



# **ZW3327**

## **IL&RL TestStation**

**UserManual (V200806)**

**2020.08**

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# 1 Overview

## 1.1 Product Overview

ZW-3327 IL&RL Test Station is a combination of years production and testing experience of its own optical passive components and optical communication instrumentation, fully drawing on the advantages of instrumentation at home and abroad, elaborate development of a precision optical detection instrument. It is widely used in insertion loss and return loss testing for fiber optic cables, Passive optical device and Fiber-optic communication systems, it is the basic test instrument for manufacturers, scientific research institutions and operators for production testing, research and development, and Engineering Construction and maintenance.

## 1.2 Features

- 1) Built-in High Stability Optical Light Source;
- 2) Multi-test mode, support dual-wavelength IL RL simultaneous test;
- 3) The upper computer and lower computer threshold can be set;
- 4) Support Multiple Fiber interface conversion;
- 5) Large color screen display
- 6) Support Multiple Communication Interfaces;
- 7) The insertion loss of multimode patch cord can be detected by adding 850 wavelength
- 8) Light Path built-in VFL, easy to find the other end of the patch cord, enhance the test speed;

## 2 Technical specification

model	ZW3327A	ZW3327B
Optical return loss test	SM	MM
Test wavelength (nm)	1310/1550 ( $\pm 10\text{nm}$ )	850/1300 ( $\pm 10\text{nm}$ )
Fiber type ( $\mu\text{m}$ )	9/125	50/125 or 62.5/125
Output power (dBm)	$\geq -5$	$\geq -10$
Output stability (dB)	$\pm 0.015(15\text{min}@25^{\circ}\text{C})$	$\pm 0.05(15\text{min}@25^{\circ}\text{C})$
Connector type	FC/APC	
Test range (dB)	0~75	
Display resolution	0.1	
Detector type	InGaAs 2.0	
Wavelength range (nm)	800~1700	
Calibration wavelength (nm)	850/1300/1310/1490/1550/1625	
Measurement range (dBm)	+3~-75	+3~-70
Uncertainty of insertion loss	$\pm 0.05\text{dB}$	$\pm 0.1\text{dB}$
Insertion loss stability	$\pm 0.01\text{dB}$	$\pm 0.03\text{dB}$
Power uncertainty (dB)	0.25dB(+3~-55dBm)	
Display resolution	0.01	
Connector type	Variety interface , FC/SC/ST/ universal $\Phi 2.5\text{mm}$ / universal $\Phi 1.25\text{mm}$ etc.	

Display	3.5inch TFT color screen
Communication interface	USB2.0/RS232/ Wireless module (optional)
operating system	Win7 32/64 bit Win10 32/64 bit
display	Recommend 21-inch display, Min resolution 1600*900
Operating temperature	-5~+40℃
Storage temperature	-25~+70℃
Power Supply	AC 220V
Dimension(mm)	280x260x120

### 3 Standard Configuration

General product configurations are listed in the following table:

1	ZW-3327 main tester	1pc
2	Power Cord	1pc
3	Adapter (FC\SC\ST2.5mm、1.25mm)	1pack
4	FC/APC-FC/PC standard fiber (SM/MM)	1pc
5	FC/APC-FC/APC standard fiber (SM/MM)	1pc
6	User Manual	1pc
7	Cotton swabs	1pack
8	Fuse	1pc
9	CD (optional)	1pc
10	USB cable (optional)	1pc
11	RS232 serial port line (optional)	1pc
12	Wireless module (optional)	1pc
13	Foot pedal	2pcs

## 4 Overall Appearance

### 4.1 Overall Appearance

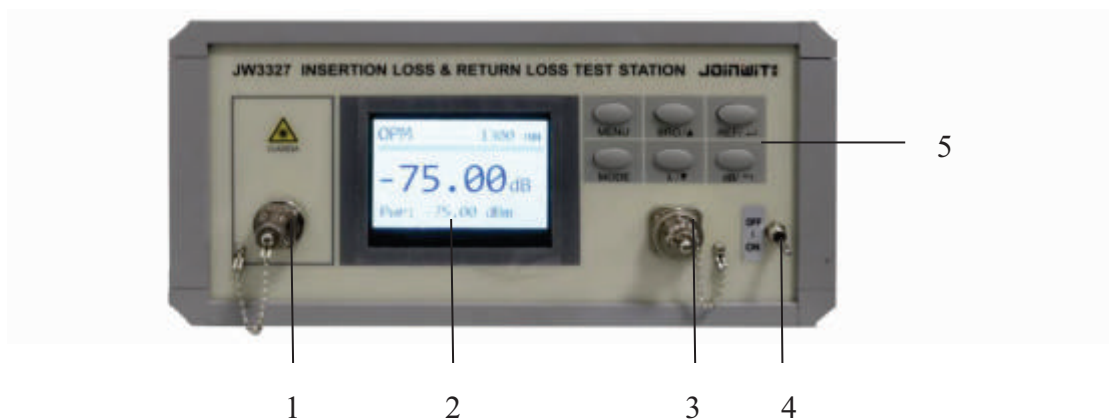
ZW-3327 IL&RL test station adopts high-grade aluminum profile case with clean surface and atmosphere. The front panel uses TFT color screen as the display, font display clear, no overlap. Full consideration of Ergonomics and take into account the beauty, generous, machine appearance as shown in figure 4-1.



Figure4-1 Overall appearance

### 4.2 Front Panel Appearance

The front panel of ZW3327 IL&RL test station includes light source outlet, display area, light detector, VFL control switch and key press area, as shown in figure 4-2.

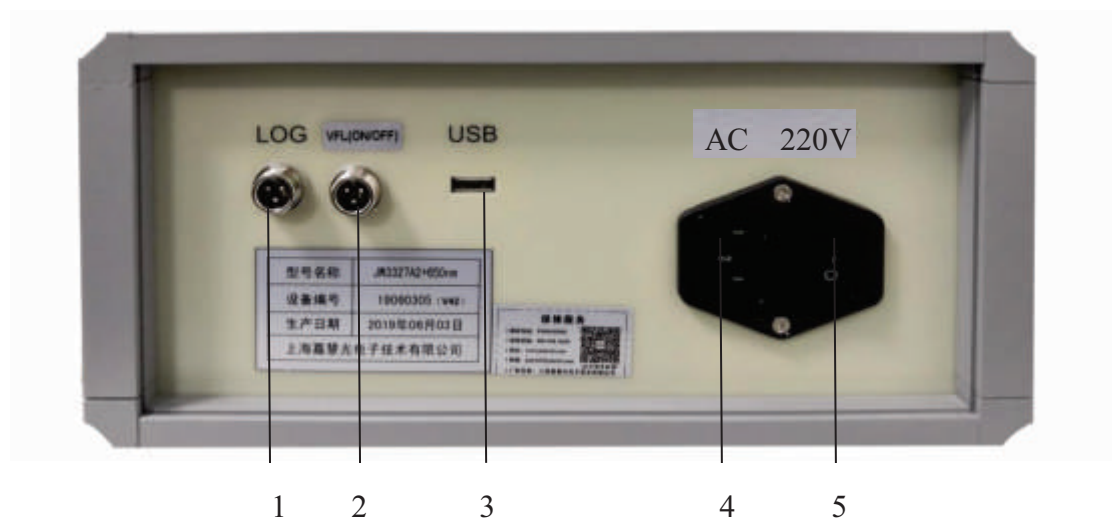


1 OLS output port    2 Display area    3 Detector port    4 VFL control switch    5  
Button area

**Figure4-2 front panel appearance**

### 4.3 Back panel appearance

The back panel of ZW3327IL&RL test station contains data transfer pedal interface, red light control pedal interface, USB interface, power interface and power switch, as shown in figure 4-3.





1 Data transmission foot pedal interface    2 VFL controlled foot pedal interface    3  
USB interface  
4 Power interface    5 Power switch

**Figure4-3 Back panel appearance**

## 5 Button Instruction

NO.	Button name	function
1	MENU	1: Enter Menu Settings 2: Move the button to the left (under threshold setting)
2	BR0/▲	1: RL Calibration (long press, under Single



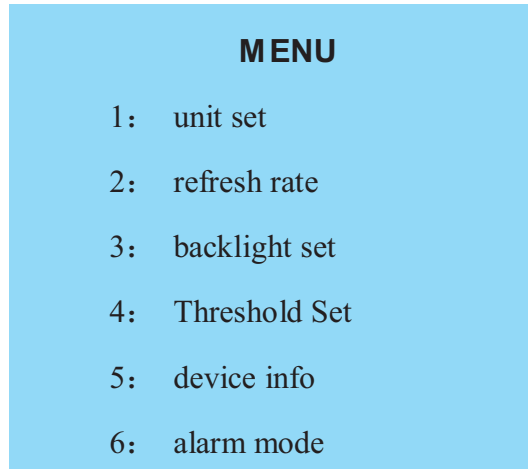
		RL measurement of interface ) 2: Up (under menu) 3: Plus 1 (under threshold setting)
3	REF/ 	1: Set reference value (under single IL and RL measurement interface) 2: Confirm and save (under menu)
4	MODE	1: Test mode switch (five modes) a. Single wavelength IL measurement b. Single wavelength RL measurement c. Single wavelength IL&RL measure simultaneously d. Dual wavelength IL&RL measure simultaneously e. OPM 2: Move to the right (with the threshold set)
5	$\lambda$ /▼	1: Switching wavelength 2: Select down (under menu) 3: Minus 1 (under threshold setting)
6	dB/ 	1: Return to zero (Under single IL measurement & OPM) 2: Return upper level menu not saved (under menu)

**Note:** Short press if not specified as long press.





## 6 Menu Description

### 6.1 Menu function description

Press the MENU key to enter the main menu setting interface, as shown in Figure 6-1.



**Figure6-1 Main menu interface**

Menu settings can be selected by pressing the up and down buttons of the keys. when selected the font color will become red; By pressing the REF /  Button of the key to enter the selected submenu, then select the submenu options by the up and down keys and REF /  key, press DB /  key in the Submenu to return to the main Menu; press DB /  key again in the main menu to exit the menu settings.

## 6.2 Menu setting description

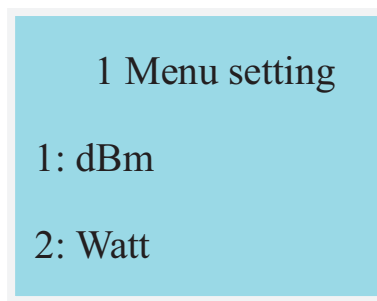
No.	Button name	Function
1	Unit set	1: dBm 2: Watt
2	Refresh rate	1: 100ms 2: 200ms 3: 400ms 4: 1000ms
3	Backlight set	1: 100% 2: 80% 3: 60% 4: 40% 5: 20%
4	Threshold set	1: 1310 IL threshold 2: 1310 RL threshold 3: 1550 IL threshold 4: 1550 RL threshold

5	Device info	1: ID 2: IL Send 3: RL Send
6	Alarm mode	1: non-alarm 2: fail alarm 3: pass alarm

## 6.3 Menu setting method

### 6.3.1 unit set

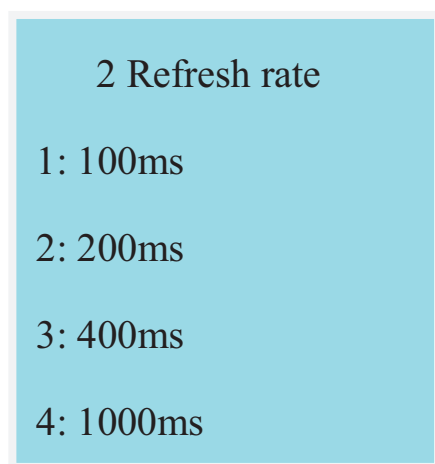
Press the MENU key to enter the MENU and select the unit settings; if the DBM unit is selected, the power value on the main interface is displayed as a logarithmic value; if the Watt unit is selected, the power value on the main interface is displayed as a linear value, with the default unit being dBm, as shown in figure 6-2.



**Figure6-2 Unit set**

### 6.3.2 Refresh rate setting

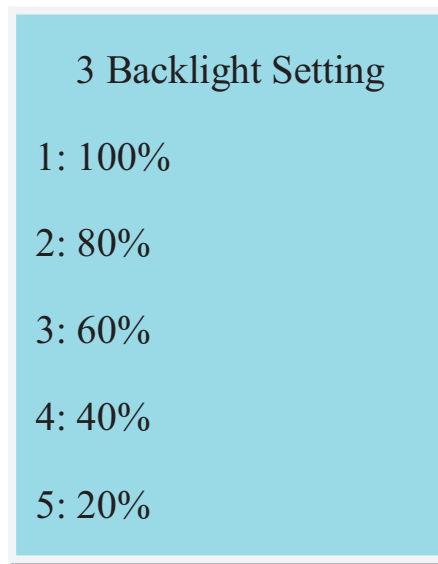
This menu sets the display refresh rate by default to 200ms, as shown in figure 6-3.



**Figure6-3 Refresh rate setting**

### 6.3.3 Backlight Setting

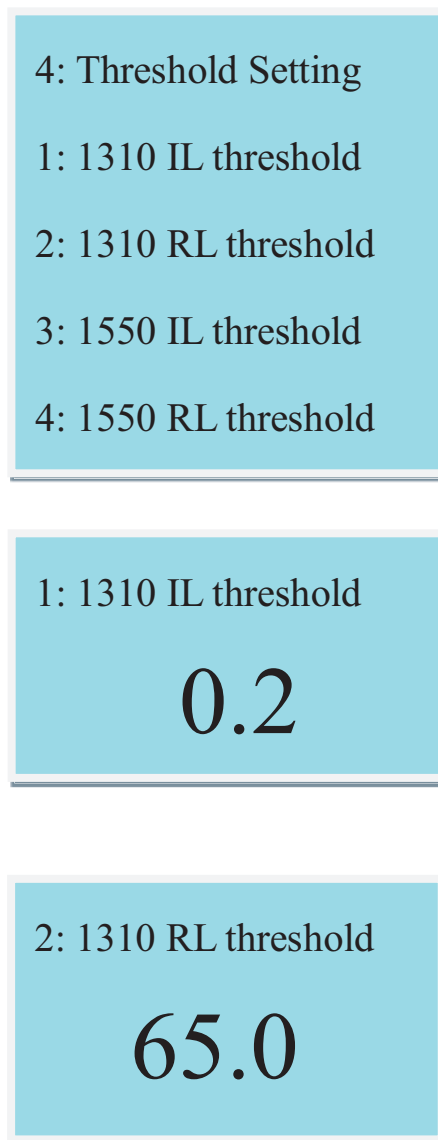
This menu adjusts the brightness of the display, as shown in figure 6-4. The default is 100% .



**Figure6-4 Backlight Setting**

### 6.3.4 Threshold Setting

The menu includes threshold settings for insertion loss and return loss at 1310 and 1550 nm wavelengths, respectively. The resolution of insertion loss threshold is 0.01 and that of return loss threshold is 0.1. When the measured insertion loss is greater than or equal to the range of insertion loss thresholds set, or the measured return loss is less than or equal to the range of insertion loss thresholds set, the data will be displayed in red font, as shown in figure 6-5. (This device threshold is completely independent of the threshold set by the PC software)



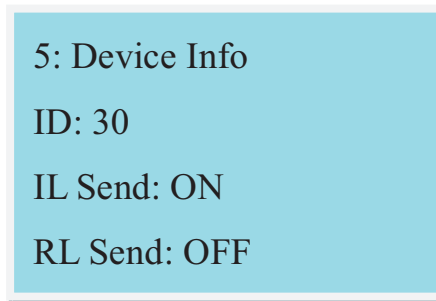
**Figure 6-5 Threshold Setting**

#### 6.3.5 Device Information Setting

ID: Local Address ID, used with the host computer software, multi-device networking online use.

IL Send: Measured Insert Loss Upload Switch, with ON and OFF state. Status ON indicates that the measured value is within the upper computer software threshold range, triggered by a foot switch can upload data to the upper computer software; status OFF indicates no upload.

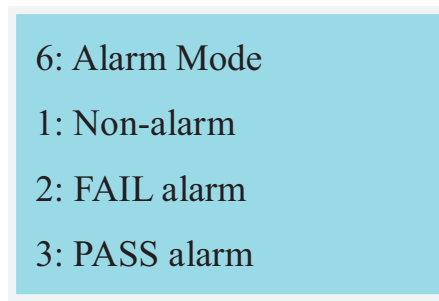
RL Send: Return Loss Upload Switch, defined similar to IL Send.



**Figure6-6 Device information setting**

### 6.3.6 Alarm Mode Setting

The menu can choose not alarm, unqualified alarm and qualified alarm mode, as figure 6-7.



**Figure6-7 Alarm mode setting**

## 7 User Instructions

### 7.1 Power on

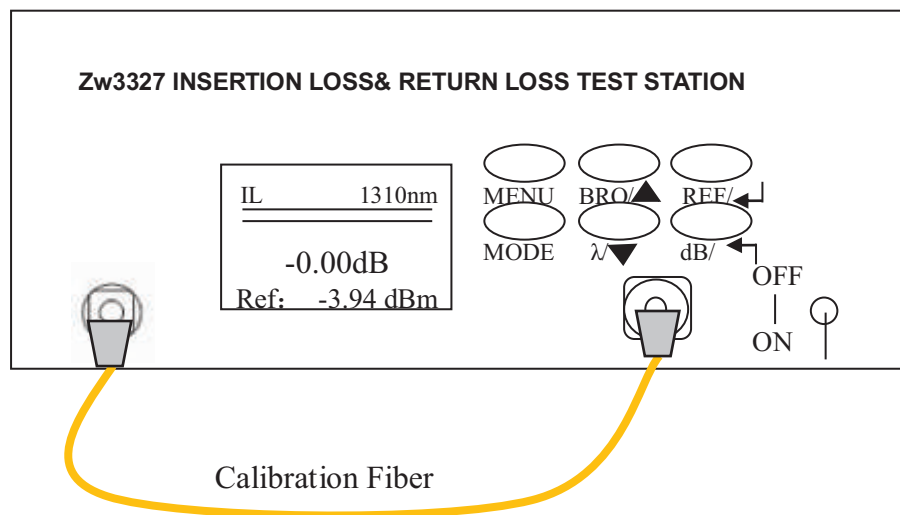
Switch on 220V AC, open the power switch on the back panel, the screen will show the boot interface.

### 7.2 Test IL Value

#### 7.2.1 IL to Zero

During the test, the MODE key is used to switch to the single insertion loss measurement MODE, the output end of the light source is connected to a calibrated optical fiber matching connector as shown in figure 7 -1, calibration of the power

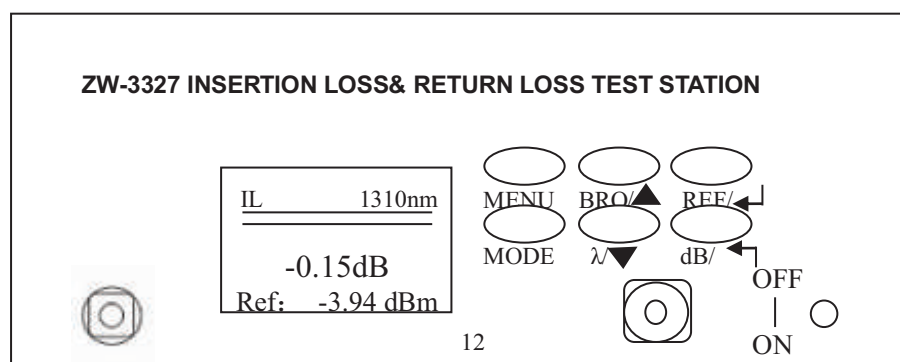
meter interface at the other end of the fiber, in single-wavelength measurement mode, select the test wavelength by pressing  $\lambda/\nabla$  divide key, press Ref /  $\leftarrow$  key to record the optical power reference value and complete the insertion loss zeroing operation. One side of the light source shall not be pulled out of the standard line.

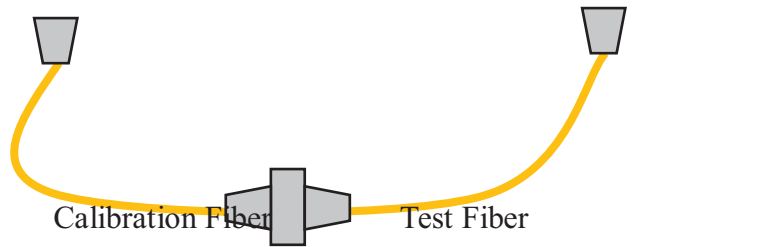


**Figure7-1 IL to zero**

### 7.2.2 IL Test

After the zero insertion operation, the measured fiber is connected with the calibrated fiber through the Flange, pay attention to the type of the measured fiber joint, and the mismatched type of the joint is connected with the calibrated fiber, which may damage the calibrated fiber, and get incorrect measurements. As figure 7-2 will be connected to the measured fiber, you can measure the insertion loss.



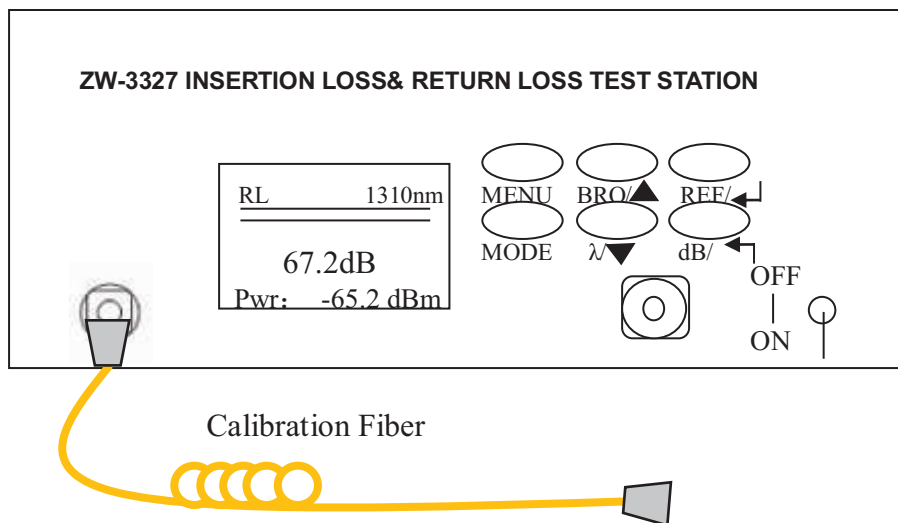


**Figure7-2 IL Test**

## 7.3 Test RL value

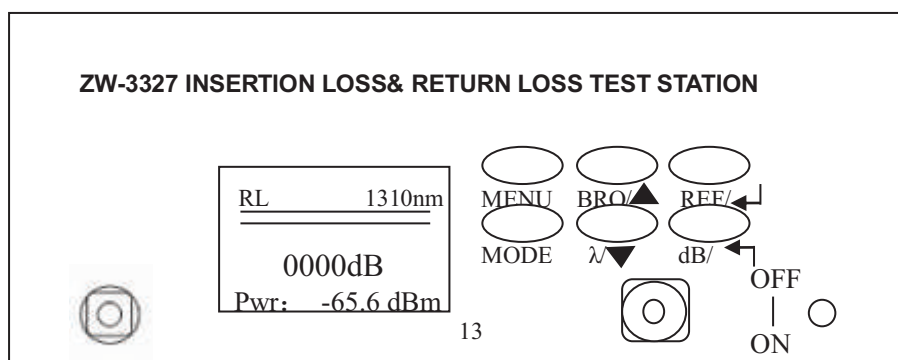
### 7.3.1 RL Calibration

In the single-wavelength return loss measurement mode, the calibrated fiber is wound 5 ~ 6 times using the winding rod as shown in Fig. 7-3.

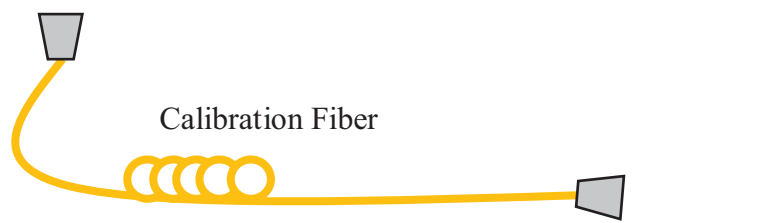


**Figure7-3 RL Calibration 1**


Observe the PWR value on the screen, it getting smaller to below -65. As shown in figure 7-4, press the BRO /▲ key for 2-3 seconds to record the return loss calibration value, the display will shows “0000”.

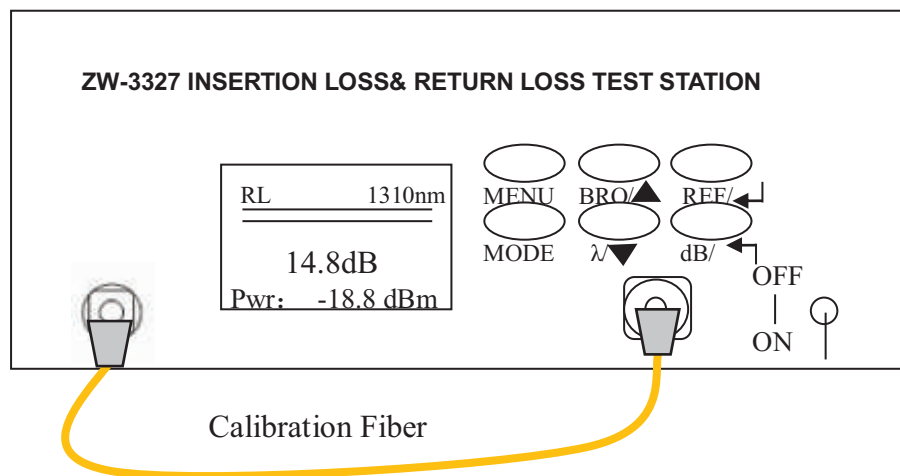






**Figure7-4 RL Calibration2**

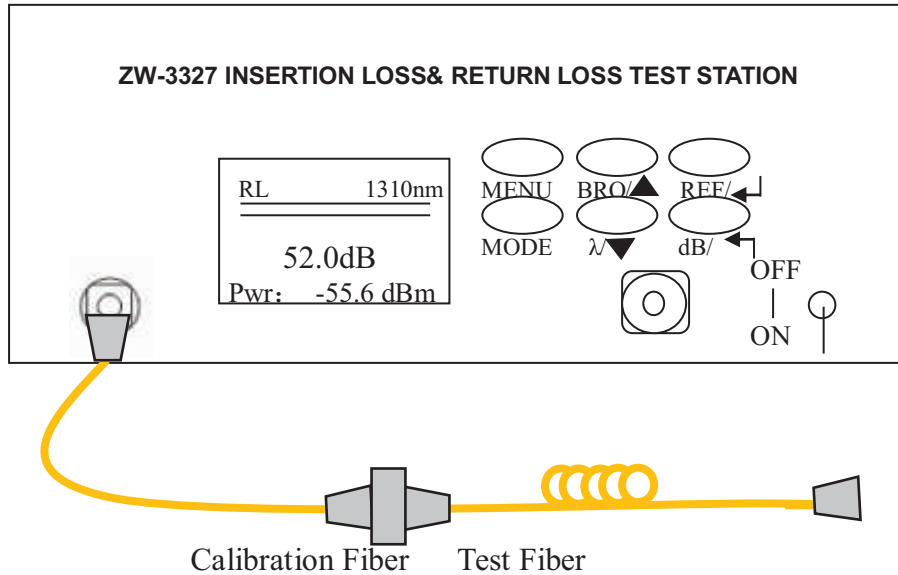
Open the wound access light detection port, Short press REF /  key record light power reference value as figure 7-5, complete back damage calibration operation. One side of the light source shall not be pulled out of the standard line.



**Figure7-5 RL Calibration3**

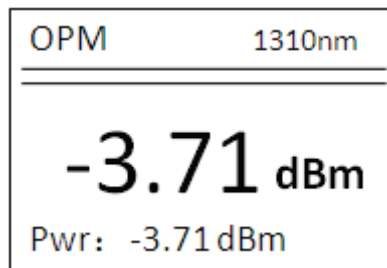
### 7.3.2 RL Test

After the return loss calibration operation is completed, the measured fiber is connected to the calibrated fiber through the flange. Pay attention to the type of the measured fiber joint, and the mismatched type of the joint is connected to the calibrated fiber, which may damage the calibrated fiber, and get incorrect measurements. If the measured fiber is connected with Figure 7-6, the return loss can be measured by winding the measured fiber 5~6 times using the winding Rod.



## 7.4 OPM Measurement

When testing, switch to OPM test mode by MODE key, press  $\lambda/\nabla$  key to select test wavelength, press REF /  $\leftarrow$  key to record optical power reference value. Then clean the fiber to be measured, access the instrument detector interface, pay attention to the type of fiber to be measured, the type of joint does not match the access instrument, may damage the instrument fiber, and get incorrect measurement results.



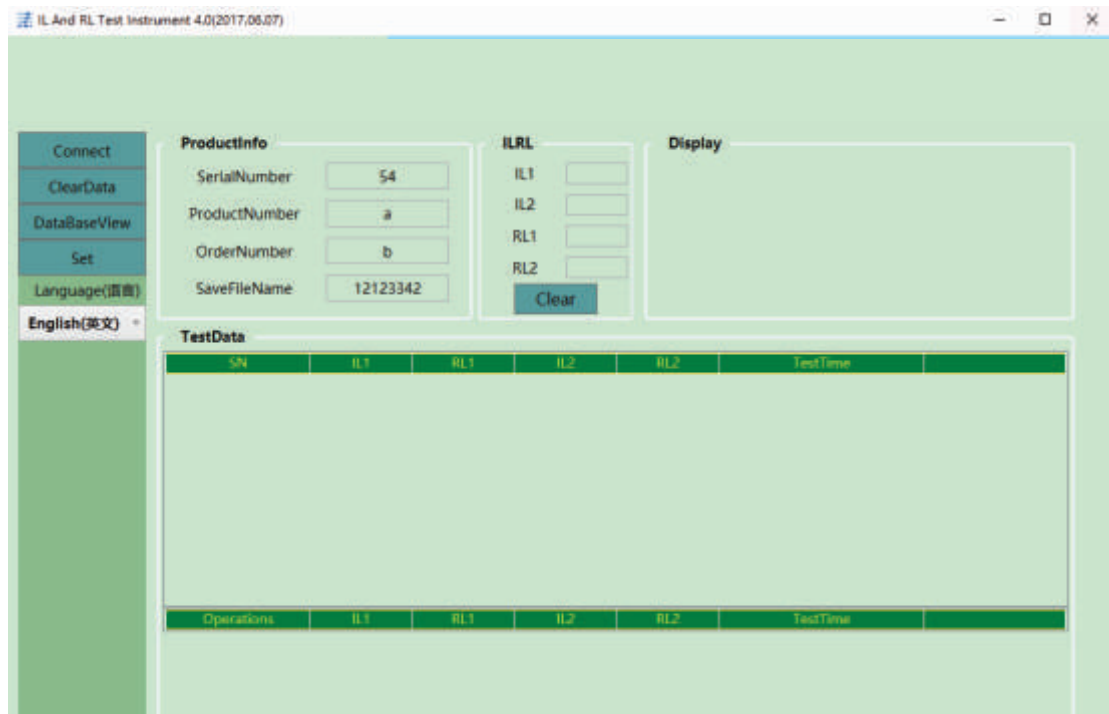
**Figure7-7 OPM Measurement Interface**

## 7.5 VFL control

Turn on the front panel VFL Control Switch, step on the VFL control pedal switch, VFL off, lift the pedal switch, VFL recovery. Turn off the Front Panel VFL Control Switch, VFL off.

## 8 Test Software

The IL&RL loss tester provides the upper computer test software for the user to view the data, record the storage and unified management. The tester provides standard test software to manipulate the test data, as shown in figure 8-1.



**Figure 8-1 Test software interface**

On Test software interface of IL&RL Loss Tester. It is easily to view the real-time test values, and test data for different operations.

### 8.1 Connecting introduction

Connect the instrument and the computer through the data line, connect the power cord, open the power switch on the back side of the instrument, open the PC software, click on the left side of figure 8-1 "connection", the successful connection tips as figure 8-2.

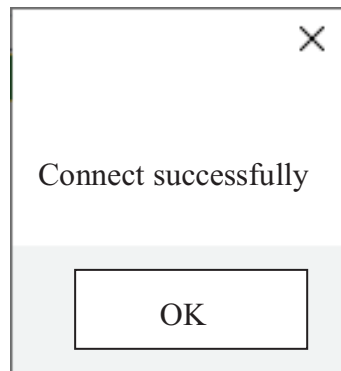


Figure 8-2 connect successful prompt interface

## 8.2 Introduction option Setting

Contains threshold settings, database settings, Excel settings, and other settings, as shown in figure 8-3.

**ThresholdSet:**

ID	Type	WaveA	WaveB	WaveA IL(MIN)	WaveA IL(MAX)	WaveB IL(MIN)	WaveB IL(MAX)
1	标准	1310	1550	0	1	0	1
2	标准1	1310	1550	0	0.5	0	0.5
3	标准2	1310	1550	0	0.03	0	0.03
4	MM	850	1550	0	0.3	0	0.3

**DataBaseSet:**

LocalDataBase ☒ Enable

RemoteDataBase ☒ Enable

ConnectRemoteDb

ServerName: XZ-201512121106

LoginName: sa

PassWord: \*\*\*\*\*

DataBaseName: data

**Excel Set:**

☐ Enable ExcelSave

TemplatePath: C:\ Template.xls

**Figure 8-3 option interface setting**

1. Threshold Setting: Data that does not meet the threshold setting cannot be uploaded to the test software. It can insert new threshold settings or delete threshold settings and select the threshold you want to use.
2. Database setting: local or remote databases can be used.
3. Excel Setting: Choose the data Save Path, template and save mode according to the requirement, fill in the custom information.
4. Other setting: according to the actual situation to select the status of the instrument, you can check the automatic addition of a serial number or only test IL function.

### 8.3 Introduction of product information area

As shown in figure 8-4, the product information can be filled in according to the actual situation.

**ProductInfo**

SerialNumber	54
ProductNumber	a
OrderNumber	b
SaveFileName	12123342

**Figure 8-4 Product information area interface**

## 8.4 Data upload area introduction

After the test, if more than one test data in the non-conforming situation, the data in the threshold range will appear in the upload area such as figure 8-5, "Clear" button used to empty the data upload area button.

**ILRL**

IL1	
IL2	
RL1	50.82
RL2	50.22

Delete

**Figure 8-5 Data upload area interface**

## 8.5 Realtime data area introduction

When the device is connected to the test software, the area displays the test data values in real time, as shown in figure 8-6.

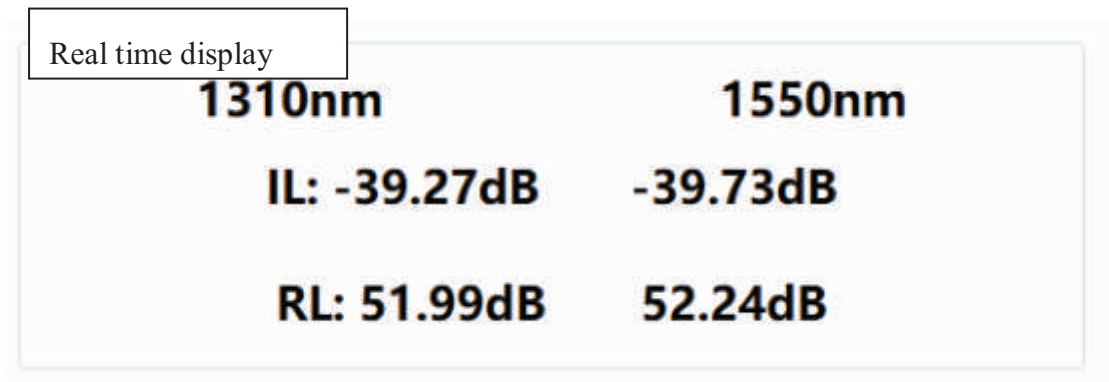


Figure 8-6 Real-time display interface

## 8.6 Test data area introduction

Each uploaded piece of data is displayed in that area, as shown in figure 8-7.

Test data

SN	IL1	RL1	IL2	RL2	TestTime
10	-0.11		-0.10		2019/11/20 8:43:39
11	-0.13		-0.10		2019/11/20 8:41:45
12	-0.13		-0.10		2019/11/20 8:41:46
13	-0.13		-0.10		2019/11/20 8:41:47
14	-0.13		-0.10		2019/11/20 8:41:51
15	-0.14		-0.10		2019/11/20 8:42:53
16	-0.13		-0.10		2019/11/20 8:42:55
17	-0.13		-0.10		2019/11/20 8:42:58
18	-0.13		-0.10		2019/11/20 8:42:59
19	-0.13		-0.09		2019/11/20 8:43:36

Figure 8-7 Test data interface

## 8.7 Data analysis area introduction

The analysis of the uploaded data is shown in this area, as shown in figure 8-8.

Operations	IL1	RL1	IL2	RL2	TestTime
MAX	-0.15	50.62	-0.06	50.22	2019/11/20 10:18:13
AVR	-0.15	7.26	-0.07	7.17	2019/11/20 10:18:13
MIN	-0.15	0.00	-0.07	0.00	2019/11/20 10:18:13
UNI	0.00	50.62	0.01	50.22	2019/11/20 10:18:13

Figure 8-8 Data analysis interface

## 8.8 Clear data option introduction

The clear option is used to clear the interface from displaying data.

## 8.9 Database view option introduction

The database view option can be used to filter, delete, and export data as shown in figure 8-9.

DataBaseView									
SerialNumber		Query DeleteSelect DeleteAll DisplayAll ExportExcel							
ID	SerialNumber	ProductNumber	OrderNumber	IL1	RL1	IL2	RL2	TestTime	
1				68.27	0.0	N/A	N/A	2016/1/25 18:13:15	
2				68.28	0.0	N/A	N/A	2016/1/25 18:13:16	
3				68.30	0.0	N/A	N/A	2016/1/25 18:13:16	
4				68.26	0.0	N/A	N/A	2016/1/25 18:13:17	
5				67.40	0.0	N/A	N/A	2016/1/25 18:22:39	
6				67.28	0.0	N/A	N/A	2016/1/25 18:22:50	
7				66.90	0.0	N/A	N/A	2016/1/25 18:27:35	
8				66.40	0.0	N/A	N/A	2016/1/25 18:57:15	
9				66.40	0.0	N/A	N/A	2016/1/25 18:57:15	
10				66.40	0.0	N/A	N/A	2016/1/25 18:57:16	
11				66.39	0.0	N/A	N/A	2016/1/25 18:57:16	
12				66.39	0.0	N/A	N/A	2016/1/25 18:57:17	
13				66.39	0.0	N/A	N/A	2016/1/25 18:57:17	
14				66.47	0.0	N/A	N/A	2016/1/25 18:57:17	
15				66.47	0.0	N/A	N/A	2016/1/25 18:57:17	
16				66.47	0.0	N/A	N/A	2016/1/25 18:57:18	
17				66.46	0.0	N/A	N/A	2016/1/25 18:57:24	
18				66.45	0.0	N/A	N/A	2016/1/25 18:57:24	
19				42.07	0.0	N/A	N/A	2016/1/26 9:02:54	
20				42.07	0.0	N/A	N/A	2016/1/26 9:03:05	
21				42.05	0.0	N/A	N/A	2016/1/26 9:03:06	
22				42.05	0.0	N/A	N/A	2016/1/26 9:03:06	
23				42.05	0.0	N/A	N/A	2016/1/26 9:03:07	
24				42.13	0.0	N/A	N/A	2016/1/26 9:03:09	
25				42.18	0.0	N/A	N/A	2016/1/26 9:03:10	
26				42.18	0.0	N/A	N/A	2016/1/26 9:03:10	
27				42.04	0.0	N/A	N/A	2016/1/26 9:03:11	

Figure 8-9 Database view interface

Note:

(1) the output of the laser and the Erbium-doped fiber amplifier is invisible laser



radiation. When the equipment is working, do not look directly at the output of the light source and the jumper end connected to the output of the light source to avoid burning eyes and skin.

(2) the instrument is a high-precision equipment. The marking end connected to the light source outlet MUST BE APC end face, and keep clean and free of scratches. Otherwise it is very easy to damage the instrument internal light output APC face.

(3) before measurement, it is recommended to test all optical fiber end surfaces with optical fiber magnifier and to clean the end surfaces with special cleaning appliance.

(4) it is recommended to use a 1m long marking line.

(5) when the system drifts, it is necessary to calibrate the insertion loss power meter. When not in use, must use the dustproof cap to cover tightly the light power meter interface.

(6) if the output remains unstable, it may be for the following reasons:

1. The line is not as smooth as the line.

2 The marking line end face has the stain, needs to clean the end face.

3 the end face of the marking line has been scratched and needs to be replaced.

4 marking the beginning of the end of a stain, the need to clean the end.

5 marking the beginning of the face has been scratched, the need to replace the new marking.

6 instrument internal light source output end face has stains, remove the output port cleaning end face.

(7) if the output power value is too low, the reasons are as follows:

1.The connection between the end of the marking line and the optical power meter is not good, and the marking line can not be inserted in place.

2.The light path of the internal light source of the instrument is out of order.

(8) always keep the end of the sensor clean, fat-free, pollution-free, do not use unclean, non-standard adapter connector, do not insert the polished surface of the end, or it will damage the end of the sensor, so that the performance of the whole system

greatly compromised.

(9) always keep the end of the sensor clean, fat-free, pollution-free, do not use the non-clean, non-standard adapter connector, do not insert the polished surface of the end, or it will damage the end of the sensor, so that the performance of the whole system greatly compromised.

Stick with one adapter whenever possible.

(10) periodically clean the surface of the sensor. When cleaning the surface of the sensor, please use the special cleaning cotton swab to wipe gently along the circumference direction.

(11) heavy objects shall not be placed on the top of the equipment to prevent deforming the appearance of the equipment and affecting its performance.

## **9 Maintenance**

1. The tester should work without obvious vibration. Keep the output end face clean. If there is any dirt or damage, the output flange should be turned down, and the end face should be cleaned with dust-free paper or cleaning cloth and anhydrous alcohol.
2. When the connection port of the equipment is not in use, please cover the dustproof cap to prevent dust from entering.
3. Be careful about plugging and unplugging light connectors.
4. Handle with care to prevent the device from falling and collision.

## 10 Warranty

**We do not recommend that users repair the ZW-3327 by themselves.**

**\* Warranty period of the instrument is within 18 months from the date of shipment.**

Shanghai Joinwit Company will provide its product promise, and the warranty period is valid within 18 months from the date of shipment. When the purchased product was found to have quality problems during this period, Shanghai Joinwit Company will make appropriate repairs or replacements.

If a problem occurs during the use of the instrument, the solution based on the common failure indication cannot be resolved. Please contact the company's marketing or after-sales personnel. Users are not allowed to open the chassis without authorization; otherwise they will not provide warranty service.

For quality failure due to production defects, the manufacturer is responsible for free repair or replacement of the meter. This guarantee is only applicable to the normal use of the meter and no one is damaged or improperly used.

**Warranty of ZW-3327 does not include wearing parts and problems/faults caused by the following reasons:**

- 1) Unauthorized repair or modification of the instrument
- 2) Improper use, negligent use, accident, etc