

Handheld Cable Fault Locator

User Guide



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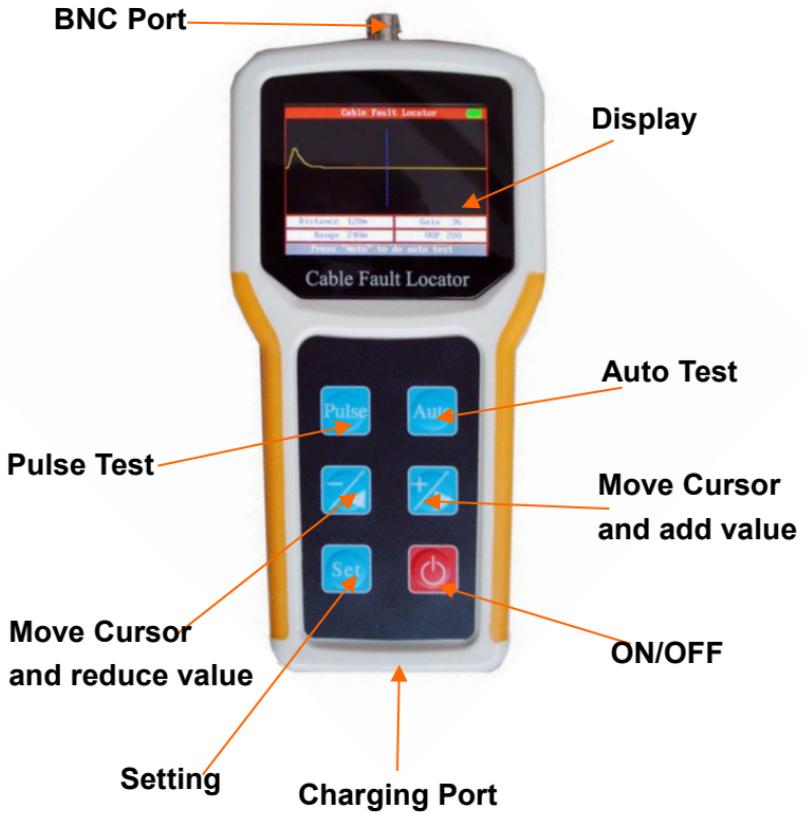
Welcome to

Handheld TDR Cable Fault Locator

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LAYOUT



BRIEF 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).

SPECIFICATIONS

1) Max range: 8 km (2km/4km/16km/32km are optional)

2) Highest resolution: 1m

3) Dead Zone: 0 m

4) Power consumption: 1W

5) Weight(kg): 0.38kg

6) Dimension(mm): $204 \times 100 \times 36\text{mm}^3$

7) Working temperature: -15°C to $+45^{\circ}\text{C}$

Storage temperature: $-20^{\circ}\text{C} \sim +55^{\circ}\text{C}$

8) USB storage (optional): transmit wave form to U disk,
and analyze the wave form on computer.

WORKING PRINCIPLE

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:

$$\therefore 2L = V T$$

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

For example, the sending end transmits a pulse to the cable, after $20\mu\text{s}$, the sending end get the reflection pulse. If the pulse transmission velocity in the electric cable is $201\text{m}/\mu\text{s}$, the fault distance L is: $L = 201 \times 20/2 = 2010\text{m}$

TESTING PROCEDURES

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.

AUTO TEST

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

Note: The default setting wave velocity is $200\text{m}/\mu\text{s}$, when you perform intelligence testing, the user shall check whether need to adjust the velocity.

MANUAL TEST

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

1) Gain

Press , until "Gain" shows reverse color display. Then press  or  to adjust the amplitude (1~99 adjustable), Press , 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 chosen as longer than actual length of the cable to be tested. To adjust the **Range**, press , until **Range** shows reverse color display. Press  or  to adjust the **Range**.

3) VOP

The precision of the wave velocity, directly affects the precision of the testing result. So the wave velocity shall be calibrated according to the cable characters. Press , 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) Waveform Comparison (Optional)

Press  until it displays “Press “-” to memory, “+” to both”. Now press “  ” to save the current waveform; press  to call the original out and compare with the current waveform.

5) Save File (Optional)

Press  until it displays “Press ”-“ or “+” to enter file mode”. Now press  or  to enter into file save mode.

File save mode can not only test & save cable but also can check & analyze the original waveform.

Save File

When you choose "Current Test", press  to test

the current cable. After test is finished, if you want to save file, you can press  until "Press "-" to quit, "+" to **save**" appears. Under this condition, press  to normal testing mode; press  to save the current file to U-disk.

Check and analyze the previous wave files

Press  until it displays "Press "-" to memory, "+" to both". Now press "" to save the current waveform; press  to call the original out and compare with the current waveform. When you are interested in any wave files, you can press  to analyze the current wave file. Under this mode, you can do some operation of the saved file. And the operation method is same as cable operation method. For detailed operation steps, you can refer to the manual testing chapter.

VOP REFERENCE TABLE

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

PACKING LIST

Items	Quantity
TDR Cable Fault Locator	1 PCS
Test Line	2 PCS
Charger	1 PCS
Carrying Bag	1 PCS
User Manual	1 PCS
CD with management software	1 PCS (Just for USB function)
U-Disk	1 PCS (Just for USB function)

CHARGING

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.

ATTENTIONS

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

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

Do not hit LCD screen.