SMARTSOLO
SCIENTIFIC

IGU-16HR

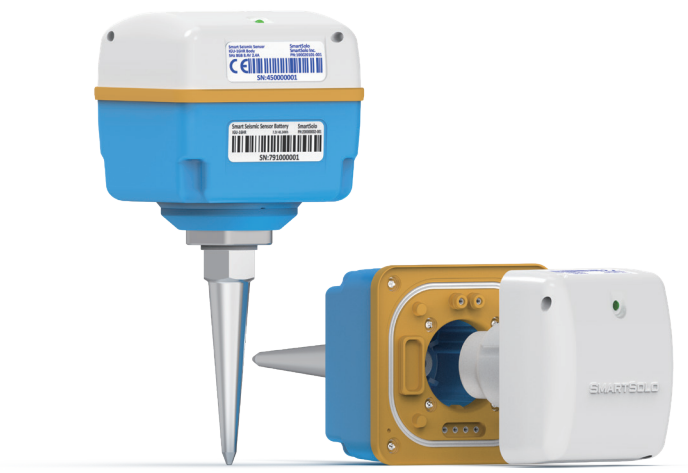
The IGU-16HR node instrument can conveniently and quickly form various networked seismic arrays, combined with active and passive source methods, to obtain massive data for high-density array spatiotemporal measurement (DAM).
Suitable for scientific research and enterprise survey needs in different scale regions.



Applications:
- Geological structure research
- Natural earthquake observation research
- Volcano observation research
- Observation and research on geological hazards
- Exploration of oil and gas, geothermal energy
- Coal exploration
- Metal mineral exploration
- Infrastructure geological assessment



SmartSolo IGU-16HR
High Resolution Smart Seismic Sensor



Features

- High quality, high sensitivity, high reliability
- Low distortion, low cost
- Compact size, lightweight
- Extremely wide operating temperature range
- Extended Battery Life
- IP 68 waterproof
- Capable of handling various complex field environments
- Flexible system configuration, comprehensive software assistance
- Built-in high-precision clock
- High-speed data download
- Optional 10 Hz and 5 Hz geophones

Descriptions

The SmartSolo IGU-16HR high resolution smart seismic sensor is an intelligent seismic node that can implement large-scale, high-density, and cost-effective exploration solutions. Building upon the foundation of the highly sensitive geophone DT-SOLO. SmartSolo is dedicated to pursuing the essence of seismic exploration-delivering high-fidelity seismic wave signals along with precise data timestamps and locations, while incorporating the electronic and software technologies of the mobile internet era. IGU-16HR is widely recongnized as it is a comprehensive, high-quality, intelligent, reliable, user-friendly, and structurally simple seismic exploration data logger that can be used in any harsh environment, all at an excellent price-to-performance ratio.

Applications

- Active source reflection and refraction seismic exploration
- Seismic imaging
- Energy exploration
- Seismic exploration
- Geothermal resource exploration
- Seismic disaster early warning
- Mudslide and landslide disaster early warning
- Urban building health monitoring

Flexibility

The SmartSolo IGU-16HR high resolution smart seismic sensor is compact and lightweight, weighing only 1.1 kilograms, including the battery and spike. It can be easily carried and deployed without any external connectors, eliminating any additional burden work. Even for small-scale teams that require multiple deployments, the equipment transportation can be easily accomplished.

Reliable Performance

The SmartSolo IGU-16HR high resolution smart seismic sensor is designed to operate reliably in an wide temperature range from -40 °C to +70 °C. It features a built-in high-precision disciplinable clock and a large-capacity expandable local storage card. Additionally, it supports IP 68 waterproof and dustproof ratings, hence there's no need to worry about water immersion, clogging, or moisture. It is fully capable of working in various harsh environments.

Rich Peripheral Equipment

The SmartSolo IGU-16HR high resolution smart seismic sensor equipped with a wealth of peripheral devices and auxiliary support, including various auxiliary software such as the Data Management Center (DMC) and the Data Collection Center (DCC), as well as a range of hardware auxiliary devices including the Data Download Rack (DHR). By using these peripherals, it is easily to complete havest the acquisition data which up to 3000 channels @ 2 ms & 20 working days less than 3.25 hours, providing invaluable assistance for seismic data acquisition.

Extended Battery Life

The SmartSolo IGU-16HR high resolution smart seismic sensor boasts an exceptionally long battery life to meet the demands of extended operations. In the standard conditions, the IGU-16HR smart seismic sensor can support continuous operation for up to 25 days @ 1 ms sampling after a single charge, and in segmented working mode (12 hours working/12 hours sleep), it can last for an impressive 50 days. Its outstanding battery life makes the IGU-16 ideal for mid to long-term monitoring applications.

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Typical Node Specifications

Seismic Data Channel	1
Size	103 mm (L)×95 mm (W)×118 mm (H) (without spike)
Weight	1.1 kg (including battery and spike)
Ingress Protection	IP 68
Charging Temperature Range	+3 °C ~ +45 °C
Charging Time	<3.25 hours
Operating Temperature	-40 °C ~ +70 °C
Operating Life @ 25 °C	25 days @ 1 ms, 24 hrs/day operation 50 days @ 1 ms, 12 hrs/day operation
Data Storage	16 GB (expandable to 32 GB)
GNSS Mode	Support GPS, BEIDOU, GLONASS, single mode or double mode optional

Sensor Specifications DT-SOLO 5 Hz

(All parameters are specified at +22 °C in the vertical position unless otherwise stated)

Natural Frequency(Fn)		5 Hz
Spurious Frenquency		>170 Hz
Coil Resistance		1850 Ω
Damping	Open Circuit Damping	0.60
	Damping with 43 kΩ	0.70
Sensitivity (Open Circuit Intrinsic Voltage Sensitivity)		80 V/m/s (2.03 V/in/s)
Distortion		< 0.1% @ 12 Hz, (0°~10°) tilt

Sensor Specifications DT-SOLO 10 Hz

(All parameters are specified at +25 °C in the vertical position unless otherwise stated)

Natural Frequency(Fn)		10 Hz
Spurious Frenquency		>240 Hz
Coil Resistance		1800 Ω
Damping	Open Circuit Damping	0.51
	Damping with 20 kΩ	0.70
Sensitivity (Open Circuit Intrinsic Voltage Sensitivity)		85.8 V/m/s (2.18 V/in/s)
Distortion		< 0.1% @ 12 Hz, (0°~10°) tilt

Acquisition Channel

(@ 2 ms sample interval, 31.25 Hz, +25 °C unless otherwise indicated)

ADC Resolution	32 bits (The ADC has 32-bit resolution, the noise-free resolution is no more than 24-bit)
Sample Interval	0.25, 0.5,1, 2, 4 ms
Preamplifier Gain	0 dB ~ 36 dB in 6 dB steps
Anti-alias Filter	206.5 Hz @ 2 ms (82.6% of Nyquist) Selectable - linear phase or minimum phase
DC blocking Filter	1 Hz ~ 10 Hz, 1 Hz increments or DC removed
GPS Time Standard	1 ppm
Timing Accuracy	±10 µs, GPS disciplined
Maximum Input Signal	±2.5 V peak @ 0 dB
Equivalent Input Noise	0.18 µV @ 2 ms 18 dB
Total Harmonic Distortion	<0.0002% @ 0 dB
Common Mode Rejection	>100 dB
Gain Accuracy	<0.5%
System Dynamic Range	145 dB
Frequency Response	0~1652 Hz@0.25 ms

Note: Follow SEG polarity rules(When shocked by seismic motion, sensor upward motion as the channel record is Negative signal,sensor downward motion as the channel record is Positive signal)

Specifications are subject to change without prior notice.

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New generation of seismic instruments | New generation of electrical instruments |
New generation of data acquisition systems