rises 10 dB above the threshold the compressor's output will only increase by 5 dB with a 2.0:1 ratio, or just 1.7 dB with a 6.0:1 ratio. This is shown by the angled section in the upper half of the orange line.

Setting RATIO to a very high setting, like 20:1, sets the compressor to function as a hard limiter which makes the orange line almost horizontal. At 20:1 compression means a 10 dB increase on the input will only allow the output to increase by .5 dB. Typically, when using higher RATIO settings you'll want to use a higher THRESH setting since the compressor—now functioning as a limiter, should only kick in on the loudest input signals to stop them from over-driving the buses that signal is feeding to prevent audio distortion.

The ATTACK control sets how fast the compressor reacts (from 0.10 mS up to 330 mS once the audio crosses the THRESH level. The RELEASE control sets how fast the compressor reacts after the audio drops below the THRESH level. It can be set from 50 mS up to 3.00 seconds. The MAKEUP level can be used to adjust the Dynamics output in order to compensate for high levels of compression which lower the overall level.

As with other Views the colored numbers indicate which settings can be adjusted using the "hardware" controls. If only GATE IN is active the OPEN, CLOSE, and THRESH settings are mapped to the three encoders. Button 1 then controls the Gate on/off. When COMP IN is active, the "hardware" controls shift to control the settings shown in Figure 4-19 on the last page.

The Compression and Gate settings on each channel and bus are stored as part of an Event.

### Equalization (EQ) View

This View button becomes active when an input channel, Submix Group channel, or Master channel SEL button is active. The View allows the equalization for the selected channel or bus to be adjusted and turned on and off. The Strata EQ consists of a four-band parametric equalizer with adjustable high and low pass filters. Two of the parametric EQs can also be set as **LO SHELF** and **HI SHELF** equalizers.



**Note:** Before adjusting the equalization we recommend turning off compression and gating since their actions will interact with your adjustments. Once the EQ settings are optimized switch to the DYN View and turn on compression and/or gating and adjust their settings as required.

The EQ View (Figure 4-20) has two sections: the top half has the equalizer control buttons while the bottom has a large audio graph

showing the effect of the various EQ controls on the audio as they are adjusted. The audio graph shows the frequency response logarithmically from 20 Hz (left side) to 20 kHz (right side) with the display's center being roughly 600 Hz. The middle horizontal line represents 0 dB of gain and each horizontal line above or below it represents a 5 dB change in level. All four parametric EQs can be returned to 0.0 dB level by tapping the **FLAT** button.



Figure 4-20 EQ View

The parametric equalizers and bandpass filters are color-coded to help identify each filter's settings in the audio graphic since the center frequency for all four parametric equalizers can be set anywhere from 20 Hz to 20 kHz. The High Pass Filter (HPF), when on, is shown in orange; the **LO** EQ settings are shown in red; the **LO/MID** EQ settings in yellow; the **HI/MID** EQ settings in blue; and the Low Pass Filter (LPF), when on, and the **HI** EQ settings are in magenta.

When the three EQ in/out buttons are: **EQ OUT**, **HPF OUT**, and **LPF OUT**, the EQ is not in-line and the settings have no effect on the audio. The HPF and LPF settings are not shown in the audio graphic and the parametric EQ settings colors are translucent. The EQ icon on that channel's OLED is gray (or not even seen with lower OLED levels).

Tapping the EQ OUT button fills that button and it shows **EQ IN**, indicating the EQ is now in-line. The graphic colors for the EQ settings remain translucent but over top of those graphics there's an opaque graphic showing the overall effect of the various EQ settings on the

channel's frequency response. Tapping HPF OUT or LPF OUT (they then show **HPF IN** and/or **LPF IN**) adds the high pass and/or low pass filters to the audio graphic, which are also shown opaque to show their effect on the audio. The EQ icon on that channel's OLED is red when any in/out button shows EQ IN, HPF IN, or LPF IN.

### High Pass & Low Pass Filters

The High Pass Filter (HPF) and Low Pass Filter (LPF) can be independently turned on or off to narrow the overall frequency range of the channel's audio to less than 20 Hz – 20 kHz. The frequency pass band is shown graphically as the controls are adjusted: the orange graphic represents the HPF or low frequency roll off while the magenta graphic represents the LPF or high frequency roll off.

Tapping either HPF or LPF frequency button sets the fader to control that filter's frequency. This also sets up the hardware controls so that green encoder and button 1 controls the HP filter and blue encoder and button 2 controls the LP filter.

Adjusting the high pass frequency sets where the lower frequency sounds begin to be rolled off or attenuated. The control range is from 16 Hz up to 500 Hz. Audio below the selected frequency gets rolled off at 24 dB/octave. Audio above that frequency is not affected. The HPF is commonly used to remove low frequency rumble and sounds emitted by air conditioners, AC line hum, nearby traffic, footsteps, etc.

Adjusting the **LPF FREQ** sets where the higher frequency or brighter sounds begin to be attenuated. The control range is from 20 kHz down to 1 kHz. This control can selectively remove higher frequency sounds like the hiss from an air conditioner, chair squeaks, and other high frequency noise without affecting the voice sound—until the control is adjusted below about 5 kHz. Audio above the selected frequency is rolled off at 24 dB/octave while audio below that frequency is not affected.

### Four-Band Parametric Equalization (EQ)

Tapping a parametric EQ button selects that column of controls. The on-screen fader can then be used to adjust that setting. As in other Views with level adjustments, the touchscreen panel "hardware controls" are available to adjust the settings with overlaid numbers which change depending upon which parametric EQ is selected. The numbers indicate which encoder (1=green, 2=blue, 3=yellow) to use to adjust that setting. A number may also appear on an associated button to indicate which hardware button turns that setting on/off (the numbered button LED also indicates the on-screen button setting).

The four parametric EQs (LO, LO/MID, HI/MID, and HI) are identical in operation. Each has a **FREQ** (frequency) control to adjust the center-point of that parametric EQ; a **BW** (bandwidth) control to adjust the width of that EQ; and a **LEVEL** control to set the amount of boost or cut applied by that equalizer. Once the level control is used to raise or lower an equalizer

so it appears in the audio graphic you can make further adjustments using the touchscreen. Use two fingers on the audio graphic to adjust the BW wider or narrower. Tap and drag up to raise the LEVEL or tap and drag down to lower the level. Tap and drag left or right to adjust the center frequency.

Each parametric EQ's center frequency is adjustable from 16 Hz up to 20 kHz. The bandwidth that each EQ affects is adjustable from 0.2 octaves up to 3.00 octaves wide. Each equalizer can boost or cut the selected frequency band up to +14 dB or -14 dB from nominal (0.0 dB).

### EQ Lo Shelf & EQ Hi Shelf

When the LO SHELF or HI SHELF button is lit, the bandwidth (BW) entry for the LO or HI parametric EQ shows – indicating that EQ is now a shelving EQ. The LO SHELF allows one to boost or cut all of the low frequencies by the same amount, beginning at the frequency set by the FREQ control. The amount of boost or cut is set by the LEVEL control. HI SHELF allows one to boost or cut all high frequencies above the frequency set by the FREQ control. The amount of boost or cut is set by its LEVEL control.

The LEVEL control can boost or cut the shelf by +14 dB or -14 dB. The FREQ control sets where the shelf ends or begins: the LO SHELF FREQ control adjusts where the low shelf ends, from 16.1 Hz up to 198 Hz; the HI SHELF FREQ control adjusts where the high shelf starts, which can be from 4 kHz up to 20.2 kHz.

The EQ settings on each channel and bus are stored as part of an Event.

### Input View

This View is activated by pressing SEL on one of the input channels. This allows most of the channel settings to be changed as required. The View has four main sections as shown in Figure 4-21 on the next page.

#### Input View – Section 1

This section shows the signal format and channel number at the top. It has a larger version of the input meter shown on the channel OLED plus a Gain Reduction (GR) meter. The output format (or spilled) is shown below the meter. The Delay and input Gain settings are shown below the meter along with indicators listing which Master that signal is assigned to. If any EQ or Dynamics are assigned the min-graphs show those settings. Clicking the AUX SENDS button brings up the Aux Send View so the channel can be assigned or unassigned from these buses.

#### Input View – Section 2

This section shows the selected source name at the top. The LEFT or RIGHT buttons, when lit, invert the channel phase. The PHANTOM button applies phantom power to the signal input. A 48V icon is then shown in the

channel display and the PPwr option for that input would be checked in Navigator.

The signal Mode is set by tapping one of the five buttons on a stereo source or six buttons on a 5.1 source. The source's input gain can be set using the GAIN fader. The channel can have a delay assigned to it by turning the Delay on (Tap the OFF button to change it to ON) and adjust the DELAY fader for the amount of delay required. A mono signal can be panned; a stereo signal can be balanced; or to signals can be blended into a mono signal by using the PAN/BLEND control.



Figure 4-21 Input View

### Input View – Section 3

This section controls the Bus Minus/Direct Out signal for that input channel. The default name, shown at the top of this section, is BUS MINUS and the input channel number. When the DIR OUT button is tapped, lighting the button, the "Bus Minus X" audio changes to be a Direct Out signal. When DIR OUT is unlit the audio is the base mix minus that input channel's audio.

Just below the name, the destination that the bus minus (or direct out) is feeding is shown along with which base mix is feeding that bus minus. Tapping on either blue box brings up a signal select list so a new destination can be connected or a different base mix can be selected.

The Fader adjusts the level of the bus minus or direct out signal. The meter shows the level of the base mix or the direct out signal. The bus minus or direct out can be set to be sent PRE FADER or PRE ON by lighting

those two buttons (tap them to turn that feature on or off). The signal can also be monitored after fader control by tapping the AFL button. The board operator can talk to that bus minus output by tapping TALKBACK, which is a latching function which turns off the base mix and switches in talkback while it is lit.

Below this section is the Wild Button 1 setting. Tap on the blue display box to bring up a list of the functions that can be set for that button. In figure 4-21 the function is set for PROC IN which allows that button to turn both the Gate and Compressor on.

### Input View – Section 4

This section controls the Track output which is available on the first 32 input channels only. Each channel feeds their own Track output which has the same number as the input channel. On channels 33–64 the Track section is not active. The Track feed is turned on by tapping the OFF button, which says ON when on. Tapping it will then turn off the Track audio.

The Fader adjusts the level of the Track signal, which is similar to the Direct Out signal in that it contains only the input signal on that channel, but Track is a stereo signal, as shown by its stereo metering along the right side. The meter shows the level after the Track fader.

Like the bus minus, the Track signal can also be sent PRE FADER and/or PRE ON by lighting up either of those two buttons (tap them to turn that feature on or off). The Track signal can also be mono-summed by lighting the MONO SUM button. It can also be monitored post track fader control by tapping the AFL button. The board operator can also talk to the Track output by tapping TALKBACK, which is a latching function which turns off the track audio and switches in talkback while lit. Talkback can be used to slate takes when prerecording shows or segments.

Below this section is the Wild Button 2 setting. Tap on the blue name box to bring up a list of the functions that can be set for that button. In figure 4-21 the Wild 2 button is set to ISOLATE. When that button is lit it puts that channel into isolation, lighting a red ISO icon in the channel OLED. Isolation prevents that channel from being toggled when the other Layer is active.

### Automix View

This View is used to set up the weighting for the input channels which have their blue AUTOMIX buttons lit up. Up to four separate Automix Groups can be assigned using the 1-4 buttons and up to sixteen channels can be assigned to the Auto mix at any one time. The input channels numbers are shown above each control and their signal name is shown below each control.

Automix is typically used with a group of similar signals, like microphones on a news set or a talk show, or various sound effects and

audio playback decks which may have to be mixed together. Any group of signals, which need to maintain a fairly constant output, regardless of how many signals are active at one time, can be assigned to an Automix Group. Each signal is then given a weighting using the fader control which sets the importance of each signal. For example in Figure 4-22 on the next page, Automix Group 1 had five mics assigned to it. Input 1 is set with the most weighting while inputs 2 and 5 have the lowest weighting, and inputs 3 and 4 have just slightly more weighting. In Automix Group 2, Input 9 has much more weighting than Inputs 10, 11, 12, and 56, which all have the same weighting which is much lower than Input 9. We can surmise from this that Input 9 is a host mic and the others are guest mics.



Figure 4-22 Automix View

The Automix Group outputs normally feed the Main Master 1 output but can be set up to feed other buses by tapping Bus Assign and selecting a bus.

### Clip Player View

This View brings up the controls for the Strata audio clip player, used to play back audio tracks on a USB flash drive plugged into either USB port at the top of the Monitor Panel. The audio files must be 48 kHz .WAV files. If the USB flash drive has one or more Playlist files, saved in .m3u format then those will automatically be read into the Strata. The Clip Player is a Mix Engine source named **ClipPlay**, which can be made visible on any input channel using the Strata Surface Setup GUI.

When the Clip Player View is opened, as shown in Figure 4-23, you'll see the list of PLAYLISTS that were detected on the USB flash drive. Tap on a Playlist name to see the tracks associated with that Playlist in the TRACKS list. Tap on a Track name to select it and show its name in the upper blue box. When the track is cued, press PLAY to play the track. Press PAUSE to stop playback with the track at the paused position then press PLAY to resume playing that track. Press STOP to cancel play and recue the track.

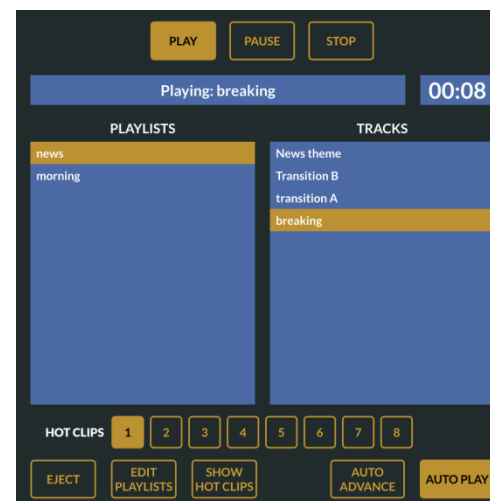


Figure 4-23 Clip Player View

Just below the Playlist and Tracks lists are eight HOT CLIP buttons which can play a clip by tapping one of the buttons (or assigning Wild buttons to be Hot Clip Play buttons). Tap the SHOW HOT CLIPS button to change the middle of the View to show the Hot Clips selector (Figure 4-24).

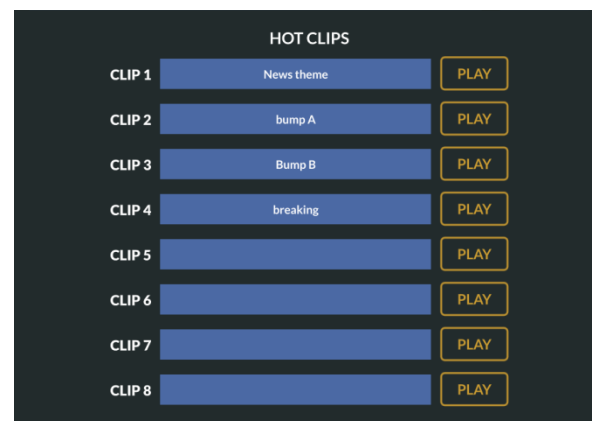


Figure 4-24 Hot Clips selector

Tap the blue box on any of the eight Clips to bring up a list of audio tracks on the USB flash drive so you can select a track to assign to that Hot Clip number. The Touchscreen Panel's three Wild buttons can also be assigned to play back one of the Hot Clips.

To play a cued track, when the Input channel is turned on, tap the AUTO PLAY button to light it. Cue up a track and then press the on switch or, if EFS is active, move the fader up from full off to start the track.

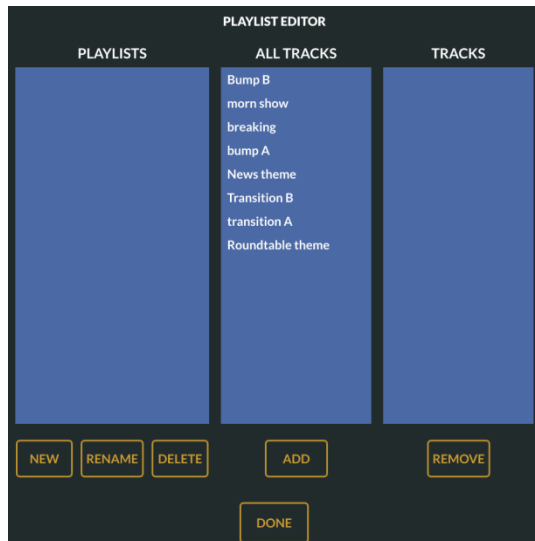


Figure 4-25 Playlist Editor view

All clip player settings are saved as part of an Event. The currently selected Track will load with the selected Event (recall 5PM news event, the "open" music track is already loaded.) The Clip Player may also be controlled over an Ethernet network via Wheatstone's ACI (Automation Control Interface). All functions are supported.

#### Sample Playlist File

Clip Player playlist files are text files saved with a .m3u extension. Comments can be added by starting a line with #. Start each new line with the path to the track followed by the track's filename. Here's an example of a file named: AM-Weekday News.m3u:

```
# AM Weekday playlist (user comment).
am_weekday/AM-Weekday Open.wav
am_weekday/AM-Weekday Bump-1.wav
am_weekday/AM-Weekday Weather-1
am_weekday/AM-Weekday Bump-2.wav
am_weekday/AM-Weekday Bump-3.wav
```

```
am_weekday/AM-Weekday Sports-1.wav
am_weekday/AM-Weekday Weather-2
am_weekday/AM-Weekday Outro.wav
```

In the example playlist, the playlist is pointing to a folder named "am\_weekday" and inside that folder are the various 48 kHz wave files named "AM-Weekday Open.wav", "AM-Weekday Bump-1.wav", and so on.

### BS.1770-3 Loudness Monitor

The implementation of the CALM Act in December 2012 has focused the attention of broadcasters in the USA on taming the audio levels at various stages of the on-air signal chain.

The Loudness Monitor provides a flexible tool for audio operators to use to track the apparent loudness of the program material being mixed on the console and delivered for recording or broadcast. Logging functions allow the engineering staff to verify and document audio levels leaving the control surface over specific periods of time.

#### The Multi-channel Loudness Algorithm

The Loudness Monitor uses the multi-channel loudness measurement algorithm specified in the ITU recommendation document ITU-R BS.1770-3 (03/2011). The algorithm calculates weighted measurement values for subjective loudness perceived over time. Extensive testing has shown a strong correlation between subjective listening and objective measurements.

The four stage processing chain applies a K weighting filter which accounts for "acoustic effects of the head" followed by a mean square calculation for each channel. The results are summed with surround channels weighted slightly higher to compensate for psychoacoustic effects. The LFE subwoofer channel is not currently included in the measurement and is a focus of continuing work. A final gating stage prevents silence and momentary low levels from adversely affecting the results.

#### Units and References

The following units and references are used in scale markings and meter configuration. Note that the ITU specified LKFS units and the EBU specified LUFS units are synonymous and the values are numerically identical.

- ✓ dBFS – Decibels Full Scale is the maximum digital signal output level of 0 dBFS which is equal to a +24 dBu analog output
- ✓ LKFS – Loudness, K weighted, Full Scale
- ✓ LUFS – Loudness Units, Full Scale, also K weighted
- ✓ 0 dBFS = 0 LKFS = 0 LUFS, -24 dBFS = -24 LKFS = -24 LUFS
- ✓ AT/85 Reference level: -24 LKFS



- ✓ EBU Reference level: -23 LKFS

**Loudness Range Reference Level:**

- ❖ AT/85 mode: -24 LKFS = 0 LU
- ❖ EBU Mode: -23 LUFS = 0 LU
- ❖ USER Mode: Custom, can be set to the station’s “dialnorm” metadata value in dB.

**Reference Documents**

- ❖ ITU-R BS.1770-3 Algorithms to measure audio program loudness and true peak audio level
- ❖ AT/85:2011 ATSC Recommended Practice: Techniques for Establishing and -Maintaining Audio Loudness for Digital Television.
- ❖ EBU-TECH 3341 Loudness Metering: EBU Mode metering to supplement loudness normalization in accordance with EBU R128.

**Meter Components**

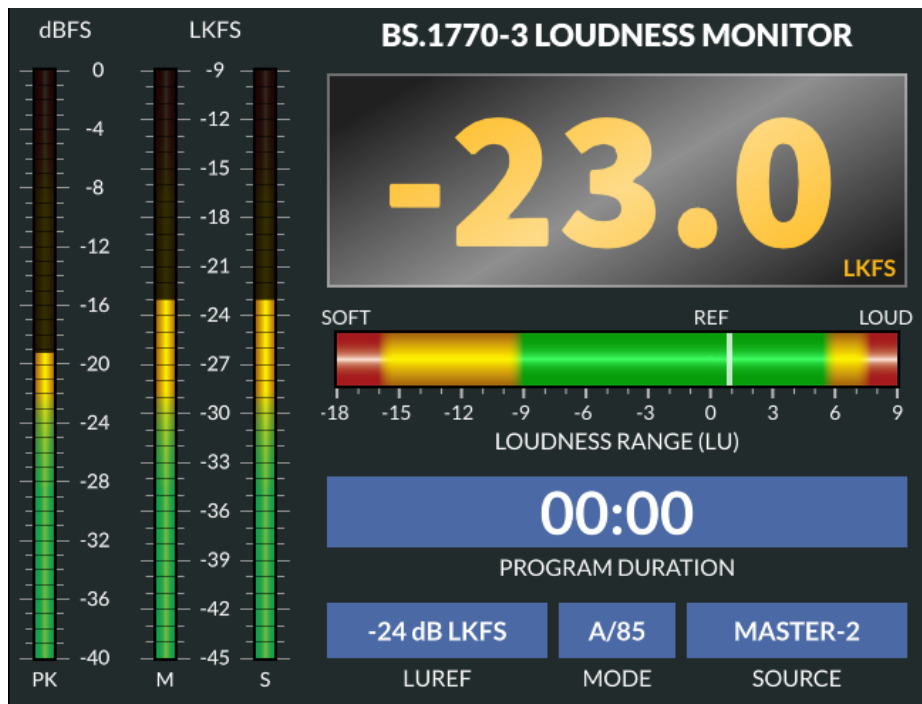


Figure 4-26 Loudness Monitor

**Audio Source**

The audio source feeding the Loudness Monitor is user selectable. You may route any mono, stereo, or 5.1 surround source available to the Strata Destination *Loudness*. This flexibility allows for monitoring of any analog, AES, MADI, or SDI source, as well as any Surface mix bus, demodulated program source, pre-recorded programming, or other source.

**Vertical Bar Graphs**

- PK (Peak Program) – Sampled peak meter displays highest peak from any meter channel
- M (Momentary Loudness) – K weighted loudness measured in a 400 ms sliding window
- S (Short Term Loudness) – K weighted loudness measured in a 3 second sliding window

**Integrated Loudness**

The large format three digit readout displays the integrated K weighted loudness of the program material. The default integration time is 10 seconds. The units are displayed as LKFS in AT/85 mode and LUFS in EBU mode.

**Gating**

The DSP algorithm for measuring loudness incorporates a two-stage gating mechanism which pauses integration during silent or momentarily soft passages in program material. The absolute and relative thresholds are applied in accordance with the BS.1770-3 specification to eliminate skewing of the measured result from program material lower than an absolute value of -70 LKFS or a relative value of -10 LU as measured in a sliding window.

**Loudness Range**

The loudness range bar provides a way for an operator to see where the program has been and alerts the user to loudness levels that are too soft or loud. The range bar follows the long term integrated loudness value displayed in the main three digit display. The loudness range provides a +9 to -18 LU window with the “zero” centered on the currently selected 0 LU reference. Loudness “history,” the measured loudness level over time, is displayed as a solid white bar in the center. History tracking begins when the timer starts and is cleared when the timer is reset.

**Program Duration Timer**

The program duration timer is provided to co-ordinate the capture, display, and logging of program loudness for a specific period of time – such as a live newscast or pre-recorded program.

## **Operation**

Operators must understand that the large digit value is integrated over time and does not instantaneously react to fader moves. Operators should use the M (Momentary) bar graph meter for in-hand level adjustments as riding fader levels from the Integrated digits will result in over or under compensation in output level as they "chase" the target value. When drawing a comparison to the primary mix bus VU meters, a good rule of thumb is to target a -4 dB average level on the main mix meters (-24 dBFS).

## **Logic Control**

The Program Duration timer may be controlled from an external contact closure. For convenience, the timer has been designed to work off the existing contact closure for the Confidence Feed input. This allows the integrated loudness level to be automatically gated whenever master control goes to a break and resume when you return to live programming.

## **Using External Control**

To enable control make sure the REM TRIG switch is lit in the Confidence Feed section of the surface. Make sure the timer is reset BEFORE the show begins and the timer will automatically begin measurement and logging when master control takes the control room to air.

## 5 - STRATA SERVICE INFORMATION

All Wheatstone consoles are designed to yield many years of continuous trouble-free 24/7 operation, which is why there are no power switches on the Strata Surface, the Gibraltar IP Mix Engine, the Stagebox I/O Interface, or any Wheatstone Blade. However, if a Strata system component does “act up” this chapter covers how to obtain service assistance, technical documentation, and replacement parts.

### PARTS AND REPAIR SERVICES

There are only a handful of field-replaceable parts on the Strata console, each of which is listed in Table 5-1. The control panel assemblies and other circuit boards used on the Strata Surface and IP Mix Engine are not field-serviceable due to their extensive use of surface-mount components. It is recommended these items be returned to the Wheatstone factory for any board level repair.

Strata technical information (User Manual, Quick Start Guide, software revision information, wiring diagrams, application notes, and service bulletins) can typically be downloaded from Wheatstone’s web site: [www.wheatstone.com](http://www.wheatstone.com). Most documentation is in PDF file format so Acrobat Reader 6.0 or later is required to view and print documents.

### Parts Ordering and Repair Services

Replacement parts and Strata accessories can be purchased through any Wheatstone dealer or directly through the Wheatstone factory located in New Bern, North Carolina, USA. Call 252-638-7000 (Eastern timezone) or email: [sales@wheatstone.com](mailto:sales@wheatstone.com).

To expedite part ordering, and to ensure the correct parts are ordered, use the Wheatstone part number when ordering. Some parts and assemblies may have long lead times, so order spares accordingly.

Any component or part being returned to Wheatstone for service, exchange, or credit must have an RA (Return Authorization) tracking number issued prior to their return. Items received without an RA number written on the shipping label side of the packaging may be delayed and subject to additional handling fees. Contact Wheatstone Technical Support to request an RA number or to obtain installation and other technical support for the Strata console by calling 252-638-7000 or by emailing: [techsupport@Wheatstone.com](mailto:techsupport@Wheatstone.com).

**Table 5-1 Strata Field-Replaceable Parts**

<i>Wheatstone #</i>	<i>Description</i>
007310	SPS-180R, standard Strata Surface power supply
007390	Mix Engine power supply, plug-in module
007561	DC Cable, power supply to Strata Surface
007232	PSR rack unit, holds two SPS-432 power modules
007590	SPS-432, slide-in power module (redundant supplies)
008314	Mix Engine, QAT card
008318	Mix Engine, CPU card
008349	Mix Engine, QCT card
011700	Fader Panel (plug-in assembly)
011701	Master Panel (plug-in assembly)
011702	Touchscreen Panel (plug-in assembly)
011728	OLED Display (plug-in assembly)
011730	Host controller card
520125	Rotary Encoder Knob, Black
520130	Fader Knob, Satin Silver
530278	Blue cap, for encoder knob
530280	Gray cap, for encoder knob
530283	Cream cap, for encoder knob
530284	Green cap, for encoder knob
540062	Motorized Fader Assembly (plug-in part)
560002	Rotary Encoder (soldered part)
940188	LCD touchscreen display

### STRATA CONSOLE FIELD SERVICE

The Strata console contains three primary assemblies: the Strata Surface, which has many field-replaceable parts including the three types of Control Panel assemblies, the OLED displays, faders, and rotary encoders; the Gibraltar IP Mix Engine, which has field-replaceable boards and modules; and the Surface Power Supply, which has no field-serviceable component parts. The optional Stagebox I/O Interface is also not readily field-serviceable.

### Service Tools

A #1 Phillips screwdriver is needed to remove the panel mounting screws on the Surface control panels and a 2mm hex driver is required to remove fader mounting screws.

## Swapping Out Control Panels

A Fader panel can be field-replaced while the console is powered, and even on-air, since program audio flows through the Mix Engine not the Surface. The Fader panels connect to a Surface host board using a single CAT5 cable. To replace a Fader panel remove the eight Phillips screws, using a #1 screwdriver, then lift the panel up and out of the chassis enough to unplug the CAT5 cable. On the replacement panel set DIP switch SW66 so it matches the settings of the panel you're replacing before plugging in the CAT5 cable.

SW66 is a four-position switch. Fader panel 1 has switch 1 set *on* and all other switches set *off*. Fader panel 2 has switch 2 set *on* and all other switches set *off*. Fader panel 3 has switches 1 and 2 set *on* and 3 and 4 set *off*. Fader panel 4 has switch 3 set *on* and all other switches set *off*.

When the Master or Touchscreen panel needs to be replaced we recommend powering down the Surface since each has multiple connections that must be made. To swap out the Master or the Touchscreen panel, obtain some padding material to lay over the Fader panel immediately in front of that panel being removed so it can be titled forward and laid facedown onto the padded material. To remove the Master or Touchscreen panel:

1. Unplug the AC cord from the Strata Surface power supply. If the Surface is using redundant power, unplug both supplies. All lights and displays should be off on the Strata Surface.
2. Use a #1 Phillips screw driver to remove the panel's eight mounting screws.
3. To replace the Monitor panel, use the encoder knobs along the top of the panel to tilt the panel forward so it can then be lifted up slightly to remove it from the chassis and set it facedown onto the padded material on Fader panel 3. The Monitor panel connects using two keyed ribbon cables and one CAT5 cable.

To replace the Touchscreen panel, use the three encoder knobs at the bottom to lift up and out so the panel can be lifted up slightly to remove it from the chassis and then set it facedown onto the padded material on Fader panel 2. The panel's control board has one ribbon cable connecting it to the Monitor panel while the monitor board has an HDMI cable, a USB cable, and a power cable.

4. Note how the cables plug into the panel. Unplug the cables and remove the defective panel. Set the replacement panel onto the padded material and plug in the cables.
5. Lift up the panel and set it onto the lower chassis rail. Route the cables so they will not be strained or get pinched as the panel is tilted back onto the top rail. Fasten the eight screws which were removed in step 2.

6. Plug the AC cord back into the power supply (or supplies) to power up the Strata Surface.

It takes two–three minutes for the Strata Surface to completely boot up and be ready for use.

## Mix Engine Status LEDs

The boards in the Mix Engine have green LED status indicators. If there are any red Error LEDs lit up it indicates a fault in that board's operation. Although audio may still be passing through the Mix Engine and there may be no other signs of trouble, a red error LED says otherwise.

To clear the fault, reboot the Mix Engine using Navigator (right-click on the Mix Engine icon in the System Dock and select *Reboot Blade*). If the Mix Engine reboots and the Error LEDs turn off then the issue was resolved. If the Mix Engine reboots and the red Error LEDs are still lit power cycle the Mix Engine. Since this action cuts off all audio going through the Mix Engine while it's power cycled, the Strata console cannot be on-air while this is done. To power cycle the Mix Engine unplug the AC cord (or both AC cords when the Mix Engine has a redundant power supply) and wait a minimum of five seconds to ensure power is fully removed from all internal circuits before plugging the AC cord(s) back in.

If the red Error LED remains lit after a power cycle it indicates a circuit fault in the card with the red LED or possibly in the Mix Engine's operation. A call to the factory is warranted. See the previous page for information on obtaining service help, parts, or an RA number to send in a board or the Mix Engine for service.

## Ethernet Switch LEDs

Each RJ45 Ethernet jack typically has two green LEDs. Both blink rapidly for 1 GB (Gigabit) speed devices (like the Mix Engine and Stagebox connections) while one blinking green LED indicates the connected device is operating at 100 MB speed. The Strata Host card and the Mix Engine CPU both use 100 MB NICs since they do not carry streaming audio.

## Fader Replacement

The motorized faders (WS # 540062) plug into the Fader and Master panels. The same model fader is used across the Strata so any fader can be substituted for another for troubleshooting purposes. The fader knobs are friction fit onto the faders but a small flat blade screwdriver may need to be used to pry them loose (use padded material on the metal panel to avoid marring). Use a 2mm hex driver to remove the fader mounting screws.

## SOFTWARE UPDATES

Wheatstone may periodically issue software revisions for the Strata Surface, the Mix Engine, the Stagebox, and Blades. The Strata Surface code version is shown and updated using the Strata Surface Setup app's **Hardware menu** (Figure 5-1). The Mix Engine, Stagebox, and Blade code is updated using Navigator's **Version Manager tab** (Figure 5-2).

## Updating Surface Code

To see the current version of code running on the Surface, in the *Surface Setup* app select the *Hardware* menu item > *Surface Versions...* A pop up window lists information on the current code which is running the various boards and processors in the Strata Surface.

If there's a new release of the Surface Setup app, it may contain new Surface code downloaded with the *Strata Surface Setup* app installation. Code updates may also be available as a separate downloaded file. Regardless, select *Hardware* > *Update Surface...* to open a file dialog box which opens a folder with the update code when downloaded with the Surface Setup app. If the code was downloaded separately, then navigate to that folder. The code file will be named: **strata\_app\_X\_XX.tar** with the Xs being the number of the code version.

Click *Open* to upload the new code to the Surface. This action can be done while the Surface is actively being used since the code is only loaded into the Surface's memory. A popup message advises that the Surface must be rebooted to use the new code. The Strata continues to pass audio as the Surface is rebooted but, of course, no Surface controls will be available during the two-three minutes it takes the Surface to complete rebooting and once again be ready for use.

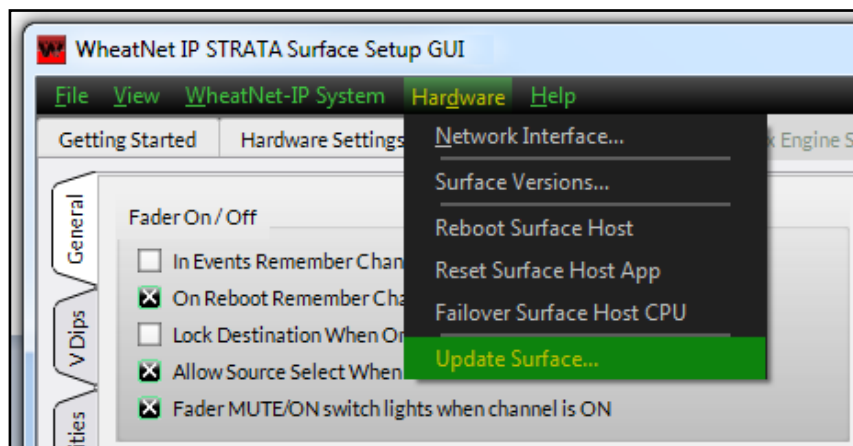


Figure 5-1 Strata Surface Code Version and Update

## Updating Mix Engine, Stagebox, & Blade Code

The code which is used on the Mix Engine, Stagebox, and Blades is typically downloaded as part of the Navigator app installation but updated code versions for Blades may also be available to download separately.

The code version running on each device can be viewed, and the code can be updated, using the **Version Manager tab** in Navigator (Figure 5-2). The *Software Version* column lists the code build which is currently running on each Blade, which includes the Mix Engine and Stagebox I/O Interfaces. Blades can be individually updated or all Blades can be updated simultaneously.

**Note:** Navigator must be licensed in order to update the Blade code.

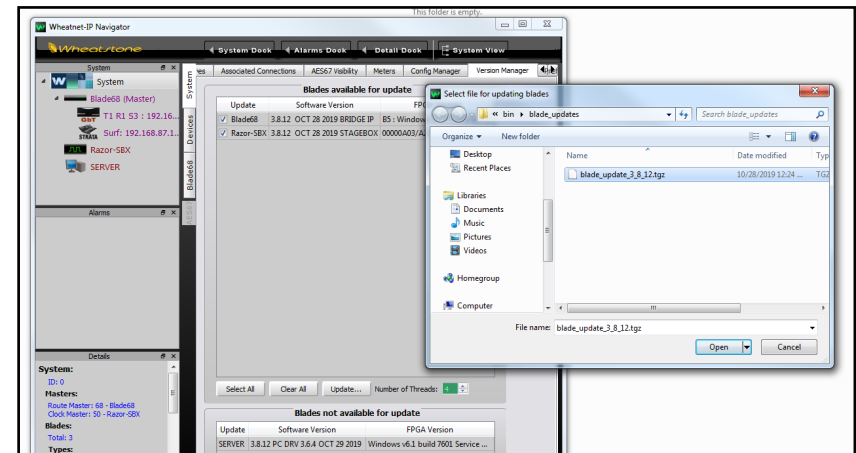


Figure 5-2 Mix Engine, Stagebox, and Blade Code Update

Select the Blades to update then click *Update...* to open a file dialog box showing the Navigator folder with the saved code files. If the code file was downloaded separately, then the code file may be in a "Downloads" folder. The Blade code is compressed: filename is **Blade\_update\_X\_X\_XX.tgz** with the Xs being the code version number.

Once the code is uploaded to the Blades, each Blade must be rebooted to then run the updated code. As the updated code is subsequently run there will be momentary muting or audio changes across the system audio so, if possible, the code update process should be done while the console is not on-air.

## APPENDIX A – CREATING A WHEATNET-IP NETWORK

**A** Strata console can be networked with a number of additional WNIP-compatible devices, like PCs and automation servers running the WheatNet-IP audio drivers; Stagebox and Blade I/O Interfaces; and hardware control panels like talent stations and signal selectors. Each of these devices can share their streaming audio content (AoIP signals and logic) with, and/or control, the other networked devices over Ethernet once they're networked together using AoIP-compatible gigabit switches.

To create a simple WheatNet-IP (WNIP) network one simply connects two or more WNIP devices to ports on an AoIP-compatible gigabit switch. Even starting with this most basic WNIP network, one can expand the network at any time, and with few limitations (most of which are distance-related) to form an ever-larger WNIP system where every device is able to share signals with every other device.

### ETHERNET SWITCHES FOR AIOP

For a stand-alone Strata console in a remote truck with one Stagebox for I/O, one could "get by" using a small 8-port gigabit switch. But, for most facilities a larger gigabit switch will be required. The two most common switch sizes are 24-port and 48-port, although many facilities like to put a smaller switch in each control room or production room, to connect all of the WNIP devices in that room together, and then network each room's switch, using a single CAT5e/6 cable, to a port on one of the main switches in the TOC.

Fortunately, under-estimating the number of ports you'll need is not that big a deal since it's a simple matter to add additional switches. The biggest issue is with reconfiguring the switch ports since networking two switches together requires they connect using *Trunk Ports* which allow multicast network traffic to properly flow between the switches. The ports used by WNIP devices are configured as *Access Ports* or switchport mode access ports.

We recommend using separate Ethernet switches for the WNIP network in order to "air-gap" their traffic from your facility's Ethernet network traffic. This not only isolates the WNIP network from the Internet but also means that future troubleshooting of network issues is a whole lot easier

since you don't have to even consider all the traffic on the facility LAN when troubleshooting your system.

One can reconfigure a facility's main Ethernet switches into VLANs or virtual networks in order to run AoIP traffic thru the facility's Ethernet switches, but creating VLANs is not covered in this manual since we wholeheartedly recommend using separate switches, designed for AoIP networking, to create your WNIP network.

The main criteria in selecting an Ethernet network switch for a WNIP network is that they're identified as "AoIP-compatible" switches. An AoIP-compatible switch, and a facility's Ethernet switch, might be the same model switch. It's their configuration settings which classify whether a switch is suitable for use on an AoIP network. Thus, an "AoIP switch" definition is arbitrary and simply refers to a network switch which can specifically be configured for multicast audio streaming, which includes being able to function as an "IGMP querier" to control multicast audio streaming traffic around the network.

Wheatstone has approved a number of switch models (mainly from Cisco and H-P) which we use in Wheatstone-designed system projects. Approved models are listed on the Wheatstone webpage under the Support & Downloads link *Compatible Switches for WheatNet-IP*. Wheatstone's technical support department also has configuration docs for the most popular models. Switches purchased through Wheatstone can also be pre-configured specifically for your network application.

Before you purchase any network switches you should create a WNIP network IP address table using an Excel spreadsheet or even a handwritten list. This is an essential step since you need to know how many ports you'll need by listing every device networked in your WNIP system: the Strata Surface host PCs; the IP Mix Engine's CPU and GBT cards; the Stagebox and Blade Ethernet jacks; the PCs and audio servers running the WNIP audio driver; the talent stations, SS-8 panels, and other control panels (like PCs running ScreenBuilder). Every one of these devices must be assigned a unique fixed IP address since a WNIP network, like every AoIP network, does not support DHCP.

Media servers and PCs with WNIP AoIP drivers are typically assigned IP addresses starting at 192.168.87.100 and moving down, reserving 192.168.87.21 for the admin PC. AoIP core and edge switches (talked about in the Multi-Station Expansion section on page 71) are typically assigned IPs from 192.168.87.1 up to 192.168.87.20. Talent stations and other networked accessories typically are assigned IP addresses above the Surfaces' and Mix Engines' IP addresses which typically start at 192.168.87.101 (and 192.168.87.201 for the matching Surface).

## CREATING THE WNIP NETWORK

This section presents an overview of what's involved in creating a WNIP network starting with a one Strata console, a Stagebox, and a small AoIP switch to create a WNIP network.

### Creating a Small WNIP Network

Various Ethernet switches from Cisco and HP have been used in WNIP systems over the years, and since their model numbers change on a regular basis, so it's best to visit the Wheatstone web site, or call Wheatstone's technical support department, to find out the currently recommended model numbers.

One current Cisco switch (as of mid-2019) that we recommend is the SG-300-series of layer 3 managed switches. Models with eight-ports up to 48-ports are available. Any of the switches in this series can be used to create a WNIP network.

For a remote truck or a venue with one Strata console along with a Stagebox for I/O, one eight or ten-port switch is sufficient. The in-room WNIP devices (Strata, Mix Engine CPU and GBT card, Stagebox, and admin PC) all plug into the switch as shown in Figure 2-8, on page 14.



**Note:** PCs and audio servers must run the WNIP AoIP audio driver to play and record audio over their network connection. WNIP AoIP drivers are licensed for one up to twenty-four stereo channels of simultaneous playback and recording. WNIP AoIP driver licenses are available thru Wheatstone or an authorized Wheatstone dealer.

### Multi-Studio Network Expansion

When there are multiple controls rooms with Strata consoles, all located within a single facility and they need to share their audio elements, we recommend you follow the small WNIP network model for each control room or studio. In this case the in-room switch is called a "Studio Edge Switch" and it's typically located in the control room. Each studio Edge Switch connects to a "Core AoIP Network Switch" located in the TOC.

Depending upon how many control rooms and production studios are being networked together and how much equipment in the TOC is also being networked, the Core Network Switch might physically consist of several medium-sized (24-port) network switches—rather than a single large 48- or 96-port switch, just so you don't put all your "eggs in one basket." This will make future troubleshooting of network issues easier, and means you'll only need one common 24-port switch on the shelf for backup.

When a multiple station or studio facility is being planned, Wheatstone offers system planning, configuration, and system programming to create system salvos, scripting for programmable buttons, etc. These services are charged on a per-studio or per-hour basis. Other services include factory

proof-of-performance as well as on-site commissioning and training. Each of these services can be arranged through your Wheatstone dealer or directly with your Wheatstone sales rep.

### Wiring Practices

Since the majority of wiring used in studio these days is straight-thru category cables (the generic name for four-pair CAT5, CAT5e, and CAT6 cabling) we recommend taking advantage of the various category cable jacket colors available to differentiate your system's signals. This not only helps during installation, it also ensures that future system troubleshooting will be a bit easier.

Here's a list of the cable jacket colors we've used on projects for common studio signals to help differentiate the multitude of category cabling that will end up being strung thru the typical facility:

- Orange** Blade-to-AoIP switch port cables
- Green** PC & Media servers-to-AoIP switch port cables
- Yellow** KVM-over-IP cables
- Blue** Facility IT Ethernet cables (since they are probably already in place and are probably blue!)
- White** IP phone system cables
- Black** Audio and logic wiring (Blade I/O to & from peripheral audio and logic devices)

Most users have standardized on a Media Server/Automation vendor—every major vendor supports WheatNet IP audio streaming and SLIO (Software Logic I/O). Since the automation servers are typically located in the TOC, KVM-over-IP extenders are available from various vendors, like ADDERLink (<https://us.adder.com/en/kvm-solutions/extenders>) to allow a single category cable to directly connect the server to a monitor, keyboard, and mouse in the control room using cable runs of up to 160 feet (48 meters).

### Signal Connection Control

Most users have several types of codecs which may be shared between studios or between different stations in a cluster. These codecs might include older ISDN interfaces along with newer Teline Merlins or Comrex Accesses, but no matter what type codec is used, one could create Associated Connections to automatically connect a mix-minus signal to the codec when it's taken on any console to make it easy for a board operator. The downside of doing this with shared codecs is that this can lead to a user changing the return feed to a codec that's still actively being used.

To prevent this from occurring, many users opt to force codec users to physically go to a rack or a PC, often mounted in a hallway outside TOC,

where they must identify whether a codec they want to use is actively in use or not, and to then dial up and connect the codec for their use. This "Public Codec Rack" is typically setup with a touch screen monitor, running Screenbuilder (a Wheatstone app which is configured using a GUI interface), which allows users to switch codec routing without the need to use Wheatstone Navigator's Crosspoint grid, or use a system salvo, to switch the return connections to the codecs.

The Screenbuilder app is a very powerful tool that can be licensed to run on multiple PCs. The app uses standardized on-screen elements (faders, meters, labels, buttons, clocks, timers and other widgets) to physically control the WNIP network devices. Arranging these on a PC screen allows one to create custom control panels, and quick-access buttons, for monitoring and controlling codecs, for setting up feeds for recorders, and for controlling feeds to Internet streamers.