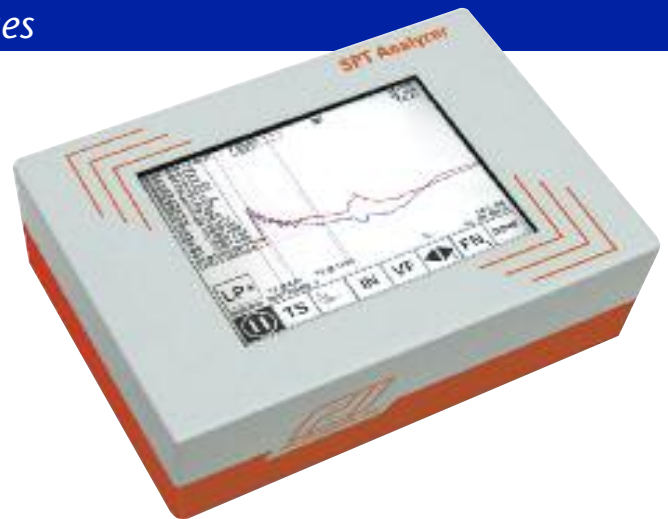


SPT Analyzer

For Improved Reliability of SPT N-values

Determines the Energy Transferred by SPT Hammers using Force and Velocity Measurements

- ◆ Conforms to American Society for Testing and Materials Standards:
 - Energy measurements are recommended to normalize results (N-values) from SPT tests (ASTM D1586)
 - Normalization of N-values based on energy measurements are required when SPT results are used to determine the liquefaction potential of sands (ASTM D6066)
 - The only ASTM accepted means of determining energy for normalization of N-values is by force and velocity measurements (ASTM D4633)
- ◆ Assesses the efficiency and consistency of operation of SPT rigs.
- ◆ Conforms to European Standard EN ISO 22476-3.



What is SPT?

The Standard Penetration Test (SPT) is a widely used soil exploration tool that involves using a SPT hammer to drive a split barrel sampler at the bottom of a drill string to obtain soil samples. The number of blows required to penetrate the last 300mm (1ft.) is the "N value", which is related to soil strength.

Why Measure the Energy Transferred by the SPT Hammer?

Several different types of SPT hammers are used to conduct Standard Penetration Tests. Their varying efficiencies influence the "N value". The measured "N value" is standardized by multiplying it by the ratio of the measured energy transferred to the rod to 60% of the theoretical potential energy. The standardization compensates for the variability of the efficiencies of different SPT hammer types, and improves the reliability of soil strength estimates used in geotechnical applications.



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Output

SPT Analyzer data is stored and transferred to a computer via USB memory stick. The PDA-W software furnished with the SPT Analyzer outputs graphs of Force, Velocity, Energy and Displacement versus time, while the PDILOT software outputs numerical, statistical, and graphical results for each data set.

How is the Instrumentation performed?

The SPT Analyzer is furnished with a 0.6 m sub assembly (or section) of an SPT rod (AW, NW or other type) instrumented with 2 strain gage bridges, and precisely calibrated by Pile Dynamics. Once in the field, two accelerometers are bolted to the rod section. The instrumented section is inserted at the top of the drill string between the hammer and the existing sampling rods.

The rod is connected to the SPT Analyzer. The strain gages and accelerometers obtain the force and velocity signals necessary for the calculation of transferred energy during the normal course of the SPT test. The energy is displayed in real time on the SPT Analyzer screen.

SPT Analyzer Specifications

Physical:

- Size: 150 X 220 X 290 mm (5.9 x 8.7 x 11.4 inches)
- Weight: 5 Kg (11 lbs)
- Temperature range: -10 to 40°C (14 to 104° F) operating; -20 to 65°C (-4 to 149° F) storage
- High visibility color VGA backlit LCD display optically enhanced for outdoor viewing
- High contrast touch screen doubles as keyboard
- Power: built-in 6 hour duration battery, 12 VDC car battery, or 100-240 VAC w/12 VDC converter
- Fast charger recharges built-in battery in 4 hours

Electronic:

- PC compatible processor, running Microsoft Windows® XP Home Edition
- 40 GB hard disk minimum; 512 KB DRAM minimum
- Ethernet port; 2 USB ports; VGA external monitor port
- Analog signal frequency response 5 KHZ (-3 dB)
- 24-bit A/D converter with sampling frequency of 5.12 MHz
- 4 channels with effective digitizing frequency up to 100 KHZ (with cable)
- 1K, 2K, 4K, 8K and 15K data record sizes available
- Built in calibration test function
- Basic unit accuracy 2%

Functional:

- Two channels of strain and two channels of acceleration data acquisition
- Automatic balancing of signals and signal conditioning
- Signal conditioning for force and acceleration have similar frequency response
- Internal calibration check of strain and acceleration
- Signal amplification capability

Other:

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



Instrumented SPT rod



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