

Test Equipment Solutions Datasheet

Test Equipment Solutions Ltd specialise in the second user sale, rental and distribution of quality test & measurement (T&M) equipment. We stock all major equipment types such as Spectrum Analyzers, Signal Generators, Oscilloscopes, Power Meters, Network Analyzers etc from all the major suppliers such as Keysight, Tektronix, Anritsu and Rohde & Schwarz.

We are focused at the professional end of the marketplace, primarily working with customers for whom high performance, quality and service are key, whilst realising the cost savings that second user equipment offers. We fully test & refurbish equipment in our in-house, traceable Lab. Items are supplied with manuals, accessories and typically a full no-quibble 1 year warranty. Our staff have extensive backgrounds in T&M which enables us to deliver industry-leading service and support. We endeavour to be customer focused in every way right down to the detail, such as offering free delivery on sales, presenting flexible technical + commercial solutions and supplying a loan unit during warranty repair, if available.

As well as the headline benefit of cost saving, second user offers shorter lead times, higher reliability and multivendor solutions. Rental, of course, is ideal for shorter term needs and offers fast delivery, flexibility, try-before-you-buy, zero capital expenditure, lower risk and off balance sheet accounting. Both second user and rental improve the key business measure of Return On Capital Employed.

We are based in at Oakley, Bedfordshire in the UK from where we supply test equipment worldwide. Our facility incorporates Sales, Support, Admin, Logistics and our own in-house Lab.

All products supplied by Test Equipment Solutions include:

- No-quibble parts & labour warranty (we provide transport for UK mainland addresses).
- Free loan equipment during warranty repair, if available.
- Full electrical, mechanical and safety refurbishment in our 40GHz in-house Lab.
- Certificate of Conformance (calibration available on request).
- Manuals and accessories required for normal operation.
- Free insured delivery to your UK mainland address (sales).
- Support from our team of seasoned Test & Measurement engineers.
- ISO9001 quality assurance.

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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

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

Accuracy

Current setting#	Resistance range	accuracy
50 - 110 A	0 - 100.00 m Ω	Typical $\pm$ (0.2% + 0.2 $\mu\Omega$) Max. $\pm$ (0.2% + 0.8 $\mu\Omega$)*
11 - 49 A	10 $\mu\Omega$ - 100.00 m Ω	Typical $\pm$ (0.2% + 0.5 $\mu\Omega$) Max. $\pm$ (0.2% + 2.0 $\mu\Omega$)*
10 A	10 $\mu\Omega$ - 1000.0 m Ω	Typical $\pm$ (0.2% + 1.0 $\mu\Omega$) 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 Ω	$\pm$ (0.0% + 0.0 $\mu\Omega$)
11 - 49 A	10 $\mu\Omega$ - 100.00 m Ω	$\pm$ (0.0% + 1.0 $\mu\Omega$)
10 A	10 Ω - 1000.0 m Ω	$\pm$ (0.1% + 2.0 $\mu\Omega$)

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FEATURES AND BENIFITS

	DLRO100						
Features	E	EB	X	XB	H	HB	Benefits
CAT IV 600 VAC / 500 VDC up to 2000 m CAT IV 300 V 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 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 Works from an AC supply if the battery is fully discharged 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

DLRO100H	(mains only)
DLRO100HB	(mains and battery)
DLRO100X	(mains only)
DLRO100XB	(mains and battery)
DLRO100E	(mains only)
DLRO100EB	(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								
LG1	EN, DE, FR, NL	P1	P2	-	P4	P5	-	-	-
LG2	EN, ES, PT, IT	P1	P2	P3	-	-	P6	-	-
LG3	EN, AR, TR, FR	P1	P2	P3	-	-	-	P7	-
LG4	EN, CZ, SK, PL	P1	P2	-	-	-	-	-	-
LG5	EN, CN, JA, KO	P1	P2	P3	-	-	-	-	P8
LG6	EN, RU, HU, RO	-	P2	-	-	-	-	-	-
LG7	EN, NO, SV, FI	-	P2	-	-	-	-	-	-

ORDERING INFORMATION

Description	Order Code	Description	Order Code
Included Items		Optional Accessories	
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 Adaptors (x2)	1005-555
Mains lead		DLRO100 Lead Set Adaptors (10 A Leads)	1008-604
USB Cable (X, H variants only)		DLRO100 CAT IV 600 V Kelvin Lead Set (5m)	1005-634
		DLRO100 CAT IV 600 V Kelvin Lead Set (10m)	1005-635
		DLRO100 CAT IV 600 V Kelvin Lead Set (15m)	1005-636
		DLRO100 DC Clamp (MCPD 100L)	1005-622
		DLRO100 ISO17025 (UKAS) Calibration Certificate	1005-888
		DLRO100 Lithium Ion Battery Pack	1005-973