

## RAINLEOTI NF-9816

# RAINLEOTI OTDR Fiber Optic Tester NF-9816 User Manual

Model: NF-9816 | Brand: RAINLEOTI

## 1. INTRODUCTION

The RAINLEOTI NF-9816 is an intelligent and versatile 16-in-1 multi-function fiber optic tester designed for comprehensive optical cable installation, engineering acceptance, and on-site repairs. This device integrates various testing capabilities, including OTDR, Optical Power Meter (OPM), Visual Fault Locator (VFL), Light Source (LS), Optical Loss Test (OLS), Event Map, End State Check, RJ45 Cable Testing, and more, providing a user-friendly interface with both touch screen and button controls.

## 2. KEY FEATURES

- **16-in-1 Multi-Functionality:** Includes Expert OTDR, Automatic OTDR, 10G Split-Wave OPM, Optical Power Meter, Event Map, End State Check, RJ45 Hunting/Sequence/Cable Length, Multi-Core Test, Wastage Test, Stabilized Light Source, Red Light Source, LED Light, End Surface Detection, and Lithium Battery Charging.
- **OTDR Fiber Optic Testing:** Supports automatic and expert modes with 1310/1550nm wavelengths, 28dB/26dB dynamic range, and up to 80km test distance. Features one-touch testing for quick setup.
- **Integrated Optical Test Functions:** OPM calibrated for 850/1270/1300/1310/1490/1550/1577/1625nm (-50~+26dBm), VFL (650nm, 10KM range), LS (CW, 270Hz, 1kHz, 2kHz modes), and OLS (650nm, 10KM range).
- **RJ45 Cable Tester:** Equipped with a line-finding receiver for RJ45 line-finding, length measurement, and sequencing functions. Checks cable pair status and length according to T568A/T568B standards.
- **Advanced Analysis:** Event Map for automated fiber link testing, Endface Inspection for contamination/damage detection, and End State Verification for non-invasive terminal connection checks and link loss diagnostics.

- **Durable Design:** Built-in 4000mAh, 3.7V lithium polymer battery for over 12 hours of active use, Type-C charging, and a robust design for field use.

### 3. WHAT'S IN THE BOX

The RAINLEOTI NF-9816 package includes the following items:

- OTDR Fiber Optic Tester Unit (Host)
- Wire Tracker Receiver
- Type-C Charging Cable
- Charging Head (Power Adapter)
- RJ45 Network Cable
- 8G Memory Card and Card Reader
- Cotton Swabs for cleaning
- Various Fiber Optic Adapters (FC, SC, ST, LC, SC/UPC-SC/APC)
- Fiber Optic Jumper Cable (APC to UPC)
- Certificate
- Note Card
- Toolkit
- Instruction Manual
- Packaging Box

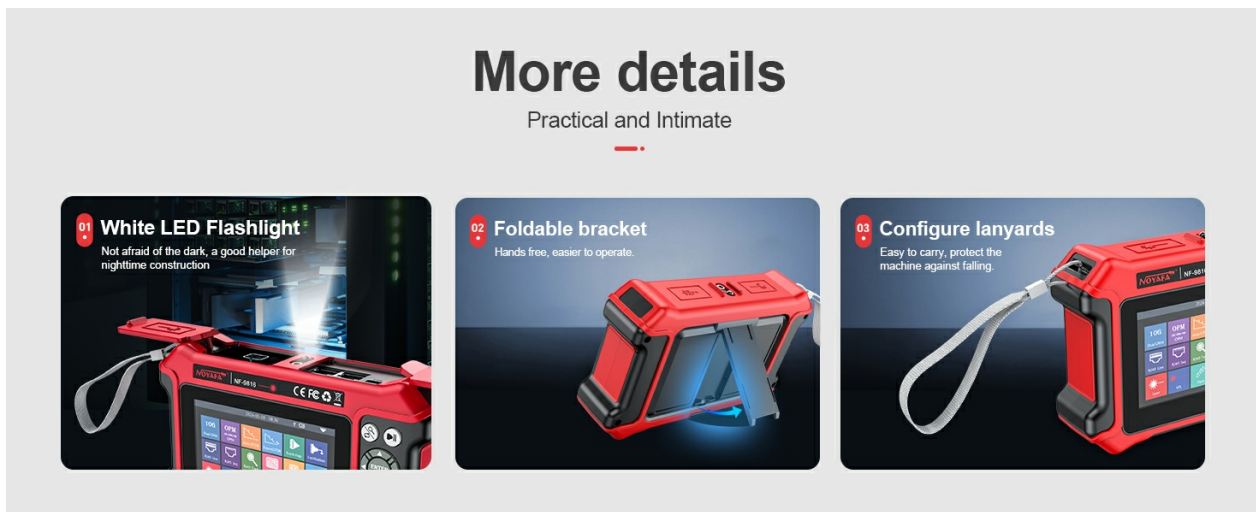


Figure 1: Contents of the RAINLEOTI NF-9816 package.

### 4. SETUP

#### 4.1. Charging the Device

The NF-9816 is equipped with a built-in 4000mAh, 3.7V lithium polymer battery. To charge, connect the provided Type-C charging cable to the device's Type-C port and a power source using the charging head. The device supports Type-C charging for various power supply needs.

# Filter technology with light test

# 1550 nm

High isolation filtering technology, with light testing.  
Does not cause optical device damage

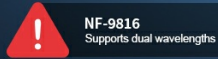


Figure 2: The device features a 4000mAh battery and Type-C charging.

## 4.2. Connecting Fiber Optic Cables

The tester is compatible with almost all connectors on the market. It includes FC/SC connectors directly on the unit. For other connector types (ST, LC), use the provided adapters.

# Excellent Integration

Compatible with almost all connectors on the market.

### Only Include FC/SC Connectors

#### Convenience & Time Saving

Don't need to switch devices or spend time searching for the right connector adapters.

#### Cost-Effective Solution

No need to buy a separate tester for each connector type (SC, FC, LC, MTP/MPO, etc.).

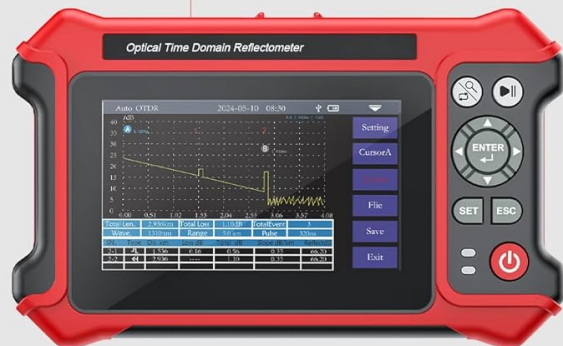
#### Enhanced Field Support

Field technicians and service providers can rely on the tester's adaptability to simplify their toolkit across various environments.

#### Ease of Integration

The tester's adaptability makes it ideal for integrating into any network infrastructure, whether upgrading or maintaining legacy systems.

#### Enhanced Flexibility for Network Upgrades and Repairs



FC



SC



ST



LC



SC/UPC-SC/APC

Figure 3: The device supports various fiber optic connectors including FC, SC, ST, LC, and SC/UPC-SC/APC.

### 4.3. RJ45 Cable Connection

For RJ45 cable testing, connect one end of the network cable to the RJ45 port on the tester and the other end to the line-finding receiver or the remote kit for length and sequence tests.

## 5. OPERATING INSTRUCTIONS

The NF-9816 features a 4.3-inch multi-touch capacitive screen and button combination design for easy operation.



Figure 4: The main interface of the RAINLEOTI NF-9816, showing various function icons.

### 5.1. OTDR Fiber Optic Testing

The device supports two OTDR modes: Automatic OTDR and Expert OTDR. The OTDR offers wavelengths of 1310/1550nm with a dynamic range of 28dB/26dB and a maximum test distance of 80 kilometers. Power values for both wavelengths are displayed on the same screen.

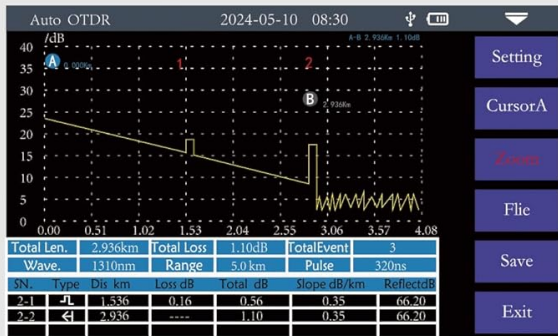
- **Automatic OTDR:** Simply set the measurement wavelength and test duration; the instrument will automatically select other parameters and complete the test.
- **Expert OTDR:** Requires setting parameters such as measurement wavelength, test range, and pulse width. In expert mode, you can select 'Real-time Test' or 'Auto Test' based on your needs.

**Note: Do not perform live testing with off-line wavelengths!**

### Automatic OTDR

◆ Simply set the measurement wavelength and test duration; the instrument will automatically select the other parameters and complete the test.

**Note: Do not perform live testing with off-line wavelengths!**

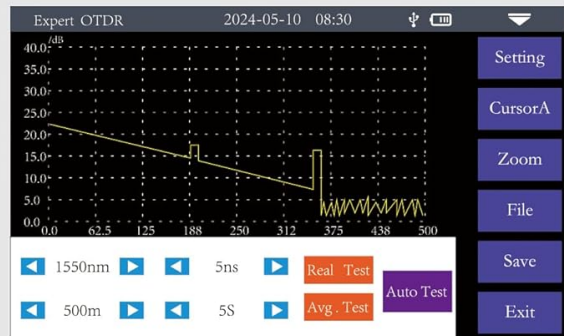


### Expert OTDR

◆ Requires setting parameters such as measurement wavelength, test range, and pulse width.

◆ In expert mode, you can select "Real-time Test," "Averaging Test," or "Auto Test" based on the customer's actual needs.

**Note: Do not perform live testing with off-line wavelengths!**



### Expert ODTR - Parameter Settings

◆ Configurable Parameters: Test Wavelength / Test Range / Test Time / Event Loss Threshold / Emission Threshold / End Threshold / Units.



- Event Loss Threshold: 0.2dB ~ 30dB, default set to 0.25dB.
- Reflection Threshold: 10dB ~ 60dB, default set to 40dB.
- End Threshold: 1dB ~ 30dB, default set to 10dB.
- Units: Select the desired unit, km / kft / mi.

Figure 5: Screenshots illustrating the Automatic OTDR and Expert OTDR modes with parameter settings.

## 5.2. OPM/VFL/LS/OLS Functions

This tool integrates essential fiber optic tests:

- **OPM (Optical Power Meter):** Calibrated for 850/1270/1300/1310/1490/1550/1577/1625nm wavelengths with a range of -50~+26dBm.
- **VFL (Visual Fault Locator):** 650nm wavelength, max range 10KM. Injects visible red light into the fiber to observe leakage points and locate fiber faults.
- **LS (Light Source):** Modes include CW, 270Hz, 1kHz, 2kHz. Provides stable optical power output.
- **OLS (Optical Loss Test):** Used for testing optical passive loss at 650nm, max range 10KM.

**Warning: Avoid direct eye contact with the laser output; the laser can cause eye damage!**

## 10G Split-Wave OPM

- The split-wave optical power meter is primarily used for the service activation, installation, and maintenance of 10G EPON/XGPON FTTx networks.
- It not only has the basic functions of a general optical power meter but also features dedicated measurement for downstream 1490nm and 1577nm wavelengths specifically designed for 10G EPON/XGPON. The power values for both wavelengths are displayed on the same screen, allowing real-time monitoring of the power values of individual wavelength optical signals on the line and accurate assessment of whether the optical power meets the standards.
- Reference: Set the current power as the reference power.
- Calibration: Enter the calibration mode.
- Zeroing: Reset the reference power to zero.

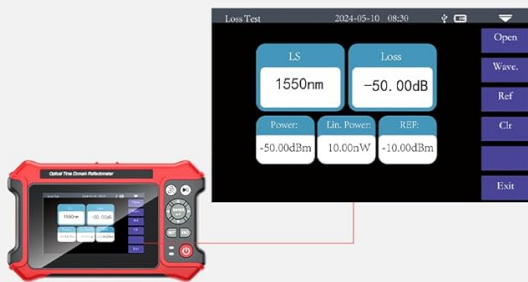


## Multi-Core Testing

- Step 1: When testing a multi-core optical cable, create a new project—Project Name—Number of Fibers (set according to the number of fibers in the cable being tested)—Press Enter to confirm—Create Project.
- Step 2: Open the project—Select the project name—Open the project—Select the corresponding test sequence for individual tests—You can page up/down for tests/replacements/viewing.
- Step 3: Once a fiber's test is completed, the corresponding icon turns green.

## OPM

- Used for signal power testing of various devices and optoelectronic components, as well as insertion loss testing.
- Wavelength: Switch the testing wavelength of the optical power meter.
- Reference: Set the current power as the reference power.
- Calibration: Enter the calibration mode.
- Threshold: Set the power measurement threshold values exceeding the threshold are highlighted in red, while values below the threshold are shown in green.



## Loss

- Both the light source and optical power are displayed simultaneously, making it easier to test the insertion loss, isolation, and return loss of passive optical components.

Figure 6: Display of OPM, Multi-Core Testing, and Optical Loss Test functions.

## Stable Light Source

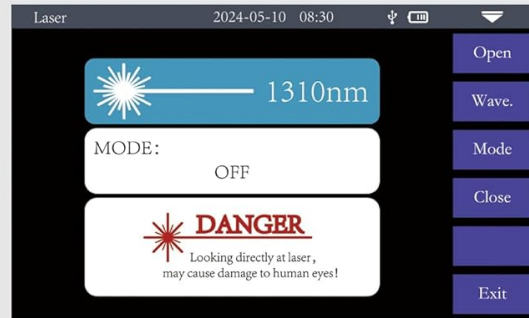
●The stable light source uses the same wavelength laser as the OTDR function and is used for telecom, CATV, and LAN fiber cable parameter testing; insertion loss, isolation, and return loss testing for optical passive components; and testing the wavelength response of detectors.

The light source has five working modes: CW, 270Hz, 330Hz, 1kHz, and 2kHz.

Open: Turn on the light source.

Wavelength: Switch the light source wavelength.

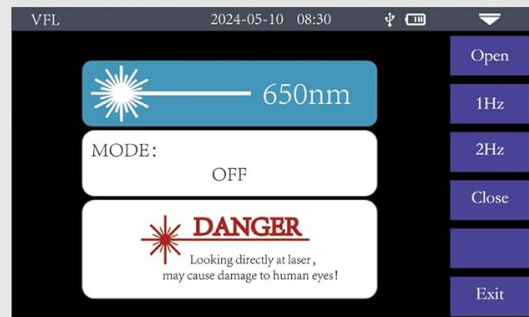
Mode: Switch the light source mode (CW, 270Hz, 330Hz, 1kHz, 2kHz).



## VFL

●Inject visible light (red light) into the fiber to observe the leakage points on the tested fiber, making it easy and accurate to locate fiber faults.

●It is suitable for detecting end-point faults and high-loss areas caused by microbends on bare fibers, fiber jumpers, and other fiber optic cables where red light can leak out.



**Warning: Avoid direct eye contact with the laser output; the laser can cause eye damage!**

Figure 7: Stable Light Source and Visual Fault Locator (VFL) interfaces.

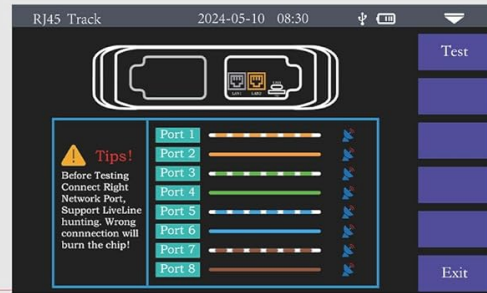
### 5.3. RJ45 Cable Tester

The fiber optic tool kit is equipped with a line-finding receiver to perform RJ45 line-finding, length measurement, and sequencing functions. It checks cable pair status, length, and calibrates according to network standards T568A/T568B. It can test voltage-resistant cables (under 60V DC) and help find wire locations using a digital radar method.

# RJ45 Cable Tracking/Length/Sequence

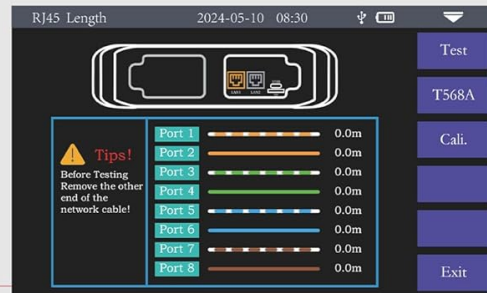
## RJ45 Cable Tracking

This device is voltage-resistant and burn-proof, allowing direct live-line tracking. It is suitable for low-voltage devices with DC voltage under 60V, such as Ethernet switches and routers. The yellow-marked interface on the right side of the instrument.



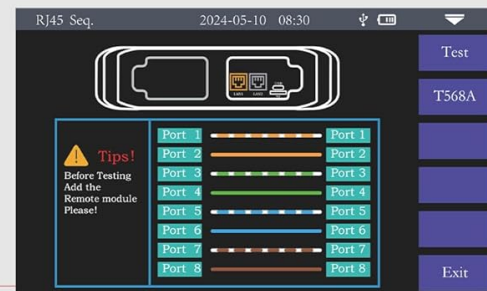
## RJ45 Length

Cable Length Test: Tests the length of the Ethernet cable.  
Calibration: Corrects the cable length measurement.  
Cable Standards: T568A/T568B.  
Do not perform live testing on this function!  
The yellow-marked interface on the left side of the instrument.



## RJ45 Sequence

During testing, please connect the far-end module to the bottom of the instrument.  
2 Types of RJ45 Cables: straight-through cable and crossover cable.  
Do not perform live testing on this function!  
The yellow-marked interface on the left side of the instrument.



**⚠️ Avoid incorrect connections to prevent damage!**

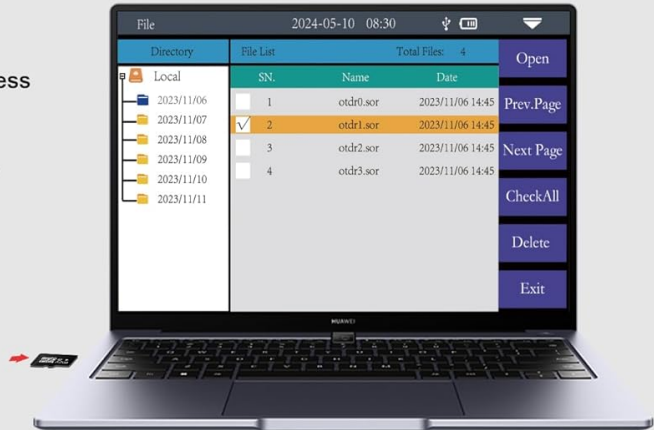
Figure 8: RJ45 Cable Tracking, Length, and Sequence testing interfaces.

## 5.4. Event Map / Endface Inspect / Endstate Verify

- **Event Map:** Automates fiber link testing, displaying key information like fiber length, connector types, and breakpoints in a clear graphical format.
- **Endface Inspection:** Crucial for ensuring quality of fiber optic communication by detecting contamination or damage. Requires a compatible USB interface endface inspection device (sold separately).
- **End State Verification:** Allows non-invasive checks of terminal connections and link loss diagnostics.

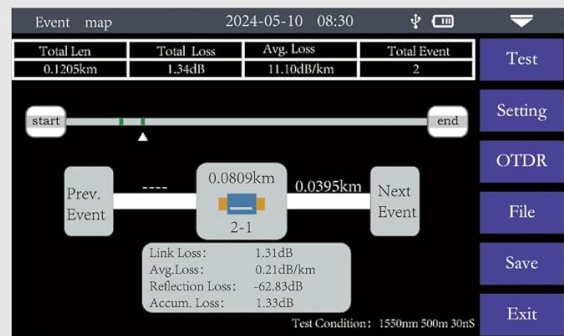
## File Management

- An 8GB TF card is included with the device.
- Test data files can be saved to the TF card.
- Insert the TF card into a PC to analyze and process the data on the PC.
- Select [File] to enter the file operation interface, where you can search for files and perform actions such as opening or deleting files.



## Event Map

- This feature provides a fully automated one-click test, displaying information such as the length of the fiber link, connector type, and breakpoints in a graphical format. The results are clear and easy to understand.
- The starting point of the link after adding the guide fiber at the front end
- Downward events, typically fusion splice points
- Upward events, caused by differences in refractive index between two fiber segments
- Connectors, flanges, SC, ST, LC connectors, etc.
- Fiber macro bends
- End of the link



**Note: Do not test with light for wavelengths that are not online!**

Figure 9: File Management interface and Event Map display.

## Endface Inspection

● Endface inspection and cleaning of fiber optics are crucial steps to ensure the quality of fiber optic communication. Contamination or damage to the fiber endface can cause signal attenuation, reflection loss, and unreliable connections. Therefore, regularly inspecting and cleaning fiber endfaces is essential for ensuring effective optical transmission.

● By selecting a compatible USB interface endface inspection device, you can inspect and clean the endfaces of the tested fiber link interfaces to ensure the quality and reliability of the link's communication transmission.



## End State Verification

● Intelligent detection of the fiber network terminal resource status allows for checking the ONT terminal connection status in the hallway distribution box without entering the user's premises, meeting the needs for port release and resource data verification on-site.

This enables refined management of network resources.

● It also measures the link loss from the splitter to the user's end for weak light diagnostics.

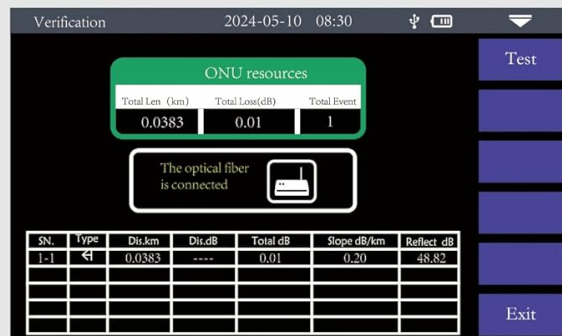


Figure 10: Endface Inspection and End State Verification interfaces.

### 5.5. Network Test Functions (Similar Models)

While specific details for NF-9816 are limited, similar RAINLEOTI models offer network testing capabilities that may be present or available as add-ons:

- **Ping Scan:** Detects whether the network is normal by pinging a remote IP address.
- **IP Scan:** Quickly scans IP addresses and checks for IP conflicts on network devices, supporting MAC address detection.
- **LLDP:** Detects main capabilities, management IP address, device, and interface information of switches. Port flashing helps quickly identify the switch port connected to the device.
- **PPPOE:** Used for dial-up internet access testing.

Video 1: An overview of the OTDR Optical Fiber Tester's various functions, including OTDR, OPM, VFL, and network tests.

Video 2: A brief demonstration of the 'About OTDR Mini' model, showcasing its compact design and interface.

Video 3: Demonstration of network cable testing features, including IP scan and port flash, on a similar NOYafa NF-8506 model.

## 6. TECHNICAL SPECIFICATIONS

Feature	Specification
Model Number	NF-9816
OTDR Wavelengths	1310/1550nm dual wavelengths
Dynamic Range	28dB/26dB
Fiber Type	G.652 SM Fiber
Event Blind Zone	3m
Attenuation Blind Zone	8m
Test Range	5m-80km
Pulse Width	5ns-10us
Test Accuracy	$\pm(1m + \text{sampling interval} + 0.0025\% \times \text{test distance})$
Loss Accuracy	$\pm 0.2\text{dB}$
Sampling Points	16k-128k
Sampling Resolution	0.05m-8m
Reflection Accuracy	$\pm 3\text{dB}$
Data Storage	Internal 8M, supports TF Card (included)
Laser Safety Class	Class II
File Format	.SOR standard file format
Connections	FC/UPC (interchangeable with SC, ST) or FC/APC (interchangeable with SC, ST)
OPM Wavelengths	850/1270/1300/1310/1490/1550/1577/1625nm
OPM Test Range	-50dBm ~ +26dBm
VFL Wavelength	650nm $\pm 20\text{nm}$
VFL Output Power	$\geq 10\text{mW}$
VFL Modes	CW/1Hz/2Hz
RJ45 Cable Tracking Distance	$\geq 300\text{m}$
RJ45 Cable Length Test Range	$\geq 300\text{m}$
Display	4.3-inch color LCD
Operating System	Linux

Feature	Specification
Power Source	Battery Powered (4000mAh Lithium Polymer)
Battery Life	Standby: 20h; Testing: >12h
Item Weight	1.98 pounds (0.9 kg)
Dimensions	8.66 x 6.18 x 2.87 inches (220 x 157 x 73 mm)

## 7. MAINTENANCE

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### 7.1. Cleaning Fiber Optic Ports

Regular inspection and cleaning of fiber endfaces are crucial for ensuring effective optical communication. Use the provided cotton swabs to clean the fiber optic ports and connectors to prevent contamination or damage that can cause signal attenuation, reflection loss, and unreliable connections.

### 7.2. Battery Care

The built-in 4000mAh lithium polymer battery ensures long-lasting use. To maximize battery life, charge the device fully before first use and whenever the battery level is low. Avoid completely draining the battery frequently. The device has intelligent overcharge, overcurrent, and short-circuit protection.

## 8. TROUBLESHOOTING

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- **Screen Visibility in Bright Sunlight:** The device features a high-gloss screen. In direct sunlight, glare may affect visibility. Try to operate the device in shaded areas or use your hand to shield the screen.
- **RJ45 Cable Test Limitations:** For basic models, the RJ45 cable test may only provide a pass/fail indication without detailing specific faults like cross-wiring or mis-wiring. Refer to your specific model's documentation for detailed RJ45 testing capabilities.
- **Inaccurate Fiber Optic Readings:** Ensure all fiber optic connectors and ports are clean. Dirty fiber ends are a common cause of signal loss and inaccurate measurements. Use the provided cleaning swabs.
- **Battery Leakage:** If battery leakage is observed, discontinue use immediately and contact customer support.

## 9. WARRANTY AND SUPPORT

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RAINLEOTI is dedicated to providing a superior testing experience. If you have any questions about our products, please feel free to contact us. We value and look forward to your inquiries and promise to answer within 24 hours.

For support, please refer to the contact information provided in your product packaging or visit the official RAINLEOTI store on Amazon.

