



MULTI-FUNCTION OTDR-1000

INSTRUCTION MANUAL

SOFTWARE DOWNLOAD:

URL: <https://jonard.com/OTDR-1000>

WARNING

To avoid eye damage, DO NOT look directly at the optical interface or the end of the optical fiber.

To reduce the risk of fire or electrical shock, do not use this device in thunderstorms or humid environments.

Do not attempt to open the housing of this device. If repairs are needed, it must be repaired by the manufacturer.

ATTENTION

Battery: The charging voltage of the battery is 5V between 0°C ~ 50°C. If ambient temperature exceeds this range, charging will terminate.

The device should also be charged at least once every month to maintain battery performance.

Use the included power supply (or another one that's 5V) to prevent any damage to the battery.

Fiber End Face Cleaning: Before testing, clean the end face of the fiber optic cable using our TK-182RF Fiber Optic Connector Cleaning Kit.

LCD screen: The display of this series of instruments is 3.5 inch color LCD. In order to maintain good viewing effect, please keep the LCD screen clean and clean. When cleaning, the LCD screen can be cleaned by wiping with soft fabric.

Introduction

1.

The OTDR-1000 Multi-function OTDR is the perfect all-in-one handheld device for evaluating FTtX and access network construction and maintenance, identifying fiber breakpoints, measuring cable length, and calculating relative optical power losses. This unit includes the following components:



- ① OTDR-1000
- ② Rugged Carrying Case
- ③ Instruction Manual
- ④ Cleaning Pads
- ⑤ Micro USB Cable
- ⑥ OTDR Software
- ⑦ Power Charger
- ⑧ EU Plug Adapter
- ⑨ OTDR SC Adapter
- ⑩ OTDR LC Adapter

Brief

2.



Top view

- ① OTDR/LS Port
- ② OPM Port
- ③ VFL Port
- ④ Flashlight

Left side

- ① Micro USB
- ② Charging LED Indicator
- ③ TF Card Port

Right side

- ① RJ45 Interface
- ② Reset button

Bottom view

- ① RJ45 Remote tester

Main view

- ① Dust Cover
- ② 3.5 inch Color LCD
- ③ Function Keys

Key Overview

3.

Function keys

Correspond to the operations on the bottom of the screen



Zoom key

Allows you to zoom in or out. Use with directional keys to operate.

Measure key

Starts or stops OTDR testing while in the OTDR interface

ON/OFF key

Short press to turn on. Long press to turn off. Short press while the device is on to turn flashlight on/off

Exit key

Return to the previous menu

OK key

Enter the next level of interface, Enter function

Directional keys

Allow you to move left, right, up, or down

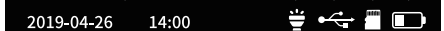
Main Interface

4.

When the device is powered on, the main menu will be displayed automatically.

There are 8 different modules to choose from, which can be selected using the direction keys and entered using the OK key.

The following symbols may also appear on the top of the screen:



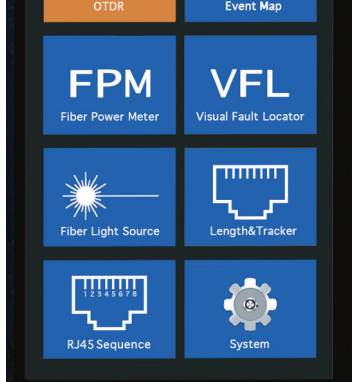
Time: Displays the date and time. Can be changed in the Settings.

Flashlight: Will appear when flashlight is on.

USB: Will appear when connected to a computer via USB.

TF: Will appear if a TF card is inserted into the device.

Battery: Indicates the power level of the battery.



OTDR Overview

5.

Introduction:

The OTDR Module allows you to test the integrity of a fiber cable and is used for the building, certifying, maintaining, and troubleshooting of fiber optic systems. It builds a virtual image of the fiber optic cable to determine the condition and performance of the fiber and displays any events that may occur.

Function Keys:

F1: Enter the Settings of the OTDR.

F2: Switch between the A and B cursors.

F3: Saves the data being displayed.

F4: Open a specified file or folder.

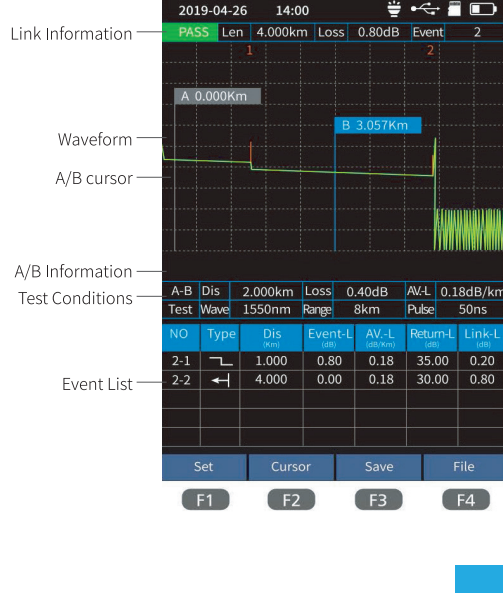
Other Keys:

Directional Keys: Use the Directional Keys to move the A and B cursors.

Zoom Key: Press the Zoom key to enter Zoom mode. Press the left or right directional buttons to zoom in or zoom out of the data.

Measure Key: Press the Measure key to begin the OTDR test.

Exit Key: Return to the Main Menu interface.



Setting Up the OTDR

6.

Press the **F1** key to enter the settings of the OTDR, and use the Directional Keys to choose the parameters you want to change.

There are several settings that can be adjusted:

Note: The function keys will not work while changing the parameters.

Wave

Choose the wavelength you want to test, either 1310 nm or 1550 nm.

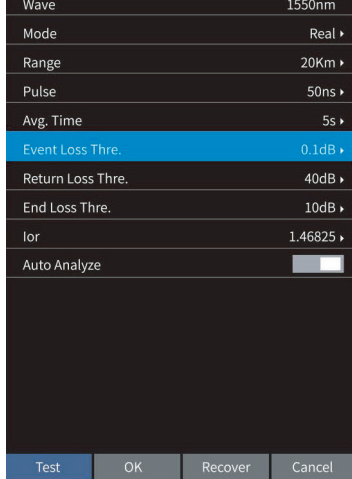
Mode

There are 3 mode settings to choose from:

Auto-Test: Automatic test that adjusts the Range and Pulse automatically to give the best possible view of events on the fiber cable being tested.

Real-Test (Real Time/Live Mode): Live tests the fiber using the set parameters. This allows the end-user to view the installation/restoration made. While testing in this mode, press the Measure key to stop testing.

Avg. Test: Tests the fiber cable using the set parameters. In this mode, you can manually set the Range and Pulse. If the Auto-test does not correctly identify the events, use this mode using a longer range and/or different pulse setting.



Setting Up the OTDR

7.

Range

The Range is the maximum distance shown on the trace. Select the range that is nearest to, but not less than, the distance to the event you want to evaluate. If the tester does not correctly identify the end event, select the next higher range and retest. The Range can be set from 500 m (0.31 mi) to 64 km (39.77 mi).

Pulse

Adjust the pulse width to a larger width to see farther down the fiber or to a shorter width for better resolution. Shorter pulses allow you to see reflective events in more detail and help you see hidden events, which may not appear when using a larger pulse width. However, shorter pulses reduce the range of the OTDR and create more background noise between events. When using shorter pulses, small loss events could be hidden in the noise on the trace.

Pulse Width is directly related to distance and resolution. The greater the distance and more events within the trace your viewing, a larger pulse width is selected. Therefore, larger pulse widths allow one to see further down a fiber. Shorter distances and loss events will require a shorter pulse width to be selected, to avoid oversaturation of trace details which improves resolution to see events in greater detail.

However, shorter pulse widths reduce the OTDR's dynamic range and create more background noise between events. With the correct pulse width selected, end-users will avoid events being hidden, over expanded, repetitive events that do not actually exist, as well as other inaccurate event/trace results.

Larger pulses increase the backscatter signal level, which gives a better signal-to-noise ratio around non-reflective events. This is used to see smaller loss events and measure their loss more accurately. However, using larger pulses increases the dead zones of events and can hide small reflections. The pulse width can be adjusted from 3 ns to 160 ns.

Note: When using **Auto-Test** mode, the OTDR module will automatically adjust the Range and Pulse to be as short as possible, giving the best possible view of events.

Avg. Time

The averaging time is the amount of time the tester takes to make measurements to calculate the averages of the measurements. Longer average time has less noise, increasing the dynamic range and accuracy of the results, and it allows you to see small events more clearly, such as splices. The Avg. Time can be adjusted from 5 s to 180 s.

Setting Up the OTDR

8.

Event Loss Thre.

Set the Event Loss Threshold for loss or non-reflective events. Events that are at or above this threshold are recorded in the event table for evaluation. The Event Loss Threshold can be set from 0.01 dB to 9.0 dB.

Return Loss Thre.

The OTDR-1000 returns the ORL (Optical Return Loss) by calculating the total of all light reflected from reflective events plus the total backscatter from the entire length of fiber being tested. This ORL measurement is sometimes used as a specification for very high speed systems, as ORL can be a contributor to noise in a transmission link. In most situations, the Return Loss Threshold is set at 40 dB and should not be changed.

End Loss Thre.

Set the threshold to detect the end of the fiber cable being tested. An event that is above the threshold is shown as the end of the fiber. The End Loss Threshold can be set from 0 to 99 dB.

Ior

Ior or Index of Refraction calculates the total length of the fiber being tested. Optical length may differ from the length of the fiber jackets in a link due to curves and small variations in the Ior of the fibers. Each fiber type includes a default Ior value, specified by the manufacturer. Set the Ior to this value before testing. Ior can be adjusted from 1.000 to 1.999.

Function Keys

While in the Settings menu, the function keys perform different tasks:

F1: Test: Run a test using the parameters that are set.

F2: Okay: Set the thresholds and return to the main OTDR screen.

F3: Recover: Reset to factory settings.

F4: Cancel: Return to the main OTDR screen without saving the changed parameters.

Using the OTDR

9.

Using the OTDR

While in the main OTDR screen, press the Measure Key to begin testing using the parameters that have been set. When testing is complete, it will show the results in graph and chart form.

In the graph, you can view the events that have occurred in the fiber optic cable, and the chart will pinpoint where the events have taken place in the fiber.



OTDR-Zoom mode

10.

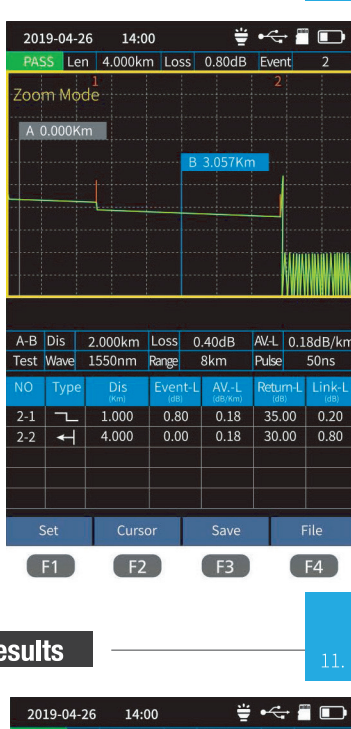
While viewing results, you can use the Zoom Key and the Directional Keys to zoom in and out of the data. Press the Zoom Key again to exit zoom mode.

Press to enter zoom mode



- X-axis direction zoom in ▶
- X-axis direction zoom out ◀
- Y-axis direction zoom in ▲
- Y-axis direction zoom out ▼

Press 1:1 display



Evaluating Results

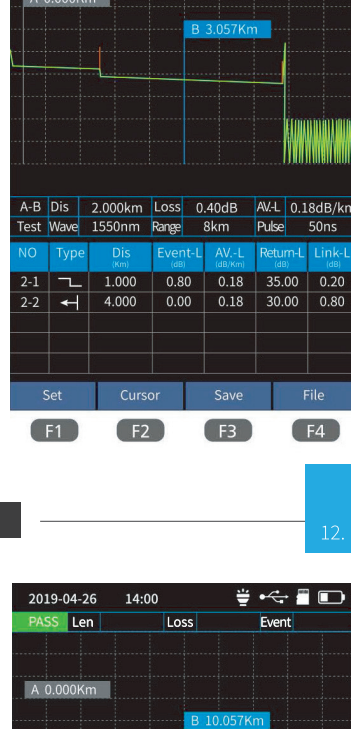
11.

You can also set the two cursors, A and B, to mark different events. To do so, press the **F1** Key to select a cursor, and move it using the left and right Directional Keys.

When evaluating data, you can also use the chart below the graph to determine which events have occurred. They are indicated by the four symbols below:

- Reflective event
- Non-reflective event
- Fiber splitter
- Fiber end

In the example to the right, there was a non-reflective event at the 1.000 km distance, and the end of the fiber was determined to be at 4.000 km.



OTDR-File Save

12.

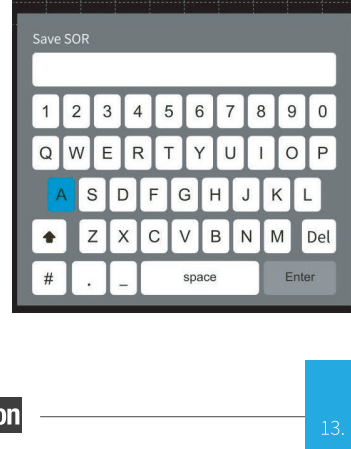
OTDR File Saving:

Press **F3** to save the results after testing is complete. The keyboard will pop up, and you can enter the name of the file using the directional keys and OK key. When done, press **Enter** to save the file.

If the automatic save (OTDR) function is turned on in "System Settings", the results it will be saved automatically after the testing is complete.

Auto-Save Function:

To turn on the auto-save function, enter the System Settings on the main screen and turn on Auto-Save. The OTDR-1000 will now automatically save the test results after doing an average test or auto-test.



OTDR-File Operation

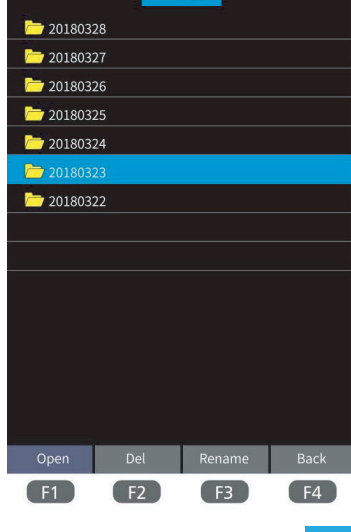
13.

To enter this screen, press the **F4** Function Key while in the main OTDR screen.

While in this screen, you can Open, Delete, or Rename your test results using the Function Keys. You will also need to select files by using the Directional Keys, and you can open them using the Enter Key. These data files can also be accessed while the OTDR is plugged into a computer.

Function Keys:

- F1:** Open the selected file
- F2:** Delete the selected file
- F3:** Rename the selected file
- F4:** Return to the main menu



Event Map (iOLM)

14.

The Event Map displays the link quality, length, events, and other information clearly and easy to understand. Here you can load a saved OTDR (.sor) file and view your results more clearly, or you can rerun the test using this module.

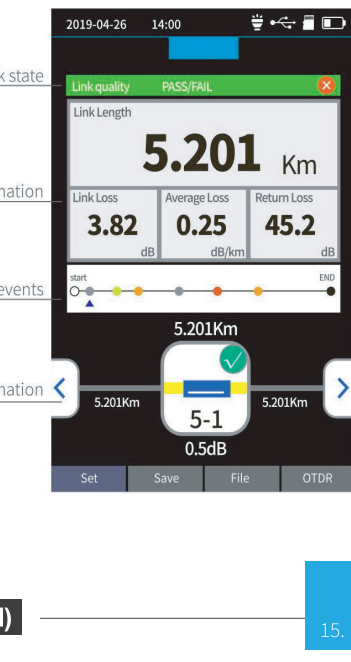
If you want to run a test using this module, follow the instructions for the OTDR module. You will need to set the test parameters in the Settings the same way before running the test.

If you want to simply view the results of a previous OTDR test, press the **F3** Function Key to bring up the saved files in the OTDR. Select the corresponding dated folder, and select the file you wish to view using the Directional and Enter Keys.

When the data is loaded, you can switch through the various events using the left and right directional buttons. You can also switch modes to the main OTDR module using the same data, by pressing the **F4** Function Key. When done, press the Back Key to return to the Event Map screen.

Function Keys:

- F1:** Set the parameters and test
- F2:** Save the results after testing
- F3:** File Manager
- F4:** Return to the OTDR module



Power Meter (OPM)

15.

The Power Meter or OPM module identifies and measures the relative power of fiber optic cables using 270/330/1k/2k Hz frequencies and 850 nm to 1650 nm wavelengths.

To test a fiber cable using this OPM module, follow these instructions:

1. Connect a known good fiber patch cable to an optical light source and set the frequency and wavelength.
2. Connect the other end of the patch cable to the OPM port of the OTDR-1000.
 - a. If using a fiber cable with an LC connector, you will have to use a patch cord or another adapter. The port of the OTDR-1000 is a standard 2.5 mm port, which can be used with SC, ST, and FC connectors.
3. Set the same wavelength on the OTDR-1000 by pressing the **F1** Key until the desired wavelength is reached.
 - a. You can also set the wavelength by pressing the **F4** Key in the calibration menu.
 - b. The wavelength can be set to 850 or 1300 for multimode cables or 980, 1310, 1550, 1490, 1625, or 1650 nm for singlemode cables
4. While the Light Source is running, press the **F2** Function Key to take the Reference Value of the fiber optic cable. This will give you an absolute power measurement to use to get the Relative Power of the fiber optic cable you want to test.
5. Disconnect the fiber patch cord and connect the fiber optic cable you want to test to the Light Source and OPM port of the OTDR-1000.
6. You will now have the Relative and Linear Power of the fiber optic cable showing on the main screen of the OPM module.

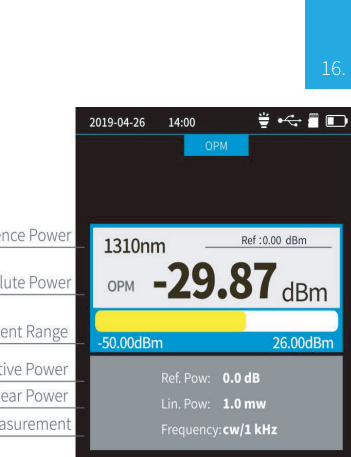
Function Keys:

- F1:** Switching wavelength
- F2:** Setting Reference Power
- F3:** Zero Reference Power
- F4:** Enter the Calibration Mode

Formulas for Absolute, Relative, and Linear Power:

$$P_{Abs} = 10 \lg(P_{Lin} / 1mW)$$

$$P_{Rel} = P_{Abs} - P_{Ref}$$



Visual Fault Locator (VFL)

16.

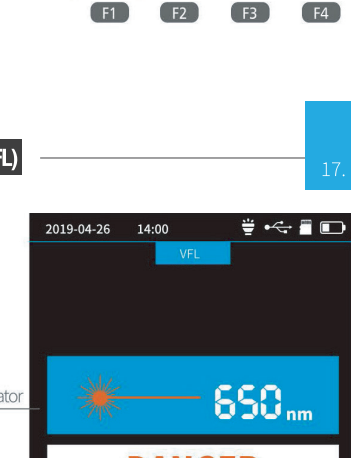
The Visual Fault Locator or VFL module identifies fiber breakpoints, fiber leaks, poor connections, and stress points in a fiber cable up to 3 miles (4.82 km) long using a 650 nm Class III laser.

To use the VFL module, simply connect a fiber optic cable using a 2.5 mm connector to the VFL port of the OTDR-1000 and connect the function keys to turn on the laser. Scan the outside of the fiber to see if the red light illuminates any faults in the cable.

CAUTION: Do not look directly into the laser output port. Laser can cause eye damage.

Function Keys

- F1:** Turn on VFL to Continuous Wave mode
- F2:** Turn on VFL to Pulse mode at 1 Hz
- F3:** Turn on VFL to Pulse mode at 2 Hz
- F4:** Turn off VFL laser



Laser Source (LS)

17.

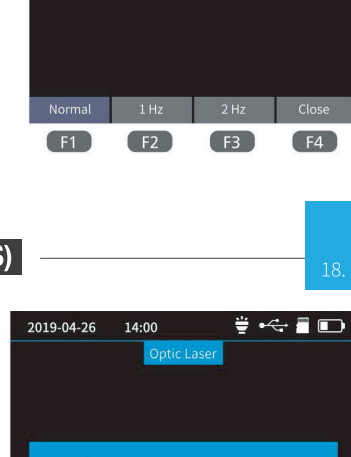
The Light Source or LS module is used in conjunction with a Power Meter to provide a stable laser source at 1310 nm and 1550 nm wavelengths and various frequencies.

To provide light to test a fiber optic cable, follow these instructions:

1. Set the wavelength of the Light source by pressing the **F4** Function Key to change it between 1310 nm or 1550 nm.
2. Connect the fiber optic cable you wish to test to the VFL port on the OTDR-1000.
 - a. The VFL port of the OTDR-1000 is a standard 2.5 mm port, which can be used with SC, ST, and FC connectors.
3. Press the **F1** Function Key to turn on the Light Source.
4. Press the **F3** Function Key to change the frequency of the laser source. This can be changed to CW (continuous wave), 270 Hz, 330 Hz, 1 kHz, or 2 kHz.
5. When done, press the **F2** Function Key to turn off the Light Source laser.

Function Keys:

- F1:** Turn on the Light Source
- F2:** Turn off the Light Source
- F3:** Change LS Frequency
- F4:** Change LS Wavelength



RJ45 Sequence

18.

The RJ45 Sequence module is used to test the sequence of the network cable in CAT5/5e/6/6a cables. To test the sequence, insert one end of the cable into the RJ45 port on the side of the OTDR-1000, and the other end to the remote of the OTDR-1000.

Note: The remote is located in the bottom of the OTDR-1000. If you test the sequence without connecting to the remote, the ports on the right side of the screen will say "Break".

Once connected, press the **F1** Function Key to test the sequence of the cable.

If any of the wire pairs are mismatched, the corresponding ports will be shown in blue. If the ports are correctly matched, they will appear in yellow.

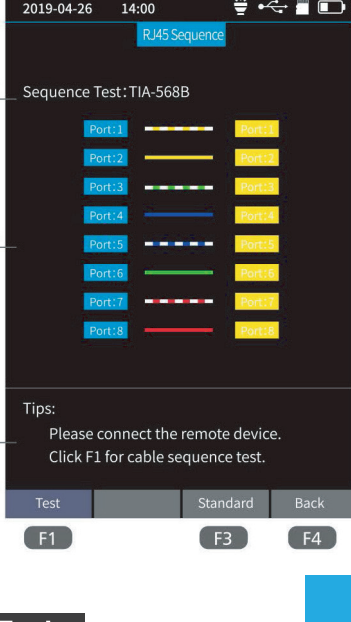
If you want to test a cable wired using TIA-568A standards, press the **F3** Function Key to change to the standards.

Function Keys:

- F1:** Test the sequence of the connected network cable
- F2:** Change the units to English or Metric
- F3:** Change the standards to TIA-568B or TIA-568A
- F4:** Exit RJ45 sequence module

CAUTION:

Do not test on live network cables.



RJ45 Line Length & LineTracker

19.

The RJ45 Line Length and Line Tracker module is used to measure the length of or trace network cables (tracing probe for tracking is not included).

To test the length of a network cable, plug one end of the network cable into the RJ45 port on the side of the OTDR-1000, and keep the other end open. If using a cable with TIA-568A standards, press the **F3** Function Key to change to this standard before testing.

Next, press the **F1** Function Key to start the line length test.

When done, you can press the **F2** Function Key to change the units from English to Metric.

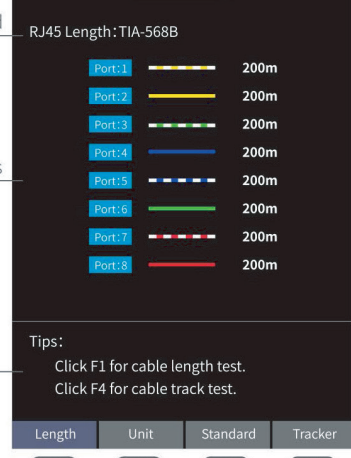
To provide a tone for wire tracing, plug one end of the network cable into the RJ45 port of the OTDR-1000, and press the **F4** Function Key. Please note, a separate tracing probe is required to trace the tone.

Function Keys:

- F1:** Test the length of the network cable
- F2:** Change the units to English or Metric
- F3:** Change the standards to TIA-568B or TIA-568A
- F4:** Generate a tone for line tracking

CAUTION:

Do not test on live network cables.



System Settings

Here you can change the automatic shutdown, backlight brightness, sound, date, time, language, and automatic save functions of the OTDR-1000. Use the directional keys, and OK key to change these settings.

Auto OFF: Change the time it takes to automatically shut down the device when not being used. This can be adjusted to OFF, 10 min, 30 min, or 1 hr.

Backlight: Adjusts the screen brightness to 0%, 25%, 50%, 75%, or 100%.

Beep: Turn the button press sounds on or off.

Date: Adjusts the Date that appears in the upper left corner of the screen.

Time: Adjusts the Time that appears in the upper part of the screen.

Language: Change the Language from English to Chinese.

Auto Save (otdr): Enable this to automatically save a .sor file each time a test is run in the OTDR module. When enabling this setting, set the primary name of the files that are automatically saved. Files will be saved sequentially, for example, if you set the name to be "otdr", the files saved automatically will be "otdr1", "otdr2", "otdr3", etc.

USB Connection: Enable this setting before connecting the OTDR-1000 to a PC.

Factory Data Reset: Resets the unit to factory settings.

Version Information: Displays the Hardware and Software versions of your unit, as well as the Serial Number and Module Information.

