GEOdot-D

Ultra low power seismic digitizer

- Ultra-low power 0.2W
- High resolution 32bit ADC digitizer.
- Wide input range 40Vpp – 0.1Vpp
- 8 selectable gain steps X1-X128
- Connects to any commercial seismic sensor.
- Three extra analog inputs
- Three TTL command outputs
- Dimensions D=110mm, H=30mm
- 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
- Build-in seismometer lock-unlock-centering
- Build-in seismometer mass position monitoring
- 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 digitizer developed for seismic monitoring applications and environmental studies. The system uses three 32-bit analog-to-digital converters, achieving a dynamic range of. up to 143 dB and supporting selectable sampling rates from 50 to 800 samples per second. The device is based on a high-performance, low-power RISC processor running the proprietary GEObit operating system.

Seismic data are recorded in GBT file format on a removable 64Gb microSD card, fully compatible with both Linux and Windows platforms. Data retrieval is straightforward through direct file transfer from the microSD card, and wireless or wired access via Bluetooth or USB is available if the instrument is deployed underground.

In addition to the three high-resolution seismic channels, the digitizer includes three auxiliary 16-bit channels for seismometer state-of-health parameters monitoring, such as mass position, or any environmental parameters monitoring. It supports locking, unlocking, and centering of broadband seismometers, supporting both active-high and active-low logic to ensure compatibility with the commercial broadband and wideband seismometers. The analog front end offers multiple gain settings. The device integrates a three-axis MEMS accelerometer with a 97 dB dynamic range, allowing simultaneous acquisition of seismic and acceleration data. Accurate timing is provided by a 32-channel GNSS receiver in combination with a TCVCXO clock featuring 0.2 ppm frequency stability.

The digitizer is optimized for ultra-low power operation 0.22 W, which allow continuous operation for up to six months when powered by a 170 Ah zinc–air battery. User interaction is supported through Bluetooth and USB interfaces, with dedicated iOS and Android applications offering real-time data visualization, instrument configuration, SOH monitoring, and seismometer control.

The device measures 110 mm in diameter, 30 mm in height, and weighs only 150 g, enclosed in an IP68-rated hard-anodized aluminum housing, well suited for harsh environmental conditions and underground installations.



INSTRUMENT SPECIFICATIONS

ULTRA LOW POWER, MINIATURE SIZE 32BIT ADC SEISMIC DIGITIZER/RECORDER

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
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

CONTROL - CALIBRATION

Control Signals	Seismometer Lock, Unlock, Center, Calib. Enable, active high/low user selectable
Calibration	Pulse, Sine waveform, variable amplitude and frequency, 16bit DAC

DIFFERENTIAL INPUT FRONT END

Input (standard gain)	40Vpp, 20Vpp, 10Vpp, 5Vpp, 2.5Vpp, 1.25Vpp, 0.625Vpp

INTEGRATED WIDE - BAND SENSOR FRONT END (optional)

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

PHYSICAL (DIGITISER/RECORDER WITH INTEGRATED SENSOR ELECTRONICS)

Size	D=110mm, H=30mm
Weight	0.18kgr

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

GEObit
Monitoring the earth

Exact
PT. EXACT GLOBAL TEKNOLOGI
Indonesia **Authorized Agent**

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