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OTDR

Optical Time Domain Reflectometer

User Manual

Foreword

Thank you for purchasing our OTDR (Optical Time Domain Reflectometer).This manual ma information of the general operation and maintenance of the OTDR, as well as the common troubleshooting guides. To ensure correcting use, please read carefully before beginning operation and follow the instructions in this manual.

This manual is for use only in conjunction with this instrument. Any unit or individual that is not authorized by our company may not tamper with, copy or distribute the contents of this manual for commercial purposes.

The contents of this manual are subject to change without notice. If you have any questions, please call the supplier, we will be happy to provide you with the best quality service.

Safety Tips

Charger：

Input: AC 100V ～ 240V，50/60Hz;@0.3A～0.5A。

Output: DC 8.4V,1A～2A,Polarity: positive inside, negative outside

Please use the charger in strict accordance with the specifications, or it may cause damage to the equipment

Battery:

Special lithium battery is used in the instrument. In order to fully utilize the performance of the battery, when using the OTDR for the first time, please exhaust the battery and then charge the battery. The first charging time should be no less than 8 hours. The charging temperature of the internal battery is from 0 °C to 50 °C. When the ambient temperature is too high, please terminate the charging for your safety. When the instrument is unused for more than 2 months, it should be charged in time to maintain the battery power; do not remove the battery; please do not let the battery close to the fire source or strong heat; do not open or damage the battery; Temperature for long-term storage of the battery is -20 °C ~ 45 °C.

Laser Safety：

When using the OTDR, please pay attention to avoid direct view of the laser output port, and do not look directly at the end of the fiber during testing; After used the OTDR, please cover the dust cap. When the visible fault locator function is turned on, please do not look directly at the output port of the VFL; and do not look directly at the end of pigtail connected to VFL port to avoid the damage to eyes.

Features：

1. Multi-wavelength: 1310/1550/1625/1490/850/1300nm
2. Multiple dynamic range: 42/40/38/35/32/30/26dB
2. 7 inch LCD screen
4. Capacitive touch screen, sensitive control
5. Data save as SOR format
6.OTDR, Optical Power Meter, Optical Light Source, Visual Fault Locator, Event Map, Fiber Microscope, all-in-one function
7. Equipped with PC data analysis and simulation software, can process, generate and print test reports in batch.

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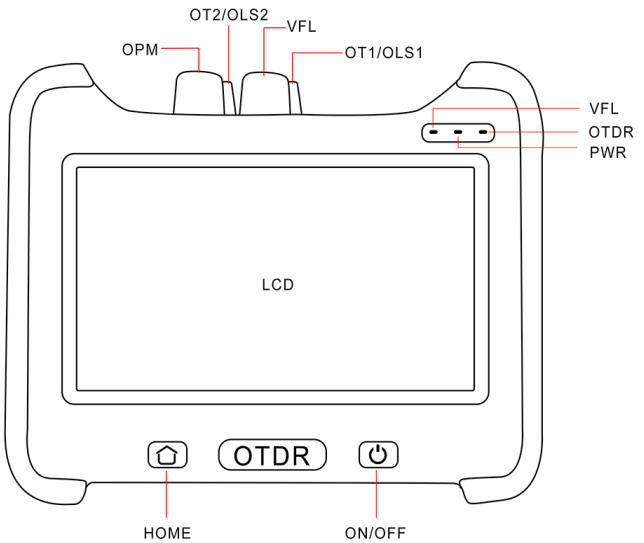
1.Specification

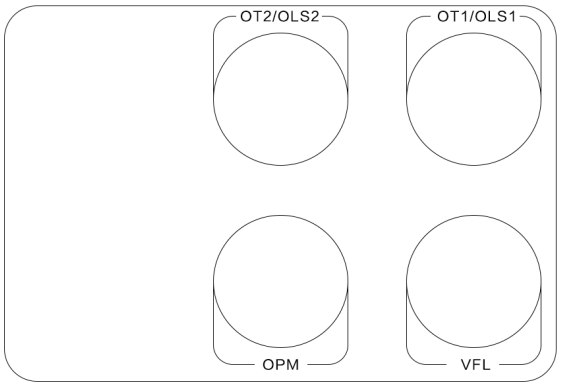
Type	TMO350-S0	TMO350-S1	TMO350-S2	TMO350-M1	TMO350-T1	TMO350-T2	TMO350-SM1
Testing wavelength	1310/1550nm	1310/1550nm	1310/1550nm	850/1300nm	1310/1490/1550nm	1310/1550/1625nm	850/1300/1310/1550nm
Dynamic range	32/30dB	35/33dB	38/36dB	26/28dB	38/35/36dB	38/35/36dB	28/30/42/38dB
Event Dead Zone	0.8m	0.8m	1m	1m	1m	1m	1m
Attenuation Dead Zone	4m	4m	4m	5m	4m	5m	5m
Pulse Width	3ns, 5ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1μs, 2μs, 5μs, 10μs, 20μs						
Testing Distance	500m, 2km, 5km, 10km, 20km, 40km, 80km, 120km, 160km						
Measurement Time	Use-defined (smart link) ; with real-time measurement function						
Linearity	≤0.05dB/dB						
Loss Threshold	0.01dB						
Loss Resolution	0.001dB						
Distance Resolution	0.01m						
Sampling Resolution	minimum 0.25m						
Sampling Point	Maximum 128,000 points						
Distance Accuracy	±(1m+measuring distance×3×10^{-5}+sampling resolution)						
Internal visual source	10mw, CW/1Hz / 2Hz						
Stable laser source	>-6dBm						
DataStorage	80000 groups of curve						
Interface	3 USB port						
Display	7 inch capacitive touching screen						
Battery	7.4V/6.6Ah lithium battery, continuous 8-10 hours						
Working Temp	-10℃~+50℃						
Storage Temp	-20℃~+75℃						
Relative Humidity	≤90%, non-den						
Dimension	230×185×70mm / 1.5kg						
Accessories	Main unit, 8.4V power adapter, Lithium battery, FC adapter, USB cord, User guide, CD disk, carrying case						
Option	SC/ST, Bare fiber adapter						

2. Interface and Function

2.1 Front panel

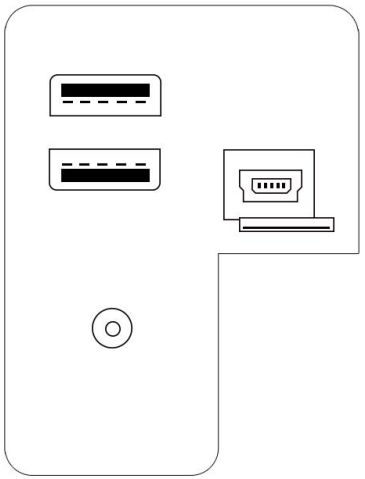


2.2 Top Interface



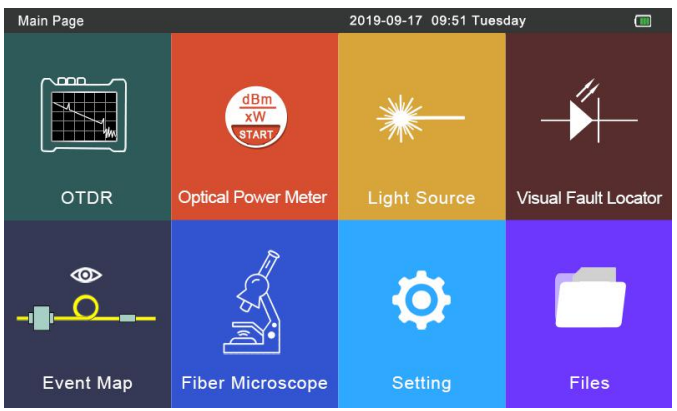
2.3 Bottom Interface

USB data transmission interface, device charging interface



3. LCD display

Main Page



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4. Operation

4.1 ON/OFF & Charge

Turn on: Press ⏻ on the front panel for 2 seconds. If the instrument starts normally, the PWR indicator will light and the LCD will display the home page.

Turn Off: Press the OFF button, the display shows: Confirm to turn it off? Yes: OK; NO: ESC

Turn off by force：when the tester works abnormally, press ⏻ for 6 seconds to turn off the tester by force.

During normal use, the battery level will be displayed at the upper right corner of the OTDR. When the battery level is too low, the battery level symbol will turn red as warning. Please charge it with the charger provided by factory. The remaining charge will be displayed at the top of the screen. The red color of LED on the charger indicates that charging is in progress, and the green color means it is already fully charged.

After turning on the OTDR, please enter into the system settings from the main menu, set the parameters like date, time, backlight, brightness, auto power off time and other information.

4.2 Connect the fiber

Note: Light is emitted from the light source port of the instrument. In any case, the optical interface of the OTDR and the end of the pigtail connected to the optical interface are not facing the eyes of the operator or other personnel, otherwise the eyes may be injured. Even blind!

Before connecting the fiber, please check whether the connector type matches or not, and also check whether the connector is clean or not; both the unmatched connectors and the contaminated connectors can cause inaccurate measurements and can even damage the the instrument. The correct way is to clean the jumper, especially the surface with absolute alcohol before inserting the fiber optic connector (jumper). After the alcohol has evaporated, connect it to the instrument.

If the light source port is not connected to the fiber optic cable, immediately cover the dust cover to prevent dust from adhering to the light output port of the instrument.

4.3 Setting measurement conditions

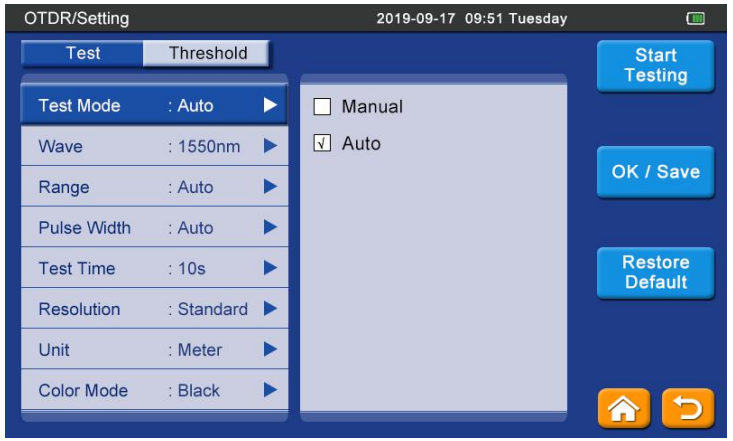
4.3.1 Auto Test

1.Press OTDR/parameters button

2.Choose wavelength

3.Choose Test Mode

4.Choose Automatic test



4.3.2 Manual Test

The manual test is a professional test mode, and operators can set the test conditions according to the actual condition of the fiber.

1.Press OTDR/parameters
2. Choose Test Mode: Manual
3. Choose suitable parameters

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Experienced engineers can select the most suitable measurement parameters; according to t accumulated experience of the measurement and the situation of the field curve, which can ir measurement efficiency and quickly find the fault point.

4.4 Test

1.PRESS OTDR Setting menu " start Test" to proceed the test.
2.Press the "Test" button in the top of the menu bar above to test (test according to the last set value)

4.5 Checking curve analysis test result.

After the test is completed, measuring the curve.
Measuring information results and events
The list will be displayed.
The corresponding event on the curve will be marked accordingly.

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4.6 Measure Distance and Average Loss

OTDR/Operation, choose cursor A , cursor B, or cursor AB, move the cursors to left or right through press the direction keys, the distance and average loss between B-A will display in the gray area above the curve

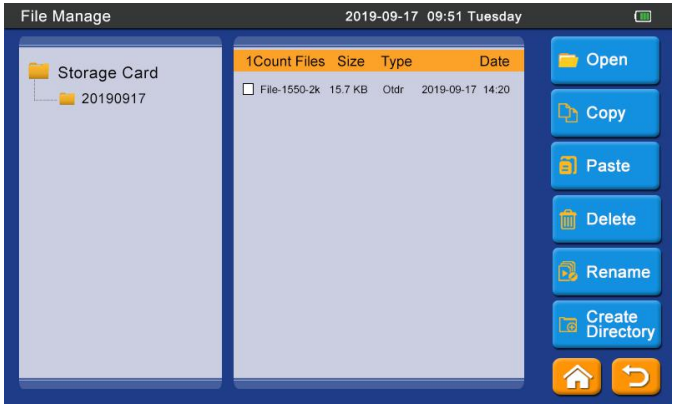
4.7 Save& Browse&export record

4.7.1 Save record

After the curve testing is completed, click “File” → “Save”, or “Save As” to pop up the measurement result save prompt box. You can edit the file name prefix according to the test position through the keyboard, input the file name start number according to the line number, and directly press “Save”. The “Save” button will automatically add 1 to the line number.

4.7.2 View Record

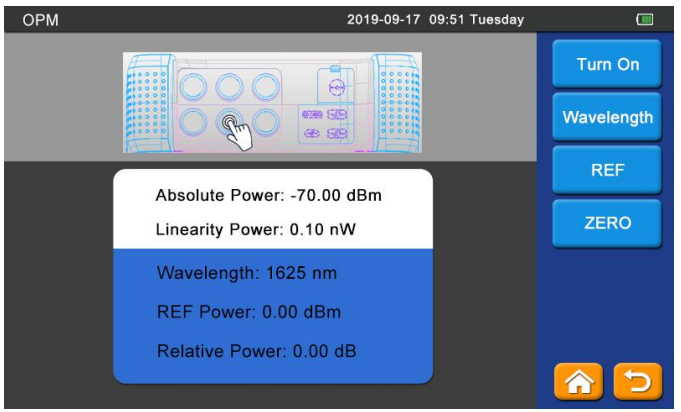
Save the recorded local browsing into the main menu of this instrument / File Management w shown on the below



4.7.3 Data Upload

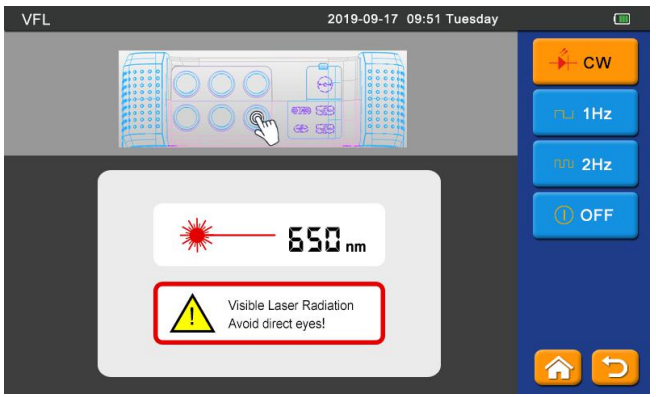
To export the measurement results, insert connect the USB to the top of the OTDR, turn it on, enter the main menu/File Management/Copy, and paste the test record saved by the instrument to the USB.

5.Optical Power Meter



Proceed the test setting on the right side of the list and the test results are intuitive. When there is a deviation, clean the connector first.

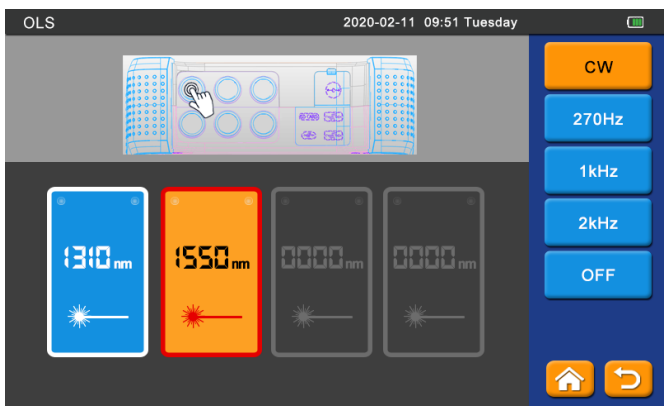
6.VFL(Visual Fault Locator)



CW：continuous light; OFF：turn off the light; 1Hz：Slow Blink; 2Hz：Fast Blink

Reminder: When using the VFL function, Do not see directly to the optical interface of the instrument and the end of the pigtail connected to the optical interface , otherwise it may hurt the eyes or even blind!

7.Optical Light Source



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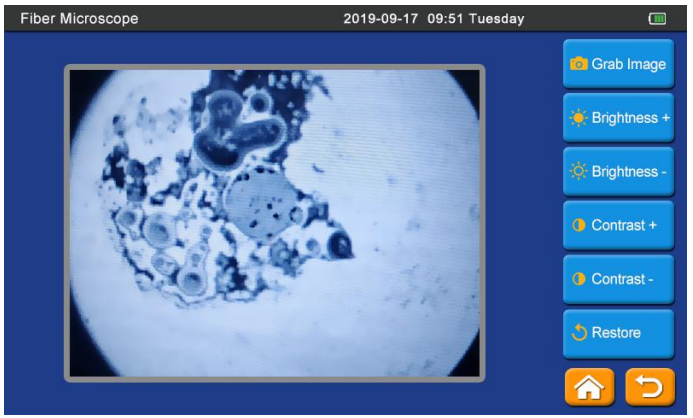
According to the test requirement, choose the suitable wavelength.

CW:Continuous light output，0Hz。

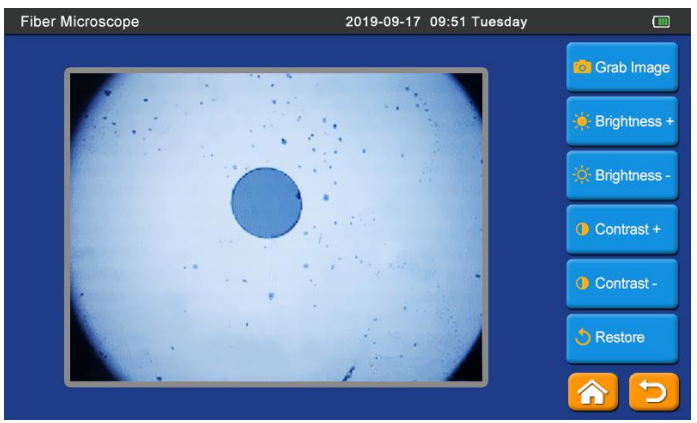
270Hz，1kH and 2kHz are Non-continuous light output, Simulate actual data signal transmission.

8.End surface inspection

It can quickly detect the fiber end surface to grasp the fiber end condition. The precise focus picture is clear.
Detect the picture before cleaning.



Detect the picture after testing.



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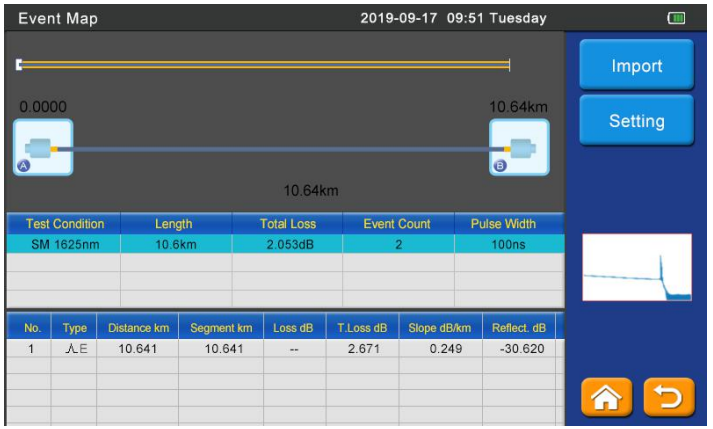
9.Event Map

By importing the corresponding SOR file, the event map graphically displays the link status of the fiber according to the event list. The connector type is displayed as accurately as possible by setting the attenuation threshold of the corresponding connection point.

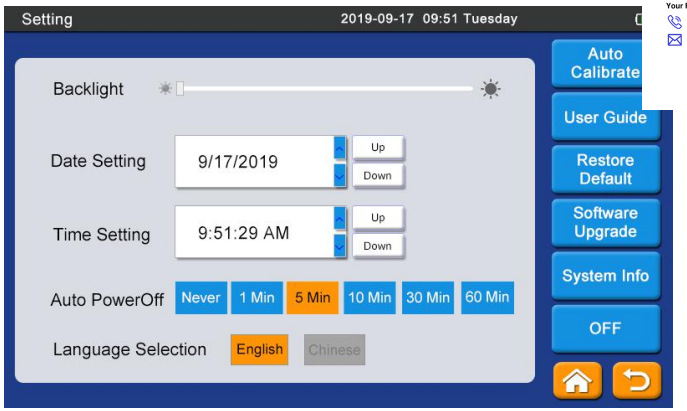


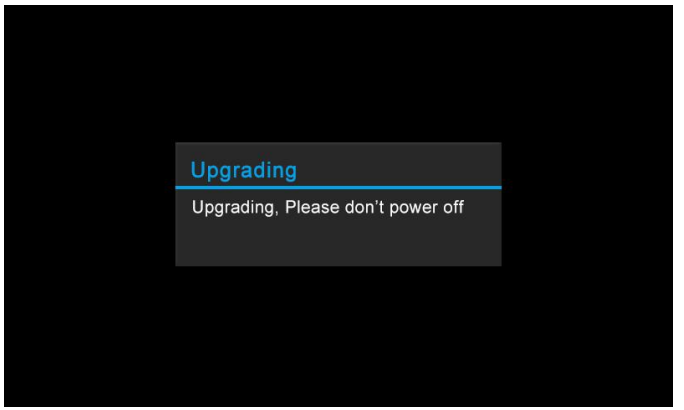
10.Upgrade software

The OTDR can be upgraded by plugging in a USB disk (the upgrade software must be in the root directory) on the USB interface

step:

1. Computer downloads the update file to the USB disk;
2. Connect the USB disk into the OTDR USB interface;
3. Turning on the OTDR and entering the system settings menu, press “Software Upgrade” to confirm the automatic upgrade.





11. Simulation analysis software

The device is equipped with simulation analysis software, which can preview the curve from computer, offline curve analysis and preview and print the curve. It is convenient for operators to manage and maintain the data of fibre link.

11.1 Batch read and storage of test data

The terminal simulation analysis software has a data batch processing function, which can perform batch printing processing on user test data.

Turn on the OTDR and entering into the main menu / file management / copy, paste the test record saved by the OTDR into the USB disk. Connect the USB disk to the computer and select the print file through curve preview. Report can be printed in batch after the selection is completed. It is convenient for users to submit test data.

11.2 Print Test Report

Can check the OTDR test report through print preview. The test report contains the information such as test conditions, test curves, link loss, average loss, event list, etc., and the test reports can be batch printed after confirmation.

The software can open, print preview, and print curves through files.Through the report wizard, you can set to print multiple test curves per page. The test report is shown as below:

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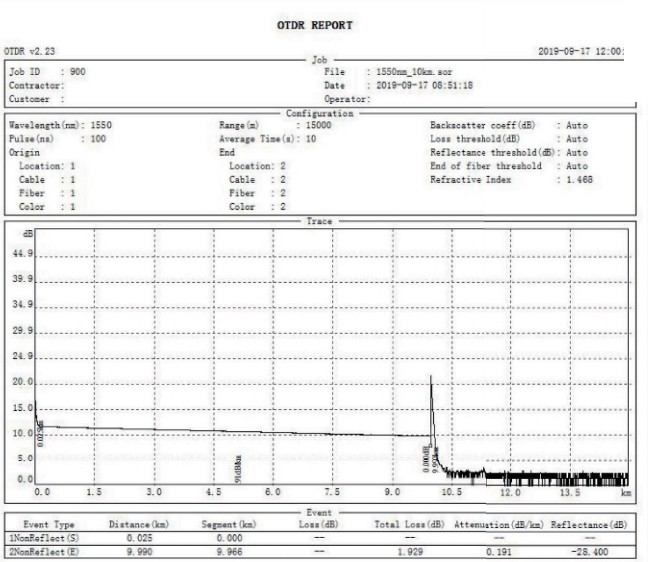

OTDR REPORT

OTDR v2.23 2019-09-17 12:00:

Job
Job ID : 900
Contractor:
Customer :
File : 1550nm_10km.sor
Date : 2019-09-17 08:51:18
Operator:

Configuration
Wavelength(nm) : 1550
Pulse(ns) : 100
Origin
Location: 1
Cable : 1
Fiber : 1
Color : 1
Range(m) : 15000
Average Time(s) : 10
End
Location: 2
Cable : 2
Fiber : 2
Color : 2
Backscatter coeff(dB) : Auto
Loss threshold(dB) : Auto
Reflectance threshold(dB) : Auto
End of fiber threshold : Auto
Refractive Index : 1.468

Trace

Event

Event Type	Distance(km)	Segment(km)	Loss(dB)	Total Loss(dB)	Attenuation(dB/km)	Reflectance(dB)
1NonReflect(S)	0.025	0.000	---	--	---	---
2NonReflect(E)	9.990	9.966	---	1.929	0.191	-28.400

12. Maintenance and troubleshooting

12.1 Clean connectors

The optical output interface of this OTDR is a replaceable universal interface, the connector should be kept clean during using. When the device fails to test the normal curve, or the test result is inaccurate, please consider cleaning the connector firstly.

When cleaning, be sure to turn off the OTDR and VFL functions. Unscrew the connector and wipe the connecting end face with a special dust-free paper towel or cotton swab moistened with alcohol.

At the same time, after using the instrument, please cover the dust cap to keep the connector clean.

12.2 Clean Display

The screen of this OTDR adopts 7inch touching LCD **screen**. Please don't use the sharp things to click, otherwise will damage the LCD screen. When cleaning, operators can wipe the LCD screen with a soft paper. Do not wipe the LCD with an organic solvent, as this may cause damage to the LCD **.**

12.3 Calibration

It is recommended to calibrate the OTDR every two years. Please contact the supplier for specific calibration items.

12.4 Trouble shootings

Fault	Reasons	Solutions
Can't turn on	Low power	Charge the battery and observe the charger indicator. If CHR LED is red continue charging. Otherwise, contact the supplier.
Can't be charged properly	The use environment does not meet the charging conditions	Charge the device in an environment of 0 ° C ~ 50 ° C
	Battery problem, or internal circuit problem	Contact the supplier to replace the battery
Unable to measure normal curve	Parameter settings are incorrect	Reset the correct test parameters
	The end of the fiber is contaminated	Clean the end face of fiber
	Connector of device is damaged	Change the connector
	Connectors do not match	Change the matched connector
The test curve has a large burr.Waveform is not smooth	Output connector is not connected correctly	Reconnect the appropriate output connector
	Pulse width is too low	Increase value of pulse width
Saturated (flat top) phenomenon at the front end of the test curve	Pulse width setting is too large	Reduce value of pulse width
At the beginning of the test curve, the reflection peak drops slowly and tailing occurs.	The end of the fiber is	Clean the end face of fiber
	Connector of device is damaged	Change the connector
	Connectors do not match	Change the matched connector
Unable to test reflection peak of fiber end	Range of setting too low	Increase value of range
	Pulse width is too low	Increase value of pulse width
False report of test curves	Quality of test curve is bad; Event threshold setting is too small	Increase value of test pulse width and increase the value of event threshold
The measured fiber length is not accurate	Parameter settings are incorrect	Reset the appropriate parameters
	Refractive index setting is not	Reset fiber refractive index
The measured average fiber loss value is not accurate	The front end of the test curve is	Clean end face of fiber interface
	The cursor position is not set	Reset cursor position

● The above description is for reference only. Please refer to the new instructions for detailed usage. If you have any questions during the use of the device,please contact the supplier to resolve it.

● During the use of the OTDR, It is forbidden to disassemble the device without authorization, otherwise the warranty will be lost!

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13. Packing List

NO	Name	Qty
1	OTDR	1
2	AC/DC Charger	1
3	USB data cable	1
4	FC adaptor	1
5	SC adaptor	1
6	User manual	1
7	CD	1
8	Calibration certificate	1
9	Cleaning cotton swab	1

Note: The default connector of this OTDR FC/UPC, and the FC/APC type is optional. The above contents are subject to change without notice due to the need for design improvement.

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