USER MANUAL

PON POWER METER

AR-PON-PM

VERSION:V2.20

CONTENTS

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.

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 Power Meter	
Items	Title	Quantity
1	Tester	1 Unit
2	User Manual	1 Pc
3	USB	1 Pc
4	Soft CD	1 Pc
5	1.5VAA Battery	3 Pc

2. Overview

PON 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 andAV).
7. Optical power meter and VFL with one port. (onlyA).
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.

3. Technical Specifications

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!

3.1 PON module:

PON module:	PON Power Meter	A	AV	AP
1310 upstream measurement				
Pass Zone (nm)	1260nm~1360nm			
MeasurementRange(dBm)	-40dBM~+10dBm			
Output power (max)	15dBm			
Isolation@1490/1550(dB)	>40dB			
Burst mode measurement error	<±0.5dB			
1490 downstream measurement				
Pass Zone (nm)	1470nm~1505nm			
MeasurementRange(dBm)	-40dBM~+10dBm			
Output power (max)	15dBm			
Isolation@1310/1550(dB)	>40dB			
1550 downstream measurement				
Pass Zone (nm)	1535nm~1570nm			
MeasurementRange(dBm)	-40dBM~+20dBm			
Output power (max)	25dBm			
Isolation@1310/1490(dB)	>40dB			
Measurement Accuracy				
Connatural uncertainty(dB)	±0.5dB			
Linearity(dB)	±0.1dB			
Passing through insertion Loss (dB)	<1.5dB			
General Information				
Detector Type	InGaAs			
Optical Connector	FC/SC/ST Interchangeable/2.5 universal adapter			
Fiber Type	SM 9/125um			
Measurement Unit	dB/dBm/xW			

Continue...

PON module:	PON Power Meter	A	AV	AP
General Information				
Resolution (dB)	0.01dB			
Operation Voltage (V)	DC 3.3V ~5.5V			
Power Supply	3pc 1.5V Battery			
Continuously Operation time (h)	PON: 90h	PON: 90h OPM: 100h VFL: 50h	PON: 90h VFL: 50h	PON: 90h OPM: 100h
Operation Temperature (ºC)	-10ºC~60ºC			
Storage Temperature (ºC)	-25ºC~70ºC			
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	PON Power Meter (*)	A	AP
Measurement Accuracy			
Connatural uncertainty(dB)	None	±0.5dB	
Linearity(dB)		±0.1dB	
Measurement Range (dBm)		-70dBm~+6dBm	
General Information			
Measurement Unit	None	dB/dBm	
Resolution (dB)		0.01dB	
Calibration Wavelength(nm)		1300 / 1310 1490/1550/1625	850/1300/1310 1490/1550/1625
Detector Type		InGaAs	
Optical Connector		FC/SC/ST Interchangeable/2.5 universal adapter	

(*) PON Power Meter do not have the OPM module.

3.3 VFL Module:

VFL	PON Power Meter (*)	A	AV
Output power	None	±0.5dB	
Wavelenght		650nm	
Optical Connector		FC/SC/ST Interchangeable/2.5 universal adapter	
Fiber Type		SM/MM	

(*) PON Power Meter without VFL module.

4. Instruction

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

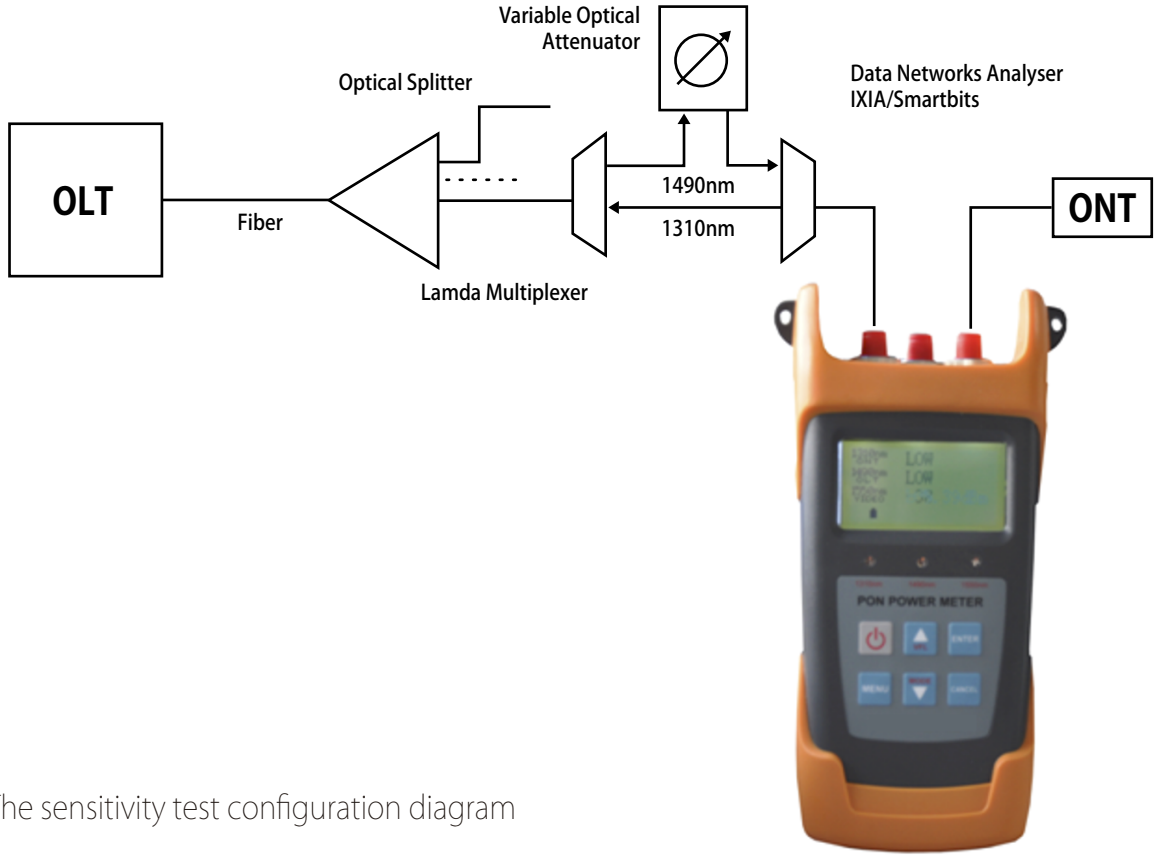
1. Description

1. OLT/VIDEO：1490nm/1550nm Down Stream
2. ONT：1310nmUp Stream Port (1310nm)
3. VFL or OPM Port
4. Display
5. ONT1310nmUp Stream Port LEDs
6. OLT1490nm/1550nm Down Stream LEDs
7. Video signal LEDs (1550nm)
8. AUTOpower/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

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

2. PON Online test connection diagram

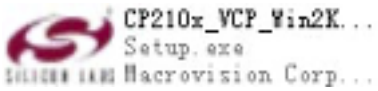
OLT PON Interface optical power test configuration diagram



ONT The sensitivity test configuration diagram

4. Data Communication

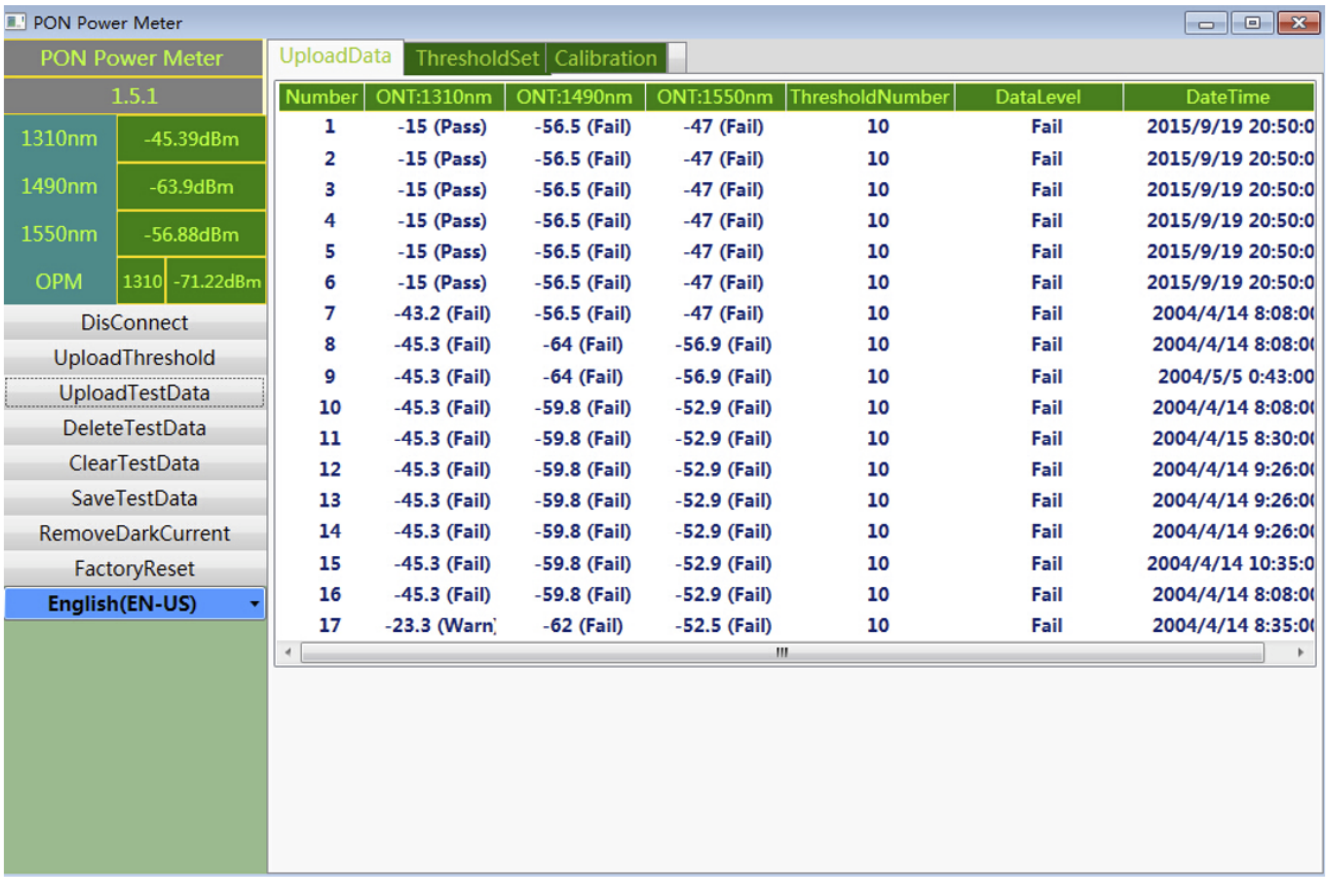
Run the CD,install USB driver software CP210x_VCP_Win2K_XP_S2K3.exe.



Then install dotNetFx40_Full_x86_x64.exe.

Connect PON power meter to the computer's port using the provided USB cable, Open the software as shown in below figure:

Upload the data



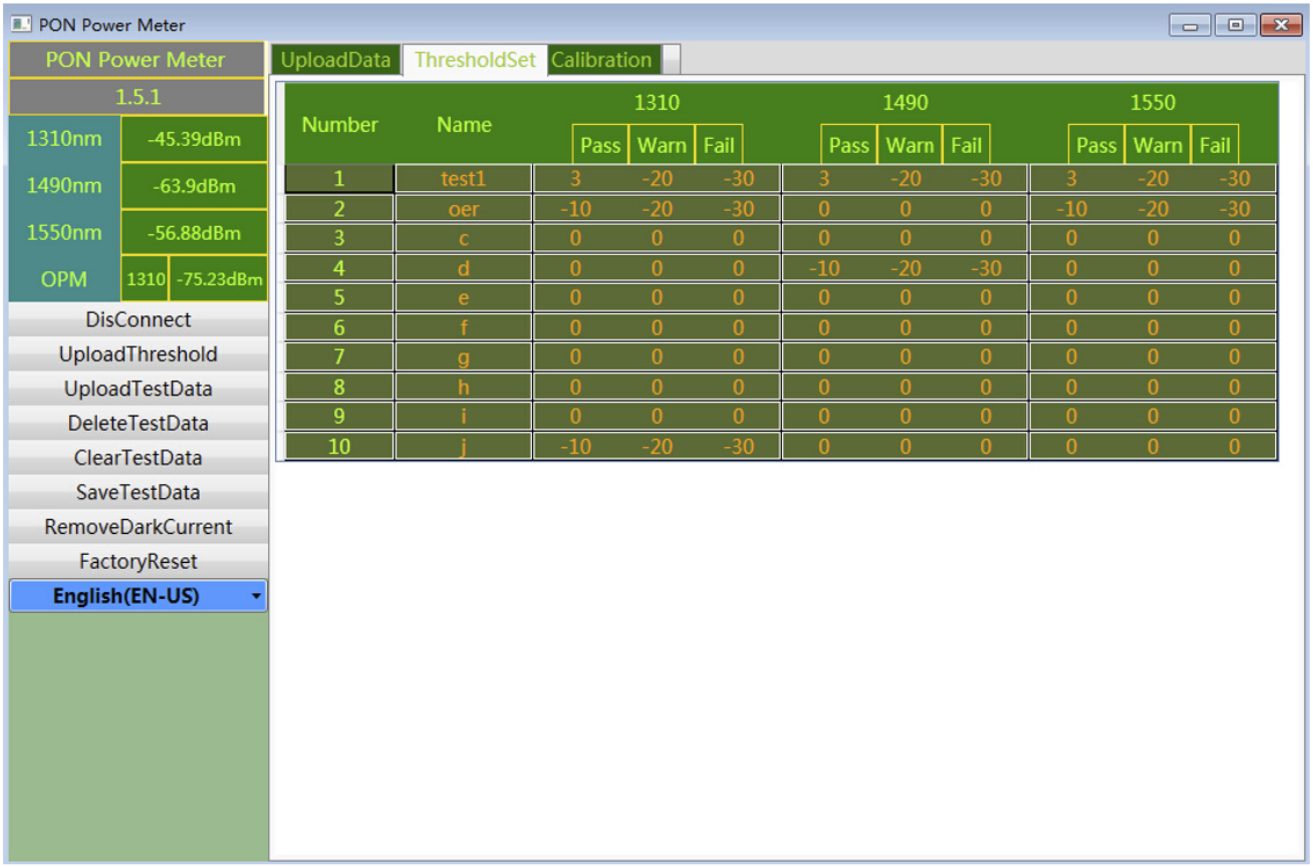
Number	ONT:1310nm	ONT:1490nm	ONT:1550nm	ThresholdNumber	DataLevel	DateTime
1	-15 (Pass)	-56.5 (Fail)	-47 (Fail)	10	Fail	2015/9/19 20:50:0
2	-15 (Pass)	-56.5 (Fail)	-47 (Fail)	10	Fail	2015/9/19 20:50:0
3	-15 (Pass)	-56.5 (Fail)	-47 (Fail)	10	Fail	2015/9/19 20:50:0
4	-15 (Pass)	-56.5 (Fail)	-47 (Fail)	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.

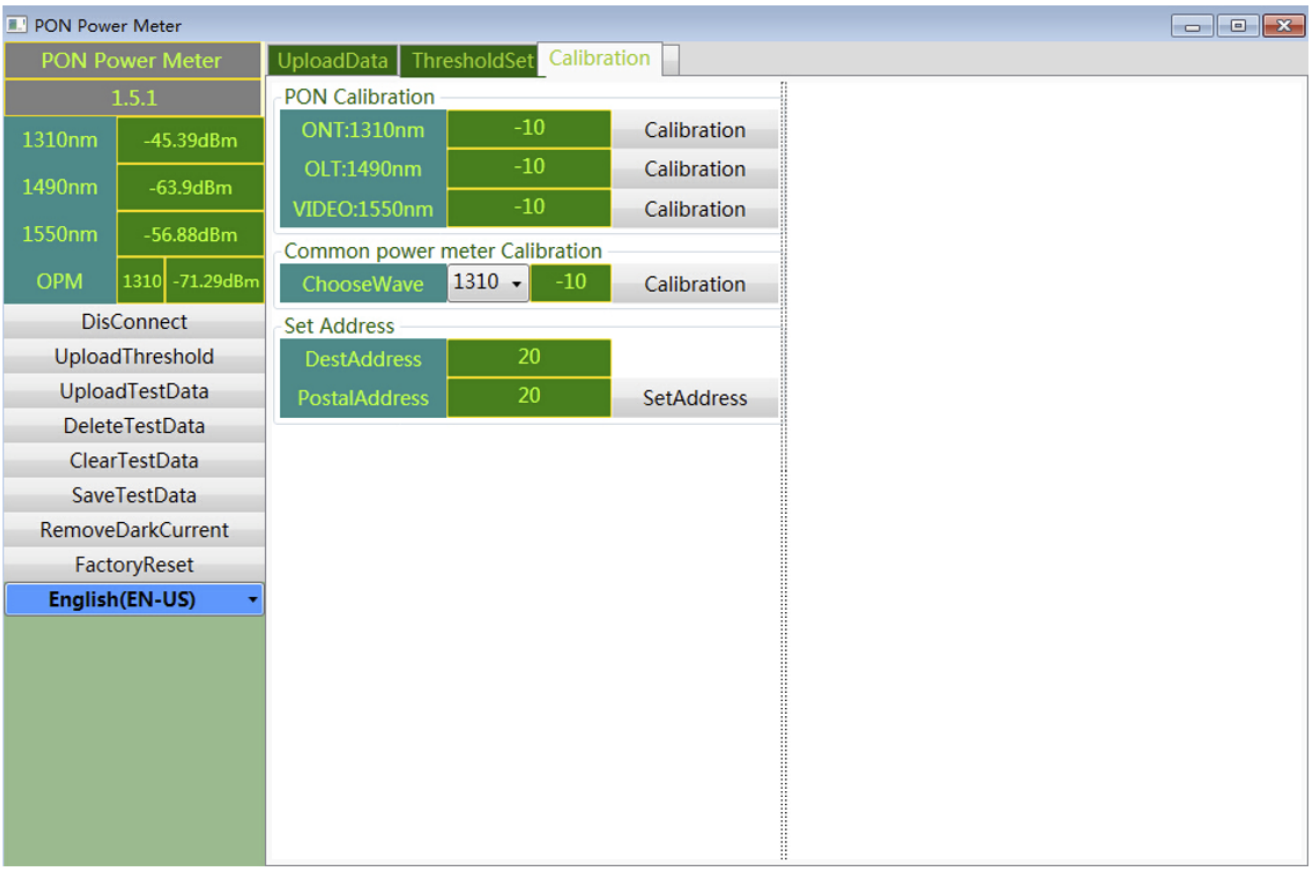
Threshold Setting:



Number	Name	1310			1490			1550		
		Pass	Warn	Fail	Pass	Warn	Fail	Pass	Warn	Fail
1	test1	3	-20	-30	3	-20	-30	3	-20	-30
2	oer	-10	-20	-30	0	0	0	-10	-20	-30
3	c	0	0	0	0	0	0	0	0	0
4	d	0	0	0	-10	-20	-30	0	0	0
5	e	0	0	0	0	0	0	0	0	0
6	f	0	0	0	0	0	0	0	0	0
7	g	0	0	0	0	0	0	0	0	0
8	h	0	0	0	0	0	0	0	0	0
9	i	0	0	0	0	0	0	0	0	0
10	j	-10	-20	-30	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

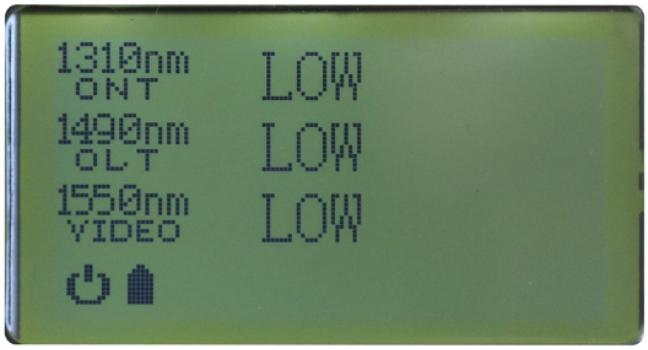


Choose **"Calibration"** tab, the user can perform user self-calibration operation also can choose **"Factory Reset"** mode. For example, the current optical power at 1310nm is -10dBm, type -10dBm in the text box of input standard power, and click Calibration tab, then finished the calibration operation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

5. 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 ENTER to close 10 minutes auto-off.

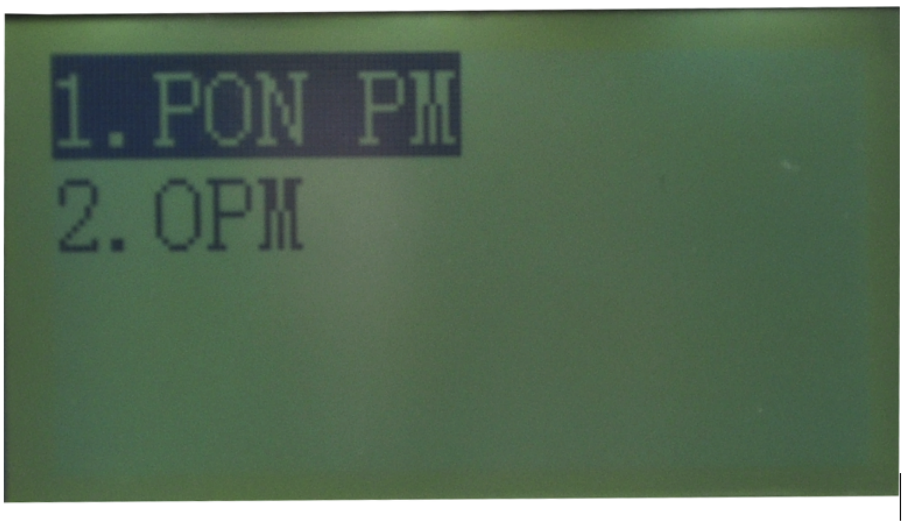
2. Power OFF

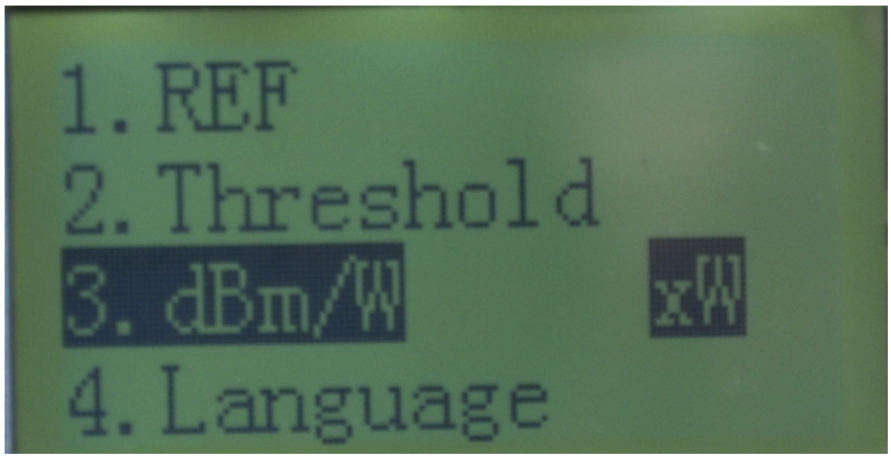
Press ⏻ key for about two seconds,to turn off the unit.

PON Power Meter module

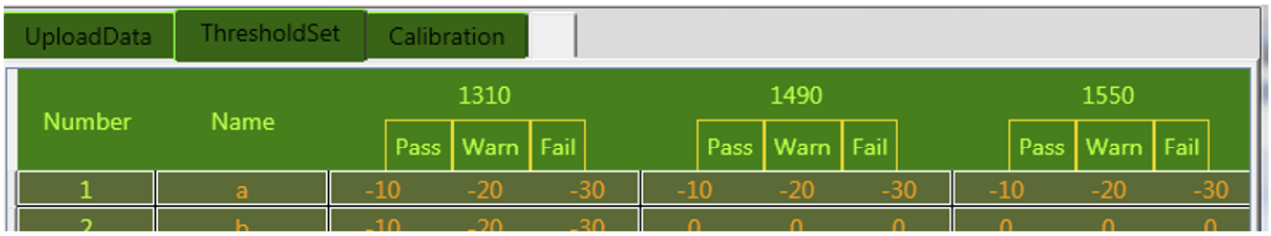
PON power meter can simultaneously measure the PON network upstream signals of 1310 nm, 1490 nm downstream data signal and descending video signal output power of 1550 nm

After open the instrument, Press MENU to enter into menu operation, Press " CANCEL " to exit
Press " VFL "or " MODE " to choose the following settings, and press " ENTER " to choose the function.



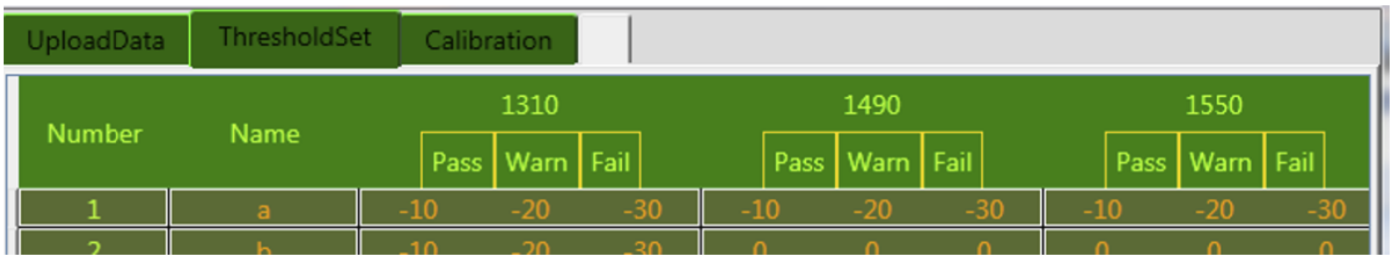


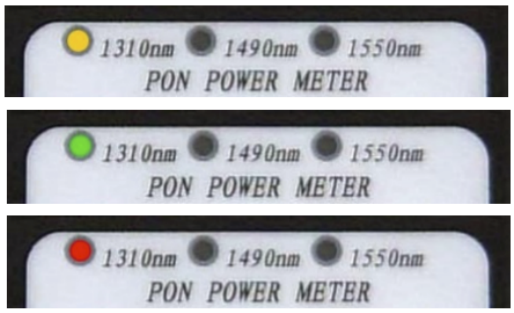
Use " VFL or MODE " to choose the required threshold value, (The thresholds rang and name have already set in the software, and also download to the instrument, please check with the user manual of Chapter 6 data communication), For example choose threshold and name it as "a" and press " ENTER ".



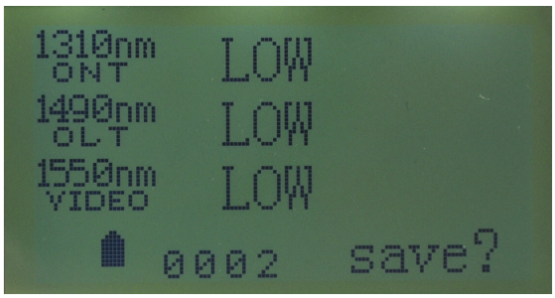
Press " CANCEL " back to the testing menu.
Clean the tested optic cable, connect with **OLT/VIDEO port** and **ONT port**, (SC type connector), **noted** with the optic adaptor type, the optical adaptor will be break, and the tested value will be faulty if the un-matched adaptor connected.

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.





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.

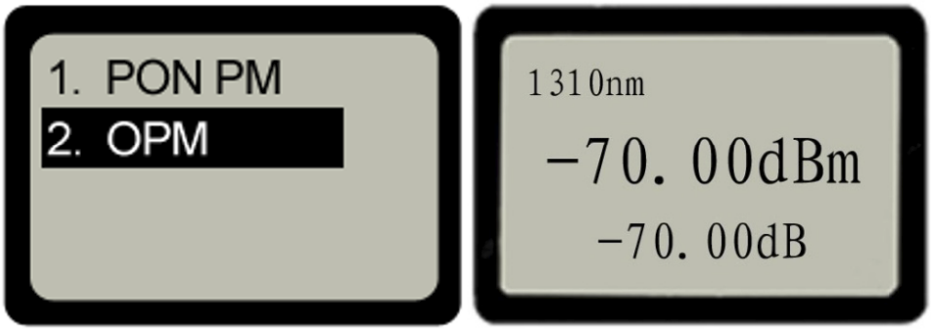


Press " ENTER ", there will displaying saving on the screen, check with the upper pic. The data recording series No.is 0002. press " ENTER " saving, and " CANCEL " for cancel, and the saving recording can be checked in the "data view" under "historical data" Menu.
After finish the testing work, keep the connect port clean, so cover the dusty-cap once finish the work.

Instructions for Normal Optical Power Meter Function(*)

Press ⏻ button to open the instrument, use " MENU " button and VFL ; MODE to choose the Optical Power Meter measurement, then press " ENTER " to enter into the selected function. VFL or MODE 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.

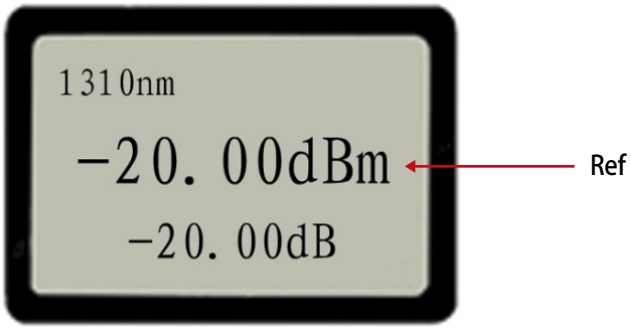
Take 1310nm measurement for example:



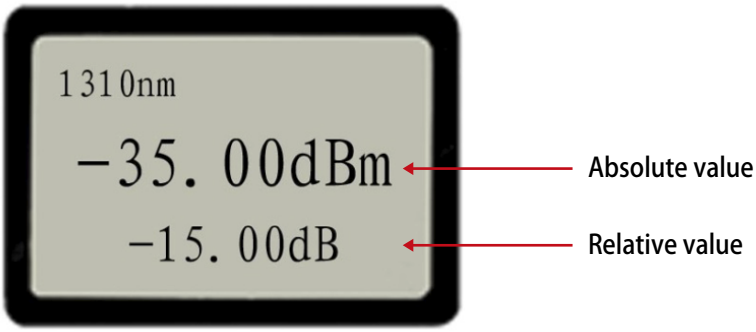
(*) PON Optical Power Meter &AV without this function.

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.

VFL module(*)

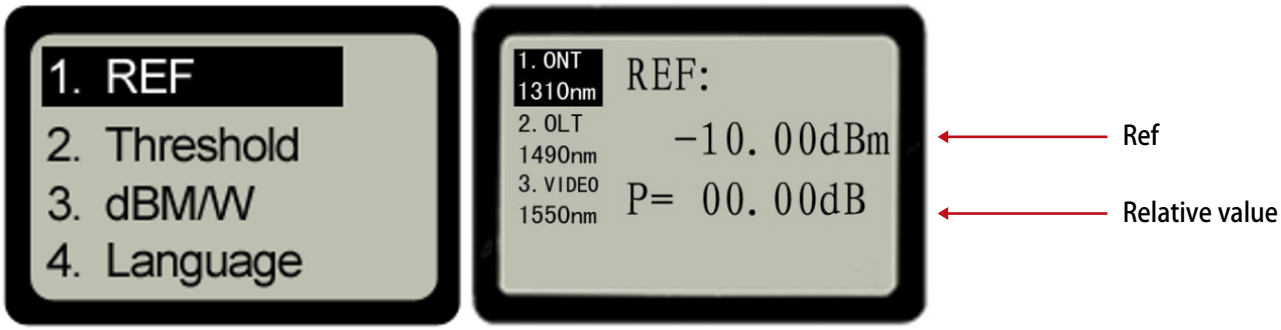
During the event or break point checking of the short distance optic fiber and pigtails we can use the VFL function.

First of all, Clean the optic Fiber end-face, and connect it them the VFL port (FC adaptor), after open the instruments, press " VFL " to activate this function, then can see the visual laser at the breaking point or the end of the pigtails. Press " MODE " to shift the CW and the Hz wavelength. And press VFL again o close this function.

(*) 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 VFL or MODE to select the different wavelengths, Press " ENTER " to change the Ref value as shown in below figure



Threshold Selection

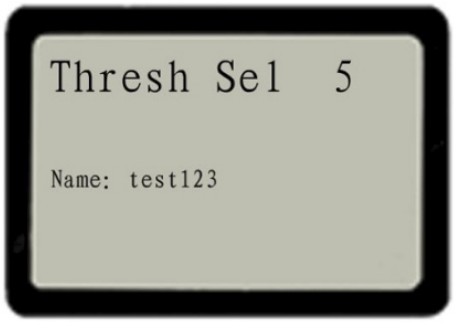
It offers up to 10 different threshold sets in total. There are three status LEDs in the front panel and each light indicator has three conditions of colors which represent different signal status as below:

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 VFL or MODE to select the corresponding shresholds. With using software to modify the values range and names of thresholds (Details as explained in term 5-Data Communication.)

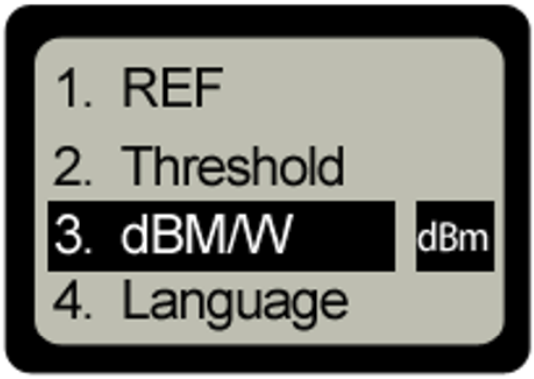


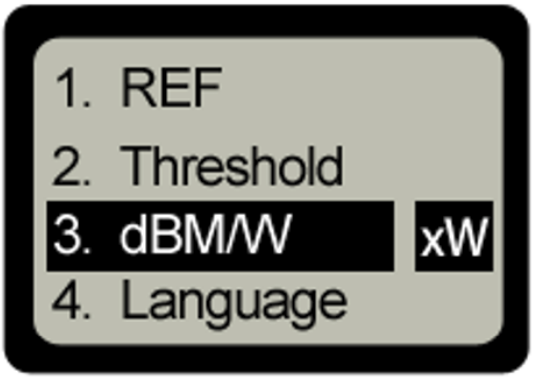
Status LEDs

(*) Threshold Selection just can be use English or figure, can not use Chinese.

Switches of measurements units

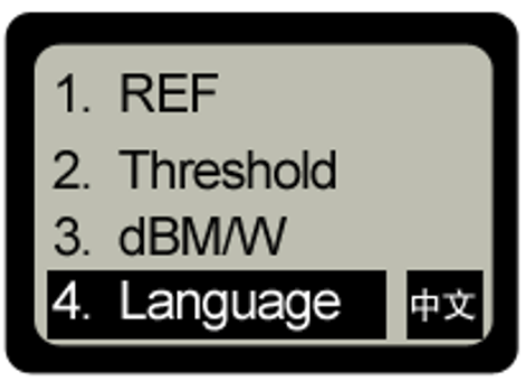
Measure the output power of the fiber use dBm or Xw, Press " ENTER " with and to choose the measurements units, press " CANCEL " to exit and cancel the current operation as shown in below figure
。

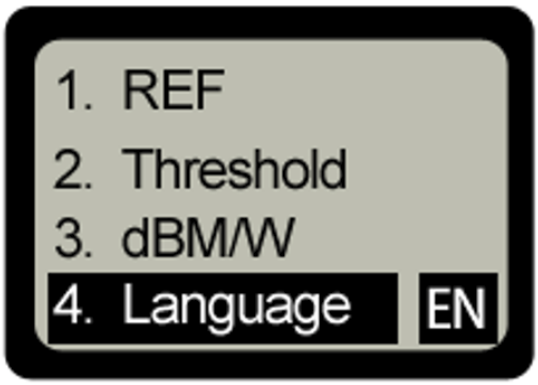




Switches of language

There are two language English and Chinese to Choose, Press " ENTER " and to select **"Language"** option, Press " CANCEL " to exit and cancel the current operation.





Time setting

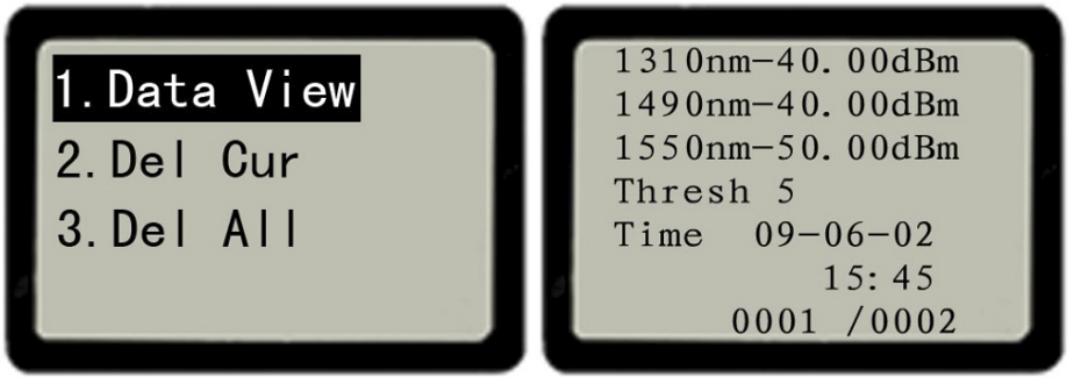
In item 5 have "Time Setting" Press VFL and MODE select the "Time Set" option, and press ENTER to change year-month-date-time respectively as shown in below figure, use VFL and MODE to change the digits. After setting, press " ENTER " to confirm. Press " CANCEL " to exit and cancel the current operation.

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

Press **" Menu"** to enter into menu operation, using with VFL and MODE to highlight **"History Data"** option. There are three options in History data:

1. "Data View"

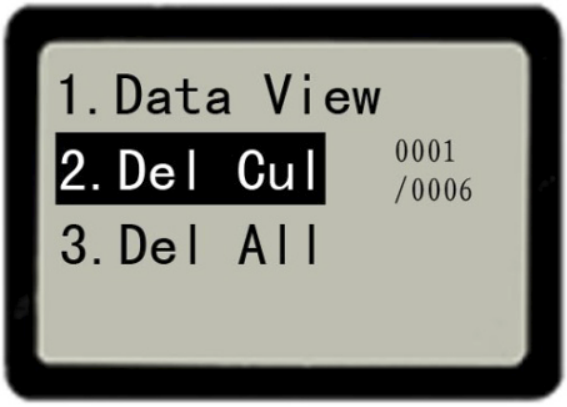
Under **"History data"**, use VFL and MODE to highlight **"Data View"**, press " ENTER " to confirm and view the history data as shown in below figure. Press " CANCEL " to exit.



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 VFL and MODE 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 VFL and MODE to highlight **"Del Cur"**, press " ENTER " to confirm to delete the current data as shown in below figure.



3. "Del All"

Under **"History data",** use VFL and MODE to highlight **"Del All"**, press " ENTER " to confirm to delete all the saved history data as shown in below figure.

5. Troubleshooting

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!

Problem	Possible Cause	Solution
No display on the LCD	1. Power Off 2. 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

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

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 2nd month to 18th 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?