



Excel Technology Co Pty Ltd

In-Pavement Piezo Tester  
PTM 1000

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# In-Pavement Piezo Tester

## *Simple rugged easy to use in-pavement Piezo tester*



The PTM-1000 is rugged field service instrument which has been purpose designed for in-pavement Piezo performance analysis. The test instrument displays individual vehicle actuations and accumulates actuations in order to display the linearity of the sensor. These two modes provide the user with a complete interpretation of an in-pavement piezo's performance characteristic.

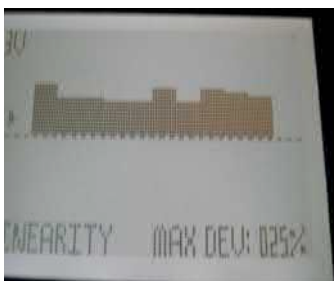
The PTM-1000 unit utilises the existing site BNC style piezo feeder connection – remove the BNC from the WIM and connect to the PTM1000. Live data from in-pavement sensor will be displayed on the Graphic LCD panel. The graphical display provides a two dimensional representation of the signal generated by the piezo strip when pressure is applied to the strip as the wheels and axles of a vehicle pass over the device located in the road surface. The shape and levels of the signals associated with vehicles of varying weight and speed is critical to evaluating piezo performance.

The front panel facilitates the selection of the primary mode, the trigger threshold enabling display and record retention, the time scale of the sample and the voltage scale of the sample. Selection of these sampling controls facilitates displaying optimised axle actuations from a small standard vehicle to a 'B-Double' truck. A button enables a timer controlled back light function for operation under poor lighting conditions. The device may be operated safely by a single technician

## **Features and Attributes**

### **PTM-1000**

- Rugged design with robust plastic protective shroud.
- Single 9V Battery operation
- Graphical LCD display incorporating numeric measurement indication
- Weather proof touch sensitive function selection keypad
- Timed backlight operation for periods of poor visibility
- Single switch operation incorporating an operational timer for power consumption management
- Single connection – all measurements displayed simultaneously
- Identifies short circuit and open circuit piezo
- Identifies vehicle actuation with two dimensional true signal voltage display



## In-Pavement PIEZO Tester Operational Specification

- Overall measurement accuracy typically 3% within optimised range
- Optimised measurement range 0.5V to 3.0V
- Capacitance range 5.0nf to 20.0nf
- Maximum voltage input 9V
- Maximum resistance 20Mohm
- Maximum dissipation 0.04
- Operates with PIEZOs specified within the ROADTRAX specified range
- Time base operation within corresponding maximum speed 140khr

## In-Pavement PIEZO Tester Equipment Specification

### Power Supply and Physical Dimensions

PT 1000 requires a single 9Volt D cell

Weight 0.5 Kg (1.0lb)

Size 260 mm x 120 mm x 40 mm (10.5 x 4.5 x 1.5inch) including provision for Piezo connection and switch/buttons

Current consumption: Piezo NOT connected current – 40 milliamps

Current consumption: Piezo connected – operational display - 115 milliamps

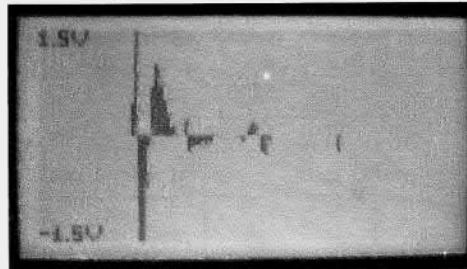
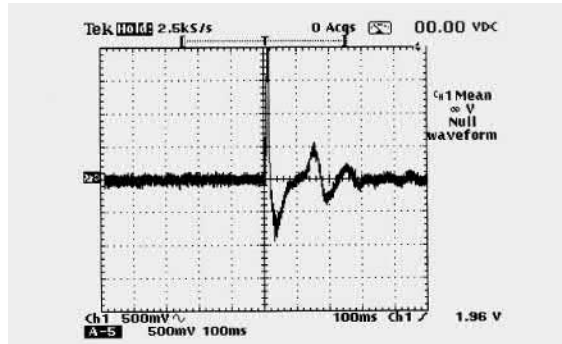
### Signal Display

Voltage level Max 3.0V, Steps 0.5, 1.0, 1.5, 3.0 Volts, Surge protection limit 9V.

Trigger threshold Range - three steps within each voltage step (0.5, 1.0, 1.5, 3.0 Volts)

Signal time base Range 3, 5, 10, 20, 50, 100, 200, 300 Millisecs

### Calibration Schedule



### Connector Specification

Piezo Connector: BNC 50 Ohm, frequency <4Ghz

IDC style connectors withstanding voltage 500 volt RMS for 1 minute - .5 amp current rating

Mate-en-lock current rating 3 amp per pin, contact resistance 30 M Ohm max at DC100mA

PCB Modular Terminal 'Phoenix style' 10 amp rated voltage 300 volt AC

### Environmental

Circuitry implemented on all cards is rated to 65°C operation with a relative humidity of 90%. Circuit cards are conformal coated and will operate within Australian Standard Guidelines for Traffic Control Devices as per TSC/3 and TSC/4. The CONFORMAL coating material used to protect the circuit cards is labelled SCC3 CC from Electrolube. The material is sprayed onto the circuit cards in accordance with the manufacturer recommendations and required Occupational, Health and Safety practices. The conformal coating material has a dielectric strength of 90 KV/mm and an operational temperature range of -70°C to 200°C and is self extinguishing when exposed to a flame.

## Operational Instructions

Connect PIEZO BNC to meter.

Switch ON – Switch located on instrument panel labelled ON<>OFF (Timed ON activity)

Verify Battery Voltage level – Bottom left screen.

Select appropriate SIGNAL Level (VOLTAGE SCALE) display by touching the "Voltage Scale' Button. The level steps through a range of increments from .3 to 3 Volts. This enables the device to provide the best display for given site characteristics. Site characteristic will vary according to the age of the piezo sensor, the quality of the installation and vehicle activity.

Select Time Scale (3 – 300 Milliseconds / CM) – This parameter allows the user to view the piezo pulses associated with complete vehicle whether the vehicle is 5 Mts long or 25Mts long. The higher scale end of 300milliseconds / CM allows the complete viewing a B double truck. When this setting is selected the user can view successive vehicles. This parameter establishes the viewing window in time and displays all events within that window.

Select Trigger Level – this is a small iconic > symbol which when moved vertically on left hand side of the screen sets parameters for qualifying signal level thresholds. Most sites have noise this function sets a level which must be exceeded by the incoming piezo pulse in order to be displayed.