SentryS-ProS



High-performance Sensor Box with dual-core MCU for sensor and data management integrating GNSS and a high-precision Time Base Unit (TBU) to guarantee accurate synchronization across multiple devices. Continuous, uninterrupted data streaming until 1000 sps is supported.

SentryS-ProS has a noise floor significantly lower than SentryS-Pro and comparable to that of several force-balance accelerometers. It is designed for structural monitoring in ultra-quiet environments and of stiff, low-excitation structures, including historic masonry buildings, heritage bridges, archaeological monuments, and high-rise buildings. It reliably resolves modal frequencies below 1 Hz.

APPLICATIONS

- Seismic and volcanic monitoring
- HVSR measurements
- Structural Health Monitoring
- Dynamic and Modal identification for SHM

MAIN FEATURES

- Accelerometer with very low self-noise (0.02 µg/√HZ typ. 1-10 Hz)
- 32 bit resolution
- Adjustable sampling rate (100, 200, 500, 1000 sps)
- Programmable low- pass digital filter
- Full-scale range ± 10 g (ca. 170 dB)
- High-precision vibration measurement with environmental vibrations down 1 µg/√Hz

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- Integrated Single Board Computer (SBC)
- Integrated temperature, humidity, pressure sensor
- Compatible with standard software, including Earthworm and SeisComP, and supports SeedLink data streaming.
- Ultra-low-latency mode for Earthquake Early Warning (EEW)
- Continuous, periodic, or event-triggered acquisition
- Precise synchronization across multiple nodes (< 0.1 ms)
- 64 GB micro SD for local data storage
- Ethernet, Wi-Fi, 3G/4G (optional) for data transfer and remote monitoring
- Output data format: miniSEED (others on request)
- State-of-health (SOH) monitoring
- System Status LEDs
- 12 VDC input from mains (via AC/DC adapter), battery, or solar panel

OPTIONAL

- Bi-axial digital INCLINOMETER
- 3G-4G modem

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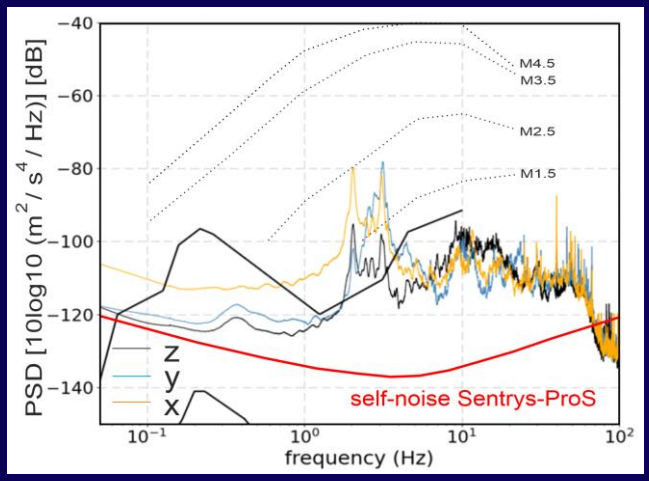
SentryS-ProS

FEATURES

SYSTEM	
Device with a digital very-low-noise MEMS accelerometer and integrated environmental sensors,. Optional: a dual-mode digital inclinometer.	
SENSORS	type - characteristics
ACCELEROMETER	Triaxial digital QMEMS (orthogonal axes)
ADC	Sigma-Delta 32 -bit
Output bandwidth	DC –210 Hz
Output Full Scale Range	± 10 g
Resolution	0.06 µG/LSB
Dynamic Range	~ 170 dB
Noise density	0.02 µg / √ Hz
Data Output Rate (max)	1000 sps
Operating temperature	- 30 to + 85 °C
ENVIRONMENTAL	Temperature, Humidity, Pressure
temperature	operative range: -40 ÷ +85 °C (±1.0°C accuracy)
Humidity	operative range: 0 ÷ 100 % rel. humidity (±3% accuracy)
Pressure	oper. Range 300 ÷1100 hPa (±1 hPa absolute accuracy)
INCLINOMETER (optional)	Dual-mode digital inclinometer
Dual-axis (horizontal operation)	±90°
Single-axis (vertical operation)	±180°
Accuracy	0.1°
Resolution	0.025°
TIME BASE UNIT	
GNSS module	GPS L1C/A, SBAS L1C/A, QZSS L1C/A, QZSS L1 SAIF, GLONASS L1OF, BeiDou B1I, Galileo E1B/C Accuracy of time pulse RMS 30 ns
Real Time Clock (RTC)	When GNSS is unavailable, the TBU uses the RTC to maintain timing and regulate the output frequency.
POWER	
Power voltage range	10– 36V DC*
Power consumption (at 12 V DC)	< 2 Watt standard
Types of power supply	12 Vdc, electrical power source (AC/DC adapter) 12 Vdc from battery 12 V from solar panel 20 W LAN PoE (optional)

PHYSICAL	
Standard **SentryS-ProS**	
Width	150 mm
Depth	90 mm
Height	80 mm
Weight	800 grams
Enclosure/Materials	Hard anodised aluminium
Communication interfaces / Connector	High-performance PBT connectors
Environmental protection	IP67



Accelerometer self-noise (red line) compared with ambient-noise measurements in a twelve-storey building.

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