

# DLRO10HD

## 10 Amp Digital Low Resistance



### DESCRIPTION

Augmenting Megger's DLRO10 and 10X range 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 1A 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.

### ADDITIONAL FEATURES AND BENEFITS

- Rugged case well suited to transportation with shoulder strap and lead set pouch
- Removable lid facilitates easy test lead connection
- Operational ingress protection is IP 54 (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

- 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: IP 65 lid closed, IP54 operational (battery operation only)
- Rotary switch selects one of five test modes, including auto start on connection, giving ease of use

### 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.

#### 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 stabilises. The operator decides when the result is stable and presses the 'Test' button to terminate the test.

#### 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  $\pm 10\%$

Voltmeter input impedance >200 k $\Omega$

Test current	Resistance range	Resolution (as displayed)	Basic accuracy*	Full scale voltage	Max. power output
0.1 mA	0 to 2500.0 $\Omega$	0.1 $\Omega$	$\pm 0.2\%$	25 mV	25 $\mu$ W
0.1 mA	0 to 250.00 $\Omega$	0.01 $\Omega$	$\pm 0.2\%$	25 mV	2.5 $\mu$ W
1 mA	0 to 25.000 $\Omega$	1 m $\Omega$	$\pm 0.2\%$	25 mV	25 $\mu$ W
10 mA	0 to 2500.0 m $\Omega$	0.1 m $\Omega$	$\pm 0.2\%$	25mV	250 $\mu$ W
100 mA	0 to 250.00 m $\Omega$	0.01 m $\Omega$	$\pm 0.2\%$	25 mV	2.5 mW
1 A	0 to 25.000 m $\Omega$	1 $\mu\Omega$	$\pm 0.2\%$	25 mV	25 mW
10 A	0 to 2500.0 $\mu\Omega$	0.1 $\mu\Omega$	$\pm 0.2\%$	25 mV	0.25 W
1 A	0 to 2500.0 m $\Omega$	0.1 m $\Omega$	$\pm 0.2\%$	2.5 V	2.5 W
10 A	0 to 250.00 m $\Omega$	0.01 m $\Omega$	$\pm 0.2\%$	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.

#### GENERAL SPECIFICATIONS

Temperature coefficient < 0.01% per  $^{\circ}$ C, from 5  $^{\circ}$ C to 40  $^{\circ}$ 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  $^{\circ}$ C to +50  $^{\circ}$ C (14  $^{\circ}$ F to 122  $^{\circ}$ F) <90% RH

Reference conditions 20  $^{\circ}$ C  $\pm$ 3  $^{\circ}$ C

Storage temperature and humidity -25  $^{\circ}$ C to +60  $^{\circ}$ C, <90% RH

EMC In accordance with IEC61326-1 (Heavy industrial)

Noise rejection Less than 1%  $\pm$ 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 m $\Omega$  total for 10 A operation irrespective of battery condition.

**ORDERING INFORMATION**

Item (Qty)	Order No.	Item (Qty)	Order No.	
DLRO10HD Low Resistance Ohmmeter	1000-348	Straight Duplex Handspikes (2)		
<b>Included accessories</b>		Heavy Duty with fixed contacts.		
DH4 duplex handspike 1.2m	6111-503	2m/7ft	242002-7	
Test lead pouch (lid mounted)	1000-036	5.5m/18ft	242002-18	
DLRO10HD user guide CD	1000-869	9m/30ft	242002-30	
Warranty book.	6170-618	Duplex Heavy Duty 5cm (2")		
<b>Optional Accessories at extra cost</b>		C-Clamps. (2)		
Calibration Shunt, 10 Ω, current rating 1 mA.	249000	2m/7ft	242004-7	
Calibration Shunt, 1 Ω, current rating 10 mA.	249001	5.5m/18ft	242004-18	
Calibration Shunt, 100 mΩ current rating 1A.	249002	9m/30ft	242004-30	
Calibration Shunt, 10 mΩ current rating 10 A.	249003	Duplex handspikes with replaceable		
Certificate of Calibration for Shunts, NIST	CERT-NIST	Needle Points 2m/7ft	242003-7	
Replacement tips for DH4, DH5 and DH7 handspikes.		Duplex 1.27 cm (1/2 ")		
Needle point	25940-012	Kelvin Clips. (2)		
Serrated end	25940-014	gold plated 2m/7ft	241005-7	
<b>Optional Test Leads at extra cost</b>		silver plated 2m/7ft	242005-7	
<b>Duplex Leads</b>		Duplex 3.8 cm (1 1/2")		
DH5 straight duplex handspikes (2).		Kelvin Clips. (2) 2m/7ft	242006-7	
One has indicator lights. 2.5m/8ft	6111-517	5.5m/18ft	242006-18	
DH7 Duplex handspikes (2) suitable for working on 600 V. systems. 2.5m/8ft	1001-035	9m/30ft	242006-30	
<b>Duplex Handspikes (2) with spring loaded helical contacts.</b>		<b>Single Leads</b>		
	2m/7ft	242011-7	Single handspike (1) for potential measurement.	
DH1	2.5m/8ft	6111-022	2m/7ft	242021-7
	5.5m/18ft	242011-18	5.5m/18ft	242021-18
			9m/30ft	242021-30
<b>only 1 lead supplied</b>		Current clip (1) for current connections.		
DH2	6m/20ft	6111-023	2m/7ft	242041-7
	9m/30ft	242011-30	5.5m/18ft	242041-18
DH3	9m/30ft	6111-024	9m/30ft	242041-30
Note: For more details of optional leadsets see separate test lead datasheet DLRO_TL_DS_en_V01.pdf				