E-Saximeter

The Essential Device for Accurate Blow Counting

Pile Dynamics, Inc.

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**

Features

- **Entirely wireless**
- **Easy to read screen**
- **USB Computer interface**
- **Pre-programmed and user programmable hammers**

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.

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.

Quality Assurance for Deep Foundations

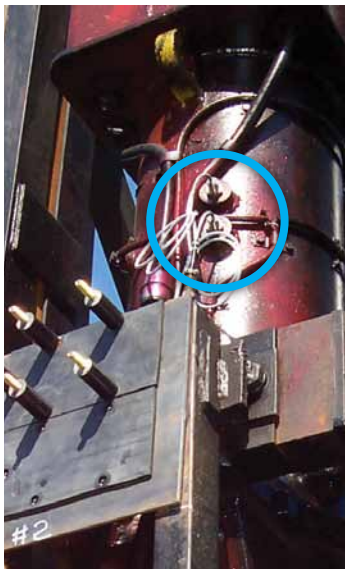
Optional Enhancements:

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 send 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.



Proximity Switches

Depth Sensor

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

Wireless Transmitters and Proximity Switches

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

Optional Depth Measurement Unit	
Installation	mounts on crane, cable attaches to hammer
Size	305mm x 910mm x 910mm
Weight	73kg
Resolution	0.6mm
Max range	49m

Optional Energy Switches (pair of proximity switches, available in 3 types)			
Functionality	Normally open	Normally open	Normally closed (for special applications)
Size (diameter x length)	18mm x 50mm	30mm x 50mm	30mm x 30mm
Weight	114 g	205 g	182 g
Switching Frequency	200 Hz	650 Hz	200 Hz
Sensing range	10 mm	10 mm	15 mm
Repeatability	.01 mm	.01 mm	.01 mm
Installation	mounts on hammer		

Transmitters	**for Optional Energy Switches**	**for Optional Depth Measurement Unit**
Installation	mounts on hammer	mounts on depth sensor
Size	90mm x 125mm x 32mm	64mm x 98mm x 34mm
Weight	.54kg	.46kg
Data Transmission	via a standard radio protocol	
Frequency Range	2.402 ~ 2.480 GHz	
Max Range	100m	
Electronic	Low power 16 bit processor with 12 bit analog to digital converter and 12 bit digital to analog converter	
Power	Built-in rechargeable battery w/8 hour min duration	supplied by +12V to +24V crane battery
Temperature Range	0 to 40° C operating; -10 to 65° C storage	

Pile Dynamics, Inc.
30725 Aurora Road
Cleveland, OH 44139 USA

+1-216-831-6131 info@pile.com www.pile.com