



CODEVINTEC

Tecnologie per le Scienze della Terra e del Mare

45° 27' 39.384" N
9° 07' 30.145" E

Geode Ultra-Light Exploration Seismograph



Photo: CGT - Siena

The new 24-bit Geode seismic recorder is the most versatile and flexible seismograph available today

Applications

- > Refraction, reflection
- > Earthquake monitoring
- > VSP (Vertical Seismic Profile)
- > Blast and vibration measurements
- > Marine surveys
- > Sub-bottom profiling
- > Continuous recording



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Geode Exploration Seismograph

It is no wonder that over 2,700 Geodes have been sold. It is the most versatile and flexible seismograph available. Small and lightweight enough to pack in your suitcase, it expands easily for full-scale 2D and 3D surveys at a cost your bottom line will love.

When you are not using the Geode for reflection, refraction, MASW/MAM, or tomography surveys, use it for monitoring earth quakes and other passive sources. The Geode will even do marine profiling or continuous recording. It is the most popular engineering seismograph in the world, and is widely used throughout the academic and research community.

For light-duty applications, you can use your laptop to view, record and even process your data. In harsh conditions, control your Geodes with Geometrics' Strata-Visor NZ/C series computers and seismographs. You can connect Geodes together to build systems of over 1,000 channels. Geodes are shock-proof, dust-proof, submersible and able to withstand extreme temperatures.

Fifteen years on, we can say with confidence that the Geode is the most reliable seismograph we have ever produced. Because of this, we can offer a 3-year warranty backed by Geometrics, now in our 48th year of providing prompt, knowledgeable customer support.

Features & benefits

- > **Bulletproof** - Not really, but almost. Survives 1.5m drop onto concrete in 14 orientations. The Geode comes standard with a 3-year warranty.
- > **Distributed architecture** - Use standard 24-pair geophone cables, no matter how many channels.
- > **Ultra-wide bandwidth** - Useful for everything from crosshole surveys to earthquake monitoring.
- > **Geophone and line testing** - No need for time-consuming "tap test".
- > **Versatile** - Configure systems ranging from 8 to 1000 channels.*
- > **Waterproof and dustproof** - No need to pick up the system in a sudden rain or dust storm.
- > **High temperature range** - Use in the Sahara, Amazon or at the North Pole.
- > **GPS synchronization** - Sub-sample timing accuracy so you know exactly when an event occurs.

* Systems can be expanded temporarily via Geometrics' rental pool or existing loaner networks.





Technical specifications

Configurations

8, 12, 16, or 24 channels in weatherproof field-deployable Geode module. Geode is operated from either Windows XP/7/10-based laptop or by Geometrics' ruggedized StrataVisor NZ field computer/seismo-graph. Basic operating software controls one Geode. It can also be optionally expanded to control multiple Geodes, as well as do marine surveying, continuous recording, GPS synchronization, and seismic surveillance.

A/D Conversion

24-bit result using Crystal Semiconductor sigma-delta converters and Geometrics proprietary oversampling.

Dynamic Range

144 dB (system), 110 dB (instantaneous, measured) at 2 ms, 24 dB.

Distortion

0.0005% @ 2 ms, 1.75 to 208 Hz.

Bandwidth

1.75 Hz to 20 kHz. 0.6 and DC low frequency option available.

Common Mode Rejection

> 100dB at ≤ 100 Hz, 36 dB.

Crosstalk

-125 dB at 23.5 Hz, 24 dB, 2 ms.

Noise Floor

0.20 μ V, RFI at 2 ms, 36 dB, 1.75 to 208 Hz.

Stacking Trigger Accuracy

1/32 of sample interval.

Maximum Input Signal

2.8V PP, 0 dB.

Input Impedance

20 kOhm, 0.02 μ f.

Preamplifier Gains

Standard factory configuration is 24 and 36 dB. Optional configurations include 12 and 24 dB or 0 dB.

Anti-alias Filters

-3 dB at 83% of Nyquist frequency, down 90 dB.

Acquisition and Display Filters

- > **Low Cut:** OUT, 10, 15, 25, 35, 50, 70, 100, 140, 200, 280, 400 Hz, 24 or 48 dB/octave, Butterworth.
- > **Notch:** 50, 60, 150, 180 Hz and OUT, with the 50 dB rejection bandwidth 2% of center frequency
- > **High Cut:** OUT, 32, 64, 125, 250, 500 or 1000 Hz, 24 or 48 dB/octave.

Sample Interval

0.02, 0.03125, 0.0625, 0.125, 0.25, 0.5, 1.0, 2.0, 4.0, 8.0, 16.0 ms.

Correlation

Optional (with SGOS, standard with MGOS) high-speed hardware correlator available in each Geode for fast cycle time with vibrators and pseudo-random sources. Correlates 16K record, unlimited channels, in under 1 second.

Record Length

ws standard, 65,536 samples optional.

Pre-trigger Data

Up to full record length.

Delay

Full record length to +100 sec.

Data Transmission

Uses Ethernet transmission standard over CAT-5 copper or multimode fiber-optic cable. Distance between boxes: CAT 5 cable up to 0.25 km; fiber-optic cable up to 1.5 km.

Event-Trigger

Based on seismic event; criteria set by user.

Continuous Recording (optional)

Record GPS-synchronized, gapless data in SEG-2 format.

Auxiliary Channels

All Geode channels can be programmed as either AUX or DATA.

Roll Along

Built-in, no external roll box required

Geophone Testing

Pulse test measures resistance, sensitivity, natural frequency, and damping.

Instrument Tests

Optional analog testing available. Measure noise, crosstalk, CMR, dynamic range, gain similarity and trigger accuracy. Additional built-in oscillator required.

Data Formats

SEG-2 standard. SEG-D and SEG-Y available as options.

System Software

Basic operating software includes full compliment of acquisition, display, plotting, filtering and storage features. Numerous optional features available; see SCS data sheet.

Bundled Applications Software

Basic operating software includes full compliment of acquisition, display,

Data Storage

Stores data locally in SEG-2 on laptop/PC media. Drivers available for tape/disk storage in SEG-2/D/Y.



Plotters

Drives any Windows-compatible plotter or printer.

Triggering

Positive/negative TTL or contact closure, software adjust-able threshold. STA/LTA-like algorithm for triggering on seismic waveform.

Power

Requires 12V external battery. Uses 0.5 W/channel during acquisition (0.25 ms sample rate). A single 12 Amp-hour battery is sufficient for a typical day of data acquisition; standby mode reduces power consumption by 70%.

Environmental

Operates from -50°C to +70°C (-58°F to +158°F). Waterproof and submersible. Withstands a 1m drop onto concrete on 6 sides and 8 corners. Passes MIL810E/F vibration.

Physical

L: 25.4 cm; W: 30.5 cm; H: 17.75 cm; Weight: 3.6 kg (10x12x7 in; 8 lb). Uses waterproof Bendix 61-pin connector for geophone input.

Operating System

Windows XP/7/10.

Warranty

Three years standard, extended warranty available.

Optional Built-In Test Functions

Instrument

- > Noise
- > DC Offset
- > Gain Accuracy
- > Gain and Phase Similarity
- > Distortion
- > Crossfeed
- > CMR
- > Bandwidth
- > Timing Accuracy

Geophone

- > Natural Frequency
- > Resistance
- > Damping
- > Sensitivity

Typical uses

- > **Versatile Seismic Recorder** Petroleum exploration and monitoring, engineering studies, depth to bedrock, fault and fracture location, hydrologic investigations, research and teaching.
- > **Reflection** Suitable for shallow reflection, deep reflection, 2-D and 3-D surveys
- > **Refraction** Comes with built-in first break picking and analysis
- > **Marine Surveys** Very fast time between shots, real-time single-trace gathers, gun monitoring, noise snapshots, tape swapping for 24/7 operation.
- > **Sub-bottom Profiling** Works with boomers, sparkers, bubble-pulse sources or air guns
- > **4-D Time Lapse Surveys** Weather-proof Geodes can be left in place or redeployed easily for accurate repeat surveys
- > **Earthquake Monitoring** Uses STA/LTA type algorithm to trigger on incoming data stream synchronizes with GPS clock
- > **Continuous Recording** Continuous mode plus GPS synchronization for blast and vibration monitoring, general industrial applications.
- > **MASW** UBC Vs30/ IBC Vs100 Site Classification, microzonation studies (H/V method), foundational engineering