Optical Time Domain Reflectometer

USER GUIDE

DIREKTRONIK

Item: 20123278

Version: V1.0

Safety Warning

Power Adapter:

Input: AC 100V ~ 240V, 50/60Hz; @0 .8A

Output: DC 5V, 1A , USB Type-C

Use the power adaptor in strict accordance with the specifications , or it may cause damage to the device.

Battery:

The internal part of the instrument contains a lithium battery. To optimize battery performance, use the internal battery to power the device during initial use. Charge the battery only after it is fully depleted

The first charging time should not be less than 5 hours . Battery charging temperature range - 10°C~50°C . When temperature is too high , please stop charging for safety.

When the instrument is idle for more than 3 months , it should be charged in time to maintain the battery power.

Long-term storage temperature range is - 20°C~45°C .

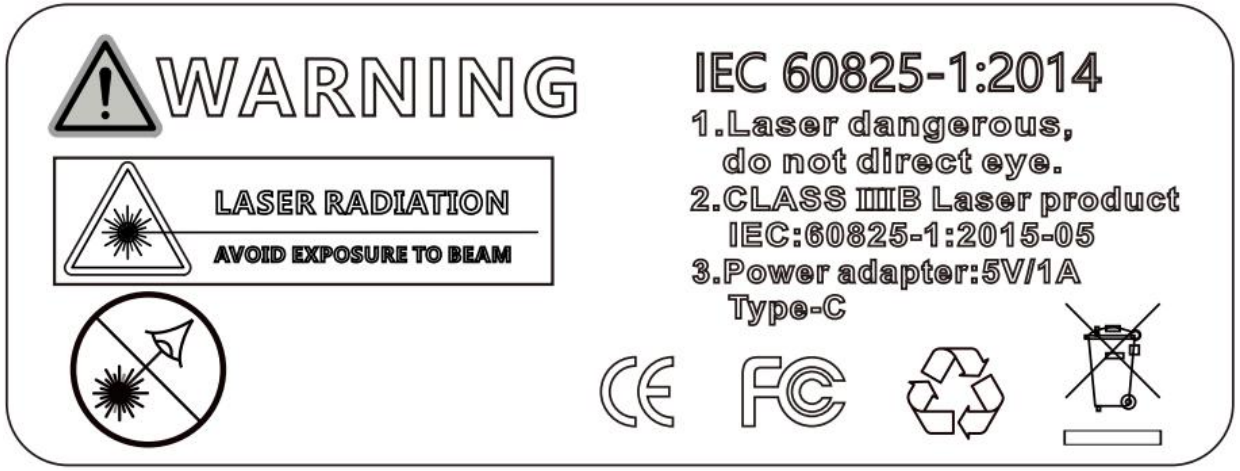
Do not take out the battery without permission . Please keep the battery away from the fire source and strong heat; Do not disassemble or damage the battery.

Laser Safety Instruction:

The laser safety level of this instrument:OTDR is CLASS Ⅱ;visual laser source is Class ⅢB , which is harmful to the human body. Please pay attention to safety during use.

Safety Warning

During use, avoid direct eye exposure to the laser output port or the end of connected optical fibers. Always cover the output port with the dust cap when not in use.



Optical Time Domain Reflectometer

Model	TC-275-A	TC-275-B	TC-275-C	TC-275-D	TC-275-E	TTC-275-F
Wavelength	1310/1550 ± 20nm	1 310 ± 20nm	1550 ± 20nm	1610 ± 5nm	1625 ± 5nm	1650 ± 5nm
Dynamic range	22/20dB	22dB	22dB	22dB	22dB	22dB
Fiber type	G .652D/G.657A1					
Dead zone	EDZ:2m; ADZ:8m					
Measuring range	100m/500m/1km/2km/5km/10km/20km/40km/60km/80km					
Pulse width	5ns/10ns/20ns/50ns/100ns/275ns/500ns/1us/2us/5us/10us					

OPM		Laser source		Other	
Wavelength	850/1270/1300/1310/1490/1550/1577/1610 /1625/1650nm	Wavelength	OTDR wavelength	650nm (optional) ②	≥10mW
Range	A:-70~+10dBm B:-50~+26dBm	Laser type	FP / DFB①	515nm (optional)	≥10mW
Frequency	270Hz/330Hz/1kHz/2kHz	Power	-5dBm ± 3dB (Adjust)	Battery	2000mAh/3.7V
Uncertainty	± 5%	Uncertainty	± 5%	Adapter	Type C
Connector	Universal:FC/ SC/ ST	Connector	SC	Memory③	Inside≥400 External:SD

Wavelength Description：

1、Optional wavelength：1)1310/1550nm； 2)1310nm；3）1550nm；4）1610nm；5）1625nm；6）1650nm

2、Can test wavelength online: (dual wavelength does not have online testing function), other wavelengths can test optical power online：**<0dBm.**

SF1:1310nm Can support online testing of 1490/1550/1577/1610/1625nm live fiber.
SF2:1550nm Can support online testing of1310/1490/1577/1610/1625nm live fiber.
SF3:1610nm Can support online testing of1310/1490/1550/1577nm live fiber.
SF4:1625nm Can support online testing of1310/1490/1550/1577nm live fiber.
SF5:1650nm Can support online testing of1310/1490/1577/1610nm live fiber.

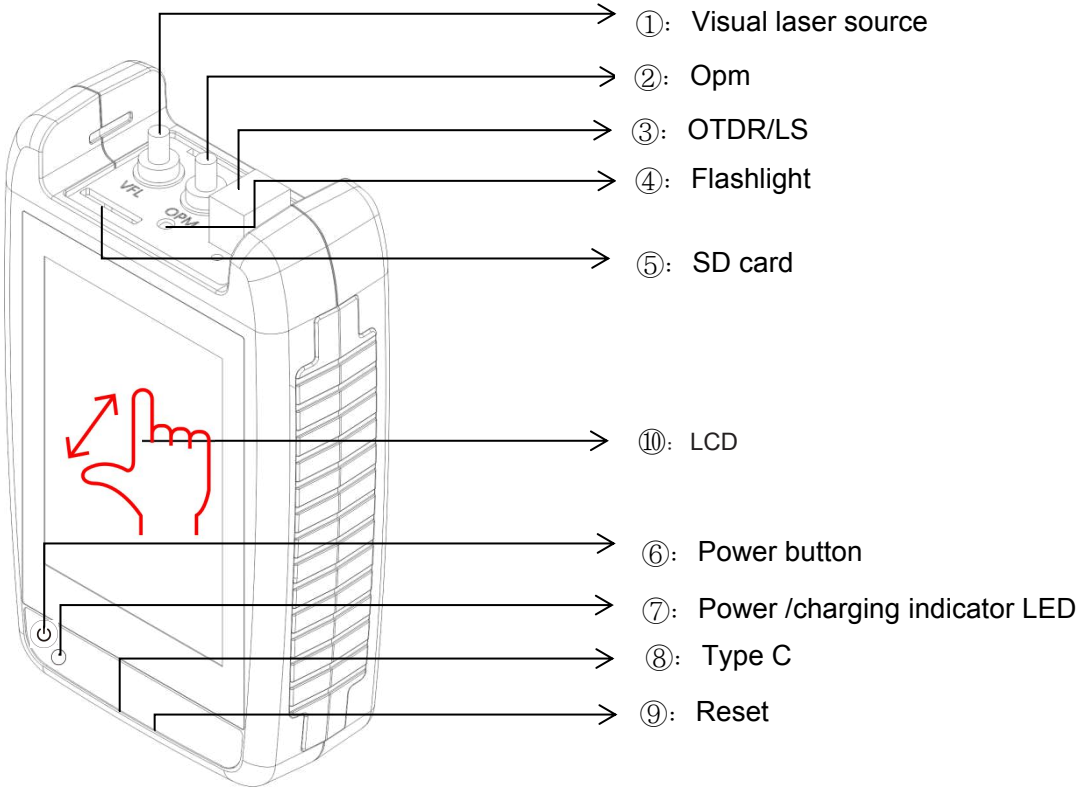
Description：

①： The laser type of the light source is related to the selected wavelength:
1310/1550nm： FP-LD
1610nm： DFB-LD
1625nm： DFB-LD
1650nm： DFB-LD

②： Visual light sources are divided into red light sources and green light sources, and

③： The machine comes with built-in memory and can also be expanded with an external SD card. It supports a maximum external expansion of 32G SD card.It is recommended not to store too much data on the SD card as it may affect the smoothness of machine operation.

Functional component description



Functional component description

Number	Function	Describe
①	VFL	Visual Fault Locator por
②	OPM	Optical power meter port
③	OTDR/ LS	OTDR/Laser source port
④	Flashlight	Short press the power button to operate
⑤	SD card	Supports up to 32GB SD card expansion
⑥	Power button	⏻ POWER ON/OFF -Long press：power on/off -Short press：operate flashlight
⑦	LED	CHR: Charging indicator light -Red indicator charging, fully charged and turned off. -Flashing indicator: No battery installed POWER: Green light indicates the device is on
⑧	USB Type C	Used for charging and transmitting data
⑨	Reset key	Used to reset the instrument pane system crashes
⑩	LCD	resolution：320X480 TFT Capacitive LCD screen, supporting multi touch control.

Operating instructions

Turn on the instrument

Press【**POWER**】button to turn on the instrument,Entering the main interface, you can see the various functional modules of the module.

Turning on and off the flashlight:

In the power on state, short press the 【 POWER 】 button to control the flashlight on and off

Shutdown:

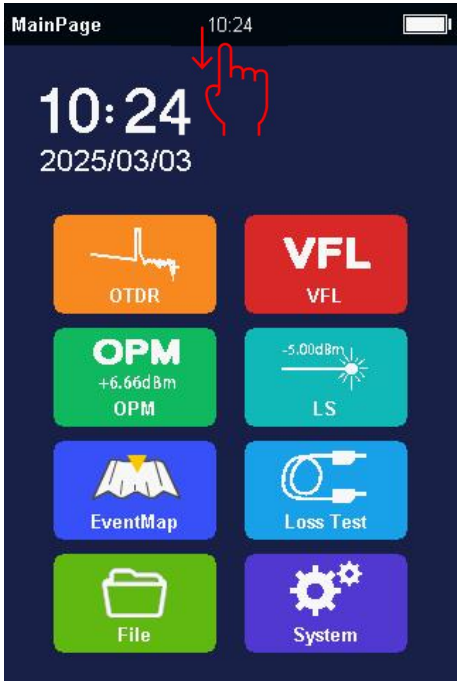
Long press the POWER button to shut down.

Shortcut menu:

In any interface, there is a shortcut menu at the top of the screen. Scroll down to pop up: [Screenshot], [Flashlight], [Shutdown], [Return]

Main interface module: seven functional modules

1) OTDR
2) OPM
3) VFL
4) Event map
5) Laser source
6) Loss tester
7) Flashlight(Controlled by short pressing the power button or using a drop down menu)



Main menu

System setting

Language:

English/French/Spanish/Portuguese/Italian/German

Auto off:

Long term inactivity can achieve automatic shutdown, and the waiting time can be set according to one's own needs.

USB data export:

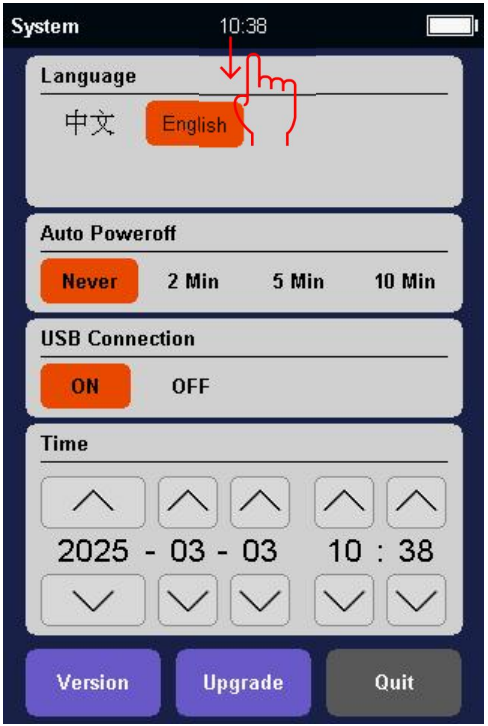
When connected to a computer, turn on 'USB Data Export and the device will automatically drive as a USB drive on the computer. At this point, it can be operated as a USB flash drive on a computer.

Date and Time:

After removing the instrument battery, the system time will be reset. After reinstalling the battery, the date and time need to be set.

Upgrade:

1) Transfer the upgrade package via USB cable.
2) After unplugging the USB cable, click on 'Upgrade' and the instrument
3) panel will automatically enter upgrade mode to complete the firmware update.



System setting

OTDR Parameter settings

wavelength：1310/1550nm （Configured by the instrument）
Test mode：Manual/AUTO
Range：100m/500m/1km/2km/5km/10km/20km/40km/60km/80km
Pulse width:
5ns/10ns/20ns/50ns/100ns/200ns/500ns/1us/2us/5us/10us
Time：5s/10s/30s/60s/real time
Refractive index：The refractive index of the measured optical fiber, and the accuracy of the refractive index is related to the precision of the instrument measurement.
End threshold: used to determine the end threshold. When the loss at a certain location exceeds the set end threshold, it will be positioned as the end of the fiber optic cable.

Loss threshold: threshold used to limit loss events. When the loss is less than the set value, the event is ignored.

The difference between manual testing and automatic testing：

The difference between manual testing and automatic testing lies in the selection of parameters such as measurement range and measurement pulse width.

Auto:The instrument will automatically select the measurement range and pulse width based on the length and loss of the measured optical fiber.

Manual :The instrument adopts the measurement range and pulse width set by the user themselves.

OTDR Parameter settings

Before OTDR Testing

Fiber preparation

The OTDR works on any single mode . The single mode fiber means it is with 9 um core . And because of OTDR testing theory, please be sure the fiber is not very short,at least 3 meters,and not greater than 80km.

Fiber Connector

There are two kinds of fiber connector, one is APC with 8° angle , the other is UPC (PC) horizontal angle .Users are not allowed to change between them.The OTDR port is installed with SC connector in factory default.If users want to change SC connector to FC connector, it is allowed.Unscrew SC connector and pull it out in vertical direction.Then screw FC connector into OTDR port.Please check if the key on FC connector locked into slot exactly in OTDR port.

Connector Cleaning

Please use a connector cleaner to clean OTDR port and fiber connector.Please take off entire dusty cap on the tip of cleaner when you clean OTDR port.When you clean fiber connector,just take off top half dusty cap on cleaner tip.

OTDR Testing

Start OTDR Testing

After the cleaning work done, connect the fiber to the OTDR port

Press 【▶】 to begin Auto and Average Test

Name	Description
WL	Wavelength:It is for current test only
PW	Pulse width:It is for current test only
Y	Vertical axis scale in dB .
A	T he position of cursor A in distance & loss at current position
B	T he position of cursor B in distance & loss at current position
A-B	Distance between A and B . Loss Value between A and B

Event list

Name	Description
No	Event number from near end to far end
Type	Attenuation event or reflect event
Distance	The distance from first event to current event . Km in unit
Loss	The loss value at current event dB in unit
Avg.Loss	The average loss/ km from first event to current event
T. Loss	The total loss from first event to current event dB in unit
Reflect	The reflect signal value dB in unit

OTDR module

To Operate OTDR Testing Results

To save OTDR Testing Results

After testing done, press **[Save]** button to save otdr testing results.

Name	Description
Cap	Change upper and lower letter
Clr	Clear what already input
Back	Delete one letter from right side to left side
<	Move cursor from right to left and then insert a letter
>	Move cursor from left to right and then insert a letter
Quit	Back to OTDR testing and do not save current curve
Name	**Description**
Cap	Change upper and lower letter

File renaming:

Enter the file management interface, select the file that needs to be renamed, and press[renaming],You can rename the saved file.

Delete file:

Enter the file management interface, select the file to be deleted, and click the [Delete] button to delete the saved file.

Save results

Event map

Event list

Name	Description
No	Event number from near end to far end
Type	Attenuation event or reflect event
Distance	The distance from first event to current event. Km in unit
Loss	The loss value at current event . dB in unit
Avg.Loss	The average loss/ km from first event to current event
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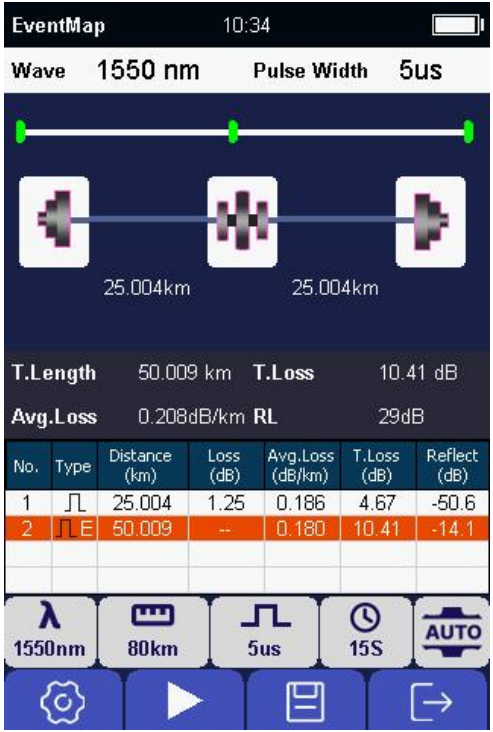
Reflect	The reflect signal value dB in unit

OTDR curve viewing

If you want to view the OTDR curve, you can press the **[OTDR]** button to enter the OTDR curve display.



Event map

LS module

The wavelength of the stable light source is the same as that of the OTDR, and they share the same laser.

Turn on Light Source

Press **[Start]** to turn on the light source. Once turned on, laser icon at middle of screen will be changed in red. Once laser source is turned off, the color will be back in gray.

Change Wavelength

Press **[Wave Switch]** button to change wavelength. Wavelength is according to model of the OTDR.

Change Frequency

Press **[Freq Switch]** button to change frequency, The optional frequency is CW,270Hz,330Hz,1kHz, 2kHz.

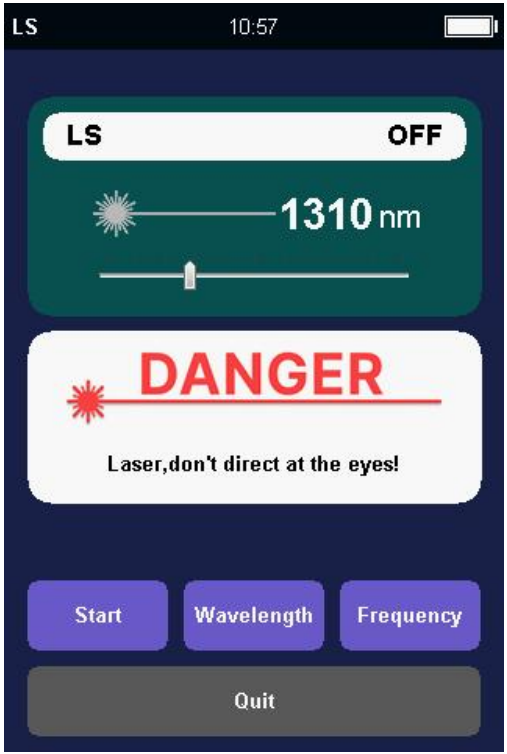
Quit:

Press **[Quit]** button to come back main page.

Warning:

Do not look at light source port.

Laser is not visible , but it is dangerous for human.



LS module

OPM Module

Turn on optical power meter

Press **[Start]** to turn on the optical power meter.

Change Wavelength

Press **[Wave Switch]** button to change wavelength . The wavelength is 850nm,1300nm,1310nm,1490nm,1550nm,1625nm and 1650nm.

Set REF

Press **[REF]** button to set current optical power value to a reference.

Set Zero

Press **[Zero]** button to set current optical power value to zero.

Quit

Press **[Quit]** button to come back main page.

Calibration: Users can calibrate the power meter themselves.

1、Select the wavelength that needs to be calibrated(Switch through the 'Wavelength' menu)

2、Switch the cursor focus to the set input position of the power meter, adjust the standard power value by pressing the up and down keys, confirm with the [OK] key after adjustment, and then exit to complete the self calibration of the power meter.

OPM module

Visual light source（VFL）Module

VFL Module

The Visual Fault Locator supports 2 modes. One is CW, the other is 2Hz Flash. Press **[CW]** button to select CW. Press **[2Hz]** button to select 2Hz menu.

Turn off Visual Fault Locator

Press **[Shutdown]** to turn off the visual fault locator. Once turned off, laser icon at middle of screen will be changed in gray. Once laser source is turned on, the color will be back in red.

Quit

Press **[Quick]** button to select Quit menu and press **[OK]** button to come back main page.

Warning:

Do not look at light source port.

Laser is not visible, but it is dangerous for human.

VFL Module

Loss testing module

The loss testing module simultaneously turns on the light source and the optical power meter module, using the light source as the transmitter and the optical power meter module as the receiver, to complete the entire loss calculation of the fiber optic link.

1、First, connect the light source and the optical power meter using standard optical fibers.

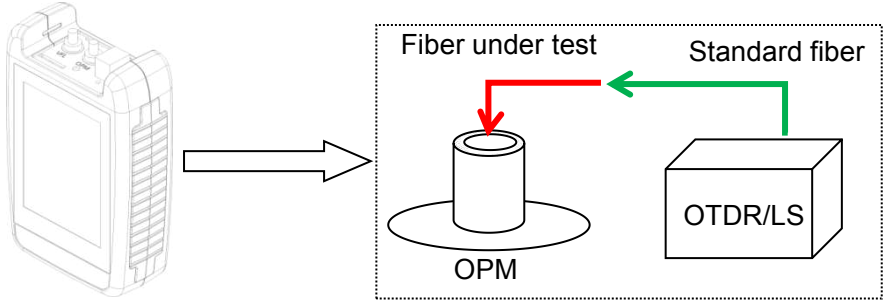
2、Then open the 'Loss Test' module.

3、Switch the desired wavelength using the 'Wavelength' button.

4、After the light source stabilizes (it is recommended to wait for 5 minutes), press [Reference], and the relative power will be displayed as 0dB. The "Reference Value" will be displayed as the current output power value of the light source.

5、Pull out the standard fiber and connect the tested fiber in series to the interface of the standard fiber and the optical power meter.

6、The current 'relative power' display shows the insertion loss value of the tested fiber.



Loss test module

Innovation leads development, technology achieves the future

SE NO

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Focusing on the field of fiber optic communication