



# SmartSeis SE

## Exploration Seismograph

The SmartSeis™ SE is a new generation seismograph that brings together the latest digital and computer technology to help you map the subsurface. The units can be configured with either 12 or 24 channels.

The SmartSeis™ can be used in a wide range of applications, including: depth-to-bedrock, rippability surveys, ground water hydrology, foundation investigations, landslide studies, hazardous waste mitigation, fault location, stratigraphy, gravel detection, mineral exploration, aquifer tracing, landfill delineation, coal seam mapping, shear wave velocities for site response, and surface wave analysis.

The user-friendly SmartSeis™ SE uses advanced data acquisition techniques so that high quality data is automatic. Built-in data processing gives preliminary answers right in the field. The SmartSeis™ has special circuitry that continuously looks at the seismic signal and adjusts the amplifier gains to the optimum setting. Many surveys can employ just a sledgehammer as the source and sum sequential impacts to increase effective depth penetration. Pick on-screen first arrivals with a full-sun visible 640x480 pixel liquid crystal display. Selectable real-time DIGITAL filters in the SmartSeis can eliminate interference produced from power lines, wind, and surface waves to significantly extend your depth range and reflection capabilities. A paper copy of the record can be produced using the built-in thermal printer. The data is annotated with the acquisition parameters, line geometry, and even date and time for correlation with field notes.

A velocity cross section is automatically generated directly on the seismograph by a version of SIPT. The cross section is printed on the SmartSeis's built-in high-resolution thermal printer. The full version of SIPT accommodates multiple spreads, unique geometries and plots color cross sections

- \* Self-contained, weatherproof instrument with full sun visible LCD screen, built-in printer, PC and integrated analysis software

- \* Automatic gain selection so you always get the best data

- \* Signal enhancement for surveys lets you use a small source like a sledgehammer in noisy areas

- \* Pull-down menus for fast and easy setup and operation

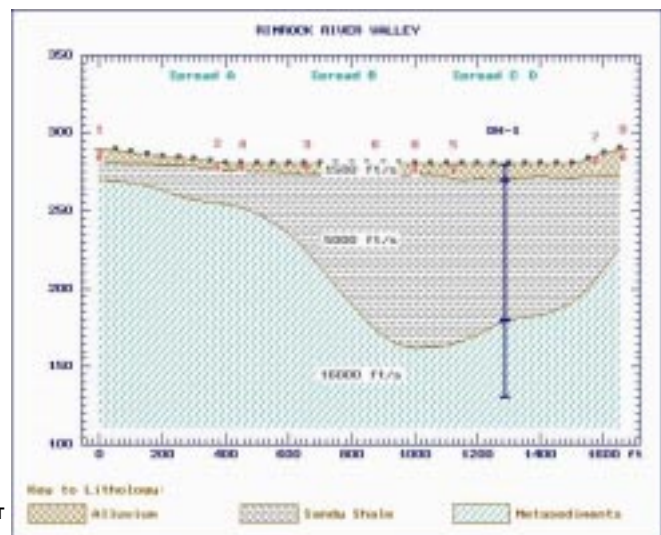
- \* Built-in noise monitor mode lets you see data quality is good before shooting

- \* Real-time digital acquisition and display filters reduce noise from unwanted sources

- \* Lightweight, low power and portable

- \* 12 or 24 channels

- \* Real-time data processing for quick results in the field



**Applications:**

- Depth-to-bedrock
- Rippability surveys
- Groundwater hydrology
- Foundation investigations
- Landside potential
- Hazardous waste migration
- Dynamic moduli measurements
- Fault Location
- Stratigraphic mapping
- Gravel and aggregate mining
- Thickness of overburden
- Mineral and gold exploration
- Landfill delineation and siting
- Shear wave velocity profiles

**Specifications:**

<b>Number of Channels:</b>	12 or 24.
<b>Sample Interval:</b>	31, 64, 125, 250, 500, 1000 or 2000 $\mu$ s.
<b>Record Length:</b>	up to 24,000 samples per channel.

**Acquisition Filters and Noise Reduction Technology:** Many field sites are noisy - moving vehicles, overhead power lines, vibrating machinery. The SmartSeis includes real-time digital filters that you can customize to improve your data in adverse urban environments.

**32 bit Stacking:** Reduces contributions from random noise by letting you add repeated hammer blows to improve signal strength.

**Memory Freeze:** Allows selective stacking of weak channels.

**Power Line Notch:** Reduces 50/60 Hz and harmonics.

**Low-Cut Filtering:** Reduces the effects of distant traffic and ground roll. Includes filter frequencies of out, 25, 35, 50, 70, 100, 140, 200, 280, 400 Hz.

**High-Cut Filtering:** Removes wind noise. Includes filter frequencies of out, 250, 500, 1000 Hz.

**Display Filters** can be run non-destructively after raw data is collected, making costly repeated shots unnecessary. Custom filter frequencies are available.

**Display:** High-resolution 640x480 LCD, PC compatible. Visible in bright sunlight.

**Noise Monitor:** Waterfall style moving trace display, also shows channel continuity and geophone performance.

**A/D Conversion:** 18-bit A/D, 32 bit stacker.

**Gain Control:** Automatic, set by continuously measuring two-stage instantaneous floating-point amplifier. True amplitude is preserved and can be used for ground motion studies.

**Data Display:** Wiggle-trace, shaded or variable area, trace clipping, automatic gain control, fixed gain and post-acquisition filtering included.

**Energy Sources:** Hammer, weight drop or explosives.

**Pretrigger:** Allows viewing of data before trigger.

**Delay:** 0 to 9999 ms in 1 ms increments.

**Data Storage:** Sufficient for several days recording. Includes both floppy and hard drive storage.

**In-field Processing:**

- Automatic first break picking with manual over-ride.
- On-screen travel time plots.
- Automatic layer assignments with manual over-ride
- Automatic calculation of depths below shots and geophones. Built-in software ray traces model and indicates where data quality might be poor. Prints table of all data, depth calculations and a quality control plot showing questionable data. Report-ready cross section annotated with calculated velocities.

**Interfaces:** RS-232, video, keyboard and printer.

**Data Format:** SEG-2 standard.

**Mating Connectors:** Cannon NK-27-21C, 12 channels each connector.

**Plotter:** Built-in four-inch (11 cm) wide thermal printer.

**Testing:** Full instrument testing available using external test oscillator system.

**Power:** Runs on 12V auto-type battery. Power cable with clip leads included.