The E-Saximeter (E-Sax) is used by piling inspectors everywhere to generate a complete Pile Driving Log, including:

- Pile name
- Start and stop driving times
- Blow count versus depth
- Blows per minute
- Final equivalent blow count for the last 20 blows
- Stroke of open end diesel hammers
- Potential energy of open end diesel hammers

**Stroke and Potential Energy**

For open end diesel hammers, the E-Saximeter computes stroke from the measured Blows per Minute (BPM). The hammer stroke is then multiplied by ram weight to yield hammer potential energy. These quantities are used to confirm assumptions made when analyzing the pile by the Wave Equation (GRLWEAP Software Program). For hammers other than Open End Diesel, optional accessories allow computation of kinetic energy.

**Blow Count Versus Depth and Time**

A sound recognition device detects and counts all hammer blows. Background noise is managed through manual or automatic adjustment of the sound level at which a blow is detected. The E-Sax operator inputs the starting depth and indicates the start of driving via the keypad.

As the pile is driven, the operator pushes a button for each depth increment of penetration and the E-Sax stores the number of hammer blows per depth increment. Once the end of driving is indicated, the E-Sax computes the quantity Blows per Minute.

**Driving logs on a large number of US State Department of Transportation projects are created with E-Saximeters.**
Optional Enhancements:

**Depth Measurement**
This accessory avoids having an operator enter depth of penetration increments during driving. A depth sensor tracks the movement of the hammer, and a wireless transmitter sends the data to the E-Sax, completely automating the generation of a pile driving log.

**Kinetic Energy Measurement**
A pair of proximity switches mounted on the hammer detects the ram position at two points, just before ram impact. A wireless transmitter sends this information to the E-Saximeter, which then calculates impact velocity from the time it takes the ram to travel between the two points. The Hammer Kinetic Energy just before impact, a fundamental quantity for those performing Wave Equation analysis of Pile Driving (GRLWEAP software program), is computed from impact velocity.

### E-Saximeter Specifications

**Main Unit:**
- **Size:** 100mm x 190mm x 50mm
- **Weight:** 0.54kg
- **Temperature Range:** 10 to 40°C operating; -10 to 65°C storage
- **Power:** Built-in rechargeable battery with 16 hour minimum duration
- **Display:** LCD, 4 lines x 16 characters, viewing area 62mm x 26mm
- **Keypad:** Large Key (1.27mm²), non tactile

**Electronic:**
- 32 bit CICS Micro CPU up to 50MHz
- 10 bit 2 channel analog to digital converter;
- 8 bit 2 channel digital to analog converter
- Internal microphone 70 to 115 dB
- Standard Type A USB drive for data transfer
- 8 MB internal Magnetoresitive RAM

### Functional and Other:

**Maximum Blow Detection Rate:**
- 68 bpm for open end diesel hammers; 300 bpm for all others

**Operates in English or SI units, Full one year warranty, Technical manual included**

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### Optional Depth Measurement Unit

<table>
<thead>
<tr>
<th>Installation</th>
<th>mounts on crane, cable attaches to hammer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>305mm x 910mm x 910mm</td>
</tr>
<tr>
<td>Weight</td>
<td>73kg</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.6mm</td>
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<tr>
<td>Max range</td>
<td>49m</td>
</tr>
</tbody>
</table>

---

### Optional Energy Switches (pair of proximity switches, available in 3 types)

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Normally open</th>
<th>Normally open</th>
<th>Normally closed (for special applications)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (diameter x length)</td>
<td>18mm x 50mm</td>
<td>30mm x 50mm</td>
<td>30mm x 30mm</td>
</tr>
<tr>
<td>Weight</td>
<td>114 g</td>
<td>205 g</td>
<td>182 g</td>
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<tr>
<td>Switching Frequency</td>
<td>200 Hz</td>
<td>650 Hz</td>
<td>200 Hz</td>
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<tr>
<td>Sensing range</td>
<td>10 mm</td>
<td>10 mm</td>
<td>15 mm</td>
</tr>
<tr>
<td>Repeatability</td>
<td>.01 mm</td>
<td>.01 mm</td>
<td>.01 mm</td>
</tr>
<tr>
<td>Installation</td>
<td>mounts on hammer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### Wireless Transmitters and Proximity Switches

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