



**Award
winning
product**

Power cable fault locators
Van mountable solutions
Pinpointer fault locators
Cable locators and route tracers
TDRs (Power and Telecom)
Insulation testers

The word 'Megger' is a registered trademark

Megger

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Cable fault location has often been seen as a dark art, as the causes of faults are different and varied. Successfully locating faults locations depends on an experienced operator. The challenge to Megger's engineering team was to remove the mysteries from fault locating, and to make the whole process more logical. This methodical approach was used to define a feature set that would satisfy fault location needs in the varied conditions where the tester would be used around the world.

These are the vital steps for successful and rapid fault location:

- Analysis
- Fault conditioning
- Fault position pre-location
- Fault pinpoint location
- Restoration

PFL systems come as compact mobile, field proven units, configured to meet your local requirements. All PFL systems satisfy the "Megger logical approach" to cable fault location:

- Cable and fault diagnosis
- Prelocation of cable faults
- Fault conditioning
- Pinpoint fault locating using acoustic methods

Models PFL40A-1500 and PFL40A-2000

Features include DC testing to 40 kV up to 25 mA

A 40 kV DC testing capability is used to prove the integrity and confirm fault conditions in cable networks.

The variable output voltage can also be used to test sheaths requiring 5 or 10 kV test voltages.

The operator selectable over-current trip provides protection to the system under test in the event of a breakdown of the cable under test, or excessive leakage current.

Fault pre-location

Each system provides a variety of low and high voltage methods that you can use to pre-locate the fault position.

The TDR mode – (Pulse Echo) uses a real time trace and a stored trace for viewing simultaneously on the large colour display, allowing comparison and difference measurements to be determined.

The large screen colour Megger TDR1 features auto-ranging, auto distance to fault, intuitive software and operator assist functions that guide the operator through the fault locating process.

Arc reflection method – the 8/16/34kV system stabilises faults by creating a temporary "carbon bridge" to earth. The arc establishes a short circuit after which a pulse echo measurement defines the distance to the fault. The measurement is then compared to a healthy phase.

ICE (impulse current) and Voltage Decay methods – these well known transient analysis methods of prelocation are also available, utilising either the integrated linear coupler or an external voltage divider.

Fault conditioning

By employing Arc Reflection or Proof/Burn techniques the operator can stabilise flashing, unstable or high resistance faults allowing the location of the more difficult faults.



Proof/Burn

Following a breakdown of the cable under test, you can employ the 34 kV dc output to apply a high current, thus stabilising a flashing or unstable the fault condition. This allows pre-location of the more difficult fault conditions.

Acoustic Pinpoint Fault Location

Accurate acoustic pinpoint location of faults is achieved with the powerful 8/16/34 kV (4 kV optional). The surge generator (thumper) can be supplied in either 1500 Joules or 2000 Joules configurations.

The Megger MPP range of pin pointers is used to pick-up the audio and electromagnetic signals generated at the point of breakdown by the surge generator (thumper).

Additional accuracy can be achieved by adding additional ground microphones (detectors) to the standard MPP1000. These additions convert the standard system to a MPP1000 or MPP1002 which accurately displays the direction and distance to the fault.

Included accessories

Each PFL40 unit comes complete with:

- High voltage shielded output cable (15 m)
- Supply cable (7.6 m)
- Flexible ground cable (15 m)
- Earth/ground rod
- Interlock shorting plug
- Quick start guide (in lid)
- Cable bag and user guide
- Stand-alone and rack-mounted cable reel assemblies are available as options.

Designed to the same demanding criteria as the PFL40A, the PFL20M-1500 finds faults quickly, accurately and safely.

- **Multiple fault locating techniques**
 - Arc reflection method
 - Pulse echo
 - Impulse current
 - Proof and burn
- **Highly portable, rugged and weatherproof**

PFL20M-1500

Features include DC testing to 20 kV up to 60 mA used to prove the integrity and confirm fault conditions in cable networks.

The PFL20M-1500 includes outstanding new features including a simple-to-operate TDR built into the lid and a new inductive arc reflection filter. The optional on-board inverter provides the user with a choice of input power options.

The PFL20M-1500 combines all the tools necessary to perform accurate cable fault location, including dc tester/burner, surge generator and TDR. These tools enable the user to effectively perform all of the following fault location techniques:

- Time domain reflectometry (pulse echo)
- Arc reflection method
- Impulse current
- Pinpoint fault location using the acoustic method

Features included

- d.c. testing (proof/burn) up to 20 kV with a maximum current of 60 mA. Used for cable testing and the conditioning of faults.
- Pulse echo - use a real time trace and a stored trace for viewing simultaneously on the colour display, allowing comparison and difference measurements to be determined. Features auto-ranging, auto distance to fault and operator assist functions that guide the operator through the fault locating process.
- 16 kV 1500 Joule surge generator (thumper) used in generating a breakdown at the point of fault.
- Impulse current (ICE) method – a well-known high voltage prelocation method.
- Arc reflection method – the 16 kV system stabilises a fault by creating a temporary “carbon bridge” to earth. The new inductive filter ensures maximum energy is available at the point of fault, overcoming some of the inherent losses associated with some arc reflection systems.
- Acoustic pinpoint fault location – utilising the powerful surge generator and an MPP pin pointer, the exact position of faults is achieved.

The PFL is field-portable. A built-in inverter provides a choice of input power options. It is also ruggedly constructed and weatherproof to IP54 specifications.

The PFL20M-1500 is specifically designed to provide a fast, accurate and safe method for locating faults in underground cable networks.

Its compact size makes the PFL20M-1500 suitable for use as a stand-alone unit, which can be easily transported on to site.

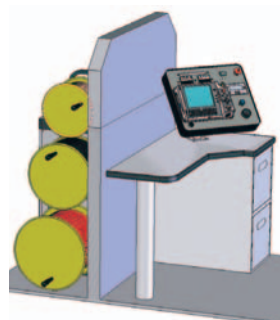
The unit can be operated from the mains, battery or 12 V inverter. The enclosure is weatherproof for use in a variety of inclement weather conditions.



One of the new features of the PFL20M-1500 is the lid-mounted MTDR that offers multiple test modes and simple, easy pushbutton operation.



CFL40A - van mountable option (available 2008)



Artist impression of the CFL40A

The new CFL40A has been designed to complement the already acclaimed and successful PFL40A series of portable fault locators.

The MTDR and all control functions have been installed in a newly designed remote panel, connected to the HV unit by a flexible umbilical. This configuration lends itself to installation into a suitable vehicle by the customer, or Megger.

Megger will be providing a full installation and fitting service throughout Europe.



TDR1000/2P

- **Simple operation**
- **Fast fault find facility**
- **TX Null transmission pulse nulling**
- **Adjustable cable impedance**
- **No blocking filter required**
- **IP54 rating**
- **3 year warranty**

The TDR1000/2P is a hand held, compact Time Domain Reflectometer for locating faults on metallic cables. It has a minimum resolution of 0.1 m/0.3 ft and a 3 km/9 kft maximum range depending on Velocity factor selected and cable type.

Four output impedances are available (25, 50, 75, and 100 ohms) and a velocity factor

between 0.2 and 0.99 will meet any cable test requirements.

Control of the TDR1000/2P has been simplified with each key having a dedicated function, such as cursor left and right, velocity factor, range, etc. Training times are dramatically reduced, and with less chance of time-consuming mistakes, productivity is improved.

TX Null eliminates the 'dead zone' at the start of the displayed trace, normally obscured by the transmission pulse. By adjusting the TX Null control the user can see these 'near end' faults clearly.

One press of the find key automatically adjusts the range and gain, and positions the cursor to the major event on the cable within seconds, removing the need for the engineer to gradually scroll through the ranges looking for the fault or the end of cable reflection.



TDR2000/2P

- **20 km range at VF = 0.90**
- **Monochrome or colour options**
- **Primary cell or rechargeable options**
- **Large back lit LCD display**
- **Dual cursor measurement**
- **Intermittent fault location**
- **Output pulse amplitude and width control**
- **"TX Null" technology**
- **No blocking filter required**
- **Trace Master PC software included**
- **15 memory trace storage**

The TDR2000/2P is a state of the art, monochrome or colour, dual channel Time Domain Reflectometer, capable of identifying and locating a wide range of faults on metallic cables.

The TDR2000/2P has a minimum resolution of 0.1m and a maximum range of 20 km at VF=0.9 and 16 km at 0.65 VF. The TDR2000/2P can perform single or dual channel measurements on a wide range of metallic cables. Active channels can be compared with each other or with previously stored traces from memory. Differential channel measurements are possible and cross talk between channels can also be identified.

All results are displayed on a high resolution, QVGA colour display. Full contrast adjustment provides optimum display contrast in a variety of ambient light conditions.



TDR900

- **Fully auto ranging for measuring the length of power, telephony, CATIV and LAN cables**
- **Extra large, high resolution backlit LCD**
- **Cable length calibration function**

The TDR900 is an advanced instrument capable of measuring cable lengths and finding distance to an open or a short using Time Domain Reflectometry. It offers

exceptional features and a range of capability normally associated with far more expensive instruments.

The measurement range spans from 5 m (15 feet) to 3 km (10,000 feet) with a minimum resolution of 50 cm (20 inches).

The TDR900 can be used for any cable consisting of at least two insulated metallic elements, one of which may be the sheath or shield of the cable. The meter has automatic internal matching networks to allow testing of 25, 50, 75, 100, 125, or 150 Ω cables. (These correspond to power, telephony, CATIV and LAN cables).

MTDR1

The MTDR1 is a modern, digital TDR designed to pre-locate cable faults on underground systems. It incorporates Windows™ based software and an ergonomically designed front panel for easy operation.

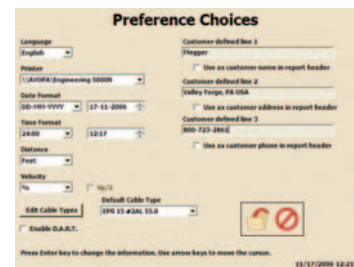
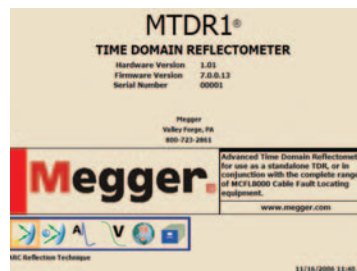
MTDR features:

- Large colour VGA display
- Auto-ranging and auto-distance to fault
- Operator assist mode
- Pulse echo modes
- Impulse current (ICE)
- Voltage decay
- Arc reflection
- Internal memory
- Output to printer or USB
- Qwerty keyboard for report generation

In normal pulse echo and arc reflection mode, the MTDR features auto-ranging, auto fault distance and an assist function guiding the operator through the fault locating process. COMLink communication software is included for transferring cable images between the MTDR and a personal computer.



The report screen shows the capability of creating a printable report with specific customer required data.



L1070

Unparalleled in capability, the L1070 Portable Locator locates buried cable and pipe in various situations. Capable of locating over long or short distances, inductive or conductive, active or passive, the L1070 delivers quick and accurate results with a user-friendly interface.

Operating the receiver at multiple frequencies optimises performance for the specific needs of the user. Low frequency of 815 Hz provides longer range and reduced errors from adjacent cables, which is ideal for electric power services.

The 82 kHz range gives you the ability to locate bad paths in telecom networks. You can locate underground tee-joints and perform induction location using either a flexible coupler (optional extra) or the transmitter itself.



A special design feature on the L1070 allows the user to select and compare receiver information on two frequencies simultaneously, without having to return to the transmitter. Excellent passive 50/60 Hz locating will pinpoint active power lines and other utilities where AC is present without the use of the transmitter.

**220000 series**

70 kV/ 120 kV and 160 kV d.c. dielectric test set

Available in analogue and digital models

- **Lightest weight available in air-insulated high-voltage model**
- **Advanced performance with long-term reliability provided by filtered half-wave rectification**
- **Designed for maximum operator safety**

220000 series provides a dependable, safe, lightweight and portable d.c. voltage source for testing the quality and integrity of electrical power cables, cable installations, motors, switchgear, insulators, transformers and capacitors.

**220005/220015**

5 kV and 15 kV d.c. dielectric test set

- **Continuously variable test voltage**
- **Rugged field construction**
- **Compact and portable**

Dielectric test sets measure leakage current while applying a dc voltage at or above the insulation system's operating level.

This measurement aids in determining the insulation system's ability to withstand overvoltages such as lightning strikes and switching surges.

**MIT310 A**

The Megger MIT310A has a moving coil display for those who prefer a real moving needle. Black decals on a white background give high contrast, even in poor light conditions.

Designed to take the bashing that testers receive on site, the Megger MIT insulation testers are rubber armoured.

The rigid display cover folds right out of the way during testing and locks down to protect the display when it is finished.

No buried functions means it is obvious how to use the Megger MIT.

Colour coded ranges help test selection, reducing testing time and helping with fault location.

Safe contact detectors – even if the MIT is connected to a live circuit whilst on continuity setting, the tester will remain safe and is not damaged.



Hinged lid

MIT510

This 5 kV insulation resistance tester is easy to operate and is very tough. It allows automatic IR. The built-in timer and high test ranges allow simple and quick evaluation of the condition of the insulation under test. The MIT510 is both mains or battery powered.



MIT1020

5 kV insulation resistance tester offers the ability to test insulation to 10 kV, to comply with IEEE43:2000. It allows automatic IR, PI, DAR, SV and DD tests. Results storage and download give full diagnostic information for later analysis. The MIT1020 can be powered using either mains or its on-board re-chargeable battery.



MIT410

This stylish tester is not designed for its visual impression but for pure practicality. The tapered handle is comfortable, and lets the user use either hand.

The safety rating of CAT IV 600 V combined with functions such as TRMS voltage measurement, polarisation index (PI), dielectric absorption (DAR) and frequency measurement makes this an ideal tester.



Other products that you may find useful

Digital earth testers

Supplied in a tough CATIV case, every tester has an extra large selector switch, a clear display for easier operation in outdoor conditions and simple one button operation. Battery powered with a bar graph that updates battery strength and noise reduction up to 40 V peak to peak.

DLRO Low resistance ohmmeters

Measuring low resistance helps identify resistance values that have increased above acceptable values. The operation of electrical equipment depends on the controlled flow of current within the design parameters of the given piece of equipment. With its comprehensive range of low resistance ohmmeters, Megger offer solutions to ensure electrical systems performance.

Relay tester

The MPRT testers and the AVTS® software from Megger raise the standard for automatic testing and management of protective relay systems. The MPRT offers traditional manual and semi automatic testing of relay system whilst the AVTS package offers fully automatic testing as well as relay maintenance schedule management.

Hand-held transformer testers

Megger's transformer testers are lightweight and tough, with all the functionality you need for rapid testing.

The TTR25 is an automatic transformer ratio test set and the TTR100 is capable of testing three-phase.



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