pulseEKKO®

FOR THE GPR PROFESSIONAL
Unparalleled performance with a wide range of frequencies for applications ranging from deep mineral exploration and glaciology to high resolution geotechnical investigations and concrete imaging.

**Features**

- Broad range of frequencies (12.5 MHz to 1000 MHz)
- Low noise, high accuracy digital acquisition directly at receiving antenna
- Wide range of regulatory compliant transmitters
- Computer controlled voltage and temperature-stabilized time and amplitude
- Low power consumption

### Resistive Dipole Antenna

<table>
<thead>
<tr>
<th>Center Frequency</th>
<th>Size</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.5 MHz</td>
<td>736 × 14 × 5 cm (290 × 5.5 × 2 in)</td>
<td>7.2 kg (15.9 lbs)</td>
</tr>
<tr>
<td>25 MHz</td>
<td>368 × 14 × 5 cm (145 × 5.5 × 2 in)</td>
<td>3.6 kg (7.9 lbs)</td>
</tr>
<tr>
<td>50 MHz</td>
<td>184 × 14 × 5 cm (72 × 5.5 × 2 in)</td>
<td>1.8 kg (4 lbs)</td>
</tr>
<tr>
<td>100 MHz</td>
<td>92 × 14 × 5 cm (36 × 5.5 × 2 in)</td>
<td>1.2 kg (2.6 lbs)</td>
</tr>
<tr>
<td>200 MHz</td>
<td>48 × 14 × 5 cm (18 × 5.5 × 2 in)</td>
<td>0.8 kg (1.8 lbs)</td>
</tr>
</tbody>
</table>

### Resistive Dipole Transducer

<table>
<thead>
<tr>
<th>Center Frequency</th>
<th>Size</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 MHz</td>
<td>38 × 38 × 20 cm (14.5 × 14.5 × 8 in)</td>
<td>3.0 kg (6.6 lbs)</td>
</tr>
<tr>
<td>500 MHz</td>
<td>23 × 23 × 17 cm (9 × 9 × 6.5 in)</td>
<td>1.2 kg (2.6 lbs)</td>
</tr>
<tr>
<td>1000 MHz bistatic</td>
<td>15 × 15 × 12 cm (6 × 6 × 5 in)</td>
<td>0.6 kg (1.3 lbs)</td>
</tr>
<tr>
<td>1000 MHz Tx-Rx Combined</td>
<td>19 × 13 × 15 cm (7.5 × 5 × 6 in)</td>
<td>1.0 kg (2.2 lbs)</td>
</tr>
</tbody>
</table>
The digital video logger (DVL) has a high-resolution, sunlight visible, touchscreen and an intuitive user interface for efficient data-collection. Easily adjust survey parameters including survey type, antenna geometry, stacking and triggering to optimize your GPR survey.

**Map View**
Using GPS, view a map of the GPS survey path, grids, field interpretations & flags.

**Internal GPS**
Geo-tag screen captures and grids for Google Earth™

**Optional External GPS**
Serial port GPS connection for high accuracy positioning

**Color Field Interpretations**
Mark targets at depth with the touch of a finger

**In-Field Depth Slicing**
Flexible grid collection with immediate results

**Wi-Fi Enabled**
Connect to a Wi-Fi network or hotspot to email reports from the field

**USB Data Transfer**
Quickly transfer project data for further analysis

**Save configurations**
Easily setup, name and save multiple configurations on the DVL to increase efficiency in the field.

**EKKO_Project Software**
EKKO_Project makes complex GPR analysis and reporting easy with intuitive tools to organize, edit, process & plot your data.
**Full Bistatic**

Work in rough, poorly accessible areas.

**SmartTow**

Rapid GPR profiling over smooth to moderately rough surfaces.

**SmartCart**

Fast surveying to cover large flat open areas.

**One-Man**

Single person operation for surveying in moderate to rough terrain.

**SmartChariot**

Vehicle hitch-mounted; rapidly survey large, flat areas such as roads and golf courses.

---

**Ergonomic deployment platforms.** Quick release fasteners and interchangeable components enable rapid system reconfiguration. Integrated support for GPS, odometers and fiducial markers with triggering from a wide range of inputs provides accurate spatial positioning.

---

**Product specifications**

<table>
<thead>
<tr>
<th>Control Module</th>
<th>Transmitter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time Window:</strong> 0.5 to 200,000 ns</td>
<td><strong>Emission Regulation-Compliant Transmitters:</strong> FCC, ETSI (EU) and Industry Canada</td>
</tr>
<tr>
<td><strong>Points per Trace:</strong> 10 to 31,000</td>
<td><strong>Power Consumption:</strong> 150 mA @ 12V</td>
</tr>
<tr>
<td><strong>Hardware Stacking:</strong> 1 to 32768</td>
<td><strong>Temperature Range:</strong> -50 to +50 C</td>
</tr>
<tr>
<td><strong>Software Stacking:</strong> Unlimited</td>
<td><strong>Receiver</strong></td>
</tr>
<tr>
<td><strong>Signal Enhancement:</strong> DynaQ</td>
<td><strong>Receiver Sensitivity:</strong> 1.5 V/lsb</td>
</tr>
<tr>
<td><strong>Hardware Temporal Sampling Increment:</strong> 5 ps</td>
<td><strong>Data Recording:</strong> 16 bit</td>
</tr>
<tr>
<td><strong>Sampling:</strong> Digital Equivalent Time Sampling (DETS)</td>
<td><strong>Power Consumption:</strong> 100 mA @ 12V</td>
</tr>
<tr>
<td><strong>Pulse Repetition Frequency (PRF):</strong> up to 100 kHz</td>
<td><strong>Temperature Range:</strong> -50 to +50 C</td>
</tr>
<tr>
<td><strong>Data Quality Assurance:</strong> Active temperature and supply voltage compensation</td>
<td><strong>System</strong></td>
</tr>
<tr>
<td><strong>Power Consumption:</strong> 100 mA @ 12V</td>
<td><strong>Maximum System Performance:</strong> $18B, dB + 10\log_{10} (# \text{stacks}) \times 219, dB @ 2048 \text{ stacks}$</td>
</tr>
<tr>
<td><strong>Temperature Range:</strong> -50 to +50 C</td>
<td><strong>Environmental:</strong> IP65</td>
</tr>
<tr>
<td></td>
<td><strong>Auxiliary Positioning:</strong> GPS, laser tracking</td>
</tr>
</tbody>
</table>

**Regulatory Specifications**

Complies with regulatory agency requirements for ultra-wideband equipment: FCC (Federal Communications Commission), Industry Canada and European Community (ETSI) standards.
pulseEKKO’s bistatic antennas allow for variable antenna separations – ideal for CMP, WARR, multi-fold and transillumination surveys.

**CMP**
Common mid point (CMP) surveys for subsurface velocity measurements and seismic-style trace stacking.

**WARR**
Wide angle reflection and refraction (WARR) surveys.

**Borehole**
Subsurface measurements in boreholes.

**Transillumination**
Direct one-way transmission through an object to extract travel time, amplitude and dispersion information.

**MULTI-CHANNEL SURVEYS**

- **Multi-Frequency**
- **Multi-channel array**
- **Multi-fold survey**
**APPLICATIONS**

**GEOLOGICAL STRATIGRAPHY**
Profile subsurface stratigraphy and bedrock surface

**MINING & QUARRYING**
Detect changes in rock type, fractures, faults and joints for safety and resource development in underground mines.

**GEOTECHNICAL & ENVIRONMENTAL**
Map depth to bedrock, detect sinkholes, locate underground storage tanks (USTs). Drainage systems on golf courses and farms can also be located.

**FORENSICS & ARCHAEOLOGY**
Law enforcement uncover buried caches of drugs, money, weapons and clandestine graves. Archaeologists image underground artifacts, tombs and the foundations of ancient structures.

**GLACIOLOGY, ICE & SNOW**
Measure ice thickness for winter road safety, snow depth, glaciological and polar ice-cap research.

**STRUCTURE ASSESSMENT**
Assess the interior of concrete and pavement for asset management and maintenance planning.

**Sensors & Software Inc.**
1040 Stacey Court
Mississauga, ON
Canada L4W 2X8
+1 905 624 8909
+1 800 267 6013
sales@sensoft.ca
www.sensoft.ca

*pulseEKKO is a trademark of Sensors & Software*