



# Geode Ultra-Light Exploration Seismograph

Multi-purpose seismic recorder: refraction, reflection, earthquake monitoring, VSP, blast and vibration measurements, marine surveys, sub-bottom profiling and continuous recording

Light-weight (8 lb/3.6 kg), in-field modules connect to the Ethernet port on your laptop for easy, instant interfacing

Available with 3 to 24 channels per box; connect more boxes to build low cost distributed systems up to 1000 channels

Data transmitted from Geode to host computer digitally, reducing long, expensive analog cables

24-bit dynamic range, low distortion and built-in geophone and line testing, noise monitor

20 kHz bandwidth provides ultra-high resolution or low frequencies for earthquake monitoring

Standby low-power means light batteries, long life

Powerful built-in no-charge applications software gives quick answers:

- Model problems before going to the field
- Pick breaks on site and view travel-time curves on site for optimum shot positioning
- Display an in-field preliminary cross section to see what you might have missed
- Undertake a comprehensive analysis back at the office and easily compare results with several interpretation methods



## 3-YEAR WARRANTY

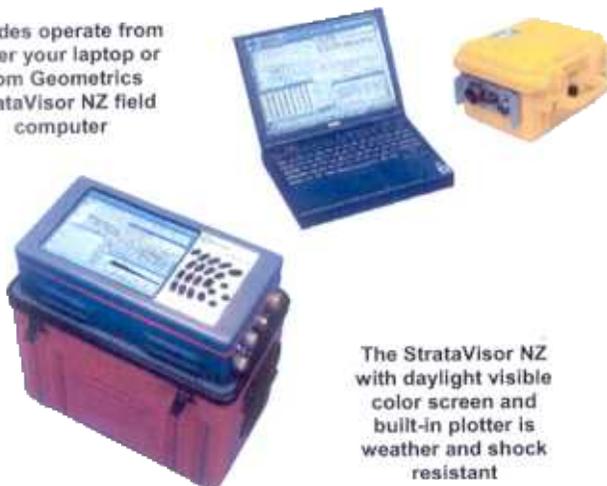
The new 24-bit Geode seismic recorder is the most versatile and flexible seismograph available today. Small and lightweight enough to throw in your suitcase for an evaluation survey. Expands instantly for full-scale 2-D and 3-D surveys at a cost your accountant will love. And when you are not using the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

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



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



## Specifications:

**Configurations:** 3, 6, 8, 12, 16 or 24 channels in weatherproof field deployable Geode module. Geode is operated from either Windows 98/NT4/ME/W2K/XP based laptop<sup>1</sup> or by Geometrics' ruggedized StrataVisor NZ field computer/seismograph. Basic operating software controls one Geode and can be optionally expanded to control multiple Geodes, do marine surveying, continuous recording, repeaters, sub-bottom profiling, VSP, GPS synchronization, blast and vibration monitoring and surveillance.

**A/D Conversion:** 24 bit result using Crystal Semiconductor sigma-delta converters and Geometrics proprietary over sampling.

**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 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:** Standard factory configuration is 24 and 36 db, selectable in software. Optionally, can be jumpered for software selectable 12 and 24 dB or can be jumpered in four channel blocks as a single fixed gain of 0 dB for high-voltage devices.

**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 high-speed hardware correlator available in each Geode for fast cycle time with vibrators and pseudo-random (MiniSosie) sources<sup>2</sup>. Correlates 16K record, unlimited channels in under 1 sec.

**Record Length:** 16,384 samples standard, 65,536 samples optional<sup>4</sup>.

**Pre-trigger Data:** Up to full record length.

**Delay:** 0 to 100 sec 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 0.25 km; fiber-optic cable up to 1.5 km.

**Intelligent Self-Trigger:** Earthquake, blasting and vibration monitoring<sup>2</sup>

**Continuous Recording:** Available for vibration monitoring.<sup>2</sup>

**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<sup>2</sup>

**Line Testing:** Real time noise monitor displays real-time output from geophones. Optional geophone 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. SEG-D and SEG-Y also available<sup>2</sup>.

### System Software:

Basic operating software includes full compliment of acquisition, display, plotting, filtering and storage features. Other functions available as options to control multiple Geodes, add additional preamp gains, high-speed correlation, expanded record length, tape writing, geophone pulse test, expanded test and diagnostics, roll along capability, marine surveying, sub-bottom profiling, blast and vibration monitoring, continuous recording and surveillance.

### Bundled Applications Software:

- SIPQC delay time refraction software from Rimrock Geophysics
  - SeisImager refraction modeling and analysis software from OYO
  - WinSeis-Lite reflection processing software from Kansas G.S.
- SIPQC and SeisImager are configured for preliminary in-field

analysis and require connection to instrument to run. Full desktop versions of these packages are available either from Geometrics.

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

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

**Triggering:** Positive, negative or contact closure, software adjustable threshold. Will self-trigger on continuous data using threshold detecting STA/LTA-like algorithm.

**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. Passes MIL810E/F vibration.

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

**Operating System:** Windows 98/ME/NT4/W2K/XP.

**Warranty:** Three year standard, extended warranty available.

1 - Most laptop computers are NOT field devices. They are easily damaged by harsh treatment or exposure to extreme environments Geometrics StrataVisor NZ/Cs designed to operate in harsh conditions for extended periods and should be used with the Geode for surveys where reliability is important.

2 - Available as an option.

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**Optional Built-In Test Functions**

Digital:

- CPU diagnostics
- Internal network test
- Digital functions
- Battery Warning

Instrument:

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

Line:

- Noise
- Geophone similarity
- Disconnected phones

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