Optical Time Domain Reflectometer
USER'S MANUAL

SP-OTDR32F-T1 Series

SHENZHEN SPEEDWOLF TECHNOLOGY CO.,LTD

(V2018.1.2)

Thank you for purchasing our SPEEDWOLF OTDR (Optical Time Domain Reflectometer) SP-OTDR32F-T1 Series.This user's manual contains useful information about the instrument's functions and operating procedures of the OTDR. To ensure correct use, please read this manual thoroughly before beginning operation. After reading the manual, keep it in convenient location for quick reference whenever a question arises during operation.

Foreword

Note

The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functions. The figures given in this manual may differ from those that actually appear on your screen.

Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest SPEEDWOLF dealer.

Copying or reproducing all or any part of the contents of this manual without our company's permission is strictly prohibited.

Safety Precautions

To use the instrument safely and effectively, be sure to observe the precautions given in the user's manual. Not complying

Before test with OTDR module please ensure there is no active signal in optical network under test, any signal which power is higher than 0dBm will permanently damage this meter and this kind of damage are not within the scope of free warranty!

Warning

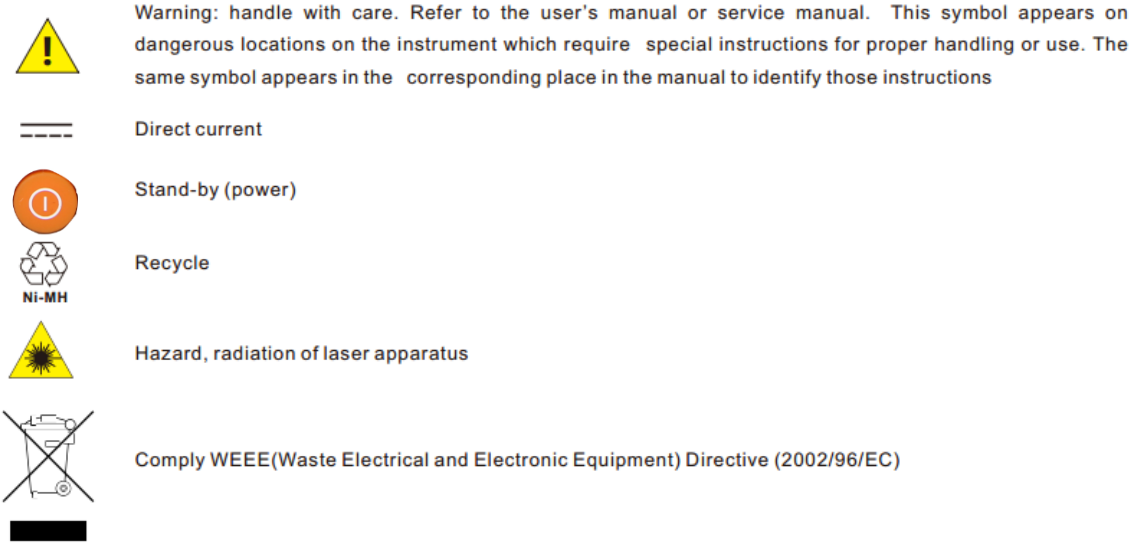
- Use the Correct Power Supply
- Before connecting the power cord, ensure that the source voltage matches the rated supply voltage of the AC adapter and that it is within the maximum rated voltage of the provided power cord.
- Use the Correct Power Cord
- Use only the power cord that comes with the instrument. Do not use it for other devices.
- Use the Correct AC Adapter
- Use only the AC adapter specified for the instrument. Do not use it for other devices.
- Use Only the Designated Battery pack
- Use only the battery pack specified for the instrument. Do not use it for other devices.

- Do Not Look at the Laser Light
- Do not look at the laser's direct ray, reflected ray from a mirror, or indirect ray without the proper protective eyewear. In addition, avoid being exposed to the laser light. It can cause blindness or damage to the eye.
- Do Not Operate in an Explosive Atmosphere
- Do not use the thermocouple in a location where any flammable or explosive gas/vapor is present. Operation in such an environment constitutes a safety hazard.
- Do Not Remove Covers
- The covers should be removed by qualified personnel only.
- Opening the cover is dangerous, because some areas inside the instrument have high voltages.
- Carrying and Moving the Instrument
- Remove all power cords and connection cables from the main unit before moving the instrument. When carrying the instrument, hold it firmly by the handle. Also, if storage media is inserted into the instrument, always remove the storage media before carrying or moving the instrument. Never leave the media inserted when carrying or moving. The storage media can become damaged.

Icons on the main body or in manual

Symbol

Icons on the main body or in manual



1. Introduction:

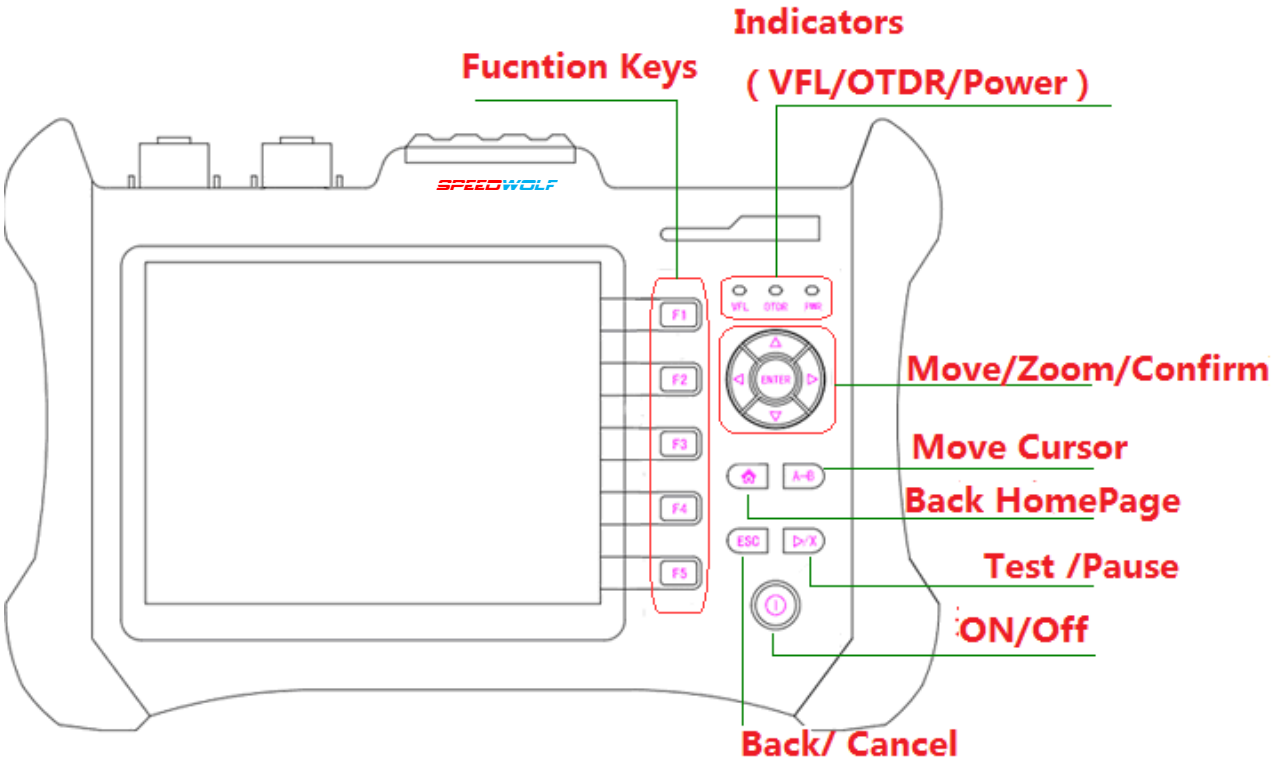
1.1 Standard Accessory

SP-OTDR32F-T1 Series OTDR standard accessory showed in next table.

NO	Description	Qty

1	Charger	1pc
2	Data Cable	1pc
3	CD (Software+ manual)	1pc
4	Carry Case	1pc
5	Cleaning Cotton	1pc
6	SC FC connectors	1 set

1.2 Introduction of keys



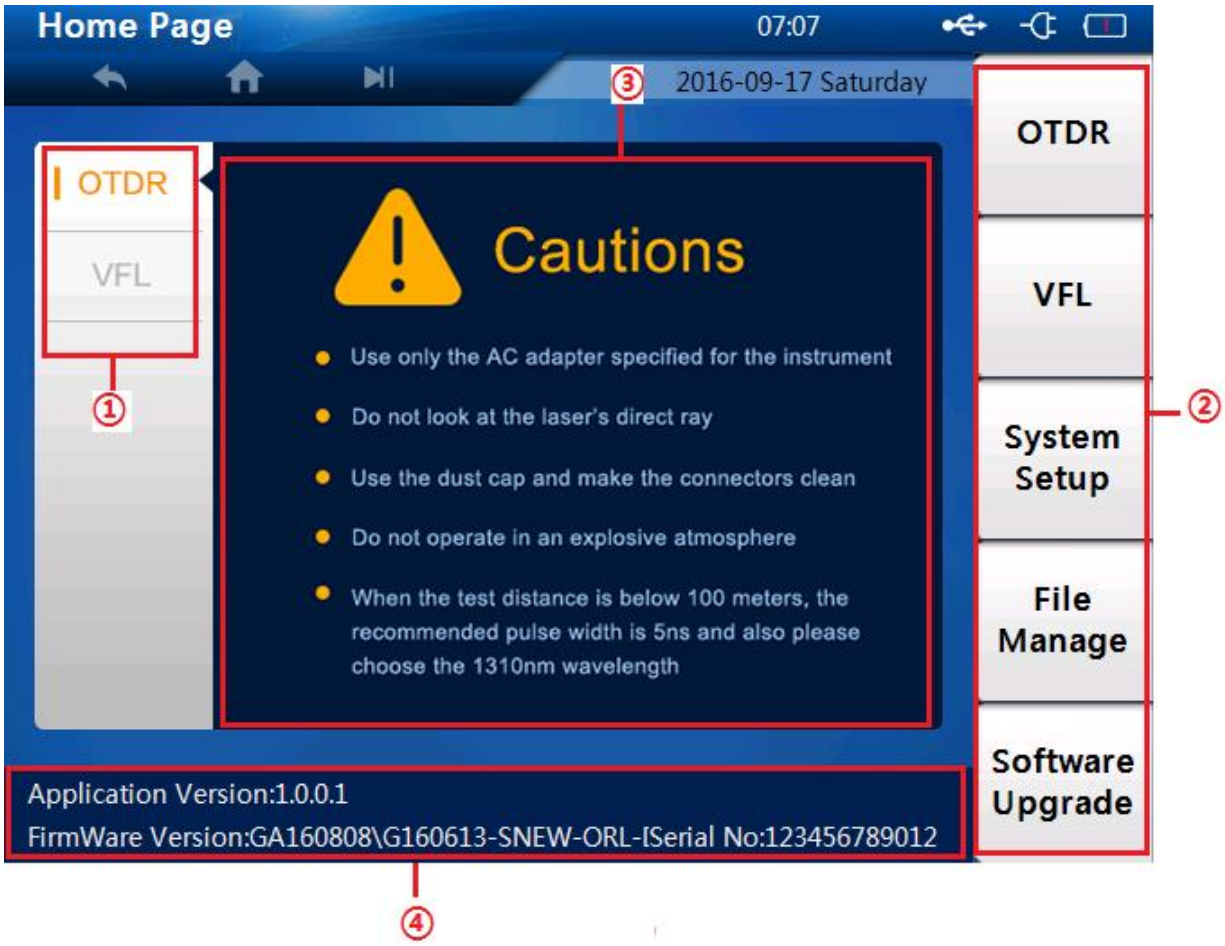
NO	Name	Functions
1	(F1-F5)	Function keys
2	【▲】/【▼】【▸】/【◂】	Move the Cursor
3		Turn On or Turn Off the tester
4	ESC	Exit from current page/Menu
5		Back to Home Page
6	Indicator LED	**Power LED** Indicate working state and charging state (Green-working state or fully charged, Red-charging) **VFL LED :** Indicate the working state **OTDR LED**: Indicate test state (green-averaging mode, red-realtime mode)
7	Power LED	Indicate working state and charging state (Green-working

		state or fully charged, Red-charging)

1.3 Introduction of connectors

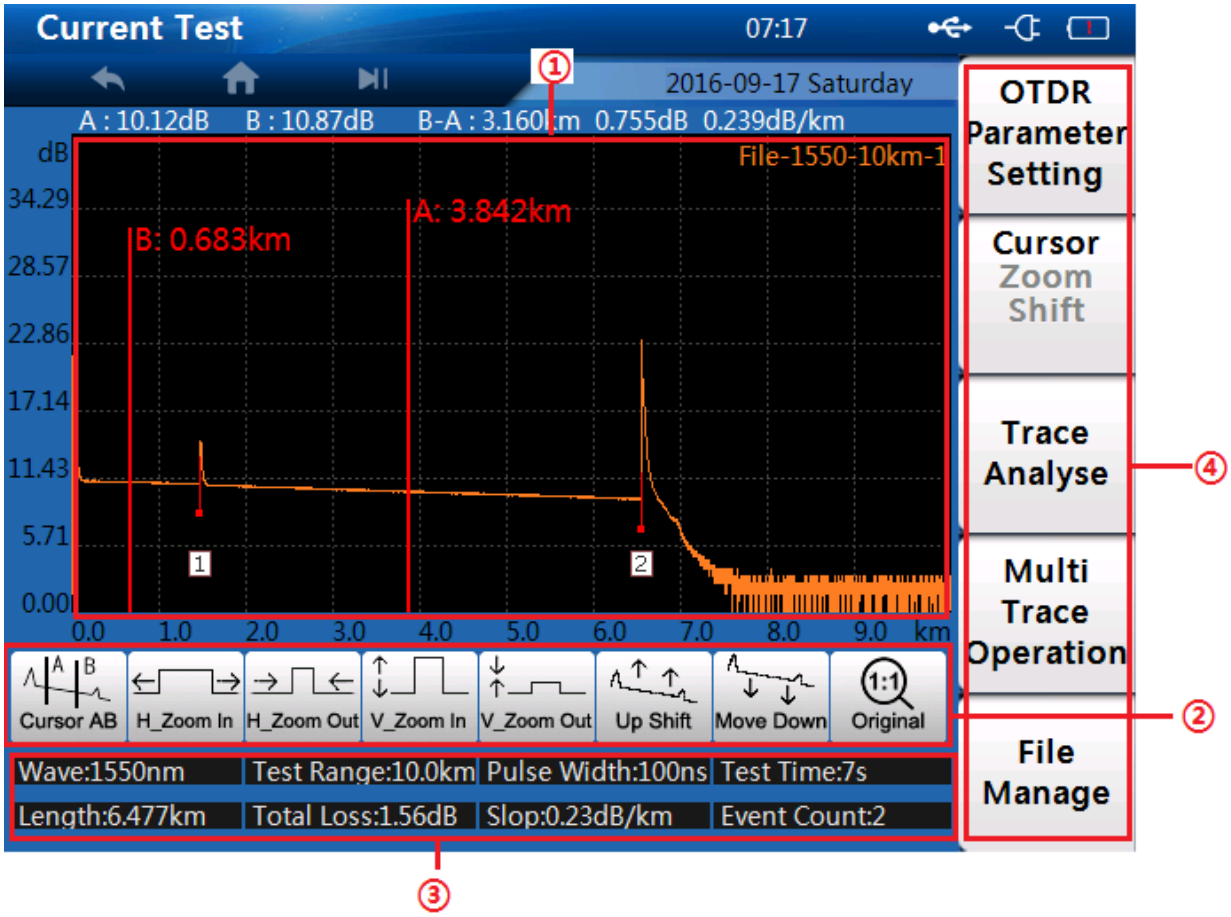
NO	Name	Functions
1	AC-DC Power Port	Connect to AC adapter
2	USB (B)	Remote control through PC
3	USB (A)	Connect external device like keyboard and FIM Probe
4	VFL	VFL module port
5	OTDR Test Port	1310/1550NM Laser source port

1.4 Introduction of Main Page:



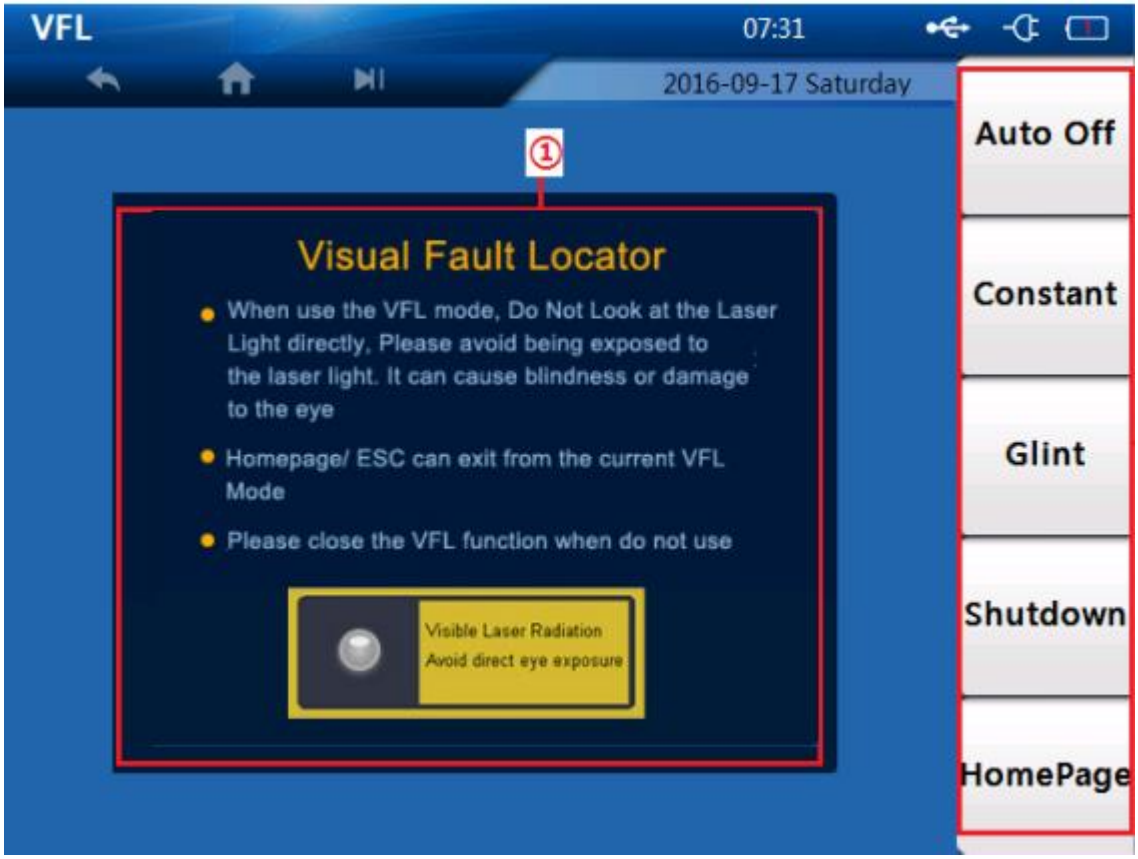
NO	Functions & Descriptions	
1	OTDR/VFL	Enter into the OTDR test interface or the VFL test interface
2	Functions Module	Enter into the relevant menus
3	Basic State Information Area	Display information of date ,time and power
4	Cautions On Main Page	The cautions when using OTDR

1.5 Introduction of Test Page



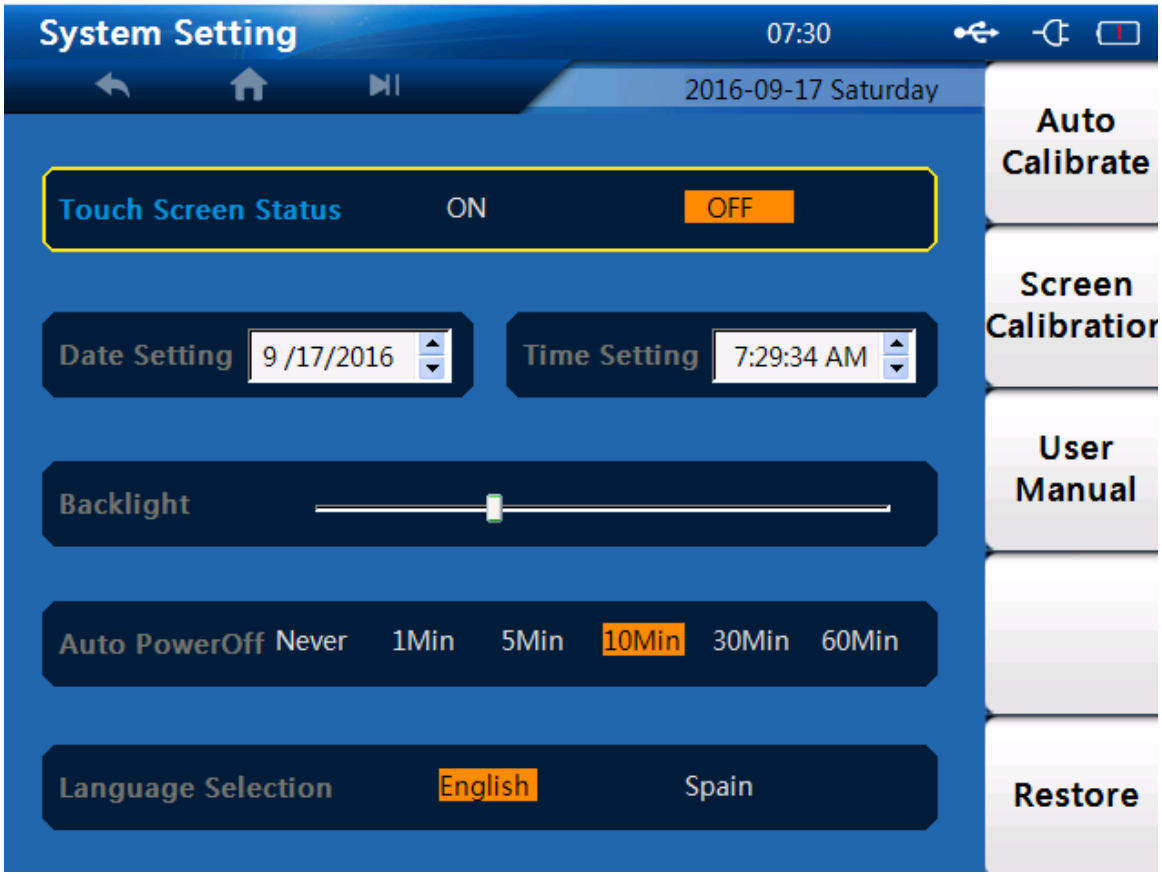
NO	Functions	Description
1	Curve Display Area	Display events and curves
2	Curve Operating Area	Move or Zoom the curves
3	Test Parameters Display Area	Display the current test wavelength; test range; pulse width; test time; Length, total loss and slop ration and the counts of events
4	Right-side Menu Area	Enter into the relevant menu: Parameters setting; switch cursors; Multi Curve Analysis; Milti Trave Operation and File Manage

1.6 Introduction of VFL Test Page



NO	Functions
1	Notes when using the VFL
2	VFL Operation menu（Constant/ Glint /Shutdown/ Back Homepage）

1.7 Introduction of System Settings:



Touching Screen Status	Turn On / Turn Off the touching Screen
Date Setting	Set the date, and the information also will affect the saved files/records
Time Setting	Set the time, and the information also will affect the saved files/records
Auto Off	Set the Auto Off time, or shut down this function
Backlight	Adjust the brightness of the backlight
Language Selection	We provide only one language according to customers choice (Here operators can not choose two languages)

2. Features and Specifications

2.1Features:

- Event Dead zone as lower as 1.5meter
- Combined multi dynamic range and wavelengths
- Muti measurement mode, support Touching LCD and pressing keys
- Warning function could prevent OTDR module from being damaged by optical signal in fiber.
- Realtime measuring function, convenient to monitor the splicing process
- Integrated 10mw Visual Fault Locator
- Support English/ Chinese input, adopts friendly input interface, totally simulate the computer keyboard input ,
- Integrated with 8GB internal memory, more than 80,000 groups curve storage
- PC remote access and control function is available , which support the printing work of the measurement report
- 5.6-Inch outdoor-enhanced touchscreen, 7.4V/6.6Ah Lithium battery

2.2 Technical specifications

Pulse Width	(SM 1310/1550NM) 5ns 10ns 20ns 50ns 100ns 500ns 1μs 2μs 5μs 10μs (MM 850/1300NM) 5ns，10ns，20ns，50ns，100ns，500ns，1us
Distance Range	(SM 1310/1550NM) Dead zone test, 1.3km, 2.5km, 5.0km, 10km, 20km, 40km, 80km, 120km (MM 850/1300NM):100m，400m，1.3km，2.5km，5km，10km，20km，40km，80km
Sampling Resolution	Minimum 0.05m
Sampling Point	128,000
Linearity	≤0.05dB/dB
Loss Threshold	0.01dB
Loss Resolution	0.001dB
Distance Resolution	0.01m
Distance Accuracy	±（1m+measuring distance×3×10 +sampling resolution）
Data Storage	20000 groups of curve
VFL	10mW，CW/2Hz
Interface	3 USB ports（Type A×2，Type B×1）
Display	5.6 inch TFT-LCD, Touching screen
Battery	7.4V/4.4Ah lithium battery , support 8 hours continuous working

Working conditions	Working Temp：-10℃~+50℃；Storage Temp：-20℃~+70℃；Humitity ：≤95%（non-dew）
Dimensions/Weight	253×168×73.5mm / 1.5kg（include battery）
Packing list	Straps; Adaptor; Lithium battery; FC connector; USB Cable; CD(softwar e and user manual); softbag; cleaning cotton

3. Working Principle

3.1. Purpose of Measurement

OTDR shows the back-scatter light power of the optical signal relative to the distance. With this information, the OTDR could measure a series of important information of an optical fiber such as the quality of the line, distance of the line and etc.

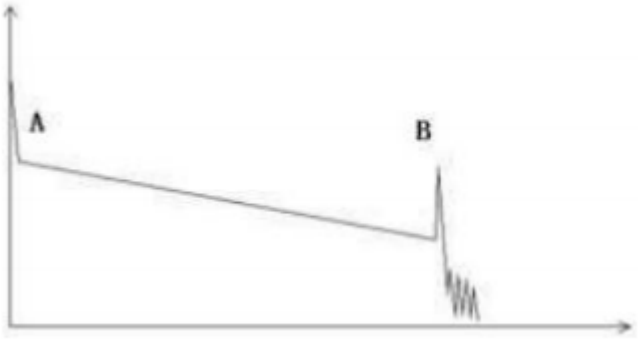
3.2. Content of Measurement

- Event position—a broken point or the end of the tested fiber.
- Optical attenuation coefficient of a optical fiber. Single event loss, such as the loss of a connection or a macro bending. Or the loss of a end-to-end line on the tested optical fiber.

3.3 Analyze of Curve

- OTDR can auto analyze a tested trace, the position process shows below:
- Get the reflection events generated by connectors or mechanical splicer.
- Non-reflection events(usually it is splicing points or macro bending).
- End: the first point which the loss of it is over the threshold would be scanned as the end of a trace.
- Events list: event type, loss, reflection and distance.

3.3-1Normal Curve



Normal Trace

A normal trace shows as above, the A mark is a start-peak and the B mark is a end-reflection-peak. The tested trace is oblique, the total loss will become bigger
with the increasing of the fiber length. The total loss(dB) divides total length is the

average loss(dB/km) of a fiber.

3.3-2Curve with Jumper Connected

Curve with Jumper Connected

If there is additional reflection peak in a tested trace, this may be caused by a connection point or some other reasons. Anyway, appearance of the reflection peak shows that the two connecting surfaces of the connection are smooth. The smoother the connection surfaces are, the higher the reflection peak is.

For an instance, if a broken optical line is under test, the OTDR trace will show a broken point. After a maintenance of this line, use the OTDR test it again, we may see a reflection peak replacing the broken point on the OTDR trace, this shows the maintenance is done.

3.3-3 Curve with Broken Point

Curve With Broken Point

If the tested trace is just like the figure shows above, this might be caused by several reasons like: a bad connection between the connector and the lunching port, the optical pulse cannot be launched into the optical fiber or a short distance broken point of the tested fiber from the initial connection and the preset testing distance and pulse width is larger.

To fix this problem, we should:

1. Check the connection of the connector and the launching point
2. Reset the test parameters; decrease the preset distance and the pulse width.

If the problem still exists, we could estimate:

1. The connector of the test fiber is broken or polluted.
2. The launching port on the OTDR is broken or polluted.

3. The distance of the broken point of the from the initial connection is too close
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To fix this problem, we should:
1. Check the connection of the connector and the launching point
2. Reset the test parameters, decrease the preset distance and the pulse width.

If the problem still exists, we could estimate:
1. The connector of the test fiber is broken or polluted.
2. The launching port on the OTDR is broken or polluted.
3. The distance of the broken point of the from the initial connection is too close

3.3-4 Curve with Non-reflective Event

Curve with Non-reflective Event

There is a common phenomenon that an obvious step is on the middle of a tested trace, it often caused by a fiber bending, fiber knot, being pressed by something heavy or a fuse splicing point. The step means a bigger loss of a fiber; it is also called event point. If the direction of it is downward, it could be called non-reflection event. If the direction is upward, we can call it reflection event.

Sometimes, the loss value could be a negative value; it does not means the loss does not exist. It is common phenomenon called pseudo gain, it is by a connection of two fibers with different back scatter coefficient, the scatter coefficient of the back fiber is large than the front one's. In addition, the different refract ratio also can cause the phenomenon. To avoid it, we could test a fiber bi-directionally.

3.3-5 Abnormal Condiction

Abnormal Condition

The situation that there is no reflection peak at the end of a trace shows above should be paid attention on. If the distance of the tested fiber is available and the distance shown on OTDR is not equal to the original distance, this shows that the fiber might be broken down or twisted and the bending radius of it is over limited.

The distance shown on OTDR is the position of the fault point.This phenomenon is often used in maintenance. If a fiber is uncertain, we can bend a fiber and make sure the bending radius is over limited, then use real time testing function of the OTDR to confirm the fiber.

3.3-6 Distance is too Long

Distance is too Long

This situation often happened in a long distance testing, caused by under-range dynamic range of the OTDR that the energy of it can not support a long distance transmission or caused by a under-range preset testing range of distance or pulse width corresponding to the actual fiber length. To avoid this situation, adjust the testing distance and the pulse bigger and extend the sampling time.

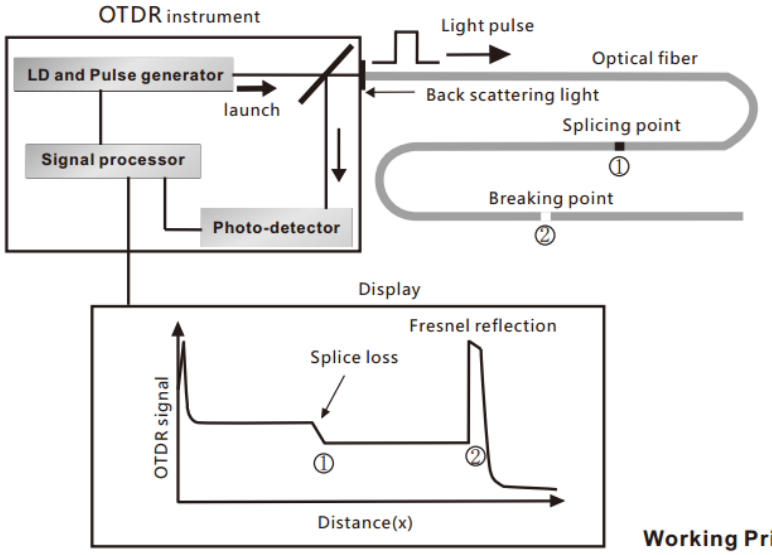
3.4 Fundamental of OTDR

OTDR——Optical Time Domain Reflector is a high precision optical testing meter that use the theory of Rayleigh scattering and Fresnel reflection. It is widely used in the maintenance, construction and monitoring of an optical line. All the important parameters like fiber length, optical loss, connection loss, broken or twisted point and etc. of a fiber can be shown on the OTDR. When the a light transmits along a fiber, it would be scattered to various directions caused by the difference of come properties of the transmission medium, this phenomenon called Rayleigh scattering. During the scattering process, some of the light will be scattered along the absolutely converse direction, this phenomenon is called Rayleigh

backscattering. It provides some details about the fiber length. The parameters about fiber length can be got by calculation with the parameter of time(This is the derivation of TD in OTDR——Time Domain optical Time Domain Reflectormeter).

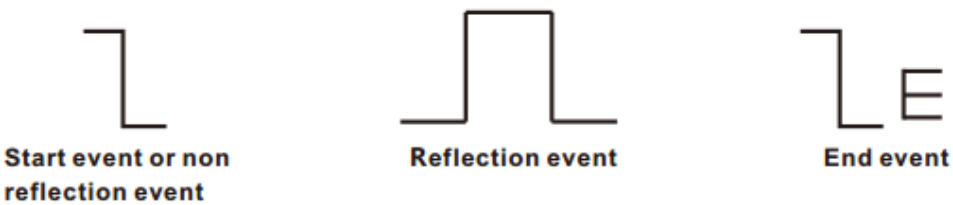
These back-scattering signals shows the loss level of a fiber and through these information, OTDR can generates a backward oblique trace which reflects several important attributes of a optical fiber. When the light, transmitting downward along the fiber, meet a different density medium, a part of the light will be reflected, this phenomenon is called Fresnel reflection. There are many reasons can cause the changing of the medium density like a little slot at the splicing point, a broken of fiber or etc. This phenomenon is usually used to locate the discontinuous point. Compare to the Rayleigh scattering, the consuming amount of the light in Fresnel reflection is much more then it is in Rayleigh scattering. The power of Fresnel reflection is tens of thousands times to the back-scattering's. The reflection level depends on the changing grade of refraction ratio.

Formula of the distance: distance = (c/n)*(t/2).
Here: c is the light speed traveled in vacuum(2.998*108m/s).
T is the delay between launching pulse and receiving pulse.
N is the refraction ratio of the testing fiber(specified by manufacturer).
When display the whole trace, each point of the trace represents the average value of several sampling points. By zoom in and zoom out function, the value of each sampling point can be got



Working Principle of OTDR

3.5 Event Type



Start event or non reflection event

Reflection event

End event

The events on trace are all the points that the value of power loss fluctuates abnormally. It usually contains various types of connection and
bending, crack, broken and etc. The event points marked on trace with special marks are the abnormal points in a fiber that cause the excursion of
a normal trace.
The events can be divided into Reflection-event and Non-reflection-event

Start event

The Start-Event on an OTDR trace is the initial point. Under the default setup, Start-Event is located on the first event(usually it is a connection between the OTDR launching port and the connector of a fiber) of a fiber. It is a Reflection-event.

End event

The End-Event on a OTDR trace is the end point of a fiber. Under the default setup, End-Event is located on the last event(usually it is an end face or a broken down point of a fiber). Usually, it is a Reflection-event.

Reflection-event

The phenomenon on a trace that some power of the optical pulse is reflected called a reflection event. Reflection-event is displayed as a peak signal on a trace.

Non-reflection-event

The phenomenon on a trace that there exists some abnormal loss in a optical line, but no reflection occurred is called a Non-reflection-event. It is displayed as a drop with no peak on a trace.

Event detection

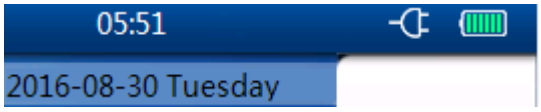
OTDR launches a bunch of optical pulse into a under-test fiber, receives the returned optical signal and starts calculating the distance from an event. The more the distance from the event is, the longer the returning time is cost. According to the receiving time, distance can be calculated. By detecting the trace generated by the returned optical signal, the attributes of the fiber itself, the connector of the fiber, adaptor in the fiber and
splicing point in the fiber can be confirmed.

4. Precautions before using

4.1 Turn on

Press power button (>2s) to turn on OTDR, power state indicator turns green .when power is low some warning information will display on the screen.

Power state indicator



	Full
	80% Power
	60% Power
	40% Power
	20% Power
	Less than 20%

Cautions:

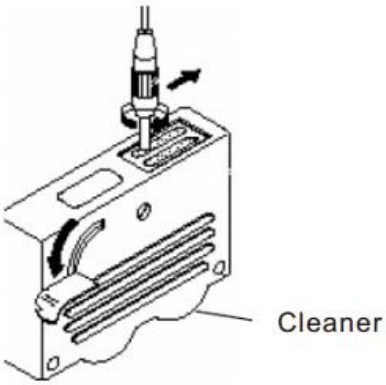
In case of low power, special icon will appear, and after that for a while SP-OTDR32F-T1 will turn off automatically.

If it has not been used for an extended period of time, SP-OTDR32F-T1 will turn of immediately after turned on to protect the internal battery, please connect the AC adapter

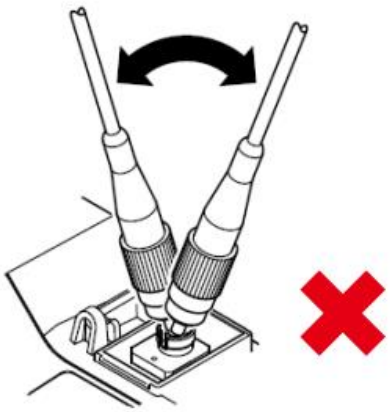
4.2 Connect the Fiber

Steps:

Before connect fiber to the OTDR, clean the fiber end first, the dust which on the end of connector may damage the optical port or reduce test quality.



1. Put connector against the cleaner.
2. Rotate the handle of cleaner.
3. Rub each other carefully to clean the contaminant.
4. Repeat procedure 1 and 3.
5. Open the protecting cover of optical port.
6. Insect connector into optical port carefully.

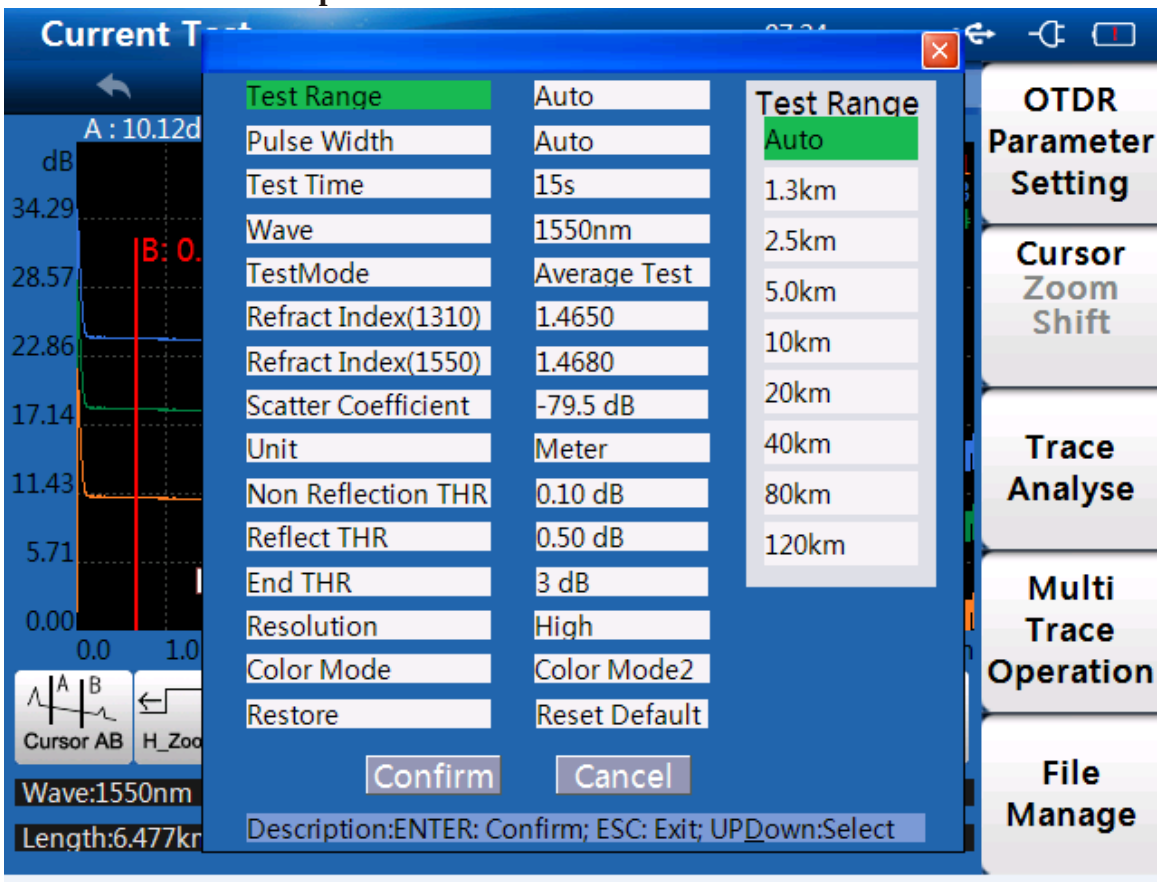


Warning

Before connection with OTDR module, make sure that there is no optical signal exist inside the fiber.

5. OTDR Parameters Setting

5.1 Introduction of the parameters



Test Range	Test distance of OTDR .adjust only in manual mode, in auto mode this item set as "Auto".
Pulse Width	Wider pulse has stronger backward signal, OTDR has longer detecting distance but wide pulse width will cause the saturation of backward signal, make blind area bigger. so the selection of pulse width has close relationship with the length of fiber. Long fiber has wide pulse width.. pulse width could only modified in "Manual"mode.
Test Time	Under averaging test mode(TEST), longer test time has better SNR (Signal Noise Ratio) but takes more time .
Wavelength	Test Wavelength of OTDR (1310/1550NM)
Test Mode	Auto Mode: The factory default mode is Auto Test Mode; If you set the parameters, the test mode will change into manual test mode
Refract Index (1310)	Full Spelling: Refraction Index (1310nm)
Refract Index (1510)	Full Spelling: Refraction Index (1550nm)
Scatter coefficient	Scatter Coefficient
Unit	Meter/ Feet/ Inch
Non-Reflection THR	Full Spelling: Non-Reflection Threshold
Reflection THR	Full Spelling: Reflection Threshold
End THR	Full Spelling: End Threshold
Resolution	Sampling resolution of test. High resolution has more sample point and high precision, but take more memory space.
Color Mode	The display background of curves (Color mode 1: white background; Color mode 2: Black background)

Restore	Restore the defaults settings

5.2 Auto Mode Test

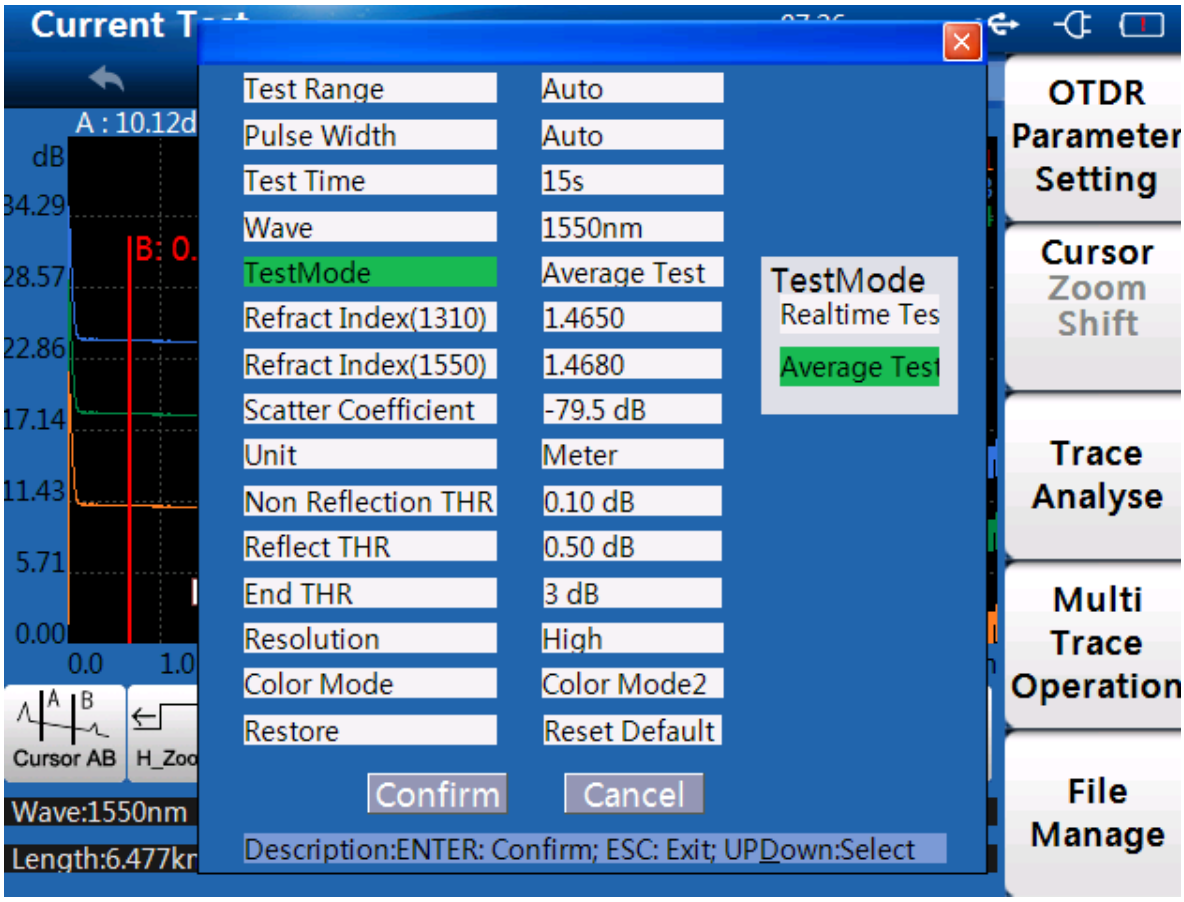
In Auto mode, you could just do the test without any settings

Caution

Auto test mode is not suitable to proceed to do short distance test (Less than 100 meters), When the test distance is below 100 meters, the recommended pulse width is 5ns and also pleas e chooses the 1310nm wavelength

5.3 Manual Mode Test

In manual mode, user could set proper range and pulse width manually.



Cautions

When "Pulse width" set to "Auto", the OTDR will choose proper pulse width automatically.

When "Test Range" set to "Auto", the OTDR will choose proper range automatically.

Once you set the "Test range", "Pulse width" item will not adjust automatically, you could also adjust manually.

Proper relationship between Range (MR) and pulse width(PW)(For user's reference only):

Length / Pulse Width	500m	2km	5km	10km	20km	40km	80km	120km
5ns	√	√	×	×	×	×	×	×
10ns	√	√	√	×	×	×	×	×
20ns	√	√	√	√	×	×	×	×
50ns	×	√	√	√	√	×	×	×
100ns	×	×	√	√	√	×	×	×
200ns	×	×	×	×	√	√	×	×

500ns	×	×	×	×	×	√	√	×
1000ns	×	×	×	×	×	√	√	√
2000ns	×	×	×	×	×	×	√	√
5000ns	×	×	×	×	×	×	√	√

6.0 Making

Measurements

The OTDR has two test modes: averaging test mode and real-time test mode.

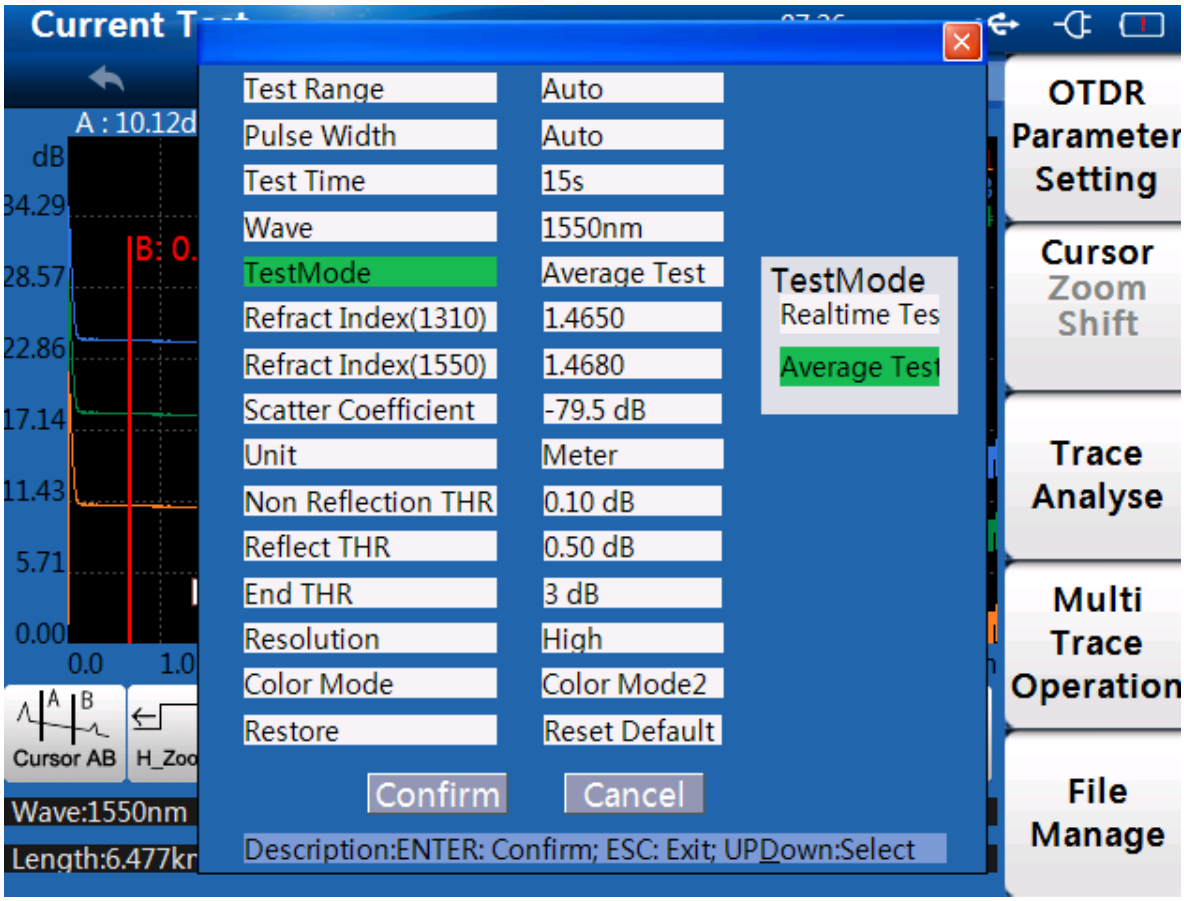
6.1 Averaging Test Mode

Averaging test mode can calculate the data of curve over a period of time and display as a averaging one ,test time could set "Test Time" in "Test Setting".

Press button on the control panel, test state indicator turns red, enter averaging test interface.

6.2 Real-time Test Mode

Real-time test mode could check network, adjust test range and pulse width in real-time.
Set the parameters as the following interface:



6.3 Auto Test:

The default test method is Auto Test, operators do not need to do any parameters setting,

Just press ,the OTDR will do test automatically;

6.4 Manual Test

In Manual test mode, operators need to set the parameters according to the real situations

As below:

After set the parameters, press " ENTER" or Click the "Confirm on the screen, and then press

to do the Test

6.5 Event List

After test, event list will appear immediately at the bottom of the window, operators could get detail information about this test from the list.

Description of items showed in chart below:

Type	Type of event(Attenuation events, Reflection events and End event)
Distance(km)	Distance from start point to event
Segment	Distance from this event to last event.
Loss dB	Loss of this event(dB)
T.Loss dB	Total loss from start event to this event(dB)
Slop dB/km	Ratio of event loss value(dB) (from this event to last event)to distance (Km)(distance from this event to last event)
Reflect.dB	Return loss of this event(dB)

6.6 Distance Measurement

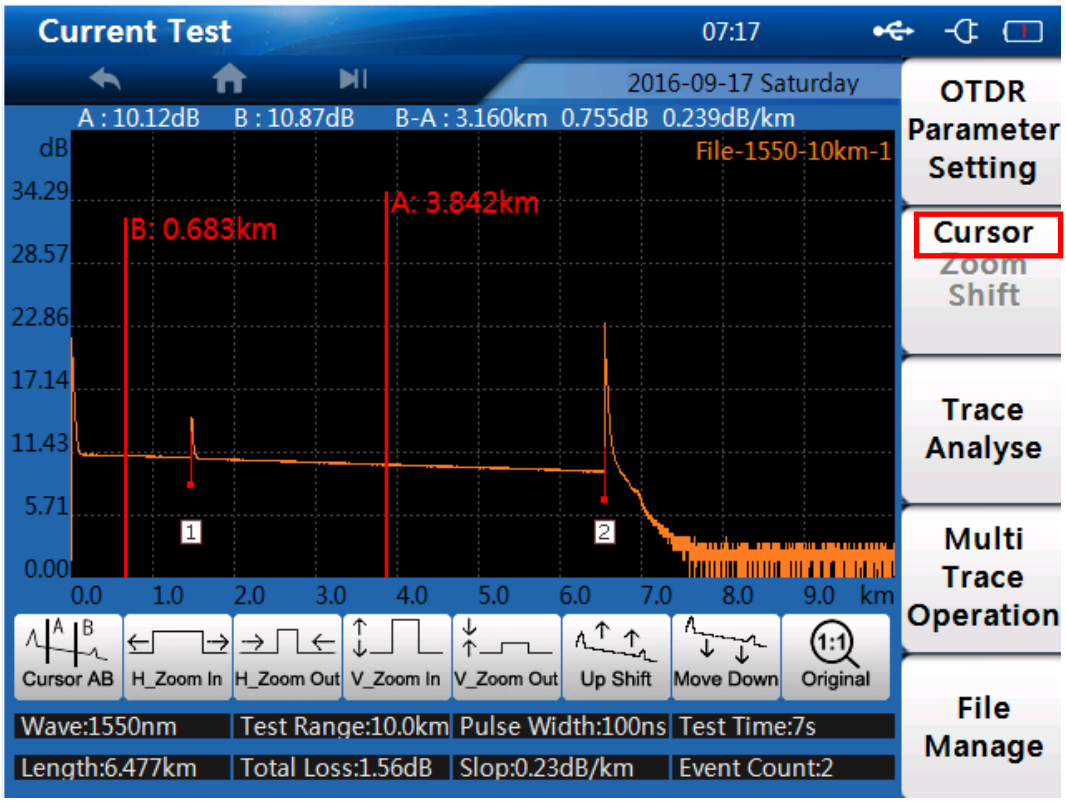
Measure the distance from one point to another.

Steps;

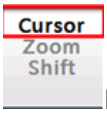
By Touching Screen

1. In the Current Test interface, The “Cursor” is in black color, Move the cursors by switching the

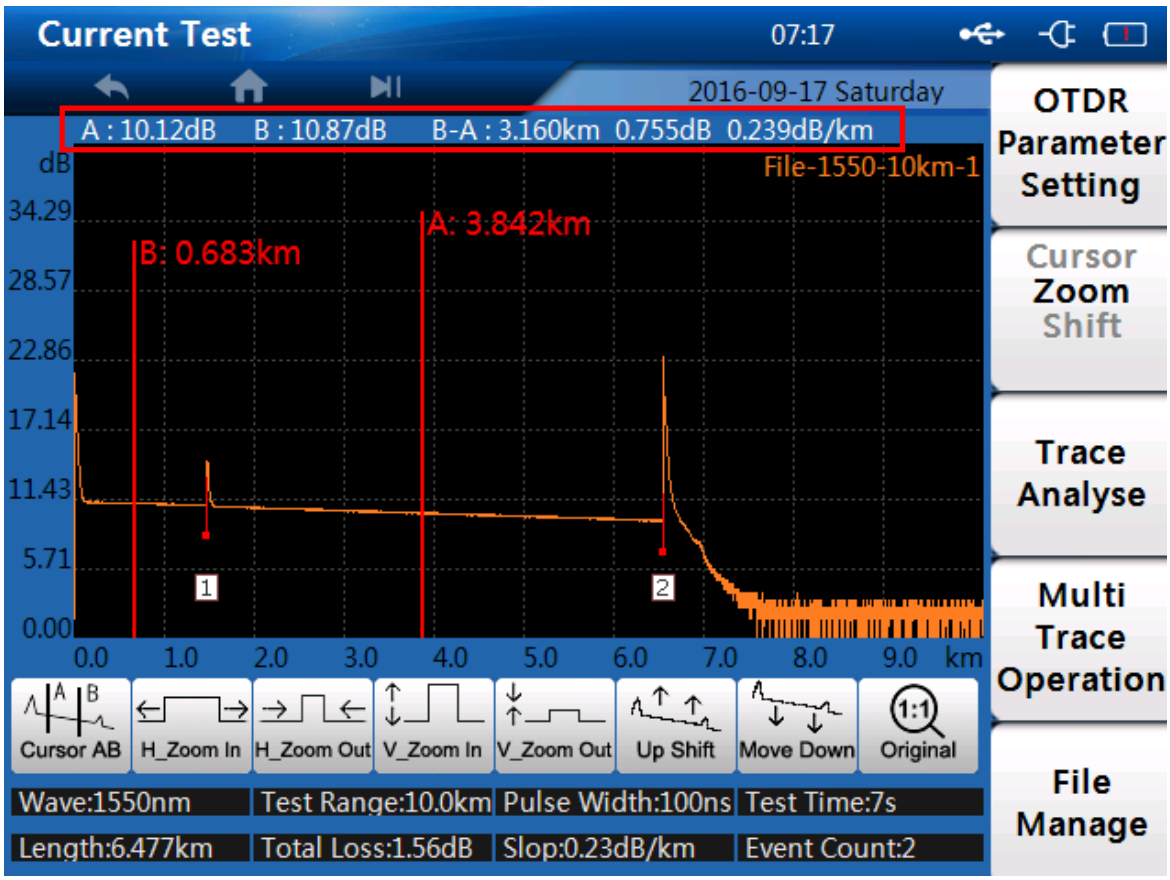
icon to get the distance and the loss between A and B,



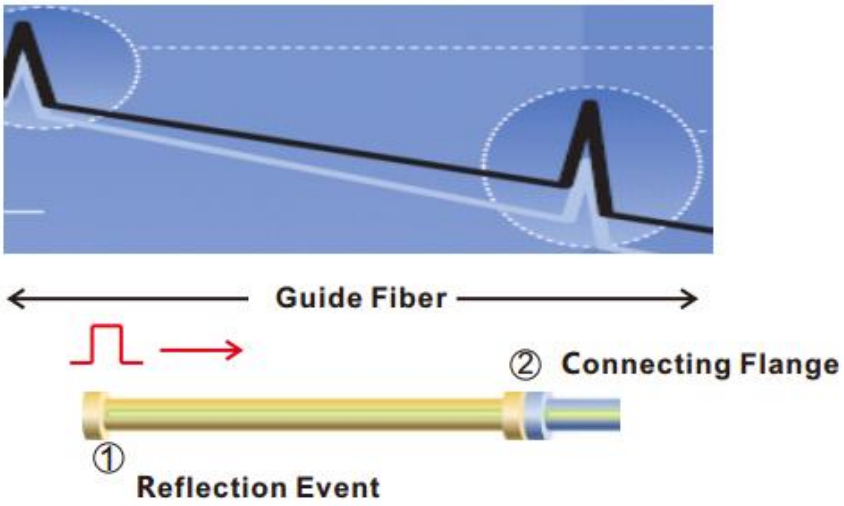
.



1. Make sure the Cursor is in Black color If not, please press【F2】button to active cursor function.
2. Control 【◂ 】 【▸ 】to move cursor A or B.
【◂】: move left 【▸】: move right
3. Get information by following the guide below:



6.7 OTDR Optimizing Tool



1. Guide fiber

Use an guide fiber to figure out the character of connector. By adding this fiber we could move the fist connector out of the

blind area. In the same way we could use this way to figure out the character of last connector.

2. About guide fiber

Proper length of Guide fiber is 100~1000m, it depends on the blind area of OTDR. In theory, minimum length of guide fiber

should be two times longer than attenuation blind area , but it should be longer in practice.

6.8 Set Proper Parameters

At the fist time using OTDR, if operators chooses some testing parameter which is not suitable to the real condition may cause the bad result. Operators should take Testing range, pulse width and wavelength into consideration.

6.8-1 Set proper testing range

Testing range means maximum display range. This parameter will indicate how long will OTDR display on its screen. this range must longer than testing fiber, Usually we choose range which is 20% longer than testing fiber. Take note that testing range should not has large difference with testing fiber, Otherwise it will affect the effective resolution and overlarge testing range will result in the generation of huge and useless data(see Figure 1).

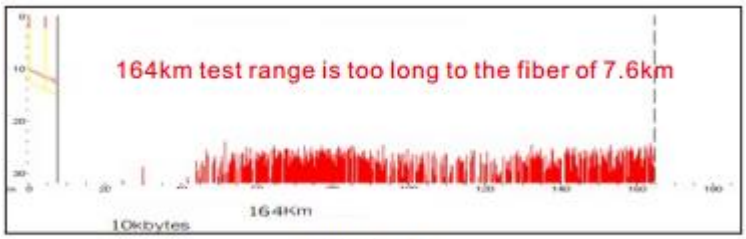


Figure 1

6.8-2 Set proper pulse width

Pulse width and blind area, dynamic range is directly related to the maximum length ,in below picture, use ten different pulse width to test one testing fiber.the smallest pulse width result in the smallest blind area and the most terrible noise. The longest pulse width result in the smoothest curve and almost 1km blind area(see Figure 2).

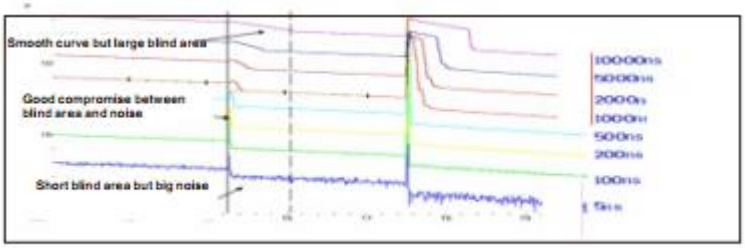


Figure 2

It is obviously at the top of testing fiber influence on Pulse width , in below chart,we cant detect the first connecting point locate in the 540m by large pulse width(see Figure 3).

Dynamic range decided by Pulse width, larger pulse width will spend more optical power, but it reach further(see Figure 4).

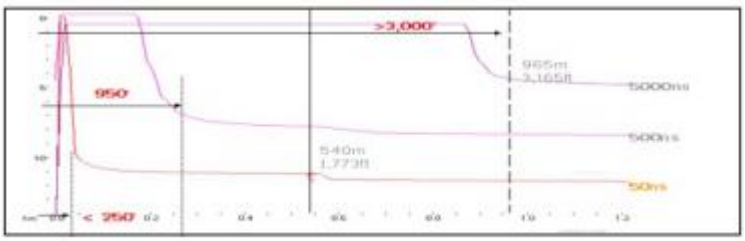


Figure 3

6.8-3 Set proper wavelength

Proceed to test with same fiber but different wavelength we will get different result. Longer the testing wavelength is,more sensitive of the bending, in below chart ,first splicing point has bending problem, splicing loss value under 1550nm is bigger than that under 1310nm. the other points are similar with 1310nm and 1550nm.This phenomenon indicate that this fiber is just bended at the first point. If it's possible please alway compare the point state under 1310nm and 1550nm and judge whether it's bended or squashed(see Figure 5).

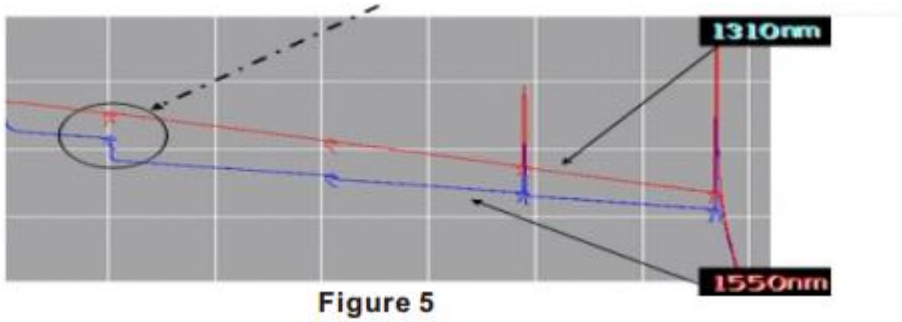


Figure 5

6.8-4 Set proper test time

In averaging mode, long testing time could reduce noise during the data sampling and Improve precision to get better and smoother curve(see Figure 6).

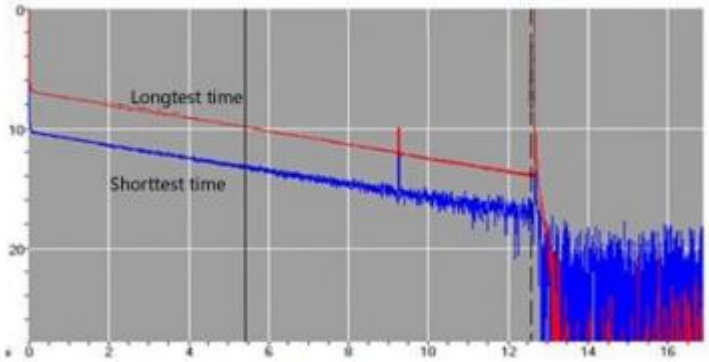
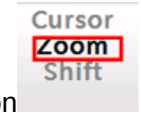


Figure 6

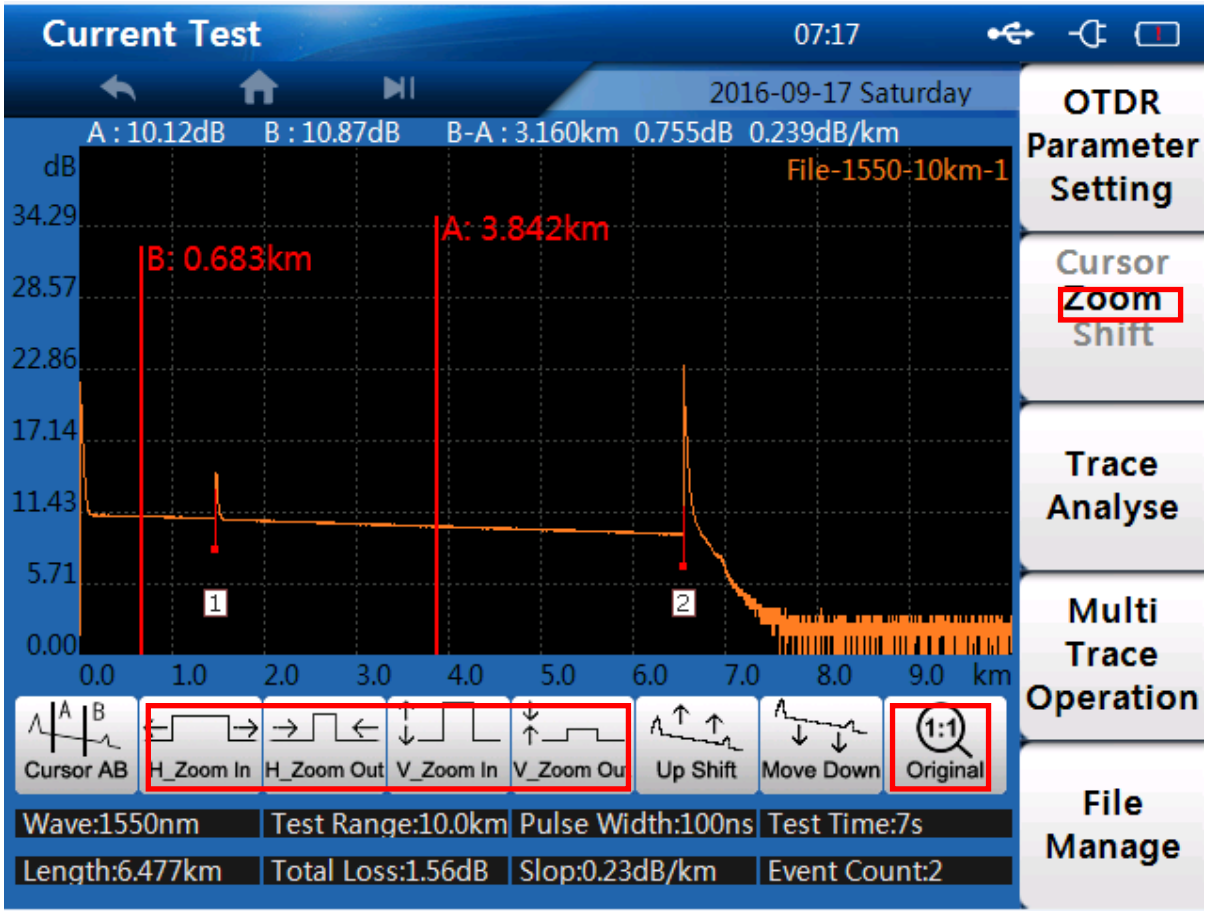
6.9 Zoom In the Traces and Move the display area

Please check the below screen shot, make sure the [zoom] is in black color, If not, please press [f2] click the icon 

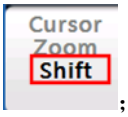
; we can see the four icons below :

H-Zoom In: Horizontal zoom in the trace

H-Zoom Out: Horizontal zoom out the trace
V-Zoom In: Vertical zoom in the trace
V-Zoom Out: Vertical zoom out the trace
Original: Make the trace back to original

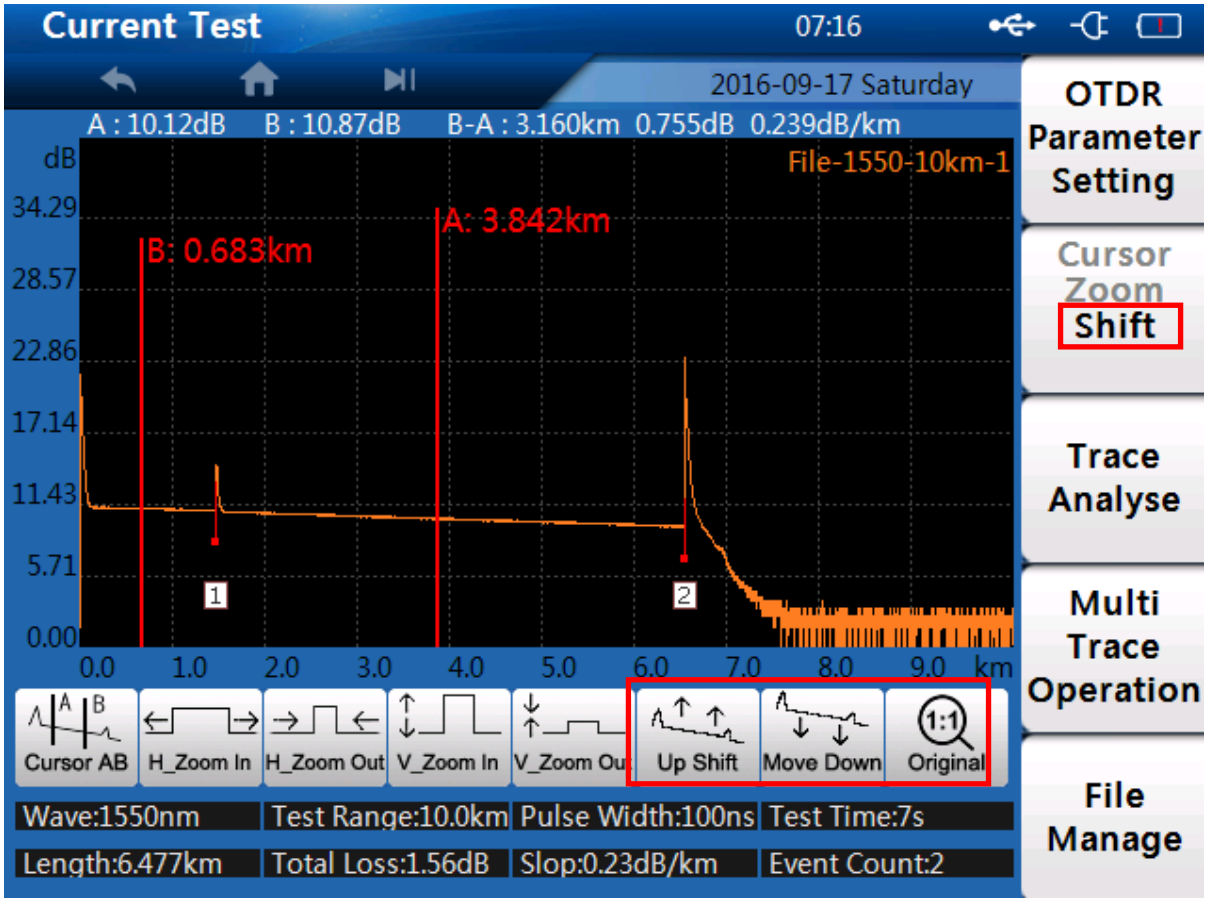


6.10 Shift the Trace

Please check the below screen shot, make sure the [Shift] is in black color, If not, please press [f2] click the icon 

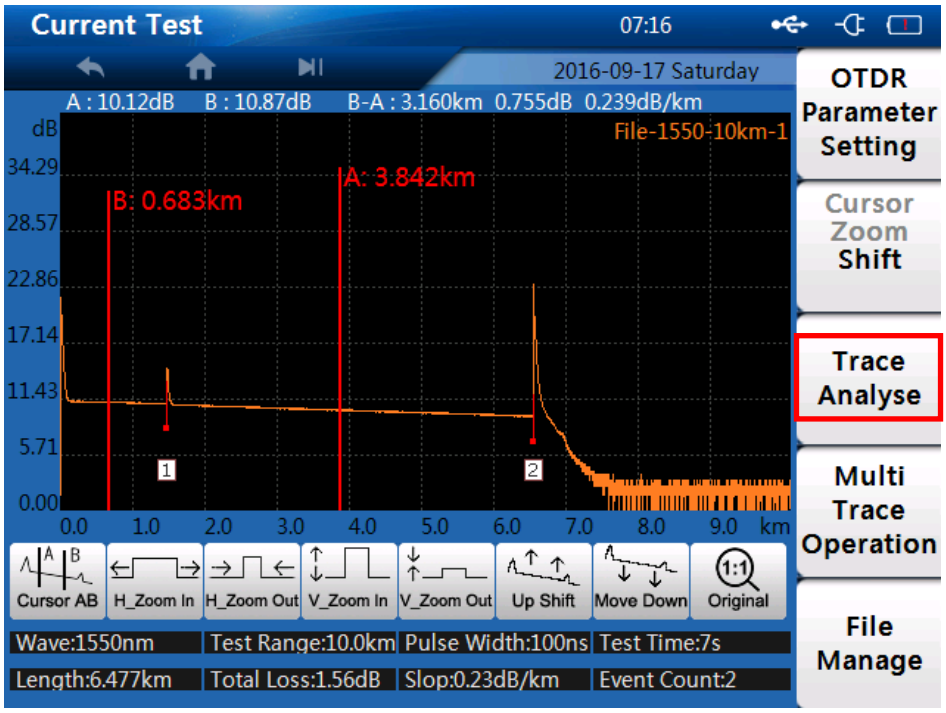
; we can see the four icons below :

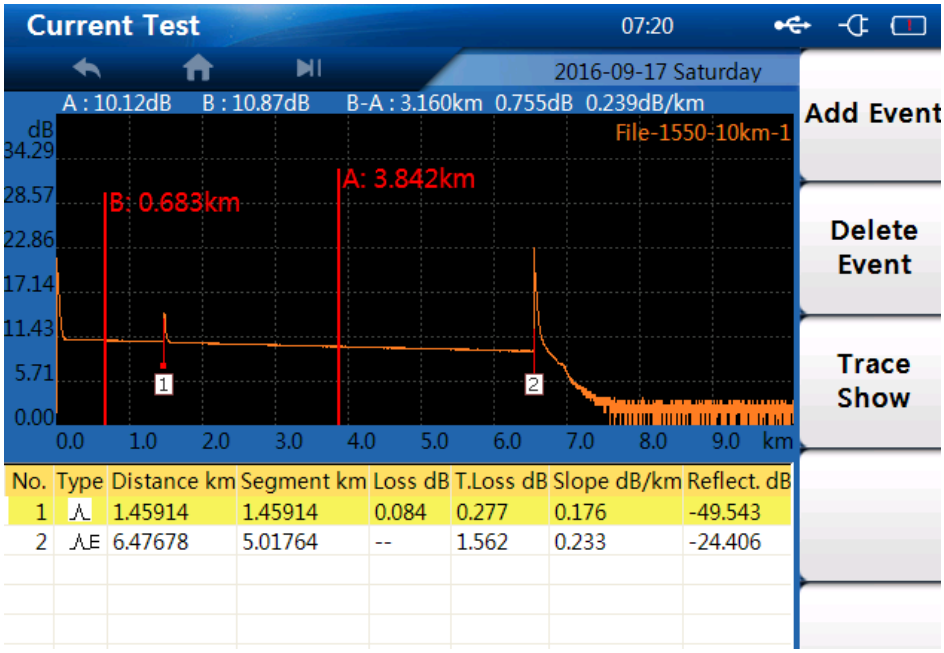
Up Shift: Shift the trace upward
Move Down: Move the trace downward
Original: Make the trace back to original



7. Trace Analyses

Press [F3] to activate the [Trace Analyse] function, the right screen (Event List) will appear:





Note: Please refer to the previous page to check the introduction of each events details;

7.1 Add an Event

If operators think there should be an event missed on the curve, operators can add event

In current Test interface, Press【F1】button to activate the [Add Event] function, move cursor to the target event

7.2 Delete Event

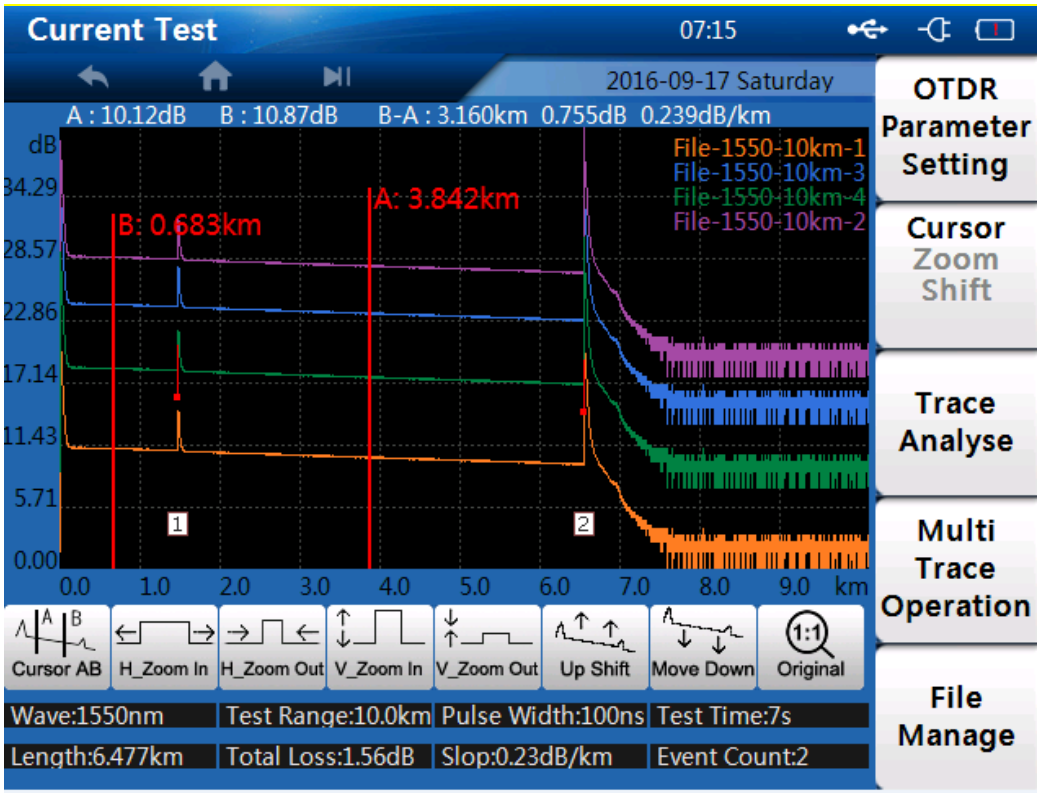
If operators think there should be an event unnecessary on the curve, operators can delete the event

In current Test interface, Choose the unnecessary event, Press【F2】button to activate the [Delete Event] function,

7.3 Trace Show

Press [F3] can back to the curve display interface

8; Multi Trace Operation



In current test interface, press **[F4]** or click “Multi Trace Operation” to activate this function, we can Compare the saved traces in the OTDR

9. File Manage;

Press [f5] to activate the File Manage function, in the OTDR Current test interface, we will see the three items: Save/ save as/ Open menu; we can save or Open the curves in our tester

10. VFL Module

Please refer to the pervious [1.6Introduction of VFL Test Page]

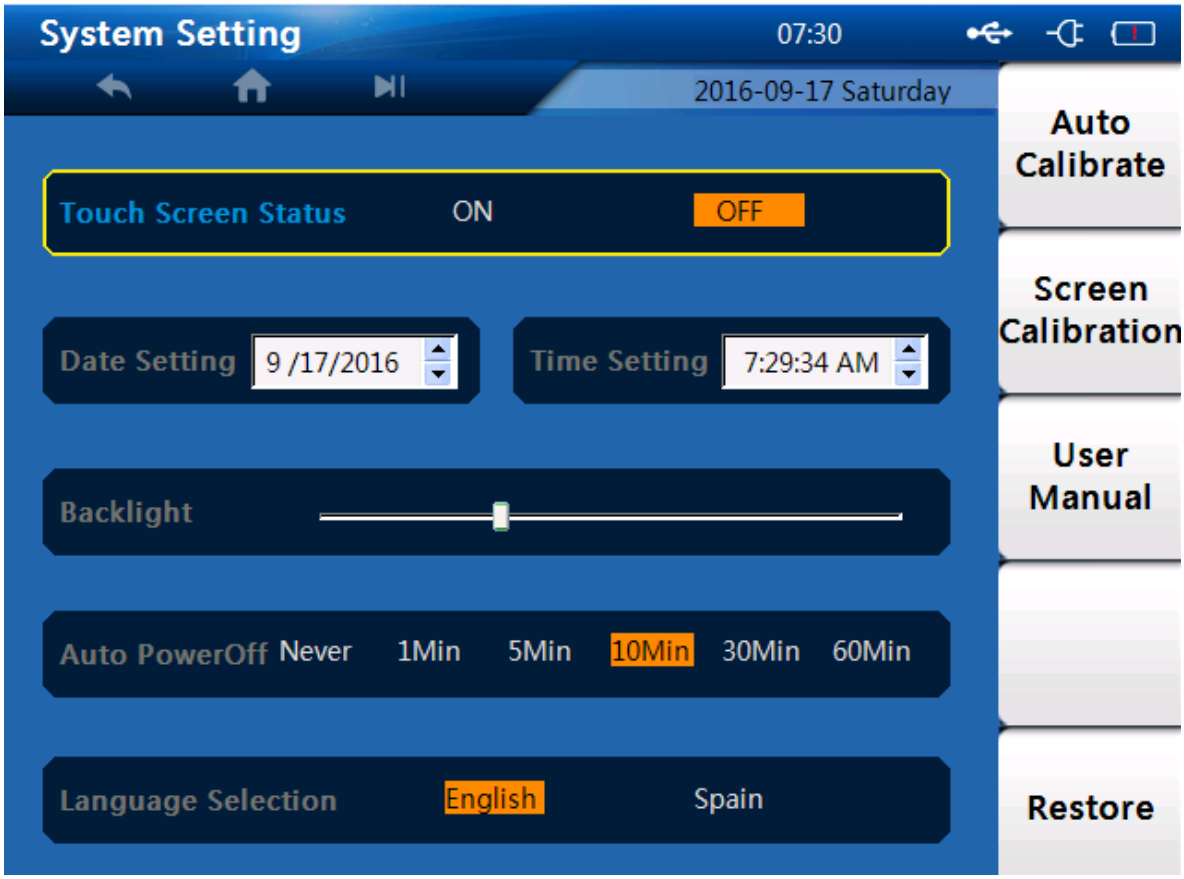
VFL module could launch visible light to identify the fiber ,locate fault of SM or MM fibers.It is the supplementary to the testing of blind area and basic tool of optical network, LAN ,ATM fiber system and telecommunication network maintenance.

Press [F2] or click VFL Button on the “ Homepage” to activate this function, we can enter into the following interface

Do the operation according to the right-side menu

11. System Setup

Press [F3] or click System Setup Button on the “ Homepage” to activate this function, we can enter into the following interface



From above interface, we can do the system set (Please refer to the previous page)

12.File Manage

Press [F4] or click File Manage Button on the “Homepage” to activate this function, we can enter into the following interface

From above interface, we can do the File settings (Please refer to the previous page)

13. Software Update

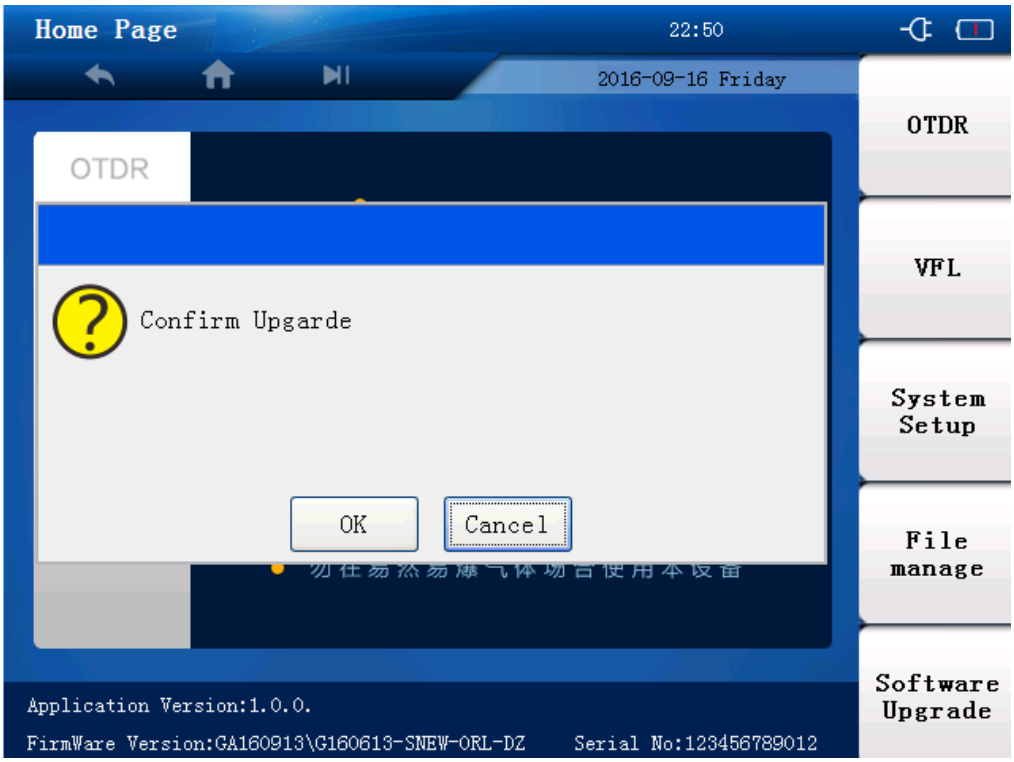
Press [F5] or click Software Upgrade Button on the “ Homepage” to activate this function, we can enter into the following interface

Steps:

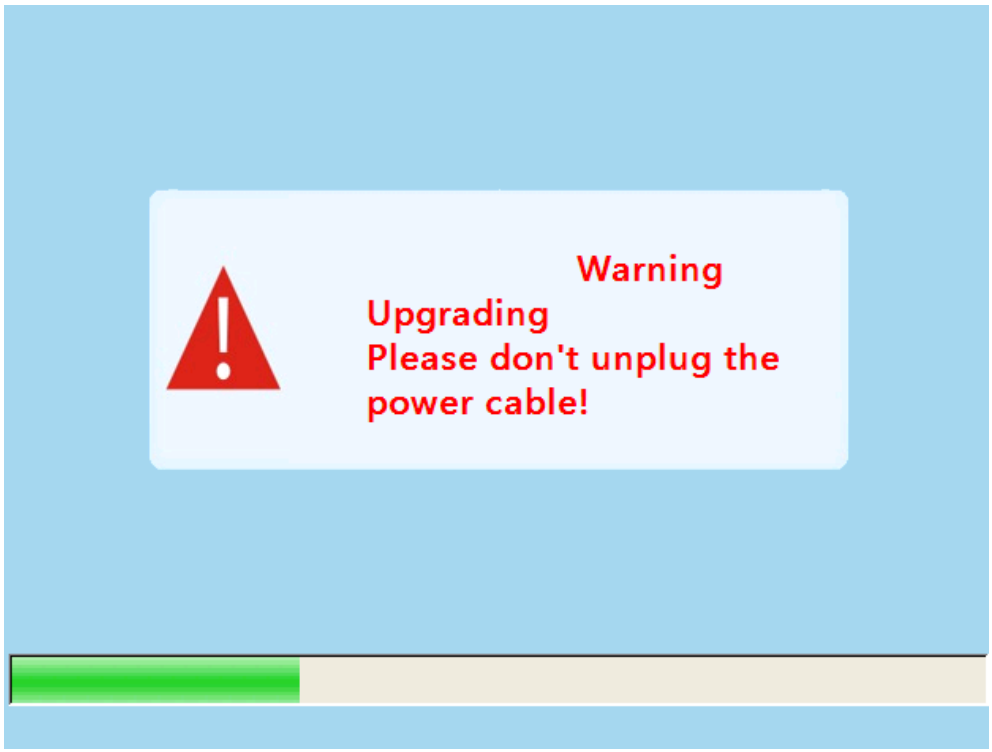
1.Download patch from PC and storage into U disk(must storage in root directory).

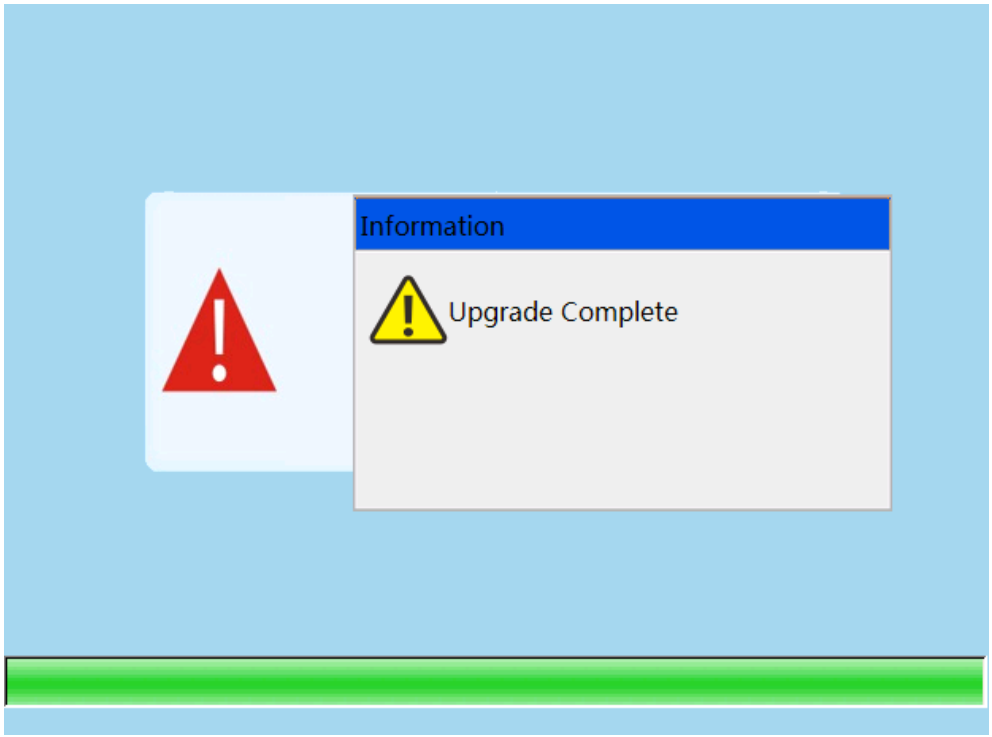
2. Insert U disk into USB port.

3.Turn on SP-OTDR32F-T1, Click “ Software Upgrade” , the below interface will display:



4. Click “ OK” to do the upgrade





10. Maintenance

10.1 Use rechargeable Li-ion battery.

Pay attention to the following:

1. Keep OTDR dry and clean store at room temperature(15℃).
2. Charge it monthly if you don't use it for a long time(more than one month).
3. Keep Optical port clean by alcohol soaked cotton and recover dust cap after use.
4. Clean optical port and connector at fixed period.

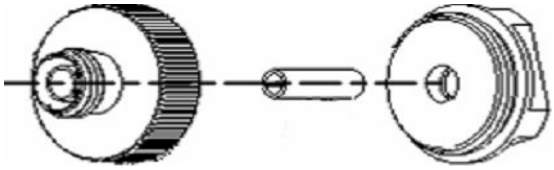
10.2 Follow the principles below before cleaning:

1. Shut off before cleaning.
2. Any operations contrary to the instructions may result in dangerous laser injuries.
3. Disable laser launching before cleaning.
4. When the instrument is in operation, please always avoid looking directly into optic output. Although laser radiation is invisible, it may do serious injury to eyesight.
5. Be cautious of electric shock and make sure AC power is disconnected from the instrument before cleaning. Always use dry or moist soft cloth to clean the outside of the instrument, and never touch inside.
6. Don't proceed any modification on OTDR.
7. For maintenance, please always operated by qualified worker

10.3 Cleaning Tools

1. Optic fiber cleaner (for cleaning of optic connectors)
2. Optic fiber cleaning rod (for cleaning of optic outputs)
3. Optic fiber cleaning tissue (for cleaning optic interfaces)
4. Isopropyl alcohol

5. Cotton ball
6. Paper tissue
7. Cleaning brush
8. Compressed



10.4 Cleaning of Optical Port

Procedure:

1. Screw down the cap.
2. Pull out ceramic core by fingers.
3. Clean port carefully.
4. Recover ceramic core.
5. Screw on the cap.

11. Faults and trouble shootings

Fault	Reasons	Solutions
Can't turn on	1.Holding time on power button is not enough(>2s). 2.Run out of power / battery has broken. 3.No battery. 4.Too cold there.	1. Long press on ON/OFF key. 2.Connect external power/ Replace a new battery. 3.Install battery. 4.Change another environment.
Display shows nearly nothing after turned on	1.Brightness need to be adjusted. 2.Connection between display and motherboard is not good	1.Adjust brightness. 2.Open and reconnect
Battery does not work properly	1.Temperature is too high. 2.Connection is not proper. 3.Battery is nearly broken	1.Try to decrease temperature. 2.Reconnect battery. 3.Replace a new one.
Measuring graphic only has front end reflection	1.Connector loose, polluted, damaged or unmatched. 2.Locating pin has broken	1.Clean and reconnect. 2.Change a new adapter
No response	No response by pressing any keys	Restart

Find Ghost	1. Often happened in large plus width, long range and short link condition. 2.Common ghost caused by continuous reflection of connector.	1. Use proper measuring range and pulse width setting. 2.Reconnect fault point of Reflection event, reduce reflection strength.。

12 Warranty

12.1 Terms of Warranty

All our products are warranted against defective material and workmanship for a period of time from the date of shipment to the original customer. Any product found to be defective within the warranty period would be repaired or replaced by our company.

12.2 Exclusions

The warranty on your equipment shall not apply to defects resulting from the following:

Unauthorized repair or modification

Misuse, negligence, or accident

Our company reserves the right to make changes to any of its products at any time without having to replace or change

Previously purchased units.

12.3 Transportation

To return instrument for reasons of yearly calibration or other, please contact us to obtain additional information and RMA#code(Return Materials Authorization number). And describe briefly reasons for the return of the equipment, to allow us offer you more efficient service.

To return the instrument in the case of repair, calibration or other maintenance, please note the following:

Pack the instrument with soft cushion like Polyethylene, so as to protect the shell of the instrument.

Please use the original hard packing box. If use other packing material, please ensure at least 3 cm soft material cover around the instrument.

Be sure to correctly fill out and return the warranty registration card, which should including following information: company name, postal address, contact, phone number, email address and problem description.

Seal the packing box with exclusive tape.

Ship to your representative or the agent of the Company in a reliable way.

13 Ordering information:

Type	Testing wavelength	Dynamic range	Event/Attenuation dead-zone
SP-OTDR32F-T1-A	1310/1550nm	30/28dB	0.8/4m
SP-OTDR32F-T1-B	1310/1550nm	32/30dB	0.8/4m
SP-OTDR32F-T1-MD21	850/1300nm	19/21dB	1.2/8m

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If you have any question,please contact us directly for help,Email: after-sale@speedwolf.net