

# DLRO10HD

## 10 Amp Digital Low Resistance Ohmmeter



- High or low output power selection for condition diagnosis
- Rechargeable battery or line power supply, continuous operation, even with dead battery
- 10 A for 60 seconds, less time waiting to cool, great for charging inductance
- High input protection to 600 V, inadvertent connection to line or UPS voltage will not blow a fuse
- Heavy duty case: IP65 lid closed, IP54 operational (battery operation only)
- Rotary switch selects one of five test modes, including auto start on connection, giving ease of use

### DESCRIPTION

Augmenting Megger's DLRO10 and 10X range of low resistance ohmmeters the DLRO10HD combines ultimate simplicity of operation with a rugged IP65 case designed for stable ground and bench operation.

The unit is powered from either its rechargeable battery or line power making it suitable for continuous testing in production line/repetitive use environments.

Rotary switch controls are simple and easy to operate in all weather conditions and with gloved hands. A large, clear, backlit LCD display is easy to read from a distance.

The DLRO10HD provides significantly enhanced compliance and is capable of delivering 10 A into measurements up to 250 mΩ and 1 A into measurements up to 2.5 Ω. The duration of each test may be up to 60 seconds.

The DLRO10HD is rated CAT III 300 V. A range of test leads is available to suit the application.

The DLRO10HD provides five test modes each of which is selected through a simple rotary control.

### TEST MODES

Automatic unidirectional mode applies current in one direction only to speed up the measurement process. However thermal EMF resulting from dissimilar metal bonds can cause lower accuracy. Test starts automatically when probes are connected.

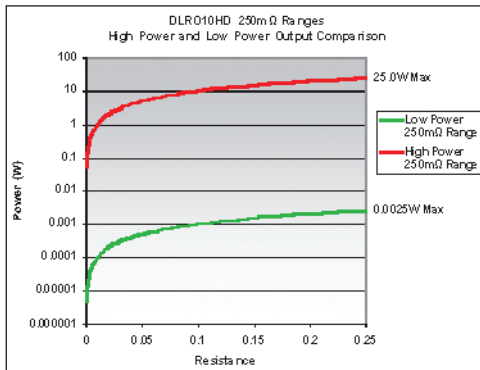
Continuous mode allows repeated measurements to be made on the same sample. Simply connect the test leads and press the test button. The measurement is updated every three seconds until the circuit is broken.

Inductive mode is selected when measuring resistance on, for example, motors and generators. When measuring inductive loads it is necessary to wait for the voltage to stabilise as the inductive element is charged. Test leads are firmly connected to the device under test and the 'Test' button pressed. The instrument will pass the selected current through the sample continuously in one direction only and take repetitive readings that will gradually decrease to the true value as the voltage stabilizes. The operator decides when the result is stable and presses the 'Test' button to terminate the test.

### ADDITIONAL FEATURES AND BENEFITS

- Rugged case well suited for transportation and includes a lead set pouch
- Removable lid facilitates easy test lead connection
- Operational ingress protection is IP54 (battery power only) ensuring protection from the elements
- 7Ah lead acid battery provides extended operation and can be charged whilst operating from line power
- Rotary mode switch with bidirectional (current reversal with averaging cancels thermal EMFs), unidirectional, automatic, continuous and inductive modes
- Large, clear LCD display with backlight and contrast adjustment
- Auto power off function conserves battery

The DLRO10HD features two ranges with extended compliance. Effectively there are two 2.5 Ω and two 250 mΩ ranges one low power, and one high power. The chart below shows the power output curves for the two 250 mΩ ranges. Each range provided 10 μΩ resolution allowing the user to make comparative measurements at either 0.25 Ω or 25 Ω maximum outputs.



**APPLICATIONS**

The DLRO10HD measures low resistance values in applications ranging from railways and aircraft to resistance of components in industry.

Any metallic joint can be measured but users must be aware of measurement limitations depending on application. For example, if a cable manufacturer plans to make resistive measurements on a thin wire, a low test current should be selected to prevent heating the wire thereby changing its resistance.

Measurements on electric motors and generators will be inductive and require the user to understand the inductive mode and charging process before a correct result is achieved.

The DLRO10HD is well suited to measuring thick conductors, bonds and quality of welding because of its 10 A range for resistance values up to 250 mΩ.

Electromagnetic noise induced into the leads can interfere with a reading. A noise symbol alerts the user and prevents a measurement when the instrument detects noise above its threshold.

When dissimilar metals are joined a thermocouple effect is created. Users should select a bidirectional mode to ensure cancellation of this effect. The instrument measures with current flowing in both directions and averages the result.

Normal mode is initiated by pressing the ‘Test’ button after connecting the test leads to the unit under test. Continuity of all four connections is checked. Current is applied in both forward and reverse direction following which measurement is displayed.

Automatic mode is started as soon as the probes make contact. Forward and reverse current measurements are made and the average value is displayed. This mode is ideal when working with the supplied DH4 handspikes. Each time the probes are removed and reconnected to the load a new test will be performed without the need to press the test button.

**ELECTRICAL SPECIFICATIONS**

**Resistance/Current Ranges**

The green resistance ranges on the keypad indicate low output power (<0.25 W) outputs. Red ranges indicate higher 2.5 W (1 A) and 25 W (10 A) power outputs.

**Resolution and Accuracy**

Test current accuracy ±10%

Voltmeter input impedance >200 kΩ

Test Current	Resistance Range	Resolution*	Basic Accuracy Voltage	Full Scale Output	Max. Power
0.1 mA	0 to 2500.0 Ω	100 mΩ	±0.2% ±200 mΩ	25 mV	2.5 μW
0.1 mA	0 to 250.00 Ω	10 mΩ	±0.2% ±20 mΩ	25 mV	2.5 μW
1 mA	0 to 25.000 Ω	1 mΩ	±0.2% ±2 mΩ	25 mV	25 μW
10 mA	0 to 2500.0 mΩ	100 μΩ	±0.2% ±200 μΩ	25 mV	250 μW
100 mA	0 to 250.00 mΩ	10 μΩ	±0.2% ±20 μΩ	25 mV	2.5 mW
1 A	0 to 25.000 mΩ	1 μΩ	±0.2% ±2 μΩ	25 mV	25 mW
10 A	0 to 2500.0 μΩ	0.1 μΩ	±0.2% ±0.2 μΩ	25 mV	0.25 W
1 A	0 to 2500.0 mΩ	100 μΩ	±0.2% ±200 μΩ	2.5 V	2.5 W
10 A	0 to 250.00 mΩ	10 μΩ	±0.2% ±50 μΩ	2.5 V	25 W

\* The accuracy stated assumes forward and reverse measurements.

Inductive mode or unidirectional mode will introduce an undefined error if an external EMF is present.

Basic accuracy at reference conditions.

**SPECIFICATIONS**

**Temperature Coefficient:** < 0.01% per ° C, from 5° C to 40° C

**Maximum Altitude:** 2000m (6562 ft) to full safety specifications

**Display size/type:**

Main 5 digit + 2 x 5 digit secondary displays

**Battery type:** 6 V, 7Ah sealed lead acid

**Voltage input range:** 90 - 264 V, 50-60 Hz

**Charge time:** 8 hours

**Backlight:** LED backlight

**Battery life:** 1000 Auto (3 sec) tests

**Auto power down:** 300s

**Mode Selection:** Rotary switch

**Range selection:** Rotary switch

**Weight:** 6.7 kg

**Case dimensions:** L315mm x W285mm x H181mm

**Pouch for test leads:** Yes (lid mounted)

**Test leads:** DH4 lead set included

**IP rating:** IP65 case closed, IP54 battery operation

**Safety rating:** In accordance with IEC61010-1, CATIII 300 V when used with DH7 leads

**Operating temperature and humidity**

-10° C to +50° C (14° F to 122° F) <90% RH

**Reference conditions:** 20° C ±3° C

**Storage temperature and humidity**

-25° C to +60° C, <90% RH

**EMC**

In accordance with IEC61326-1 (Heavy industrial)

**Noise rejection**

Less than 1% ±20 digits additional error with 100 mV peak 50/60 Hz. on the potential leads. Warning will show if hum or noise exceeds this level.

Maximum lead resistance

100 mΩ total for 10 A operation irrespective of battery condition.

**DLRO PRODUCT COMPARISON GUIDE**



**DLRO10**



**DLRO10HD**



**DLRO10X**

Feature	DLRO10	DLRO10HD	DLRO10X	Benefit/s
Power limited output test ranges (<0.25 W)	■	■	■	Negligible heating, little need for contact temperature compensation Can help to highlight contamination Extends battery life
High power output test ranges (25 W)		■		Can help to highlight weakness with heating, such as poor connection due to rough surfaces or broken strands on cables Improved inductive load performance
Auto current reversal	■	■	■	Cancels out thermal EMFs
Auto start (continuity detection)	■	■	■	Fast operation without pressing test button
High input protection <600 V	■	■	■	Inadvertent connection to live line supply or UPS voltage will not even blow a fuse Testing just continues as normal
Noise immunity specified at 100 mV	■	■	■	Make measurement in harsh environments
Noise limit exceeded indicator	■	■	■	Confidence that measurements are not effected
User interchangeable detachable battery pack	■		■	Continuous testing with optional second battery. Use one battery while second charges
Hang from neck operation	■		■	Ideal for use up ladders and platforms improved manoeuvrability
Operate from mains/line supply		■		Continuous testing from mains ideal for manufacturing applications Always ready to test no waiting for battery to charge
IP65 lid closed		■		Can be transported in any wet conditions
IP54 in use		■		Can be operated in the rain
Ultra tough case		■		Built to take the knocks in the most arduous of conditions
Test result storage with memos			■	Ideal for predictive maintenance systems Less errors in writing down test results
Printer and PC output			■	Save results to your PC or send to a printer
User selectable test limits			■	Aids rapid testing to specified limits

**ORDERING INFORMATION**

<b>Item (Qty)</b>	<b>Cat. No.</b>	<b>Item (Qty)</b>	<b>Cat. No.</b>
DLRO10HD Low Resistance Ohmmeter	1000-348	Straight Duplex Handspikes (2)	
<b>Included Accessories</b>		Heavy Duty with fixed contacts	2m/7ft 242002-7
DH4 duplex handspike 1.2m	6111-503		5.5m/18ft 242002-18
Test lead pouch (lid mounted)	1000-036		9m/30ft 242002-30
DLRO10HD user guide CD	2000-869	Duplex Heavy Duty 5cm (2")	
Warranty book	6170-618	C-Clamps (2)	2m/7ft 242004-7
<b>Optional Accessories at extra cost</b>			5.5m/18ft 242004-18
Calibration Shunt, 10 Ω, current rating 1 mA	249000		9m/30ft 242004-30
Calibration Shunt, 1 Ω, current rating 10 mA	249001	Duplex handspikes with replaceable	
Calibration Shunt, 100 mΩ current rating 1 A	249002	Needle Points	2m/7ft 242003-7
Calibration Shunt, 10 mΩ current rating 10 A	249003	Duplex 1.27 cm (1/2")	
Certificate of Calibration for Shunts, NIST	CERT-NIST	Kelvin Clips, (2) gold plated	2m/7ft 241005-7
Replacement tips for DH4, DH5 and DH7 handspikes		silver plated	2m/7ft 242005-7
Needle point	25940-012	Duplex 3.8 cm (1 1/2")	
Serrated end	25940-014	Kelvin Clips (2)	2m/7ft 242006-7
<b>Optional Test Leads at extra cost</b>			5.5m/18ft 242006-18
<b>Duplex Leads</b>			9m/30ft 242006-30
DH5 straight duplex handspikes (2)		<b>Single Leads</b>	
One has indicator lights	2.5m/8ft 6111-517	Single handspike (1) for potential	
DH7 Duplex handspikes (2) suitable		measurement	2m/7ft 242021-7
for working on 600 V. systems	2.5m/8ft 1001-035		5.5m/18ft 242021-18
Duplex Handspikes (2) with spring			9m/30ft 242021-30
loaded helical contacts	2m/7ft 242011-7	Current clip (1) for current	
	DH1 2.5m/8ft 6111-022	connections	2m/7ft 242041-7
			5.5m/18ft 242041-18
			9m/30ft 242041-30
only 1 lead supplied	DH2 6m/20ft 6111-023	Note: For more details of optional lead sets see separate test	
		lead datasheet DLRO_TL_DS_en_V04.pdf	
			9m/30ft 242011-30
	DH3 9m/30ft 6111-024		

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