Impulsreflektometer

TDR-400

Manual

Impulse Reflectometer TDR-400

The TDR-400 is a handy, light impulse reflectometer, processor controlled, with LCD display for check and locate faults in telecommunication and power cables.

<u>Technical data</u>

Display: LCD display, 120 x 32 pixel, illuminated
Power supply: NiMH accumulator 6 V/ 700 mAh (5 x R3),
                    Power consumption 80 mA
Dimensions: 157 x 84 x 30 mm
Operating: with 3 keys
Weight: 300 g

<u>Measuring ranges</u>

Measuring range   0 – 2000 m
Resolution   0.25m, 0.5m, 1m, 4m
Accuracy   0.2 % of the measuring range
Propagation factor   0.25 to 0.999
Storage places   10 for propagation factor
Dynamics   44 dB
Impedance   75 Ohm
Output   F-socket
Output pulse   4 V / 5 ns or 100 ns

<u>Operating</u>

− Switch on: push key 1, after that push key 3. (accumulator full app. 7 V, empty app. 5.5V)
− Switch off: push simultaneously key 2 and 3, after 4 min. inactivity automatically.
                If the accumulator voltage drops to 5.9 V, a fade-in happens on the display.
                At 5.5 V the IRM switches off itself.

- Change between length measurement and length range: push shortly key 3
- Cursor move or range change: with key 1 or 2
- Fast cursor moving: keep key 1 or 2 pushed

- Selection of resolution, output pulse width, storage place or propagation factor:
        push long key 3 until the desired symbol appears inversely.
        change of the selected value with the keys 1 and 2.
        Permanent storage: push keys 1 and 3 simultaneously.
        back: push short key 3 .
- moving of the zero line:

The amplitude on the cursor position can be set to the zero line by pushing the keys 1 and 2 simultaneously. Because the IRM 5 has its highest sensitivity in the area of the zero line, e.g. the graphical representation of the amplitude on the pulse peak can be seen. This function can be cancelled by pushing the key 3.
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- Start mode: If at a determined resolution the keys 1 and 3 are pushed simultaneously, this resolution is at switch on of the IRM active.
- Charging: Plug power supply 2-24 V DC or AC on the charging socket 5,5 / 2,1 mm (+pole inside).
Display of the power supply voltage (12-28 V) and charging monitoring on the display.

Propagation factors:

Mains cable	0.49–0.57, (ca. 0.53)
Coaxial cable with PE-dielectric	0.66
Coaxial cable with foam-PE	0.77–0.85
Air isolation	

Determination of the propagation factor (nvp-value) of a cable:
Connect a cable of a known length (e.g. 100 m) on the IRM, set the cursor on the cable length and change the propagation factor so, that the pulse echo is located behind the cursor.

Measuring principle:

The measuring pulse fed into the cable will reflected by in homogeneity of the cable impedance (cable faults) and showed on the display.
The distance and the kind of the fault can be determined out of the shape and the time setting of the reflection.
(Practical experience can be obtained by test measurements).
The Propagation factor (nvp-value) declares the velocity of electrical signals in the cable in relation to the speed of light.

− The propagation factor of the cable under test must always preset before the length measurement.
− If the propagation factor is unknown, a approximate value is set and the fault is determined from both ends of the cable

Fault location:

ATTENTION ! No measurement on live cables ! (electric strength max. 65 V)
At 0 m the positive transmitting pulse can be seen. If the connected cable is open on its end, an additional positive going pulse appears on the display. In the case of a shorted end of the cable a negative going pulse appears reflected from the cable end (pulse echo).
Adjust the cursor to the beginning of the pulse and read the cable length.

If the cable is terminated with a resistance equal to the impedance of the cable, no reflexion occurs when the cable is faultless.

In the case of breaks, contact faults in sleeves, short circuits or taps/splitter in the sector to be tested, the distance to the cable beginning can be determined by the pulse echo.

If wide pulses are used for the measurement, the echoes are stronger, but faultless taps/splitter cause then strong echoes.

<u>Zero adjustment of the transmitting pulse:</u>

Select a storage place of the propagation factor and push key 1 and 2 simultaneously up to „-_Π_-" appears on the display. Shift the transmitting pulse with key 1 or 2 so that the cursor is located at beginning of the pulse.
Store this setting by pushing the keys 1 und 3 simultaneously.
Back to the normal operation with key 3.