



PACIFIC RESEARCH & ENGINEERING



EMX
IP Networked Digital Console



& Dynamics, and Aux Send levels, which are included on every channel. Each fader channel also has three user-set “Soft” buttons to customize channel functionality, plus cue control and two buttons (Talkback and Auto FB) which simplify taking calls and doing live remotes. The Monitor Control panel buttons and controls support the Control Room, an associated Studio, and an External location, along with having the controls for the built-in timer and to save and recall console Events.

EMX uses the PR&E Mix Engine, with its 1 Gb connectivity and built-in 5-port Ethernet switch, to allow EMX sources to be shared with any networked device (and vice versa), including Razor I/O Interfaces, the M4IP-USB Blade, Windows PCs running the WheatNet-IP audio driver, and other EMX and DMX consoles. EMX supports WheatNet-IP logic-over-IP, as well as ACI (Automation Control Interface), so any WheatNet-IP-supported radio automation server can also be networked with the EMX—no additional audio or logic wiring required.



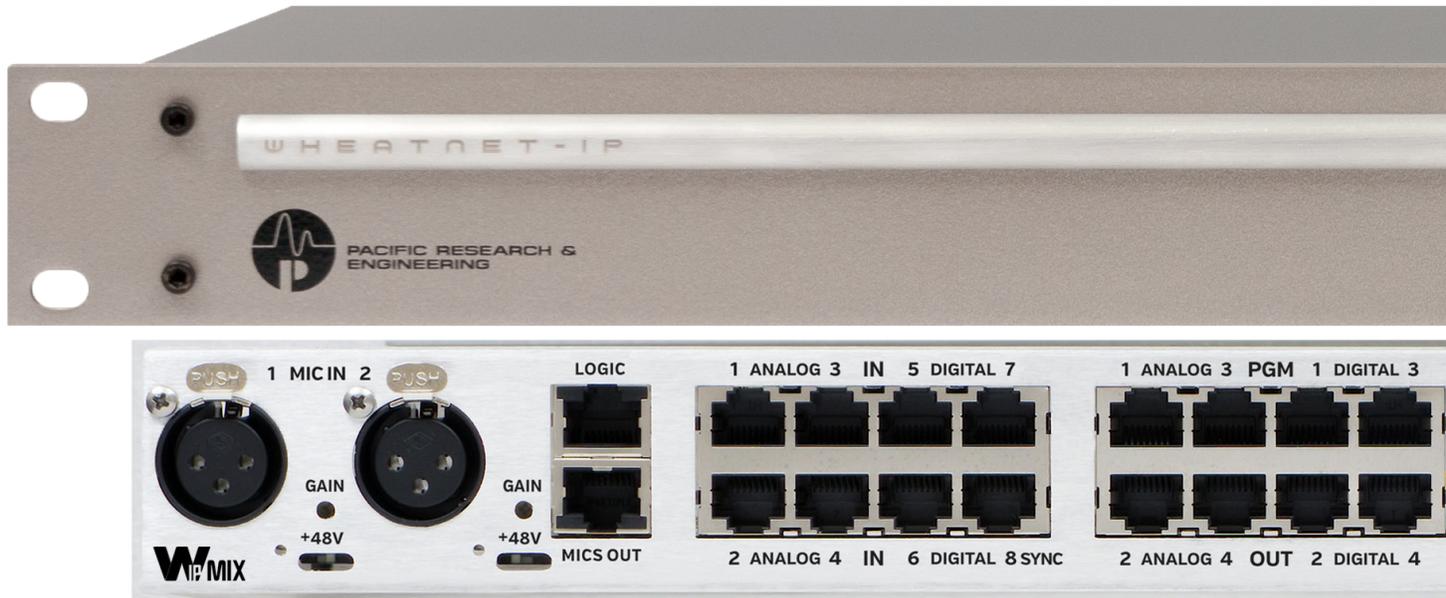
With PRE-IP AoIP networking, based on WheatNet-IP, EMX is world class – positioned for use in top radio studios everywhere.

It lives up to and exceeds its legendary status as PR&E.

Features

- Modular console, 4 fader channels per module, 1 monitor module
- Frame sizes: EMX-16, EMX-16W, EMX-20, EMX-20W, EMX-24, and EMX-24W (the “W” indicates a Wide frame which has the equivalent of five extra spaces for adding accessory modules, such as Telco or smart OLED switch panels, whereas the regular frames have a single space)
- Separate rackmounted power supply (redundant/spare available)
- 4 Stereo MAIN (PGM) buses
- 2 Stereo AUX buses
- Stereo CUE bus and built in CUE amplifier and speakers
- Stereo HEADPHONE circuit with built in amplifier
- Dedicated 2-channel TELCO output configured for convenient use with VoxPro editing software
- Built-in bus minus system allows separate mix minus feed from every fader channel
- Individual Talkback button on each fader channel
- Auto Foldback function switches mix minus feed depending on channel ON/OFF status
- Built-in 4-band fully parametric EQ on every fader channel
- Built-in parametric HPF and LPF on every fader channel
- Built-in Compressor-Limiter-Expander on every fader channel
- Pan control on every fader channel
- Multi-function encoder on each fader channel for source selection and to adjust (access-controlled) Advanced Channel Feature controls: Mode; Pan; EQ & Dynamics; and Aux Send levels
- Full color OLED display screen on every fader channel to show channel settings
- LED illuminated switches
- Built in Automation Control Interface allows external control of the surface from 3rd party devices, Tablets, and software applications.
- 3 user-set Soft buttons on each channel for “hot” source selections, EQ in/out, Aux pre/post, etc. Set using the EMX Surface Setup app
- Extensive monitor select systems for Control Room and Studio give easy access to all Program buses, two externals, telco, user programmed and wild on-the fly
- LED meter bridge with high resolution meters (programmable for Average, Peak, or Peak dot over Average bar) and separate Overload and On-Air indicators
- Dedicated meters for PGM 1, PGM 2, and PGM 3
- Switched meter allows display of levels for two Externals, Telco, PGM 4, cue, plus wild on-the-fly selection
- Front panel selectable Split Cue function puts sum of currently selected program in the left side and CUE in the right side of the Headphone feed
- Full color OLED displays for Control and Studio showing current source and level
- Complete console set ups can be saved as Events and recalled when needed
- Full color OLED display for Event save/restore selection
- Front panel level controls for Talkback to Control Room and Talkback to Studio
- Complete Logic over IP system connects with Automation systems, talent panels, script engines, and GPIO ports with no extra wiring
- Access protection of multiple functions

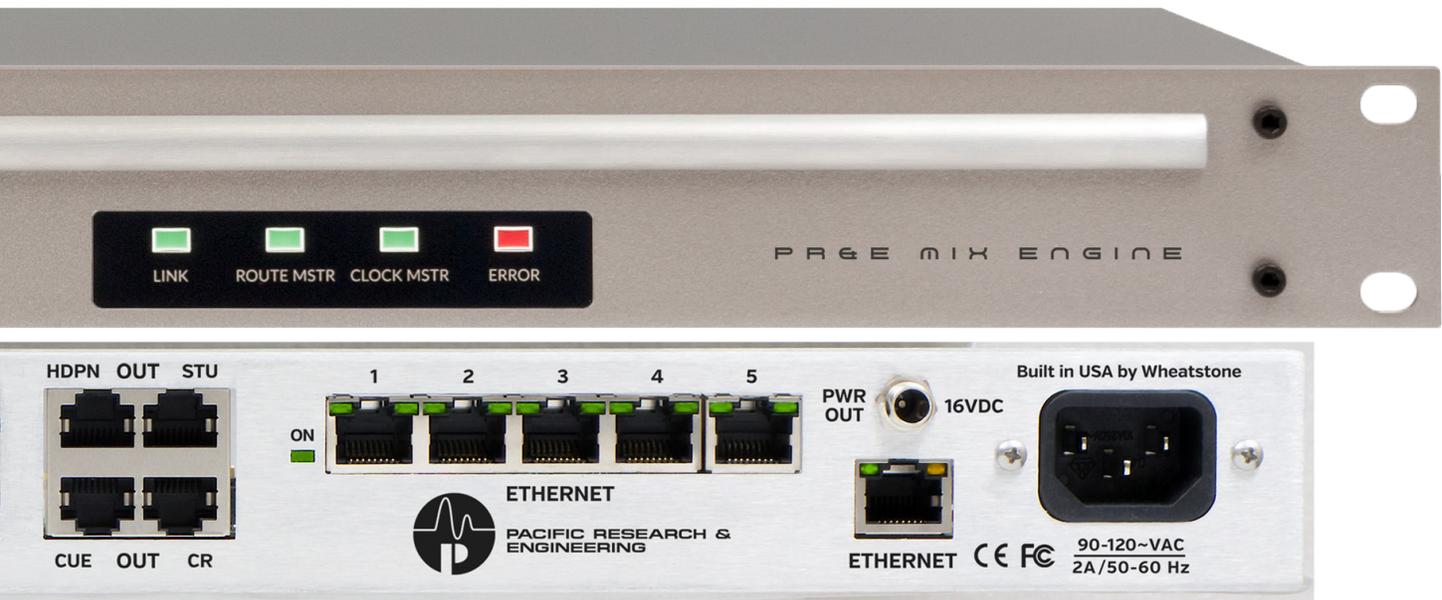
PR&E Mix Engine



The 1RU PR&E Mix Engine is the heart of the EMX, housing its audio and logic I/O, and its signal processing and mixing DSP. The EMX Surface connects to the Mix Engine using one Ethernet cable (connected to Port 1 of the built-in Ethernet switch) to communicate with its Mix Engine and to receive AoIP streams for its meter bridge cue speakers and board operator headphone jack on the right-side of the Surface.

The PR&E Mix Engine includes two high-quality low-noise mic preamps and a five-port Gigabit Ethernet switch so no external AoIP switch or other hardware is required when the EMX is stand-alone or used in a smaller facility.

All of the EMX console's sources and destinations are available to connect to every other networked PR&E AoIP device (and vice versa)—from DMX consoles and Razor Signal Interfaces to other EMX consoles, along with any networked M4IP-USB Blades (licensed for PR&E use) and any VoxPro or other PC running the WheatNet-IP audio drivers.



All AES3 and line-level analog audio connect using RJ45 jacks (StudioHub+® compatible) and CAT5 cables for fast crimp-free/solder-free connections. There are 28 RJ45 jacks on the Mix Engine's rear panel along with two female XLR jacks for:

- Two Microphone inputs (XLR jacks) with switched 48-volt phantom power and gain trim on each preamp.
- One Dual mic preamp output jack (connect a short CAT5 jumper to any analog input to use one or both mic preamps).
- Eight Stereo inputs: four balanced analog and four AES3 (any input can be set to be dual mono inputs).
- Eight Stereo outputs (set for PGM 1, PGM 2, PGM 3, and PGM 4 from the factory), each has a balanced analog and AES3 jack. Any output source can be changed, as needed, using the PR&E Navigator app.
- One Six-port GPIO Logic uses the WheatNet-IP RJ45 jack logic convention.
- Four Stereo analog monitor outputs for powered Control Room Monitors, Studio monitors, external Cue speakers, and a guest Headphone amplifier. Sources on unused outputs can be switched, using the PR&E Navigator app, to create additional local stereo outputs.
- One Mix Engine Ethernet Port (short CAT5e jumper, included, connects to Port 5 on the Ethernet switch).
- Five Ethernet ports, on the built-in Gigabit Ethernet switch, network the Surface and Mix Engine along with three additional networked devices: Razor AoIP Signal Interfaces, a setup PC or a VoxPro PC running WheatNet-IP audio drivers, another EMX or DMX console, an M4IP-USB BLADE (licensed for PR&E use), or a main facility AoIP switch.

Cool Stuff about EMX

No External Switch Needed

With the PR&E Mix Engine, we've provided five Ethernet ports for interfacing the Surface, the Mix Engine, your PC for use with PR&E Navigator or EMX Surface



Setup, as well as optional devices such as VoxPro PC, a media server, or a couple of Razor I/O Interfaces for expansion. Essentially acting as a built-in switch, this keeps IT management and procurement costs down while making it dead simple to expand your AoIP network.

Of course, if you DO want to expand even further and add more EMX and DMX consoles, you can add a WheatNet-IP-certified Gigabit switch and be off and running to a larger network.

Robust Metal Construction, Made in USA

We've built the EMX to withstand years of use and abuse.



The finest components and the most reliable construction come together to create a surface that any station would love to have in their on-air studio or control room and production suites.

Source and Program Select

Any channel can be assigned to any combination of the four Program, two Auxiliary, and Off Line buses, making your material available to an on-air feed as well as an Internet stream, for instance.



Any audio signal, whether connected to the EMX or to a networked Razor, PC, or another EMX, can be a source on any fader channel. While doing this allows for complete flexibility, in practice it's better to "trim the list of sources," which the EMX Surface setup app does in the channel "Visibility list."



This allows channels with dedicated sources, like the board operator mic, the automation server playback channels, and the phone, to just see those sources, whereas you always need a couple "RLS" faders where just about every signal is listed.

Cue and Talkback

Cue, when lit, sends that channel's audio (pre-fader and pre-on) to the built-in cue speakers and to the cue monitor output on the Mix Engine. Settings in the EMX Surface Setup app allow cue to feed any combination of the headphones, the studio monitor output, and even the control room monitors.



TB (talkback) is a momentary button that allows the board operator to talk to a caller or a remote. Needless to say TB does nothing if the source is not a caller or remote.

Off Line and Auto Foldback

The Off Line and Auto FB (Foldback) buttons are used exclusively with callers and remotes to control which bus (Off



Line or a PGM bus) is feeding each caller's or remote's bus-minus signal. Off Line is used to allow for hands-free interaction between the board operator and a caller or remote. When Off Line is lit, that fader channel is feeding the Off Line bus.

The Auto FB button allows the caller or remote channel status to control their bus-minus audio. When their channel is Off, Off Line is sent to the bus-minus so the board operator can freely interact with them. Then, when their channel is turned on, the bus-minus auto-switches to the on-air PGM bus (typically PGM 1) so the caller or remote can hear everything else going to air, but minus their own audio, of course.

The Magic Knob

This single multi-function knob at the top of each channel provides quick, intuitive control over:



console audio mode; channel panning/balance; channel EQ & Dynamics settings; and over the levels feeding the Aux 1 and Aux 2 Sends. The channel's OLED display shows relevant information for each Advanced Channel Function, except for EQ & Dynamics—multiple channel OLEDs switch to show the EQ and Dynamics screens while that function is active. Access can be controlled so that so that basic settings are protected from board-ops if desired.

Input Panel

MULTI-FUNCTION ENCODER KNOB

When the channel is off, rotating the encoder switches the channel display to show alternate sources, selected by “clicking” the encoder. The encoder can also control channel mode, pan, EQ & Dynamics, and AUX send levels.

SOFT

These buttons have no preset assignments. They are set, using the EMX Surface Setup app, for channel-specific functions like a hot source take button, EQ on/off, or Aux Send on/off.

PGM ASSIGN

Directs the channel's signal to any of four stereo output busses.

OFF LINE

Assigns the channel to the Off Line bus, used with callers and remotes.

AUTO FB

Only active when the source is a caller or remote to switch their bus-minus audio between Off Line (channel off) to a PGM bus (channel on).

CUE

Places the fader channel audio into the CUE mix.

TB

Only active when the source is a caller or remote which allows the board operator to talk to that caller or remote.

FADER

100mm Long-throw fader for channel level control.

OLED DISPLAY

Normally shows fader channel source and status icons but changes display when other functions are being used such as MODE, PAN, EQ/DYNAMICS, AUX.

ON/OFF

Switches the channel's audio on and off as well as issuing start/stop LIO functions.



a. Control Room Panel

CR/HDPN SELECT ENCODER

Rotate to choose a wild on-the-fly monitor source (visible names listed in the OLED) then press to Take. Also used to select a source when assigning the EXT 1, EXT 2, EXT 3, and TEL buttons.

CR/HDPN MONITOR SOURCE SELECT BUTTONS

The EXT 1, EXT 2, and EXT 3 buttons are user-set, using just the panel button and the encoder, to assign an off-air tuner, pre-delay audio, and other source to the button. The Tel button, pre-assigned to the Telco Record bus, can also be user-set to a different source if desired. The four PGM Monitor buttons allow any main Program bus (PGM 1, PGM 2, PGM 3, or PGM 4) to be instantly monitored.

SPLIT CUE

Affects how cue is fed to the HDPN output when Cue-to-HDPN is enabled in the EMX Surface Setup app. When unlit, and cue is active, cue is fed to the HDPN outputs in stereo, cutting off the monitor audio. When lit, and split cue is active, the monitor source is summed to one ear and cue is summed to the other ear.

CR FADER

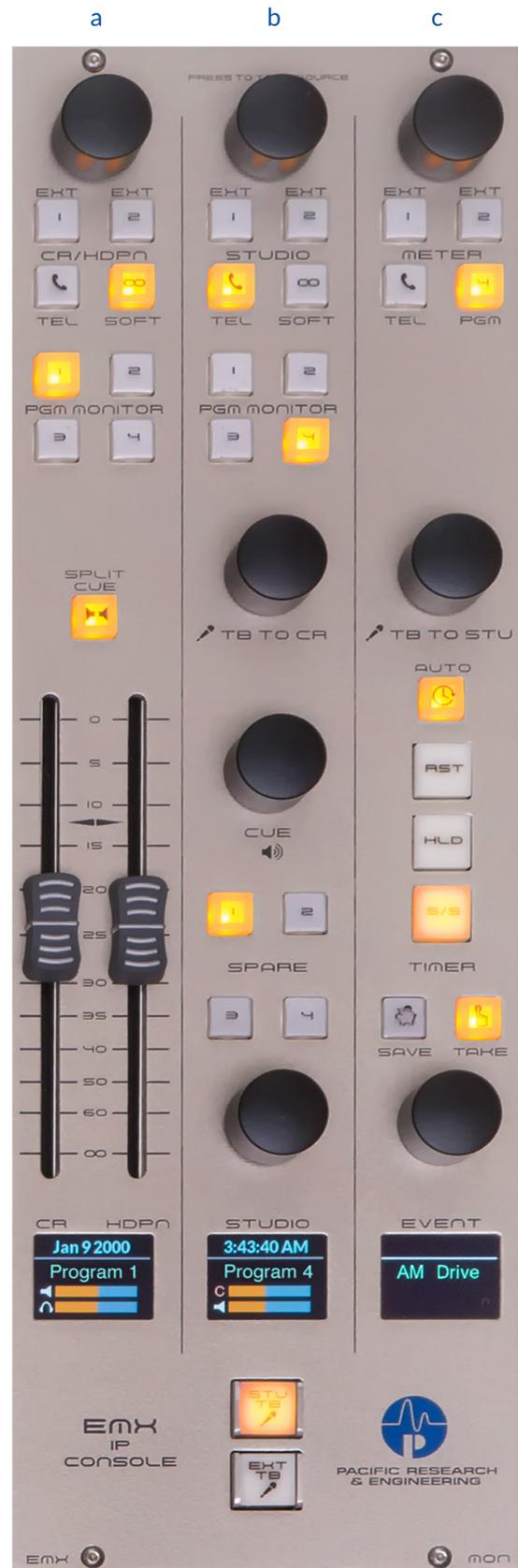
Controls the level of the Control Room monitor speakers (CR OUT on the Mix Engine).

HDPN FADER

Controls the monitor level to the Surface headphone jack and to the HDPN OUT jack on the Mix Engine.

CR AND HDPN OLED DISPLAY:

Shows the current date above the white line. Just below the white line, the current monitor source for the CR and headphones is listed. At the bottom of the display are bar-graphs indicating the levels of the CR monitor and HDPN faders. When the CR source selector encoder is rotated, the display switches to show the visible monitor source list for the control room.



b. Studio Panel

STUDIO SELECT ENCODER

Similar to CR select encoder except is used for Studio monitor sources.

STUDIO EXT AND PGM SELECT BUTTONS

Similar to CR select buttons except is used for Studio monitor sources.

TB TO CR ENCODER

Adjusts the talk level from a studio microphone feeding the headphones, cue, and/or monitor speakers.

CUE LEVEL ENCODER

Controls the level of the Cue speakers and Cue Out on the Mix Engine.

SPARE BUTTONS

These four buttons' functions are assigned using the EMX Surface Setup app.

STUDIO LEVEL ENCODER

Controls the level of the Studio monitor speakers (STU OUT on the Mix Engine).

STUDIO OLED DISPLAY

Shows the current time above the white line. Just below the white line, the current Studio monitor source name is listed. At the bottom of the display are bar-graphs indicating the levels of the Cue and Studio outputs. When the Studio select encoder is rotated, the display switches to show the Studio's visible monitor source list.

TB TO STUDIO BUTTON

Press to switch the studio monitor audio to the talkback source (typically the board operator mic). Press-holding the button for a few seconds will latch it for extended conversations between control room and studio.

TB TO EXTERNAL BUTTON

Another spare button which can be assigned to function as a talk button to switch the audio feeding an output identified as "External output." When pressed, the External audio switches to the talkback source (typically the board operator mic). When released the audio switches back to its normal audio source.

c. Event/Meter Panel

METER SELECT ENCODER

Turn to select the desired source for the switched meters (list shows in OLED display).

METER SELECT BUTTONS

Hot button source selectors to quickly switch the Switched meter to show PGM 4, Telco Record, and two user-set sources (EXT 1 and EXT 2).

TB TO STU ENCODER

Adjusts the talk level of the control room microphone going to the studio monitor speakers.

TIMER CONTROL BUTTONS

AUTO, RESET, HOLD, START/STOP.

EVENT SAVE AND TAKE BUTTONS

Pressing Take activates the Event encoder so a new Event can be selected. Pressing Take again then takes the new Event, which could range from just changing a few channel sources and bus assignments, to setting the entire console up for a different Daypart or function, which could mean changing source assignments, turning EQ & Dynamics on or off, changing Aux Send levels, changing how bus-minus signals are connected.

Pressing Save allows the current settings of the entire console to be saved as one of four Events, as selected by the Event encoder. Both the Save and Take buttons are access-controlled using the EMX Surface Setup app settings.

EVENT ENCODER

Scrolls through the four event names, so an existing Event can be taken or a new event can be saved.

EVENT OLED DISPLAY

Shows the current Event above the white line. Just below the white line, the current source on the Switched Meter is listed. At the bottom of the displays are bar-graphs indicating the levels of the TB TO CR and TB TO STU encoders. When the Switched Meter encoder is rotated, the OLED switches to show the Switched Meter visible source list. When the Event encoder is rotated the four Event names are listed.

EMX Onboard Processing & Displays

Full Parametric EQ and Dynamics Processing on Every Channel

EQ Lo FREQ 100 Hz	EQ Lo BW .99 OCT	EQ Lo LEVEL 5.9 dB	EQ Lo Mid FREQ 794 Hz	EQ Lo Mid BW .50 OCT	EQ Lo Mid LEVEL -4.0 dB	LPF OUT	EQ Lo Shelf IN	Input 8 IN/OUT EQ LO FILTERS
EQ Mid Hi FREQ 2.4 kHz	EQ Mid Hi BW 1.2 OCT	EQ Mid Hi LEVEL 2.1 dB	EQ Hi FREQ 6.3 kHz	EQ Hi BW 0.1 OCT	EQ Hi LEVEL 1.5 dB	HPF OUT	EQ Hi Shelf IN	

The EMX has 4 fully parametric EQ bands with peak/shelf control for the low and high bands plus high and low pass filters - on every channel. Same with compression, limiting, and expansion dynamics control - a full suite on every channel. When the EQ & Dynamics feature is active, multiple OLED channel displays are simultaneously switched to show the various EQ & Dynamics screens, simplifying how one edits their settings.

EQ Cue Dyn HOST MONO	EQ Dyn GUEST 1 MONO	EQ Dyn GUEST 2 MONO	Pan Center	VOXPRO MONO	PLAY 1 STEREO	EQ PHONE 1 MONO	EQ Dyn CODEC STEREO	Oct 11 2017 PGM 1
Expander OPEN 5.0 mS	Expander THRES 0.0 dB	Expander HANG 100 mS	Expander RATIO 3:1	Expander DEPTH 3.9 dB	Expander CLOSE 300 mS		Input 8 IN/OUT EXPANDER FILTERS	3:20:09 PM PGM 1

With full color OLED displays and color-coded functions, you can see all your settings at a glance. Shown are just a sampling of the displays available on the EMX.

Literally Plug & Play...



1. Using standard CAT-6 cables, plug the EMX surface and engine into the built-in switch on the Mix Engine.
2. Plug in the PC or audio server, running the PR&E Navigator and EMX Surface Setup apps, to easily configure the network, edit the default settings, and setup the Surface to match your application.
3. If you like, add one or more Razor I/O Interfaces or M4IP-USBs to add more sources and destinations to your EMX.
4. Plug your own audio sources into the PR&E Mix Engine and Razor(s).
5. Turn it all on and hit the airwaves.

To network the EMX with a larger facility, connect a CAT6 cable from the Mix Engine's Ethernet switch to any WheatNet-IP-compatible Gigabit switch. EMX sources are then immediately available to stream to any number of other EMX and DMX consoles, Razor I/O Interfaces, M4IP-USB mic/voice processors, PCs and servers running WheatNet-IP audio drivers, AES67-compatible devices, and even WheatNet-IP Blades (when licensed for cross-networking).

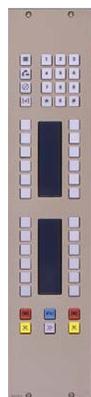
Extending EMX Surfaces



EMX utilizes PRE-IP AoIP networking, based on WheatNet-IP protocol, to access, control, and process any and all audio sources on the network. Each of the Razor I/O Interfaces pictured above provides you with 8 analog, digital, or analog/digital inputs and outputs, as well as logic and Ethernet connections on RJ45 connectors.



PRE-IP supports Wheatstone's M4IP-USB (licensed for PR&E use) four channel mic/voice processor. It can be used anywhere on your PRE-IP network and provides the integral tools all BLADE-3s offer.



EMX is pre-configured to install and interface a TELCO panel when ordered using an EMX wide frame.

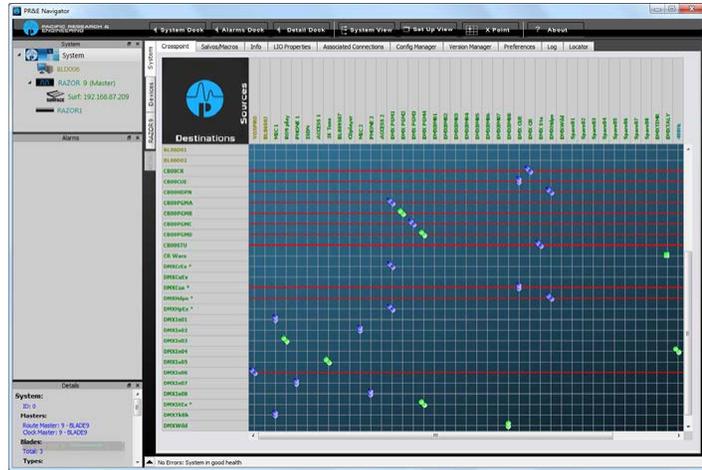


The SS-8 programmable button panel is optionally available. Buttons can be scripted to accomplish a great number of tasks, and they feature integrated OLEDs so you can customize their appearance.

EMX Software

PR&E Navigator

This is used to name signals; remotely monitor any signal in the system; create and take Salvos; assign GPIO mapping; route/connect signals using an XY crosspoint grid; synchronize the Surface date/time displays; update Mix Engine and Razor code; amongst many other functions.



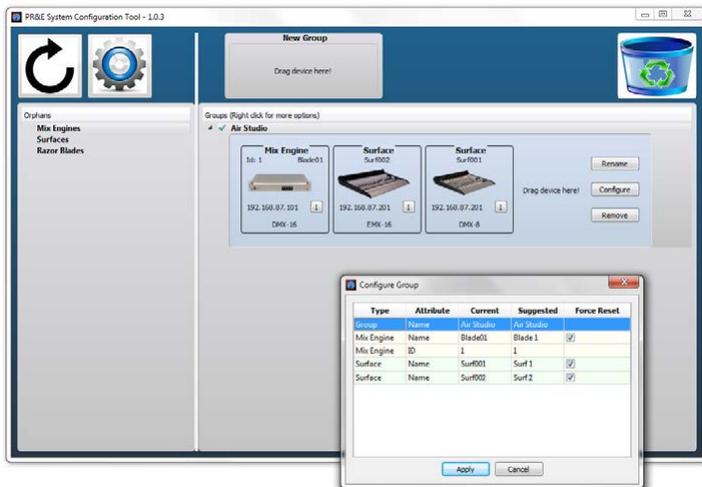
PR&E Surface Setup

Configuring your EMX is as simple as running this program. Use it to configure each EMX Surface specifically for use in an on-air studio, a production room, a newsroom, or other application.



PR&E System Configuration Tool

This tool automatically updates the factory-assigned standard IP addressing and naming used for the EMX Surface, Mix Engine, and Razor I/O Interfaces to allow multiple EMX and consoles, and Razor I/O Interfaces, to be networked together, ensuring each device has unique signal names, IP address, and system ID.



FACT: When a PC running the PR&E apps, or any PC for that matter, is networked with the EMX, it can stream from one up to 24 stereo audio channels, bi-directionally, without needing a sound card (higher number of streams requires a Gigabit NIC card in the PC).



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