Mini OTDR
Installation Instructions

MODELS	
LNT-OTDR-A	Mini OTDR/ Copper Tester (1550/1310nm),5.5" Touch Screen, RJ45 Remote, Carrying Case, Charger, Adapters for OTDR Interface

Installation Instructions

Thank you for purchasing the LYNN Mini OTDR tester. Before using it, please read the manual thoroughly and ensure proper usage.

For safe operation of the OTDR tester, carefully review the "Safety Information" section in the manual.

Keep the manual in a secure place for future reference.

Please retain the S/N label for warranty purposes. Products without an S/N label may incur charges for repair services.

Safety Information:

- The tester should only be used in accordance with local electrical regulations and should not be used in places where electrical use is restricted.
- Use only original accessories to avoid damage to the tester caused by non-certified accessories.
- Accessories are solely intended for use with our testers and should not be used for other purposes.
- To prevent functional deterioration or failure, do not expose the product to moisture.
- Keep dust and liquids away from exposed parts of the tester.
- Avoid rough handling and vibration during transportation and use to prevent damage to components and potential failure.

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- Do not leave the tester unattended while charging. Immediately power off the tester if the battery becomes excessively hot. Charging should not exceed 10 hours.
- Do not connect live cables or devices to tester ports while it is powered on.
- Avoid using the tester in high humidity conditions. Power off immediately if the tester becomes damp and disconnect other connected cables.
- Do not use the tester in environments with flammable gases.
- The tester should not be disassembled, as there are no user-serviceable components inside.
- Avoid using the instrument in environments with strong electromagnetic interference.
- Do not touch the tester with wet hands or expose it to liquids.
- Clean the tester with a dry cloth. For stubborn dirt, use a soft cloth with water or neutral detergent, ensuring the cloth is well wrung out.

1. **Battery Installation**

Note: The tester includes a built-in lithium-ion rechargeable battery. For safety during transportation, the battery cable inside the battery compartment should be disconnected. Before using the instrument, ensure that the battery cables inside the battery compartment are properly connected.

To power on or off the tester, press the power key continuously. Please use the original adapter and connected cable for the device. The battery charging is complete when the battery icon is full, or the charge indicator turns off automatically.

2. **OTDR**

2.1 Summary

The OTDR is an instrument used to analyze the measuring curve of optical fibers, providing insights into uniformity, defects, fractures, joint couplings, and other properties. It measures optical fiber attenuation, connector attenuation, and faults, and displays loss distribution along the fiber length. It is essential for optical fiber construction, maintenance, and monitoring.

2.2 Warnings

- When using the OTDR to measure optical fibers, ensure that no active light exists in the measured optical fiber, except for 1610nm wavelength products. Otherwise, the measurement results may be inaccurate, and the instrument could be permanently damaged.

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- Do not look directly at the optical interface or view it through an optical instrument.
- Avoid direct exposure to the laser outlet when the OTDR is operational.
- After use, always cover the optical outlet of the OTDR with the dust cap.
- Avoid looking directly at disconnected optical fiber terminals. If possible, direct the disconnected terminal towards a non-reflective object.

2.3 Operation Sequence

- Fiber Connection → Parameter Setup → Testing → Tracer Viewing


2.31 Fiber Connection

Connect the fiber to the top optical interface of the OTDR using an SC-PC optical connector. Note: When using the OTDR to measure optical fiber, ensure no active light exists in the measured optical fiber to prevent damage to the instrument.

2.32 Auto OTDR Test

The OTDR defaults to auto mode. Click "OTDR test" or select wavelength, pulse width, and measurement duration in "Quick Setup" to initiate testing. Additional parameter settings are as follows:

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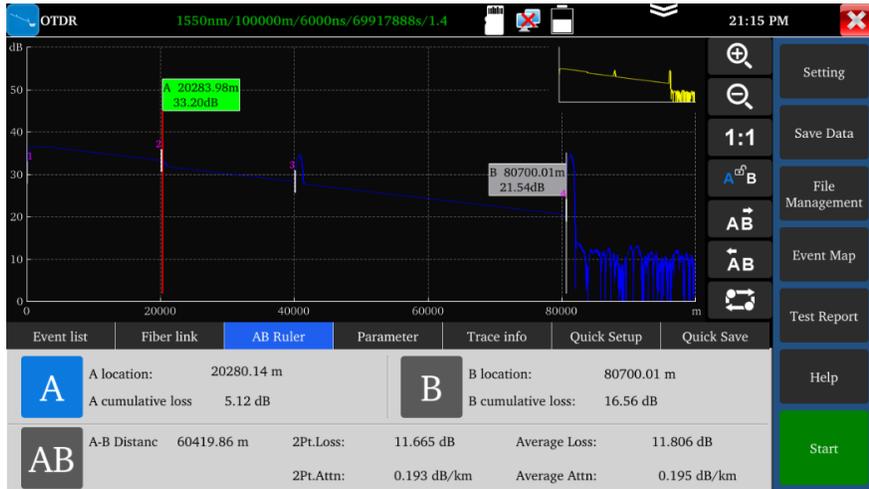
2.33 Expert OTDR Test

Manually select parameters such as range and pulse width for more precise test results. Zoom in on the curve tracer and view detailed event maps. Quick tests can configure parameters like laser wavelength, distance range, pulse width, and measurement duration.
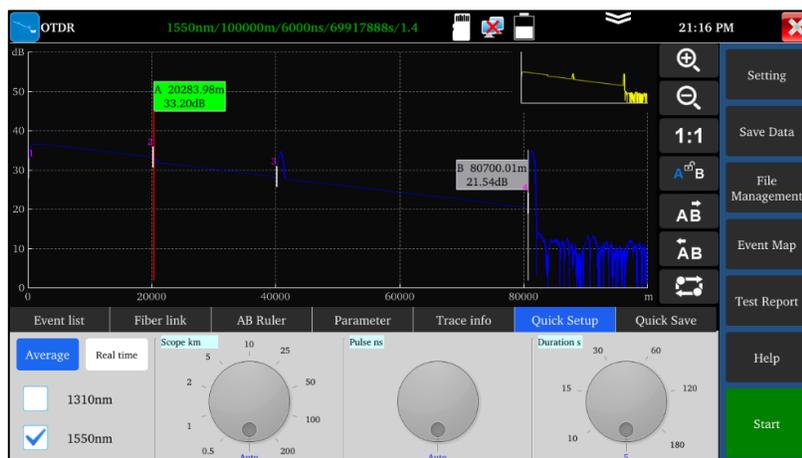
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2.34 Parameter Settings

1. **Quick Setup**
   Quickly sets parameters such as laser wavelength, distance range, pulse width, and measurement duration. Adjust these parameters during testing if necessary.

2. **Parameter Setting**

   - **Laser Wavelength:** User-selectable options include 1310nm, 1550nm, and 1610nm for single mode fiber. Up to two wavelengths can be simultaneously selected for measurement and analysis, but only under average measurement mode.
   - **Distance Range:** Options include "auto, 500m, 1Km, 2Km, 5Km, 10Km, 25Km, 50Km, 100Km, and 200Km". Use automatic range for uncertain lengths; for known lengths, choose a range approximately 1.5 times the minimum length.
   - **Measurement Duration:** Options range from 5s to 180s. Note: In real-time measurement mode, the selected duration does not affect measurement.
   - **Pulse Width:** Select from various options including "auto, 5ns, 10ns, 20ns, 30ns, 50ns, 80ns, 160ns, 300ns, 500ns, 800ns, 1000ns, 2000ns, 4000ns, 6000ns, 10000ns, 20000ns".
   - **Measurement Mode:** Choose between "average measurement" and "real-time measurement". Duration settings do not affect measurements in real-time mode.
   - **Refractivity (IOR):** Default value is 1.4685 and should not be altered without proper knowledge, as it affects length calculations.
   - **Unit:** Select measurement units as "meters (m)" or "feet (ft)".
   - **Reflection Threshold:** Automatically set; no user adjustments provided.
   - **Non-reflection Threshold:** User-adjustable within a range of 0.01 to 2.99, with an auto default when set to 0.00.
   - **End Threshold:** Used to determine event points for data processing. User-selectable within a range of 1 to 19.99dB, with a default of 5.00dB.
   - **Optical Fiber Warning:** Options "ON" or "OFF". When "ON", alarms if optical signals are detected in the fiber during testing.
   - **Default Setting Recovery:** Resets parameters to defaults: auto for distance, auto for pulse width, 5s for measurement duration, 1550nm for wavelength, average mode for measurement mode, meters for unit, 1.4685 for refractivity, auto for back scattering coefficient, auto for reflection threshold, auto for non-reflection threshold, 5.00dB for end threshold. Click "Save" after configuration.
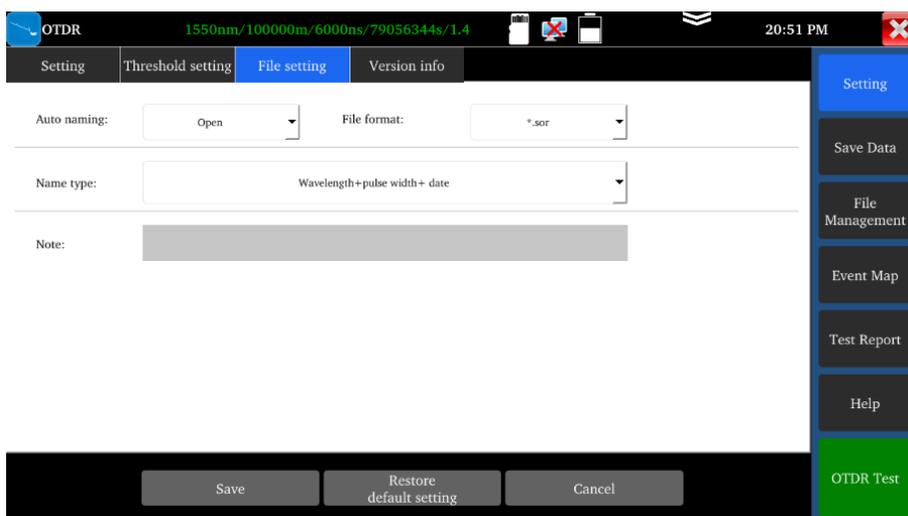
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3. **Threshold Setting**

- In the Event Map, set thresholds for evaluating fusion and connector points:

  - **Total Loss:** Fiber link loss, range 0-60dB.
  - **Reflection Loss (Connector):** Loss at connectors, range 0-60dB.
  - **Non-reflection Loss (Fusion Point):** Loss at fusion or bend points, range 0-60dB.
  - **Link Attenuation Coefficient:** Attenuation coefficient at different wavelengths, range 0-60dB.

4. **File Setting**

  - **Auto Naming:** Options "Open" or "Close". Enables automatic file naming when "ON".
  - **File Format:** Select between "otdr" and "sor" formats.
  - **Name Type:** Specify automatic naming conventions including wavelength, pulse width, date, range, and comments.

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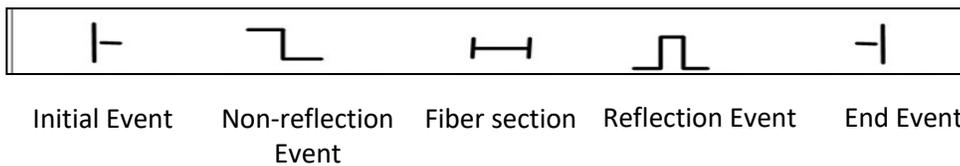## Installation Instructions

2.35 Trace Tool

- To initiate testing after configuring and saving parameters, click "Start." The interface will display the selected wavelength, distance range, pulse width, measurement duration, and refractivity. Upon completion of testing, a trace will be generated. Click "Stop" to conclude the testing process.
- **Trace Definition:** Following the initial measurement, the trace presents the reflection power diagram in relation to distance. This graphical representation illustrates measurement results. The vertical axis indicates power, while the horizontal axis represents distance. Event points are denoted with red symbols.
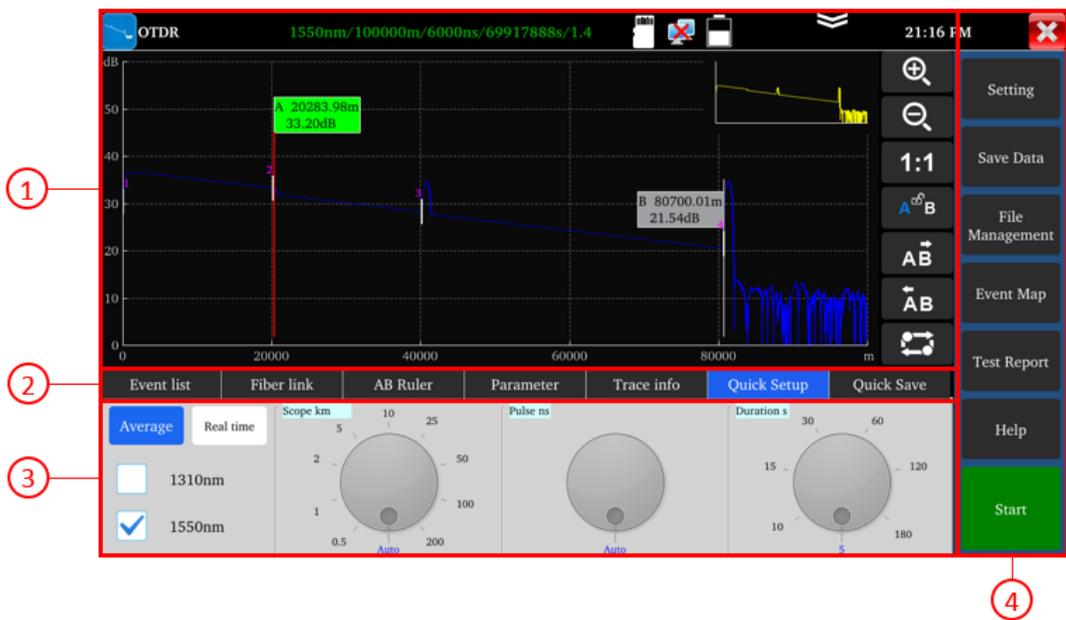
Trace Area ② Trace Operation Buttons Area ③ Information Area ④ Menu Buttons Area

2.36 Event Categories Guide

- Events in optical fibers highlight abnormal occurrences causing loss or sudden changes in reflection power beyond standard fiber scattering. These events encompass various connections, bends, flaws, or fractures within the optical fiber link.
- Event points on the screen denote these anomalies, leading to deviations in the trace and are categorized with distinct symbols. Events include "reflection events" and "non-reflection events."

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

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- **Initial Event:** The "initial event" on the OTDR trace marks the starting point of the optical fiber. By default, it appears at the first event, typically the initial connector of the OTDR, in the tested optical fiber. This event is classified as a reflection event.
- **End Event:** The "end event" marks the termination of the optical fiber on the OTDR trace. By default, it appears at the final event of the tested optical fiber, usually the end or fracture point. This event is commonly a reflection event.
- **Reflection Event:** When optical pulse energy reflects, such as at connectors, it triggers a reflection event. On the trace, these events manifest as peak signals.
- **Non-reflection Event:** Non-reflection events cause loss across the entire optical fiber transmission link without light reflection. These events appear on the curve as drops in optical power.

- **Event Inspection:** The OTDR transmits optical pulses into the optical fiber under inspection. It immediately receives and calculates the returned optical signal to determine the event's distance within the optical fiber. Greater distances result in longer return times. The distance is calculated based on the reception time of the event.
- By inspecting the curve of the reflected signal, the optical transmission characteristics of the optical fiber, connectors, and joints can be verified.

### 2.37 Info Window Area Instructions

- The info window displays essential contents such as measurement parameters, event lists, scale plate A/B, and analytical parameters.
- **Event List Data:** Displayed data includes serial number, category, position, plug-in loss, attenuation coefficient, echo loss, and accumulate loss. "Serial number" indicates the nth event currently displayed on the trace graph. "Category" specifies the event type. "Position" denotes the distance from the optical fiber's initial point to the event point. "Plug-in loss" quantifies the event's insertion loss. "Attenuation coefficient" details the fiber's attenuation properties from the last event to the current one. "Echo loss" indicates the event point's reflection value. "Accumulate loss" sums up the fiber loss from the initial point to the current event.
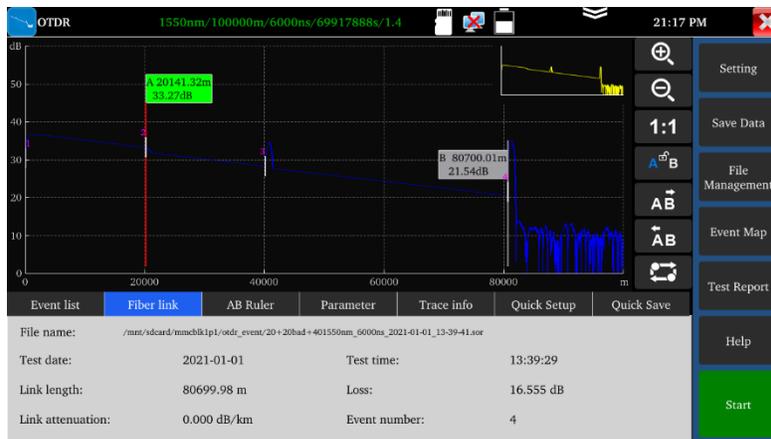
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- The event list differentiates between event point data and event section data. Event categories include: initial event, optical fiber section, reflection event, non-reflection event, and end event. Corresponding visuals of event categories are depicted accordingly.
- To review the event list information, tap the "event" icon on the touch screen to access the info window.
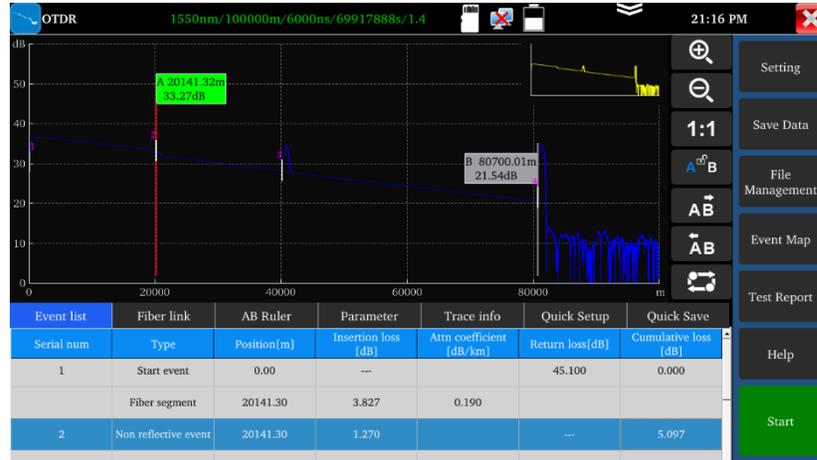
- **Optical Fiber Link Information**: Information regarding the optical fiber link includes the file name, measurement date, measurement time, link length, link loss, link attenuation coefficient, and quantity of events. Definitions and settings for the file name, measurement duration, and measurement date are accessible from the "Set" menu. To review the optical fiber link information, navigate to "Fiber Link" on the touch screen interface, where details can be accessed in the info window. The contents of this information are illustrated in the accompanying image.

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- **Scale Plate Information**: The scale plate information comprises details such as the position of points A or B, plug-in loss at points A or B, backscattering coefficient at points A or B, accumulated loss at points A or B, distance of the A-B section, loss between the two points of the A-B section, attenuation coefficient between the two points of the A-B section, and LSA (local specific attenuation) coefficient of the A-B section. Signposts are utilized to mark and analyze single events, curve sections, and distances. Information from signposts includes distance, loss, and attenuation coefficient between them. Adjusting any signpost updates its recorded values accordingly. To access scale plate information, select the "Scale Plate" icon via the touch screen interface to view details in the info window. The contents of this information are depicted in the accompanying image.

Measurement Parameters and Settings

Measurement parameters include laser wavelength, distance scope, pulse width, refractivity, back scattering coefficient, reflection threshold, bundling threshold, non-reflection threshold, and duration of measurement. Definitions and settings for these parameters can be found in the "Settings" menu. To view fiber link information, click on "Fiber Link." The fiber link details are displayed in the image below.

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2.38 Trace Zoom

Touch Screen Zoom Instructions

- Use two fingers to zoom, with the center point between them as the zoom center.
- When the angle between your fingers is less than 45 degrees horizontally, zoom horizontally.
- When the angle is more than 45 degrees horizontally, zoom vertically.
- Double-tap the top right thumbnail to restore the trace to its original state.

Trace Movement

- Press and drag the trace to move it horizontally or vertically.

Trace Operation Button Instructions

Horizontal Amplification: Tap the button on the touch screen to enlarge the curve horizontally.

Horizontal Reduction: Tap the button on the touch screen to reduce the curve horizontally.

1:1 Restore: Restore the scaled curve to its original 1:1 ratio.

After tapping the button on the touch screen, use the left and right arrow keys for further adjustments.

After tapping the button on the touch screen, use the left and right arrow keys to move the B pole.

When in this state, the left and right arrow keys can move both the A and B poles simultaneously.

To move the marker left, press the screen button; the selected A/B pole will move left.

To move the marker right, press the screen button; the selected A/B pole will move right.

Track Switching: This button is effective only when multiple curve tracks are open. After tapping the button on the touch screen, you can switch between different curves.

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2.39 Data Saving

- Click "Quick Save" to automatically name and save the file according to the naming type set in "Settings-file setting."
- Click the "Save Data" icon to choose the path for saving the file and modify the file name.
- You can choose the file format (PDF or .SOR) in "Settings-file setting."
- By default, files are saved in the internal SD card under the OTDR directory.

2.40 Data Import

- In File Management, select the file to be opened, and click "Open" at the bottom to import the curve file.
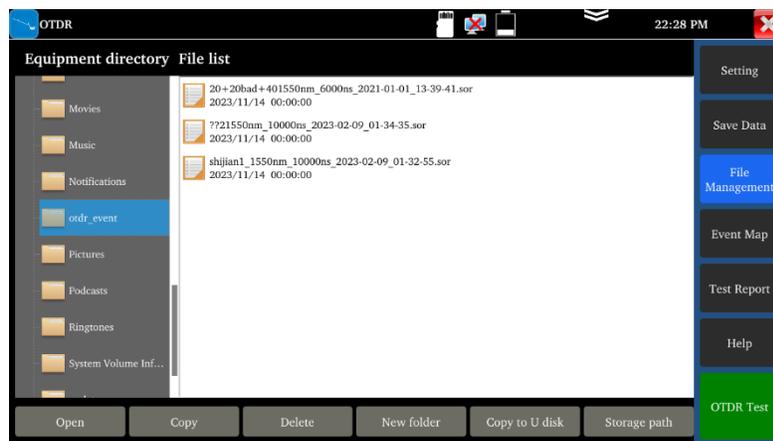

2.41 File Management

- **Open:** Open the selected curve file. Up to 4 traces can be selected simultaneously on the main page.
- **Rename:** Rename the selected file or folder.
- **Copy:** Copy the selected file or folder to an external or internal SD card.
- **Delete:** Delete the selected file or folder.
- **New Folder:** Create a new folder in the selected directory of "Equipment Directory." This new folder will be the default storage path.
- **Storage Path:** Set or view the current storage curve path.

2.42 Analysis of "Multi-traces Setting"

Click on trace 1/2/3/4 in "Multi-traces Setting" to display up to 4 traces simultaneously. Different colors are used to distinguish the opened traces.
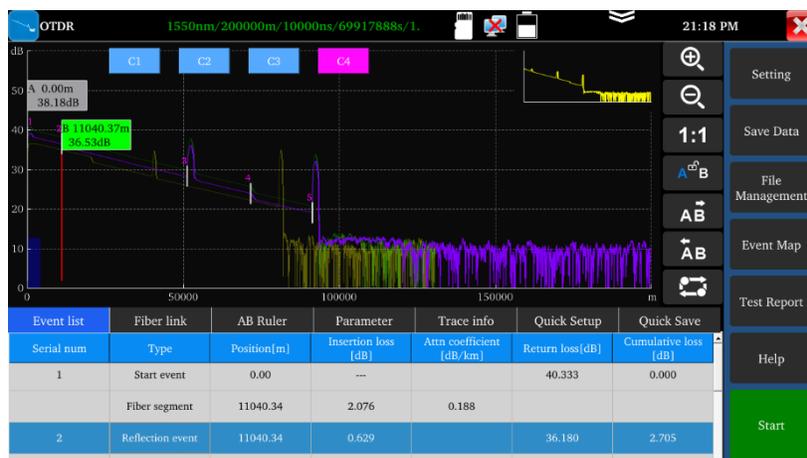
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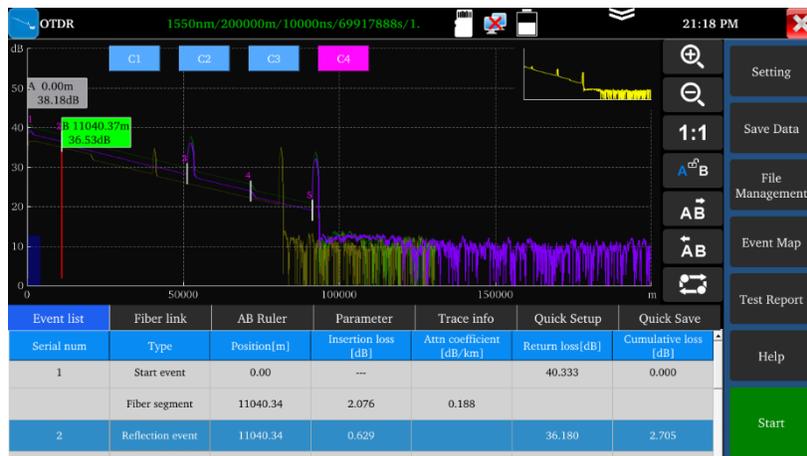
2.43 Instruction for "Trace 1/2/3/4" Button

Button icons in the trace operation area apply to all opened traces simultaneously. You can switch the current trace using the trace switching button or by directly clicking "C 1" (or "C 2", "C 3", "C 4"). The info window displays data for the current trace. Alternatively, click C1/C2/C3/C4 in the upper left corner to switch traces.

After scaling, switching between traces of different ranges will automatically restore the view to 1:1. Switching between traces of the same range will retain the current scaling. Click "delete" to remove a trace.

2.44 Event Map

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

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Initial Event: The starting point of the link.

Reflection Event: Connector, shown as a peak signal.

Non-reflection Event: Fusion point or optical fiber bending, shown as a drop in optical power.

End Event:

Normal end: The terminal of the fiber, shown with a reflection peak.

Fracture: Optical fiber bending, shown with a non-reflection peak.

2.45 Test Report

You can save trace trajectories, events, parameters, optical fiber links, rules lists, and other information. Up to 4 traces can be saved simultaneously, and a test report can be created in EXCEL or PDF format.

3. Loss Test

To set the reference value, use short standard jumpers to connect the OTDR and LS ports of the instrument.

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After setting the reference value, connect the optical device to the OTDR and LS interfaces on the instrument to test the insertion loss of optical passive devices. Click "Loss Test" under optical fiber tests to enter the interface.

Calibration:

1. Connect the standard jumper to the meter's OTDR and LS ports.
2. Click "Start." After the power stabilizes, click "Set Parameter."
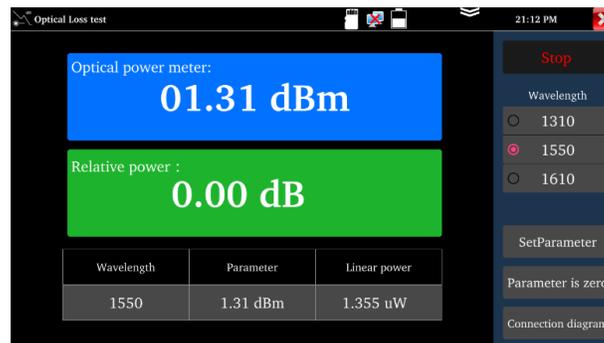
After setting the reference, connect the tested optical device to the meter's OTDR and LS ports and click "Start." The relative power displayed on the interface will be the insertion loss value of the tested device.

For accurate results, calibrate before each test.

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4. Laser Source

The laser source outputs stable power laser with the same wavelength as the OTDR function. It is useful for the engineering and maintenance of optical fiber communication and CATV, fiber parameter setting, and the production and research of optical components.


- **Open/Off:** Turn the laser source on or off.
- **Wavelength:** Options are 1310/1550/1610 nm, matching the OTDR module.
- **Mode:** Switch the frequency of the laser source among CW, 270Hz, 330Hz, 1000Hz, and 20000Hz.
- **Power:** Adjust the power using the slider; the range is 1-100.
- **WARNING:** Do not look directly at the laser to avoid eye damage.
- **Stability:** CW, ±0.2dB/15min (tested after 15 minutes of turning on the laser source).

5. Optical Power Meter

Click the ⬚ icon to enter the optical power meter interface, which supports five wavelengths: 1625nm, 1550nm, 1490nm, 1310nm, 1300nm, and 850nm. It displays linear or nonlinear optical power and is used for optical power testing and relative measurement of fiber link loss. It is an essential tool for the installation and maintenance of optical fiber communication, cable television, and CCTV security systems.

Note: Keep the fiber connector and the dust cap clean and use special alcohol to clean the detector.
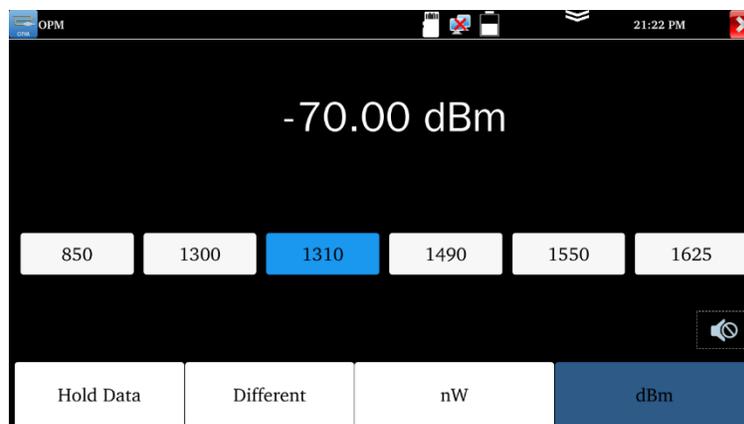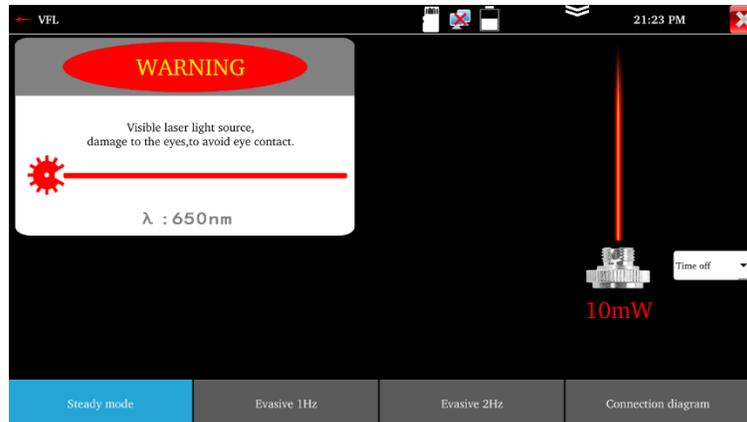
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6. Visual Fault Locator

Click the [icon] icon to enter the Visual Fault Locator (VFL) interface.

You can select from four VFL modes: "Steady Mode," "Evasive 1Hz," "Evasive 2Hz," and "Time Off."

- **Steady Mode:** Click the "Steady Mode" button to activate a steady red laser source. Click it again to exit.
- **Evasive 1Hz / Evasive 2Hz:** Click these buttons to enter the corresponding pulse modes.
- **Time Off:** Click this button to turn off the VFL. You can set a timed turn-off (5 mins, 10 mins, 30 mins, 60 mins, or 120 mins).

7. UTP Cable Test

1. Connect the LAN cable or telephone cable to the UTP port of the tester.
2. Connect the other end to the UTP port of the remote.
3. Enter the cable test app to test the cable's continuity and sequence.

Continuity Detection of the RJ45 Cable

1. Connect one end of the cable to the tester's UTP port to test the continuity of the RJ45 cable plug.
2. If the tester shows "√" for pins 1-8, the RJ45 cable plug is normal.
3. If it shows "x," it indicates that the core of the port is disconnected. (Note: The cable should be within 1 meter from the port.)

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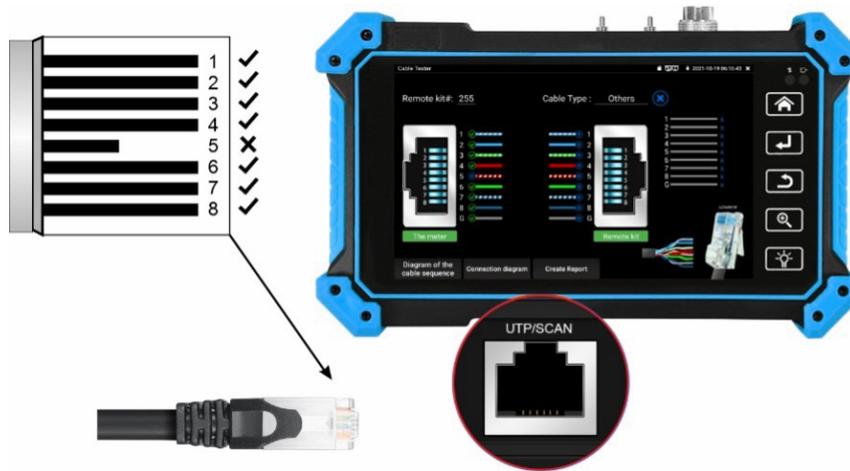
8. RJ45 Cable TDR Test

1. Connect the cable to the LAN port of the tester.
2. Connect or disconnect the other end from any device.
3. Enter the "RJ45 Cable TDR Test" app to test the cable's length. Ensure no device is connected for accurate measurement. The maximum measurement length is 600 meters.

line pair	status	length (m)
1 2	open	182.3
3 6	open	184.2
4 5	open	185.9
7 8	open	182.1

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9. Specifications

OTDR Technical Specifications					
Wavelength (nm) **Optional ***	1550	1310/1550	1550	1310/1550	1610
Dynamic range(dB)² **Optional***	24	28/26	24	28/26	28
Pulse width (ns)	5,10,20,30,50,80,160,300,500,800,1000,2000,4000,6000,10000,20000				
Testing range	≤100 Km				
Event blind zone (m)³	≤0.8m				
Attenuation blind zone (m)³	≤3m				
Linearity (dB/dB)	±0.05 dB/ dB				
Loss threshold (dB)	0.05				
Loss resolution ratio (dB)	0.01				
Minimum distance resolution	0.03				
Sampling point(K)	32-128				
Distance uncertainty (m)	$\pm(1\,m + 5\times10^{-5}\times$ distance + sampling interval)				
Distance scope (km)	0.1,0.5,1,2.5,10,25,60,120,180,260				
Typical real-time refreshing duration	1s				
File format	SOR standard format/PDF/EXCEL				
Measurement duration	5sec, 10sec, 15sec, 30sec, 1min, 2min, and 3min are selectable				
Storage	FLASH (EMMC)8G + TF card				
Interface type	SC-PC				
Remarks: 1. The technical specification describes the ensured performance of the instrument when using typical PC model connector to measure, without considering the uncertainty caused by optical fiber refractivity. 2. Dynamic range is the data measured under the condition of the maximum pulse width and 3 minutes of average time. Dynamic range is the data measured under the condition of 200km/20000ns/3min. 3. Measuring conditions of blind zone: reflection event is within 5Km, reflection strength is 45dB. Measured by the minimum pulse width.					

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Specification		
Size	5.55 inch screen display	
Network Port	10/100/1000M auto adapt (optional)	
RJ45 cable TDR test	Test cable's length, Max testing up to 600 meter(optional)	
Power output	5V 1A power output	
UTP cable test	Test UTP cable connection status and display on the screen. Read the number on the screen. detect the near-end, mid-end and far-end fault point of RJ45 cable connector, also can test shield cable	
Network test	IP Scan, PPPOE, port flashing, Ping test(optional)	
Electroscope*(optional)	Voltage range	AC12-1000V
	Frequency	50/60Hz
	Alarm type	Sounds and light double alarms
	Level	CAT.III 1000V / CAT.IV 600V;CE
Visual fault locator	10mW visual fault locator with 650nm wavelength, emit red laser sources to test multi-mode and single mode fiber's bending and breakage, test range 8KM	
Optical power meter	Wavelength:1625,1550nm,1490nm,1310nm,1300nm,850nm, measurement range ,-70 ～ +6 dBm, for optical power testing and Fiber link loss relative measurement	
Power		
External power supply	Type-c 5V （2A)	
Battery	Built-in 3.7V 4000mA Li-ion Battery	
Rechargeable	After charging 3.5 hours, normal working time 5 hours	
Parameter		
Operation setting	Capacitive touch screen, English, Simplified Chinese, traditional Chinese	
Auto off	5-30 (mins)	
Working environment		
Working Temperature	-10℃---+50℃	
Working Humidity	30%-90%	
Dimension/Weight	183mm x 110mm x 36.5mm / 0.45Kg	