

## **CMX-TL-1605 MANUAL**

**Camplex 1550nm Single Mode Mini  
OTDR with VFL/OPM/Real Time  
Event Map**



Export Information

US ECCN: EAR99

HTS Code: 8544.42

US Dept. of Commerce CCATS: N.a

A Division of Tower Products Incorporated

Revision #01

## Table of Contents

Safety Precautions.....	Page 3
Introduction.....	Page 4
In the Box.....	Page 4
Features.....	Page 4
Specifications.....	Page 5
Panel Description.....	Page 7
Function Keys.....	Page 7
Main Interface.....	Page 8
OTDR-Curve.....	Page 9
OTDR List:.....	Page 10
OTDR Settings.....	Page 11
Event Map.....	Page 13
OPM.....	Page 14
VFL.....	Page 15
Laser Source.....	Page 16
File Operation.....	Page 17
System Settings.....	Page 18
Support & Warranty.....	Page 16



## Safety Precautions:

Please read all instructions before installing or operating this equipment and connecting the power supply.

Please keep the following in mind as you unpack and install the unit:

1. To prevent fire or shock hazards, do not expose this equipment to high humidity and/or dust. Do not use in an unprotected outdoor installation nor any area classified as overly damp or wet.
2. The temperature for installation should be kept between -4°F and 140°F (-20°C and 60°C). Avoid direct sunlight exposure or extreme temperature changes over a short period of time.
3. Do not disassemble or place the unit on an unstable base.
4. Do not drop the unit and avoid heavy impacts.
5. This unit should not be permanently installed unless proper ventilation is provided. Any enclosure openings must not be blocked or covered as they protect the unit from overheating.
6. Before cleaning, turn off the power and unplug the unit from all connections. Use a damp cloth. Do not use liquid cleaners or aerosol cleaners.
7. Do not overload outlets and extension cords, as this may result in a risk of fire or electric shock.
8. Never push objects of any kind, including liquids, into this unit through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock.
9. Do not attempt to open or service this unit yourself; opening or removing covers may expose you to dangerous voltage and other hazards.
10. The unit does not contain user-serviceable parts. Contact your authorized dealer or an authorized repair service company if it requires service.

## Introduction:

The CMX-TL-1605 Single Mode Mini ODTR (Optical Time Domain Reflectometer) is the perfect all-in-one handheld testing device for evaluating the integrity of your Single Mode fiber optic cable by identifying fiber breakpoints and calculating relative optical power losses. Featuring an easy-to-use auto-test feature providing live test results with an event map, this unit is perfect for both inexperienced and experienced technicians looking to maintain and troubleshoot their fiber optic infrastructure.

**DISCLAIMER:** Can only test Single Mode fiber.

**ATTENTION:** The CMX-TL-1605 is equipped with a lithium-ion polymer battery. Before testing, it is highly recommended to clean the end face of the fiber connectors.

## In the Box:

- OTDR
- Power Adapter
- Data Cable
- Calibration Certificate
- Cleaning Swabs
- Carrying Case



## Features:

- Multi-touch 3.5" screen for full touch-screen operation
- Short event area, easy to test 5m jumper
- One-click automatic test analysis of test results
- Type-C USB connection, SOR file batch support
- Supports Live test results
- Intelligent link analysis (Event Map)
- Maximum Range 30km (18miles)
- Integrated VFL/OPM/LS
- Lightweight and easy to carry
- Savable and transferable data





## Specifications:

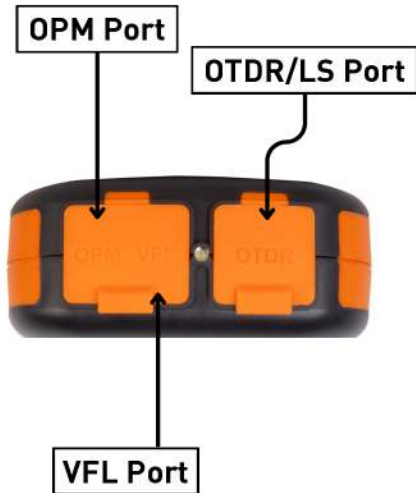
General	
Display	Full touch 3.5 inches, 320×480, Color LCD screen
Power supply	AC/DC adapter: input: 100V~240V, 50/60Hz, 0.6A output: 5V, 2A, Lithium battery: 3.7V, 2200mAh
Battery Working	Standby >6h Continuous testing >4h
Data Storage	internal ≥2000 curves
Data Interface	Type-C USB
Working Temperature	14°F to 122°F (-10°C to +50°C)
Storage Temperature	-40°F to 158°F (-40°C to +70°C)
Relative Humidity	0~95% Non condensing
Weight	≤200g (Battery included)
Size	4.75in x 3in x 1.25in (126mm×80mm×37mm)
WFL	
Wavelength	650nm±20nm
Output Power	≥10mW
Mode	CW/1Hz/2Hz
Connector	Universal FC/SC/ST
Laser Safety Level	Class III
OPM	
Wave Range	800nm~1700nm
Calibration Wave	850/1300/1310/1490/1550/1625/1650nm
Test Range	-70~+10dBm(Optional)/-50~+26dBm(Standard)
Resolution	0.01dB
Uncertainty	±5%
LS	
Wavelength	Consistent with OTDR
Laster Type	Consistent with OTDR
Power	≥ -5dBm
Stability	CW, ±0.5dB/15min (After 15min of preheating)
Connector	SC/PC
Mode	CW/270Hz/330Hz/1kHz/2kHz

## Specifications:

OTDR	
Model	FM028
Type	G.652 SM
Wavelength	1550nm±20nm
Dynamic Range	20dB
Event Blind Zone	2.5m
ATT Blind Zone	10m
Test Range	100m/300m/500m/1.25km/2.5km/5km/10km/30km
Pulse Width	5ns/10ns/20ns/30ns/50ns/80ns/100ns/200ns/300ns/500ns/800ns/1μs/2μs/3μs/5μs/8μs/10μs/20μs
Ranging Accuracy	±[1m+Sample interval+0.005%×Test distance]
Linearity	±0.05dB/dB
Max Sample Points	≥20000
Max Sample Resolution	≤0.03m
Loss Resolution	0.01dB
Loss Threshold	0.20dB
Range Resolution	0.01m
Refractive Index	1.00000~2.00000
Reflection Accuracy	±3dB
File Format	SOR standard file format
Loss Analysis	4-point method/5-point method
Laser Safety Level	Class II
Connector	SC/PC

## Panel Description:

### Top View



### Bottom View

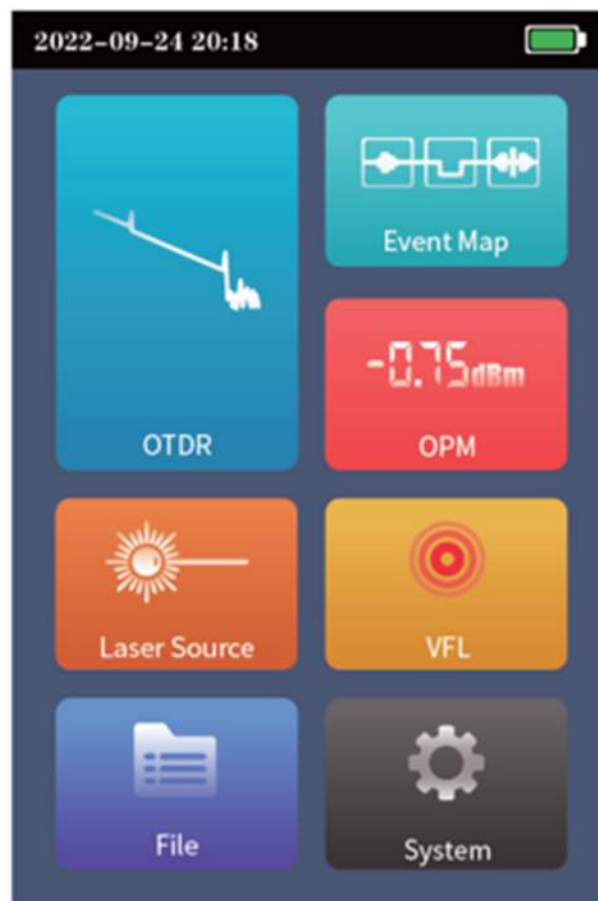
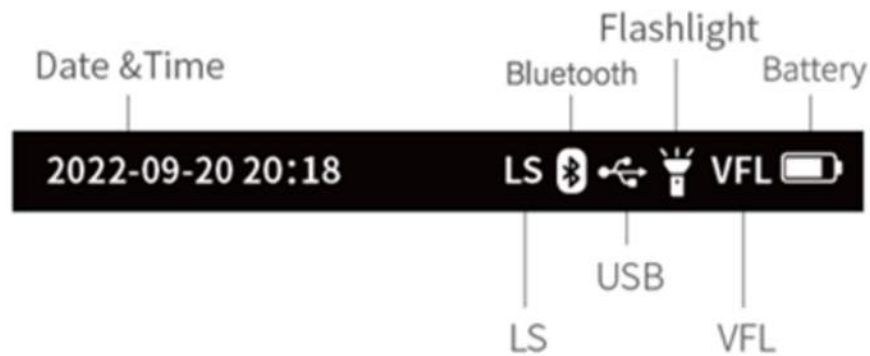


## Function Keys:



## Main Interface:

After powering on the device, you will be at the main menu. There are seven (7) function modules to choose from. Press the function icon to enter the corresponding function interface.





## OTDR-Curve:

**Setting Parameters:** Select the desired test wavelength, range, pulse width, and time.

**Mode Options:** Real-time, average, and auto-test mode options.

**Wavelength:** Select the desired test wavelength of the OTDR

**Test Range:** Set to be roughly twice the length of the measured optical fiber.

**Test Pulse Width:** 5ns-10000ns optional; different measuring ranges and pulse widths are available.

 :AB cursor on/off switch

 :View, open and delete SOR files

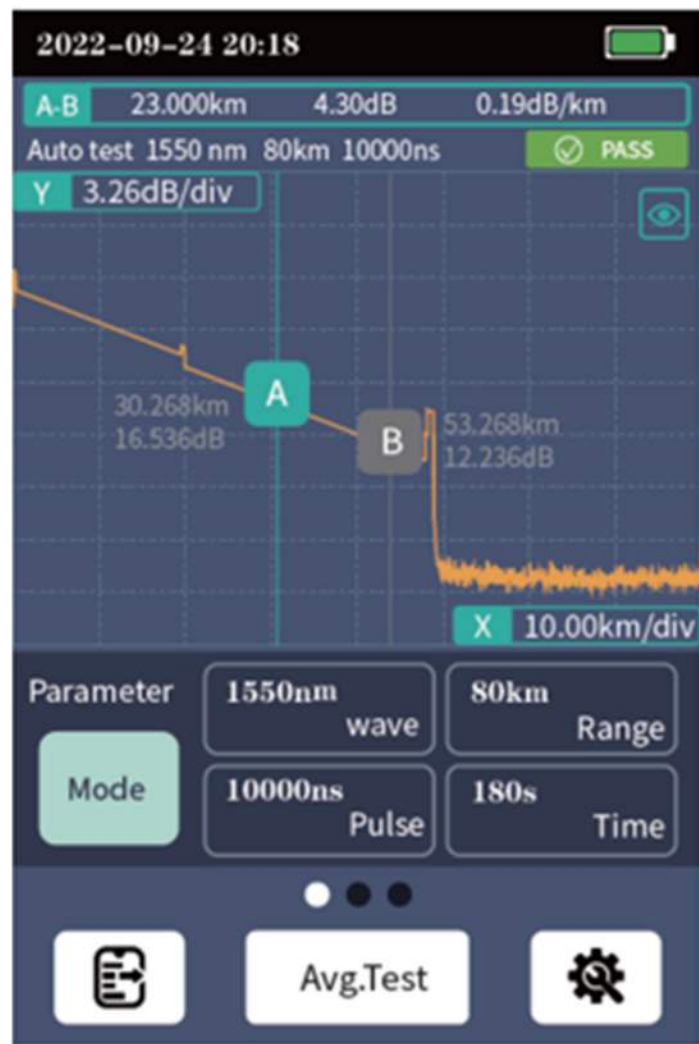
 :After the test, manually save the SOR file

### Curve Operation:

**Curve Zoom, Drag:** Touch screen gesture.

**Restore Initial Curve:** Double click Screen.

**Move Cursor:** Drag A or B



## OTDR List:

**List:** The tested results are displayed in the form of a list

**A-B Total Length:** The total length of the link under test.

**A-B Total Loss:** The total loss of the link under test

**A-B Slope:** The loss per Kilometer of the link under test.

**In the Event List:**

**NO.:** The order of the current event(s).

**Type:** The Type of the current event(s).

**Distance:** The location of the current event.

**Loss:** The loss of the current event.

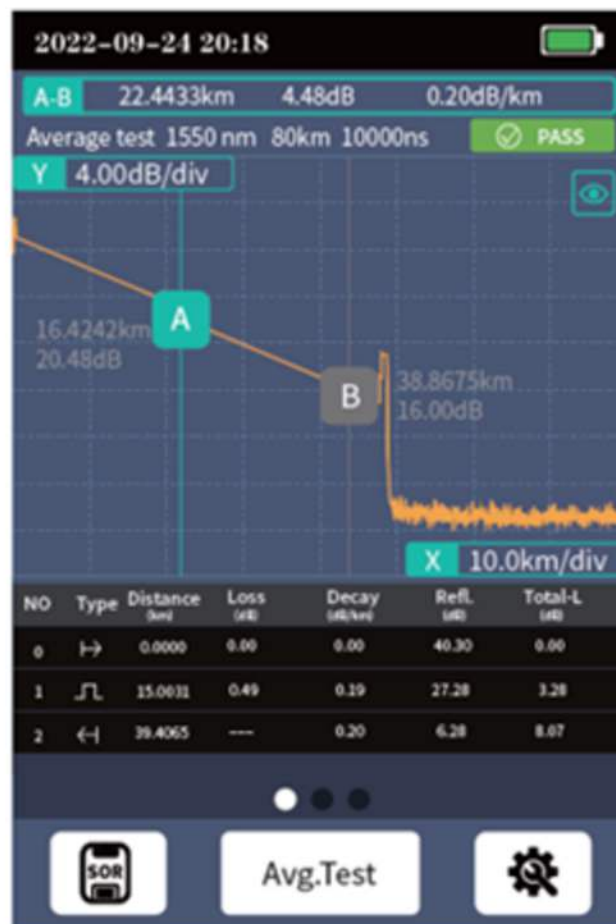
**Decay:** The loss from the starting point to the current event.

**Reflection:** The return loss of the current event.

**Total Loss:** The loss from the starting point to the current event.

## There are six types of events:

- Reflective event ———— 
- Non-reflective event ———— 
- Rise event ———— 
- Fiber splitter ———— 
- Fiber end ———— 
- Fiber start ———— 



## OTDR Setting:

### Setting Parameters:

Set the refractive index of the test wavelength and select the test unit and sampling mode.

Test units include km, mi, and kft.

There are three measurement modes: fast, conventional, and high-precision.

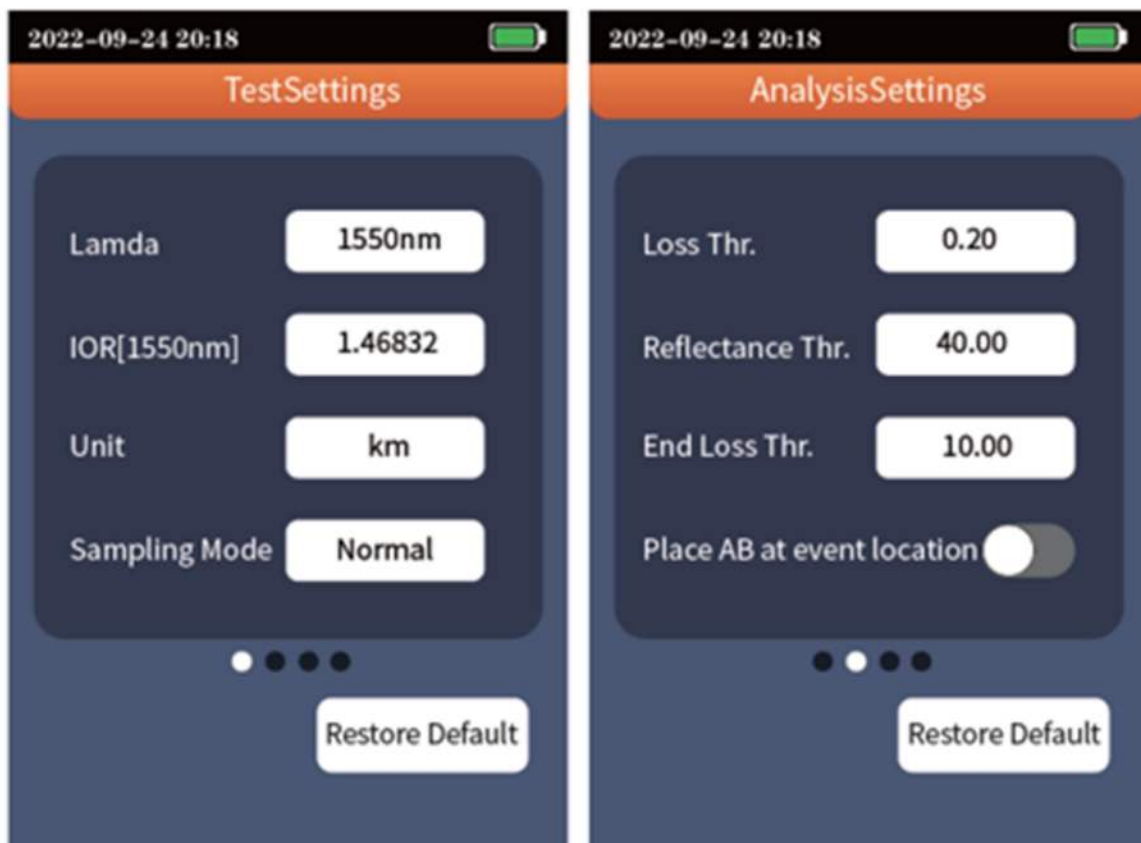
### Analysis parameter/threshold setting:

Set the reflection threshold, non-reflection threshold, and end threshold required for event analysis.

**Event loss threshold:** Set the loss threshold of the connection point, fusion point, or macro bend in the link that can be tested between 0.2 and 30 dB; the default value is 0.2 dB. Events exceeding the set threshold will be listed in the event table or ignored.

**Reflection threshold:** Set the return loss threshold of the link reflection event that can be tested, ranging from 10dB to 60dB; the default is 40 dB.

**End threshold:** Set end loss at the end of the link that can be tested, ranging from 1 to 30dB; 10dB by default.



## OTDR Setting:

### Acceptability Criterion:

Set the judgment value for the average connection/fusion/bending/link loss. If it is less than the value, it is judged as "PASS"; otherwise, it is "FAIL."

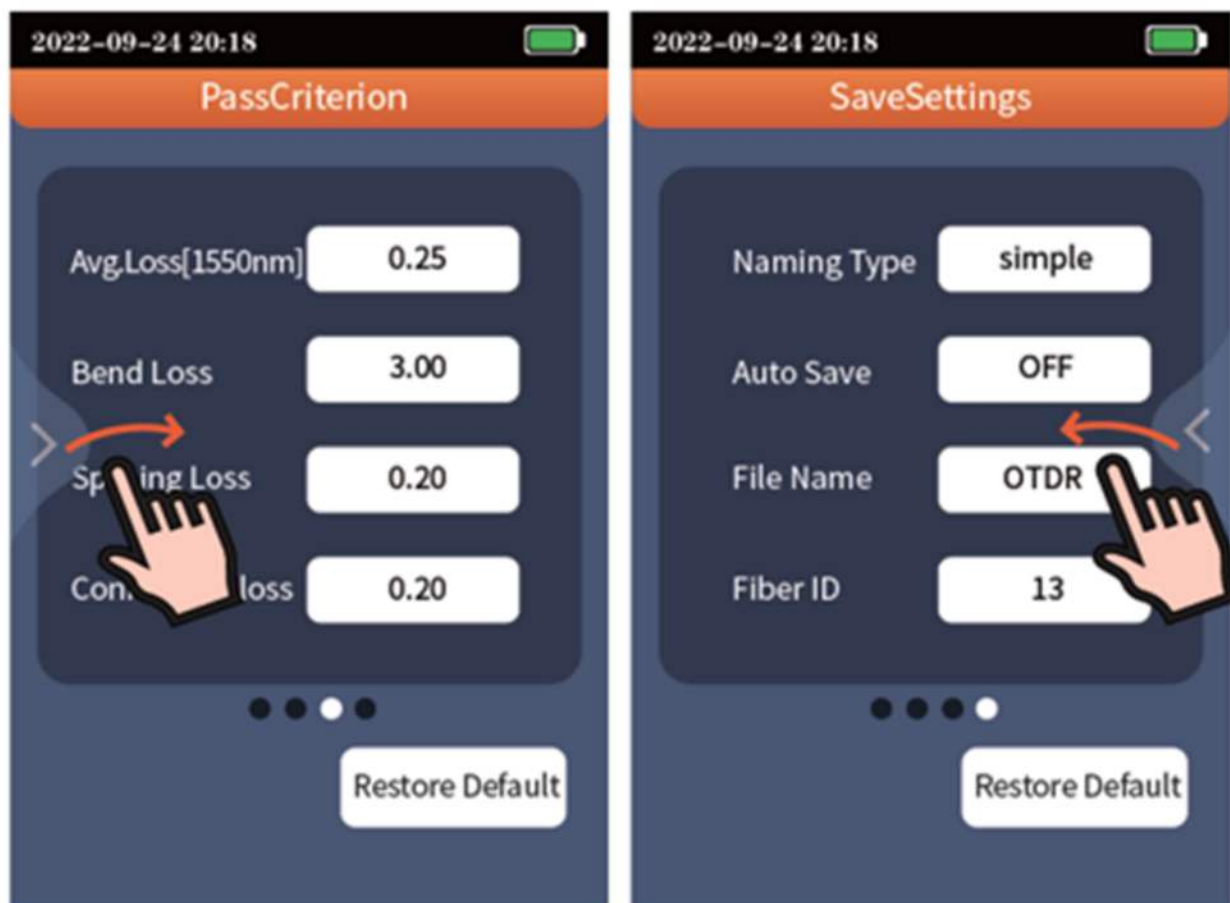
**Average Loss:** The loss value per kilometer of the link under test

**Bending Loss:** Non-reflective events caused by fiber bending must be tested at two wavelengths simultaneously.

**Splicing Loss:** Non-reflective event refers to fusion.

**Connection Loss:** Reflection event refers to flange, SC, LC, and other joints.

**Return:** The gesture slides from the right or left.





## Event Map:

This function is a fully one-key automatic test. Information such as the length of the optical fiber link to be measured, the type of the joint, and the position of the breakpoint are displayed graphically, and the results are clear and easy to understand.



— The starting point of the link, after the guiding fiber is added to the front



— Drop event, representing fusion point



— Connector, square flange, SC, LC etc



— Optical fiber macro bending



— Optical fiber splitter



— End of link





## OPM:

It is used for signal power and insertion loss testing of various equipment and photoelectric components. It can identify and measure the power of a 270/330/1K/2kHz Frequency laser.

**λ** : Switching the operating wavelength of the power meter, wavelength switching 850, 980, 1300, 1310, 1490, 1550, 1625, 1650 nm

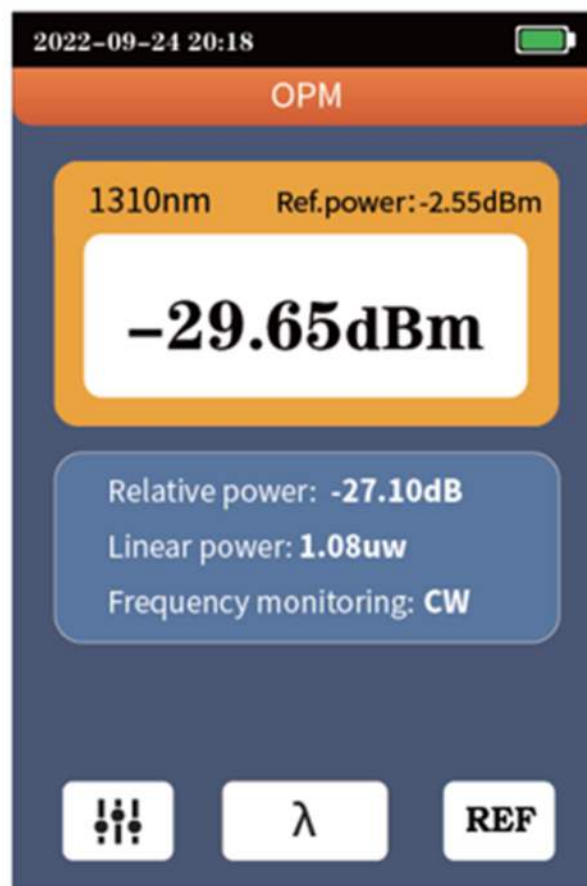
**REF** : Set the current power as the reference power

**⚡** : Enter the user calibration mode, coordinate with the standard light source to calibrate the power

The conversion relations of absolute power, relative power and linear power are as follows:

$$P_{\text{Abs.Pow}} = 10 \lg P_{\text{Lin.Pow}} / 1\text{mW}$$

$$P_{\text{Rel.Pow}} = P_{\text{Abs.Pow}} - P_{\text{Ref.Pow}}$$



## VFL:

Inject visible red light (650nm) into the optical fiber and observe the light leakage position on the measured fiber. This can quickly and accurately determine the position of the optical fiber fault point. It applies to detecting the near-end failure point of bare optical fiber, optical fiber jumper, and other optical fiber and optical cable that can pool red light and the high-loss section caused by micro bending.

: Turn on the red light source and work continuously

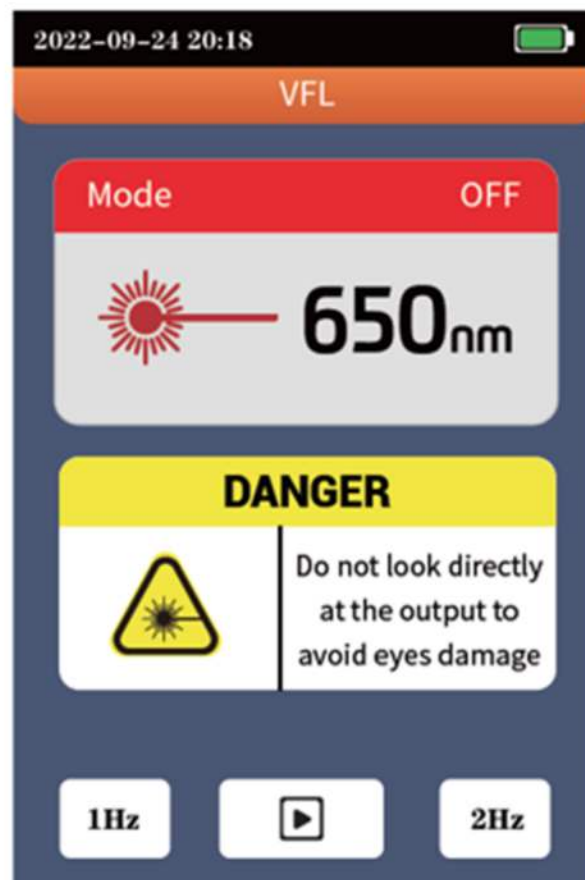
**1Hz**: Red light source flashes once a second

**2Hz**: Red light source flashes twice in one second

: Turn off the red light source

### Warning




Avoid looking directly at the laser output port, because the laser will cause damage to the human retina!



## Laser Source:

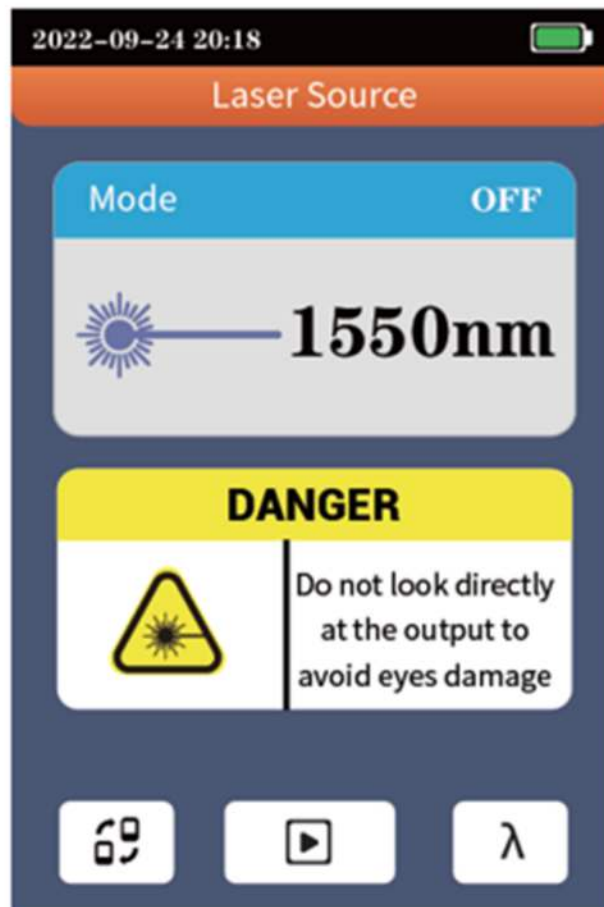
The Output laser has the same wavelength as the OTDR function, which can be used to test the parameters of telecommunication, CATV, and LAN optical cables, the insertion loss, isolation, and return loss of optical passive components, and the wavelength responsivity of the detector.

**There are five working modes:** CW, 270Hz, 330Hz, 1kHz, and 2kHz. (Stays on 1550nm)

-  : turns on the laser source
-  : Switching light source wavelength in case of dual or multi wavelength
-  : switch laser source frequency, CW, 270Hz, 330Hz, 1kHz and 2kHz

### Warning

Avoid looking directly at the laser output port, because the laser will cause damage to the human retina!



## File Operation:

### Save Settings:

**Simple:** The file name is “file name prefix (default “otdr”)- serial number”, and the serial number increases in sequence.

**Detailed:** The file name is “file name prefix-range-pulse width-serial number,” and the serial number increases in sequence.


**Auto Save:** Automatic saving of test curve after opening

**File name:** File name prefix

**Fiber ID:** The serial number of the current optical fiber.

### File Operation:

All test curves are saved on the instrument's internal disk. Press [File] to enter the file operation interface to open and delete files.

 Open the selected file

 Delete the selected file



## System Settings:

**USB Connection:** Connect the computer through Type-C USB and turn the device into a virtual USB flash disk, which can export files inside the device.

**Auto off:** Off/5/10/20/45/90 minutes

**Beep:** Turn the touch tone on or off

**Backlight:** 0%-100% brightness

**Power Saving:** 20/30/60/120s automatic screen out

**Time:** Set instrument time

**Date:** Set instrument date

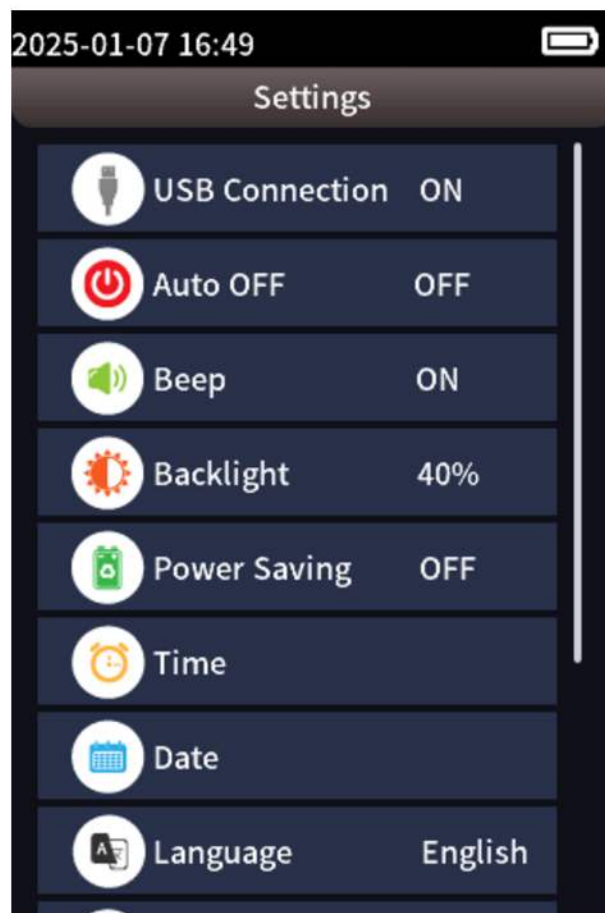
**Language:** Set native Language type

**Factory settings:** Restore default parameter values

**Reset SD card:** Delete all files on this device

**Update:** Native software update

**Information:** View local information and alarm records.







## Support & Warranty:

Camplex warrants cable assemblies to be free from manufacturer defects and built to a +/-2% tolerance of the overall length. Prior to shipment, Camplex tests and certifies all cable assemblies for insertion loss, return loss, and interferometric data on all fibers in both directions. Camplex cables have a limited lifetime warranty to be free from manufacturer defects.

All other Camplex products are warrantied for one (1) year from date of purchase, with parts and labor included.

This warranty is limited to defects in workmanship or materials and does not cover customer damage, abuse, or unauthorized modification. If this product fails or does not perform as warranted, your recourse shall be repair or replacement. Under no condition shall Camplex be liable for any damage incurred through use of this product. This damage includes but is not limited to lost profits, lost savings, or incidental or consequential damage arising from the use of or inability to use this product.

Camplex specifically disclaims all other warranties, expressed or implied, and the installation or use of this product shall be deemed to be an acceptance of these terms by the user. Camplex reserves the right to repair or replace items identified as within warranty.

To determine warranty product failures, all warranty repairs must be returned freight prepaid and insured.

Export Information

US ECCN: EAR99

HTS Code: 8544.42

US Dept. of Commerce CCATS: N.a

A Division of Tower Products Incorporated

Revision #01