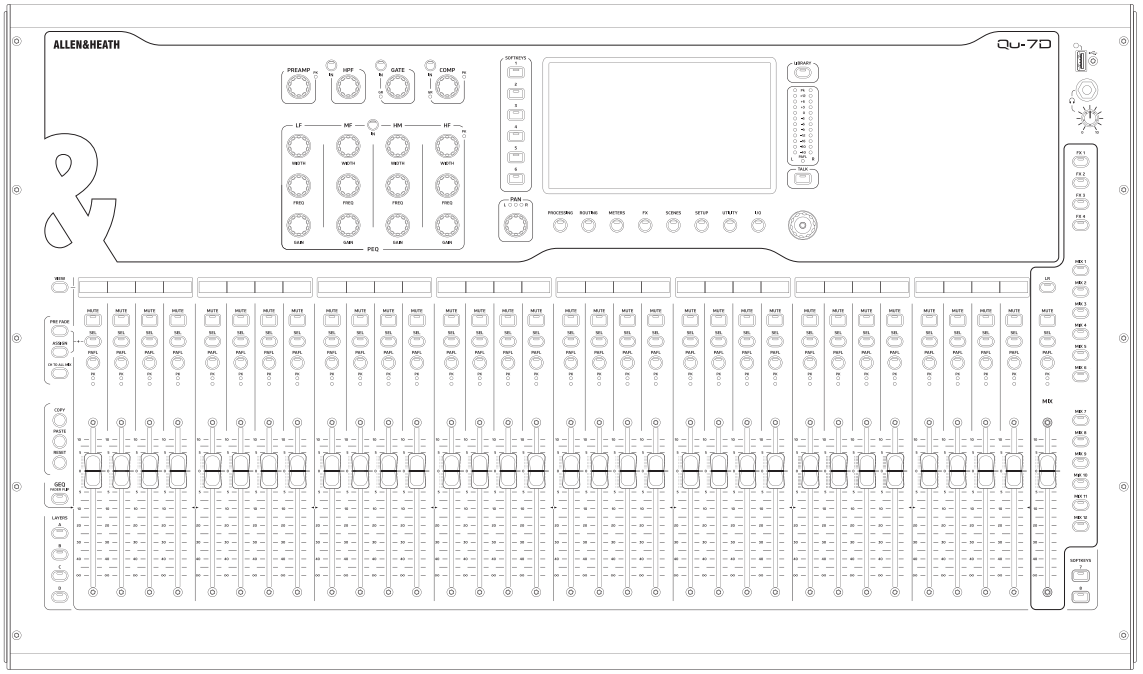
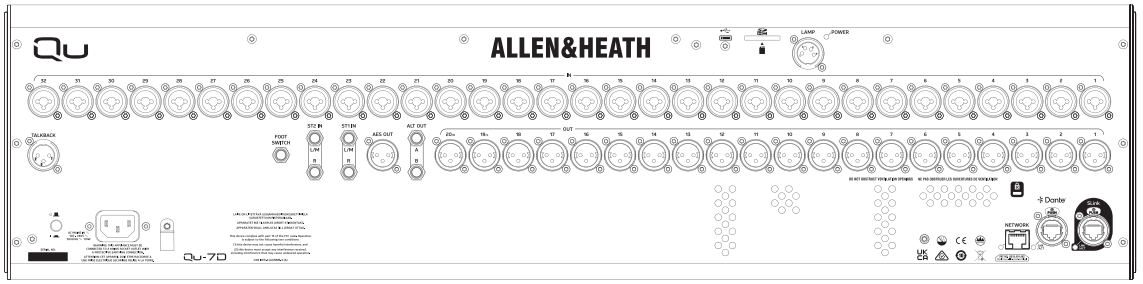
Qu-7 / Qu-7D

Technical Datasheet



(Qu-7D Top Panel)



(Qu-7D Rear Panel)

Features

- 96kHz XCVI Core
  variable bit-depth up to 96bit, <0.7ms latency
- 38x Inputs to Mix (32x Mono/Linkable, 3x Stereo)
- Stereo Main LR Output
- 12x Mixes (6x Mono/Linkable Aux/Group, 6x Stereo Aux/Group)
- 4x FX Sends
- 4x Mono/Linkable Matrix Mixes
- 32x XLR/Jack 'Combi' Mic/Line Input Sockets
- 2x Stereo Line Input Sockets (each 2x TRS)
- 1x XLR Talkback Socket
- 12x XLR Output Sockets
- 2x TRS Output Sockets
- 1x AES3 Stereo Digital Output Socket
- 128x128 SLink Port for Everything I/O expansion and system connections
- 16x16 48/96 kHz Dante interface (Qu-7D only)
- Stereo Headphone Output
- 7" Capacitive Touchscreen
- 33x 100mm Motorised Faders
- 4x Customisable Channel Strip Layers
- 8x SoftKeys
- 12V Lamp Socket
- Configurable single/dual Footswitch Connection
- Configurable Chromatic Channel Meter LED's
- IEC Mains Connection with Worldwide PSU
- RJ45 Network Socket
- USB-A For stereo audio record/playback and data (2 Channels @48/96kHz, 24bit)
- USB-C Audio interface for multichannel record/playback (32x32 @48/96kHz, 16/24bit)
- SD Card Slot for multichannel audio record/playback (16 Channels @96kHz, 32 Channels @48kHz, 24bit)
- Input processing – Trim, HPF, Gate, Parametric EQ, Compressor, Channel Delay
- Mix processing – Graphic EQ, Feedback Assistant, PEQ, Compressor, Channel Delay
- Fully patchable Insert points
- 6x Multi-FX Engines with dedicated Stereo Return Channels and PEQ
- 32 Channel, zero latency, DEEP Automatic Mic Mixer
- 31/61 Band Real Time Analyser
- Feedback Assistant with 8 simultaneous detectors
- Gain Assistant
- 300 Scene memories per Show
- Channel Safes, Global/Per-Scene Recall Filters
- FX, Processing and Channel Libraries
- User Permissions to restrict operator access
- DAW Control emulation via USB or TCP/IP
- Compatible with ME personal monitoring range
- Remote control via free apps – Windows/MacOS/iOS/Android

Architectural & Engineering Specification

The mixer shall be a standalone digital mixer built around a 96kHz XCVI FPGA core with 38 input sources mixing to 28 busses, with a system latency of <0.7ms.

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

The surface shall include moving faders with 4 layers, each 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 Select, Mute and PAFL buttons with indicators, a variable LED meter, a peak indicator LED and a 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.

Send levels to mixes shall be displayed and adjusted using the faders in conjunction with dedicated Mix keys.

A 'CH to All Mix' key will be provided to allow viewing and adjustment of all send levels from the selected channel.

Quick access to assignment and switching of Pre/Post send points will be provided using dedicated keys.

The fader and rotary controls shall include a white skirt in contrast to the colour of the surface for visibility during operation in low light conditions.

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

There shall be dedicated Copy/Paste/Reset keys for parameter data.

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

A view key shall allow the temporary display of channel number and patching on the channel strip LCD displays, as well as current SoftKey assignments on the touchscreen.

Local analogue inputs shall use balanced XLR/TRS 'combi' sockets and connect to fully recallable, digitally controlled preamplifiers. These shall be able to provide up to +60dB of gain, with a -20dB Pad included on the TRS ¼ inch Jack input for use with line level signals. Industry standard 48V phantom power shall be switchable per socket and apply only to the XLR connection.

The number of local preamps will match the number of faders, to allow a simple, standalone, analogue-like 1-to-1 setup.

An extra, patchable, XLR-only socket with preamp specification matching that of the other XLR inputs shall be provided for Talkback.

Two stereo input connections feeding dedicated channels for playback purposes will each use 2 balanced TRS ¼ inch Jack sockets, in a half-normalled configuration for use with mono sources.

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

A stereo digital, professional AES3 output shall be provided via an industry standard 110ohm XLR connection with options for sample rate conversion.

A high-power headphone output shall be provided for monitoring using a TRS ¼ inch Jack socket, with associated level control and dual 12 segment LED meter.

There shall be a USB Type-A connector for stereo recording/playback, data-transfer and firmware updating.

An SDHC slot shall be provided for the recording or playback of multichannel audio, using a standard format to allow files to be imported into any DAW.

There shall be a USB-C connection following the USB 2.0 standard for multi-channel, bi-directional audio streaming and MIDI control between the mixer and a computer.

There shall be an intelligent "SLink" Ethernet audio expansion port with locking EtherCON connector, supporting multiple A&H digital protocols and providing access to 128x128 digital channels, connected over a single cable and allowing remote preamp control of Allen & Heath Everything I/O expanders, connection to Allen & Heath ME Personal Mixing Systems and direct connection to other A&H mixers wherever supported.

A Dante variant will provide up to 16x16 channels of connectivity to a Dante network at 48/96kHz. This model will include a dedicated additional locking EtherCON connection and a bridge to the network port for control messaging.

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

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

All Mix channels shall contain the following processing: Insert, Graphic EQ or Feedback Assistant, Parametric EQ, Compressor, Delay, Balance.

6 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 with a dedicated stereo return channel and sourced from a dedicated FX send bus, a Mix bus or directly from an Input channel, or a unit may be inserted directly into any input or output channel.

A Feedback Assistant will be provided to detect feedback across up to 8 outputs simultaneously and automatically apply up to 16 filters per instance.

The ability to automatically set and monitor preamp gain settings will be provided by a Gain Assistant.

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

A 32 channel Automatic Mic Mixer shall be provided for automatic and dynamic assignment of gain in spoken word applications.

There shall be 8 DCA groups and 8 Mute groups.

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.

A PAFL sub-mix shall be provided, for the purposes of monitoring one or more signals and at different points in the signal path.

All signal delays in the system shall be adjustable in Milliseconds, Meters (with metric temperature adjustment) or Feet (with imperial temperature adjustment).

MIDI Transport Control shall be available via the touchscreen and as SoftKey options.

MIDI messaging to and from common core parameters including send levels and muting will use MIDI NRPN messaging. Scene recall will send and respect standard MIDI messages.

The mixer shall provide a Fast Ethernet (100 Mbit/s) port for Cat5 cable connection to a wireless router, access point, existing network or direct connection to a computer for live mixing control using control apps supported on multiple popular platforms, and for MIDI over TCP/IP messaging.

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 a 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.

Channel 'safes' shall be provided to prevent selected items from being changed from their state when the safe was enabled. A suitable selection of global and per-scene filters shall be provided 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.

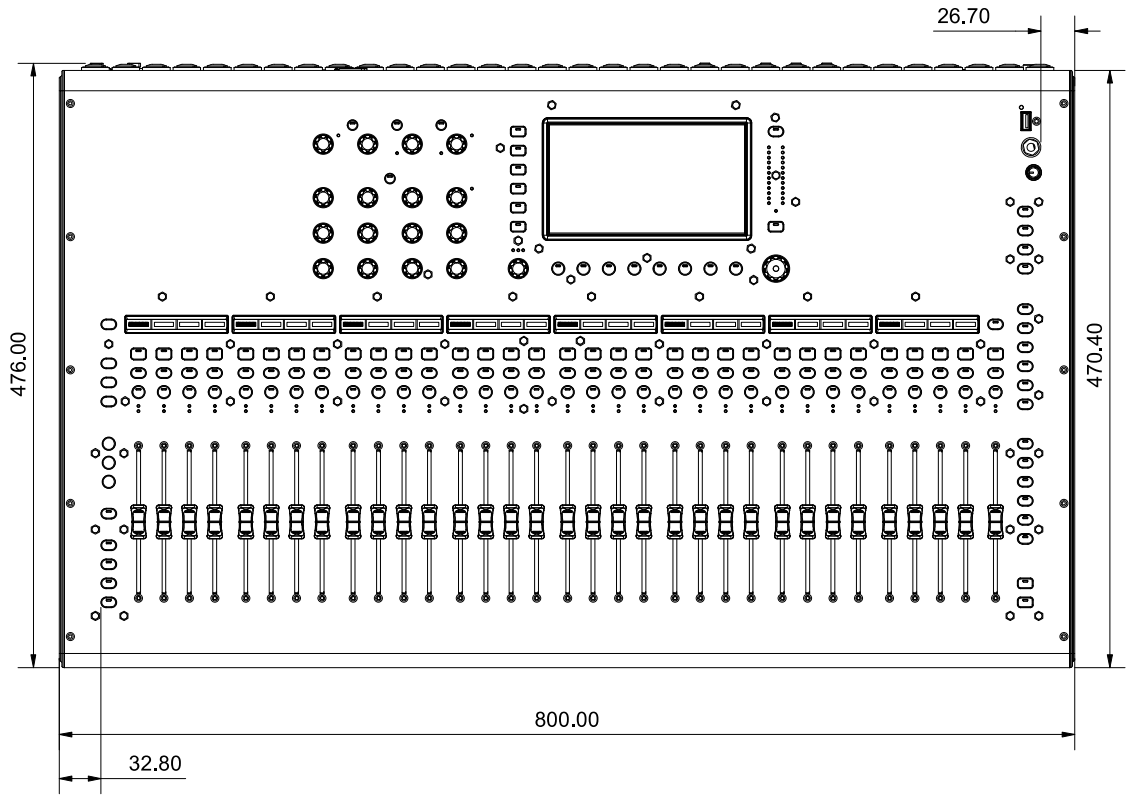
The mixing system shall periodically record all current settings and return the mixer to that state after reboot following a power-cycle.

The mixer shall have a built-in power supply accepting AC mains voltages of 100~240V, 50/60 Hz 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 40 degrees Celsius.

The mixer shall be made available in 3 frame sizes, each with a Dante capable variant. These mixers shall be the Allen & Heath Qu-5/Qu-5D, the Allen & Heath Qu-6/Qu-6D and the Allen & Heath Qu-7/Qu-7D.

Dimensions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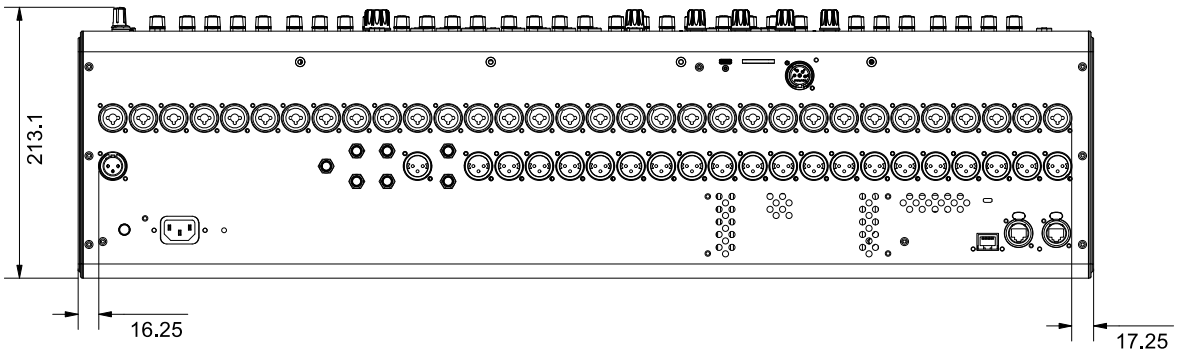
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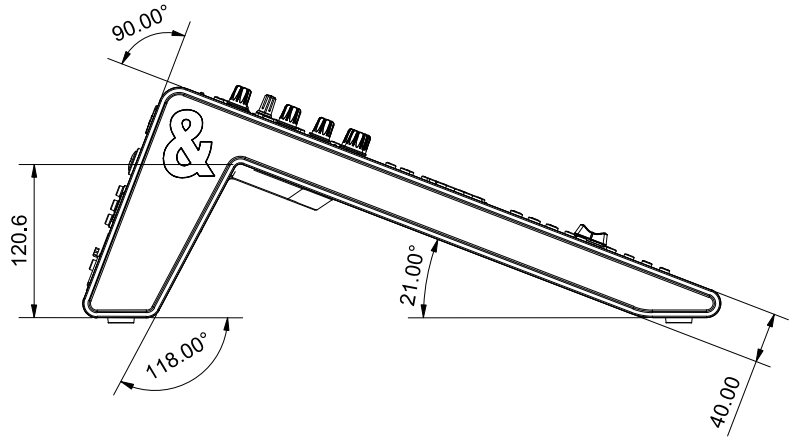
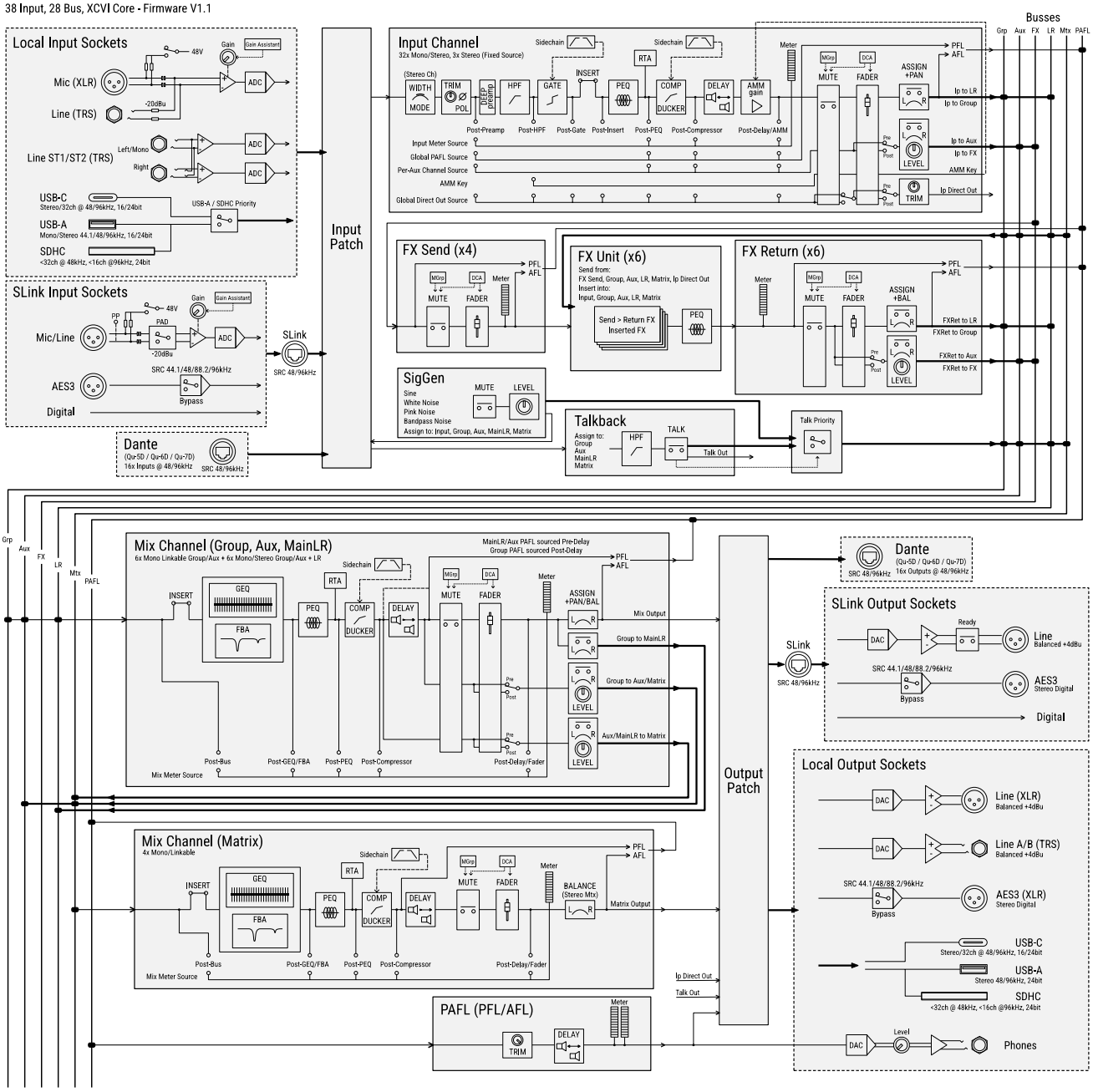
17.25


90.00°
120.6
21.00°
118.00°
40.00

Block Diagram

Qu-5/Qu-5D, Qu-6/Qu-6D, Qu-7/Qu-7D SYSTEM BLOCK DIAGRAM

38 Input, 28 Bus, XCVI Core - Firmware V1.1



Technical Specifications

Inputs	**Mic/Line Inputs**	Balanced Combi XLR/Jack, fully recallable preamp
	Input Sensitivity	-60 to +0dBu
	TRS Inputs	-20dB Pad (Fixed)
	Preamp Gain	0dB to +60dB, 1dB steps
	Maximum Input Level (XLR/Jack)	+16dBu Mic input / +30dBu TRS pad input
	Input Impedance	>1.5kΩ MIC / >20kΩ TRS
	THD+N, Unity gain 0dB	0.002% -92dB (20Hz-20kHz, AES Direct Out, @0dBu 1kHz)
	THD+N, Mid gain +30dB	0.004% -88dB (20Hz-20kHz, AES Direct Out, @-30dBu 1kHz)
	Phantom Power	+48V (+3V / -2V)
	Stereo Line Inputs	Balanced, 2x 1/4" TRS jack
	Input Sensitivity	Nominal +4dBu
	Trim	+/-24dB
	Maximum Input Level	+21dBu
	Input Impedance	>6kΩ
Outputs	**XLR Outputs**	Balanced, XLR
	Outputs A and B	Balanced 1/4" TRS Jack
	Source	Fully patchable
	Output Impedance	<75Ω
	Nominal Output	+4dBu = 0dB meter reading
	Maximum Output Level	+22dBu
	Residual Output Noise	-88dBu (muted, 20Hz-20kHz)
	AES Digital Output	Balanced XLR 2 channel,
		96kHz sampling rate (Default with SRC Bypassed)
		Switchable output sample rates, 44.1/48/88.2/96kHz
		2.5Vpp balanced terminated 110Ω
SLink	**Connection**	Neutrik EtherCON (RJ45)
	dSnake mode	40 input, 20+40(ME) output channels, 48kHz
	DX mode	32 input, 32 output channels, 96kHz
	GigaACE/GX	128 input, 128 output channels, 96kHz
	Inputs	Fully patchable
	Outputs	Fully patchable
	Sync/SRC	Assignable as audio clock source, 48kHz<>96kHz SRC
Dante	(Qu-7D only)	16 input, 16 output channels, 48/96kHz operation
	Inputs	Fully patchable
	Outputs	Fully patchable
	Sync/SRC	Assignable as audio clock source, 48kHz<>96kHz SRC
USB Audio	**Qu-Drive**	USB-A or SD Card, recording or playback
	Stereo Record (USB-A)	2 channel, WAV, 48/96kHz, 24-bit, fully patchable
	Stereo Playback (USB-A)	1/2 channel, WAV, 44.1/48/96kHz 16/24-bit, fully patchable
	Multitrack Record (SDHC)	16 channels 96kHz, 32 channels 48kHz, 24-bit, WAV, fully patchable
	Multitrack Playback (SDHC)	16 channels 96kHz, 32 channels 48kHz, 24-bit, WAV, fully patchable
	SD Card	SDHC, 32GB, UHS-I, Class 10 for maximum channels, 48/96 kHz, 24-bit
	USB Audio Streaming	USB-C connection, USB 2.0 Core Audio compliant, ASIO/WDM for Windows
	Send (upstream)	32 channels, 48/96kHz, 24-bit
	Return (downstream)	32 channels, 48/96kHz, 24-bit

Control	Touch Screen	7" Capacitive, 800 x 480 resolution, 24-bit RGB
	SoftKeys	8
	Mute Groups / DCA Groups	8 / 8
	Network	TCP/IP Ethernet for Control and MIDI
	MIDI	USB-C and TCP/IP
	Footswitch	Single or Dual, Momentary or Latching
System	38 input, 28 bus, XCVI Core	Measured balanced XLR in to XLR out, 0dB gain, 0dBu input
	Dynamic Range	110 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, 0.005%, -87dB (20Hz-20kHz)
	dBFS Alignment	+18dBu = 0dBFS (+22dBu at XLR output)
	Meter Calibration	0dB meter = -18dBFS (+4dBu at XLR out)
	Main Meter Type	2x 12 segment, fast (peak) response, follows PAFL
	Channel Meter Type	Chromatic Channel Metering, fully programmable colour/brightness
	Peak Indication	-3dBFS (+19dBu at XLR out), Multi-point sensing
	Sampling Rate	96kHz
	Bit Depth	XCVI custom bit depths, up to 96-bit
	Latency	<0.7ms, Local Mic Input to Main L/R
	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 (Qu-7 / Qu-7D)	105W / 110W
Input Processing	**Source**	
	Channels 1-32	Fully patchable
	ST1 / ST2 / USB Channels	Fixed patch, ST1 / ST2 / USB1&2
	USB Global Source	Qu-Drive or USB-C Streaming (Auto Switching)
	Polarity	Normal/Invert
	Trim	-24 to +24dB
	High Pass Filter	12/18/24dB per octave 20Hz – 2kHz
	Insert	Fully Patchable (Digital/Analogue/-10dBV level)
	Delay	Up to 341ms
	Gate	Patchable Sidechain
	Sidechain filter	Hi-pass (20Hz-5kHz), band-pass (120Hz-10kHz, Q=1), Lo-pass (120Hz-20kHz)
	Threshold / Depth	-72dBu to +18dBu / 0 to 60dB
	Attack / Hold / Release	50µs to 300ms / 10ms to 5s / 10ms to 1s
	PEQ	4-Band fully parametric, 20Hz-20kHz, +/-15dB
	Band 1, Band 4	Selectable Shelving (Baxandall), Bell, HPF/LPF 12dB/octave
	Band 2, Band 3	Bell
	Bell Width	Variable, 1.5 Q to 1/9th octave
	Compressor	Patchable Sidechain, Ducker mode, DEEP options, +18dB Makeup gain
	Sidechain filter	Hi-pass (20Hz-5kHz), band-pass (120Hz-10kHz, Q=1), Lo-pass (120-20kHz)
	Threshold / Ratio	-46dBu to 18dBu / 1:1 to infinity
	Attack / Release	30µs to 300ms / 50ms to 2s
	Knee	Soft/Hard
	Detector response	Peak/RMS switchable
	Parallel Path Compression	dry/wet -inf to 0dB
	Channel Direct Out	Follow Fader/Mute/Mute Group/DCA (Global)
	Direct Out Source	Post-Preamp, Post-HPF, Post-Gate, Insert Return, Post-PEQ, Post-Comp, Post-Delay
	Direct Out Level	trim -inf to 10dB (per channel)

Mix Processing	**Insert**	Fully Patchable (Digital/Analogue/-10dBV level)
	Delay	Up to 682ms
	Feedback Assistant	Automatic feedback suppression, 16 filters per mix, 8 concurrent detectors
	Filter Cut	0dB to 18dB
	Automatic Filter Width	18 to 116 Q
	Manual Filter Width	6 to 640 Q
	GEQ	28 bands 31Hz-16kHz, +/-12dB Gain, Constant 1/3 oct, DEEP options
	PEQ	As Input PEQ
	Compressor	As Input Compressor
FX	Internal FX	6x FX engines, Send>Return (4 dedicated FX send) or Inserted (with Wet/Dry)
	Types	SMR Reverb, Stereo Tap Delay, Gated Reverb, ADT, Blue Chorus Symphonic Chorus, Flanger, Phaser
	6x Dedicated Stereo FX returns	Fader, Pan, Mute, Routing to LR/Mix, 4-Band PEQ
Audio Tools	**PAFL**	PFL or stereo in-place AFL, 0 to -24dB Trim, PAFL Delay Up to 682ms
	Talkback	Dedicated input, Assignable to any mix, Preamp/Trim Control, 20Hz-20kHz 12dB/oct HPF
	Signal Generator	Assignable to any input or mix, Sine/White/Pink/Bandpass Noise
	RTA	2x 31-Band 1/3 oct (Stereo) or 61-Band 1/6 octave (Mono), 20Hz-20kHz
AMM	Type	32 Channel, Gain Sharing Algorithm
	Sidechain Filter HPF / LPF	250Hz / 5kHz (12dB/octave)
	Priority	-15dB to +15dB per channel
Dimensions & Weights	**Qu-7 / Qu-7D**	Width x Depth x Height
	Unit only	800 x 476 x 213 mm (31.5" x 18.7" x 8.4")
	Packed in shipping box	940 x 670 x 320 mm (37" x 26.4" x 12.6")
	Unpacked weight	16.7 kg (36.8 lbs)
	Packed weight	20.8 kg (45.9lbs)