



## Geode Ultra-Light Exploration Seismograph

**3 YEAR WARRANTY**

- ❑ Multi-purpose seismic recorder: refraction, reflection, earthquake monitoring, VSP, blast and vibration measurements
- ❑ Light-weight (8 lb/3.6 kg), in-field module plugs in to your laptop<sup>1</sup> for small surveys or connects to Geometrics' new StrataVisor NZ series seismographs for use in harsh environments
- ❑ Available with 3 to 24 channels per module; connect more modules to build low cost distributed systems up to 1000 channels
- ❑ Data transmitted from Geode to host computer digitally, reducing long, expensive analog cables. Separate boxes over 1 km using lightweight, rugged fiber-optic cable.
- ❑ 24-bit dynamic range, low distortion and built-in geophone<sup>2</sup> and line testing<sup>2</sup>, noise monitor
- ❑ 20 kHz bandwidth provides ultra-high resolution or low frequencies for earthquake monitoring
- ❑ Standby low-power means light batteries, long life
- ❑ Powerful applications software gives quick answers:
  - Model local geology and display travel-time curves so you know what to expect
  - Pick breaks on site and view travel-time curves on site for optimum shot positioning
  - Display an in-field preliminary cross section and ray coverage plots to see what you have missed
  - Undertake a comprehensive analysis back at the office and easily compare results with several interpretation methods



The new 24-bit Geode seismic recorder is the most versatile and flexible seismograph available today. Small and lightweight enough throw in your suitcase for an evaluation survey. Instantly expandable for full-scale 2-D and 3-D surveys at a cost your accountant will love. And when you are not using the Geode for reflection, refraction downhole or tomography surveys, use it for monitoring earthquakes, quarry blasts or vibration from heavy equipment.

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 series seismographs. You can connect Geodes together to build systems over 1000 channels on multiple lines. Geodes are shock-proof, dust-proof, submersible and 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 eliminating expensive, hard to configure interface cards. Geodes can even be installed on your office network.

The Geode comes with a 3-year warranty backed by Geometrics, now in our 32<sup>nd</sup> year of prompt, knowledgeable customer support. Additional Geodes are available for rent to quickly expand your capabilities.

Geodes operate from either your laptop or from Geometrics StrataVisor NZ field computer



The StrataVisor NZ has a daylight visible color screen, built-in plotter and is weather and shock resistant



## Specifications:

**Configurations:** 3, 6, 8, 12, 16 or 24 channels in waterproof field deployable Geode module. Geode is operated from either Windows 95/98/ME/NT4 based laptop<sup>1</sup> or by Geometrics' ruggedized StrataVisor NZ field computer. Single Geodes are operated using SGOS software, which contains basic seismograph functions used for engineering surveys. Multiple Geodes can be connected together to build systems with many channels and many lines using MGOS software.

**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. Low corner 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 uV, 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 uF.

**Preamplifier Gains:** Software selectable between 24 or 36 dB. Can be jumpered to allow software selection of 12 or 24 dB or jumpered to 0 dB<sup>2</sup>.

**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, 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 high-speed hardware correlator available in each Geode for fast cycle time with vibrators and pseudo-random (MiniSosie) sources<sup>2</sup>.

**Record Length:** 16,384 samples standard, 65,536 samples optional<sup>2</sup>.

**Pre-trigger Data:** Up to 4,096 Samples.

**Delay:** 0 to 9999 ms in steps of 1 sample interval.

**Data Transmission:** Uses Ethernet transmission standard over CAT 5 copper or multimode fiber-optic cable. Distance between boxes: CAT 5 cable up to 250m; fiber-optic cable up to 1500m.

**Auxiliary Channels:** All Geode channels can be programmed as either AUX or DATA. Fixed data and aux channels available in StrataVisor NZ.

**Roll Along:** Built-in, no external roll box required.

**Line Testing:** Real time noise monitor displays real-time output from geophones. Optional geophones pulse test helps identify bad geophones and shorted or broken cables<sup>2</sup>.

**Instrument Tests:** Optional built-in daily, weekly and monthly testing available<sup>2</sup>. External laboratory quality test system available to measure noise, crosstalk, dynamic range, gain similarity and trigger accuracy to factory specification.

**Data Formats:** SEG-2 standard with SGOS. SEG-D and SEG-Y available<sup>2</sup>.

### System Software:

**Single Geode Operating Software (SGOS):** Includes full compliment of acquisition, display, plotting, filtering and storage features.

**Multiple Geode Operating Software (MGOS):** Optional package that allows single laptop to control multiple Geodes and adds additional preamp gains, correlation, expanded record length, tape writing, geophone pulse test, expanded test and diagnostics and roll along capability.

### Bundled Applications Software:

- SIPQC delay time refraction software from Rimrock Geophysics
  - [Survey@2D](#) simulated annealing refraction software from Optim
  - SeisImager refraction modeling and analysis software from OYO
  - WinSeis-Lite reflection processing software from Kansas G.S.
- Application software packages are configured for preliminary in-field analysis. Full desktop versions of these packages are available either from Geometrics or directly from the manufacturer.

**Data Storage:** Stores data locally in SEG-2 on laptop/PC media. Drivers available for tape/disk storage in SEG2/D/Y<sup>2</sup>.

**Plotters:** Drives a variety of Windows<sup>TM</sup> compatible printers including Printrex 4, 8 and 12 inch plotters. Consult factory.

**Triggering:** Positive, negative or contact closure, software adjustable threshold.

**Power:** Requires 12V external battery. Uses 0.65 W/channel during acquisition, sleep mode reduces power consumption by 70% while in standby.

**Environmental:** -30 to 70 degrees C. Waterproof and submersible. Withstands a 1 m drop onto concrete on 6 sides and 8 corners.

**Physical:** 10"L x 12"W x 7"D (25.4cm L x 30.5cmW x 17.75cmD). Weighs 8 lb. (3.6 kg).

**Operating System:** Windows 95/98/ME/NT4.

**1- Laptop computers are NOT field devices.** They are easily damaged by harsh treatment or exposure to extreme environments. They have a short battery life. Geometrics StrataVisor NZ is designed to operate in harsh conditions for extended periods and should be used with the Geode for professional surveys when reliability is important.

**2 - Available with MGOS software only.**

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