

# **User Manual**

## **PON Optical Power Meter**

**Version: V3.0**

# Contents

Notes	2
1. Standard Configuration	3
2. Overview	3
3. Technical Specifications	4
4. Instruction	7
5. Trouble shooting	21
6. Maitanance	22
7. Warranty & Servicing	22
Appendix I	24

# Notes

## Icon Meaning:

In this manual will appear some text with the below icon, The meaning as follows:



**Warning:** Improper behavior and operation, to prevent any wrongdoing and harm.



**Note:** Due to the improper operation may cause harm to the human body or product, so special note to warn the user. Please make sure that!



**Important note:** To identify the key information, general notes, noun explanation or reference information, etc.



**WEEE Sigh:** This product or component part (s) shall not be considered as a general garbage dump, please according to your area on waste treatment method for disposal of such products.

### About Battery

This series of products are different types used in power supply or have a different way. There are disposable alkaline batteries, or rechargeable batteries. Do not mixture of different types or different capacity of battery, prohibited to charge a rechargeable battery.

### About Storage

When product long-term deposit or do not use, please remove products within the battery stored separately, in order to avoid battery leakage caused by instrument damage.



To prevent electric shock, please do not open the product case, must be the company authorized by a qualified professional personnel for repair; Do not expose this product in the rain or damp environment, so as to avoid fire or click on the occurrence of danger!



Due to the laser can cause the big harm to eyes, please do not look directly into the laser output when you use the tester.

## Chapter 1 Standard Configuration

Please refer to the following models corresponding to the standard configuration, check whether your product accessories is complete, if lack of any items, please contact the dealer as soon as possible!

Model	Pon Optical Power Meter	
Items	Title	Quantity
1	tester	1unit
2	User Manual	1pc
3	USB	1pc
4	Soft CD	1pc
5	1.5VAA Battery	3pc

## Chapter 2 Overview

**PON Optical Power Meter** target at the FTTx application and maintenance. This power meter is able to simultaneously test and estimate the signals of the voice, data and video. It is an essential and ideal tool for the construction and maintenance of the PON projects.

### Features:

- (1).It can experiment at Voice, data and video signal synchronous measurement and display on BPON/EPON/GPON.
- (2)Providing simultaneous measurement for all three wavelengths on the fiber (1490nm, 1550nm,1310nm )
- (3)Used in Burst mode measurement of 1310nm upstream.
- (4). Use the software connect with PC, setting the threshold, data transfer, and calibration the wavelength.

- (5). USB communication port enables data transfer to a PC.1000measurement items can be saved in PON power meter or computer for data review.
- (6). With optical power meter module,include850、1300、1310、1490、1550、1625sixs(AP, Awithout850nmwavelength); With visual fault locator module (PON and AV)
- (7). Optical power meter and VFL with one port. (only A)
- (8). Optional Chinese/English display.
- (9). Offers up to **10** different threshold sets in total,Three status LEDs represent different optical signal conditions of Pass, Warn and Fail respectively.
- (10). 10 minutes Auto-off function can be activated or deactivated
- (11). Good key design,high sensitivity, greatly reducing the volume and weight of the tester.
- (12). Different models corresponding to different function, according to own use to choose .

## Chapter 3 Technical Specifications

### 3.1 PON module:

PON module:	PON Optical Power Meter	A	AV	AP
<b>1310 upstream measurement</b>				
Pass Zone(nm)	1260nm~1360nm			
MeasurementRange(dBm )	-40dBm~+10dBm			
Output power(max)	15dBm			
Isolation@1490/1550(dB)	>40dB			
Burst mode measurement error	<±0.5dB			
<b>1490 downstream measurement</b>				
Pass Zone(nm)	1475nm~1505nm			
MeasurementRange(dBm )	-40dBm~+10dBm			
Output power(max)	15dBm			
Isolation@1310/1550(dB)	>40dB			
<b>1550 downstream measurement</b>				

Pass Zone(nm)	1535nm~1565nm			
MeasurementRange(dBm )	-40dBm~+20dBm			
Output power(max)	25dBm			
Isolation@ (1310/1490nm)	>40dB			
<b>Measurement Accuracy</b>				
Connatural uncertainty(dB)	±0.5dB			
Linearity(dB)	±0.1dB			
Passing through insertion Loss(dB)	<1.5dB			
<b>General Information</b>				
Detector Type	InGaAs			
Optical Connector	FC/SC/ST Interchangeable/2.5 universal adapter			
Fiber Type	SM 9/125um			
Measurement Unit	dB/dBm/xW			
Resolution (dB)	0.01dB			
Operation Voltage(V)	DC 3.3V~5.5V			
Power Supply	3pc1.5V battery			
Continuously Operation time (h)	PON: 90h	PON: 90h OPM: 100h VFL: 50h	PON : 90h VFL: 50h	PON: 90h OPM: 100h
Operation Temperature(°C)	-10°C~60°C			
Storage temperature(°C)	-25°C~70°C			
Weight(kg)	423g	425g	424g	424g

Note: The operation time of the battery are all for the instrument that do not turn on backlight, if the backlight turn on the operation time will be shorted.

### 3.2 Normal Optical Power Meter Module: :

Normal Optical Power Meter	<b>PON Optical Power Meter</b> <sup>②</sup>	<b>A</b>	<b>AP</b>
<b>Measurement Accuracy</b>			
Connatural uncertainty(dB)	None	± 0.5dB	
Linearity(dB)		± 0.1dB	
Measurement Range(dBm)		-70dBm~+6dBm	
<b>General Information</b>			
Measurement Unit	None	dB/dBm	
Resolution (dB)		0.01dB	
Calibration Wavelength(nm)		1310/ 1490/1550/1625	850/1300/1310/ 1490/1550/1625
Detector Type		InGaAs	
Optical Connector		FC/SC/ST Interchangeable/2.5 universal adapter	

②: PON Optical Power Meter do not have the OPM module

### 3.3VFL Module:

<b>VFL</b>	<b>PON Optical Power Meter</b> <sup>③</sup>	<b>A</b>	<b>AV</b>
Output power	None	>1mW	
Wavelength		650nm	
Optical Connector		FC/SC/STInterchangeable/2.5 universal adapter	
Fiber Type		SM/MM	

③: PON Optical Power Meter without VFL module.

## Chapter 4 Instruction

PON Optical Power Meter / A two models are different between functions and the form, detailed in this chapter, please check carefully.

### 1. Description



1- ONT: 1310nm Up Stream Port (1310nm)
2- OLT/VIDEO: 1490nm/1550nm Down Stream
3- VFL or OPM Port
4- Display
5- ONT1310nm Up Stream Port LEDs
6- OLT1490nm/1550nm Down Stream LEDs
7- Video signal LEDs (1550nm)
8- AUTO power/off key
9-UPIn the first interface, switch visual fault location model (VFL)
10- ENTER: Confirmation the function selection and saving the data.
11- MENU: PON/CW Power meter module Option

12- DOWM. In the first interface, Switch betweenVFL in continuous light (the CW) and pulse light (HZ)
13- CANCEL:Function cancel
14- USB PORT

④: Only A and AV up/down keys for VFL function

## PON Online test connection diagram



OLT PON Interface optical power test configuration diagram



## Upload the data

PON Power Meter		UploadData	ThresholdSet	Calibration	Number	ONT:1310nm	ONT:1490nm	ONT:1550nm	ThresholdNumber	DataLevel	DateTime
1310nm	-45.39dBm	1	-15 (Pass)	-56.5 (Fail)	-47 (Fail)	10	Fail	2015/9/19 20:50:0			
1490nm	-63.9dBm	2	-15 (Pass)	-56.5 (Fail)	-47 (Fail)	10	Fail	2015/9/19 20:50:0			
1550nm	-56.88dBm	3	-15 (Pass)	-56.5 (Fail)	-47 (Fail)	10	Fail	2015/9/19 20:50:0			
OPM	1310 -71.22dBm	4	-15 (Pass)	-56.5 (Fail)	-47 (Fail)	10	Fail	2015/9/19 20:50:0			
		5	-15 (Pass)	-56.5 (Fail)	-47 (Fail)	10	Fail	2015/9/19 20:50:0			
		6	-15 (Pass)	-56.5 (Fail)	-47 (Fail)	10	Fail	2015/9/19 20:50:0			
		7	-43.2 (Fail)	-56.5 (Fail)	-47 (Fail)	10	Fail	2004/4/14 8:08:0			
		8	-45.3 (Fail)	-64 (Fail)	-56.9 (Fail)	10	Fail	2004/4/14 8:08:0			
		9	-45.3 (Fail)	-64 (Fail)	-56.9 (Fail)	10	Fail	2004/5/5 0:43:00			
		10	-45.3 (Fail)	-59.8 (Fail)	-52.9 (Fail)	10	Fail	2004/4/14 8:08:0			
		11	-45.3 (Fail)	-59.8 (Fail)	-52.9 (Fail)	10	Fail	2004/4/15 8:30:0			
		12	-45.3 (Fail)	-59.8 (Fail)	-52.9 (Fail)	10	Fail	2004/4/14 9:26:0			
		13	-45.3 (Fail)	-59.8 (Fail)	-52.9 (Fail)	10	Fail	2004/4/14 9:26:0			
		14	-45.3 (Fail)	-59.8 (Fail)	-52.9 (Fail)	10	Fail	2004/4/14 9:26:0			
		15	-45.3 (Fail)	-59.8 (Fail)	-52.9 (Fail)	10	Fail	2004/4/14 10:35:0			
		16	-45.3 (Fail)	-59.8 (Fail)	-52.9 (Fail)	10	Fail	2004/4/14 8:08:0			
		17	-23.3 (Warn)	-62 (Fail)	-52.5 (Fail)	10	Fail	2004/4/14 8:35:0			

- (1) Open the PON power meter, first of all click “connect”, connect PON power meter to the computer(Click“English”to set the language of the operation interface to be English )
- (2) choose “Upload Data”, click “Upload Test Data”sign, the saved data can be read on the computer, and saved as a file format.
- (3) click the“Delete Test Data” button or“Clear Test Data”to delete the data.

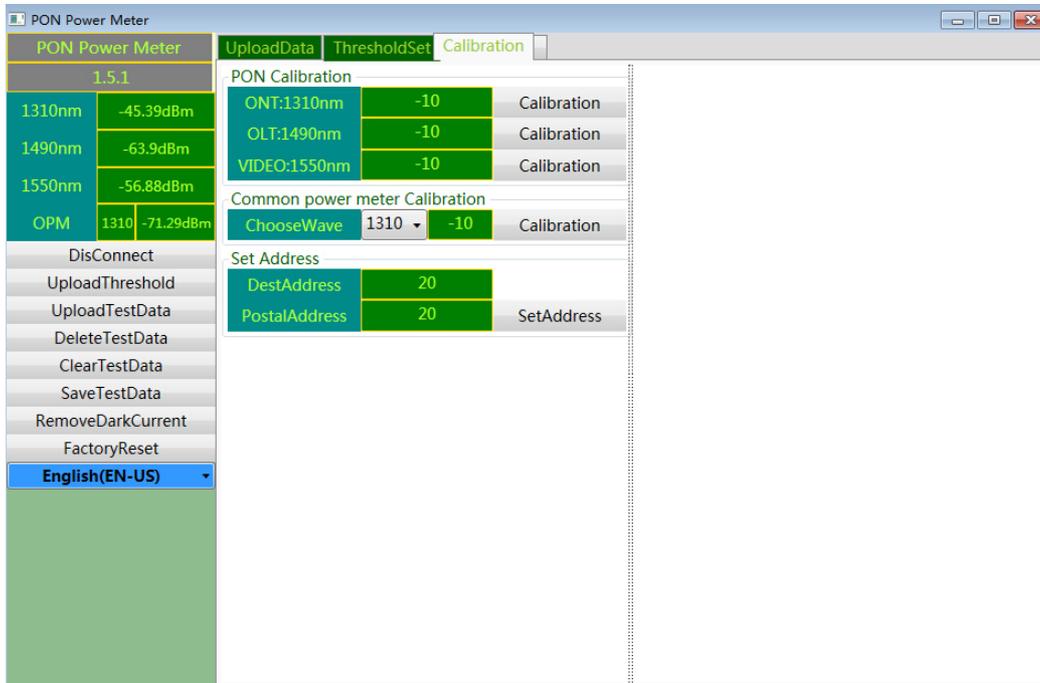
## Threshold Setting:

PON Power Meter		UploadData	ThresholdSet	Calibration	Number	Name	1310			1490			1550		
							Pass	Warn	Fail	Pass	Warn	Fail	Pass	Warn	Fail
1310nm	-45.39dBm	1	test1	3	-20	-30	3	-20	-30	3	-20	-30	3	-20	-30
1490nm	-63.9dBm	2	oer	-10	-20	-30	0	0	0	-10	-20	-30	0	0	0
1550nm	-56.88dBm	3	c	0	0	0	0	0	0	0	0	0	0	0	0
OPM	1310 -75.23dBm	4	d	0	0	0	-10	-20	-30	0	0	0	0	0	0
		5	e	0	0	0	0	0	0	0	0	0	0	0	0
		6	f	0	0	0	0	0	0	0	0	0	0	0	0
		7	g	0	0	0	0	0	0	0	0	0	0	0	0
		8	h	0	0	0	0	0	0	0	0	0	0	0	0
		9	i	0	0	0	0	0	0	0	0	0	0	0	0
		10	j	-10	-20	-30	0	0	0	0	0	0	0	0	0

Click “Upload threshold value” icon to read the threshold.

From the toolbar, select “Threshold Set”, and right click the Threshold to type or modify the threshold value.

## Calibration



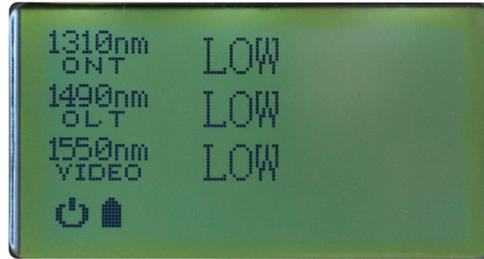
Choose “Calibration” tab, the user can perform user self-calibration operation also can choose “Factory Reset” mode. For example, the current optical power at 1310nm is -10dBm, type -10dBm in the text box of input standard power, and click Calibration tab, then finished the calibration operation at 1310nm wavelength.

## Power ON/OFF

### 1.Power ON



Press  for about two seconds to make the unit power on, Enter into the PON power meter function , the unit displays as shown in below figure:



As shown in above figure, the LCD will display simultaneously three wavelengths of 1310nm upstream measurement and 1490nm,1550nm downstream measurements. When optical signal is present under test, the optical channel will display power levels in dBm, when optical signal is not available, then the optical channel will display “LOW”. “” indicates 10 minutes auto-off function is activated. The unit will turn itself off after

10 minutes of idle time. Press  to close 10 minutes auto-off.

## 2.Power Off

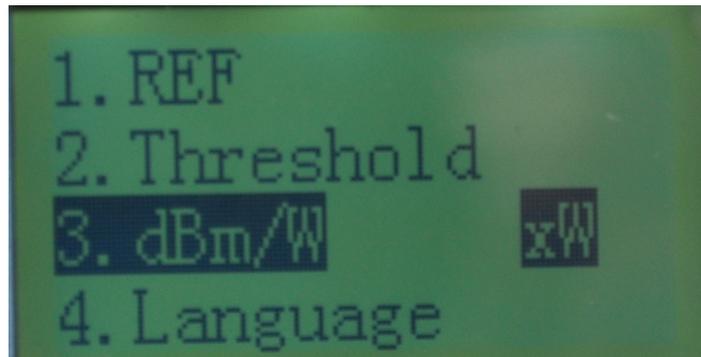
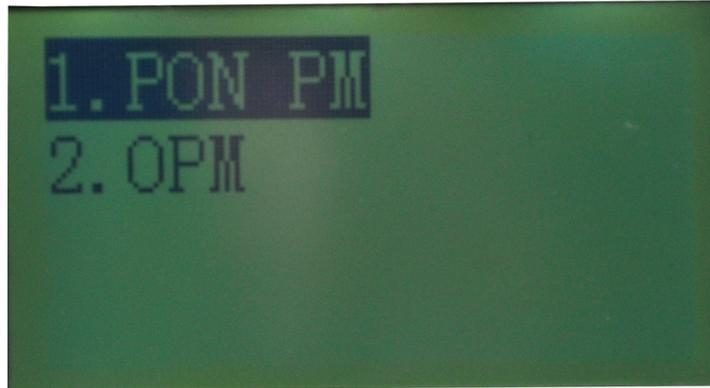
Press  key for about two seconds, to turn off the unit.

## PON Power Meter module

PON power meter can simultaneously measure the PON network upstream signals of 1310 nm, 1490 nm downstream data signal and descending video signal output power of 1550 nm

After open the instrument, Press  to enter into menu operation, Press  to exit

Press “” OR “” to choose the following settings, and press  to choose the function.



Use “ or ” to choose the required threshold value, (The thresholds range and name have already been set in the software, and also downloaded to the instrument, please check with the user manual of Chapter 6 data communication), For example choose threshold and name it as “a”



and press “”.

UploadData		ThresholdSet			Calibration					
Number	Name	1310			1490			1550		
		Pass	Warn	Fail	Pass	Warn	Fail	Pass	Warn	Fail
1	a	-10	-20	-30	-10	-20	-30	-10	-20	-30
2	b	-10	-20	-30	0	0	0	0	0	0



Press “” back to the testing menu.

Clean the tested optic cable, connect with **OLT/VIDEO port** and **ONT port**, (SC type connector), **noted** with the optic adaptor type, the optical adaptor

will be break, and the tested value will be faulty if the un-matched adaptor connected

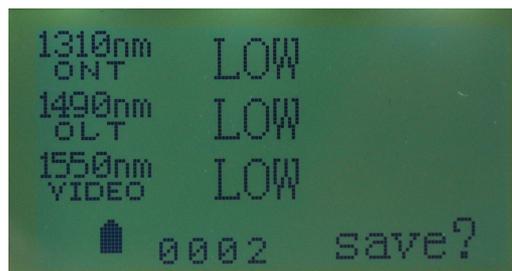


Pay attention to the type of the measured optical fiber connectors, does not match the type of access instrument, may damage the instrument output optical fiber connector, and can not get the true result.

1310nm, upstream, 1490nm, 1550nm downstream, and 3 wavelength measurement at the same time.

UploadData		ThresholdSet			Calibration					
Number	Name	1310			1490			1550		
		Pass	Warn	Fail	Pass	Warn	Fail	Pass	Warn	Fail
1	a	-10	-20	-30	-10	-20	-30	-10	-20	-30
2	b	-10	-20	-30	0	0	0	0	0	0

**Eg.:** The selected threshold name is "a" (-10dBm, -20dBm, -30dBm). The measured result displayed: -11dBm (Optical power) at 1310nm upstream measurements shown in above figure, as it is within -10dBm (Pass threshold) ~ -20dBm (Warning threshold), therefore, it means the optical signal in **Pass** status and the LED at 1310nm will light up with green color: If the measured result is between -20 ~ -30dBm, it means the optical signal in **Warn** status and the LED at 1310nm will light up with yellow color which means the optical signal may got problems but still can be used; If the measured result is out of the range of thresholds, i.e greater than -10dBm or smaller than -30dBm, then it means the optical signal got problems, the LED at 1310nm will light up with red color. The same process be used at 1490 and 1550nm wavelengths.





Press“ENTER”, there will displaying saving on the screen, check with the



upper pic. The data recording series No.is 0002. press“ENTER” saving, and



“CANCEL” for cancel, and the saving recording can be checked in the “data view” under “historical data” Menu.

After finish the testing work, keep the connect port clean, so cover the dusty-cap once finish the work.

### Instructions for Normal Optical Power Meter Function<sup>⑤</sup>



Press button to open the instrument, use “MENU” button and



; to choose the Optical Power Meter measurement, then press

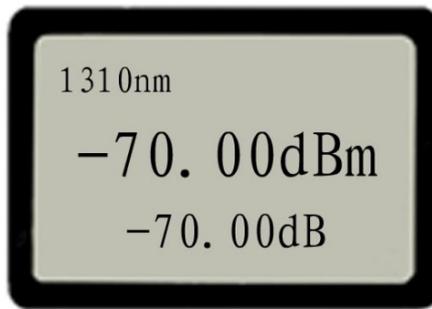
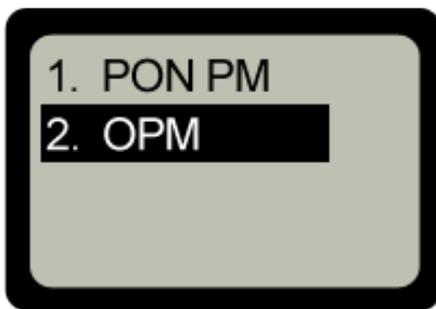


“ENTER” to enter into the selected function. or



Button in this case, is to choose the wavelength. Instrument only provide the test of 850nm、1300nm、1310nm、1490nm、1550nm、1625nm,display “-70dBm”when without light.

Take 1310nm measurement for example:



Connect with the tested optic fiber

Clean the optic Fiber end-face, and connect with the PIN port on the instrument (SC/ FC/ST adaptor), noted with the type of the optic fiber adaptor, the non-matched connecting will make the damage of the connector on the instrument and also make the faulty of the measuring result.

E.g.: 1310nm measurement, after connect with the optic fiber, it will displaying

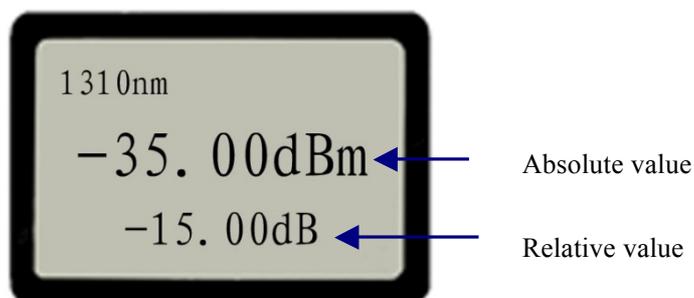


-20dBm, press“ENTER”, set the -20dBm as the reference value, and it will also

display relative value (dB), see as following:



In order to get the loss between the two measurements, do another time testing under the first relative output power. The relative value will be calculated automatically. For example the second time testing of 1310nm output power is -35dBm, the relative output power will be -15dBm.(relative output power=absolute output power-reference value -15dBm=-35.00dBm-(-20.00dBm) see as following:



After finishing testing, cover the dusty cap to keep the optical connector port to be clean.

⑤: PON Optical Power Meter &AV without this function.

## VFL module<sup>⑥</sup>

During the event or break point checking of the short distance optic fiber and pigtails we can use the VFL function.

First of all, Clean the optic Fiber end-face, and connect it them the VFL

port (FC adaptor), after open the instruments, press “” to activate this function, then can see the visual laser at the breaking point or the end of the

pigtails. Press “” to shift the CW and the Hz wavelength. And press



again to close this function.

⑥: PON Optical Power Meter &AP without this function.

### Other function instruction:

#### PON Power Meter:

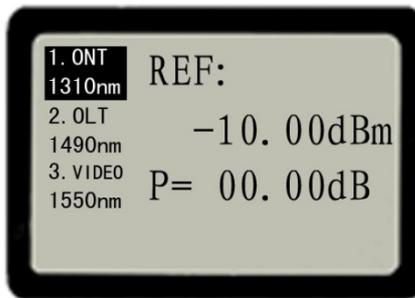
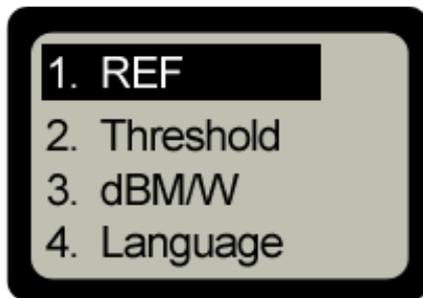
#### Relative output power measurement:

As per requirements of measurement to select the different wavelengths

and Ref settings, relative power=testing value-Ref value. Press



or  to select the different wavelengths, Press "" to change the Ref value as shown in below figure



← REF  
← RELATIVE VALUE

#### Threshold Selection

It offers up to 10 different threshold sets in total. There are three status LEDs in the front panel and each light indicator has three conditions of colors which represent different signal status as below:

Green---Represents Pass

Yellow---Represents Warning

Red----Represents Fail

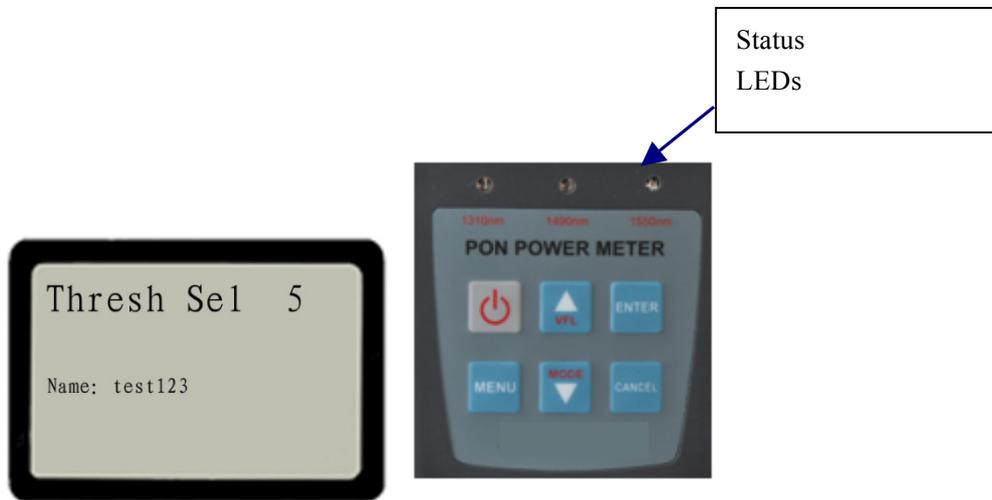
Behind "ThreshSel" displays selected threshold setting order number from 1~10,

and behind "Name" displays selected threshold name, press



or

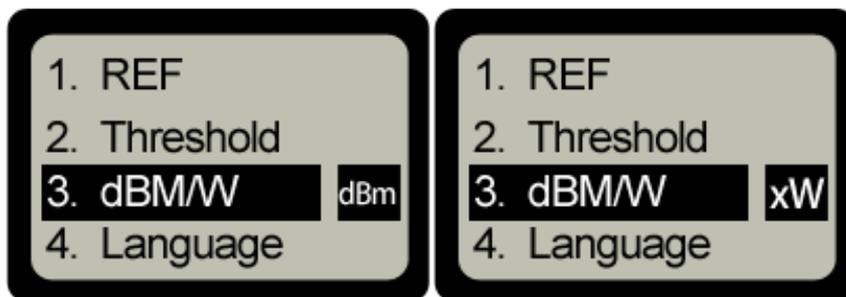
to select the corresponding shresholds. With using software to modify the values range and names of thresholds (Detailsas explained in **term 5-Data Communication.**)



⑦: Threshold Selection just can be use English or figure,can not use Chinese.

### Switches of measurements units

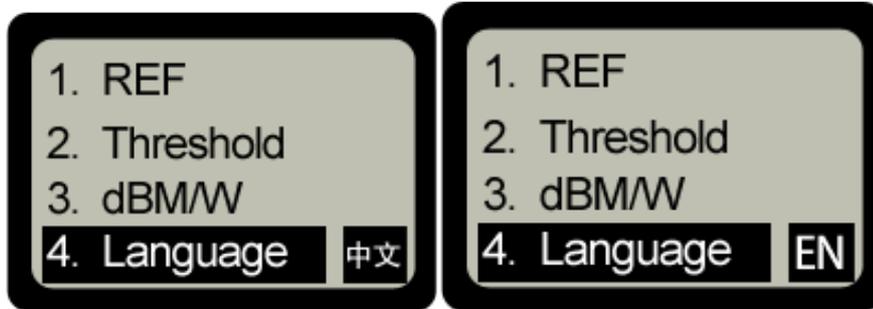
Measure the output power of the fiber use dBm or Xw, Press “” with  and  to choosethe measurements units, press “” to exit and cancel the current operation as shown in below figure。



### Switches of language

There are two language English and Chinese to Choose, Press “”

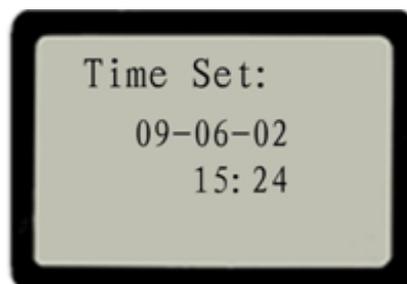
 and  to select “Language” option, Press “” to exit and cancel the current operation.



### Time setting

In item 5 have “Time Setting” Press  and  select the “Time Set” option, and press  to change year-month-date-time

respectively as shown in below figure, use  and  to change the digits. After setting, press “” to confirm. Press “” to exit and cancel the current operation.



This option is designed to review and delete saved measurements data.

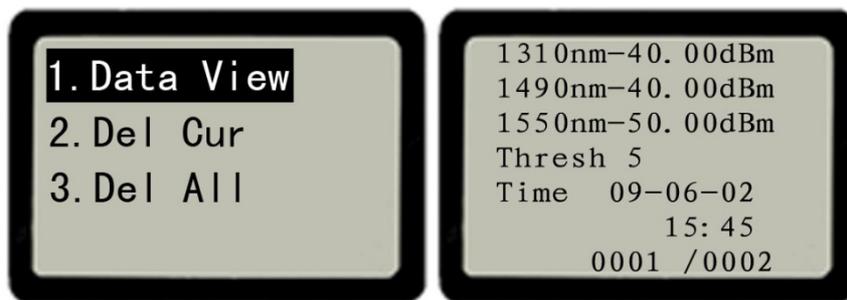
Press “ Menu” to enter into menu operation, using with  and  to highlight “History Data” option. There are three options in History data:

(1) . " Data View"

Under "History data", use  and  to highlight "Data View",

press  to confirm and view the history data as shown in below

figure. Press  to exit.



As shown in above figure, when there is no optical signal to be tested, the power level will show -40dBm at 1310nm&1550nm and -50dBm at 1550nm, when the optical signal is present, the unit will display the corresponding tested value. "Thresh Sel 5" is the name of current selected threshold set. 0001 here represents the current viewed data, 0002 here means the total qty of saved measurements data. Use

 and  to choose or change the different saved history data.

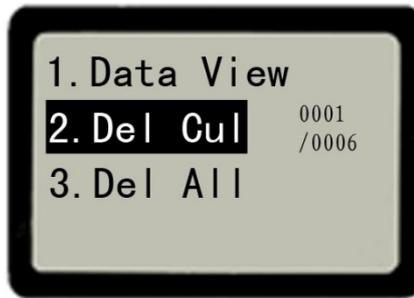
If there is no measurements is saved in the unit, it will display "No Record"

(2) . "Del Cur"

Under "History data", use  and  to highlight "Del Cur",

press  to confirm to delete the current data as shown in below

figure.



(3). “Del All”

Under “History data”, use  and  to highlight “Del All”, press “” to confirm to delete all the saved history data as shown in below figure.

## Chapter 5 Troubleshooting

Problem	Possible Cause	Solution
No display on the LCD	1. Power Off 1. Lower Battery	1. Press “  ” to turn on 2. Change the battery
Inaccurate measurements	1. Optical interface is not clean 2. Improper fiber connection	1. Clean the fiber optic interface 2. Reconnect the fiber

## Chapter 6 Maintenance

To help ensure long, trouble-free operation:

- 1) Always keep clean fiber-optic connectors before using, keep the unit free from oil and dust.
- 2) Do not use unclean, non-standard fiber-optic connector adapter, do not insert to bad fiber-optic connector interface which may cause the system out of the work.
- 3) Try to use one type fiber optic connector adapter.
- 4) After finish the testing or when the unit is unused, please cover the dust-proof cap to ensure the optical interface is clean and to avoid measurements errors caused by dust.
- 5) Push/pull the fiber-optic connectors carefully to avoid the scratches on the interface.
- 6) Clean optical connectors regularly with cleaning cotton swabs.

## Chapter 7 Warranty & Servicing

Caution: Repair it in the field is NOT recommended.

- 1) we warrant that **PON Optical Power Meter** will be free from defects in material and workmanship for a period of **18 months**. The date will be started from the date of goods receiving by original customer.
- 2) If any defectives happened due to quality problems of the product **during the first month(from the date of goods receiving)** of warranty period, we undertakes **at its own cost** (including all the freight costs and import taxes ) to **repair or replace or return** the faulty product.
- 3) If any defectives happened due to quality problems of the product **during the 2<sup>nd</sup> month to 18<sup>th</sup> month** of warranty period, we promises to repair or replace free of charge. **But** the freight cost and related taxes will be shared by both parties. We will pay the shipping cost from customer side to We and pay the import taxes in China. Customer will pay the shipping cost from We to customer side and its local import taxes accordingly.

**This warranty is limited to defects in workmanship and materials and does not cover damages from accident, acts of god, neglect, wrong usage or abnormal**

**conditions of operation.**

4) We will charge corresponding fees for the cost of materials, repair and shipping in conditions of below:

- Defects occurred under normal use and service but out of the warranty period.
- Failures and damages occurred do not because of defects in material and workmanship of products.
- Failures and damages occurred because of failing to comply with the Operation Instruction and necessary attention.
- abnormal conditions of operation or handling:

Such as artificial damage, or operating in abnormal conditions of like high temperature, high voltage, humidity and etc., We will charge depend on the actual failure rating.

# Appendix I

***WE guarantees that any information you supply will remain confidential.***

***By returning this card, you will automatically be notified about updates, modifications, and recalibration.***

## ***CUSTOMER SERVICE***

---

### **Warranty Registration Card**

**Serial Number:**

**Model Number:**

**Date of Purchase:**

Company Name:

Company Address:

TEL:                      FAX:

E-mail:

Note: Please fax this note within one month from the date of receiving units.

Do you have any comments on the quality of this product or the service from We?