

QU-16

RACKMOUNTABLE DIGITAL MIXER
FOR LIVE, STUDIO AND INSTALLATION

16 MONO INPUTS	USB AUDIO STREAMING
3 STEREO INPUTS	DAW MIDI CONTROL
4 STEREO FX RETURNS	4 MUTE GROUPS
16 BUSES	4 FX ENGINES
12 MIX OUTPUTS	19" RACK MOUNTABLE
AES DIGITAL OUT	



ALLEN & HEATH

Introducing the New Compact Digital Mixer from Allen & Heath

We have been creating high end mixing consoles for some of the most discerning ears in the business since 1969. We're not a software house, we don't make stomp boxes or cable testers – creating excellent mixers is, has been and always will be our great passion. Qu-16 has been designed by our in-house research and development team in Cornwall, Great Britain, and is a direct descendent of the GLD and iLive digital mixing systems that have earned the industry's respect night after night on tour and in live venues across the globe – so you can be confident that you're standing behind a premium mixer that looks, feels, and sounds like a pro.

Qu-16 harnesses the full potential of digital mixing technology, with total recall of settings (including the all-important fader position and preamp gain), convenient recording and playback solutions, iPad control, personal monitoring options and the choice of local or remote Cat5 I/O.

AnalogiQ™ Preamps

Qu-16's sixteen AnalogiQ™ total recall preamps feature zero crossing detection and an advanced padless 1dB step gain stage, closely allied to the DSP for optimal gain accuracy and audio transparency. The analogue signal is captured by high class, low latency 24bit analogue to digital converters matched to high quality 24bit digital to analogue converters to deliver the required outputs. The AnalogiQ™ design has been refined over many months to offer superb transparency, minimal distortion and an ultra-low noise floor, with a warm, musical sound that is missing from some digital consoles.

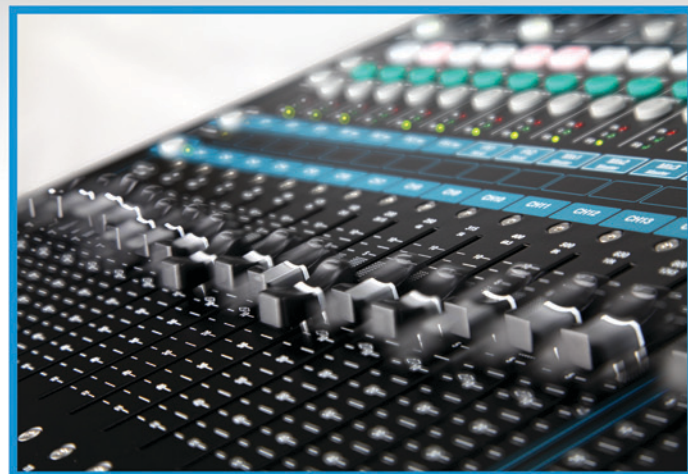
The Mixing Experience

Having massive processing power and advanced functionality is great, but it counts for nothing if you can't access the controls you need in a heartbeat. Once you start using Qu-16 you'll sense the years of research into ergonomics and the hands-on mixing experience that our team has drawn upon to deliver a wonderfully natural layout and workflow. It's not about recreating an analogue interface, it's about creating an experience that's fluid, comfortable and intuitive for novices, digital natives and old school road warriors alike, making all the benefits of digital mixing technology readily accessible to all.



Touch Control

The 800 x 480, sixteen million colour Touchscreen and its dedicated data encoder form the heart of the Qu-16 interface, providing super-fast, easy access to all settings. The user-friendly interface has been designed with clarity in mind. Dedicated keys and screen tabs quickly guide you to meter and RTA views, FX racks, channel processing, USB audio control, scenes, setup menus and much more.



Fader Automation

Moving faders started as an expensive option in the studio desks of the 80s, and later became the norm with the advent of digital technology. Nevertheless some entry-level digital mixers lack this precious commodity which is a fundamental part of the Total Recall approach. Fader automation is essential for rapid mixing, especially when you're dealing with multiple monitor mixes – just press a mix key and the faders immediately fly to the send levels for that mix.

Qu-16 features 17 motorized ALPS faders, 16 arranged over 2 layers, allowing instant access to all channels and masters in a compact space, plus a dedicated master fader which dynamically follows the mix selection. A third, Custom layer is available for ad-hoc user strip layout, where any combination of Inputs, FX Sends, FX Returns and Mix masters can be assigned.

The SuperStrip

All your key processing tools are presented in a clean layout on the SuperStrip, with 1 function per physical control. The SuperStrip is complemented by an onscreen Touch Channel for intuitive access to full processing parameters without clutter or complex menu structures. Processing for Mono and Stereo inputs includes trim, polarity, HPF, gate, insert, 4 band PEQ, compressor and delay. The main LR and the Mono mixes have controls for Insert, 1/3 octave GEQ, compressor and delay. The Stereo mixes provide Insert, 4-band PEQ, compressor, delay and balance control.



iLive FX



Qu-16's dynamics and FX algorithms are derived from the FX used in our iLive pro touring series. Some of the world's most respected audio engineers have chosen to use iLive's FX on tour in preference to top-end plug-ins and external FX units. Qu-16 boasts 4 stereo iLive FX engines, featuring lovingly crafted emulations of legendary classic reverbs, gated reverbs, delays, modulators, flangers and more. The FX library has the ability to grow with future firmware releases. FX are returned to the mix on dedicated return channels, so you're not tying up your mono and stereo input channels. Each Stereo FX Return has a dedicated 4 band PEQ.

Qu-Pad

Add the Qu-Pad iPad app to your Qu-16 setup and you're free to adjust the monitors on stage, roam around the venue whilst tweaking the PA, and then mix the show from the heart of the audience. Qu-Pad connects to the mixer over Wi-Fi* and gives instant access to all live mixing parameters and settings.

*Requires the connection of a Wi-Fi router or access point to the Qu-16 Network port.



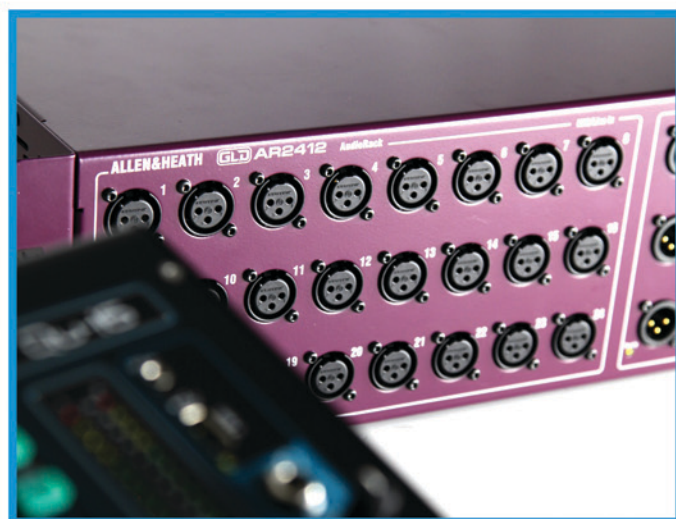
ME Personal Mixing System

Qu-16 is fully compatible with our ME Personal Mixing System. Any number of ME-1 personal mixers can be chained from the dSNAKE port (or from an AR2412 Stagebox if you've got one connected to the dSNAKE port). Each performer can be given tailored control over their own mix, leaving the engineer free to focus on the audience experience. Find out more at allen-heath.com/ME



dSNAKE

Qu-16 is a self-contained mixer, so if you've already got the analogue cables you're good to go. If you're thinking of trading in the copper multicore for a Cat5 digital snake, Qu-16's dSNAKE port has you future-proofed, allowing connection to a remote AR2412 or AR84 Stagebox. dSNAKE is our proprietary networking solution, boasting a transport latency of only 105us over cable runs of up to 120m / 390'. So if you're mixing FoH you can place your I/O on the stage and run a single Cat5 cable back to the Qu-16 in the mix position.



Accessories

AR2412 – 24 inputs, 12 outputs AudioRack with dSNAKE connection and expansion port for personal monitoring.

AR84 – 8 inputs, 4 outputs AudioRack with dSNAKE connection.

AH7000 – 80m drum of Neutrik EtherFlex Cat5 with locking connectors.

AH8721 – 120m drum of Klotz Cat5 with locking connectors.

LEDLamp – variable brightness 18" gooseneck lamp.

QU-16-RK19 – Rack mounting kit.

Total Recall

True digital mixing is about being able to save and recall scenes (snapshots) at the press of a button. Qu-16 can store up to 100 full Scenes for recall at will. Channels and mixes can be made Safe from Scene recall. For example, if an instrument or mic gets swapped out after the soundcheck, the channel can be made safe to avoid settings being overridden by Scene recalls. Or if a broadcast feed or walk-in iPod is added last-minute before the show kicks off, that mix or channel can be made safe from any scene change. In addition, single parameter updates can be blocked using per scene Recall Filters or a Global Recall Filter. So if you tweak the graphic EQ to reflect the room response when the audience gets in, you can block this to prevent any overwriting at scene change.

Custom settings for each EQ, compressor, channel or FX can be saved as Library presets. This lets you store your tried and tested SM58 EQ or reverb pattern and apply it to other channels or shows. Libraries, Scenes and the complete Show configuration can be saved to a USB key, so you can carry the show with you, ready to use on another Qu-16.

Qu-Drive

Forget soundcard drivers and software setup, Qu-16 has an integrated multitrack USB recorder, providing 18 channels of 48kHz 24bit recording and playback straight to / from your USB hard drive. Capturing multitrack recordings of your shows has never been so easy.



A selectable stereo pair can be recorded alongside the 16 Mono channels, and multitrack audio can be played back to the 16 Mono channels plus ST1.

On top of this, Qu-Drive also provides stereo recording, patchable from any pair of Mix outputs, the Main LR (pre, post, or summed to mono) or even the PAFL bus, with 2-track stereo playback to ST3.

USB Audio Streaming

Qu-16's built-in interface streams multitrack audio to your Mac channel 1 to 16, the Main LR mix and 3 selectable stereo pairs.



The returns from the Mac can be assigned to the 16 Mono channels plus stereos.

The interface is class-compliant on Mac OS X – which means it's truly plug 'n play, with no need to install a driver. It will be recognized straightaway by any DAW supporting Core Audio, including Logic, Cubase, Reaper, and Pro Tools.

Standard MIDI control is tunnelled over the USB connection so you can easily map the faders to the tracks of your favourite DAW. Alternatively, a MIDI driver is available for use with the Ethernet port.

Applications

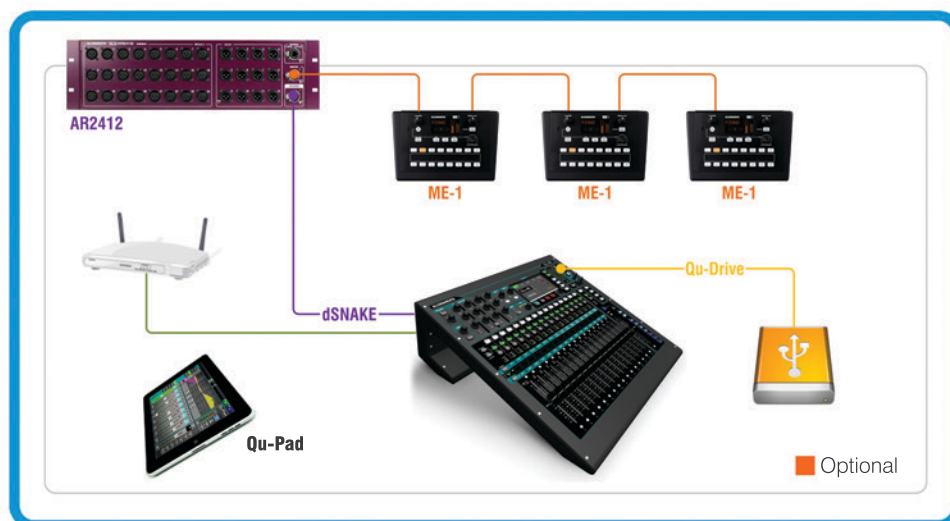


Live

Qu-16 with traditional analogue multicore from stage and direct recording on USB media.

Studio

Qu-16 as tracking mixer, soundcard, DAW controller and monitor router, plus optional ME-1s for personal cue foldback to recording room.



Live with Remote Audio

Qu-16 with dSNAKE Cat5 digital snake connection to an AR2412 Audio Rack, direct recording on USB media, iPad wireless control and optional ME-1s for personal monitoring on stage.

ARMed to the Hilt

Qu-16 is equipped with 5 cores of high efficiency ARM core processing, with dedicated ARM cores running the touchscreen display and surface, USB streaming, Qu-Drive multi-channel USB recording / playback, Ethernet and fader automation. Between them the ARM cores provide state-of-the-art processing, working in parallel to deliver extensive control, instant-on operation, and lightning-fast response.

The mixer's DSP farm exploits next-generation dual core DSPs, giving 10 DSP cores, with 8 dedicated to the channel and mix processing alone. With so much DSP power under the hood the channel processing is only using a fraction of capacity, so Qu-16 is future-proofed, with ample room for updates and extra functionality.

The Qu-16 DSP architecture employs varied bit depths, tailored to specific algorithms, with 48 bits on critical EQ functions and a 56 bit accumulator on the mix bus where it really counts, allowing every nuance of the audio to be captured in the final mix.

The Shape of Things to Come

Made from 18 gauge, cold-rolled Zintec steel, Qu-16's distinctive frame is designed for strength, rigidity and ease of rack mounting. We've done unspeakable things to that chassis in the lab and it's taken everything we've thrown at it – even being stomped on by our resident ex-tank crewman.

Silence is a precious commodity in the live or studio environment, which is why nobody wants those moments of stillness ruined by the whirring of fans coming from the mix position. Qu-16's sleek profile generates optimal airflow through the mixer, eliminating the need for any fans.

The shape has some unexpected benefits too. When we started taking Qu-16 out to gigs we soon found the space beneath it incredibly useful for keeping our USB drive, talkback mic, cue sheet and other clutter tucked out of the way. We've even had engineers hanging the mixer from a handy scaffold bar and mixing vertically.



Technical Specifications

Inputs Mic/Line Inputs 1-16

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

Stereo Line Inputs

ST1, ST2 connector	Balanced, 1/4" TRS jack, half normalised
ST3 connector	Unbalanced, 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 Outputs

Output Impedance	Balanced, XLR
Nominal Output	<75Ω
Maximum Output Level	+4dBu = 0dB meter reading
Residual Output Noise	+22dBu
	-91 dBu (muted, 20-20kHz)

Stereo Alt Output & 2Trk Output

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
	-91 dBu (muted, 20-20kHz)

AES Digital Output

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

dSNAKE Inputs

Inputs	Remote source for CH1-16, ST1, ST2, ST3
Outputs	Remote outputs for Mix1-10, LR
	Compatible with AudioRacks AR2412, AR84
	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
dBFS Alignment	0dBu
Meter Calibration	+18dBu = 0dBFS (+22dBu at XLR output)
Meter Peak Indication	0dB meter = -18dBFS (+4dBu at XLR out)
Meter Signal Indication	-3dBFS (+19dBu at XLR out), multi-point sensing
Meter Type	-48dBFS (-26dBu at XLR out)
	Fast (peak) response
Sampling Rate	48kHz +/-100PPM
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)
Operating Temperature Range	0 deg C to 35 deg C (32 deg F to 95 deg F)
Mains Power	100-240V AC, 50/60Hz, 82W max

USB Audio Qu-Drive

Device	USB A
	USB hard drive recommended for recording
	USB hard drive must be used for Multitrack
Stereo Record	2 channel, WAV, 48kHz, 24-bit, patchable
Stereo Playback	2 channel, WAV, 44.1 or 48kHz, 16 or 24-bit, to ST3
Multitrack Record	18 channel, WAV, 48kHz, 24-bit, CH1-16 + patchable pair
Multitrack Playback	18 channel, WAV, 48kHz, 24-bit, CH1-16, ST1
USB Interface	USB B, Core Audio compliant
Send (upstream)	Multi channel, WAV, 48kHz, 24-bit
Return (downstream)	Multi channel, WAV, 48kHz, 24-bit

Dimensions Qu-16 Mixer

& Weights

Desk mounted	Width x Depth x Height
Rack mounted	440 x 500 x 186 mm (17.4" x 19.7" x 7.4")
Packed in shipping box	11U, 483 x 486 x 190 mm (19" x 19.1" x 7.5")
Packed weight	610 x 680 x 380 mm (24" x 27" x 15")
Unpacked weight	13.5 kg (30 lbs)
	10 kg (22 lbs)

Control

Faders	100mm motorised
Touch Screen	5" TFT, 800x480 resolution
SoftKeys	4
Mute Groups	4
Network	TCP/IP Ethernet for iPad app

Input Source

Processing	CH1-16
	ST1, ST2
	ST3
	Local, Remote, USB
	Local, Remote, USB
	Local, Remote, USB

Stereo Linking

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

Polarity

	Normal/Reverse
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High Pass Filter

	12dB/octave 20Hz - 2kHz
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Insert

	Assign FX into input channels
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Delay

	Up to 85ms
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Gate

	Self key Sidechain
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Threshold / Depth

	-72dBu to +18dBu / 0 to 60dB
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Attack / Hold / Release

	50us to 300ms / 10ms to 5s / 10ms to 1s
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PEQ

	4-Band fully parametric, 20-20kHz, +/-15dB
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Band 1

	Selectable LF Shelving (Baxandall), Bell
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Band 2, Band 3

	Bell
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Band 4

	Selectable HF Shelving (Baxandall), Bell
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Bell Width

	Non-constant Q, variable, 1.5 to 1/9th octave
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Compressor

	Self key Sidechain
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Threshold / Ratio

	-46dBu to 18dBu / 1:1 to infinity
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Attack / Release

	300us - 300ms / 100ms - 2s
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Knee

	Soft/Hard
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Types

	Peak Manual, RMS Manual, SlowOpto, PunchBag
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Channel Direct Out to USB

	Follow Fader, follow Mute (global options)
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Source select (global)

	Post-Preamp, Pre-EQ, Post-EQ, Post-Delay
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Mix Insert

	Assign FX into Mix channels
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Processing Delay

	Up to 170ms
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GEQ (Mix 1-4, LR)

	Constant 1/3 oct, 28 bands 31Hz-16kHz, +/-12dB Gain
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PEQ (Stereo Mix 1-3)

	4-Band fully parametric, 20-20kHz, +/-15dB
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Band 1

	Selectable LF Shelving (Baxandall), Bell
--	--

Band 2, Band 3

	Bell
--	------

Band 4

	Selectable HF Shelving (Baxandall), Bell
--	--

Bell Width

	Non-constant Q, variable, 1.5 to 1/9th octave
--	---

Compressor

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

Threshold / Ratio

	-46dBu to 18dBu / 1:1 to infinity
--	-----------------------------------

Attack / Release

	300us - 300ms / 100ms - 2s
--	----------------------------

Knee

	Soft/Hard
--	-----------

Types

	Peak Manual, RMS Manual, SlowOpto, PunchBag
--	---

FX Internal FX

	4x RackFX engine, Send>Return or Inserted
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Types

	Reverbs, Delays, Gated Reverb, ADT
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	Chorus, Symphonic Chorus, Phaser, Flanger
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	Fader, Pan, Mute, Routing to Mix/LR, 4-Band PEQ
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	4 dedicated Stereo FX returns
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Audio Tools PAFL

Talkback

Signal Generator

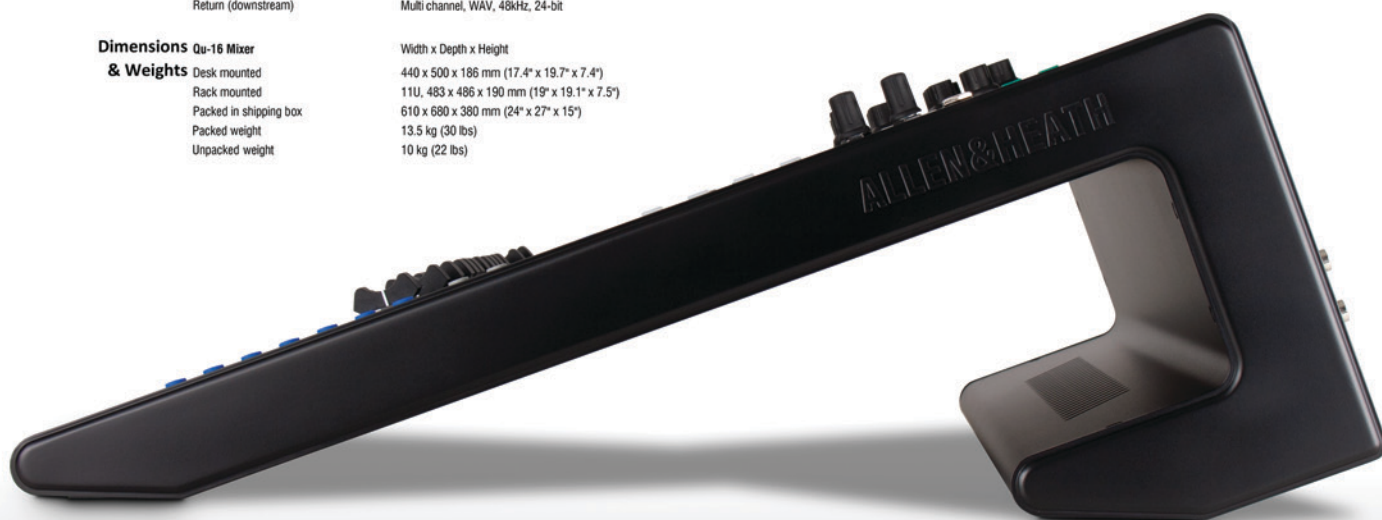
RTA

	PFL or stereo in-place AFL, 0 to -24dB Trim, 85ms Delay
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	Assignable to any mix, 12dB/oct HPF
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	Assignable to any mix, Sine / White/Pink/Bandpass Noise
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	31-Bands 1/3 octave 20-20kHz, follows PAFL source
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Quickly access preamp gain, HPF frequency, PEQ settings, gate & compressor threshold, and PAN. The Source key toggles between analogue inputs or USB.

GEO Flip toggles the faders to Graphic EQ sliders.

Copy, Paste or Reset any section of processing or a whole channel or mix. The Fn (Function) key brings up a popup page relevant to the current screen.

Fader strips with Mute, Select, PAFL switches, signal meter, and 100mm motorised fader. Access all the processing for each strip with Sel. The Peak indicators are multi-point – they are triggered by any signal clip in the channel path.

16 faders in 3 layers give access to all channels and masters in a compact space. Assign any combination of Inputs, FX sends, FX returns and Mix masters to the Custom layer.

ST3 Mini-jack stereo input for portable devices.

Qu-Drive multitrack / stereo recording and playback, data transfer, archiving and firmware update.

5" 800x480 colour touchscreen with dedicated navigation keys and rotary encoder.

4 user-assignable SoftKeys for scene recall, mutes, tap tempo and more.

Access mix sends on faders with the dedicated Mix keys.



- 1 Balanced Stereo Inputs
- 2 Ethernet network port for remote / wi-fi control
- 3 dSNAKE™ Remote Audio port for digital snake and personal monitoring
- 4 USB audio streaming, class-compliant on Mac

- 5 All 12 Mix outputs on XLR
- 6 2TRK Out
- 7 Patchable Alt Out
- 8 AES digital stereo output
- 9 Dedicated Talkback preamp

