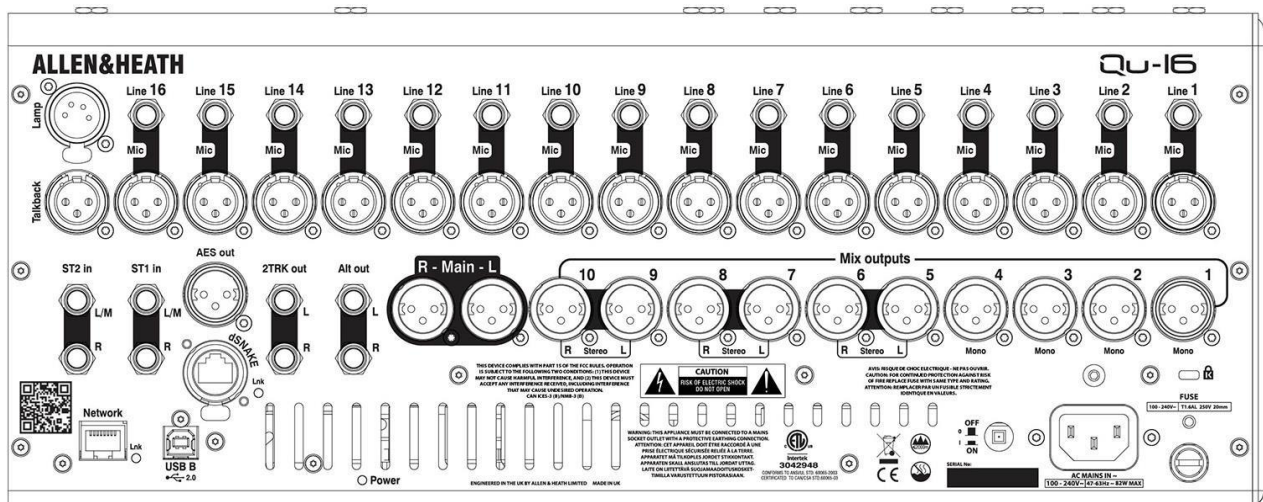
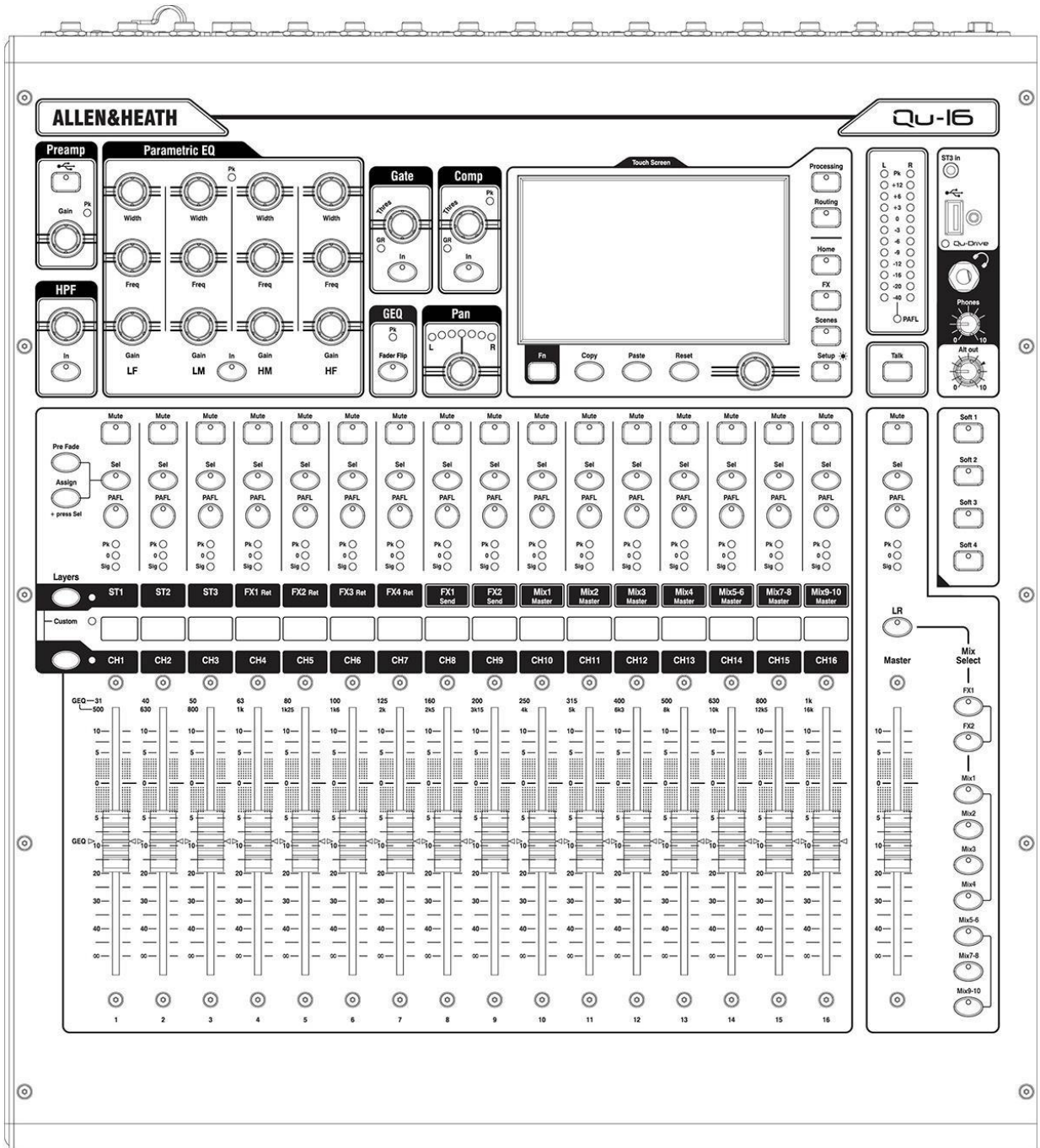


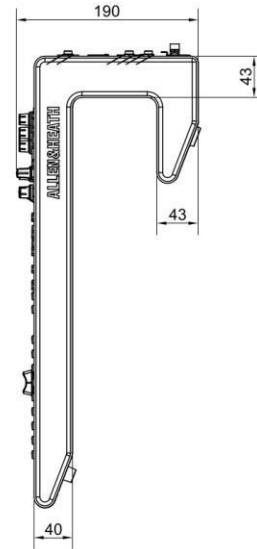
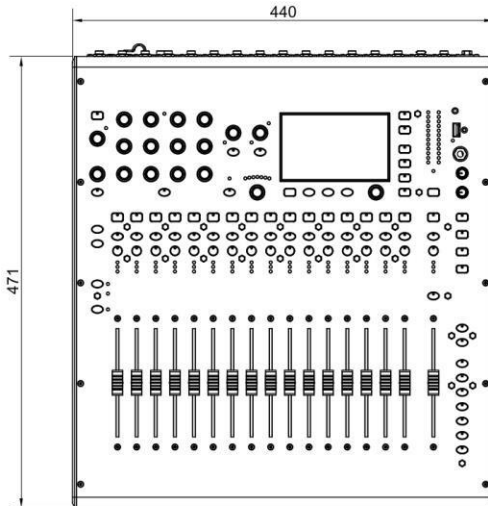
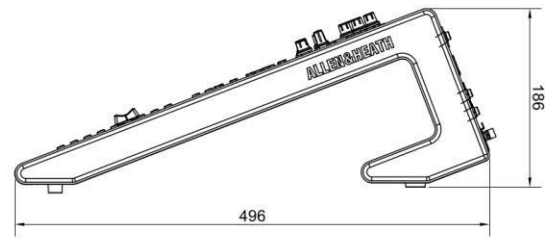
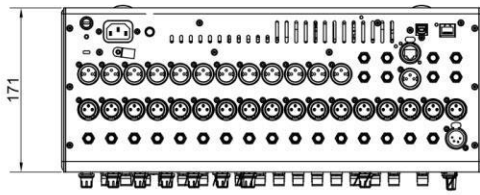
Technical Datasheet

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
- Automatic Mic Mixing
- Output processing – PEQ, Graphic EQ, Compressor, Delay
- 31 Band Real Time Analysis and Spectrogram
- 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.

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.

The mixer shall have a physical control per function following the select button for the input and output channels allowing for fast access to all key processing parameters.

The fader and rotary controls shall be of a high contrast colour to the mixer surface for excellent visibility during operation in low light conditions

The ability to assign channel on/off status to the current mix using the channel 'Mix' keys shall also 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.

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

An Automatic Mic Mixer shall be provided for automatic level control of up to 16 microphones using a constant gain sharing algorithm to dynamically adjust the gain for each mic in spoken word applications

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. 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.

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

Real Time Analysis metering shall include a spectrogram to allow for accurate monitoring of audio energy across the frequency spectrum over time for the purpose of feedback detection and correction of room acoustics.

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.

These applications 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.

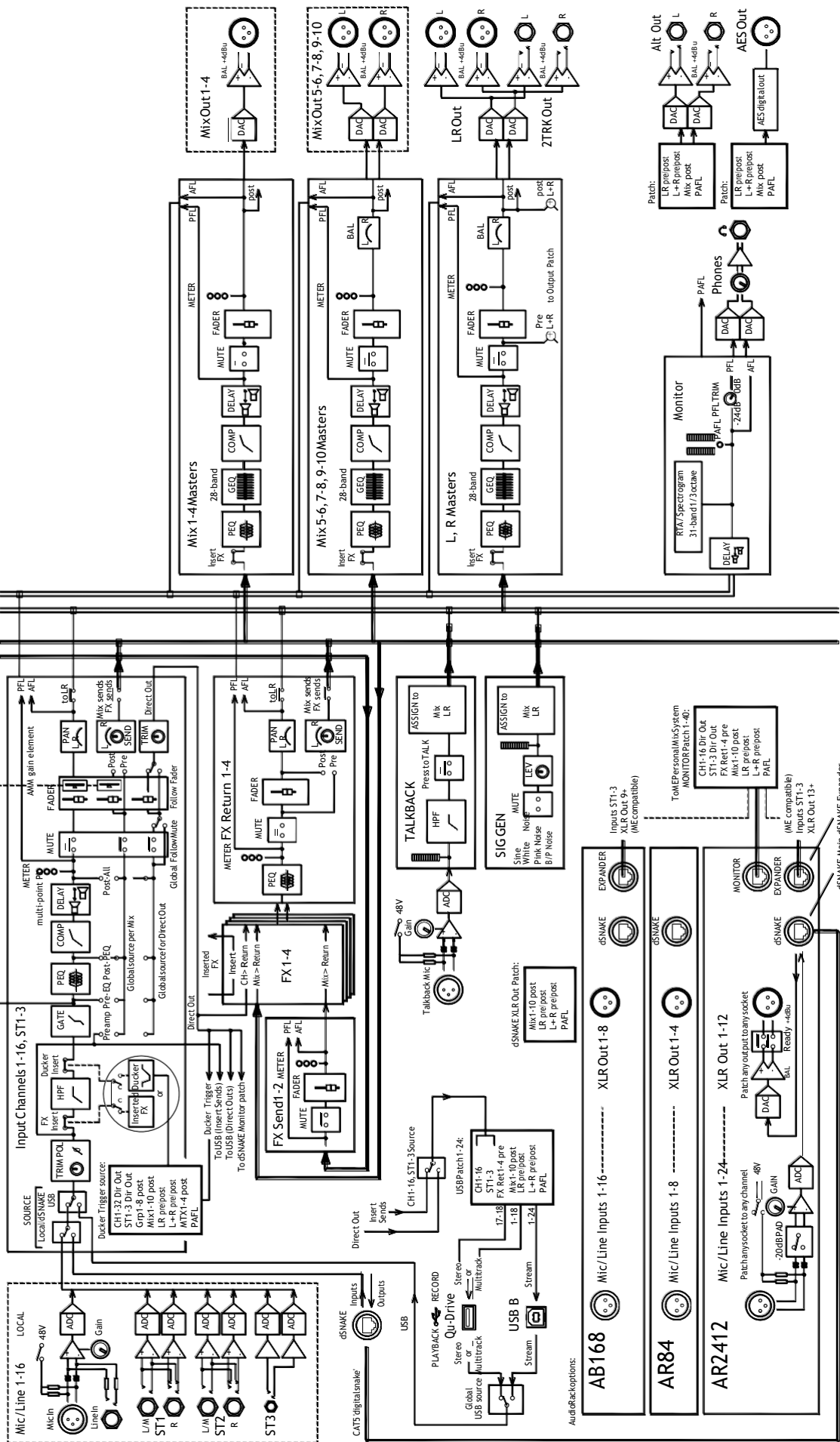
The mixing system shall periodically record all current settings and return the mixer to that state after reboot following a power-cycle.

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.

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

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

Qu-16 SYSTEM BLOCK DIAGRAM Firmware V1.8



Mixer Specifications

Inputs

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

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

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	>7k Ω

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

Outputs

Mix1-10 and LR Out	Balanced, XLR
Output Impedance	<75 Ω
Nominal Output	+4dBu = 0dB meter reading
Maximum Output Level	+22dBu
Residual Output Noise	-90 dBu (muted, 20-20kHz)

Stereo Linking

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

Stereo Alt Out & 2Trk Out

	Balanced, 1/4" TRS jack
Source (Alt Output / 2Trk Output)	Patchable / LR post-fade
Output Impedance	<75 Ω
Nominal Output	+4dBu = 0dB meter reading

Polarity

	Normal/Reverse
--	----------------

High Pass Filter

	12dB/octave 20Hz – 2kHz
--	-------------------------

Insert

	Assign FX1-4 into Input channels
--	----------------------------------

Delay

	Up to 85ms
--	------------

Gate

	Self-key Sidechain
--	--------------------

Threshold / Depth	-72dBu to +18dBu / 0 to 60dB
-------------------	------------------------------

Maximum Output Level	+22dBu	Attack / Hold / Release	50us to 300ms / 10ms to 5s / 10ms to 1s
Residual Output Noise	-90 dBu (muted, 20-20kHz)		
AES Digital Output	2 channel, 48kHz sampling rate, XLR 2.5Vpp balanced terminated 110Ω	PEQ Band 1 Band 2, Band 3 Band 4	4-Band fully parametric, 20-20kHz, +/- 15dB Selectable LF Shelving (Baxandall), Bell Bell Selectable HF Shelving (Baxandall), Bell
dSNAKE			
Inputs	Remote source for CH1-32, ST1, ST2, ST3	Bell Width	Non-constant Q, variable, 1.5 to 1/9th octave
Outputs	Patchable from Mix1-10, LR, Grp1-8, MTX1-4 Compatible with AudioRacks AR2412, AR84, AB168 Compatible with ME personal mixing system	Compressor Threshold / Ratio Attack / Release	Self-key Sidechain -46dBu to 18dBu / 1:1 to infinity 300us – 300ms / 100ms - 2s
System	Measured balanced XLR in to XLR out, 0dB gain, 0dBu input	Knee	Soft/Hard
Dynamic Range	112 dB	Types	Peak Manual, RMS Manual, SlowOpto, PunchBag
Frequency Response	+0/-0.5dB 20Hz to 20kHz		
Headroom	+18dB		
Internal operating Level	0dBu	Mix Processing	
dBFS Alignment	+18dBu = 0dBFS (+22dBu at XLR output)	Channel Direct Out to USB	Follow Fader, follow Mute (global options)
Meter Calibration	0dB meter = -18dBFS (+4dBu at XLR out)	Source select (global)	Post-Preamp, Pre-EQ, Post-EQ, Post-Delay
Meter Peak indication	-3dBFS (+19dBu at XLR out), multi-point sensing		
Meter Signal indication	-48dBFS (-26dBu at XLR out)	Insert	Assign FX into Mix channels
Meter Type	Fast (peak) response	Delay	Up to 170ms
Sampling Rate	48kHz +/-100PPM	GEQ	Constant 1/3 oct, 28 bands 31Hz-16kHz, +/-12dB Gain
ADC, DAC	24-bit Delta-Sigma		
Latency	1.2 ms (local XLR in to XLR out) 0.7 ms (local XLR in to AES out)	PEQ Band 1	4-Band fully parametric, 20-20kHz, +/- 15dB Selectable LF Shelving (Baxandall), Bell

		Band 2, Band 3	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
Mains Power	100-240V AC, 50/60Hz	Bell Width	Non-constant Q, variable, 1.5 to 1/9th octave
Maximum Power Consumption	82W		
USB Audio		Compressor	Self-key Sidechain
Qu-Drive	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	FX	
		Internal FX	4x RackFX engine, Send>Return or Inserted
USB Audio Streaming	USB B, Core Audio compliant	Audio Tools	
Send (upstream)	24 channel, WAV, 48kHz, 24-bit	Types	Reverbs, Delays, Gated Reverb, ADT
Return (downstream)	22 channel, WAV, 48kHz, 24-bit		Chorus, Symphonic Chorus, Phaser, Flanger
		4 dedicated Stereo FX returns	Fader, Pan, Mute, Routing to Mix/LR, 4-Band PEQ
Dimensions & Weights			
Qu-16 Mixer	Width x Depth x Height	PAFL	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")	Talkback	Assignable to any mix, 12dB/oct HPF
Rack mounted	483 x 472 x 190 mm (19" x 18.6" x 7.5")	Signal Generator	Assignable to any mix, Sine / White/Pink/Band-pass Noise
Packed in shipping box	610 x 680 x 350 mm (24" x 27" x 13.8")	RTA	31-Bands 1/3 octave 20-20kHz, follows PAFL source
Unpacked weight	10 kg (22 lbs)		