

# **Optical Power Multi Meter**

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**User Manual  
V1.0**

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## 1. Summary

Combining optical source and optical power meter in one, Optical Power Multi Meter is a portable and intelligent instrument for optical network test. There are inner 1310nm and 1550nm dual wavelength and single output optical source. It can fulfill the functions of steady optical source and optical power meter at the same time, and it realizes the loop test and two-way automatic test. Its single-end test solution greatly advances the test efficiency. The inner microprocessor and linearity magnification technology ensure the long time calibration and test accuracy.

Optical Power Multi meter can carry out not only the absolute and relative power test, but also the optical loss test for fiber, optical cable and optical passive devices automatically, and it can save test results. It can be widely used in LAN, WLAN, MAN, CATV, long distance fiber network system as well as all kinds of fiber testing field. It is suitable for construction, maintenance of fiber communication and CATV system; meanwhile, it is used for laboratory test and R&D. It is an ideal portable tool for fiber project staff.

## 2. Functions

- 2.1. Multi wavelength precise test
- 2.2. Absolute power test for dBm or  $\mu$ W
- 2.3. Relative power test for dB
- 2.4. Single end for dual wavelength output, free switch from 1310 nm and 1550 nm
- 2.5. 1000 groups of test data storage and management
- 2.6. Multi adapters (FC, SC, ST, LC for power meter; FC, ST, SC for light source)
- 2.7. Light modulation and identification of 270Hz, 330Hz, 1K, 2

- KHz and auto wavelength identification mode
- 2.8. Wavelength identification (with the help of light modulation and identification mode)
  - 2.9. USB communication function can upload the test result to management software by USB port.
  - 2.10. Handheld, large LCD display, easy to operate
  - 2.11. Real-time clock function can real-time display the current time; provide recording time for data storage.
  - 2.12. Auto power off in 10 minutes
  - 2.13. LED backlight on/off function
  - 2.14. Backlight auto off in 10s
  - 2.15. Lithium battery or AA dry battery
  - 2.16. Battery voltage monitoring display
  - 2.17. Under voltage indication and under voltage auto off

### 3. Technical Specifications

#### Optical power meter module

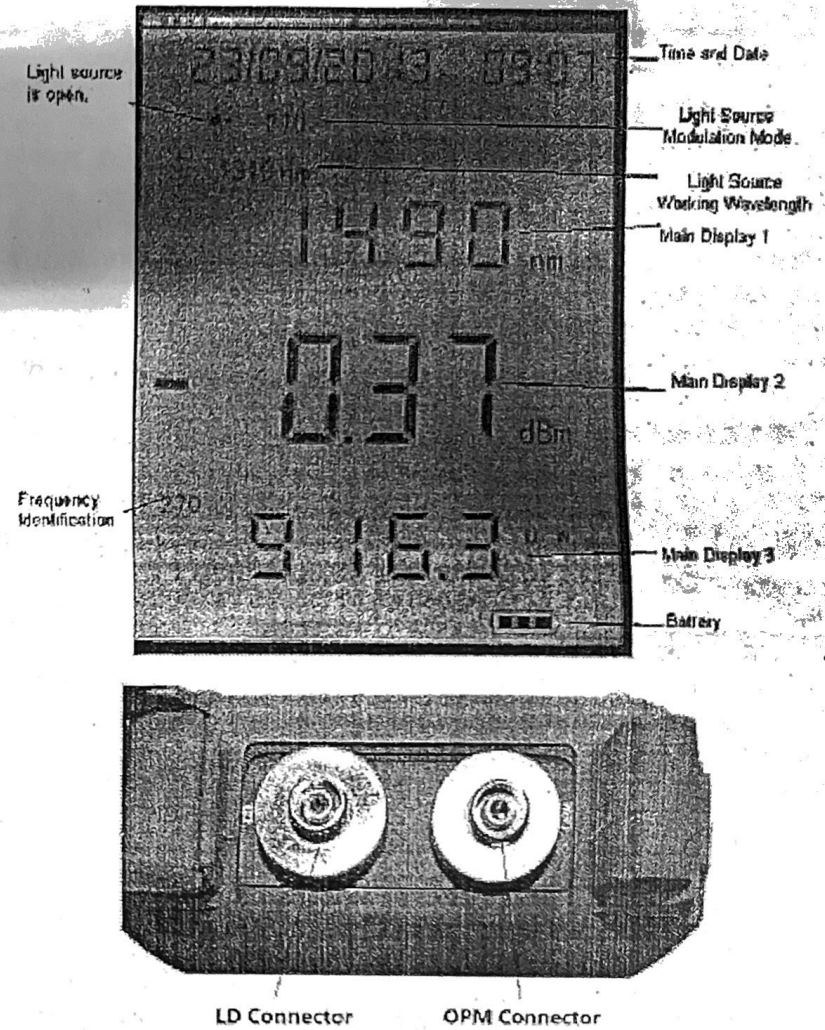
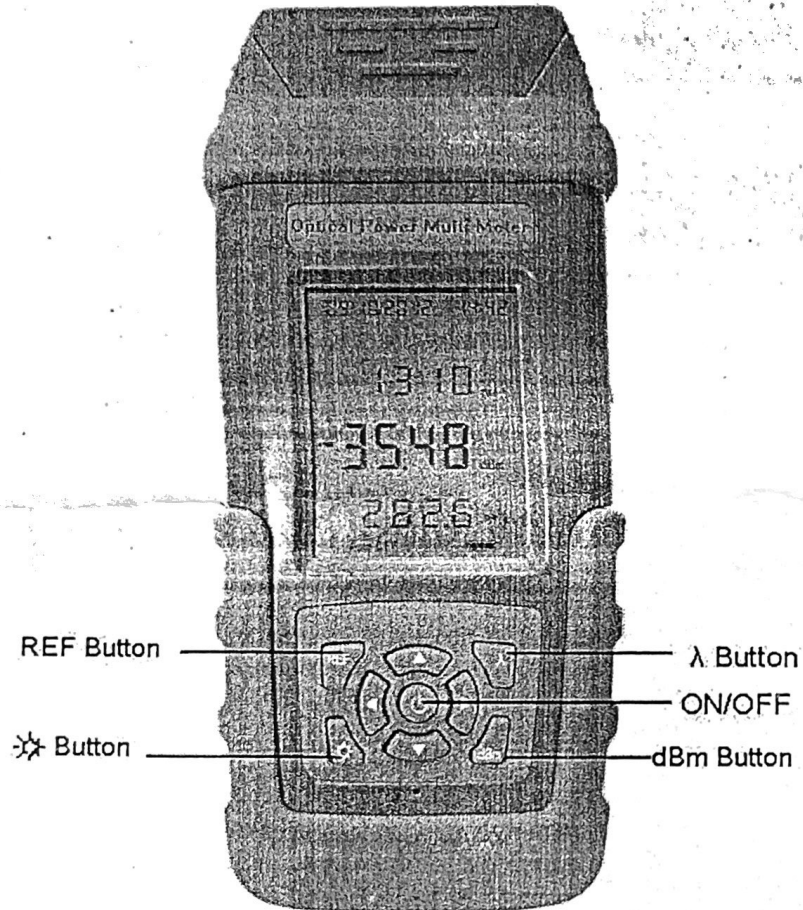
1. Wavelength range: 800~1700 nm
2. Detector type: InGaAs
3. Optical power test range: -50~+26dBm, -70~+10dBm
4. Uncertainty:  $\pm 5\%$
5. Resolution: Linearity display 0.1%, logarithm display 0.01dBm
6. Automatic frequency identification: 330Hz, 270Hz, 1 KHz, 2 KHz.
7. Automatic wavelength identification (with the help of corresponding modulation mode)

#### Optical source module

1. Emitter type:  
FP-LD/DFB-LD
2. Dual wavelength switch function:  
1310 $\pm$ 20nm, 1550 $\pm$ 20nm
3. Spectral line width:  
 $\leq 5$ nm
4. Output optical power:

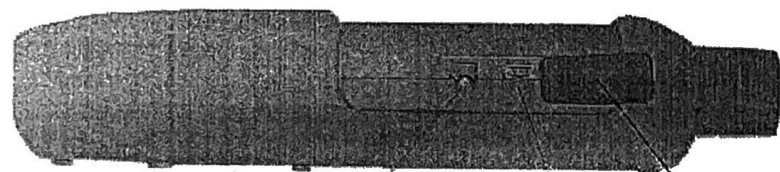
- $\geq -7$  dBm,  $\geq 0$  dBm (customized)
5. Short-time stability of output optical power:  
 $\leq \pm 0.05$ dB/15min
  6. Long-time stability of output optical power:  
 $\leq \pm 0.1$ dB/5h
  7. Light output mode:  
CW continuous light and 330Hz, 270Hz, 1KHz, 2KHz modulation output.
  8. Modulation of automatic wavelength identification mode (with the help of corresponding identification mode)
- Others**
1. Work wavelength, work status, modulation light identification, indication: LCD display
  2. Monitor inner battery voltage: LCD display
  3. Auto power off: 10 minutes
  4. 1000 groups of test data storage and management
  5. Battery: 7.4V/1000mAh high-performance rechargeable lithium battery or 4pcs AA dry battery
  6. Working duration for battery:  
 $\geq 90$ h (Li-battery, only optical power meter work)  
 $\geq 24$ h (Li-battery, the optical source and optical power meter work synchronously)
  7. Operating temperature:  $-10^{\circ}\text{C} \sim 40^{\circ}\text{C}$
  8. Storage temperature:  $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$
  9. Relative humidity:  $\leq 90\%$ (no condensation)
  10. Weight: 0.43Kg
  11. Dimension: 200mm $\times$ 90 mm $\times$ 43 mm

### 4. Layout



**LD Connector:** Light Source output interface (When the light is turned on, please don't look directly into optical output or connected fiber optic connectors, in order not to damage eyes)

**OPM Connector:** optical power test interface



Charge hole      USB Port      Cover

**USB Port:** the instrument communicates with the management software by USB port

**Charge hole:** connect the instrument with the charger for power charging.

## 5. Operations

### On/Off key:

Pressing "⏻" for over 3 seconds, the tester can open. When the instrument is power-on, it defaults optical power meter module and 1310nm wavelength. LCD shows the working wavelength, optical power, battery power, modulation frequency identification and so on. Pressing "⏻" for over 3 seconds when tester is open, the tester will shut down. System defaults automatic power off in 10 minutes, the LCD will show "Auto-OFF"

### Open and close auto-off function:

In optical power meter module, shortly pressing "⏻", auto-off function logo will disappear in LCD. It means auto-off function is closed. Shortly pressing "⏻" again, auto-off function logo will show in LCD. It means auto-off function is open and the tester will shut down in 10 minutes without any operations.

### Backlight key:

Pressing "☀" can open or close backlight. If the backlight is closed, any operation can open 10 seconds backlight.

### ■ Introduction for optical power meter module

#### 1. Switch the measuring wavelengths

You can choose one of six kinds of wavelengths: 850nm, 1300nm, 1310nm, 1490nm, 1550nm and 1625nm through this key. The chosen wavelength will be displayed in LCD screen. When the instrument is power-on, it defaults the wavelength of 1310nm, and circulates in order of 1310nm, 1490nm, 1550nm, 1625nm, 850nm, 1300nm

#### 2. Show absolute power and relative power value.

The instrument defaults the absolute measurement of optical power. The value displayed by main display 2 means logarithmic power value (dBm). The value displayed by main display 3 means linear power value (\*W). Shortly pressing "▲", the instrument enters optical source output state; shortly pressing "⏻" to quit laser source module, return back to optical power test state.

If you set laser in working state, these two modules can work at the same time.

### ■ Introduction for light source module

#### 1. Open and close light source.

If it is the first time to enter into the status of light source output state, it dose not output signal. And "1310nm", "1550nm" or "Closing the light source" can be chosen circularly by pressing "λ".

#### 2. The modulation output of light source.

When any wavelength is chosen, press "▲" or "▼" to realize the modulation selection of CW, 270Hz, 330Hz, 1KHz, 2KHz, --AU auto wavelength identification.

#### 3. Display the working status information of stable light source

The ☀ on the upper left of the LCD is blinking all the time when there is some working light source. And it is forbidden to look at the output end of laser source or the connector of the optical fiber when the light source is under the power on status. The LCD displays the corresponding wavelength and modulation status when the tester is under the module of stable

light source. When it is back to the module of optical power, the LCD displays the information of optical power, as well as the corresponding working light source, it will indicate 1310nm or 1550nm on the upper side of "Main display 1" or "Main display 3". And it also shows the modulation frequency of the light source on the upper side of LCD. When the light source is under the modulation of "Auto", its corresponding working light source (1310nm or 1550nm) will be blinking all the time.

■ **Other functions:**

**Under voltage indication:**

When it is under voltage, the indicator will show "L", and it will be powered off automatically if the voltage is lower than the protected value. Please change battery or charge it in time when it is under voltage, and the charging time is 4~6h, when the indicator is turning from red to green, it is full of voltage.

**6. Maintenance**

**NOTE:** The laser can cause damage to the eyes; do not look directly at the optical output or the connected fiber optic connectors when the light turned on, so as not to damage the eyes!

**NOTE:** If you use batteries, it is forbidden to charge the dry batteries to avoid danger!

To keep the performance of the instrument and prolong the service life, please pay attention to the following:

1. The instrument should be avoided to shock, hit, fall off and other mechanical damage.
2. All types of optical output port adapters should be strictly avoided to touch hard objects, dirty, acid, alkali and corrosive substances. You should cover the dust proof cap when it is not at work, beware of dust or other harmful chemical erosion.
3. Use alcohol to clean the ceramic core fiber jumper end. You can not use it until the alcohol is dry.

4. When the instrument is being operated, it is forbidden that the eyes look at the output end of laser instrument directly, or the eyes or skin is likely to be burnt by the laser.
5. To clean the ceramic core regularly.
6. Please take the battery out if it is not used for long time to avoid the effect for battery life.
7. Must use the charging adapter supported by the model of instrument

**7. Faults & Solutions**

Faults	Reasons	Solutions
Cannot turn on the tester	Low voltage of battery	Charge the battery
Big test error	Sensor interface is dirty	Clean the sensor interface
Open light source but no optical power outputs.	Connector ceramic core damage	Change connector
Light source power becomes smaller	Connectors, internal laser fiber ceramic core are dirty	Clean the ceramic core with cotton dipped in alcohol