

IMU-3C

The IMU-3C node instrument can conveniently and quickly form various networked arrays, obtain extensive data, and perform high-density array spatiotemporal measurement (DAM). Suitable for scientific research and enterprise survey needs in different scale regions.

Applications:

- Microseismic monitoring
- Aftershock monitoring
- Geological hazard monitoring (debris flow, landslide, rockfall, etc.)
- Structural health monitoring (e.g. bridges, tunnels, buildings, dams)
- Fracturing monitoring
- CCUS
- Perimeter security
- Earthquake and tsunami monitoring and warning

SmartSolo IMU-3C

3-Channel Intelligent Monitoring Unit



Features

- New generation three channel data recorder
- 32 digits Σ - Δ High resolution ADC with a maximum sampling rate of 0.25 ms
- Built-in high-precision DAC signal generator
- External various types of detectors
- Built-in GNSS module, supporting synchronous connection of internal and external GNSS antennas
- Supports built-in and external power supply
- Built-in 4G module (supports SIM card replacement) for real-time data transmission and parameter configuration
- Built-in WiFi module for close range data download and parameter configuration
- Built-in 4G antenna and WIFI antenna
- Dual status indicator lights, indicating the device's collection and data transmission status

Descriptions

IMU-3C is a three channel intelligent data recorder with real-time communication function, suitable for harsh outdoor environments. In a smooth network environment, data can be obtained and measurement parameters can be set remotely through built-in 4G, WiFi, and Ethernet connections. Support real-time data stream transmission under Windows and Linux systems, and support functions such as event threshold triggering, self testing, remote update of configuration information, and remote firmware upgrades.

The IMU-3C is easy to deploy and has an IP68 protection level. It can operate stably for a long time within the working temperature range of -40°C to $+70^{\circ}\text{C}$. It can be used independently without the need for additional protective equipment.

Highly reliable and cost-effective, it is an excellent choice for long-term monitoring tasks in harsh environments.

Single Port USB Data Download Cable

Up to 20MB/S fast speed data download



Single Port Charging Adapter

Single port charging device
Low cost fast charging solution

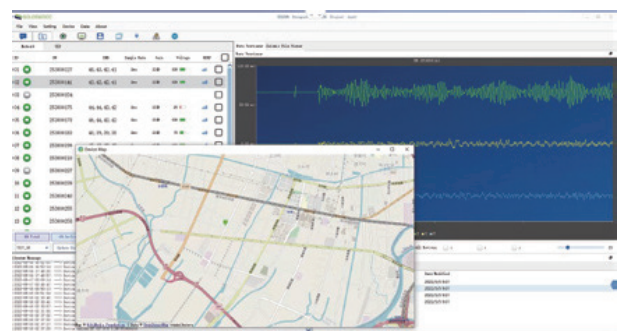


Applications

- Landslide monitoring
- Energy and mineral exploration
- Real time railway warning
- Short period array observation
- Microseismic fracturing monitoring
- Natural seismological research
- Environmental monitoring
- Dam monitoring
- Monitoring of Solitary Stone Karst
- Monitoring of goaf
- Geological survey
- Geothermal and water resource exploration
- Building structural health monitoring
- Various long-term field observation studies
- Observation and research on geological hazards

Auxiliary Software

Remote parameter configuration and data transmission can be achieved through SoloSWDCC software, supporting devices Real time monitoring of status and real-time display of data waveforms; Support configuring event triggering modes.



Specification

General Specification

Seismic Data Channel	3
Physical Size (LxWxH)	136x120.7x88 mm
Weight	1.3 kg
Waterproof	IP68
Operating Temperature Range	-40° C ~ +70° C
Charging Temperature Range	+3° C ~ +45° C
Charging Time	≤ 7 hours
Battery Life @25° C	60 hrs @2 ms, 4G real-time transmission working mode 25 days @2 ms, offline working mode 10 days@2ms, Ethernet transmission working mode
Data Storage	64 GB (expandable to 128 GB)
Data Transmission Mode	4G mode (4G, USB) Ethernet mode (ETH, USB)
SIM Card	Support by the local telecom operator
Data Harvesting	USB3.0
External Power	7 ~ 15 V DC (single supply)
GNSS Model	Support GPS, BEIDOU, GLONASS, single or dual mode operation

Acquisition Channel Performance

(@ 2ms 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 Intervals	0.25, 0.5, 1, 2, 4, 8, 10, 20 ms
Preamplifier Gain	0 dB to 36 dB, 6 dB steps
Anti-alias filter	206.5 Hz @2 ms (82.6% of Nyquist) Selectable - Linear Phase
DC Blocking Filter	DC Remove
GNSS Time Standard	1 ppm
Timing Accuracy	±10 μs, GNSS Disciplined
Maximum Input Signal	±2.5 V peak @Gain 0 dB
Instantaneous Dynamic Range	125 dB @Gain 0 dB
Equivalent Input Noise	0.18 uV @2 ms Gain 18 dB
Total Harmonic Distortion	<0.0002% @Gain 0 dB
Common Mode Rejection	>100 dB
Gain Accuracy	<1%
Cross Feed	< -110 dB
System Dynamic Range	145 dB
Frequency Response	0~1652 Hz @0.25 ms

Geophone DT-SOLO 2 Hz Specification

(All parameters are specified at +20 °C in the vertical position for vertical geophone and horizontal position for horizontal geophone unless otherwise stated.)

Natural Frequency	2 Hz ±15%
Frequency Range	15 s~500 Hz
Distortion	<0.30%, @12 Hz 0° ~ 7.5° vertical angle, 0° ~ 0.5° horizontal angle
Damping	0.70 ±15%
Sensitivity	260 V/m/s (6.6 V/in/s) ±10%

Geophone DT-SOLO 5 Hz Specification

(All parameters are tested at +22° C in a vertical or horizontal position, Unless otherwise specified)

Natural Frequency	5 Hz ±7.5%
Spurious Frequency	>170 Hz (>150 Hz, horizontal geophone)
Coil Resistance	1850 Ω ±5%
Distortion	<0.1% @12 Hz, 0° ~ 10° vertical tilt, 0° ~ 3° horizontal tilt
Damping	Damping with 43 kΩ Load: 0.70 ±7.5%
Sensitivity (open circuit)	80 V/m/s (2.03 V/in/s) ±5%

4G IoT Frequency Band

(It can access to 4G cellular networks, and can be used in China and surrounding areas.)

Performance	LTE CAT4 3GPP R9 (Type 4: 150Mbps Upper peak/50Mbps Lower peak)
Frequency band	LTE-FDD: B1/3/5/8 LTE-TDD: B34/38/39/40/41 WCDMA: B1/8

Note: 4G signal is high-frequency electromagnetic waves. 4G signals are highly susceptible to factors such as geographical environment, spatial magnetic field, and 4G base stations, resulting in instability and reliability. Based on this, we hereby declare that SmartSolo's IMU-3C product itself is of sturdy and durable quality, with no issues with data collection and local storage. However, we do not guarantee any data transmission problems caused by 4G signal failures other than this product.

DT-SOLO Three Component Geophone

DT-SOLO Technical

Product Series

Horizontal 3-component Type	D3C-H3	DT-SOLO 10Hz
	D3C-H5	DT-SOLO 4.5Hz/5Hz
	D3C-H7	DT-SOLO 2Hz (Plastic Version)
	D3C-H8	DT-SOLO 2Hz (Metal Version)
Vertical 3-component Type	D3C-V3	DT-SOLO 10Hz
	D3C-V5	DT-SOLO 4.5Hz/5Hz



Geophone Physical Specifications

Item	D3C-H7	D3C-H8	D3C-H5	D3C-V5	D3C-H5	D3C-V5	D3C-H3	D3C-V3
Type	DT-SOLO 2Hz (HP302 V&H)		DT-SOLO 4.5Hz (HP304 V&H)		DT-SOLO 5Hz (HP305 V&H)		DT-SOLO 10Hz (HP301 V&H)	
Length*width (mm)	120x150	145	110x105	82	110x105	82	110x105	82
Height(mm)	100(nut) 150(spike)	140(nut) 190(spike)	140(spike)	178	140(spike)	178	140(spike)	178
Weight(kg)	2	3	1.75	1.15	1.75	1.15	1.725	1.125

3-component Geophone Performance

Natural Frequency(Hz)	2	4.5	5	10
Tolerance	±15%	±10%	±7.5%	±3.5%
Distortion	<0.3%	<0.1%	<0.1%	<0.1%
Damping				
Open Circuit	0.7	0.65	0.6	0.51
With resistance Load	NA	NA	0.7(with 43KΩ load)	0.7(with 20KΩ load)
Tolerance	±15%	±10%	±7.5%	±3.5%
Sensitivity(V/m/s)				
Open circuit	260	80	80	85.8
With Resistance Load			76.7(with 43KΩ load)	78.7(with 20KΩ load)
Tolerance	±10%	±5%	±5%	±5%
Coil Resistance(ohm)	6000	1850	1850	1800
Tolerance	±10%	±5%	±5%	±5%
Mass(g)	60	22.7	22.7	14
Operation Temperature	- 40° C~ +70° C	- 40° C~ +80° C	- 40° C~ +80° C	- 40° C~ +90° C
Test Temperature	20° C	22° C	22° C	25° C

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