QUANTERRA

A Division of Kinemetrics

Q330M+

HIGH-RESOLUTION INTEGRATED SEISMIC SYSTEM SUPPORTING CD1.1 PROTOCOL

The Q330M+ is the newest member of the world-standard Q330 family, addressing the special needs of the nuclear treaty verification community. Largely based on the time-proven Q330S+ datalogger, Q330M+ leverages Quanterra's extensive experience in ultra-reliable network-aware seismic systems design.

The Q330M+ combines sampling rates up to 1kHz with a rich protocol library, including CD1.1, IEEE-1588 Precision Time Protocol (PTP), and FIPS-compliant hardware authentication.

The Q330M+ supports real-time data telemetry to several data consumers in parallel, each stream with its own data buffering, and internal, reliable recording on SLC SD card, simultaneously.

FEATURES

Data Packet Authentication

The Q330M+ includes an internally mounted Spyrus Authenticator device for applications requiring authetication.

Webserver for Setup and Configuration

The Q330M+ runs a webserver to allow the user to perform setup and configuration via any browser, using a friendly GUI.

Auxiliary Channel Processor (optional)

Based on the Quanterra Environmental Processor used in IRIS USArray/TA and GSN stations, the ACP adds 5 16-bit analog inputs and one serial digital interface for environmental and meteorological sensors. The ACP digitizes in phase with the Q330M+ main clock and adds the new channels synchronized to the main data channels.

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SPECIFICATIONS

Channels	3, optionally 6, 24-bit main channels; 6 8-bit auxiliary channels
Dynamic Range (0-7Hz bandwidth)	141dB RMS sine wave 144dB zero-to-peak sine wave 150dB peak-to-peak sine wave
Input Impedance	150 kΩ differential for active sensors; 2 MΩ differential at gain ≥8 for passive sensors
Input Range	40Vpp at gain=1
Gain	Selectable per 3-channel group: 1, 2, 4, 8, 16, 32, 64, 128
Digitizer Noise	16dB below NLNM from 0.02 -16Hz used with standard broadband sensors, such as STS-2.5; voltage noise as low as -163dB re $1V^2/Hz$, depending on gain
Filtering	Configurable Linear or Minimum-phase
Sample Rate	1000, 500, 250, 200, 100, 50, 40, 20, 10, 1
Time Accuracy	<1µs when locked to GPS or PTP server
Total Harmonic Distortion	Better than -120dB
Cross-talk	Better than -130dB
Data Storage and Retrieval	PC/MAC/Linux-formatted removable SLC SD card, standard 8GB (up to 32GB possible); optional external USB flash drive for data copying or mirroring, standard 64GB (up to 256GB possible
Sensor Control	Calibrate: step, low-THD sine wave, MLS or random binary; lock/unlock & re-center
Operational Status	Over 50 State-of-Health channels including temperature, voltages, currents, GPS status, Sensor boom position (6 channels)

Network	Ethernet (10/100BT) Full IP Protocol Stack (Linux)
Authentication	Hardware; supported algorithms: DSA 1024 digital signature and key exchange ECDSA Digital Signature Algorithm (in the future)
Protocols	CD1.1, Q330 native, SeedLink
Other Ports	1 x USB2.0 2 X CONSOLE PORTS UP TO 115 kbaud 1 x digital I/O for vault intrusion switch
Power	12VDC nominal (9-36VDC operational) Consumption depending on configuration
Physical	Sealed, Aluminum, 18 x 4 x 6 in., 10 lbs., rubber endcaps, externally visible status and fault indicators; rated IP68 (24 hours immersion at 1m depth)
Temperature	Fully specified -20 to +60° C Guaranteed operative -40 to +70°C

Specifications subject to change without notice

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