OTDR710MAX

Optical Time Domain Reflectometer

User Guide _ Version 1.0

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Please prepare the following information before you contact us and describe the problems.

- Product model and S/N
- Warranty information

Content

1. Safety Information

Read all safety information carefully before using this product to ensure personal safety and proper use.

- Assure the power supply conforming to the specification of this product and qualified for the country of use.
- Use batteries that meet the specifications of this product.
- Do not use damaged power cords, accessories or other peripheral equipment.
- Make sure the product is operated on the permitted ambient conditions.
- Never directly look into the optical outputs interface.
- Dangerous laser radiation: 

2. Introduction

Ascentac OTDR710MAX Series is an Optical Time Domain Reflectometer that utilizes Rayleigh backscattering technology to characterize fiber optic links. It provides comprehensive analysis through traces, event tables, and event maps, enabling clear visualization of results—including reflective events (connectors), non-reflective events (fiber bends), and fiber breaks—while accurately calculating total fiber length and optical loss.

Ascentac OTDR710MAX Series features the Intelligent Optical Link function, which performs scans using multiple pulse widths. By synthesizing the test results from various pulse widths, it provides users with a simplified and intuitive representation of complex optical links.

Ascentac OTDR710MAX Series offers a 3-in-1 integrated solution, featuring a Stabilized Light Source (SLS), an Optical Power Meter (OPM), and a Visual Fault Locator (VFL). Additionally, the light source and power meter can be used simultaneously to perform professional optical loss measurements.

Ascentac OTDR710MAX Series provides cable tracking and wire mapping functions, enabling users to efficiently locate target network cables and verify the integrity of cable wiring.

2.1 Features

- Dynamic range up to 50dB
- Event dead zone: 0.5m; Attenuation dead zone: 2.5m
- Simultaneous comparison of up to 30 trace curves
- Fiber link graphical analysis for quick link status assessment
- Store test results and upload to PC

2.2 Application

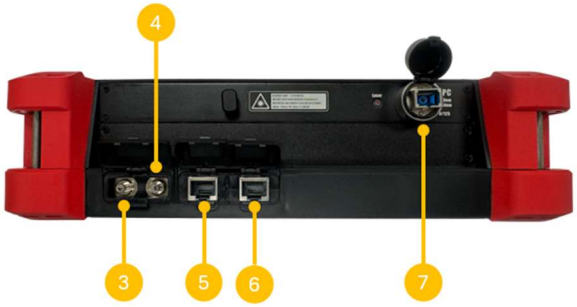
- Telecom & CATV maintenance
- Fiber optic fault detection and repair

3. Product Description

3.1 Appearance

- Front View

- Top View



- Left View

- Right View

3.2 Interface

Item	Function	Item	Function
1	10.1" Display Screen	8	USB Interface
2	Power Button (On/Off)	9	Headphone port
3	OPM Optical Port	10	LAN port
4	VFL Optical Port	11	SIM card port
5	Cable Tracking Port	12	TF card port
6	Wire Mapping Port	13	Charging Port
7	OTDR Optical Port		

4. Operating Instructions

4.1 Main Screen

The Main Screen contains the following information:

- Date and Time
- CPU Temperature
- Applications

Note：

The available functions on your device depend on the specific model and accessories purchased.

Applications are categorized into three statuses: Activated, Trial, and Locked. To activate specific functions, please contact the manufacturer to obtain an authorization code.

Activating an Applications:

1. Long press the icon of the application you wish to activate on the Main Screen.
2. Tap "Unlock"; an application authorization window will pop up.
3. Enter the authorization code provided by the manufacturer to activate the application.

Clearing Application Data:

1. Long press the icon of the application you wish to clear data for on the Main Screen.
2. Tap "Clear Data" to complete the process.

- Navigation and Status Bar (set to "ON" by default). For detailed information

regarding Navigation and Status Bar settings, please refer to Section 4.4.4 "Display".

NOTE: Due to differences in hardware platforms, your product's actual interface may differ slightly from the images shown in this user manual.

NOTE: In this manual, the terms "Tap" and "Double-tap" (related to touchscreen operations) refer to "Single-click" and "Double-click", respectively.

4.2 OTDR Application Overview

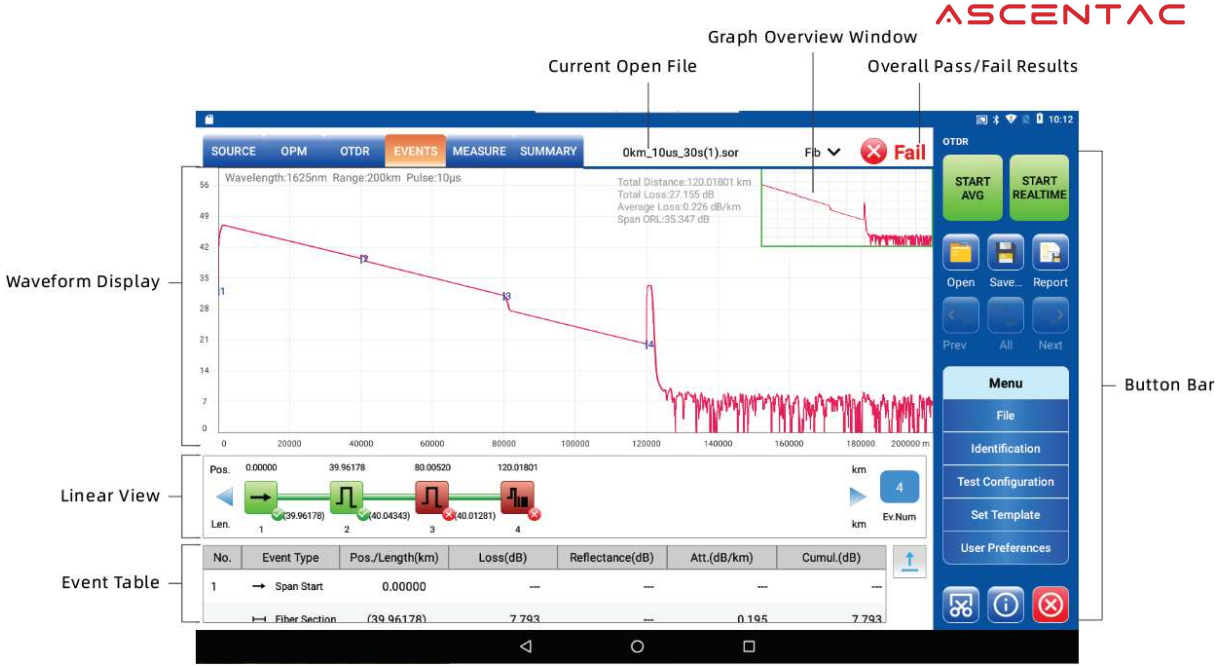
4.2.1 Introduction to OTDR

The Optical Time Domain Reflectometer (OTDR) is used to characterize optical fiber spans, which typically consist of multiple fiber segments joined by splices and connectors.

A standard OTDR provides a fiber trace (graphical representation) and calculates key parameters such as fiber length, attenuation, breaks, Total Return Loss (ORL), splice loss, connector loss, and total end-to-end loss.

4.2.1.1 Main Window

As shown below, the Main Window contains all the commands required to operate the OTDR:



NOTE: Due to screen resolution variations, the OTDR application screens may differ slightly from the illustrations in this user manual.

4.2.1.2 Data Post-Processing

If the OTDR application is not being used, traces can be viewed and analyzed on a computer with the OTDR Assistant for PC software installed.

4.2.1.3 Basic Principles of OTDR

- The OTDR is a precision optoelectronic instrument designed based on Rayleigh scattering and Fresnel reflection produced by backscattering as light travels through an optical fiber. It is widely utilized in the maintenance and construction of optical fiber links to measure fiber length, transmission attenuation, splice loss, and fault location.

  The formula used by the OTDR to calculate distance is as follows:

$$\text{Distance} = \frac{c}{n} \times \frac{t}{2}$$

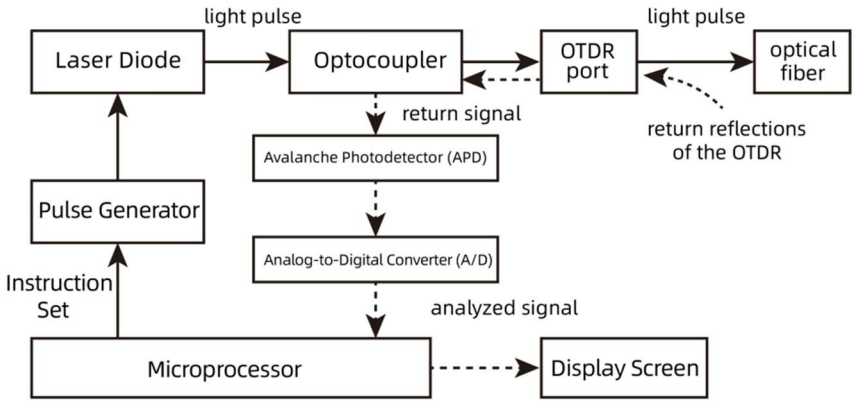
  Where:

c = Speed of light in a vacuum (2.998 x 10^8 m/s)

t = Time delay between pulse emission and reception

n = Refractive index of the fiber under test (specified by the manufacturer)

- Rayleigh Scattering: As a pulse travels along the fiber, it encounters minute variations in the material (such as changes in the refractive index and discontinuities), causing light to scatter in all directions. A small portion of this light is reflected directly back toward the transmitter; this phenomenon is known as backscattering.
- Fresnel Reflection: This occurs when light encounters a sudden change in material density along the fiber, such as at a connection with an air gap or at a fiber break. Compared to Rayleigh scattering, Fresnel reflection is significantly stronger, and its intensity depends on the degree of the refractive index change.



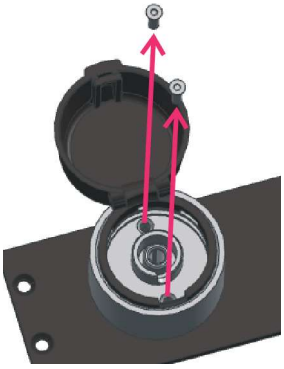
On a complete trace, each displayed data point represents the average value of multiple sampling points. To examine individual sampling points in detail, you must zoom in on the trace.

4.2.2 Preparing the OTDR for Testing

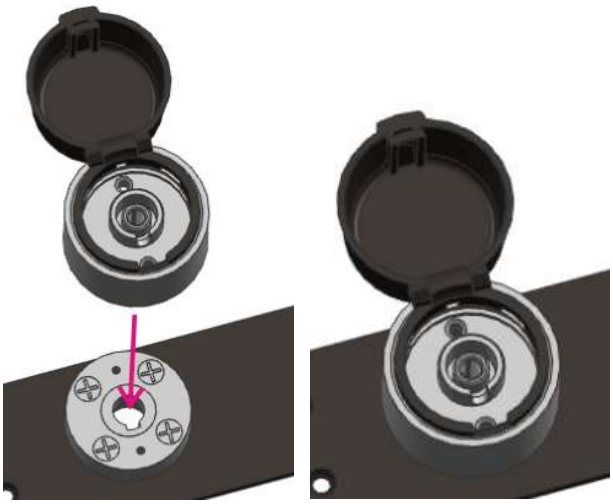
4.2.2.1 Installing or Replacing the Stainless Steel Connector

Follow these steps to install or replace the stainless steel connector:

A. Remove the screws from the connector, then pull out the head assembly.



B. Select the appropriate connector head and base assembly for replacement.



C. Secure the connector head and base using the screws.

4.2.2.2 Cleaning and Connecting Optical Fibers

Important

To ensure maximum power transmission and avoid erroneous measurements:

- Fiber End-Face Inspection Before inserting a fiber patch cord into the connector, it is mandatory to inspect the fiber end-faces following the methods described below to ensure they are clean. The Company assumes no liability for any equipment damage or measurement inaccuracies resulting from improper cleaning techniques or incorrect operational procedures.
- Always identify the connector type of your fiber patch cord before connection. Inserting an incompatible connector into the port will cause permanent damage to the ferrule.

Steps for Connecting Fiber Patch Cords

A. Inspection

Use a fiber inspector (microscope) to examine the fiber. If the fiber is clean, insert it into the connector. If contamination is detected, clean it according to the following procedure.

B. Cleaning the Fiber End-Face

B-1: Gently wipe the fiber end-face using a **lint-free swab** moistened with optical-grade cleaning fluid.

B-2: Use a dry swab to ensure the connector is completely dry.

B-3: Visually re-inspect the fiber end-face to confirm it is pristine.

C. Alignment

Carefully align the fiber patch cord with the connector, ensuring the end-face does not come into contact with other surfaces to avoid friction or scratches. If the patch cord has an alignment key (latch), ensure it is fully seated into the corresponding groove of the connector.

D. Securing the Connection

Push the fiber patch cord in until it is fixed in place to ensure optimal physical contact. If the patch cord features a threaded sleeve, rotate it until it is firmly secured. Do not overtighten, as excessive force may damage the fiber end-face.

NOTE: If the fiber is not properly locked or fully connected, it will result in severe insertion loss and high reflectance, leading to inaccurate test data.

4.2.2.3 Auto-Naming Trace Files

Depending on your configuration, file names consist of one or two fixed parts (alphanumeric characters) and one or two variable parts (increments or decrements of numeric values), as shown below:

If increment is selected...	If decrement is selected...
The variable part increments sequentially until it reaches the maximum value for the specified number of digits, then restarts from 1.	The variable part decrements sequentially until it reaches 1, then restarts from the maximum value for the specified number of digits.

Note: To enable numeric decrement, the starting value must be greater than the ending value.

Automatic File Naming and Increment Logic

After saving a result, the device automatically increments (or decrements) the current file name suffix to generate the name for the next file.

- **Digit Selection:** You can specify the number of digits to be displayed for the increment or decrement value.
- **Flag Incrementation:** One or more flags (labels) in the file name can be set to increment. Selecting a single flag will apply your predefined increment/decrement value.
- **Sequential Logic:** If multiple flags are selected, they will increment sequentially starting from the last item in the list (the one with the highest index).

Example:

If the file name includes a Location flag, a Cable flag, and a Fiber flag in that order, the incrementation sequence will be as follows:

Location 1, Cable 1, Fiber 1

Location 1, Cable 1, Fiber 2 (Fiber increments first)

Location 1, Cable 2, Fiber 1 (Cable increments after Fiber reaches its limit)

and so on.

NOTE: If the current trace file is not saved, the suggested file name will remain reserved for the next trace. This feature is highly efficient for multi-fiber (multi-core) cable testing.

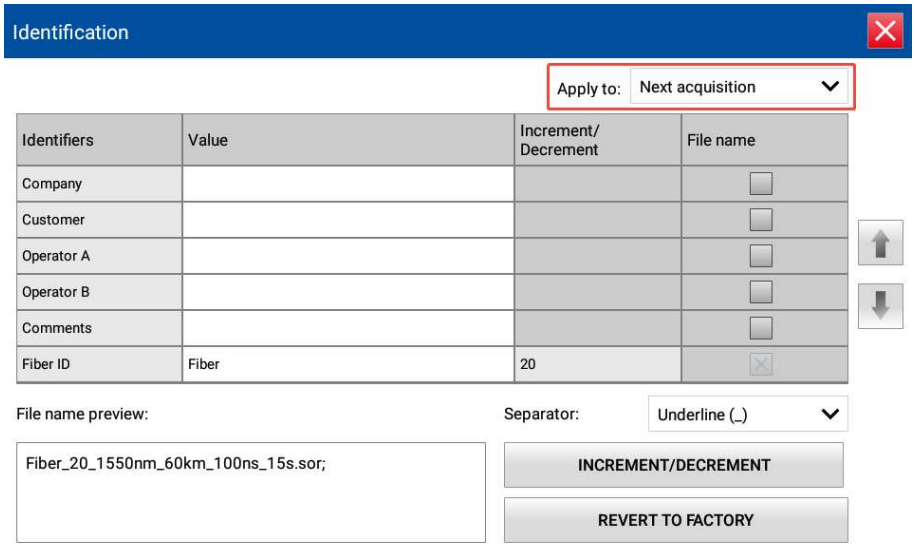
If the automatic naming function is disabled, the application will revert to using the default file name.

NOTE: In the (.sor) format, the device will generate a file for each wavelength.

Setting Up Automatic File Naming

A. From the Menu, tap on "Flags".

B. In the "Apply To" list, select either "Next Acquisition" or "Current Acquisition".

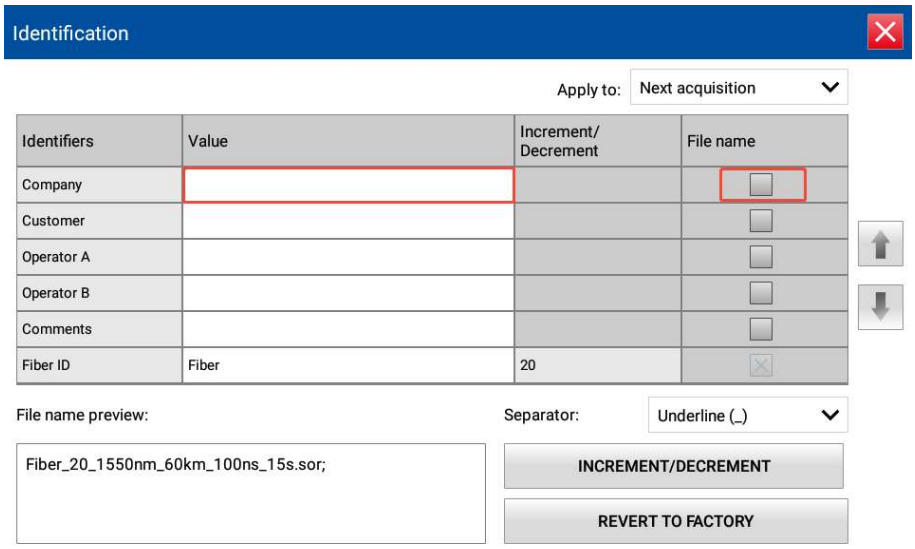


C. Follow these steps to input the required data:

C-1: Locate the row containing the flag you wish to modify. Select the check box in the "File Name" column to enable that flag.

C-2: Tap the "Value" field of the desired flag.

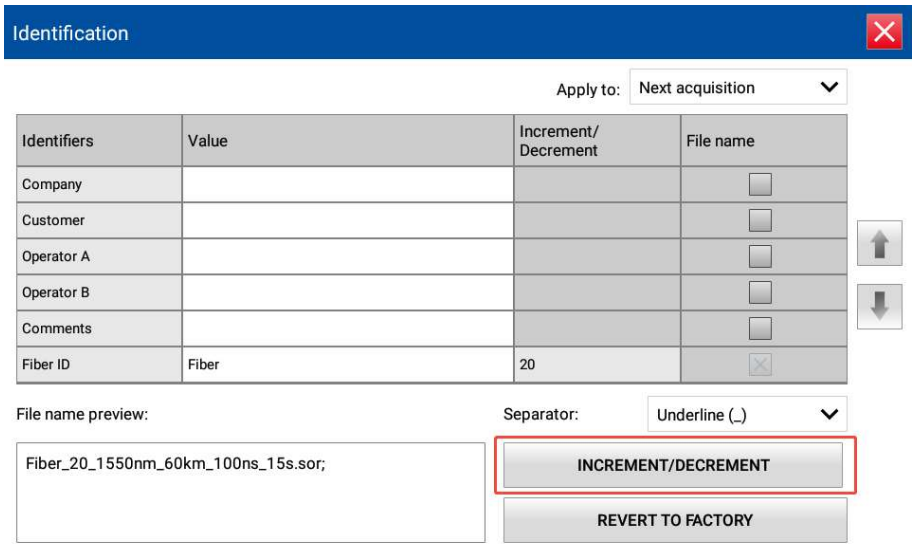
C-3: Enter the relevant information using the on-screen keyboard.



NOTE: Information displayed in gray boxes is read-only and cannot be modified.

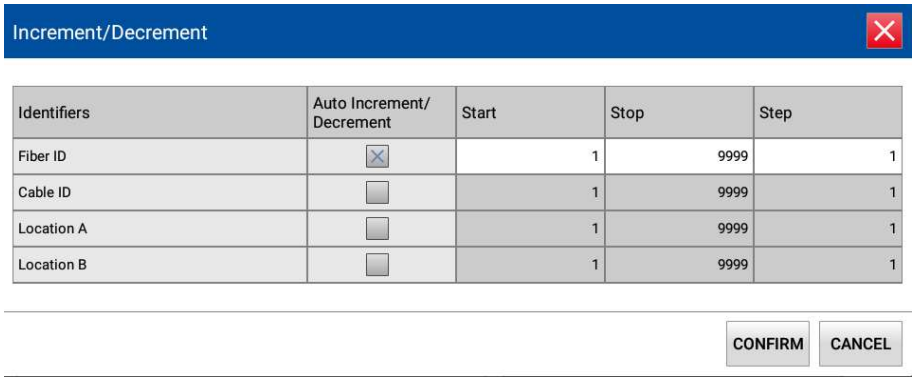
D. To enable auto-increment for Cable, Fiber, or Location (A/B) flags:

D-1: Tap the "Increment/Decrement" button.



D-2: In the popup window, select the "Auto-Increment" check box next to the target flag.

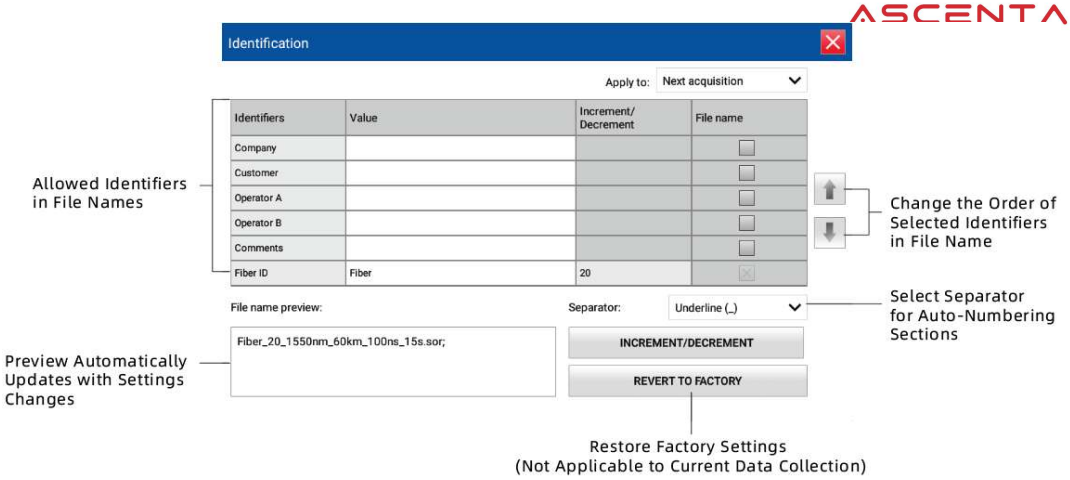
D-3: Enter the Start Value, Stop Value, and Step Value as required.



Note: To enable numeric decrement, the Start Value must be greater than the Stop Value.

D-4: Tap **"OK"** to save and return to the "Flags" window.

E. Select the flags you want to include in the file name. Highlight a flag and use the Up or Down arrow buttons to change its position within the file name.



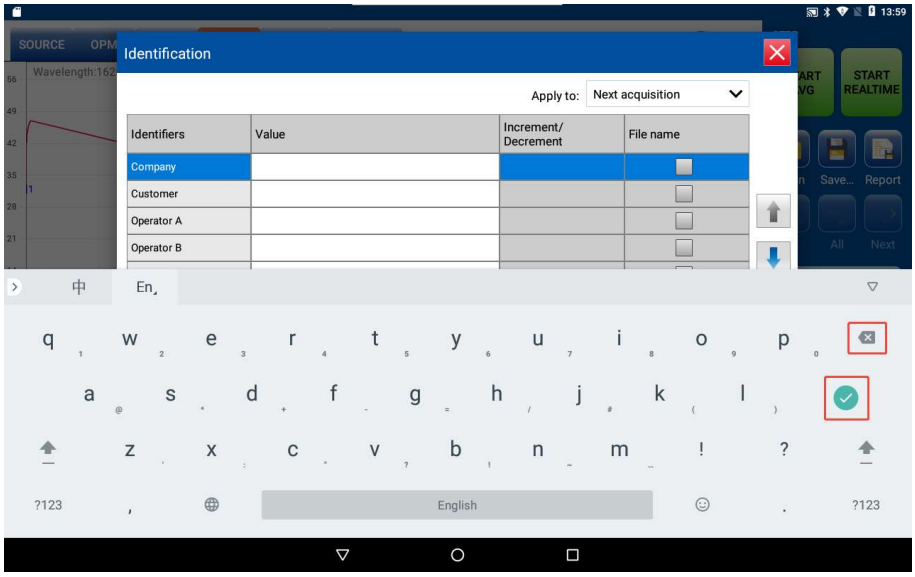
F. Tap“ ”to confirm the new settings and return to the main window.

Steps to Clear "Value" Entries

A. From the Menu, tap "Identification ".

B. In the "Apply To" list, select "Next Acquisition".

Tap the white box in the "Value" column that needs to be cleared, a soft keyboard will pop up, tap " " to delete the contents of the "Value" column, and then tap the " " utton to return to the identification window.



C. Tap“ ”to return to the main window.

4.2.2.4 Setting Index of Refraction and Backscatter Coefficients

Before performing a test, you must configure the Index of Refraction (IOR) and the Backscatter (RBS) Coefficient. These parameters will be applied to all newly acquired traces.

- **Index of Refraction (IOR)**

  Also known as the Group Index, the IOR is used to convert the light propagation time into physical distance. An accurate IOR is essential for all distance-related OTDR measurements, such as Event Location, Attenuation, Section Length, and Total Length. This value is typically provided by the fiber cable manufacturer.

  The application provides default values for each wavelength. You can manually adjust the IOR for each wavelength; it is highly recommended to verify this information before every test.

- **Backscatter (RBS) Coefficient**

  The RBS coefficient represents the amount of backscattered light for a specific fiber. It is used to calculate Event Loss and Reflectance. Like the IOR, this coefficient is usually provided by the manufacturer.

  The application provides default values for each wavelength. You can manually configure the RBS coefficient for each wavelength as needed.

  The application saves these settings within the measurement result file, ensuring they can be viewed even when the file is opened on other devices.

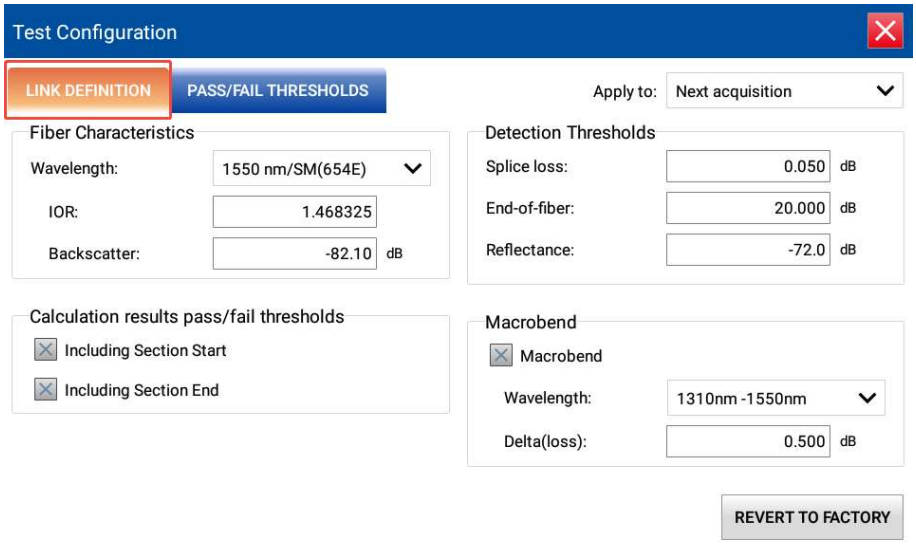
  Both IOR and RBS settings can be reset to default values.

Steps to set IOR and RBS Coefficients

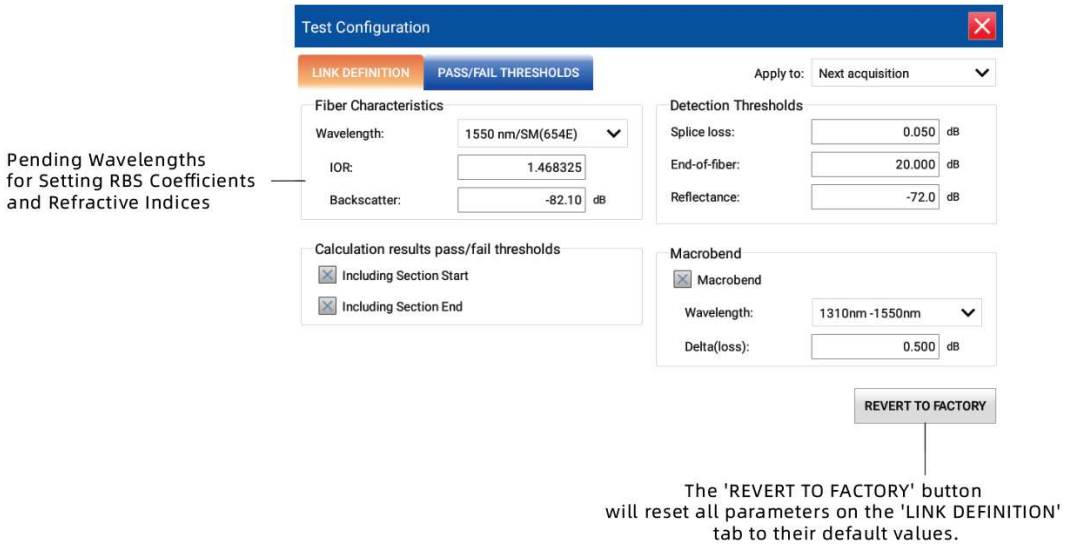
A. From the Menu, tap on "Test Configuration".

B. In the "Apply To" list, select "Next Acquisition".

C. Within the "Test Configuration" window, open the "Link Definition" option. ◦



D. Select the desired wavelength.



Important

The RBS coefficient must be obtained from the fiber manufacturer before any changes are made to its default value. Incorrect configuration of this parameter will result in inaccurate reflectance measurements.

E. Tap“  ”to return to the main window.

4.2.2.5 Setting Analysis Detection Thresholds

Configuring the following analysis detection thresholds allows you to optimize the Event Detection functionality:

- **Splice Loss Threshold:** Used to display or hide small non-reflective events (such as fusion splices).
- **Reflectance Threshold:** Used to hide false reflective events caused by noise, convert harmless reflections into loss events, or detect critical reflections that may damage the network or other optical equipment.
- **End-of-Fiber Threshold:** Used to immediately stop analysis when a severe event loss occurs (e.g., an event that could compromise network signal transmission).

NOTE: If you are using a Live Fiber module, the default End-of-Fiber threshold is set to 15 dB.

NOTE: Modifying the detection thresholds of the current trace will trigger a re-analysis of the trace. Please be aware that all manually adjusted values will be lost during this process.

Important
If the application is set to automatically determine data acquisition settings, the user-defined End of Fiber (EoF) threshold will be applied. Once this threshold is defined, the application inserts an EoF event at the first point where the loss exceeds the specified value. Subsequently, the application uses this EoF event to establish the final data acquisition parameters.

Setting thresholds helps ignore events with minor measured values or ensures that all events are detected, even those with very small measurements.

The application saves these threshold values directly into the measurement result file. This ensures that the thresholds remain visible even when the file is opened on other devices.

Steps to Set Analysis Detection Thresholds:

A. In the "Menu," tap "Test Configuration."

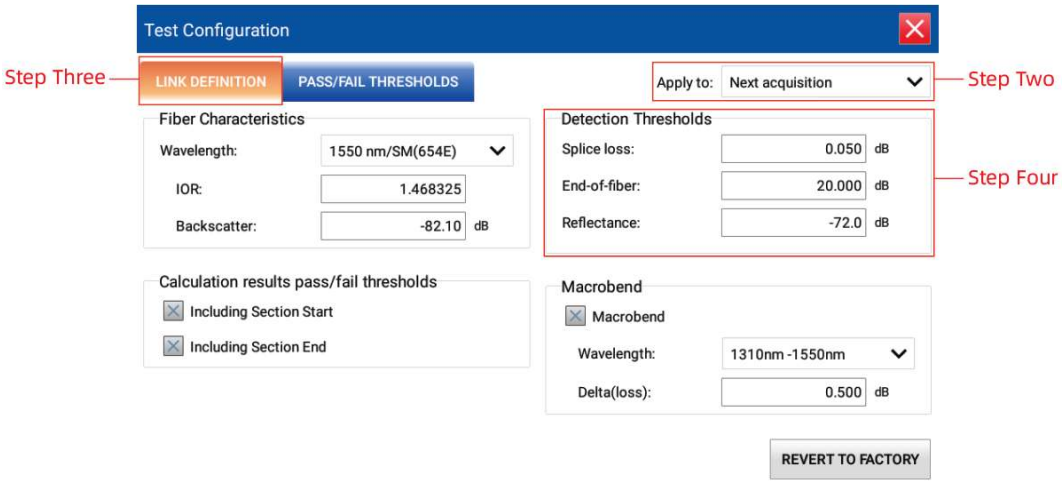
B. In the “Apply to” list, select “Next acquisition”.

C. In the "Test Configuration" window, open the "Link Definition" tab.

Important
The "REVERT TO FACTORY" button resets all parameters in the "Link Definition" tab to their default values.

D. Under "Detection Thresholds," enter the values for each parameter as needed.

To revert all parameters to their default values, click the "REVERT TO FACTORY " button.



E. Tap“  ”to return to the main window.

Any changes made to the analysis detection thresholds will be applied to all new curves.

4.2.2.6 Configuring Macrobend Parameters

The device identifies macrobends by measuring the event loss at a specific wavelength (e.g., 1310 nm) and comparing it with the loss at another wavelength (e.g., 1550 nm) at the same location.

A macrobend is confirmed if both of the following conditions are met during the comparison:

- **Higher Loss at Longer Wavelength:** The loss measured at the longer wavelength is greater than the loss at the shorter wavelength.
- **Loss Difference Exceeds Threshold:** The difference between the two loss values exceeds the specified Loss Delta. The default value is 0.5 dB (suitable for most fibers), but this can be adjusted based on actual requirements.

You may also disable the macrobend detection function if it is not required.

Note: Macrobend detection is not available for filtered wavelength or single-wavelength port. It is only available for multi-wavelengths measurement.

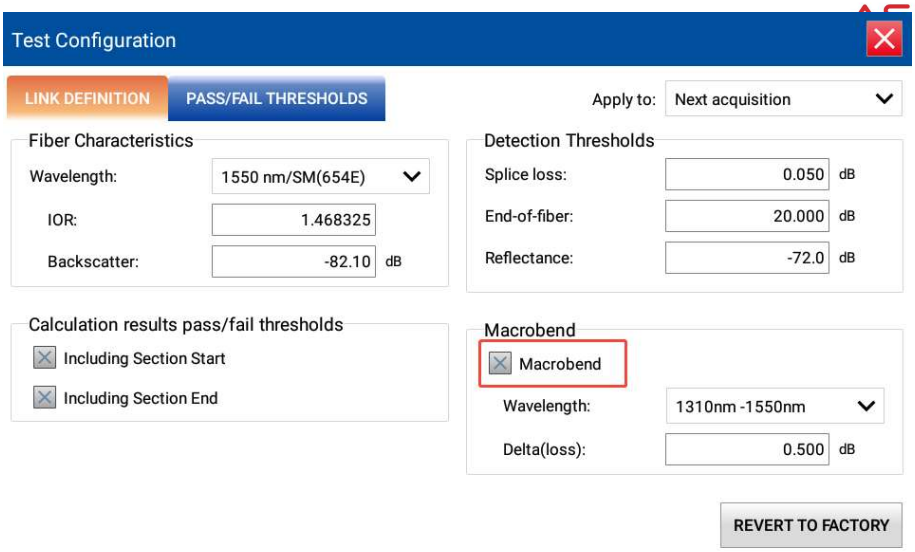
Steps to Configure Macrobend Parameters:

A. From the "Menu", tap "Test Configuration".

B. In the "Apply to" list, select "Next acquisition".

C. In the "Test Configuration" window, open the "LINK DEFINITION" tab.

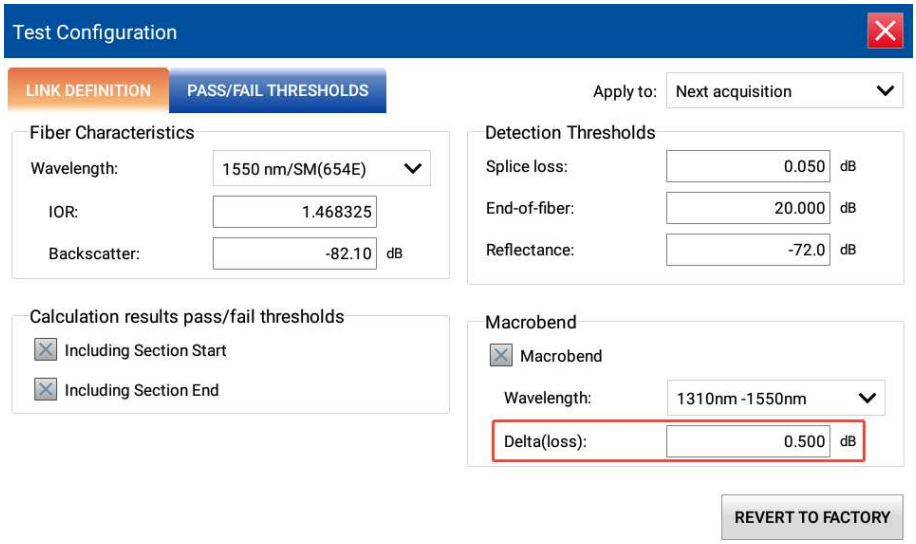
D. Select the "Macrobend" checkbox to enable macrobend detection, or deselect it to disable the function.



E. If necessary, set the Loss Delta as follows:

E-1: In the "Wavelength list", select the pair of wavelengths for which you want to set the difference.

E-2: In the "Delta (loss)" box, enter the desired value.



E-3: Repeat steps E-1 and E-2 to configure the delta values for other wavelength combinations.

F. Tap"  "to return to the main window.

4.2.2.7 Configuring Pass/Fail Thresholds

You can configure the Pass/Fail Threshold parameters for your tests. The application saves these thresholds directly into the measurement result file, ensuring they remain accessible even when the file is opened on other devices. Thresholds can be defined for splice loss, connector loss, reflectance, fiber section attenuation, span loss, and span ORL. Different thresholds can be set for each wavelength. These settings will be applied to the analysis results of the current trace and all subsequent new traces for their respective wavelengths.

If a processed file contains additional wavelengths, the application automatically adds them to the available wavelength list. You can then define thresholds for these new wavelengths or revert all thresholds to their factory default values.

The configured loss, reflectance, and attenuation thresholds apply to all events where such values can be measured. Once these thresholds are set, the application performs a Pass/Fail test to determine the status of the measurement results.

In the Events Table, any value exceeding the predefined threshold is highlighted in white text on a red background. Additionally, the values for Span Length, Span Loss, and Span ORL (Optical Return Loss) are displayed in the Summary tab.

Steps to Set Pass/Fail Thresholds:

A. From the "Menu," select "Test Configuration."

B. In the "Apply To" list, select "Next Acquisition."

C. Select the "Pass/Fail Thresholds" tab.

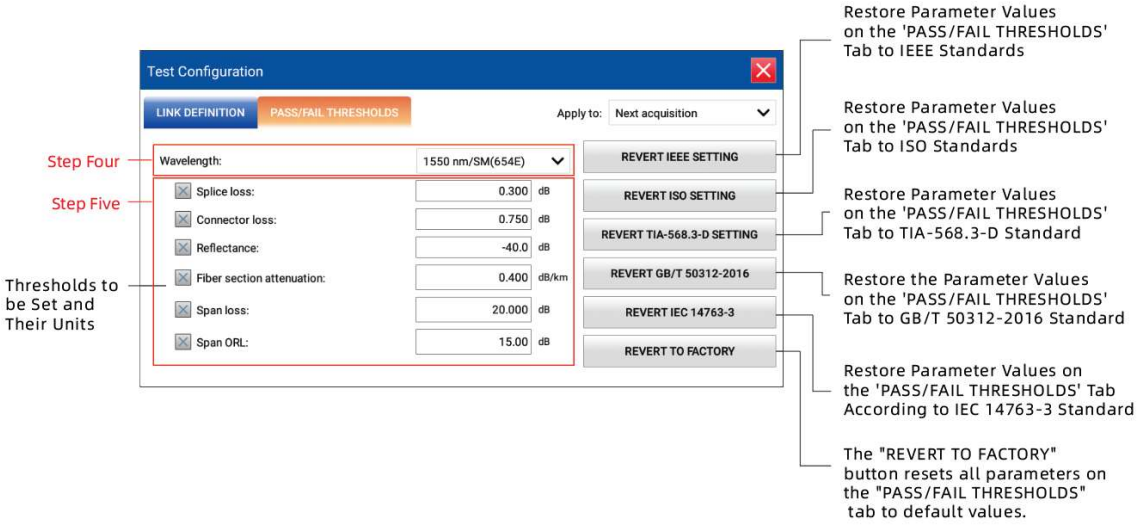
Important

If there is a data collection that has been executed and saved, the "Apply to" list will show two options: "Next acquisition" and "Current acquisition". Both the current curve settings and the new data collection will be modified.

D. From the "Wavelength" list, select the wavelength for which you want to set thresholds.

E. Select the checkbox corresponding to the threshold you wish to use, and enter the desired value in the respective text box.

F. Tap“  ”to return to the main window.



4.2.2.8 Set Whether the Calculation Results and Pass/Fail Thresholds Include the Start/End Point of the Span

You can configure whether the application's test results and Pass/Fail thresholds include the start and end points of the span.

By default, the application includes the start and end points of the span.

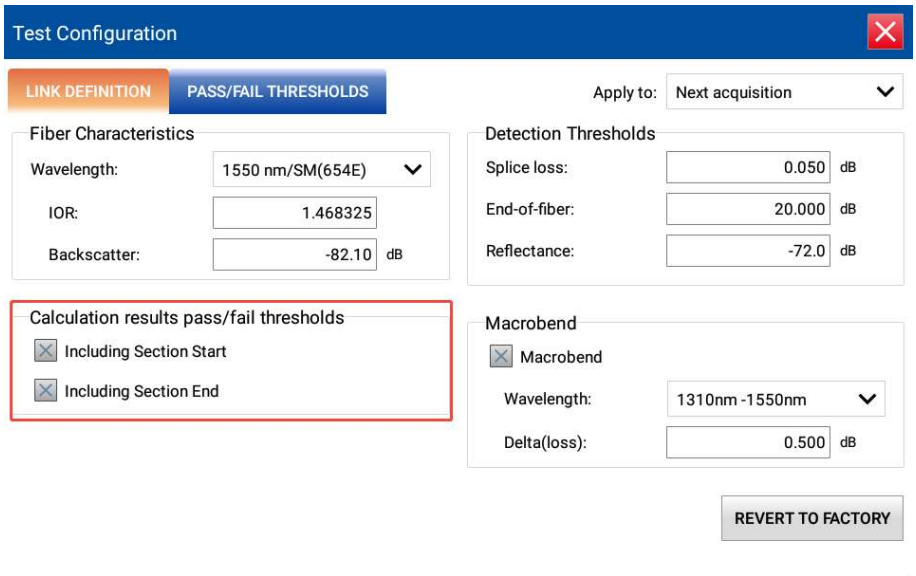
Steps to Include or Exclude Span Start/End in Results and Pass/Fail Thresholds:

A. From the "Menu", tap "Test Configuration".

B. Select the "LINK DEFINITION" tab.

C. Under "Calculation results and Pass/Fail thresholds", select the check box Include span start points or select the check box Span end points. Alternatively, deselect the checkboxes to exclude the Span Start or Span End from the calculations.

D. Tap"  "to return to the main window.



4.2.3 Testing Fibers

You can perform comprehensive OTDR testing using a variety of tools and customize all test parameters. By default, all available wavelengths are selected. You may manually configure data acquisition parameters or allow the application to determine the most appropriate values. In Auto Mode, the application automatically evaluates the optimal settings based on the fiber link currently connected to the device.

The pulse width is determined by factory-set Signal-to-Noise Ratio (SNR)

requirements, ensuring the SNR is sufficient to detect the End of Fiber (EoF) event. The EoF event detection algorithm utilizes the End of Fiber threshold configured in the "Test Configuration" window (for more details, refer to Section 4.2.2.5, "Setting Analysis Detection Thresholds"). If you are unsure of which value to choose, you can restore the parameter to its factory defaults.

Note: You may interrupt data acquisition at any time. The application will display the information collected up to the point of interruption, along with the corresponding analysis results.

Once the analysis is complete, all events will be displayed in the "Events" tab. For more details, please refer to Section 4.2.5, "Analyzing Traces and Events."

After analysis, you can save the measurement results. If the previous results have not been saved, the application will prompt you to save them before restarting data acquisition.

Steps to acquire curves:

A. Properly clean the fiber patch cord. (For more details, refer to Section 4.2.2.2, "Cleaning and Connecting Optical Fibers.")

B. Connect the fiber to the OTDR optical interface. If the device has two optical

interfaces, ensure the fiber is connected to the appropriate port (SM, SM Live, or MM).

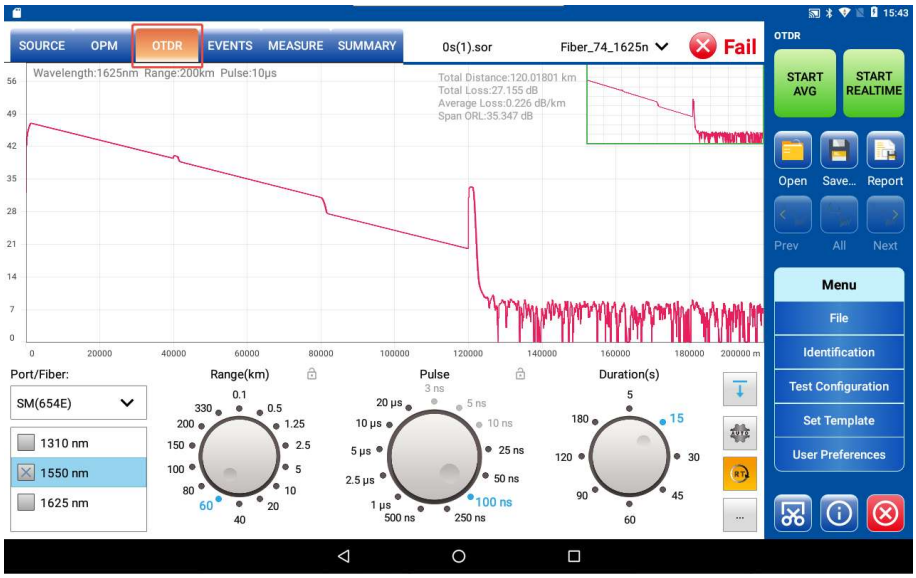
Important

- Never connect a live fiber to the OTDR optical interface unless proper configurations have been made.
- Input optical power between -65 dBm and -40 dBm can interfere with OTDR data acquisition. The extent of this interference depends on the selected pulse width.
- Any input signal with power exceeding 10 dBm will cause permanent damage to the OTDR module.

C. Set the Index of Refraction (IOR/Group Index) and RBS coefficient as needed. (For more details, refer to Section 4.2.2.4, " Setting Index of Refraction (IOR) and Backscatter (RBS) Coefficients.")

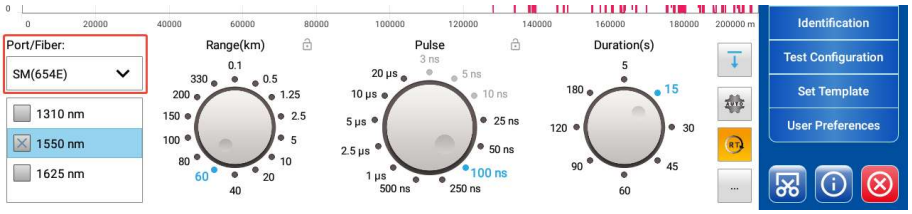
D. Configure the First Connector Check as needed. (For more details, refer to Section 4.2.3.3, "Enabling or Disabling First Connector Check.")

E. Open the "OTDR" tab.



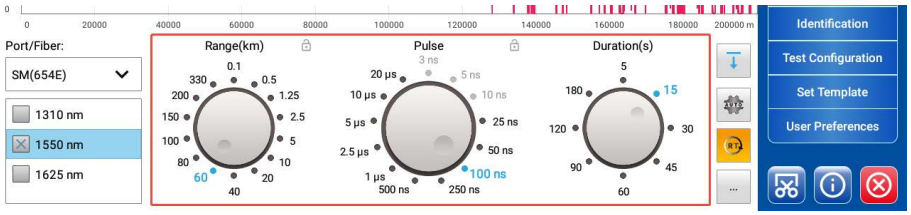
F. When using a standard OTDR, select the desired fiber type in the "Port/Fiber"

list (for live fiber testing, select "SM Live"; for C-type fiber, select "50 µm"; for D-type fiber, select "62.5 µm").



G. For standard OTDR testing, select or click the desired wavelength(s).

H. Select the required Distance Range, Pulse Width, and Acquisition Time. (For more details, refer to Section 4.2.3.4, "Setting Distance Range, Pulse Width, and Acquisition Time.")



I. Tap "Start." If the first connector check is enabled, a message will appear if the input power is abnormal. (For more details, refer to Section 4.2.3.3, "Enabling or Disabling First Connector Check.")

Note: The application performs data acquisition starting from the shortest to the longest selected wavelength. During acquisition, you may modify parameters as needed. The OTDR will recalculate the average after each modification. This recalculation applies only to the wavelength currently under test. Changing the time parameter will not restart the acquisition process.

J. Once analysis is complete, tap "Save" on the button bar to store the curve. The application generates the file name based on the configured auto-naming parameters (refer to Section 4.2.2.3, " Auto-Naming Trace Files"). The file name will be displayed in the status bar. The file is stored in the default

folder (refer to Section 4.2.4.7, "Setting the Default Storage Folder").

4.2.3.1 Automatically Configuring Data Acquisition Parameters

When using the auto configuration feature on a module that supports multiple wavelengths, the application sequentially determines the optimal distance range and pulse width for the first wavelength, followed by the second, and so on.

After using the auto configuration feature, you can also enable the function to automatically select the most suitable range and pulse width based on the distances determined by the application.

Steps to Use the Auto-Configuration Feature:

A. In the main window, select the "OTDR" tab.

B. Select the duration.

C. Tap the “AUTO” button.

D. Tap “Start” to initiate data collection.

4.2.3.2 Configuring Launch and Receive Fibers

The launch fiber and the receiving fiber are used to characterize the first and last connectors on the fiber under test, respectively.

- **Launch Fiber:** In an existing fiber test link, an additional length of fiber (typically 1-2 km) is inserted at the beginning to optimize the quality and stability of the OTDR test signal and to examine the reflection and loss of the first event. This additional fiber reduces the impact of the OTDR's initial blind zone, allowing the test curve to enter a stable attenuation state earlier, facilitating accurate analysis of event points in the link (such as connectors and bend loss).
- **Receive Fiber:** In an existing fiber test link, a predetermined length of fiber (typically 1-2 km) is subtracted from the end to eliminate interference from far-end reflections or events. By intercepting the effective test interval, signal anomalies caused by the end connector, terminal reflections, or redundant fiber are avoided, allowing the OTDR test curve to more clearly reflect the actual link attenuation characteristics and event point distribution.

When testing with the device, connect the fiber under test to the device via a launch fiber. You can also connect a receiver fiber to the end of the fiber under test. By default, the fiber span includes the receiver fiber (but not the launch fiber).

After setting the launch fiber length, the application sets the start point of the fiber under test as the start point of the fiber span. The span start point becomes Event 1, and its distance reference value becomes Event 0. This allows the device to

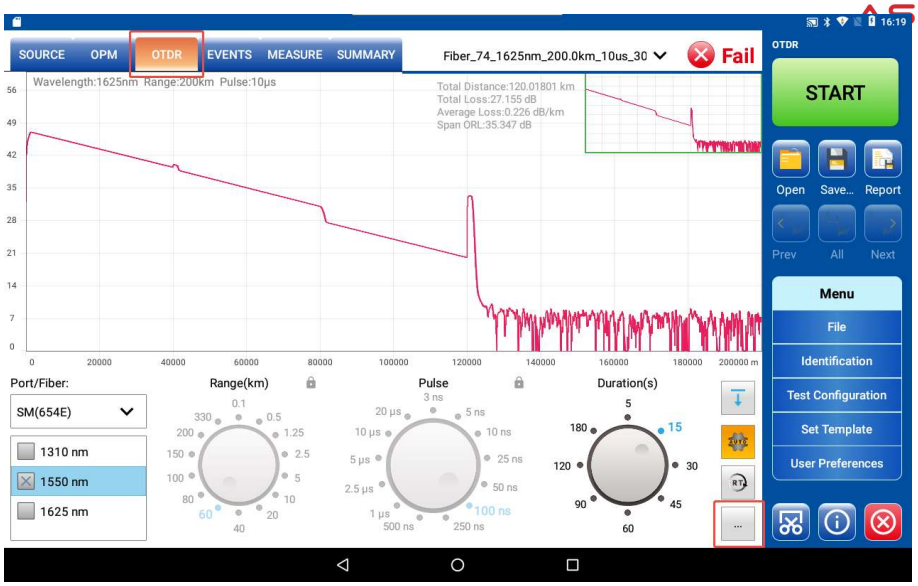
identify the first connector at the start of the fiber. The displayed value includes the loss caused by the span start event. The span start event is also considered when determining the connector loss and reflectivity status. If the fiber length is unknown, the launch fiber can also be configured by event number.

After setting the receive fiber length, the application locates the fiber end event and moves the fiber span endpoint (excluding the continuous event or analysis end event) based on the specified receive fiber length. There should be an event near the specified span endpoint. If not, the application automatically adds an event at the appropriate location. In addition to distance values, the application can also set the span endpoint based on event numbers.

If the launch and receive fibers are not specified, they are considered part of the fiber under test (fiber span). The application calculates the cumulative loss only for the specified fiber span. The event table displays events outside the fiber span in gray, and the graph does not display these events.

Steps to Configure Launch and Receive Fibers:

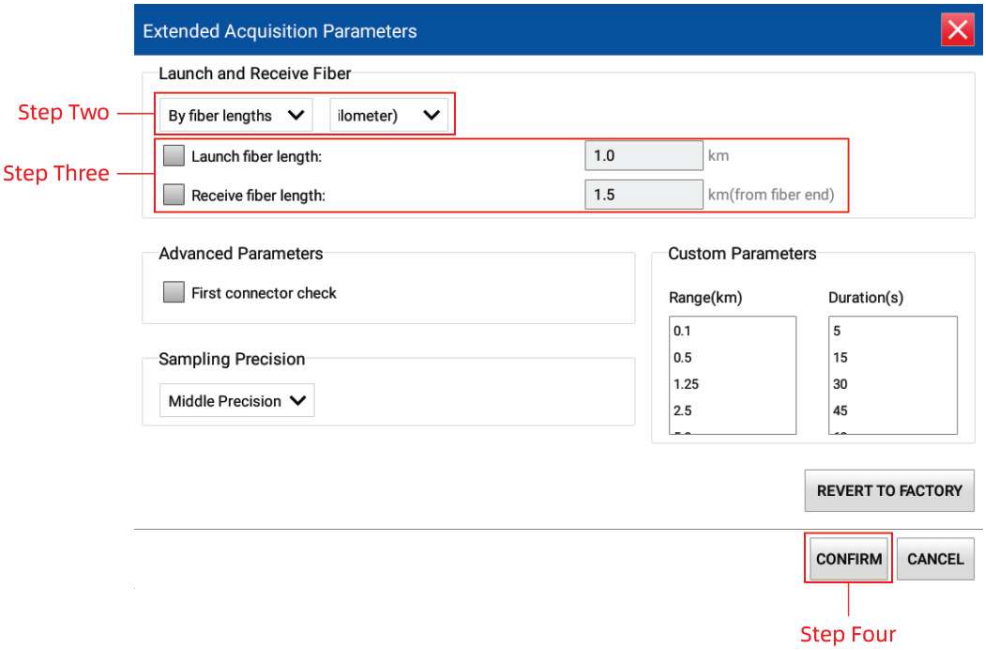
A. In the main window, select the "OTDR" tab and tap the"  "button.



B. Under "Launch and Receive Fiber", select "By fiber length" or "By fiber event".

C. Select the required check boxes and enter values in the corresponding text boxes.

D. Tap "CONFIRM" to return to the main window.



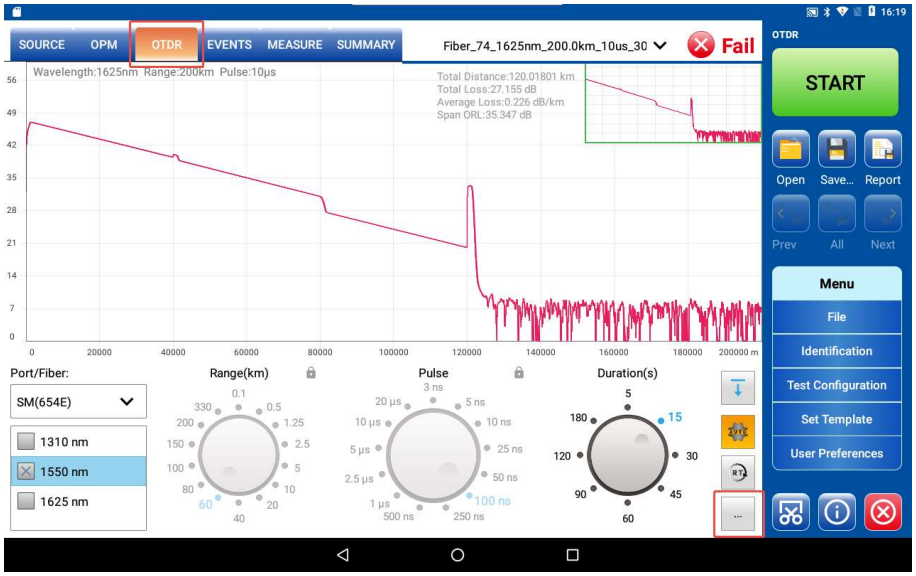
4.2.3.3 Enabling or Disabling the First Connector Check Feature

The First Connector Check function ensures that the fiber is properly connected to

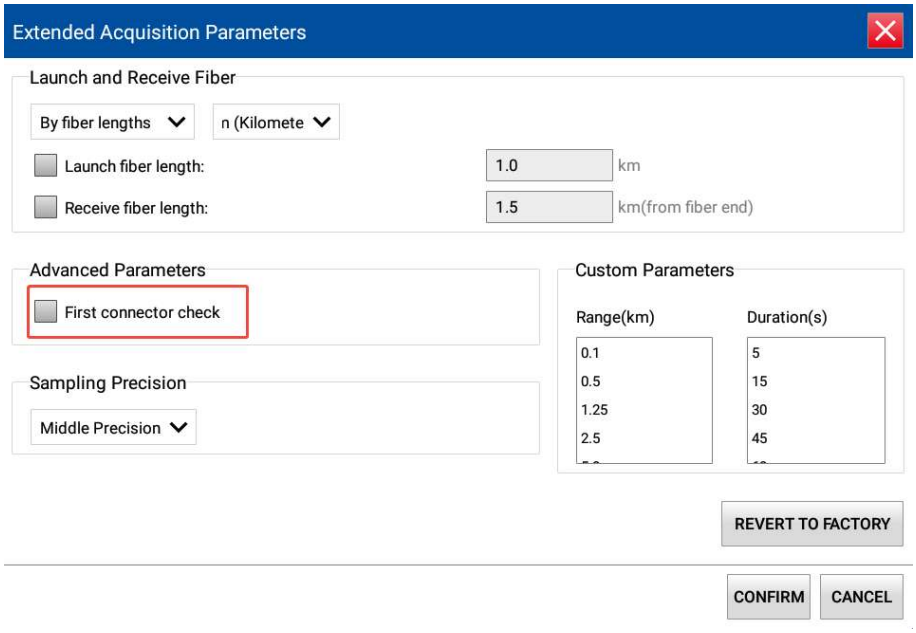
the OTDR. It monitors the input power. If the loss at the first connector is abnormally high, a message will appear notifying you that no fiber is connected to the OTDR port. By default, this function is disabled.

Steps to Enable or Disable the First Connector Check:

A. In the main window, tap the "OTDR" tab, and then tap the"…"button。



B. Under "Advanced Parameters", select the Check "first connector check" box to enable the function, or deselect it to disable the function.



C. Tap “CONFIRM” to return to the main window.

4.2.3.4 Setting Range, Pulse, and Duration

The range, pulse, and duration can be configured using the controls in the OTDR main window.

- **Range:** Specifies the distance range of the fiber under test based on the selected measurement unit (refer to Section 4.2.4.2, "Selecting Distance Units" for details). Modifying the distance range will change the valid values for the pulse width. The application only retains valid pulse width values for the specified range.
- **Pulse:** Specifies the pulse width for the test. A wider pulse allows for testing longer fiber distances but results in lower resolution. Conversely, a narrower pulse provides higher resolution but is limited to shorter fiber distances. The supported distance ranges and pulse widths depend on the OTDR model.

  Note: Certain distance ranges may be unavailable if specific pulse widths are selected.
- **Duration:** Specifies the length of data acquisition (the time period for averaging calculation results). Generally, a longer acquisition time produces a cleaner trace (especially for long-distance fibers) because more noise is averaged out as the acquisition time increases. This averaging process improves the signal-to-noise ratio (SNR) and the OTDR's ability to detect small events.

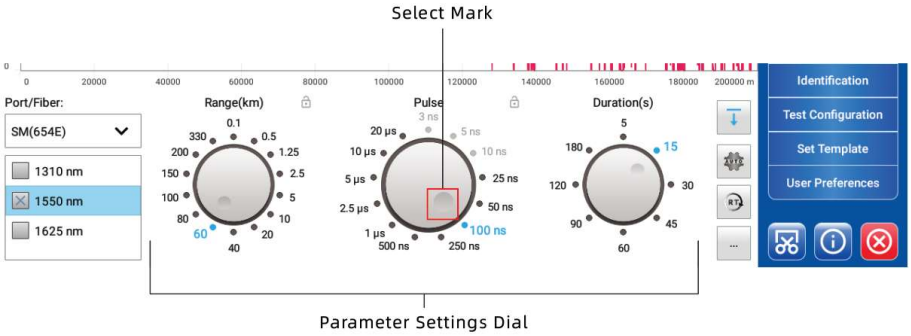
How to set the range, pulse and duration parameters:

If you are using a standard OTDR, in the OTDR tab:

- **Rotate the Dial:** Tap the dial for the parameter you want to set. The selection marker will move clockwise or counter-clockwise.

  OR

- **Direct Selection:** Tap the value you want to select. The selection marker will move to that value immediately.



Note: If the OTDR supports single-mode (SM), SM Live, or multi-mode (MM) wavelengths, the application will apply the settings to the respective wavelength types based on the selected fiber type. (Please note that 50 μm and 62.5 μm fibers share the same settings).

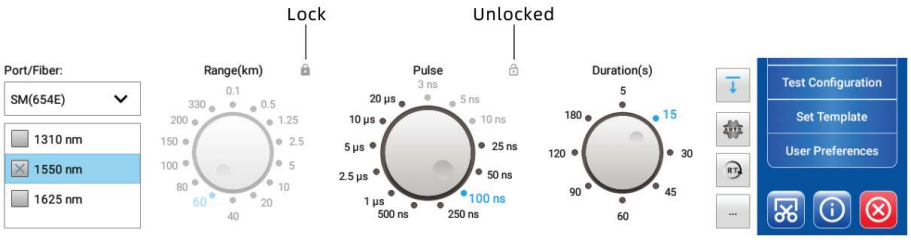
To lock range, pulse:

Tap " " to lock the currently set data acquisition parameters.

NOTE: The duration parameter cannot be locked.

To unlock the current distance range, pulse width data：

Tap " " to unlock the current data collection parameters and reset them.



4.2.3.5 Monitoring Fiber in Real-time Mode

The application supports real-time visualization of changes in the fiber link. In this mode, the application continuously updates the trace without calculating averages until you switch to averaging mode or stop data acquisition.

Note: Real-time mode does not support trace re-analysis.

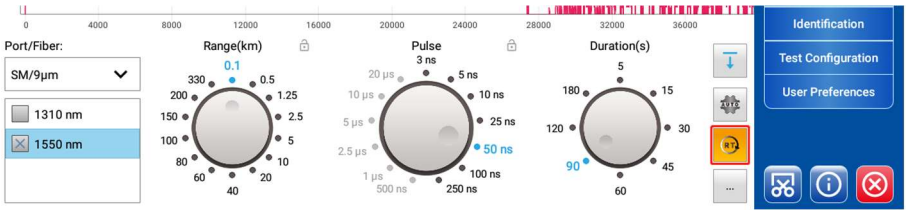
Note: If the Graphic Overview display is enabled, the application will update the trace at a lower frequency (for more details, refer to Section 4.2.4, "Customizing the OTDR").

Note: Only one wavelength can be monitored at a time in Real-time mode.

You can switch from real-time mode to averaging mode at any time. If multiple wavelengths were selected before starting the test, you can also toggle between wavelengths during the data acquisition process.

Steps to Enable Real-Time Mode:

A. In the "OTDR" tab, tap "RT" button. The "RT" button will turn orange, indicating that Real-Time mode is enabled.



B. When using a standard OTDR, select the desired fiber type in the "Port/Fiber" list (for live fiber testing, select "SM Live"; for C-type fiber, select "50µm"; for D-type fiber, select "62.5µm").

OR

C. For standard OTDR testing, select the checkbox for the desired test

wavelength.

D. Select the required range, pulse, and duration. (For more details, refer to Section 4.2.3.4, "Setting Range, Pulse, and Duration.")

E. Tap “RT”.

Note: In real-time mode, the duration cannot be set.

Steps to disable Real-Time Mode:

- To stop monitoring, tap Stop “RT”.
- You can also stop real-time acquisition by starting data acquisition in averaging mode.

4.2.4 Customizing the OTDR

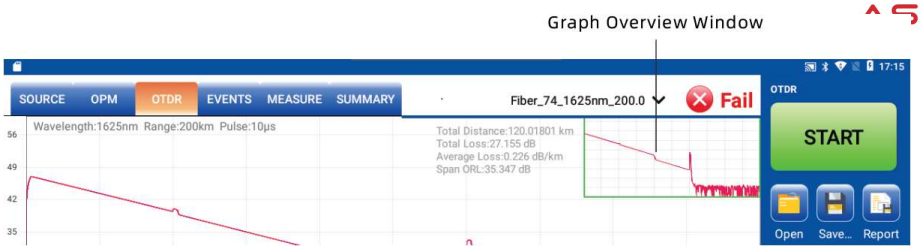
You can customize the appearance and operation of the OTDR application.

4.2.4.1 Setting Event Table and Graphic Display Parameters

You can customize the event table by choosing which items to show or hide, and modify the following curve display parameters:

Note: Hidden fiber sections are not deleted from the data.

- **Fiber Sections:** You can show or hide fiber sections in the Event Table based on the type of values you wish to display.
- **Grid:** You can show or hide the gridlines on the graph background. The grid is displayed by default.
- **Graphic Overview:** The Graphic Overview window indicates the position of the zoomed-in area relative to the entire graph.

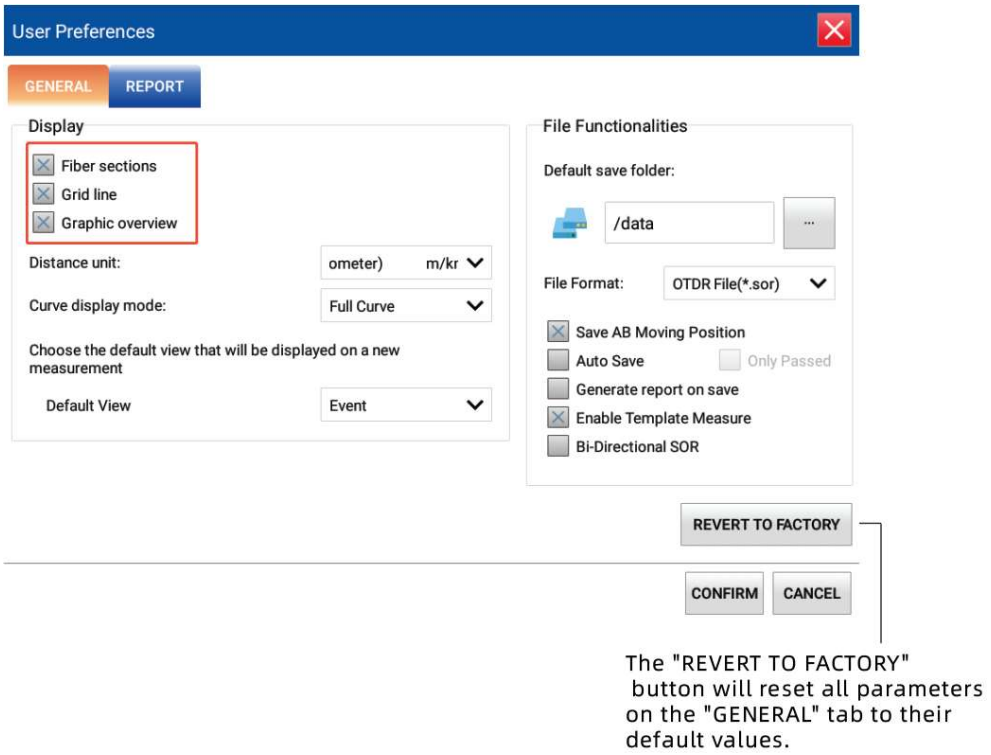


Steps to configure event table and graphic display parameters:

A. From the "Menu", select the "User Preferences" button.

B. Select the "GENERAL" tab.

C. Under "Display", select the check boxes for the items you want to display or include in the table. Alternatively, uncheck a checkbox to hide the corresponding item.



D. Tap "CONFIRM" to return to the main window.

4.2.4.2 Setting Distance Units

You can select the measurement units to be used within the application. Available

options include:

- m/km
- ft/mi

The default distance unit is kilometers (km).

Note: Generally, distances shorter than 1 km or 1 mile will be automatically converted to meters or feet. However, if the units are unified to kilometers or miles within a list, values less than 1 km or 1 mi will not be converted.

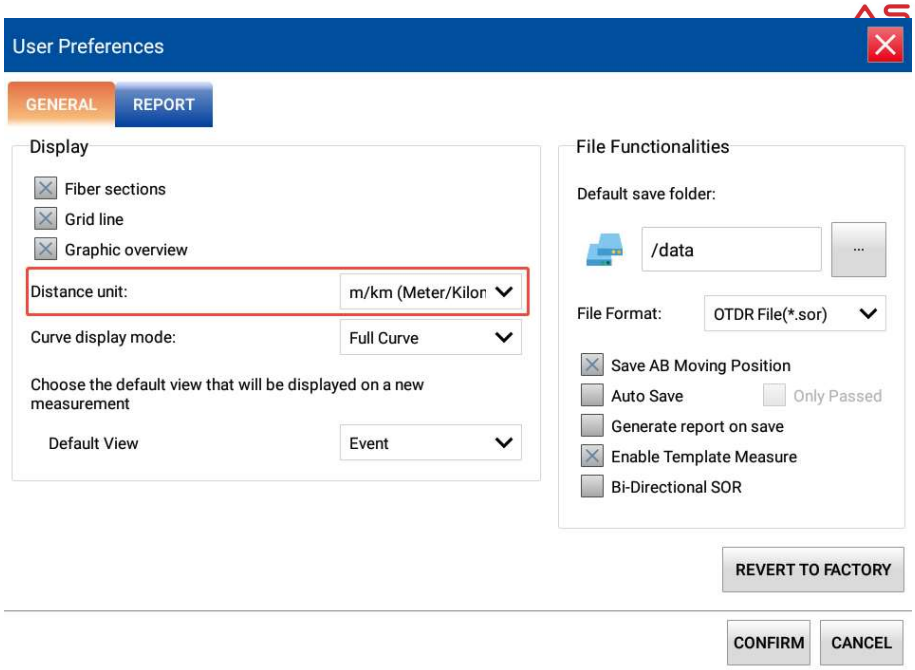
Note: Even if the selected distance unit is not kilometers, the attenuation values for fiber sections are always displayed in dB/km, as this is the global fiber optic industry standard.

Steps to set distance units:

A. From the "Menu", select the "User Preferences" button.

B. Select the "GENERAL" tab.

C. In the "Distance Unit" drop-down list, select the desired distance units.

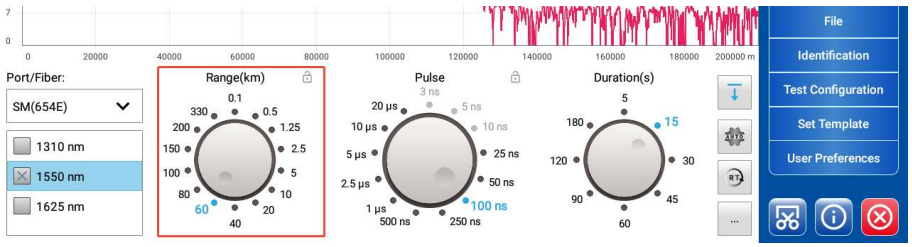


D. Tap "CONFIRM" to return to the main window.

The application returns to the main window, and all places where distance units are used use the newly selected units.

4.2.4.3 Customizing Data Acquisition Distance Range

The distance range is one of the parameters you can customize before performing data acquisition. For more details, refer to Section 4.2.3.4, "Setting Range, Pulse, and Duration."



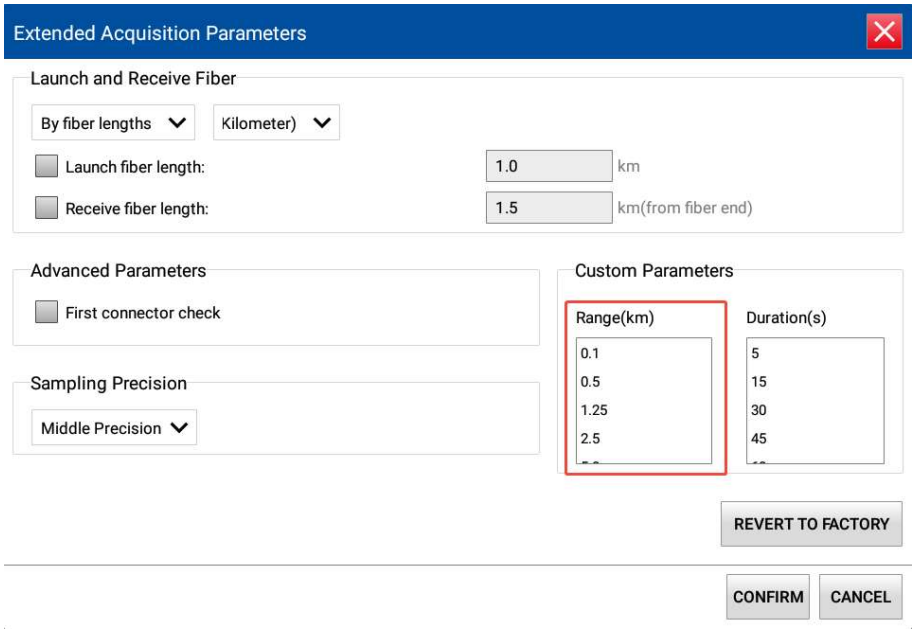
Note: Values selected through the auto-range acquisition feature cannot be modified.

Steps to Customize the Distance Range:

A. In the main window, select the "OTDR" tab and tap the“ ”button.

B. Under “Custom Parameters”, in the “Range” list, select the value that you want to modify.

C. When the value is highlighted, enter the new value.

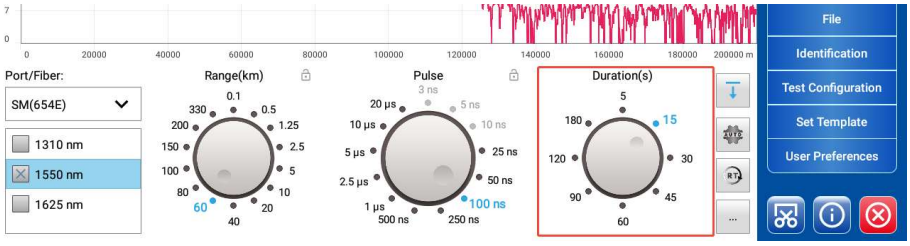


D. Tap "CONFIRM" to return to the main window.

NOTE: Press "REVERT TO FACTORY" to restore the device to factory settings.

4.2.4.4 Customizing Duration

You can customize the duration. These values are the time periods over which the OTDR averages the data acquisition. For more details, refer to section 4.2.3.4, "Setting Range, Pulse, and Duration."



By customizing the duration, you can improve the signal-to-noise Ratio (SNR) of the

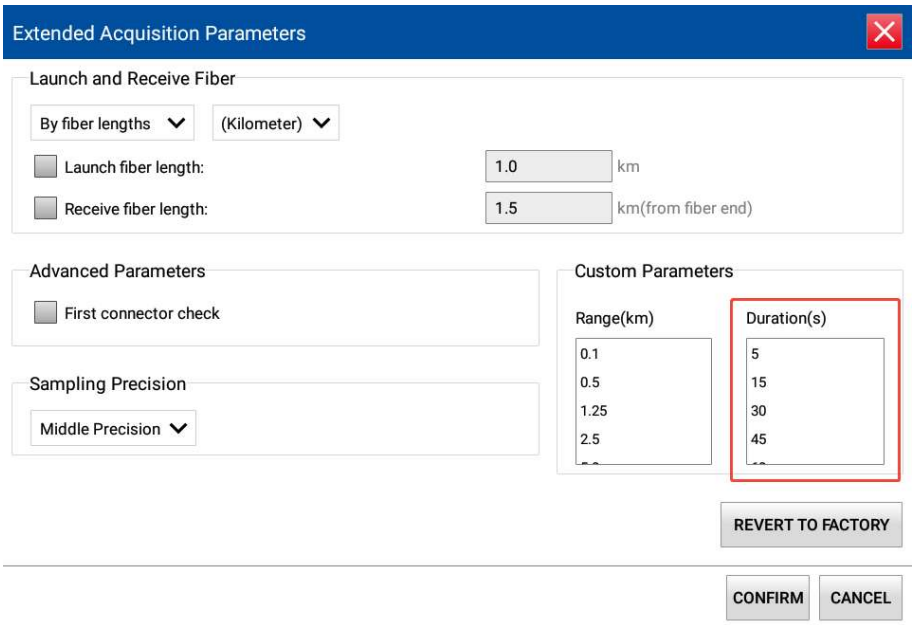
trace and enhance the detection capability for low power level events. As a rule of thumb, quadrupling the acquisition time doubles the SNR (a 3 dB improvement).

Steps to Customize the Distance Range:

A. In the main window, select the "OTDR" tab and tap the“ ... ”button。

B. Under “Custom parameters”, in the “Duration” list, select the value you want to edit.

C. When the value is highlighted, enter the new value.



D. Tap "CONFIRM" to return to the main window.

NOTE: Press "REVERT TO FACTORY" to restore the device to factory settings.

4.2.4.5 Selecting Curve Display Modes

You can choose how the application displays curves on the screen and in reports. The available options include:

- **Full Trace:** Displays the entire curve and the complete data acquisition distance.

- **Span:** Displays only the section of the curve from the span start to the span end.

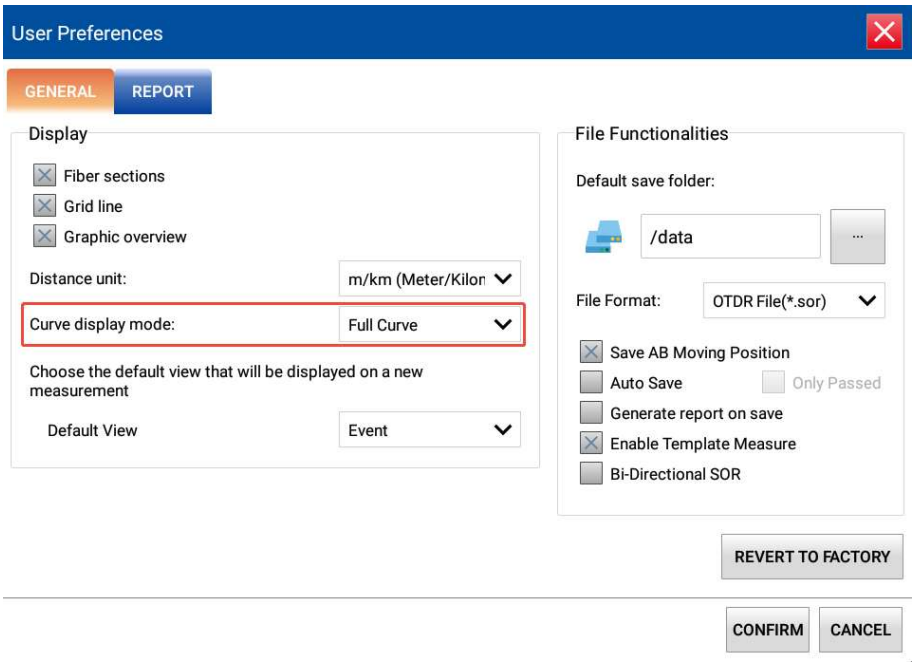
Note: By default, the curve zoom range is the full curve.

Steps to Select the Curve Display Mode:

A. From the "Menu", select the "User Preferences" button.

B. Select the "GENERAL" tab.

C. In the "Curve Display Mode" drop-down list, select the desired mode for displaying curves.



D. Tap "CONFIRM" to return to the main window.

4.2.4.6 Selecting Default View

You can select the default view to be displayed once data acquisition and analysis for all wavelengths are complete. This selected view will also be the default display when opening a saved test result file.

The table below lists the available views:

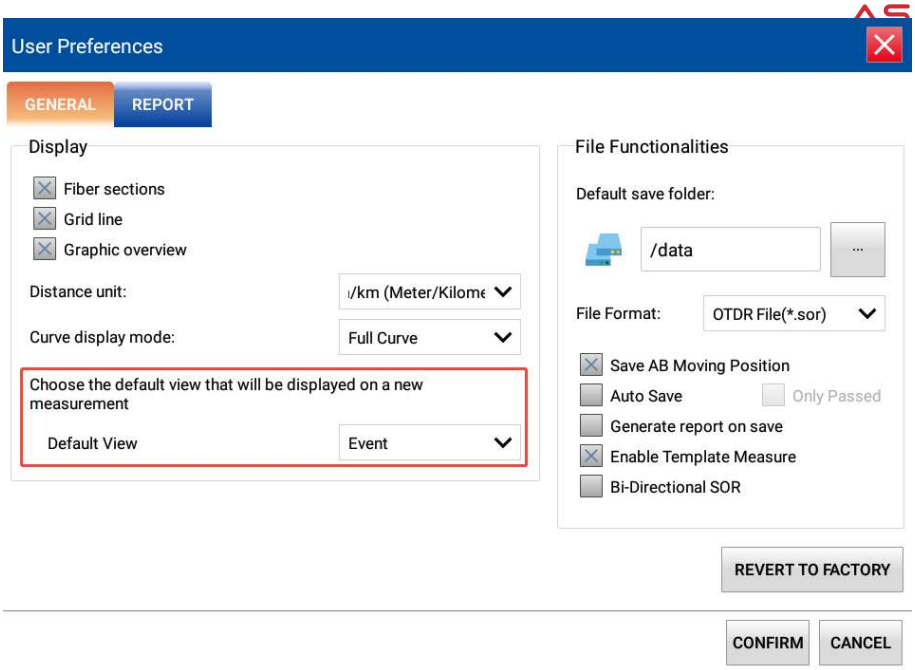
View	Remarks
Keep Current View	The displayed options remain unchanged before and after data acquisition.
OTDR	Displays the graphs and controls for OTDR data acquisition. The appearance of this view may vary slightly depending on the module used and whether the graph is displayed in full view mode. For more information, refer to section 4.2.5.1, "Graph."
Events	Displays data acquisition results in the "Events" tab. For more information, refer to section 4.2.5.3, "Events Tab."
Measure	Displays data acquisition results in the "Measure" tab. For more information, refer to section 4.2.5.5, "Measure Tab."
Summary	This option displays information for each wavelength, such as Pass/Fail status, span loss, span ORL (Optical Return Loss), and span length. For more information, refer to section 4.2.5.2, "Summary Tab."

Steps to Set the Default View:

A. From the “Menu”, select the “User Preferences” button.

B. Select the “GENERAL” tab.

C. In the “Default View” drop-down list, select the desired view.



D. Tap "CONFIRM" to return to the main window.

The application will automatically switch to the selected view the next time you perform a data acquisition or open an existing file.

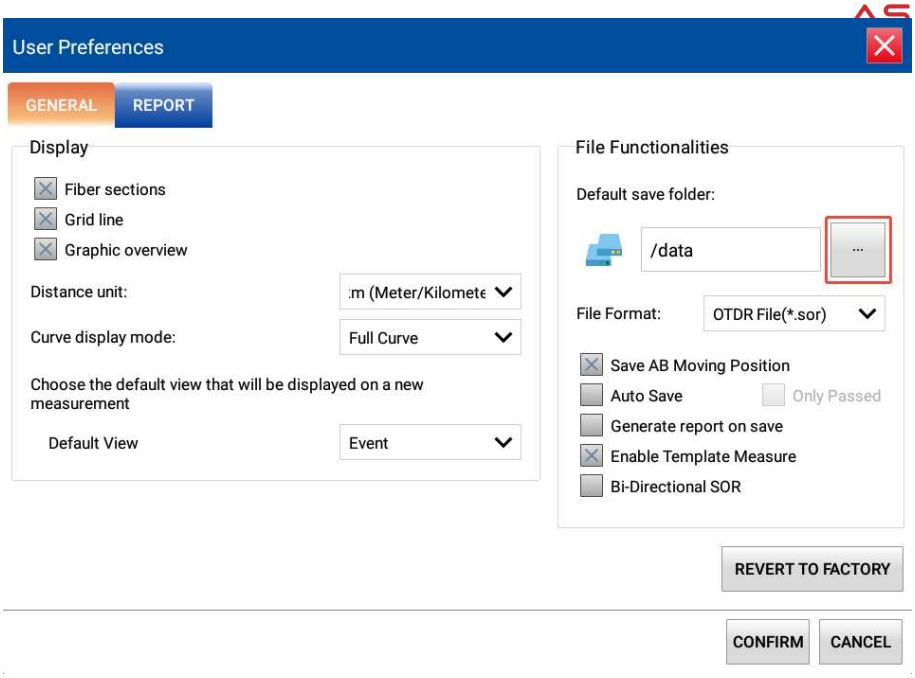
4.2.4.7 Setting Default Storage Folder

The default storage folder is /data. You can change this folder as needed or use a USB drive or TF card. If no USB drive or TF card is connected at the time of saving, the data acquisition results will be saved to the default storage folder.

Steps to Set Default Storage Folder:

A. From the “Menu”, select the “User Preferences” button. Select “ GENERAL”.

B. Under "File Functionalities", tap the“ ... ” button behind "Default save folder".



C. In the Folder window, select the location where you want to save the file.

D. Tap "CONFIRM" to exit the Folder window.

4.2.4.8 Enabling or Disabling the Autosave Measurements

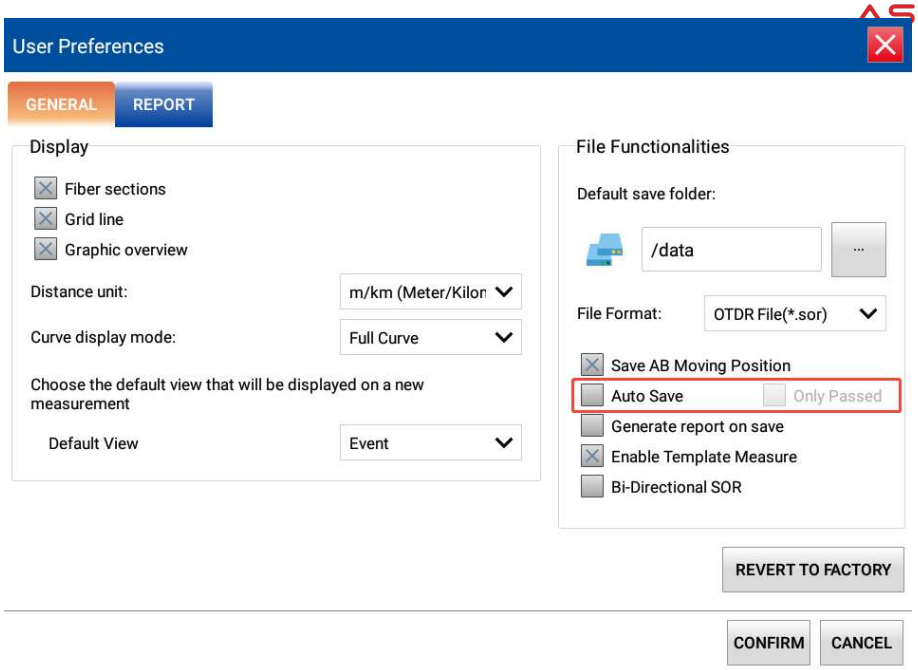
By default, the application does not automatically save measurements after the analysis is complete. You can configure the application to auto-save all measurements regardless of the outcome, or to save them only when the result has a "Pass" status.

Steps to Enable or Disable the "Auto-Save Measurements" Feature:

A. From the "Menu", select the "User Preferences" button.

B. Select the "GENERAL" tab.

C. Specify whether you want to save all measurements regardless of the outcome, or only those with a "Pass" status.



Note: If the required measurements are not saved automatically, you must save them manually.

D. Note: If the required measurements are not saved automatically, you must save them manually.

The application will automatically save the changes you have made.

4.2.4.9 Enabling or Disabling the "Save A/B Moving Position" Function

By default, the save A/B moving position function is enabled. Any movement of the A/B cursors is saved in the file, ensuring they are positioned at their last saved locations the next time the file is opened.

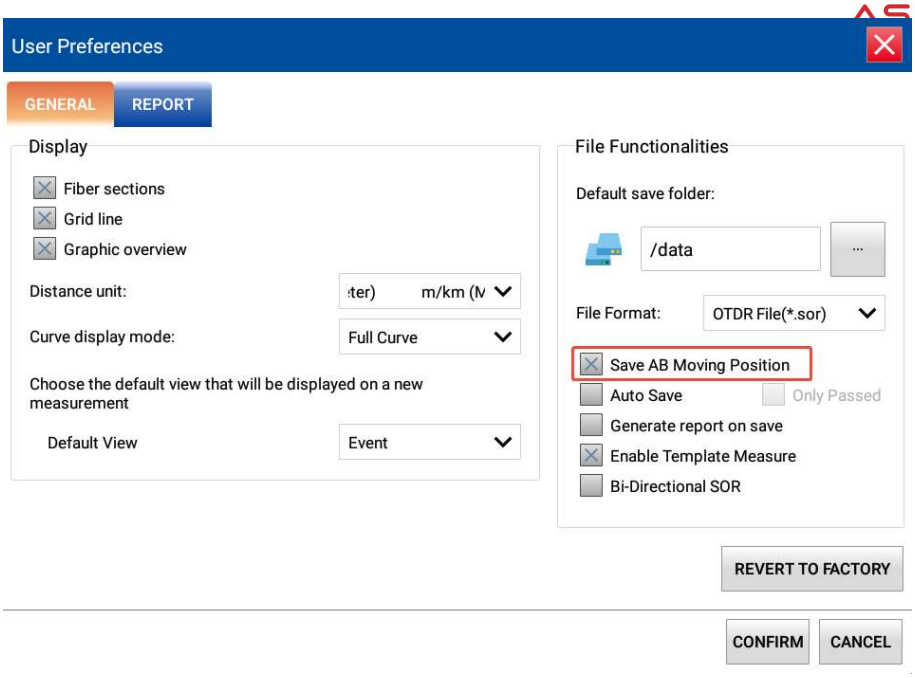
Steps to Enable or Disable the "Save A/B Moving Position" Feature:

A. From the “Menu”, select the “User Preferences” button.

B. Select the “GENERAL” tab.

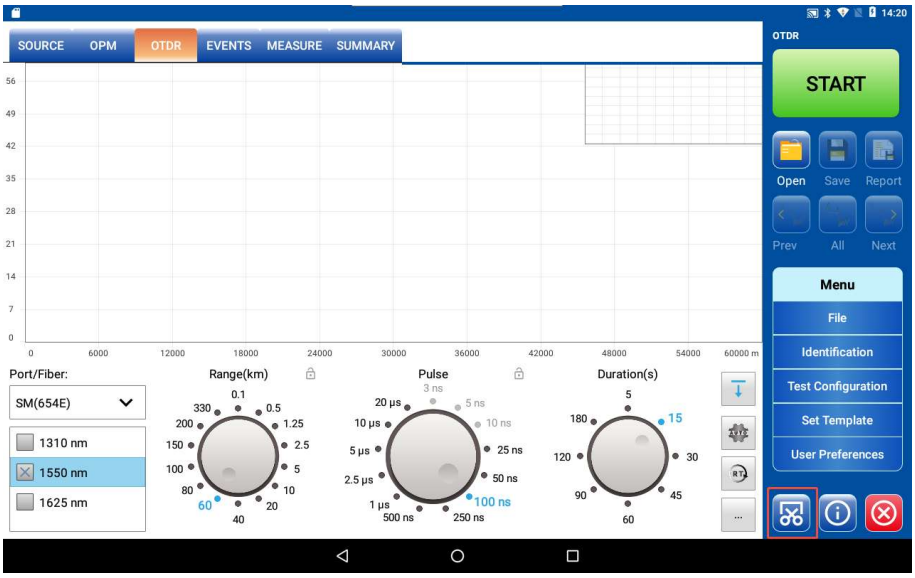
C. Specify whether to save AB moving position.

D. Tap "CONFIRM" to return to the main window.



4.2.4.10 Screenshot Function

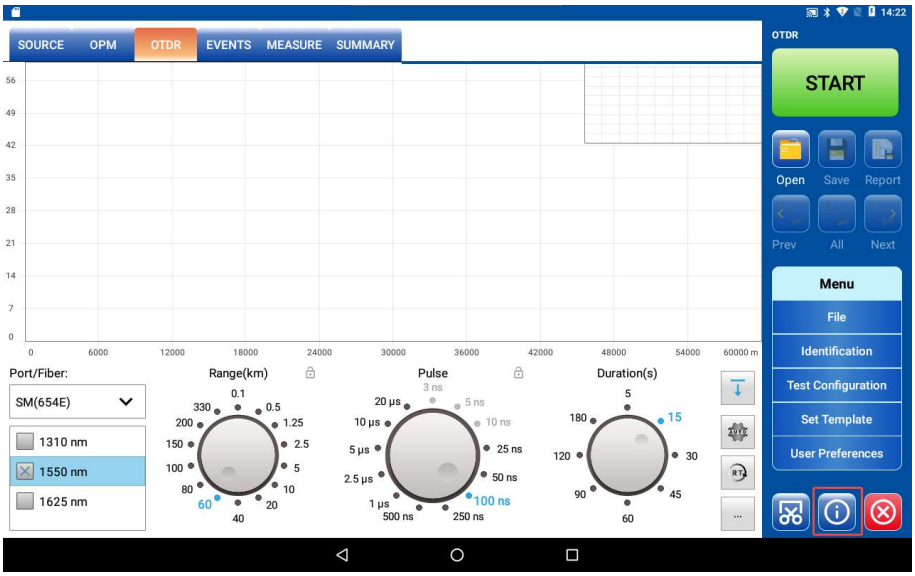
You can use the screenshot function whenever necessary. Click the"  " button to capture the entire screen. To view the captured images, please navigate to the "screenshot" folder in the file manager.



4.2.4.11 Checking Version Information

Querying the module version information allows you to view the OTDR software

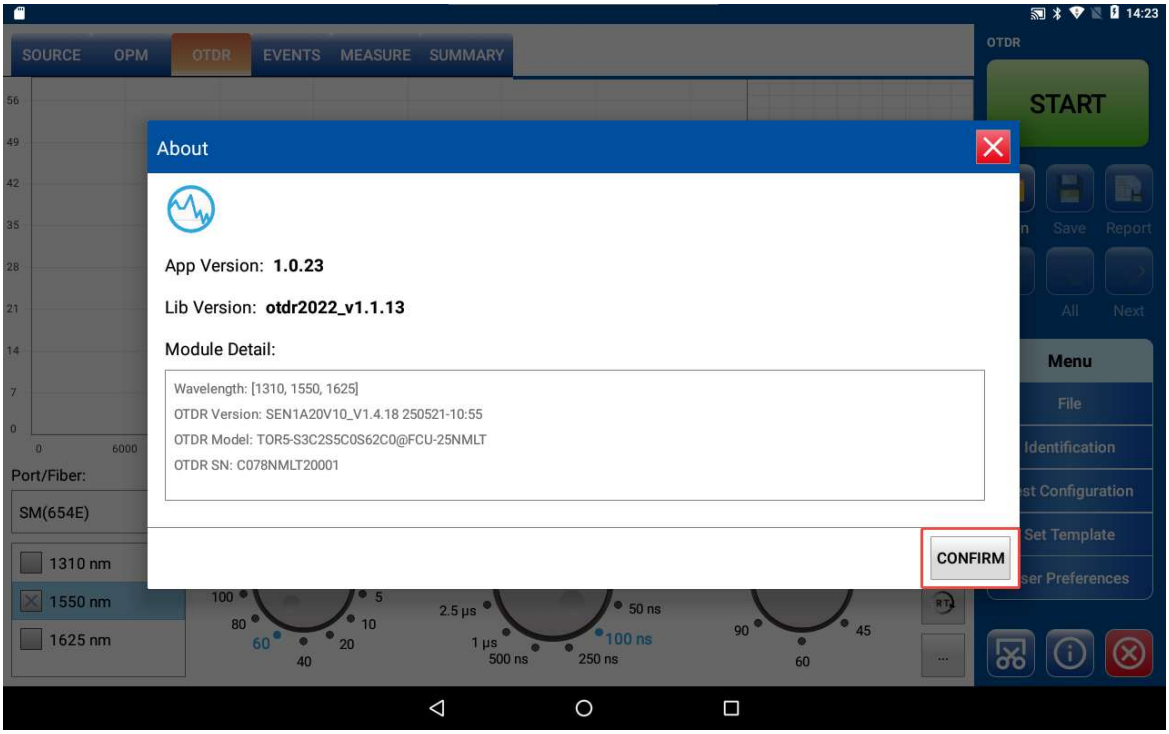
version.



Steps to Check Version Information:

A. In the "Menu", tap the"  "button。

B. Tap "CONFIRM" to return to the main window.



4.2.5 Analyzing Curves and Events

Once analyzed, the collected information appears in the curve graph, and the identified events are listed in the event table at the bottom of the screen. The curve graph and event table will be detailed in subsequent sections. You can also re-analyze existing traces.

There are several ways to view the results:

- Graph view
- Summary table
- Event table
- Linear View
- Measuring table

Additionally, you can generate trace reports directly on the device. For more details, refer to section 4.2.8.2, "Generating Reports." For information on event types, refer to section 4.2.12, "Event Type Descriptions."

4.2.5.1 Graphics

The events listed in the event table are simultaneously marked with numbers on the trace.

In the graph view, some elements are permanently displayed, while others appear only when selected. You can modify trace display parameters (such as the grid). For more details, refer to section 4.2.4.1, "Configuring Event Table and Graphic Display Parameters "

The navigation buttons allow you to cycle through all graphs in the grave View. For more information, please refer to section 4.2.5.8, "Selecting the Wavelength to Display."

4.2.5.2 "Summary" Tab

"The "Summary" tab displays key values for each wavelength, such as span Loss and span ORL (Optical Return Loss), along with the overall status of the results:

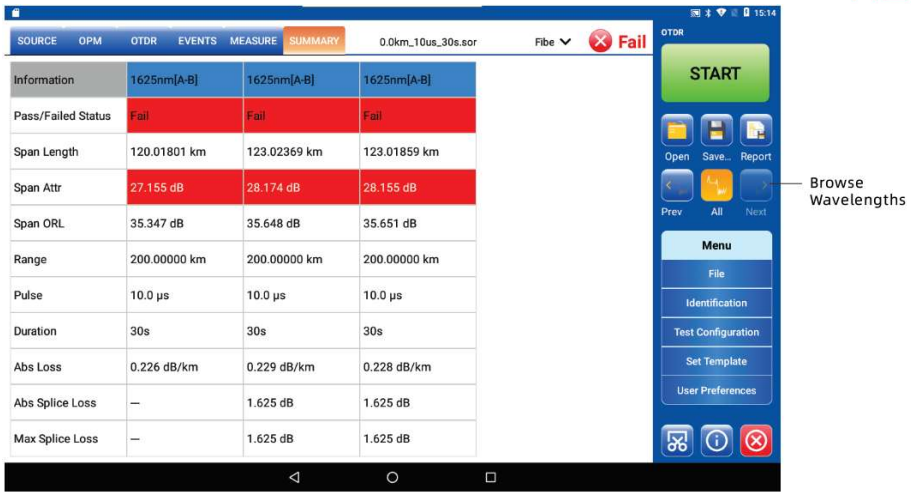
- **Pass**: All results are within the defined thresholds.
- **Fail**: At least one result has exceeded the thresholds.

"The live fiber power value displayed in the "Summary" tab represents detected external incoming light. This can affect the dynamic range performance of the module. However, the OTDR can still perform measurements as long as the optical power is above -40 dBm.

The impact on dynamic range is less significant when using short pulse widths, whereas it increases considerably with long pulse widths. For long pulses, the dynamic range will be noticeably affected even when the power is as low as -70 dBm.

Depending on the module and port you are using, please note the following information:

- **SM Live Port**: Used for in-service (live) testing. It features a built-in bandpass filter designed to suppress incoming light from the fiber under test. The filter attributes, such as bandwidth and suppression levels, depend on your specific OTDR model. A high live fiber power may indicate one of two scenarios:
  A. The bandpass filter is insufficient. To reduce the live fiber power value, an external filter can be added. However, the rated wavelength tolerance of the laser must be taken into account when using this method.
  B. Excessive noise is entering the OTDR, preventing the internal bandpass filter from effectively suppressing it. This noise may originate from laser sidebands, amplifiers, or as a result of the Raman effect.
- **Singlemode (SM) and Multimode (MM) Ports**: These ports do not include filters to suppress incoming light from the fiber under test. There should be no transmitter emitting light sources at the far end.



- Curves must be analyzed before they can be displayed in the "Summary" tab. Live traces cannot be analyzed. The application will always display summary information, but it may be incomplete.

To view the "Summary" tab, select the "Summary" option in the main window.

Note: To display the "Summary" tab by default after data acquisition and analysis are complete for all wavelengths, please refer to Section 4.2.4.6, "Selecting Default View" for further details.

4.2.5.3 "Events" Tab

The “Events” tab contains the following information:

- Curve display
- Linear view
- Events list

By scrolling through the event table, you can view information for all detected events and fiber sections on the trace. When the graph is displayed, selecting an event in the table will cause a marker line to appear at the corresponding location on the trace. If the selected item is a fiber section, it will be delimited by two marker lines. For more information on markers, please refer to section 4.2.6.1, "Using Markers."

Whether the markers correspond to an event or a fiber section depends on the item selected in the event table. Selecting an event in either the table or the graph allows you to move the markers. The event table lists all events detected on the fiber under test. An event is a point where a measurable change in optical transmission properties occurs, including losses caused by splices, connectors, or breaks. If an event exceeds the pre-defined threshold, its status will be set to "Fail."

The event table displays the following information:

- **No.**: The event number (assigned sequentially by the OTDR application).
- **Type**: This column displays symbols and event type names. For a detailed description of each symbol, refer to section 4.2.12, "Event Type Descriptions."

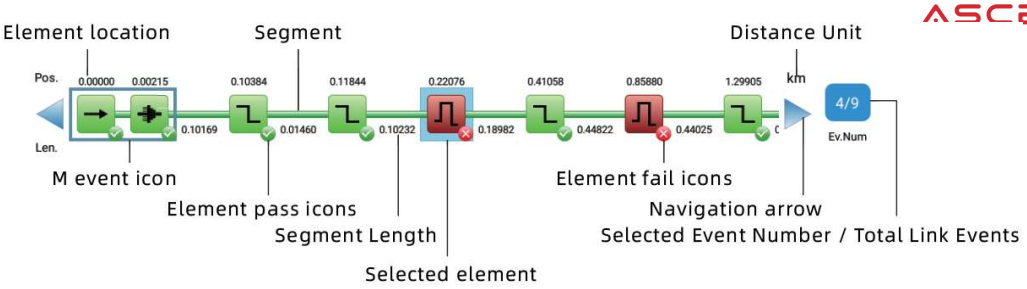
- **Loc. / Length**: The distance between the OTDR and the measured event (or between the event and the start of the fiber span), or the length of a fiber section shown in parentheses (the distance between two events).
- **Loss**: The loss of an event or fiber section in dB (calculated by the application).
- **Reflectance**: The reflectance of reflective events measured along the fiber.
- **Attenuation**: The attenuation (loss/distance) measured over a fiber section. This column is only visible when fiber sections are displayed. For more details, refer to section 4.2.4.1, "Setting Event Table and Graph Display Parameters."

Note: Regardless of the selected distance unit, the attenuation rate is always expressed in dB/km, following the fiber optics industry standard.

- **Accum. Loss**: The cumulative loss from the span start to the span end. This value is shown in the last column for each event or fiber section. The application calculates cumulative loss only for events displayed in the event table. Hidden events are excluded.
- **Event Diagnostics:** For "Fail" events, diagnostic information is displayed below in black text on a yellow background. The diagnostic function provides additional information regarding detected problems or ambiguous measurement conditions, such as the potential root cause of a "Fail" status. It assists in troubleshooting connector faults, understanding why events are marked as "Fail," and identifying unexpected instrument or test conditions.

4.2.5.4 Linear View

In the linear view, events are displayed sequentially from left to right. You can scroll through the view using your finger.



- **Element location:** The distance from the element to the starting point of the link being measured.
- **Segment:** Indicates an icon for a fiber segment with no events.
- **Distance Unit:** distance unit information.
- **M event icon:** This icon indicates an event that is a combination of multiple events.
- **Element Pass/Fail icons:** A "" icon indicates that the event failed, a "" icon indicates that the event passed, and gray elements indicate that the event or fiber section is not within the current fiber span. Events or fiber sections that have not been tested for Pass/Fail status are also displayed in gray.
- Fiber span (and) icons are displayed on the element. The element color corresponds to the event status (green for pass, red for fail).
- **Segment Length:** Displays the length of fiber without events.
- **Selected element:** A blue background indicates the currently selected element.
- **Navigation arrow:** You can click it to scroll the link map.
- **Event number preview box:** Displays the total number of events in the current link. If an element in the link is selected, the selected event number and total number of events will be displayed.
- You can also select elements or segments in the linear view, and the corresponding items in the event table or graph are selected.
- The linear view always shows the current curve.

- When the event list is empty, the linear view is not displayed. To view a curve in the linear view, you must first complete the curve analysis.

NOTE: If the link is long and not all elements can be displayed on the screen, you can scroll left or right on the link diagram or click the navigation arrows to view the elements.

NOTE: Distances between elements are not shown to scale.

How to quickly locate events:

- In the main window, open the "Events" tab.
- Tap an event in the event list or an element icon in the linear view, and the curve will automatically scroll to the selected event location. Alternatively, you can click on an event marker on the curve to quickly locate it within the event table and linear view.

4.2.5.5 "Measure" Tab

The application can display four marker lines: a, A, B, and b. The positions of these markers on the trace can be adjusted to calculate loss, attenuation, reflectance,

and optical return loss (ORL). You can use the controls to change the position of all markers. In addition to dragging the markers directly on the trace graph, you can also move them using the left/right arrow keys.

To display the "Measure" tab, click on the "Measure" option in the main window.

Note: To have the "Measure" tab displayed by default after data acquisition and analysis are complete for all wavelengths, please refer to Section 4.2.4.6, "Selecting the Default View" for further details.

4.2.5.6 Switching Between Full Screen, Compact, and Split Views

You can switch between available display modes to change how information is presented:

- **Default View**: Located in the "Events" tab, contains graph, linear view, and event list
- **Compact View**: Located in the Event tab, it displays graphs, linear views, and event tables, and the graph aspect ratio will be compressed.
- **Full Screen View**: In the Events tab, only the Linear View and Event Table are displayed.

To switch between available views:

To switch between the available views, use the up and down arrow keys to switch between views.

4.2.5.7 Changing the Display Scale of the Curve

You can manually resize the graphic using two fingers, and the scaled graphic can be restored to its original size.

To view a specific part of the graph:

- ap the screen and drag to specify the part of the graph you want to view.
- You can choose to scale the graph along both the horizontal and vertical axes:
  A. Slide two fingers horizontally relative to each other to achieve horizontal zoom of the graph.
  B. Slide two fingers vertically relative to each other to zoom in and out on the vertical axis of the graphic.

Note: You can preview the current area in the graph overview. For more details on the graph overview, please refer to section 4.2.4.1, "Setting Event Table and Graph Display Parameters."

- To restore the full graph view, double-click anywhere within the graph view.

4.2.5.8 Select the Curve to Display

You can switch between different curves and view all open curve files.

To display curves in sequence:

Tap "  " or "  " to switch between available curves.

To select a curve to display:

Tap the curve list menu bar at the top and select the curve you want to display.

To display only the current curve or all curves:

Tap "  " to switch between single curve view and multi-curve view.

NOTE: The information displayed in the "Event" and "Summary" tabs changes based on user interaction.

NOTE: Hiding a curve does not affect the Pass/Fail status or result values.

NOTE: If you need to view the curve wavelength, you can view it in the upper left corner.

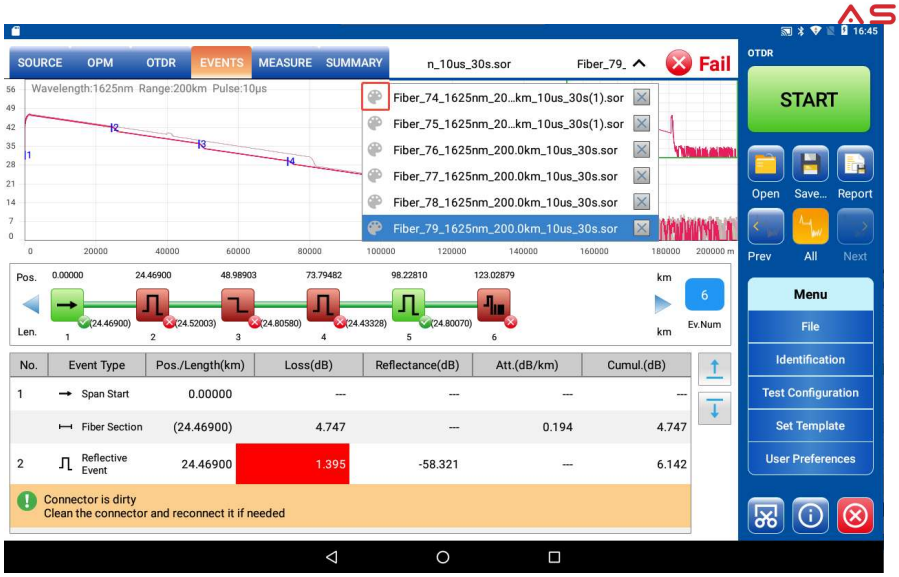
4.2.5.9 Setting the Curve Color

You can set different colors for curves to distinguish them.

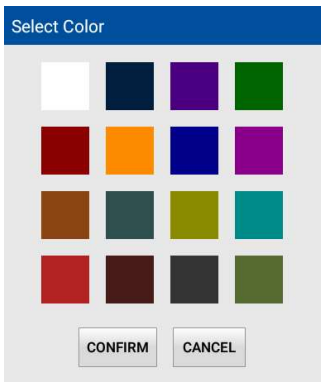
Setting Curve Colors

A. On the wavelength list menu bar at the top of the screen, tap the"

"button for the curve you wish to modify.



B. Select the desired color.



Note: "White" means no color is set.

C. Tap "CONFIRM". Once the color is applied, the selected color will be displayed in the Wavelength List menu bar.

4.2.5.10 Using Template Curve

Once a curve is set as a template, the application uses that curve as a reference

for creating all curves that will be acquired during a given work session. This ensures that the acquired curves have exactly the same number of events at the same locations as the reference curve.

Template measurement is enabled by default.

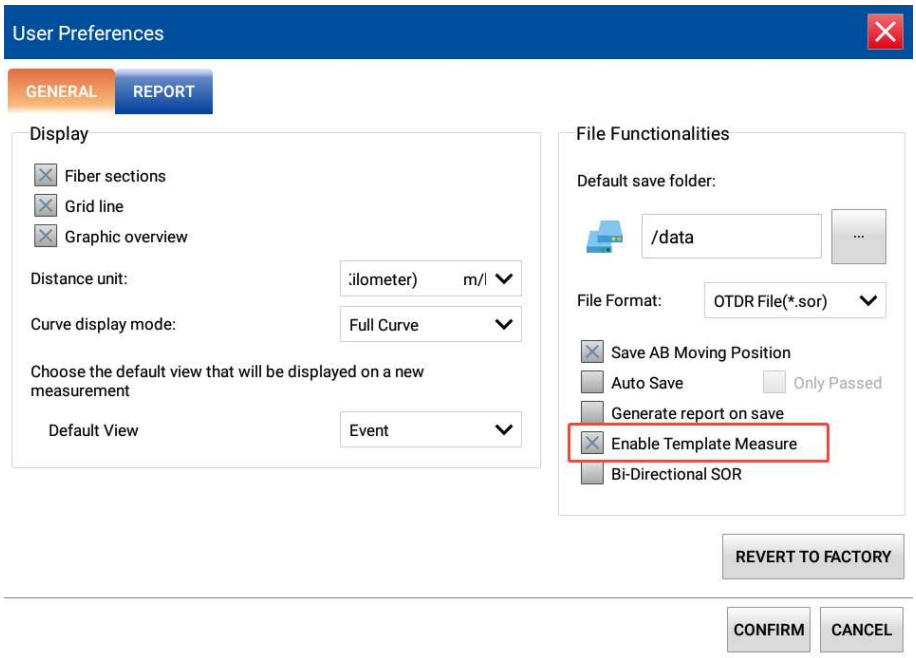
NOTE: The template curve will not be hidden when reopening a new file or starting measurement. It will be removed from the chart only after canceling the template.

Steps for Using Template Traces

A. From "Menu", select the "User Preferences" button.

B. Select the " GENERAL " tab.

C. Under "File Functionalities", select the "Enable Template Measure" check box.



D. Tap "CONFIRM" to return to the main window.

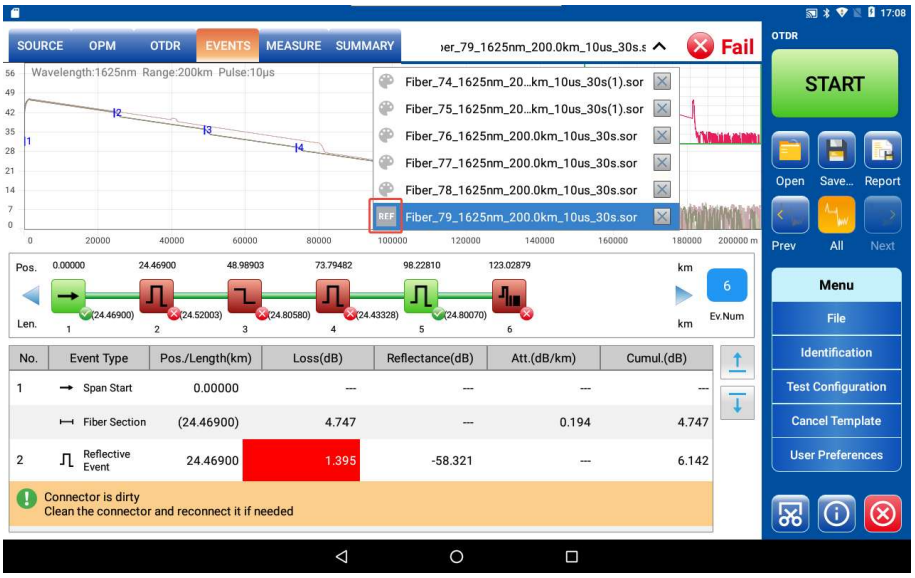
Template curves can now be used.

Steps to set the current trace as the reference

A. In the "Menu", tap the "Set Template" button and a confirmation pop-up window will pop up. Confirm and the setting will be successful.

NOTE: Set the template curve color to gray-yellow.

In the wavelength list menu, the curve set as template is displayed as“REF”.



B. To open a measurement file, perform the following:

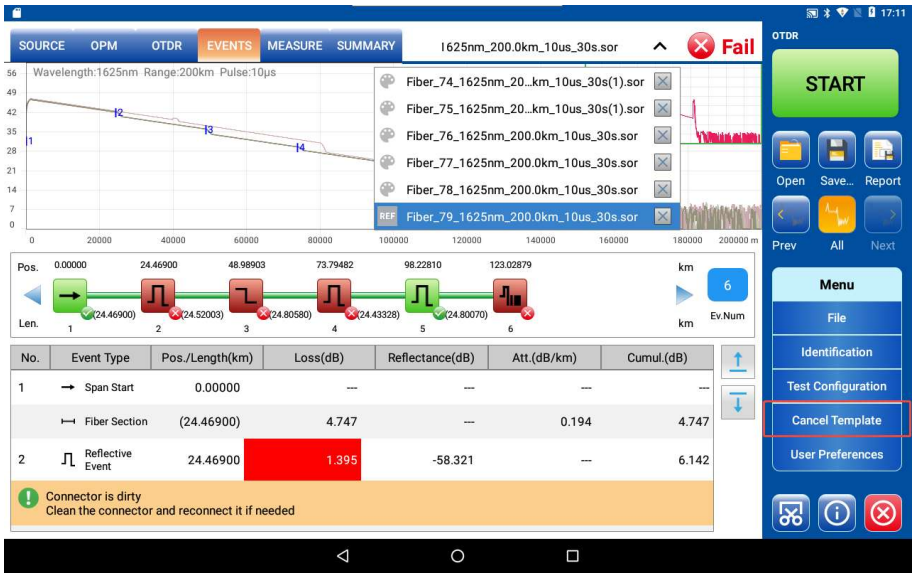
B-1 In the main window, tap the“ ”icon, or from the "Menu," select "File" and then tap "Open."

B-2 Select the file to use as a reference curve in the list.

B-3 Click “CONFIRM”.

Steps to disable the measurement reference curve

A. In the "Menu", tap the "Cancel Template" button.



4.2.5.11 Viewing and Modifying Current Measurement Configurations

You can view the trace settings at any time. The settings are organized into two groups:

- **Fiber Settings**: index of refraction (IOR, or group Index) and Rayleigh backscatter (RBS) coefficient.
- **Detection Thresholds**: Detection thresholds for splice loss, reflectance, and fiber end.

Note: If you are using an in-service (Live) module, the fiber end threshold is set to 15 dB by default.

The measurement configurations you view apply only to the current curve (at the current wavelength) and not to all traces. To change settings for subsequent data acquisitions, please refer to **s**ection 4.2.2.4, "Setting Index of Refraction and Backscatter Coefficients" and section 4.2.2.5, "Setting Analysis Detection Thresholds" for more details.

When viewing or modifying a curve settings, the application displays the following parameters:

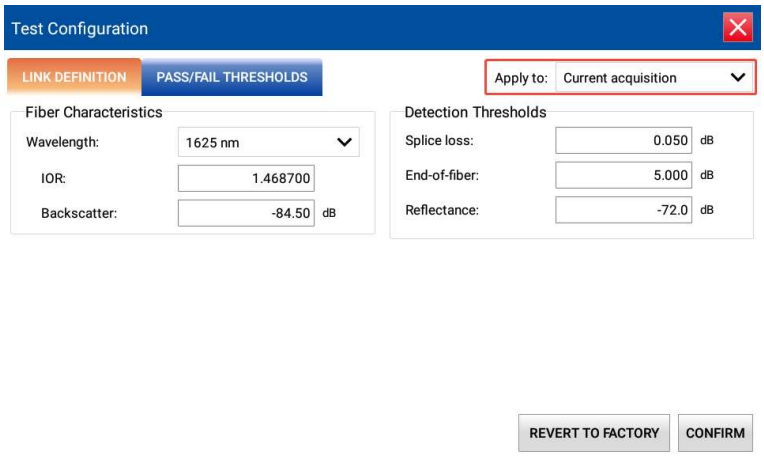
- **Wavelength**: The test wavelength.
- **Index of Refraction (IOR)**: The refractive index of the fiber (also known as the Group Index). Modifying this parameter will change the distance measurement results of the curve.
- **Backscatter**: The Rayleigh backscatter coefficient of the fiber. Modifying this parameter will change the reflectance and optical return loss (ORL) measurement results.
- **Detection Thresholds**:
  A. **Splice Loss**: The setting for the current trace analysis, used to detect small non-reflective events.
  B. **Reflectance**: The setting for the current trace analysis, used to detect small reflective events.
  C. **Fiber End**: The setting for the current trace analysis, used to detect significant event losses that impact signal transmission.

For further details, please refer to section 4.2.2.5, "Setting Analysis Detection Thresholds."

Steps to view or modify measurement configurations

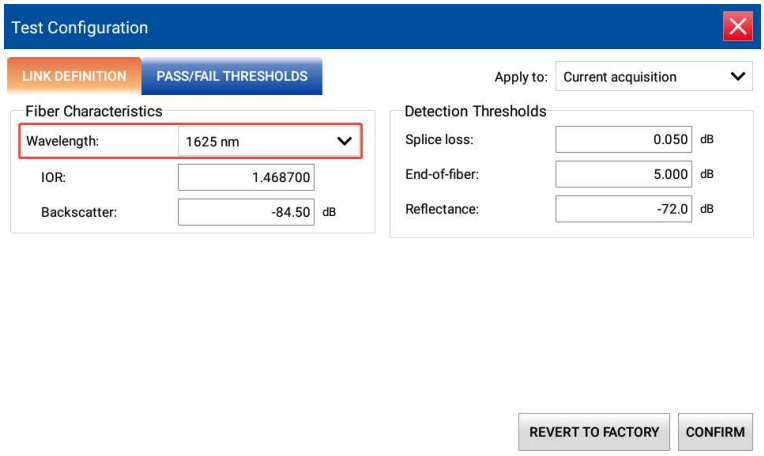
A. From the “Menu”, tap “Test Configuration”.

B. In the “Apply to” list, select “Current acquisition”.



C. In the "Test Configuration" window, open the "Link Definition" tab.

D. Under "Fiber Characteristics", from the Wavelength list, select the desired wavelength.



E. To modify the parameters of the current trace, enter the values in the corresponding fields; alternatively, to restore all parameters to their default values, tap the "REVERT TO FACTORY" button.

4.2.5.12 Opening Measurement Files

The application supports opening up to 30 files simultaneously.

For more details, refer to section 4.2.4.6, "Selecting the Default View").

Steps to open a measurement file

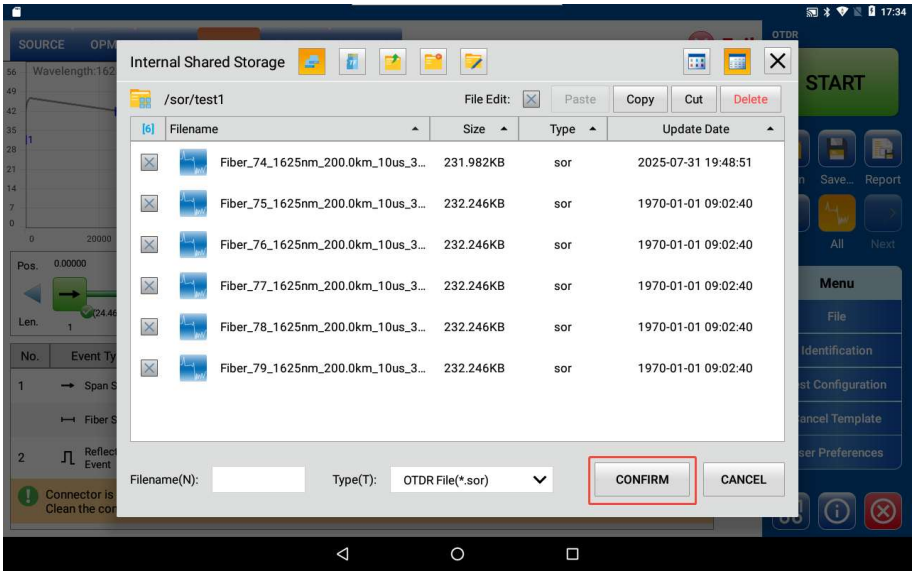
A. In the “Menu”, tap “File”, and then select the file you want to open.

Alternatively, tap“  ”in the main window.。

B. Change the file path as needed.

C. Scroll through the file list and tap the checkbox to select the curve file you want to open.

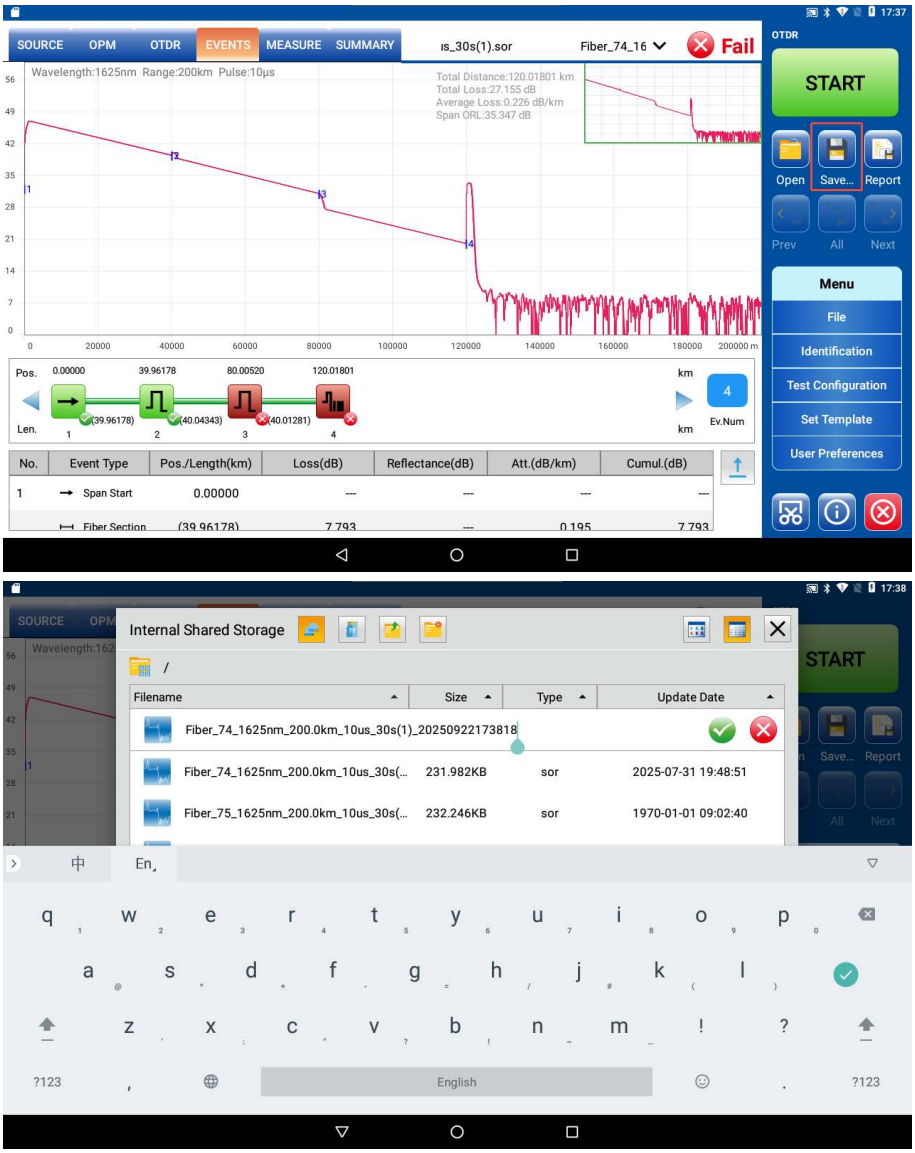
D. Tap "CONFIRM" to return to the main window.



For acquired but unsaved curves, the app prompts you to save them. Tap "Save."

For previously opened measurement files, you can "Save As" to create a previously saved measurement file. When you "Save As" a measurement file, you can

customize the file's storage location and name.



4.2.5.13 Setting Bi-Directional SOR

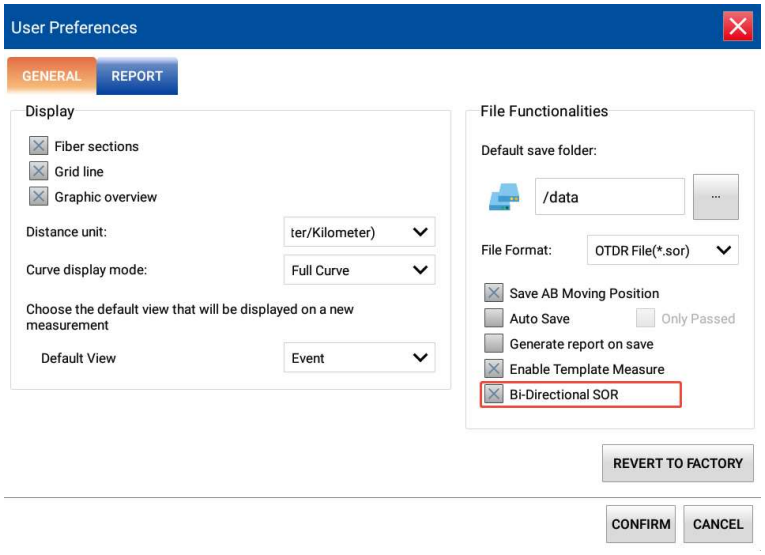
The optical time domain reflectometer has a two-way data analysis function.

Steps to open a Bi-Directional SOR file:

A. From the “Menu”, select the “User Preferences” button.

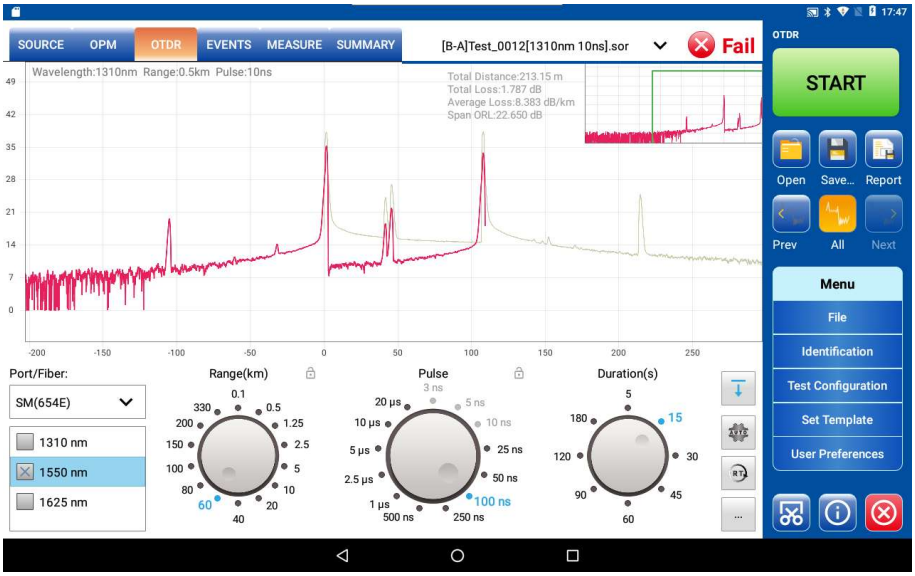
B. Select the “GENERAL” tab.

C. Under “File Functionalities”, select the “Bi-Directional SOR” check box.



D. Tap “CONFIRM” to return to the main window.

E. Tap "File", select the bi-directional SOR file to be analyzed and open it, and the application will automatically match it.



4.2.6 Manual Analysis Results

You can manually measure splice loss, fiber section attenuation, reflectance, and optical return loss (ORL) by moving markers and zooming into specific events or trace segments. These operations can be performed after a trace is acquired or opened from a file, as well as during the data acquisition process.

4.2.6.1 Using Markers

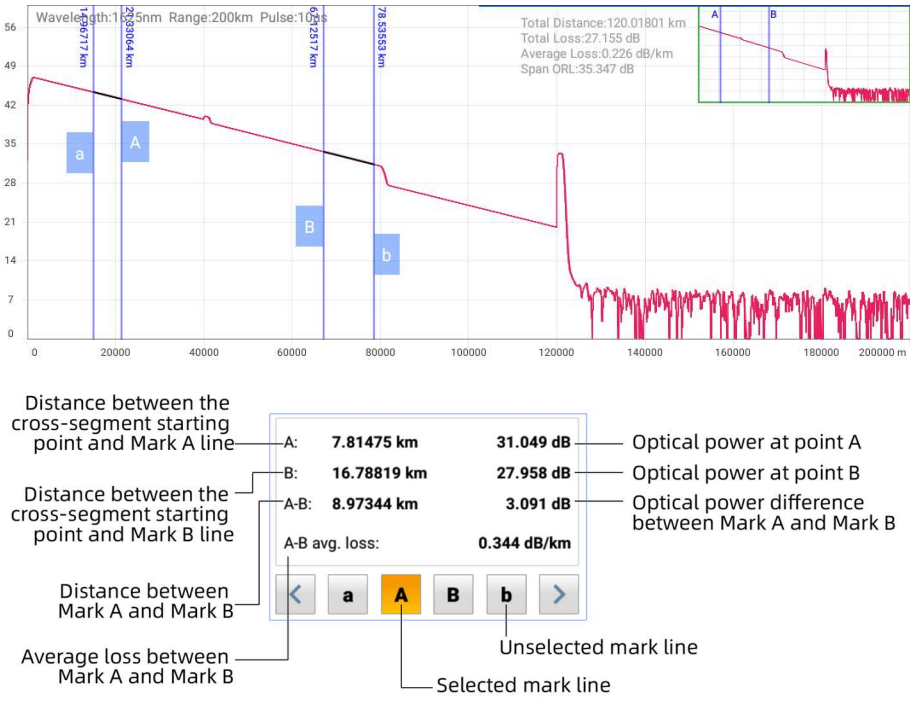
You can use markers to determine the location, relative loss, and reflectance of an event.

The distance between the four markers can be locked and moved as a single unit, or they can be unlocked for individual adjustment. You can also lock the distance between marker pairs (A and a, B and b) to move each pair together, or unlock them as needed. Additionally, all markers (a, A, b, B) can be locked and moved as a combined group.

Moving markers directly in the graph:

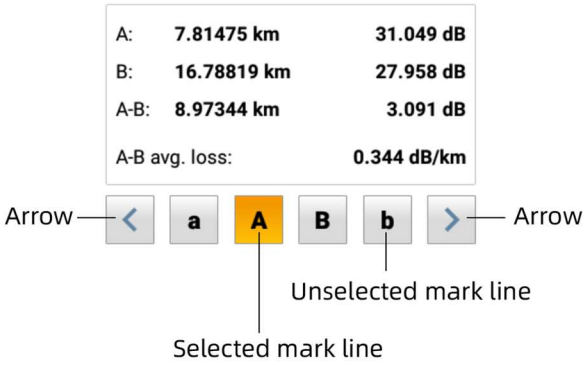
A. In the Measurement tab, select a marker directly on the trace.

B. Drag the marker to your desired position.



Moving markers using arrow buttons:

A. In the Measurement tab, tap the button corresponding to the desired marker.



B. Once the marker is selected, press the left or right arrow buttons to move the marker along the curve.

Note: If multiple markers are selected, they will move simultaneously.

Note: Press and hold the left or right buttons for rapid movement.

Restore the markers back to the visible area:

A. Ensure that only the desired markers are selected.

B. Use the left/right arrow keys to move the markers along the curve until they reappear in the visible area.

4.2.6.2 Getting Event Distance and Relative Power

The OTDR testing program automatically calculates event locations and displays the distances in the "Event" tab. You can also manually determine event locations and the distances between them, as well as view the relative power values. The X-axis represents distance, and the Y-axis represents relative power.

Manually getting event distance and relative power values:

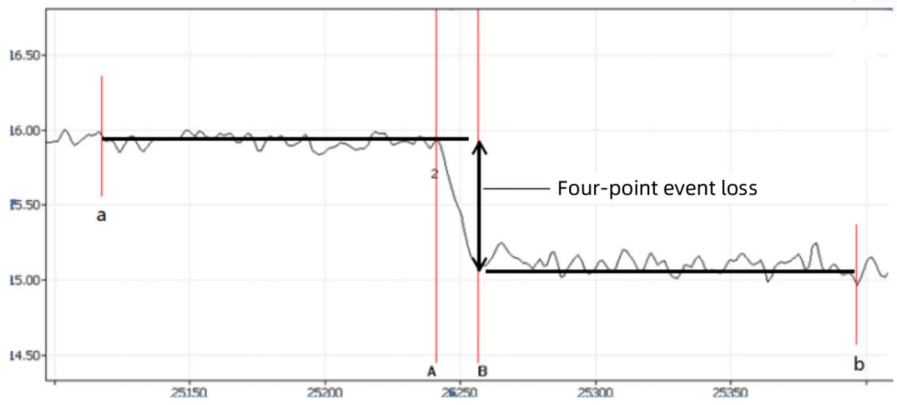
A. In the "window", select the "Measure" tab.

B. Move marker A to the starting point of the event. For more detailed information, please refer to section 4.2.6.1, "Using Markers."

4.2.6.3 Getting Event Loss and Maximum Reflectance

The application calculates event loss (measured in dB) based on the signal power drop in Rayleigh backscatter (RBS). Both reflective and non-reflective events can cause event loss. The loss calculated by the application is known as "Four-point event loss," which is determined using the least squares approximation (LSA) method. The loss values displayed in the Events tab represent the four-point event loss.

- **Four-point event loss:** Least squares approximation is used to fit a straight line to the backscatter data within the two regions defined by markers a, A, and b, B. The two regions are the region to the left of the event bounded by marker A and the region to the right of the event bounded by marker B.



Then, the two fitted straight lines are extrapolated toward the event center, and the event loss can be directly derived from the power difference between the two straight lines.

- **Reflectance:** This refers to the ratio of reflected light to incident light.

Note: Reflectance values obtained during real-time testing mode may not be accurate.

Getting event loss and maximum reflectance:

A. In the main window, select the "Measurement" tab.

B. At the bottom of the window, tap "Event." Markers a, A, B, and b appear on the graph.

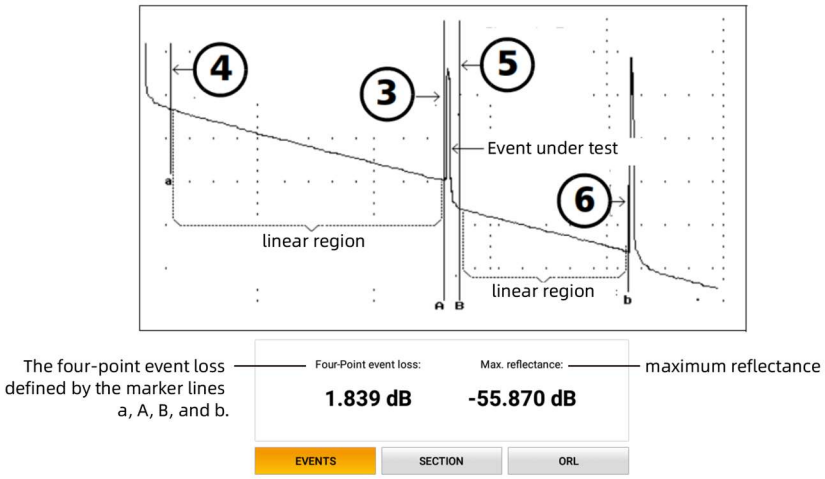
C. Zoom in on the trace and place marker A at the end of the linear region preceding the event under test. For more details, refer to section 4.2.5.7, "Changing the Display Scale of the Curve" and Section 4.2.6.1, "Using Markers."

D. Place sub-marker a at the beginning of the linear region preceding the event (excluding any significant events).

E. Place marker B at the beginning of the linear region following the event.

F. Place sub-marker b at the end of the linear region following the event

(excluding any significant events).



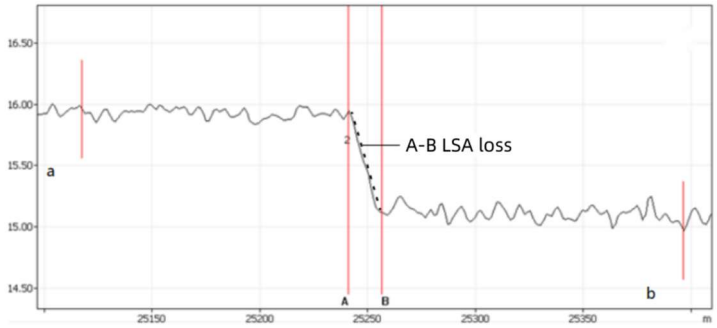
Note: For non-reflective events, "---" will be displayed for reflectance.

4.2.6.4 Getting Section Loss and Attenuation

The Least Squares Approximation (LSA) method measures the attenuation (loss over distance) between two points by fitting a straight line to the backscatter data between markers A and B. The LSA attenuation corresponds to the power difference (Δ dB) over the distance between these two points.

Compared to the two-point method, the LSA method provides an averaged measurement and is more reliable in conditions with high noise levels. However, this method cannot be used if any events (such as reflections) occur between the two markers.

A-B LSA loss refers to the event loss within the boundaries defined by markers A and B. It is calculated by fitting a straight line to the backscatter data between these two markers.



The decrease in optical power (dB) between the two marker lines (i.e., the slope of the fitted line) represents the event.

This method is suitable for calculating splice loss, but not for reflective events (more precisely, not for "straight-line" events). The A-B LSA loss method is primarily used to quickly calculate the loss of a given fiber segment length.

NOTE: The A-B LSA event loss measurement method should only be used for fiber segments. Measuring events using this method is meaningless.

Getting Section Loss and Attenuation:

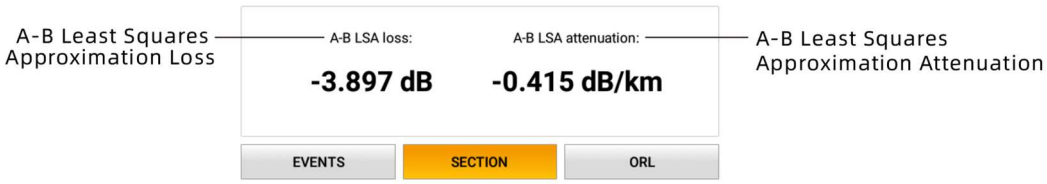
A. In the main window, select the "Measurement" tab.

B. In the main window, select the "Measurement" tab.

C. Place markers A and B at any two points along the trace. For more detailed information, please refer to section 4.2.6.1, "Using Markers."

D. Zoom in on the trace and adjust the marker positions as needed. For more detailed information, please refer to section 4.2.5.7, " Changing the Display Scale of the Curve."

Note: Ensure that there are no events between markers A and B during measurement.



4.2.6.5 Obtaining Optical Return Loss (ORL)

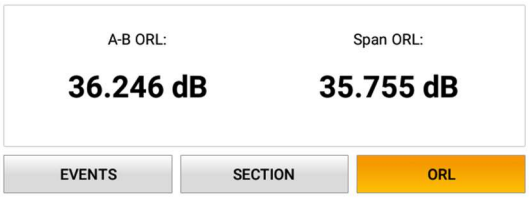
Optical Return Loss (ORL) refers to the total combined effect of multiple reflective and scattering events within a fiber optic system.

The calculated ORL results provide the following information: The ORL between markers A and B.

Steps to obtain ORL value:

A. In the main window, select the "Measure" tab.

B. At the bottom of the window, tap "ORL."markers A and B will appear on the graph.



C. Move markers A and B to define the specific area for which you want to obtain the ORL value.

4.2.7 Managing Trace Files Using the OTDR Test Application

After acquiring a trace or processing the trace after data acquisition, you may need to save, open, rename, or delete the trace file.

After acquiring a trace or processing the trace after data acquisition, you may need to save, open, rename, or delete the trace file.

The OTDR application allows you to open and save trace files in Bellcore format (.sor).

4.2.8 Creating and Generating Reports

For future reference, you can add the measured fiber position of the trace to the trace report.

4.2.8.1 Adding Information to Test Results

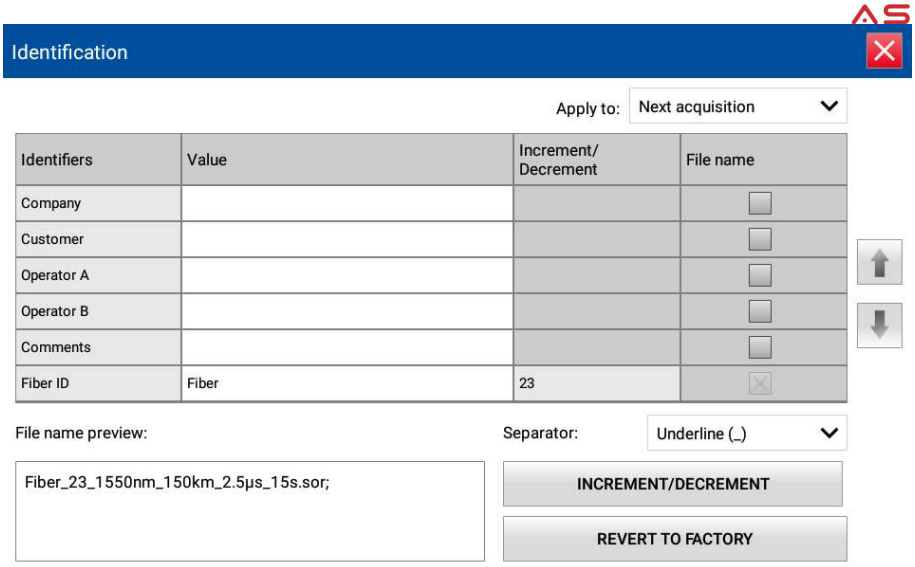
Before or after acquiring a trace, you may want to include or update information regarding the fiber under test, the task, or add general remarks. The application supports saving this input information for use in future data acquisition files. Different wavelengths within the same file share the same information (including Location A and "B, Cable ID, Fiber ID, etc.). If you clear the information in the "Identification" window, the identification data will not be saved to the file.

Steps to add information to test results:

A. From the "Menu", tap "Identifier".

B. In the "Apply to" list, select "Current acquisition" or "Next Data acquisition".

C. Enter the required information. For more detailed information, please refer to section 4.2.2.3, "Auto-Naming Trace Files."



Note: The Serial Number, Model Number, and Calibration Date fields are read-only and cannot be edited. Wavelength, Pulse, and Duration cannot be edited within the Identification window; these parameters must be configured in the OTDR tab before starting data acquisition.

D. Tap“ ” to return to the curve graph. The information you enter is saved with the curve and can be reviewed or modified at any time using the steps above.

To clear information in the Identification window:

For detailed information on clearing values, please refer to the "File Auto-Naming Procedure" in section 4.2.2.3.

Note: Information in the Wavelength, Range, Pulse, Duration, and Serial Number fields cannot be deleted.

4.2.8.2 Generating Reports

You can select from the following report generation modes:

- **Single Current:** Exports only the currently selected measurement file.

- **Split All:** Exports all measurement files that are currently open or measured and saved, generating a separate report for each file.
- **Combine All:** Exports all measurement files that are currently open or measured and saved, bundling all file data into a single comprehensive report.

You can generate a PDF report directly from the device. By default, the report includes all curves, but you can also generate a report that only includes the current curve.

The following lists the information options that can be included in the PDF report. All options are selected by default.

- **Global Pass/Fail:** Indicates whether the result passed or failed the test. This status is displayed in the upper right corner of the report.
- **General Information:** including file name, test date and time, comments, customer, company, cable identification, task identification, fiber identification and other information.
- **Location:** Displays information for locations A and B, operators A and B, device model, serial number, and calibration date.
- **Result:** Displays link measurement data, such as span length, span loss, average loss, average connector loss, maximum connector lLoss, and span ORL.
- **Graph:** Generates a graph identical to the on-screen display. All curves (wavelengths) in the same file use the same scaling factor. Markers are also displayed on the graph.
- **Markers:** Displays marker information, including the positions of A and B, as well as the distance and dB values at their current locations.

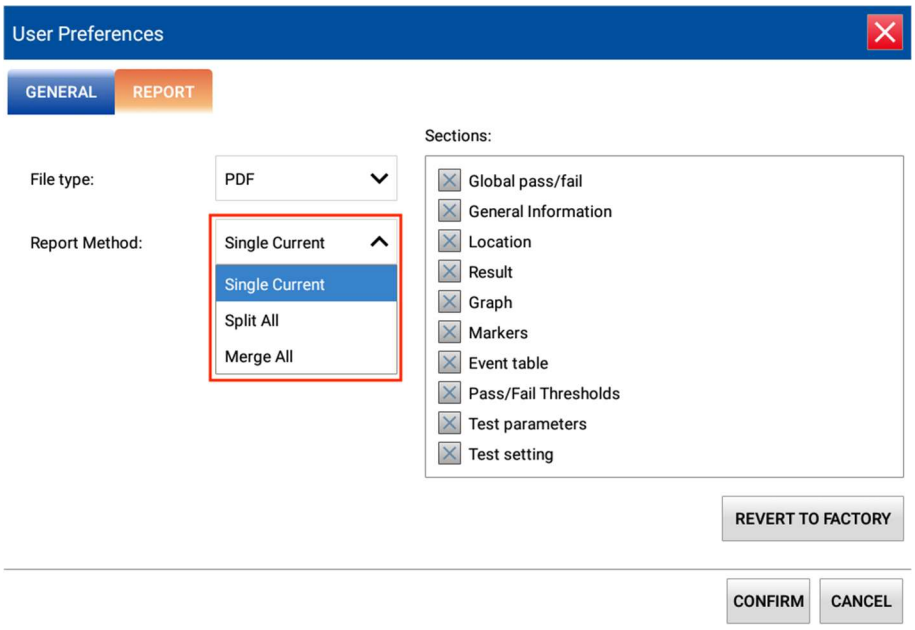
- **Event Table:** Values with a "Fail" status are highlighted with white text on a red background; "Pass" values are not highlighted. If the application detects a macrobend across two wavelengths, it will be included in the event table.
- **Pass/Fail Thresholds:** Displays the thresholds set in the Pass/Fail Thresholds tab of the Test Configuration window, including splice loss, connector loss, reflectivity, fiber segment attenuation, span loss, span length, and span optical return loss thresholds.
- **Test Parameters:** Displays wavelength, range, pulse, and duration.
- **Test Setting:** Displays refractive Index, backscatter coefficient, splice loss threshold, reflectance threshold, fiber end threshold, macrobend wavelength, and macrobend loss delta.

Selecting the Report Generation Mode:

A. From the "Menu", tap the "User Preferences" button.

B. Select the "REPORT" tab.

C. In the Report Method drop-down window, select the desired mode.

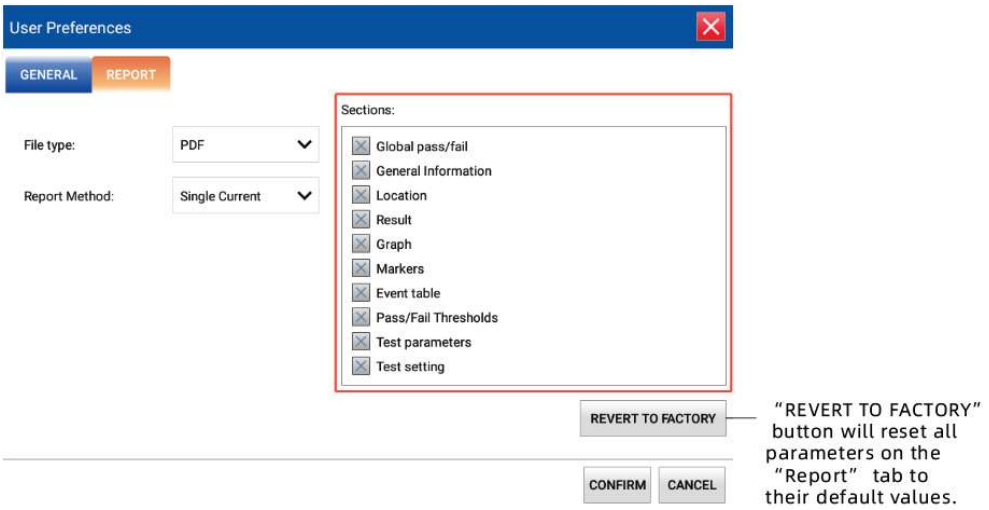


Specifying Report Content:

A. From the "Menu", tap the "User Preferences" button.

B. From the "Menu", tap the "User Preferences" button.

C. Select the specific items you wish to include in the report (e.g., markers, graph, event table).



D. Tap "CONFIRM" to return to the main window.

Manually Generating Reports:

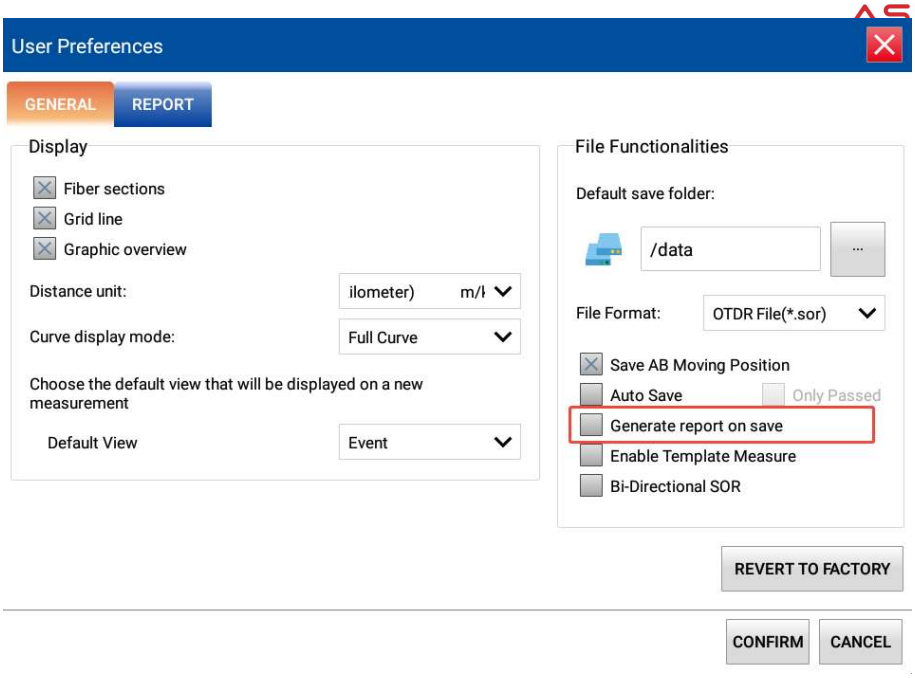
In the main window, tap"  " The application will export the report and automatically return to the main window.

Automatically Generating Reports:

A. From the "Menu", tap the "User Preferences" button.

B. Select the "GENERAL" tab.

C. Select the "Generate report on save" check box.



D. Tap "CONFIRM" to return to the main window.

NOTE: In this way, each time you save an OTDR file, the application automatically generates and saves a report file.

4.2.9 Using the OTDR as an Optical Light Source

When using the OTDR as a light source for measurements, the OTDR port emits a specifically modulated light pulse. In this mode, this port can only emit but not detect this optical pulse.

Important

- Never connect a live fiber to the OTDR optical interface unless proper configurations have been made.
- Input optical power between -65 dBm and -40 dBm can interfere with OTDR data acquisition. The extent of this interference depends on the selected pulse width.
- Any input signal with power exceeding 10 dBm will cause permanent damage to the OTDR module.

Steps to use the OTDR as an optical light source:

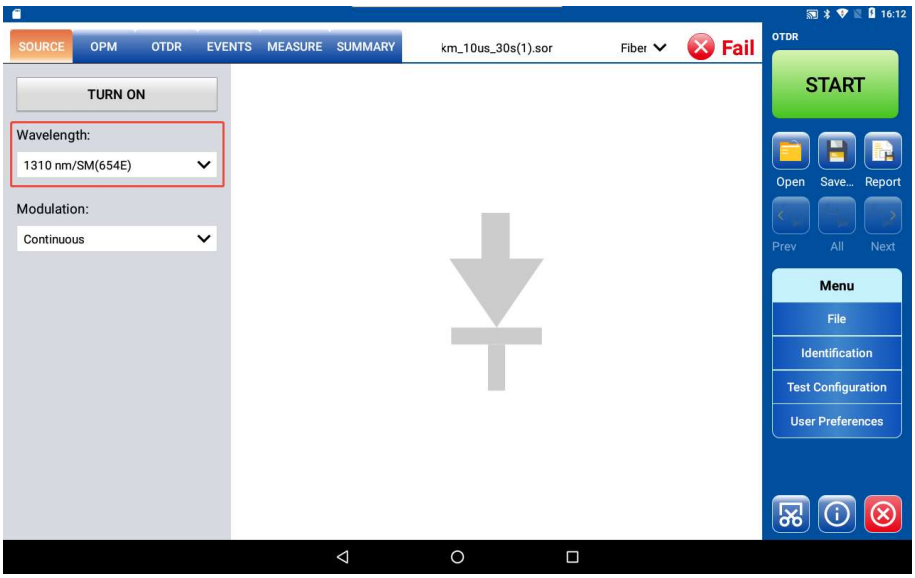
A. Properly clean the fiber patch cord. For more detailed information, please refer to section 4.2.2.2, "Cleaning and Connecting Optical Fibers").

B. Connect one end of the fiber under test to the OTDR port.

If the device has two OTDR ports, please verify the wavelength to be used and connect the fiber to the appropriate port (single-mode, Live single-mode, or multi-mode).

C. In the main window, tap the "Source" tab.

D. If you are using a standard OTDR, select the desired wavelength from the list of available options.



NOTE: If only one wavelength is available, that wavelength is selected by default.

E. Select the desired modulation mode from the list of available options:

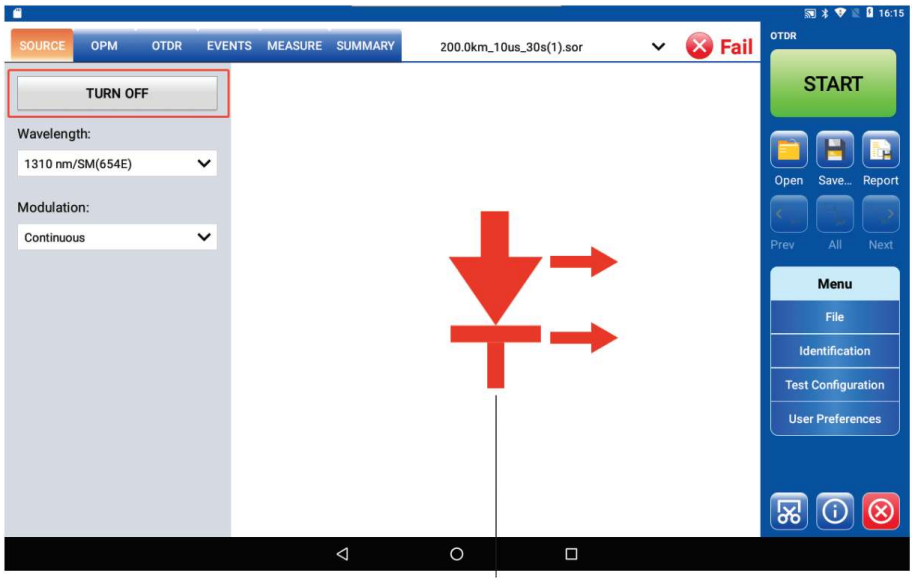
E-1 **For loss measurement:** Connect an optical power meter to the other end and select "Continuous".

E-2 **For fiber identification:** Select "**270 Hz**", "**1 kHz**", or "**2 kHz**". This allows personnel at the other end of the link to identify the fiber under test,

which is particularly useful when testing multiple cables.

To further assist in fiber identification, the application provides a blink mode. In this mode, the OTDR transmits a modulated signal (1 kHz or 2 kHz) for 1 second, pauses for 1 second, and then repeats the cycle. To enable this mode, select "1 kHz + Blink" or "2 kHz + Blink".

F. Tap "TURN ON" to start laser emission. You may tap "Off" at any time to stop the laser emission.



Displayed in red indicates that the light source is active.

Using a power meter with modulation and detection capabilities, the operator at the other end can quickly and accurately locate the fiber under test or perform loss measurements.

4.2.10 Using the OTDR as an Optical Power Meter (Optional)

When using the OTDR as an optical power meter for measurements, the port can only detect light pulses and cannot perform transmission.

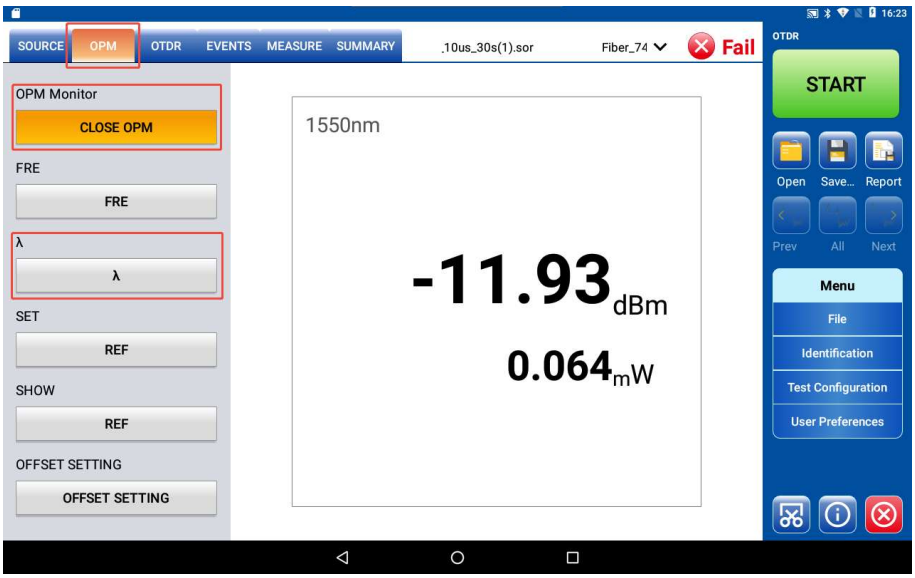
4.2.10.1 OPM Wavelength Settings

Steps to configure the OPM wavelength:

A. In the main window, tap the “OPM” tab.

B. Tap the “OPM” button under the detecting section to enable the OPM function.

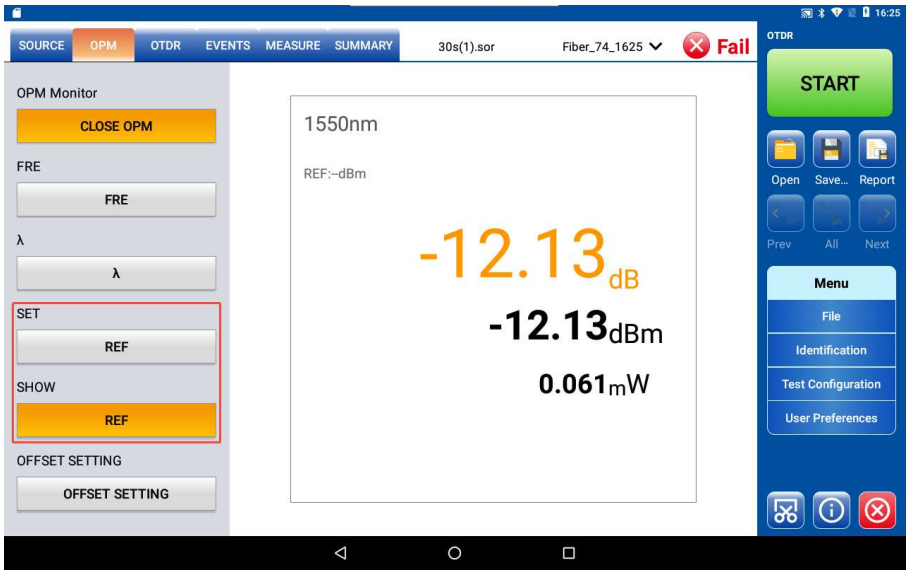
C. Depending on project requirements, different wavelengths of optical signals must be measured. It is essential to select the corresponding wavelength for power measurement. If the wavelength of the light under test does not match the wavelength selected on the OPM, it will result in measurement errors. Click the “λ” button to cycle through the available wavelengths. The device supports measurements at six wavelengths: 1310 nm, 1490 nm, 1550 nm, 1577 nm, 1625 nm, and 1650 nm.



4.2.10.2 Viewing and Setting REF Values

Setting a reference value is typically used to pre-determine attenuation values that are not included in actual line loss measurements before measuring an actual line, or to compare differences against a set standard power level. After enabling OPM and in the presence of light, you can tap the "REF" button under Settings to set the REF reference value for the current wavelength. Each

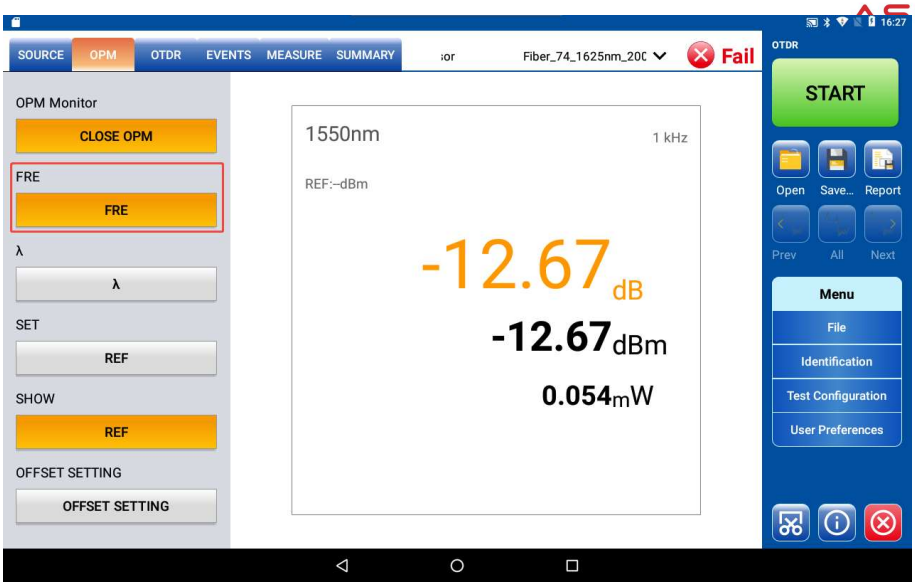
wavelength has a separate REF setting. Tapping the "REF" button under Display displays the relative difference (dB) between the actual measurement and the new reference value, as shown below:



4.2.10.3 Frequency Identification

Frequency Identification: Automatically identifies the frequency of the carrier modulation signal emitted by our laser light source.

Once the OPM is enabled and an optical signal is detected, tap the “FRE” button under the Frequency Identification section to enable or disable the frequency identification function.



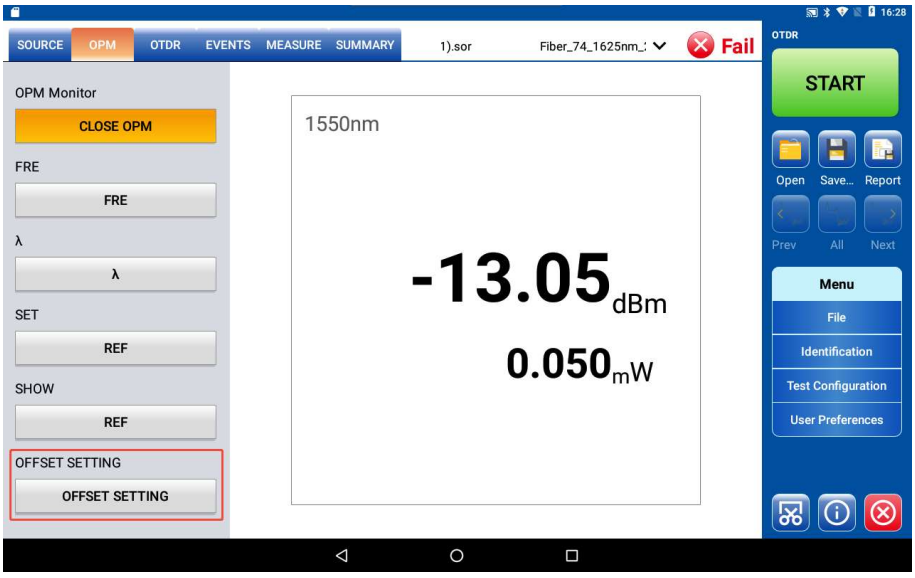
4.2.11 Setting the Offset Value

The offset setting allows manual calibration of each calibration wavelength.

NOTE: The offset setting range is (-5.00dB to 5.00dB).

Steps to set the Offset:

A. In the main window, tap “OPM”.



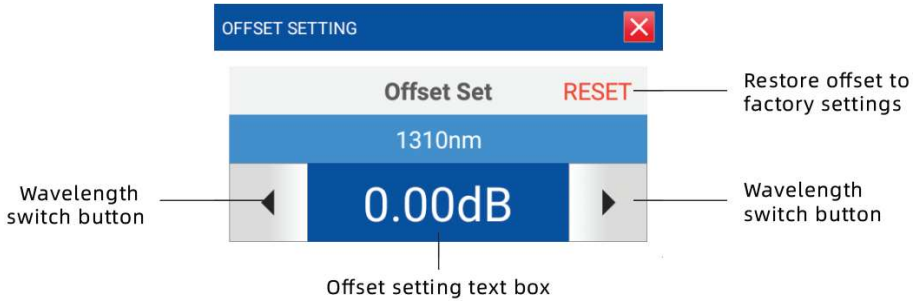
B. Tap "OFFSET SETTING" and tap "◀" or "▶" in the pop-up window to switch to the desired wavelength.

C. Tap the Offset parameter and set it.

D. Tap the "  " button to return to the main window.

To reset the offset parameters, tap the "RESET " button.

NOTE: The "RESET" button restores the factory offset parameters for all wavelengths.



4.2.12 Event Type Descriptions

This section describes all possible event types that may appear in the event table.

The following points explain how these events are represented:

- **Distinct Symbols:** Different event types are represented by unique symbols.
- **Trace Representation:** Each type of event is marked on the fiber graph, which displays reflected power as a function of distance. ◦
- **Event Indicators:** Arrows on the trace indicate the precise location of each event.
- **Full Trace View:** Most graph display a complete curve, representing the entire data acquisition range.
- **Detailed View:** Some graphs may only show a specific portion of the measurement range, allowing for a clearer view of the events of interest.

4.2.12.1 Span Start

The "Span Start" on a trace is the event that marks the beginning of the fiber span under test. By default, the Span Start" is located at the first event of the fiber link

(typically the first connector of the OTDR). However, you can manually set any other event as the Span Start, which will cause the first row of the event table to correspond to that specific event on the trace.

4.2.12.2 Span End

The "Span End" on a trace is the event that marks the conclusion of the fiber span under test. By default, the Span End" is located at the last event of the fiber link, which is referred to as the end-of-fiber event. You may also manually set any other event as the Span End, which will cause the last row of the event table to correspond to that specific event on the trace.

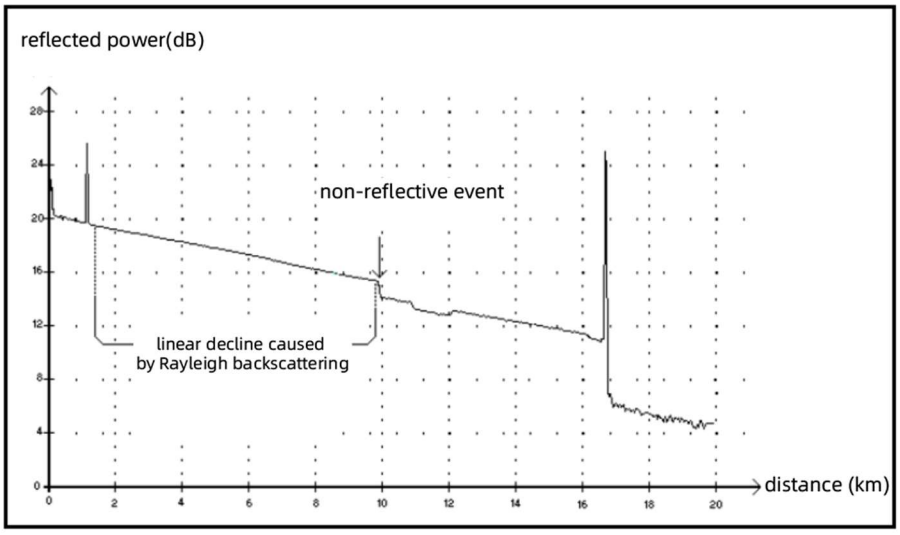
4.2.12.3 Start Event

This is the first event of the fiber under test, typically representing the first connector of the OTDR.

4.2.12.4 End Event

An event with a loss value exceeding the end threshold is defined as an end event. This typically represents the final event of the fiber under test.

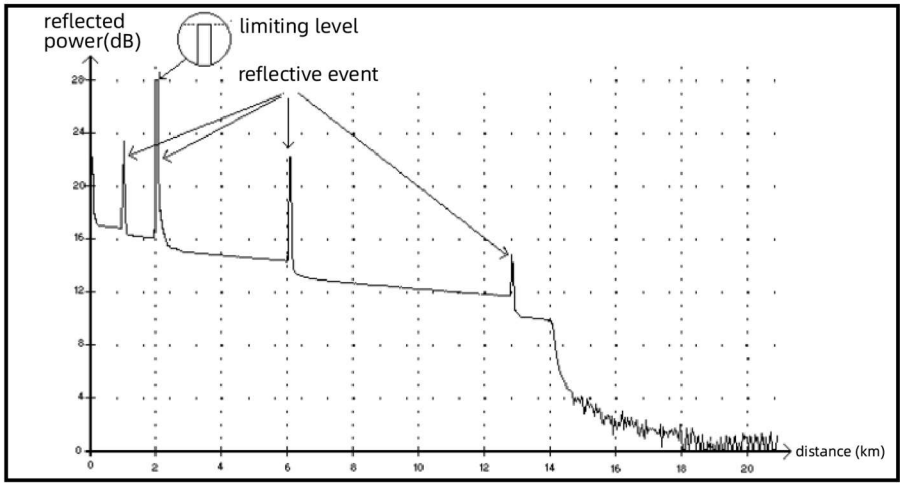
4.2.12.5 Non-reflective Events +



These events are characterized by a sudden drop in the Rayleigh backscatter signal, appearing as a discontinuity in the downward slope of the signal curve.

- **Common Causes:** These events are typically caused by splice, macro-bend, or micro-bend in the optical fiber.
- **Measurement Data:** The application displays the loss value for non-reflective events but does not provide a reflectivity value.
- **Threshold Alerts:** If thresholds are configured, the application will identify a non-reflective fault in the event table once the loss threshold is exceeded.

4.2.12.6 Reflective Events



Reflective events appear as sharp spikes in the fiber trace, caused by sudden changes in the refractive index.

- **Energy Reflection:** These events cause a significant portion of the initial input pulse energy to be reflected back to the OTDR.
- **Common Causes:** Reflective events indicate the potential presence of connectors, mechanical splices, or even poor-quality fusion splices and fiber cracks.
- **Measurement Data:** The application typically displays both the loss value and the reflectivity for reflective events.
- **Saturation and Dead Zones:** When a reflective spike reaches its maximum level, the peak may become flat (clipped) due to detector saturation. This results in an increased dead zone (the minimum distance between this event and the next detectable or measurable event).
- **Threshold Alerts:** If thresholds are configured, the application will flag a reflective fault in the event table once the reflectivity or connector loss threshold is exceeded.

4.2.12.7 Macro-bend Events

The device measures the event loss at a specific location using one wavelength

(e.g., **1310 nm**) and another wavelength (e.g., **1550 nm**), then compares these two loss values to pinpoint the location of a macro-bend.

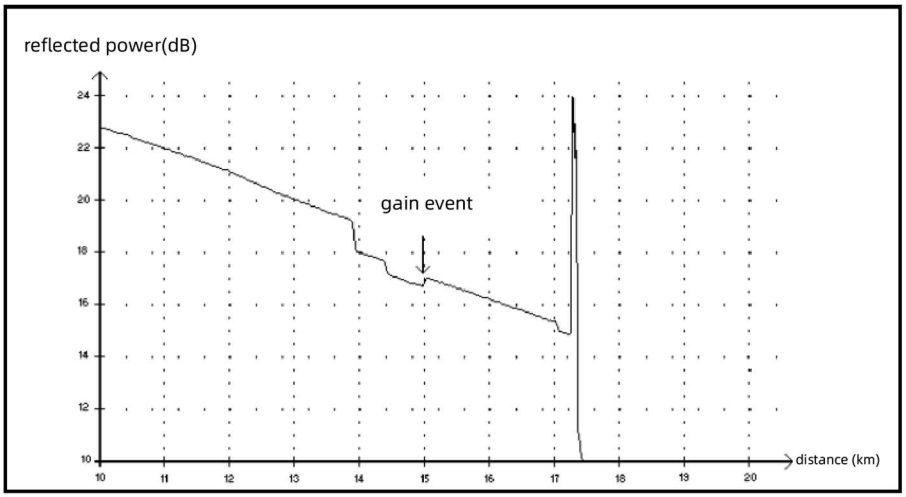
The device will identify and display an event as a macro-bend if the following conditions are met during the comparison:

- **Wavelength Sensitivity:** The loss at the longer wavelength is greater than the loss at the shorter wavelength.

  AND

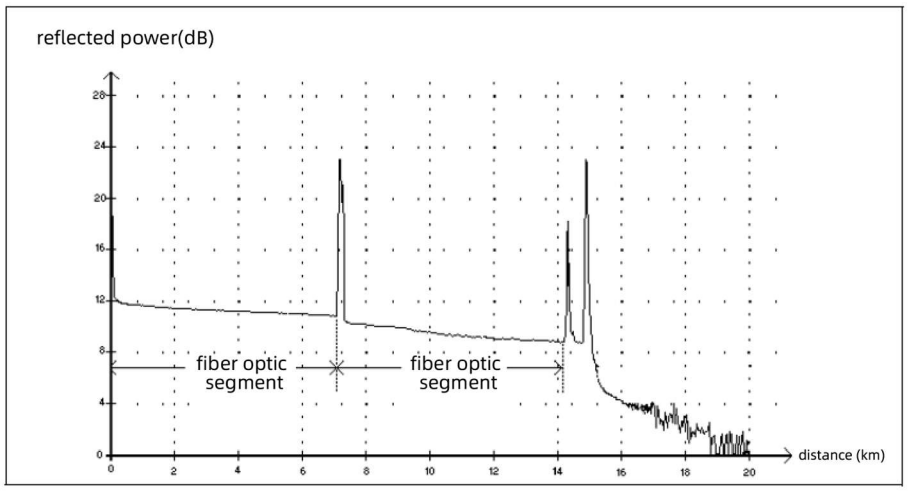
- **Loss Delta (Difference):** The difference between the two loss values exceeds the specified threshold. The default Loss Delta is 0.5 dB (suitable for most fibers), though this value can be adjusted based on actual field conditions.

4.2.12.8 Gain Event



A gain event is an event that appears as a joint with a noticeable increase in power (negative loss). It occurs when two fiber segments with different backscatter characteristics (backscatter coefficient and backscatter capture coefficient) are spliced together.

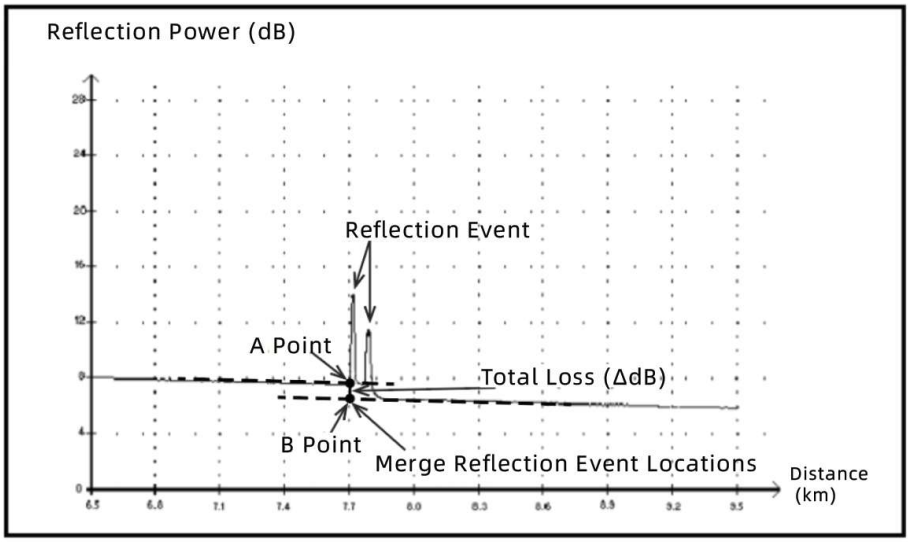
4.2.12.9 Fiber Sections



This symbol represents a segment of the fiber that contains no specific events.

- **Total Length Composition:** The sum of all fiber sections within the entire trace equals the total fiber length. Even if the detected events consist of multiple data points, each fiber section remains a distinct entity.
- **Measurement Data:** The application displays the loss value for each fiber section but does not provide a reflectivity value.
- **Attenuation Calculation:** The attenuation coefficient (dB/km) is calculated by dividing the section's total loss by its length.

4.2.12.10 Merged Events Σ



This symbol represents an event formed by the merging of multiple closely spaced events. In the event table, the total loss resulting from these combined events is displayed next to the merged event symbol.

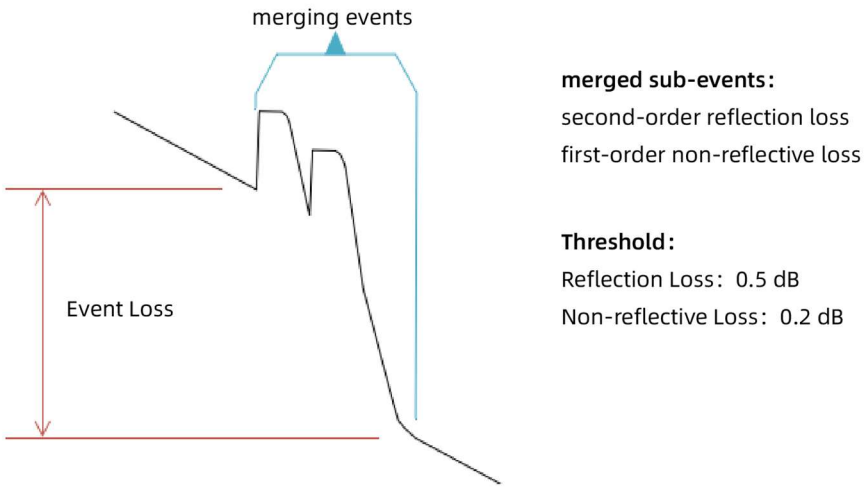
- **Sub-events Structure:** A merged event consists of individual sub-events. In the Event Table, only the merged event is assigned numerical attributes; sub-events do not have independent loss values.
- **Reflective Events:** These indicate the potential presence of connectors, mechanical splices, poor-quality fusion splices, or fiber cracks.
- **Non-reflective Events:** These indicate the potential presence of splices, splitters, or macro-bends.
- **Reflectivity Data:** The application displays the combined reflectivity of the merged events, the maximum reflectivity among the sub-events, and the individual reflectivity values for each reflective sub-event.
- **Total Loss Measurement (Δ dB) :** The total loss generated by the merged event is measured by constructing two straight lines.
- **LSA Line Fitting:** Using the least squares approximation (LSA) method, all trace points within the linear region preceding the first event are fitted to create the first reference line.
- **LSA Line Fitting:** Using the LSA method, all trace points within the linear region following the second event are fitted to create the second reference line. If

there are more than two merged events, this line is constructed in the linear region after the final merged event and then extended back toward the first event.

- **Total Loss Calculation:** The total loss (Δ dB) is defined as the power difference between the starting point of the first event (Point A) and the point on the extended second line directly below the first event (Point B).
- **Data Limitation:** The application does not display individual loss values for sub-events.

4.2.12.11 Pass/Fail Test

The following examples introduce the Pass/Fail test logic:



For merged events, the system can determine the total loss of the combined events, but it cannot calculate the individual loss for each sub-event.

Consequently, Pass/Fail results for merged events may occasionally produce false positives or false negatives.

When using thresholds to evaluate the status of an event, there are two common approaches:

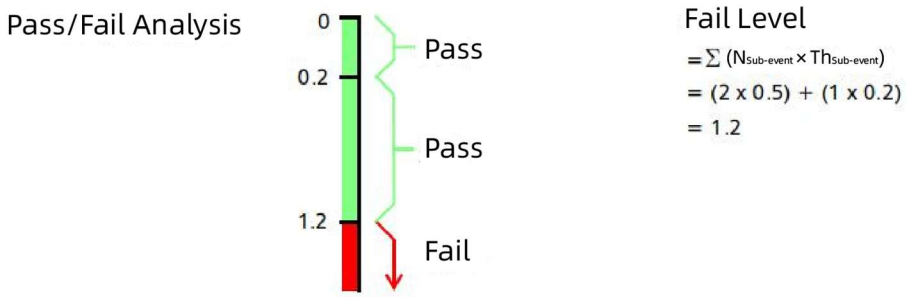
- **Global Testing:** Testing all event types, including both reflective and non-reflective events.

- **Selective Testing:** Testing only specific event types (for example, excluding reflectance or reflective loss from the evaluation).

4.2.12.12 Testing All Event Types

When testing all event types, the Pass/Fail judgment criteria are as follows:

- **Pass:** If the event loss is less than or equal to the minimum threshold, the event status is marked as "Pass".
- **Fail:** If the event loss exceeds the product of the number of sub-events of a specific type multiplied by the threshold for that event type, the event status is marked as "Fail".
- **In-between / Undetermined:** If the event loss falls into the "In-between" range, the overall status is treated as "Pass", as it is impossible to accurately determine the individual weights of each sub-event within the merged event.



Example: If the total loss of a merged event is less than or equal to 1.2 dB, it is considered "Pass". Otherwise, it is considered "Fail".

4.3 Smart View Description

4.3.1 Introduction to Smart View

Smart View is an application optimized for characterizing access networks and FTTx network. Depending on the configuration of the Smart View module, the application can be used before or after network activation.

4.3.1.1 How It Works

The Smart View application uses our hardware to perform data acquisition and display the various elements detected on the link under test. However, while a typical OTDR can only acquire a single average trace using a given set of test parameters, the Smart View acquires a series of measurement results and displays them in a simple, intuitive link view.

The test parameters for each sub-measurement are determined by an intelligent algorithm during the measurement process. Smart View measurements vary from link to link, with test parameters determined based on link length, loss, and optical return loss (ORL). Test time depends on the link under test but is primarily influenced by the total link loss. The application uses information from all sub-measurements to refine the characterization of each element found on the link, resulting in accurate and complete results. Depending on the module configuration, you can perform single-wavelength or multi-wavelength data acquisition. In the latter case, the application provides results for each wavelength and displays a combined Pass/Fail status for each element.

The application represents the link as a straight line and summarizes these results on this line, displaying the location, loss, reflectivity, and element type of each element.

4.3.1.2 Export Data to Other Formats

The Smart View application can generate reports in PDF format, facilitating later

batch processing of measurement results.

4.3.1.3 Launch and Receive Fibers

Unlike traditional OTDRs, the Smart View only requires a short input fiber (>50 meters) to achieve all the benefits of this reference method, regardless of link length and loss. When testing passive optical network (PON) links, a maximum input fiber length of 200 meters is recommended. Multiple connections can degrade the OTDR output port's loss and optical return loss performance, so using a longer input fiber is recommended.

In the Link View, the first element of the link under test is marked with the letter (A). Using an input fiber allows accurate measurement of the first connector (A) on the fiber link under test and eliminates wear and tear on the OTDR connector from the link evaluation. If using an APC interface, some degradation in OTDR connector performance is acceptable, as the angled polishing maintains low optical return loss, preventing near-end resolution from being too low. Using an input fiber eliminates OTDR connector loss from the measurement results. With each measurement, the iOLA evaluates OTDR connector loss and reports the connector's condition. Please note that excessive connector loss will reduce the instrument's measurement capabilities. Additionally, using an input fiber reduces the need for direct manipulation of the connector, thus protecting the OTDR connector. This is because repairing or replacing the input fiber cable is easier than replacing the OTDR connector.

In the Link View, the last element of the link under test is marked with the letter (B).

To measure the last connector (B) of the link and improve the accuracy of the total insertion loss by comparing the difference between two known fibers (to avoid errors caused by different backscatter coefficients of the fibers in the link), a receiver fiber can be connected to the end of the fiber opposite the test module. Without a receiver fiber, the Smart View application can measure the position and optical return loss of this connector even if it is not mated, but it cannot measure its loss or display the connector's Pass/Fail status. The required length of the receiver fiber depends on the loss of the link under test. Higher loss requires a longer pulse to reach the receiver fiber. Unlike the input fiber, the receiver fiber has the same limitations as a traditional OTDR. For testing a 1 km fiber span with a loss below 2 dB, the receiver fiber length requirement is only 100 m. Depending on the fiber length after each splitter, for testing a PON link with a loss of 23 dB, the receiver fiber length requirement is 500 m to 2 km.

The Smart View app allows you to manually set the length of the input and receive fibers. It can also automatically measure the input or receive fibers. When performing a calibration, the app quickly measures and calculates the fiber length. Therefore, calibration requires only connecting the fiber under test to the module.

If a link element is found on the calibrated fiber or an OTDR connector fault is detected, the calibration fails and the application displays an alarm indicating the reason for the failure. A short (<5 m) fiber patch cord can be used between the instrument and the calibrated fiber; this length will be included in the calibration length. If the calibration is successful, the input or receive fiber length in the Test

Parameters tab will be updated accordingly.

When performing a measurement, the Smart View attempts to match the elements found on the link to the specified input and receive fibers in order to define the positions of connectors A and B. If no event is found at the specified distance because the link has a "perfect" connection to the input or receive fibers, the Smart View inserts an element (zero loss and zero optical return loss) at the specified position.

For more detailed information, please refer to section 4.3.3.11, "Configuring Smart View."

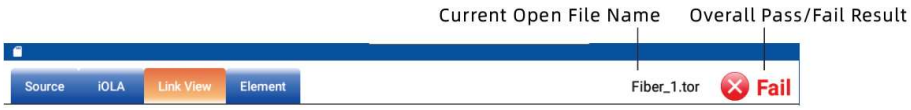
4.3.2 Getting Started with Smart View

4.3.2.1 Main Window

The main window allows you to start data acquisition and view measurements and values.

4.3.2.2 Status Bar

The status bar at the top of the main window displays the name of the currently loaded Smart View file, a data acquisition progress bar, and an global Pass/Fail status.

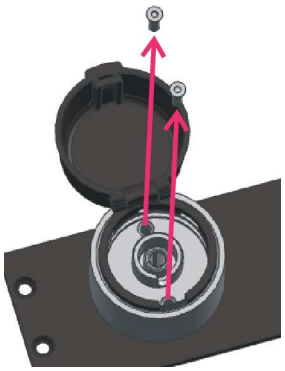


4.3.3 Preparing for Smart View Test

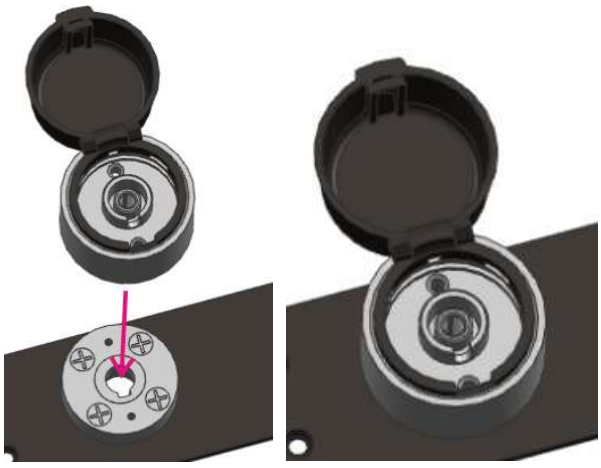
4.3.3.1 Installing or Replacing the Stainless Steel Connector

Follow these steps to install or replace the stainless steel connector:

A. Remove the screws from the connector, then pull out the head assembly.



B. Select the appropriate connector head and base assembly for replacement.



C. Secure the connector head and base using the screws.

4.3.3.2 Cleaning and Connecting Optical Fibers

Important

To ensure maximum power transmission and avoid erroneous measurements:

- Fiber End-Face Inspection Before inserting a fiber patch cord into the connector, it is mandatory to inspect the fiber end-faces following the methods described below to ensure they are clean. The Company assumes no liability for any equipment damage or measurement inaccuracies resulting from improper cleaning techniques or incorrect operational procedures.
- Always identify the connector type of your fiber patch cord before connection. Inserting an incompatible connector into the port will cause permanent damage to the ferrule.

Steps for Connecting Fiber Patch Cords

A. **Inspection**

Use a fiber inspector (microscope) to examine the fiber. If the fiber is clean, insert it into the connector. If contamination is detected, clean it according to the following procedure.

B. **Cleaning the Fiber End-Face**

B-1 Gently wipe the fiber end-face using a **lint-free swab** moistened with optical-grade cleaning fluid.

B-2 Use a dry swab to ensure the connector is completely dry.

B-3 Visually re-inspect the fiber end-face to confirm it is pristine.

C. **Alignment**

Carefully align the fiber patch cord with the connector, ensuring the end-face does not come into contact with other surfaces to avoid friction or scratches. If the patch cord has an alignment key (latch), ensure it is fully seated into the corresponding groove of the connector.

D. **Securing the Connection**

Push the fiber patch cord in until it is fixed in place to ensure optimal physical contact. If the patch cord features a threaded sleeve, rotate it until it is firmly secured. Do not overtighten, as excessive force may damage the fiber end-face.

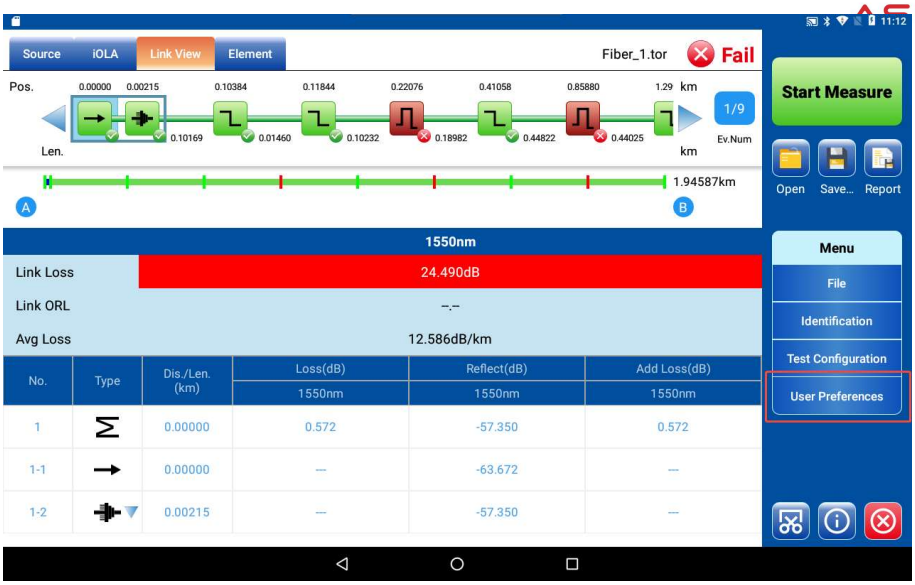
NOTE: If the fiber is not properly locked or fully connected, it will result in severe insertion loss and high reflectance, leading to inaccurate test data.

4.3.3.3 Configuring General Information Options

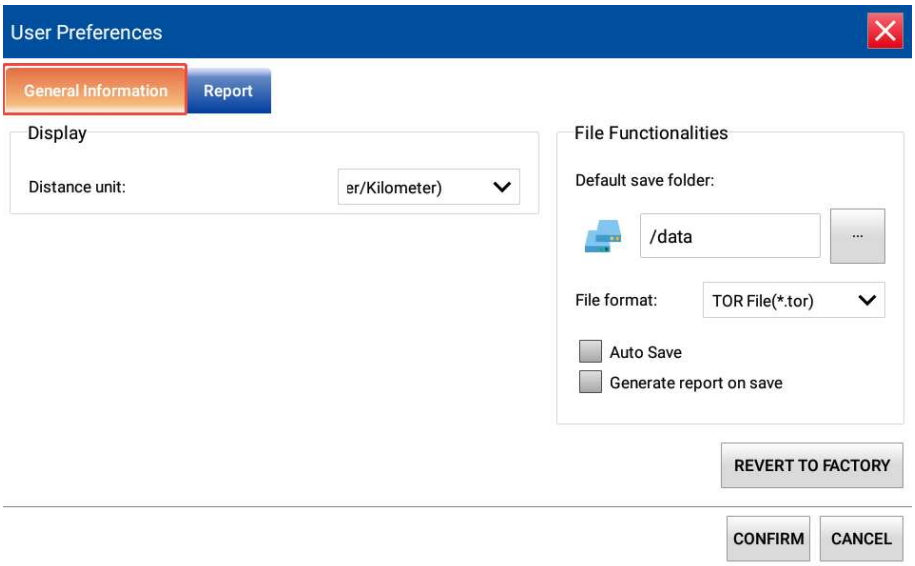
The "General Information" tab allows you to configure the application's distance units and file management functions.

To configure the general information tab:

A. From the"Menu", tap"User Preferences".



B. Select the "General Information" tab.

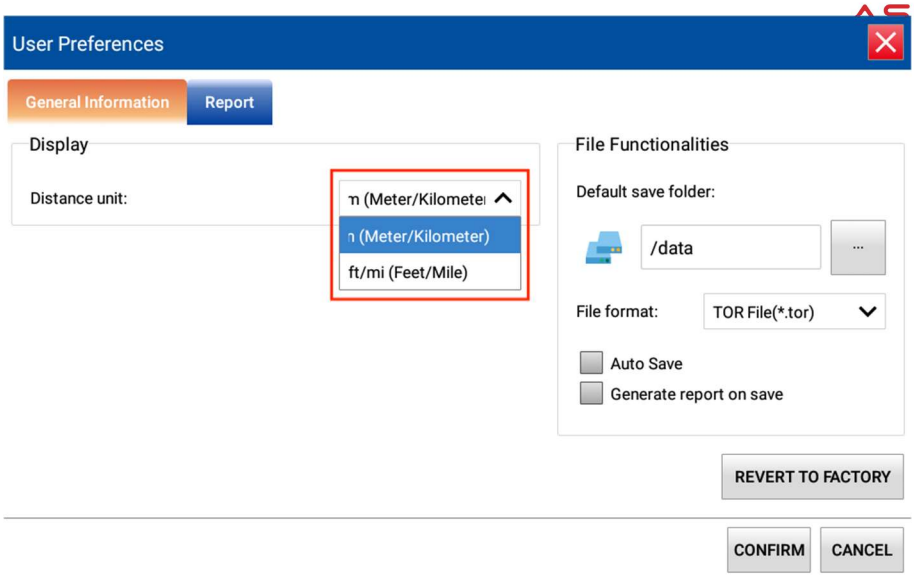


C. Under the "General Information" tab, configure the following options:

- **Distance unit:** Select the distance unit from the drop-down menu. The default distance unit is kilometers. You can select the units of measurement to use in the application. The available options are:

  ˙m/km

  ˙ft/mi



NOTE: The units used in the application and reports depend on the units selected here.

NOTE: Normally, distances less than 1 km or 1 mile are converted to meters/feet. If the list shows kilometers or miles, distances less than 1 km or 1 mile are not converted.

NOTE: Even if distance units other than kilometers are selected, attenuation values for fiber sections are always displayed in dB/km, as this is more consistent with the fiber optic industry standard.

- **Default save folder**：Enter the location where you want to save your files.

  This path is used to save Smart View files after data acquisition is complete.

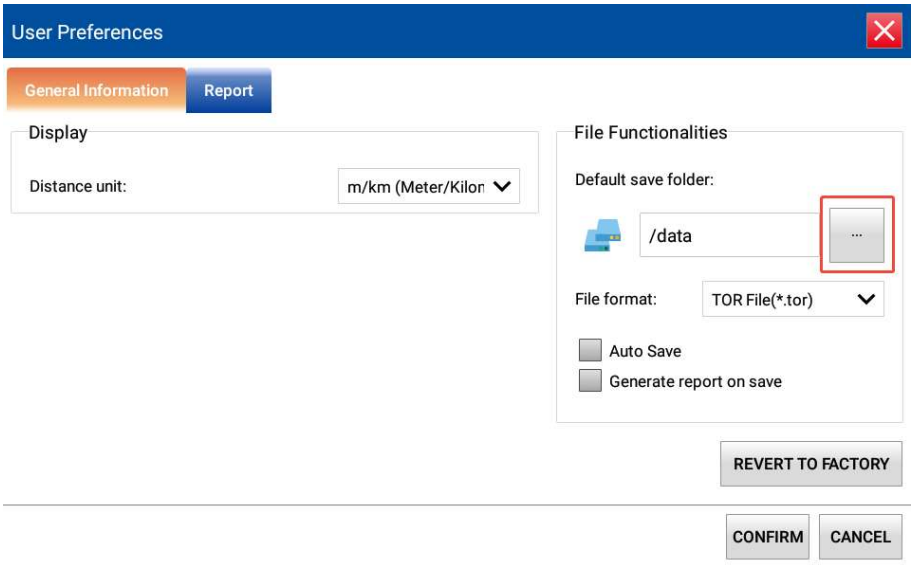
  Note: If data acquisition is launched for the first time, the application uses the default path provided by the operating system to save files. The default save folder is /data. You may change this folder as needed, or use a USB flash drive or TF card.

  Steps to set the default save folder:

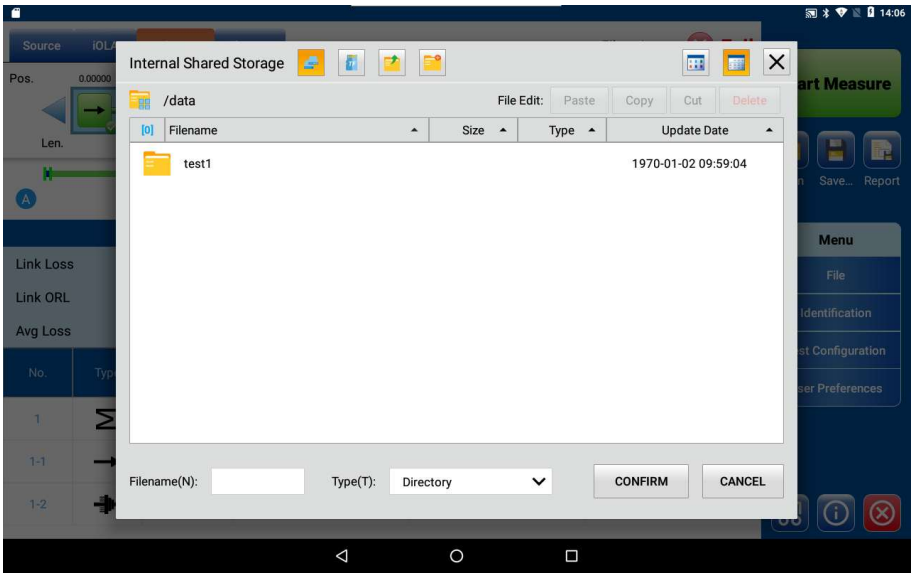
  a. From the "Menu", tap "User Preferences".

b. Select the "General Information" tab.

c. Tap the“ ... ” button behind“Default save folder”.



d. In the “File” window, select the location where you want to save the file.



e. Tap “CONFIRM” to exit the “File” window.

f. Tap “CONFIRM” to return to the main window.

- **Default file format:** Save in TOR file format by default.
- **Auto Save:** The application automatically saves the measurement file after the analysis is completed. By default, the application does not

automatically save measurements after analysis. However, you can configure it to automatically save measurements.

Note: The application will not be able to save files under the following circumstances:

˙The Smart View measurement is missing the required OTDR intermediate data.

˙The Smart View data acquisition process is manually interrupted.

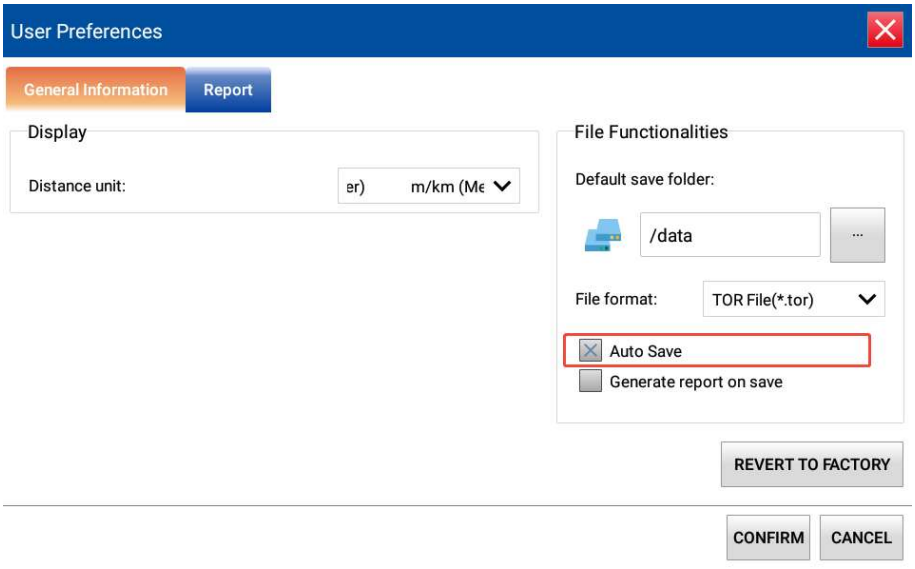
˙The Smart View measurement is automatically interrupted due to live fiber.

Steps to enable or disable the "Auto Save Measurements" Function:

a. From the “Menu”, tap the “User Preferences” button.

b. Select the “General Information” tab.

c. Select the “Auto Save” measurements check box.



NOTE: If the desired measurement is not saved automatically, you will need to save it manually.

d. 4. Tap “CONFIRM” to return to the main window. The application automatically applies the changes.

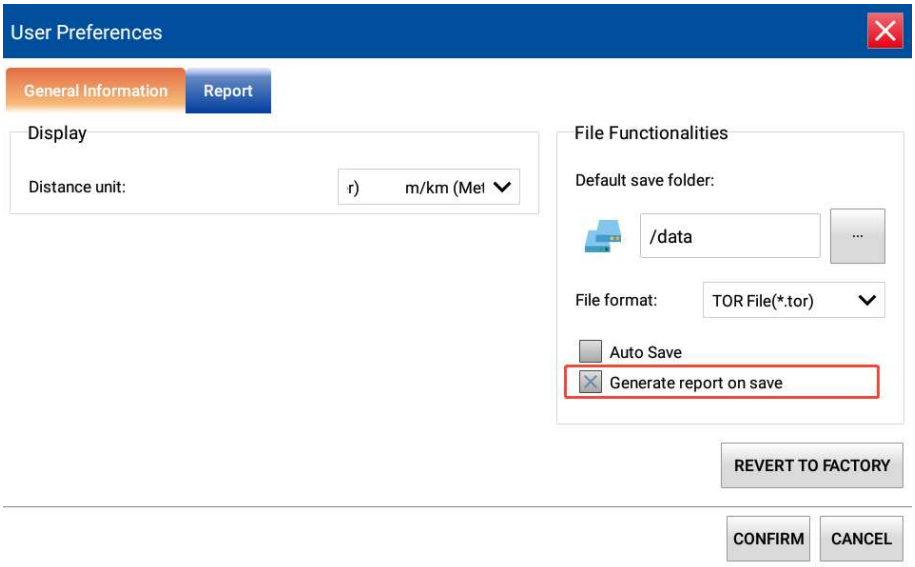
- **Generate report on save:** The application automatically generates a report when you save the file.

  Steps to enable or disable the "Generate report on save" Function:

  a. From the “Menu”, tap the “User Preferences” button.

  b. Select the “General Information” tab.

  c. Select the “Generate report on save” measurements check box.



  d. Tap “CONFIRM” to return to the main window.

  The application will automatically generate and save a report file each time you save an OTDR file.

  NOTE: The "Generate report on save" feature does not apply to the "Save As" file function.

4.3.3.4 Customizing Smart View Reports

You can configure the specific content included in the Smart View PDF reports generated on the device.

Note: The application only supports the PDF format for generated reports.

The following options represent the information that can be included in the PDF

report. By default, all options are selected:

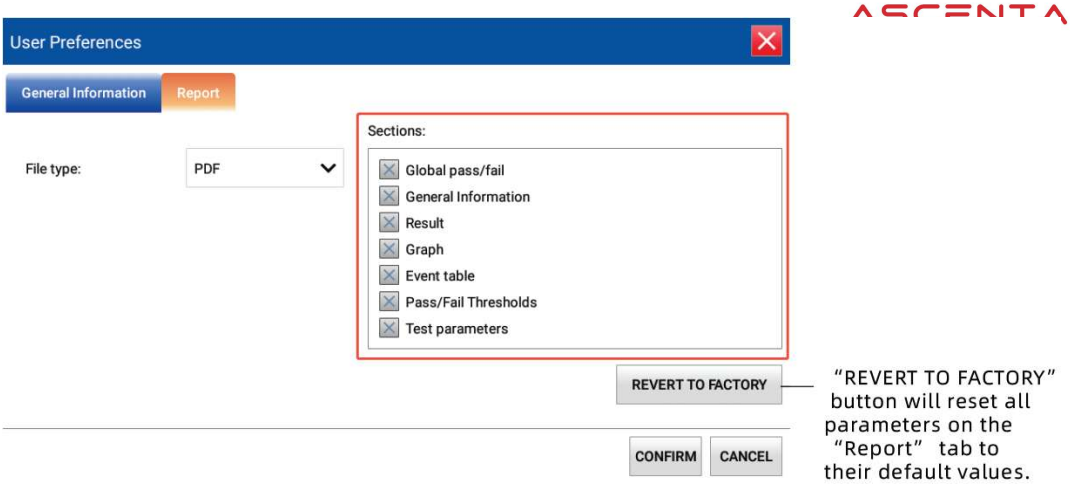
- **Global Pass/Fail:** Indicates whether the overall test results pass or fail. This status is displayed in the upper-right corner of the report.
- **General Information:** Includes the file name, as well as the test date and time.
- **Results:** Displays link measurement data, such as span length, span loss, average loss, and span optical return loss.
- **Graph:** Generates a graph that is exactly as it appears on the screen. All traces (wavelengths) in the same file use the same zoom factor. The graph also displays event markers.
- **Event Table:** Any values with a "Fail" status are displayed in white text on a red background. Values with a "Pass" status are not highlighted. If the application detects any macro-bend events, they will be included in the event table.
- **Pass/Fail thresholds:** Displays the thresholds set in the Pass/Fail Thresholds tab of the Test Configuration window, including splice loss, reflectivity, connector loss, maximum link loss ORL, fiber section attenuation, and maximum link loss.
- **Test parameters:** Displays wavelength, connector loss, reflectivity, refractive index, and backscattering.

Steps to specify report content:

A. From the “Menu”, tap the “User Preferences” button.

B. Select the “Report” tab.

C. Select the content to be included in the report.



D. Tap "CONFIRM" to return to the main window.

4.3.3.5 Auto-Naming Smart View Files

Depending on your configuration, file names consist of one or two fixed parts (alphanumeric characters) and one or two variable parts (increments or decrements of numeric values), as shown below:

If increment is selected...	If decrement is selected...
The variable part increments sequentially until it reaches the maximum value for the specified number of digits, then restarts from 1.	The variable part decrements sequentially until it reaches 1, then restarts from the maximum value for the specified number of digits.

Note: To enable numeric decrement, the starting value must be greater than the ending value.

Automatic File Naming and Increment Logic

After saving a result, the device automatically increments (or decrements) the current file name suffix to generate the name for the next file.

- **Digit Selection:** You can specify the number of digits to be displayed for the increment or decrement value.
- **Flag Incrementation:** One or more flags (labels) in the file name can be set to

increment. Selecting a single flag will apply your predefined increment/decrement value.

- **Sequential Logic:** If multiple flags are selected, they will increment sequentially starting from the last item in the list (the one with the highest index).

Example:

If the file name includes a Location flag, a Cable flag, and a Fiber flag in that order, the incrementation sequence will be as follows:

Location 1, Cable 1, Fiber 1

Location 1, Cable 1, Fiber 2 (Fiber increments first)

Location 1, Cable 2, Fiber 1 (Cable increments after Fiber reaches its limit)

and so on.

NOTE: If the current trace file is not saved, the suggested file name will remain reserved for the next trace. This feature is highly efficient for multi-fiber (multi-core) cable testing.

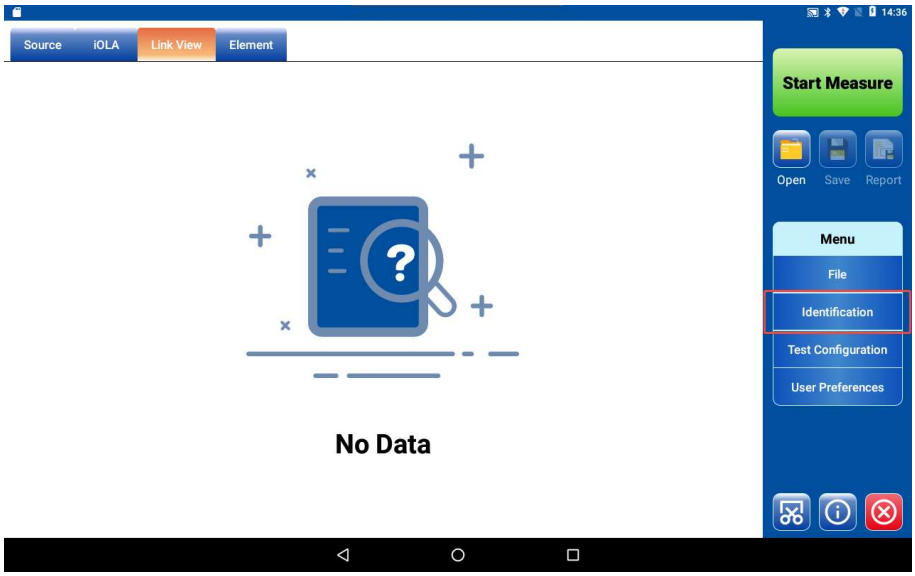
If the automatic naming function is disabled, the application will revert to using the default file name.

Changes to the auto-naming parameters apply only to files that have not been saved. If a test has been completed but not saved, you can view the auto-naming parameters only for the current and next data collection. If a test has not been completed, you can view the parameters only for the next data collection. In other cases, the application does not display the auto-naming parameters.

You can also restore all parameter values to default settings.

Steps to configure auto-file naming:

A. From the “Menu”, tap “Identification”.

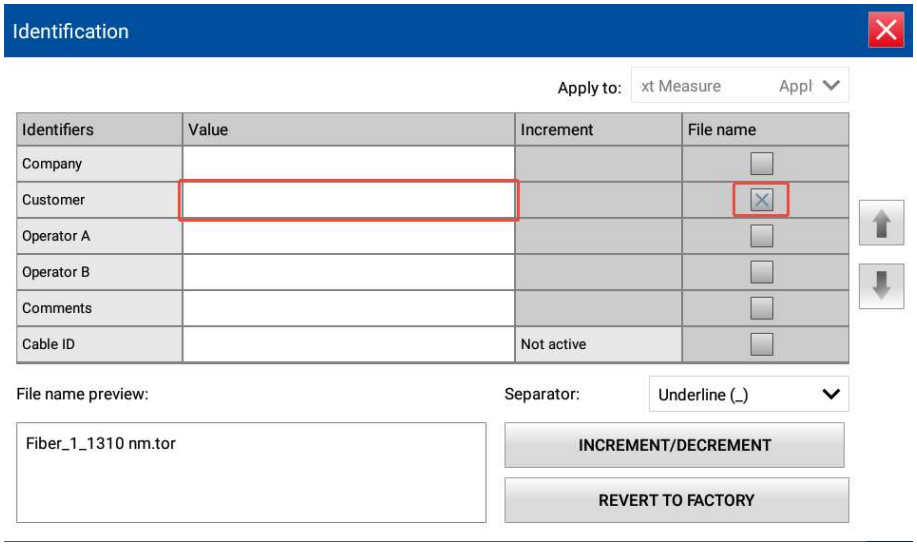


B. Enter all information by doing the following:

B-1 Find the row containing the identification you want to change and tap the checkbox in the "File Name" column to enable the identifier you want to change.

B-2 Tap the “Value” field for the desired identifier.

B-3 Enter the appropriate information.

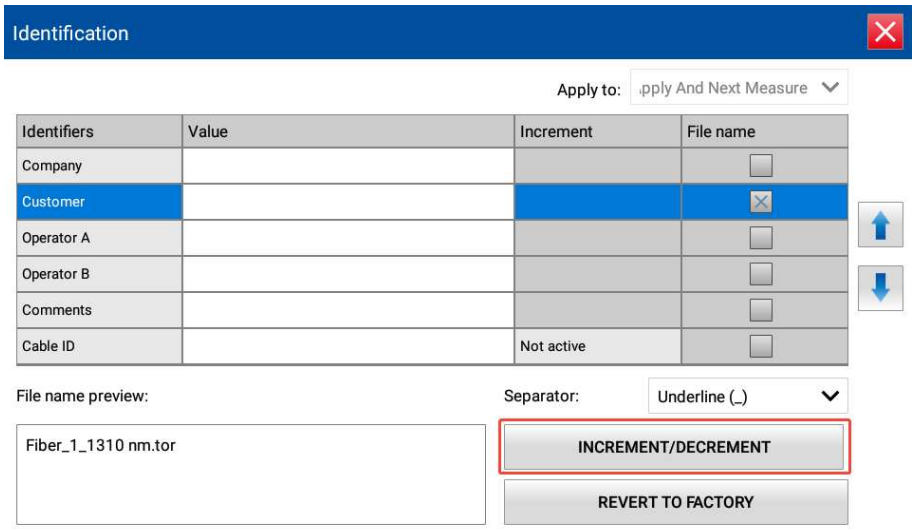


NOTE: The information in the gray box cannot be changed.

C. To automatically increment the cable ID, fiber ID, or position (A and/or B), do

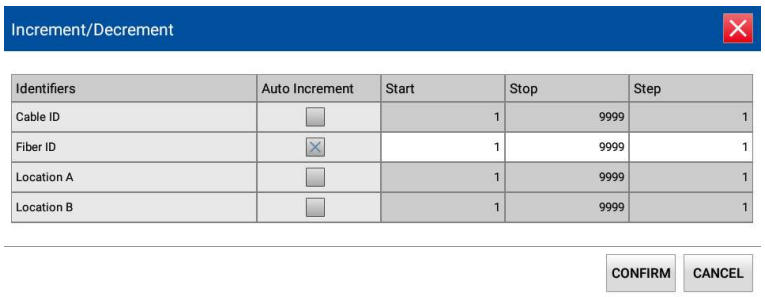
the following:

C-1 Tap the "INCREMENT/DECREMENT" button.



C-2 In the "INCREMENT/DECREMENT" window, select the "Auto-Increment" check box for the target ID.

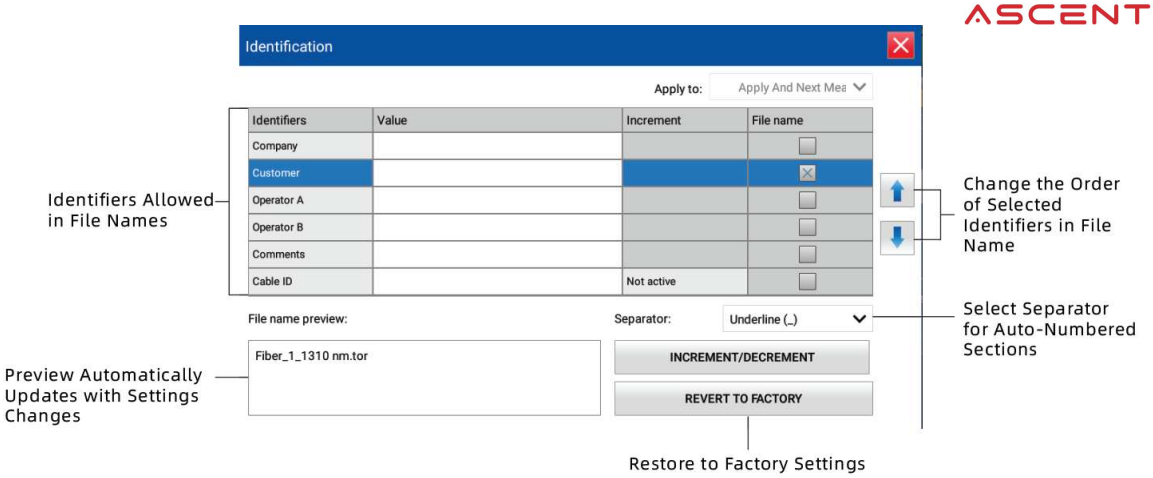
C-3 Enter the Start, Stop, and Step values as needed.



NOTE: To decrement the value, the start value must be greater than the stop value.

C-4 Tap "CONFIRM" to return to the Identify window.

D. Select the identification to include in the file name. Select the logo and press the up or down arrow button to change the position of the logo in the file name.

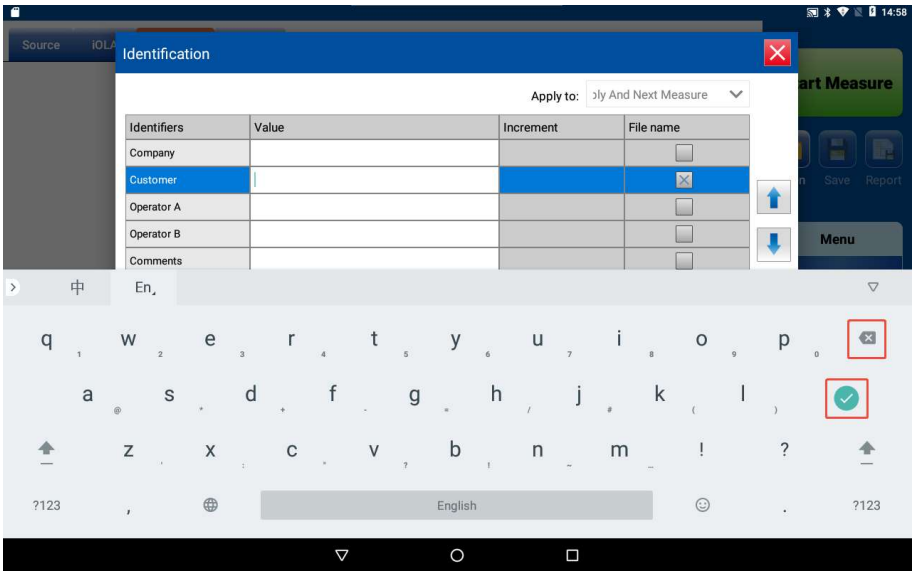


E. Tap “CONFIRM” to confirm the new settings and return to the main window.

Steps to clear "Values":

A. From the “Menu”, tap “Identification”.

B. Tap the white box in the "Value" column that needs to be cleared, a soft keyboard will pop up, tap "" to delete the contents of the "Value" column, and then tap the "" button to return to the identification window.



C. Tap“” to return to the main window.

4.3.3.6 Setting Index of Refraction and Backscatter Coefficients

Before performing a test, you must configure the Index of Refraction (IOR) and the Backscatter (RBS) Coefficient. These parameters will be applied to all newly acquired traces.

- **Index of Refraction (IOR)**

  Also known as the Group Index, the IOR is used to convert the light propagation time into physical distance. An accurate IOR is essential for all distance-related OTDR measurements, such as Event Location, Attenuation, Section Length, and Total Length. This value is typically provided by the fiber cable manufacturer.

  The application provides default values for each wavelength. You can manually adjust the IOR for each wavelength; it is highly recommended to verify this information before every test.

- **Backscatter (RBS) Coefficient**

  The RBS coefficient represents the amount of backscattered light for a specific fiber. It is used to calculate Event Loss and Reflectance. Like the IOR, this coefficient is usually provided by the manufacturer.

  The RBS coefficient represents the amount of backscattered light for a specific fiber. It is used to calculate Event Loss and Reflectance. Like the IOR, this coefficient is usually provided by the manufacturer.

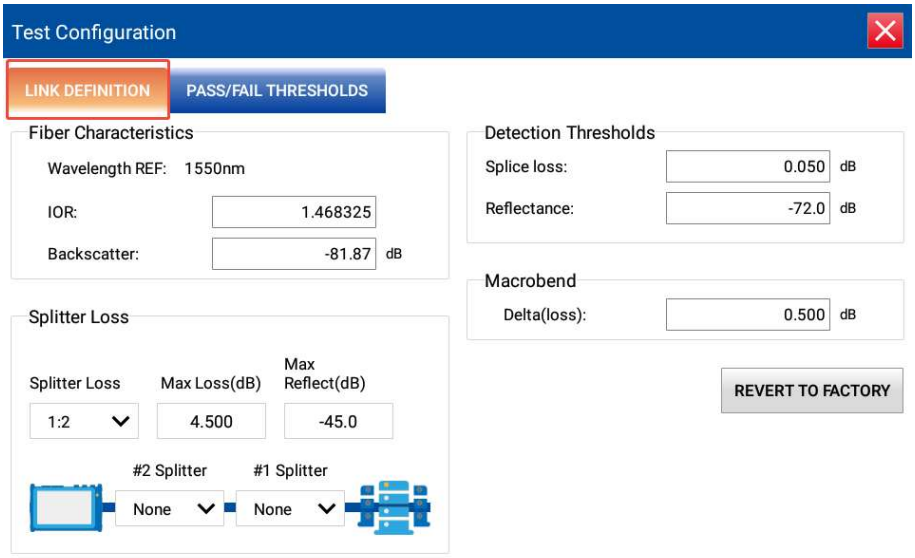
  The application saves these settings within the measurement result file, ensuring they can be viewed even when the file is opened on other devices.

  Both IOR and RBS settings can be reset to default values.

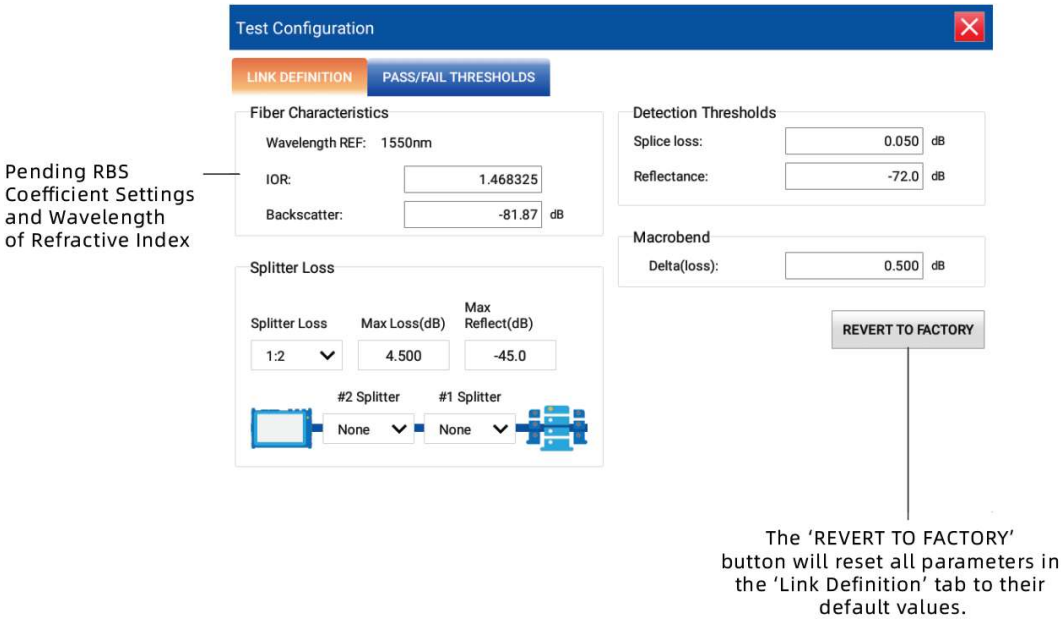
  Steps to set IOS and RBS coefficient:

A. From the "Menu", tap "Test Configuration".

B. In the "Test Configuration" window, open the "LINK DEFINTION" tab.



C. Under "Fiber Characteristics", set the IOR and RBS coefficient as needed.



Important

You must obtain the RBS coefficient provided by the fiber manufacturer before changing its default value. If this parameter is set incorrectly, the **reflectivity measurements** will be inaccurate.

D. Tap "  " to return to the main window.

4.3.3.7 Setting Detection Thresholds

Configuring the following analysis detection thresholds can optimize the event detection functionality:

- **Splice Loss Threshold:** Used to show or hide small non-reflective events.
- **Reflectivity Threshold:** Used to hide ghost reflections caused by noise, convert harmless reflective events into loss events, or detect significant reflections that could potentially damage the network or other optical fiber equipment.

Setting these thresholds helps to ignore known events with small measurement values or ensure that all events (even those with very small measurements) are detected.

The application saves these threshold values into the measurement result files. This allows the thresholds to be viewed even when the measurement files are opened on other devices.

Steps to set detection thresholds:

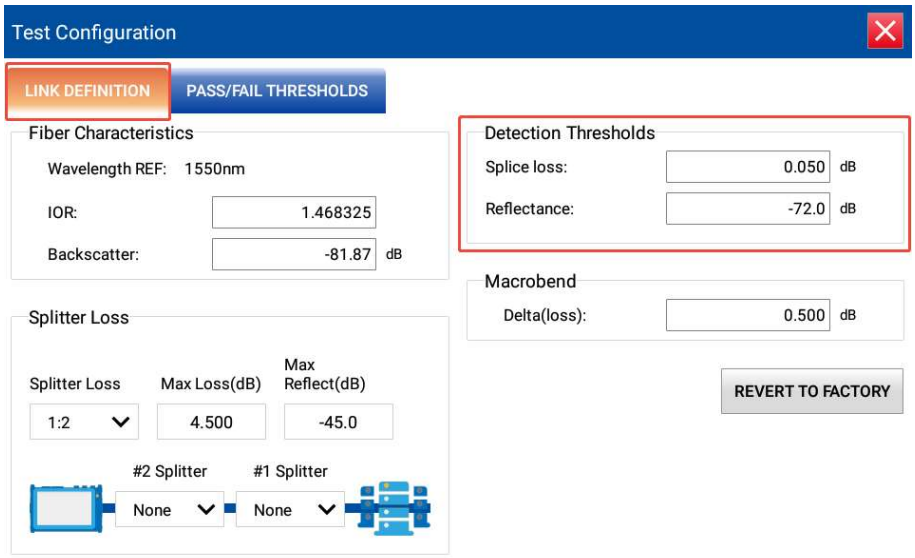
A. From the "Menu", tap "Test Configuration".

B. In the "Test Configuration" window, open the "LINK DEFINTION" tab.

Important
"The "REVERT TO FACTORY" button restores all parameters on the "LINK DEFINTION" tab to their default values.

C. Under "Detection Thresholds", enter values for each parameter as needed. If you want to restore all parameters to default values, tap the "REVERT TO

FACTORY" button.



D. Tap"  " to return to the main window.

4.3.3.8 Setting Splitter Ratio

A splitter is a passive optical fiber coupler used to divide the light from a single fiber into multiple fiber channels.

The configured splitter ratio must correspond to the actual splitter ratio on the link. For example, if a 1:2 splitter is installed on the link, you must also configure a 1:2 splitter and its associated loss threshold in the application. During measurement, the application will determine whether the detected loss of the 1:2 splitter exceeds the detection threshold. If it exceeds the threshold, the result is a "Fail"; otherwise, it is a "Pass".

Note: For detailed information on setting splitter loss thresholds, please refer to section 4.3.3.10, "Setting Pass/Fail Thresholds."

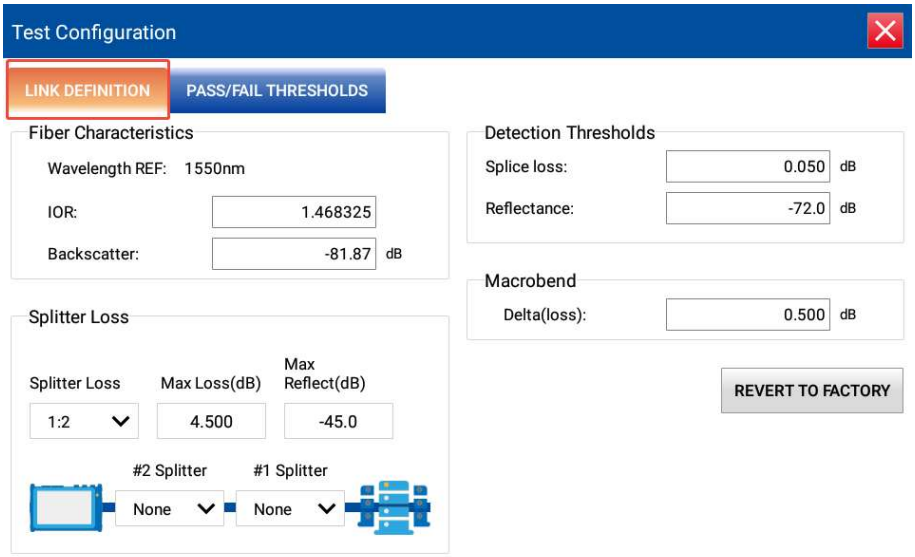
Note: Generally, the application performs measurement judgment sequentially. It determines whether the loss of each splitter is within the detection threshold based

on its sequence number. You cannot skip the configuration of the first splitter to set up the second one.

Steps to set splitter Ratio:

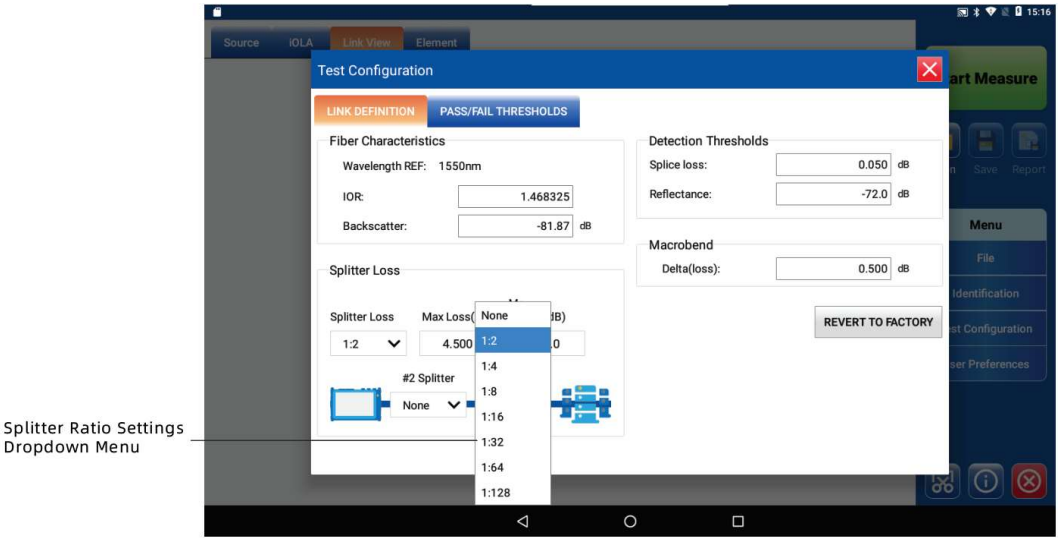
A. From the "Menu", tap "Test Configuration".

B. In the "Test Configuration" window, open the "LINK DEFINTION" tab.



C. Under "Splitter Loss", select the splitter ratio you want to set.

NOTE: "None" means do not enable the splitter.



4.3.3.9 Setting Macrobend Parameters

The equipment can be configured to compare the loss values of events at the same location using two different wavelengths (e.g., 1310 nm and 1550 nm) to locate macrobend. An event is identified as a macrobend if it meets the following conditions during the comparison:

- The loss at the longer wavelength is greater than the loss at the shorter wavelength.

  AND

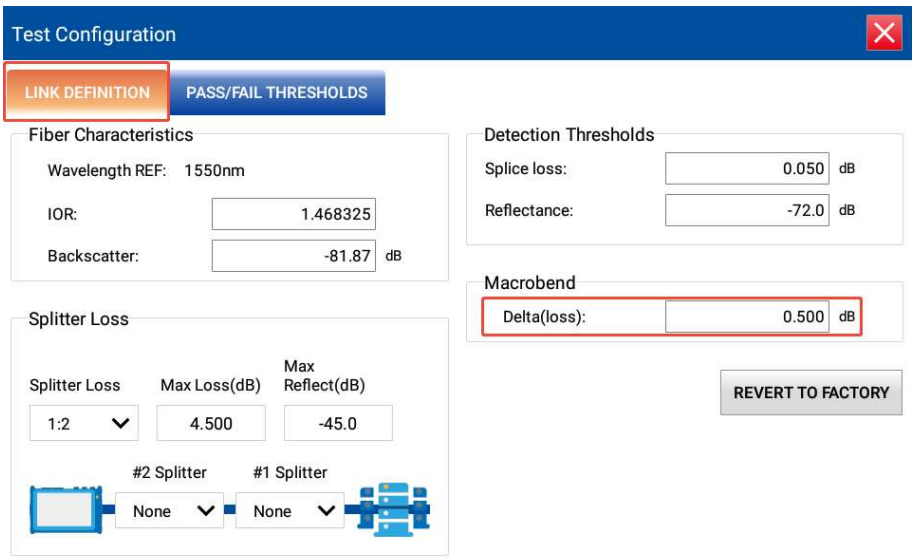
- The difference between the two loss values exceeds the specified loss delta. The default loss delta is 0.5 dB (suitable for most fiber types). You can adjust this value based on your specific requirements.

Steps to set macrobend parameters:

A. From the "Menu", tap "Test Configuration".

B. Select the "LINK DEFINTION" tab.

C. In the Delta (Loss) box, enter the desired value.



D. Tap“  ” to return to the main window.

4.3.3.10 Setting Pass/Fail Thresholds

You can configure the Pass/Fail threshold parameters for your tests. The application saves these thresholds into the measurement result files, allowing them to be viewed even when the files are opened on other devices.

You can set thresholds for **splice loss, connector loss, s**plitter loss, reflectivity, fiber section attenuation, min/max link loss, max link ORL (Optical Return Loss), and min/max link length. Different thresholds can be applied to each wavelength.

These settings will be applied to the current trace analysis results and all new traces for their respective wavelengths.

If the files being processed contain other wavelengths, the application will automatically add those wavelengths to the available wavelength list. You can then set thresholds for these new wavelengths or restore all thresholds to their default values.

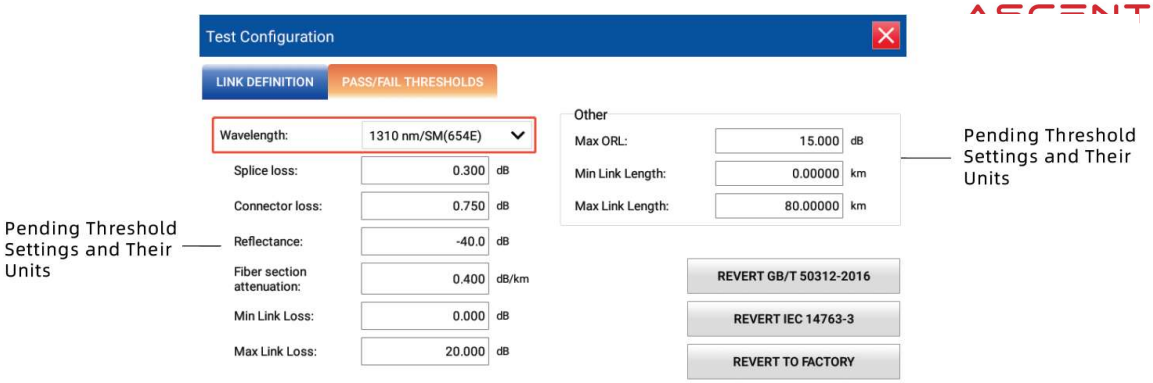
The configured thresholds for loss, reflectivity, and attenuation apply to all measurable events. Once the thresholds are set, the application can perform Pass/Fail testing to determine the status of the measurement results (pass or fail).

Steps to set Pass/Fail threshold:

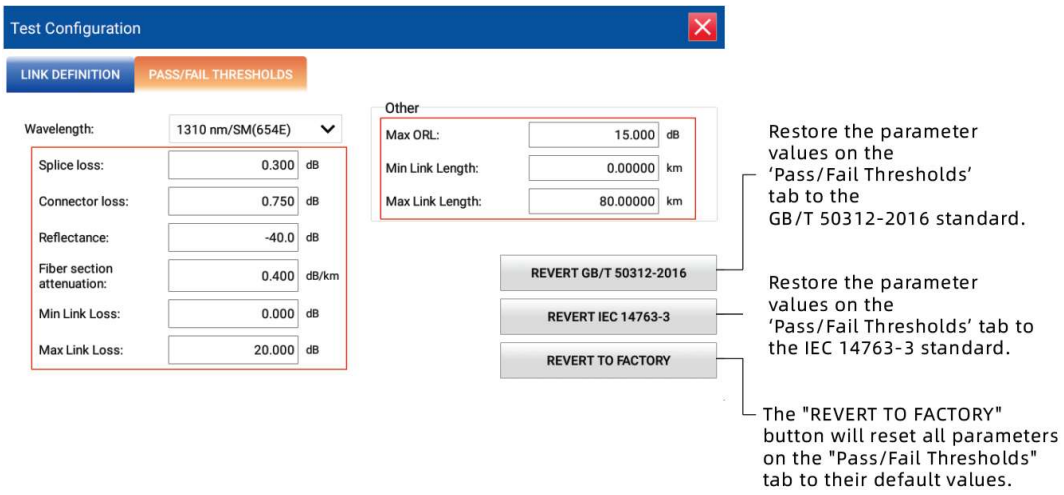
A. From the “Menu”, select “Test Configuration”.

B. Select the “PASS/FAIL THREHOLDS” tab.

C. In the “Wavelength” list, select the wavelength for which you want to set the threshold.



D. Enter the desired value in the corresponding Threshold text box.



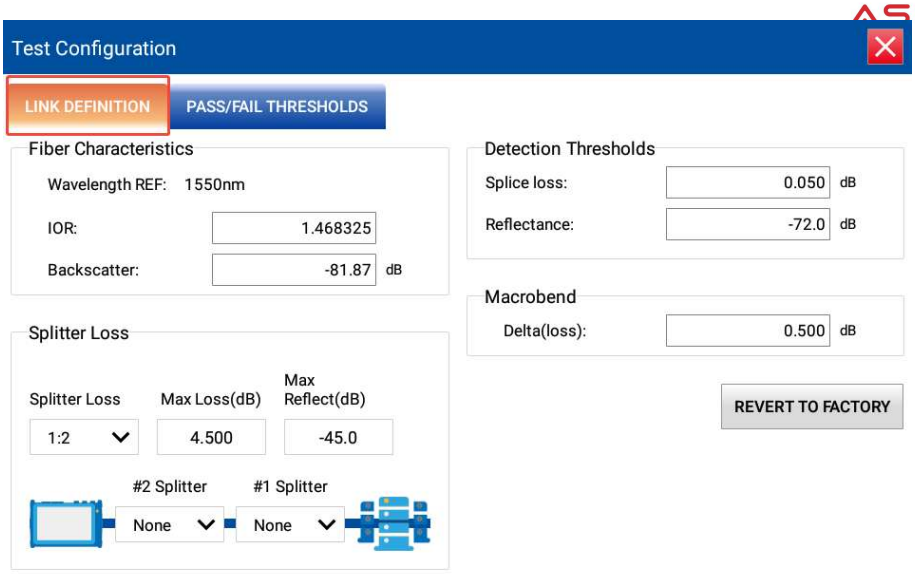
E. Tap“ ” to return to the main window.

During measurement, the application determines whether the detected loss of the splitter exceeds the threshold value. If the loss exceeds the threshold, the result is marked as "Fail". Otherwise, it is marked as "Pass."

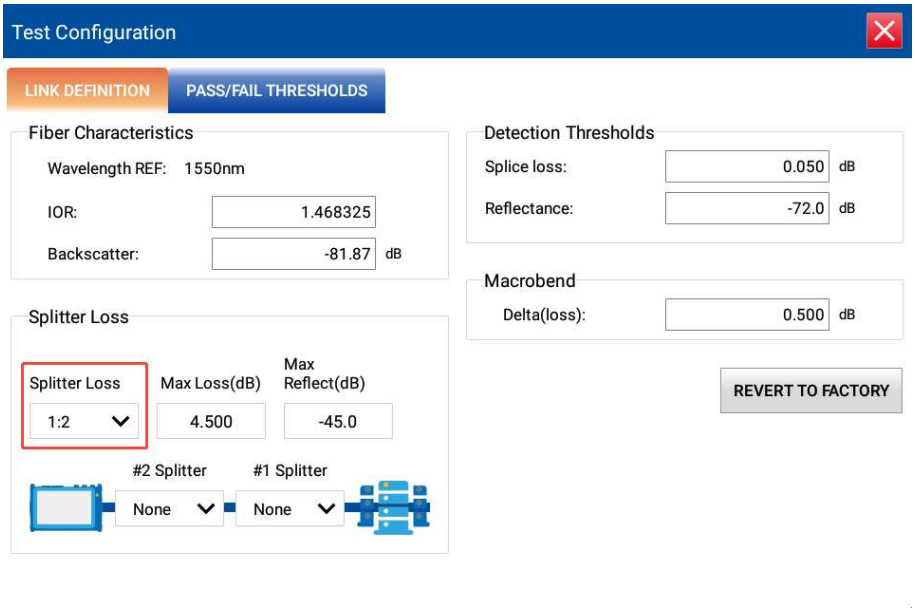
Steps to set splitter loss thresholds:

A. From the “Menu”, select “Test Configuration”.

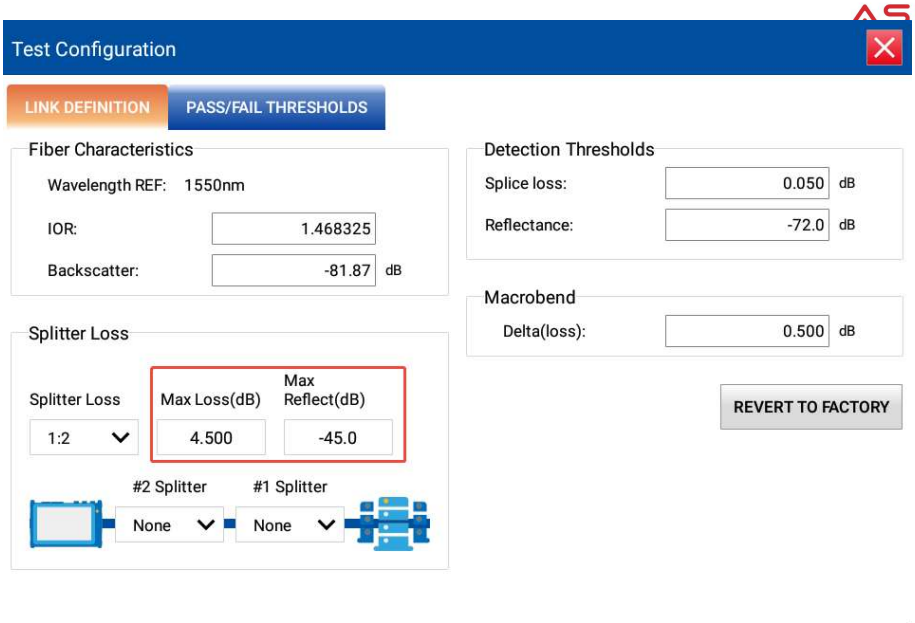
B. Select the “LINK DEFINITION” tab.



C. Select Splitter Scale to display the default thresholds for splitter loss and reflectance.



D. Enter the desired value in the corresponding Threshold text box.



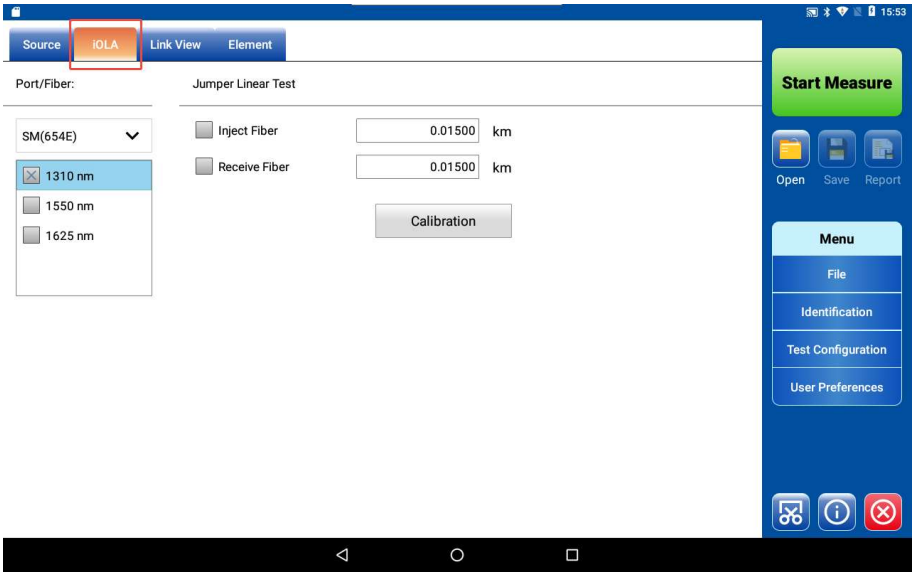
E. Tap "  " to return to the main window.

4.3.3.11 Configuring Smart View

The "Smart View" option displays the settings used during measurement. The application collects data using the ports and wavelengths selected in the "Smart View" settings, and these settings will persist for next data acquisition.

Steps to configure Smart View:

A. In the main window, select the "iOLA" tab.



B. If there are two ports on the module, select the one to be used for testing.

Simultaneously select the fiber core type:

. For Type C fiber, select the 50 µm core.

. For Type D fiber, select the 62.5 µm core.

C. elect the **wavelengths** for the next data acquisition.

D. If the link under test is connected to a launch fiber and a receive fiber, enter their respective lengths.

. The valid length for a launch fiber is 0 to 5 km.

. The valid length for a receive fiber is 0 to 10 km.

For more details, please refer to section 4.3.1.3, "Launch and Receive Fibers."

4.3.4 Initiating Data Collection

This chapter describes the steps for performing data acquisition using the Smart View feature.

4.3.4.1 Starting Smart View Data Collection

This section describes the steps for performing Smart View data acquisition. Smart View provides a visual representation of the fiber condition, displaying fiber spans and segments connected by connectors. It also calculates key parameters such as fiber length, breaks, total return loss, splice loss, connector loss, and total loss.

To perform Smart View data collection:

Tap Start Measurement. Before starting a new data collection, the application will prompt you to save any unsaved data (if applicable).

Note: If the file functions are not enabled, you will not be prompted to save files. For more information, please refer to section 4.3.3.3, "Configuring General

Information Options."

Once Smart View data collection begins, the "Link View" tab is displayed by default. The status bar shows the overall progress for all wavelengths. For example, if two wavelengths are being processed, the progress will reach 50% when the data collection for the first wavelength is complete.

4.3.4.2 Starting Single Wavelength Data Acquisition

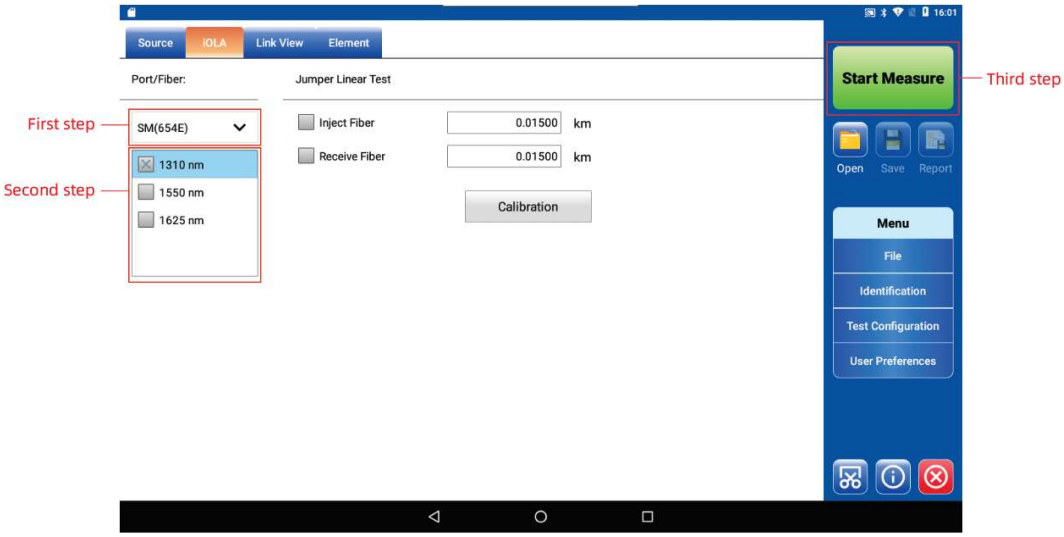
If the module supports multiple wavelengths, you can use the single wavelength data acquisition function to perform a measurement on a specific wavelength.

Steps to start single wavelength data acquisition:

A. In the iOLA tab, select the port to be used. Simultaneously, select the fiber type: for multimode fiber, select either 50 µm or 62.5 µm.

B. Select a wavelength.

C. Tap "Start Measure".



4.3.4.3 Starting Multi-Wavelength Data Acquisition

If the module supports multiple wavelengths, you can use the **multi-wavelength**

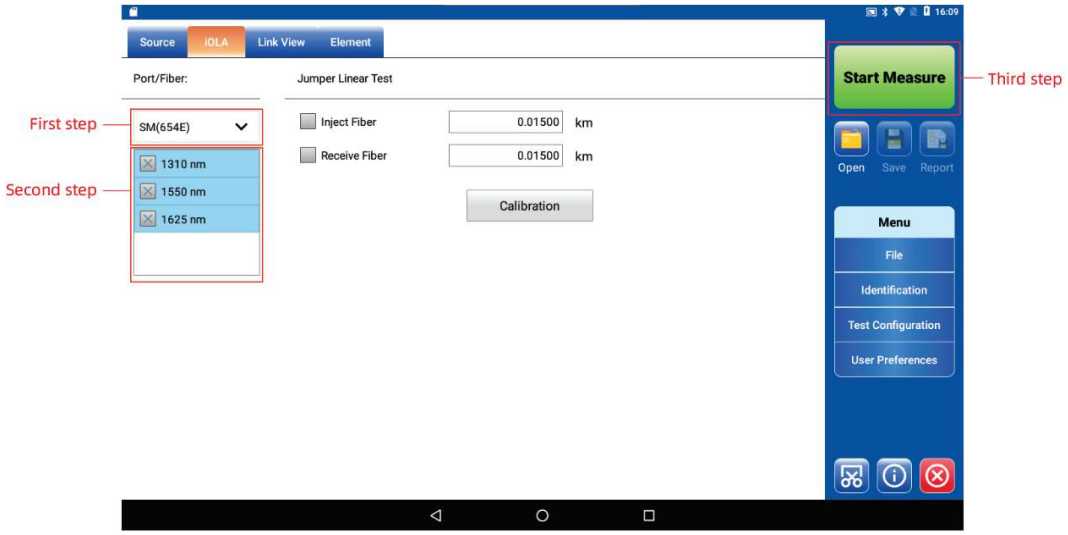
data acquisition function to perform measurements on several wavelengths. During multi-wavelength data acquisition, the application displays the specific wavelength currently being measured.

Steps to start multi-wavelength data acquisition:

A. In the iOLA tab, select the port to be used. Simultaneously, select the fiber type: for multimode fiber, select either 50 µm or 62.5 µm.

B. Select multiple wavelengths.

C. Tap "Start Measure".



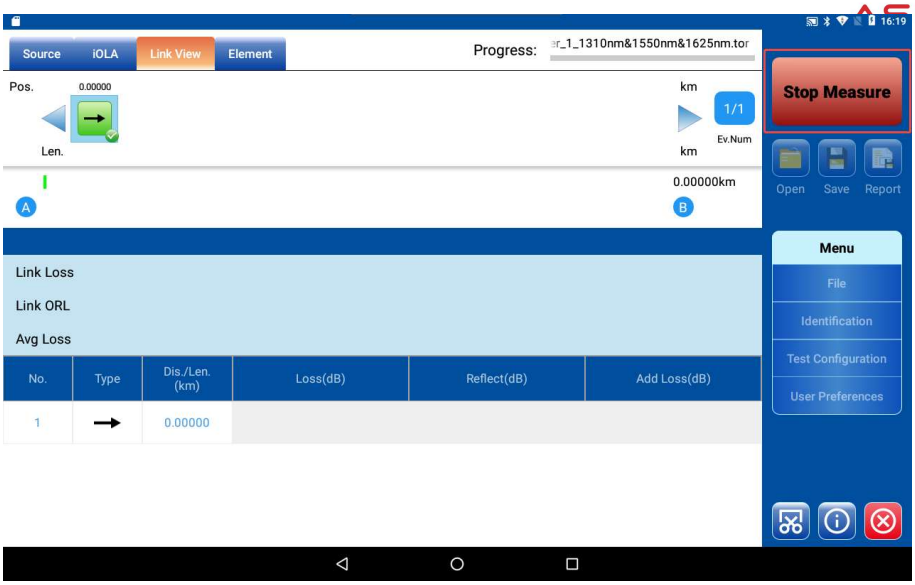
4.3.4.4 Stopping Data Collection

Data collection will stop automatically once the measurement is complete. You can also terminate the task at any time during the data collection process.

Note: If you manually stop multi-wavelength data acquisition, the application will not process the remaining wavelengths that have not yet been measured.

Steps to stop data Collection:

In the main window, tap "Stop Measure".



For data collection that is stopped manually, the Global Pass/Fail status will be displayed as Fail.

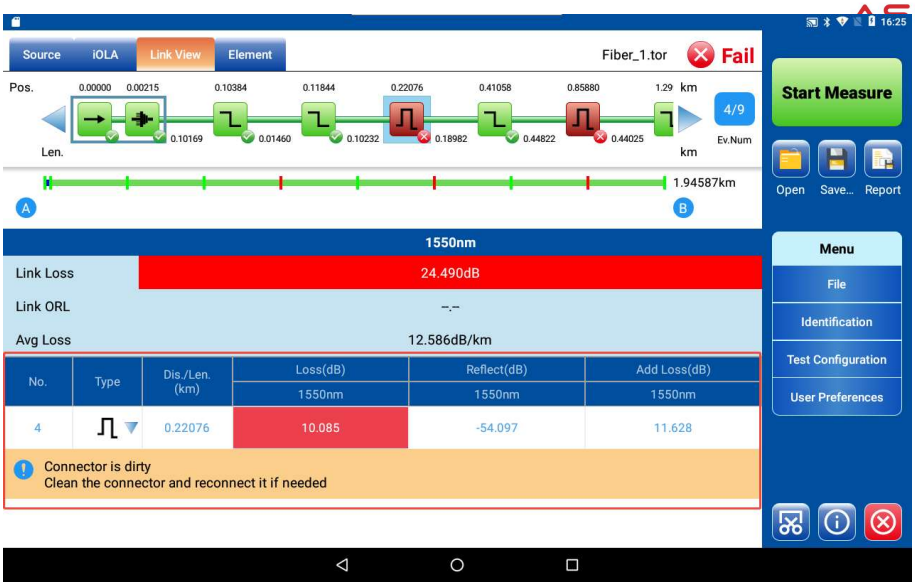
Note: Manually stopped data collection cannot be considered a reliable link measurement. To fully characterize the link, a complete data collection cycle must be performed.

4.3.5 Understanding Diagnostic Functions

This chapter describes the diagnostic features provided by the Smart View application.

For detected issues or ambiguous measurement conditions, the diagnostic function provides additional relevant information, such as the root cause behind a link element's "Fail" status. These diagnostics are instrumental in troubleshooting connector failures, understanding why specific link elements are flagged as "Fail," and identifying unexpected instrument or test conditions.

The application marks link elements with a icon and displays the details in the "Link View" and "Elements" tabs. A given element can have multiple pieces of diagnostic information.



Element diagnostics provide information related to specific to the link element. Any link element that fails will include diagnostic information to assist in troubleshooting. Some elements (such as macrobends) may also have associated diagnostic information even if their status is "Pass."

4.3.6 Managing Results

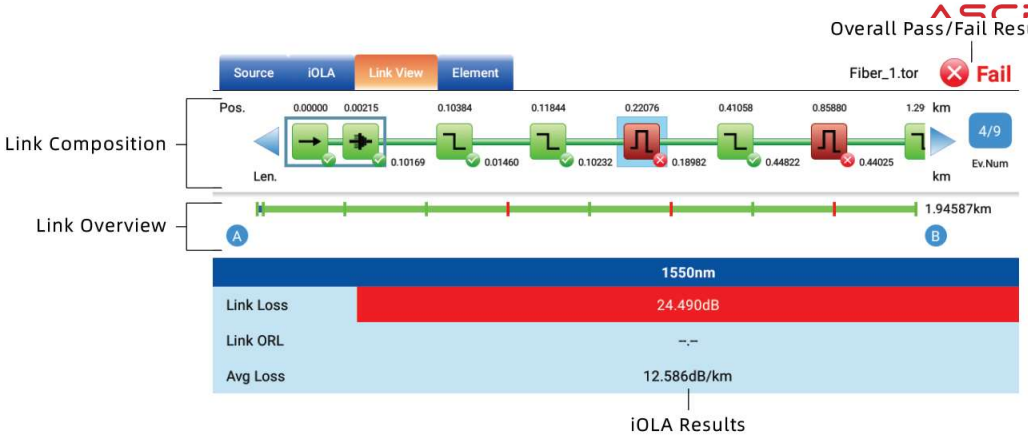
This chapter describes the link view, element details, and results displayed after data collection is completed.

4.3.6.1 Link View

The Smart View Link View is an intuitive representation that integrates multiple measurement results and values into a single view.

“The Link View consists of several key areas:

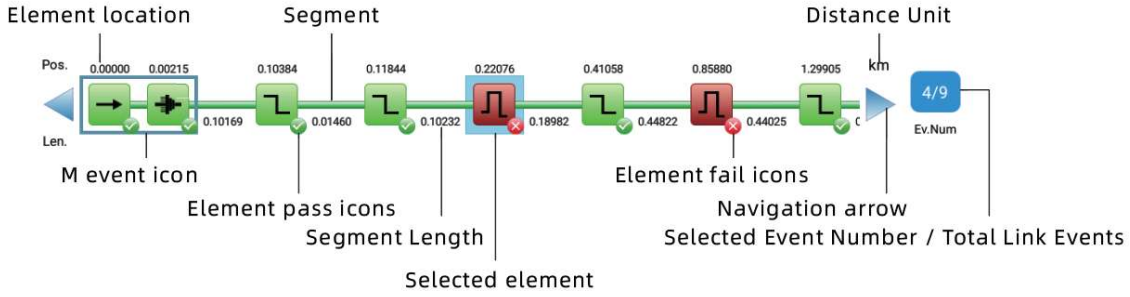
- Link Composition
- Link Overview
- Smart View Results
- Global Pass/Fail Status



Note: For detailed information regarding element icons, please refer to section 4.2.12, "Event Type Descriptions."

4.3.6.1.1 Link Composition

The link composition is as follows:



- Element location: The distance from the element to the starting point of the link being measured.
- Splitting Ratio: If the element is a beam splitter, the splitting ratio is displayed.
- Section: Indicates the fiber section icon with no events.
- **Distance Unit:** Unit information of distance. For more details, please refer to section 4.3.3.3, "Configuring General Information Options."
- **Merged M-Event Icon:** This icon represents an event formed by merging multiple individual events. For detailed information regarding merged M-events, please refer to section 4.2.12, "Event Type Descriptions."

- Element pass/fail icons: The "  " icon indicates that the event failed, and the "  " icon indicates that the event passed.
- Segment Length: Displays the length of fiber without events.
- Selected element: A blue background indicates the currently selected element.
- Navigation arrow: You can click it to scroll the link map.
- Event number preview box: displays the total number of events in the current link. If an element in the link is selected, the selected event number and total number of events will be displayed.

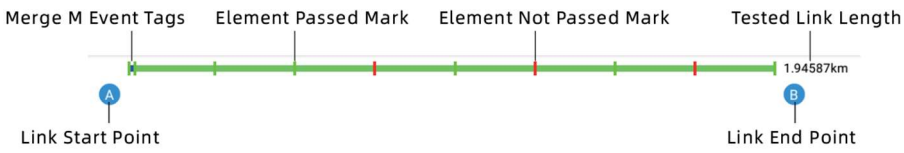
NOTE: If the link is long and not all elements can be displayed on the screen, scroll left or right on the link diagram or tap the navigation arrows to view the elements.

NOTE: The distances between elements are not displayed to scale.

4.3.6.1.2 Link Overview

The Link Overview displays the entire fiber link view, eliminating the need to scroll through the interface. The color-coded indicators and their descriptions are as follows:

- **Red:** The element has failed the test.
- **Green:** The element has passed the test.
- **Blue:** Represents a merged M-event.

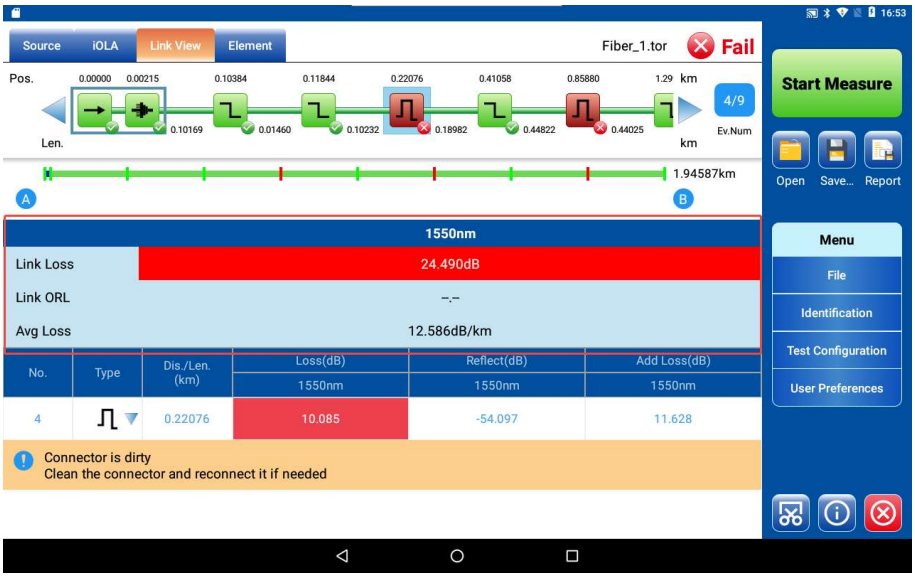


The length of the link under test (excluding the lengths of the launch and receive fibers), which refers to the fiber length between point A and point B.

4.3.6.1.3 Smart View Results

After performing Smart View data collection, the application displays the collected results.

Note: If no Smart View data collection results are available, the values will be displayed as 0.



During the multi-wavelength data collection process, only the results for the wavelengths currently being collected or already completed are displayed. Link Loss, link optical return loss, and average loss are shown categorized by wavelength. The application tests and displays the results for link loss and link ORL based on the current Pass/Fail thresholds. Average loss provides visibility into the loss value for the entire link, giving users a comprehensive view of the optical cable's current health and determining whether the current loss level is acceptable for the intended application.

4.3.6.1.4 Global Pass/Fail Status

The global pass/fail status is determined by the individual pass/fail results of the Link

length, link Loss, link optical return loss, and each link element.

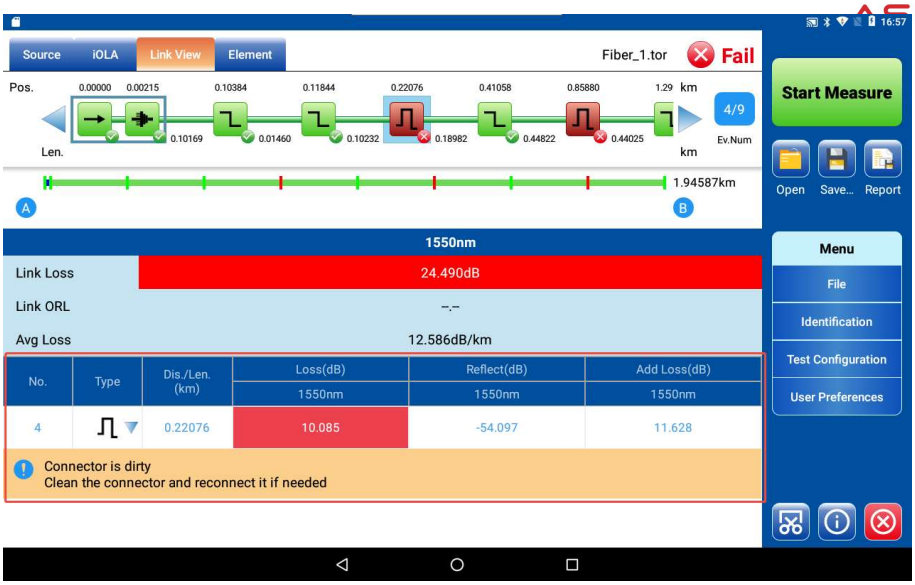
- **Failure Logic:** If any single value among these parameters is in a "Fail" state, the overall status will be marked as Fail.
- **Automatic Updates:** If numerical values are modified within the application, the status updates automatically. Similarly, if an Element Type is changed in the "Elements" options, the application will recalculate the pass/fail status for each value, which may subsequently affect the overall status.
- **Display Timing:** The Smart View application waits until the entire data collection process is complete before displaying a "Pass" status. However, if any measured value reaches a "Fail" state, the overall status will immediately display as "Fail."

Note: To obtain an accurate and valid Pass/Fail status, you must wait for the entire data collection process to conclude.

4.3.6.2 Viewing Element and Section Details

To view the details of a specific element or section:

A. In the "Link View" tab, select the desired element or section. The detailed information for that specific item will be displayed. If a Fail event is detected, the application will also provide diagnostic information. For more details regarding the diagnostic functions, please refer to section 4.3.5, "Understanding Diagnostic Functions."



OR

B. In the main window, tap the "Element" tab to view the details of an element or section.

Loss and reflectance in a "Fail" state are highlighted with red color blocks.

The element or section details display the following information:

- **NO.:** Events detected in the link will be numbered in the order in which they are detected.
- **Event Type:** The type of the element selected in the Link View. You can

change the element type by selecting it from the drop-down list. If the selected element is a splitter, you can also change the splitting ratio.

- **Position/Length:** The position of the element in the link and the length of the segment. If the input fiber is connected, position 0.00 is set to the first element.
- **Loss:** The loss value for each wavelength.
- **Reflectance:** The reflectance value for each wavelength.
- **Attenuation:** The "Element" table will display the attenuation coefficient for each fiber section.
- **Accumulated loss:** The "Element" table will displays the cumulative loss for each event type.

4.3.7 File Management

4.3.7.1 Opening Smart View Files

When opening a **Smart View** file, the application attempts to apply the wavelength settings stored in the file by default. If a specific wavelength is unavailable on the current module, the application will automatically select the

closest available wavelength to the one in the opened Smart View file.

Steps to open a measurement file:

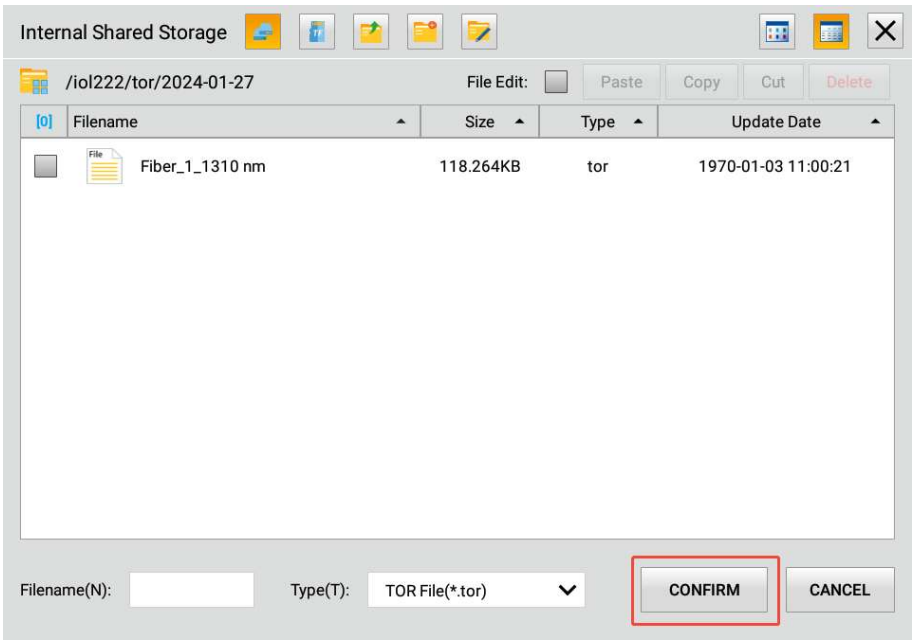
A. In the "Menu", tap "File", and then select the file you want to open.

Alternatively, from the main window, tap "  ".

B. Change the file path as needed.

C. Scroll through the file list and select the Smart View file you wish to open.

D. Tap "CMFIRM," and the application will return to the main window.



For any measurements that were acquired but not saved, the application prompts you to save them. Tap "Save."

4.3.7.2 Saving Smart View Files

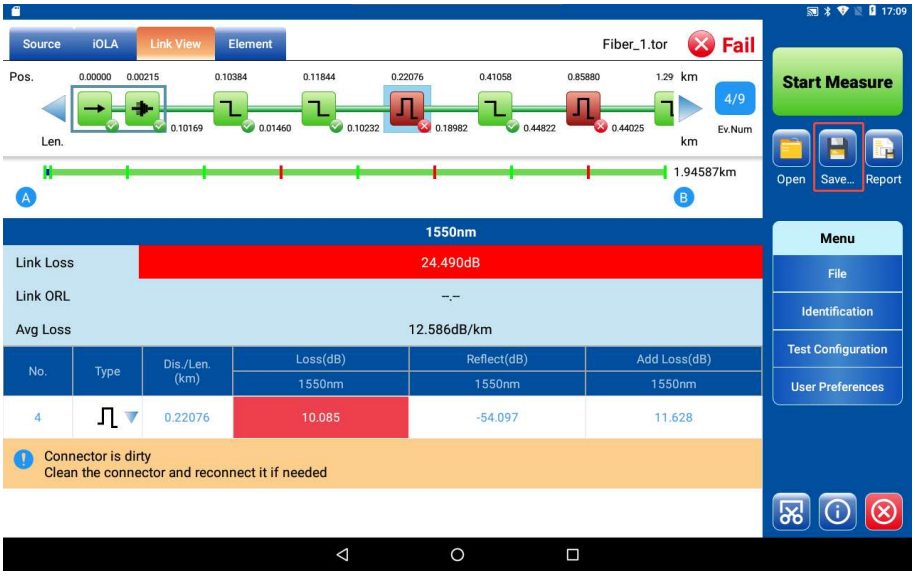
Steps to save a Smart View file:

- After the measurement is complete, tap "  " to save the current measurement file.

  OR

- By default, the application does not automatically save measurements after the analysis is finished. You can configure the system to enable auto-save. For detailed instructions, please refer to section 4.3.3.3, "Configuring General Information Options."

Note: If a measurement file is not automatically saved, you must perform a manual save.



4.3.7.3 Generating Reports

The device supports the generation of reports in PDF format only. You can generate PDF measurement reports either manually or automatically directly on the device. For details regarding the information included in the PDF report and how to customize the report content, please refer to section 4.3.3.4, "Customizing Smart View Reports."

Steps to manually generate a report:

In the main window, tap "  ". The application will then display a prompt to save the report.

For information regarding the automatic generation of reports by the application, please refer to section 4.3.3.3, "Configuring General Information Options."

4.3.8 Using Smart View as a Light Source

When using the OTDR as a light source for measurements, the OTDR port will emit a specifically modulated light pulse. Please note that this port can only emit and cannot detect these light pulses.

Important

- Never connect a live fiber to the OTDR optical interface unless proper configurations have been made.
- Input optical power between -65 dBm and -40 dBm can interfere with OTDR data acquisition. The extent of this interference depends on the selected pulse width.
- Any input signal with power exceeding 10 dBm will cause permanent damage to the OTDR module.

Steps to use the OTDR as an optical light source:

A. Properly clean the fiber patch cord. For more detailed information, please refer to section 4.2.2.2, "Cleaning and Connecting Optical Fibers").

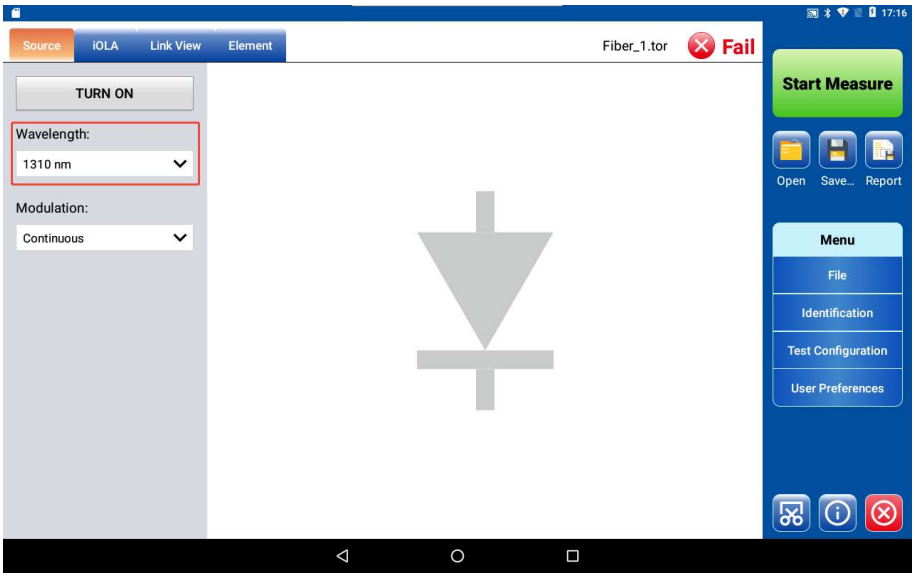
B. Connect one end of the fiber under test to the OTDR port.

   If the device has two OTDR ports, please verify the wavelength to be used and connect the fiber to the appropriate port (single-mode, Live single-mode, or multi-mode).

C. In the main window, tap the “Source” tab.

D. If you are using a standard OTDR, select the desired wavelength from the list of

available options.



NOTE: If only one wavelength is available, that wavelength is selected by default.

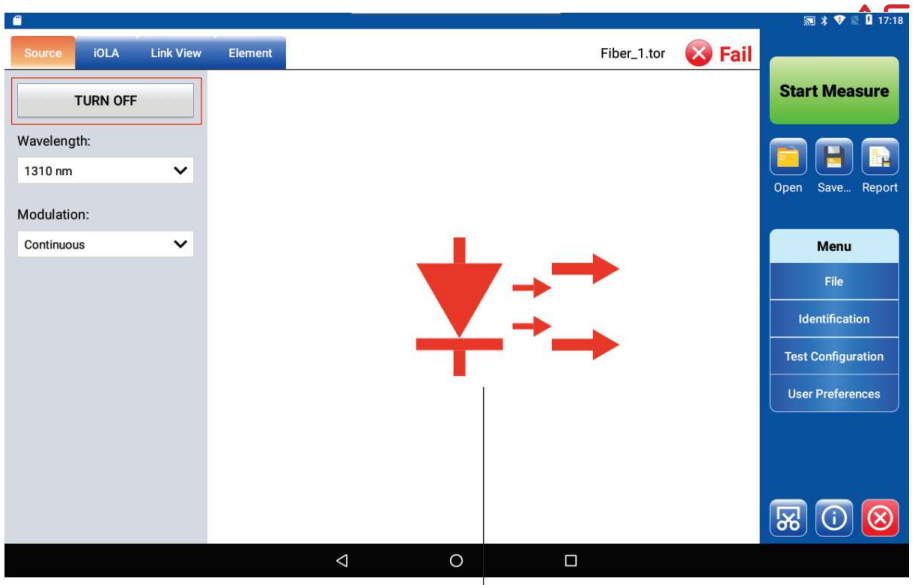
E. Select the desired modulation mode from the list of available options:

E-1 **For loss measurement:** Connect an optical power meter to the other end and select "Continuous".

E-2 **For fiber identification:** Select "270 Hz", "1 kHz", or "2 kHz". This allows personnel at the other end of the link to identify the fiber under test, which is particularly useful when testing multiple cables.

To further assist in fiber identification, the application provides a blink mode. In this mode, the OTDR transmits a modulated signal (1 kHz or 2 kHz) for 1 second, pauses for 1 second, and then repeats the cycle. To enable this mode, select "1 kHz + Blink" or "2 kHz + Blink".

F. Tap "TURN ON" to start laser emission. You may tap "Off" at any time to stop the laser emission.



The red display indicates that the light source is active.

Using a power meter with modulation and detection capabilities, the operator at the other end can quickly and accurately locate the fiber under test or perform loss measurements.

4.4 System Settings

4.4.1 Language

You can select the display language for the device. The available options include:

- 繁體中文
- English
- 简体中文

Steps to set the language:

A. In " Setting," tap "Language."

B. Select Language Setting.

Note: Switching the language will reset currently open applications.

4.4.2 Wireless and Networks

The Wireless and Networks section includes four primary functions:

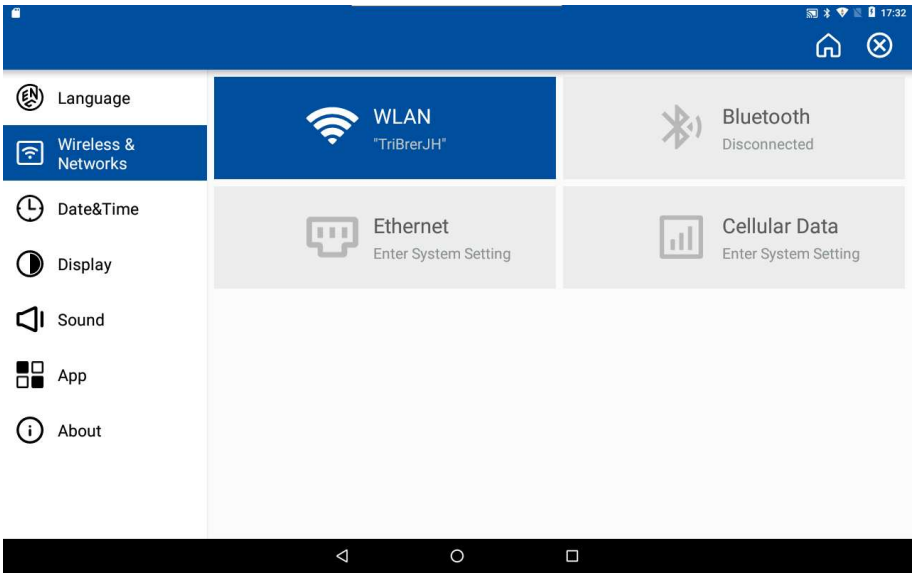
- WLAN
- Ethernet
- Cellular Data
- Bluetooth

When an internet connection is required, you can connect via the following methods:

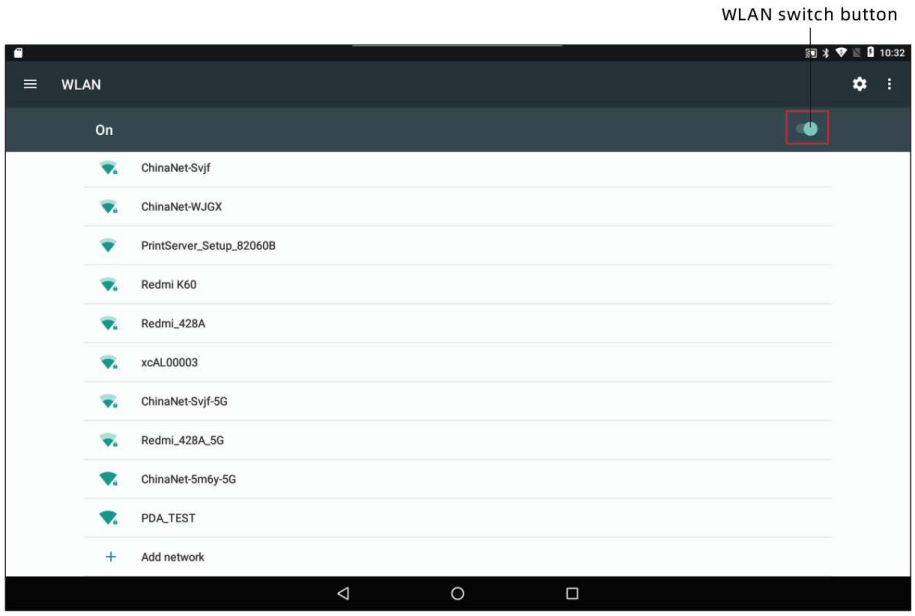
- WLAN
- Ethernet
- Cellular Data

When file reception is required, you can receive them via the following methods:

- Bluetooth



4.4.2.1 Connecting the device to the WLAN



Steps to connect the device to the WLAN:

A. In the "Setting", tap "WLAN'".

B. Select the "WLAN" option, then tap "  " to turn it on.

C. Tap the following option:

C-1 **Network:** Enter the password (if required).

C-2 **Add Network:** To join a hidden network, enter the network name, security type, and password.

If“ ” appears at the top, it indicates that the device is connected to the WLAN.

4.4.2.2 Connecting the Device to Ethernet

If WLAN is unavailable and no SIM card is installed, you can connect to the internet via the network port.

Steps to connect the device to Ethernet:

A. Connect the Ethernet cable to the RJ45 port.

B. In the“Setting”, tap “Wireless & Networks”.

C. Select the “Ethernet” option and tap “ ” turn it **on**.

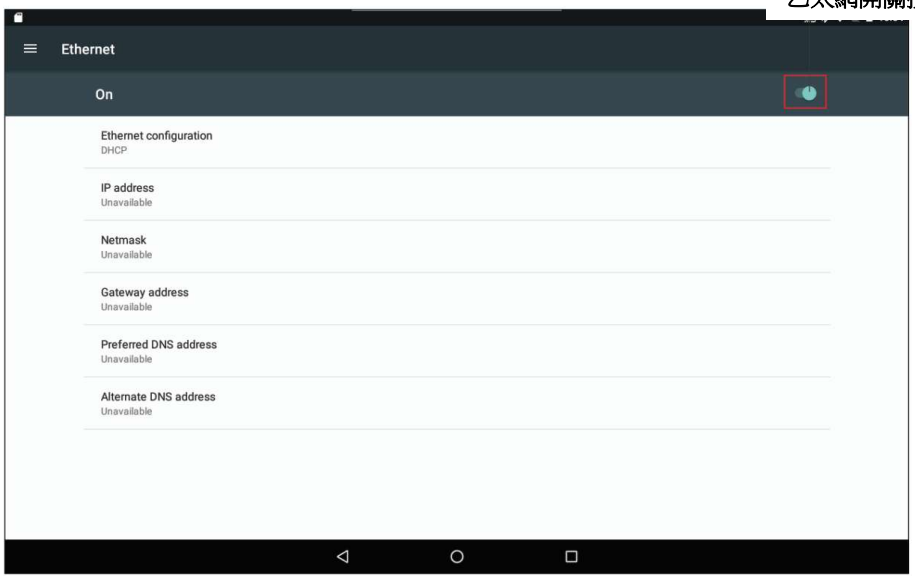
D. You can select the Ethernet configuration type:

D-1 DHCP

D-2 Static IP

If“ ” appears at the top, it indicates that the device is connected to the internet.

Ethern 乙太網開關按鈕

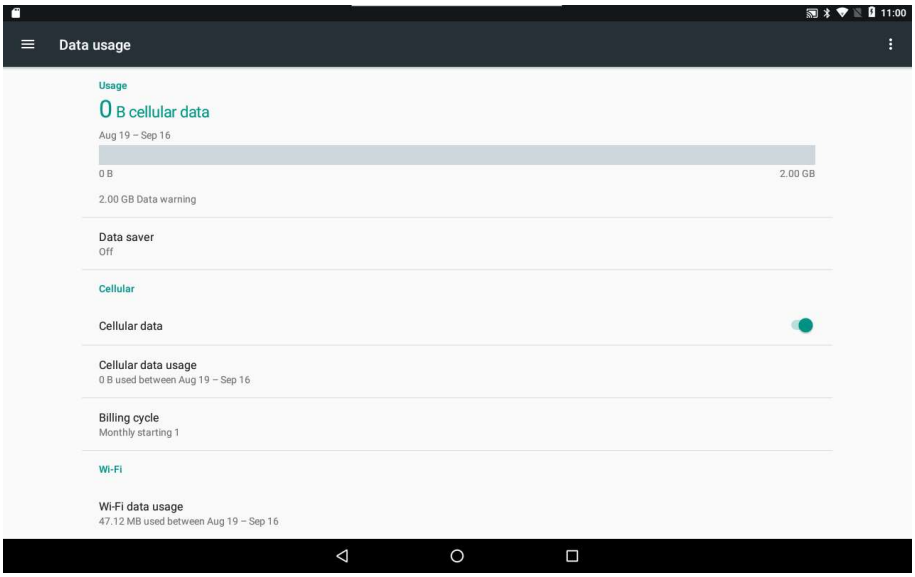


4.4.2.3 Connecting the Device to Cellular Data

After inserting the SIM card, if the Wi-Fi is unavailable, the device will automatically connect to the carrier's cellular data network. If the device is not connected to the network, please verify that the SIM card is activated and unlocked.

If“ ” appears at the top, it indicates that the SIM card has been inserted. If the SIM card is not inserted, “ ” will not be displayed.

Clicking on "Cellular Data" will allow you to view your data usage.



4.4.2.4 Connecting to Bluetooth

You can use Bluetooth to receive files. Please ensure that both devices are placed in close proximity to each other.

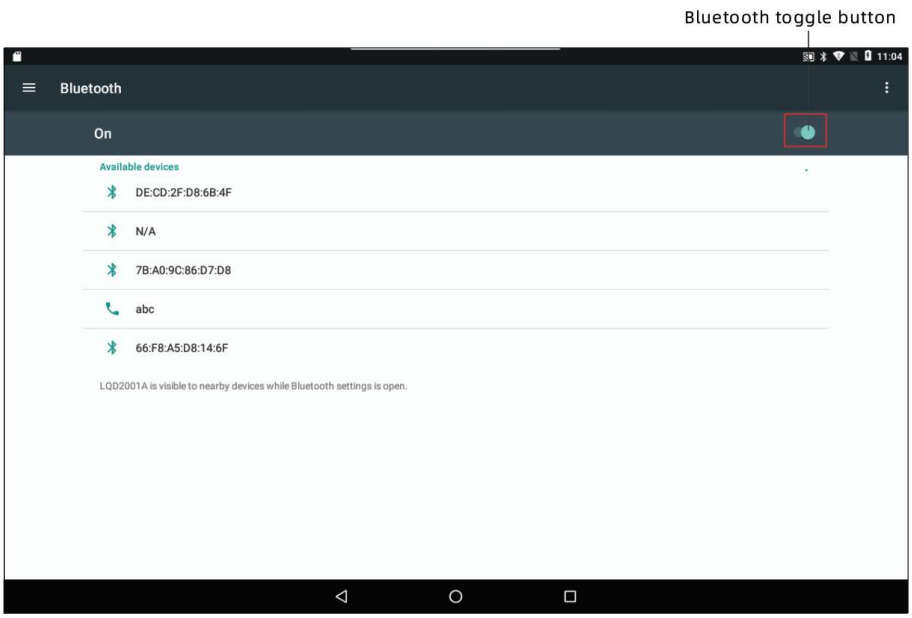
Steps to connect the device to Bluetooth:

A. In the “Setting” tap “Wireless & Networks”.

B. Select the "Bluetooth" option and tap “ ” to turn it on.

C. Tap on the device you want to pair with.

If“ ” appears at the top, it means Bluetooth is turned on.



4.4.3 Date & Time

You can manually customize the time or use the network-provided time.

Steps to set the date and time:

A. In "Setting" tap "Date & Time".

B. You can configure the following items:

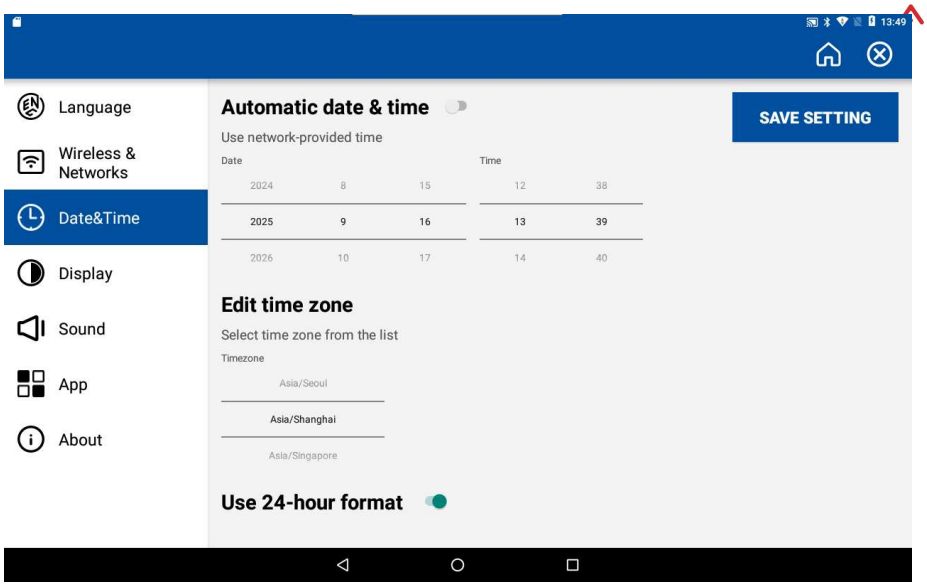
B-1 **Date and Time:** If the device needs to automatically determine the time and date, it must be connected to the internet.

B-2 **Time Zone.**

NOTE: Without a SIM card, the automatically obtained time zone will be UTC (0 time zone).

B-3 **24-Hour Format:** The device displays time from 0 to 23 hours.

C. Tap "SAVE SETTING" to complete the settings.



4.4.4 Display

You can set the screen brightness, sleep duration, sleep timeout for shutdown, and the display or hiding of navigation and status bar.

Steps to configure display settings:

A. In "Setting" tap "Display".

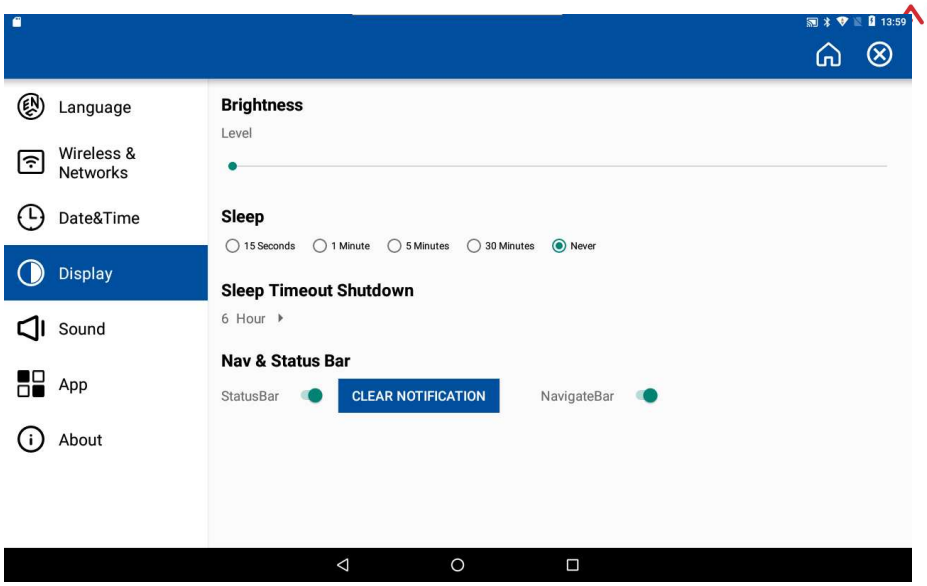
B. You can configure the following items:

B-1 Brightness

B-2 Sleep

B-3 Sleep Timeout Shutdown

B-4 Nav & Status Bar



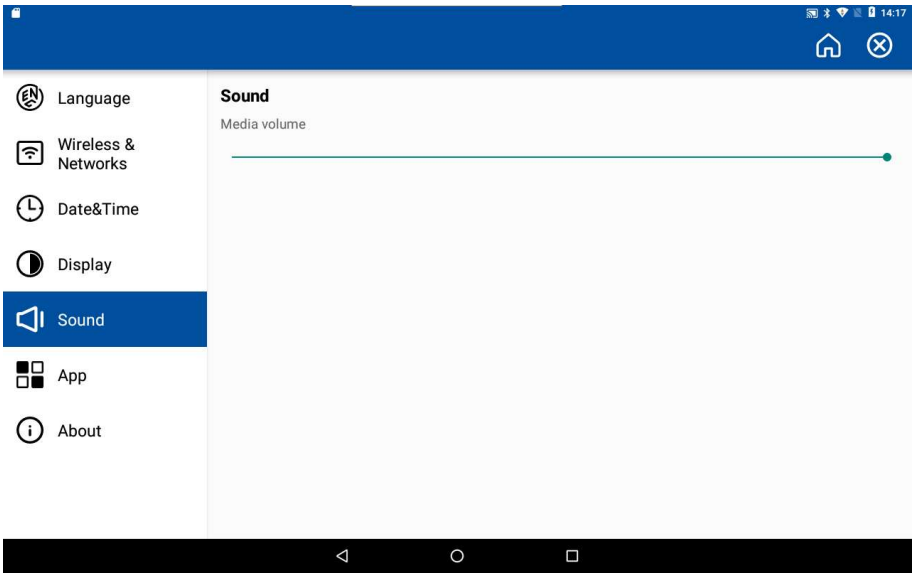
4.4.5 Sound

You can customize the media volume in "Setting".

Steps to customize the volume:

A. In "Setting" tap "Sound".

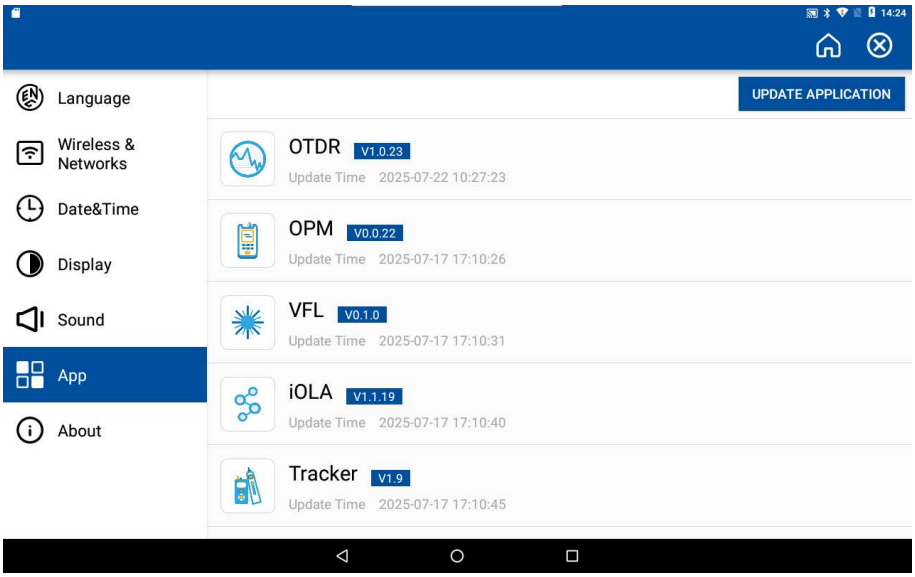
B. Adjust the volume according to your needs.



4.4.6 App

In the "App" you can access all the applications on your device.

You can also update system apps through the “App”.



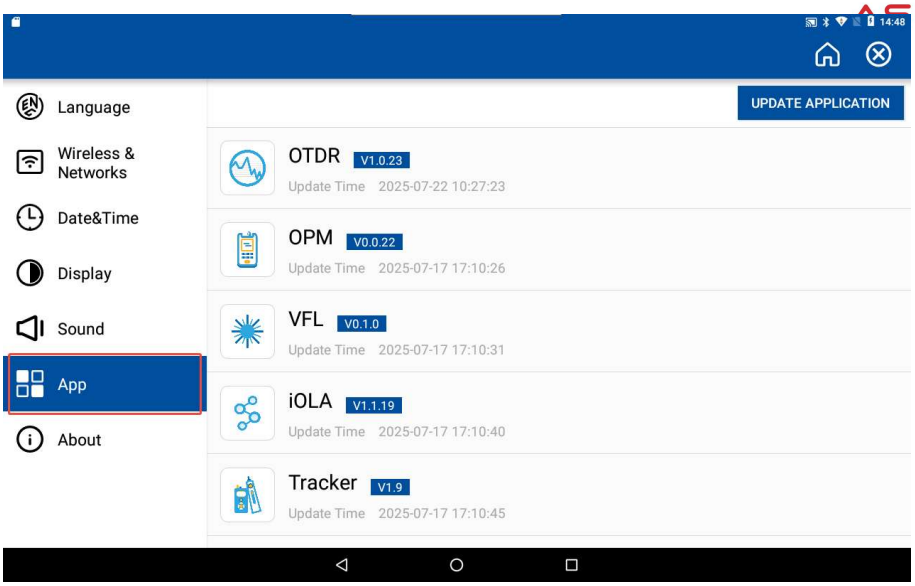
4.4.6.1 Viewing App Details

App details may include the following information:

- Application version number
- Storing Files
- Application Size
- Cached Data

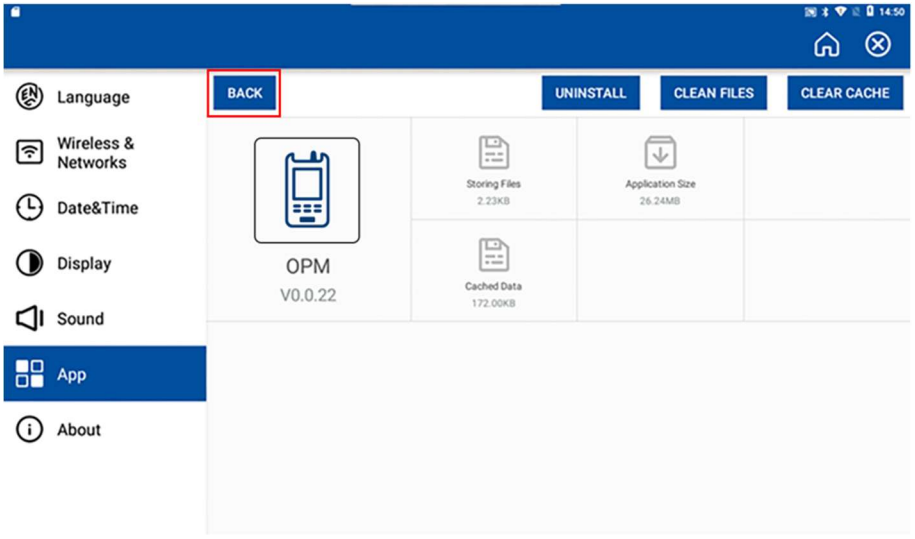
Steps to view app details:

A. In the “Setting” interface, tap “App”.



B. Tap app you want to view to enter the app details interface.

C. Tap "BACK" to return to the app list.



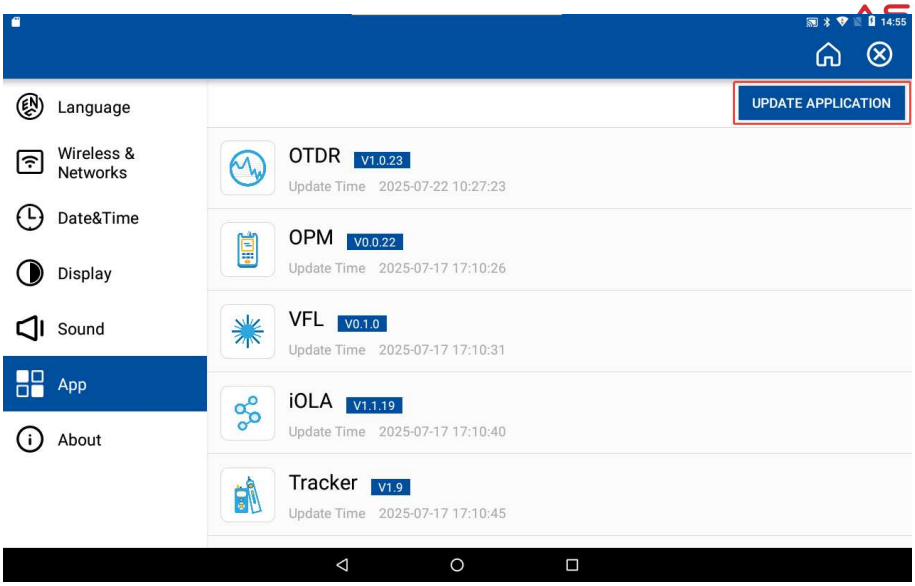
4.4.6.2 Update Application

Steps to update system apps:

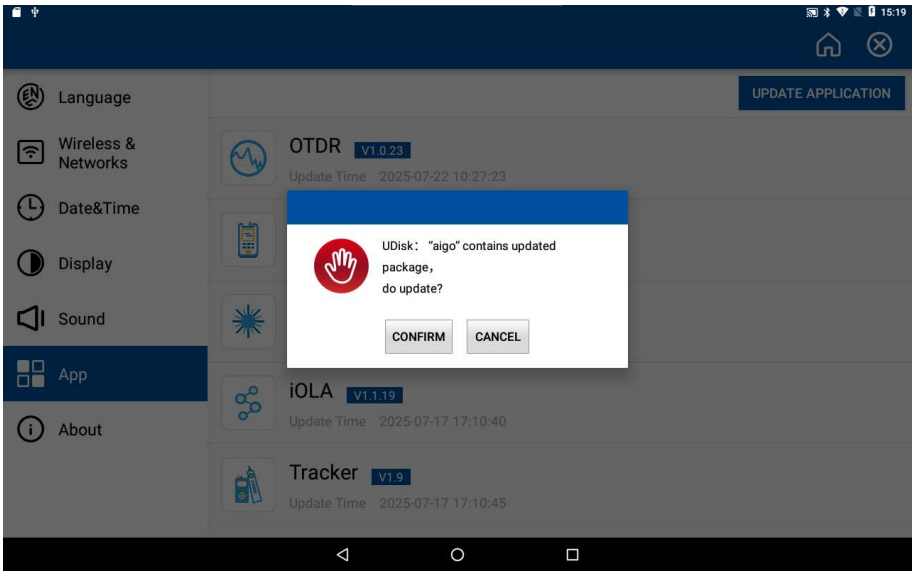
A. Insert the USB drive containing the update program.

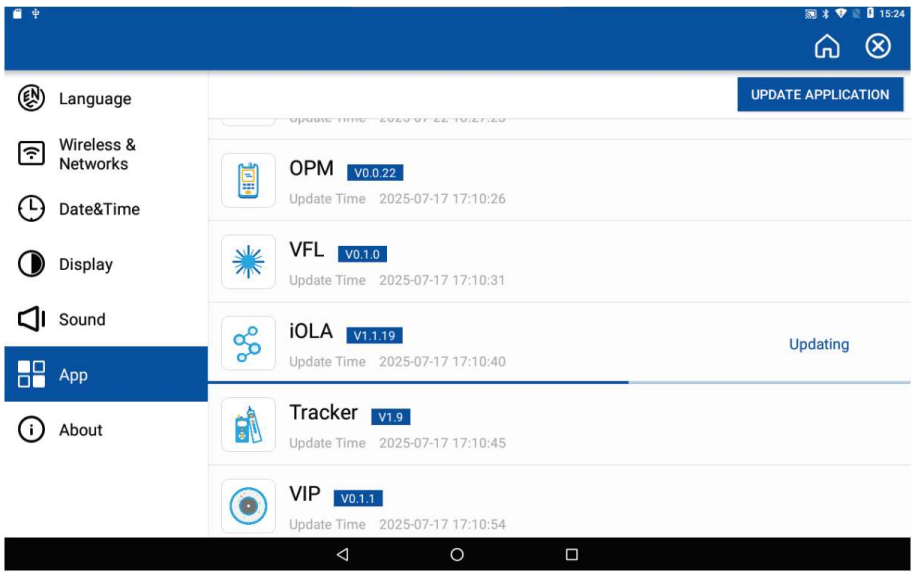
B. In the "Setting", tap "App".

C. Click "UPDATE APPLICATION", and the system will automatically recognize the upgrade package.



D. Tap "CONFIRM" and wait for the update to complete.



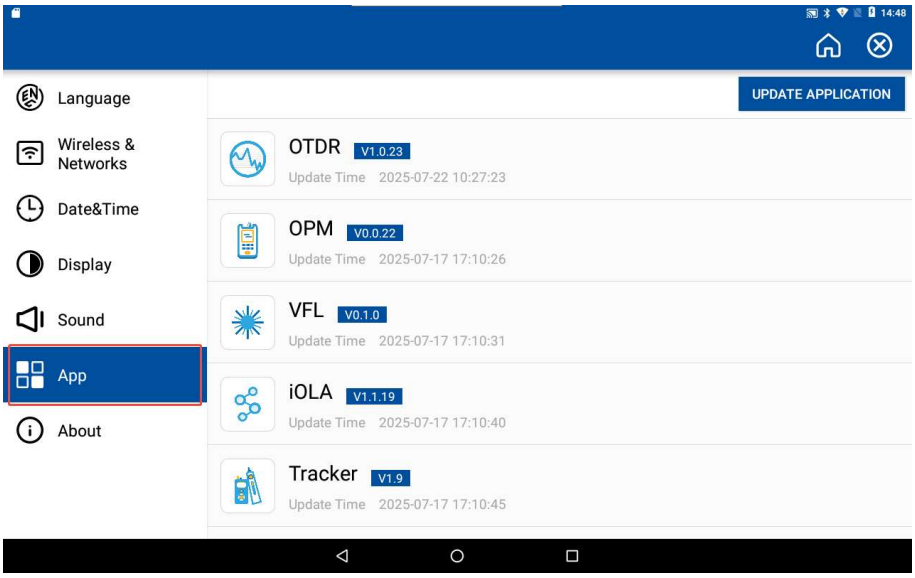


4.4.6.3 Uninstall Application

Remove any applications from the device that are no longer needed or used.

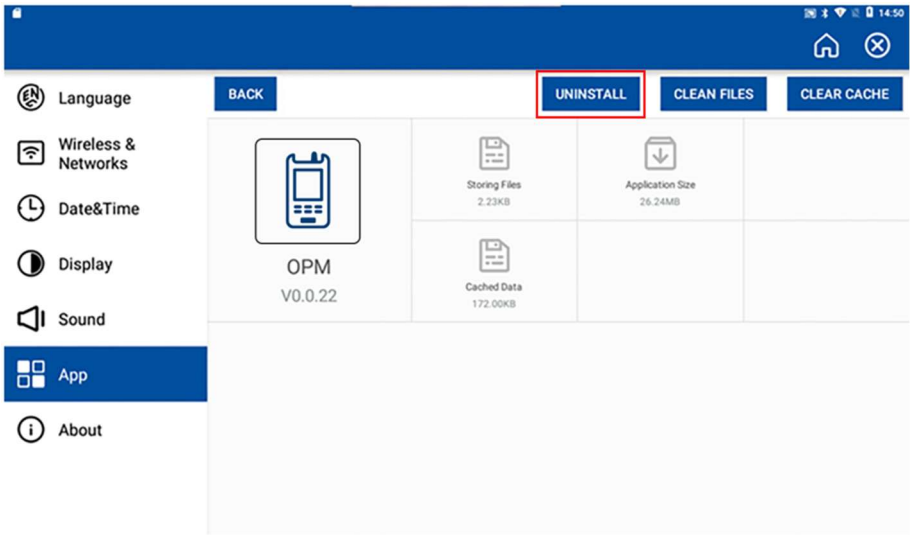
Steps to uninstall an App:

A. In the "Setting", tap "App".



B. Tap app you want to uninstall to view its details.

C. Tap "UNINSTALL" to complete the uninstallation.



4.4.6.4 Clear Application Files

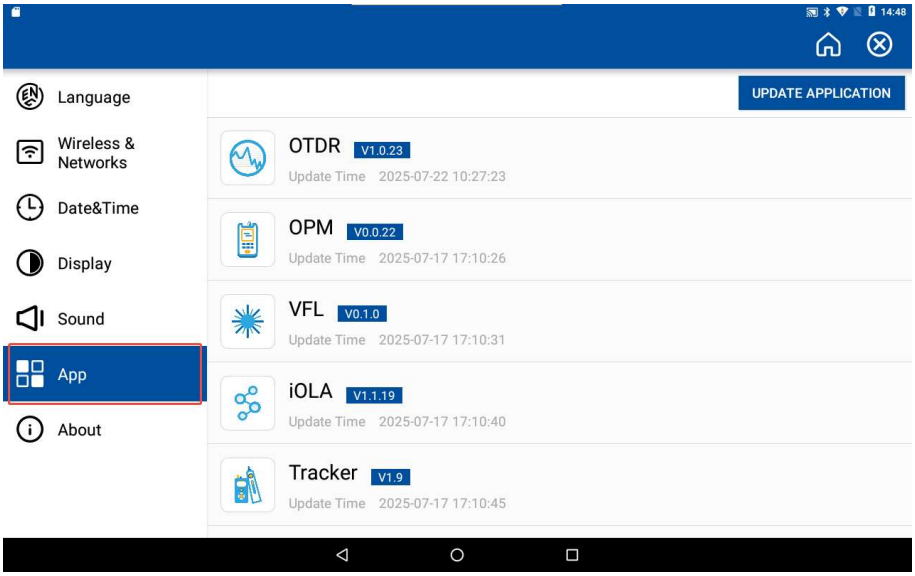
Clear the app files stored in the internal storage.

NOTE: This will only clear the storage files of the current app.

Important
Please be sure to back up your important data to avoid loss, as this action cannot be undone.

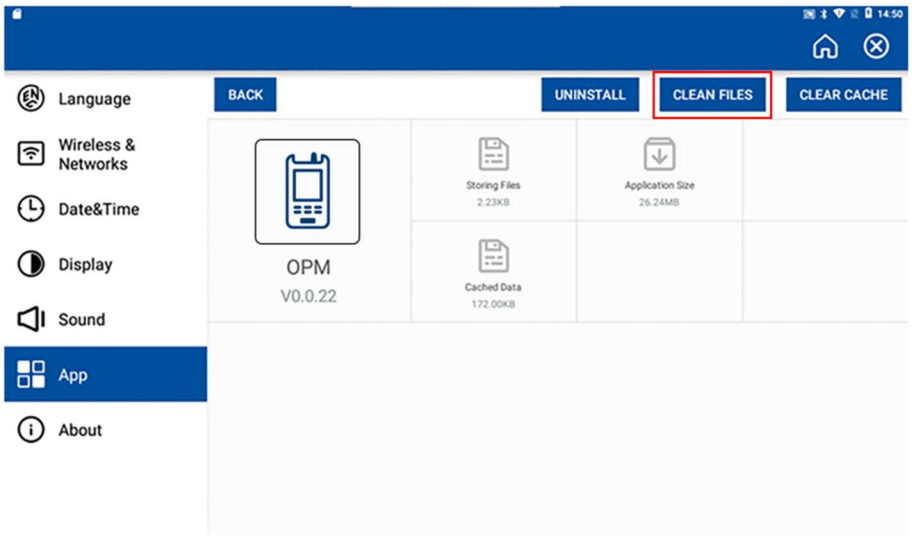
Steps to clear application files:

A. In the "Setting", tap "App".



B. Tap app whose files you want to clear to view the app details.

C. Tap "CLEAN FILES".



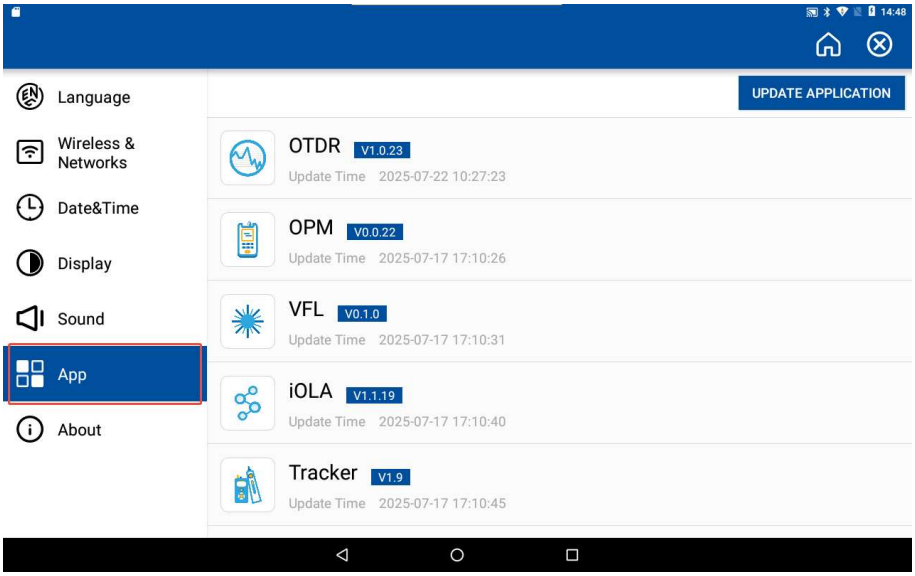
4.4.6.5 Clear Cache

Clearing the cache removes all user data and cache records.

NOTE: This only clears the cache data for the current app.

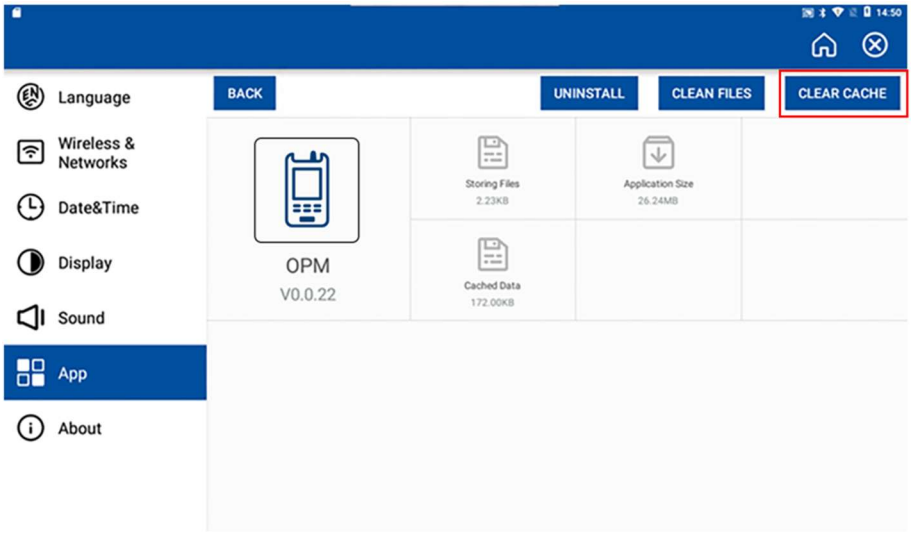
Steps to clear cache files:

A. In the "Setting", tap "App".



B. Tap app whose cache you want to clear to view the app details.

C. Tap "CLEAR CACHE".



4.4.7 About

Steps to obtain information about the device:

A. In "Setting", tap "About".

B. Information available for viewing includes:

B-1 Version

B-2 RAM

B-3 Screen Size

B-4 System Version

B-5 Storage Size

B-6 Model

B-7 Language

B-8 Kernel Version

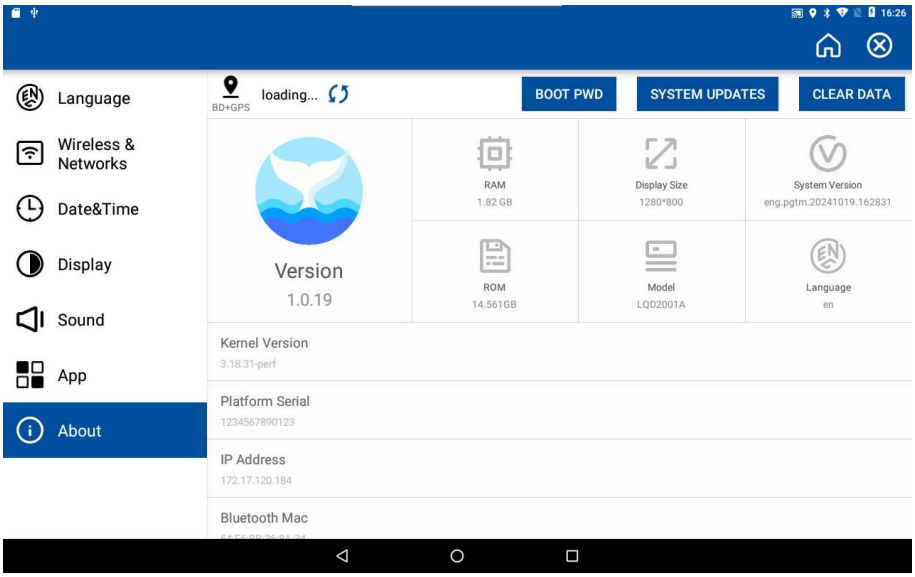
B-9 Platform Serial Number

B-10 IP Address

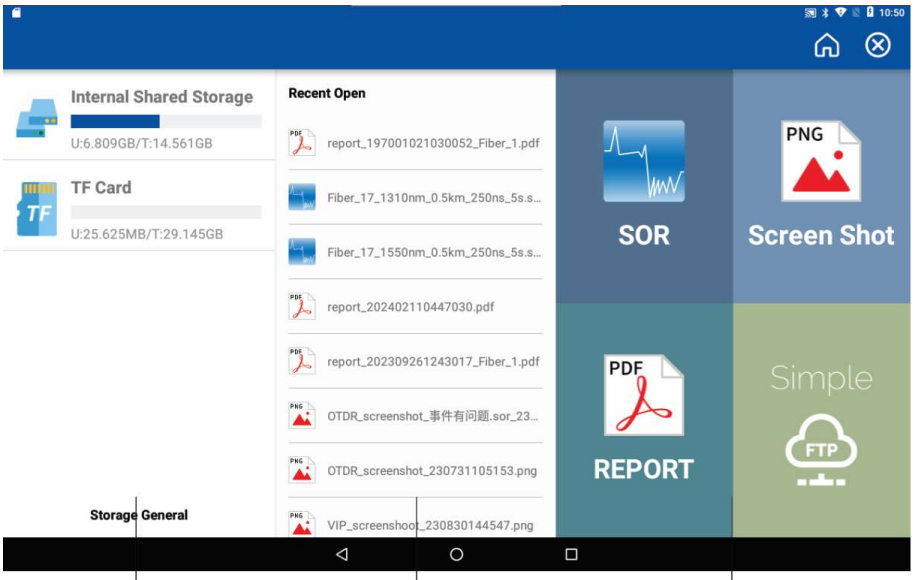
B-11 Bluetooth Address

B-12 IMEI

B-13 Location Information



4.5 File Manager



4.5.1 View Storage

Steps to view storage:

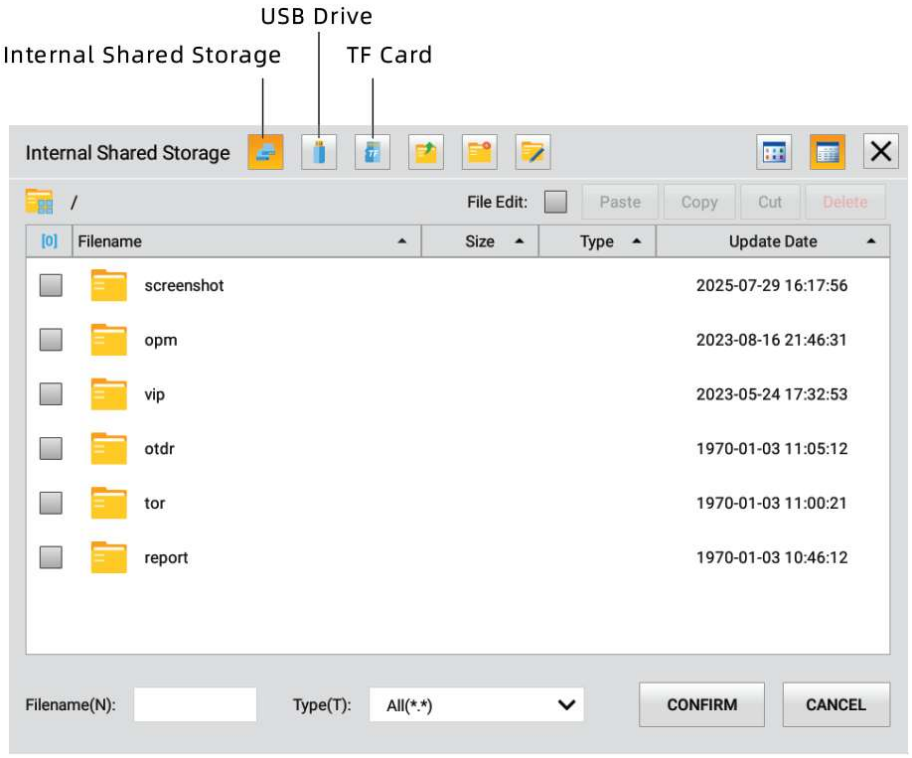
A. Tap the storage device you want to view to open the pop-up window.

B. To switch to a different storage device, tap the“ ”button to close the pop-up

window, then tap the storage device you want to view.

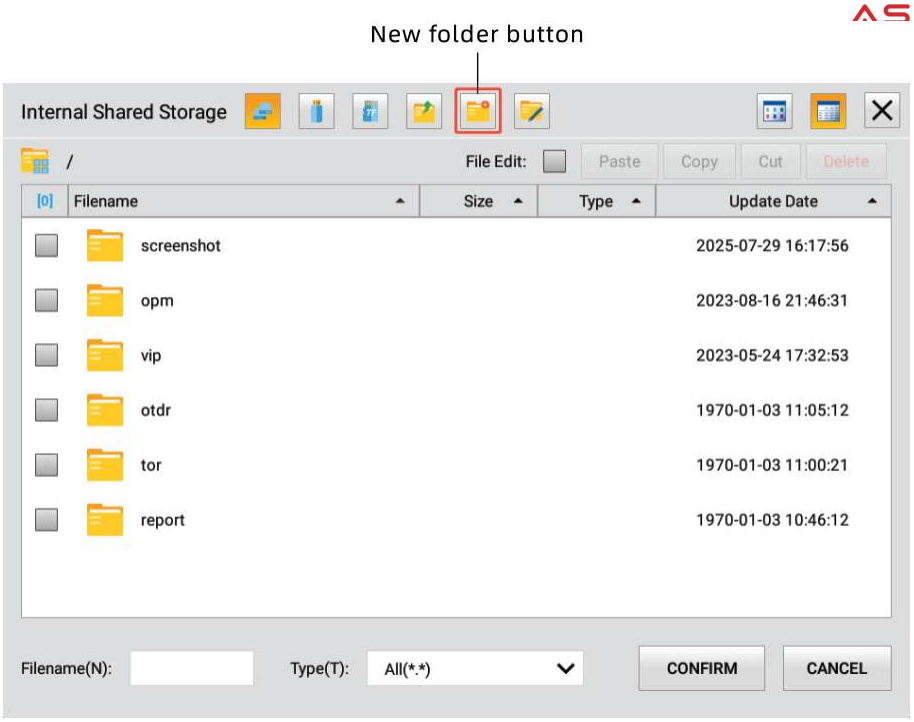
OR

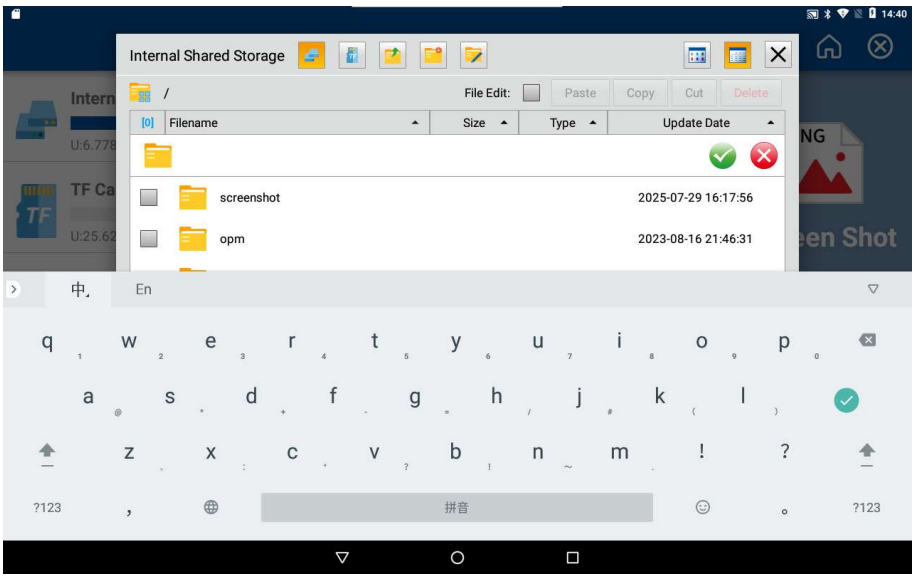
Tap the“ ” 、“ ”or“ ” button to quickly switch to the desired storage view.



4.5.2 File and Folder Management

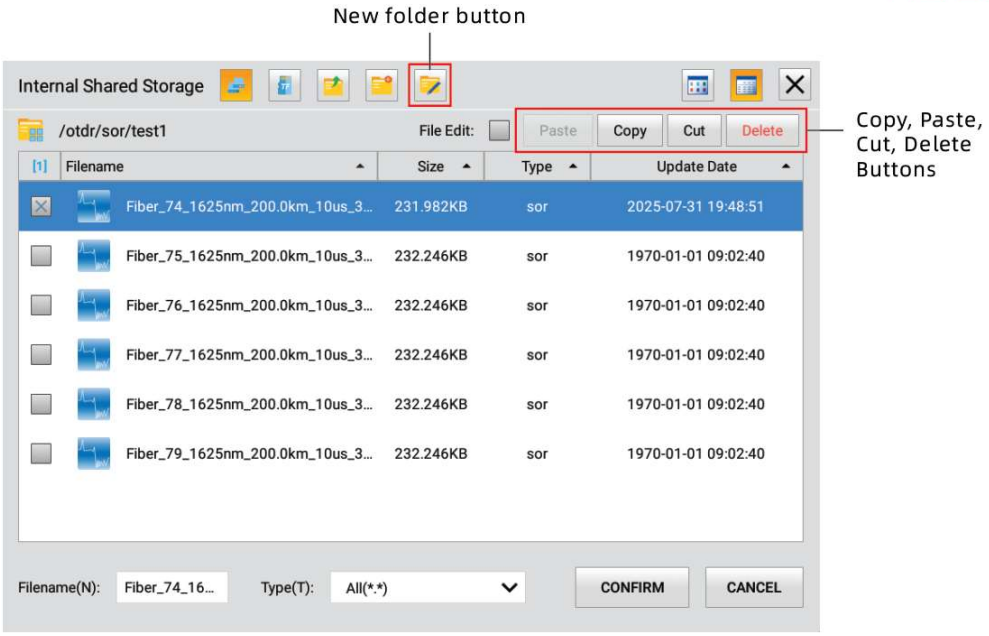
To create a new folder, tap the “ ” button, as shown in the image below:



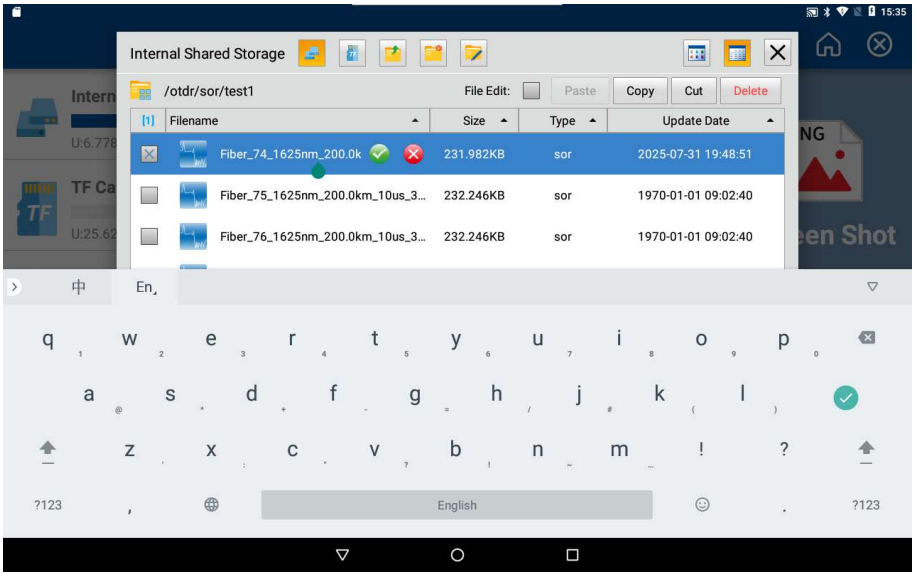


After entering the desired folder name, tap the "✓" button to confirm the creation of the new folder. To cancel the creation of the folder, tap the "✗" button.

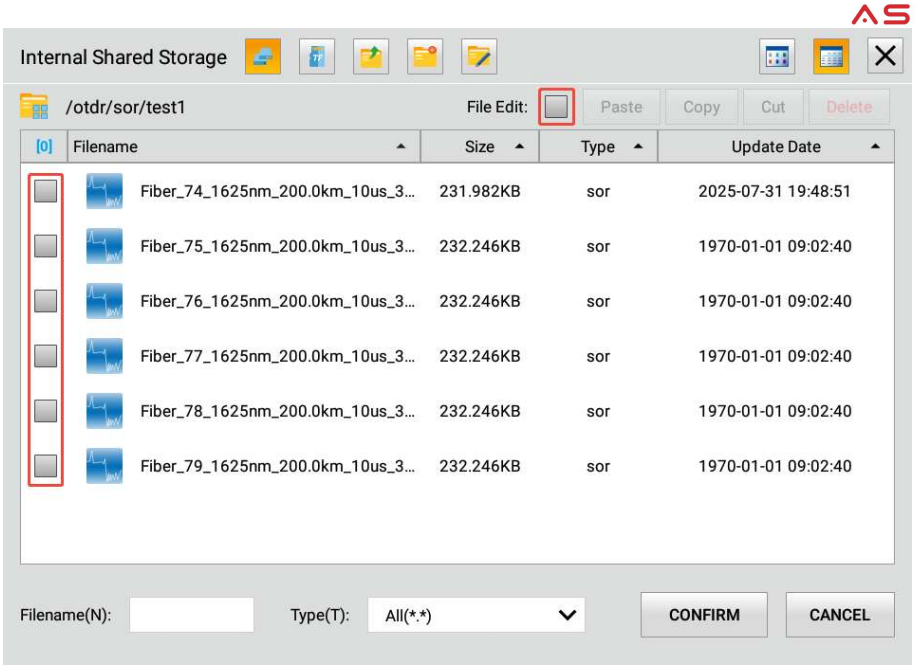
Select a folder or file first, then choose an option: "Copy," "Paste," "Cut," "Delete," or "Rename" buttons, as shown below:



After tapping the "Rename" button, the keyboard will pop up. Enter the new file name as needed, then tap the "✓" button to confirm. To cancel the renaming, tap the "✗" button.



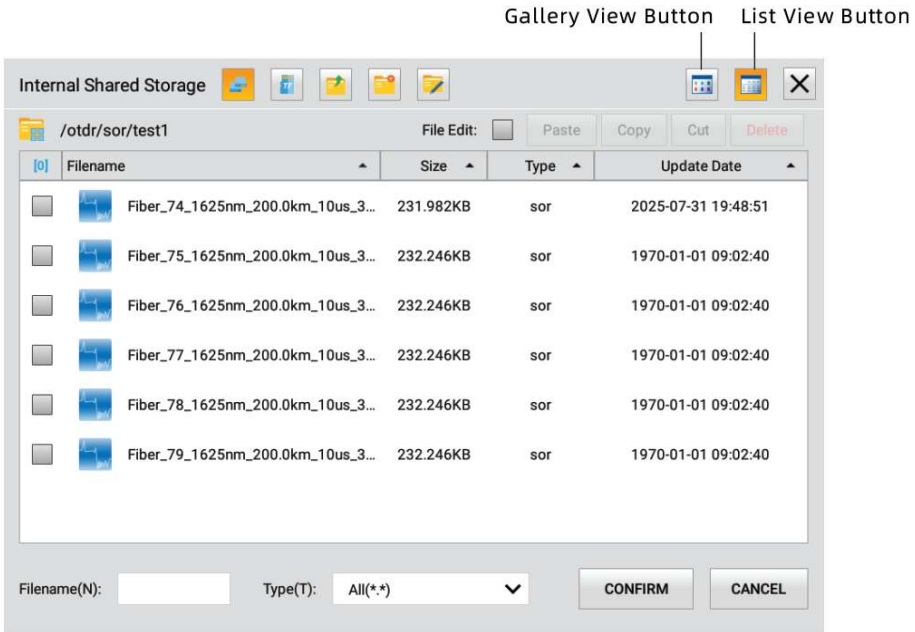
To modify multiple files or folders simultaneously or to perform batch processing, tap the "☐" Checkbox as shown below:



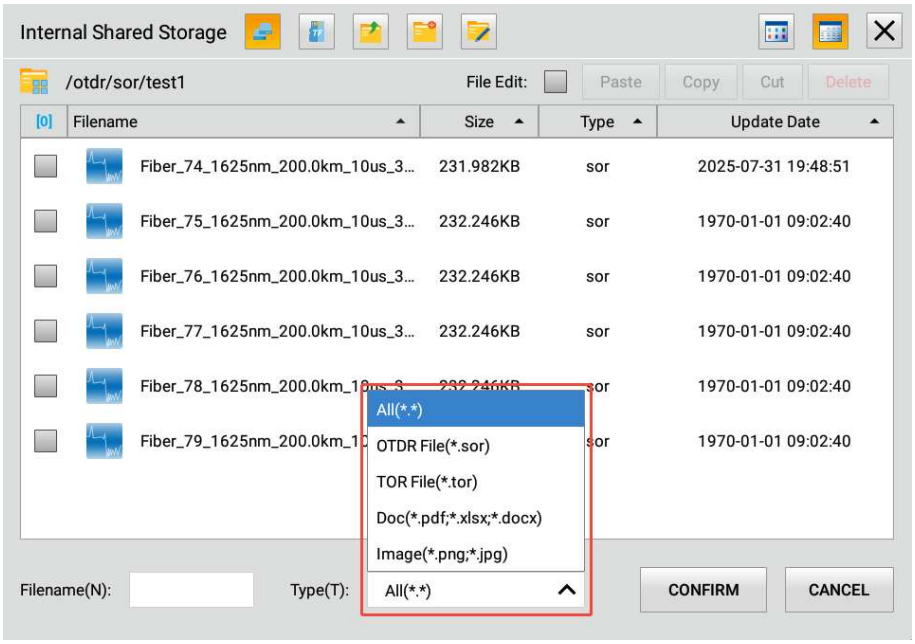
To switch the file view, tap the "  "or"  " button. The available view types are:

- List View
- Gallery View

The view switch buttons are shown in the image below:

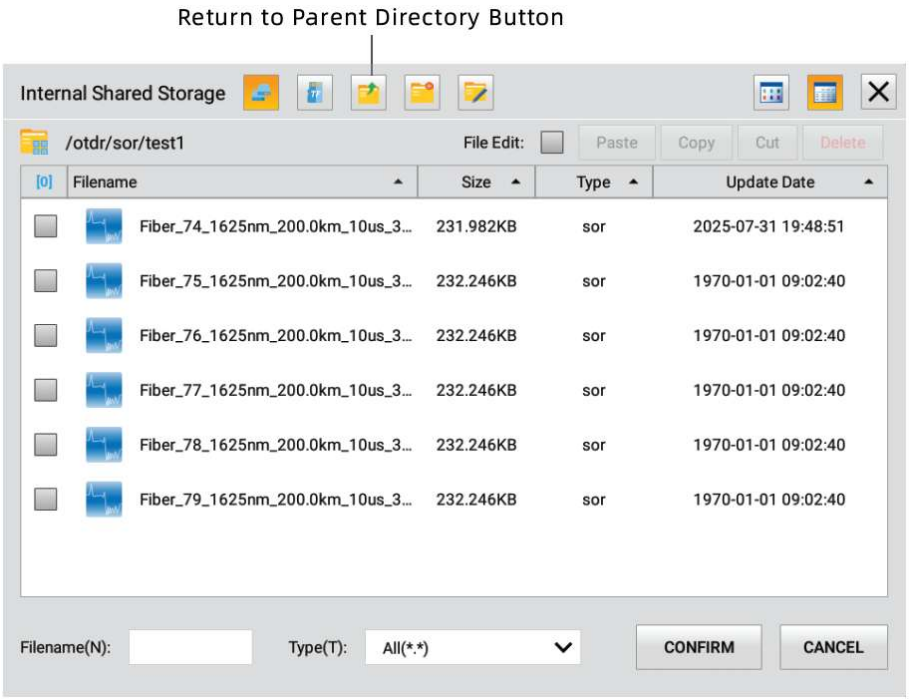


To filter file types, tap the " All(*.*) " button and select the file type you wish to view, as shown in the image below:



NOTE: The supported file types for filtering include OTDR files (.sor), TOR files (.tor), documents (.pdf, .xlsx, .docx), and images (.png, .jpg).

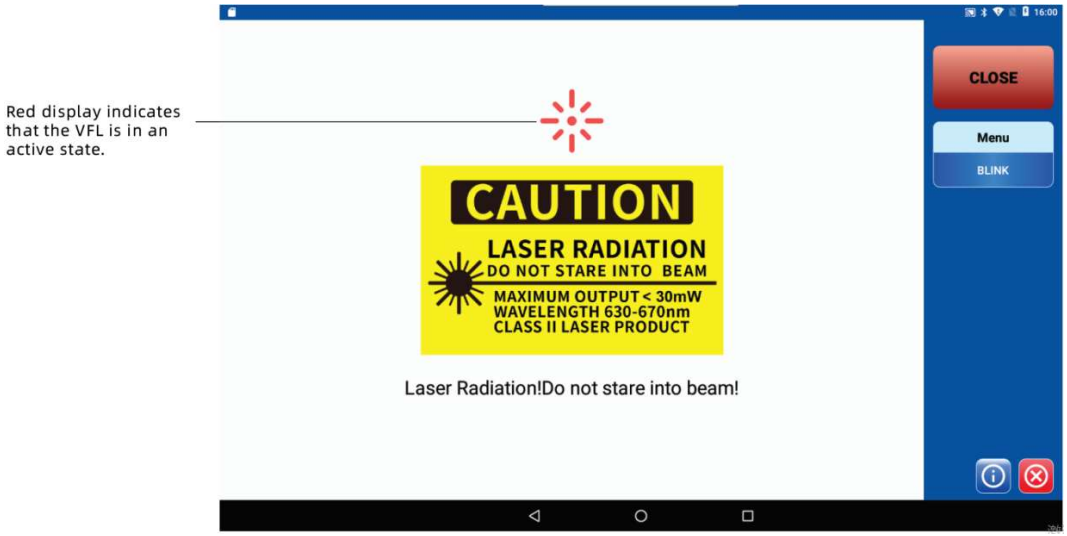
To return to the parent directory, tap the " " button, as shown in the image below:



4.6 VFL Operating Instructions

VFL operation methods include:

- Device App Operation
- Accessory Application (For detailed information on OPM/VFL accessories, please refer to the "OPM/VFL Accessory Operating Instructions" section).



一 · VFL App Operating Instructions

Important
The VFL accessory must be connected to the main unit when using the VFL application. Otherwise, the application will not function.

Steps to use VFL:

A. Clean the fiber patch cord correctly. For detailed information, please refer to section 4.3.3.2, "Cleaning and Connecting Optical Fibers."

B. Connect one end of the fiber under test to the VFL port.

C. Tap "OPEN" to start. You can tap "CLOSE" at any time to stop emitting the laser.

The application also supports a Flashing function. To enable it, tap "BLINK" in the

"Menu."

NOTE: VFL flashing frequency : ≈4Hz.

4.7 OPM Operating Instructions

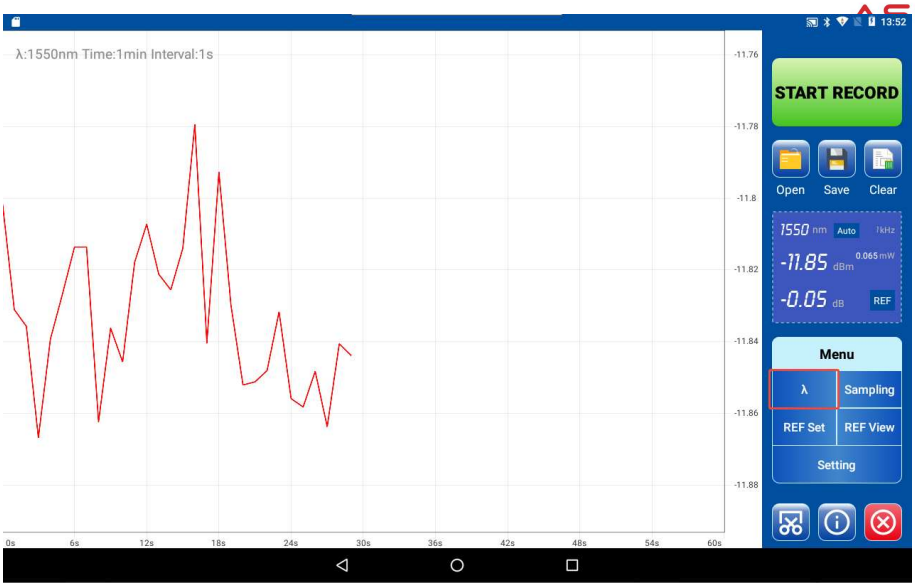
OPM operation methods include:

- Device App Operation
- Accessory Application (For detailed information regarding OPM/VFL accessories, please refer to the "OPM/VFL Accessory Operating Instructions" section).

Important
The OPM accessory must be connected to the device host when using the OPM application. Otherwise, the application will not function.

4.7.1 OPM Wavelength Settings

In the " Menu," tap the "λ" button to cycle through the calibrated wavelengths. The accessory supports measurements for 10 calibrated wavelengths: 850nm, 980nm, 1270nm, 1300nm, 1310nm, 1490nm, 1550nm, 1577nm, 1625nm, and 1650nm.



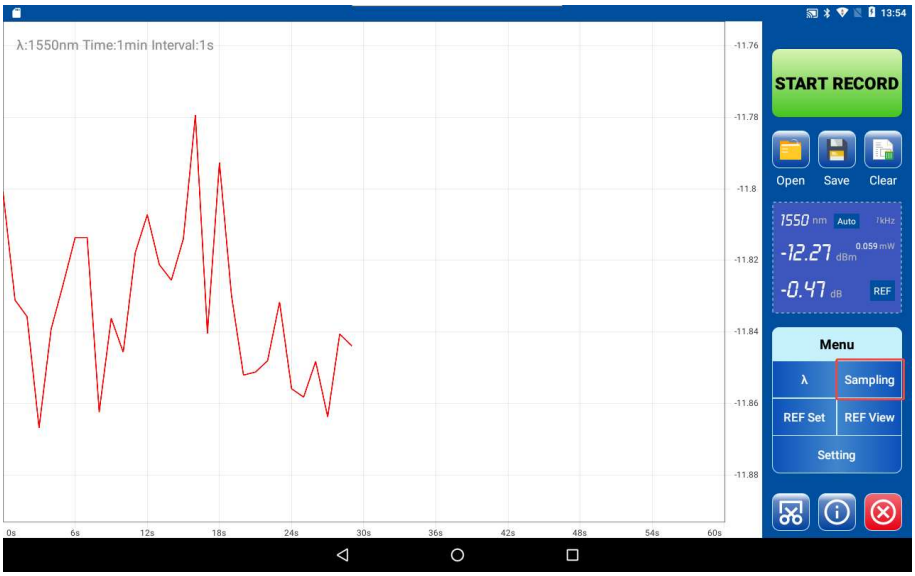
4.7.2 OPM Sampling Settings

OPM sampling settings include:

- Sampling Interval
- Sampling Time

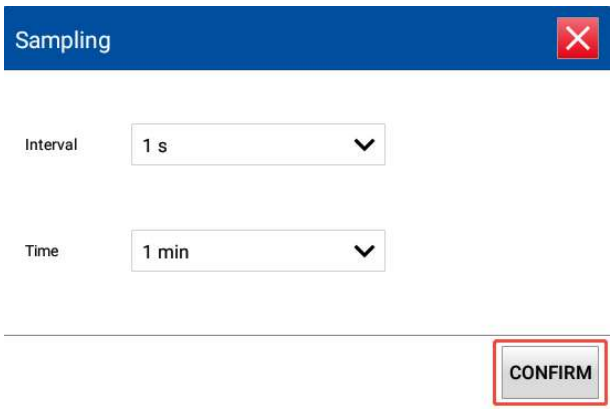
Steps to configure sampling:

A. In the "Menu," tap "Sampling" to open the sampling settings window.



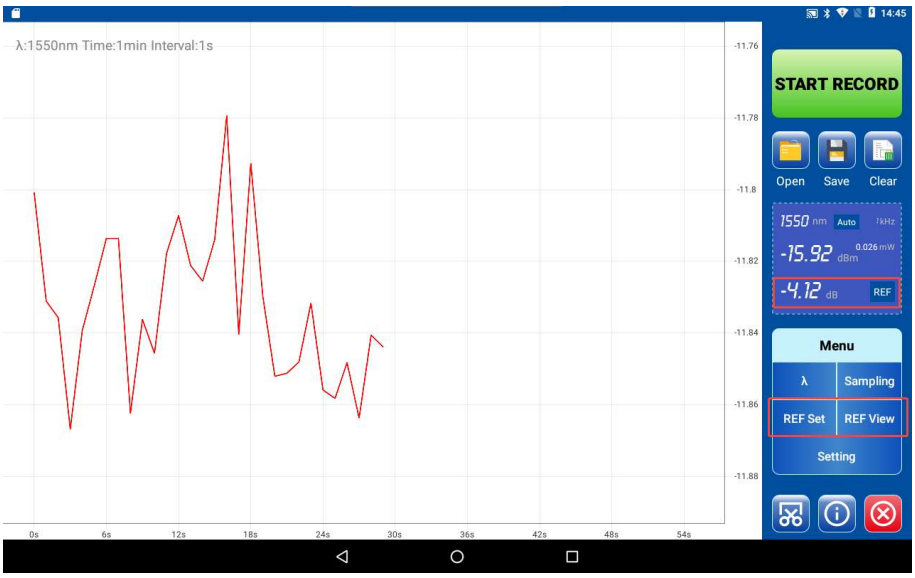
B. You can set the sampling parameters according to your needs.

C. Tap "CONFIRM" to save the sampling parameters.



4.7.3 Viewing and Setting the REF Value

Each calibrated wavelength has its own independent REF value. When a light signal is detected, you can tap " REF Set " to set the reference value for the current wavelength. You may also tap " REF View " to check the stored REF value for the current wavelength, as shown below:



4.7.4 Wavelength and Frequency Identification Settings

- **Wavelength Identification:** When paired with our company's laser source equipment, the OPM can automatically identify the wavelength of the current

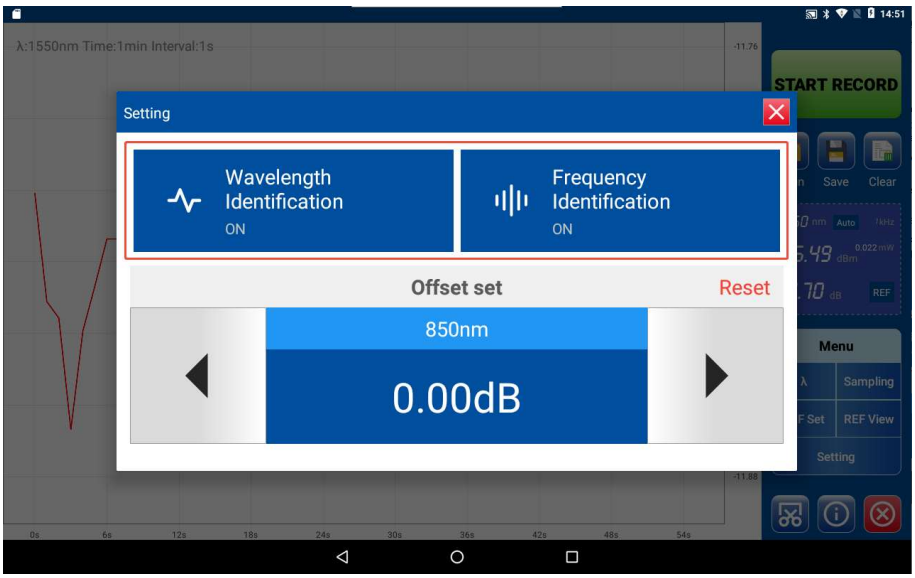
light source and switch to that wavelength value.

- **Frequency Identification:** When used with the modulated signals emitted by our company's laser source, the OPM can automatically detect the frequency value.

Steps to configure Wavelength and Frequency Identification:

A. In the "Menu" tap the "Setting" button.

B. In the "Setting" window, you can enable or disable the automatic identification feature for wavelength/frequency. As shown in the figure below:



C. Tap the“ ” button to return to the main window.

4.7.5 Offset Settings

The offset settings allow for manual calibration adjustments for each calibrated wavelength.

NOTE: The configurable offset range is between -5.00dB and 5.00dB.

Steps to configure the offset:

A. In the "Menu" tap the "Setting" button.

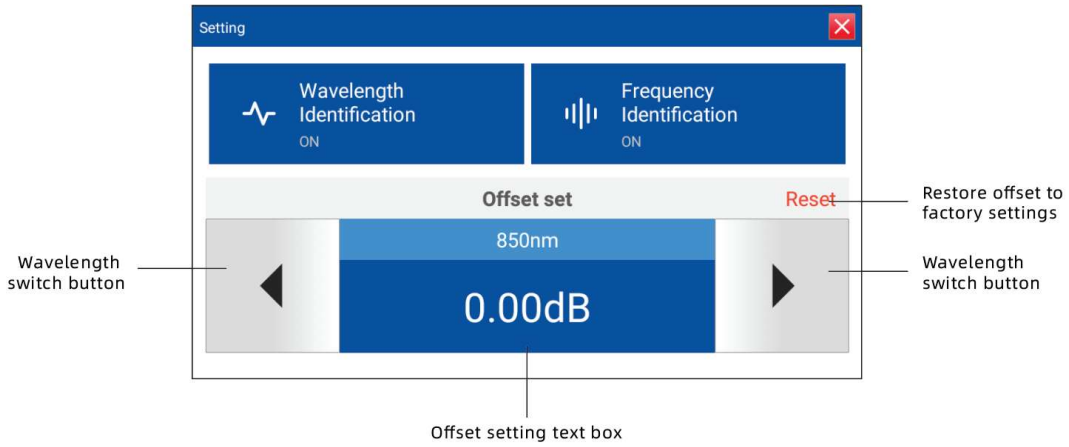
B. In the "Setting" window, tap "◂" or "▸" to switch to the desired setting wavelength.

C. Tap the offset parameter and set it.

D. Tap the "✕" button to return to the main window.

To reset the offset parameter, tap the "Reset" button.

NOTE: The "Reset" button restores the factory offset parameters for all wavelengths.



4.7.6 Waveform Recording

You can configure the parameters manually, and the wavelength and frequency can be used in conjunction with the application's automatic identification feature.

NOTE: The Wavelength/Frequency Identification feature must be used with our company's laser source equipment.

NOTE: You may interrupt data acquisition at any time. The application will display all information collected up to the point of interruption.

Steps to obtain the curve:

A. Clean the fiber patch cord correctly. For detailed information, please refer to section 4.3.3.2, "Cleaning and Connecting Optical Fibers."

B. Connect one end of the fiber under test to the OPM port.

C. Switch the wavelength and adjust the sampling parameters and REF values.

D. Manually configure the offset settings for each calibrated wavelength.

E. Tap " START RECORD ".

F. After the recording is complete, tap "Save" on the button bar to store the curve, or tap "Clear" to delete the current record.

4.7.7 Opening the Recorded File

Steps to open the recorded file:

A. Tap“ 

” in the main window.

B. Scroll through the file list and select the waveform file you want to open.

C. Tap "CONFIRM".

For waveforms that have been acquired but not saved, the application will prompt you to save.

4.8 OPM / VFL Accessory Operating Instructions

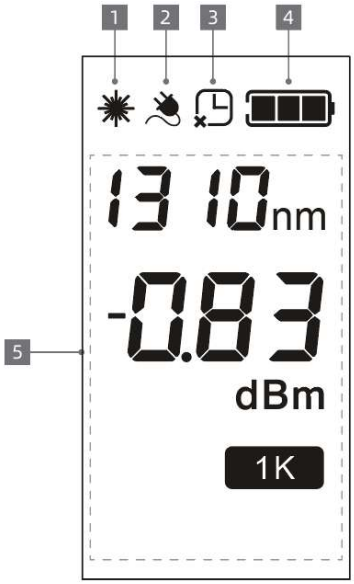
Press and hold the designated area, then remove the accessory from the main unit.

4.8.1 Appearance

1 OPM Interface 2 VFL Interface 3 Function Key

4 Type-C Connector 5 Charging Indicator Light

4.8.2 Display Instructions



1 VFL Icon 2 Power Icon 3 Battery Saver Icon

4 Battery Indicator Icon 5 Optical Power Meter Information Area

4.8.3 Power On/Off and Power Saving Functions

Short press "  " to power on the accessory, which will automatically activate the power-saving function. When the power-saving function is enabled, the device will automatically shut down after 10 minutes of inactivity, accompanied by three beeping sounds as a shutdown reminder.

To disable the power-saving function:

To power on while in shutdown mode, long press the "  " button. The "  " icon will light up at the top of the screen, indicating that the power-saving function is disabled.

4.8.4 Charging Function

- **Automatic Charging:** The accessory charges automatically when connected to

the main unit.

NOTE: The main unit supports accessory charging whether it is powered ON or OFF.

- **Recommendation:** It is recommended to use a 5V/1A power adapter and a charging cable connected via the Type-C interface.

  Charging Status Indicators (when accessory is powered off)

  You can determine the charging status by observing the indicator lights:

  - **LED On:** Charging in progress.
  - **LED Off:** Fully charged.

  When the accessory is powered on and charging:

  - The“ ” icon lights up, indicating the power source is connected.
  - The“ ” icon increments dynamically.
  - The“ ” icon will remain static.

4.8.5 VFL Functions

VFL operation steps:

A. Press the “ ” button briefly to power on.

B. Press the “ ” button briefly to toggle the VFL status: On / Flashing / Off. The “ ” icon at the top of the screen will display the current status.

NOTE: VFL flashing frequency : ≈4Hz.

4.8.6 OPM Functions

4.8.6.1 OPM Wavelength Settings

Short press the "  " button to cycle through the calibrated wavelengths. The accessory supports measurements for 10 calibrated wavelengths: 850nm, 980nm, 1270nm, 1300nm, 1310nm, 1490nm, 1550nm, 1577nm, 1625nm, and 1650nm.

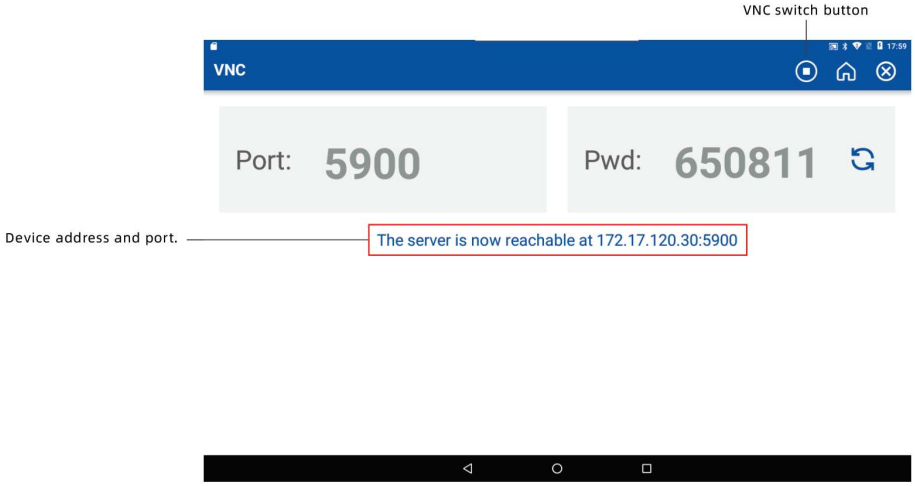
4.8.6.2 Viewing and Setting the REF Value

Each calibrated wavelength has its own independent REF value. When an optical signal is detected:

- **Long press** the "  " button to set the REF reference value for the current wavelength.

➢ **Short press** the "  " button to view the stored REF reference value for the current wavelength.

4.9 Remote Control Operating Instructions

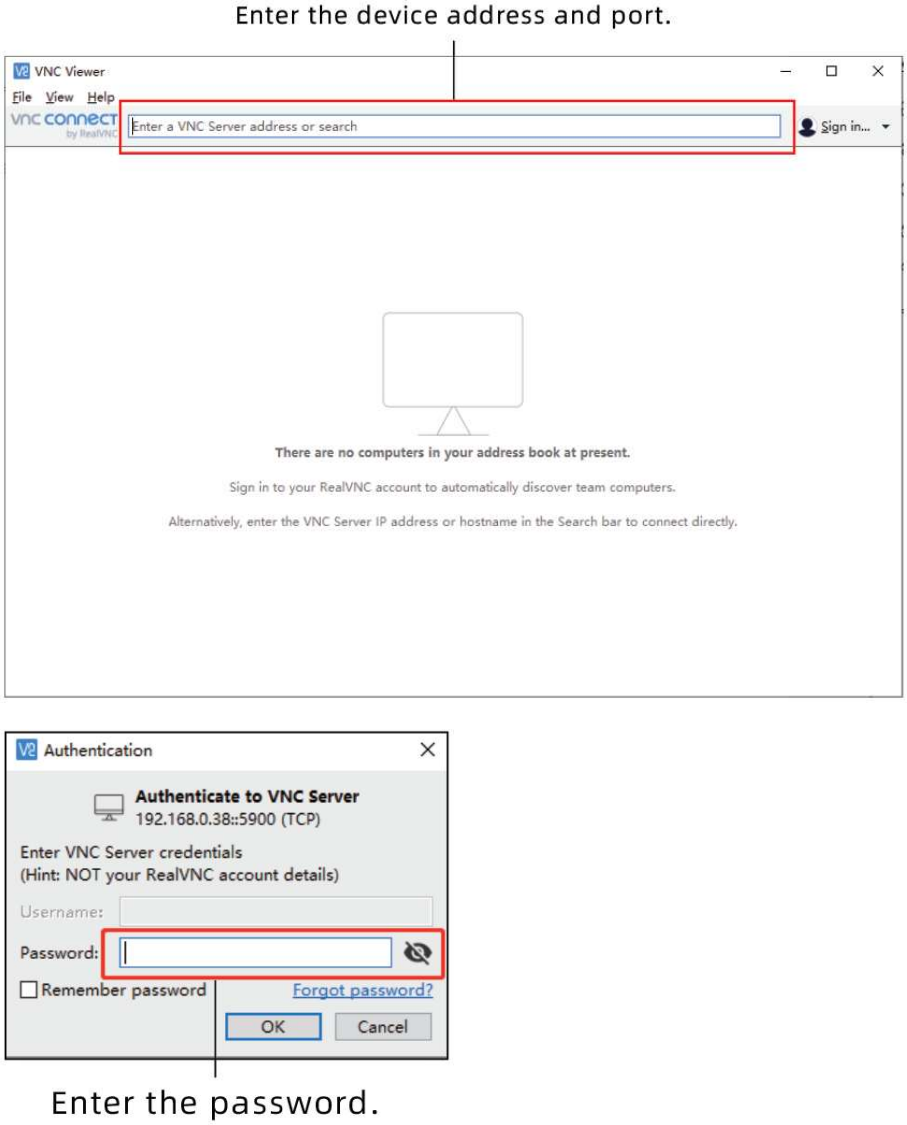


Use the PC to remotely control your device.

The remote end needs to have the "VNC Viewer" software installed. To obtain the installation file:

https://www.realvnc.com/en/connect/download/viewer/

Tap the "  " button to turn on the remote control switch. After the remote software is installed, you will need to enter the device address, port, and password to connect and control the device.



Important

The "VNC" application can only be used when the device and PC are on the same local area network segment (LAN).

4.10 Tracker Operating Instructions

Methods for operating the tracker include:

- **Device application Operations**

- **Accessory Applications:** For detailed information regarding the network cable testing accessory, please refer to section 4.11, "Network Cable Test Accessory Operating Instructions."

Important
When using the tracker application, the network cable testing accessory host must be connected to the device host; otherwise, the application will not function.

Application testing functions:

- RJ45 Sequence Test
- RJ45 Cable Tracker

4.10.1 Using the RJ45 Sequence Test Function

The RJ45 Sequence Test function can detect whether the wiring sequence of the network cable is correct and identify issues such as miswiring or broken connections.

Steps to use the RJ45 sequence test function:

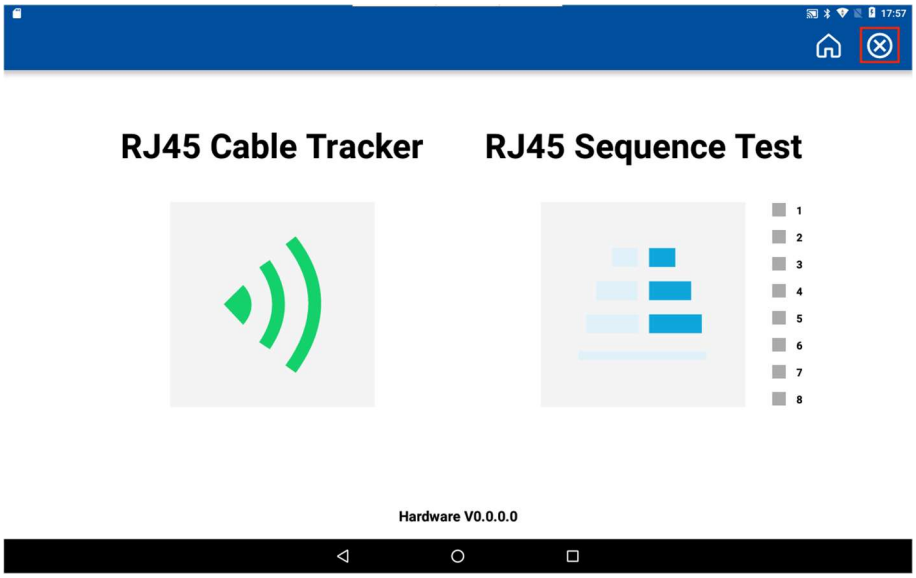
A. Press and hold the designated area to remove the network cable test accessory from the device host. For detailed information regarding the network cable test accessory, please refer to section 4.11, "Network Cable Test Accessory Operating Instructions."

B. Connect one end of the network cable to the RJ45 interface of the main unit and the other end to the RJ45 interface of the subordinate unit.

C. Tap " " to activate the sequencing function. You can determine the quality of the network cable based on the UI display of the main unit and the status of the sequencing indicator lights on the subordinate unit.

Note: Once the RJ45 Sequence Test function is activated, it remains active and cannot be manually turned off within the mode. You can tap" " to switch to the RJ45 Cable Tracker function, or tap" " to exit tracking application. For

detailed information regarding the RJ45 Cable Tracking function, please refer to section 4.10.2, "Using the RJ45 Cable Tracker Function."



4.10.2 Using the RJ45 Cable Tracker Function

The RJ45 Cable Tracker function efficiently and rapidly locates specific network cables from within large cable bundles, behind decorative walls, and other hard-to-reach areas.

Steps to use the RJ45 cable tracker function:

A. Press and hold the designated area to remove the remote unit of the network cable test accessory from the main unit. For detailed information regarding the network cable test accessory, please refer to section 4.11, "Network Cable Test Accessory Operating Instructions."

B. Connect one end of the network cable to the RJ45 port of the network cable testing accessory.

C. Long press the power button on the side of the network cable testing accessory to turn it on, and the LED lights will automatically activate.

D. Tap "  " to activate the RJ45 cable tracker function.

E. Press the power button on the side of the network cable testing accessory briefly to switch the detection sensitivity as needed.

F. As the probe of the network cable testing accessory approaches the cable,

the device will emit a regular beeping alert.

Note：Once the RJ45 Cable Tracker function is activated, it remains active and cannot be manually turned off within the mode. You can tap "  " to switch to the RJ45 Sequence Test function or tap "  " to exit tracking application. For detailed information regarding the RJ45 Sequence Test function, please refer to Section 4.10.1, "Using the RJ45 Sequence Test Function."

4.11 Network Cable Test Accessory Operating Instructions

Press and hold the designated area to remove the remote unit of the network cable test accessory from the main unit.

4.11.1 Appearance

The network cable test accessory consists of two parts: the Master unit and the Slave unit.

1 Master module 2 Slave module

1 RJ45 port 2 Line sequence indicator light 3 Hunt function indicator

4 Low battery indicator 5 Switch off/Function switch button 6 Sequencing function indicator

7 Type -c port 8 Charging light

1	RJ45 port	2	Line sequence indicator light	3	Detection sensitivity indicator light
4	Low battery indicator	5	Power switch	6	LED light

4.11.2 Power On/Off

- **Master Unit:** Long press the "  " button to turn the device on or off. Upon powering on, the RJ45 sequence function is selected by default.
- **Slave Unit:** Long press the Power button on the side to turn the device on or off. After powering on, the LED light will turn on automatically, and the low sensitivity detection mode is selected by default.

When the accessory is low on battery, the battery indicator light will flash as a reminder.

4.11.3 Charging

4.11.3.1 Charging the Slave Unit

The slave unit needs to be connected to the master module for charging.

4.11.3.2 Charging the Master Unit

- **Automatic Charging:** The accessory will automatically charge when connected to the main unit.

  Note: The main unit supports accessory charging whether it is powered ON or OFF status.

- **External Charging:** It is recommended to use a 5V/1A power adapter and a charging cable connected to the Type-C interface. When the accessory is powered off, the charging status can be determined by the indicator light:
  - **Indicator Light ON:** Charging in progress.
  - **Indicator Light OFF:** Charging complete (Fully charged).

4.11.4 Switching Between RJ45 Sequence and Cable Tracker Functions

While the master unit is powered on, short press the "  " button to toggle between the RJ45 sequence and RJ45 cable tracker functions. You can confirm the currently selected detection mode via the function indicator lights.

4.11.5 RJ45 Sequence

Steps for operating RJ45 sequence function:

A. Long press the "  " button on the master unit to turn it on. Upon powering on, the RJ45 sequence function is selected by default.

B. Connect one end of the Ethernet cable to the RJ45 port of the master unit and the other end to the RJ45 port of the slave unit.

C. The status of the wire sequence indicator light can be used to determine if the Ethernet cable is qualified.

4.11.6 RJ45 Cable Tracker

Steps for operating the RJ45 sequence function:

A. Long press the "  " button on the accessory master unit to power it on. After powering on, briefly press the "  " button to switch to the RJ45 cable tracker function.

B. Connect one end of the Ethernet cable to the RJ45 port of the Ethernet testing accessory master unit.

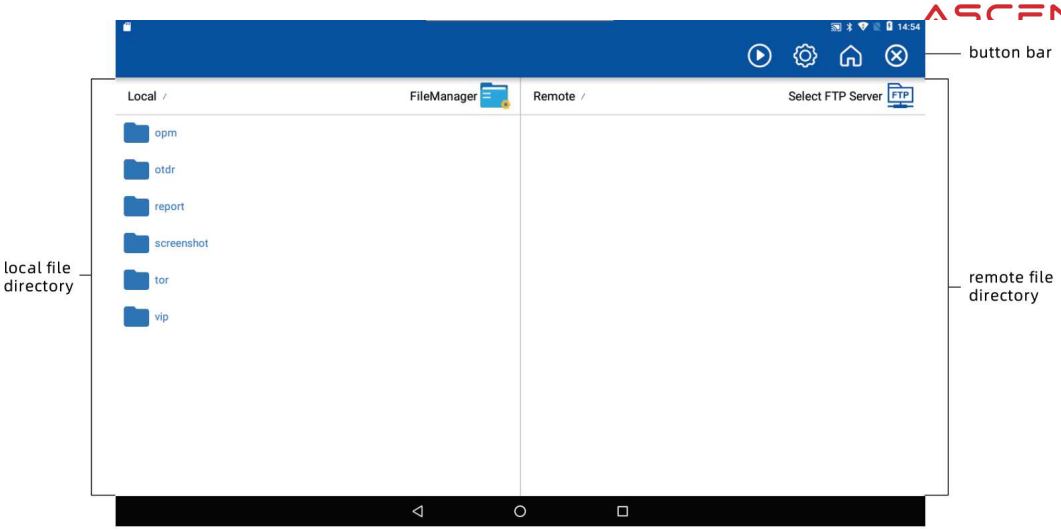
C. Remove the slave unit of the Ethernet testing accessory. Long press the power button on the side of the slave unit to turn it on, which will automatically activate the LED light, with the default setting selecting low detection sensitivity.

D. Short press the power button on the side of the slave unit to switch the detection sensitivity as needed.

E. As the probe of the slave unit gets closer to the Ethernet cable, the unit will emit a regular beeping sound as a reminder

4.12 TFB

FTP (File Transfer Protocol) is a standard network protocol used for bidirectional transmission between a client and a server. It enables control over file operations, including downloading, uploading, and copying.

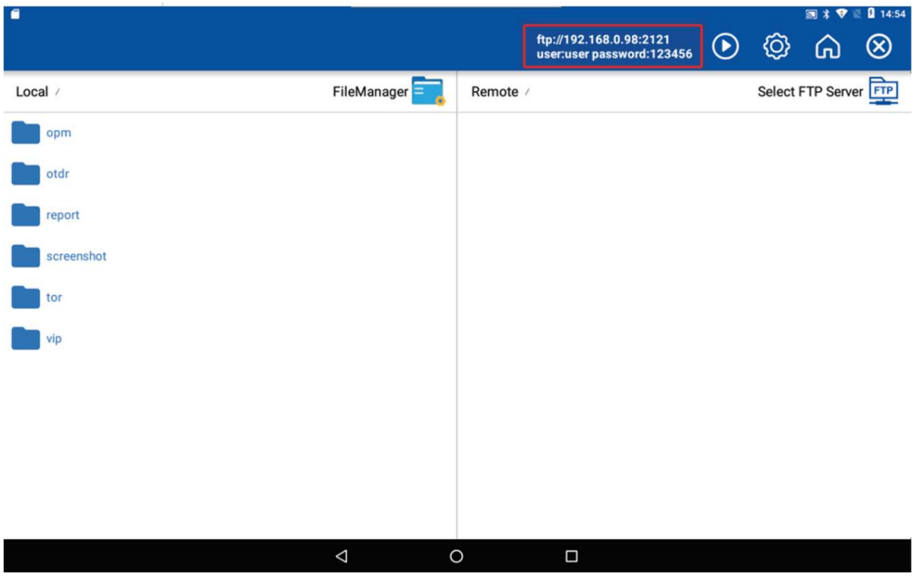


4.12.1 Establishing a Transmission Connection

To allow other devices such as PC and mobile to access device files:

A. PC and mobile devices need to download and open an FTP client.

B. Tap“ ” to enable the FTP function. the device address, port, username, and password information will be displayed at the top of the screen.

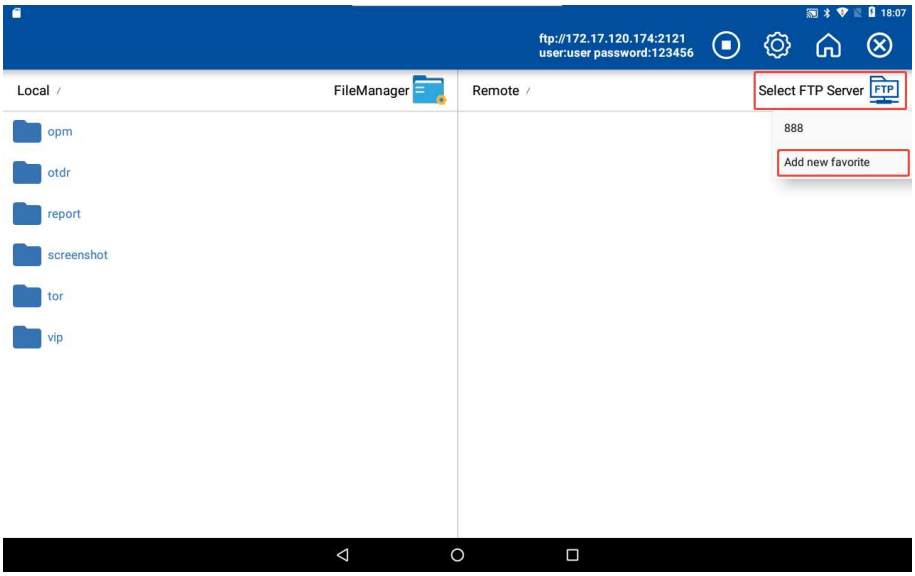


C. Enter the device address, port, username, and password to establish a connection on your PC or mobile device.

To allow the device to read files from a PC or other external devices:

A. Download and open an FTP Server application on your PC or mobile device.

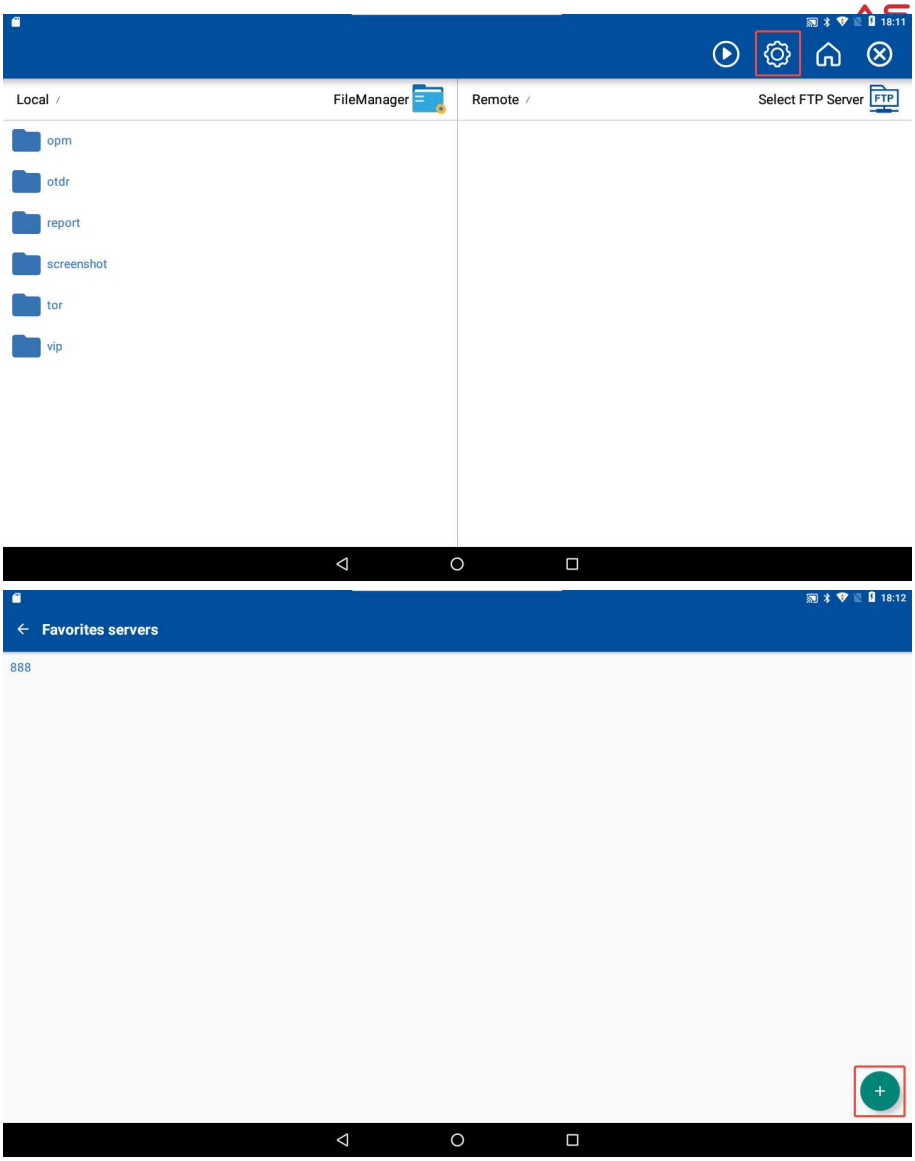
B. Tap "Select FTP Servicer" - "Add new favorite."



OR

Tap“ ” to enter the server management interface, then tap the “ ” button to add a new server. Enter its address, port, username, and password for the FTP server to establish the connection.

NOTE: After adding a new server, the application will automatically save the server information. For detailed information regarding the server management of, please refer to section 4.12.2 of the FTP instructions, " FTP Server Management".



If a server already exists, just tap connect.

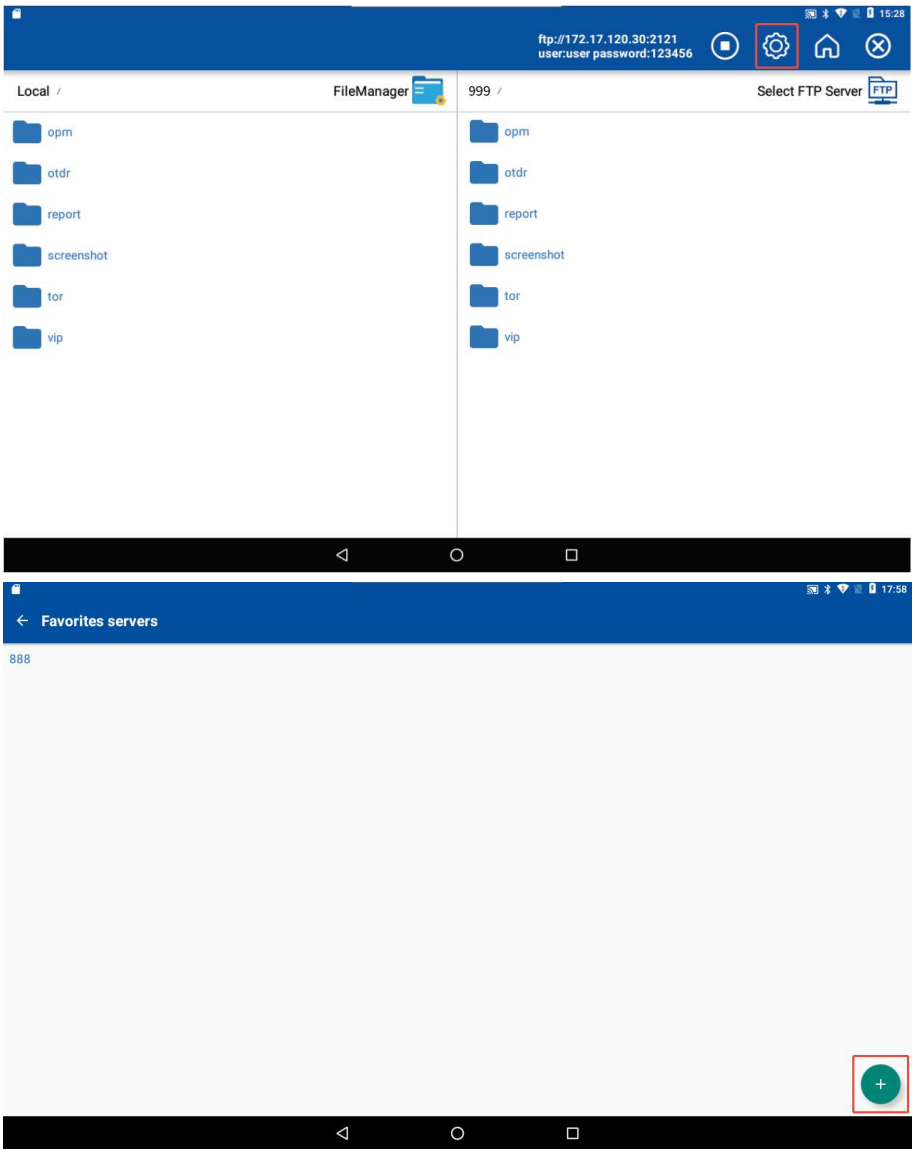
4.12.2 FTP Server Management

Tap“ ” to enter the server management main interface, where you can add, modify, or delete FTP server configurations.

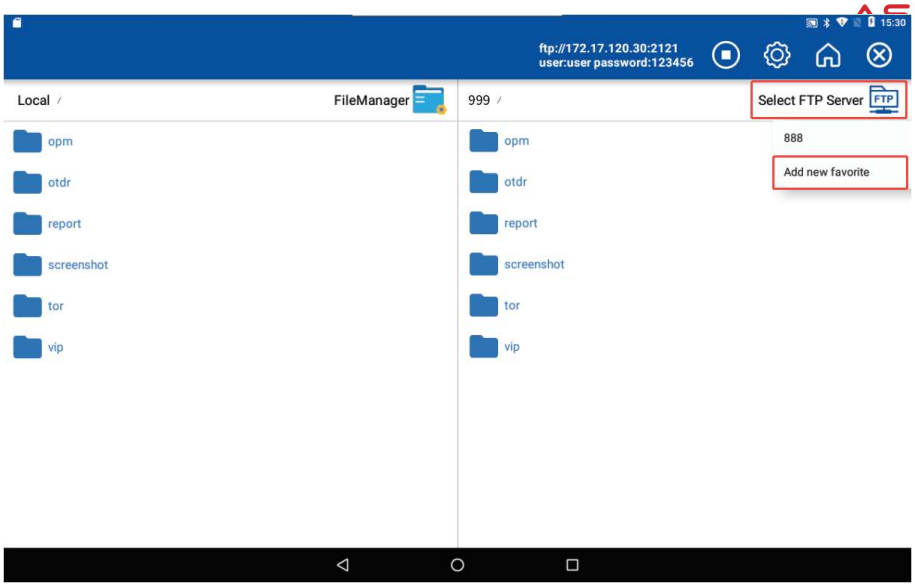
4.12.2.1 Adding a New Server

Tap“ ” to enter the service management main interface. Tap the “ ” button to add a new service, then enter the FTP Server address, port, username,

and password.

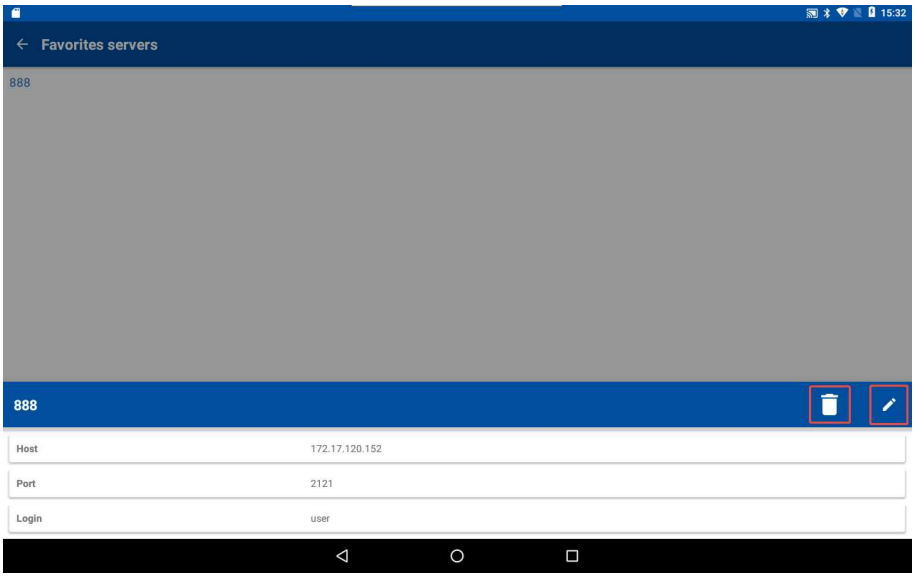


Alternatively, in the FTP main window, click "Select FTP Server" and then "Add new favorite".



4.12.2.2 Modifying or Deleting FTP Servers

On the service management main interface, tap an existing FTP server to open a service information window. Here, you can view details such as the address and port. Tap“ ” to edit the service information. Tap“ ” to delete the current service device from the list.



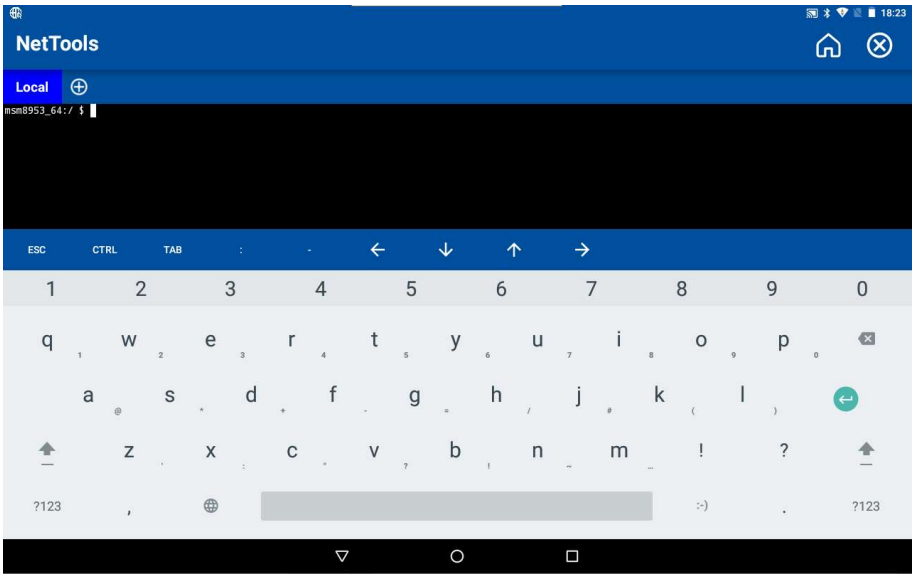
4.13 Network Tools

The Net Tools application provides convenient terminal management experience

for developers, administrators, and tech enthusiasts. This app transforms your mobile device into a powerful terminal environment, enabling you to execute commands, manage files, oversee systems, and configure networks effortlessly, anytime and anywhere. Its intuitive interface, compatibility with various terminal tools, and script support make operations efficient and personalized.

After opening the Net Tools application, it defaults to the Local: system terminal command line window.

You can use the soft keyboard to input Linux commands on the Local page.

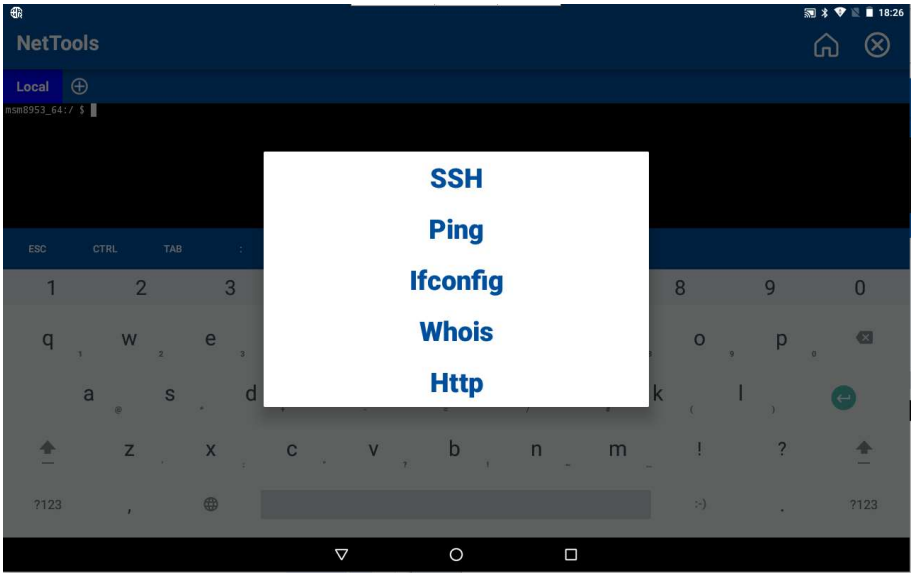


To enter shortcut commands, tapping the "  " button allows you to select from the following options:

- SSH：SSH is a security protocol and command-line tool in the system, used for remotely connecting to and managing other computers. It encrypts communications, allowing secure execution of commands, file transfers, and remote system management between different hosts, ensuring data confidentiality and integrity.
- Ping：Ping is a command-line tool in the system used to detect network connectivity with the target host. It sends network probe packets to the target

host and waits for a response. By checking the response time and packet loss, the stability of the network can be assessed, and it can also be used for troubleshooting.

- Ifconfig：Ifconfig (abbreviation for Interface Configuration) is a command-line tool used for configuring and displaying network interface information. It can be used to view, configure, and manage network interfaces on the system, including setting IP addresses, subnet masks, broadcast addresses, MAC addresses, etc.
- Whois：Whois is a command-line tool in the system used to query the registration information of domain names. It can display information such as the domain owner, registrar, registration date, etc., helping to understand the background and ownership of a specific domain.
- Http:Http is a command-line tool in the system used to query whether a URL can be accessed and to return the status code.



4.14 Fiber Inspector

The VIP application is designed to be used with a microscope probe, allowing for

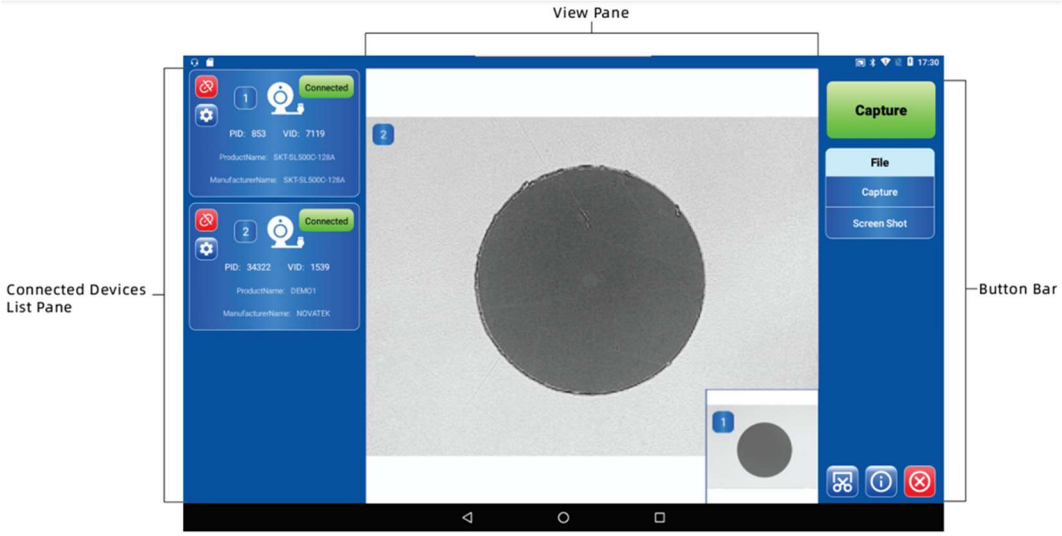
clear observation of the condition of fiber end-faces, including scratches, spots, and more. The microscope probe connects to the device's USB port, and the application will automatically detect the probe device.

NOTE: There is no limit to the number of probe devices that the main device can detect.

4.14.1 Main Window

The main window is divided into three parts: the connected device list, the view pane, and the button bar.

- **Connected device list:** Displays information for all inspections about the detected devices.
- **View pane:** Renders real-time images from the microscope probe, further partitioned into a main Pane and a sub-pane.
- **Simultaneous multi-device display:** It can simultaneously display probe images from two connected devices, allowing users to switch flexibly between different views or devices.



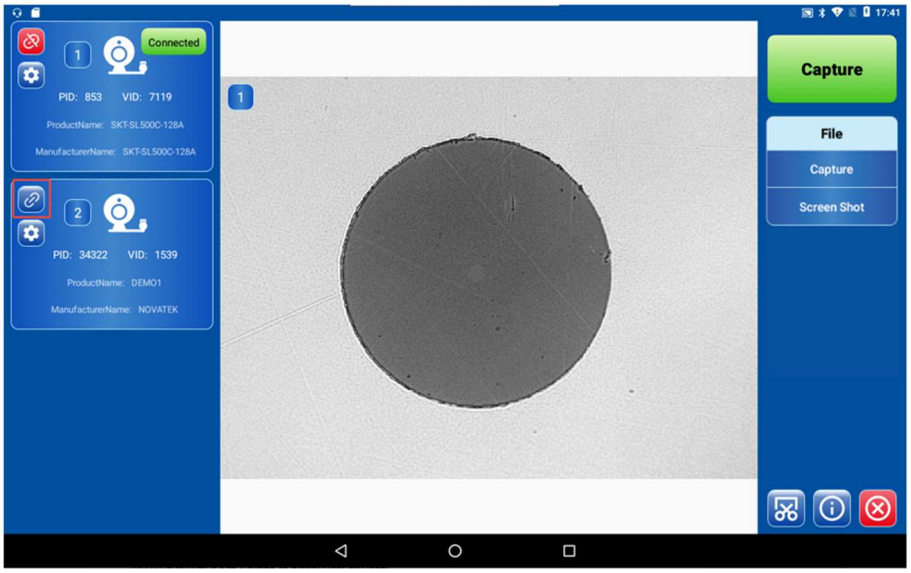
4.14.2 Connecting Devices

NOTE: The device host can connect a maximum of two probe devices. If two probe devices are already connected and you want to switch between them, you must first disconnect one probe device before connecting the new one.

Steps to connect devices:

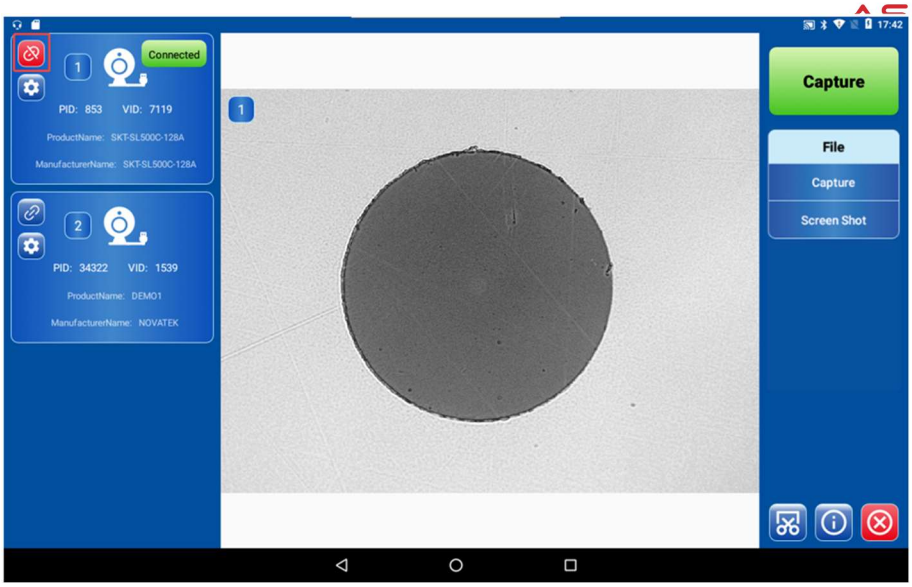
A. Connect the microscope probe to the USB port of the device host.

B. Tap the "  " button to connect the probe device.



Steps to disconnect devices:

Tap the "  " button to disconnect the probe device.

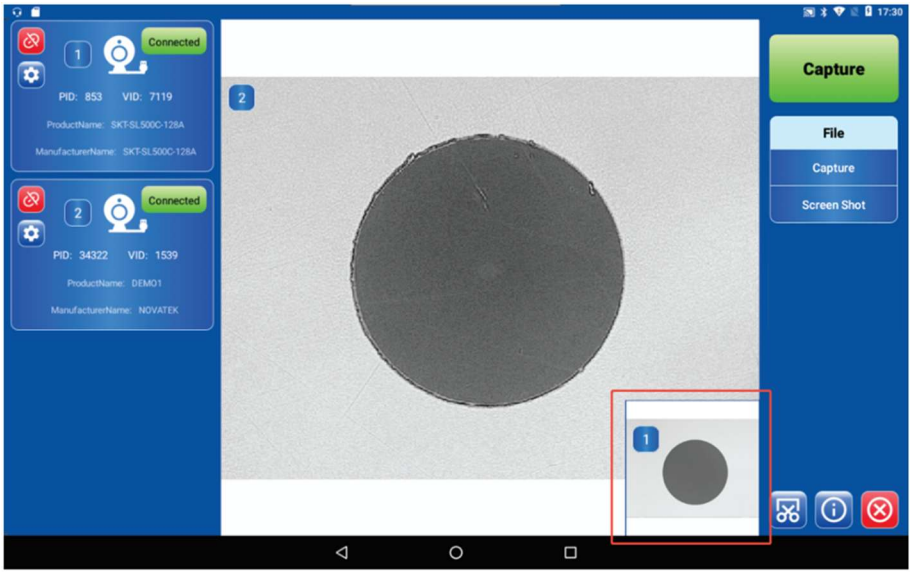


4.14.3 Switching Display Image

When two probe devices are connected, display the main pane and sub-pane in the panel view.

Steps to switch display image:

Tap the sub-pane to switch the display.



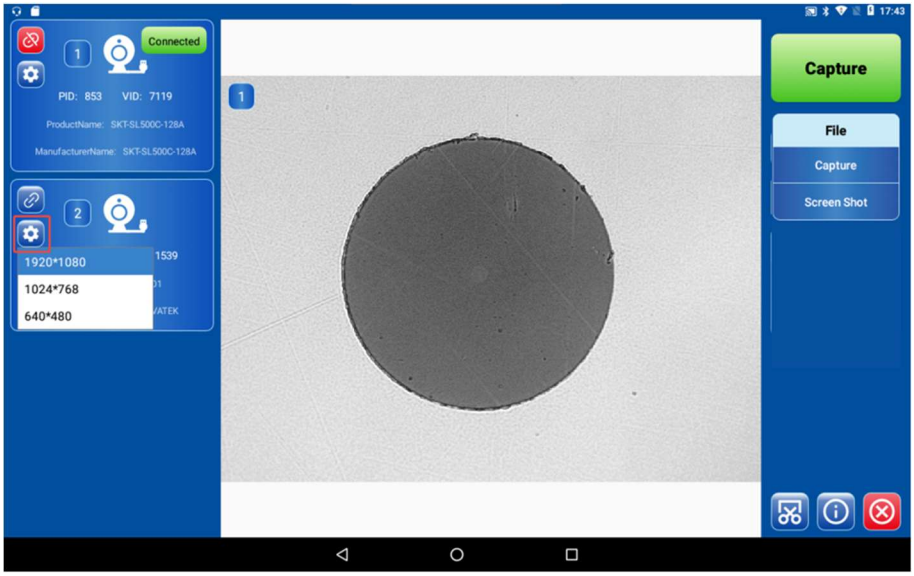
4.14.4 Setting Resolution

If the current display does not meet your needs, adjusting the resolution can help to clearly identify the details of the end face.

NOTE: The available resolutions depend on the version of the connected microscope probe.

Steps to set resolution:

Tap "  " to display the resolution options. Select the appropriate resolution.

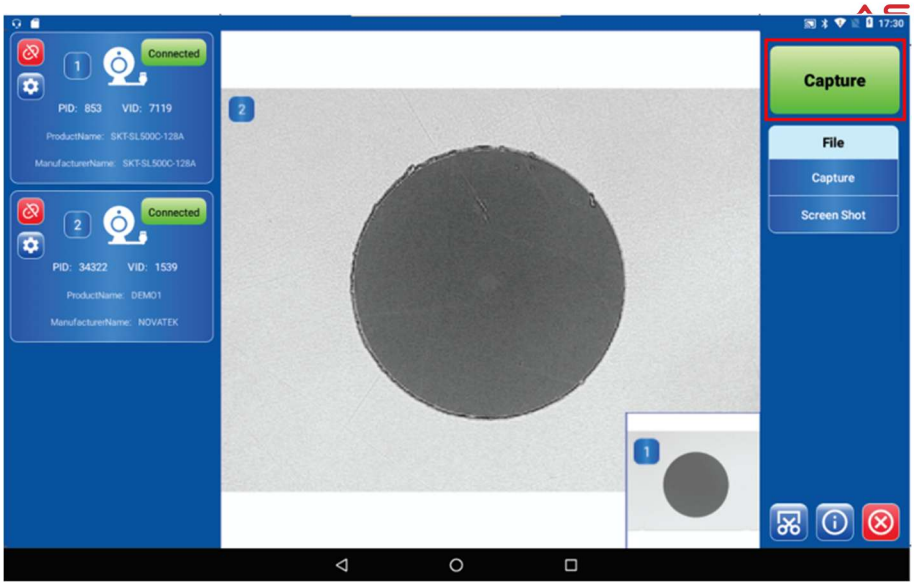


4.14.5 Image Capture Function

To capture end-face content, tap the "Capture" button or the "  " icon to take a screenshot.

- **Capture button:** Captures the live preview content within the view pane.
- "  "**icon:** Captures the entire main window, including all UI elements and status bars.

If two probe devices are currently connected, tapping the "Capture" button will simultaneously save individual images from both probes.

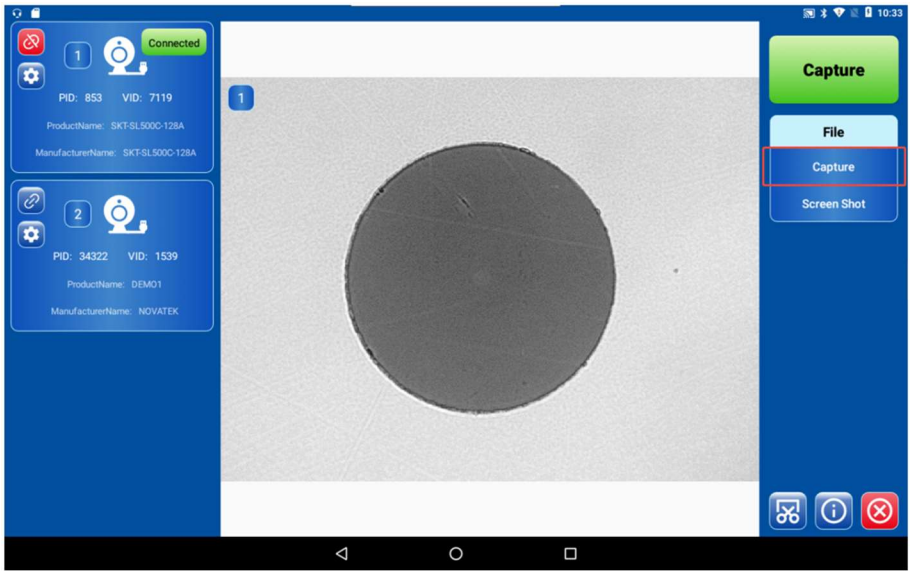


4.14.6 Viewing File

To view the capture file:

In "File", tap "Capture" to open the file window. From there, you can select and view your desired image files.

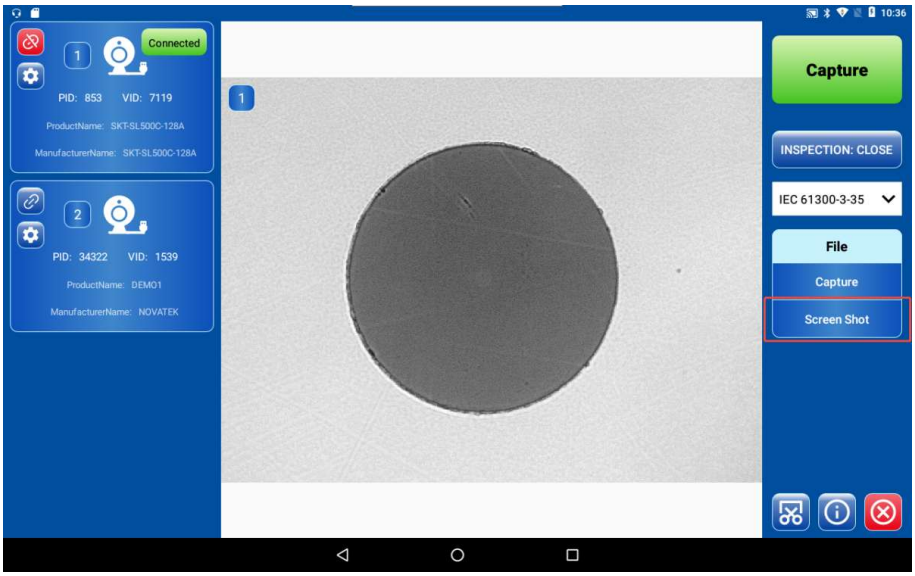
NOTE: This window only displays the "Capture" files from the fiber optic end-face microscope.



To view the screen shot file:

In “File”, tap “Screen Shot” to open the file window. From there, you can select and view your desired image files.

NOTE: This window only displays screenshot files and includes all screenshot files from the device.



4.15 Update

The update include the following two items:

- Program update: Upgrade the application and hardware firmware versions.
- System update: Upgrade the system version.

Update Procedures:

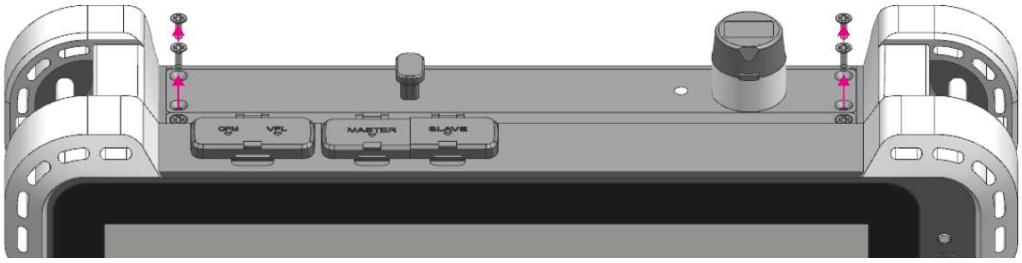
A. Insert USB flash drive containing the update files into the device.

B. In the "Update" menu, select "Program Update" or "System Update ". The system will automatically recognize the update package and proceed with the update.

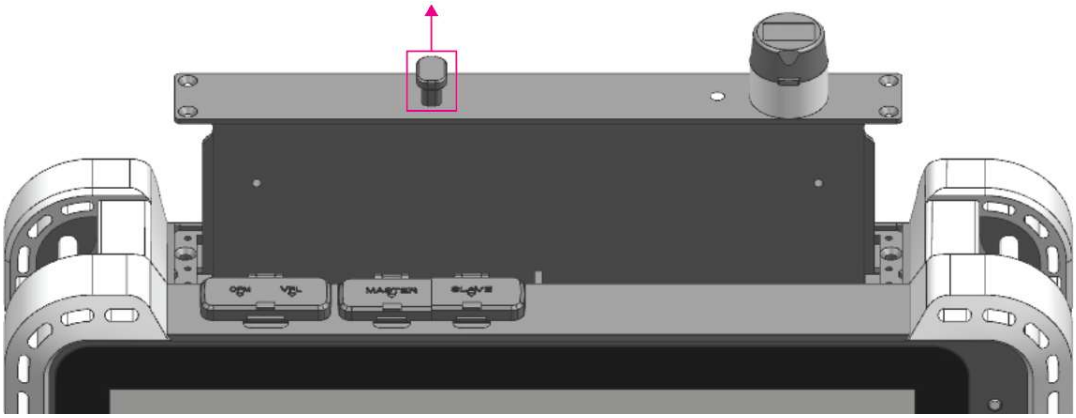
4.16 Installation and Replacement of the OTDR Module

Steps for installing and replacing the OTDR Module：

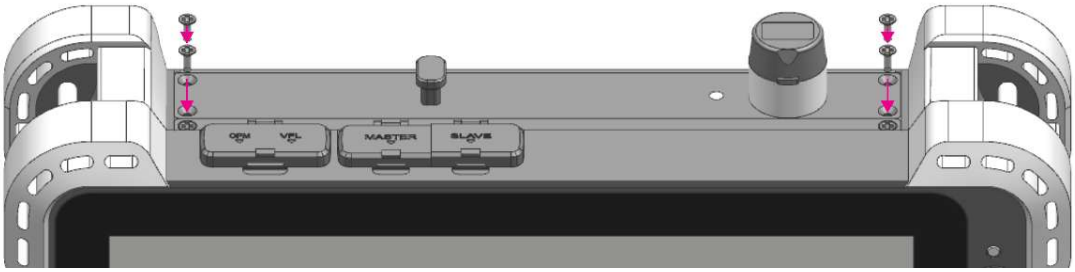
A. Remove the four screws from the top panel.



B. Grip the handle and pull the OTDR module upward.



C. Insert the replaced OTDR module and secure it to the device using screws.



Important
The OTDR module must be inserted or removed while the equipment is powered off. Hot swapping may cause damage to the module, and our company is not responsible for any damage resulting from improper operation.

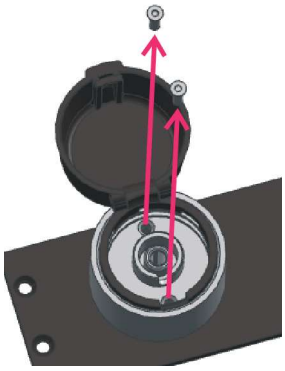
4.17 Installation and Replacement of Interchangeable Flanges

The equipment supports multiple interchangeable flange styles, facilitating quick installation and removal, and ensuring compatibility with various fiber optic connections.

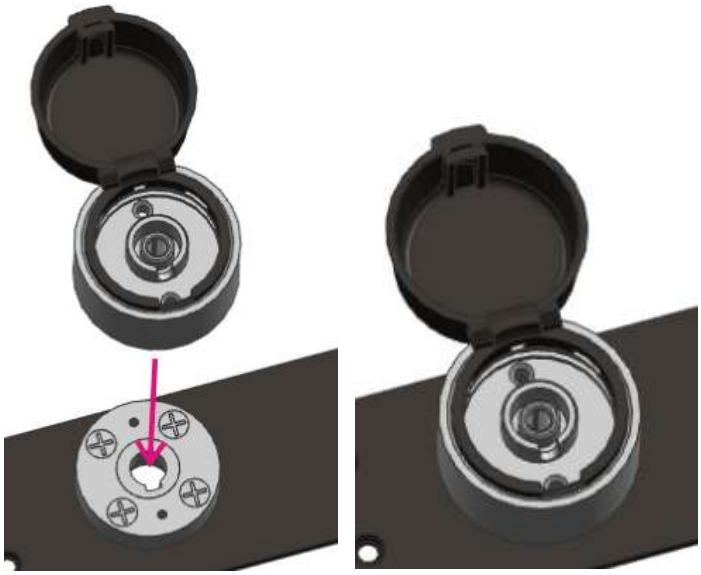
- **Style One**

  Steps for installing and replacing interchangeable flanges：

  A. Remove the screws from the flange head assembly and then pull out the head assembly.



  B. Select the flange head assembly that needs to be replaced with the base.

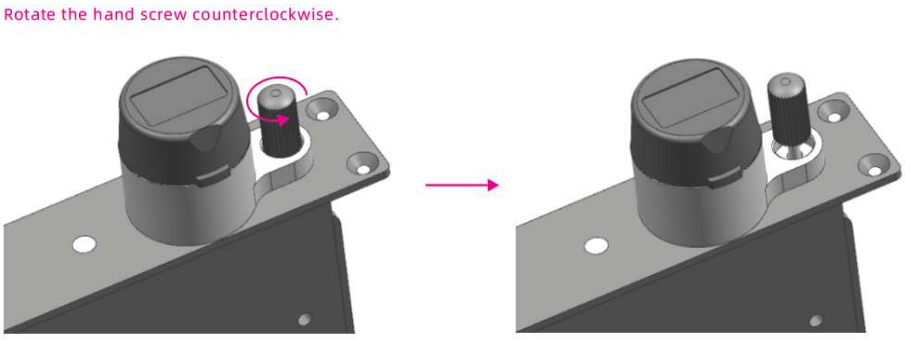


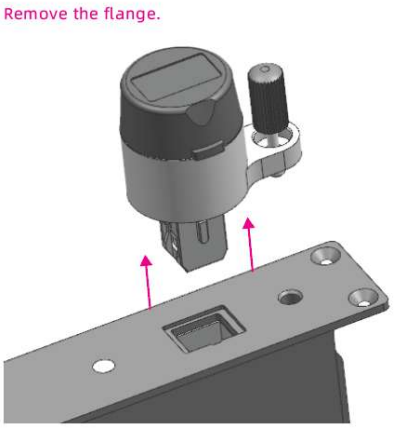
  C. Use screws to secure the flange head assembly to the base.

- **Style Two**

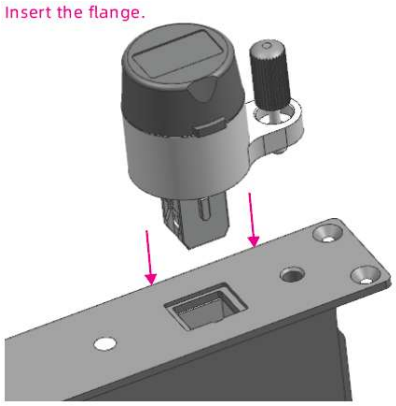
  Steps for installing and replacing interchangeable flanges：

  A. Rotate the hand screw counterclockwise and then pull out the flange.





  B. Select the flange to be replaced and tighten it clockwise.



4.18 Appendix

Default Parameter Threshold Table：

	Wavelength（nm）	Default Threshold
Index of Refractive（dB）	850	1.490000（Adjustable Range：1.000000~2.000000）
	1300	1.467700（Adjustable Range：1.000000~2.000000）
	1310	1.467700（Adjustable Range：1.000000~2.000000）
	1550	1.468325（Adjustable Range：1.000000~2.000000）
	1625	1.468734（Adjustable Range：1.000000~2.000000）
Backscatter（dB）	850	-66.30（Adjustable Range：-76.30~-56.30）
	1300	-73.70（Adjustable Range：-83.70~-63.70）
	1310	-79.60（Adjustable Range：-99.90~-70.00）
	1550	-82.10（Adjustable Range：-99.90~-70.00）

	1625	-84.50（Adjustable Range：-99.90~-70.00）
Connector Loss（dB）		0.050 （Adjustable Range：0.010~5.000）
Fiber End（dB）		5.000 （Adjustable Range：1.000~25.000）
Reflectivity（dB）		-72.0 （Adjustable Range：-78.0~-14.0）
Difference（dB）		0.500 （Adjustable Range：0.000~20.000）

5. Troubleshooting and Maintenance

Problem	Cause	Solution
Unresolved fiber end detected.	Fiber under test is too long.	Ensure the fiber under test is within the maximum measurable range of the OTDR.
The online testing function isn't working normally.	1、The selected model does not support online testing. 2、The set wavelength does not match the wavelength of optical fiber system.	1、Confirm whether the device model supports the online testing function. 2、Select the correct test wavelength (1625nm).
The OTDR dead zone is too large, affecting analysis of short-distance events.	1、Improper pulse width settings result in an enlarged dead zone. 2、The test distance does not match the actual fiber length for optimal performance. 3、Dirty connector or poor connections result in increased event reflectance.	1、Select a narrower pulse width (e.g., 5ns to 100ns) for short-distance testing. 2、Use "Auto OTDR" or " OTDR Pro" adjust the distance range to 1.5 to 2 times the actual fiber length. 3、Clean the fiber end-faces to ensure proper connector mating and alignment.
Abnormal data or test interruption during Smart View testing.	1、Incorrect configuration of Launch or Receive fiber lengths, leading to mismatched event mapping. 2、Manually stopping the test during acquisition resulted in incomplete wavelength data. 3、The splitter ratio setting does	1、Correctly configure the Launch and Receive fiber lengths in the Smart View settings. 2、Do not stop the test manually to ensure full data acquisition for all wavelengths. 3、Select the correct splitter ratio in the "Splitter setting" based on the actual link topology.

	not match the actual link, affecting loss characterization.	
Fiber inspection probe not detected or no video display.	1、The inspection probe is not correctly inserted into the device's USB port, or the connection is unstable. 2、The device's USB port provides insufficient power to drive the probe. 3、The application failed to recognize the probe, or more than two probes are connected simultaneously.	1、Re-insert the probe to ensure a secure connection, or try using a different USB port. 2、Use the original charger to ensure stable power supply and avoid using USB extension cables. 3、Manually click the connection icon in the "Device Connection List" and ensure that no more than two probes are connected at the same time.
RJ45 Tracker or RJ45 Mapper function failed.	1、The network cable testing accessory is not connected t o the host device. 2、The sequencing test was aborted or interrupted by sel ecting a different function du ring the process. Application data anomaly.	1、Keep the accessory connected to the host device while using the cable tracking function. 2、Keep the feature enabled and wait for the test to complete before clicking the "X" icon in the top-right corner to exit. 3、Try restart the device.
Remote control function fails to connect or operation fails.	1、The device and the PC are not on the same network domain or subnet. 2、The firewall or network settings are blocking the VNC port (Default: 5900). 3、The entered IP address, port number, or password is incorrect.	1、Ensure that both the device and the PC are connected to the same network domain. 2、Check the firewall settings to allow traffic through Port 5900, or try using an alternative port. 3、Verify the IP address, port, and password in the device's "Remote Control" interface, and ensure they are entered correctly in the VNC Viewer.

System software update failure resulting in a startup error.	1、USB drive format is incompatible, or the update file is corrupted. 2、The update file version is incompatible with the device hardware. Power failure or USB disconnection occurred during the update process.	1、Use a FAT32-formatted USB drive and contact Technical Support to obtain a complete update package. 2、Confirm the file version compatibility with your hardware. Contact Technical Support if you are unsure. 3、Ensure the device has sufficient power during the update (connecting a charger is recommended). Do not touch the USB drive or the device.
The saved test files cannot be opened or analyzed using the PC analysis software.	1、File Compatibility Issue: The .sor file version generated by the device may be incompatible with the PC analysis software version. Data Corruption: The file may have been corrupted during the saving process.	1、Verify file format compatibility with your PC software and upgrade the device firmware to the latest version if needed. 2、Try re-exporting the test files, or re-running the test to save the data again. 3、Verify that the test files can be opened correctly on the device, then use a different USB drive to re-save them.