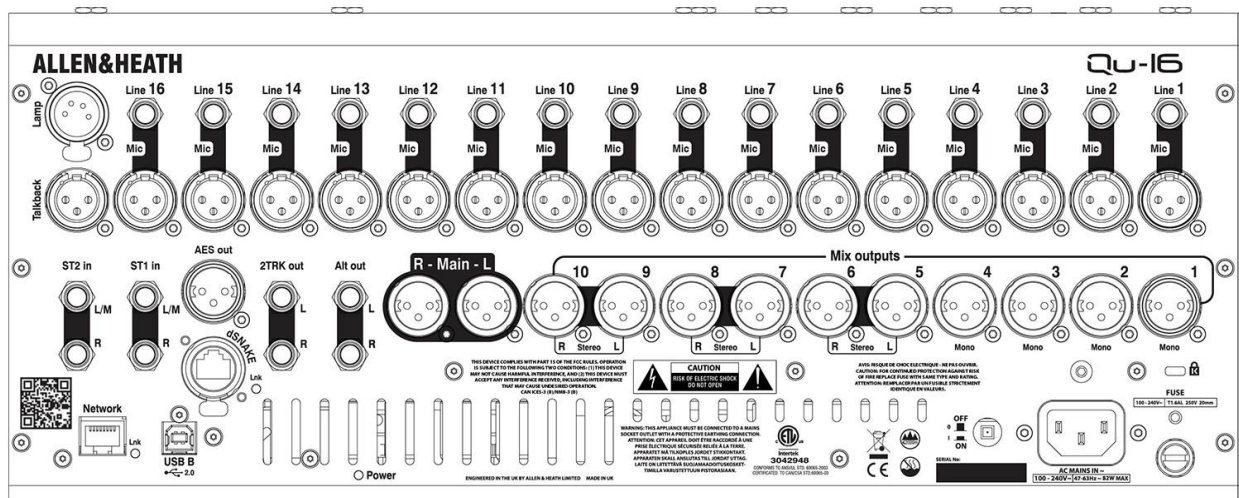
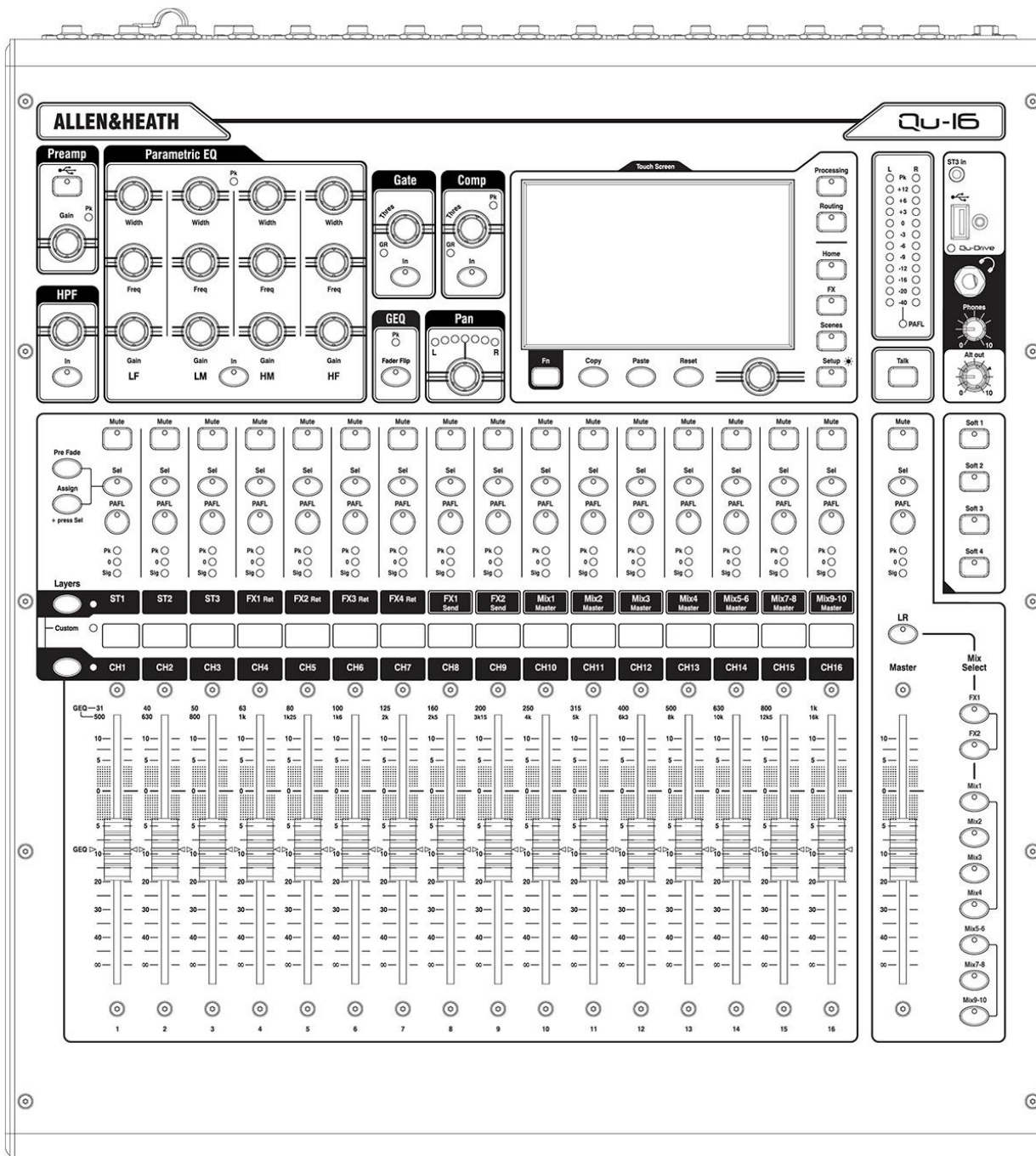


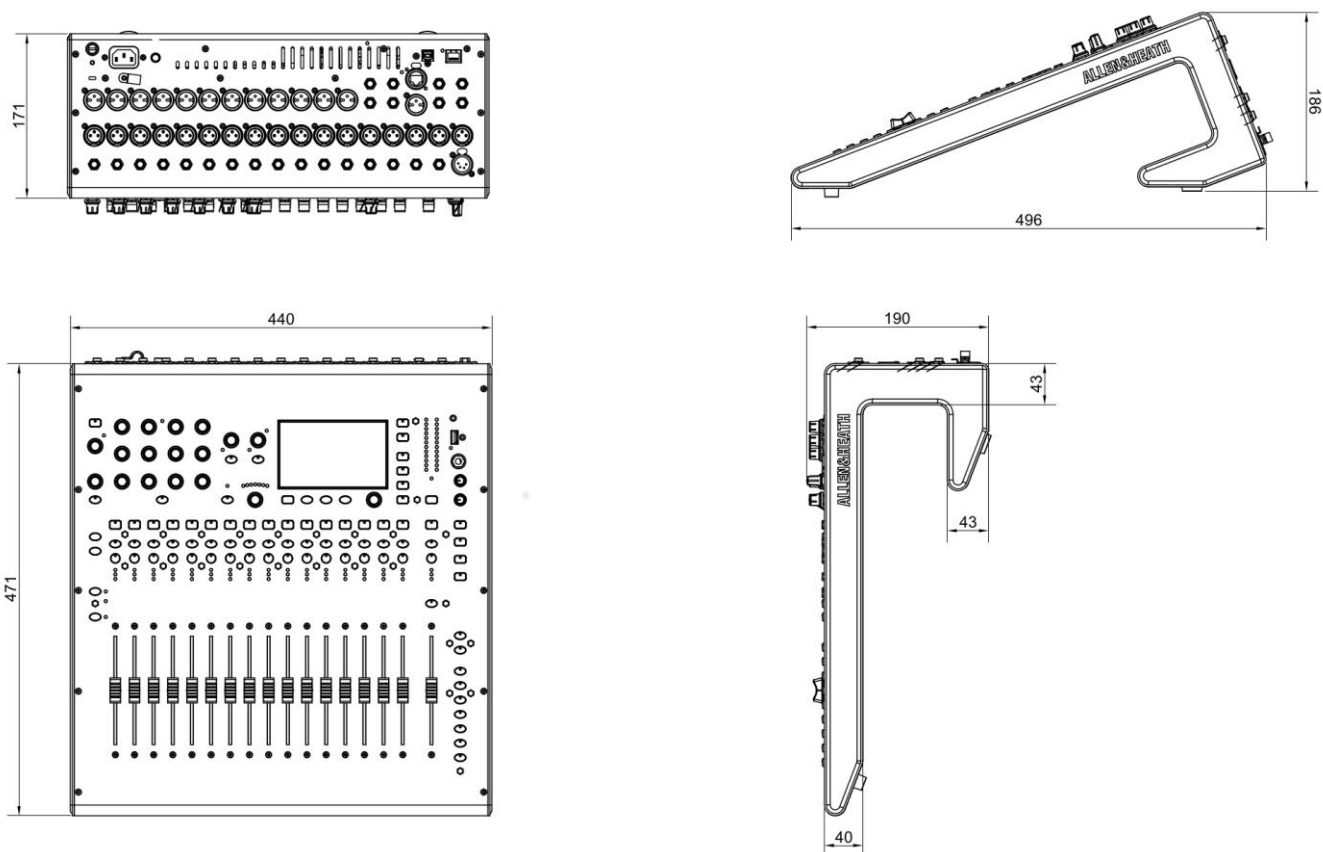
## Technical Datasheet

### Overview

- Rack-mountable Digital Mixer for Live, Studio and Installation
- 5" colour touchscreen
- 16 Mono Inputs (TRS + XLR)
- 3 Stereo Inputs (TRS)
- 4 Stereo FX with dedicated FX Returns
- 16 Busses
- 12 Mix Outputs (XLR) (LR, Mono Mix 1-4, Stereo Mix 1-3)
- 4 SoftKeys
- Extra stereo outputs – AES digital, Alt Out, 2TRK out
- Talkback mic input
- dSNAKE Cat5 snake for remote audio using AR2412, AR84 or AB168
- 4 Mute Groups
- 4 DCA Groups
- AnaLOGIQ™ total recall analogue preamps
- Effects ported from the flagship iLive console
- Dedicated stereo FX return channels
- Master strip for quick access to mix levels and processing
- Input channel linking for stereo sources
- Input processing – Preamp, HPF, Gate, PEQ, Compressor, Delay
- Output processing – PEQ, Graphic EQ, Compressor, Delay
- 5" (800x480 pixel) colour touch screen for quick control
- Motorised faders for sends on faders, GEQ fader flip and mix recall
- Quick copy and reset of processing, mixes and scenes
- 100 Scene memories
- Channel Safes, Global and per Scene Recall Filters
- FX, processing and channel User Libraries
- Qu-Drive for stereo and 18-track recording/playback to USB hard drive
- USB streaming to/from an Apple® Mac or Windows™ PC computer
- MIDI DAW Control driver for Mac (converts to HUI or Mackie Control)
- USB transfer of Scenes, Libraries, Shows
- User assignable Custom Layer
- Qu-Pad engineer's mixing wireless remote app for iPad
- Qu-You personal monitoring app for iPhone, iPad, iPod Touch
- Compatible with the Allen & Heath ME personal mixing system
- User Permissions to restrict operator access
- Optimised fan-less airflow design for silent operation



## Dimensions



## A&E Specifications

The mixer shall be a compact, rack-mountable mixer with 16 mono and 3 stereo line input channels mixing to 12 mix outputs.

There shall be 4 stereo rack FX engines, 4 DCA groups and 4 Mute groups.

The surface shall include 17 moving faders with 3 layers, each layer having dedicated keys and indicators, giving access to input channels, output channel mixes, FX sends, FX returns, Main mix, and a customisable layer giving access to DCA masters and MIDI control as well as user-defined overview of channels.

Each fader strip shall have a dedicated PAFL, Mix, Select, and Mute button with indicators, a 3-LED multi-point meter, and coloured LED indicating fader assignment.

Ability to assign channel on/off status to the current mix using the channel 'Mix' keys shall be provided.

All processing, Pre/Post fade routing and assignments of signals to mix send, FX send and Audio, DCA and Mute Groups shall be accessed and adjusted via a 5-inch colour touchscreen provided on the mixing surface.

The name and number of the current selected channel or mix shall be identified on screen when in the processing or routing pages.

Send levels to mixes shall be displayed and adjusted using the faders.

All output mix channels shall contain the following processing: External input, Trim, Polarity, Insert, Parametric

EQ, and Graphic EQ with RTA and fader-flip mode, Compressor, Delay.

All signal delays in the system shall be adjustable in Milliseconds.

4 user-assignable soft keys shall be provided for quick access to Mute Groups, DCA Mutes, Tap Tempo and Scene Recall. There shall also be dedicated keys for quick Copy/Paste/Reset of mixes and processing parameters.

A Channel Ducker shall be provided to reduce the level of selected channels when a designated channel is in use. This channel priority shall be available across all mono and stereo input channels and also channel groups.

4 user-assignable effect racks shall be provided with a library of factory preset FX emulations. The FX racks shall be individually configurable as send/return from a channel or FX/Mix, or inserted into input or output channels.

A global source option for the direct out of each input channel shall be provided in the routing screen. The tap-off point shall be adjusted to the following positions in the processing path: post Preamp, post HPF, post Gate, post Insert return, post PEQ, post Compressor, and post Delay. There shall be further global options for Follow Fader, and Follow Mute.

Direct outputs shall be assignable via the mixer soft patch bay to any physical output socket interface channel or ME channel.

A signal generator shall be provided with the ability to send a variable level signal to any output mix with visual assignment status on-screen. The following types of signals shall be available: Sine, White Noise, Pink Noise, and Band-Pass.

Comprehensive input, output, and FX channel and RTA metering shall be provided on-screen.

A default Mains to PAFL sub-mix shall be provided.

12-LED bar meters on the surface shall indicate the 3 Main mix buss levels, the PAFL signal shall override the LR meters accompanied by a PAFL-active indicator.

A Talkback facility shall be provided with the ability to send to any output mix with on screen status indication. An option to enable talkback latching and HPF shall be provided.

A quarter-inch jack socket for PAFL headphones output shall be provided, with an analogue output level control.

The mixer shall include stereo and 18-track recording/playback to optional USB hard drives. The format shall be 48 kHz/ 16 bit WAV.

The mixer shall play back stereo WAV files at 44.1 or 48 kHz and shall have a USB Type-A connector on the surface for recording, playback, data-transfer, archiving, and firmware updates to USB drive.

On the rear panel there shall be a Type-B USB connection following the high-speed USB 2.0 standard for multi-channel, bi-directional audio streaming of 24 out / 22 in and MIDI DAW control between the mixer and a computer.

A DAW transport control using popular DAW control protocols for computer shall be available via the touch-screen.

The mixer shall provide a Fast Ethernet (100 Mbit/s) port for Cat5 cable connection to a computer for MIDI over TCP/IP control of mixer parameters via a wireless router (access point) for live mixing control.

The mixing system shall include application software for Apple iOS touchscreen devices connected via a wireless network router to the LAN port and allow control of functions including the preamp gain, pad, and phantom power.

The application shall have a graphical representation of physical controls and indicators present on the surface including signal processing parameters and shall provide control of output channel processing including Parametric EQ, Graphic Eq, Compressor and Delay. Routing assignments and level adjustments of input signals to all mixes and bus shall be provided. The application software shall provide signal metering and processing threshold indication when online including the Real Time Analyser.

There shall be a local "dSNAKE" Ethernet audio expansion port with locking Ethercon connector, providing up to 22 input signals and 12 output signals, plus 40 personal mixing sends to be connected over a single cable 'digital snake' and allowing Remote Preamp control to an Allen & Heath AudioRack, or Allen & Heath ME Personal Mixing Systems.

Input and output channel processing and parameters in the mixer shall be saved on demand as a user library item for recall in other channels. Individual processing sections shall be save-able on demand as user library items for that type.

All library items shall be stored on board and archived with the show-file. Library items shall be transferrable to USB drive as portable data to be used in other systems.

The mixer shall provide the facility to save 100 scenes of the settings of the mixing system and these scenes shall be nameable.

A comprehensive table of Scene Safes shall be provided to prevent selected items from being changed from their state when the safe was enabled. A comprehensive scene filter shall be provided per scene to Allow / Block each parameter saved in a scene from being changed as that scene is recalled.

An option shall be provided for password protection for log-in of several users with different levels of system access and permissions. A particular scene may be chosen to be recalled per change of user-login if desired.

The mixing system shall periodically record all current settings and return the mixer to that state after reboot following a power-cycle.

The mixing control surface shall have a built in power supply accepting AC mains voltages of 100~240V, 50/60 Hz, 95W max via an earthed 3-pin IEC male connector mounted on the rear chassis. A Two Pole Push-Button switch shall be provided near the mains input.

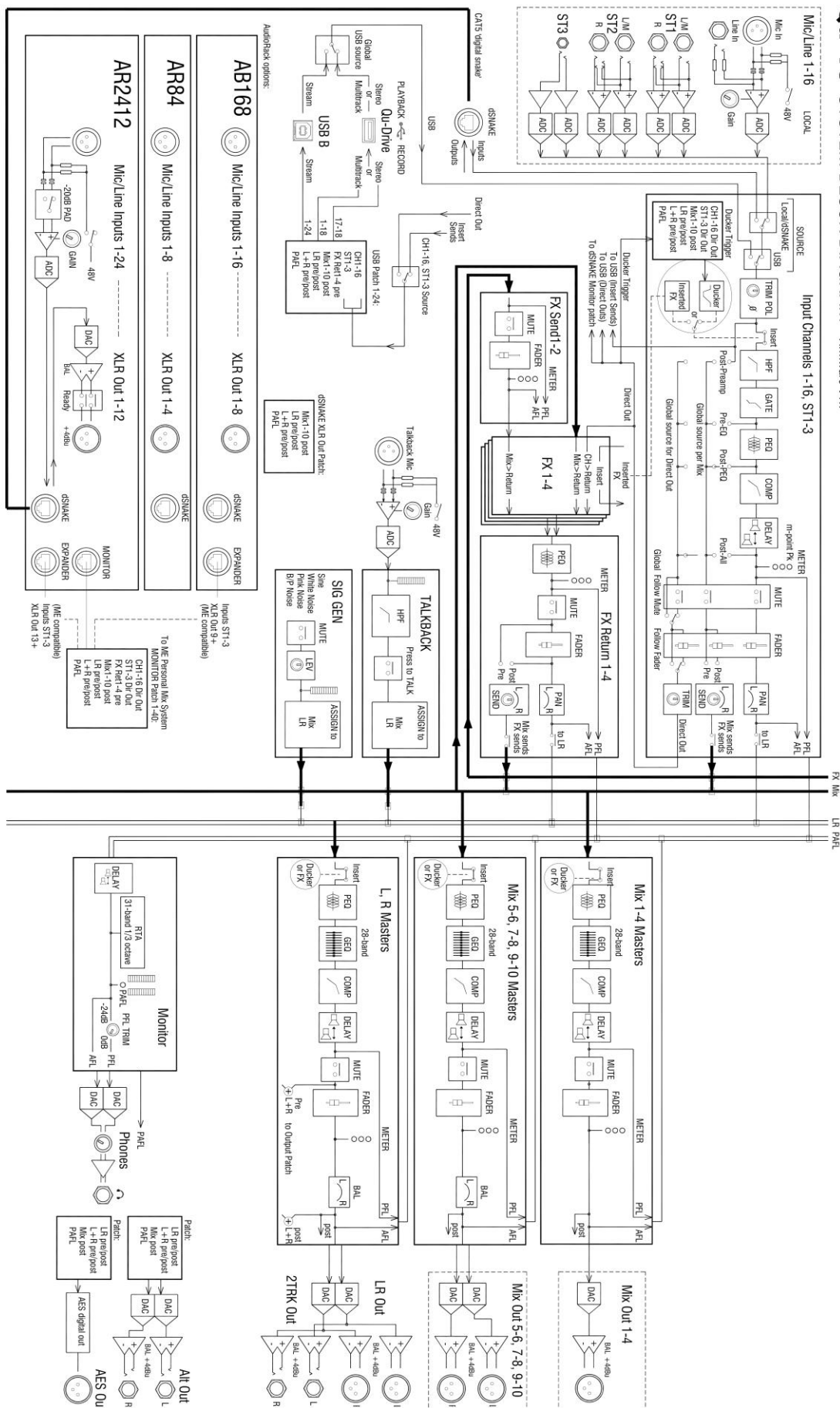
The mixer shall have an optimised fan-less airflow design for silent operation.

Recommended operating temperature for the mixer shall be 5 to 35 degrees Celsius.

The mixer shall be the Allen&Heath Qu-16 Digital Mixer.



# **Qu-16 SYSTEM BLOCK DIAGRAM**    Firmware V1.7



## Mixer Specifications

### Inputs

#### Mic/Line Inputs

Input Sensitivity (XLR / TRS)	Balanced, XLR and 1/4" TRS jack, fully recallable
Analogue Gain	-60 to +5dBu / -50 to +15dBu
Maximum Input Level (XLR / TRS)	-5 to +60dB, 1dB steps
Input Impedance (XLR / TRS)	+19dBu / +29dBu
THD+N, Unity gain 0dB	>5kΩ / >10 kΩ 0.0005% -89 dBu (20-20kHz, Direct Out @0dBu 1kHz)
THD+N, Mid gain +30dB	0.001% -83dBu (20-20kHz, Direct Out @0dBu 1kHz)

#### Stereo Line Inputs

ST1, ST2 connector	Balanced, 1/4" TRS jack, half-normalled
ST3 connector	Unbalanced, stereo 3.5mm Mini Jack
Input Sensitivity (ST1, ST2 / ST3)	Nominal +4dBu / 0dBu
Trim	+/-24dB
Maximum Input Level (ST1,ST2 / ST3)	+22dBu / +18dBu
Input Impedance	>7kΩ

### Outputs

#### Mix1-10 and LR Out

	Balanced, XLR
Output Impedance	<75Ω
Nominal Output	+4dBu = 0dB meter reading
Maximum Output Level	+22dBu
Residual Output Noise	-90 dBu (muted, 20-20kHz)

#### Stereo Alt Out & 2Trk Out

Source (Alt Output / 2Trk Output)	Balanced, 1/4" TRS jack
Output Impedance	Patchable / LR post-fade
Nominal Output	<75Ω
Maximum Output Level	+4dBu = 0dB meter reading
Residual Output Noise	+22dBu
	-90 dBu (muted, 20-20kHz)

#### AES Digital Output

2 channel, 48kHz sampling rate, XLR  
2.5Vpp balanced terminated 110Ω

### dSNAKE

#### Inputs

#### Outputs

Remote source for CH1-32, ST1, ST2, ST3  
Patchable from Mix1-10, LR, Grp1-8, MTX1-4  
Compatible with AudioRacks AR2412, AR84, AB168  
Compatible with ME personal mixing system

### System

Dynamic Range	Measured balanced XLR in to XLR out, 0dB gain, 0dBu input
Frequency Response	112 dB
Headroom	+0/-0.5dB 20Hz to 20kHz
Internal operating Level	+18dB
	0dBu
dBFS Alignment	+18dBu = 0dBFS (+22dBu at XLR output)
Meter Calibration	0dB meter = -18dBFS (+4dBu at XLR out)
Meter Peak indication	-3dBFS (+19dBu at XLR out), multi-point sensing
Meter Signal indication	-48dBFS (-26dBu at XLR out)
Meter Type	Fast (peak) response

### Control

Faders	100mm motorised
Touch Screen Qu-16, 24	5" TFT, 800x480 resolution
SoftKeys	4
Mute Groups	4
DCA Groups	4
Network	TCP/IP Ethernet for MIDI and iPad app

### Input Processing

#### Source

CH1-32	Local, dSNAKE, or USB
ST1, ST2	Local, dSNAKE, or USB
ST3	Local, dSNAKE, or USB Stereo
USB Global Source	Qu-Drive or USB B Streaming

### Stereo Linking

Parameters linked	Odd/even input pairs EQ, dynamics, insert, delay, assignments, sends
Link options	Preamp, polarity, Sidechain, fader/mute, pan

### Polarity

### High Pass Filter Insert

	Normal/Reverse
	12dB/octave 20Hz – 2kHz
	Assign FX1-4 into Input channels

### Delay

	Up to 85ms
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### Gate

Threshold / Depth	Self-key Sidechain
Attack / Hold / Release	-72dBu to +18dBu / 0 to 60dB
	50us to 300ms / 10ms to 5s / 10ms to 1s

### PEQ

Band 1	4-Band fully parametric, 20-20kHz, +/- 15dB
Band 2, Band 3	Selectable LF Shelving (Baxandall), Bell
Band 4	Selectable HF Shelving (Baxandall), Bell
Bell Width	Non-constant Q, variable, 1.5 to 1/9th octave

### Compressor

Threshold / Ratio	Self-key Sidechain
Attack / Release	-46dBu to 18dBu / 1:1 to infinity
	300us – 300ms / 100ms - 2s

### Knee

	Soft/Hard
	Peak Manual, RMS Manual, SlowOpto, PunchBag

### Types

### Mix Processing

#### Channel Direct Out to USB

Source select (global)	Follow Fader, follow Mute (global options) Post-Preamp, Pre-EQ, Post-EQ, Post-Delay
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### Insert

Delay	Assign FX into Mix channels
	Up to 170ms

Sampling Rate ADC, DAC	48kHz +/-100PPM 24-bit Delta-Sigma	<b>GEQ</b>	Constant 1/3 oct, 28 bands 31Hz-16kHz, +/-12dB Gain
Latency	1.2 ms (local XLR in to XLR out) 0.7 ms (local XLR in to AES out)	<b>PEQ</b> Band 1 Band 2, Band 3	4-Band fully parametric, 20-20kHz, +/- 15dB Selectable LF Shelving (Baxandall), Bell Bell
Operating Temperature Range	0 deg C to 35 deg C (32 deg F to 95 deg F)	Band 4	Selectable HF Shelving (Baxandall), Bell Non-constant Q, variable, 1.5 to 1/9th octave
Mains Power Maximum Power Consumption	100-240V AC, 50/60Hz 82W	Bell Width	
<b>USB Audio</b>		<b>Compressor</b>	Self-key Sidechain
<b>Qu-Drive</b>	USB A	Threshold / Ratio	-46dBu to 18dBu / 1:1 to infinity
Stereo Record	2 channel, WAV, 48kHz, 24-bit, patchable	Attack / Release	300us – 300ms / 100ms - 2s
Stereo Playback	2 channel, WAV, 44.1 or 48kHz, 16 or 24-bit, to ST3	Knee	Soft/Hard
Multitrack Record	18 channel, WAV, 48kHz, 24-bit, patchable	Types	Peak Manual, RMS Manual, SlowOpto, PunchBag
Multitrack Playback	18 channel, WAV, 48kHz, 24-bit	<b>FX</b>	
		Internal FX	4x RackFX engine, Send>Return or Inserted
<b>USB Audio Streaming</b>	USB B, Core Audio compliant	<b>Audio Tools</b>	
Send (upstream)	24 channel, WAV, 48kHz, 24-bit	Types	Reverbs, Delays, Gated Reverb, ADT Chorus, Symphonic Chorus, Phaser, Flanger
Return (downstream)	22 channel, WAV, 48kHz, 24-bit	4 dedicated Stereo FX returns	Fader, Pan, Mute, Routing to Mix/LR, 4- Band PEQ
<b>Dimensions &amp; Weights</b>			
<b>Qu-16 Mixer</b>	Width x Depth x Height	<b>PAFL</b>	PFL or stereo in-place AFL, 0 to -24dB Trim, 85ms Delay
Desk mounted	440 x 500 x 186 mm  (17.4" x 19.7" x 7.4")	<b>Talkback</b>	Assignable to any mix, 12dB/oct HPF Assignable to any mix, Sine / White/Pink/Band-pass Noise
Rack mounted	483 x 472 x 190 mm  (19" x 18.6" x 7.5")	<b>Signal Generator</b>	
Packed in shipping box	610 x 680 x 350 mm (24" x 27" x 13.8")	<b>RTA</b>	31-Bands 1/3 octave 20-20kHz, follows PAFL source
Unpacked weight	10 kg (22 lbs)		
Packed weight	13.5 kg (30 lbs)		