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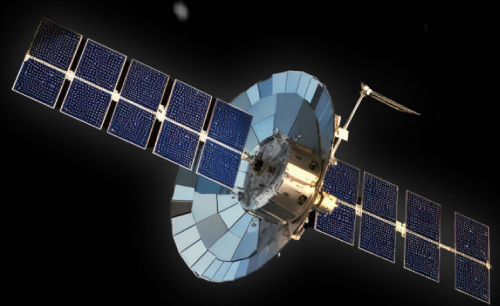
IGU-16HR 3C AIO 5Hz

The IGU-16HR 3C AIO 5Hz 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
- Research on surface and body waves
- Natural earthquake observation research
- Observation and research on volcanoes and tsunamis
- Infrasound research
- Observation and research on geological hazards
- Infrastructure geological assessment

SmartSolo
IGU-16HR 3C AIO 5Hz
3-Component Smart Seismic Sensor



Features

- New generation 3-channel smart seismic sensor
- 32-bit Σ-Δ high-resolution ADC, with a sampling rate of up to 0.25ms
- Lower the frequency limit down to 5 s
- Built-in GPS and high-precision clock
- DT-SOLO high-sensitivity 5Hz geophones
- Continous operation for 40 days @ 24 hrs/day operation
- Support external power supply and Bluetooth QC function
- Supports external power supply
- Dual-status indicator lights for Bluetooth, charging, and operational status
- Real-time QC of seismic data and instrument status
- Lightweight and compact
- Shares a set of auxiliary equipment with IGU-BD3C-5, greatly reducing equipment costs
- The most cost-effective system available in the market

Descriptions

SmartSolo IGU-16HR 3C AIO 5Hz is the latest integrated smart seismic sensor introduced by SmartSolo. It features a high-precision 5Hz three-component geophone built-in and equipped with Bluetooth communication capabilities, which allows real-time monitoring of battery status, satellite connection, data acquisition scripts, and the ability to view seismic data waveforms in real-time. With its integrated design, it is suitable for various data collection tasks involving both active and passive sources, such as long-term background noise monitoring, microtremor acquisition, MASW (Multi-Channel Analysis of Surface Waves), and hydraulic fracturing monitoring, among others.

Applications

- Dense array
- Active and passive source seismic exploration
- Natural microtremor detection
- Transient surface wave exploration
- Karst area detection
- Underground spaces and void detection
- Engineering safety risk assessment
- Disaster early warning

New Generation 3-channel Smart Seismic Sensor

Identifiable lower frequency limit down to 5s

Built-in battery supports continuous operation for up to 40 days

Supports external power supply and Bluetooth QC

Reliable Performance, High Resolution

Built-in GPS and high-precision clock

32-bit Σ-Δ high-resolution ADC

Up to 0.25ms sampling rate

Dual-status indicator lights

Indicate Bluetooth, charging, and operational status

Real-time Data Transmission and Storage

Real-time QC of seismic data and instrument status

Built-in 64GB storage, 128 GB optional

The peripheral equipment for IGU-16HR 3C AIO 5Hz

Combined download and charging device

16 Slots all-in-one

SoloLite software

High-speed data download

USB 3.0 @ 20 MB/s

Portable data download and charging all-in-one device

Flexible system configuration

Comprehensive software assistance



Combined download and charging device



16 Slots all-in-one

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Typical Node Specifications

Seismic Data Channels	3
Physical Size	Φ158 x 160 mm (without spike)
Weight	2.8 kg (included internal battery and spike)
Ingress Protection	IP 68
Operating Temperature	-40 °C ~ +70 °C
Charging Temperature Range	+3 °C ~ +45 °C
Charging Time	<7.5 hrs, fuly charged (stadard battery)
Operating Life @ 25 °C	40 days @ 2 ms, 24 hrs/day operation 80 days @ 2 ms, 12 hrs/day operation
Data Storage	64 GB (expandable to 128 GB)
GNSS Mode	Support GPS, BEIDOU, GLONASS, single mode or double mode optional
Data Harvesting	USB 3.0
Bluetooth QC	Availiable
External Power Supply	7 ~ 15 V DC (single power supply)

Sensor

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

Natural Frequency	5 Hz
Coil Resistance	1850 Ω
Distortion	<0.1% @ 12 Hz, (0° ~ 10°) tilt, (0°~3°) horizontal tilt
Damping	Open Circuit Damping : 0.6 Damping With 43kΩ : 0.7
Open Circuit Sensitivity	80 V/m/s (2.03 V/in/s)



Acquisition Channel

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

ADC Resolution	32 bits
Sample Interval	0.25, 0.5, 1, 2, 4, 8, 10, 20 ms
Preamplifier Gain	0dB ~ 36 dB in 6 dB steps
Anti-alias Filter	206.5 Hz @ 2ms (82.6% of Nyquist) Selectable - linear phase or minimum phase
DC Blocking Filter	1 Hz ~ 10 Hz, 1 Hz increments or DC removed
Maximum Input Signal	±2.5 V peak @ 0 dB
Instantaneous Dynamic Range	125 dB @ 2ms 0 dB
Equivalent Input Noise	0.18 μV @ 2ms 18 dB
Total Harmonic Distortion	<0.0002% @ 0 dB
Common Mode Rejection	>100 dB
Gain Accuracy	<1%
GPS Time Standards	1 ppm
Time Accuracy	±10 μs, GPS disciplined
Cross Feed	< -110 dB
Phase Difference Between Channels	<0.1 ms
Transverse Vibration Suppression	Better than 0.1%
Consistency of Amplitude Between Channels	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