

Geode Exploration Seismograph



GEOMETRICS
Innovation • Experience • Results

FEATURES & BENEFITS

- Multi-purpose seismic recorder: refraction, reflection, MASW and MAM, earthquake monitoring, marine surveys, and continuous recording
- Available with 8 to 24 channels per box; connect more boxes to build low-cost distributed systems up to 1,000 channels
- 24-bit dynamic range, low distortion, and full wave-form noise monitor
- Standby low-power mode means light-weight batteries, long life

3-YEAR WARRANTY



OVER 2,500 UNITS SOLD

- Light-weight (8 lb/3.6 kg), in-field modules connect to the Ethernet port on your laptop for easy, instant interfacing
- Data transmitted from Geode to host computer digitally, reducing long, expensive analog cables
- DC to 20 kHz bandwidth enables wide range of applicability, from ultra-high resolution exploration to earthquake monitoring
- Geophone and line testing

It is no wonder that over 2,500 Geodes have been sold since its introduction in the year 2000. It was the most versatile and flexible seismograph available then, and it still is. Small and lightweight enough to pack in your suitcase for an evaluation survey, it expands easily for full scale 2D and 3D surveys at a cost your accountant will love. When you are not using the Geode for reflection, refraction, MASW and MAM, or tomography surveys, use it for monitoring earthquakes and other passive sources. The Geode will even do marine profiling or record data continuously.

For light-duty applications, you can use your laptop to view, record and process your data. In harsh conditions, control your Geodes with Geometrics' StrataVisor™ NZ/C series computers and seismographs. You can connect Geodes together to build systems over 1,000 channels on multiple lines. Geodes are shock-proof, dust-proof, submersible and able to withstand extreme temperatures. Geode modules deploy right in the field, close to your geophones to improve signal quality and reduce cable costs. Data are transmitted digitally using industry-standard Ethernet. Geodes can even be

installed on your office network. Fifteen years on, we can say with confidence that the Geode is the most reliable seismograph Geometrics has ever produced. As such, it comes with a 3-year warranty backed by Geometrics, now in our 46th year of providing prompt, knowledgeable customer support. Geodes are also available for rent to quickly expand your system.



Geode Exploration Seismograph

SPECIFICATIONS

Configurations: 8, 12, 16, or 24 channels in weatherproof field-deployable Geode module. Geode is operated from either Windows XP/7-based laptop or by Geometrics' ruggedized StrataVisor NZ field computer/seismograph. 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 Hz. 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: 2.8 V 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.

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: 16,384 samples 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: SeisImager/2D Lite refraction analysis software from OYO.

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 adjustable 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 -30 to 70 degrees C. Waterproof and submersible. Withstands a 1m drop onto concrete on 6 sides and 8 corners. Passes MIL810E/F vibration.

Physical: 10" x 12" x 7" (25.4cm x 30.5cm x 17.75cm). Weighs 8 lb. (3.6 kg). Uses waterproof Bendix 61-pin connector for geophone input.

Operating System: Windows XP/7.

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

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