

BTDR1500

Combined Automatic Resistance Bridge & TDR Fault Locator



- **10 m to 3 Km TDR Measurement Ranges**
- **Automatic Resistance Bridge with Measurement range up to 100 Km**
- **Built in Insulation tester, d.c. Voltmeter and Loop Resistance Meter**
- **Suitable for Telecom, Coax, Datacom and Power Cables**
- **Dust and Shower Proof to IP54**

DESCRIPTION

The Megger® BTDR1500 is an advanced instrument capable of identifying nearly all types of cable fault using both Time Domain Reflectometry and Automatic Resistance Bridge Techniques. It offers exceptional features and a range capability normally associated with larger, more expensive products.

Location of open circuits and low resistance faults using the TDR facility can be performed from 0,1 m to 3000 m with a measurement accuracy of 1%. Location of faults using the Automatic Resistance Bridge facility can be performed on cables up to 100 km in length (dependent on conductor diameter and resistance) with a measurement accuracy of 0,2%.

In TDR mode the BTDR1500 can be used on any cable consisting of at least 2 insulated metallic elements, one of which may be armouring or the cable screen. The instrument can be carefully matched to the cable using the Tx Null control allowing long lengths of cable to be easily tested and elimination of "dead zone" such that faults close to the instrument can also be seen. The propagation velocity value can be similarly adjusted to match the cable, thus ensuring an accurate distance measurement can be directly read. To enable a wider range of faults to be detected in TDR mode, the gain of the instrument is also variable, allowing more minor faults to be identified over the entire length of the cable.

The Automatic Digital Bridge can measure the insulation resistance up to 200 M Ω (insulation test), the loop

resistance up to 2 k Ω (2-wire loop test) and the series leg resistance of up to 1 k Ω (3-wire loop test). Where a fault causes the insulation resistances to lie below 20 M Ω , the fault position can be determined (AUTO test) relative to the meter end and also relative to the far end where a loop has been made by fitting a strap between the wire under test and one or two return wires. In the case of a single return wire (2-wire test method), the position of the strap is assumed to be at the position of half the total loop resistance. If two return wires can be used (3-wire test method) the position of the strap will be known to greater accuracy and will be independent of the resistance of either of the return wires.

In addition to the TDR facility and Automatic Resistance Bridge, the BTDR1500 has a voltmeter range for measuring a DC voltage to ± 250 V and can verify if a telecomm cable has a Telecom Network Voltage (TNV) present on it.

APPLICATIONS

Telephony

Designed to be used in the first line of defence when uncovering transmission related problems, the BTDR1500 provides fast and accurate cable fault location results. Able to identify Bridge Taps and splices, the presence of water in cables, opens or shorts in A, B & Earth (Tip, Ring and Sheath), Capacitive Networks, load coils, wet and high resistance splices.

Suitable for the first step in pre-qualifying DSL and other digital lines by identifying high resistance faults that would

otherwise cause signal attenuation within the cable. Excessive signal attenuation will reduce DSL available transmission distances and the associated reduction in signal amplitude will increase error rates and ultimately reduce transmission speeds. Also measures loop resistance to enable losses and line length to be calculated to ensure suitability of lines for use in Digital Transmissions.

FEATURES AND BENEFITS

TDR

TX Null Balancing circuit allows the transmitted pulse to be eliminated from the displayed trace, removing the "Dead Zone" and allowing faults to be identified at the near end of the cable. Pulse widths down to 7 ns allow for accurate discrimination between faults.

Pulse widths up to 3000 ns and four gain settings allow for the detection of cable faults up to 3 km away.

Auto range facility selects most appropriate measurement range according to cursor position to ensure ultimate accuracy in fault location.

Automatic Resistance Bridge

Advanced automatic balance Resistance Bridge enables location of cable faults up to 100 km away to an accuracy of 0.2%.

Two or three wire operation enables accurate fault location on balance or unbalanced cable pairs.

Loop resistance measurement up to 2 k Ω enable cable losses and line length to be calculated to ensure suitability of lines for use in Digital Transmissions.

Insulation resistance measurement range enables identification of the nature of a cable fault and assists in the pre-qualification of potential DSL lines.

DC Voltage measurement indicates the presence of Telecom Network Voltages (Battery Voltage)

GENERAL

Dust and shower proof enclosure to IP54 enables operation in inclement conditions often encountered in the field.

Drop and bump tested to military specifications to ensure the product stands up to the rigours of field use.

SPECIFICATIONS

Except where otherwise stated this specification applies at an ambient temperature of 20°C.

TDR Specification

Ranges:

10 m, 30 m, 100 m, 300 m, 1 km, 3 km

Accuracy:

$\pm 1\%$ of range

\pm pixel at 0,67 VF

Resolution: 1% of range

Gain:

Set for each range with four user selectable steps

Velocity Factor:

Variable from 0,30 to 0,99 in steps of 0,01

Output pulse:

5 volts peak to peak into open circuit

Output impedance: 100 Ω

TX Null: 0 Ω to 120 Ω

Update rate:

Once per second for 5 minutes after last key press

BRIDGE SPECIFICATION

Loop Resistance ranges

0 to 190 Ω in steps of 0,1 Ω

190 Ω to 2000 Ω in steps of 1 Ω

Fault Resistance Ranges

$\pm 0,2\%$ ± 1 digit from

0 Ω to 1 M Ω

$\pm 0,2\%$ ± 3 digits from

1 M Ω to 5 M Ω

$\pm 0,2\%$ ± 6 digits from

5 M Ω to 10 M Ω

Loop reading:

$\pm 0,2\%$ of reading ± 1 digit on Ω

Voltage to Line:

100 V d.c. nominal

Current to Line:

100 mA d.c. nominal

Insulation range:

0 to 19 M Ω in steps of

0,01 M Ω

19 M Ω to 200 M Ω in steps of 0,1 M Ω

Insulation Accuracy:

$\pm 0,2\%$ of reading ± 1 digit

General Specification:

Input protection:

300 V d.c. or 300 V a.c. 60 Hz (min source Impedance $> 1,5 \Omega$)

Power down:

Automatic after 5 minutes inactivity

Back light:

1 minute when activated

Batteries:

6 x LR6 (AA) Nominal Voltage

9 V d.c. (Alkali) 7,2 V (NiCad)

Battery consumption:**TDR Mode:**

100 mA nominal, 140 mA with back light

Bridge mode:

50 mA nominal, 90 mA with back light

Hours:

20/30 hours depending on back light use

Safety

Meets BS EN 61010-1: 1993 (Including amendment 2: 1995-06

IEC 60950 3rd Edition

1999-04 and rated for use on TNV-3 circuits.

If it is to be used in situations where hazardous live voltages may be encountered then an additional blocking filter must be used.

EMC

In accordance with IEC61326 including Amendment No.1.

Mechanical**Case Dimensions:**

L=230 mm, W=115 mm,

D=48 mm (9,0" x 4,5" x 2,0")

Instrument weight:

0,6Kg (1,32lbs)

Case Material: ABS**Connections:**

Four x 4 mm safety terminals (E, A, B, & C)

Lead: 1,95 m (6,5 ft.)**Display:**

128 x 64 pixel Graphic LCD

Environmental**Operational temperature:**

-15°C to +50°C (5°F to 122°F)

Storage temperature:

-20°C to +70°C (-4°F to 158°F)

ORDERING INFORMATION

Item	Order Code
Combined Automatic Resistance Bridge and TDR Fault Locator	BTDR1500
EAN-13 Code	5036175190876
Included accessories	
TDR Miniature Clip Test Lead Set	6231-652
Bridge Miniature Clip Test Lead Set	6220-707
Test and Carry Pouch	6420-128
User Guide	6172-511
Optional Accessories	
Mains Blocking Filter	6220-669

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