## **GEOtinyBH10** Borehole Compact Digital Seismometer

GEObit

Monitoring the earth



## FEATURES.

GEOtinyBH10 is a compact miniature digital seismom eter which integrates three seismic and three acceleration channels. It supports high resolution 24bit digitizer, embedded linux OS and GPS or NTP timing. Seedlink server ensures reliable real time data telemetry while large storage volume ensures long period local data recording. The instrument has very low power consumption so it can operate getting powered from a small 12Vdc battery. The 3C velocity sensor is borehole type. Modular sensor interface allows the user to select between



a variety of sensor types and frequency corners (10sec, 5sec, 2sec, 1sec, 2Hz, 4,5Hz), thus covering the short period and wide band seismic range. Design simplicity is the great advantage, and it is reflected to the price which is only fraction of the common commercial seismometers. The user is able to deploy even 100% more units than using common seismometers at the same cost.

- Aftershock monitoring
- Regional seismicity monitoring
- Seismic tomography acquisition
- Induced seismicity monitoring
- Volcano monitoring
- Structural monitoring
- HVSR, MASW surveys
- Educational seismograph
- Personal seismograph

Sensor PSD compared to a Guralp3T 120Sec sensor RED= GEOtiny, BLUE = 120sec seismometer DIGITIZER

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

Channels	Three seismic and three acceleration channels
A/D converter	Fourth Generation, Delta-Sigma, 24bits data stream
THD	125dB
Modulator	Fourth Generation, 4th order Delta- Sigma Modulator
Filter	Programmable FIR,auto-calibration function
Nonlinearity	+/-0.001%
Sampling Rate	1-1000 sps, optional 0.1-1000sps
Power	9-18Vdc, or 9-36Vdc 0.9W, 1.3W with integrated sensor board
Dynamic Range	>138dB@100sps,>128db@1000sps
Analog Front-	Modular. Low noise preamplifier or
	wide-band sensor electronics
Storage Media	MicroSD flack card, romovable USP stick
Storage Media	>64Gb, Ringbuffer RAM storing 10h+ data.
Information file	System log file. SOH message
Recording mode	Continuous, Triggered STA/LTA based
Operation	Advanced functionality if connected to an Earthworm server
Operating System	Open Source based, ability for custom application run
Memory	Internal 256Mbyte RAM in ringbuffer mode and minimum 64Gbyte FLASH memory
TIME BASE	
Туре	GNSS receiver (GPS, GLONASS, WAAS, EGNOS, BeiDou, QZSS) /DPLL, GPS port, 32 channels
Antenna	Up to 15m cable GPS 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
Network Time	NTP. PTP

## **TRANSPORTATION**

Mass Lock

Not required. Automatic mass centering

COMMUNICATION Ethernet port, WiFi, embedded Telemetry seedlink and earthworm servers Protocols SSH, FTP, SFTP, Web Protocols Interface, TCP/ IP, HTTP, HTTPS, PPP, MQTT, COAP/COAPS,NTP LED Five high brightness LEDs **CONTROL - CALIBRATION** Calib. Enable, automatically enabled **Control Signals** during calibration function Calibration Pulse, Sine waveform, variable amplitude and frequency, 16bit DAC **VELOCITY WIDE - BAND SENSOR** Bandwidth 10sec - 98Hz Sensitivity 1500V/m/sec using GEObit force-balance electronics Electro-dynamic Force-Balance Technology technology Dynamic Range >146dB **ACCELERATION SENSOR** Bandwidth DC - 550Hz >97dB Dynamic Range Range +/- 8g, 4g, 2g user configurable PHYSICAL Dimensions Digitizer: 130mm diameter x 55mm heigh, BH sensor: 500mm diameter X 160mm heigh Weight Digitizer: 0.8.kgr Sensor: 2.6kg(ALU), 3.2kg(SS) BH sensor: 5 meters standard, longer Cable length cable available Comms & power cables: 2.5m Tilt +/-10 degrees Smart packer or guiding wheels Mounting Material Hard anodized Aluminum or Stainless Steel **ENVIRONMENT** -20 to +70 °C Temperature range Humidity 100%, IP68 enclosure Overvoltage, reverse polarity, Protection

overcurrent protection



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