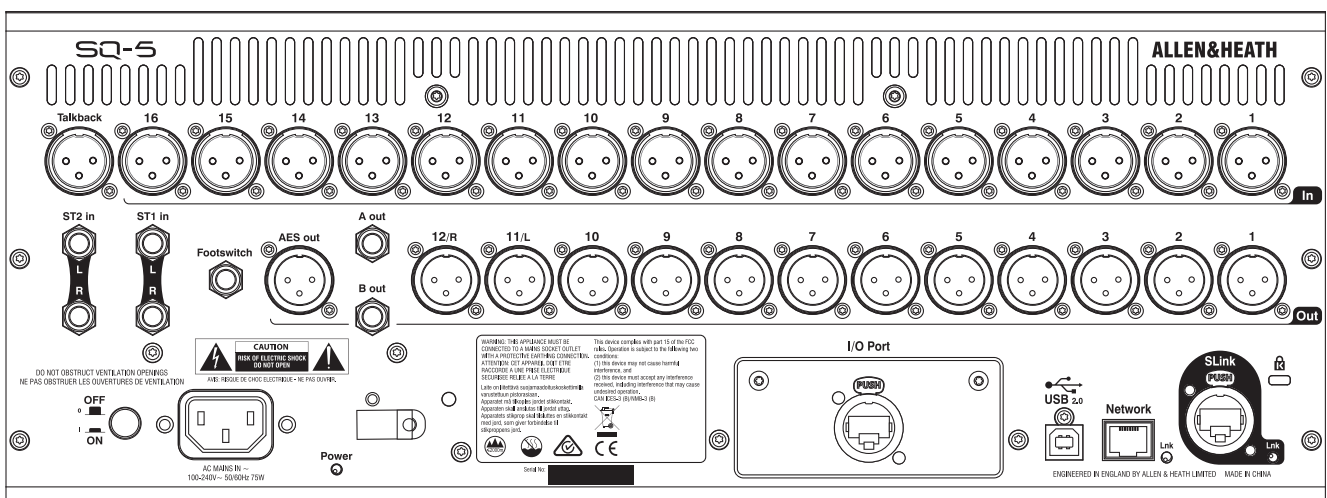
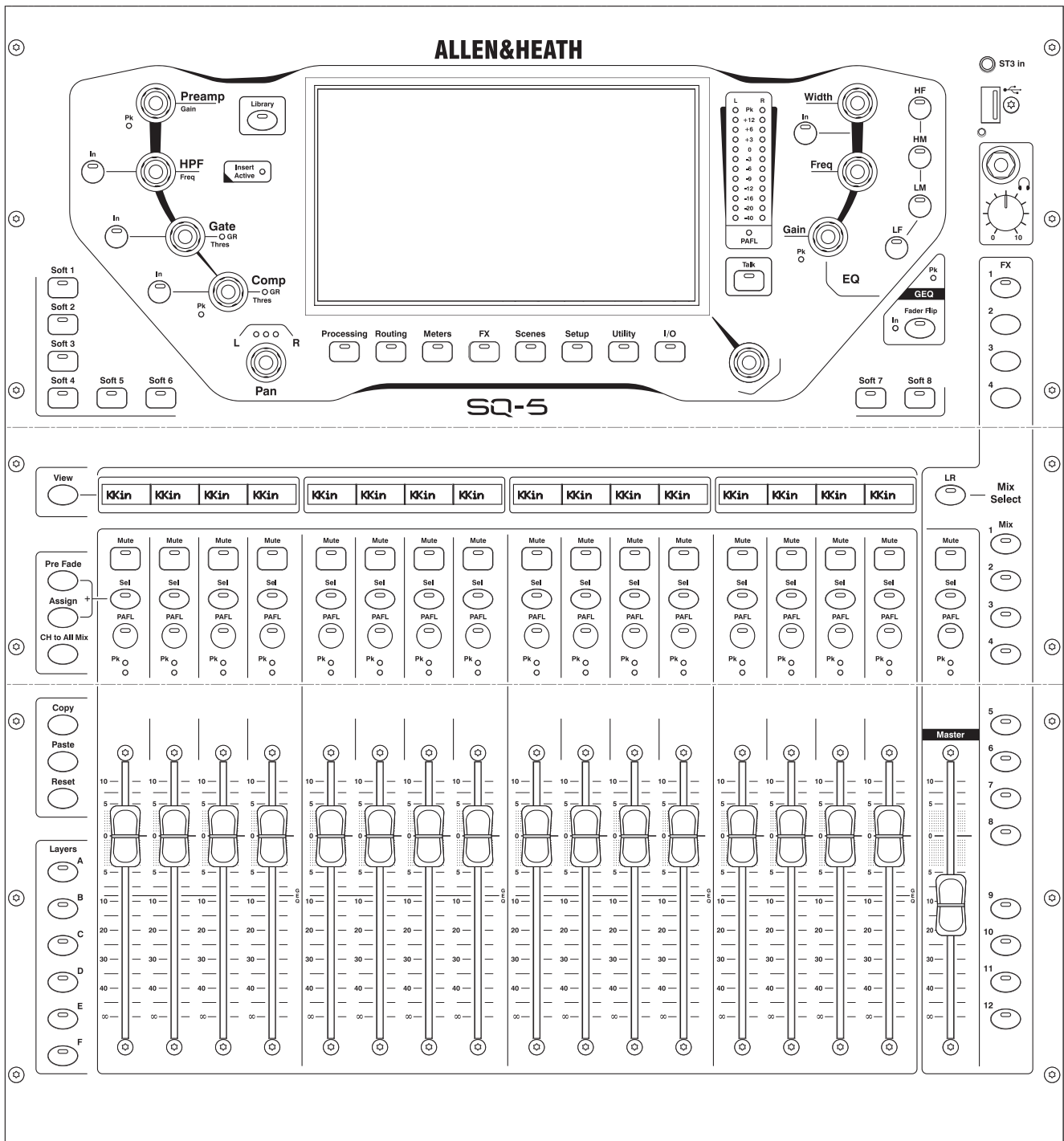


## Technical Datasheet

### Overview

- Rack-mountable Digital Mixer for Live, Studio and Installation
- 48 Input Channels
- 16 Local Mic Inputs (XLR)
- 2 1/4" Stereo Inputs (TRS)
- 1 3.5mm Stereo Input
- 36 Total Busses
- 12 Stereo Mix (Aux or Group) + Main
- PAFL Bus
- 14 Assignable Local Outputs (12 XLR + 2 1/4" TRS)
- AES Digital Output
- Dedicated Talkback mic input (XLR)
- 1/4" TRS Headphone out with dedicated control
- SLink EtherCON connection for remote audio using dSnake, DX or gigaACE protocol (64x64 channels)
- I/O Port for Option Card (including 3rd party protocols – Dante/Waves)
- 8 Mute Groups
- 8 DCA Groups
- 8 Stereo FX with dedicated FX Returns
- DEEP Processing Ready
- RackFX Effects suite
- 7" colour touchscreen
- 8 Assignable SoftKeys
- Dedicated physical controls for channel processing (Gain, HPF Frequency, Gate Threshold, Compressor Threshold, Pan, EQ Gain/Frequency/Width)
- 16+1 Faders with 6 Layers for 96 assignable Channel Strips
- Motorised faders for sends on faders, GEQ fader flip and mix recall
- 16 Backlit LCD Channel Strip displays
- Single Point Metering
- Integrated Surface Illumination
- Single/Dual Footswitch Control
- Input channel linking for stereo sources
- Patchable Insert points
- Input processing – Preamp, HPF, Gate, PEQ, Compressor, Delay
- Output processing – PEQ, Graphic EQ, Compressor, Delay
- Automatic Mic Mixing
- 31 Band Real Time Analyser
- Quick copy/paste/reset for parameters
- User Permissions to restrict operator access
- 300 Scene memories per show
- Channel Safes, Global and per Scene Recall Filters
- FX, processing and channel Libraries
- SQ-Drive for stereo and multitrack recording/playback direct to USB drive
- USB transfer of Scenes, Libraries, Shows
- 32x32 channel USB streaming to/from Mac/PC
- DAW Control driver for MIDI control via USB or TCP/IP
- Wireless remote mixing apps for iPad and Android
- Compatible with ME personal monitoring range





### A&E Specifications

The mixer shall be a compact, rack-mountable digital mixer built around a 96kHz XCVI FPGA core with 48 input channels mixing to LR and 12 stereo mix outputs.

The surface shall include 17 moving faders with 6 layers, each layer having dedicated keys, giving easy access to input channels, mixes, FX sends, FX returns, DCA masters and MIDI control.

Each fader strip shall have dedicated PAFL, Select, and Mute buttons with indicators, a variable LED meter, a peak indicator LED and variable colour backlit LCD display.

There shall be dedicated physical controls which allow for adjustment of key processing parameters, and which follow the select button for the input and output channels.

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 rotary controls shall also be illuminated to indicate function and availability for use.

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

Surface illumination shall be integrated into the bodywork of the mixer.

Local analogue inputs shall use balanced XLR sockets and connect to fully recallable digitally controlled preamplifiers. These shall be able to provide up to +60dB of gain, industry standard 48V phantom power, and include a switchable -20dB Pad to allow a maximum input level of +30dBu.

Local analogue outputs shall be provided on 12 XLR sockets and 2 balanced TRS ¼ inch Jack sockets. These will have a nominal line output of +4dBu and a maximum output of +22dBu.

There shall be a local “SLink” Ethernet audio expansion port with locking EtherCON connector, supporting multiple AoIP protocols and providing access to 64x64 digital channels, connected over a single cable ‘digital snake’ and allowing remote preamp control of Allen & Heath Remote Audio Units, as well as connection to Allen & Heath ME Personal Mixing Systems.

A digital I/O Port shall be provided to accept optional cards, supporting 64x64 channels and the ability to interface with 3<sup>rd</sup> party AoIP protocols such as Dante and Waves.

All input and output processing, routing options and system configuration shall be accessed and adjusted via a 7-inch colour touchscreen and associated dedicated rotary control.

8 user-assignable SoftKeys with variable colour LED illumination shall be provided for quick access to Input/Mix/DCA/Group Mutes, Tap Tempo, Scene Controls, MMC and SQ-Drive Controls.

A footswitch connection shall be provided to allow assignable control from an optional single or dual footswitch.

There shall be dedicated keys for quick Copy/Paste/Reset of processing parameters and mixes.

The ability to assign channel on/off status and to switch between Pre/Post fade to the currently selected mix shall also be provided with dedicated keys.

All input channels shall contain the following processing: Polarity, Trim, Insert, Gate, High Pass Filter, Parametric EQ, Compressor, Delay, Pan.

All FX Return channels shall contain the following: Parametric EQ, Pan.

All output mix channels shall contain the following processing: External input, Polarity, Trim, Insert, Parametric EQ, and Graphic EQ with RTA and fader-flip mode, Compressor, Delay, Balance.

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

The mixer will allow the insertion of Allen & Heath DEEP processing models to channels, without affecting latency or processing abilities.

8 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.

There shall be 8 DCA groups and 8 Mute groups.

An Automatic Mic Mixer shall be provided for automatic and dynamic adjustment of gain in spoken word applications.

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 to follow Fader, DCA and Mute. Direct outputs shall be assignable via the mixer soft patch bay.

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 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. 12-LED bar meters on the surface shall indicate the Main mix bus level and the PAFL signal shall override the LR meters accompanied by a PAFL-active indicator.

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

There shall be a USB Type-A connector on the surface for stereo/multitrack recording/playback, data-transfer, archiving, and firmware updates direct to USB drives. On the rear panel there shall be a USB-B connection following the USB 2.0 standard for multi-channel, bi-directional audio streaming 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.

Stereo digital output shall be provided on XLR following the AES/EBU standard and with switchable sample rates.

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, and the mixing system shall include application software for tablet and phone devices connected via a wireless network router to the LAN port.

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. All library items shall be 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 300 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.

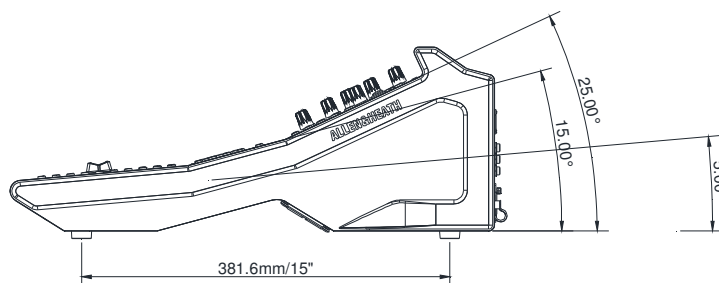
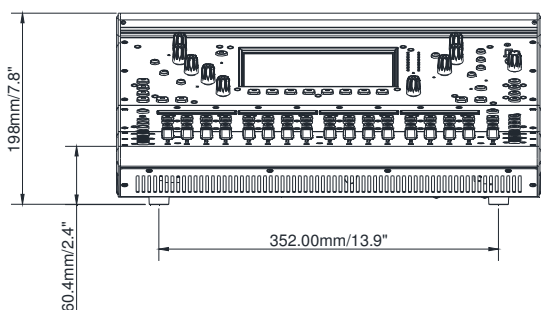
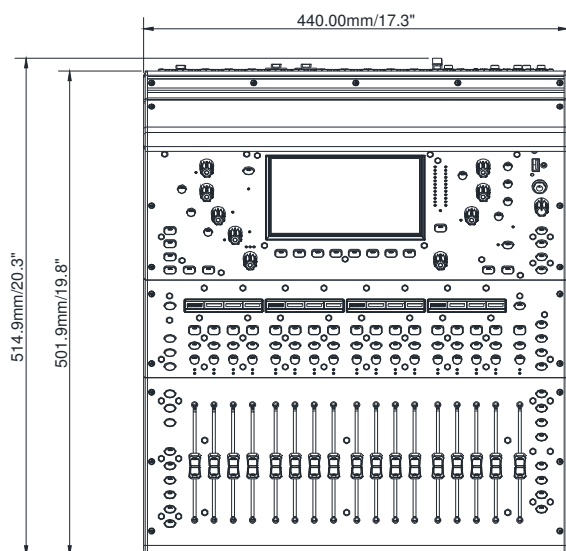
The mixing system shall periodically record all current settings and return the mixer to that state after reboot following a power-cycle.

The mixing control surface shall have a built in power supply accepting AC mains voltages of 100~240V, 50/60 Hz, 75W 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 SQ-5.

## Dimensions

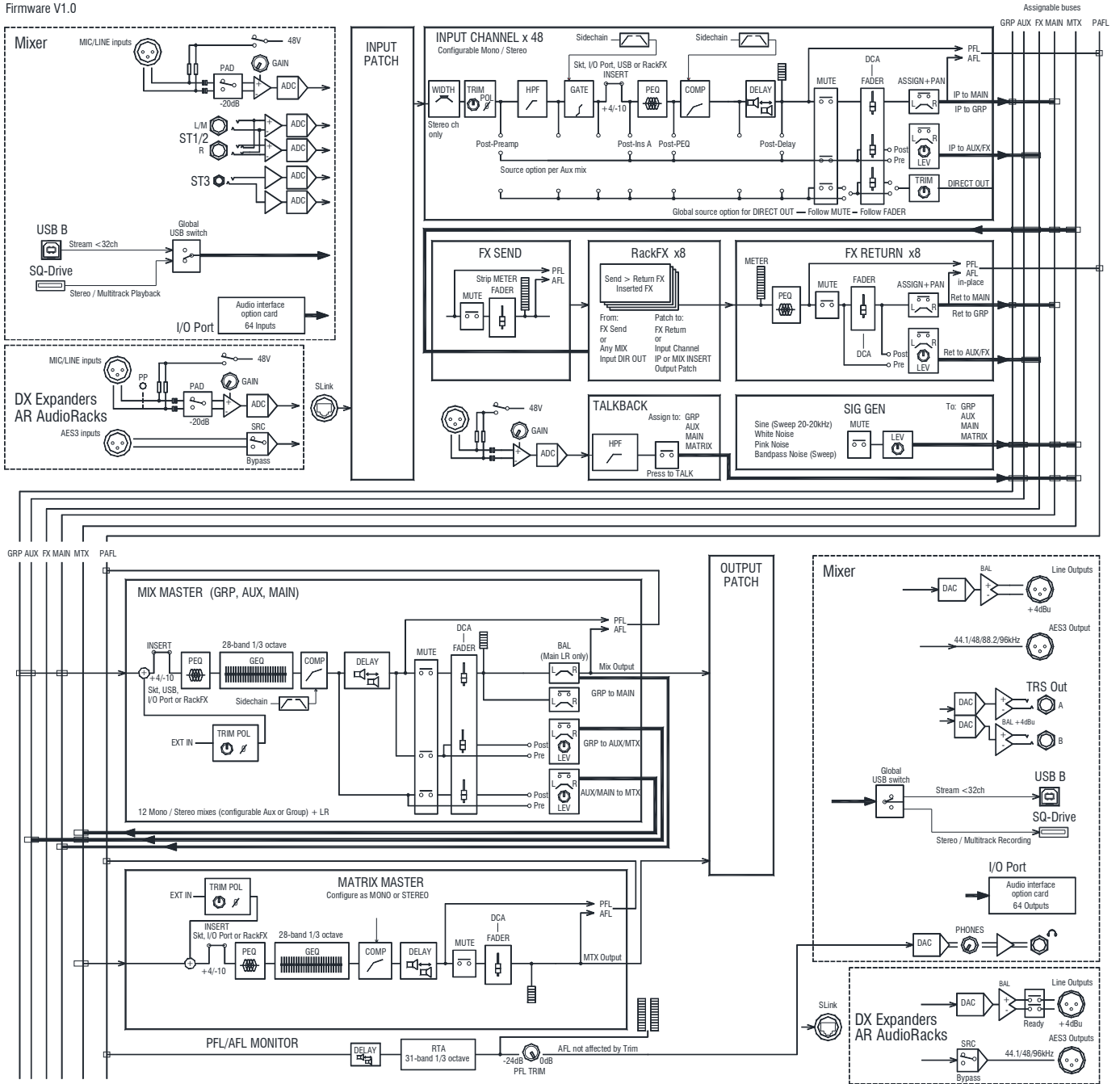


# Block Diagram

## SQ SYSTEM BLOCK DIAGRAM

Firmware V1.0

48 input channels x 36 bus Mix Engine



## Mixer Specifications

<b>Mic/Line Inputs</b>	Balanced XLR, fully recallable	<b>Faders</b>	100mm motorised
Input Sensitivity	-60 to +0dBu	Touch Screen	7" Capacitive, 800 x 480 resolution, 24 bit RGB
Switchable Pad	-20dB	SoftKeys	8 (SQ-5), 16 (SQ-6)
Analogue Gain	0dB to +60dB, 1dB steps	Mute Groups / DCA Groups	8 / 8
Maximum Input Level	+30dBu	Network	TCP/IP Ethernet for MIDI and Control
Input Impedance	>5k $\Omega$	MIDI	TCP/IP and USB B
THD+N, Unity gain 0dB	0.002% -92dBu (20Hz-20kHz, AES Direct Out, @0dBu 1kHz)	Footswitch	Single or Dual, Momentary or Latching*
THD+N, Mid gain +30dB	0.003% -91dBu (20Hz-20kHz, AES Direct Out, @-30dBu INPUT 1kHz)	<b>Source</b>	
Phantom Power	+48V (+3V / -2V)	CH1-48	Fully patchable
<b>Stereo Line Inputs</b>		USB Global Source	SQ-Drive or USB B Streaming
ST1, ST2 connectors	Balanced, 1/4" TRS jack	<b>Polarity</b>	Normal/Invert
ST3 connector	Unbalanced, stereo 3.5mm Mini Jack	<b>Trim</b>	-24 to +24dB
Input Sensitivity (ST1, ST2 / ST3)	Nominal +4dBu ST1, ST2 / 0dBu ST3	<b>High Pass Filter</b>	12dB/octave 20Hz – 2kHz
Trim	+/-24dB	<b>Insert (Pre EQ/Comp)</b>	Fully Patchable
Maximum Input Level (ST1,ST2 / ST3)	+22dBu / +18dBu	<b>Delay</b>	Up to 341ms
Input Impedance	>7k $\Omega$	<b>Gate</b>	Patchable Sidechain
<b>Outputs 1-12 (SQ-5) and 1-14 (SQ-6)</b>	Balanced, XLR	Sidechain filter	Hi-pass (20-5k), band-pass (120-10k), Lo-pass (120-20k)
<b>Outputs A and B</b>	Balanced 1/4" TRS Jack	Threshold / Depth	-72dBu to +18dBu / 0 to 60dB
Source	Patchable	Attack / Hold / Release	50 $\mu$ s to 300ms / 10ms to 5s / 10ms to 1s
Output Impedance	<75 $\Omega$	<b>PEQ</b>	4-Band fully parametric, 20-20kHz, +/-15dB
Nominal Output	+4dBu = 0dB meter reading	Band 1, Band 4	Selectable Shelving (Baxandall), Bell
Maximum Output Level	+22dBu	Band 2, Band 3	Bell
Residual Output Noise	-90dBu (muted, 20Hz-20kHz)	Bell Width	Variable Q, 1.5 to 1/9th octave
<b>AES Digital Output</b>	Balanced XLR 2 channel, 96kHz sampling rate (Default with SRC Bypassed) Switchable output sample rates, 44.1kHz/ 48kHz/ 88.2kHz/ (96kHz) 2.5Vpp balanced terminated 110 $\Omega$	<b>Compressor</b>	Patchable Sidechain
<b>Connection</b>	Neutrik EtherCON (RJ45)	Sidechain filter	Hi-pass (20-5k), band-pass (120-10k), Lo-pass (120-20k), Q=1
<b>snake mode (48kHz devices)*</b>	64 channels assignable, compatible with AR2412, AR84, AB168, ME	Threshold / Ratio	-46dBu to 18dBu / 1:1 to infinity
<b>dx mode (96kHz devices)</b>	32 channels assignable*, compatible with DX168	Attack / Release	30 $\mu$ s to 300ms / 50ms to 2s
<b>gigaACE (96kHz devices)</b>	128 channels assignable, compatible with dLive, SQ and DXHub*	Knee	Soft/Hard
<b>Inputs</b>	Fully Patchable	Detector response	Peak/RMS switchable
<b>Outputs</b>	Fully Patchable	Parallel Path Compression	dry/wet -infin to 0dB
<b>Sync/SRC</b>	assignable as master audio sync for all modes, * SRC 64 channel	<b>Channel Direct Out</b>	Follow Fader, Mute, Mute Group, DCA (global all ch)

<b>Inputs</b>	Multi-channel IO option module	Source select	Post-Preamp, Post-HPF, Post Gate, Insert Return, Post PEQ, Post Comp, Post Delay
<b>Outputs</b>	Fully Patchable		trim -infin to 10dB per channel
<b>Sync/SRC</b>	Fully Patchable	<b>Insert</b> (Pre EQ/Comp)	Fully Patchable
	assignable as master audio sync	<b>Delay</b>	Up to 682ms
Dynamic Range	Measured balanced XLR in to XLR out, 0dB gain, 0dBu input	<b>GEQ</b>	28 bands 31Hz-16kHz, +/-12dB Gain, Constant 1/3 oct
Frequency Response	112 dB	<b>PEQ</b>	As Input PEQ
Headroom	+0/-0.5dB 20Hz to 20kHz	<b>Compressor</b>	As Input Compressor
Internal operating Level	+18dB	Internal FX	8 x RackFX engine, Send>Return or Inserted (4 dedicated fx bus)
THD+N, Mic/Line routed to Main L/R Out	0dBu	Types	SMR Reverb, StereoTap Delay, Gated Reverb, ADT, BlueChorus
dBFS Alignment	Unity gain faders@0dB, 0.006%, -84dBu (20 - 20kHz)		Symphonic Chorus, Flanger, Phaser
Meter Calibration	+18dBu = 0dBFS (+22dBu at XLR output)	8 dedicated Stereo FX returns	Fader, Pan, Mute, Routing to Mix/LR, 4-Band PEQ
Main Meter Type	0dB meter = -18dBFS (+4dBu at XLR out)	<b>PAFL</b>	PFL or stereo in-place AFL, 0 to -24dB Trim, PAFL Delay Up to 682ms
Channel Meter Type	2 x 12 segment, fast (peak) response	<b>Talkback</b>	dedicated input, Assignable to any mix, Gain, Pad, 48V, 12dB/oct HPF
Peak Indication	Single Point Metering, fully programmable colour/brightness	<b>Signal Generator</b>	Assignable to any mix, Sine/White/Pink/Bandpass Noise
Sampling Rate	-3dBFS (+19dBu at XLR out), multi-point sensing	<b>RTA</b>	31-Bands 1/3 octave 20-20kHz, follows PAFL source
Bit Depth	96kHz	<b>SQ-Drive</b>	USB A
Latency	Uses XCVI core custom bit widths in algorithms, up to 96bits	Stereo Record	2 channel, WAV, 96kHz, 24-bit, source fully patchable
Operating Temperature Range	<0.7mS, Local Mic Input routed to Main L/R. (Direct, No EQ/ Effects)	Stereo Playback	1/2 channel, WAV, 44.1, 48, 96kHz 16,24-bit, source fully patchable
Mains Power	0 deg C to 40 deg C (32 deg F to 104 deg F)	Multitrack Record	16 channel, WAV, 96kHz, 24-bit, track sources fully patchable
Max Power Consumption SQ-5/SQ-6	100-240V AC, 50/60Hz	Multitrack Playback	16 channel, WAV, 96kHz, 24-bit fully patchable
	75W / 90W	<b>USB Audio Streaming</b>	USB B, Core Audio compliant, ASIO/WDM for Windows
<b>SQ-5</b>	Width x Depth x Height	Send (upstream)	32 channel, 96kHz, 24-bit
Desk mounted	440 x 514.9 x 198 mm (17.3" x 20.3" x 7.8")	Return (downstream)	32 channel, 96kHz, 24-bit
Packed in shipping box	610 x 680 x 360 mm (24" x 26.8" x 14.2")		
Unpacked weight	10.5 kg (23.1 lbs)		
Packed weight	14 kg (30.9 lbs)		
<b>SQ-6</b>	Width x Depth x Height		
Desk mounted	638 x 514.9 x 198 mm (25.1" x 20.3" x 7.8")		
Packed in shipping box	820 x 680 x 360 mm (32.3" x 26.8" x 14.2")		
Unpacked weight	13.3 kg (29.3 lbs)		
Packed weight	17.3 kg (38.1 lbs)		

\* Firmware v1.1