

## Megger Digital Low-Resistance Ohmmeters

Measure very low resistances accurately and reliably

- Resolution to 0.1  $\mu\Omega$
- 10A Current Capability
- Standard Accuracy of 0.25%
- 4-Wire Measurement Eliminates Errors
- Digital Readout with Automatic Zero Circuit

B

Operating on the four-wire measurement principle to eliminate lead and contact resistances, they offer basic accuracies of  $\pm 0.25\%$  and resolution down to 0.1 $\Omega$ . Use them to measure the resistance of:

- Switch and circuit breaker contacts
- Transformers and generators
- Motor windings
- Busbar and other joints
- Aircraft, static wicks, rail, and pipe bonds
- Cable splices, welds, and fuses
- Metal alloys
- Graphite electrodes and other composites
- Wire and cable

DLROs are also used to find ground faults in electrical equipment, determine temperature coefficient and temperature rise by resistance methods, and to locate cracks in castings such as squirrel cage motor rotors.

### Dual-Pak Model 247000

A battery-powered unit that features separate measuring and charger modules for maximum portability.

### Single-Pak Model 247001

Compact—packages measuring circuits, rechargeable batteries and charger in one self-contained unit.

**247001—**  
Integrated  
charger and  
measurement  
module lets you  
recharge the unit  
on-site



### Low-Range Model 247002

This model provides an extra range, 0–599.9  $\mu\Omega$ , for applications requiring 0.1  $\mu\Omega$  resolution. It also features a current-reversing switch to average out any voltage offset in the test sample.

### Test Leads

You need two potential and two current leads to make low-resistance measurements.

### Duplex Test Lead Styles

**Kelvin Clips:** Feature spade lugs on outboard end and alligator clips with insulated, silver- or gold-plated jaws.

**Helical Spring Points:** Tips rotate and compress into the body of the probe for accurate measurements.

**Heavy-Duty Fixed Points:** Economical, lightweight, built for durability.

**Heavy-Duty C-Clamps:** Current passes through the C-Clamp and screw thread; the potential passes through a four-point anvil insulated from the clamp metal.

**Each Unit Includes:** 17032 line cord (where applicable), rechargeable battery, and instruction manual.

### Specifications and Ordering Information

Mfg#	24700 (Dual Pak)	247001 (Single Pak)	247002 (Low Range Single Pak)
Resistance Range:	0–5.999 m $\Omega$ , 0–59.99 m $\Omega$ , 0–599.9 m $\Omega$ , 0–5.999 $\Omega$ , 0–59.99 $\Omega$	0–5.999 m $\Omega$ , 0–59.99 m $\Omega$ , 0–599.9 m $\Omega$ , 0–5.999 $\Omega$ , 0–59.99 $\Omega$	Additional 0–599.9 $\mu\Omega$ Range
Resolution:	1 $\mu\Omega$ , 10 $\mu\Omega$ , 0.1 m $\Omega$ , 1 m $\Omega$ , 10 m $\Omega$	1 $\mu\Omega$ , 10 $\mu\Omega$ , 0.1 m $\Omega$ , 1 m $\Omega$ , 10 m $\Omega$	0.1 $\mu\Omega$ , 1 $\mu\Omega$ , 10 $\mu\Omega$ , 0.1 m $\Omega$ , 1 m $\Omega$ , 10 m $\Omega$
Current:	10A, 1A, 100 mA, 10 mA, 1 mA	10A, 1A, 100 mA, 10 mA, 1 mA	10A, 1A, 100 mA, 10 mA, 1 mA
Accuracy:	0.25% of rdg + 1 LSD	0.3% of rdg + 1 LSD	0.3% of rdg + 1 LSD
Power Source:	rechargeable batteries	rechargeable batteries with internal charger	rechargeable batteries with internal charger
Size:	8 x 9 x 8" HWD (20 x 23 x 20 cm)	12 x 6 x 10" HWD (30 x 16 x 25 cm)	12 x 6 x 10" HWD (30 x 16 x 25 cm)
Weight:	12.25 lbs (5.6 kg)	12 lbs (5.5 kg)	12 lbs (5.5 kg)
Order #	MP247000	MP247001	MP247002
Price:			

### Individual Test Leads

Order #	Type	Length	Termination	Max. Test Current	Price
MP242021-7	Potential	7 ft	Hand Spikes	N/A	
MP242041-7	Current	7 ft	Terminal Clips	10A	

Transcat Accredited Calibration with Data	CALL
Transcat Accredited Calibration without Data	CALL

### Duplex Test Leads

Order #	Len.	Termination	Max. Test Current	Price
MP242011-7	7 ft	Helical Hand Spikes with Spring Points	20A/10A	
MP242011-18	18 ft			
MP242009-18	18 ft	Helical Hand Spikes with Spring Points and Current Pushbutton Switch	10A	
MP242002-7	7 ft	Heavy-Duty Fixed-Point Hand Spikes	10A	
MP242002-18	18 ft			
MP242004-7	7 ft	2" (5 cm) Heavy-Duty C-Clamps		
MP242005-7	7 ft	0.5" (1.3 cm) Kelvin Clips**		
MP242006-7	7 ft	1.5" (4 cm) Kelvin Clips	10A	
MP242006-18	18 ft			
* Gold plated		** Silver plated		

## Megger Digital Low Resistance Ohmmeter

- Results in Under 3 Seconds
- Accuracy  $\pm 0.2\%$   $\pm 2$  Counts All Ranges
- 4-Wire Measurement Cancels Out Lead Resistance
- Automatically Selects Suitable Test Current
- Auto Current Reversal Cancels Standing EMFs
- User Settable High/Low Limits (DLRO-10X only)
- Auto-ranging Manual Menu Option on DLRO-10X
- DLRO-10X Stores Test Results and Has Printer Output (RS-232)
- 250 mW Power Limit (with Optional Override) to Avoid Heating the Test Sample
- Automatically Detects Continuity in Potential and Current Connections
- Visible Warning of Voltages Present at the Terminals

**Each Unit Includes:** NiMH battery module, Two Duplex handspikes 1.2m/4 ft (2), one with indicator lights, Battery charger for operation from 115/230V 50/60 Hz, Cigar lighter adapter for battery charging, User guide, Warranty manual.

Normally, measurements are made with forward and reverse currents to cancel the effects of any standing voltages across the test sample. DLRO-10X displays both forward and reverse measurements as well as the average of the two. DLRO-10X also allows the user to set high- and low-pass limits, thereby enabling simple go-no-go testing. DLRO-10 displays the average, while DLRO 10X displays individual and average measurements.



**DLRO-10X**

### Measurement modes

**Normal mode** initiates a test by pressing the test button.

**Auto mode** allows forward and reverse current measurements.

**Continuous mode** allows repeated measurements to be made on the same sample.

**High Power mode** overrides the 250 mW power limit.

**Unidirectional mode**, on DLRO-10X only, applies a current in one direction only.

### Applications

- Switch and contact breaker resistance
- Busbar and cable joints
- Integrity of welded joints
- Battery inter-cell connections
- Small transformer and motor winding resistance
- Rail and pipe bonds
- Graphite electrodes and other composites
- Wire and cable resistance

### Specifications and Ordering Information

Mfg#	DLRO-10	DLRO-10X
Measurement Ranges		
Full Scale	Accuracy	Test Current
1.9999 m $\Omega$	$\pm 0.2\%$ $\pm 2$ counts	10A
19.999 m $\Omega$	$\pm 0.2\%$ $\pm 2$ counts	1A
199.99 m $\Omega$	$\pm 0.2\%$ $\pm 2$ counts	100 mA
1.9999 $\Omega$	$\pm 0.2\%$ $\pm 2$ counts	10 mA
19.999 $\Omega$	$\pm 0.2\%$ $\pm 2$ counts	1 mA
199.99 $\Omega$	$\pm 0.2\%$ $\pm 2$ counts	100 $\mu$ A
1999.9 $\Omega$	$\pm 0.2\%$ $\pm 2$ counts	100 $\mu$ A
Measurement Modes:	Manual, Auto, Continuous, High Power	Manual, Auto, Continuous, High Power, Unidirectional
Control:	Fully Automatic	Fully Automatic/Manual
Display Measurement:	4 1/2 digit seven segment LED	Large backlit LCD
Test Current Accuracy:	$\pm 10\%$	$\pm 10\%$
Battery Capacity:	7 Ah NiMH rechargeable battery supplied with instrument	
Charging Rate Standard/Fast:	14 hrs/4 hrs to 90% capacity at 20°C	
Temperature Operation:	$+5^{\circ}\text{C}$ to $+45^{\circ}\text{C}$ ( $41^{\circ}\text{F}$ to $113^{\circ}\text{F}$ ) at full specification	
Safety:	In accordance with EN61010-1 600V Category III	
Size/Weight:	220 x 100 x 237 mm (8.6 x 4 x 9.5 in)/2.6 kg (5 3/4 lb)	
Order #	MPDLRO-10	MPDLRO-10X
Price		

### Recommended Optional Accessories

Order #	Mfg #	Description	Price
MPEV6121-492	EV6121-492	Additional NiMH Battery Pack	
MP6380-138	6380-138	Carrying Case for DLRO 10 and All Standard Accessories	
MP18313	18313	Carrying Case for Optional Lead Sets	

**NOTE: See page B63 for additional single and duplex leads**

**B**

**Electrical Test Instruments**

## Isotek Milliohmmeter

- Kelvin Connections
- Autoranging
- 0.1% Accuracy
- Less Than 5 mA Test Current
- 1 Ohm to 200 Ohms

**B**

The M210 Milliohmmeter provides accurate low-ohms measurement. This battery-operated resistance meter is designed to accurately measure low resistance from 0.001Ω to 200Ω.

**Each Unit Includes:** Carrying case with strap and Kelvin clip leads.



▲ M210/9B



M210 ▶

### Specifications

Ranges (selectable automatically):	1.999Ω, 19.99Ω, 199.9Ω
Increment:	0.001Ω, 0.01Ω, 0.1Ω
Accuracy:	±0.1% of range
Zero Offset:	±0.001Ω
Test Current:	5 mA, max
Test Power:	5 mW, max
Operating Range:	5°C to 35°C
Display:	3 1/2-digit LCD
Size: Instrument:	5.7 x 3.25 x 1.43" HWD
Carrying Case:	6.1 x 5.65 x 1.8" HWD
Weight:	1 lb 3 oz

### Ordering Information

Order #	Mfg #	Description	Price
MPM210	M210	Milliohmmeter	
MPM210/9B	M210/9B	Kelvin Probe and Clip Leads (Option)	

Transcat Accredited Calibration with Data	CALL
Transcat Accredited Calibration without Data	CALL

Electrical Test Instruments

## **NEW** Extech High Resolution MilliOhm Meter

**Benchtop Meter Provides Resolution Down to 1 mΩ**

- 4-Wire Test Cable with Kelvin Clip Connections
- Comparator Function for Hi/Low/Pass Testing
- Automatic Zero
- Includes 4-Wire Test Leads with Kelvin Clips and Power Cord

### Specifications

Range	Resolution	Current
20mW	0.01mW	1A
200mW	0.1mW	1A
2W	0.001W	10mA
200W	0.1W	1mA
2kW	0.001W	100mA
20kW	0.1kW	10mA
Dimensions/Weight	11 x 8 x 3.5" (280 x 210 x 90 mm) / 4.85 lbs (2.3 kg)	

### Ordering Information

Order #	Mfg #	Description	Price
MP380560	380560	Precision MilliOhm Meter	
MP380465	380465	Spare Kelvin Clip Test Lead Set	



▲ 380560