MTDR300
3-Phase Time Domain Reflectometer

- **Battery and main power supply operation**
- **Range >55 km/34 miles (TDR)**
- **Range >220 km/137 miles (transient)**
- **Auto-ranging find end of cable**
- **Auto-fault find cursor to fault**
- **Single jog-dial operation via user friendly menus**
- **Large 10.4" (26.4 mm) full XGA color display**
- **Rugged, robust, field proven case**

DESCRIPTION

The MTDR300 is a 3-phase time domain reflectometer (TDR) designed to provide quick, effective, accurate and safe prelocation of cable faults in electrical networks.

Operation of the instrument is via a single jog dial and intuitive menu system. The large color display further enhances operator comfort and aids rapid and accurate fault prelocation.

The MTDR300 can be powered from its internal rechargeable battery or a main power supply. It's housed in a rugged, robust, field-proven case making it suitable for use in hostile or challenging environments.

By combining the MTDR300 with an impulse generator (thumper) and arc reflection filter, several methods of high voltage fault prelocation are possible.

The CAS-1 stand-alone software package is supplied with all MTDR300s. This package allows the download (and upload) of saved traces for future analysis. It is also an ideal training package, as it contains all features of the MTDR itself.

FEATURES AND BENEFITS

- 3-phase TDR operation
  - Single jog dial operation
  - Intuitive operator friendly menu system
  - Auto-ranging find end of cable
  - Auto-fault find cursor to fault
  - TDR range up to 55 km/34 miles
  - Transient range up to 220 km/137 miles
- Multiple fault location techniques
  - 3-phase pulse echo
  - Arc reflection
  - Arc reflection plus
  - Differential arc reflection
  - Impulse Current (ICE)Voltage Decay
- Battery or main power supply operated
- Battery low and charge indicators
- Robust, rugged construction

APPLICATION

After the fault type has been identified, the appropriate fault prelocation method can be determined.

Rule of thumb

Fault resistance <300Ω** = LV fault location

Fault resistance >300Ω** = HV fault location

** approx.

- LV fault prelocation

TDR (also known as pulse echo techniques) are used to prelocate low resistance faults in cable networks. The MTDR300 offers 3-phase operation allowing the comparison of up to 3-phases at the same time. This can be especially useful to identify the faulted phase and allow phase comparison.

- HV fault prelocation

(1–below, 2, 3, 4–next page–require an impulse generator)

(5–next page–requires a DC source)

1. **Arc reflection.** This has become the most widely used method of recent years, with the trace being easy to interpret. In this method, the fault is stabilized by creating a temporary "bridge" to earth. During this

period, a standard pulse echo measurement is taken into what is effectively a short circuit fault. This trace is then compared with a previously taken low voltage trace. The point of divergence is the fault position.

2. **Arc reflection plus (ARP).** The MTDR300 offers the ability to view up to 1,024 traces (range dependent) taken during one arc. This overcomes the problem of misleading traces displayed during unstable periods of the arc.

3. **Differential arc reflection (DART).** In this mode, unwanted and confusing common reflections are removed leaving a clean trace with only the fault position being displayed. This method is especially suited in complex cable networks with several joints/splices or other equipment attached to it.

4. **Impulse current (ICE).** The impulse current method is a transient fault prelocation technique and is suitable for the location of high resistance faults. A linear coupler, or C.T., integrated into the impulse generator senses the transients emitted from a flashover (fault). These signals are displayed on the MTDR300 which effectively acts as a storage oscilloscope.

5. **Voltage decay.** This is similar to impulse current, except in this instance the flashover is created by charging up the cable with a DC source. The emitted signals are detected by a voltage divider and displayed on the MTDR300, again acting as a storage oscilloscope.

SPECIFICATIONS

Modes
3-phase pulse echo; arc reflection; arc reflection plus (ARP); differential arc reflection (DART); impulse current (ICE); voltage decay

Range
AUTO & 10-ranges
100 m–55 km (328 ft–34 miles) - TDR
100 m–220 km (328 ft–137 miles) - transient

Output pulse width
AUTO with range
50 ns, 100 ns, 200 ns, 500 ns, 1 µs, 2 µs, 5 µs, 10 µs

Output pulse amplitude
25 V into 50 Ω

Sampling Rate
100 Mhz

Timbase Accuracy
200 ppm

Resolution
(Vp = 55%): 2.7 ft (0.82 m)

Display
10.4 in. (26.4 mm), full XGA, 1024 X 768 color

Cursors
Dual with independent control

Gain
60 dB range in 5 dB steps

Input
Impedance 50 Ω
3 x TDR
1 x arc reflection/transient methods

Ports
1 x USB

Software
CAS-1 (cable analysis software)

Supply
Main power supply
100 to 240 VAC, 45 to 65 Hz

Battery
14.4 V NiMh battery
Approx. 2 hrs operation on full charge
Approx. 2 hrs recharge time

Dimensions
12 in. x 7.6 in. x 14.2 in.
305 mm x 194 mm x 360 mm

Weight
14.7 lbs (6.7 kgs)

Environmental

Temperature
-4° F to +122° F (-20° C to +50° C)

Humidity
< 95% non-condensing

ORDERING INFORMATION

Item (Qty)	Cat. No
MTDR300 3-phase TDR	MTDR300
Included Accessories	
Accessory pouch	6320-244
Power supply cables	
1 x USA	17032-4
1 x SCHUKO	17032-13
1 x UK	17032-12
1 x international	17032-5
Coaxial cable 10 ft/3 m (3 ea)	19907-11
BNC (F) adaptor (3 ea)	36828
Earth/ground cable (1 ea)	2003-022
User guide (1)	AVTMMTDR300
Cable analysis software	CAS-1

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ISO STATEMENT
Registered to ISO 9001:2000 Cert. no. 10006.01

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