XL-CFL83

TDR Cable Fault Locator

Users manual

Contents

I. Introduction

This Cable Fault Locator (hereafter referred as locator) can measure the exact fault location such as the broken line, cross faults, earthing, poor insulation and poor contact of the lead covered cables as well as plastic cables.

The highlights for this locator are that it can test numbers of typical faults, features are as follow:

1) Digital gain Adjustment control to make the gain adjustment very easy.

2) Digital waveform automatically Identify technique to make sure no test dead zone.

3) Top grade ARM single chip micro computer can make calculation and judge the fault waveform exactly.

4) Large colorful LCD display; humanized operation interface; six function keys can do all the tests.

5) High-energy Li battery, continuous work 10 hours (with special charger).

II. Specifications

1) Max range: 8 km
2) Highest resolution: 1m
3) Dead Zone: 0 m
4) Power consumption: 1W
5) Weight(kg): 0.42kg
6) Dimension(mm): 200×90×43mm
7) Working temperature: -15°C~+45°C
   Storage temperature: -20°C~+55°C
8) USB storage (optional): transmit wave form to U disk, and analyze the wave form on computer.

III. Testing principles

Pulse testing is a kind of remote testing method; one can locate the fault point without testing on the field or testing with end-to-end coordination. The principle of the theory is:

The instrument emits a pulse to the line, when the line has faults, the pulse reflection will change. If the come and back time can be measured, the location of the fault point can be detected.

Suppose the pulse transmission velocity in electric cable velocity is V, the come and back time that the pulse travels between the test point and the fault point is T, the fault distance is L, then:

$$\because \quad 2L = V\,T$$

$$\therefore \quad L = V\,T/2$$

For example, the sending end transmits a pulse to the cable, after 20 μs, the sending end get the reflection pulse. If the pulse transmission velocity in the electric cable is 201m/μs, the fault distance L is

$$L = 201 \times 20/2 = 2010\text{m}$$

IV. Steps of locating fault point

Diagnosis of fault characters

To insure the accuracy of the testing of fault point, the testing personnel shall diagnose the fault characters correctly and then choose the most suitable testing mode. The characters of telecom cable faults can be simply divided into the following several kinds:

1) Broken line

One or many cable core line are broken.

2) Crossed line

The insulating resistance between the different couple of lines drops and causes the communication amplitude drops.

3) Earthing fault

The insulating resistance between the core line to the lead cover drops and causes low communication quality

4) Crosstalk noise

When the cable core insulation material is invaded by water or humidity, the insulating resistance will drop and

cause low communication quality or even blocks.

5) Bad insulation

The insulating resistance between different couple of lines and the core drops to a very low level, the communication quality comes under serious influences.

Fault Testing

Cut off the cable to be tested both sides lines or equipment. Make sure the cable to be tested is free of voltage. Using this instrument to do intelligence testing first, if the fault cannot be detected and then you can change to manual testing.

Locating fault point

The tester will Judge the approximate location based on the testing result, then check the cable, cable gland, cross boxes, etc., depending on the actual situation.

V. Intelligent Auto Testing

Press "**ON**", connect the testing lead line and fault cable line. Press "**AUTO**" and then the instrument will show the testing result.

Note: The default setting wave velocity is 200m/μs, when you perform intelligence testing, the user shall check whether need to adjust the velocity (see "**Adjust wave velocity**" in the next section).

VI. Manual Testing

The relevant setting and parameters will demonstrate on the underneath of the display screen. Press "**OK**" to adjust the setting and parameters.

1) Gain

Press "**OK**", until "**Gain××**" shows reverse color display. Then press "▲" or "▼" to adjust the amplitude (1~99 adjustable), Press "**PULSE**", the screen will display the wave after gain adjustment.

2) Range

During manual testing, range decides the maximum testing distance of the instrument, so the range value shall be chose as longer than actual length of the cable to be tested. To adjust the Range, press "**OK**", until "**Range××**" shows reverse color display. Press "▲" or "▼" to adjust the Range.

3) VOP

The precision of the wave velocity, directly affect the precision of the testing result. So the wave velocity shall be calibrated according to the cable characters. Press "**OK**", until "**VOP××**" shows reverse color display. Then, press "▲" or "▼" to adjust the wave velocity.

Adjust the **Range** and **VOP** according to the

characters and estimated length of the cable to be tested. Appropriately adjust the wave amplitude to make the waveforms on the display screen to be observed easily. Move the cursor to inflection of the reflected waveform. The fault distance will demonstrate on the underneath of the display screen.

4) Cursor movement

Press "◀" or "▶" to move the cursor and the distance is from the cursor to the initial point.

VII. Reference value for common cable wave velocity

Insulators	signal propagation velocity (m/us)
High Polymer	168-186
Filled polythene	192
Polythene	201
Teflon	213
Paper pulp(0.13uF/Km)	216
Foamed polyethylene	246
Paper(0.117uF/Km)	264
9.5mm coaxial(w)	286
9.5mm coaxial(s)	295

VIII. Charge

Current battery power is showed at the top-right of the screen. If the battery power is inadequate, please use the instrument charger to charge it.

The indicator light of the charge adapter will be red when charging; and it will turn green after it's fully charged.

IX. Notes

1. Keep display screen away from direct sunlight. The contrast ratio of LCD will drop when temperature higher than 60ºC and it will return to normal when temperature is lower than 60ºC.

2. Before testing, better measure the voltage of fault cable to be tested, in order to avoid test errors or damage the instrument

3.Do not hit LCD screen.