Handheld Power Meter

Manual

Model# FF-3216A/C

Safety Sign:

When using the optical power meter, always take bask safety precautions to reduce the harm for the testers, and injury to persons. All the safety sign may not mark in this manual.

Warning：Prohibited misconduct and operation, to prevent any improper conduct and operation of the damage.

Notice： notic the important information, notification, and referencs, thse notice information should be understand.

Safety sign on the instrument：

WEEE Sign：Users of electrical and electronic equipment from private households should have the possibility of returning WEEE at least free of charge.

⚠ Safety Advice

1.When the tester use Disposable alkaline batteries, do not charge it. Ensure the correct polarity installation,when replace the battery.

2．When the products are not in use, please remove the batteries and kept separate to avoid instrument damage caused by battery leakage. If leakage occurred, Please do not touch.

3. To prevent electric shock, do not open the product case, only the authorized qualified professionals can do the maintenance; Do not expose the testers to rain or wet conditions, to avoid the risk of fire or electric shock

4．Instruments used LCD screen. Do not fall the instrument. If the LCD are seriously hit, it may cause fluid leakage. And please do not touch.

Contents

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Chapter 2: Overall

Handheld Optical Power Meter is a newly designed fiber optic tester, which aims at the installation, engineering acceptance and maintenance of fiber network.

Compared with other usual power meters, the   has more functions, like automatic wavelength identification, auto wavelength switching, intelligent backlight, data savage via USB port.

Combined with ITS MATCHED handheld optical light source, it offers a quick and accurate testing solution on both SM and MM fibers.

● Wave ID—Auto wavelength identification & switching

● Frequency ID ---Auto frequency identification

● 2 types of backlight modes, manual or outside light intensity, which indicated by LED light red or blue color.

● Intelligent backlight

● 1000 records storage or download via USB cable

● USB communication port for saved testing records download

● Reference power level can be set up and stored

● User self-calibrating function

● Auto-off function

● Up to 200hrs battery life

Chapter 3: Data Sheet

Model	FF3216A	FF-3216C
Calibration Wavelength（nm）	850/1300/1310/1490/1550/1625	
Detector type	InGaAs	
Measurement Range（dBm）	-70～+6	-50～+26
Uncertainty (dB)	±0.15（3.5%）	
linearity (dB)	±0.02	
Display resolution(dB)	0.01	
Frequency ID（Hz）	270，330，1K，2K	
Wave ID（nm）	850,1300, 1310，1490，1550，1625	
Date Storage Capacity	1000	
Communication Port	USB	
Standard Connector	FC /2.5mm universal	
Optional Optical Connector	FC/SC/ST Interchangeable/2.5mm universal	
Optional Optical Connector	LC/FC/SC/ST Interchangeable	
Alkaline battery	3*AA，1.5V	
Power Adapter(V)	8.4	
Battery Operating time (h)	200 without backlight	
Operation Temperature(℃)	-10～+60	
Storage Temperature(℃)	-25～+70	
Dimension(mm)	175*90*44.5	
Weight(g)	231	

Remark: Battery operating time is based on the condition of the power off the backlight. If power on the backlight continuously, the operation time will be shorter.

Chapter 4: Function

4.1Front

4-1

(1) ⏻Power Key

ON/OFF the instrument

Power Saving setting: the unit will automatically shut off after 15 minutes idle time, whatever in the condition of battery power supply or AC power supply. Once choose this setting, the "auto-off" will display on the left bottom of the screen. This power saving is the default setting, once open the power meter, will enter into this mode. Short press the power key to off auto power saving mode.

Power Saving(Auto-off)
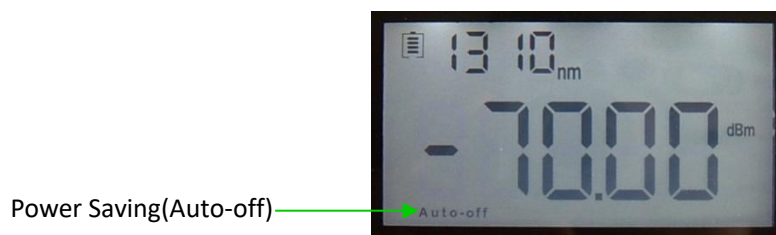
(2) λ Wavelength Selection/Wavelength identify

Short press this key to switch the wavelength and display it on the top left of the LCD screen, 1310nm is the default wavelength

3

Calibrated wavelength

Press the [λ] for 2 seconds, enter into wavelength auto-identify, on the upper right of screen have "AU",

and also long press this key to quite this function.

Wavelength auto-identify

(3)[☀] backlight control(two mode of back light control, press this key to choose one mode):

"LDR" the intelligent backlight control mode. Power meter will off/on the backside

in t 15second based on the outside light condition, and this is the default mode

Back light control key mode. Press [☀] to on/off the back light

(4)[SAVE]Saving/data-view key。

Data-saving, can saving not less than 1000 data. Press[SAVE], the screen will display the **data**

saving No, tip saving the data, doubel press the [SAVE] confirm the saving.

data saving No.

Current saving data(wavelength, output

Data view. Long press [SAVE] enter into the data view interfac, short press[SAVE]can view the data.

0008

......

0001

(5) (DEL) Delete/Cancel Key。

    1.Data Delete. When view the data, press (DEL) to delete the record.

    2.Cancel the saving. When in the saving mode, press (DEL) to cancel the current data saving.

(6) (UNITS) unit switch key

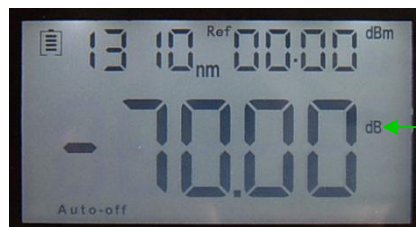   Press this key to switch between the absolute measurement(dBm) and relative measurement(dB) and xW of the optical power.

    mW、dBm conversion：$10 \log(mW) = (dBm)$

    mW、uW、nW conversion：$1mW = 103uW = 106nW$

dBm

dB

xW

(7) [REF] REF setting:

To store the current power value as the reference value which will be displayed on the top right of the LCD screen, at the same time the "Ref" also display on the right top. It will compare the current power with the reference power and show the relative power value in dB.

The relation ship bsetween relative value(dB), absolute value(dBm), and Ref value: relative value=｜absolute value｜-｜Ref｜

Ref value setting

Relative value setting
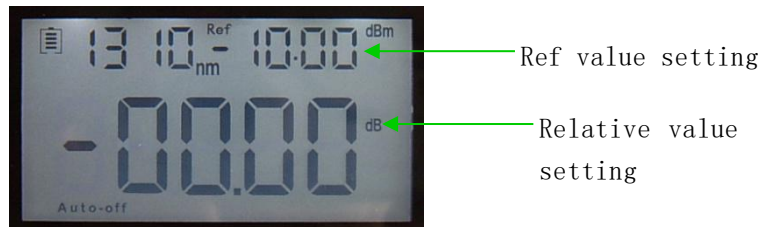
(8) "B/L SET"backlight indicator
Indicate backlight control mode. Green light indicate that "LDR"intelligent backlight control mode, Red light indicate that key-control mode
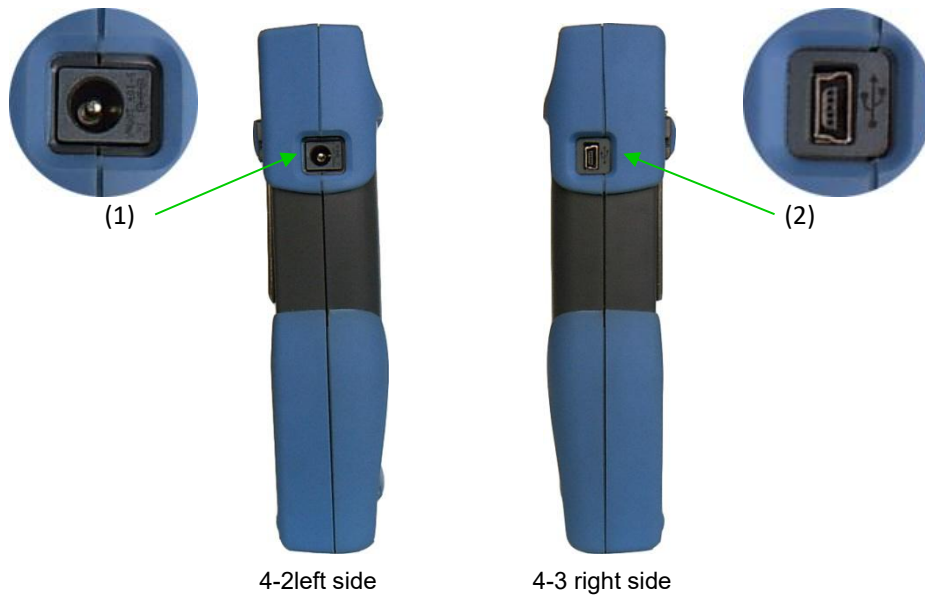

Indicator (Green)

Indicator (red)

(9) "LDR" Intelligent backlight controller
In the intelligent backlight control mode, the controller will automatically adjust the backlight with the outside light, which to save the power.
(10)Screen
Display the data and the instrument working mode.

4.2 Two sides

4-2left side   4-3 right side

(1)Power Supply unit port

Can connect with the AC adaptor pic. 4-4。
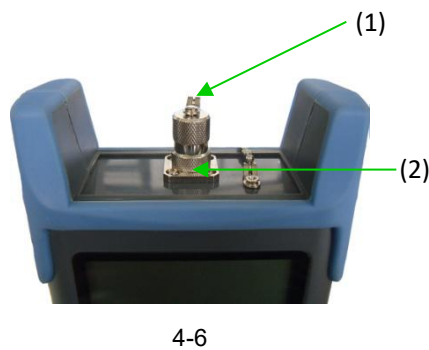

AC adaptor

Power Supply
Unit

Power Plug

4-4

Notice：Please use only the power supply unit supplied with the tester, use other kind of PSU may cause damage for the instruments.

(2)USB Port。

Use the USB cable supplied to connect the Optical Power Meter to The USB port on PC pic. 4-5。

Mini USB Port

Universal USB(connect with PC)

4-5

4.3 Top

(1)

(2)

4-6

(1)Dust Cap

In order to protect the optical connector, avoid damage on the connector, so when not in use make sure that you place the dust cap over the connectors.

(2)Optical Connector。

The standard of this power meter connector is PC &Φ2.5mm universal connector.pic. 4-7&4-8。
Screw off the FC connector, it will turn to &Φ2.5mm universal connector.

4-7 FC connector   4-8 Φ2.5mm universal connector

Notice: When change the optical connector, take care for the connector and the end-face.

FC connector can connect with FC adaptor, Φ2.5mm universal connector can connect with FC, SC, ST adaptor. Pic 4-9

FC Patch Cord   SC Patch Cord   ST Patch Cord

4-9

Notice: the tinny dust on the connector will effect the accurate of the measurement value, so please clean the connector and the patch cord end-face before do the test.
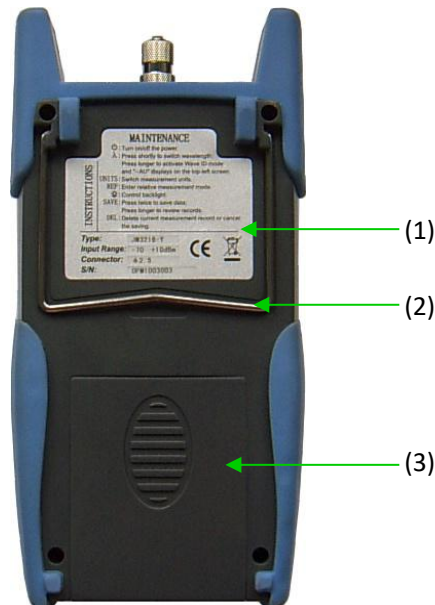
Use the alcohol and the cotton swab to clean the connector. Dip the cotton swab with alcohol, insert the cotton swab in the connector, slightly rotating the cotton swab, after that change a dry cotton swab and clean it again. Pic. 4-10。

Cotton Swab

4-10

4.4 Backside

(1)

(2)

(3)

4-11

(1)Label

Content include the function, and the instrument information

(2) bracket

Collapsible metal bracket, 0~90 degree can adjusted.

(3)Battery Pack

Can insert 3 1.5AA batteries.

Notice: When insert the batteries, take a note of their positive(+)and negative(-) connector orientation, The negative battery connector should be against the spring. And do recycle the battery, do not throw the battery to the dustbin, or that will happen the dangerous.
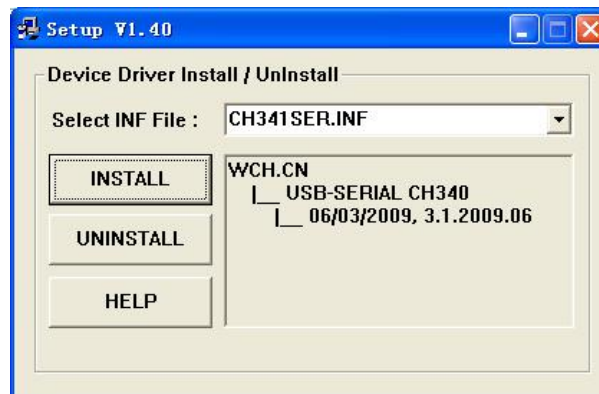

Chapter 5 Software

5.1Install the device

Run the software in the PC,, find the "CH341SER-CH340T"as show in the below

Double click that "exe" program, will pop up 5-1。

5-1

click "INSTALL"，after seconds, pup up 5-2。
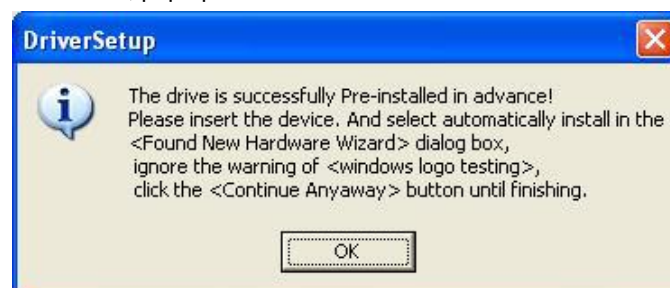
5-2

Press "OK", exit this install interface. However the driver still haven't install yet, continuo the following
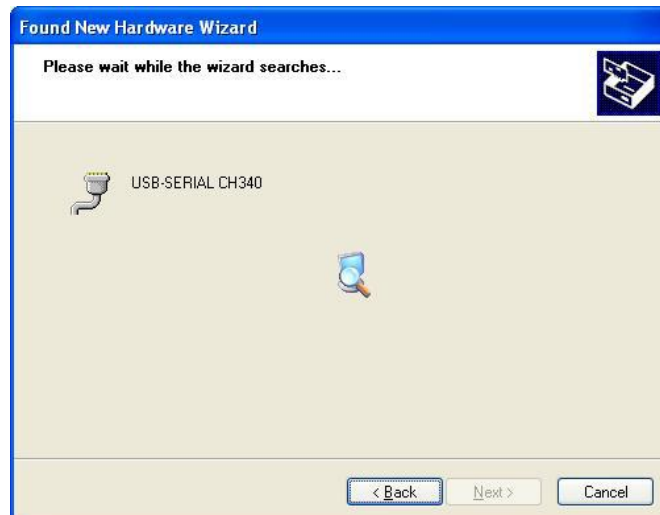
operation:

Use USB cable connect with power meter and the PC, switch on the instrument, pop up 5-3


5-3

Press "NEXT", Pop up 5-4。

5-4

Wait for a second, pop up 5-5。

5-5

Press Finish, complete the deriver installing.

Please check if the installing is complete or not, to avoid the communication problem when power meter connect with the PC. Open the "Device Manager"(right click "My computer" choose "property", pop up the property interface, choose "hardware option", click "Device Manager"), find the "Port(COM 和 LPT)"if your interface is the same as the following pic 5-6, means the install success. If the interface do not have "USB-SERIAL CH340" which the same as 5-7, means the failure install, so need to re-install the devices.
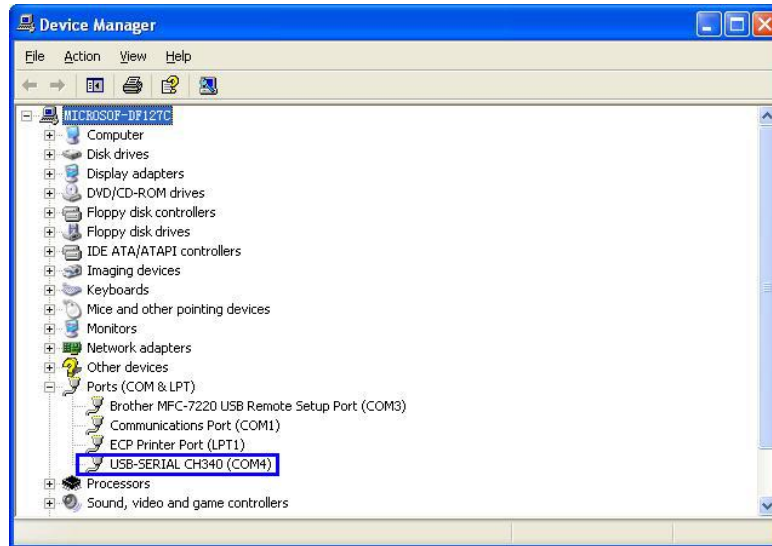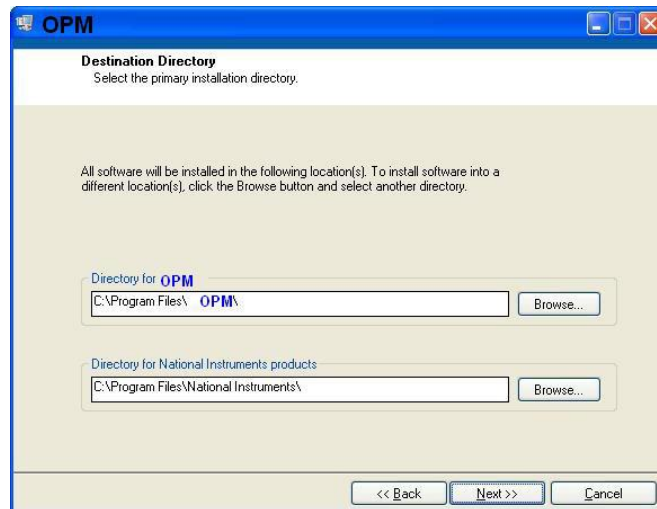

5-6
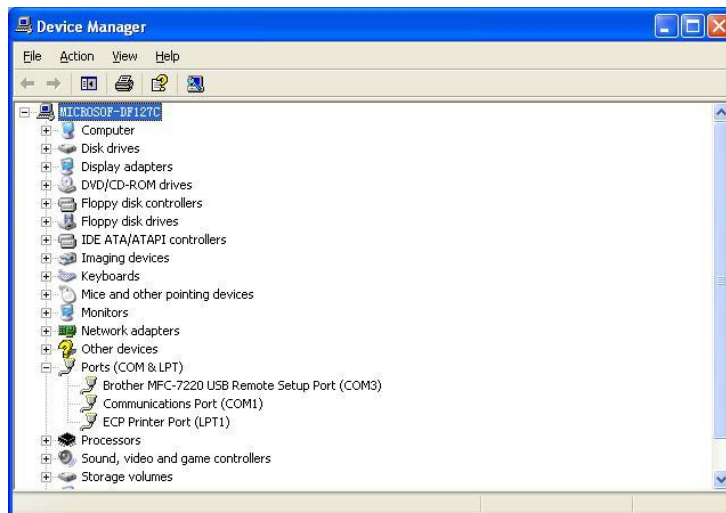
5-7

After success install the devices, can switch off the power meter, disconnect the USB.

5.2 Install the application software

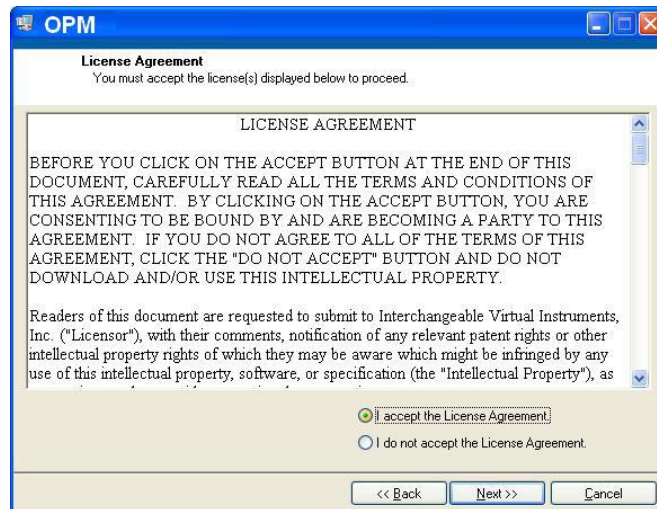Run the CD in the PC, find the "setup"file

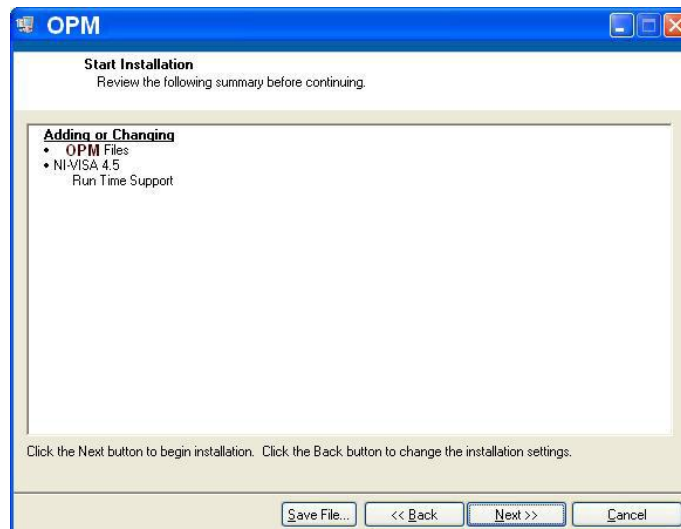Double click this icon，pop up 5-8

5-8

Press "Next",Pop up 5-9。
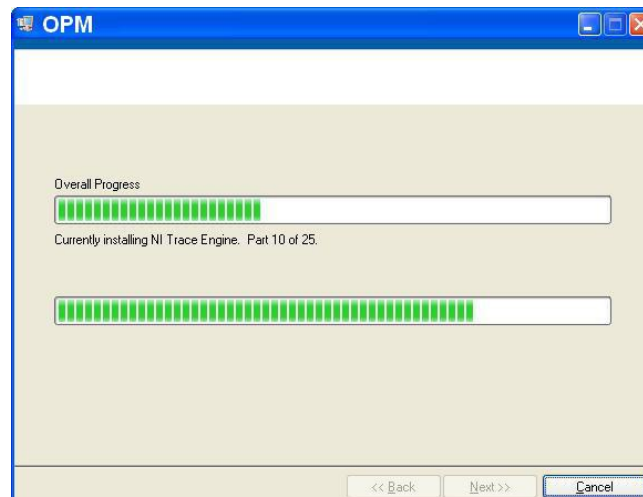

5-9

Choose "I accept ……", Click"Next",pop up 5-10。

5-10

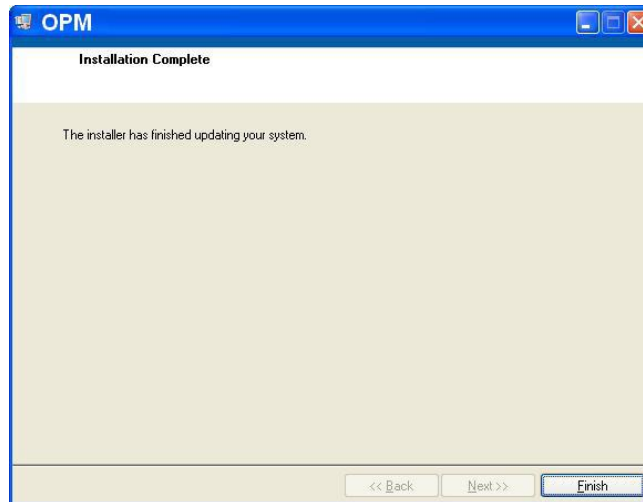Choose "I accept ......", click"Next",pop up 5-11。

5-11

Click "Next", pop up5-12。

5-12

Wait for a seconds，Pop up 5-13。

5-13

Click"Finish",Complete the installing.

5.3 Software function instruction

This software have two functions: data processing, and the instrument setting
After finish the software, find the short cuts icon for this software.

Double click this icon, open the software, pop up the software interface, pic 5-14，data processing is the default interface once open the software.
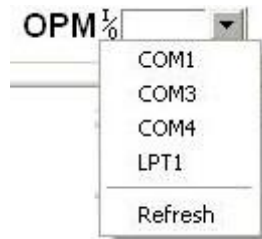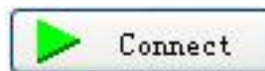
5.3.1 Data Processing

5-14
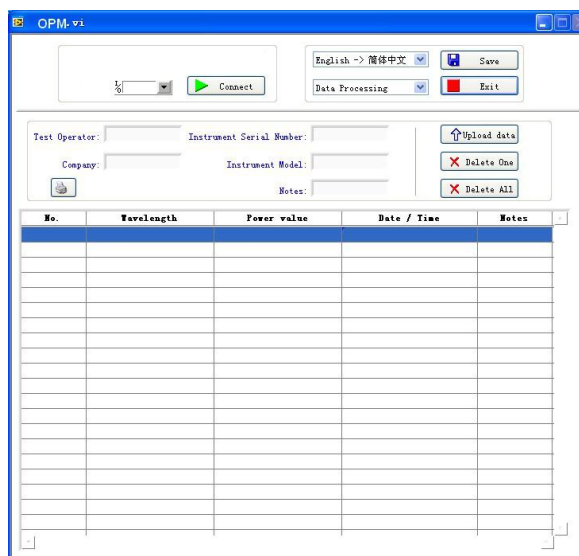
Data Processing interface include 4 parts.

(1)Manual

①Port Option。Drop down the manual, choose the right port, which the same port that the PC connect with the power meter.

OPM⅛ ▼
COM1
COM3
COM4
LPT1
Refresh

②Connect icon, make the PC connect with the power meter, and communicate.

▶ Connect

③Language option, Drop-down the manual, Find the right language for the user prefer, Chinese/ English.

English -> 简体中文 ✓
✓ English -> 简体中文
简体中文 -> English
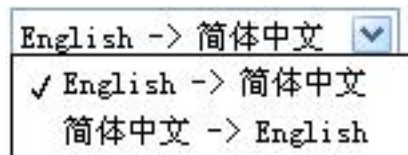
④Function interface option: Two functions for option--data processing and the instrument setting, drop-down the manual to choose.

Data Processing ✓
✓ Data Processing
Instrument Set
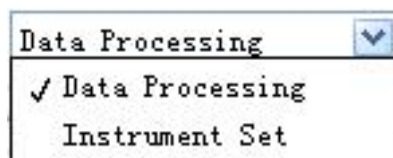
⑤Save button, save the current measurement data as the EXCEL file, convenience for user to view and analysis the data on the PC.

💾 Save
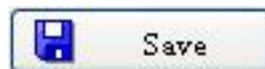
⑥Exit button, disconnect the communication, close the software.
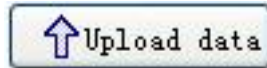
⬛ Exit

(2)Testing information form

Fill the information in blank

Test Operator: _____   Instrument Serial Number: _____

Company: _____   Instrument Model: _____

Notes: _____

(3)Printing button to print the measurement value.

(4)Data process button

①Upload the data to the PC, display the data on PC, for the user view.

⇧Upload data

②Delete the choose data。

✕ Delete One

③Delete all the data that saved in the instrument.

✕ Delete All

(5)Data display area

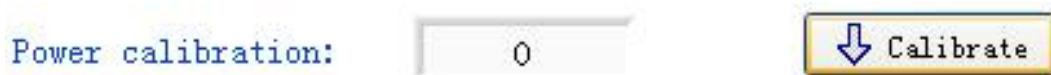To display the saved data of the instrument

5.3.2 Power Meter setting

5-15

Power Meter setting interface, pic. 5.3.2，which include 4 parts：

(1)Manu bar（Please refer description in data process interface）

(2)Calibration, the user can do the self-calibration.

Power calibration:　　0　　　⇩ Calibrate

3Time Setting.。

2010 ↕ Y　5 ⌄ m　8 ⌄ d　　18 ⌄ H　44 ⌄ M　　⇩ Set

(4)Recover the factory default setting. Power meter calibration recover the factory default setting.

⇩ Reset

Chapter 6 Operation Instruction and Notes

6.1 Powering the Optical Power Meter

The optical power meter can be either battery powered or AC adaptor powered, giving total flexibility for most testing sites and situations

6.1.1 AA battery

When use AA battery, 🔋 will display on the left top of the screen， 6-1。

Battery Power indicate ◄—

图 6-1

Power Grade：

🔋 left 70%～100% electricity

🔋 left 40%～70% electricity

🔋 left 30%～40% electricity

🔋 left 20%～30% electricity。

🔋 not enough electricity, left less than 20%，the power meter will forced power off

Fit the battery， 6-2

6-2

Press the clip fastener on the battery compartment cover down. Remove the battery compartment cover, remove all three batteries making a note of their positive and negative connector orientation. The negative battery connector should be against the spring. Insert 3 new 1.5VV AA battery. Refit the battery compartment cover. The clip fastener should click shut.

Notice：Make sure that you insert the batteries with their positive and negative connectors correctly aligned.

6.1.2 Power Supply Unit

When the battery is used out, can use the power supply unit, and at this time on the left top of the screen, there will be a ⌒⌇(6-3)。When the battery in the power meter, and still have enough electricity, the tester will choose AC power supply as the priority.

AC power supply sign ←

6-3

When use the AC adaptor, connect the power plug as pic, and insert to the AC socket.

AC adaptor

Power Supply

Power Plug

6-4

Notice：Please use only the power supply unit supplied with the tester, use other kind of PSU may cause damage for the instruments.

6.2 Power On the optical power meter

First of all insert the battery or the PSU, do not have any laser in, press ⏻ to open the tester, 6-5 is the opening interface

Electricity indicate ◄─────────────── Calibrated wavelength

dBm value

Power saving mode(Auto-off)

6-5

When the tester is standby, press ⏻ key can cancel or choos auto-off function.If auto-off fucniton are choosed, the "Auto-off"will display on the left bottom of the screen.

6.3 Backlight setting

After open the optical power meter, long press ☀, choose backlight control mode.

6.3.1 "LDR" Intelligent backlight control mode

Long press ☀,"B/L SET"is green (6-6),after 10 seconds, the green indicate off, the LDR the controller will automatically adjust the backlight within 15 seconds with the outside light, which to save the power.

indicator(Green)

6-6
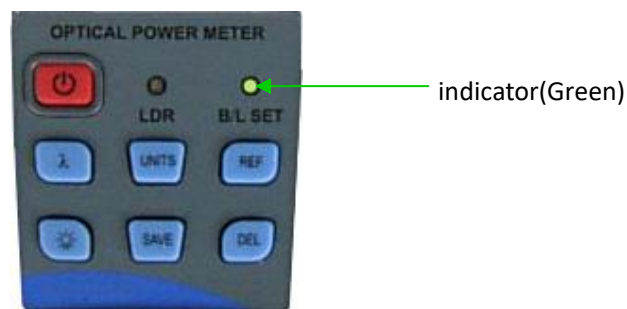
6.3.2 Choose the key control backlight mode.

Long press ☀, "B/L SET"indicator turns to red(6-7), enter into key control backlight mode, after 10 seconds the indicator off, short press ☀ can ON/OFF the backlight.

6-7

6.4 Output power measurement

6.4.1 Take off the dust cap, connect with the patch cord.

Notice: Make sure the connector and the end-face of the patch cord is clean, and take notice on the type of the patch cord, make sure the correct patch cord are connected.

6.4.2 Select the wavelength

Short press [λ], select the calibrated wavelength, notice that if the selected wavelength are not the same with the laser source wavelength, that will cause the error of the measurement value. There are 6 calibration wavelength for selection.
(6-8)
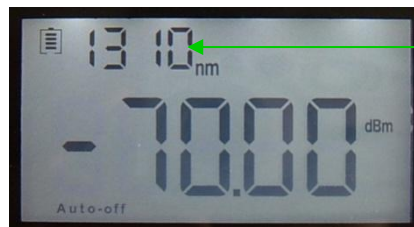
6-8

6.4.3 unit switch

Press [UNITS] to switch between the absolute measurement(dBm) and relative measurement(dB) and xW of the optical power.(6-9)

dB

xW

6-9

6.4.4 Relative value measurement

Each wavelength can set the Ref value, Press [REF], set the current value as the ref value, and automatically calculate out the relative value. (Right top of the screen display the "ref" and setting dBm value 6-10)

Relative value setting

Relative value setting
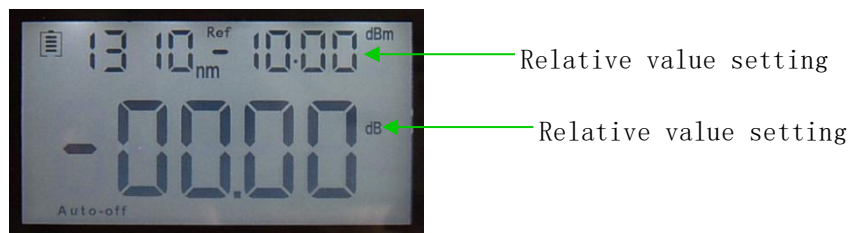
图 6-10

6.4.5 Data processing

Data saving and deleting. The power meter have 1000 data saving memory. When do the output power measurement, press [SAVE], at the right top of the screen will display the data saving No. eg: "0008"(6-11), hint that if the data save or not, double press [SAVE] confirm the saving, [DEL] cancel saving.

Current saving data(wavelength, dBm)

Data saving No.

6-11

Data view & delete. Long press [SAVE], can view the saving record, the screen will display the last

saving data. Short press [SAVE], can view the data from the last record.(6-12) Press [DEL] to delete

the record, long press [SAVE] exit the data view.
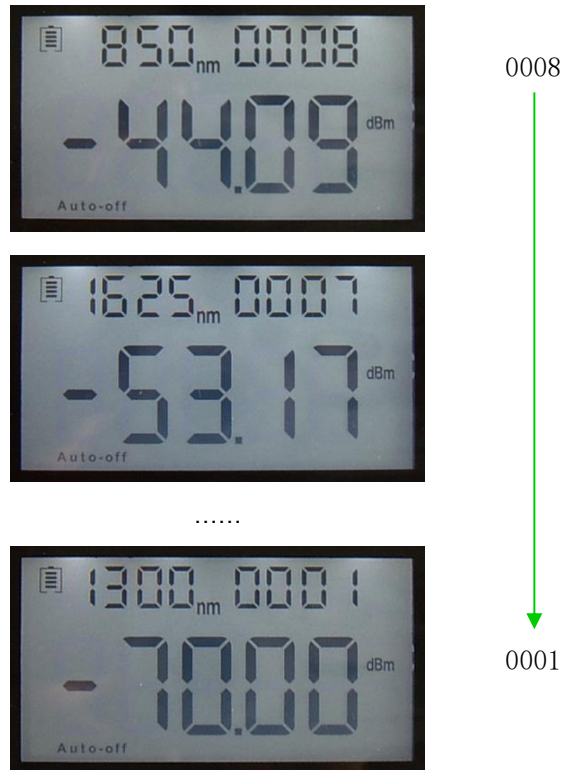
图 6-12

6.5 Data Communication

Note：Before proceed the data communication, make sure the driver and application software are installed successfully (Details of installation please refer to chapter 5)

6.5.1 Open the software

Double click [JW3216] icon to open the software, user can choose the language on request (Chinese or English), shown as figure 6-13.
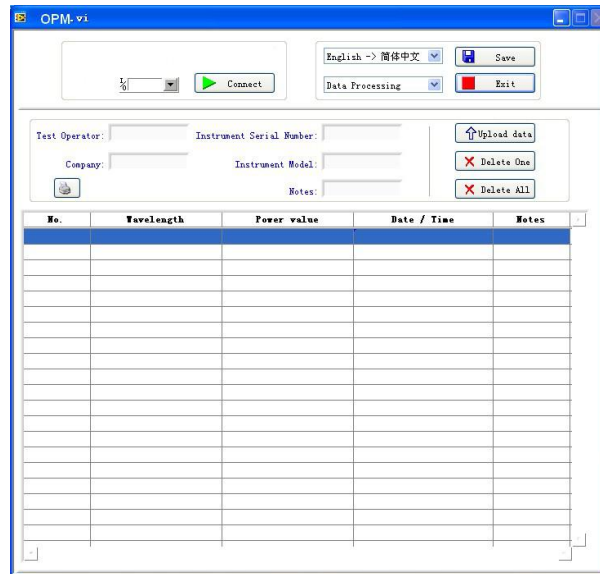
6-13

Connect   Optical power meter with computer via USB cable, turns on the power meter.

From the Device Manager: "Port（COM&LTP）, We can see that power meter port is "COM4"，(6-14)
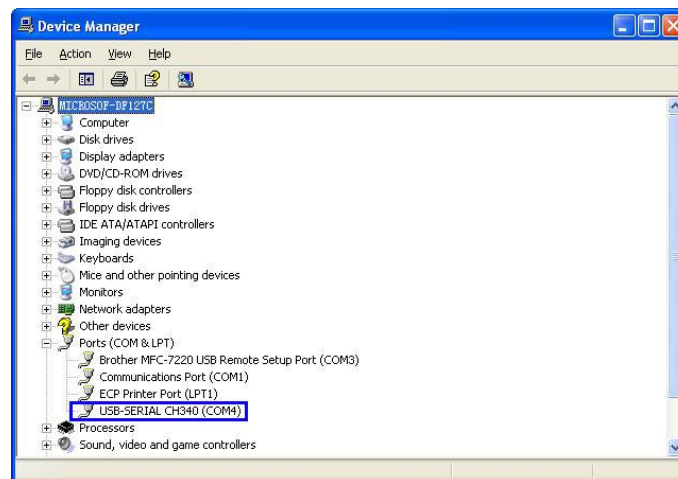
6-14

Therefore, choose "COM4"port shown as below figure (6-15)
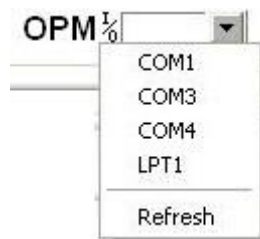
6-15

Next click "Connect"as shown in below figure 6-16, will pup up a successful connection window
shown as 6-17, click "OK" to finish the connection, the unit can be communicated with computer properly.

6-16

6-17

6.5.2 Data edit

    Firstly, input the following basic information as shown on figure 6-18.

图 6-18

    Then click "Upload data", the saved data in the unit will be uploaded into computer and shown as on below figure (6-19).

6-19

Data edit at data display area, including data delete, data save and data priting.

Select the required data,click "delete one" to delete it from the sheet, as shown on figure 6-20 and figure 6-21, in addition,the corresponding data from the power meter also will be cleared accordingly.

6-20

6-21

Click "Delete all"pop up a window shown as figure 6-22, click "OK" to delete all data, also will clear all saved data from the unit.
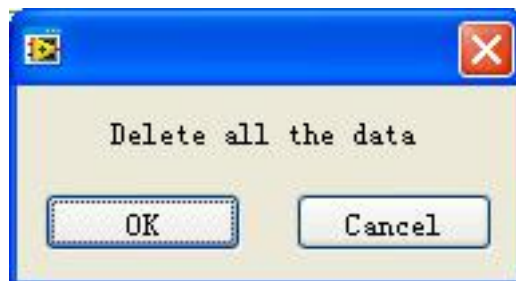
6-22

Click "Save" pop up a window shown as figure 6-23, input the file name, choose the save path and press "ok"for storage. File will be with EXCEL format and will pop up testing report automatically shown as figure 6-24.

6-23

6-24
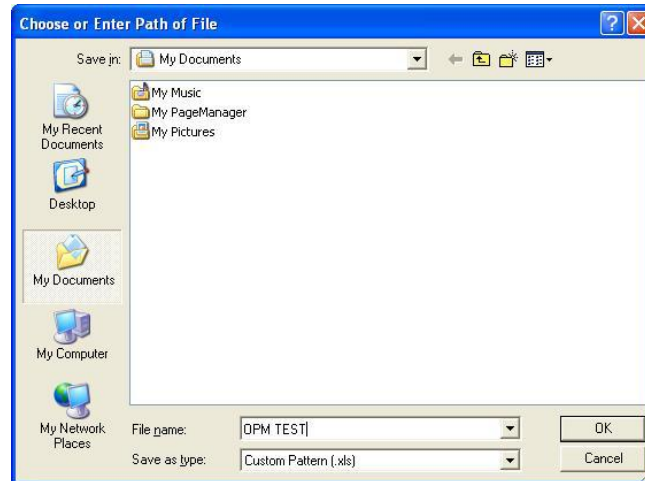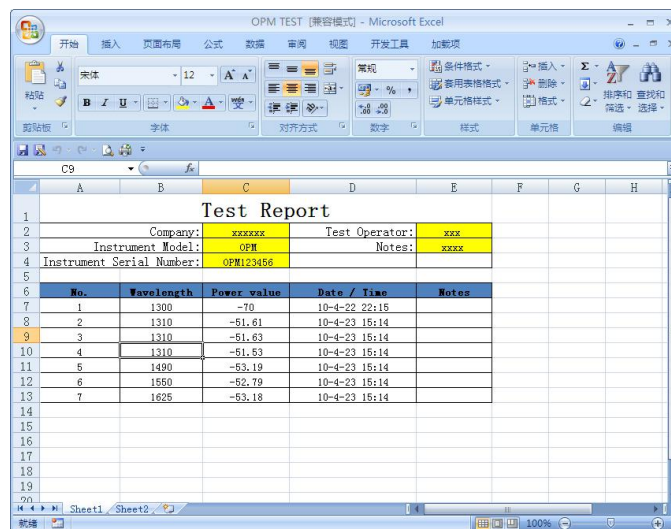
Click [icon] on the software，you can print testing report directly, you can also print the testing report from Excel.

6.5.3   Function setting on the unit

Under function setting mode to switch the interface as shown on figure 6-25 and figure 6-26:
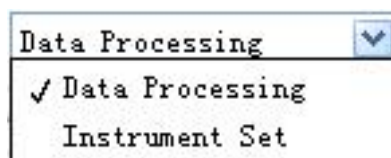
6-25

6-26

There are there items can be set on the unit:

    (1) Optical Power Calibration

6-27

Input the corresponding optical power and click "calibration", users can recalibrate the optical power by themselves.

    (2) Time setting

6-28

  Input the corresponding date and time, and then click "Set" to modify the time and date accordingly.

   (3)Back to factory mode
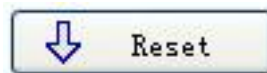
6-29

  Click "Reset",the unit will be back to default setting(factory mode setting).

6.5.4 Close software

    Click exit，pop up a window shown as below(figure 6-30):
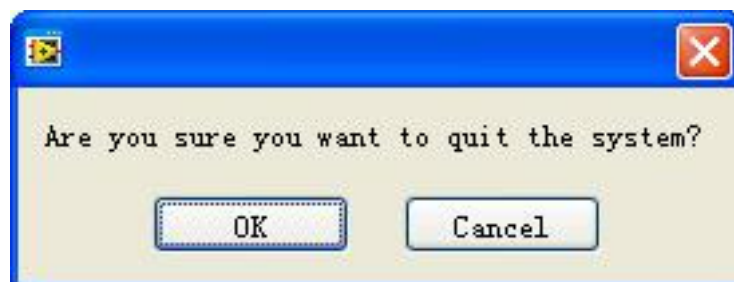
6-30

6.6 Wavelength Automatic Identification

● Connect   power meter with its same serials light source JW3116.

● Enable light source be Under "Wave ID" operation mode: press $\boxed{\lambda}$ of light source to emerge light output from light source.Hold down $\boxed{\text{CW}}$ for few seconds，light source will be enter into Wave ID mode, also "--AU"will be shown on the upper right of LCD for a indication.

● Enable power meter be under "Wave ID"operation mode: Hold down $\boxed{\lambda}$ for few seconds，power meter will be enter into Wave ID mode, also "--AU"will be shown on the upper right of LCD for a indication.

● Once the ID information is changed from light source(press $\boxed{\lambda}$ to change wavelength), after 3 to 5 seconds later, the detected information on optical power meter also will be changed automatically according to light source. Please refer to below figure(6-31) for easy understanding.

● Exit Wave ID mode: Hold down $\boxed{\lambda}$ again to exit Wave ID mode from power meter and hold down $\boxed{\text{CW}}$ again to exit Wave ID mode from light source.

1310nm(xxdBm)
1550nm(xxdBm)
……

MATCHED Light Source   Power Meter

6-31

6.7 Frequency detection

When use tone detection function, following requirements have to be taken into account:

For A: Tone detection will be effective only with measurement range between +6~-40dBm.

For C: Tone detection can be worked only with measurement range between +26 ～ -20dB, because the detected frequency will be unstable when the power is weak.

 How to act tone detection on   Power Meter?

● Connect   power meter with its same serials light source JW3116.

● Output frequency from MATCHED optical light source: Press $\boxed{\lambda}$ to emerge light from the unit, press $\boxed{\text{CW}}$ for very short second，MATCHED light source will output frequencies of 270Hz、330Hz、1KHz、2KHz accordingly，which will be shown on the upper right of the LCD in MATCHED light source. In the mean time, the   power meter will detect the corresponding frequency automatically from MATCHED light source. Please refer to below figure (6-32) for better understanding:

MATCHED Light Source   Power Meter

6-32

Note：

Frequency ID and wave ID cannot be operated at the same time.

To avoid risk of serious eye damage, please do not look into the optical port of laser source at any time.

6.8   Power off

Automatic power off: When auto-off function is activated, the unit will turn itself off automatically after 10minutes idle time, whatever the power supply is with alkaline batteries or is with power supply adaptor directly.

Manual power off: Under any operation mode, hold down ⏻ for a few seconds to turn the unit off.

Note: With either power off operation, the unit will store the last calibration wavelength and backlight control mode automatically, which will be the default setting when user turns unit on next time.

Chapter 7   Troubleshooting

Problems	Possible cause	Solution
Faint display on the LCD screen	1. Power is off 2. The battery power is too low	1. Press ⏻ key. 2. Change the batteries
Inaccurate measurements	1. Optical connector is not clean. 2. incorrect fiber connection	1. Clean optical connectors 2. Re-connect the fiber

Chapter 8 General Maintenance

8.1 Always keep the connector ports of your power meter are clean.

8.2 Do not use bad quality optical fiber connectors/adaptors, otherwise, it will damage the interface of detector that will greatly affect the performance of the unit.

8.3 Try to use only the adaptor supplied.

8.4 Once not in use, make sure dust-proof cap is placed properly over the optical ports.

8.5 Carefully plug in/out for fiber connectors/adapters to avoid scratches on the port of the power meter.

8.6 Keep regular cleanings on optical port of power meter, please clean with cotton swabs supplied using alcohol properly.

Chapter 9 Quality Warranty

Details of warranty terms and conditions are given as below:

1) The company. warrants that 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 shipment.

2) If any defectives happened due to quality problems of the product during the warranty period, The company. promises to repair or replace free of charge. **But** the freight cost and related taxes will be shared by both parties. The company. will pay the shipping cost from customer side to our factory. and pay the import taxes related. Customer will pay the shipping cost from our factory to customer side and its local import taxes accordingly.

3) 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) The company. 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.