

## IGU-16HR 3C 2Hz

(15s~500Hz)

The IGU-16HR 3C 2Hz 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 2Hz (15s~500Hz)

### 3-Component Smart Seismic Sensor



#### Features

- New generation smart 3-component seismic sensor
- High resolution data with up to 0.25ms sampling and 32-bit delta-sigma ADC
- **Low frequency signal can be recovered as low as 15s**
- **Up to 40 days of continuous recording (see Technical specs for details)**
- Built-in GPS receiver and disciplined high precision clock
- Based on the most highly regarded DT-SOLO HS geophone with 2Hz
- Support external power supply and Bluetooth QC function
- Dual status indicator to indicate Bluetooth, charging and working status
- Real-time QC seismic data and instrument status
- Light weight and compact size
- Share the same peripherals as IGU-BD3C-5, saving equipment cost
- Most cost-effective system on the market

#### Descriptions

SmartSolo IGU-16HR 3C 2Hz (15s~500Hz) is the latest integrated smart seismic sensor introduced by SmartSolo. It features a high-precision 2Hz three-component geophone built-in and comes equipped with Bluetooth communication capabilities. This 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

- Near-Surface Engineering Geophysics
- Hydrogeophysics
- Geological Hazard Monitoring
- Environmental Vibrations
- Structural Health Monitoring
- Fracturing Monitoring
- Crustal Structure
- Sedimentary Structure
- Volcano Monitoring

#### New Generation 3-channel Smart Seismic Sensor

Lower frequency limit down to 15 s

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  $\Sigma$ - $\Delta$  high-resolution ADC

Up to 0.25 ms sampling rate

Dual-status indicator lights

Indicate Bluetooth, charging, and operational status

#### Real-time Data Transmission

Real-time QC of seismic data and instrument status

Built-in 64 GB storage

Compatible with controlled seismic sources and pulse seismic sources

#### The Peripheral Equipment for IGU-16HR 3C 2Hz

Specialized download and charging charger

4 Slots USB adapter

Power adapter

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



Specialized download and charging charger



4 Slots USB adapter



Power adapter

## Typical Node Specifications

Operating Temperature Range	-40 °C ~ +70 °C
Ingress Protection	IP 68
Physical Size	Φ158 × 160 mm (without spike)
Weight	5.4kg (included internal battery and spike)
Data Storage	64 GB (expandable to 128 GB)
Operating Life @ 25 °C	40 days @ 2 ms, 24 hrs/day operation 80 days @ 2 ms, 12 hrs/day operation
External Power Supply	7 ~ 15 V DC (single power supply)
Bluetooth QC	Available
Data Harvesting	USB 3.0
Charging Temperature Range	+3 °C ~ +45 °C

### Sensor

(All parameters are specified at +20 °C in the vertical or horizontal position unless otherwise stated)

Natural Frequency	2 Hz
Bandwidth	15 s ~ 500 Hz
Distortion	≤0.3% @ 12 Hz, (0° ~ 7.5°)vertical tilt, (0°~ 0.5°)horizontal tilt
Damping	0.70
Sensitivity	260 V/m/s (6.60V/in/s)



### Acquisition Channel

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

Seismic Data Channels	3
ADC Resolution	32 bits
Sample Intervals	0.25, 0.5, 1, 2, 4, 8, 10, 20 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
Maximum Input Signal	±2.5 V peak @ 0dB
Instantaneous Dynamic Range	125 dB @ 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	<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

Specifications are subject to change without prior notice.

**SMARTSOLO**  
S C I E N T I F I C

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