ShinewayTech®

*Dependable Partner for Future Networks*

# VLS/SLS/OPM/OLT Series

# User's Manual

**Shineway Technologies, Inc.**

# Safety Information

## Safety Terms in This Manual

WARNING! "WARNING" identifies procedures or practices that if not followed could result in serious injury.

CAUTION! "CAUTION" identifies any procedure or practice that if not followed could result in damage to the instrument or serious injury.

NOTE "NOTE" identifies information that may be beneficial during the use and maintenance of the instrument.

WARNING!

SLS/VLS/OLT series is a laser instrument. Users should always avoid looking directly into the optic output port. And the use of microscope or magnifier should also be avoided, for the use of such devices can focus a highly intense beam onto the retina, which may result in permanent eye damage.

CAUTION!

**Battery:** Battery for all palm optical fiber testers is a 9V lamination alkaline battery. Please make sure to use the right type of battery.

**Battery Power:** Do not expose batteries to fire or intense heat. Do not open or mutilate batteries. Avoid touching the electrolyte in the batteries, which is corrosive and may cause injuries to eyes, skin or damage to clothes.

**External Power:** All hand-held instruments from our company support external power. Power requirements: 9V DC@250mA. Power adapter is optional fitting.

**Laser Radiation:** To avoid serious eye injury, never look directly into the optic outputs of fiber optic network equipment, test equipment, patch cords, or test jumpers.

- Always avoid looking directly into the optic output port when the instrument is

working.

- Always place protective dust caps on the detector port when the instrument is not being used.
- Always avoid looking directly at the unconnected end of optic fiber in testing and make the unconnected end pointing at a non-reflective object, if possible.

**Protective Sleeve:** When the instrument is not in use, don't remove the rubber protective sleeve so as to avoid possible damage in case of a fall or collision.

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# 1. General Information

## 1.1 Scope of This Manual

Thank you for purchasing ShinewayTech® instruments. Please read this manual carefully before using any of ShinewayTech® series fiber-optic instruments. Always observe the warnings and cautions appearing throughout this manual, for any inobservance may cause body injuries or damage to the instrument.

This manual contains the information necessary for proper operation and maintenance of ShinewayTech® series palm optical fiber testers, troubleshooting instructions as well as information regarding obtaining services.

All ShinewayTech® series hand-held fiber optical instruments are carefully assembled and undergo a rigorous mechanical, electrical, and optical inspection prior to shipment. Beside the instrument, the package should also include a 9V alkaline battery, a power adapter (optional), an optical jumper cable (optional), a flange (FC/PC flange if no special requirements) and this users' manual etc.. For detailed information, refer to the packing list.

Upon receiving the instrument, please check for any obvious signs of physical damage that may have occurred during shipment. Report any damage to the shipping agent or the representative of Shineway Technologies Inc. immediately. Retain the original packing mate.

## 1.2 Unpacking and Inspection

This instrument has been carefully packed in accordance with standard shipping procedures. Examine the instrument for damage that may have occurred during shipment. If you find any damage or the instrument is not working, or if any of the following items are not included, please contact your representative of Shineway Technologies, Inc.

If necessary, you may contact the Representative of Shineway Technologies or directly contact Shineway Technologies, Inc via this email: support@shinewaytech.com

**NOTE**

To return the instrument in the case of repair, calibration or other maintenance, please note the following:

- Be sure to pack the instrument with soft cushion like Polyethylene, so as to

protect the shell of the instrument.

- Please use the original hard packing box. If use other packing material, please ensure at least 3 cm soft material around the instrument.
- Be sure to correctly fill out and return the warranty registration card which should include the following information: company name, postal address, contact, phone number, email address and problem description.
- Be sure to seal the packing box.
- Be sure to ship to your representative or the agent of the Company in a reliable way.

# 1.3 Introduction and Features

ShinewayTech® palm optical instruments feature compact, light weight, easy to use, easy to carry, power switch between internal battery and external power. According to the ergonomics, the series are designed to fully embody the user's convenience with friendly graphical interface. The series are shockproof and moisture-proof, suitable for long time field operation.

## 1.3.1Visible Laser Source

The VLS series is compact, easy-to-use visible red laser source for accurately locating breaks and tight bends in optic fibers. The VLS generates red laser that escapes from bare optic fiber or optic fiber with tight bends, breaks or bad connectors, therefore the instrument can be used to identify failures in optical jumper cable, jumper board, and bad connectors. Besides, it is also regarded as a perfect complementary tool for OTDR, due to its capability of finding breaks in the blink area of OTDR.

Battery of VLS series is 9V alkaline battery. Battery state can be displayed on LED. The low volume battery-state indicates replacing battery for the power is low. VLS has function of auto power off. If auto off is on, the instrument will auto power off after 5 minutes of idleness. This function can be canceled by control key of panel.

**Features:**

- Pocketsize, easy to use
- Fast response, no warm up
- Damp, dust, shock proof design
- Dual-way powering system including a 9V battery and an optional AC adapter
- Auto off function conserving battery life
- Interchangeable fiber optic connectors (FC/PC, or optional SC,ST)

### 1.3.2 Stabilized Laser Source

The SLS series have three models: SLS-10 Single-wavelength, SLS-21 Dual-wavelength, and SLS-25 Triplex-wavelength. The SLS series are powerful, pocketsize, lightweight, easy-to-use stabilized laser sources with dual-way power supply. Based on advanced technologies of precision laser control, the SLS models have been designed to provide high capability of laser source for engineering, R&D and equipment manufactures, and being favored for its quality, value, reliability and safety. Designed according to the ergonomics, the SLS series also have auto off function. Inside MPU and liner amplification technology ensures long time accuracy.

Together with optical power meter, the SLS series can measure attenuation of single-mode and multiple-mode optic fiber link, and can be also used for installation and maintenance of single-mode SONET/SDH, Cable TV, ATM and other optic fiber ring.

**Features:**

- Pocketsize, easy to use
- Fast response, no warm up
- Damp, dust and shock proof design
- Modulation in CW and modulated frequencies
- Single connector, dual wavelength output
- Single/dual/triplex wavelength selectable
- Interchangeable fiber optic connectors (FC/PC, or optional SC,ST)
- High stabilized output of optical signal
- Dual-way powering system including a 9V battery and an optional AC adapter
- Auto off function conserving battery life

### 1.3.3 Optical Power Meter

The OPM series is a high-performance palm optical power meter for optic fiber network, which features field speed test, and is favored by customers for its quality, value, liability, accuracy and safety.

The series is designed for installation, verification and maintenance with advanced precise laser detection and processing technology. The OPM series features by small size, large LCD display, damp and shock proof design, dual-way powering system and support for single-mode/multi-mode testing. The OPM series is ideal for both laboratory and field applications by using concise function keys to implement quick, high accuracy testing.

There are five series of OPM, which are OPM-10, OPM-15, OPM-21, OPM-25. The wavelength range of OPM series covers from 850nm to 1625 nm, and the measurement power range is from +27dBm to -70dBm. Besides, OPM-21/25 has a large memory capacity of 3000 records and can transfer the measurement data to a PC for editing and printing, which make data management faster, more convenient, and more accurate.

Under the situation of laboratory, LANs, WANs and CATV as well as long-distance optical network, the Optical Power Meters, together with ShinewayTech's stabilized laser

sources, can be used to identify optic fiber, measure optical attenuation, verify continuity and evaluate fiber link transmission quality

**Features:**

- Pocketsize, large easy to read LCD display, easy to use
- Fast response, no warm up
- Accurate measurement multi-wavelengths through a single connector
- Direct loss measurement units in dB(only available for OPM-15/21/25)
- Absolute power measurement units in dBm or μW
- Wide testing range
- Dual-way powering system including a 9V battery and an optional AC adapter
- Damp, dust and shock proof design
- Large memory capacity of 3000 records(only for OPM-21 and above)
- PC software available for testing data collection and report generation (only available for OPM-21 and above)
- Auto off function conserving battery life

### 1.3.4 Optical Loss Tester

The OLT series is a comprehensive testing instrument for optic fiber network, which features by palm size, intelligentized, multi-function and is specially designed for the current need in optic fiber installation, verification and daily maintenance. The OLT series is compact, light-weighted, easy to carry, powerful, dual-way power supply, and has high performance-price rate. According to the ergonomics, the series are designed to fully embody the user's convenience with friendly graphical interface. Inside MPU and liner amplification technology ensures long time accuracy.

OLT series is an integration of laser source module and power meter module, which can perform loop testing of optic fiber network conveniently

**Features:**

- Pocketsize, large easy to read LCD display, easy to use
- Multi-wavelength measurement
- Direct loss measurement units in dB
- Absolute power measurement units in dBm or μW
- Modulation in CW and modulated frequencies
- 270/1K/2K Hz Modulated frequencies
- Single optic output, dual-wavelength output
- Dual-way powering system including a 9V battery and an optional AC adapter
- Low power indicator
- Auto off conserving battery life

# 2. Basic Operation

## 2.1Foreword

This part introduces the basic operations of the ShinewayTech® series hand-held optical testing instruments. Specific operations of each type are elaborated in "Specific Operation", chapter 4 of this manual. Please read this manual carefully for optimal operation. Should you encounter any problems during operation, you are welcome to contact the technical staff of our company or agents

## 2.2 Battery Installation and Replacement

ShinewayTech® series palm optical instruments use an alkaline battery. Before use of the instrument, make sure the battery is correctly installed.

When the battery power is low, low battery indicator is shown on LCD. As long as there is any character on LCD, the instrument can still be in operation. However, when LCD turns dark, the output power becomes unstable, therefore measured power value will not be accurate and in consequence, the measurement accuracy is degraded.

## 2.3 Turn off Auto-off Function

With default setting, the Auto-off function of ShinewayTech® series palm optical fiber tester is on, for this can conserve power and battery life. Auto-off function needs to be turned off, when long-time test is performed. Please follow the following procedures.

**Turn off Auto-off:**

- VLS: when power on the instrument, hold**[On/Off]** until the indicator light turns green to disable Auto-off.
- SLS, OPM and OLT：when power on the instrument, hold**[On/Off]** until letter "P" is displayed on LCD to disable Auto-off. In the coming measurement, "AUTO OFF" will not be displayed on LCD. With the default setting, the series will conserve battery life by automatically turning itself off if no keys have been pressed for approximately 5 minutes.
- With default setting, the Auto-off function is on after each power on.

## 2.4 Cleaning of Connectors

Please observe the following safety instructions when cleaning this instrument:

- Make sure the instrument is power off when cleaning.
- Any inobservance may cause hazardous laser radiation.
- Make sure laser source is off, when cleaning any optical output port.
- When the instrument is working, under no conditions should the operator try to look at the end of optical output facilities. Laser radiation is invisible, but it can severely harm people's eyesight.
- Be careful of electric shock. Make sure to separate the instrument with electric power supply. Always use dry or slightly damp cloth to clean the outside of the instrument. And cleaning of the inside of the instrument should always be avoided.
- Do not attach any fittings or alter the instrument at discretion.
- For maintenance, please always refer to qualified and certificated professionals.

In order to keep the accuracy of the instrument, proper cleaning should be performed before conducting any test procedures. Use optic fiber cleaning rod to wipe the connectors softly.

If without no proper maintenance, it may cause performance degradation as follows:

- An increase in distance measurement errors;
- Linear errors;
- Attenuation of optical power;
- Received optical power value exceeds the normal range of measurement.

## 2.5 LCD of Laser Source and Optical Power Meter

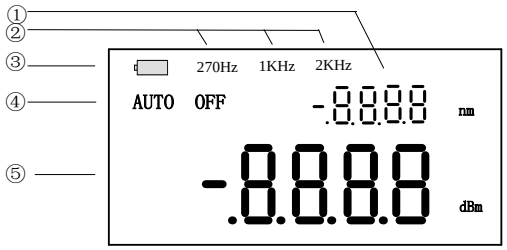


FIGURE1. LCD OF LASER SOURCE AND OPTCIAL POWER METER

① : Current wavelength
② : Current modulated frequency
③ : Low battery power indicator
④ : Auto Off indicator
⑤ : Power value of current wavelength

## 2.6 LCD of Optical Loss Tester

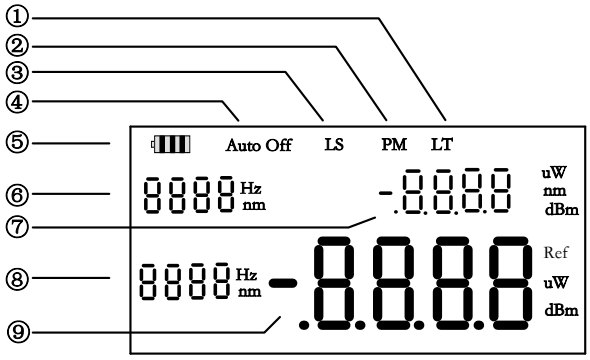


FIGURE2. LCD OF OPTICAL LOSS TESTER

①: LT indicates the current operation is link loss testing.
②: PM indicates the current operation is switched to optical power meter module.
③: LS indicates the current operation is switched to laser source module.
④: AUTO OFF indicates Auto-off function is on.
⑤: Low battery power indicator
⑥: Wavelength or Modulated Frequency
⑦: Output power of laser source
⑧: Current wavelength or frequency under mode of power meter module
⑨: Tested Power value under mode of power meter module

## 2.7 Prohibition of Use of Calibration Knob

**CAUTION!** Users are strongly prohibited to use this knob, which is designed for calibration. Any use of this knob without technical staff's help may result in system paralysis. Shineway Technologies will not be responsible for any damage and loss resulting from this.

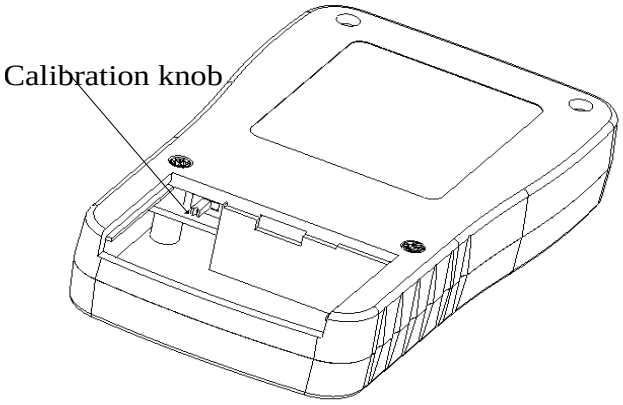


FIGURE3. POSITION OF CALIBRATION KNOB

# 3. Specific Operation

## 3.1 Visible Laser Source

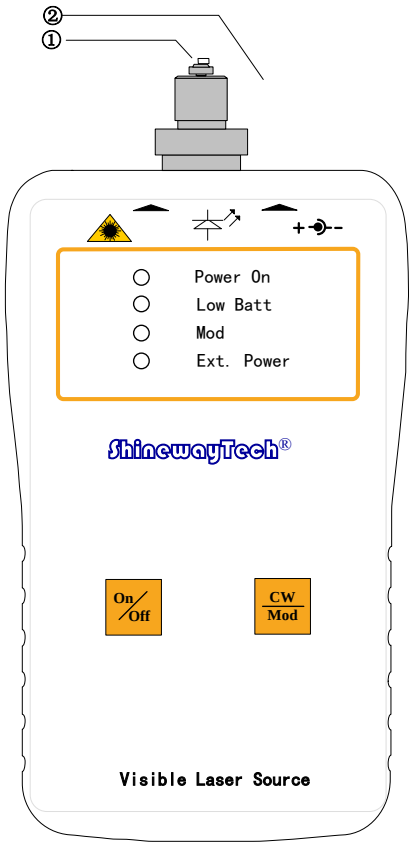


FIGURE4. PANEL OF VLS

### 3.1.1 Connectors

① Optical output
FC/PC(interchangeable ST,SC)
② External power jack
Power jack requirement: 9V DC@250mA.

### 3.1.2 Keypad Functions

**[On/Off]** Power on and off the instrument.

**]CW/Mod]** Press to switch between Continuous Wave and Modulated Frequency; After power on, the default setting of the instrument is Continuous Wave; Press this key to switch to 1Hz Modulated Frequency.

### 3.1.3 Indicator Functions

**Power On:** Power on indicator: 1. Default setting—Auto-off function is on(Red); VLS-20 will automatically turn off if no key is pressed for 5 minutes. 2. Auto-off function is off (green). Hold**[On/Off]** till the indicator light turns red to activate Auto-off function.

**Low Batt:** Low battery power indicator: When the battery power is too low, the light turns red to remind users to replace battery.

**Mod:** Modulated Frequency indicator: When output of visible laser source is 1Hz signal, the indicator turns green.

**Ext Power:** External power indicator: The indicator turns green when using power adapter.


*In the process of measurement, please always avoid looking directly into open optic fiber, optical output, optical connectors or other laser source, for it might cause eye injuries.*

## 3.2 SLS-10 Single-Wavelength Laser Sources

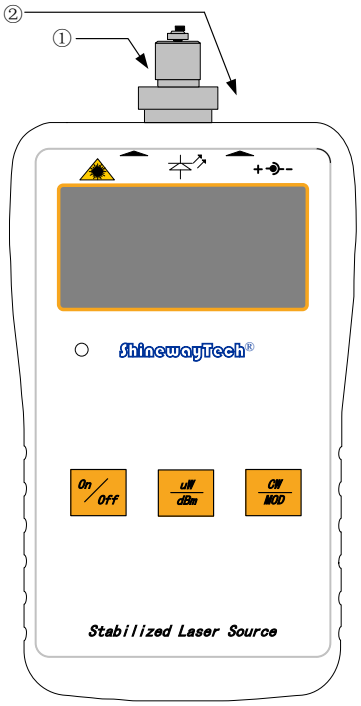


FIGURE5. PANEL OF SLS-10

### 3.2.1 Connectors

① Optical output
FC/PC (interchangeable ST,SC) connectors
② External power jack
Power jack requirement: 9V DC@250mA.

### 3.2.2 Keypad Functions

**[On/Off]**Power on and off the instrument. With default setting, SLS-10 will automatically turn off if no key is pressed for 5 minutes.

**[µW/dBm]**Press this key to switch between µW and dBm unit; the current optical power will be displayed on LCD.

**[CW/Mod]**Press this key to switch output of SLS-10. SLS-10 provides two types of

wave output: generally, continuous wave(CW) will be set to work with the measurement of optical power or quality of optical communication; Modulated Frequency (Mod) is set mainly for the purpose of identification of optic fiber. Wave output type in use will be displayed on LCD.

**[○]:** External power supply indicator. When the indicator is on, the instrument is using external power supply.

**CAUTION!**

*In the process of measurement, please always avoid looking directly into open optic fiber, optical output, optical connectors or other laser source, for it might cause eye injuries.*

## 3.3 SLS-21 Dual-wavelength/SLS-25 Triplex-wavelength Laser Sources

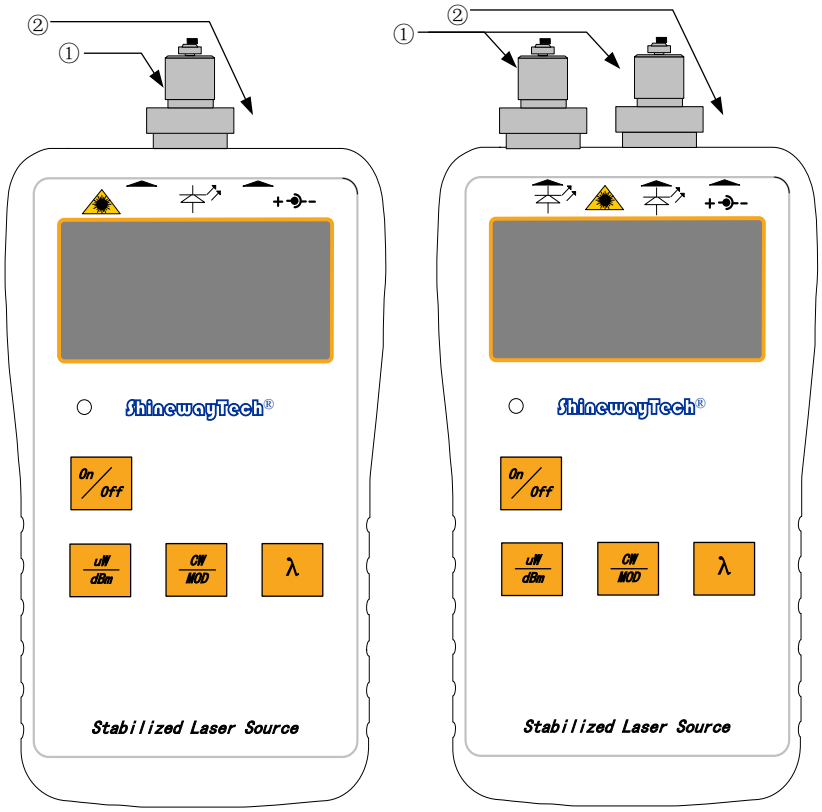


FIGURE6. PANEL OF SLS-21 / SLS-25

### 3.3.1 Connectors

① Optical output
FC/PC (interchangeable ST, SC) connectors
② External power jack
Power jack requirement: 9V DC@250mA.

### 3.3.2 Keypad Functions

**[On/Off]** Power on and off the instrument. With default setting, SLS-21/SLS-25 will automatically turn off if no key is pressed for 5 minutes.

**[μW/dBm]** Press this key to switch between μW and dBm unit; the current optical power will be displayed on LCD.

**[CW/Mod]** Press this key to switch output of SLS-21/SLS-25. SLS-21/SLS-25 provides two types of wave output: generally, Continuous Wave(CW)will be set to work with the measurement of optical power or quality of optical communication; Modulated Frequency (Mod)is set mainly for the purpose of identification of optic fiber. Wave output type in use will be displayed on LCD.

**[λ]** Press this key to select the desired wavelength. The current wavelength will be displayed on LCD.

**[○]** External power supply indicator. When the indicator is on, the instrument is using external power supply.


- Two optical outputs for triplex wavelength laser source, and single optical output for dual wavelength laser source.
- In the process of measurement, please always avoid looking directly into open optic fiber, optical output, optical connectors or other laser source, for it might cause eye injuries.

## 3.4 OPM-10/OPM-15 Optical Power Meter

OPM-15 is basically OPM-10 with relative measurement function. The following operation will only take OPM-15 as an example.

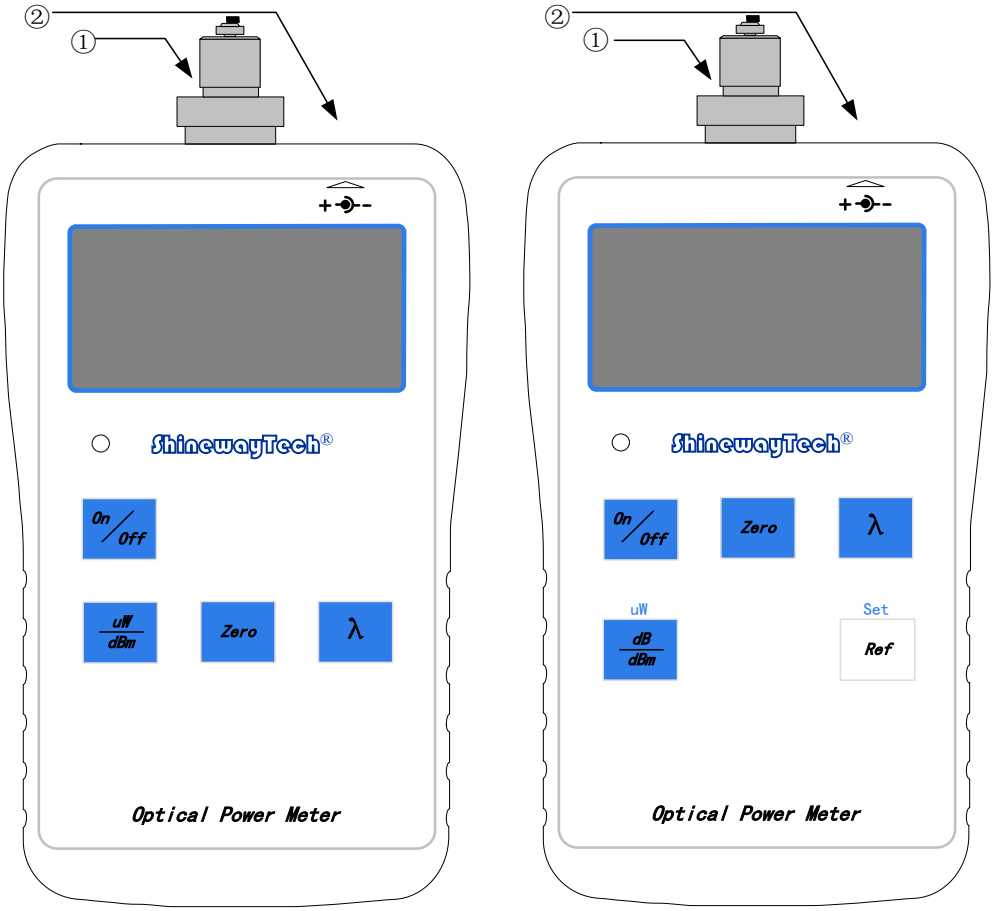


FIGURE7. PANEL OF OPM-10 /OPM-15

### 3.4.1 Connectors

① Optical output
FC/PC(interchangeable ST,SC) connectors
② External power jack
Power jack requirement: 9V DC@250mA.

### 3.4.2 Keypad Functions

**[**On/Off**]** Power on and off the instrument. With default setting, OPM-10/OPM-15 will automatically turn off if no key is pressed for 5 minutes.

**[**dB/dBm**]** For OPM-15, press this key to switch the measurement mode between absolute power (dBm) and relative loss (dB). Hold the key until "HELD" is displayed (approximately several seconds) switches to μW mode.

**[**Zero**]** Press this key, OPM-10/OPM-15 will start automatic zeroing.

**[**Ref**]** Press this key to display the reference value stored in memory. Hold the key down until "HELD" appears in the display (approximately several seconds), and store this value in internal memory as the reference power level. When OPM-15 is switched to dB mode, LCD displays the difference in dB between the reference level and the current input signal.

**[λ]** Press the key to select the wavelength, which must be consistent with the wavelength of the optic fiber to be measured.

**[○ External Power Supply Indicator]** When the indicator is on, the instrument is using external power supply.


For OPM-10, there is no function of relative measurement, then**[μW/dBm]** becomes the key to switch between units of **μW** and **dBm**.

# 3.5 OPM-21/OPM-25 Optical Power Meter

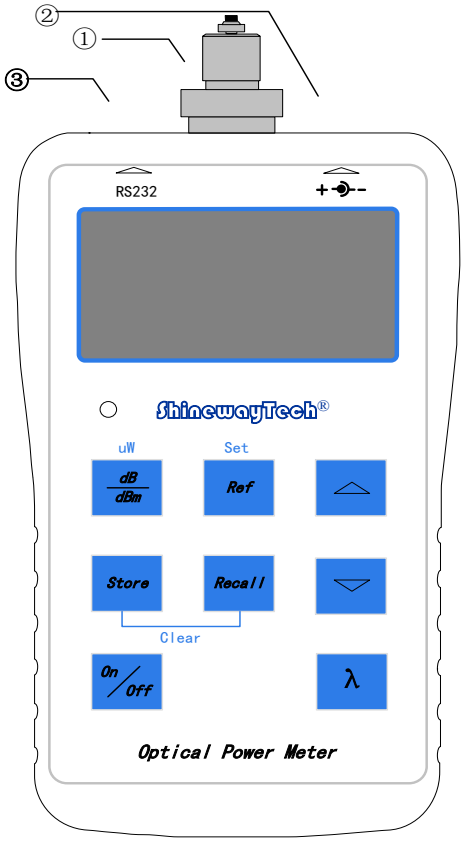


FIGURE8. PANEL OF OPM-21/OPM-25

## 3.5.1 Connectors

① Optical output
FC/PC(interchangeable ST, SC)connectors

② External power jack
Power jack requirement: 9V DC@250mA.

③ Data port
RS-232 serial port. Use PC data analysis software to upload saved data in the instrument to a PC through this port.

## 3.5.2 Keypad Functions

**[dB/dBm]** For OPM-21/OPM-25, press this key to switch the measurement mode between absolute power (dBm) and relative loss (dB). Hold the key until "HELD" is

displayed (approximately several seconds) switches to μW mode.

**[Ref]** Press this key to display the reference value stored in memory. Hold the key down until "HELD" appears in the display (approximately several seconds), and store this value in internal memory as the reference power level. When OPM-21/OPM-25 is switched to dB mode, LCD displays the difference in dB between the reference level and the current input signal.

**[Store]** Press this key to save the current measurement under different wavelength categories and flashes the location number. The OPM-21/OPM-25 stores 500 measurements for each wavelength.

**[Recall]** Press the key to enter the "Recall mode" to allow viewing, editing, and transferring of stored measurements. Hold the key for several seconds until "HELD" displays. Then the stored data is transferred to a PC via the RS-232 serial port (The supplied Data Collection Software need to be installed in the PC).

**[▲and▼]** After pressing Recall, use the ▲ and ▼ keys to browse the stored data in the memory. Holding ▲and▼ together can start auto zeroing.

**[On/Off]** Power on and off the instrument. With default setting, OPM-21/OPM-25 will automatically turn off if no key is pressed for 5 minutes.

**[λ]** Press the key to select the wavelength, which must be consistent with the wavelength of the optic fiber to be measured.

**[Clear]** Hold the **Store** & **Recall** keys down together until "HELD" displays to clear all stored data at the currently selected wavelength

**[○]** External power supply indicator. When the indicator is on, the instrument is using external power supply.

## 3.6 Optical Loss Meter

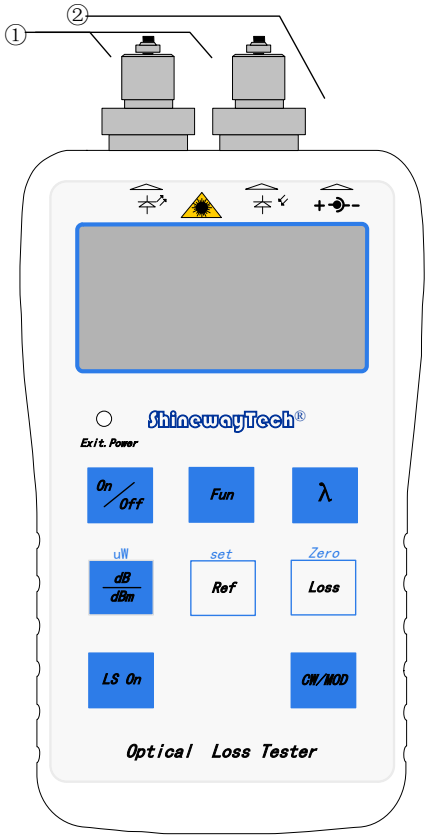


FIGURE9. PANEL OF OLT

### 3.6.1 Connectors

① Optical output
FC/PC(interchangeable ST, SC) connectors
External power jack: 9V DC@250mA.

### 3.6.2 Keypad Functions

**[On/Off]** Power on and off the instrument. With default setting, OLT-20 will automatically turn off if no key is pressed for 5 minutes.

**[Fun]** Press to switch between panel of OLT-20 laser source and optical power meter. The default panel is optical power meter.

**[λ]** Key to select wavelength. After power on, the default set is optical power meter, so the key is used to select wavelength of optical power meter. Press**[**Fun**]** to switch to laser

source, and the key is used to select wavelength of laser source.

**[dB/dBm]** For OLT-20, press this key to switch the measurement mode between absolute power (dBm) and relative loss (dB). Hold the key until "HELD" is displayed (approximately several seconds) switches to μW mode.

**[Ref]** Press this key to display the reference value stored in memory. Hold the key down for several seconds until "HELD" appears in the display, and store this value in internal memory as the reference power level. When OLT-20 is switched to dB mode, LCD displays the difference in dB between the reference level and the current input signal.

**[Loss]** Key for link testing. Press this key, OLT-20 will display loss of optic fiber at relative wavelength; Hold this key for several seconds until "HELD" displays to start auto-zeroing.

**[Ls On]** Key to activate laser source**.** Press to activate laser source. Press **[**Fun**]** to switch to LCD display of laser source.

**[CW/Mod]** Press the key when laser source is on, OLT-20 will switch the mode of optical power output OLT-20 provides two modes of wave outputs: normally, it is Continuous Wave(CW) to work with the measurement of optical power or quality of optic communication. Modulated frequency (Mod) is mainly used for identification of optic fiber. Wave mode is displayed on the LCD.

**[**○**]** External Power Supply Indicator. When the indicator is on, the instrument is using external power supply.

# 4. Data Upload Application System

## 4.1 Introduction

OPM Upload Application System is a special application developed for OPM-21/25. It allows the previously stored measurement records in the instrument to be uploaded to a PC to be displayed, saved or printed via RS-232 serial port. Users are provided with convenient data management function, including browsing, saving, graphic plotting, form reporting and printing.

The data saving format is compatible with Microsoft EXCEL, therefore uses can also use EXCEL to browse, edit and print saved records.

## 4.2 Software Installation

### 4.2.1 Computer System Requirement

Requirements for operating system and hardware:

- CPU: Pentium or above
- Operating System: Microsoft Windows 98/2000/XP
- Internal memory: 64MB or above
- Hard disk: 10 MB or above (Space available)
- CD-ROM driver: 8 speed or above
- RS-232 serial port: at least one 9 pin series port

### 4.2.2 Install and Run Data Upload Application System

- Start Windows98/2000/XP, if windows is running, exit all other running applications;
- Insert the installation disk into CD-ROM;
- Double click setup.exe to install;
- Follow the instructions of installation wizard step by step till the installation completed.

# 4.3 Software Operation

## 4.3.1 GUI

After installation of OPM Upload Application System, click run, and the GUI will be as follows:

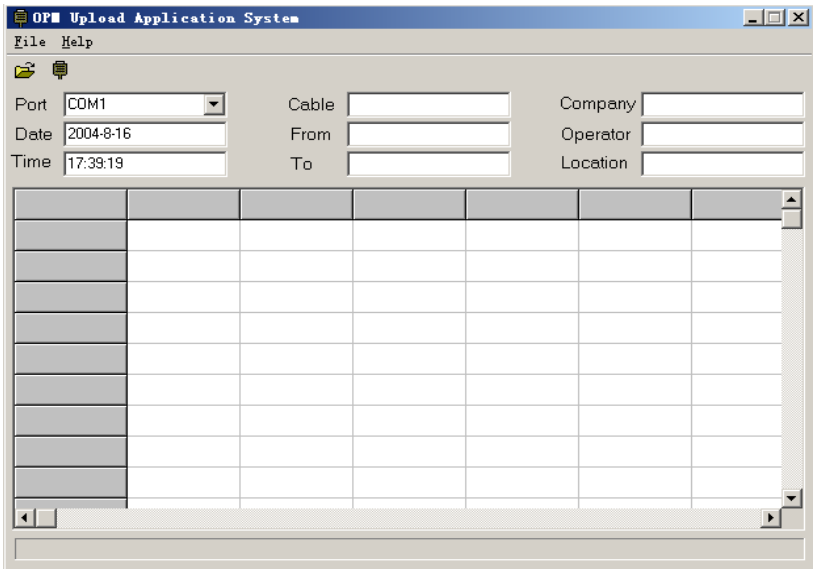


FIGURE10. GUI OF OPM DATA UPLOAD APPLICATION SYSTEM

## 4.3.2 Menu and Tool Bar

Click File, (as in Figure 11.), the following contents will be displayed:
Upload: First select the right COM port, then click Upload to upload records.
Open: Open a saved data file to browse the previous testing results.
Close: Close the file.
Save: Save the record currently displayed.
Print: Print the data displayed on screen via a printer
Exit: Exit the software

FIGURE11. FILE MENU

### 4.3.3 Upload Records

Power off the instrument first, and connect it with PC via serial port cable; Then power on the instrument, and run OPM Upload Application System software. Click Upload menu bar under menu "File", the uploading will start automatically. The GUI is as in Figure 12.

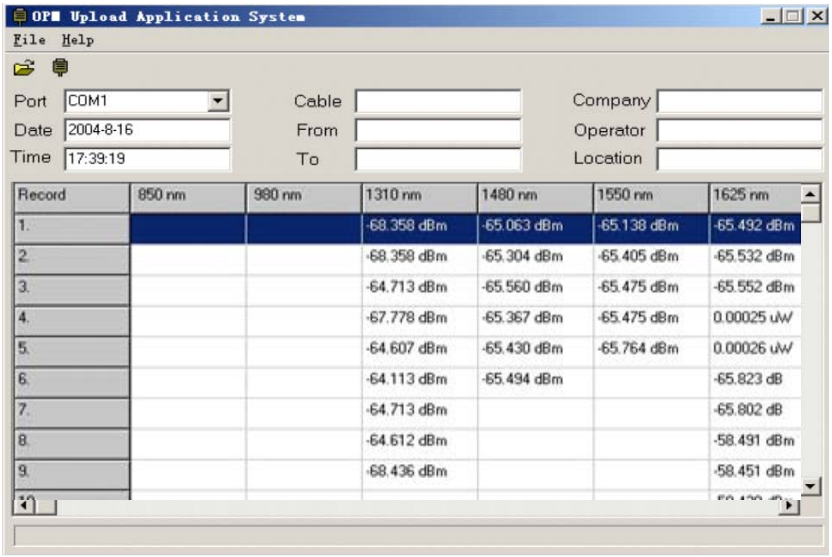


FIGURE12. GUI OF UPLOADING RECORDS

### 4.3.4 Save Records

After uploading records, click Save menu bar under File to save the records. The GUI is as in Figure 13. The following information needs to be filled out by users.

Date: Automatically set according to PC's internal setting.
Time: Automatically set according to PC's internal setting.
Cable: Fill in the number of the cable under test.
From: Fill in the starting point of the cable under test
To: Fill in the destination of the cable under test
Company: Fill in the name of the company
Operator: Fill in the name of the operator
Location: Fill in the location of fiber

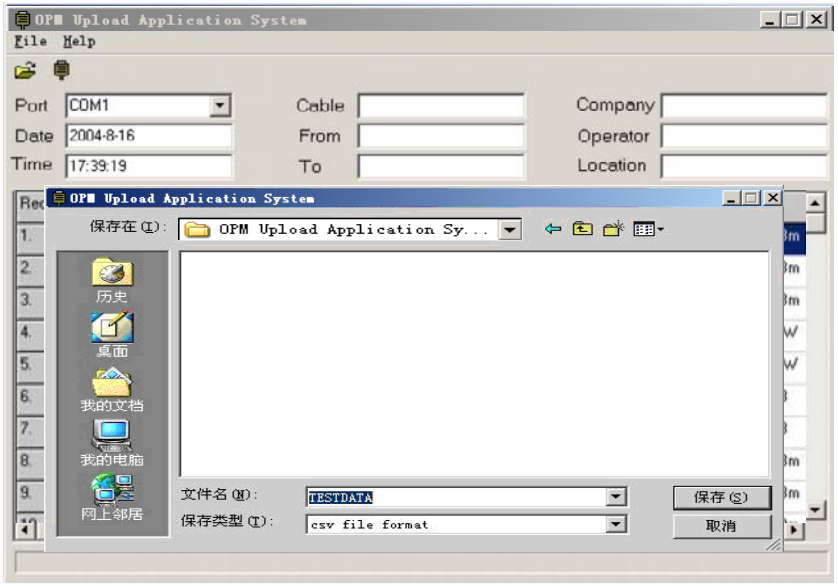


FIGURE13. GUI OF SAVING RECORDS

### 4.3.5 Browse Saved Records

Saved records can be reopened, browsed, reviewed, and edited. Click Open Menu Bar on the File menu and select a file, and the GUI will display as follows:

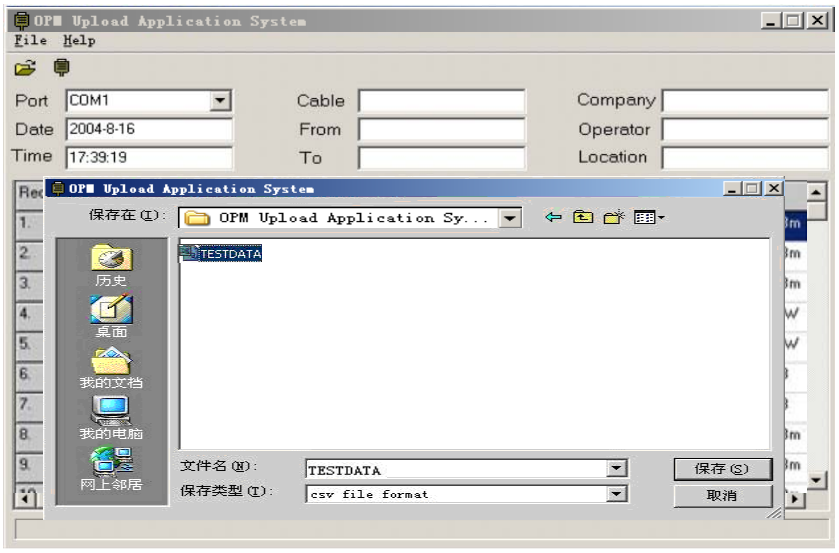


FIGURE14. GUI OF OPENING SAVED RECORDS

Press Enter, measure records will display as shown in the following figure. Users can browse the records via mouse clicking. To close opened file, click Close menu bar on the File menu.

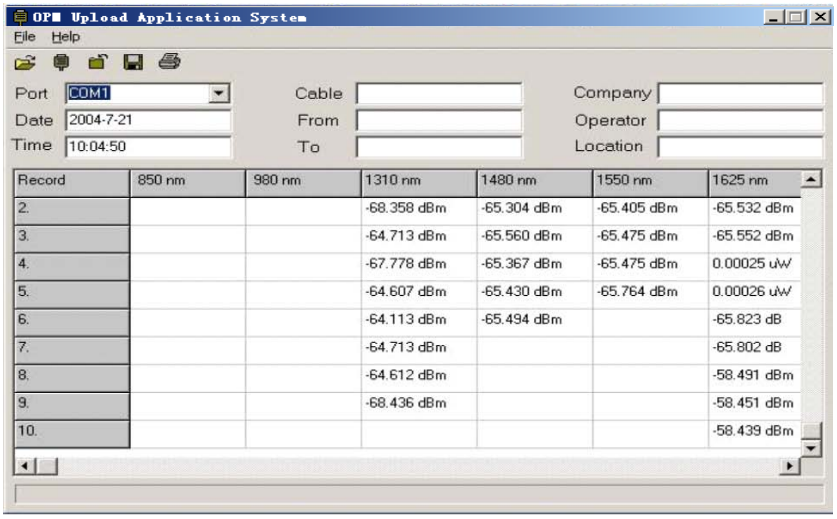


FIGURE15. GUI OF BROWSING SAVED RECORDS

### 4.3.6 Print Saved Records

After uploading records or opening a saved record file, user can print the records via a printer, as shown in Figure16.


FIGURE16. GUI OF PRINTING SAVED RECORDS

### 4.3.7 Exit

Click the Exit menu bar under the "File" menu to terminate the application.

# 5. Typical Applications

This section will discuss the use of ShinewayTech® instruments. We hope this would be beneficial to your operation.

Please read the cautions and notes carefully before carrying out actual measurement.

## 5.1 Connector Insertion Loss

To measure the insertion loss of a connector, a stabilized laser source and an optical power meter (with relative measurement function) are needed. Please follow the procedure described below:

1. I**nitialization:** Connect the SLS series laser source to the OPM series optical power meter using a suitable optical jumper cable with a length of 6-9 feet (2 to 3 meters) to measure the actual optical power of stabilized laser source, as shown in Figure17.


FIGURE17. INITIAL CONNECTION OF CONNECTOR INSERSION LOSS TESTING

2. **Check the instrument status**: Ensure that the source is in Continuous Wave (CW) output mode. Set the optical power to the appropriate wavelength (using the [**λ**] key) and to dBm units (using the [**dB/dBm**] key). Note that only under the dBm mode, the reference power value can be set.

3. **Store the reference power value**: Press the **[Ref]** key for several seconds until "HELD" appears on the LCD screen, OPM-15/OPM-21/OPM-25 will set the current measured dBm as reference value. The display should read 0.00dB, as shown in Figure 18.


FIGURE18. SAVE REFERENCE POWER VALUE

4. **Measure Connector Insertion Loss**: Disconnect the optical jumper cable end from the power meter and connect the power meter through flange. The power meter reads the connector insertion loss as shown in Figure19.

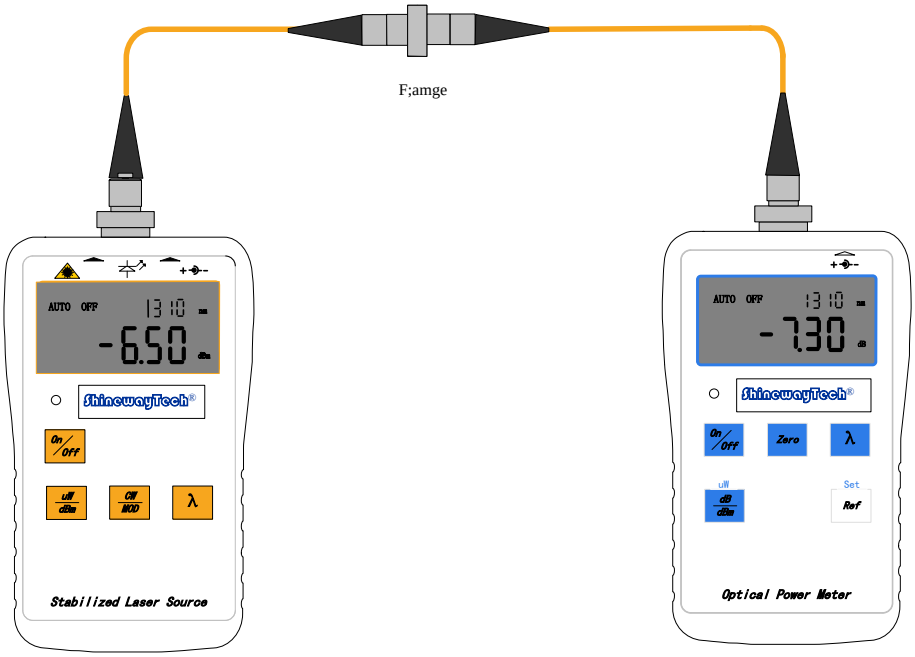


FIGURE19. CONNECTOR INSERTION LOSS TESTING

**CAUTION!**

- To ensure the accuracy of measurement, optical connectors should be kept clean.
- In the process of measurement, please always avoid looking directly into open optic fiber, optical output, optical connectors or other laser source, for it might cause eye injuries.
- Only under the dBm mode, reference power value can be set.

## 5.2 Link Loss Testing

For link loss testing, a stabilized laser source and an accurate optical power meter are needed to measure the attenuation of a single-mode or multimode link.

Please follow the following procedures:

1. If users want to make full use of the measurement function of the instruments(laser source and power meter), then test of the output power of laser source connected to optical jumper cable must be performed before link testing. And connect laser source and power meter with tested optical jumper cable, as in Figure20. Power value is noted as P1.

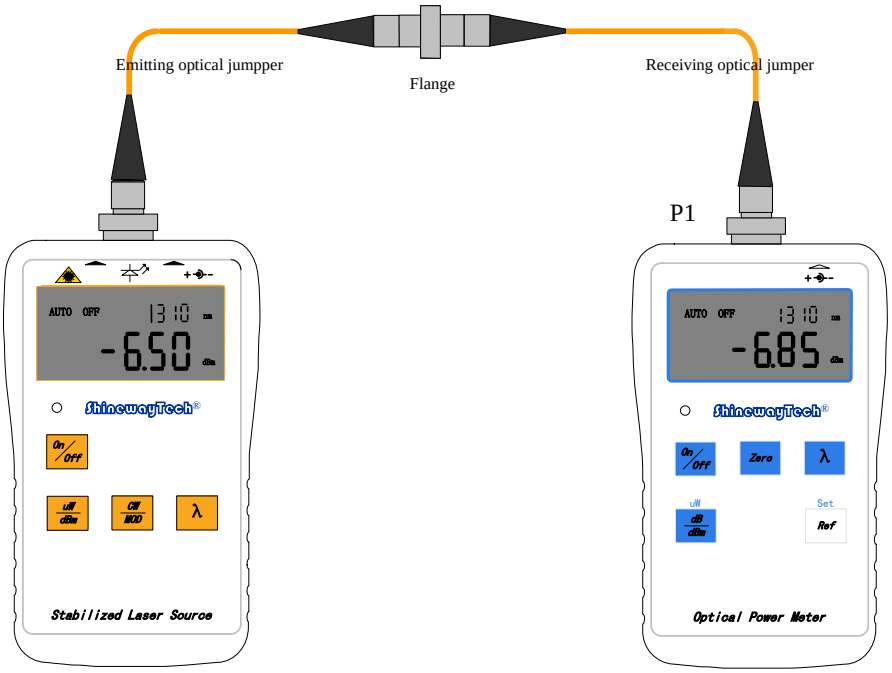


FIGURE20. CONNECTION OF LINK LOSS TESTING

Note: Laser source should be working under CW mode; and power meter should be in relevant wavelength, and the unit is dBm.

2. Connect laser sources and optical power meters to their respective patch panel ports using the test jumpers, as shown in Figure21.

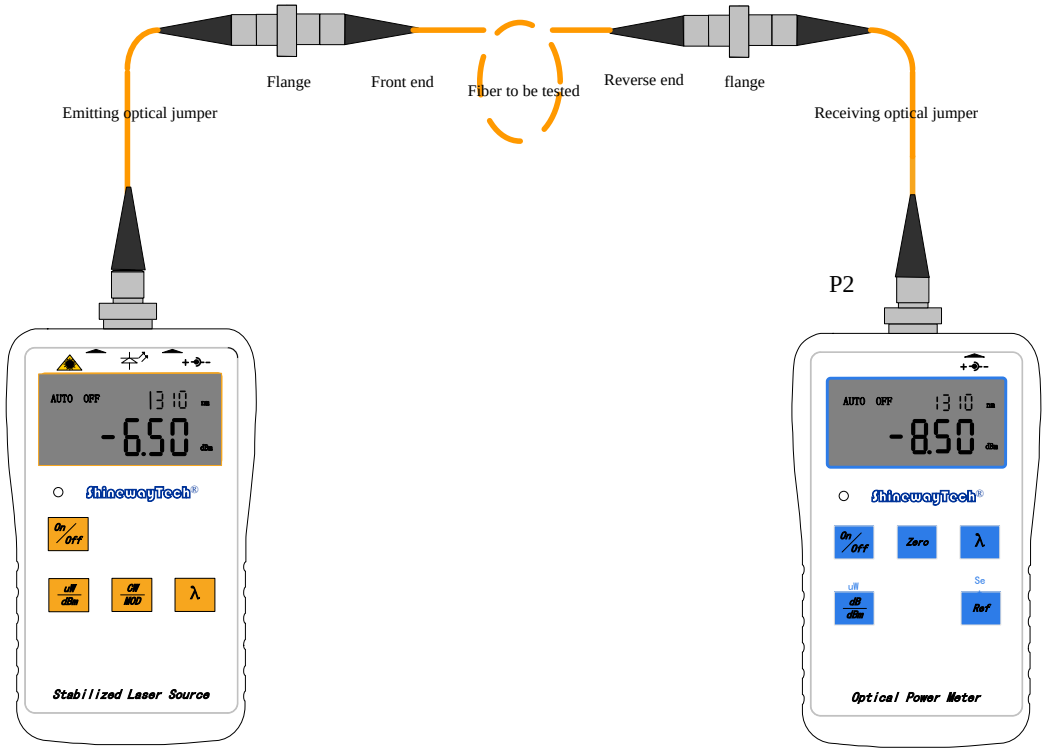


FIGURE21. FORWARD LOSS TESTING

3. Use the formula "FORWARD LOSS (dB) = P1 – P2", take the dBm reading on the power meter (P3) in step 2) and the source output power value (P1) in step 1). For example, if P2 = -8.50dBm, and P1=-6.85dBm, then the FORWARD link loss is 1.65dB.

4. Connect laser sources and optical power meters to their respective patch panel ports using the test jumpers, as shown in Figure22. Calculate the reverse link loss using the formula "REVERSE LOSS (dB) = P1 – P3".

5.Report both forward and reverse loss values.

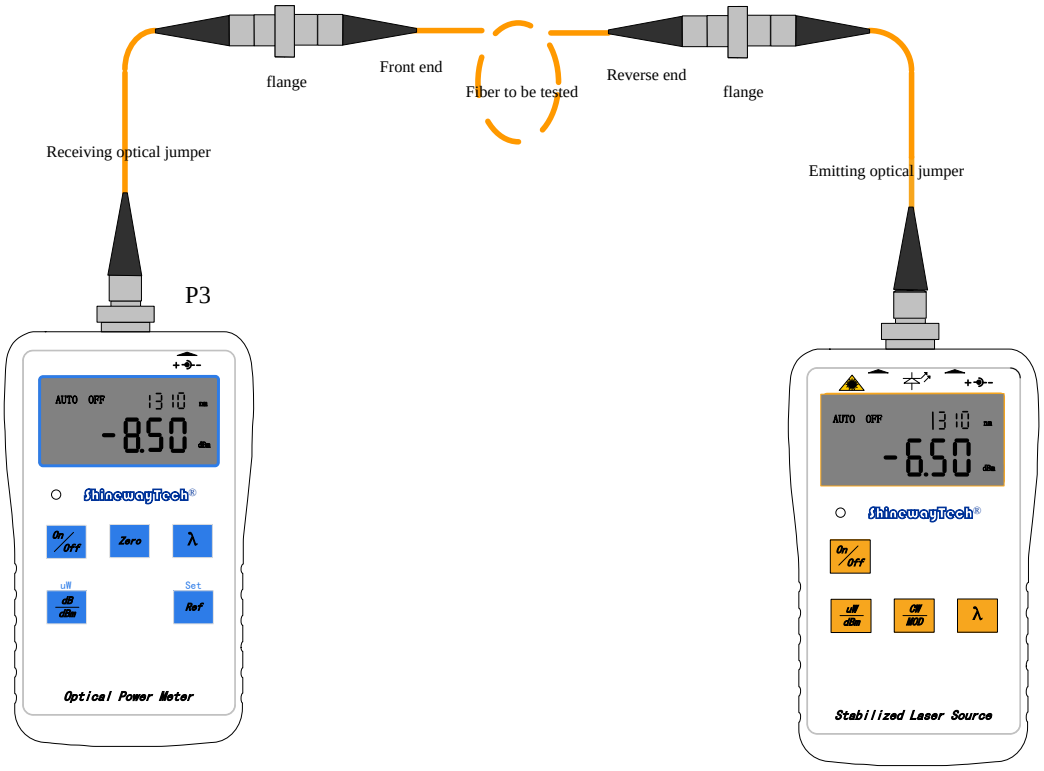


FIGURE22. REVERSE LOSS TESTING

**CAUTION!**

- To ensure the accuracy of measurement, optical connectors should be kept clean.
- In the process of measurement, please always avoid looking directly into open optic fiber, optical output, optical connectors or other laser source, for it might cause eye injuries.

## 5.3 Locate a Break within a Fiber by Visible Laser Source

The VLS-20 injects visual red light into a fiber. The visible light escapes from the fiber wherever the continuity is interrupted. A break always generates a highly visible output. If the fiber is only under stress, a smaller effect may be produced. In general, however, if any light is seen escaping from the fiber, it is an unmistakable sign that there is a problem that must be repaired, as shown in Figure23.

The light in jacketed fiber is heavily attenuated; sometimes it necessary to darken the room to see where the light is escaping from the fiber and locate the break.

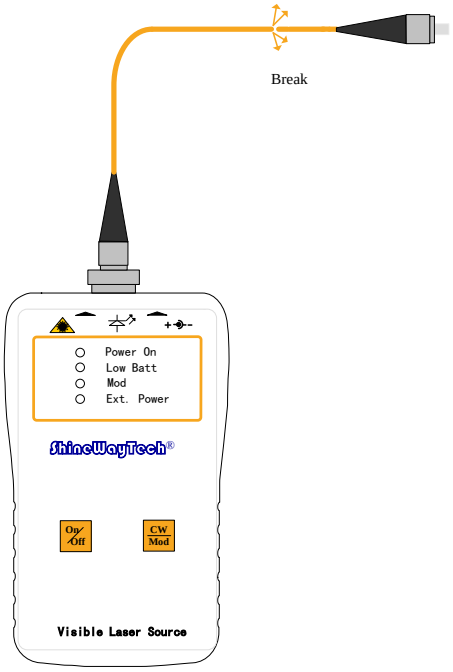


FIGURE23. APPLICATION OF VISIBLE LASER SOURCE

**CAUTION!**

- To ensure the accuracy of measurement, optical connectors should be kept clean.
- In the process of measurement, please always avoid looking directly into open optic fiber, optical output, optical connectors or other laser source, for it might cause eye injuries.
- When locating the breaks and escaping light, eyes should be kept away from optic fiber for at least 30cm.

## 5.4 Locate a Failure of Connectors with Visible Laser Source

Optic fiber wearing out often happens near or even inside connectors. It is not easy to present convincing evidence for such failures. The following instructions may be of some help.

If visible laser is injected into the optic fiber, however, in the far end, there is no visible laser output. Normally, those failures occur.

The following can verify those problems.

Reverse the connection of the optic fiber, inject visible laser from the far end, and visible laser will escape from the break.


Optical jumper

**① Connector**

FIGURE24. SKETCH MAP OF OPTICAL JUMPERE

If there is failure in the connector, bend optic fiber slightly till visible laser escapes from the optic fiber, when your finger gradually move to the far end of the fiber, slowly bend the optic fiber till there is no light escaping. If when reaches the far end, there still is visible laser. Then, for sure, there is a break or are breaks near the connector.

**CAUTION!**

- To ensure the accuracy of measurement, optical connectors should be kept clean.
- In the process of measurement, please always avoid looking directly into open optic fiber, optical output, optical connectors or other laser source, for it might cause eye injuries.
- When locating the breaks and escaping light, Eyes should be kept away from optic fiber for at least 30cm.

## 5.5 Test Single-mode Fiber Loss with Dual-wavelength Laser Source

The SLS-21 is a dual-wavelength laser source designed for measurement of attenuation of single mode optic fiber. At present, most long-distance optic fiber communication are transmitting via 1310nm and 1550nm wavelength. Therefore, we might encounter either wavelength in testing, in this case, dual wavelength laser source becomes very important in testing.

Now please follow the procedures below to measure attenuation of single-mode optic fiber.

1. Connect SLS-21 with OPM-15 (or OPM-21/OPM-25) with one at least 3-meter long optical jumper cable. Power on both instruments and set the wavelengths of laser source and optical power meter both to 1310nm. Reading from the optical power meter is from -6.5dBm to -7.25dBm in our expectation per Figure25.

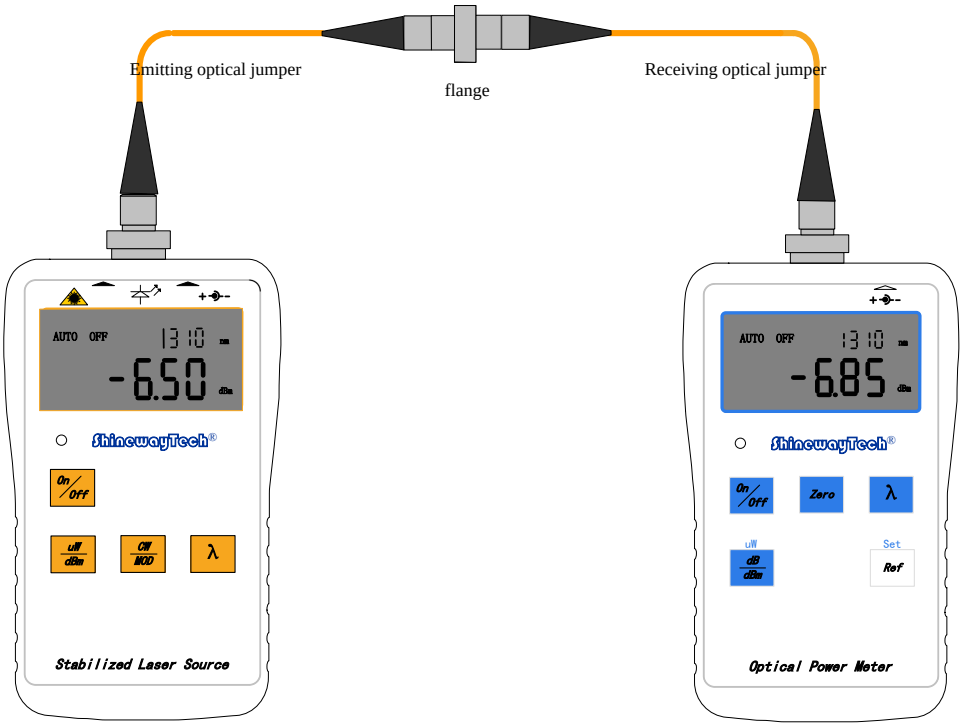


FIGURE25. SKETCH MAP OF CONNECTION

2. Press the **[Ref]** key on OPM for several seconds until "HELD" appears on the LCD screen, optical power meter will set the current measured dBm as reference value. The display should read 0.00dB.

3. Connect both ends of optic fiber to be tested with laser source and power meter through optical jumper, as in Figure26.

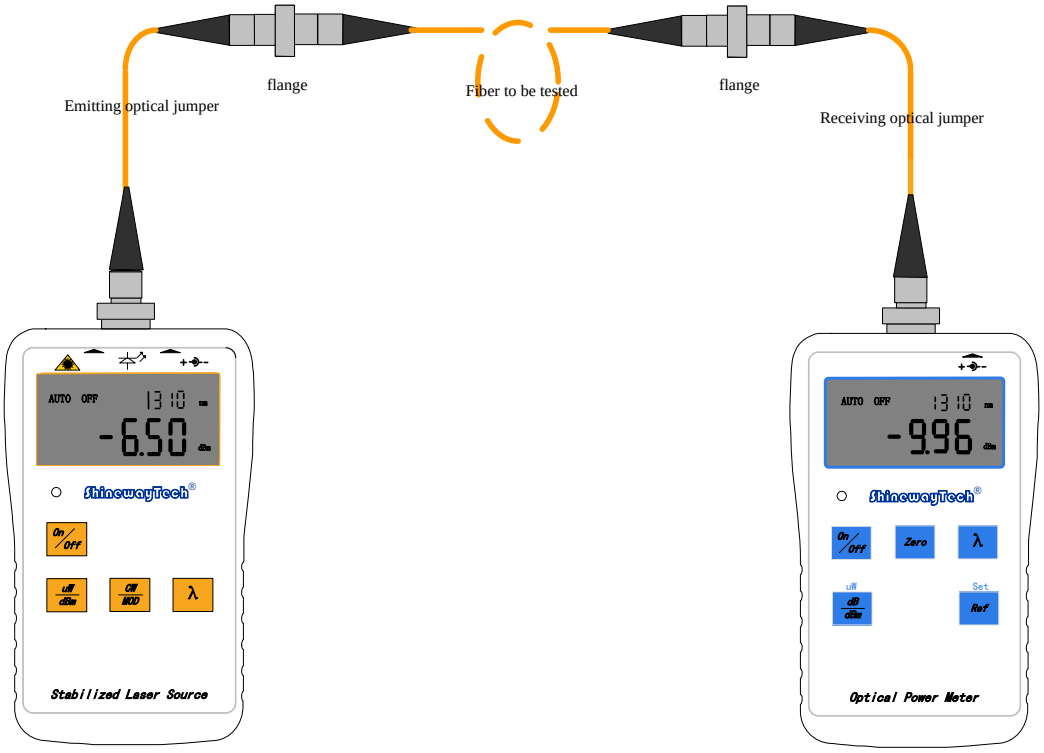


FIGURE26. OPTIC FIBER LOSS TESTING

4. The reading on optical power meter is the loss at 1310nm wavelength of the tested optic fiber.

5. Set the wavelengths of both laser source and power meter to 1550nm, start from step 1. all over again, and loss at 1550nm wavelength can be measured.

6. For measurement of next optic fiber, start from step 1. all over again.

**CAUTION!**

- To ensure the accuracy of measurement, optical connectors should be kept clean.
- In the process of measurement, please always avoid looking directly into open optic fiber, optical output, optical connectors or other laser source, for it might cause eye injuries.

## 5.6 Loop Loss Testing by Optical Loss Tester

The OLT-20 provides loop testing function which enables fast testing of optic fiber loss.

1. Connect optic link to the instrument, as in Figure27.

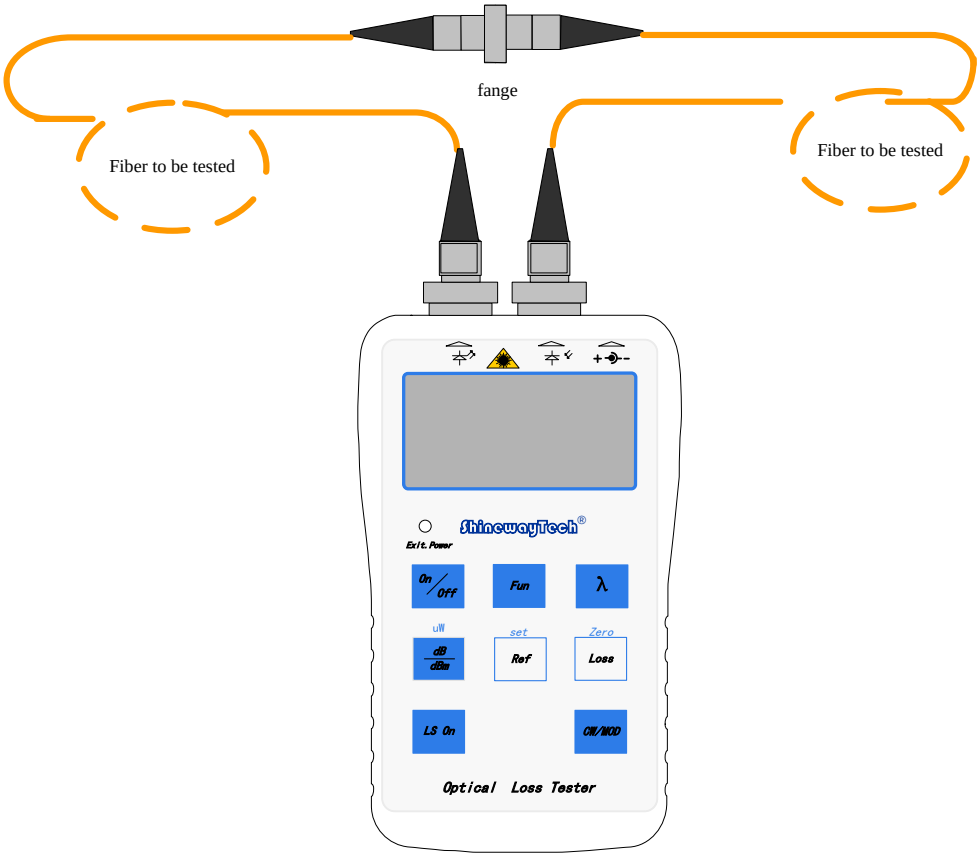


FIGURE 27. TESTING CONNECTION OF OPTICAL LOOP LOSS TESTER

2. Press [Loss] after power on, and OLT-20 will automatically provide loss in the optic link at 1310nm/1550nm wavelength.

**CAUTION!**

- To ensure the accuracy of measurement, optical connectors should be kept clean.
- In the process of measurement, please always avoid looking directly into open optic fiber, optical output, optical connectors or other laser source, for it might cause eye injuries.

**NOTE**

**Notes during operation of all instruments:**

- Be sure to keep connectors and butt clean which must be kept free from dirt, oils, or other contaminants.
- Make sure optical output not scratched.

- Always replace protective dust caps on the optical output.

# 6. Maintenance and Calibration

## 6.1 Battery Replacement

Every instrument has a 9V alkaline battery. For battery replacement, remove the battery compartment cover located at the back of the unit and replace the battery. Ensure that the polarization of the battery is correct.

**NOTE**

If the instrument is left unused for a long time (idle for over 2 months), it is recommended to take the battery out of the compartment

## 6.2 Cleaning of Connectors

Connectors must be kept clean. Detector need to be cleaned from time to time, the protective dust caps must be kept clean.

## 6.3 Auto Zeroing

Follow the following procedures to start auto zeroing:

- Replace the dust cap to connectors(to prevent laser leakage).
- After power on, press Zero(for OPM-21/OPM-25, press▲ and ▼ together), until "SUCC" displays. This means auto zeroing is successful.
- If "ERR" displays, this means auto zeroing is unsuccessful. Check whether the dust cap is tightly fastened to connectors, then proceed with auto zeroing.
- If still unsuccessful, please contact customer service of ShinewayTech® or our agents to solve the problem.

## 6.4 Calibration Requirements

Calibration of the SLS, VLS, OPM, OLT is recommended every three years. Please contact Shineway Technologies, Inc. or our agent for proper calibration.

# 7 Warranty Information

## 7.1 Terms of Warranty

All ShinewayTech® products are warranted against defective material and workmanship for a period of one (1) year from the date of shipment to the original customer. Any product found to be defective within the warranty period would be repaired or replaced by Shineway Technologies Inc. free of charge. In no case will Shineway Technologies, Inc. liabilities exceed the original purchase price of the product.

This warranty does not cover accessories or optional parts.

## 7.2 Exclusions

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

- *Unauthorized repair or modification*
- *Misuse, negligence, or accident*

Shineway Technologies, Inc. reserves the right to make changes to any of its products at any time without having to replace or change previously purchased units.

## 7.3 Warranty Registration

A warranty registration card is included with the original shipment of equipment. Please take a few moments to fill out the card and mail or fax it to the local Customer Service Center of Shineway Technologies, Inc. to ensure proper initiation of your warranty term and scope of your warranty.

## 7.4 Returning Equipment

To return equipment for reasons of yearly calibration or other, please contact the local Customer Service Center of Shineway Technologies, Inc. to obtain additional information and a RMA# (Return Materials Authorization number). And describe briefly reasons for the return of the equipment, to allow us offer you more efficient service.

## 7.5 Contacting Customer Service

Please check our web site **(www.shinewaytech.com)** for updates to this manual and additional application information. If you need technical or sales support, please contact local Customer Service.

**Shineway Technologies Customer Service, Greater China Region:**

Address: 5th Floor Office Building, No. 14 Huayuan North Road, Haidian District, Beijing, P.R.China
Postal code: 100083
Tel: +86 10 51551122
Fax: +86 10 62386994
Email: support@shinewaytech.com

**THANK YOU FOR CHOOSING SHINEWAY TECHNOLOGIES!**