## Chapter 2  Specifications

### Specifications

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<th>Specification</th>
<th>Description</th>
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<td>Data Recorded</td>
<td>One (1) acoustic and three (3) seismic channels.</td>
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| Frequency Response          | **Mini-Seis**: 2 to 500 Hz. (-3 dB. points) at 2048 samples per second. Lower sample rates reduce the high frequency response proportionately.  
**Mini-Seis II**: 2 to 250 Hz. (-3 dB points) at 1024 samples per second.                                                                                      |
| Seismic Sensors             | Three component mounted velocity geophones or accelerometers, depending on the ordered recording ranges.                                                                                                     |
| Microphone                  | Ceramic element rated to at least 160 dB.                                                                                                                                                                      |
| Memory                      | Solid state with all summary, setup, and recorded data retained with power off. A lithium backup battery retains data if primary power fails.                                                              |
| Clock                       | A 24 hour clock maintains the date and time accurate to within 1 minute per month, even if primary power fails.                                                                                               |
| Timer Mode                  | Allows an instrument to be active only during selected hours on a daily basis.                                                                                                                                |
| Display                     | The high contrast LCD has two lines of 40 characters to facilitate the instrument's setup. It also allows the operator to view operating parameters and summary data.                                               |
| Optional Keypad             | Contains 6 keys for entering setup data and operating commands.                                                                                                                                               |
| Power on Log                | A log of the last 64 on/off cycles is kept in memory to indicate the active monitoring periods. If the timer is used, the log is updated each time it activates.                                                   |
| Battery                     | Internal 6 volt rechargeable.                                                                                                                                                                                 |
| Operating Time              | With a fully charged battery all models will operate from 7 to 10 days at 1024 samples per sec. Longer times may be obtained using the timer mode or external power from a small solar cell or automobile battery.   |
| External Battery Life       | A standard automobile battery will keep the internal battery at full charge for several months at moderate temperatures. If the external battery fails, the unit will continue to operate on its internal battery. |
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Charging
An internal charging circuit allows charging with the supplied plug-in wall mount charger or any 10 to 15 volt DC supply. Power supplies for international use are available.

Operating Temperature
0 to 130 degrees F (-18 to 54 degrees C)

Case
Heavy gauge aluminum for effective electrical shielding and rugged protection. A stainless steel case is optional. The case is sealed allowing shallow burial.

Size
Approximately 7.5 in. x 4.5 in. x 2.5 in.

Weight - Aluminum Case
Approximately 3.5 lbs. (1.6 Kg.) without accessories.

Weight - Stainless Steel
Adds 2 lbs. (.9 Kg.) above the aluminum case weight.

Weight - Accessories
Approximately 6 lbs. (2.7 Kg.) including the storage case.

Waveform Data
Mini-Seis: The full waveform signature is stored in solid state memory for up to 340 events.

Mini-Seis II 1/8M: Approximately 10 to 20 typical blast events.
Mini-Seis II 1/4M: Approximately 50 to 100 typical blast events.
Mini-Seis II 1/2M: Approximately 150 to 250 typical blast events.

Summary Data
Summarized data include the event time, date, battery voltage, peak measurements, unit serial number and frequencies. The summarized data are stored in solid state memory for the last 341 events.

Sample Rate
Mini-Seis: From 2048 samples per second per channel down to 32 samples per second per channel.

Mini-Seis II: 1024 or 512 samples per second per channel.

Recording Units
English (U.S.) or metric.

Seismic Recording Ranges
Standard (x2)
0.005 IPS to 2.5 IPS (0.125 to 64 MMPS)
0.01 IPS to 5.0 IPS (0.25 to 127 MMPS)
0.02 IPS to 10.0 IPS (0.50 to 254 MMPS)

Optional (x1 - accelerometers)
0.01 IPS to 5.0 IPS (0.25 to 127 MMPS)
0.02 IPS to 10.0 IPS (0.50 to 254 MMPS)
0.04 IPS to 20.0 IPS (1.00 to 508 MMPS)

Optional (x4)
0.0025 IPS to 1.2 IPS (0.063 to 30.5 MMPS)
0.005 IPS to 2.5 IPS (0.125 to 64 MMPS)
0.01 IPS to 5.0 IPS (0.25 to 127 MMPS)

Optional (x8)
0.0013 IPS to 0.6 IPS (0.033 to 15.2 MMPS)
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| Acoustic Ranges | 0.02 to 2.56 millibars (100 to 142 dB)  
                   0.04 to 5.12 millibars (106 to 148 dB).                                      |
| Trigger Levels | Seismic  
                   2.5 IPS Range - 0.01 to 0.57 IPS (0.25 to 14.5 MMPS).  
                   5.0 IPS Range - 0.02 to 1.14 IPS (0.5 to 29 MMPS).  
                   10.0 IPS Range - 0.04 to 2.28 IPS (1.0 to 58 MMPS).  
                   Seismic trigger sensitivities are proportionally modified by optional  
                   gains.                                                        |
| Manual Trigger | Allows triggering from the keyboard or by an external input. One unit  
                  may be used to trigger additional instruments.                   |
| Record Duration | Mini-Seis: From 1 to 6 seconds at a sample rate of 2048 samples  
                   per second. At lower sample rates, the duration is automatically  
                   increased proportional to the amount of decrease in the sample  
                   rate.                                                        |
| Cycle Time     | Mini-Seis: At 1024 samples per second, up to 12 seconds of data  
                   can be taken with only 50 milliseconds between events. After 12  
                   seconds of data are stored, another event cannot be taken until  
                   the previous data have been processed. Processing requires about 3  
                   seconds per second of recording time.                        |
| Records Stored | Up to 341 typical coal mine or quarry blast events.                     |
| Calibration Test (Seismic) | A dynamic transducer test is performed automatically after each  
                             event or manually on command. The test is stored in the  
                             summarized data and may be downloaded as an event.          |
| Calibration Test (Acoustic) | An electronic test of the microphone is performed with the seismic  
                              test and is stored in memory along with the seismic test.      |
| 84 Hour Cal Test | In a remote installation, an automatic calibration test occurs if no  
                   event has been recorded for 84 hours.                           |
| RS232 Serial Port | Data can be downloaded and setup commands can be uploaded  
                    directly by computer or remotely by modem.                     |
| Baud Rate      | From 1200 to 38.4K.                                                     |