KINEMETRICS

EpiSensor 2

## Force Balance Accelerometer

EpiSensor 2: The Ultra-High Performance at Low Power!
Seismic Strong Motion Accelerometer

The EpiSensor 2 is an advanced force-balance, triaxial broadband seismic sensor that builds upon the outstanding record of its predecessor, the EpiSensor; the world's first seismological-grade strong motion accelerometer. The high dynamic range of the EpiSensor 2 allows both weak and strong motion high-fidelity recording from a single sensor.

The seismic industry-leading self-noise of the EpiSensor 2 is accomplished with quiescent power consumption (typical 325 mW for a triaxial sensor), well below that of any 4g sensors on the seismic monitoring market today. *The EpiSensor 2 has quiescent power consumption that is 60% to 70% less than competing designs!*

When combined with the world's only 26-bit seismic data acquisition system, the Quanterra Q330HRS, it establishes a new performance standard for digital strong motion recording applications. When paired to the seismic community leading ultra-low power digitizer, the Quanterra Q330, it allows high-fidelity triaxial strong motion recording with combined power consumption of well under 1W.

A new standard in power and performance is an enabling feature: it will deliver the highest quality data to advanced research projects, within an infrastructure that is simpler and less expensive than that required for typical broadband instruments.
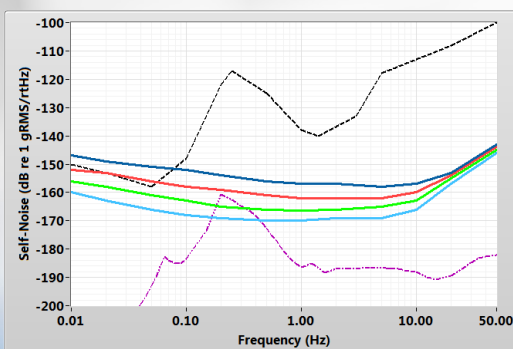
FEATURES

EpiSensor 2 Performance Attributes:

• Industry leading 166 dB dynamic range

• Very low self-noise: comparable to some broadband seismometers

• Wide passband: DC to >320 Hz

• Highest thermal stability, and enhanced dynamic accuracy, allow for higher data quality

• Selectable full-scale ranges from ±0.25 *g* to ±4 *g*

• Powerful "AUTOZERO" capability for offset removal on any full-scale range

• Full calibration capability

• Remote signaling of full-scale range via multiple interfaces

• Galvanic isolation of critical power and control interfaces

EpiSensor 2 Ease-of-Use:

• Allows full functional control through the digitizer, via an isolated Epi™ serial interface, and with a (local) button switch for:

> • Digital selection of full-scale range
>
> • Control of AUTOZERO mode
>
> • CAL ENABLE function

• Remote control modes (digitizer and serial interface) enable efficient operation in locations that are difficult to access.

• Serial interface provides access to sensor-specific information

• Installation accessories include an integrated bubble level, adjustable fine-leveling screws, and a central, non-interfering bolthole

• Very small, space-efficient footprint with connection of right-angle cable.

• Rugged enclosure rated IP67+.

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SPECIFICATIONS

Architecture: Triaxial, force-balance accelerometer with capacitive displacement transducer; X/Y/Z (non-Galperin) configuration

Centering: Optional AUTOZERO mode to allow removal of static sensor offsets (zeroed to within ±0.005 g)

Full-scale Range: Electronically (and remotely) selectable range: ±4 *g*, ±2 *g*, ±1 *g*, ±0.5 *g*, and ±0.25 *g* (peak)

Bandwidth: DC to >320 Hz (-3 dB point)

Dynamic Range (Integrated RMS): 166 dB @ 1 Hz over 1 Hz bandwidth
155 dB, 3 to 30 Hz

Non-linearity: < 0.015% (of full scale) total non-linearity
Hysteresis: < 0.005% (of full scale)

Cross-axis Sensitivity: < 0.5% total
5V/g (differential) for ±4 *g* full scale range

Offset Temperature Coefficient: Horizontal sensor: 60 µ*g*/°C, typical
Vertical sensor: 320 µ*g*/°C, typical

Power Supply: Voltage: 9 to 36 V DC isolated input

Power Consumption: <325 mW typical quiescent

Power Protection: Reverse-voltage and over-/under-voltage protected Over-current protection with self-resetting feature

Isolation: Input power, serial interface, and digital control lines galvanically isolated from sensor ground

Grounding: Case ground connected to dedicated cable line for automatic connection to digitizer case

Control Interfaces

Digital ENABLE Lines: Dedicated, isolated lines for control of full-scale range, CAL ENABLE and AUTOZERO ON/OFF

RS-232 Interface: TIA/EIA-232-F compliant, isolated RS-232 with full command-line control of all sensor parameters and functions

Pushbutton Switch and Status LEDs: Local selection and display of full-scale range, AUTOZERO, and CAL functions

Full-Scale Range Remote Signaling Mass

Position Interface: Range-dependent voltage output on traditional broadband sensor mass position lines

Signal Line Interface: Time/Amplitude-coded pulse train superimposed on differential signal lines: signaled upon full-scale range change, or upon power-ON reset

Electrical Interface

Connector: Souriau 851-07C16-26P50-A7-44 Receptacle
Acceleration Output: 40 Vpp differential
Output Impedance: 2 x 100 Ohms
Calibration Input: Protected, differential input for exciting all three axes simultaneously

Cable: Right-angle molded plug connects to sensor; Inbound end connects directly to Q330-class digitizers; Y-plug for RS-232 interface

Physical and Environmental

Housing: Epoxie-painted, Ni-plated Aluminum; scratch and crack resistant

Leveling: Integrated bubble level and fine-pitch, adjustable leveling screws

Mounting: Single, central bolthole passing through sensor; non-interfering with leveling

Size: 5.0"L x 5.25"w X 3.25"H (12.7 cm x 13.3 cm x 8.3 cm)

Weight: 3lbs

Operating Temperature: -40°C to 60°C

Storage Temperature: -65°C to 75°C

Humidity: 0 to 100%

Weather Resistance: O-ring sealed to IP67+

Remote Commands (password-protected access):
Full-scale range setting
Calibration ENABLE
AUTOZERO ON/OFF
System Response Values