KINEMETRICS

Advancement through Innovation

ETNA 2

Next Generation of Web Based, Cost Effective, Strong Motion Accelerographs

Kinemetrics' **ETNA** accelerograph established the world's standard for strong motion recording for almost two decades with more than 6000 installations worldwide. The **ETNA 2** represents the next generation of ETNA-class accelerographs offering NEW and cost effective, web based monitoring capabilities paired with another Kinemetrics' established world standard, the exemplary **EpiSensor** accelerometer.

The ETNA 2 is easy to use since it was designed around the Rockhound application software first implemented on the Basalt instruments and continued now on the new Obsidian instruments.

ETNA 2 offers the most essential accelerograph features supporting a wide range of earthquake monitoring applications in a small, lightweight, and simple to use package. If you are interested in Earthquake Early Warning, in structural monitoring, in aftershocks surveys or even in induced earthquake monitoring related to oil and gas, and geothermal fluid injection activities, the ETNA 2 is the right product for you.

And for those whose job it is to maintain large number of stations, we implemented Streamlined Station Maintenance (SSM) that allows you to use your browser to log maintenance activities such as software updates, site inspections, or battery replacements right on the unit. These logs can be automatically uploaded to your data center for archiving, reducing paper work in the field, and eliminating human error.

FEATURES

- 3 sensor channels with an internal EpiSensor triaxial deck
- 24-bit Delta Sigma converter, one per channel
- Matched to Kinemetrics outstanding EpiSensor accelerometer performance
- Built-in GPS/GNSS and PTP timing options
- Record and communicate multiple sample rates
- Earthquake Early Warning low latency 0.1s packets ready
- Multiple telemetry protocols: ORB natively or public domain Earthworm and SeedLink
- Streamlined Station Maintenance (SSM)
- Data offloaded automatically to removable thumb drive connected to the USB host port. Parallel recording (mirroring) data on an external USB thumb drive.
- Wireless communications via cellular modem
- State-of-health monitoring, including input and system voltages, internal temperature, communication link diagnostics, available storage
- IP Security through SSH and SSL
- Reverse voltage protection and self resettable fuses
- System Status LEDs
- Surviving temporary immersion at 1 m depth (rated IP67)
- Designed for RoHS Compliance and easy re-cycling
- Designed for the lowest Total Cost of Ownership (TCO)

Continued

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SPECIFICATIONS

Sensor

Type:	Triaxial EpiSensor force balance accelerometers, orthogonally oriented, internal
Full scale range:	User selectable at ±1g, ±2g or ±4g
Bandwidth:	DC to 200 Hz
Dynamic range:	155 dB+
Offset:	Factory set, software re-zeroing

Digitizer

Channels:	3 24-bit sensor channels for the internal sensors bandwidth-optimized 32-bit data path
Dynamic range: shorted-	~130 dB at 100 sps (defined as RMS clip to RMS input noise) or ~139 dB at 100 sps (defined as full scale peak to peak to RMS shorted-input noise)
Primary sample rates:	1, 10, 20, 50, 100, 200, 250, 500 sps
Secondary sample rates:	A second lower sample rate can be selected from the primary sample rates above
Acquisition modes:	Continuous (ring buffer) and triggered
Calibration & test:	Pulse and Sensor Response Test

Trigger

Trigger selection:	Independently selected for each channel Internal
Trigger:	Threshold, selectable from 0.01% to 100% of full scale or STA/LTA algorithm
Trigger voting:	Internal and network trigger votes with arithmetic combination

Timing

Type:	Oscillator digitally locked to GPS/GNSS or to PTP master
Accuracy:	<1 microseconds of UTC with GPS/GNSS locked

Storage

Data storage:	Internal SDHC Card, 32 GB
System storage:	Internal SDHC Card, 4 GB
Data:	Offloaded automatically to removable thumb drive connected to the USB host port. Parallel recording (mirroring) data on an external USB thumb drive. File formats: MiniSEED, EVT, and ASCII. Other formats available. USB drive file system: FAT32

Interfaces and Digital Control

Interfaces:	1 x Ethernet 10/100BaseT
(M12 connectors)	1 x USB 2.0 Device Port for data access 1 x USB 2.0 Host Port for peripherals 1 x RS-232 for factory use only
Relays:	2 x SPDT relays, software configurable
LEDs:	System, power and event status, Ethernet Link

Communications

Ethernet interface:	Real Time Telemetry (Multiple destinations TCP/IP Protocol), web server for parameter setup, event retrieval via FTP/SFTP; supports Point of Contact (POC) name service Modem: External, cellular or POTS, connected via the USB 2.0 Host interface; consult factory for details
Protocols:	Real-time data streaming via Antelope compatible ORB server or via public domain SEEDLink and Earthworm protocols
State-Of-Health:	Input voltage, Super Capacitor voltage, Time synchronization, internal temperature, available storage
Low latency:	1s and 0.1s data packets i.e, for EEWS applications
Data visualization:	Waveform Viewer for continuous waveform display and File Viewer for triggered event display; consult factory for other support software

Power Requirements

Consumption:	<3W operational
Voltage range:	9-28 VDC
Protections:	Reverse voltage, over/under voltage, self resettable fuses

Physical

Mounting:	Central bolt, 3 adjustable feet, air bubble leveling
Dimensions:	6" x 6" x 3" (15cm x 15 cm x 7.5cm)
Volume:	1.6 liters
Weight:	3.3 lbs. (1.5 kg)

Environmental

Temperature range:	-20° to 70°C operational
Humidity:	0-100% RH (non-condensing)
Enclosure rating:	IP67

Specifications subject to change without notice

USA - 222 Vista Ave., Pasadena, CA 91107
Tel (626)795-2220 I Fax (626)795-0868

Switzerland - PO Box 105, 1028 Préverenges
Tel +41 (21) 803-2829 I www.kinemetrics.com

11-05-2021