



FEATURES

The EFL 10T is a small-size hand-held instrument intended for maintenance and troubleshooting, and also for acceptance tests of telecommunication cables.

The EFL 10T provides numerous tools:

- Measurement of cable parameters such as
- Loop resistance
- Resistance difference
- Insulation resistance
- Cable capacitance
- Disturbing AC and DC voltages
- Cable temperature

DC AC fault location methods for the location of insulation and conductor faults:

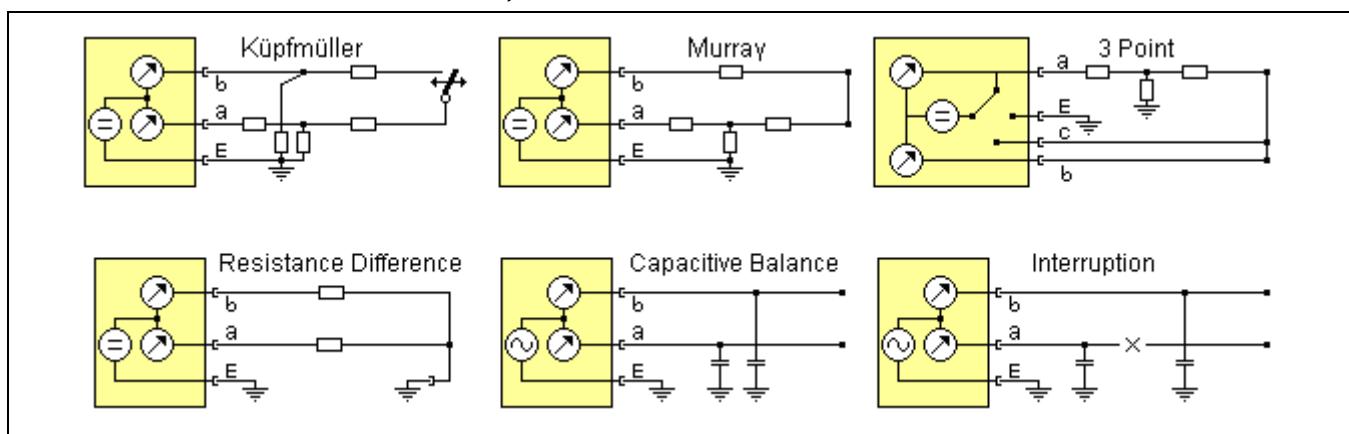
- Murray,
- 3 Pont,
- Küpfmüller
- Repeated Küpfmüller
- Interruption

Automatic test sequences making the work quicker and more effective

- Automatic Quick Test
- Automatic Quality Test
- Automatic Survey of Pair Condition

USB port and WIFI for data transfer

DC, AC FAULT LOCATION METHODS



SPECIFICATIONS OF CABLE PARAMETER MEASUREMENTS

Loop Resistance	Disturbing Voltage
Measuring range 1Ω to 10 kΩ	Measuring range
Accuracy ±0.3% ±0.1 Ω	DC voltage up to 400 V
Test results Resistance between: wire a and b	AC voltage up to 250 V rms
Resistance Difference	Frequency range 15 to 300 Hz
Loop resistance range 10 to 5000 Ω	Input resistance 1 or 2 MΩ
Lx/L- value resolution 1/1000	Accuracy ±3% ±1 V
Accuracy ±0.2% of loop resistance ±0.2 Ω	Test results AC, DC voltage between: wire a and b wire a and GND, wire b and GND
Test results Lx/L, RI, Ra, Rb, ΔRΩ, ΔR%	
Insulation Resistance	Capacitance
Measuring range 10 kΩ to 1000 MΩ	Measuring modes 2 Pole and With short circuit (EN 50289-1-5:2001)
Measuring voltage 100/250 V	Measuring range 10 nF to 2 μF
Measuring time ~100 sec	Measuring voltage 11 Hz, 100 V
DC disturbing voltage compensation Enabled	Accuracy ±2% ±0.2 nF
Accuracy	Test results Capacitance between: wire a and b wire a and GND, wire b and GND
10 kΩ to 300 MΩ 10 % ± 1kΩ	
Over 300 MΩ 20 % ± 1MΩ	Capacitive Balance
Test results Resistance between: wire a and b wire a and GND wire b and GND	Measuring range 1 nF to 2 μF
AC, DC voltages between: wire a and b wire a and GND wire b and GND	Measuring voltage 11 Hz, 100 V
	Accuracy ±2 % ± 0.2 nF
	Test results Lx/L, ΔC, ΔC%, Capacitance between: wire a and GND, wire b and GND

SPECIFICATIONS OF FAULT LOCATION

Murray, 3 Point , Küpfmüller Methods	DC-AC Repeated Küpfmüller Method
Loop resistance range 10 Ω to 10 kΩ	Loop resistance range 10 Ω to 2kΩ
Fault resistance range up to 100 MΩ	Fault resistance range up to 5 MΩ
Measuring voltage 100 V	Measuring voltage DC 100 V or AC 11 Hz 100V
DC disturbing voltage compensation Enabled	Accuracy of Lx/L value (R I = 2kΩ, Lx/L=0,1 to 1) Fault resistance < 1 MΩ ±1%
Accuracy of Lx/L value (R I = 2kΩ, Lx/L=0,1 to 1)	Fault resistance 1 MΩ to 5 MΩ ±2%
Fault resistance < 1 MΩ ±0.2%	Test results Lx/L, Rx, Ry, RI, Ra, Rb
Fault resistance 1 MΩ to 5 MΩ ±0.3%	
Fault resistance 5 MΩ to 25 MΩ ±0.5%	
Fault resistance 25 MΩ to 100 MΩ ±2.0%	
Test results	AC Fault Location Interruption Measurement
Murray, 3 Point. Lx/L, Rx, Ry, RI, Ra, Rb, FaE or FbE	Measuring range up to 20 km
Küpfmüller..... Lx/L, Rx, Ry, RI, Ra, Rb, FaE and FbE	Accuracy ±2% ±0.2 nF
	Test results Lx/L, Ca-E, Cb-E

SPECIFICATIONS OF SINGLE DMM MEASUREMENTS

AC-DC Disturbing Voltages	Loop Resistance
Measuring range	Measuring range 1Ω to 10 kΩ
DC voltage up to 400 V	Measuring mode Repeated measurements
AC voltage up to 250 V eff	DC disturbing voltage compensation Disabled
Measuring mode Repeated measurements	Accuracy (without disturbing voltages) ±0.5 % ±0.2 Ω
Frequency range 15 to 300 Hz	Insulation Resistance
Input resistance 2 MΩ	Measuring range 10 kΩ to 1000 MΩ
Accuracy ±3% ±.1 V	Measuring mode Repeated measurements
AC-DC Currents	DC disturbing voltage compensation Disabled
Measuring range 5µA to 0.1 A	Measuring voltage 100 V
Measuring mode Repeated measurements	Accuracy (without disturbing voltages) 20 %
Frequency range 15 to 300 Hz	Capacitance
Input resistance 20 Ω	Measuring range 10 nF to 2 μF
Accuracy ±3 % ± 0.1 µA	Measuring voltage 11 Hz, 100 V
	Accuracy ±3% ±0.3 nF

SPECIFICATION OF AUTOMATIC QUICK TEST SEQUENCE

Disturbing voltage	Capacitance
Measuring range up to 400 V DC, 250 V AC	Measuring range 10 nF to 2 µF
Accuracy ±3% ±1 V	Measuring voltage 11 Hz, 100 V
Test results AC, DC voltages	Test results Capacitance between: wire a and wire b (Cab)
Insulation resistance	wire a and GND, wire b joined to GND (CaE) wire b and GND, wire a joined to GND (CbE)
Measuring range 10kΩ to 300 MΩ	Accuracy ±3% ±0.3 nF
Measuring voltage 100 V	Capacitive Balance
Measuring time ~70 sec	Measuring voltage 11 Hz, 100 V
DC disturbing voltage compensation Enabled	Test results Ca>Cb or Cb>Ca, CaE/CbE, unbalance %
Accuracy 20 %	Resolution 1/1000
Test results Resistance between: wire a and wire b (Rab) wire a and GND (RAE) wire a and GND (RBE)	

SPECIFICATION OF AUTOMATIC QUALITY TEST SEQUENCE

Insulation resistance	Loop resistance
Measuring range 10kΩ to 1000 MΩ	Measuring range 1Ω to 10kΩ
Measuring voltage 100 V	Accuracy ±0.3% ±0.1 Ω
Measuring time ~120 sec	Capacitance
DC disturbing voltage compensation Enabled	Measuring range 10 nF to 2 µF
Accuracy	Measuring voltage 11 Hz, 100 V
10 kΩ to 300 MΩ 10 % ±1kΩ	Accuracy ±2% ±0.2 nF
Over 300 MΩ 20 % ±1MΩ	Test results Capacitance between: wire a and wire b (Cab)
Test results Resistance between: wires a and wire b (Rab) wire a and GND (RAE) wire a and GND (RBE)	wire a and GND, wire b joined to GND (CaE) wire a and GND, wire b joined to GND (CbE)
Resistance difference	Capacitive Balance
Loop resistance range 10 Ω to 5 kΩ	Measuring range 1nF to 2 µF
Resolution 1/1000	Measuring voltage 11 Hz, 100 V
Accuracy ±0.2% of loop resistance ±0.2 Ω	Accuracy of Lx/L value ±0.2% ± 200pF
Test results Ra, Rb, ΔRΩ, ΔR%	Test results Ca>Cb or Cb>Ca, CaE/CbE, unbalance %

SPECIFICATION OF CABLE QUALITY SURVAY TEST SEQUENCE

Insulation	Capacitance
Measuring range 10 kΩ to 300 MΩ	Measuring range 10 nF to 2 µF
Measuring voltage 100 V	Measuring voltage 11 Hz, 100 V
DC disturbing voltage compensation Enabled	Accuracy ±2% ±200 pF
Accuracy	Test results Capacitance between: wire a and wire b (Cab)
10 kΩ to 50MΩ 5 % ±1kΩ	wire a and GND (Ca-E)
50 MΩ to 100 MΩ 10 %	wire b and GND (Cb-E)
Test results .. Resistance between wire a and b (Riso)	
wire a and GND (FaE)	
wire b and GND (FbE)	
DC voltage source	Loop and wire resistance
Measuring range up to 100 V DC	Measuring range 1Ω to 10 kΩ
Test results voltage source: cascade with FaE (Va-E)	Accuracy ca.1%
cascade with FbE (Vb-E)	Test results Loop resistance (Rl)
	Resistance of wire a (Ra)
	Resistance of wire b (Rb)

DATA TRANSFER

Data transfer via USB port

The USB port provides:

- transfer of test results to USB stick
- bidirectional transfer of setups
- transfer of print screen images to USB stick
- transfer of upgrade files to EFL 10T

Data transfer via WiFi

EFL 10T acts as a HTTP server when transfers test results to Local Area Network.

LOOP CLOSING DEVICE ELC 30 (Option)

Functions

Opening or closing the far end of tested pair when just one person wants to perform a measurement during which the far endings should be opened or closed (e.g. Küpfmüller method).

The device is remote controlled over the tested pair by EFL 10T

**Specifications****Power supply**

AA size alkaline battery cells 3 pieces
Operation time ca. 1000 hours

Auto power off 4 hours

Connectors 4 mm banana plugs

Mechanical Data

Dimensions 110 x 60 x 25 mm
Weight (Including battery pack) ca. 0,2 kg

GENERAL SPECIFICATIONS

Power supply

Internal rechargeable lithium-ion battery pack
Operation time ca. 8 hours
Charging
From 230 V mains with mains adapter
From 12 V car battery with car adapter (option)
Charging time approx. 3 hours

Display 320x240 dot color TFT LCD**Connectors**

For mains or 12V car adapter 2.1/5.5 mm socket
For measuring cables 4 pcs of 4 mm safety banana sockets
Micro-USB to connect PC or memory stick

Ambient temperature ranges

Reference +23°C ± 5°C,
RH 45% to 75% *

Normal operation 0°C to +40°C,
RH 30% to 75% *(< 25 g/m³)

Limits of operation -5°C to +45°C,
RH 5% to 95% *(< 29g/m³)

Storage and transport -20°C to +70°C,
RH 95% at +45°C *(< 35 g/m³)

Protection IP 54

Shockproof EN 60068-2-27 Shock

Dimensions 200 x 100 x 40 mm

Weight 0.8 kg

* without condensation

ORDERING INFORMATION

FAULT LOCATOR BRIDGE
EFL 10T 470-000-000

Including:

Operating Manual
Calibration Certificate
Ground cable (green)
Test lead (yellow)
2 wire test lead (black/red)
OTG cable
USB cable for PC connection
Mains adapter
Battery pack (built-in)
Carrying case

HW Options:

Loop closing device ELC 30 Y-421-000
Temperature probe Y-146-014
Car Lighter power adapter EAA 20 462-000-000