Optical Power Meter

BL-526-108

User Manual

V2.0

Contents

1. Summary

The Steren BL-526-108 Optical Power Meter is a high-performance optical network test meter and comes equipped with the latest laser exploration and processing technology to perform fast field-testing. This tester is an integrated optical power meter aimed at optical network operation and maintenance, as well as equipment research and development.

The Optical Power Meter can be used to test optical power within the wavelength range of 800~1700nm, using measurement units nW, μW, mW, dB, and dBm. The BL-526-108 meter's display resolution and test accuracy levels are impressive, with six kinds of wavelength calibration points: 850nm, 1300nm, 1310nm, 1490nm, 1550nm, and 1625nm. It can be used for both linearity and non-linearity tests, and it displays both direct and relative tests of optical power.

The meter is equipped with a sizeable LCD screen and is small, lightweight, and easy to carry. It was designed to test LAN, WAN, metropolitan networks, CATV net, and long-distance fiber net. The meter can be used to accurately test fiber loss, check fiber continuity, and help evaluate the transmission quality of a fiber chain.

2. Functions

2.1 Multi-wavelength precise measurement

2.2 Absolute power measurement of dBm or xW

2.3 Relative power measurement of dB

2.4 Auto-Off function

2.5 270, 330, 1K, 2KHz frequency light identification and indication

2.6 Low voltage indication

2.7 Automatic wavelength identification (with the help of light source)

2.8 1000 groups of data storage

2.9 USB port upload

2.10 Real-time clock

2.11 650nm VFL output

2.12 Applicable to versatile adapters (FC, ST, SC, LC)

2.13 Handheld, large LCD backlight display, easy-to-use

3. Specifications

3.1 Wavelength range (nm): 800~1700

3.2 Detector type: InGaAs

3.3 Measurement range (dBm): -50~+26, -70～+10

3.4 Uncertainty: ±5%

3.5 Resolution: Linearity display: 0.1%

Logarithm display 0.01 dBm

3.6 Auto-Off duration (min): 10

3.7 Battery: Rechargeable lithium battery

3.8 Battery-hold duration (h): no less than 75 (2000mAh)

3.9 Operating temperature (°C): -10~+50

3.10 Storage temperature (°C): -30~+60

3.11 Weight (g): 430 (without batteries)

3.12 Dimensions (L*W*H, mm): 200×90×43

4. Layout

Signal Wavelength

Logarithm Power

Frequency light identification

Auto-OFF

Linearity Power

Battery Indicator

REF key

λ key

Power key

☼ key

dBm

VFL   OPM

Fig. 01

5. Operation

1. Turn On / Turn Off

- Press and hold the ⏻ button for 3 seconds to turn on the Optical Power Meter. The Home display will appear as shown below. (Fig. 02)

Fig. 02 └─ **Auto-OFF**

- Auto Power Off mode is enabled when the meter is first turned on. The default idle setting for the Auto-Off function is 10 minutes.
- The display will indicate in the lower-left corner if the Auto-Off function is enabled (Fig. 02)
- To disable Auto-Off, hold the ☼ button for 3 seconds. To re-enable Auto-Off, hold the ☼ button again for 3 seconds and check the display.
- Press the ⏻ button to turn off the meter.

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2. dBm Button

- Press the **dBm** button to show absolute optical power measurement value.

- While press the **REF** button to set the reference value, press the **dBm** button shortly to clear the reference value.

3. λ Button: Wavelength selection

- There are six wavelengths to choose from: 1310 nm (default setting), 850nm, 1300nm, 1490nm,1550nm, and 1625nm.

- Select a wavelength by pressing the **λ** button until the desired wavelength is displayed on the LCD screen.

4. REF Button: Reference Value

- Press the **REF** button to set the reference value to 0.00 dB.

- To clear the reference value, hold down the **REF** key and press the **dBm** key.

- See Appendix A, B & C to reference test cables.

5. Backlight ☼ Button

- Press the ☼ button to turn the back light on and off.

6. 270, 330, 1K, 2KHz Frequency Light Identification

- Press and hold the **λ** button for 3 seconds to activate auto mode.

- When the entering light is 270, 330, 1K & 2KHz modulated light, the meter identifies the frequency automatically and shows it on the LCD. This function co-operates with the laser source. Note: Be sure to use the laser source device with modulation frequency 270, 330, 1K, 2KHz outputs function. (Fig. 03)

Fig. 03

7. Automatic wavelength identification

- Works with the laser light source to automatically identify wavelength from the source.

8. VFL Function

- Press ▲ button shortly to output continuous light source; press ▲ button again to output pulse light source; press ▲ button again to turn off the light source.

9. Clock Setting

- From the home display, press and hold the ▲ button to enter the clock setting mode.
- Use the **λ** button and the **REF** button to select the digit to be edited; the selected digit will blink.
- Use the ◄ and ► arrow buttons to edit the value of the selected digit.
- Press the ⏻ button to save and exit.

Date format: DD/MM/YYYY **Time format: HH:MM**

Fig. 04

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- Time Setting mode will exit automatically if left idle for 10 seconds.

10. Save Record

- Short press the ◄ button to enter into the record storage interface. The record number for storing will be displayed on the screen. (Fig. 05)

- Press the ◄ button to store the record and return to the test state.

- Press the 🔾 button shortly to exit the record storage without saving.

Fig. 05

11. Browse Record

- Press ► shortly to enter into the record browse interface; browse records using the ◄ and ► buttons.

- Press **λ** shortly to delete the current record.

- Press ⏻ shortly to exit.

Fig. 06

6. Maintenance

- It is important to keep the sensor surface clean. Do not use dirty or non-standard adapters; do not insert a poorly polished connector into the port, otherwise it will damage the sensor end.

- Clean the sensor end regularly.

- Carefully replace adapters for different links. The spare adapters should be stored hermetically with caps to avoid dust contamination.

- Cover the dustproof cover to keep the interface clean when the optical power meter is not being used.

- Do not put the sensor in the air or a test error will occur due to the presence of dust.

- If the meter is not being used for an extended period, remove the battery in order to conserve battery life.

Safety

	Take appropriate eye-safe precautions when handling live fiber.

Avoid condensation

- This instrument is resistant to normal dust and moisture; however, it is not waterproof.

- If moisture gets into the instrument, remove the battery and dry out the meter for at least one hour before using again.

7. Troubleshooting

Issue	Reason	Solution
LCD display is dark	Low voltage	Charge or replace battery.
Test result = error	Sensor's surface is dirty. Low voltage.	Clean sensor. Charge or replace battery.
No display when meter is turned on	The battery is under voltage/other reasons.	Charge or replace battery.

8. Appendix A

Testing Loss of Installed Fiber Optic Cable Plant
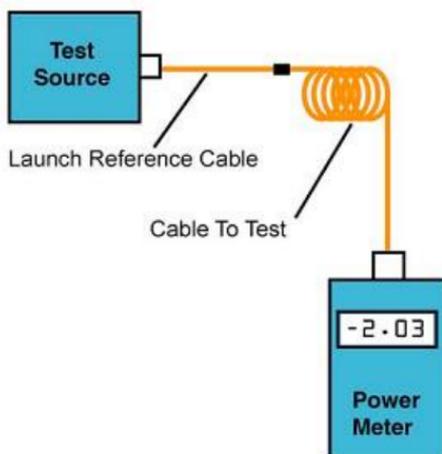**1) Test Diagram**
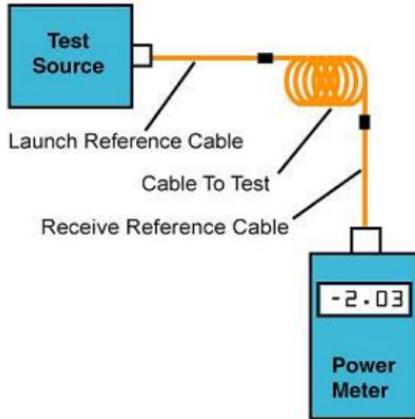
Fig. 07

2) Test Procedure

- Clean all connectors and mating adapters.

- Turn on equipment and allow time to warm-up.

- Attach launch cable to source. This should remain connected to source for the duration of the test.

- Set "0 dB" reference by pressing "REF" key. Meter may be set to read "0 dB".

- Attach source/ref cable and meter/ref cable to the cable plant under test and make loss measurement.

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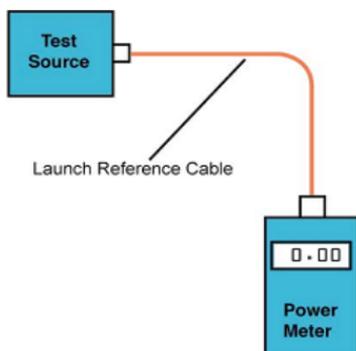
Fig. 08
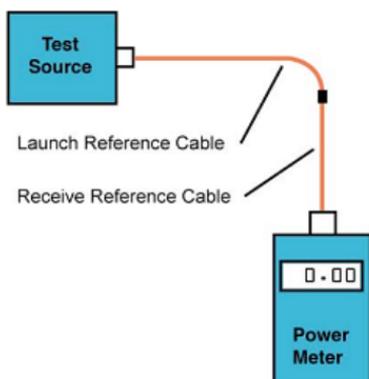
Fig. 09
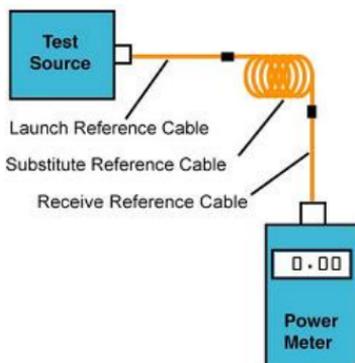
Fig. 10
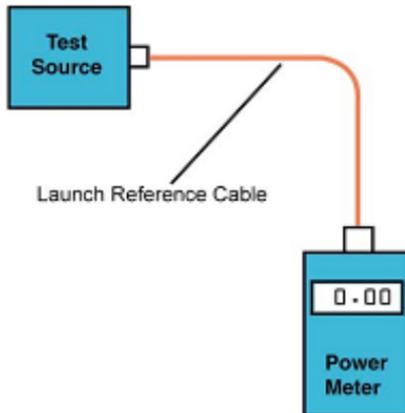
9. Appendix B

Testing Loss of Fiber Optic Cables, Single-Ended

1) Test Diagram

Fig. 11

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2) Test Procedure

- Clean all connectors and mating adapters.
- Turn on equipment and allow time to warm-up.
- Attach launch cable to source. This should remain connected to source for the duration of the test.
- Set "0 dB" reference by pressing "REF" key. Meter may be set to read "0 dB".
- Attach source/ref cable and meter/ref cable to the cable plant under test and make loss measurement.
- Reverse cable and test again.

Fig. 12

10. Appendix C

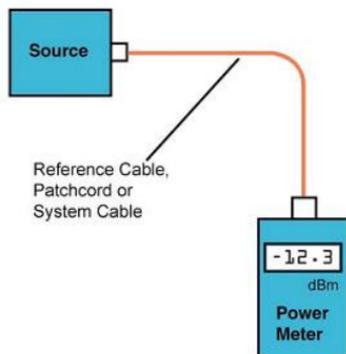**Measuring Optical Power in Fiber Optic Systems**

1) Test Diagram

Fig. 13

2) Test Procedure

- Clean all connectors and mating adapters.

- Turn on equipment and allow time to warm-up

- Set meter to wavelength of source and "dBm" to measure calibrated optical power meter.

- Attach reference cable to source if testing source power or disconnect cable from receiver.

- Attach power meter to end of cable and read measured power.

Note:

A reference cable or good quality patch cord is used for testing the source power coupled into a fiber. To test

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receiver power, disconnect the system cable that is connected to the receiver, and attach it to the power meter to measure.

11. Management Software

About this software:

The Management Software is used for data reading, function setup, and test file analysis, as well as management of the optical power meter.

Software User Guide Contents:

I. Installation of Optical Power Meter management software.

II. Connecting Meter

III. Menu description

IV. Toolbar description

V. Operating Procedures

VI. Software Troubleshooting

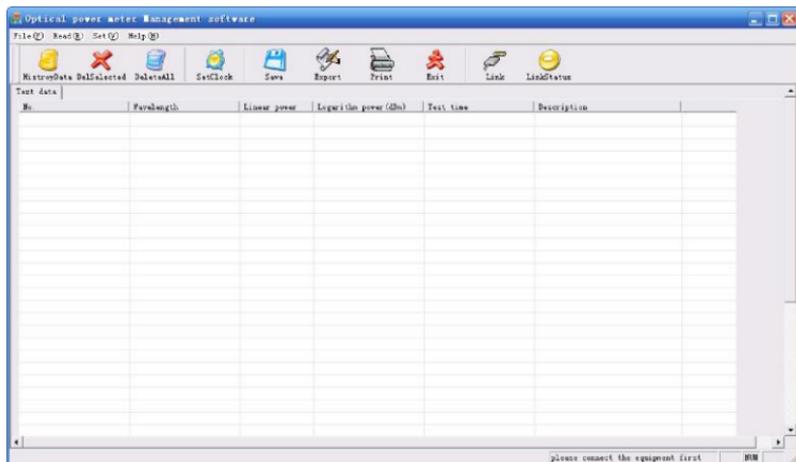# The main interface of the management software should display as below:

Fig. 14

Ⅰ. Installation

Double-click the installation icon ▉ Optical Power Meter management software V1.0 setup.exe to install the software. After successful installation, there will be a shortcut icon on the desktop. The user manual is mainly used to describe "Optical Power Meter management software V1.0.exe".

Ⅱ. Menu description

The structure of the management software menu system and respective functions are as follows:

Menu

1. File---------------Relevant menus about files

    Open----------Open the stored documents

    Save ----------Save the documents

    Export --------Export the test data to excel or csv files

    Print -----------Print data

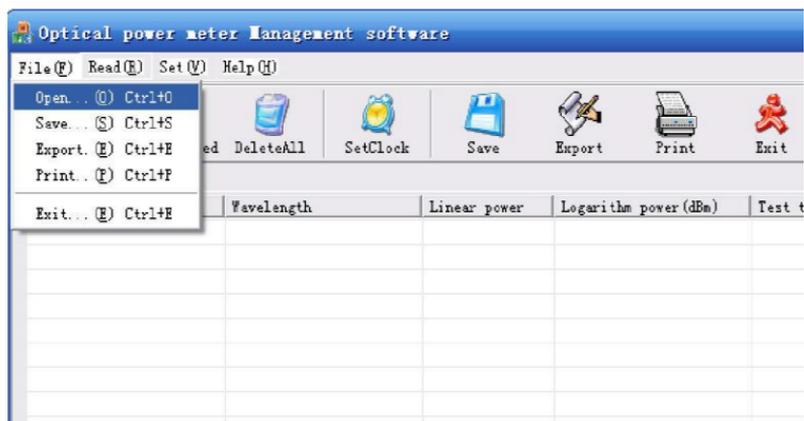   Exit ------------Exit the management software

Fig. 15

2. Read: Read the parameters on meters

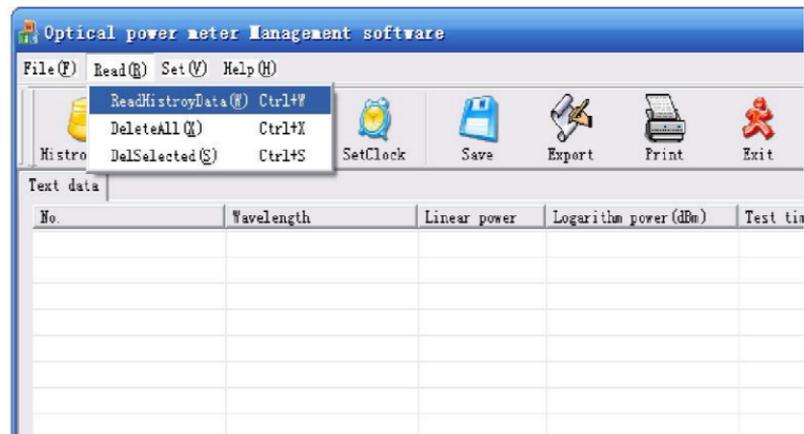History data – check Bit map of signal path in graphics

mode

Fig. 16

3. Set: Set up parameters of meter through software
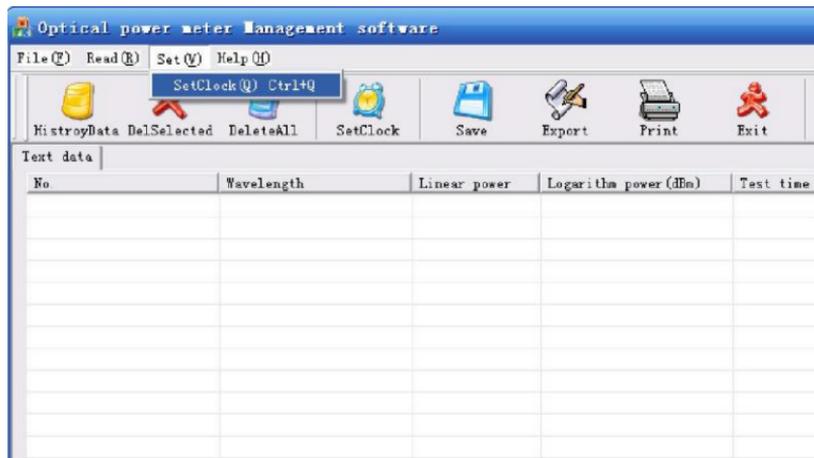
Set clock – Set clock shown on meter display

Fig. 17

4. Help: Relevant menus about help

Help – Show the on-line content for help

About – About this software

Fig. 18

III. Toolbar

The management software toolbar appears as follows:

Fig. 19

From left to right, the functions are:

History data: Shows the historical testing results in the power meter

Delete single item: Deletes a selected history testing data

Delete all: Deletes all history testing data

Set clock: Calibrates the power meter's clock

Save: Stores the uploaded data for future analysis and management

Export: Export the uploaded data in ".xls" or ".cvs" format

Print: Prints test data

Exit: Exits system

Link: Facilitates connection between meter and computer

Link Status: Shows current connection status

Various Connection Status Images:

Original Status:

Successful Connection:

Failed Connection:

IV. Operating Procedures

1. Launching software

- After installation, Click Start->Program->"Optical Power Meter management software v1.0.exe" from the computer or click the shortcut icon on the computer desktop to launch the software.

- Note: When starting the software for the first time, it should install the driver program automatically.

- Do not interrupt installation. After installation of the driver program, the software must be restarted before use.

2. Link

Before using each function of the management software, the optical power meter must be connected to a computer using

USB. Click the Link button on the toolbar to connect the software with the meter. When the "Link Status" on the

toolbar changes from LinkStatus to LinkStatus , the optical power meter is now successfully connected. If the

status appears as LinkStatus, the connection is

unsuccessful. Check the connection between the meter and

computer, and / or whether the driver of the power meter has

been installed. Then, continue attempting to connect until

the status shows LinkStatus. (See also Appendix D.)

Note: Operations such as "reading" and "set up" may only be completed when the equipment is successfully connected.

3. Read history data

The Optical Power Meter can store up to 1000 groups of history testing records. Testing records can conveniently be uploaded to a computer for analysis and storage.
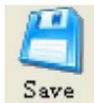
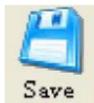- Connect the meter to a PC, then click" File->read history data", or click the ![HistroyData] button in the toolbar. The system will then read the data automatically as shown below (Fig. 19):

Fig. 20

After reading the history data, click Save in the toolbar to store the data. To edit or add notes to the data, double-click column "No." and "Description." A maximum of 10 alpha-numeric characters per column may be input into the "No." or "Description" areas.

Notice: Do not perform any additional operations during the upload of history data until the upload is complete.

4. Delete single item

To delete the single history testing data:

- Connect the meter to PC and download the history testing data to computer. Click the item needing to be deleted in the management software, and then

    click "read → delete item", or click the DelSelected button to delete the single history testing data.

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5. Delete All

To delete all history testing data:

- Connect meter with PC and download the history testing data to computer. Click "read$\rightarrow$ Delete All" or

    click the DeleteAll button to delete all the history testing data.

6. Set clock

To set the clock of the Optical Power Meter:

- Click" File $\rightarrow$ set clock", or choose the SetClock button.

- The system will show a dialog box for setting the clock:

Fig. 21

- Click the "OK" button to set the clock; clicking the "Cancel" button will close the dialog box.

7. Save data

Data read by the software can be stored in a computer for future analysis and management:

- After reading data, select "File" in the menu →

  "Save" or click the button in the menu. A "save file" dialog box will pop up: choose the root and name the file; click "OK" to save file.

8. Open files

To open stored data files and show them within the software:

- Click the "File in the menu →open" to see the open file dialog box.
- Select the desired file and click "OK" to open.

9. Export files

Data files from the management software may be exported in ".xls or .cvs" file formats:

- After reading or opening the desired file(s), click

    "File →Export" or click the Export button.

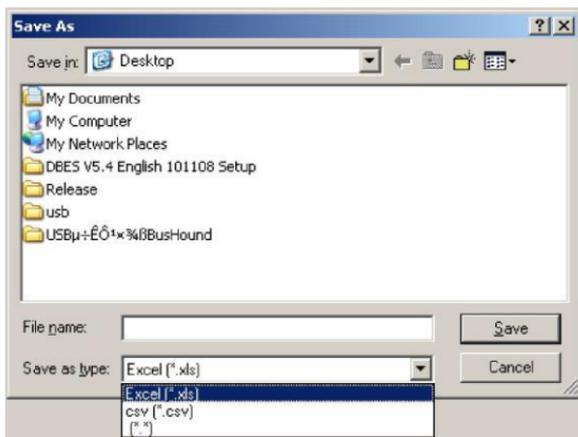- The program then shows the export file dialog box. Select the desired file and click "Save" to export.

Fig. 22

10. Print

To print the read data:

- After reading or opening files, click "File →Export"

  or click the Print button.

Ⅴ. Software Troubleshooting

Issue	Reason and analysis	Solution
Clicking "Connecting Equipment" fails	1. Physical connection is not good. 2. The power meter did not install the device driver. 3. The power meter is not on.	1. Please check the physical connection between the computer and the optical power meter. 2. Check whether the power meter has device driver (see Appendix 1A) 3. Check whether the power meter is on.
Data uploads or set-ups are unsuccessful	The standby time of power meter is due, and then the meter is power off automatically.	Restart optical power meter and follow instructions in Appendix 1A until a successful connection is obtained.
Reconnection fails after a normal disconnection	After disconnecting the equipment, the computer's serial port is in a connecting state, but equipment isn't found, and connection is unsuccessful. This occurrence is rare.	Exit the software and reopen. Then restart the meter and try to connect again.

12. Appendix D

Notes on Connecting Equipment

The connection of the meter is the first step to using the management software. Prior to using the software and clicking the "Connection of Equipment" button on the toolbar, please ensure the following:

- The USB cable connecting the meter to the computer is securely in place.
- The device driver of the meter is properly installed once the meter has been connected.
- The meter is turned on.

When using the management software for the first time and installing the device driver, check that the computer is showing "CP210x USB to UART Bridge Controller" in the hardware devices in the computer's settings. If not, it will need to be installed. You can find the "Files for drive" in the installation list of this management software and double-click file name CP210x_VCP_Win2K_XP_S2K3.exe.

- Once the above steps have been finished, click the "Link" button in the toolbar to connect the software with the meter.

- When the "Link Status" in the toolbar turns green, it means connection is successful, and the user can perform other operations.
- If "Link Status" is red, the connection has failed. Please check the physical connection of the drive installation until "Link Status" turns green.

Notes:

- The default connection status is yellow after the software starts. The status will change to green when the equipment connects with the software successfully, or the status will turn red if the connection is unsuccessful.
- Operations such as "Read" or any type of set-up may only be performed when the meter is successfully connected.