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GRANDWAY OPTICAL INSTRUMENTS SERIES

User's Guide to the FHM2A02

Optical Multimeter

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Optical Multimeter

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1 Introduction

The FHM series Multimeter combines a power meter with a three- wavelength laser source, for optical fiber network installation and maintenance. With the large capacity of data storage, it's very convenient for field testing and transferring the test results to PC through USB interface.

Features

- Three wavelengths (1310nm, 1490nm and 1550nm) combine in one output;
- The output of laser source stables at -5dBm;
- Laser source supplies CW and modulated 270Hz, 1KHz, 2KHz output;
- Laser source transmits wavelength recognition code;
- Optical power meter displays linear and logarithmic optical power values;
- Automatic shifting of measurements in optical power meter;'
- Automatic wavelength recognition and shifting to the measured wavelength in optical
- power meter;
- Storage of 999 pieces of tested data in optical power meter;
- Screen backlight;
- Charging supplies;
- LCD displayer supplies;
- Auto- off at low voltage;
- Auto-off after 10-min no operation(default);
- Auto-recognition of power supply
- Display of battery capacity;

2 Warranty

Three Years Limited Warranty

Grandway products are warranted against the defective components and workmanship for a period of three years from the date of delivery to the original customer. Any product found to be defective within the warranty period would be returned to Grandway authorized service center for repair, replacement and calibration.

Exclusions

The warranty on your equipment shall not apply to defects resulting from the following:

- ≥ Unauthorized repair or modification including battery replacement
- ≥ Misuse, negligence, or accident

Returning Product

To return product, you may contact Grandway to obtain additional information if necessary.
To serve you better, please specify the reasons for the return.
All delivery and mails should be sent to the following address:

Grandway Customer Service
6F, Xin'an building No. 99 Tianzhou Road
Shanghai, 200233 P.R. China

Contacting Us

Tel: 0086-21-54451260/61/62/63
Fax: 0086-21-54451266
E-mail: heyong@grandway.com.cn
or
shiwei@grandway.com.cn
Website: www.grandway.com.cn

3 Safety Information

Warnings!

- Never look directly into optical outputs or a fiber while the equipment is on.Invisible laser beam may damage your eyes.
- Do not short-circuit the terminal of AC adapter / charger and the batteries.Excessive electrical current may cause personal injury due to fumes,electric shock or equipment damage.
- Connect AC power cord with the equipment and wall socket properly. While inserting the AC plug, make sure there is no dust or dirt on the terminals and both plugs are fully seated. Incomplete engagement may cause fuming, electric shock or equipment damage and may result in personal injury.
- Do not operate the equipment near hot objects, in hot environments, in dusty/ humid atmosphere or when condensation is present on the equipment. This may result in electric shock , product malfunction or poor performance.

4 Preparing for Operation

4.1 Unpacking the instrument

Packing material

We suggest that you keep the original packing material. Using the original packing material is your guarantee of protecting the instrument during transit.

Checking the package contents

The standard accessories of FHM2A02 are as follows:

- ≫ Main unit(including batteries)
- ≫ Quality Check Report
- ≫ Interchangeable FC/SC/ST for PC/APC
- ≫ PC software
- ≫ User's Guide
- ≫ Carrying Bag
- ≫ Charger/AC Adaptor
- ≫ USB Connecting Cable

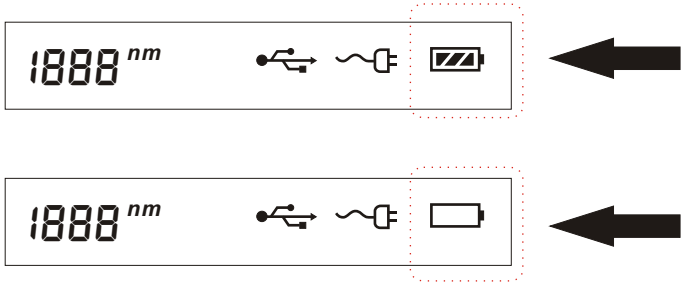
Checking for damage in transit

After unpacking the instrument, check to see whether it was damaged in transit. This is particularly likely if the outer casing is clearly damaged. If there is damage, do not attempt to operate the instrument or to repair it without authorization. Doing so can cause further damage and you may lose your warranty qualification.

4.2 Discharged batteries

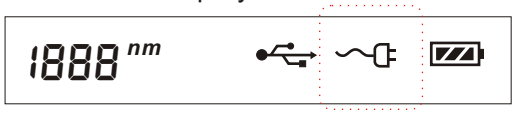
There is a battery indicator on the screen to show the remaining charge. There are four possibilities the indicator may show, full, with 2 blacks, with 1 black and empty . An empty battery indicator means the power is almost out. (See pictures below)

When the battery charge is extremely low to supply the necessary power, the instrument will automatically switch off.

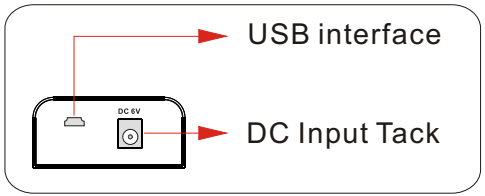


4.3 AC operation

If the instrument is mainly used at one location, e.g. in a laboratory or test department, the AC Adapter / Charger Unit can be used to power it instead of batteries. There is a DC input jack on the bottom side of the FHM2A02 instrument casing into which the output cable of the AC adapter is plugged. And when the AC adapter is plugged in, the indicator on the LCD will be displayed.



Note:
Power is supplied by the AC adapter even if batteries or cells are fitted. Make sure that the operating voltage of the AC Adapter / Charger Unit is the same as the local AC line voltage.



4.4 USB interface

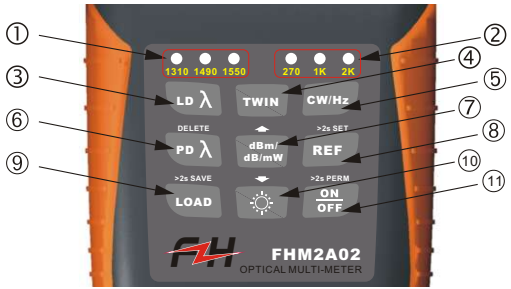
You can use the USB interface to connect the instrument with a PC and download the stored data. There is a socket on the bottom side of the instrument right beside the DC input jack and the USB cable supplied can be used to connect it to the USB interface of a PC. When the USB cable is connected, the indicator on the LCD will be displayed.

5 Operation

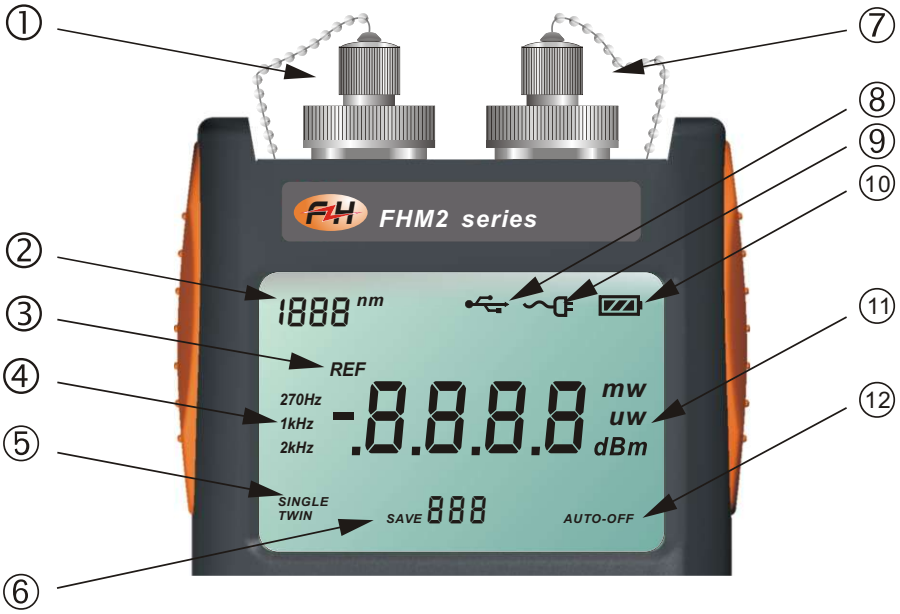
5.1 Display, controls and connectors

5.1.1 Keypad

The FHM2A02 keypad can be divided into two parts, one is used to control light source and the other is used to access a wide range of functions of power meter.



	NO.	Key	Description
Laser Source	1	1310 1490 1550	LED display of wavelength display on laser source
	2	270 1K 2K	LED display of modulated wavelength display of laser source
	3	LD λ	Wavelength shift key on laser source
	4	TWIN	Switch on/ off the auto-recognition code of laser source and power meter
	5	CW/Hz	Modulated wavelength and CW shift Key on laser source
Power Meter	6	DELETE PD λ	Wavelength shift on optical power meter; in “LOAD” mode, it is to delete the value.
	7	dBm/ dB/mW	Unit-shifting key of optical power meter and page-up key in “LOAD” mode
	8	>2s SET REF	Reference value setting key on optical power meter and display current reference value
	9	>2s SAVE LOAD	Load and storage of optical power value
	10		Background light key and page-down key in “LOAD” mode
	11	>2s PERM ON OFF	ON/OFF key, long-keypress for over 2 seconds to close the auto-off function


①
②
③
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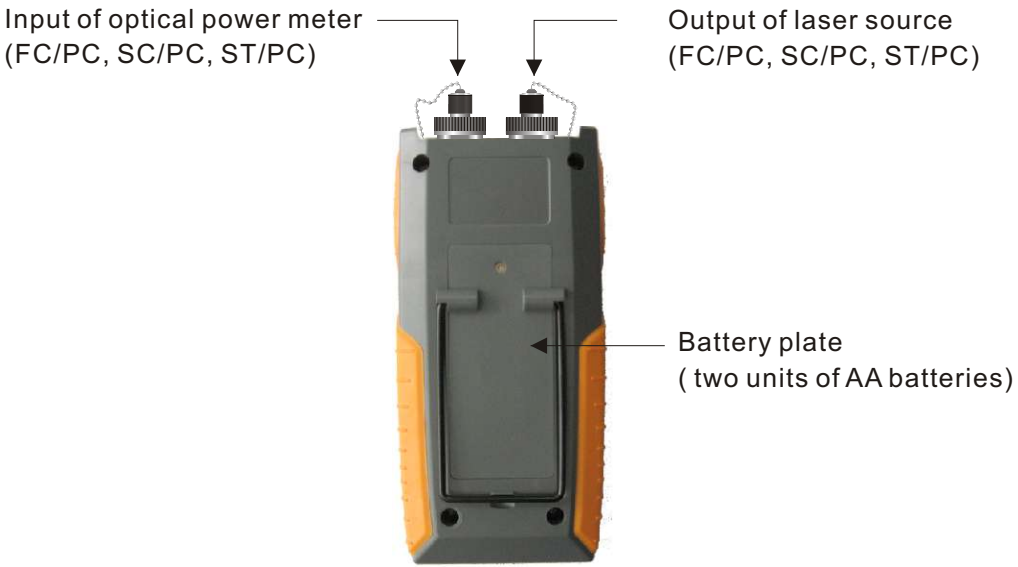
⑧
⑨
⑩
⑪
⑫
FHM2 series
1888 nm
REF
270Hz
1kHz
2kHz
-8.8.8.8
mw
uw
dBm
SINGLE
TWIN
SAVE 888
AUTO-OFF

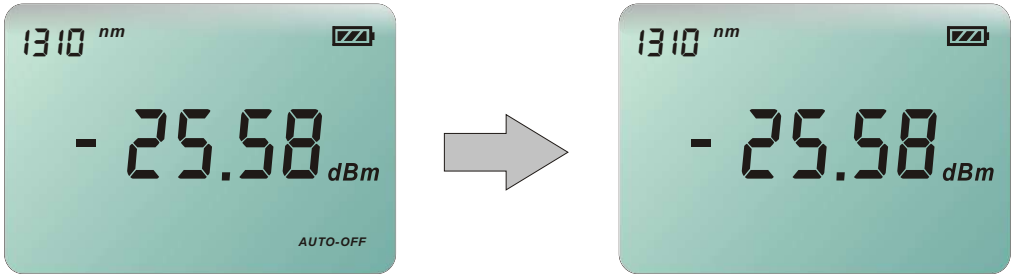
NO.	LED	Description
1	***LD***	1310nm, 1490nm and 1550nm output port(laser source output port)
2	850/1300/1310/ 1490/1550/1625nm	Current wavelength tested by the optical power meter
3	***REF***	Reference value in the optical power meter
4	***270Hz 1kHz 2kHz***	Modulated frequencies identified by optical power meter
5	***SINGLE*** ***TWIN***	SINGLE: Auto-wavelength recognition of laser source and optical power meter is off. TWIN: auto-wavelength recognition of laser source and optical power meter is on.
6	***SAVE*** 888	Number of the current data in the storage of the optical power meter
7	***PD***	Input port of optical power meter(optical power meter input port)
8		State of the USB connection
9		External power supplier indicator
10		Signal of battery capacity. Please make the charge when  flashes to show the insufficient battery capacity.The system shut off automatically when the battery capacity is not enough.
11	***mw uw dBm***	Display of value unit.
12	***AUTO-OFF***	AUTO-OFF indicator. AUTO-OFF defaults to turn on when the equipment is on.


Input of optical power meter
(FC/PC, SC/PC, ST/PC)
Output of laser source
(FC/PC, SC/PC, ST/PC)
Battery plate
(two units of AA batteries)

5.2 Turning the instrument on and off

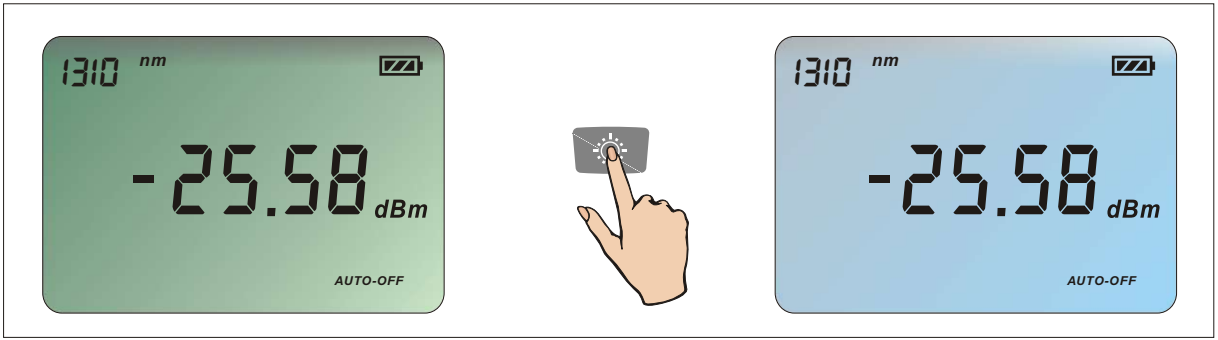
Press the “ON/OFF” key briefly.
The instrument powers on.
Press the “ON/OFF” key briefly again.
The instrument powers off.

Note: Auto-off function
1 The instrument powers off automatically if no key press in 10 minutes.
2 Press and hold the ”ON/OFF” key for 2 seconds to power on the instrument with “Auto-off” function deactivated.



5.3 Switching backlighting of the LCD on and off

Press the backlighting key.
Backlighting switches on.
Press the backlighting key again.
Backlighting switches off.
Short-keypress can also down the page in the “ LOAD” mode.



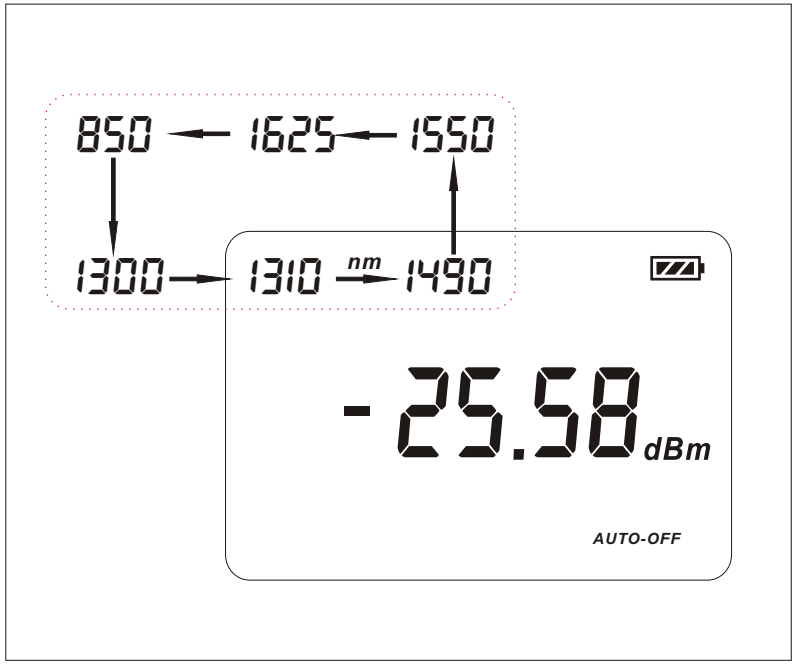
5.4 Shifting the wavelength in laser source

Press the " 

" key repeatedly until the desired wavelength is displayed. You can select from three wavelengths : 1310nm, 1490nm and 1550nm in laser source. And the wavelength LED indicator will be turned on accordingly.

5.5 Shifting the wavelength in power meter

Press the "  " key repeatedly until the desired wavelength is displayed. You can select 850/1300/1310/1490/1550/1625nm in power meter. Long-keypress will delete all the in the “LOAD” mode.



5.6 Load and store the optical power value

Long-keypress is to store the current LCD displayed value including wavelength frequency and optical power value. The beeper will sound once and the LCD will display the number of the value which have stored. e.g. SAVE007 means the 7th value has been stored.
Short-keypress is to check the previous optical power value stored in the last test.
Short-keypress is to exit the “LOAD” mode.

5.7 Setting the operating mode

Press the " 

" key briefly to switch on "TWIN" function of laser source and optical power meter.
TWIN: auto-wavelength recognition of laser source and optical power meter is turned on. The instrument can identify the wavelengths of FHM- and FHS-serial laser sources automatically.

5.8 Shifting optical power units

Press the " 

" key briefly to shift the units from dBm/dB/mW in optical power meter. The unit will display uW when the value is < 1mW in the state of displaying linear optical power value.
Short-keypress can also turn up the page in the " LOAD" mode.

5.9 Shifting the frequencies of laser source

CW/Hz

Press the " CW/Hz " key repeatedly to shift among 270Hz, 1kHz, 2kHz and CW.

5.10 Setting referent value of the optical power meter

Short-keypress the " 

" key to display the current reference value.

Long-keypress for more than 2 seconds the " 

"key to store the current value as the reference value.

6 Specifications

		FHM2A02	FHM2B02
Power Meter	Calibration wavelength(nm)	850/1300/1310/1490/1550/1625	
	Connector	Interchangeable FC/SC/ST for PC/APC	
	Data storage(items)	999	
	Ref. Value	Yes	
	Display Units	dB / dBm / mW /uW	
	Display precision(dB)	0.01	
	Accuracy	± 5%±1nW	
	Wavelength Recognition	1310/1490/1550(input power≥ -40dBm)	
	Tone Detection	270 Hz / 1KHz / 2KHz(input power≥ -40dBm)	
	Measuring Range(dBm)	-70 to +10	-50 to +26
Laser Source	Output wavelength (nm)	1310/1490/1550	
	Connector	Interchangeable FC/SC/ST for PC/APC	
	Modulation frequencies	270/1K/2K Hz	
	Output Power	-5dBm±0.5dB	
	Stability Long-term(8h)	±0.1dB@1310/1550nm; ±0.2dB@1490nm	
	Stability Short-term (15min)	±0.05dB@1310/1550nm ; ±0.1dB@1490nm	
	Wavelength Recognizing Code	Yes	

General Specification

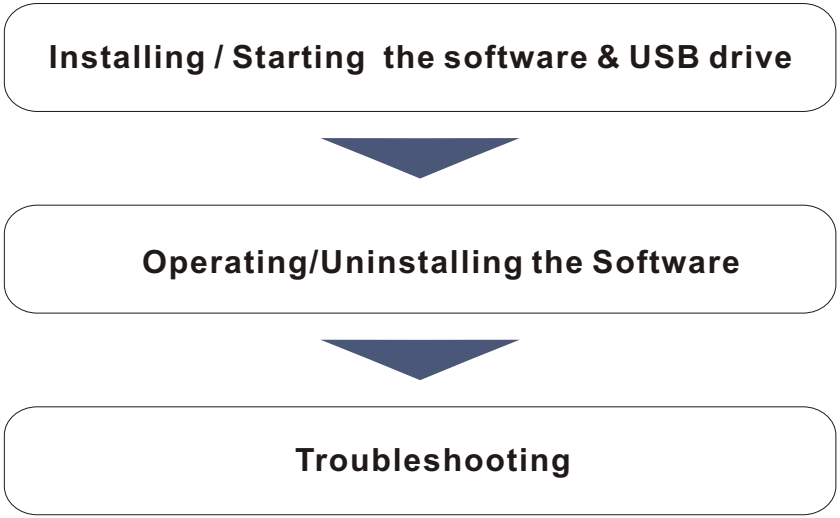
Auto Power off	✔
Power Supply	2pcs *NiHM 1.2V, 2000mAh; AC/DC Adaptor
PC interface	USB
Battery Life	> 100 Hours (laser off)
Storage Temperature	-20°C~+70°C
Operating Temperature	-10°C~+50°C
Relative Humidity	<90% (Non-condensing)
Dimension (mm)	168L×76W×43H
Weight (Gram) [1]	310

1 Including battery weight

7 Maintenance

- Please disconnect the AC adapter/charger and cover the protective dust cap once you finish using.
- It is recommended to clean the connector of the instrument and the patchcord when they get dirty through use. Optical cleaning pads and anhydrous alcohol is recommended. And please be careful not to get the detergent inside the instrument.

Operating Manual of FHM2 Software



Installing / Uninstalling the software & USB drive

Note:
Before you attach the instrument to a PC by the USB cable for the first time,you must install the FHM2 software from the disk enclosed with the product onto the PC.

System requirements

Windows2000/XP

Hardware Requirements:

Minimum requirements:
CPU: 600MHz Pentium processor or above
RAM: 128MB
Graphics adapter: VGA256 color or above
Hard disk: >300(MB) spare capacity
Driver:8 times speed CD-ROM or above

Recommendatory configuration:
CPU: 1K(MHz) Pentium processor
Memory: Above 256MB
Adapter: SVGA16 or above
Hard disk: >300(MB) spare capacity
Driver: 8 times speed CD-ROM or above

Installing Data Download Software on Windows

The installation of the FHM2 Data Manager is very convenient and time-saving.

The operation is as follow:

1. Place the disk in the CD-ROM drive. The Installation Wizard will run automatically.

2. If the Installation Wizard does not run automatically, please take the following steps:

Open [My Computer], then open the CD-ROM driver, find the "setup.exe" in the root path,double click "setup.exe" to run the installation

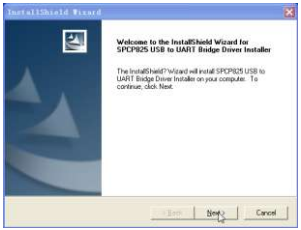
3. Click "ENTER" to the installation menu.

Installing the FHM2 USB driver and FHM2 application program.

4. Guide for the installation of the FHM2 Serial Data Manager USB driver

4.1. Click "Installing FHM2 USB driver". You will enter the Installation Wizard of FHM2 USB drive program.

4.2. Click "Next" to confirm the installation. You will enter the "setup status" dialogue.



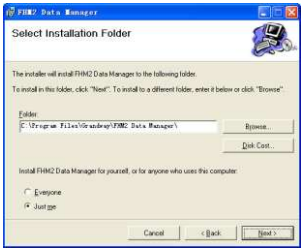
4.3. After the installation, you will enter "Finish" dialogue. Click "finish" button to end the installation.

5. Guide for the installation of the FHM2 Application Program

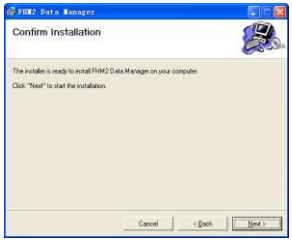
5.1. Click "Installing FHM2 Data Manager". You will enter the Installation Wizard of FHM2 Data Manager.

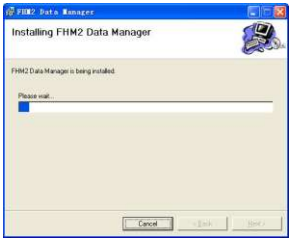
5.2. Click "Next" to continue the installation.

5.3 Enter "Select Installation Folder" Dialogue.
The default installation path is "C:\Program Files\Grandway\FHM2 Data Manager". If you wish to change the default installation path, you can click "browse" button to change the path.
After choosing your installation path, click the "Next" button to advance to the confirmation dialogue.

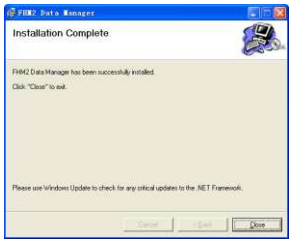


5.4. Click "Next" to confirm the installation. You will enter the "setup status" dialogue.





5.5 After the installation, you will enter "Finish" dialogue. Click "close" button to finish the installation.



Starting the software

After the installation of the USB driver and FHM2 Data Manager, you can start the program in two ways:

1. Click [Start] menu →[Programs],and select program group of the software.

Click the “FHM2 Data Manager” to start the program.

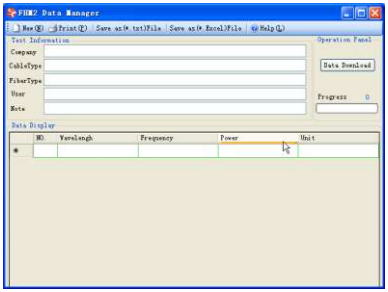
2. After the installation, there will be an icon of “FHM2 Data Manager” on the desk.

Click this icon 

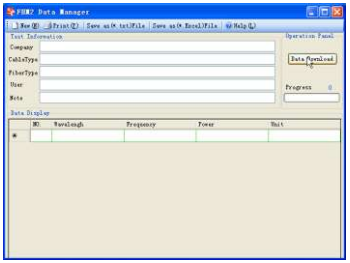
to start the program.

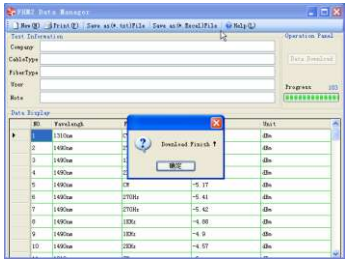
Operation of the software

The main dialogue of the program is as follow:



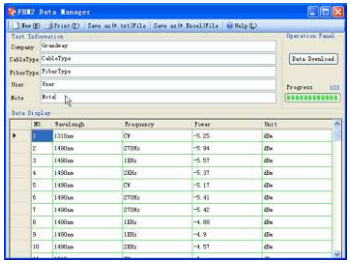
Connect the Optical Multimeter FHM2 and computer with the USB cable, and turn the instrument on. Click the "Data download " Botton to download the test results.



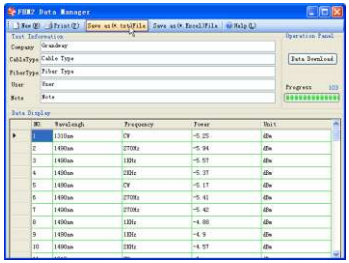


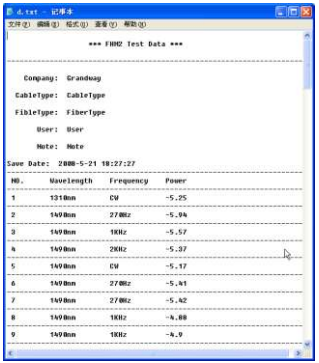
Operation of the software

The downloaded data will be displayed as above picture.
Input the relative information of the test.

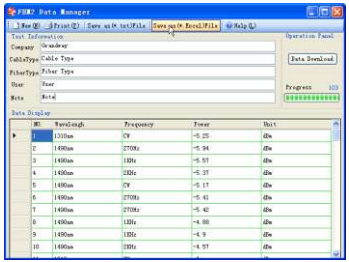


Save the file as the Text. (*.txt)

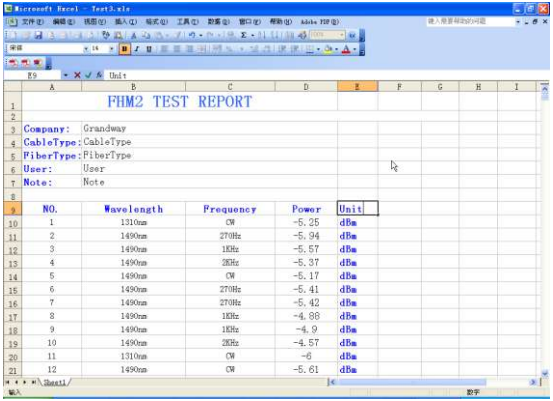




OR Save the file as the Excel.(*.xls)



Note: The computer must install the Microsoft office Excel to save as Excel format.

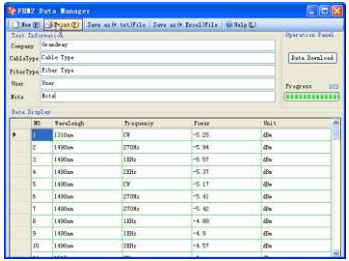


FHM2 TEST REPORT

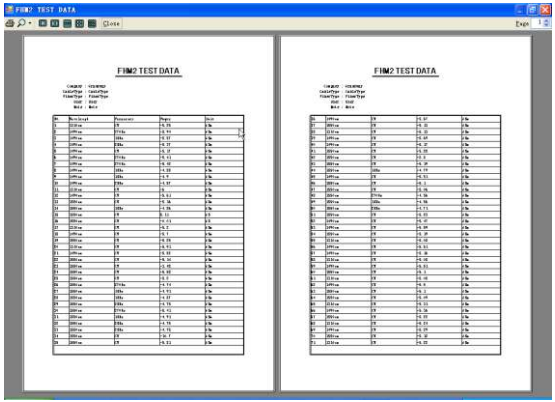
Company:	Grandway
CableType:	CableType
FiberType:	FiberType
User:	User
Note:	Note

NO.	Wavelength	Frequency	Power	Unit
1	1310nm	CW	-5.25	dBm
2	1490nm	270Hz	-5.94	dBm
3	1490nm	1KHz	-5.57	dBm
4	1490nm	2KHz	-5.37	dBm
5	1490nm	CW	-5.17	dBm
6	1490nm	270Hz	-5.41	dBm
7	1490nm	270Hz	-5.42	dBm
8	1490nm	1KHz	-4.88	dBm
9	1490nm	1KHz	-4.9	dBm
10	1490nm	2KHz	-4.57	dBm
11	1310nm	CW	-6	dBm
12	1490nm	CW	-5.61	dBm

Print the downloaded data and the information of the test.



Print preview before printing.



Uninstalling the software

The FHM2 Data Manager provides auto-uninstall
function. You can remove all the components, program groups and shortcuts of the FHM2 Serial Data Manager .

1. Click the windows [Start] menu→[Programs] and open the program files of the software.

Select “Uninstall”. Then click "Yes" Button to confirm the uninstall in the dialogue. 2. Another method to remove the program is to click [Add or Remove Programs] in the

[Control Panel]. Click [Remove] to uninstall the software or the USB drive.

Troubleshooting

1. If the system indicates not finding the port when running FHM2 software, please check if the USB cable is properly connected.

2. If the USB connection is normal but the port still cannot be found, please check the port information. You can find this info by clicking [start], [Control Panel], [System Properties], [Hardware], and [Device Manager]. There should be an item named “Sunplus USB to Serial COM Port”. A yellow exclamation mark before the item means that the instrument is not properly connected to the PC. You can solve this by disconnecting the USB cable and reconnecting it after several minutes and the yellow mark should disappear. If there is still a problem, pleas try another USB port.