

# DLRO100 Series

## Megger Digital Low Resistance Ohmmeters



- CAT IV 600 VAC / 500 VDC for safe operation
- Lightweight 100 A battery powered unit for portability
- High noise immunity for stable readings
- Smooth DC Output for circuit breaker testing
- IP54 for protection against dust and moisture whilst testing
- Save, download and delete results (100X/H variants)
- Remote operation, Bluetooth® & asset/result tagging (100H variants)

### DESCRIPTION

A significant addition to the comprehensive range of Megger Low Resistance Ohmmeters, DLRO100 enables low resistance measurement, across multiple applications, in areas without access to mains power. The integral Li-Ion battery supplies a constant 100 A current for up to 200 Manual/Auto tests to enable enhanced productivity in remote locations. With a focus on user safety, advanced design features ensure the safe operation of the instrument in the most adverse conditions, including a CAT IV 600 VAC / 500 VDC safety rating in accordance with IEC61010. The rugged design, intuitive interface and IP54 (lid open) rating ensure reliability and ease of use in the most arduous of conditions.

### Test Modes

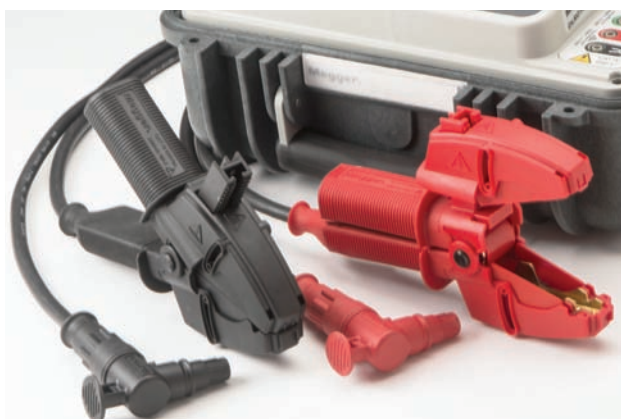
The **Manual test** mode allows the user to initiate the test procedure once the probes are in contact with the object under test. Once the TEST button is depressed the TEST lamp will illuminate and the instrument will undertake a single test to verify the resistance of the test object.

In **Auto mode** the user selects the desired current, connects the current test leads and as soon as the potential leads are connected a test will start automatically. To repeat a test, simply break contact with the potential probes and remake contact.

In **Continuous mode** the user connects the test leads and presses the TEST button, initiating the test procedure. The instrument will continue to test, updating the display after each new test cycle, until the TEST button is pressed or the test procedure times out.

### Test Leads:

Standard test leads, with separate Current & Potential, or Kelvin, combining both Current & Potential in one clamp, are available as optional accessories in 5 m, 10 m & 15 m lengths. All test leads are CAT IV 600 VAC / 500 VDC safety rated.



A new tough adjustable clamp has been designed to ensure flexibility in many applications and provides a good connection with the test piece.

### History of 'Ducter' testing

For over 100 years the 'Ducter test' has been used to describe a simple test for measuring very low contact resistances and "Ducter", which is still used as a trade mark, was the name originally given to the low resistance ohmmeter manufactured by Megger. The name Ducter was registered by Megger in June 1908 and 'Ducter' has since become the industry standard.

## APPLICATION

The need for accurate low resistance measurement is well known and very diverse. Typical applications include:

### Utilities & Service Contractors – commissioning new installations & regular maintenance testing of

- Switchgear and circuit breaker contact resistance
- Busbar and cable joints
- Wire and cable resistance
- Lightning conductor bonding

### Original Equipment Manufacturer – detecting manufacturing defects

- Production test of circuit breakers – contacts & joints
- Production test of high voltage switchgear
- Production test of welded joints & connections

### Transport – manufacturing & maintenance

- Railway rolling stock ground connections & manufactured joints
- Railway lines & conductor rails – commissioning & maintenance
- Aircraft frame bonds and static control circuits

## SPECIFICATIONS

|                                    |                                                                                |
|------------------------------------|--------------------------------------------------------------------------------|
| <b>Measurement range</b>           | 0.1 $\mu\Omega$ - 1.999 $\Omega$                                               |
| <b>Resolution</b>                  | 0.1 $\mu\Omega$                                                                |
| <b>Noise rejection</b>             | Differential 100 mV @ 50-60 Hz on Test Leads                                   |
| <b>DC output</b>                   | Smooth DC                                                                      |
| <b>IP rating</b>                   | IP54 Lid open / IP65 Lid closed                                                |
| <b>Operating temperature range</b> | -20°C up to 50°C                                                               |
| <b>Storage temperature range</b>   | -30°C up to 70°C                                                               |
| <b>Humidity</b>                    | <85% R.H. non-condensing                                                       |
| <b>Battery life</b>                | 200 single 100 A tests or up to 2x 10 minutes continuous 100 A output          |
| <b>Battery type</b>                | User replaceable Li-ion battery pack                                           |
| <b>Battery charge time</b>         | Full charge in 2.5 Hrs from flat                                               |
| <b>Maximum output voltage</b>      | 2 V (battery), 3 V (AC)                                                        |
| <b>EMC</b>                         | IEC61326-1                                                                     |
| <b>Safety</b>                      | IEC61010<br>CAT IV 600 VAC / 500 VDC up to 2000 m<br>CAT IV 300 V up to 4000 m |
| <b>Dimensions</b>                  | 400 x 300 x 200 mm                                                             |
| <b>Weight</b>                      | 7.0 kg (AC Only)<br>7.9 kg (with Battery)                                      |

## Accuracy

| Current setting# | Resistance range                   | accuracy                                                                         |
|------------------|------------------------------------|----------------------------------------------------------------------------------|
| 50 - 110 A       | 0 - 100.00 m $\Omega$              | Typical $\pm$ (0.2% + 0.2 $\mu\Omega$ )<br>Max. $\pm$ (0.2% + 0.8 $\mu\Omega$ )* |
| 11 - 49 A        | 10 $\mu\Omega$ - 100.00 m $\Omega$ | Typical $\pm$ (0.2% + 0.5 $\mu\Omega$ )<br>Max. $\pm$ (0.2% + 2.0 $\mu\Omega$ )* |
| 10 A             | 10 $\mu\Omega$ - 1000.0 m $\Omega$ | Typical $\pm$ (0.2% + 1.0 $\mu\Omega$ )<br>Max. $\pm$ (0.2% + 2.5 $\mu\Omega$ )* |

# Actual test current may be limited by maximum output voltage

\*  $k = \pm 4\sigma$

Operational uncertainty, 85% RH, -20°C to +50°C

| Current setting# | Resistance range                   | +                               |
|------------------|------------------------------------|---------------------------------|
| 50 - 110 A       | 0 - 100.00 m $\Omega$              | $\pm$ (0.0% + 0.0 $\mu\Omega$ ) |
| 11 - 49 A        | 10 $\mu\Omega$ - 100.00 m $\Omega$ | $\pm$ (0.0% + 1.0 $\mu\Omega$ ) |
| 10 A             | 10 $\Omega$ - 1000.0 m $\Omega$    | $\pm$ (0.1% + 2.0 $\mu\Omega$ ) |

## FEATURES AND BENIFITS

|                                                                          | DLRO100 |    |    |    |    |    |                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------|---------|----|----|----|----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Features                                                                 | E       | EB | X  | XB | H  | HB | Benefits                                                                                                                                                                                                                                                                  |
| CAT IV 600 VAC / 500 VDC<br>up to 2000 m<br>CAT IV 300 V<br>up to 4000 m | ■       | ■  | ■  | ■  | ■  | ■  | On all test terminals for safe operation                                                                                                                                                                                                                                  |
| Lightweight 100 A battery powered unit                                   |         | ■  |    | ■  |    | ■  | Easily portable – 7.9 Kg (17 lbs) with battery                                                                                                                                                                                                                            |
| Mains only                                                               | ■       |    | ■  |    | ■  |    | Mains only units for manufacturing and production applications where AC is always available. Weight 7.0 Kg (15.5 lbs)                                                                                                                                                     |
| High noise immunity                                                      | ■       | ■  | ■  | ■  | ■  | ■  | For stable readings in noisy environments                                                                                                                                                                                                                                 |
| Smooth DC Output                                                         | ■       | ■  | ■  | ■  | ■  | ■  | Circuit breaker testing                                                                                                                                                                                                                                                   |
| IP54 Lid open<br>IP65 Lid closed                                         | ■       | ■  | ■  | ■  | ■  | ■  | For protection against ingress during operation (lid open) and storage (lid closed)                                                                                                                                                                                       |
| Li-ion battery                                                           |         | ■  |    | ■  |    | ■  | Always ready to test with a Li-ion fast charge battery - 2.5 hours charge time from fully discharged<br>Works from an AC supply if the battery is fully discharged<br>Battery capacity - 200 single tests or up to 2x 10 minutes continuous 100 A output for extended use |
| 100A Manual, Auto and Continuous test                                    | ■       | ■  | ■  | ■  | ■  | ■  | Quick selection of test modes for different applications with 4 terminal measurement for flexibility                                                                                                                                                                      |
| Custom test                                                              | ■       | ■  | ■  | ■  | ■  | ■  | Adjustable current 10 - 110 A, ramp rates configurable from 0.5s upto 30s and configurable test duration for flexibility                                                                                                                                                  |
| Range and test mode rotary switches                                      | ■       | ■  | ■  | ■  | ■  | ■  | Quick and easy selection of current ranges and test modes                                                                                                                                                                                                                 |
| Ultra tough outer case construction                                      | ■       | ■  | ■  | ■  | ■  | ■  | Designed for use in demanding environments with a flame retardant UL94 V0 inner case for safety                                                                                                                                                                           |
| Dual Ground™                                                             |         |    | ■* | ■* | ■* | ■* | Using the optional DC clamp enables circuit breaker testing with ground protection in place for safety                                                                                                                                                                    |
| Large, clear LCD                                                         | ■       | ■  | ■  | ■  | ■  | ■  | Ideal for all light conditions, with backlight                                                                                                                                                                                                                            |
| Internal memory storage with USB download capability                     |         |    | ■  | ■  | ■  | ■  | For effective results management, up to 220 time and date stamped records                                                                                                                                                                                                 |
| Remote Control                                                           |         |    |    |    | ■  | ■  | Control the instrument remotely over USB via a PC or laptop for added safety                                                                                                                                                                                              |
| Asset tagging                                                            |         |    |    |    | ■  | ■  | Running a PowerDB app on Windows tablet or smart phone to populate unique asset IDs for efficient asset management                                                                                                                                                        |
| Bluetooth®                                                               |         |    |    |    | ■  | ■  | For effective wireless communication. For download and asset tagging                                                                                                                                                                                                      |

\* with optional Clamp

All models. Two year warranty - second year conditional on free product registration.

Display clearly showing large digits for test results and visible in all light conditions

Single button to save test results and to automatically save in auto mode

IP54 for protection against dust and rain during testing

Clearly visible C and P LED's showing continuity of current and potential connections

Back light - for low light conditions

Smooth DC Output on C1 and C2 terminals

USB & Bluetooth for communications

High noise immunity on P1 and P2 terminals

Rotary switch selection of test modes and off position

CAT IV 600 VAC / 500 DV safety rating on all terminals

Simple navigation of setup and stored results

Rotary switch selection of view, download and delete test results

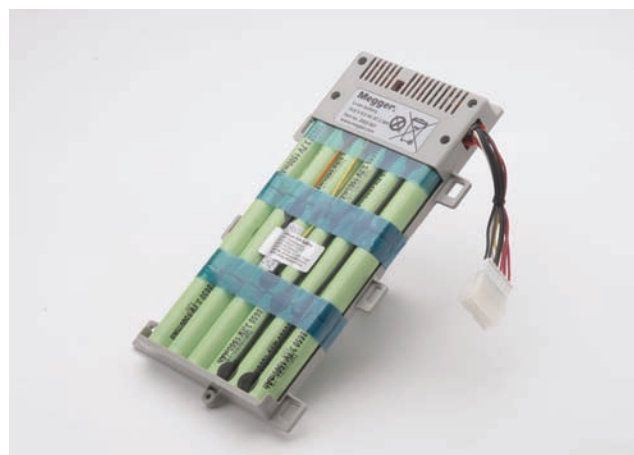
User configurable custom test. Adjustable :  
 ■ current ramp  
 ■ duration of test  
 ■ output current

Quick and easy rotary switch selection of 10 A, 50 A, 100 A tests - no configuration required

DualGround™ capability with the DC clamp



A new terminal adapter has been designed to enable the use of users own test leads.



A user replaceable high power lightweight Li-ion battery provides, from a single charge, 200 Manual/Auto 100 A tests or up to two 10 minutes continuous 100 A tests and takes 2.5 hours to charge when fully discharged.

| Model name |   |   |   |   |   | Language |  |   |   | Plug/Mains lead |   |   |
|------------|---|---|---|---|---|----------|--|---|---|-----------------|---|---|
| D          | L | R | O | 1 | 0 | 0        |  | - | L | G               | - | P |

### SELECT A MODEL

|                  |                     |
|------------------|---------------------|
| <b>DLRO100H</b>  | (mains only)        |
| <b>DLRO100HB</b> | (mains and battery) |
| <b>DLRO100X</b>  | (mains only)        |
| <b>DLRO100XB</b> | (mains and battery) |
| <b>DLRO100E</b>  | (mains only)        |
| <b>DLRO100EB</b> | (mains and battery) |

### SELECT A LANGUAGE AND PLUG

Please note only some plug types are available for certain languages - the language you need will determine the mains leads available

| LANGUAGE     |                   | PLUG TYPES AVAILABLE                                                                      |                                                                                           |                                                                                           |                                                                                               |                                                                                              |                                                                                             |                                                                                                |
|--------------|-------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| 3 DIGIT CODE | LANGUAGE INCLUDED | <br>UK | <br>EU | <br>US | <br>Swiss | <br>AUS | <br>IT | <br>India |
| <b>LG1</b>   | EN, DE, FR, NL    | <b>P1</b>                                                                                 | <b>P2</b>                                                                                 | -                                                                                         | <b>P4</b>                                                                                     | <b>P5</b>                                                                                    | -                                                                                           | -                                                                                              |
| <b>LG2</b>   | EN, ES, PT, IT    | <b>P1</b>                                                                                 | <b>P2</b>                                                                                 | <b>P3</b>                                                                                 | -                                                                                             | -                                                                                            | <b>P6</b>                                                                                   | -                                                                                              |
| <b>LG3</b>   | EN, AR, TR, FR    | <b>P1</b>                                                                                 | <b>P2</b>                                                                                 | <b>P3</b>                                                                                 | -                                                                                             | -                                                                                            | -                                                                                           | <b>P7</b>                                                                                      |

### ORDERING INFORMATION

| Description                                                                                       | Order Code | Description                                     | Order Code |
|---------------------------------------------------------------------------------------------------|------------|-------------------------------------------------|------------|
| <b>Included Items</b>                                                                             |            | <b>Optional Accessories</b>                     |            |
| Certificate of Test                                                                               |            | DLRO100 CAT IV 600V Lead Set (5m)               | 1004-448   |
| Quick Start Guide                                                                                 |            | DLRO100 CAT IV 600V Lead Set (10m)              | 1004-449   |
| Calibration Certificate                                                                           |            | DLRO100 CAT IV 600V Lead Set (15m)              | 1004-450   |
| CD containing the User Guide                                                                      |            | DLRO100 Terminal adapters (x2)                  | 1005-555   |
| Mains lead                                                                                        |            | DLRO100 CAT IV 600 V Kelvin Lead Set (5m)       | 1005-634   |
| USB Cable (X, H variants only)                                                                    |            | DLRO100 CAT IV 600 V Kelvin Lead Set (10m)      | 1005-635   |
|                                                                                                   |            | DLRO100 CAT IV 600 V Kelvin Lead Set (15m)      | 1005-636   |
| <b>Lead set is NOT included with the instrument and must be ordered as an optional accessory.</b> |            | DLRO100 DC Clamp (MCPD 100L)                    | 1005-622   |
|                                                                                                   |            | DLRO100 ISO17025 (UKAS) Calibration Certificate | 1005-888   |
|                                                                                                   |            | DLRO100 Lithium Ion Battery Pack                | 1005-973   |