



# Geode

## Ultra-Light Exploration Seismograph

The new Geode seismic recorder is the next generation of seismic recording system, combining the best of traditional seismic recorders with the flexibility and convenience of a distributed system. Place a Geode module out on the line close to the geophones and eliminate long, expensive analog cables. Never hassle with poor connections and bad roll box contacts when doing a reflection survey. And when you are not using the Geode for exploring, 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. For more demanding applications where ruggedness and reliability are key, use the Geode in combination with StrataVisor NZ series seismographs. The StrataVisor and laptop software have the same user interface, so transition between configurations is seamless.

The Geode seismic module weighs only 8 lbs (3.6 kg) and comes with 25 m of digital interface cable. Because getting the right answer is key, the Geode is bundled with a suite of no-charge industry-standard professional software that expands your capabilities for commercial or research applications.



*The Geodes operate from either your laptop for occasional surveys or from the StrataVisor NZ series in harsh field conditions where reliability counts*

- Multi-purpose seismic recorder: refraction, reflection, earthquake monitoring, blast and vibration measurements
- Light-weight (8 lb/3.6 kg), in-field module connects to your laptop for small surveys or connects to StrataVisor NZ series seismographs for professional applications in harsh environments
- Available with 3 to 24 channels per module; connect more modules to build low cost distributed systems
- Data transmitted from Geode to host computer digitally, eliminating noisy, expensive analog cables
- Uses inexpensive refraction cables for local geophone connections
- 24-bit resolution, low distortion and built-in geophone and line testing
- 20 kHz bandwidth (8 to 0.02 ms sampling) allows ultra-high resolution engineering surveys or earthquake monitoring
- Bundled professional software gives quick answers: Built-in first break picker and layer assignment
  - Industry-standard refraction analysis (SIPQC)
  - New refraction tomography (Optim)
  - Reflection processing (WinSeis-Lite)
- Three year warranty
- Standby low-power mode means light batteries, long life



*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 weatherproof field deployable Geode module. Geode is operated from either Windows 95/98/NT based laptop or by 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 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. 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.

**Input Impedance:** 20 kOhm, 0.02 uf.

**Preamplifier Gains:** Software selectable between 24 and 36 dB. Optionally selectable between 12 and 36 dB or jumpered to 0 dB(2) .

**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 (2)

**Record Length:** 16,000 samples standard, 64,000 samples optional (2)

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

**Delay:** 0 to 9999 ms in 1 ms steps

## SEISMOGRAPHS

**Data Transmission:** Uses reliable Ethernet connections and requires no custom transmission software. Interfaces directly with network capabilities of Windows 95/98/NT.

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

**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 (2).

**Instrument Tests:** Optional built-in daily, weekly and monthly testing available. External laboratory quality oscillator 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

### **System Software:**

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

**Multiple Geode Operating Software (MGOS):** 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.

**StrataVisor NZ Software:** Functionally similar to MGOS above but operates on ruggedized NZ field system.

**Data Storage:** Stores data locally on laptop hard drive for transfer to portable media .

**Plotters:** Drives a variety of NT 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 0.65W/channel during acquisition, sleep mode reduces power consumption by 70% while in standby.

**Environmental:** -30 to 75 degrees C. Waterproof and submersible. Withstands a 1 m drop onto concrete on 6 sides and 8 corners.

**Physical:** 10 3/4"L x 9 3/4"W x 7"D (27.3cmL x 24.75cmW x 17.75cm)

**Operating System:** Windows 95/98/NT.

**Data Processing and Interpretation:** Includes refraction software with first break picking, layer assignment, depth below each geophone using delay time, refraction tomography and reflection processing software. Consult Terraplus for individual data sheets.

**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. 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.**