ALLEN&HEATH

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SQ-6

Technical Datasheet

Overview

- Compact Digital Mixer for Live, Studio and Installation
- 48 Input Channels
- 24 Local Mic Inputs (XLR)
- 2 ¼" Stereo Inputs (TRS)
- 1 3.5mm Stereo Input
- 36 Total Busses
- 12 Stereo Mix (Aux or Group) + Main
- PAFL Bus
- 16 Assignable Local Outputs (14 XLR + 2 ¼" TRS)
- AES Digital Output
- Dedicated Talkback mic input (XLR)
- ¼" 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
- 16 Assignable SoftKeys
- 4 Assignable Soft Rotaries
- Dedicated physical controls for channel processing (Gain, HPF Frequency, Gate Threshold, Compressor Threshold, Pan, EQ Gain/Frequency/Width)

- 24+1 Faders with 6 Layers for 144 assignable Channel Strips
- Motorised faders for sends on faders, GEQ fader flip and mix recall
- 24 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
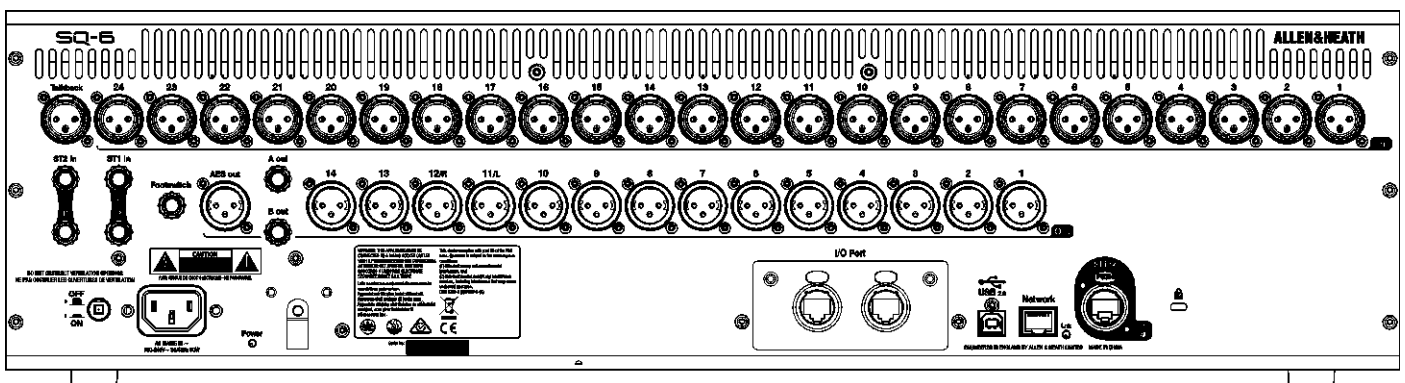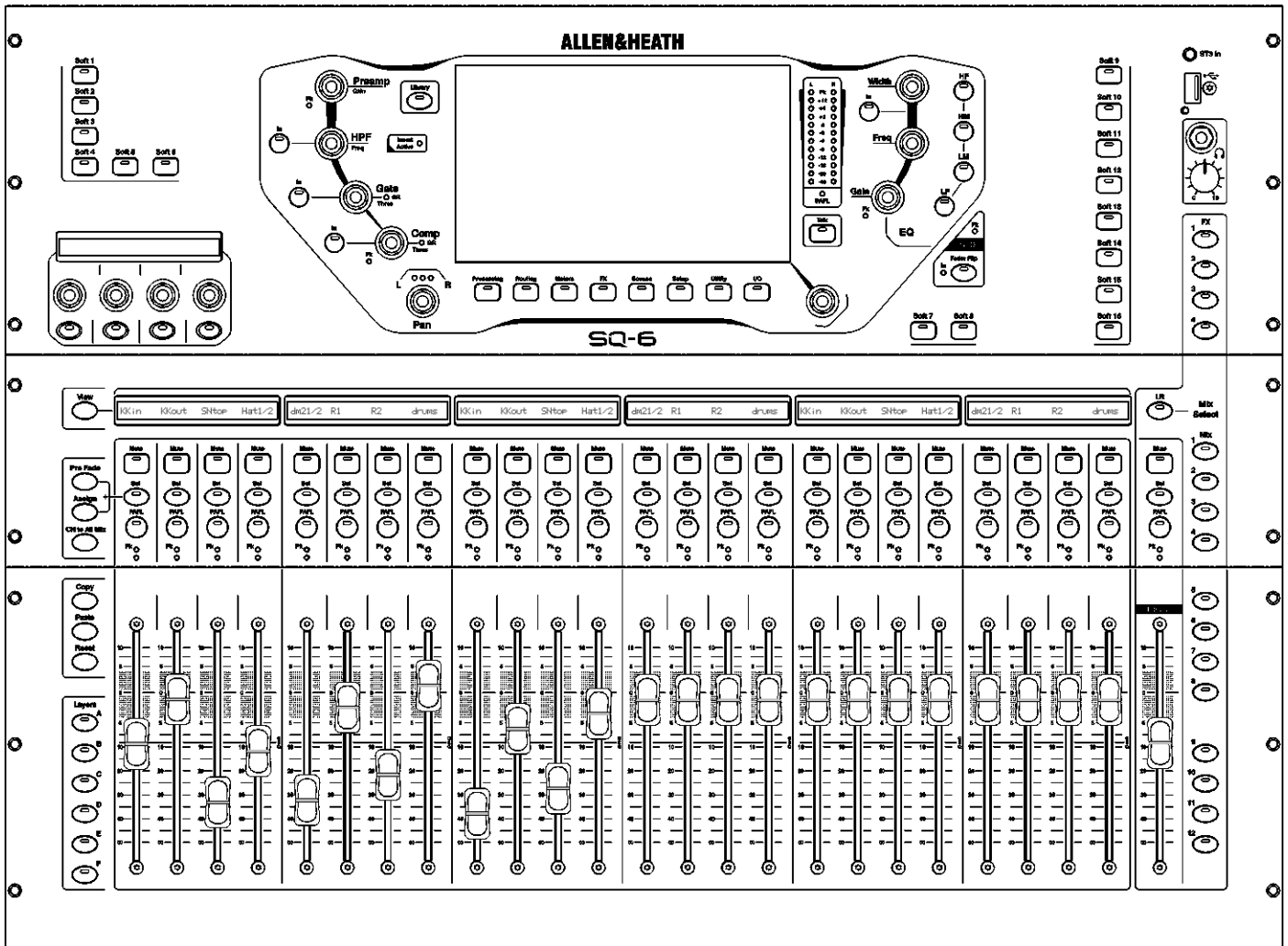
A&E Specifications

The mixer shall be a compact 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 25 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 3rd 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.

16 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, as well as 4 assignable rotary encoders with LCD display showing their current function.

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, 90W 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-6.

Dimensions

638.00mm/25.1"

514.90mm/20.3"

501.9mm/19.8"

198.5mm/7.8"

60.4mm/2.4"

550.00mm/21.7"

25.00°

15.00°

5.00°

381.6mm/15"
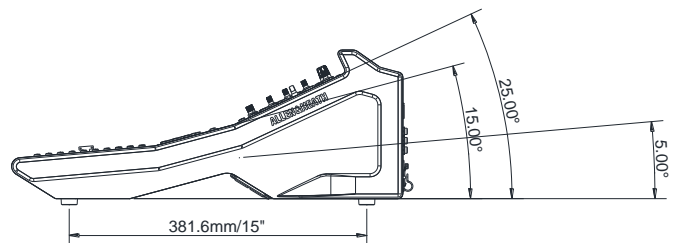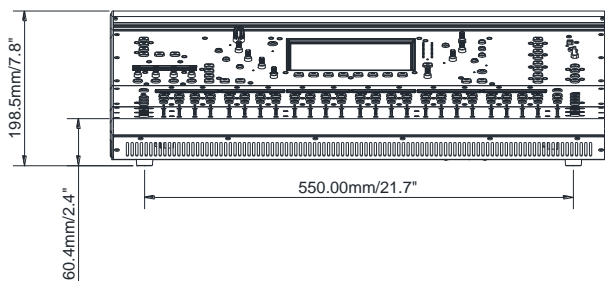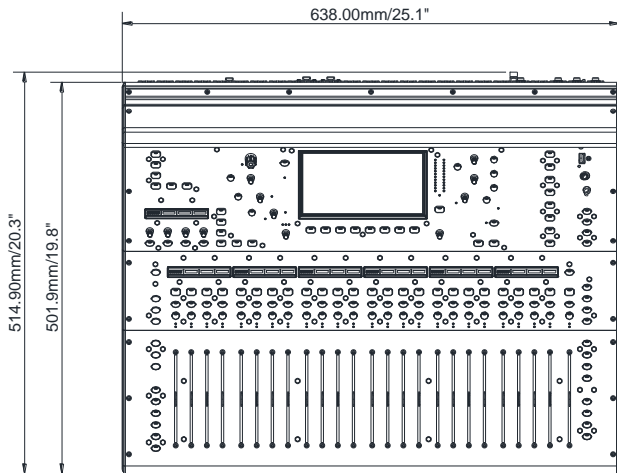
SQ SYSTEM BLOCK DIAGRAM

Firmware V1.0

48 input channels x 36 bus Mix Engine

Mixer

MIC/LINE inputs
48V
PAD
-20dB
GAIN
ADC

ST1/2
L
R
ADC
ADC

ST3
ADC
ADC

USB B
SQ-Drive
Stereo / Multitrack Playback
Global USB switch
Stream <32ch

I/O Port
Audio interface option card
64 Inputs

DX Expanders / AR AudioRacks

MIC/LINE inputs
48V
PP
PAD
-20dB
GAIN
ADC
SLink

AES3 inputs
SRC
Bypass

INPUT PATCH

INPUT CHANNEL x 48
Configurable Mono / Stereo

Sidechain
Sidechain

Skt, I/O Port, USB or RackFX INSERT

Assignable buses
GRP AUX FX MAIN MTX PAFL

WIDTH
Stereo ch only
TRIM POL
HPF
GATE
+4/-10
PEQ
COMP
DELAY
MUTE
DCA FADER
ASSIGN+PAN
L R

Post-Preamp
Post-Ins A
Post-PEQ
Post-Delay

IP to MAIN
IP to GRP
PFL
AFL

Source option per Aux mix
Post
Pre
LEV
L R
IP to AUX/FX

TRIM
DIRECT OUT

Global source option for DIRECT OUT — Follow MUTE — Follow FADER

FX SEND
Strip METER FADER
MUTE
PFL
AFL

RackFX x8
Send > Return FX
Inserted FX
PEQ

From:
FX Send
or
Any MIX
Input DIR OUT

FX RETURN x8
METER
MUTE
FADER
ASSIGN+PAN
L R
Ret to MAIN
PFL
AFL
in-place

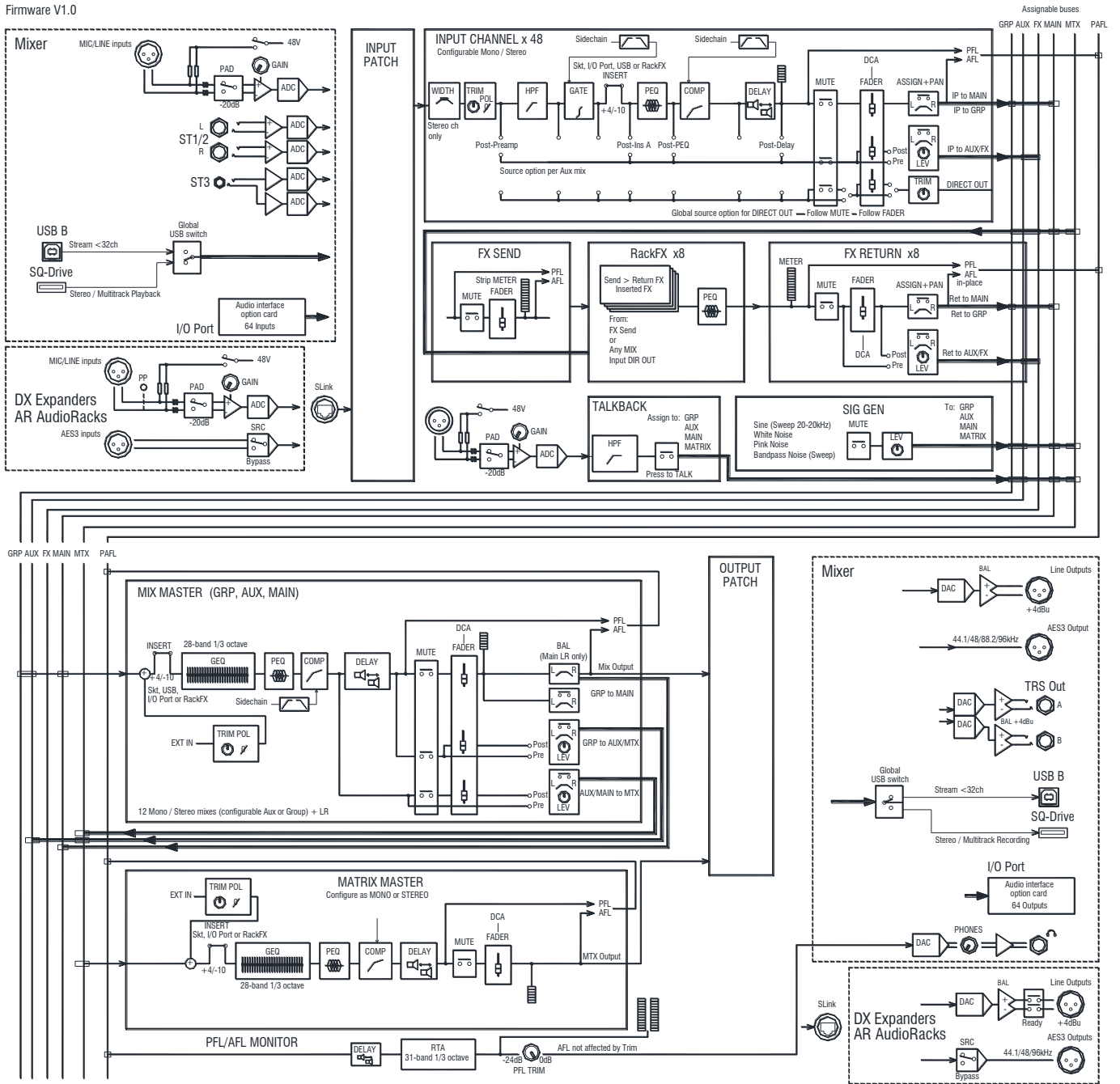DCA
Post
Pre
LEV
L R
Ret to GRP
Ret to AUX/FX

TALKBACK
48V
PAD
-20dB
GAIN
ADC
HPF
Press to TALK

Assign to: GRP AUX MAIN MATRIX

SIG GEN
Sine (Sweep 20-20kHz)
White Noise
Pink Noise
Bandpass Noise (Sweep)
MUTE
LEV

To: GRP AUX MAIN MATRIX

OUTPUT PATCH

GRP AUX FX MAIN MTX PAFL

MIX MASTER (GRP, AUX, MAIN)

INSERT
+4/-10
Skt, USB, I/O Port or RackFX
28-band 1/3 octave
GEQ
PEQ
COMP
DELAY
Sidechain
MUTE
DCA FADER
BAL (Main LR only)
L R
Mix Output
PFL
AFL

EXT IN
TRIM POL

L R
GRP to MAIN

Post
Pre
LEV
L R
GRP to AUX/MTX

Post
Pre
LEV
L R
AUX/MAIN to MTX

12 Mono / Stereo mixes (configurable Aux or Group) + LR

MATRIX MASTER
Configure as MONO or STEREO

EXT IN
TRIM POL
INSERT
Skt, I/O Port or RackFX
+4/-10
GEQ
28-band 1/3 octave
PEQ
COMP
DELAY
MUTE
DCA FADER
MTX Output
PFL
AFL

PFL/AFL MONITOR
DELAY
RTA
31-band 1/3 octave
-24dB 0dB
PFL TRIM
AFL not affected by Trim

Mixer
DAC
BAL
Line Outputs
+4dBu

AES3 Output
44.1/48/88.2/96kHz

TRS Out
DAC
DAC
BAL +4dBu
A
B

Global USB switch
Stream <32ch
USB B
SQ-Drive
Stereo / Multitrack Recording

I/O Port
Audio interface option card
64 Outputs

PHONES
DAC

SLink

DX Expanders / AR AudioRacks
DAC
BAL
Ready
Line Outputs
+4dBu

SRC
Bypass
AES3 Outputs
44.1/48/96kHz

Mixer Specifications

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

	Multi-channel IO option module
Inputs	Fully Patchable
Outputs	Fully Patchable
Sync/SRC	assignable as master audio sync
	Measured balanced XLR in to XLR out, 0dB gain, 0dBu input
Dynamic Range	112 dB
Frequency Response	+0/-0.5dB 20Hz to 20kHz
Headroom	+18dB
Internal operating Level	0dBu
THD+N, Mic/Line routed to Main L/R Out	Unity gain faders@0dB, 0.006%, -84dBu (20 - 20kHz)
dBFS Alignment	+18dBu = 0dBFS (+22dBu at XLR output)
Meter Calibration	0dB meter = -18dBFS (+4dBu at XLR out)
Main Meter Type	2 x 12 segment, fast (peak) response
Channel Meter Type	Single Point Metering, fully programmable colour/brightness
Peak Indication	-3dBFS (+19dBu at XLR out), multi-point sensing
Sampling Rate	96kHz
Bit Depth	Uses XCVI core custom bit widths in algorithms, up to 96bits
Latency	<0.7mS, Local Mic Input routed to Main L/R. (Direct, No EQ/ Effects)
Operating Temperature Range	0 deg C to 40 deg C (32 deg F to 104 deg F)
Mains Power	100-240V AC, 50/60Hz
Max Power Consumption SQ-5/SQ-6	75W / 90W
SQ-5	Width x Depth x Height
Desk mounted	440 x 514.9 x 198 mm (17.3" x 20.3" x 7.8")
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)
SQ-6	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)

Source select	Post-Preamp, Post-HPF, Post Gate, Insert Return, Post PEQ, Post Comp, Post Delay
	trim -infin to 10dB per channel
Insert (Pre EQ/Comp)	Fully Patchable
Delay	Up to 682ms
GEQ	28 bands 31Hz-16kHz, +/-12dB Gain, Constant 1/3 oct
PEQ	As Input PEQ
Compressor	As Input Compressor
Internal FX	8 x RackFX engine, Send>Return or Inserted (4 dedicated fx bus)
Types	SMR Reverb, StereoTap Delay, Gated Reverb, ADT, BlueChorus
	Symphonic Chorus, Flanger, Phaser
8 dedicated Stereo FX returns	Fader, Pan, Mute, Routing to Mix/LR, 4-Band PEQ
PAFL	PFL or stereo in-place AFL, 0 to -24dB Trim, PAFL Delay Up to 682ms
Talkback	dedicated input, Assignable to any mix, Gain, Pad, 48V, 12dB/oct HPF
Signal Generator	Assignable to any mix, Sine/White/Pink/Bandpass Noise
RTA	31-Bands 1/3 octave 20-20kHz, follows PAFL source
SQ-Drive	USB A
Stereo Record	2 channel, WAV, 96kHz, 24-bit, source fully patchable
Stereo Playback	1/2 channel, WAV, 44.1, 48, 96kHz 16,24-bit, source fully patchable
Multitrack Record	16 channel, WAV, 96kHz, 24-bit, track sources fully patchable
Multitrack Playback	16 channel, WAV, 96kHz, 24-bit fully patchable
USB Audio Streaming	USB B, Core Audio compliant, ASIO/WDM for Windows
Send (upstream)	32 channel, 96kHz, 24-bit
Return (downstream)	32 channel, 96kHz, 24-bit
	* Firmware V1.1