FWT-200 Optical Time Domain Reflectometer

USER'S GUIDE

English

Warning and note

WARNING

Any undefined change or modification of this manual will deprive you of the right to operate the equipment.
To reduce the risk of fire or electric shock, do not expose the equipment to rain or humidity.
To prevent electric shock, please do not open the shell, and it must be repaired by qualified personnel.

NOTE

As the laser is harmful to the eyes, don't look directly at the laser outlet and don't attempt to disassemble the cabinet.

PRECAUTIONS FOR USE

Using the battery:

This device is powered by special lithium ion battery. Please select the power adapter correctly for charging operation.

Avoiding condensation:

Sudden changes in temperature should be avoided. Do not use the device immediately after moving the device from the cold area to the hot area, or when the room suddenly heats up, because the device may have condensation phenomenon. If the temperature changes abruptly, stop using it and take out the battery, and the power can be switched on after at least an hour.

Storage:

When the device is not used for a long time, please take out the battery to avoid the damage caused by battery leakage.

※The content of this manual is for reference only, and everything is based on the actual product.

Summary

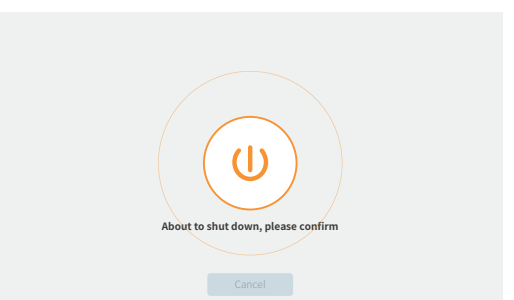
It adopts modular design, mainly includes "Auto OTDR", "OTDR Pro", "Event Map", "iOLA", "Loss Tester", "OMM", “RJ45 Tracker”, “RJ45 Mapper”, “File Manager”, “Romote Tester”, “FTP Server” and "System" 12 modules. Also can customize functional module as required.

On/Off

Press " " button for 2s to turn on the device and enter into the main menu. When the anti-mistouch button is turned off,long press " " for 2 seconds, and the shutdown confirmation interface will pop up. Click " " on the screen to confirm the shutdown.

Anti-mistouch enable:
On/Off button is invalid

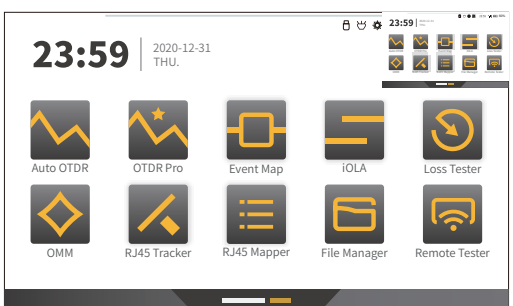
Anti-mistouch shutdown:
On/Off button is valid



Screenshot Button

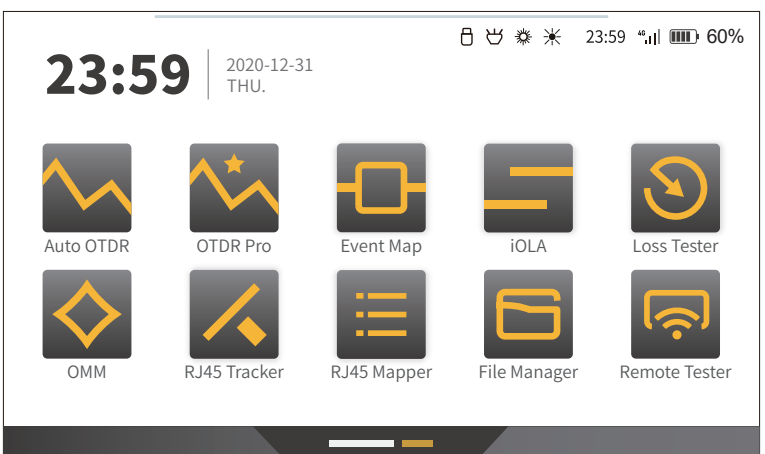
Long press " " for 2 seconds to quickly screenshot the screen and display the screenshot thumbnail in the upper right corner.

Screenshot files can be viewed in the "File Management-ScreenShot" folder.



Main Menu

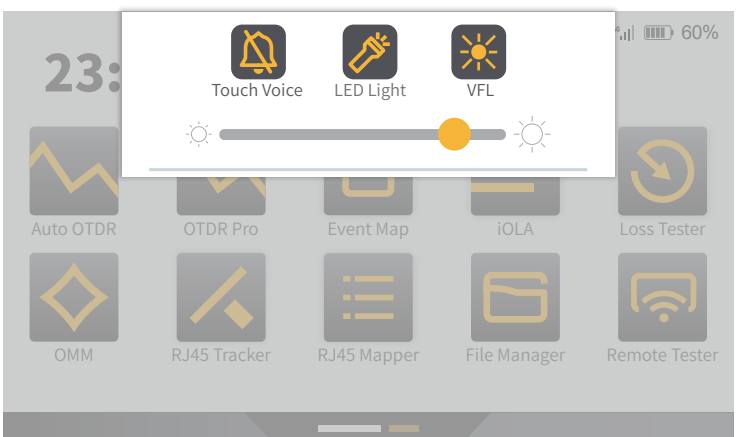
Click the function button to enter the main interface of the function, or use the "  " button to select the corresponding function. The selected one will be displayed in dark blue, and then press the "  " button to enter the main interface of the corresponding function.



Main Menu

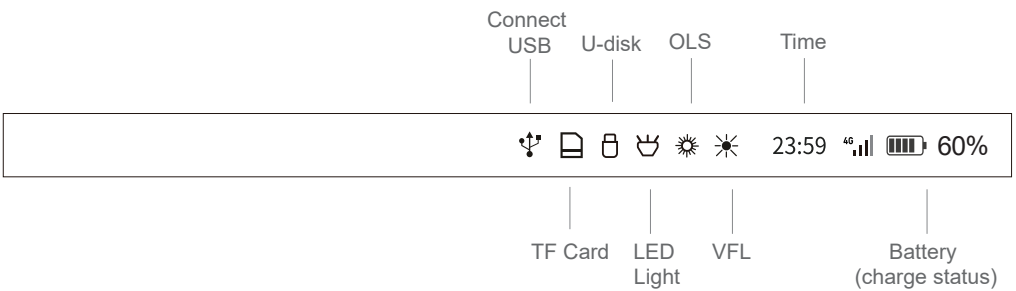
Multifunctional Window

Multifunctional Window is at the top of the screen. Slide inward from the outer frame to pull out the window for quick operations, and slide upward to return to the main interface. The multifunctional window includes touch voice, LED light, VFL, and screen brightness shortcut buttons.The VFL button can cycle through the functions of On/Off, CW and glint.



Icon Description

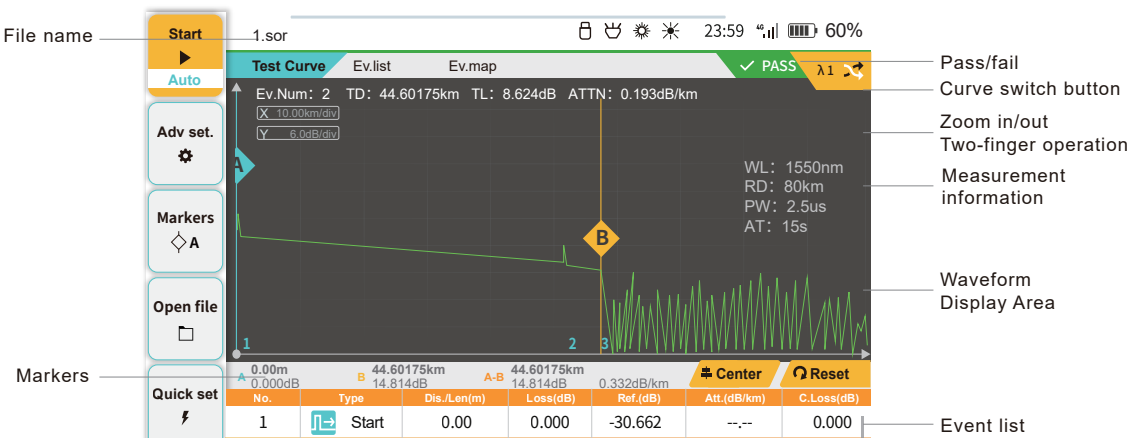
The title bar icon will light up when the corresponding function is enabled. When charging, the battery icon displays dynamically and increases, and the charging indicator light flashes. When fully charged, the charging indicator light is always on.



Auto OTDR

Measurement Interface

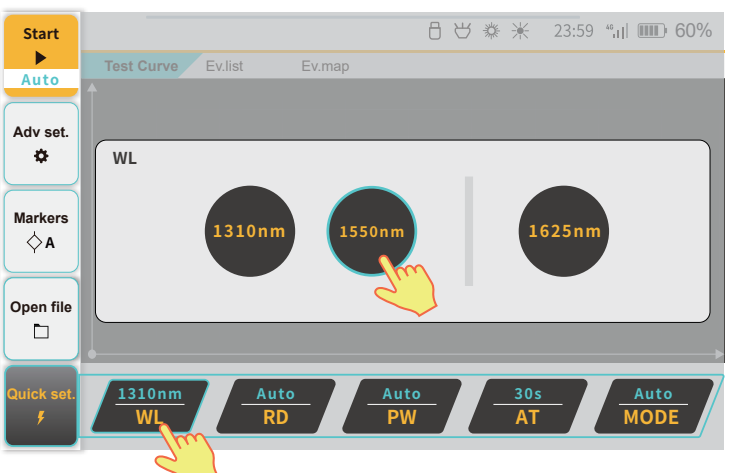
The auto OTDR function is designed to simplify user operations and complete measurements with one click. Each functional area in the interface is marked in the figure below. There are 5 functional interfaces: start measurement / advanced settings / marker operation / open files / quick settings. You can click to view the three functional pages of "Test Curve", "Event List" and "Event Map".



Auto OTDR

Quick Settings

Click " Quick set. " or short press the " F5 " button to enter the quick setting interface. Wavelength, range, pulse width, time and measurement mode can be set by clicking the required icon.



Auto OTDR

Quick Settings

In the auto OTDR mode, the user only needs to select the wavelength and time, and the instrument will automatically complete the measurement.

・Wavelength: The instrument supports multi-wavelength testing of the same type of optical fiber, user can single or multiple select the required test wavelength.

・Time: The measurement time can be set to "5s-180s". The longer the measurement time, the more accurate the result will be.

Auto OTDR

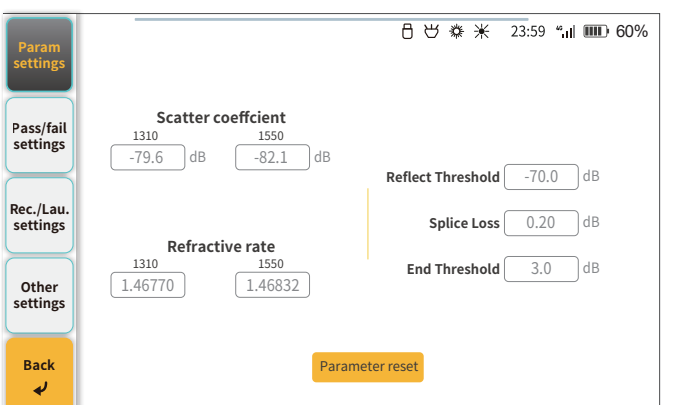
Advanced Settings- Parameter Settings

Click " Adv set. " or short press the " F2 " button on the auto OTDR interface to enter the advanced setting interface.It includes 4 modules: "Parameter Settings", "Pass/Fail Settings", "Receive/Launch Settings", and "Other Settings". "Parameter Settings" allows you to set the refractive rate and scatter coefficient of the fiber group. These two parameters are the physical parameters of the fiber under test. If there is a large deviation, it will lead to measurement errors in distance and attenuation rate. It is recommended to use the default parameters when these two parameters cannot be specified. Click the " Parameter reset " icon to restore the default values.

・Reflect Threshold: When the reflectivity is greater than the set value, the reflection is determined as a reflection event.

・Splice Loss: When the splicing loss is higher than the set value, it is determined as a loss event.

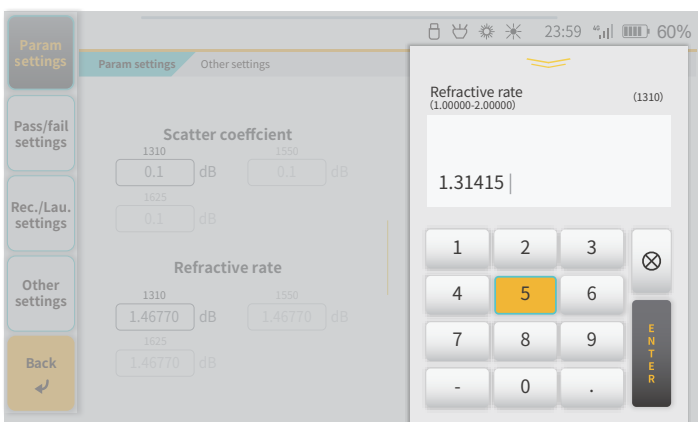
・End Threshold: When the loss is greater than the set value, it is determined as an end event.



Auto OTDR

Advanced Settings- Parameter Settings

All parameters of the "Parameter Settings" module can be set individually. Click on the parameter setting box, and the numeric soft keyboard will be displayed on the right (click on the blank space or short press " ⊗ " to exit the numeric soft keyboard), click on the settings as required and press the "ENTER" button to save the parameters. After the setting is completed, click " Back " or short press the " F5 " button to exit the setting interface. Click " Parameter reset " to restore to system default values (all 4 setting pages will be restored to default values).

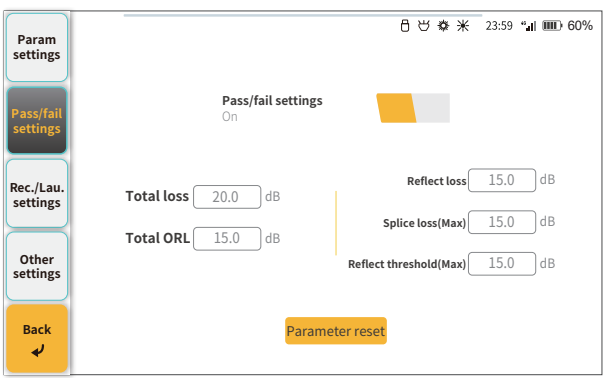


Auto OTDR

Advanced Settings-Pass/Fail Settings

Click " Pass/fail settings " or short press " F2 " or slide the screen to enter the "Pass/Fail Settings" module. Click " " to turn on or off the "Pass/Fail" function. These settings are used to quickly determine whether the line condition is qualified. If the set value is exceeded, a red prompt will be displayed in the event list.

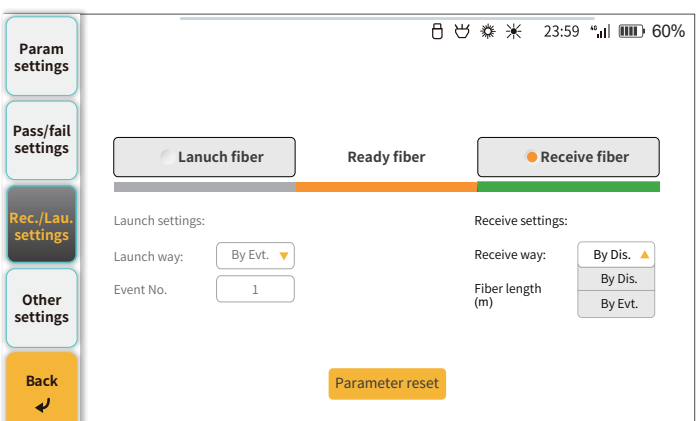
- Total loss: Maximum threshold for total link loss, settable range (0-99.9)
- Total ORL: Maximum threshold for total optical return loss of the link, settable range (0-70)
- Reflect loss: Loss threshold for reflection events, settable range (0.01-5)
- Splice loss: Loss threshold for non-reflective events, settable range (0.01-5)
- Reflect threshold: Reflectivity threshold for reflection events, settable range (-65 - 0)



Auto OTDR

Advanced Settings-Receive/Launch Settings

Click " Rec./Lau. settings " or short press " F3 " or slide the screen to enter the "Receive/Launch Settings" module. Make good use of this function to avoid OTDR test blind zone and achieve accurate measurements. You can click the "Launch Fiber" and "Receive Fiber" buttons to turn on or off the Launch and reception setting functions as needed. Click the " By Dis " button to choose to test the patch cord by event/distance settings.



Auto OTDR

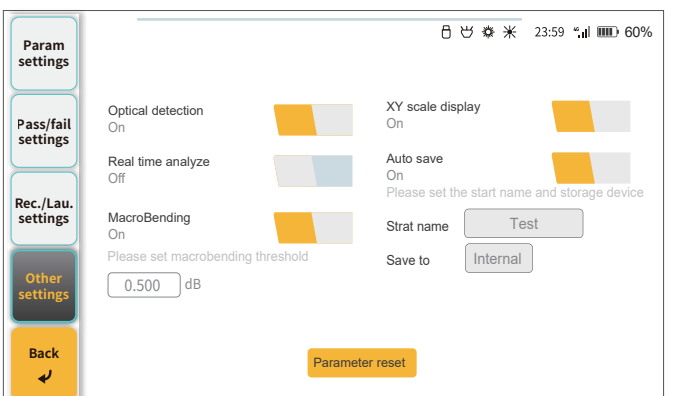
Advanced Settings-Other Settings

Click " Other settings " or short press " F4 " or slide the screen to enter the "Other Settings" module. You can click the " " button to turn on or off the required setting function as needed. The macro bending threshold, starting name, and position can be changed according to needs by clicking the parameter setting box.

・Real-time analysis: After opening, average measurement will measure the fiber again after stop of real-time measuremnt test everytime, and event analysis result will be given.

・Auto save: used to automatically store data after each measurement

・Optical detection: When turned on, the device will detect whether there is light in the optical fiber line before measurement, thereby protecting the device and central office equipment from damage.

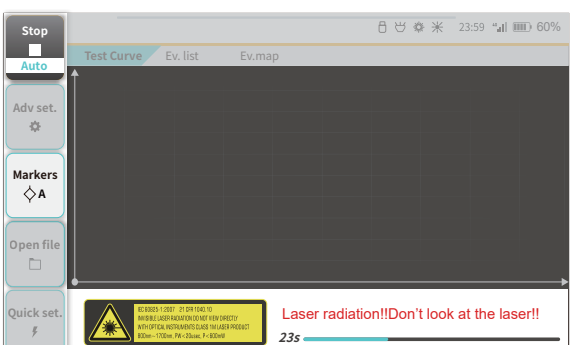


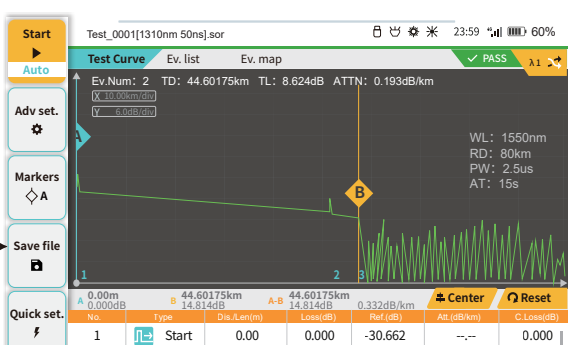
Auto OTDR

Start Measuring

Click " Start Auto " or short press the " F1 " button on the auto OTDR interface to start/stop measurement according to the current measurement conditions. The waveform can be zoomed in/out through the waveform control window. Click " Markers A " to switch the cursor, select the cursor and slide the screen or short press the direction button to operate the active cursor.

After the test is completed, the "Open File" button will change to "Save File" button to save the measurement results.

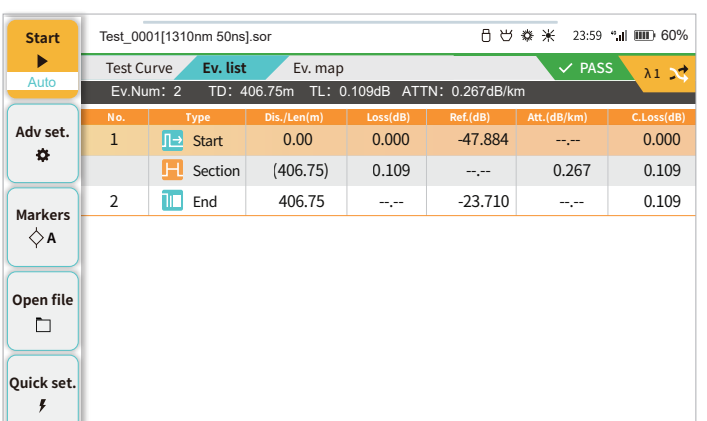




Auto OTDR

Event List

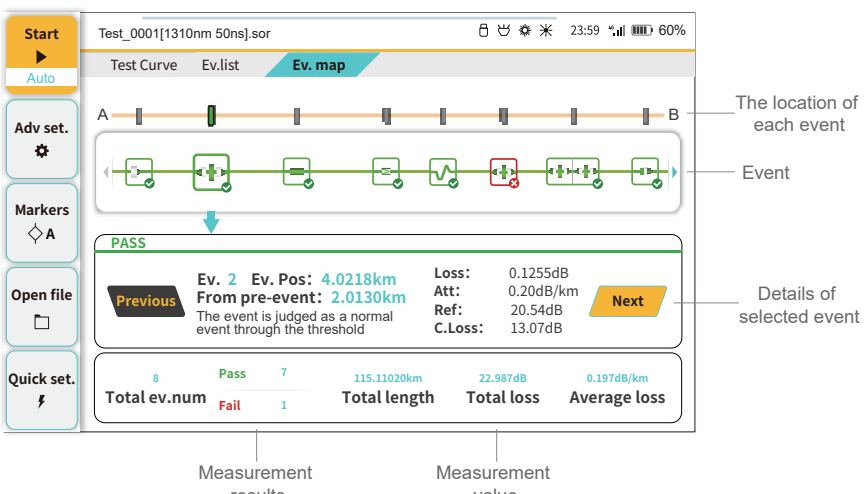
After completing the measurement, click "Event List" to enter the interface. The event list interface can display all events in the current measurement or open saved file and the specific information of each event. Click the screen or short press the direction button to operate the event list.



Auto OTDR

Event Map

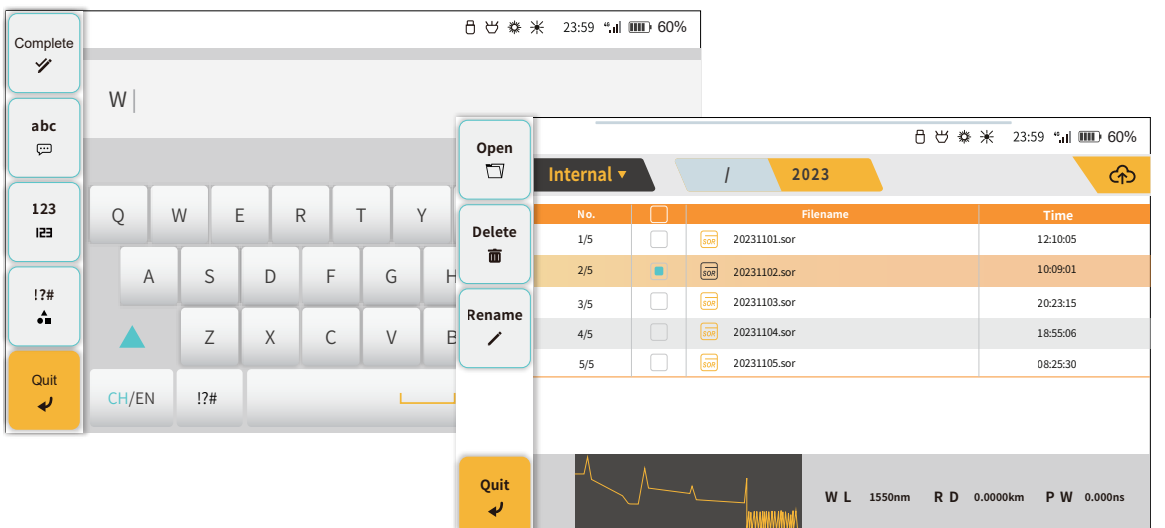
Click "Event Map" or click "  " on the main menu to enter the event map interface. Click the event icon to display the event details, or click "Previous Event/Next Event" to switch to view event details. The event map can be accessed through both Auto OTDR and OTDR Pro, and the interface display is consistent. The event map interface can start measurement, and the advanced settings/markers operations/open files/quick settings are used in the same way as the auto OTDR.



Auto OTDR

Open/Save File

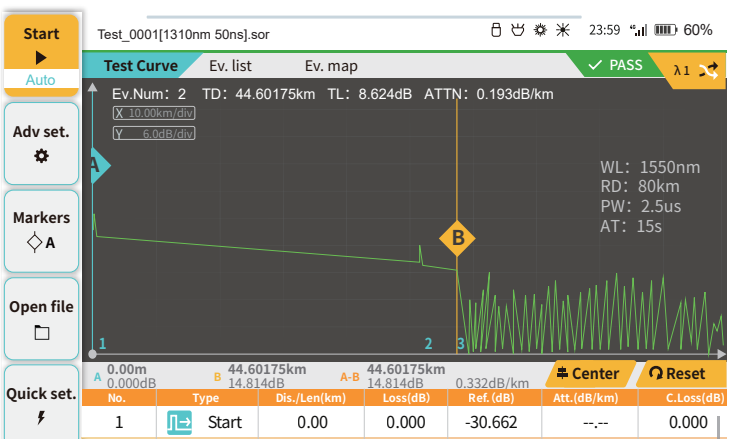
After the measurement is completed, click " Save file " or short press the " F4 " button to save the file, and the file name editing keyboard will pop up. If the auto-save function is turned on in "Advanced Settings", after the measurement is completed, the file will be saved to the designated device according to the preset file name. When you need to view the files that have been measured, click " Open file " or short press " F4 " to enter the file management interface (see P30-31 for details on file management).



Auto OTDR

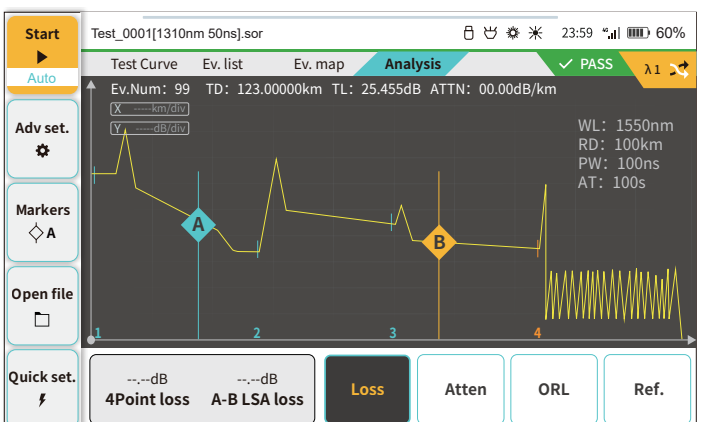
Open/Save File

The device supports opening two waveforms at the same time for comparison. You can click the check boxes of the two waveforms and then press to open. Click " λ1 " to switch waveforms. The file opening interface can start measurement, and the advanced settings/markers operations/open files/quick settings are used in the same way as automatic OTDR.



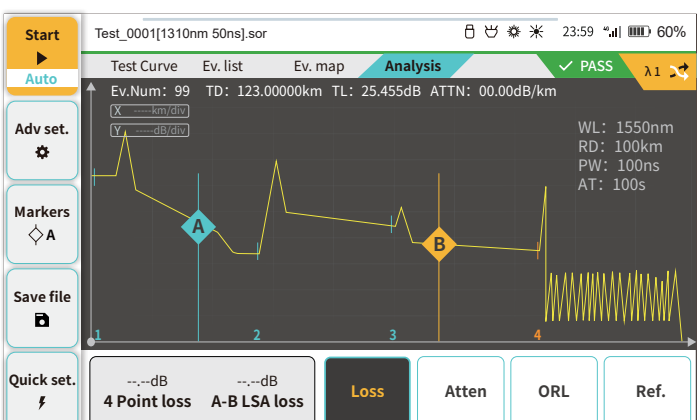
OTDR Pro

OTDR Pro is suitable for experienced users and opens more functions for users to use. See P7 for details on labeling each functional area. You can click to view the four functional pages of "Test Curve", "Event List", "Event Map" and "Advanced Analysis". Advanced analysis is used to calculate loss, attenuation, reflectivity and return loss for user-defined zones. Advanced settings/markers operations/open files/quick settings are used the same as automatic OTDR.



Click " 

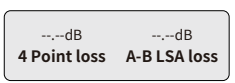
" to switch the controlled cursor, or select the cursor by touching the cursor on the screen. All cursors can be dragged directly on the screen.



OTDR Pro

Advanced Analysis

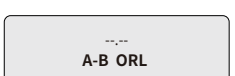
The "Advanced Analysis" information window displays the measurement results of different types of parameters.



4 points event loss: marker a, A, b and B in 4 points algorithm.

Move the markers appropriately, the difference between the LSA value in “a, A" and"b, B" can be used to judge the loss more accurately.

A-B LSA loss: marker A and B in 2 points algorithm. Calculate the difference between A and B by the LSA slope.

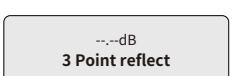


A-B ORL: the ORL value between marker A and B.

Total ORL:the ORL value in the entire circuit.

2 points attenuation: calculate the real attenuation between marker A and B, then unitized to the loss per kilometer, which makes the noise interference larger.

A-B LSA attenuation: obtained after calculating the LSA slope between marker A and B, and the attenuation is relatively stable.

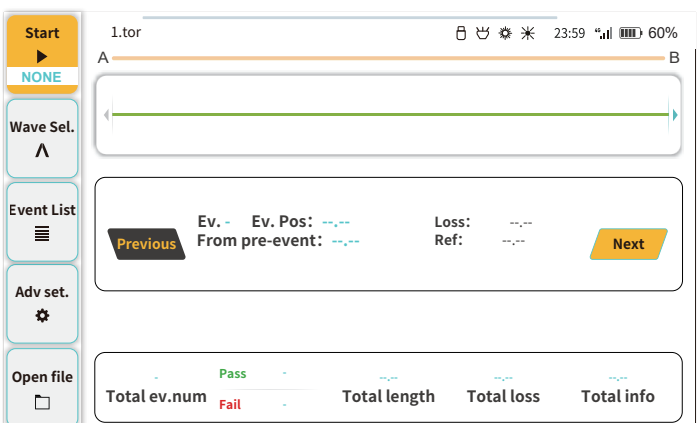


Reflectance: marker a, A and B in 3 points algorithm. Set "a, A" in the flat position before reflection and set B in the highest point of reflection to show the reflectance value.

iOLA

iOLA main interface

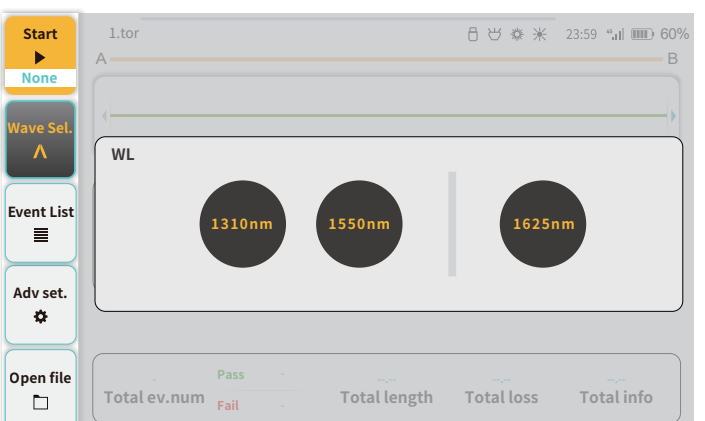
iOLA function can use multiple pulse widths to scan and test optical fiber links, and comprehensively combine the test results of multiple pulse widths to present complex optical links to users in a concise and clear manner. There are 5 function pages: start measurement/wavelength selection/event list/advanced settings/open file.



Wavelength Selection

Click " 

" to enter the wavelength selection interface, and click to select a single wavelength or multiple wavelengths.



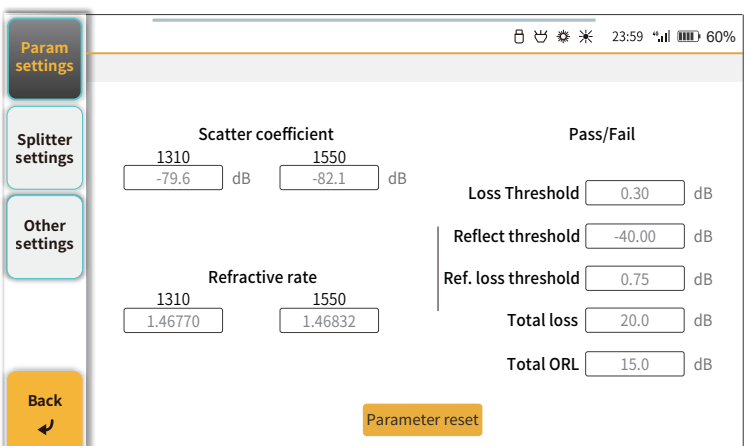
Advanced Settings

Click " 

" to enter the advanced settings interface. There are 3 modules: parameter setting/splitter setting/other settings.

Scattering coefficient/refractive rate, the inherent properties of the optical fiber under test, needs to be set by the user according to the actual situation (the parameter settings of this project are shared with the OTDR).

- Scattering coefficient (under 1ns): affects the reflectivity calculation of reflection events, settable range (-99.9 - -70)
- Refractive rate: affects the judgment of event distance, settable range (1.00000 - 2.00000)



Advanced Settings

Clicking on each item will pop up an editing window. These settings are used to quickly determine whether the line condition is qualified.

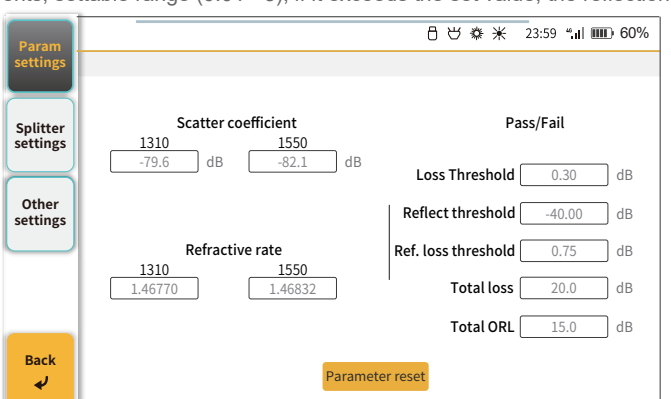
・Loss threshod: Loss threshold for non-reflective events, settable range (0.01-5), if it exceeds the set value, the event will be judged as failed

・Reflect threshod: The reflectivity threshold of reflection events, settable range (-65 - 0), if it exceeds the set value, the reflection event will be judged as failed

・Reflect loss threshod: The loss threshold of reflection events, settable range (0.01 - 5), if it exceeds the set value, the reflection event is judged as failed

・Total loss: The maximum threshold for total link loss, settable range (0-99.9), if the value exceeds the set value, the project will not pass

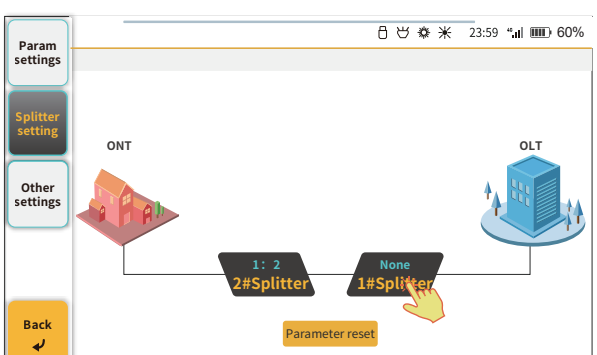
・Total ORL: The maximum threshold of the total optical return loss of the link, settable range (0-70), if it exceeds the set value, the reflection event will be judged as failed.

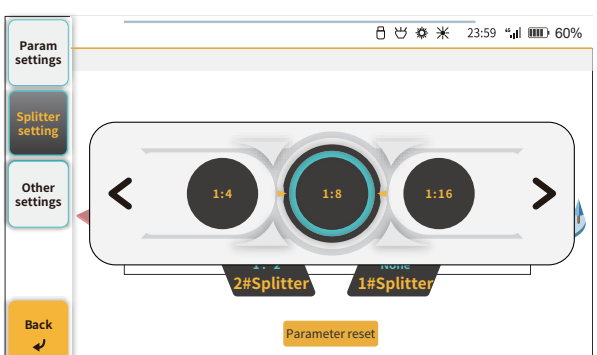


Splitter Setting

Click " Splitter setting " or short press " F2 " or slide the screen to enter the "Splitter Settings" module. Click the "1# Splitter" and "2# Splitter" windows to set them respectively.

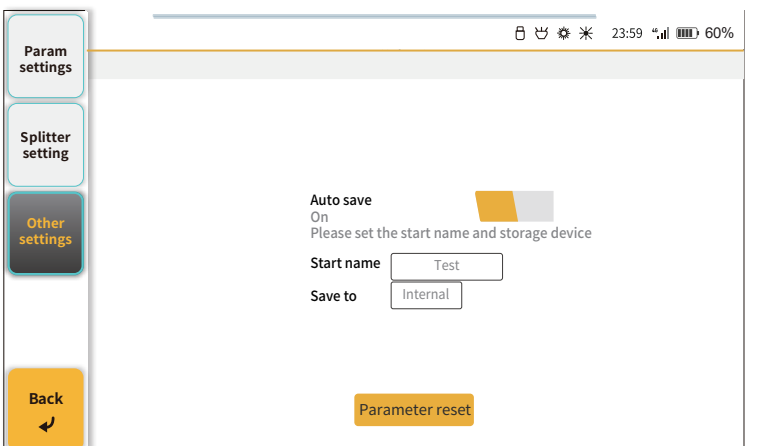
After the splitter is set, when there is a splitter in the test, this algorithm will be used first to calculate and analyze.





Other Settings

Turn on "Auto Save" and the file will be stored in the preset folder. The default folder name is today's date. The "Start Name" function allows user customization.



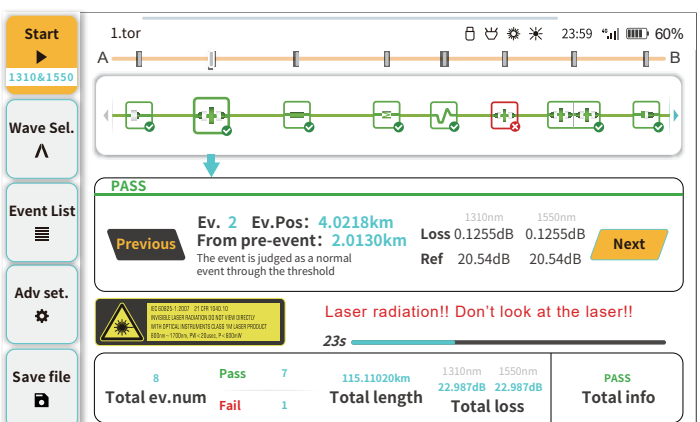
Start Measuring

Click " 

" or short press " 

" button to start/stop measurement according to the current measurement conditions, and a green progress bar is displayed at the bottom. After the measurement is completed, the measurement results and measured values are displayed at the bottom of the screen, and the fiber link status is displayed in a detailed event map. Click " 

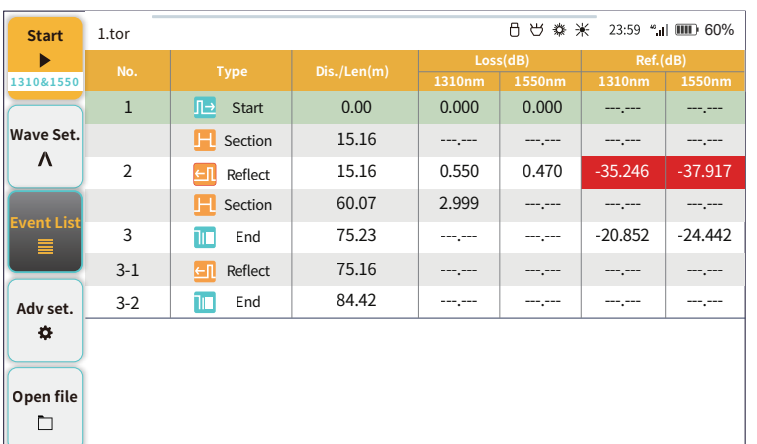
" to display the save interface, and the file will be stored in the preset folder. The default folder name is today's date.



iOLA

Event List

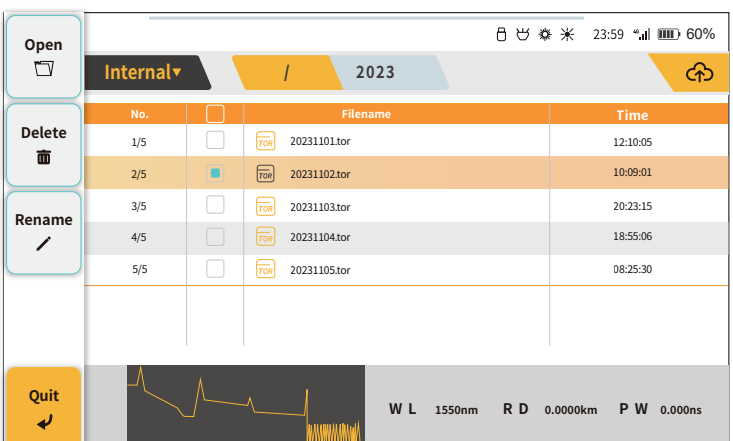
After the measurement is completed, the information can be viewed in the "Event List" interface, and the event list data of the entire optical link is displayed on the screen.



No.	Type	Dis./Len(m)	Loss(dB)		Ref.(dB)	
			1310nm	1550nm	1310nm	1550nm
1	Start	0.00	0.000	0.000	---.---	---.---
	Section	15.16	---.---	---.---	---.---	---.---
2	Reflect	15.16	0.550	0.470	-35.246	-37.917
	Section	60.07	2.999	---.---	---.---	---.---
3	End	75.23	---.---	---.---	-20.852	-24.442
3-1	Reflect	75.16	---.---	---.---	---.---	---.---
3-2	End	84.42	---.---	---.---	---.---	---.---

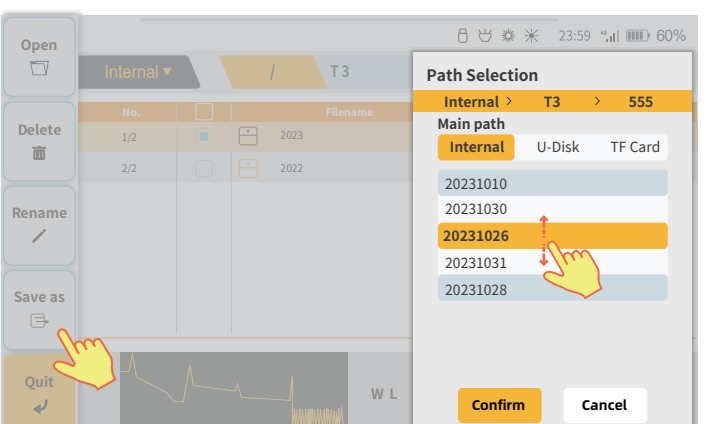
Open File

When you need to view the measured files or edit the stored files, click " Open " or short press " F4 " to enter the file management interface, select the folder or file and click "Open File" to open the selected link Event map. For a folder or file, click " Rename " to rename it, and click " Delete " to delete it.



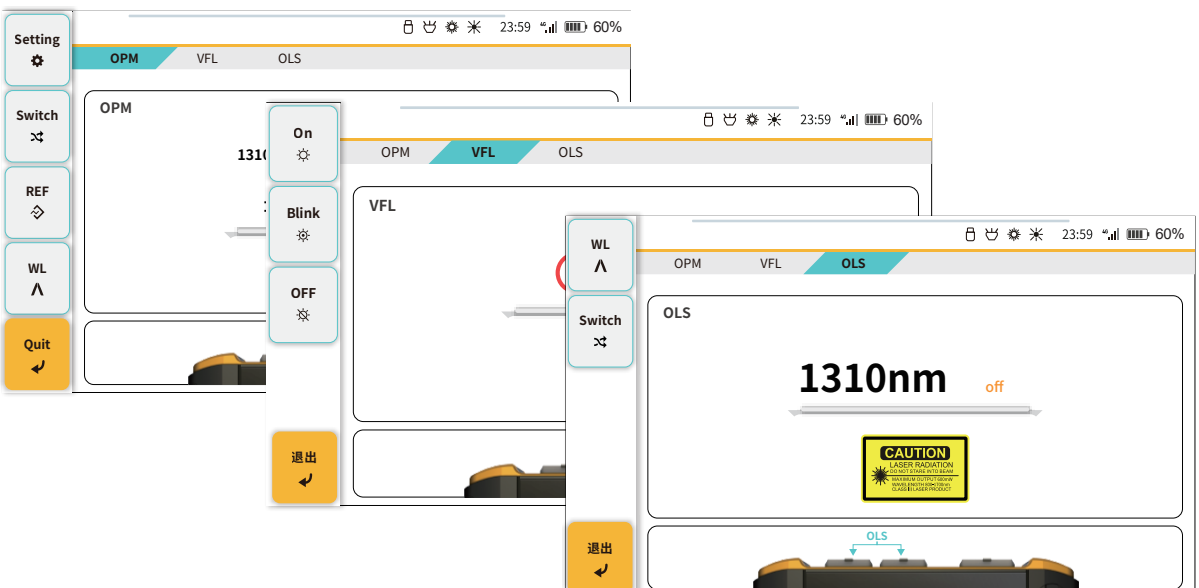
File Manager

Click " " in the menu to enter the file manager interface. You can select a device in the upper navigation bar, and click the corresponding button to return to the corresponding folder level. The selected file can be viewed as a waveform thumbnail at the bottom of the screen. For a folder or file, click " Rename " to rename it, click " Delete " to delete it (multi-selection is supported). Click " Save as " (multi-selection is supported), a path selection pops up, and the selected files can be copied to other devices as required.



OMM

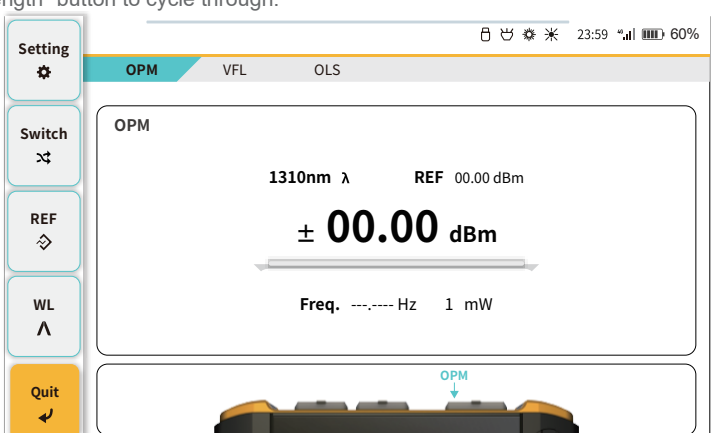
Click "  " in the menu to enter the optical multimeter interface. The "optical multimeter" OPM, VFL and OLS three-in-one function is easy to use and can be used in combination with the REF function of OPM and the stable laser light source of OLS.



・Switch: dBm/dB switching display unit. After setting REF, switch to dB display mode to monitor the change of optical power after setting REF.

・REF: When there is light, click to set the REF of the current wavelength. With the OLS and dB display mode, you can measure the insertion loss of a certain environment or test the stability of the light source; each wavelength has an independent REF setting value.

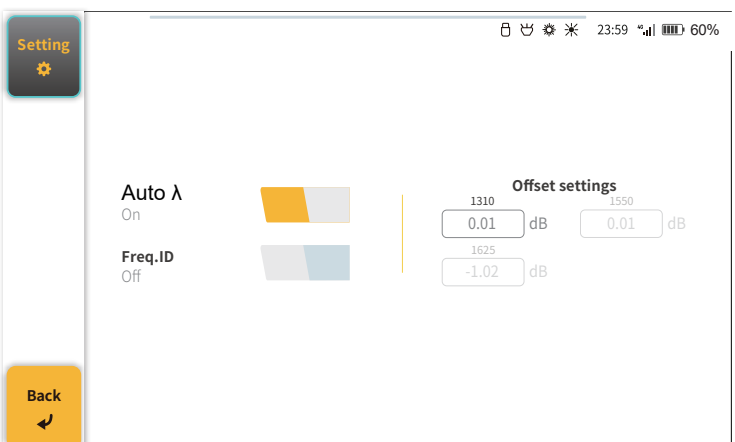
・Wavelength: 10 calibration wavelengths, 850nm, 980nm, 1270nm, 1300nm, 1310nm, 1490nm, 1550nm, 1577nm, 1625nm, 1650nm, use the "Wavelength" button to cycle through.



・Auto λ：Cooperating with our company's laser light source equipment, it can automatically identify the current wavelength of the light and automatically switch to that wavelength.

・Frequency identification: With the carrier modulation signal emitted by the OLS of this product or other laser light sources of our company, the frequency value can be automatically identified.

・Offset settings: Manual calibration settings for each calibration wavelength, settable range (-5.00dB - 5.00dB)



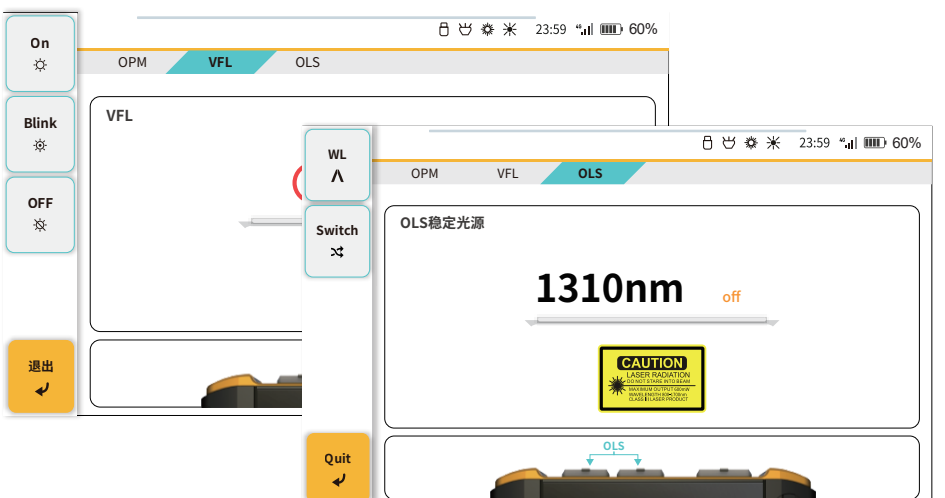
OMM

VFL/OLS

VFL: Three states can be switched: CW,glint,off.

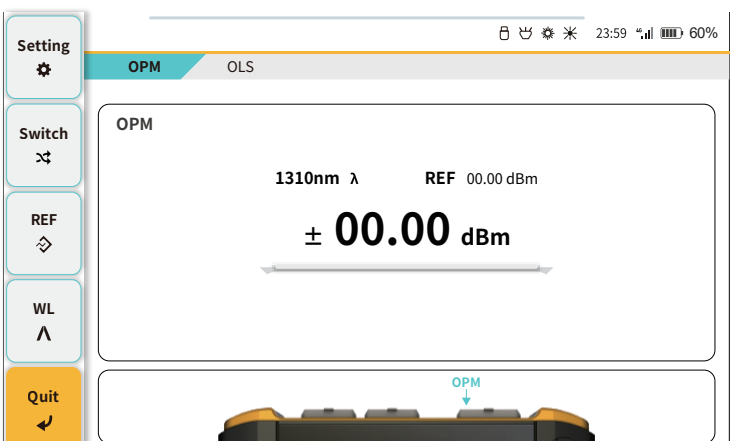
OLS: Support 1310nm, 1550nm wavelength(Specific configuration according to model).

・Modulation signal: CW, 270Hz, 1kHz, 2kHz, 1kHz+flicker, 2kHz+flicker, off.



Loss Tester

Click "  " in the menu to enter the Loss Tester interface. After turning on the OLS and setting CW, switch to the OPM interface and click REF to set the relative power value to 0.00dB. After adding the loss, check the relative power value to get the loss value.



RJ45 Tracker

Click "  " in the menu to enter RJ45 Tracker interface. This module must be used with a network line finder. After connecting one end of the test network cable to the host, turn on the network line finder. Click the "  " or short press the "  " button to start line hunting. When the detector gradually approaches the test network cable, the network line finder will issue a regular beep reminder. Click "  " or short press the "  " button to stop hunting.

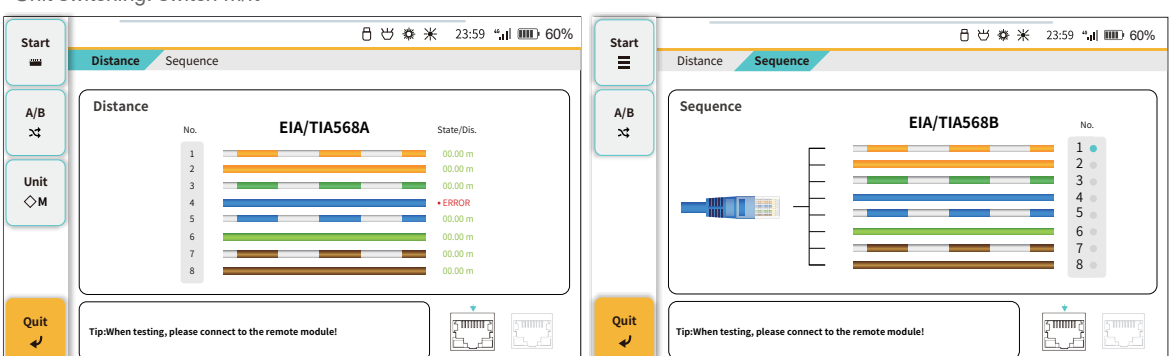
RJ45 Mapper

Click " " in the menu to enter the RJ45 Mapper interface. Connect the RJ45 connector at both ends of the network cable under test to the host and remote network module, and perform the corresponding measurement operations according to the diagram.

RJ45 distance test: Supports measuring the length of commonly used Category 5/6 network cables.

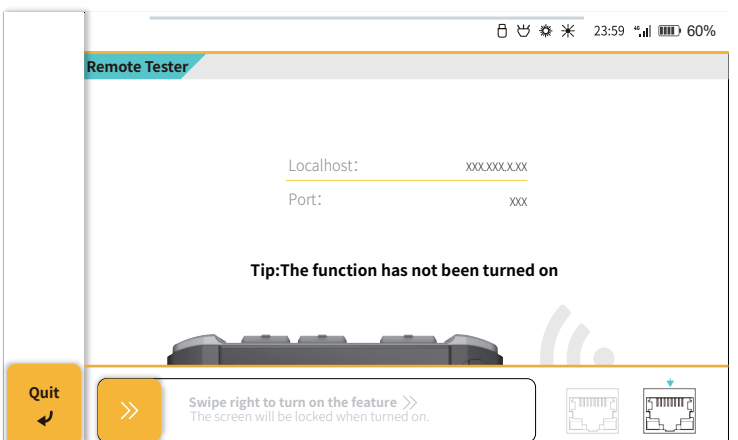
RJ45 sequence test: Check whether the network cable sequence is correct and whether there are any errors such as wrong wiring or disconnection. The other end of the network cable needs to be equipped with a remote module.

- A/B switching: switching of wiring standards
- Unit switching: switch m/ft



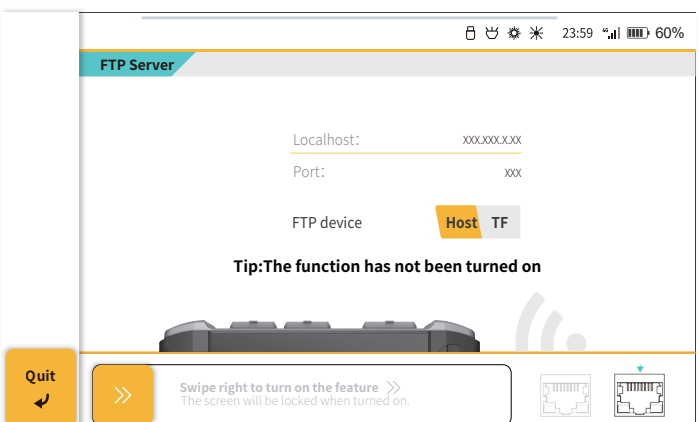
Romote Tester

Click "  " in the menu to enter the remote tester interface. Press and hold "  " and slide to the right to enable the function. The "OTDR Module Client" software needs to be installed remotely, and the local address and port can be entered remotely to control the machine remotely. Click "  " or short press "  " or "  " to return to the main menu.



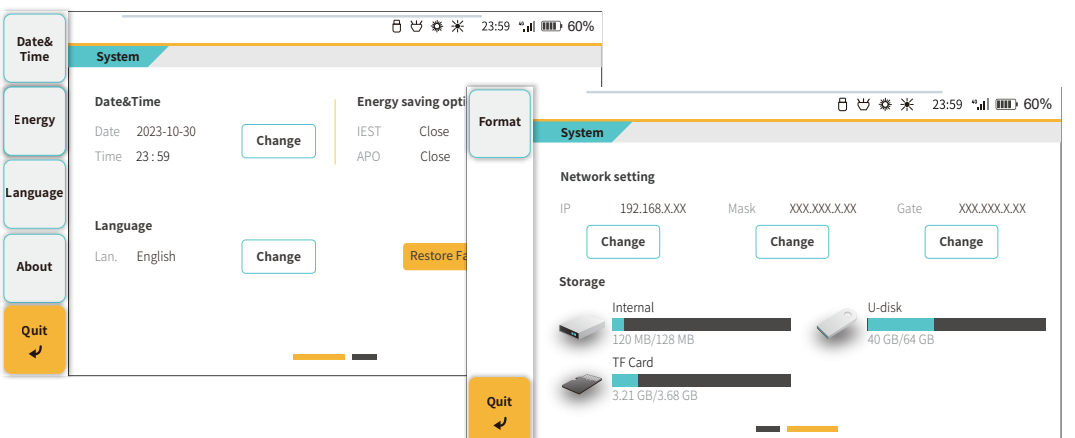
FTP Server

Click " " in the menu to enter the FTP service interface. Press and hold " " and slide to the right to enable the function. You need to install the "filezilla" software on the remote end, and enter the local address and port on the remote end to remotely view, copy and save files. Click " Quit " or short press " F5 " or " " to return to the main menu.



System

Click " " in the menu to enter the system interface. There are four setting interfaces: date & time/energy/language/about. Swipe the screen left to view network setting and storage space. Click "Change" to customize the network address. Click " Restore Factory " to format the storage space. Swipe the screen right to return to the main system settings interface.



Click the desired setting icon or click "Change" to pop up the settings pop-up window where you can customize the settings.

The settings pop-up window can be closed by clicking "cancel" or short pressing " ⊗ ". Click " Quit ↵ " or short press " F5 " or " ⌂ " to return to the main menu.