Test & Measurement instruments

TENTECH
A MEGABRAS Partner Company
10 kV digital insulation tester

Features
- Microprocessor-controlled
- Insulation resistances up to 10 TΩ
- Auto-range
- Automated tests: Absorption index, Polarization index, Capacitance, Leakage current and AC/DC voltmeter
- Chronometer up to 90 minutes
- Step voltage test
- Real time clock and calendar
- Built-in printer, 4000 readings memory
- Powered by LFP (LiFePO4) rechargeable battery, a safer, more reliable and longer-lasting battery technology

Description
The MD10KVx is a state-of-the-art high voltage digital insulation tester and analyzer for insulation resistance measurements of up to 10 TΩ. The equipment can be remote-controlled from a powerful Android application, allowing the user to perform measurements from a tablet or smartphone at a distance from high-voltage points, for more comfortable and safer tests.

Additional features include automated tests for Polarization Index, Dielectric Absorption Ratio, Step Voltage, leakage current, and capacitance. All measurements are stored both in the equipment’s internal memory as well as in the remote control device. A built-in printer allows for in situ documentation of measurement results, while the Android application lets users take photos of the site, store geolocation information (GPS coordinates) and record voice comments, all of which can then be incorporated into high quality reports generated using this application.

This highly accurate, easy to operate, portable, rugged equipment is powered by rechargeable LiFePO4 battery of outstanding characteristics, with estimated durability of up to 10 years (2000 cycles).
**Insulation testers**

**5 kV insulation analyzer**

### MD5075x

**Features**
- Microprocessor-controlled
- Insulation resistances up to 5 TΩ
- Auto-range
- Automated tests:
  - Absorption index
  - Polarization index
  - Capacitance
  - Leakage current
  - AC/DC voltmeter
- Chronometer up to 90 minutes
- Step voltage test
- Real time clock and calendar
- Built-in printer
- 4000 readings memory

**Description**
The MD5075x is one of the most complete and sophisticated digital insulation testers available in the market. Its proven technology provides safe, reliable and accurate measurements of insulation resistance up to 5 TΩ, with 4 pre-selected test voltages (500 V - 1 kV - 2.5 kV - 5 kV). Other test voltages may be selected in steps of 25 V, 100 V or 500 V.

**5 kV insulation tester**

### MD5060x

**Features**
- Insulation resistance up to 5 TΩ
- Test voltage: 0.5 kV to 5 kV in 100 V steps
- Short circuit current: 1.5 ± 0.5 mA
- Automatic measurement: Polarization index (PI) and dielectric absorption index (DAI)
- Auto-range
- Step Voltage Test (SVT)
- Built-in memory for up to 4000 measured values
- Built-in printer (optional)
- Real-time clock and calendar
- USB interface
- Programmable pass-fail test

**Description**
The MD5060x is a smart, microprocessor-controlled, 5 kV insulation tester. Besides the conventional measurement of insulation resistances up to 5 TΩ, its advanced features allow to automatically measure both the Polarization Index and Dielectric Absorption Index, thus significantly simplifying testing of transformers.
1 kV insulation tester

MD1035x

Features
• Insulation resistance up to 1 TΩ
• Test voltages: 100 V to 1 kV in 50 V steps
• Short circuit current: 1.5 ± 0.5 mA
• Auto-range
• Automatic measurement: Polarization Index (PI) and Dielectric Absorption Index (DAI)
• Built-in memory for up to 4000 measured values
• Built-in printer (optional)
• Real-time clock and calendar
• USB interface
• Programmable pass-fail test
• Internal rechargeable battery

Description
MD1035x is a smart, microprocessor-controlled, 1 kV insulation tester. Besides the conventional measurement of insulation resistances up to 1 TΩ, its advanced features allow to automatically measure both the Polarization Index and Dielectric Absorption Index, thus significantly simplifying testing of transformers.

Hand-held insulation tester

MD1000R

Features
• 3 test voltages: 250 V - 500 V - 1000 V
• Short circuit current: 1.5 ± 0.3 mA
• Guard terminal
• Auto-range
• Programmable timer
• Pass-fail test
• Low resistance and continuity measurement
• AC/DC voltmeter up to 600 V - True RMS
• Rechargeable battery

Description
This insulation tester is a portable, handheld, battery-powered equipment. Operation is very simple and user-friendly: just connect the test leads, switch-on the equipment, select the test voltage and press the ‘TEST’ button. Then the equipment automatically selects the most suitable range and shows the measured value in a 3½ digits display.

MD542

Features
• Specially designed for telecommunication maintenance
• 3 test voltages: 100 V - 250 V - 500 V
• Short circuit current: 1.5 ± 0.3 mA
• Guard terminal
• Auto-range
• Programmable timer
• Pass-fail test
• Low resistance and continuity measurement
• AC/DC voltmeter up to 400 V - True RMS
• Rechargeable battery
Insulation testers

Analog insulation resistance testers

Description
Tentech’s analog insulation resistance testers employ highly reliable, state-of-the-art technology to achieve accurate measurements of insulation resistance in a wide range of applications. Readings are performed through an easy-to-read analogue indicator with a broad scale range. This is the preferred display method for many experienced technicians as analogue instruments provide the user with valuable additional information from the pointer’s speed of displacement when performing insulation tests.

Features
• Wide range of maximum insulation resistance for different applications
• 4 test voltages*
• Guard terminal
• Multiple scale for precision improvement
• Taut band analog meter
• Rechargeable battery with battery check
• IP54 protection
*Except for Mi1000e

These instruments are especially suitable for testing insulation resistance in transmission lines and medium voltage distribution systems, whether aerial or underground, as they allow for testing with voltages similar to the operational value. They are also an excellent tool for cable troubleshooting.
With maximum test voltages ranging from 1 kV to 5 kV, this product line is particularly useful for the measurement of insulation resistance in low and medium voltage electrical systems, transformers, motors, cables, distribution networks and electro-medical equipment among other applications. These instruments allow for measurements of ultra high insulation resistances of up to 10 TΩ.

**Mi1000e**

The Mi1000e is a general purpose insulation tester for accurate measurement of insulation resistances up to 200 GΩ with two test voltages: 500 V and 1,000 V.

<table>
<thead>
<tr>
<th>Model</th>
<th>Max. insulation resistance</th>
<th>Test voltages</th>
<th>Dimensions</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mi1000e</td>
<td>200 GΩ</td>
<td>0.5 kV - 1 kV</td>
<td>8.7 x 7.5 x 3.9”</td>
<td>Approx. 3.52 lbs</td>
</tr>
<tr>
<td>Mi1050e</td>
<td>2 TΩ</td>
<td>100 V - 220 V - 0.5kV - 1 kV</td>
<td>10.8 x 9.85 x 4.87”</td>
<td>Approx. 8.15 lbs</td>
</tr>
<tr>
<td>Mi2550e</td>
<td>5 TΩ</td>
<td>0.5 kV - 1 kV - 1.5 kV - 2.5 kV</td>
<td>10.8 x 9.85 x 4.87”</td>
<td>Approx. 8.59 lbs</td>
</tr>
<tr>
<td>Mi5500e</td>
<td>10 TΩ</td>
<td>0.5 kV - 1 kV - 2.5 kV - 5 kV</td>
<td>10.8 x 9.85 x 4.87”</td>
<td>Approx. 8.59 lbs</td>
</tr>
<tr>
<td>Mi10KVe</td>
<td>2 TΩ</td>
<td>1 kV - 2 kV - 5 kV - 10 kV</td>
<td>14.9 x 12.13 x 6.88”</td>
<td>Approx. 20.9 lbs</td>
</tr>
<tr>
<td>Mi15KVe</td>
<td>3 TΩ</td>
<td>1 kV - 5 kV - 10 kV - 15 kV</td>
<td>14.9 x 12.13 x 6.88”</td>
<td>Approx. 21.3 lbs</td>
</tr>
<tr>
<td>Mi20KVe</td>
<td>4 TΩ</td>
<td>5 kV - 10 kV - 15 kV - 20 kV</td>
<td>14.9 x 12.13 x 6.88”</td>
<td>Approx. 21.6 lbs</td>
</tr>
</tbody>
</table>
Micro-ohmmeters

High current micro-ohmmeter

- **MPH 103x**
- **Features**
  - Micro-ohmmeter up to 100 A
  - Microprocessor controlled
  - Alphanumerical display
  - Resolution: 0.1 µΩ
  - Resistance reading: up to 200 Ω
  - Kelvin-type (4-wires) measurement
  - Internal memory for up to 200 readings
  - Direct reading (Up to 4½ digits)
  - Overheating protection
  - USB interface
  - Built-in printer

- **MPH 203x**
- **Features**
  - Micro-ohmmeter up to 200 A
  - Microprocessor controlled
  - Alphanumerical display
  - Resolution: 0.1 µΩ
  - Resistance reading: up to 200 Ω
  - Kelvin-type (4-wires) measurement
  - Internal memory for up to 200 readings
  - Direct reading (Up to 4½ digits)
  - Overheating protection
  - USB interface
  - Built-in printer

**Description**

High-current micro-ohmmeter is a portable, microprocessor-controlled instrument. Has optimized filters and protections for measurements in electrical substations. Can be used to accurately measure very low contact resistances of high voltage circuit-breakers and switches, busbars, etc. It employs the 4 terminals-method (U/I measuring principle) to avoid errors caused by test leads and their contact resistances.

High current micro-ohmmeter

- **MPH 102e**
- **Features**
  - Microprocessor controled
  - Alphanumerical display
  - Resolution: 0.1 µΩ
  - Resistance reading: up to 20 mΩ
  - Up to 100 A test current
  - Kelvin-type (4-wires) measurement
  - Powered by internal battery (up to 10 A) or mains supply
  - Direct reading (Up to 4½ digits)
  - Overheating protection
  - USB interface

- **MPH 204e**
- **Features**
  - Microprocessor controled
  - Alphanumerical display
  - Resolution: 0.1 µΩ
  - Resistance reading: up to 200 Ω
  - Up to 200 A test current
  - Kelvin-type (4-wires) measurement
  - Powered by internal battery (up to 10 A) or mains supply
  - Direct reading (Up to 4½ digits)
  - Overheating protection
  - USB interface

**Description**

Portable, microprocessor-controlled instrument, used to accurately measure very low contact resistances of breakers and switches, busbars, transformer windings and engines, etc. It employs the 4 terminals-method to avoid measurement errors caused by test leads and their contact resistances and allows to measure resistances up to 200 Ω, with a resolution of up to 0.1 µΩ.
High current micro-ohmmeter

**MPK 215e**

**Features**
- Micro-ohmmeter up to 200 A
- Microprocessor controlled
- Alphanumerical display
- Direct reading (Up to 4½ digits)
- Resolution: 0.1 µΩ
- Resistance reading: up to 1 Ω
- U/I (4-wires) measurement
- Overheating protection
- Internal memory for up to 50 registers with 80 readings each
- Can perform up to 30 consecutive tests with duration of 1 minute and 1 minute interval

**Description**
The MPK215e has a cooling system that allows making a large number of consecutive tests without activation of thermal protection. Under normal ambient conditions (77ºF / 25ºC) it can perform up to 30 consecutive tests with duration of 1 minute and 1 minute interval, time usually spent for repositioning the cables in another test point.

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High current micro-ohmmeter

**MPK 105x**

**Features**
- Micro-ohmmeter up to 100 A
- Microprocessor controlled
- Alphanumerical display
- Direct reading (Up to 4½ digits)
- Resolution: 0.1 µΩ
- Resistance reading: up to 300 mΩ
- U/I (4-wires) measurement
- Overheating protection
- Internal memory for up to 50 registers with 80 readings each
- Built-in printer

**Description**
The MPK105x high-current micro-ohmmeter is a portable, microprocessor-controlled instrument. Has optimized filters and protections for measurements in electrical substations. Can be used to accurately measure very low contact resistances of high voltage circuit-breakers and switches, busbars, etc., with test currents up to 100 A. It employs the 4 terminals-method (U/I measuring principle) to avoid errors caused by test leads and their contact resistances.
Micro-ohmmeters

Digital micro-ohmmeter

**Features**
- Microprocessor controlled
- Alphanumerical display
- Resolution: 1 µΩ
- Resistance reading: up to 200 Ω
- Up to 10 A test current
- Kelvin-type (4-wires) measurement
- Powered by internal battery or mains supply
- Direct reading (Up to 4½ digits)
- Serial data output (RS232)

Description
These digital very low resistance ohmmeters are a portable, microprocessor-controlled instruments used to accurately measure resistances of switches and circuit breaker contacts, transformer and motor windings, wire and cable samples, joints in busbars, etc. It uses the Kelvin-type, four-terminals measurement principle, thus eliminating errors caused by lead and contact resistances.

**10 A digital micro-ohmmeter**

**Features**
- Microprocessor controlled
- Alphanumerical display
- Direct reading (Up to 4½ digits)
- Resolution: 0.1 µΩ
- Resistance reading: up to 200 Ω
- Up to 10 A current
- Powered by rechargeable battery
- U/I (4-wires) measurement
- Serial data output (RS232)
- 0.1% basic accuracy

Description
The MPK2000e digital very low resistance ohmmeter is a portable, microprocessor-controlled instrument used to accurately measure resistances of switches and circuit breaker contacts, transformer and motor windings, wire and cable samples, joints in busbars, etc., using test currents from 1 mA up to 10 A.
Micro-ohmmeters

MO2Ke

Features
- Microprocessor controlled
- Alphanumeric display
- Resolution 0.01 mΩ
- Resistance reading: up to 2 kΩ
- Direct reading (Up to 4½ digits)
- Up to 1 A test current
- Rechargeable battery
- 0.2% ± 2 digits basic accuracy
- Kelvin-type (4-wires) measurement
- Built-in printer (optional)
- Serial data output (RS232)

Description
The MO2Ke digital low resistance ohmmeter is a portable, microprocessor-controlled instrument used to accurately measure resistances of contacts, switches, transformer and motor windings, etc., using test currents from 1 mA up to 1 A. Resistance readings are shown in the alphanumeric display with up to a 4½ digit-resolution. It allows to measure resistances of up to 2 kΩ, with resolution of 0.01 mΩ.

Ground testers

MTD20KWe

Features
- Digital and automatic
- 3½ digits display
- Earth resistance measurement
- 4 pole soil resistivity measurement (Wenner method)
- Ground voltage (noise) measurement
- Advanced filtering for high noise voltage rejection
- Audible signal indicates anomalies in the current circuit
- Resolution: 0.01 Ω
- Resistance reading: up to 20 kΩ
- Rechargeable battery
- Battery charger

Description
This equipment is suitable for fast and easy measurement of the grounding resistance in residential and industrial buildings, hospital installations, lightning rods, antennas, substations, etc. Furthermore, its soil resistivity measurement capabilities allow for soil stratification modelling in order to optimize the design of highly complex grounding systems.
Ground testers

High frequency earth tester

Features

- Intended for measurement of earth resistance of transmission towers
- Minimizes the influence of adjacent towers, even when, connected by the guard cable
- Operation frequency: 25 kHz
- Resistance reading: up to 300 Ω
- Automatic compensation of inductive component
- Automatic current injection
- USB interface and remote interface
- Built-in memory and printer
- Powered by LFP (LiFePO4) rechargeable battery, a safer, more reliable and longer-lasting battery technology

Description

Testing the grounding quality of individual transmission towers presents a complex problem, as they are all electrically interconnected by means of Guard Wires. As the adjacent towers influence the measurement, when using conventional instruments it becomes necessary to disconnect the guard wire. By using high frequency test current, the TM25R minimizes that effect allowing for a fast, safe and reliable grounding resistance measurement in each tower of a live transmission line, without the need to disconnect the guard wire. Considering that the lightning is an impulsive phenomenon, with the energy concentrated in high frequency components, this technology gives results that are more representative of the true grounding quality associated with lightning systems. The TM25R connects with Android Tablets, allowing for full remote control during the measurement through an easy to use application, saving time and making the job much more comfortable. Additional features include the option to capture the geolocation (GPS coordinates), take and save photos and record voice comments for each measurement, all of which can be incorporated into rich and highly professional reports that are easily generated using this powerful application.
Smart digital earth tester

EM4058

Features

- 0.01 Ω resolution
- Up to 20 kΩ resistance measurement with auto-range
- Earth resistance measurement
- Multi-frequency measurement current (270 Hz - 570 Hz - 870 Hz - 1,170 Hz - 1,470 Hz)
- Automated measurement and calculation of ground resistivity using Wenner’s formula
- High interference (noise) rejection
- Interference voltage measurement
- Rechargeable battery
- Built-in memory
- Built-in printer
- USB interface and remote interface
- Powered by LFP (LiFePO4) rechargeable battery, a safer, more reliable and longer-lasting

Description

The EM4058 earth tester is a digital, microprocessor controlled instrument that allows to measure the earth resistance and ground resistivity (using Wenner’s method), as well as to detect parasitic voltages present in the ground. This instrument is suitable to measure earth systems in power substations, industries, distribution networks, etc., according to IEC 61557-5.

The EM4058 has a Frequency Scan feature that performs an earth resistance measure with all available frequencies automatically and calculates, displays and prints the average result besides the individual result of each frequency. Those results are saved on the internal memory.

The EM4058 has a built-in memory to store measurements and a built-in printer, besides the USB interface that allows to communicate measured values to a computer or data logger for their later analysis and has a remote interface that allows remote control of it through an Android device. It is a portable, strong and lightweight equipment, suitable to be used out in the field and under severe weather conditions. It is powered by a rechargeable battery and it is supplied with all the necessary accessories for measurements (test spikes, leads, etc) within an auxiliary case that makes it simple to carry.

www.tentech.com
**TLogger**

**Description**

TLogger is a software that makes communication between Tentech’s equipment and a computer easier, allowing the user to synchronize the date and time of the equipment’s internal clock with the computer’s date and time, transfer the stored data, clear the memory, and generate test charts and reports.

<table>
<thead>
<tr>
<th>Function</th>
<th>MD1035x</th>
<th>MD5060x</th>
<th>MD5075x</th>
<th>MD10KVx</th>
<th>MPK103x</th>
<th>MPK203x</th>
<th>MPK105x</th>
<th>MPK215e</th>
<th>EM4058</th>
<th>TM25R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synchronize date and time</td>
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<tr>
<td>Download stored data</td>
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<tr>
<td>Clear internal memory</td>
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<td>Print reports</td>
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<tr>
<td>Generate test charts</td>
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</tbody>
</table>

**About the internal rechargeable battery**

Portable measurement equipment for field use is usually powered by rechargeable batteries. Considering the expected lifetime of standard battery technologies under normal use conditions is 2 to 3 years, battery replacement tends to be the most frequent reason why equipment needs to be sent to a service center. The introduction of a new battery technology, LiFePO4, also known as LFP, has improved this dramatically. Tentech has incorporated this technology to its range of high power consumption equipment to take advantage of its outstanding features:

- **Expected lifetime**: in excess of 10 years on average (2000 charge / discharge cycles)*
- **Low self-discharge**: when the equipment is not in use, battery charge decreases with time at a much lower rate than other battery technologies.
- **Safety**: in contrast to other lithium battery technologies commonly used, LFP batteries are thermally and chemically stable, significantly improving battery safety.

Tentech is proud of being a pioneer in adopting this breakthrough in battery technology for portable measurement equipment.

(*) This is an estimation based on data provided by battery manufacturers and cannot be guaranteed. Warranty period for LFP batteries is the same as the warranty period of the equipment itself.