GEOthree

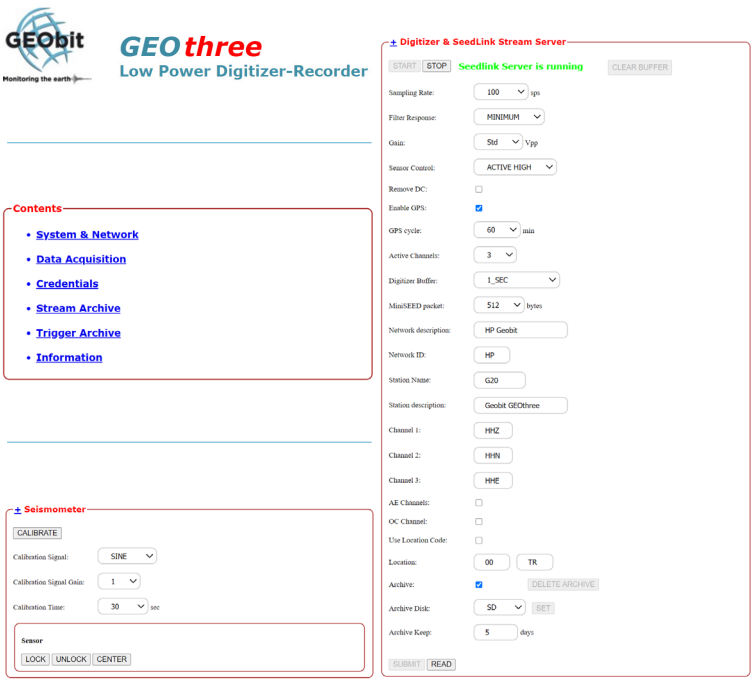
Low Power Digitizer - Recorder

GEObit
Monitoring the earth

- High resolution digitizer
- Four extra analog inputs
- Four TTL command lines
- Low power consumption
- Dimensions 168x106x68mm
- GNSS time/Precision DPLL
- 0.1-1000 samples per second
- 3+1 seismic channels
- Ultra-low noise preamplifier
- Embedded open source OS
- Embedded SeedLink server
- Embedded earthworm server
- Continuous/trigger recording
- Advanced networking functionality
- Smart seismic network operation

FEATURES

GEObit introduces GEOthree series high resolution 3+1 analog seismic channels telemetry digitizer/recorder. The size of the instrument is only 168x106x68mm. The power consumption is only 0.9W for 3 channels. Available sampling rate is 1 to 1000sps and optional lower sampling rates are supported. Build-in GNSS receiver combined with ultra accurate DPLL unit providing time drift 10e-9 sec ensures timing stability even in the absence of GPS signal. NTP timing is also available. The unit is very flexible and accepts several types of analog front-end units so any type of seismic sensor can be connected. Additionally, it provides four extra low resolution and rate analog inputs for seismometer mass position monitoring, or any other environmental parameter monitoring. Four TTL command outputs are supported for seismometer control or for any other external device control. Typically, the digitizer supports differential variable gain preamplifier. GEObit force-balance sensor front end is also supported, providing wide-band response (10sec-98Hz) and high sensitivity 1500V/m/s to a connected C100 sensor. Acquisition parameters and operation modes can be set from the user-friendly web interface, up to 64 characters password protected .



The unit operates in continuous mode, triggered mode or both and data are streamed through different data ports. Local data storage is selectable as well as logfile information. The unit supports advanced functionality, implemented from the combination of trusted open source software components. Because of it's open source architecture is able to run any custom application thus providing the next day solution to the user. The hardware is based over an embedded ARM9 400MHz ARM linux board running 14.6 linux kernel. The data are stored in mini-SEED format into the microSD card or to a removable USB stick. The instrument supports 10/100 ethernet port and debug port. FTP, SFTP, SSH are also available. The state of health is transmitted over UDP packets upon request.

INSTRUMENT SPECIFICATIONS

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

DIGITIZER

Analog channels	3+1 high resolution seismic channels plus four auxiliarychannels
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	1-1000 sps, optional 0.1-1000sps
Power	9-18Vdc, 0.9W standalone,1.1W telemetry
RMS noise	137dB @ 100sps,128db@1000sps
Analog Front-End	Modular. Low noise preamplifier or wide-band sensor electronics

DATA RECORDING

Storage Media	MicroSD flash card, removable USB stick Ringbuffer RAM storing 10h+ data. Miniseed data files
Information file	System log file. SOH message
Recording mode	Continuous, Triggered STA/LTA based or both
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

Type	GNSS receiver(GPS, GLONASS, WAAS,EGNOS,BeiDou,QZSS) /DPLL, GPS port, up to 30m cable GPS antenna or 120m active 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

DIFFERENTIAL INPUT FRONT END

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

COMMUNICATION

Telemetry	Ethernet port, WiFi, seedlink server
Protocols	Protocols SSH, FTP, SFTP, Web Interface, TCP/ IP, HTTP, HTTPS,PPP, MQTT, CoAP/CoAPS,NTP
LCD	Miniature LCD with alternative information messages
LED	Two high brightness LEDs

CONTROL - CALIBRATION

Ccontrol 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
Input (high gain)	5Vpp, 2.5Vpp, 1.25Vpp, 0.625Vpp

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	168mm x 106mm x 68mm
Weight	1.2kgr

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

Type	Borehole Type/Surface Type
Dimensions	50mm diameter x 180mm length
Cable length	5meters, longer cable available
Weight	0.85kgr
Humidity	Up to 20 bar external water pressure
Tilt	+/-10 degrees

ENVIRONMENT (DIGITIZER/RECORDER)

Temperature range	-20 to +70 °C
Humidity	100%, IP67 enclosure

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