



# Your Tools at Work

True RMS DMM & Handheld Oscilloscope

## 6 INSTRUMENTS IN 1

The versatile handheld TPI 440... a customer winner!



Rechargeable Battery and Adapter included

### COMPARE!

	TPI 440	FLUKE 87-5	FLUKE 867BE
1. 4,000 Count True RMS DMM w/ waveform display	Yes	No	Yes
2. 1 MHz Oscilloscope	Yes	No	Yes
3. Trend Mode	Yes	No	Yes
4. Component Test	Yes	No	Yes
5. Logic Test	Yes	No	Yes
6. Frequency Counter	Yes	Yes	Yes

The above information is provided to the best of TPI's knowledge and is not guaranteed. The above information is subject to change at any time.

### TPI 440 Applications

Power Quality

Variable Speed Drives

Industrial Motor Controls

Battery Testing

Programmable Logic Controls

NC/CNC Machines

Uninterruptable Power Supplies

Audio

Video

Industrial Lighting Controls

Factory Automation

Line Conditioners

Voltage Regulators

Inverters

Gaming Industry

See page two for technical information.

The Value Leader™

## 6 Instruments in 1...

- 1 Auto Ranging 4,000 Count True RMS DMM**  
TPI's 440 has 9 measurement functions and 0.3% basic DC accuracy.
  - 2 1 MHz Oscilloscope**  
View industrial power signals such as motor controls, UPS, switching power supplies, and PLC controls with detail and clarity.
  - 3 Trend Mode**  
Graph readings over a predetermined time period to check for surges or dropouts.
  - 4 Component Test**  
Check voltage-current signatures on resistors, capacitors, and semiconductors.
  - 5 Logic Test**  
Indicates transitions up to 2 MHz.
  - 6 Frequency Counter**  
Measure low frequency signals from 1Hz to 2 MHz and display duty cycle, pulse width and period.
- PC/Printer Compatibility to RS-232C Port** Optional accessory A402 allows user to download data or waveforms to PC for archiving, processing, and report generation. Ideal for extended monitoring.

## Advanced Capabilities for the Troubleshooter...

- **POWER QUALITY**
- **INDUSTRIAL MOTOR CONTROLS**
- **View waveform to verify power quality delivered to variable speed drives.**
- **Measure voltage and frequency at the same time.**
- **400µF to check motor start and run capacitors.**
- **DC µAmps for checking flame safety controls.**
- **DC mV for checking thermocouples.**

Waveform analysis is a key troubleshooting technique for quickly locating electronic system problems. An oscilloscope provides a picture of voltage with respect to time. Voltage is displayed vertically and time horizontally.

The TPI 440 combines the features of a Digital Multimeter with the waveform capability of a 1 Mhz bandwidth oscilloscope. This easy-to-use instrument features Continuous autoselect for operating simplicity and a separate T-Base Button to manually adjust the sweep rate. See reverse inside and reverse for further details.



# Optional Accessories

**TPI offers a complete line of...**

**Handheld Oscilloscopes**

**Digital Multimeters**

**Digital Clamp-on Meters**

**Gas Detection Instruments**

**Combustion Analyzers**

**Refrigeration Leak Detectors**

**Digital Manometers**

**Contact and Infrared Temperature Instruments**

**Oscilloscope Probes**

**Surface Mount Test Clips**

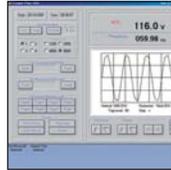
**BNC-BNC Molded Coax Cables**

**F-series Cables**

**Full Line of Accessories**



**Protective Boot A403**  
Protect against impact and wear.  
**Hanging Boot Hook A103**  
Work hands free with the 440's protective boot and hook.



**PC Software & RS232 Cable A402**  
Download data and waveforms from the 460 to any PC using Microsoft Windows.



**Soft Zipper Case A900**  
Keep your 440, AC/DC charger, test leads and optional accessories at the ready. Moveable partitions and adjustable shoulder strap.



**Clamp-on Adapters A251**  
Measure up to 400 AC amps.  
**A256**  
Measure up to 400 AC/DC amps.  
**A296**  
Measure up to 1,000 AC/DC amps.



**Low Current Adapter A254**  
Measures from 10mA to 60 amps AC/DC.



**Current Shunt Adapter A130**  
Allows any DMM with AC/DC millivolt range to measure up to 30 amps.



**Temperature Adapter A301**  
Measure -40° to 500° F. For K-type thermocouple probes.



**Fused Test Leads FTLK1**  
Reduce your risk of electrical shocks and/or instrument damage.



**High Voltage Probe HV40C**  
Measure up to 40 KV DC.



**Test Lead Kits w/Silicone Insulation TLS2000B**  
Shuttered plug  
**TLS2000RB**  
Right angle plug



**Pressure Adapter A620**  
Measure up to 500 PSI.  
**A630**  
Measure up to 10,000 PSI.



**Cigarette Lighter DC Adapter A408**  
Charge the 440 while on the road or in remote locations.



**Test Products International, Inc.    Test Products International, Ltd.    Test Products International UK, Ltd.**

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All pricing subject to changes without notice.

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# Applications and Frequently Asked Questions

## APPLICATIONS

### Industrial motor control

View start-up inrush currents, waveform symmetry, SCR trigger pulses, variable frequency drive signals, pulse width modulation, noise, miscellaneous AC/DC speed control signals, and synchronous motor and generator field excitation controls.

### Power quality

Define AC voltage wave shapes, current waveforms, machine start-up and power quality interference, and noise on industrial feeds and/or general noise.

### Battery testing

Measure voltage drops in Gel-Cell type batteries when connected in circuit. Measure stationary battery charger float and equalize voltages and individual cell voltages in DC backup power systems.

### Programmable logic controls

Read PLC input and output signals, control signals, signal conditioning circuits, communication lines and power supplies.

### NC/CNC machines

Check power quality, sensor outputs, control circuits, safety circuits, calibration and adjustments of components, relays and switches. Troubleshoot axis drives.

### Uninterruptable power supplies

Sense and monitor circuits, switching circuits, output waveforms and current waveforms.

### Audio

Locate noise spikes and voltage/current drops on all home/auto amplifiers, mixers, preamps, and paging system amplifiers.

### Video

Analyze horizontal and vertical scan rates, z-axis blanking, sync pulses and luminance.

### Industrial lighting controls

Troubleshoot SCR and Triac dimming controls and photo sensors. Measure lamp ballast voltages.

### Factory automation

Robot control signals, machine vision, machine control and sensing circuits, calibration of positioning systems, analog controllers, and servo controls.

### Line conditioners

Detect noise and monitor waveform distortion.

### Voltage regulators

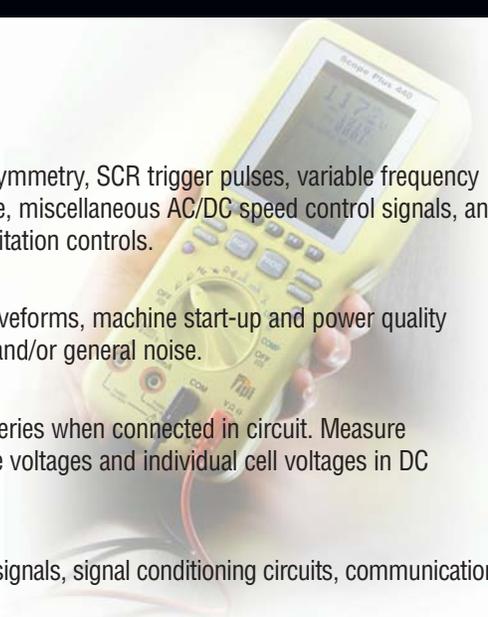
Define noise and stability.

### Inverters

Define waveform quality.

### Gaming Industry

Troubleshoot for component and capacitor degrading which causes noise to appear as periodic waveforms or rapid fluctuations. Most meters cannot catch these anomalies due to a slow sampling frequency. The 440 samples at 20 million times per second. This offers a visual graph of the voltage making it fast and simple for you to detect the noise.



## FAQ

### Where do I use the 440?

The 440 is ideal for viewing industrial power signals, UPS systems, power supplies and PLC controls. Use anywhere a DMM is used.

### Does the 440 measure capacitance?

Yes, the 440 can measure up to 400uF (microfarads).

### What is the highest voltage the 440 can measure?

The 440 can measure up to 1,000 DCV and 1,000 ACV.

### What is the lowest voltage the 440 can measure?

The 440 can measure down to 0.1 millivolts on both DCV and ACV. The scope also has a volts/division setting of 0.1 volts.

### How is the RS232 port used?

With the optional A402 cable and software you can acquire data and download it to a spreadsheet.

### Can the 440 measure more than 10 DCA or ACA?

Yes, TPI offers a number of amp adapters to extend the range up to 1,000 amps. TPI has a wide range of optional accessories that enables the user to measure amps, temperature, pressure, or CO.



# 4,000 Count True RMS DMM with waveform capabilities



**3-YEAR LIMITED WARRANTY**

**Included:** Insulated Test Leads with Alligator Clips, Power Supply, NiCad Battery, and Instruction Manual

## 6 INSTRUMENTS IN 1

- ➊ **Auto Ranging 4,000 Count True RMS DMM**  
TPI's 440 has 9 measurement functions and 0.3 basic DC accuracy.
- ➋ **1 MHz Oscilloscope**  
View industrial power signals such as motor controls, UPS, switching power supplies, and PLC controls with detail and clarity.
- ➌ **Trend Mode**  
Graph readings over a predetermined time period to check for surges or dropouts.
- ➍ **Component Test**  
Check voltage-current signatures on capacitors, resistors, semiconductors and much more.
- ➎ **Logic Test**  
Indicates transitions up to 2 MHz.
- ➏ **Frequency Counter**  
Measure low frequency signals from 1Hz to 2MHz and display duty cycle, pulse width and period.

### T-Base Button

Use feature to manually adjust sweep speed (time/division) to shrink or enlarge the viewable waveform for analysis.

### Continuous Autoset

Feature automatically determines the correct vertical and horizontal settings for optimum waveform viewing. Autoset provides hands free operation while moving between test points.

### PC/Printer Compatibility to RS-232C Port

Optional accessory A402 allows user to download data or waveforms to a PC for archiving, processing, and report generation. Perfect for extended monitoring. Eight waveform storage locations enables remote data acquisition for later viewing.

## SPECIFICATIONS

### DMM

True RMS	Yes
Basic DC Accuracy	0.3%
DCV / ACV	Up to 1,000 volts
DCA / ACA	Up to 10 amps
Ohms	Up to 40 Meg ohm
Capacitance	Up to 400uF
Frequency	Up to 2 MHz

### True RMS DMM

True RMS allows the user to obtain accurate measurements of non-sinusoidal AC voltage and current waveform found in controls and circuits.

### OSCILLOSCOPE

Bandwidth	1 MHz
Sample Rate	20 Megasamples per Second Single Shot
Channels	Single
Glitch Capture	Yes
Trend Mode	Yes
Auto Set	Continuous
Waveform Memory	8 locations
Set-up Memory	8 locations
Viewing Area	160 x 240 pixels
Contrast	Adjustable

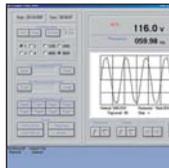
**International Version:** 220 volt 50/60Hz AC/DC adapter is included when specifying model no. **440X**.

**440E1:** Comes with 440 Oscilloscope and A403 protective boot.

**440E2:** Comes with 440 Oscilloscope, A403 protective boot, and A402 PC software with RS232 cable



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Protect against impact and wear.  
**Hanging Boot Hook A103**  
Work hands free with the 440's protective boot and hook.



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**A296**  
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Measures from 10mA to 60 amps AC/DC.



**Deluxe Test Lead Kits TLS2000B & TLS2000RB**  
High-quality silicone-rubber test leads with 700-wire strand.



**Cigarette Lighter DC Adapter A408**  
Charge the 440 while on the road or in remote locations.