OTDR with Live Fiber

Installation Instructions

MODELS	
LNT-OTDR-B	LYNN OTDR/ Copper Tester (1310/1550/1625nm) with 7”OLED touch screen RJ45 remote, Wi-Fi testing, case, charger, and adapter

- Thank you for purchasing the OTDR tester. Please read the manual before using the OTDR tester.
- For using the OTDR tester safely, please first read the safety information carefully.
- The manual should be kept for future reference.
- Keep the serial number label for after-sale service within the warranty period. Products without a serial number label will be charged for repair service.
- If there are any questions or problems while using the Multi-function OTDR tester, or there are issues with the device, please contact our technical department.

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Safety Information

- The tester is intended to be used in compliance with local rules of electrical usage and avoid using at places which bar the use of third-party electronics such as hospitals, gas stations, etc.
- Please use the original accessories to avoid damage to the tester caused by using non-certified accessories
- The accessories are only for our testers, and do not use them for other applications.
- To prevent damage or failure of the tester, the product should always stay dry.
- The connectors of the tester should be free of dust and liquid.
- During transportation and use, it is highly recommended to avoid dropping and limiting vibration of the tester.
- Don't leave the tester alone while charging and recharging. If the battery is found severely hot, the tester should be powered off from the electric source at once. The tester should not be charged over 10 hours.
- Don’t connect an active cable or device to the ports of tester when the tester is on.
- Don't use the tester where the humidity is high. If the tester becomes damp, power off immediately and move away other connected cables.
- The tester should not be used in an environment with flammable gas.
- Do not disassemble the instrument since there are no components inside the device that can be repaired by the user.
- The instrument should not be used in an environment with strong electromagnetic interference.
- Don't touch the tester with wet hands.
- Don't use heavy detergent to clean the tester. If the dirt is not easy to remove, a damp soft cloth with water or neutral detergent can be used.

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Installing the Battery

Note: The tester has a built-in lithium-ion rechargeable battery. The battery inside the battery cabin should be disconnected for safety during transportation.

Prior to the use of the instrument, the battery inside the battery cabin should be connected.

Pressing the key continuously can power on or off the tester.

Please use the original adaptor and cable of the device.

When the battery icon is full or the charge indicator turns off automatically, this indicates the battery charging is complete.

OTDR

Summary

OTDR is an instrument to understand the uniformity, defect, fracture, joint coupling and other properties of optical fiber through the analysis of the measuring curve. It is used to measure the attenuation of optical fiber, attenuation of connector and fault locator, and view the loss distribution along the length of optical fiber. It is an essential tool in the construction, maintenance and monitoring of optical fiber.

Warning

- When using OTDR to measure optical fiber, except 1610nm wavelength, visible light in the measured optical fiber shouldn't be present. Otherwise, the measuring result won't be correct, and the instrument may be damaged prematurely.
- Don't look at the optical interface directly or look over the optical interface through an optical instrument.
- When the OTDR is active, do not look at the laser outlet directly.
- After using, cover the dust cap onto the optical outlet of the OTDR.
- Don't directly look at the disconnected terminal of the optical fiber being tested. If possible, make the disconnected connector of the fiber optic cable point to a non-reflective object.

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Operation

Connect fiber → Set parameters → Test fiber → View traces

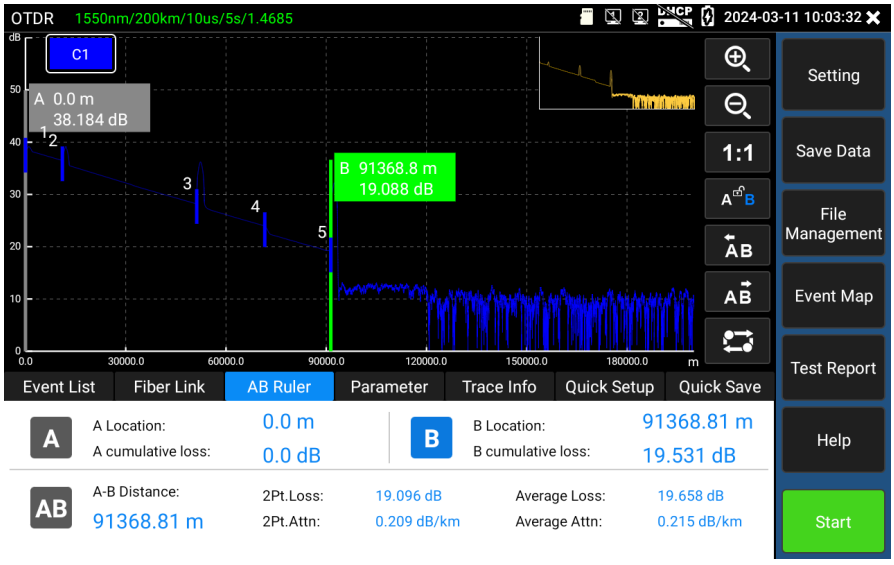
Fiber connection

Connect the fiber to the top optical interface of OTDR. It uses an FC-UPC optical connector. Use one of the included adapters for other connector types.

Notice: When using OTDR to measure optical fiber, visible light in the measured optical fiber shouldn't be present or the instrument may become damaged.

Auto OTDR test

Auto OTDR by default, click "OTDR test" or select wavelength, pulse width and measurement duration in the "Quick Setup" to start testing. Other parameter settings are below:



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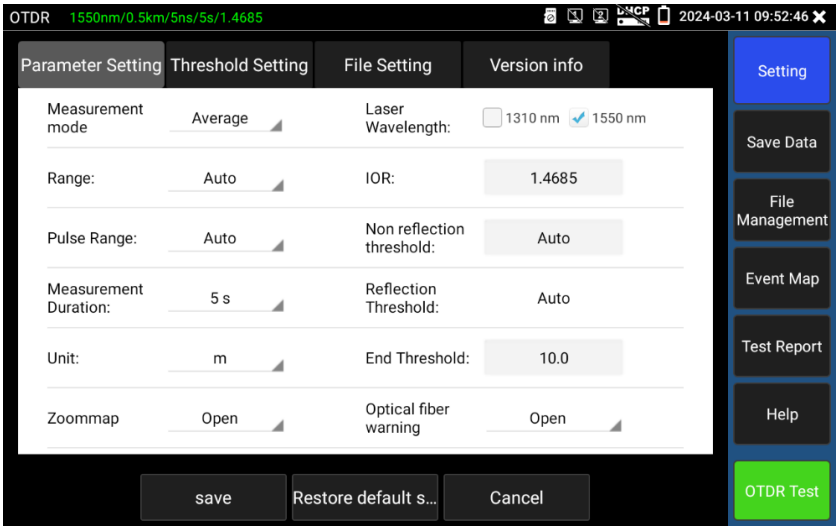
Expert OTDR test

Manually selecting the range, pulse width, and other parameters will present more accurate test results. You can zoom the curve trace and view event map details.

Quick test can set laser wavelength, distance range, pulse width and measurement duration parameters.

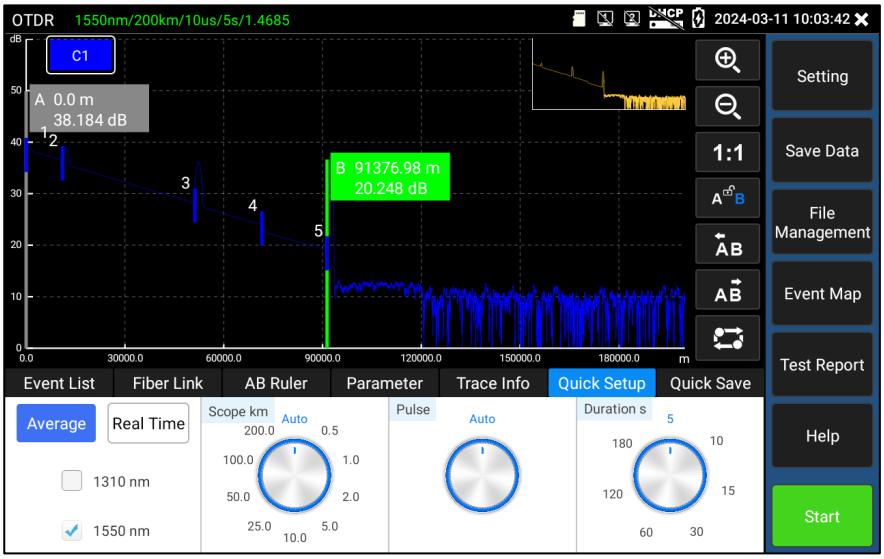
Setting can set laser wavelength, distance range, pulse width, measurement duration, measurement mode, IOR, non-reflection threshold and end threshold parameters, the reflection threshold is the specified item.



Settings

1) Quick Setup

Can quickly set wavelength, distance range, pulse width and measurement duration parameters. If the parameters need modifications during testing, they can be quickly changed.



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2) Parameter setting

Laser wavelength: Selected by user, it offers several options. Wavelengths of single mode fiber: 1310nm, 1550nm and 1610nm. Users can simultaneously select two wavelengths at most to measure and set analysis and file saving with different wavelengths. In addition, multi-wavelength measurement is valid only under the average measurement mode. Multi wavelength measurement is forbidden under the real-time measurement mode. (If the fiber is over 100 km, please select 1550nm wavelength for testing)

Distance scope: Selected by user, options include “auto, 500m, 1Km, 2Km, 5Km, 10Km, 25Km, 50Km, 100Km and 200Km”. If the length is unknown, it is recommended to use automatic range. For a known length, it is recommended to use a range having 1.5 times the minimum length.

Measurement duration: 5s, 10s, 15s, 30s, 60s, 120s, 180s is optional, If the current measurement model is real-time measurement, the selected duration of measurement won’t play a role in the measurement. When you need a meticulous and smooth curve, you can select the longer measurement time.

Pulse width: Selected by user, options include “auto, 5ns, 10ns, 20ns, 30ns, 50ns, 80ns, 160ns, 300ns, 500ns, 800ns, 1000ns, 2000ns, 4000ns, 6000ns, 10000ns, 20000ns”.

Measurement mode: Selected by user, options include “average measurement and real-time measurement”. When real-time measurement mode is selected, the selected duration of measurement won’t play a role in the measurement.

Refractivity: Set by user, the default value is 1.4685. Refractivity is a key parameter for calculating the length, please don’t change it at will.

Unit: Set by user, options include “m, km, mi, ft and kft”

Reflection threshold: No option or user setting is provided in OTDR instrument.

Non-reflection threshold: Set by user, input scope: 0.01~2.99, the default value is auto. When the manual setting value is 0.00, it will transfer to auto value.

End threshold: It is used as the threshold value for looking over event points when the instrument treating data. For example, the event points that are lower than the set value of the end threshold will be removed, while the event points that are higher than the set value of the bundling threshold will be displayed. For options set by user, input scope is 1~19.99dB, the default value is: 5.00dB.

Optical warning of optical fiber: Options include “ON and OFF”, When set to ON, if the optical fiber has an active optical signal being transmitted, the instrument will pop up alarm.

Default setting recovery: Distance scope is “auto”, pulse width is “auto”, duration of measurement is “5 s”, laser wavelength is “1550nm”, measurement mode is “average mode”, length unit is “meter”, refractivity is “1.4685”, back scattering coefficient is “auto”, reflection threshold is “auto”, non-reflection threshold is “auto”, end threshold is “5.0dB”, When finished setting, please click “Save” to save the parameters.

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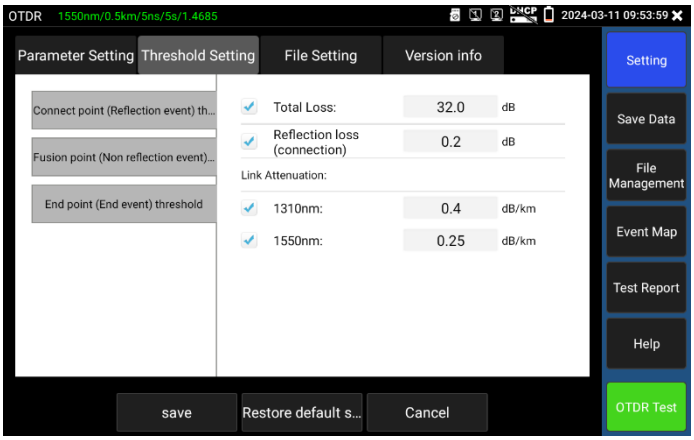
3） Threshold setting

In Event map, can set loss and link attenuation parameters of fusion and connect point events. If this is less than the reference value, then the result is considered a PASS. If the values are greater than the reference value, the result is considered as Failed.



If you do not select the parameter, then the threshold will be ignored.

Total loss: The total loss value of fiber link. Input scope: 0-60. If this is less than the reference value, then the result is considered a PASS. If the values are greater than the reference value, the result is considered as Failed.

Reflection loss (connect point): The loss value of connector. Input scope: 0-60. If this is less than the reference value, then the result is considered a PASS. If the values are greater than the reference value, the result is considered as Failed.

Non reflection loss (fusion point): The loss value of Fusion point or bend point fiber. Input scope: 0-60. If this is less than the reference value, then the result is considered a PASS. If the values are greater than the reference value, the result is considered as Failed.

Link attenuation coefficient: Different wavelength of fiber, the attenuation coefficient is different. Input scope: 0-60. If this is less than the reference value, then the result is considered a PASS. If the values are greater than the reference value, the result is considered as Failed.

4） File setting

Auto naming: Options include “ON and OFF”. When the auto naming status is “ON”, the auto naming category is optional. When the auto naming status is “OFF”, the auto naming function is off.

File format: Set by user, options include “OTDR and SOR” format.

Name type: Optional automatic naming of wavelength, pulse width, date, range, comment, etc. It will take effect when automatic naming is turned on.

Note: It is used for editing the content of name type.

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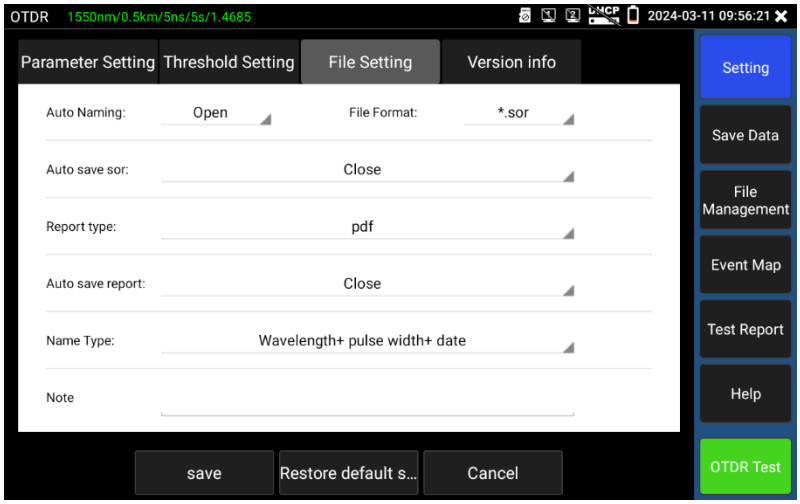

Curve Tracer

After setting and saving the parameters, click “Start” to begin testing. The wavelength, distance range, pulse width, duration of measurement, and refractivity will display at the top of interface. When the OTDR is finished with the testing, it will create the trace. Click the “Stop” to end the testing.

Definition of trace: After the first measurement, a reflection power diagram is displayed as a distance function. The diagram is called trace.

The trace displays the measurement result by a graphic model on the screen. The vertical axis represents power, while the lateral axis represents the distance. The event point is marked with a red symbol.

① Trace area ② Trace operation button area ③ Information area ④ Menu button area

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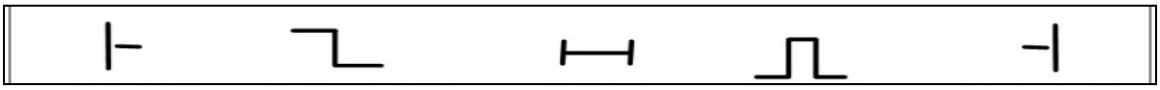
Events Categories

Events on the optical fiber show abnormal points that brought loss or sudden change of reflection power beyond normal scattering of optical fiber material. These include various kinds of connections and bending, loss of light flow or a fracture on the optical fiber link.

Event points displayed on the screen are the abnormal points in the optical fiber that led to deviation of trace, which are classified with special symbols on the trace.

Events include “reflection event” and “non-reflection event”.



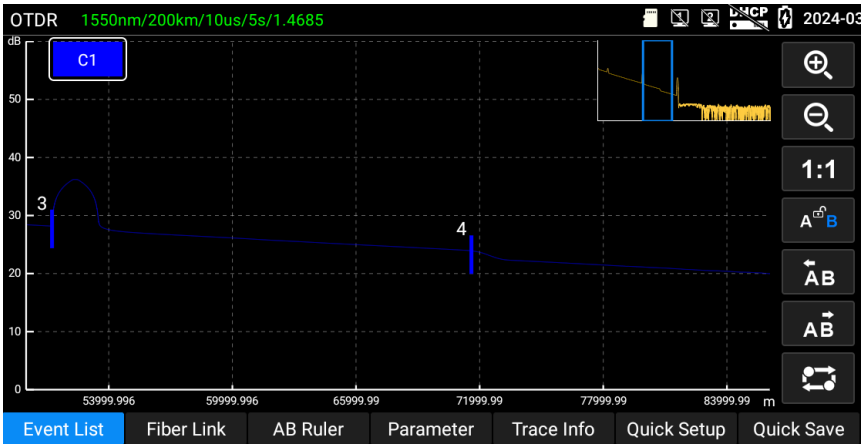
Initial Event Non-reflection Event Fiber section Reflection Event End Event

Initial Event

“Initial event” on the OTDR trace is the event that marks the starting point of optical fiber. Under default conditions, “initial event” is located at the first event (usually be the first connector of OTDR) of the tested optical fiber. The event belongs to reflection event.

Non-reflection Event

Non-reflection events bring loss on the whole transmission link of optical fiber, but no light reflection. On the curve, a non-reflection event is shown as drop of optical power, as shown in follow picture.



Reflection Event

When optical pulse energy is reflected (such as on the connector), reflection occurs. On the trace, a reflection event is shown as peak signal, as shown in the picture.

End Event

"End event" on the OTDR trace is the event that marks the terminal of optical fiber. Under default conditions, "end event" is located at the last event of the tested optical fiber. The event is called optical fiber terminal event (typically the end or fracture point of the tested optical fiber), which usually belongs to reflection event.

Event Inspection

OTDR sends optical pulse into the optical fiber that waited for inspection, then, begins to accept the returned optical signal immediately, and calculate the distance of "event" in the optical fiber. The further the event is, the longer the time for returning back to OTDR will be. The distance can be calculated according to the time when we receive the event.

Through inspecting the curve of the reflected signal, the optical transmission characteristics of optical fiber, connector and joint can be confirmed.

Info Window Area of the Main Interface

Contents of the info window include measurement parameter, event list, scale plate A/B, and analyzed parameters.

Data displayed in the event list includes serial number, category, position, plug-in loss, attenuation coefficient, echo loss, and accumulate loss. "Serial number" shows the information of the nth event that currently displayed on the trace graph. "Category" shows the event category of the event point. "Position" shows the distance from the first point of the optical fiber to the event point. "Plug-in loss" shows the quantity of plug-in loss of the event; "Attenuation coefficient" shows the attenuation characteristics of the optical fiber from the last event point to the current event point. "Echo loss" shows the reflection value of the event point. "Accumulate loss" shows the loss value of optical fiber from the first point to the current event point.

Contents of the information of the event list are shown in follow picture. The event point data and event section data are separately displayed in the event list. Serial number of events only numbers the event points. Event category displays the following information by picture: first event, optical fiber section, reflection event, non-reflection event, and end event. Corresponding pictures of the event category are shown in the follow picture. When looking over information of the event list, click the icon "event" through the touch screen, then the information of the event list can be found in the info window.

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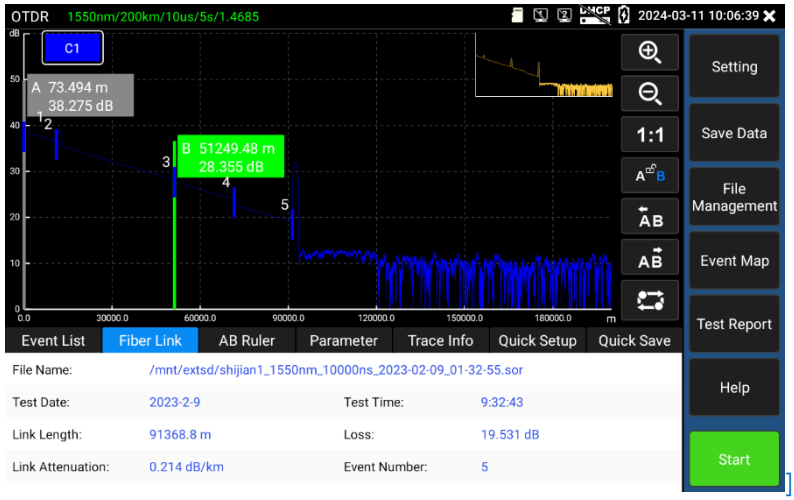
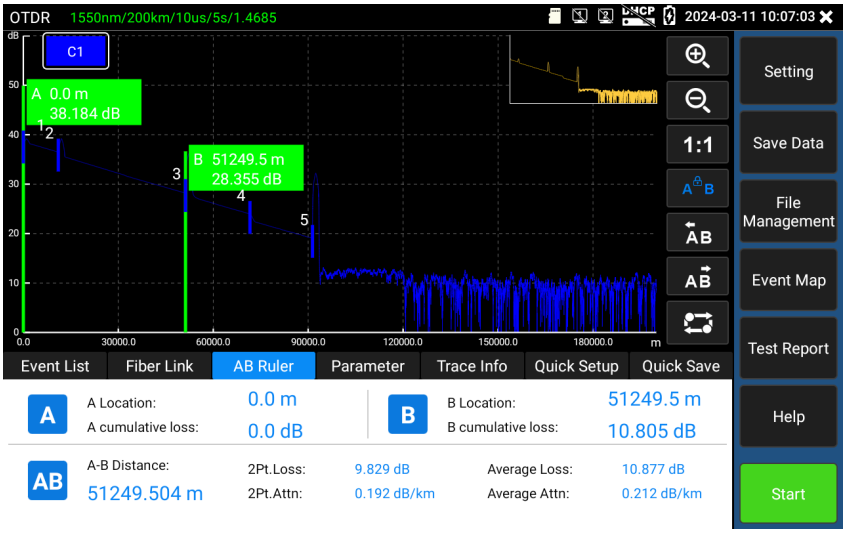
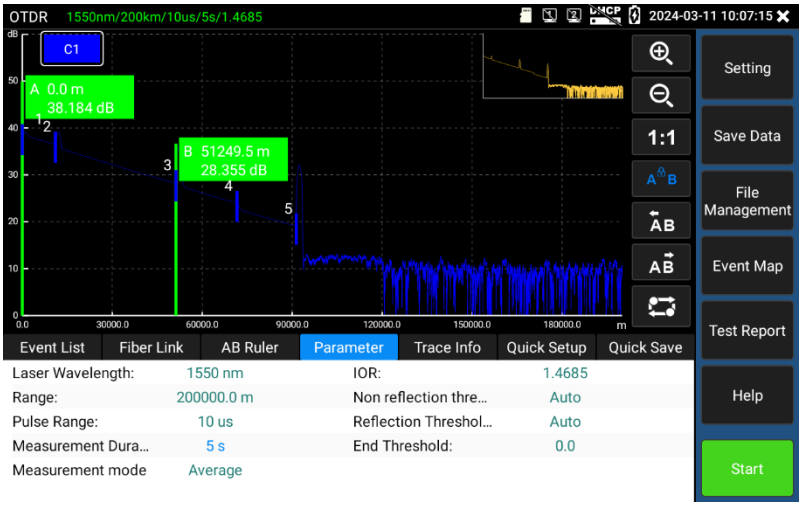
Optical fiber link information includes file name, measurement date, measurement time, link length, link loss, link attenuation coefficient, and quantity of event. Definition and setting of file name, duration of measurement, and measurement date are shown in “set” menu. When looking over information of optical fiber link, click the “fiber link” through the touch screen, then the information of optical fiber link can be found in the info window. Contents of information of optical fiber link are shown in following picture.



Information of scale plate includes position of point A (or B), plug-in loss of point A (or B), back scattering coefficient of point A (or B), accumulate loss of point A (or B), distance of A B section, loss between two points of AB section, attenuation coefficient between two points of AB section, and LSA attenuation coefficient of AB section. A signpost is used to mark and analyze a single event, curve section and distance. The information of the signpost shows distance, loss and attenuation coefficient between signposts. When changing any signpost, the record value will also be changed along with it. When looking over information of the scale plate, click the icon “scale plate” through the touch screen, then the information of scale plate can be found in the info window. Contents of information on scale plate are shown in follow picture.



Measurement parameter includes laser wavelength, distance scope, pulse width, refractivity, back scattering coefficient, reflection threshold, bundling threshold, non-reflection threshold, and duration of measurement. The definitions and settings are shown in “setting” menu. Click “Fiber link” to view the fiber link information. Fiber link information is shown in follow picture.



Trace zoom

1）Touch screen zoom operation instructions

Use two fingers at the center of the screen to zoom. When the horizontal angle between the two fingers and the center is less than 45 degrees, zoom horizontally.

When the horizontal angle between the two fingers and the center is more than 45 degrees, zoom vertically. Touch the top right thumbnail twice to restore the original state of the trace.

Trace Movement

Press the trace and move in any horizontal or vertical direction.

2) Instruction of Trace Operation Button Area

Horizontal amplification: click the button on the touch screen to enlarge the curve horizontally.

Horizontal reduction: click the button on the touch screen to reduce the curve horizontally.

1: 1 restore: restore the scaled curve in the original 1:1 ratio.

After clicking the button on the touch screen, in this state, the left and right arrow keys move the a pole.

After clicking the button on the touch screen, in this state, the left and right arrow keys move the b pole.

After clicking the button on the touch screen, in this state, the left and right arrow keys move the A and B poles at the same time.

Move the marker to the left and touch the screen to click the button, the pole A/B in the selected state will move to the left.

Move the stick to the right and touch the screen to click the button, the pole A/B in the selected state will move to the right.

Track switching. This button takes effect only when multiple curve tracks are opened. After clicking the button on the touch screen, you can switch between different curves.

Date Saving

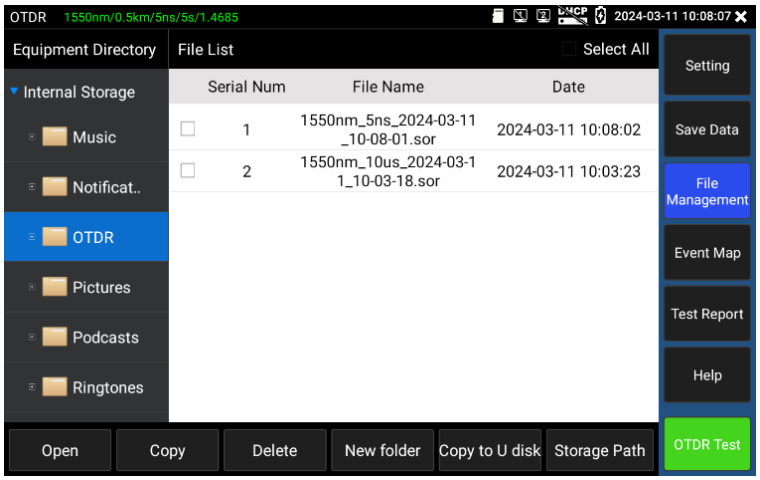
Selecting “Quick Save” will auto-name and save the file, according to “Setting-file setting” name type to name the file.

Click the icon “Save date” to select the path to save the file and modify the file name. Can choose the save file format in “Setting-file setting”, the file support PDF and .SOR file format.

Default saves files in the internal SD card of the OTDR directory.

Data import

Select the file to be opened in File management, click the “open” in the bottom to import the curve file.



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File management

Open: Open the selected curve file, 4 traces can be simultaneously selected at most on main page.

Rename: Rename the checked file or folder.

Copy: Copy the selected file or folder to External or internal SD card.

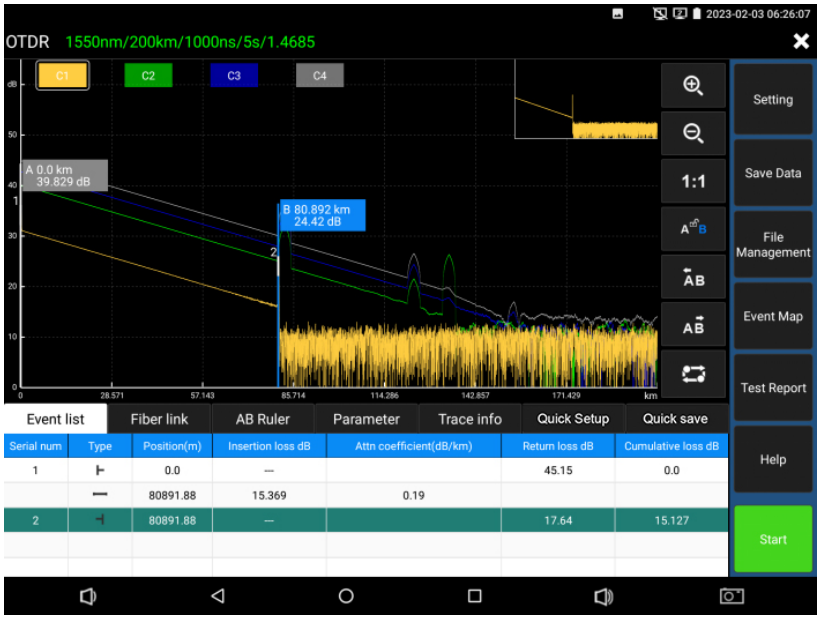
Delete: Deletes the selected file or folder.

New folder: Create a new folder in the selected directory of "Equipment directory". The new folder will be used as the default storage path.

Storage path: Set or view the current storage curve path.

Analysis of "Multi-traces setting"

Click the trace 1/2/3/4 of "Multi-traces setting", 4 traces can be displayed at most. The opened traces are distinguished through different colors.



Instruction of Button "Trace 1/2/3/4"

Button icons in the trace operation area are valid to all opened traces simultaneously. Current trace can be switched through the trace switching button or through clicking "C 1" (or "C 2", "C 3", "C 4") directly. The data in the info window is that of the current trace. Or click C1/C2/C3/C4 at left upper corner to switch the trace.

After the scaling, switching the traces of different ranges will automatically be restored to 1:1. Switching the traces of the same range will not restore the scaling.

Click "delete" to remove the trace.

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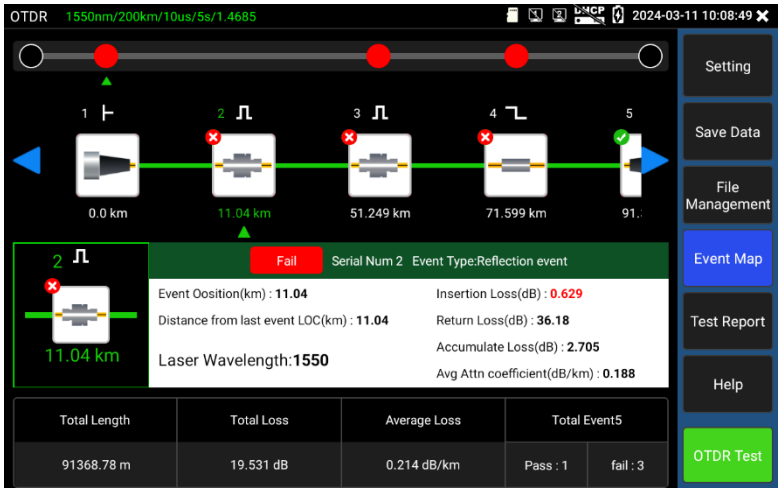
Event Map

Display the quantity of events, link loss, link length, link attenuation coefficient. Click again to switch to trace.



Initial Event: The starting point of link.

Reflection Event: Connector, reflection event is shown as peak signal.

Non-reflection Event: Fusion point or optical fiber bending, non-reflection event is shown as drop of optical power.

End Event: The terminal of fiber, the end event with reflection peak is the normal end.

End Event: Optical fiber bending, the end event with non-reflection peak is the fracture.

Test report

This can save trace trajectory, event, parameter, optical fiber link, and rules list information. It can save the 4 traces simultaneously and can create EXCEL or PDF file test report.

Loss test

Use short standard jumpers to connect the OTDR and OPM ports of the instrument respectively to set the reference value.

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After setting the reference value, let's talk about the optical device being connected to the OTDR and LS interface of the instrument.

It is used to test the insertion loss of optical passive devices.

Click loss test of optical fiber test to enter interface.

Calibration

Connect standard jumper to meter's OTDR and LS port, click "Start", after power is stable, click "Reference."

After setting the reference, connect the tested optical device to meter's OTDR and LS port, click "Start". The relative power on the interface is the insertion loss value of the tested device.

Please calibrate before each test, the test results will be more accurate.

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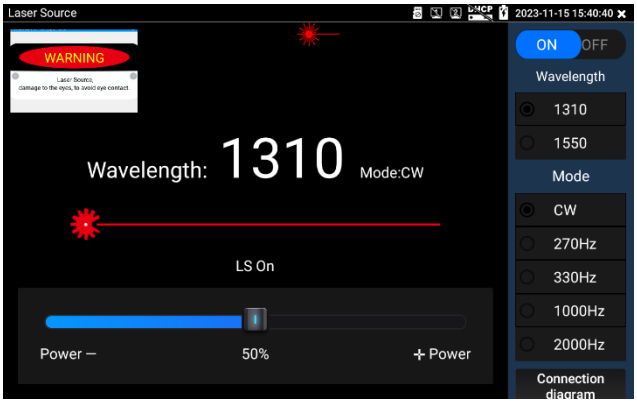
Laser source

Laser source output is a stable power laser with the same wavelength as the OTDR function.

Which can be used for engineering and maintenance of optical fiber communications and CATV, fiber parameter settings, and the production and research of optical components.



Open/Off: Turn on/off the laser source.

Wavelength: 1310/1550/1610 are optional, the wavelength is the same as the OTDR module

Mode: Switch the frequency of laser source, CW/270Hz/330Hz/1000Hz/20000Hz

Power: Move the slider to adjust the power, the power range is 1-100

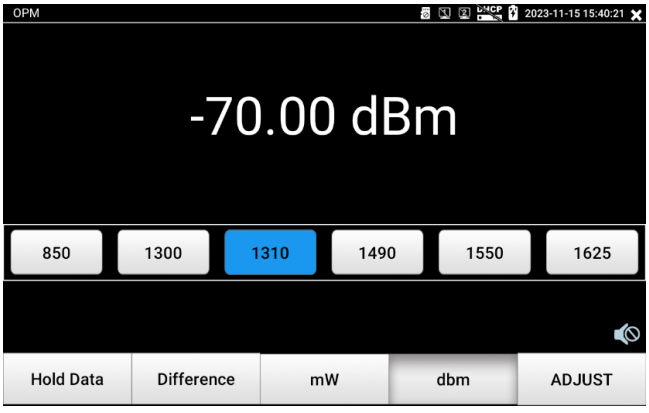
WARNING: Please don't look at the laser directly, it will damage the eyes.

Stability: CW, ±0.2dB/15min (evaluated after 15 minutes since the laser source powered on)

Optical power meter

Click icon  to enter with six available wavelengths: 1625nm, 1550nm, 1490nm, 1310nm, 1300nm, 850nm. Linear or nonlinear optical power display for optical power testing and Fiber link loss relative measurement. It is a necessary tool for installation and maintenance of optical fiber communication, cable television and CCTV security system.

Note: Please keep the fiber connector and the dust cap clean and clean the detector with the isopropyl alcohol.



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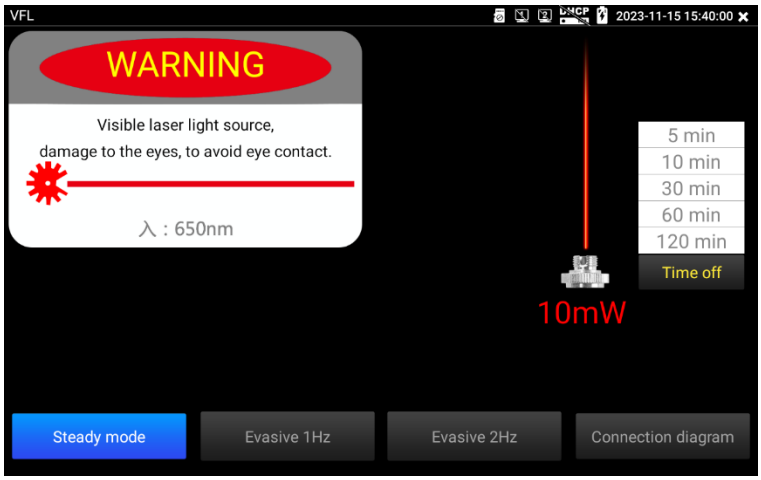
Visual Fault Locator

Click icon  to enter.

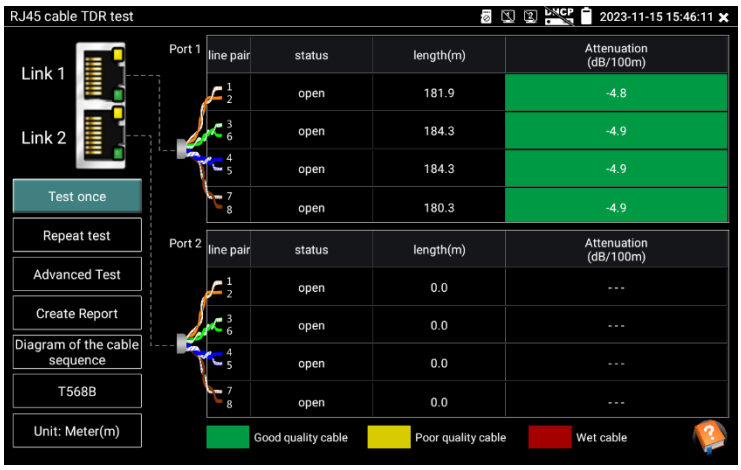


VFL has four states that can be selected: “Steady mode", "Evasive 1Hz", "Evasive 2Hz" and "Time off". Click "Steady mode" to enter steady status. Click "Evasive 1Hz" or "Evasive 2Hz" to enter pulse mode. Click "Time off” to turn the VFL off. Timed turn off can select from five durations: 5 mins, 10 mins, 30 mins, 60 mins and 120 mins.

After clicking "Steady mode", the red laser source emits a steady beam. Click again to quit.

RJ45 cable TDR test

Connect one end of the cable to the LAN port of the tester. The other end connects to another device. Enter “RJ45 cable TDR test” app to test a cable’s length, status, attenuation, impedance and skew. When testing a cable’s length, please don’t connect any device. The max measurement length is 180 meters.



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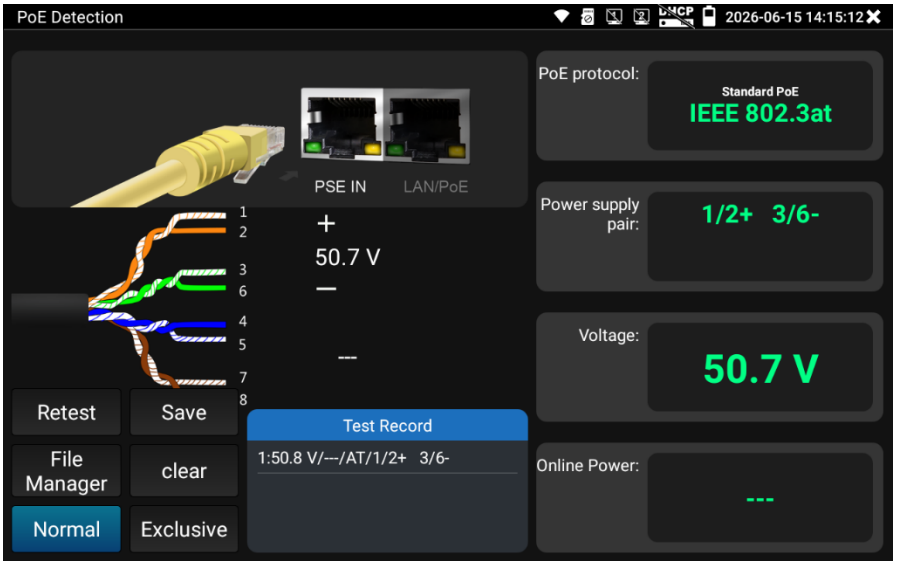
PoE Detection



Connect a network cable from a PoE switch to the Tester's PSE IN port. Connect an IP camera or other PoE using node to Tester's LAN port, the PoE voltage and the cable's pin connection status show on the screen.

⚠ **Note: This test if for measuring the voltage being drawn by the PoE node and the Tester must be between the PoE switch and the PoE node for this test to work**.

Note: The PoE switch must be connected to the PSE IN port. The powered device such as IP camera or other PoE node must be connected to the LAN port.

⚠ **Note: Do not connect PoE power supply equipment (such as a PoE switch) to the tester's UTP/SCAN port, otherwise it will damage the tester.**

PSE transmission

When PoE / PSE voltage testing, PoE/PSE connect to the tester's PSE "IN" port, the camera connect to tester's LAN port, tester not only can transmit voltage to supply power for camera, but also transmit data at the same time, as well as the computer connect to the PoE/PSE, it can log in connected tester's PoE camera.

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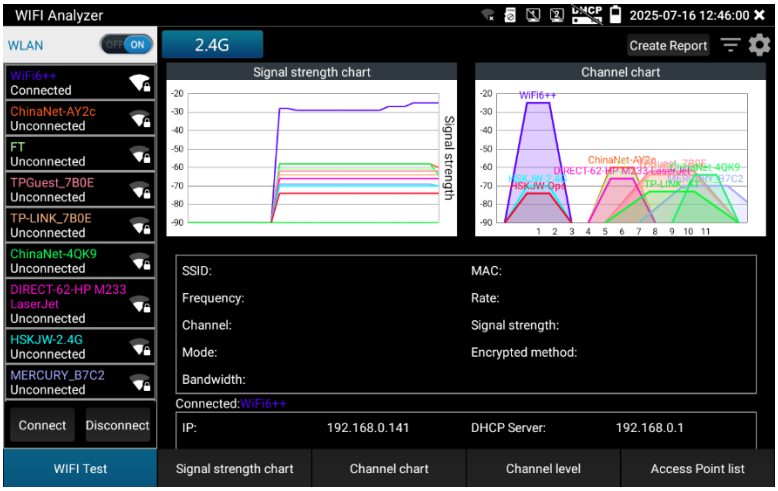
WIFI Analyzer

Detect the surrounding wifi signal and signal strength, support 2.4G frequency band.



Access point list and List format, display WIFI's channel, frequency, signal strength, device information and distance, etc.

OTDR with Live Fiber

Installation Instructions

Specifications

OTDR Technical Specifications								
Wavelength (nm) **Optional ***	1310/1550 or 1310/1550/1625				1610			
Dynamic range(dB)[2] **Optional***	28/26	30/28	32/30	34/32/30	28	30	32	34
Pulse width (ns)	3,5,10,20,30,50,80,160,300,500,800,1000,2000,4000,6000,10000,20000							
Event blind zone (m)[3]	≤0.8m							
Attenuation blind zone (m)[3]	≤3m							
Linearity (dB/dB)	±0.05 dB/ dB							
Loss threshold (dB)	0.05							
Loss resolution ratio (dB)	0.01							
Minimum distance resolution	0.03							
Sampling point(K)	32-128k							
Distance uncertainty (m)	±(1 m + 5×10^{-5}× distance + sampling interval)							
Distance scope (km)	0.1,0.5,1,2,5,10,25,60,120,180,260							
Measurement duration	5s-30min, Real time							
File format	SOR standard format/PDF/EXCEL							
Storage	FLASH (EMMC)8G + TF card							
Interface type	SC/FC-UPC							

Remarks:
1. The technical specification describes the ensured performance of the instrument when using typical UPC model connector to measure, without considering the uncertainty caused by optical fiber refractivity.
2. Dynamic range is the data measured under the condition of the maximum pulse width and 3 minutes of average time. Dynamic range is the data measured under the condition of 200km/20000ns/3min.
3. Measuring conditions of blind zone: reflection event is within 5Km, reflection strength is 45dB. Measured by the minimum pulse width.

Note: "*" sign means functions are customizable. The data above is only for reference and any change of them will not be informed in advance. For more detailed technical inquiries, please feel free to contact us.

OTDR with Live Fiber

Installation Instructions

Specifications		
Size & Display	7-inch IPS touch screen display, 1280*800 resolution	
Network Port	10/100/1000M auto adapt	
Wi-Fi	Built in 2.4G WIFI, speeds150M	
RJ45 Cable TDR Test	Test cable's length, status, attenuation, impedance and skew, etc. Max testing up to 180 meters	
Power Output	5V 2A power output	
UTP Cable Test	Test UTP cable connection status and display on the screen. Read the number on the screen. detect the near-end, mid-end and far-end fault point of RJ45 cable connector, also can test shield cable	
Network Test	Trace route, Link monitor, DHCP server, port flashing, Ping test	
Digital Cable Tracer	Search BNC cable, network cable and telephone cable from the mess cables.	
Electroscope	Voltage Range	AC12-1000V
	Frequency	50/60Hz
	Alarm Type	Sounds and light double alarms
	Level	CAT.III 1000V / CAT.IV 600V; CE
Visual Fault Locator	10mW visual fault locator with 650nm wavelength, emit red laser sources to test multi-mode and single mode fiber's bending and breakage, test range 8KM	
Optical Power Meter	Wavelength:1625,1550nm,1490nm,1310nm,1300nm,850nm, measurement range, -70 ~ +10dBm, for optical power testing and Fiber link loss relative measurement	
Power		
External Power Supply	DC 12V （1A）	
Battery	Built-in 7.4V 7800mA Li-ion Battery	
Rechargeable	After charging 2.5 hours, normal working time 11 hours	
Parameter		
Operation Setting	OSD menu, select your desired language: Chinese, English, etc.	
Auto Off	5-30 (mins)	
Working Environment		
Working Temperature	-10℃---+50℃	
Working Humidity	30%-90%	
Dimensions	264mm x 182mm x 43mm	
Weight	**1Kg**	

Package Includes:

1. Tester
2. Cable tracer
3. Adaptor DC12V 1A
4. Li-ion battery (7.4V 7800mAh
5. Tool bag / DC12V power cable/BNC cable/ RS485 cable/RS485 port/ audio cable/ safety cord
6. SC connector, FC connector, Fiber test head
7. BNC alligator clamp
8. RJ45 to BNC connector
9. OTDR test report
10. User manual