



Precision Rated Optics

Work with a **PRO!**

OLT-301 SERIES

Optical Loss Tester



Operation Guide

Table of Contents

Safety Instructions	4
1. General Information	5
1.1 Scope of this Manual	5
1.2 Unpacking and Inspection	5
1.3 Introduction	6
2. Basic Operation	7
2.1 Foreword	7
2.2 Instrument Details	7
2.2.1 External Interfaces	7
2.2.2 Keypad Operation.....	7
2.2.3 Indicator.....	8
2.3 Use of Battery	8
2.4 Connector Cleaning	8
3. Operation	9
3.1 Power On.....	9
3.2 Stabilized Laser Source (SLS).....	11
3.2.1 SLS-Laser On/Off	12
3.2.2 SLS-Reference Setting	12
3.2.3 SLS-Setup.....	13
3.3 Optical Power Meter (OPM)	13
3.3.1 OPM-Reference Setting.....	14
3.3.2 OPM-Save Record.....	14
3.3.3 OPM-Recall.....	15
3.3.3 OPM-Trace.....	15
3.3.4 OPM-Setup.....	16
3.4 Optical Loss Test (OLT)	17
3.4.1 OLT-Reference Setting.....	17
3.4.2 OLT-Bi-Directional Test.....	18
3.4.3 OLT-Save Record.....	19
3.4.4 OLT-Recall.....	19
3.4.5 OLT-Threshold Setting	20

3.4.6 OLT-Setup20

3.5 Optical Return Loss Test (ORL)-Option22

 3.5.1 ORL-ORL Test.....22

 3.5.2 ORL-Save Record23

 3.5.3 ORL-Recall.....24

 3.5.3 ORT-Setup.....24

4. Maintenance and Calibration.....25

 4.1 Cleaning of the Connectors25

 4.2 Calibration Requirement25

5. Warranty Information25

 5.1 Terms of Warranty25

 5.2 Exclusions25

 5.3 Warranty Registration26

 5.4 Returning Instruments26

 5.5 Contact Customer Service26

Safety Instructions

Safety Terms Used in This Manual

WARNING

The WARNING sign denotes a hazard. It calls attention to a procedure which could result in personnel injury.

CAUTION

The CAUTION sign denotes a hazard. It calls attention to an operating procedure if not correctly performed or adhered to, could result in damage to or destruction of part or the entire product.

NOTE

The NOTE sign information that may be beneficial during the use and maintenance of the instrument.

WARNING

OLT-301 Series Optical Loss Tester is a laser device. User should always avoid direct eye exposure to the laser output. Using microscope or magnifier to observe the laser output should also be avoided: laser beam may converge on the retina and cause permanent eye injury.

CAUTION

Battery: OLT-301 Series battery type is lithium battery.

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

External Power Supply: OLT-301 Series support external power supply: 5V DC/750mA. External power supply is optional.

Laser Radiation: To avoid serious eye injury, never look directly into the optical outputs of fiber optic network equipment, test equipment.

- Always avoid looking directly into the optical output port, when the instrument is working.
- Always replace protective dust cap on the detector port when the instrument is not in use.
- Always avoid looking directly at unconnected end of optic fiber in testing and make the unconnected end pointing at a non-reflective object.

1. General Information

1.1 Scope of this Manual

Thank you for purchasing a Precision Rated Optics instrument. Please read this manual carefully before using Precision Rated Optics fiber optic instrument. Always be aware of the Warning and Caution signs appearing throughout this manual.

This manual contains the information necessary for proper operation and maintenance of a Precision Rated Optics instrument, troubleshooting instructions as well as information regarding maintenance services.

All Precision Rated Optics instruments are carefully assembled and undergo rigorous mechanical, electrical, and optical inspection prior to shipment. Beside the instrument, the package also includes a lithium battery pack, a charging/data transfer cable, a power adapter, a FC/UPC adapter and this user's manual. For detailed information, please 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 PRO immediately. Retain the original packing materials in case reshipment is necessary.

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 PRO.

If necessary, you may contact PRO via this email: sales@PrecisionRatedOptics.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, e-mail address and problem description.
- Be sure to seal the packing box with exclusive tape.
- Be sure to ship to your representative or the agent of the Company in a reliable way.

1.3 Introduction

The Precision Rated Optics OLT-301 Series Intelligent Optical Loss Tester combines stabilized laser source and optical power meter which can perform automatic bi-directional loss test (when used in pairs) on single fiber with Pass/Fail assessment to offer user-friendly operation and avoid potential operational mistakes. The rugged and easy-to-use OLT-301 Series is the ideal optical loss tester for FTTx, LAN and CATV application.

Features:

- All-in-one: SLS + OPM + OLT + ORL + Length test
- Optical power monitoring (Auto power trace)
- Bi-directional loss test on single fiber
- ORL test
- Pass/Fail assessment
- Automatic wavelength identification/switch (AutoID)
- Remote reference value setting
- Internal clock & fiber S/N editable
- 1000 test records (CSV) storage & management
- Data transfer to PC via USB (Driver-free)
- Auto test records save in local unit/remote unit/both units
- USB power charging
- Over 35 hours continuous operation
- Multilanguage support
- No warm-up, quick start
- High resolution color LCD
- Pocketsize, lightweight and easy-to-use

Automatic Wavelength Identification

Compatible with the digital encryption protocols of its laser source module and PRO Series Stabilized Laser Source, the OLT-301 Series tester can automatically identify the wavelength of the input optical signal and switch to the corresponding test mode, which greatly reduces the workload at both ends and avoids potential error.

Automatic Bidirectional Loss Test on Single Fiber

One OLT-301 Series tester at each end of a single optical fiber can perform bi-directional loss test by just pressing one unit and can automatically measure and display the entire fiber attenuation to help users acquire complete and accurate optical fiber loss information.

Applicable to FTTx/PON testing

The OLT-301 Series tester can be used to measure Triple-play signals (1310nm, 1490nm and 1550nm) on Passive Optical Network (PON)

2. Basic Operation

2.1 Foreword

This part introduces the basic operation on the OLT-301 Series testers. Specific operations are elaborated in Chapter 3 of this manual. Please read this manual carefully for optimal operation. If you encounter any problems during operation, you are welcome to contact the technical staff of our company or representatives.

2.2 Instrument Details

2.2.1 External Interfaces

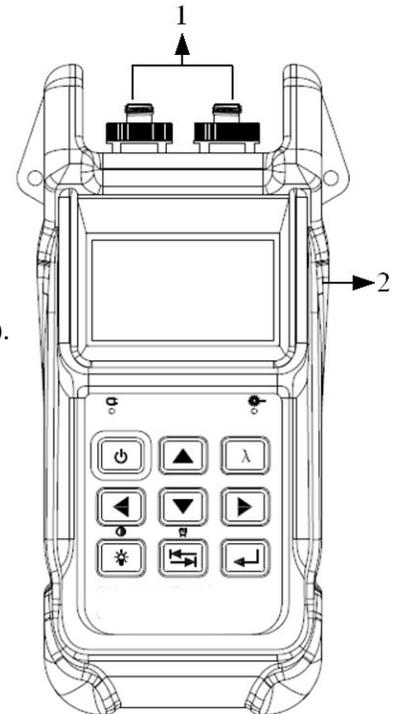
1. Optical Input & Output

The OLT-301 Series is available with FC connector (Interchangeable SC/ST).

Note: Output port is marked with “LS”; Input port is marked with “PM”.

2. USB Power /Data Port

The OLT-301 Series can be charged by external power adapter (5V DC, 750mA).



2.2.2 Keypad Operation

	Power on/off
	Toggle between wavelengths
	Toggle between setup items; Adjust value in setup mode
	Toggle between sub-interfaces in working mode; Shift digit positions in setup mode
	Toggle between working modes: SLS, OPM, OLT & ORL; Long press to enable/disable Auto Power Off
	Enter setup mode; Execute or toggle between setup values; Confirm
	Short press to turn backlight on/off; Long press to set contrast

2.2.3 Indicator



○ Charging Indicator



○ Laser Indicator (Illuminate when laser emits)

2.3 Use of Battery

The OLT-301 Series works on lithium battery. Please make sure battery is mounted properly before use. When battery is low, low battery indicator will appear on LCD. You can still use the OLT-301 Series as long as its display on LCD is identifiable. When LCD display becomes dim, laser source output will become unstable and power meter measurement will be inaccurate. Please charge as soon as possible when battery is low to ensure accurate measurement.

NOTE

Please take out the battery of the OLT-301 Series if it is not in use for a long time.

2.4 Connector Cleaning

Please follow the instructions below when cleaning:

- Turn off the instrument before cleaning.
- Non-compliant operation may result in hazardous radiation exposure.
- Turn off laser source before cleaning optical interface.
- Always avoid looking directly into the optical output port when the instrument is working, laser is invisible and can cause serious eye damage.
- Disconnect instrument from power supply before cleaning to prevent electric shock.
- Do not install unauthorized parts or make unauthorized adjustments on instrument.
- Please consult qualified professional about maintenance and repair services.

NOTE

Always clean the optical connectors before using the OLT-301 Series to ensure accurate measurement. Clean the optical connector gently with cleaning swab.

NOTE

Inappropriate maintenance may result in low performance or error:

- Distance error increases;
- Linearity error;
- Extra optical power attenuation;
- Received optical power is beyond normal range.

3. Operation

3.1 Power On

Press and loading screen appears

Then it enters functional interface (The last interface before last shutdown), see Figure 3.2.

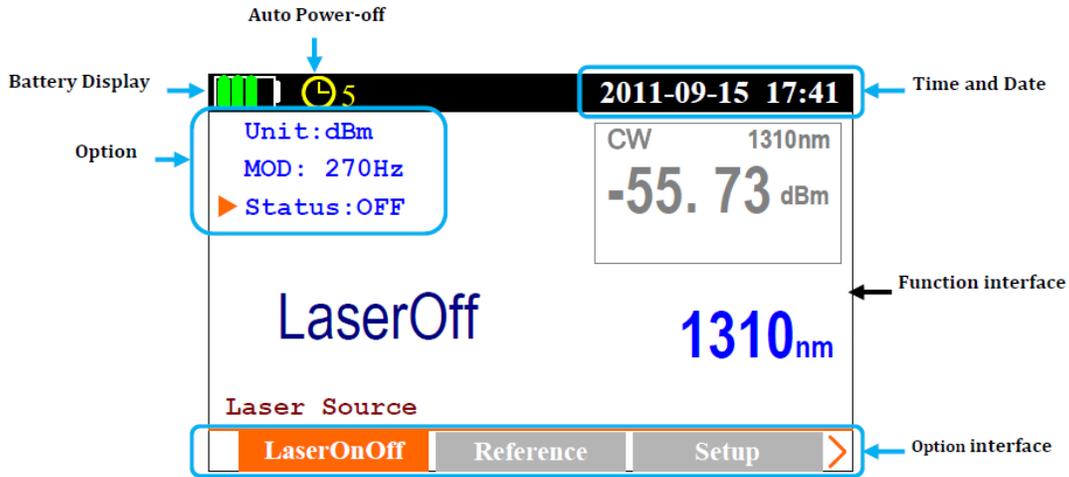


Figure 3.2

The toggle between functional interfaces:

Press to toggle [Main menu] interface, see Figure 3.3.

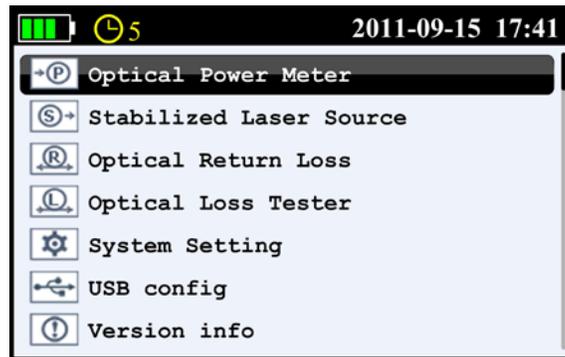


Figure 3.3

1. Press  and  to toggle the following function interface:

-  **Optical Power Meter**
-  **Stabilized Laser Source**
-  **Optical Return Loss**
-  **Optical Loss Tester**
-  **System Setting**
-  **USB config**
-  **Version info**

2. Press  and  to toggle the corresponding function interface;

3. Press  to enter the corresponding function interface.

The toggle between different setting interfaces:

Under [ **Stabilized Laser Source**] function interface, press  and  to toggle the following interfaces: **LaserOnOff** | Reference | Setup

Under [ **Optical Power Meter**] function interface, press  and  to toggle the following interfaces: Reference | **Save** | Recall | Trace | Setup

Under [ **Optical Loss Tester**] function interface, press  and  to toggle the following interfaces: **Set ref.** | BiDirTest | Save | Recall | Threshold | Setup

Under [ **Optical Return Loss**] function interface, press  and  to toggle the following interfaces: **Test** | Save | Recall | Setup

The system setup

Press to enter [System Setting] function interface: Press , and to enter and edit the Date, Time, Brightness, Auto Off and Language.

USB configuration

Press to enter [USB config] function interface: Press and to select:

Mass storage: PC recognition it for a USB flash drive;

Communication: the equipment directly transfer the data to the PC software, mainly used in the optical power meter "Draw Trance" function, the power fluctuations will be shown in the PC software.

Device information

After press , it will display the version of software and hardware.

3.2 Stabilized Laser Source (SLS)

Press and to the following interface, see Figure 3.4.

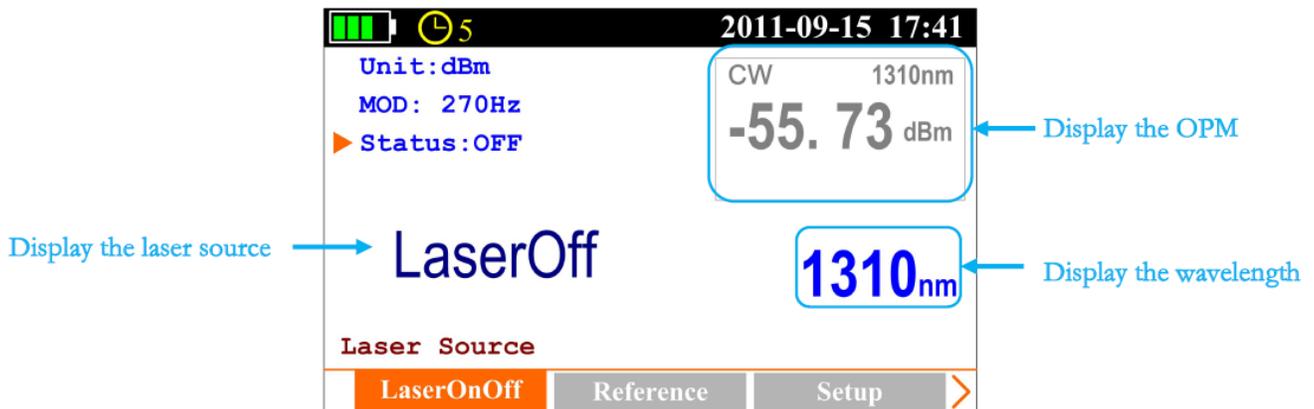


Figure 3.4

3.2.1 SLS-Laser On/Off

Press and to [LaserOnOff] sub-interface, see Figure 3.4;

Press to turn on laser source, see Figure 3.5; press again to turn off laser, see Figure 3.5;

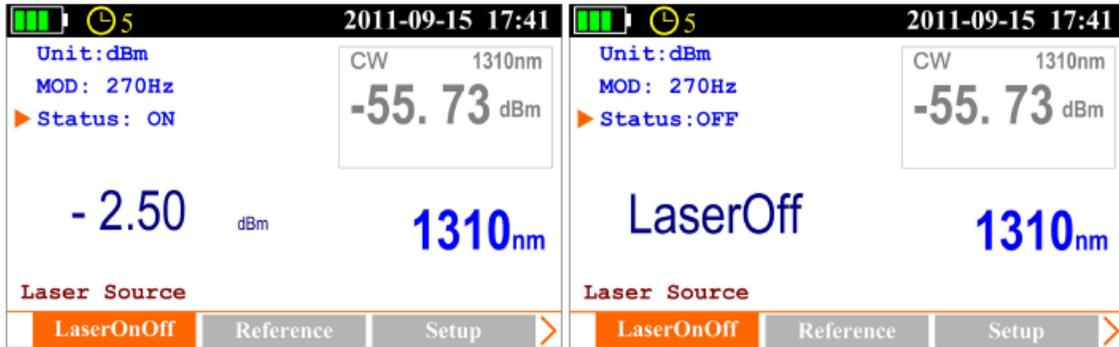


Figure 3.5

Press to select “MOD” option, press the output mode toggles between CW, 270Hz, 1KHz, 2KHz and AutoID;

Press to select “Unit” option, press the output power unit and value toggle between dBm and mW.

3.2.2 SLS-Reference Setting

Note: This function is only for AutoID mode applicable, "Ref: XXX. XXdBm" parameters will set up to the opposite side which has the corresponding models test instrument; this is only for the test reference.

Press and to [Reference] sub-interface, see Figure 3.6;



Figure 3.6

Press and to select “Set reference” and “Get from OPM”. “Set reference “: press to enter and edit power value, select “OK” and press to confirm. At this time on the right-bottom of the screen it will display

“Ref.Power:-10.00dBm”, means -10dBm is the value you just set, and this value will send to the opposite side.

“Get from OPM”: press to set the current power value which gets from OPM as the reference.

Press to toggle between the different wavelengths.

3.2.3 SLS-Setup

Press and to [Setup] interface, see Figure 3.7.

Note: This function is only for Auto ID mode applicable.

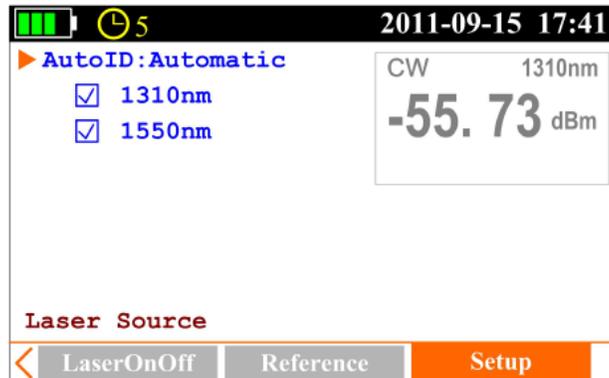


Figure 3.7

While the cursor on “Auto ID “, press to select Manual or Automatic. Under Automatic mode, press and to move to the certain wavelength (1310nm, 1550nm), press to select it or not.

3.3 Optical Power Meter (OPM)

Press and to [Power Meter] interface, see Figure 3.8.

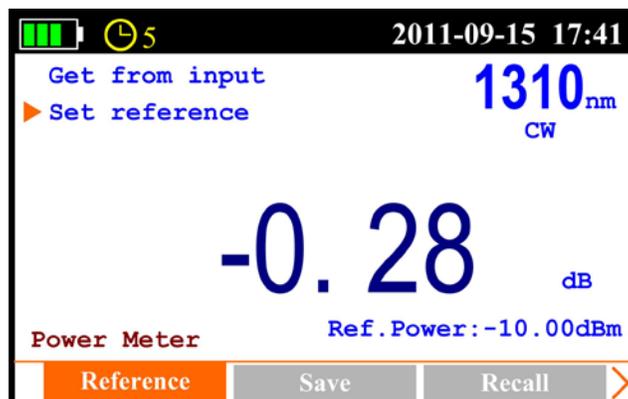


Figure 3.8

3.3.1 OPM-Reference Setting

Press and to [Reference] sub-interface, see Figure 3.8.

Press and to select item: Set reference and Get from input power, press to enable adjustment, press to adjust the value, and press to confirm.

NOTE

Set reference

Refers to manual reference value setup; if the laser source (Precision Rated Optics laser source with AutoID function) on the other side of the tested fiber enables AutoID, the OPM will automatically set the reference value sent from the laser source as reference (“AutoID” will appear in this interface).

Get from input power

Sets the current measured power value as reference value.

3.3.2 OPM-Save Record

Press and to [Save] sub-interface, see Figure 3.9.

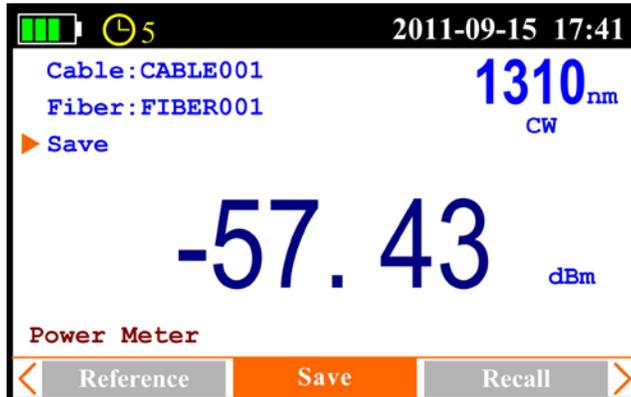


Figure 3.9

Press and to select item: **Cable:** and **Fiber:** press to edit the information, and then press to confirm.

Press and to select Save, and press to save current record.

3.3.3 OPM-Recall

Press and to [Recall] sub-interface, see Figure 3.10.

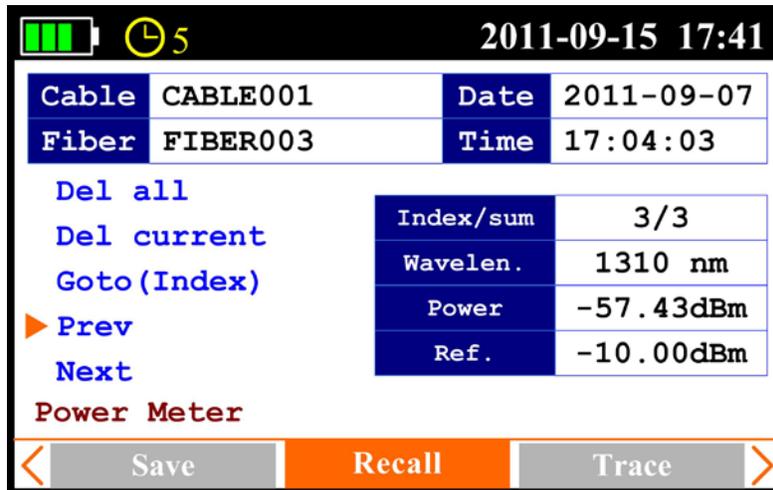


Figure 3.10

Press and to select item: Del all, Del current, Go to (Index), Prev. and Next.

3.3.3 OPM-Trace

Press and to [Trace] sub-interface, see Figure 3.11.



Figure 3.11

Press and to select item: Draw Trace, Scale, Timer and Status.

Draw Trace: press , it will display the trace as Figure 3.12;

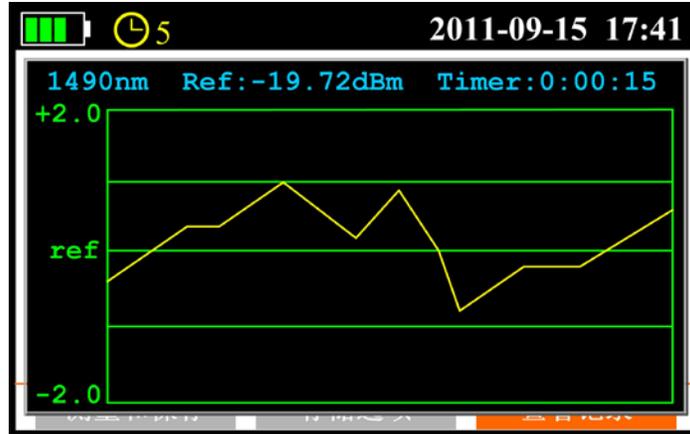


Figure 3.12

Scale: press to select the suitable scale, press to confirm;

Timer: press and to select test time **15min**, press to toggle between 15min, 60min and 8hour;

Status: press to running/stop trace.

3.3.4 OPM-Setup

Press and to [Setup] sub-interface, see Figure 3.13.

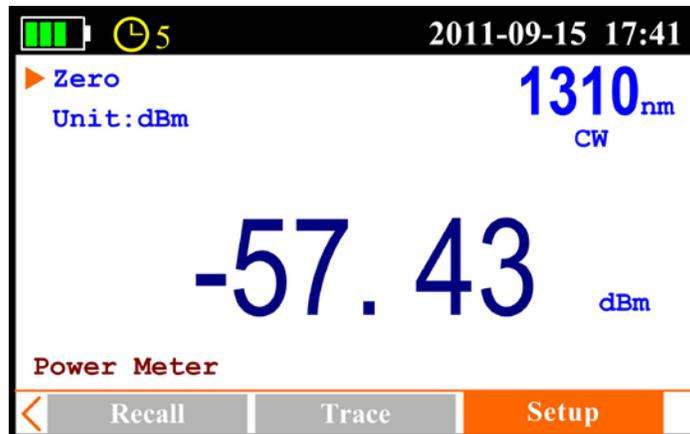


Figure 3.13

Press and to select item: **Zero** and **Unit**.

Zero: Screw on the dust cap, press the twice, the instrument will be automatically calibrate zero;

Note: this operation should do first in the use of optical power meter.

Unit: press and to select dBm, dB, mW.

Press to toggle between the different wavelengths.

Operation Procedure:

1. Zero
2. Reference Setting
3. Input laser source
4. Read the power value
5. Save
6. Toggle the wavelength, and then repeat step 3, 4 and 5.

3.4 Optical Loss Test (OLT)

Press  and  to [Optical Loss Test] interface, see Figure 3.14.

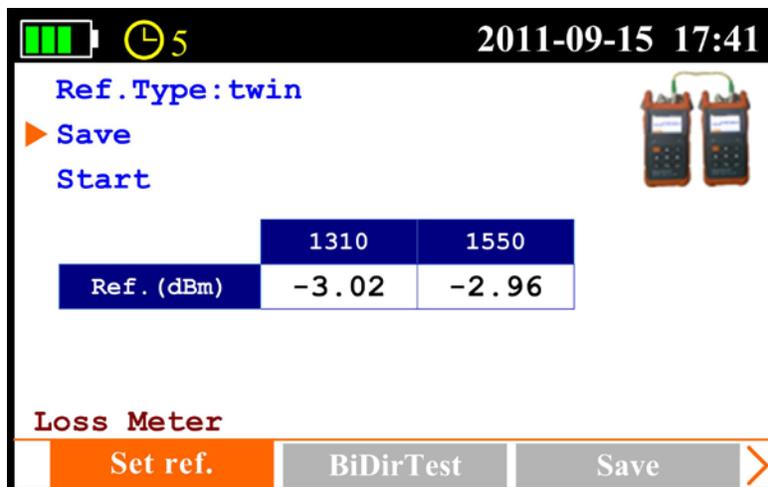


Figure 3.14

3.4.1 OLT-Reference Setting

Press  and  to [Set ref.] sub-interface, as shown in Figure 3.14.

Press  and  to select Ref. Type, and press  to toggle between single and twin, see Figure 3.15.

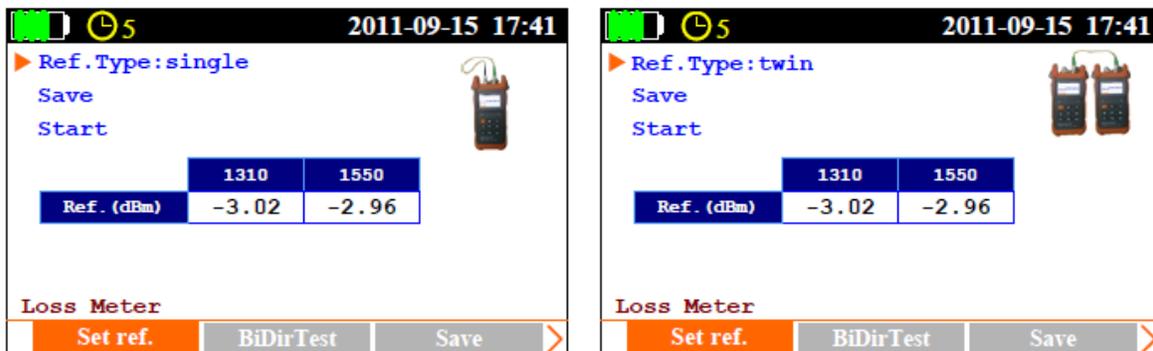


Figure 3.15

In **single**: the laser source port and power meter port connect to each other on the same unit, the power value measured by the power meter is the reference value;

In **twin**: the optical loss test ports of two different units connect to each other by patch cord and the power value measured in twin is more reasonable which is recommended.

After connecting the ports, press  and  to select Start, press  to start the test.

Press  and  to select Save, press  to save the measured value as reference value.

3.4.2 OLT-Bi-directional Test

Press  and  to [BiDirTest] sub-interface, as shown in Figure 3.16.

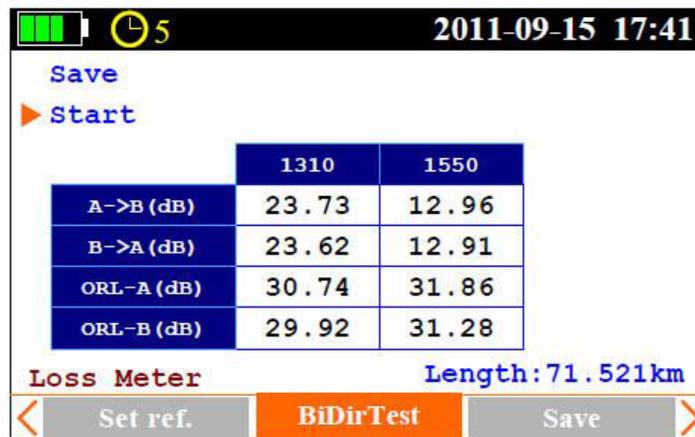


Figure 3.16

Press  and  to select Start, and press  to start the test.

Press  and  to select Save, and press  to save the result.

Please also refer to 3.4.3 to save the result.

NOTE

Please complete Threshold setting and Reference setting before bi-directional test or it will affect test result.

3.4.3 OLT-Save Record

Press and to [Save] sub-interface, as shown in Figure 3.17.



Figure 3.17

Press and to select item: Cable and Fiber, press to enable digit adjustment, press to confirm.

Press and to select Save, and press to save current record.

3.4.4 OLT-Recall

Press and to [Recall] sub-interface, as shown in Figure 3.18.

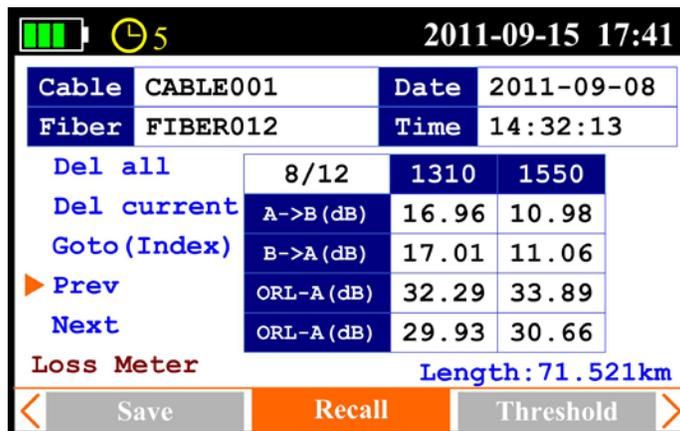


Figure 3.18

Press and to select item: Del all, Del current, Go to (Index), Prev. and Next.

3.4.5 OLT-Threshold Setting

Press  and  to [Thresholds] sub-interface, as shown in Figure 3.18.

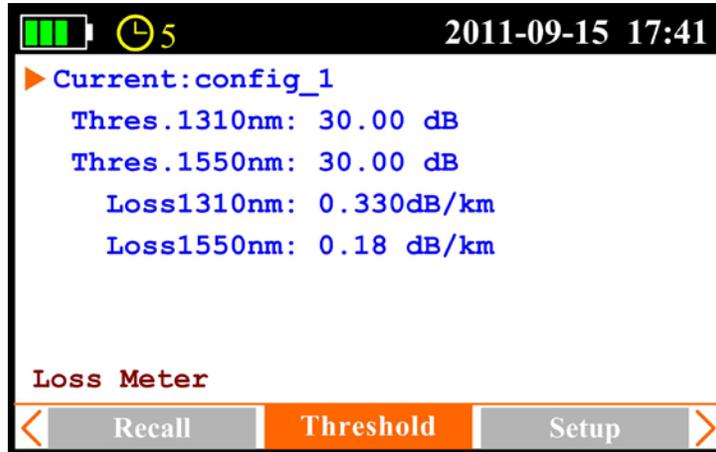


Figure 3.18

Press  and  to select the item to be adjusted, press  to enable adjustment, and press  to confirm.

NOTE

Thres: In bi-directional test, the OLT-301 Series determines test result **PASS** or **FAIL** according to the thresholds setting.

Loss: dB/km, In bi-directional test, the unit will calculate the fiber’s approximate length according to the attenuation (dB/km) set here. Please note that the attenuation at each wavelength is setup separately, hence the calculated length may be different at each wavelength. Non-fiber attenuation factors (connector, splices) and incorrect attenuation setting may also affect the length calculation.

3.4.6 OLT-Setup

Press  and  to [Setup] sub-interface, as shown in Figure 3.19.

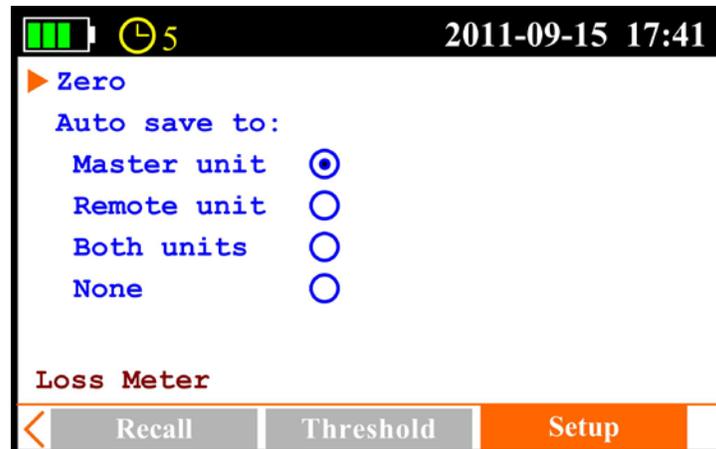


Figure 3.19

Press  and  to select items: Zero and Auto Save to, press  to confirm.

Zero: Screw on the dust cap, press the  twice, the instrument will be automatically calibrate zero;

Note: this operation should do first in the use of optical power meter.

Auto Save to: The Zero results to be automatic save to Master unit, Remote unit, Both units and None.

NOTE

Operation Procedure about Bi-directional Test:

1. Zero: Screw on the dust cap, press  the twice, the instrument will be automatically calibrate zero;
2. Reference Setting: Ref. Type set to twin
3. Threshold Setting: set "Thres" and "Loss"; the value of the Thres limit the maximum loss of the entire link, "Loss" is generally provided by the fiber's supplier, the basis for calculation of the fiber length of the entire link ;
4. Connect the reference patch-cord: connect one unit OLT port to another unit OLT port with two reference patch cords. See Figure 3.20:

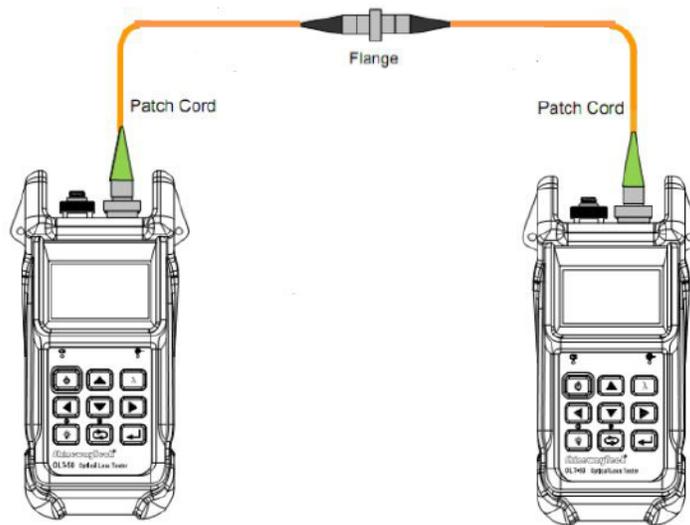


Figure 3.20

5. Under [Set. Ref] sub-interface, select Start and then press , it will display the reference power value on the interface.
6. Toggle to [BiDirTest] sub-interface, connect measured fiber link as shown Figure 3.21, then select Start and then press , test is running, and then the test result will be displayed.

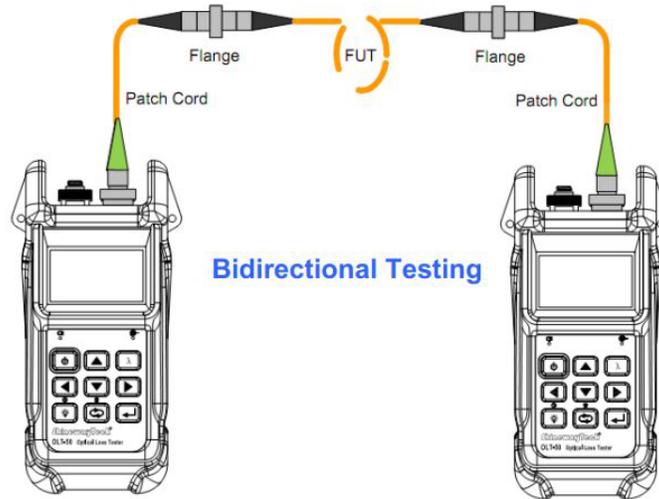


Figure 3.21

7. Toggle to [Save] sub-interface, select Save.

3.5 Optical Return Loss Test (ORL)-Option

Press  to [Optical Return Loss] sub-interface, as shown in Figure 3.22.

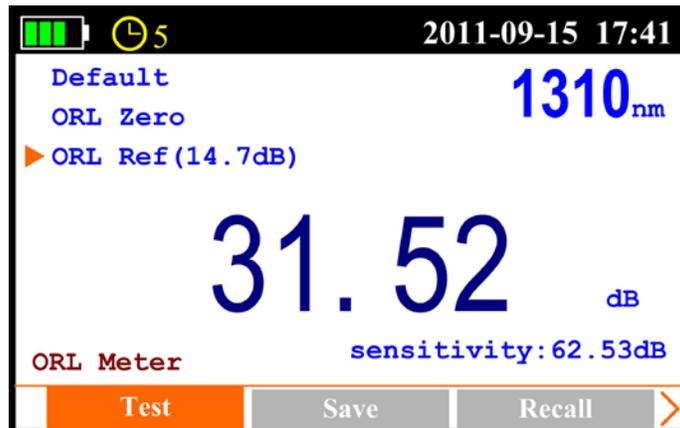


Figure 3.22

3.5.1 ORL-ORL Test

Press  and  to [Test] sub-interface, as shown in Figure 3.22.

Press  and  to select Default, ORL Zero, and ORL Ref(14.7dB):

Default: after press , the value of ORL Zero and ORL Ref(14.7dB) restores to factory defaults;

ORL Zero: Connect one end of the test patch-cord to the OLT port, and at the other end of the patch-cord winding on a small diameter round bars, while observing the current return loss value displayed, the return loss value in the winding process will gradually become larger, when the return loss value does not change, press  to save the current return loss value as the ORL Zero.

ORL Ref (14.7dB): “(14.7dB)” means the current ORL value measured under default ORL zero value and default ORL reference. Connect the reference patch-cord to OLT port, press  and  to select OK, and press  to save current ORL zero value.

NOTE

ORL zero value should be reset when changing patch cord or disconnecting/reconnecting patch cord.

3.5.2 ORL-Save Record

Press  and  to [Save] sub-interface, as shown in Figure 3.23.

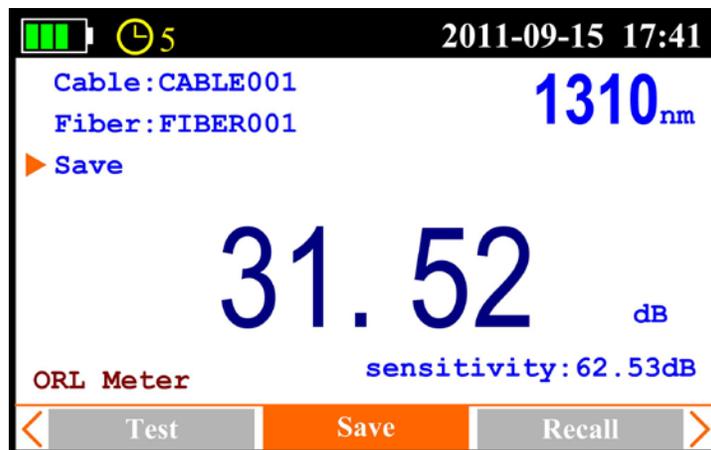


Figure 3.23

Press  and  to select item: Cable and Fiber, press  to enable digit adjustment, press  to confirm.

Press  and  to select Save, and press  to save current record.

3.5.3 ORL-Recall

Press  and  to [Recall] sub-interface, as shown in Figure 3.24.

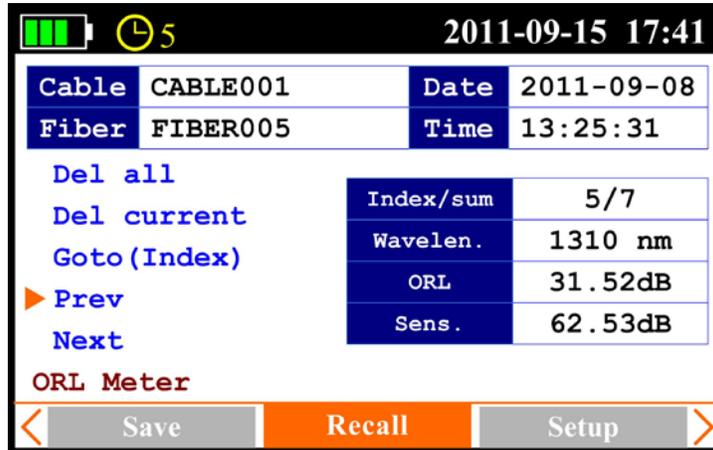


Figure 3.24

Press  and  to select item: Del all, Del current, Go to (Index), Prev. and Next.

3.5.3 ORT-Setup

Press  and  to [Setup] sub-interface, as shown in Figure 3.25.



Figure 3.25

Screw on the dust cap, press the  twice, the instrument will be automatically calibrate zero.

Operation Procedure about Optical Return Loss Test:

1. Zero: Screw on the dust cap, press the twice, the instrument will be automatically calibrate zero;
2. Set ORL Zero: toggle to [Test] sub-interface, refer to 3.5.1 set ORL Zero. At this time the display on the right-bottom of the interface sensitivity:××.××dB means lower bound of the measurable return loss value.
3. Set ORL Ref: refer to 3.5.1 set ORL Ref. Then press to toggle another wavelength and set ORL Ref at this wavelength. At this time the display value on the interface should show about 14.70.
4. Replace test patch-cord and one connects OLT port, another connects measured optical link, now read the ORL value directly.
5. Toggle to [Save] sub-interface to save the test result.

4. Maintenance and Calibration

4.1 Cleaning of the connectors

Keep the cleanness of connectors and dust caps. The detector needs to be cleaned timely.

4.2 Calibration Requirement

Calibration of OLT-301 Series is recommended every three years. Please contact PRO Technologies Inc. or our agent for proper calibration.

5. Warranty Information

5.1 Terms of Warranty

OLT-301 Series is 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 the Provider free of charge. In no case will the Provider's liabilities exceed the original purchase price of the product. The warranty doesn't include the accessories and optional parts.

5.2 Exclusions

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

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

The Provider reserves the right to make changes to any of its products at any time without having to replace or change previously purchased units.

5.3 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 Precision Rated Optic's local Customer Service Center to ensure proper initiation of your warranty term and scope of your warranty.

5.4 Returning Instruments

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

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.

5.5 Contact Customer Service

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

Toll Free: (888) 545-1254

Sales@PrecisionRatedOptics.com

Fax: (415) 358-4602



Precision Rated Optics, Inc.

Corporate Office

Billing & Processing

PO Box 877 Trexlertown, PA 18087

Precision Rated Optics, Inc.

Product Distribution Center Manufacturing & Testing

9999 Hamilton Blvd Breinigsville, PA 18031