

# GEO-A200

## Compact Digital Accelerograph

- FBA based compact digital accelerograph
- Cost effective and high performance
- Bandwidth DC-200Hz
- Dynamic range >155dB
- Ethernet - WiFi - Serial port
- 32bit ADC digitizer
- GNSS time/Precision DPLL
- 0.1-1000 samples per second
- LCD and six status LEDs
- Integrated Seismic Switch
- Embedded open source OS
- Embedded seedlink server
- Embedded earthworm server
- Continuous and trigger recording
- Advanced networking functionality
- Smart seismic network operation



## FEATURES

GEObit introduces GEO-A200 high resolution and high dynamic range compact digital accelerograph. The size of the instrument is only 139mm high and 138mm diameter. The power consumption is less than 2W. Available sampling rate is 1 to 1000sps and optional lower sampling rates are supported. Built-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 instrument provides self calibration functionality. DC offset removal is also performed automatically or on demand. Acquisition parameters and operation modes can be set from the user-friendly web interface, which can be protected with up to up to 64 characters passwords.

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 open source architecture it is able to run any custom application, thus providing the next day solution to the user. The hardware is based on 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.



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### Accelerometer

Calibration Signal: 
  
 Calibration Signal Gain: 
  
 Calibration Time:  sec

Sensor:

### Digitizer & SeedLink Stream Server

SeedLink Server is running

Sampling Rate:  sps  
 Filter Response:   
 Gain:  V/g  
 Seismic Control:   
 Restore EC:   
 Enable GPS:   
 GPS cycle:  min  
 Active Channels:   
 Digitizer Buffer:   
 MiniSEED packet:  bytes  
 Network description:   
 Network ID:   
 Station Name:   
 Station description:   
 Channel 1:   
 Channel 2:   
 Channel 3:   
 AE Channel:   
 OC Channel:   
 User Location Code:   
 Location:    
 Archive:    
 Archive Disk:    
 Archive Keep:  days

The instrument supports embeded earthworm and seedlink server with configurable data packet size that allows data transmission with low latency. The instrument is ideal for earthquake monitoring, early warning applications and structural monitoring applications. Single bolt mounting and flexibility of connectivity allows easy and quick installation.



# INSTRUMENT SPECIFICATIONS

## FBA BASED COMPACT DIGITAL ACCELEROGRAPH

### DIGITIZER

<b>Analog channels</b>	3 seismic (acceleration) channels
<b>A/D converter</b>	Fourth Generation, Delta-Sigma, 32bits data stream
<b>THD</b>	125dB
<b>Modulator</b>	Fourth Generation, 4th order Delta-Sigma Modulator
<b>Filter</b>	Programmable SINC, FIR, IIR filtering, auto-calibration function
<b>Filter Response</b>	Selectable Minimum or Linear Phase Filter
<b>Sampling Rate</b>	1-1000sps, optional 0.1-1000sps
<b>Power</b>	9-18Vdc, <2W
<b>RMS noise</b>	>137dB@100sps, >128db@1000sps

### DATA RECORDING

<b>Storage Media</b>	MicroSD flash card, removable USB stick Ringbuffer RAM storing 10h+ data. Miniseed data files
<b>Information file</b>	System log file. SOH message
<b>Recording mode</b>	Continuous, Triggered STA/LTA based or both
<b>Operation</b>	Advanced functionality if connected to an Earthworm server
<b>Operating System</b>	Open Source based, ability for custom application run
<b>Memory</b>	Internal 256Mbyte RAM in ringbuffer mode and minimum 64Gbyte FLASH memory

### TIME BASE

<b>Type</b>	GNSS receiver (GPS, GLONASS, WAAS, EGNOS, BeiDou, QZSS) /DPLL, GPS port, up to 30m cable GPS antenna or 120m active GPS antenna
<b>Accuracy Time</b>	+/-1usec to UTC time pulse, +/-5 meters to position
<b>Timing Sources</b>	Ultra low drift DPLL unit using TCVCXO,RTC
<b>DPLL drift</b>	DPLL drift less than 17usec between one hour GPS cycles

### COMMUNICATION

<b>Connectivity</b>	Ethernet port, WiFi, Serial Port (Optional)
<b>Telemetry</b>	Seedlink and Earthworm server
<b>Protocols</b>	Protocols SSH, FTP, SFTP, Web Interface, TCP/ IP, HTTP, HTTPS, PPP, MQTT, CoAP/CoAPS,NTP
<b>LCD</b>	Miniature LCD with altering information messages
<b>LED</b>	Six high brightness LEDs

### CALIBRATION

<b>Control Signals</b>	Automatic or on demand centering (offset removal)
<b>Calibration</b>	Pulse, sine waveform, variable amplitude and frequency, 16bit DAC

### INTEGRATED ACCELERATION SENSOR

<b>Axes</b>	Three, orthogonally placed
<b>Bandwidth</b>	DC - 200Hz
<b>Dynamic Range</b>	>155dB
<b>Full Scale Range (g)</b>	+/-4, +/-2, +/-1 +/-0.5, +/-0.25
<b>Noise</b>	Below ALNM between 0.2-45Hz

### PHYSICAL

<b>Size</b>	139mm height, 138mm diameter
<b>Weight</b>	2.8kg

### ENVIRONMENTAL

<b>Temperature range</b>	-20 to +70 °C
<b>Humidity</b>	100%, IP67 enclosure

### EMMERGENCY

<b>Seismic Switch</b>	SPST type relay, 1A switch
<b>Configuration</b>	Web interface configurable, threshold limit activated.



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