GEOdot10s

Ultra low power seismic digitizer

- Ultra-low power 0.2W
- High resolution 32bit ADC digitizer.
- Wide sensor range 10sec – 100Hz
- High sensitivity 1500V/m/s
- Options to integrate low freq. geophones.
- Dimensions D=110mm, H=65mm
- 50-800 samples per second
- Stores data files of GBT data format.
- Removable microSD storage unit.
- Fast data retrieval by microSD replacement or by Bluetooth / USB connection
- Supports seismometer calibration function
- Integrates three axis MEMs accelerometer
- 32channels GNSS and TCXO timing unit
- Aluminum casing, EMI protected, IP68



FEATURES

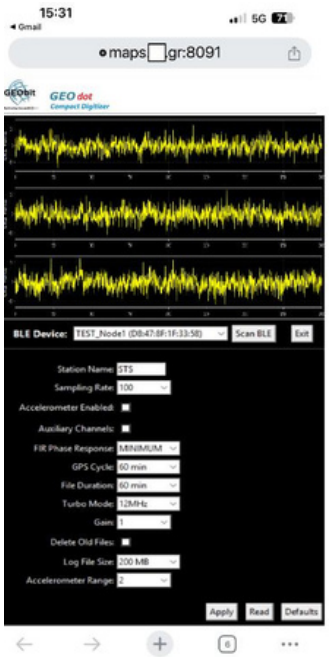
GEObit introduces a novel, state-of-the-art standalone digital seismometer designed for seismic monitoring applications. The instrument integrates a triaxial wide-band response sensor with a flat response from 10 s to 100 Hz and a, high quality MEMs accelerometer, and a high–dynamic-range digitizer (143 dB) based on 32-bit analog-to-digital converters (ADCs). Other options supporting low frequency geophones are also available. The system supports selectable sampling rates ranging from 50 to 800 samples per second (sps). Data acquisition and instrument control are managed by a high-performance, low-power RISC processor running the proprietary GEObit operating system.

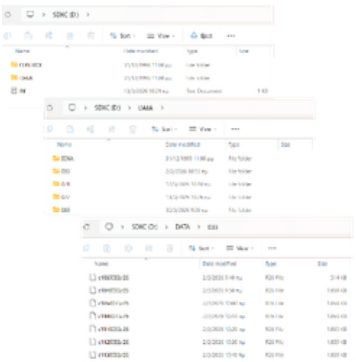
Seismic data are stored in GBT file format on a removable microSD card with a capacity of up to 64 GB. The storage medium is directly readable on both Linux and Windows operating systems, enabling straightforward data retrieval via simple file transfer. In addition, data can be accessed through Bluetooth or USB interfaces, which is particularly advantageous when the instrument is deployed in underground environments.

The onboard three-axis MEMS accelerometer with a dynamic range of 97 dB, allowing and acceleration data. Precise time synchronization is ensured by a 32-channel GNSS receiver and a TCVCXO clock with 0.2ppm frequency stability.

The instrument is optimized for ultra-low power consumption, operating at approximately 0.29 W. This enables continuous operation for up to six months when powered by a 9 V, 170 Ah zinc–air battery. User interaction and system management are supported via Bluetooth and USB connections, with dedicated iOS and Android applications providing real-time data visualization, instrument configuration, state-of-health (SOH) monitoring, and full seismometer control.

The device has a compact form factor, with a diameter of 110 mm, a height of 65 mm, and a total weight of 450 g. It is housed in an IP68-rated enclosure fabricated from hard-anodized aluminum, ensuring robustness and suitability for operation in harsh environments, including underground deployments.





INSTRUMENT SPECIFICATIONS

ULTRA LOW POWER, MINIATURE SIZE 32BIT DIGITAL SEISMOMETER

DIGITIZER

Analog channels	3 high resolution seismic channels plus three auxiliary channels
A/D converter	Fourth Generation, Delta-Sigma, 32bits data stream
THD	125dB
Modulator	Fourth Generation, 4th order Delta-Sigma Modulator
Filter	Programmable SINC, FIR, IIR filtering, auto-calibration function
Filter Response	Selectable Minimum or Linear Phase Filter
Input resistance	1MOhm differential for variable gain input
Sampling Rate	50-800 sps,
Power	4.5-30Vdc 0.2W(geophone version) 4.5-30Vdc 0.26W(10sec version)
Dynamic Range	143dB@100sps
Analog Front-End	Modular. Low noise preamplifier or wide-band sensor electronics

DATA RECORDING

Storage Media	Removable MicroSD flash card, GBT format data files
Information file	System log file. SOH message
Recording mode	Continuous
Operation	
Operating System	GEObit custom made OS
Memory	Internal 256Mbyte RAM

TIME BASE

Type	GNSS receiver (GPS, GLONASS, WAAS, EGNOS, BeiDou, QZSS) /DPLL, GPS port, 32 channels
Antenna	Up to 30m cable GNSS antenna
Accuracy Time	+/-1usec to UTC time pulse,
	+/-5 meters to position
Timing Sources	Ultra-low drift DPLL unit using TCVCXO, RTC
DPLL drift	DPLL drift Less than 17usec between one hour GPS cycles

COMMUNICATION

Communication	USB port, Bluetooth
Protocols	GBT data transfer
LED	Two high brightness LEDs
MicroSD	removable

CONTROL - CALIBRATION

Control Signals	Seismometer Calibration Enable
Calibration	Pulse, Sine waveform, variable amplitude and frequency, 16bit DAC

DIFFERENTIAL INPUT FRONT END

Sensitivity (10s)	1500V/m/s, otheroptions available
Sensitivity (geo)	From28.8 to 280V/m/s

INTEGRATED WIDE - BAND SENSOR FRONT END

Bandwidth	10sec –98Hz
Sensitivity	1500V/m/sec using GEObit force-balance electronics

PHYSICAL (DIGITISER/RECORDER WITH INTEGRATED SENSOR ELECTRONICS)

Size	D=110mm, H=65mm
Weight	0.24kgr

PHYSICAL (10s SEISMIC SENSOR IF COMBINED WITH SENSOR ELECTRONICS)

Type	BoreholeType/SurfaceType
Dimensions	50mm diameter x 180mm length
Cable length	5meters, longer cable available
Weight	1.25kgr
Humidity	Up to 100 bar external water pressure
Tilt	+/-10 degrees

ENVIRONMENT (DIGITIZER/RECORDER)

Temperature range	-30 to +70 °C
Humidity	100%, IP68 enclosure

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