

ST-18001-IRL

Optical Devices Integrated Testing Platform



User Manual

Version V16 24.09

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1 .Overview

1-1 Overview

Fibermart multi-application platform (ST-18001/18000) is an optimized test and measurement platform for optical fiber devices, which can realize the efficient development, test and manufacture of optical devices and modules.

At present, the market of optical devices is developing rapidly, from the traditional FBT shunt device, PLC, CWDM to the current DWDM, MPO, AWG, multi-channel optical switch module, etc. , the extensible test platform ST-18001/ST-18000 came into being develop. The advantage of the ST-18001/ST-18000 platform over the previous generation of Fibermart products is its ability to integrate the broadest portfolio of modular products for the most compact and configurable types.

Aiming at the test demand of MPO device, we adopt ST-18001 optical device test platform, ST-1608 non-winding IL&RL tester module and ST-1606 multi-channel optical switch module, which constitute an integrated test solution.

The application of “non-winding” technology solves the problem that multi-core optical devices can not be wound and need matching paste, and greatly improves the test efficiency of insertion loss and return loss of multi-core/ribbon fiber. At the same time, MPO application software can be configured with various test modes, test reports and threshold setting functions, so that the test of multi-core optical devices is no longer complicated and disorderly, the data and settings are in good order, reasonable and orderly, and support the function of polarity testing.

1-2 Main Features

- 1: Multi-core No-winding IL&RL test without index matching block;
- 2: Test 12/24/16/32/48 channel dual wavelength IL&RL automatically;
- 3: Adopt integrating sphere test scheme, meet the requirements of MTP/MPO optical devices;
- 4: Extend 48 channel ST-18000 optical power meter to support testing of MPO fan-out devices;
- 5: Configure a variety of special line through the software, cable test process, test mode diversification configuration, strong system compatibility ;
- 6: Support for Aging Monitoring Test Applications;
- 7: Support Automatic Detection and single-channel manual testing;
- 8: Support for polarity testing function;
- 9: Excel/Database/XML and other forms of data preservation;
- 10: High performance, built-in PC, ensure system compatibility and operate fluency;

1. Overview

1-3 Product Overview

Built-in high performance PC, save host space, external monitor easy to get started.

Perfect compatibility with operating system and software

8/12/16/24/32/48 core, special polarity, single mode, multi-mode, perfect solution for MPO device.

High performance integrating sphere configuration ensures accuracy of multicore device testing.

High efficiency test: 24 core dual wavelength IL&RL test completed in 1 minute.

Single channel non-winding IL/RL Tester, compatible with ST-8307A operating software, one machine with multi functions, reduce your equipment cost.

Support automatic monitor testing, unattended, monitor the data for you at all time and protect the quality of your device.

Abundant functions of test scheme selection, data saving, database and threshold settings can meet the needs of personalized testing.



Channel	Wavelength	IL	RL	Test Date	Test	
1	1310	0.09	1550	0.00	2017-08-23 18:39:43	Test
2	1310	-47.87	1550	-47.86	2017-08-23 18:39:44	Test
3	1310	0.53	1550	0.38	2017-08-23 18:39:46	Test
4	1310	-0.03	1550	-0.01	2017-08-23 18:39:47	Test
5	1310	-0.05	1550	0.00	2017-08-23 18:39:48	Test
6	1310	0.23	1550	0.33	2017-08-23 18:39:50	Test
7	1310	0.00	1550	0.00	2017-08-23 18:39:51	Test
8	1310	-0.01	1550	-0.01	2017-08-23 18:39:52	Test
9	1310	0.03	1550	0.00	2017-08-23 18:39:54	Test
10	1310	-0.01	1550	0.26	2017-08-23 18:39:55	Test
11	1310		1550			Test

More features and wait for your suggestions !

1 .Overview

1-4. Technical Specifications

OPM Part	Standard 2.0 Detector	Sphere
Wavelength	850~1700 nm	850~1700 nm
OPM test range	+5dBm~-75dBm	+10dBm~-55dBm
Linearity	±0.04dB(+5~-55dBm) ±0.08dB(-55~-65dBm) ±0.2 dB (-65~-75dBm)	±0.04dB(+10~-35dBm) ±0.08dB(-35~-45dBm) ±0.2dB(-45~-55dBm)
Fiber type	Standard SM & MM Fiber	Standard SM & MM Fiber
Uncertainty	±3%	±3%
IL Part	SM	MM
Wavelength	1310nm&1550nm	850nm &1300nm
Laser type	FP Laser	LED
Center wavelength	±10nm	±30nm
Ring Flux Standard	Not care	Meet IEC-61280- 4- 1
Output power	> -7 dBm	> -27 dBm
Uncertainty of IL	±0.05dB	±0.1dB
Stability of IL	±0.01dB	±0.03dB
Laser stability	0.01dB /15min 0.03dB /8hour	0.01dB /15min 0.05dB /8hour
Core	9/125	50/125 or 62.5/125
Output connector	FC/APC	FC/APC

1 .Overview

1-4. Technical Specifications

RL Part	SM	MM
Laser type	pulsed FP Laser	pulsed FP Laser
RL Test Range	12dB ~ 72dB	12dB ~ 55dB
RL Test Accuracy	± 1dB (12~55dB) ± 1.5dB (55~65dB)	± 1dB (12~40dB) ± 1.5dB (40~50dB)
RL Standard Fiber	2~10 meters	2~10 meters
Min Test Length	2 meters (endfaced APC) 3 meters (endface PC)	2 meters (endface APC) 3 meters (endface PC)
Max Test Length	1000 meters	1000 meters

Switch Module Part	Parameter
Swith Channel	Support 8~48 channel
Connector	FC/APC
Fiber Type	9/125 or 50/125 or 62.5/125
Wavelength	SM: 1260~1650nm MM: 850&1300nm
Insertion Loss	<1.2dB;Typical value 1dB
Switch Time	50mS
Repeatability	0.02dB
Longevity	≥3×10 ⁷

1 .Overview

1-4. Technical Specifications

PC Part	Parameter
Operate System	WINDOWS7 64 bits
CPU	Intel I5 7400 Processor
Memory	DDR3 4G
Hard Disk	M2 SSD 120G
Main Board	ASUS
Connector	4 pcs USB,1pc RJ45,1 pc HDMI
Monitor (External)	Recommant 21 inch,Resolution >= 1600*900

Machine	Parameter
Power Supply	220V AC
Rated Power	150W
Boot Time	15 mins
Calibration Cycle	18 months
Operating temperature	5~40 °C
Storage temperature	-10~70°C
Size	3U*450*420 (H*W*D)

1 .Overview

1-5 standard configuration

NO.	ITEM	QTY
1	ST-18001 Main Unit	1PC
2	User Manual	1PC
3	Certificate	1PC
4	220V Power Cord	1PC
5	Product Test Report	1PC
6	HDIM to VGA patch-cord	1PC
7	FC\SC\LC\Φ0.25 \Φ0.125 Universal Connector	1PC
8	MPO Adapter	NOTE.1
9	MPO Adapter	1PC
10	FC/APC~FC/APC Standard fiber 50cm	NOTE.2

Note 1: MPO Finished Adapter 1PC; 12/24 Core Flange or 16/32 core flange depending on the number of device channels.

Note 2: The number of standard fibers varies according to the number of channels of the equipment; 25 if the number of channels is 24; With 32 channels, there are 33, etc..

Note 3: All Standard Fibers will be provided according to the single or multi-mode configuration of the equipment.

1 .Overview

1-6 Selection Guide

ST-18001 IL\RL Integrated Test Platform Case

Multi-core IL/RL Testing solution

1-6-1 Module Selection and Configuration Instructions

Eg:

ST-18001-IRL-AA-BBB-C

IRL: Abbreviation of Insertion loss and Return loss test Platform

AA: Channels;

Support 08/12/16/24/32/48 channel;

BBB:Single mode and multi mode configuration;

SM0: Single mode;

MM1: 50/125multi mode;

MM2: 62.5/125multi mode;

C: Optical power meter type selection;

1:Standard Φ 2.0;

2:Integrating sphere;

3:Standard Φ 5.0;

1-6-2 Module selection and configuration case

ST-18001-IRL-24-SM0-2

This configuration consists of

ST-18001 main unit

ST-1608 No-mandrel insertion loss and return loss test module

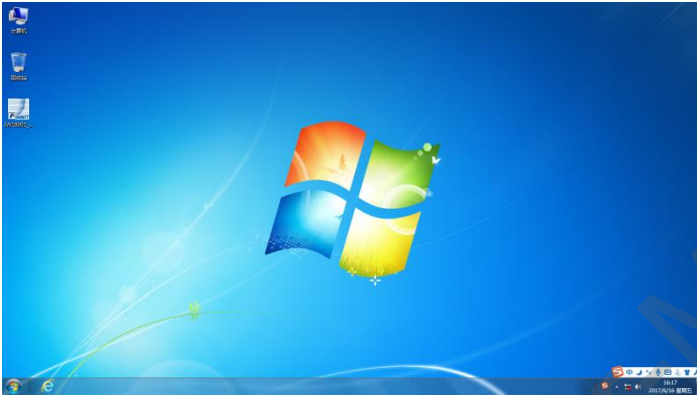
ST-1606 24 channels optical switch module.

It mainly achieves the test of 24 channels single mode insert loss and return loss of the optical device. The optical power meter is of the integrating sphere version, built-in high performance PC. Display and keyboard, mouse and other accessories are optional .

2. Software Application

2-1 Preparation

2-1-1 Hardware configuration



For the first time using ST-18001 IRL device, we recommend display be configured as follows for the best vision:
Size: ≥ 21 inches
Resolution: $\geq 1600 * 900$
Video Port: HDMI

Notes:

When you choose to buy our ST-18001, we can choose the display for you; you can also use Your Own Monitor;

If your monitor is a VGA interface, it does not matter, we have provided you with the Standard VGA to HDMI cable; if your display 21 inches or less than 1600 x 900 resolution, will not affect the function of the product, but will affect the display to a certain extent.

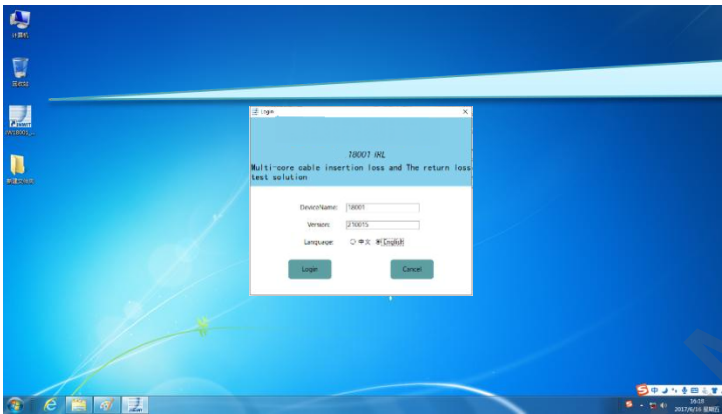
2-1-2 Open device



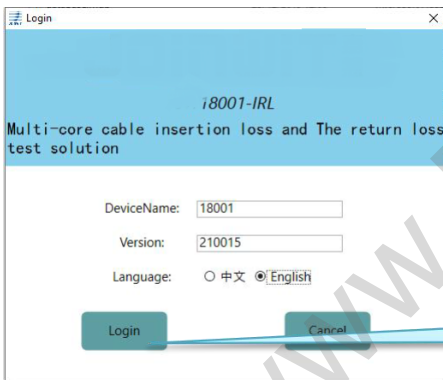
After you have connected the Monitor and the 220V power cord, please press the power switch on the front panel of the ST-18001 device. When connect, the indicator light will be shown in blue and the LCD is turned on.

2. Software Application

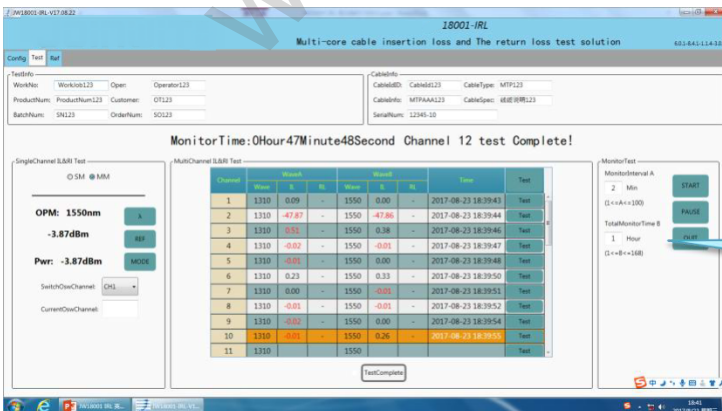
2-1-3 Open software



1: Double-click the desktop ST-18001 software icon



2: Double-click to pop up the dialog box, and click login



3: Two seconds later, the main interface pops up

2. Software Application

2-1-4 software main interface overview

1: Software title bar, view the software version: V17.06.16

2: Three functional module software: Configuration, test, calibration ;

3: Vendor testing information imports ;

4: Import measured cable info , serial number and other info ;

5: Device hardware version ;

The screenshot displays the software's main interface with the following components:

- TestInfo:** Fields for WorkNo, ProductNum, BatchNum, Operator, Customer, and OrderNum.
- CableInfo:** Fields for CableID, CableType, CableSpec, and SerialNum.
- MonitorTime:** 0Hour47Minute48Second Channel 12 test Complete!
- Single Channel IL&RI Test:** Includes OPM: 1550nm, -3.87dBm, and -3.87dBm.
- MultiChannel IL&RI Test:** A table with columns for Channel, Wave, IL, RI, Time, and Test.
- MonitorTest:** Includes MonitorInterval A (2 Min) and TotalMonitorTime B (1 Hour).

Channel	Wave	IL	RI	Wave	IL	RI	Time	Test
1	1310	0.09	-	1550	0.00	-	2017-08-23 18:39:43	Test
2	1310	-47.87	-	1550	-47.86	-	2017-08-23 18:39:44	Test
3	1310	0.51	-	1550	0.38	-	2017-08-23 18:39:46	Test
4	1310	-0.02	-	1550	-0.01	-	2017-08-23 18:39:47	Test
5	1310	-0.01	-	1550	0.00	-	2017-08-23 18:39:48	Test
6	1310	0.23	-	1550	0.33	-	2017-08-23 18:39:50	Test
7	1310	0.00	-	1550	-0.01	-	2017-08-23 18:39:51	Test
8	1310	-0.01	-	1550	-0.01	-	2017-08-23 18:39:52	Test
9	1310	-0.02	-	1550	0.00	-	2017-08-23 18:39:54	Test
10	1310	-0.01	-	1550	0.26	-	2017-08-23 18:39:55	Test
11	1310		-	1550		-		Test

6: Single-channel IL&RI test operation area ;

7: Multi-channel IL&RI test operation area ;

8: Automatic cable monitoring operation area ;

Note: the software is mainly divided into 3 parts: configuration, testing, calibration; Before using, you need to enter the relevant page.

2. Software Application

2-2 Configuration

2-2 -1 Config Overview

1: Click "Configuration" tab

2: There are 3 functional blocks in the Configuration tab: Testing program Settings, Threshold and File Saving, Local Database;

Zoom in:

NUM	Core	Wavelength	Threshold	SelectRefOptn	RefOptn
1	1	1310	1550		
2	2	1310	1550		
3	3	1310	1550		
4	4	1310	1550	18001	
5	5	1310	1550	18001	
6	6	1310	1550	18001	
7	7	1310	1550	18001	
8	8	1310	1550	18001	
9	9	1310	1550	18001	
10	10	1310	1550	18001	
11	11	1310	1550	18001	
12	12	1310	1550	18001	

Config Test Ref

TestSchemeSet FileSave LocalDataBase

LoadNewScheme Delete Save

Note: we need to configure the test plan before testing a device. Steps are as follows:

1) Click the configuration tab;

2) There are three functional blocks of configuration tab ;

Test program settings: mainly set the MPO core number, test content and wavelength;

Threshold and file saving: mainly set the threshold of MPO device , EXCEL save mode, template format;

Local database: mainly for data viewing, filtering operations;

2. Software Application

2-2-2 Configuration – Test schema Settings

1: In the test scheme setup page, we mainly set MPO core number, test wavelength, test content.

2: Double-click any line to bring up the detailed configuration page

NUM	OswPort	WaveA	WaveB	SelectRefOpn	RefOpnChannel	SelectTestOpn	TestOpnChannel	Type	ThresholdConfig
1	1	1310	1550	18001	1	18001	1	IL-RL	FC-UPC
2	2	1310	1550	18001	2	18001	2	IL-RL	FC-UPC
3	3	1310	1550	18001	3	18001	3	IL-RL	FC-UPC
4	4	1310	1550	18001	4	18001	4	IL-RL	FC-UPC
5	5	1310	1550	18001	5	18001	5	IL-RL	FC-UPC
6	6	1310	1550	18001	6	18001	6	IL-RL	FC-UPC
7	7	1310	1550	18001	7	18001	7	IL-RL	FC-UPC
8	8	1310	1550	18001	8	18001	8	IL-RL	FC-UPC
9	9	1310	1550	18001	9	18001	9	IL-RL	FC-UPC
10	10	1310	1550	18001	10	18001	10	IL-RL	FC-UPC
11	11	1310	1550	18001	11	18001	11	IL-RL	FC-UPC
12	12	1310	1550	18001	12	18001	12	IL-RL	FC-UPC

4: Threshold Scheme: here is used to select which threshold scheme, the threshold configuration will be explained later;

3: This dialog is the detailed config page; if you want to test both IL and RL, select IL-RL in test type; if only IL, select IL Only;

5: Wavelength selection: The current display is 850 & 1300 are tested; if only test 1300; in wavelength a select blank; in Wavelength B Select 1300;

7: After setting up, click the batch modification, can complete the setting of all channels ;

8: Click OK to complete the setup

6: Test port selection and optical power meter device selection are senior options, there is no setting at currently

2. Software Application

2-2-3 Configure-test scenario settings (continued-set and save a test scenario)

1: After setting the detailed parameters of the test scheme, assuming that the scheme we just configured is to test IL&RL of 850 wavelength, then we will set the core number of MPO cable; next, we will configure a 12-core MPO cable, but all we have to do is test the front 4 and the back 8 core. How does that work?

NUM	OswPort	WaveA	WaveB	SelectRefOpn					
1	1	1310	1550	18001					
2	2	1310	1550	18001	2	2	IL	FC-UPC	
3	3	1310	1550	18001	3	3	IL	FC-UPC	
4	4	1310	1550	18001	4	4	IL	FC-UPC	
5	5	1310	1550	18001	5	5	IL	FC-UPC	
6	6	1310	1550	18001	6	6	IL	FC-UPC	
7	7	1310	1550	18001	7	7	IL	FC-UPC	
8	8	1310	1550	18001	8	8	IL	FC-UPC	
9	9	1310	1550	18001	9	9	IL	FC-UPC	
10	10	1310	1550	18001	10	10	IL	FC-UPC	
11	11	1310	1550	18001	11	11	IL	FC-UPC	
12	12	1310	1550	18001	12	12	IL	FC-UPC	

3: Click delete; This row will be deleted;

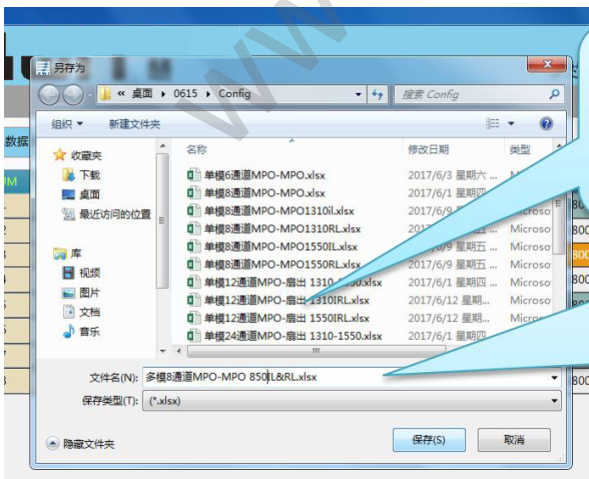
4: When we delete the 5,6,7, and 8 lines in the middle, it becomes this

2: Select any line number that does not require a test ;

LoadNewScheme Delete Save

5: After setting up, Click Save, will pop-up save dialog box, according to the characteristics of the cable to user-defined name.

6: Scheme settings are saved in the Config folder, we customize the above test scheme as "multi-mode 8 channel MPO-850 IL & RL"



Zoom in

File name (N) MM 8CHS MPO-MPO 850IL&RL.xlsx
Save type (T): (*.xlsx)

2. Software Application

2-2-4 Configuration - Test schema Settings (continued-Load an existing test scenario)

The screenshot shows a software application window titled "18001-IRL" with the subtitle "Multi-core cable insertion loss and The return loss test solution". The interface includes a menu bar with "ig", "Test", and "Ref". Below the menu bar, there are buttons for "tSchemeSet", "FileSave", and "L". A file selection dialog is open, showing a folder named "Config" with several Excel files. The selected file is "多模24通道MPO-MPO.xlsx". The dialog has a search bar and a "打开(O)" button. Below the dialog, there are three buttons: "LoadNewScheme", "Delete", and "Save". A table is visible on the right side of the application window, showing test configurations.

testTestOpn	TestOpnChannel	TestType	ThresholdConfig
18001	3	IL	FC-UPC
18001	4	IL	FC-UPC
18001	5	IL	FC-UPC
18001	6	IL	FC-UPC
18001	7	IL	FC-UPC
18001	8	IL	FC-UPC
18001	9	IL	FC-UPC
18001	10	IL	FC-UPC
18001	11	IL	FC-UPC
18001	12	IL	FC-UPC

Zoom in

LoadNewScheme

Delete

Save

If the cables and configuration options you want to test have been configured before, you don't need to reconfigure them, just click load new options and select the appropriate options from the **Config** folder.

2. Software Application

2-2-5 Configuration - File save

1) Click on the Threshold and File Save TAB

2) There are two ways to save EXCEL: Save continuously in the same EXCEL or Save as a single EXCEL template. Click on the "threshold and File Save" TAB

The screenshot shows the 'ExcelConfig' dialog box with the 'Threshold' tab selected. The 'File Save' section has 'Save as a single Excel template' selected. The 'Threshold' table is as follows:

NAKID	Wavelength	IRU/Min	IRU/Max	IRU/Min	IRU/Max	Wavelength	IRU/Min	IRU/Max	IRU/Min	IRU/Max
标准1	1310	0	3	10	75	1550	0	2.2	20	50
FC-LRPC	1310	-0.8	3	10	75	1550	-0.8	2	12.5	75
FC-APC	1310	0	0.5	36	75	1550	0	0.5	36	75
LC-LRPC	1310	0	0.5	36	75	1550	0	0.5	36	75
标准	1310	0	0.5	36	75	1550	0	0.5	36	75
ID5	1310	0	0.5	36	75	1550	0	0.5	36	75
ID6	1310	0	0.5	36	75	1550	0	0.5	36	75
ID7	1310	0	0.5	36	75	1550	0	0.5	36	75
ID8	1310	0.2	0.5	0	75	1550	0	0.5	36	75
ID10	1310	0.2	0.5	36	75	1550	0	0.5	36	75
999	1310	0	0.5	36	75	1550	0	0.5	36	75

ST-18001 test data can be saved as Excel files; for different applications, there are two ways to save Excel files.

- 1) Save continuously in the same Excel: In this way, the data from each test is saved in a Excel form and the filename can be created by itself. In this Excel , you can store up to 9,000 lines of data; over 9,000 lines, the software automatically creates a new Excel . This method is more suitable for automatic testing and monitoring of test occasions. In automatic monitoring mode, it is forced to be stored continuously in the same Excel .
- 2) Save as a single Excel template: To make it easier for our customers to produce test reports directly, we chose this way to Save them, and we can set the template based on the format of the test report. A separate device will generate a Excel report with a file named serial number name.

2. Software Application

2-2-5 Configuration- File save- Individual file save

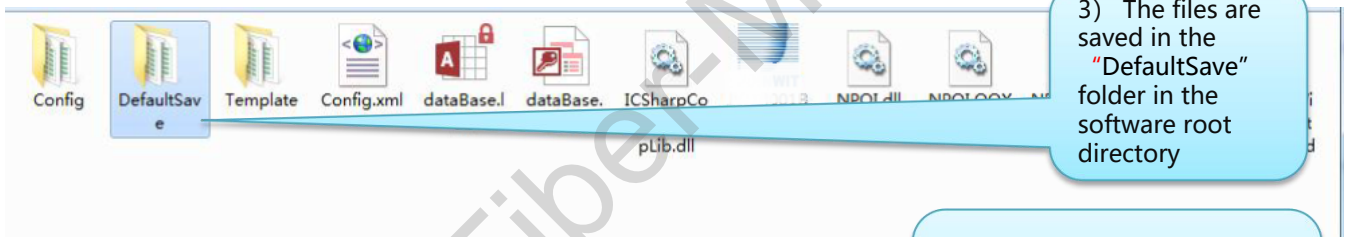
Save it in the same Excel

Savefilename

DefaultSave-20170603

1) Select save continuously in the same Excel

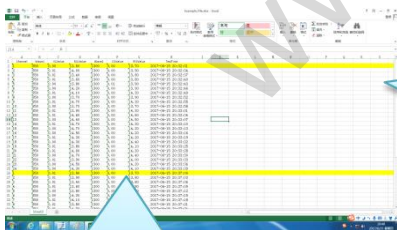
2) Fill in the file name base on requirement



3) The files are saved in the "DefaultSave" folder in the software root directory



4) In the "Defaultsave" folder we can see the Example File we just named.



6) Example_File Zoom in

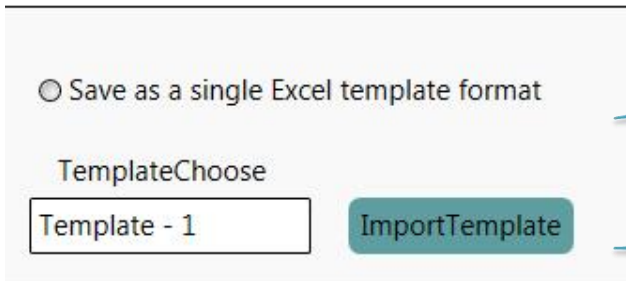
	Channel	Wave1	I1Value	RI1Value	Wave2	I12Value	RI2Value	TestTime
2	1	950	0.00	13.80	1300	0.00	13.70	2017-06-15 20:32:31
3	2	950	0.01	14.00	1300	0.00	13.90	2017-06-15 20:32:34
4	3	950	0.01	13.40	1300	0.00	13.80	2017-06-15 20:32:37
5	4	950	0.01	13.80	1300	0.00	13.80	2017-06-15 20:32:40
6	5	950	0.00	13.80	1300	0.01	13.90	2017-06-15 20:32:43
7	6	950	0.00	14.20	1300	0.00	13.90	2017-06-15 20:32:46
8	7	950	0.01	14.10	1300	0.00	14.30	2017-06-15 20:32:49
9	8	950	0.00	13.70	1300	0.00	13.90	2017-06-15 20:32:52
10	9	950	0.01	14.70	1300	0.00	14.30	2017-06-15 20:32:55
11	10	950	0.00	13.70	1300	0.00	13.70	2017-06-15 20:32:58
12	11	950	0.01	13.90	1300	0.00	14.30	2017-06-15 20:33:01
13	12	950	0.01	14.60	1300	0.00	14.60	2017-06-15 20:33:04
14	13	950	0.00	14.40	1300	0.00	14.50	2017-06-15 20:33:07
15	14	950	0.01	14.70	1300	0.00	14.30	2017-06-15 20:33:10
16	15	950	0.00	14.70	1300	0.00	14.20	2017-06-15 20:33:13
17	16	950	0.00	14.50	1300	0.00	14.20	2017-06-15 20:33:16
18	17	950	0.01	14.30	1300	0.00	14.20	2017-06-15 20:33:19
19	18	950	0.00	14.30	1300	0.00	14.40	2017-06-15 20:33:22
20	19	950	0.01	13.80	1300	0.00	14.10	2017-06-15 20:33:25
21	20	950	0.01	14.60	1300	0.00	14.30	2017-06-15 20:33:28
22	21	950	0.00	14.70	1300	0.00	14.40	2017-06-15 20:33:30
23	22	950	0.01	13.90	1300	0.00	14.00	2017-06-15 20:33:33
24	23	950	0.00	14.50	1300	0.00	14.20	2017-06-15 20:33:36
25	24	950	0.00	14.30	1300	0.00	14.10	2017-06-15 20:33:39
26	1	950	0.01	13.80	1300	0.00	13.70	2017-06-15 20:37:00
27	2	950	0.01	13.90	1300	0.00	13.80	2017-06-15 20:37:03
28	3	950	0.01	13.80	1300	0.00	13.80	2017-06-15 20:37:06

5) Open Example_File

7) On Example_File, our data is stored sequentially, based on the test time.

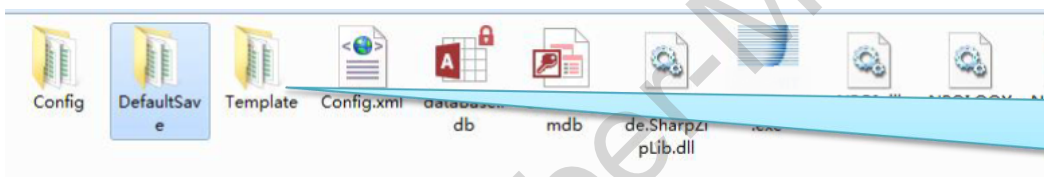
2. Software Application

2-2-6 Configuration- File save-Save as a single EXCEL template



1) Choose to save as a single Excel template

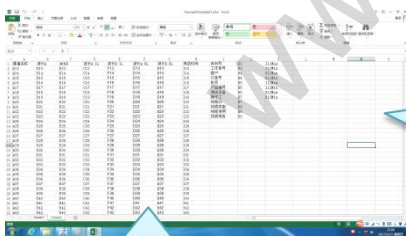
2) Import template: The template name is: ExampleTemplate1



3) The "templates" are in the "Template" folder



4) In "Templata" folder we can see that we just named it ExampleTemplate1 file



5) Open ExampleTemplate1 file

7) In ExampleTemplate1 we can see where each item of data is saved. See next page.

6) ExampleTemplate1 file Zoom in

WaveB RL	Test time	serial NO.	
H13	I13	Work order no.	E3
H14	I14	customer	H3
H15	I15	order number	B4
H16	I16	Batch number	H4
H17	I17	Product number	B5
H18	I18	Test device	H5
H19	I19	operator	E6
H20	I20	Cable ID	B6
H21	I21	Cable type	E7
H22	I22	Wire instructions	H7
H23	I23	Cable specifications	B8
H24	I24		H8
			E9

2. Software Application

2-2-7 Configuration- File save- Excel template description

	CH Name	waveA	waveB	waveA IL	waveB IL	waveA RL	waveB RL	Test time	serial NO.	J
1										B3
2	A13	B13	E13	C13	F13	D13	H13	I13	Work order no.	H3
3	A14	B14	E14	C14	F14	D14	H14	I14	customer	B4
4	A15	B15	E15	C15	F15	D15	H15	I15	order number	H4
5	A16	B16	E16	C16	F16	D16	H16	I16	Batch number	B5
6	A17	B17	E17	C17	F17	D17	H17	I17	Product number	H5
7	A18	B18	E18	C18	F18	D18	H18	I18	Test device operator	B6
8	A19	B19	E19	C19	F19	D19	H19	I19	Cable ID	H6
9	A20	B20	E20	C20	F20	D20	H20	I20	Cable type	B7
10	A21	B21	E21	C21	F21	D21	H21	I21	Wire instructions	H7
11	A22	B22	E22	C22	F22	D22	H22	I22	Cable specifications	B8
12	A23	B23	E23	C23	F23	D23	H23	I23		H8

1) In the template file, the location of all the data stored; for example, C17, the data is stored in the Excel (column C, Row 17) grid.

2) To better understand the relationship between the template and the Excel report, we found the root directory of the software, in the Save folder, in a file called EXAMPLE0001; the report is in the template format as described above. We open the file.

名称
EXAMPLE0001.xlsx

MPO/MTP TEST REPORT			
序列号 (Serial number)	EXAMPLE0001	工作单号 (Cable Type)	WorkJob123
客户 (Customer)	OT123	订单号 (Order Number)	S0123
批号 (Batch Number)	SN123	产品编号 (Product Number)	ProductNum123
测试设备 (Measure Device)	JW18001 光纤器件综合应用系统		
操作工 (Operator)	Operator123	线缆ID (Cable ID)	CableId123
线缆类型 (Cable Type)	MTP123	线缆说明 (Cable Info)	MTPAAA123
线缆规格 (Cable Spec)	线缆说明123		
Test Report			
通道号	Wave1	IL1	RL1
1	850	0.01	13.80
2	850	0.01	13.80
3	850	0.01	13.60
4	850	0.01	13.80
5	850	0.00	13.70
6	850	0.00	14.30
7	850	0.01	14.20
8	850	0.01	13.80
9	850	0.01	14.60
10	850	0.01	13.60
11	850	0.01	13.90
12	850	0.01	14.70
13	850	0.00	14.30
14	850	0.01	14.80
15	850	0.00	14.70
16	850	0.00	14.40
17	850	0.01	14.50
18	850	0.00	14.20

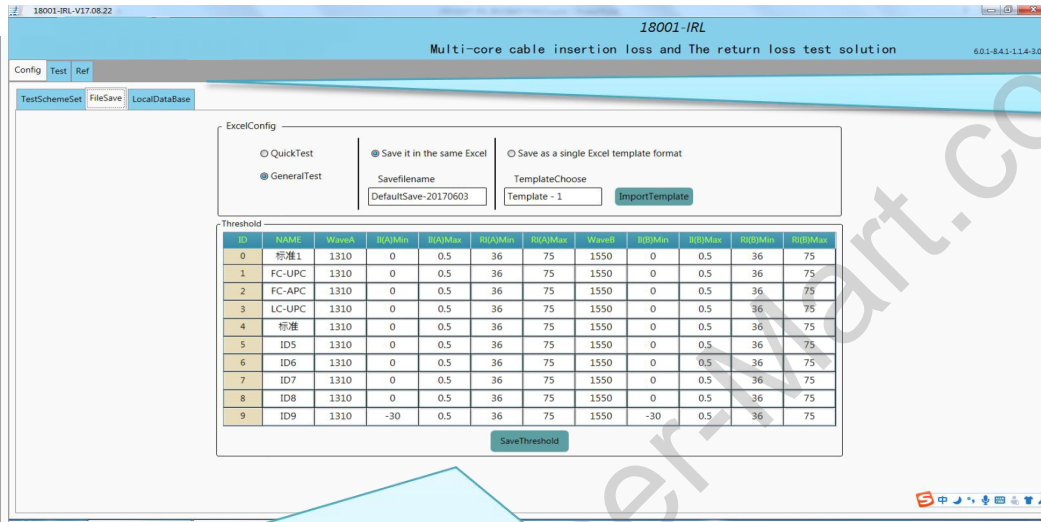
3) In the template, we circled operator B7 in red, and in the Excel, we found the location B7, operator 123, which is the operator information required to be stored in the template.

4) Similarly, we circled the return loss of channel a in the template in purple, at D3; we looked at D3, 13.60, which is the RL value of Channel A.

Note: through the above case, we can according to the needs of users, customized a template Excel that we need, to achieve customized data reporting requirements.

2. Software Application

2-2-8 Configuration - Threshold scheme



1) To set the threshold scheme, enter the threshold and file save page

2) Threshold setting Zoom in
ST-18001 has 10 preset thresholds; you can choose to modify the thresholds based on your device's test requirements.
Name: You can customize the name for your needs.
Other values, you can modify as needed, after the modification, you must point to save, and close the software restart after the threshold to be effective.

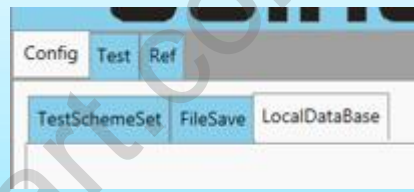
ID	NAME	WaveA	II(A)Min	II(A)Max	RI(A)Min	RI(A)Max	WaveB	II(B)Min	II(B)Max	RI(B)Min	RI(B)Max
0	标准1	1310	0	0.5	36	75	1550	0	0.5	36	75
1	FC-UPC	1310	0	0.5	36	75	1550	0	0.5	36	75
2	FC-APC	1310	0	0.5	36	75	1550	0	0.5	36	75
3	LC-UPC	1310	0	0.5	36	75	1550	0	0.5	36	75
4	标准	1310	0	0.5	36	75	1550	0	0.5	36	75
5	ID5	1310	0	0.5	36	75	1550	0	0.5	36	75
6	ID6	1310	0	0.5	36	75	1550	0	0.5	36	75
7	ID7	1310	0	0.5	36	75	1550	0	0.5	36	75
8	ID8	1310	0	0.5	36	75	1550	0	0.5	36	75
9	ID9	1310	-30	0.5	36	75	1550	-30	0.5	36	75

2. Software Application

2-2-9 Configuration - Database

1) Local database view Zoom in

SerialNum	Channel	Wave1	B1Min	B1	B1Max	B1Min	RI	RI1Max	Wave2	B2Min	B2	B2Max	B2Min	RI2	RI2Max	WorkNo	Oper	ProductName
12345-4	1	1310	0.00	0.00	0.50	36.00	12.00	75.00	1550	0.00	0.00	0.50	36.00	13.30	75.00	WorkNo12	Operator123	ProductNum123
12345-4	2	1310	0.00	0.00	0.50	36.00	12.00	75.00	1550	0.00	0.00	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123
12345-4	3	1310	0.00	0.00	0.50	36.00	27.90	75.00	1550	0.00	0.00	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123
12345-4	4	1310	0.00	0.01	0.50	36.00	12.00	75.00	1550	0.00	0.01	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123
12345-4	9	1310	0.00	0.00	0.50	36.00	36.60	75.00	1550	0.00	0.00	0.50	36.00	29.80	75.00	WorkNo12	Operator123	ProductNum123
12345-4	10	1310	0.00	0.00	0.50	36.00	26.20	75.00	1550	0.00	0.00	0.50	36.00	17.70	75.00	WorkNo12	Operator123	ProductNum123
12345-4	11	1310	0.00	0.00	0.50	36.00	12.00	75.00	1550	0.00	0.00	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123
12345-4	12	1310	0.00	0.00	0.50	36.00	90	75.00	1550	0.00	0.00	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123
12345-5	1	1310	0.00	0.00	0.50	36.00	75.00	1550	0.00	0.00	0.50	36.00	14.60	75.00	WorkNo12	Operator123	ProductNum123	
12345-5	2	1310	0.00	0.00	0.50	36.00	75.00	1550	0.00	0.00	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123	
12345-5	3	1310	0.00	0.00	0.50	36.00	75.00	1550	0.00	0.00	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123	
12345-5	4	1310	0.00	0.01	0.50	36.00	1550	0.00	0.01	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123		
12345-5	9	1310	0.00	0.00	0.50	36.00	90	1550	0.00	0.00	0.50	36.00	29.80	75.00	WorkNo12	Operator123	ProductNum123	
12345-5	10	1310	0.00	0.00	0.50	36.00	1550	0.00	0.00	0.50	36.00	17.70	75.00	WorkNo12	Operator123	ProductNum123		
12345-5	11	1310	0.00	0.00	0.50	36.00	1550	0.00	0.00	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123		
12345-5	12	1310	0.00	0.00	0.50	36.00	1550	0.00	0.00	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123		
12345-5	1	1310	0.00	0.00	0.50	36.00	0.00	0.00	0.00	0.00	0.00	0.50	36.00	14.50	75.00	WorkNo12	Operator123	ProductNum123
12345-5	2	1310	0.00	0.00	0.50	36.00	0.00	0.00	0.00	0.00	0.00	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123
12345-5	3	1310	0.00	0.00	0.50	36.00	0.00	0.00	0.00	0.00	0.00	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123
12345-5	4	1310	0.00	0.01	0.50	36.00	0.00	0.00	0.00	0.00	0.00	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123
12345-5	9	1310	0.00	0.00	0.50	36.00	0.00	0.00	0.00	0.00	0.00	0.50	36.00	29.80	75.00	WorkNo12	Operator123	ProductNum123
12345-5	10	1310	0.00	0.01	0.50	36.00	0.00	0.00	0.00	0.00	0.00	0.50	36.00	17.70	75.00	WorkNo12	Operator123	ProductNum123
12345-5	11	1310	0.00	0.00	0.50	36.00	0.00	0.00	0.00	0.00	0.00	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123
12345-5	12	1310	0.00	0.00	0.50	36.00	0.00	0.00	0.00	0.00	0.00	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123
12345-5	1	1310	0.00	0.00	0.50	36.00	0.00	0.00	0.00	0.00	0.00	0.50	36.00	14.60	75.00	WorkNo12	Operator123	ProductNum123
12345-5	2	1310	0.00	0.00	0.50	36.00	0.04	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123				
12345-5	3	1310	0.00	0.00	0.50	36.00	0.08	0.50	36.00	12.00	75.00	WorkNo12	Operator123	ProductNum123				



2) Local database view Zoom in

The data for each test is stored in the local database and can be queried by field and name. Users need other customized data manipulation requirements and can get the corresponding data from the database.

RI1	RI1Max	Wave2	B2Min	B2	B2Max	RI2Min	RI2	RI2Max
12.00	75.00	1550	0.00	0.00	0.50	36.00	13.30	75.00
12.00	75.00	1550	0.00	0.00	0.50	36.00	12.00	75.00
27.90	75.00	1550	0.00	0.00	0.50	36.00	12.00	75.00
12.00	75.00	1550	0.00	0.01	0.50	36.00	12.00	75.00
36.60	75.00	1550	0.00	0.00	0.50	36.00	29.80	75.00
26.20	75.00	1550	0.00	0.00	0.50	36.00	17.70	75.00
12.00	75.00	1550	0.00	0.00	0.50	36.00	12.00	75.00

Notes: If you need to import data into your remote server, please contact us.

2. Software Application

2-3 Test

2-3-1 Test Overview

1: Click on **Test** TAB

2: Under the test interface, there are three functional areas: single channel IL&RL test; multi channel IL&RL test; monitoring test.

3: This area can enter some config info: product serial number, tester, etc.

Multi-core cable insertion loss and The return loss test solution

TestInfo

WorkNo: WorkJob123 Operator: Operator123

ProductNum: ProductNum123 Customer: OT123

BatchNum: SN123 OrderNum: SO123

CableInfo

CableID: CableID123 CableType: MTP123

CableInfo: MTPAAA123 CableSpec: 线缆说明123

SerialNum: 12345-10

MonitorTime: 0Hour47Minute48Second Channel 12 test Complete!

SingleChannel IL&RI Test

OPM: 1550nm

-3.87dBm

Pwr: -3.87dBm

SwitchOswChannel: CH1

CurrentOswChannel:

MultiChannel IL&RI Test

Channel	WaveA			WaveB			Time	Test
	Wave	IL	RI	Wave	IL	RI		
1	1310	0.09	-	1550	0.00	-	2017-08-23 18:39:43	Test
2	1310	-47.87	-	1550	-47.86	-	2017-08-23 18:39:44	Test
3	1310	0.51	-	1550	0.38	-	2017-08-23 18:39:46	Test
4	1310	-0.02	-	1550	-0.01	-	2017-08-23 18:39:47	Test
5	1310	-0.01	-	1550	0.00	-	2017-08-23 18:39:48	Test
6	1310	0.23	-	1550	0.33	-	2017-08-23 18:39:50	Test
7	1310	0.00	-	1550	-0.01	-	2017-08-23 18:39:51	Test
8	1310	-0.01	-	1550	-0.01	-	2017-08-23 18:39:52	Test
9	1310	-0.02	-	1550	0.00	-	2017-08-23 18:39:54	Test
10	1310	-0.01	-	1550	0.26	-	2017-08-23 18:39:55	Test
11	1310			1550				Test

TestComplete

MonitorTest

MonitorInterval A: 2 Min (1<=A<=100)

TotalMonitorTime B: 1 Hour (1<=B<=168)

START PAUSE QUIT

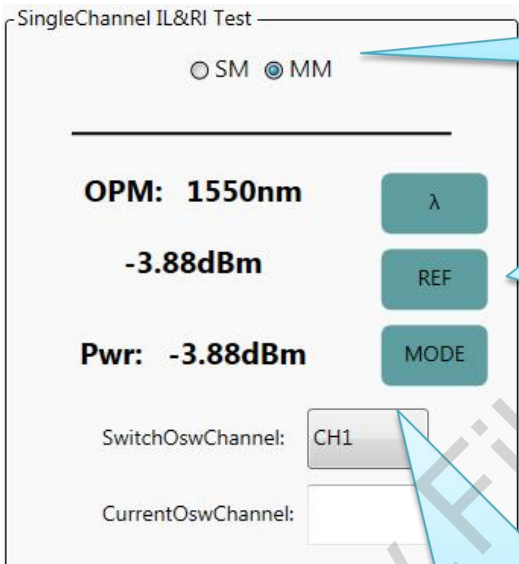
Note:

1) we usually fill in some information about the device before a device test, so that the data can be traced back in the future. So we provide a variety of information input box, you can fill in the form number, operator name, customer, order number, product serial number and a series of information.

2. Software Application

2-3 Test

2-3-2 Single channel IL&RL test



1: Depending on the device type, choose SM (single mode) version or MM (multi mode) version; usually this is confirmed at the time of manufacture, So do not need to choose.

2: 3 key operation area:

λ: Wavelength keys for wavelength switching; usually single mode switching between 1310 & 1550; multi mode switch between 850 & 1300;

REF: Zero Key, (take reference value), press this key in IL mode, can record the current optical power as reference value, for IL detection; press this key in RL mode, can measure the distance information of RL test, for RL detection;

MODE: mode switch key of OPM\IL\RL\ILRL\IL2\ILRL2 mode key switch function.

3: The switching control of multi-channel optical switch on ST-18001 equipment is carried out.

4: OPM、IL、RL、ILRL、IL2、ILRL2 Schema diagram



2. Software Application

2-3 Test

2-3-3 Multi channel IL&RL test

MonitorTime:0Hour47Minute48Second Channel 12 test Complete!

MultiChannel IL&RI Test

Channel	WaveA			WaveB			Time	Test
	Wave	IL	RL	Wave	IL	RL		
1	1310	0.09	-	1550	0.00	-	2017-08-23 18:39:43	Test
2	1310	-47.87	-	1550	-47.86	-	2017-08-23 18:39:44	Test
3	1310	0.51	-	1550	0.38	-	2017-08-23 18:39:46	Test
4	1310	-0.02	-	1550	-0.01	-	2017-08-23 18:39:47	Test
5	1310	-0.01	-	1550	0.00	-	2017-08-23 18:39:48	Test
6	1310	0.23	-	1550	0.33	-	2017-08-23 18:39:50	Test
7	1310	0.00	-	1550	-0.01	-	2017-08-23 18:39:51	Test
8	1310	-0.01	-	1550	-0.01	-	2017-08-23 18:39:52	Test
9	1310	-0.02	-	1550	0.00	-	2017-08-23 18:39:54	Test
10	1310	-0.01	-	1550	0.26	-	2017-08-23 18:39:55	Test
11	1310			1550				Test

TestComplete

5: This line display **test status**; usually, after we have tested a set of data, we will prompt the current channel to complete the test;

1: Total test key: Press the key, will be in accordance with the requirements of the test program, the test of the selected channel automatically;

2: Each row also has a separate test key, which is pressed to test only the current channel; typically used for retesting.

3: We will record each data test time of the test; we can see that the multi-mode dual-wavelength insertion loss and return loss are tested simultaneously, each channel time is about 3 seconds.

4: Retest function; When we have finished testing the whole set of data, we found that the second set of data is abnormal. If we want to retest it, we press the test key of the second set of data, and the second set of data is retested, this set of data was retested.

6: Threshold determine, the Red Font shows the unqualified data; according to the threshold of the test program, the data is qualified decision; here, the red part represents unqualified.

2. Software Application

2-3 Test

2-3-4 Monitoring Test

1. Monitoring Interval: the Interval between two adjacent tests; minutes; Input Range: 1 to 100 minutes; input decimal invalid, directly take integer.

2. Total Monitoring Time: the total time to be monitored; the unit is hours; the Input Range is from 1 to 168 hours; the input decimal is invalid, the Integer is taken directly.

Note: In Monitoring Test Mode, data saving is forced to be stored in a single Excel ; a single Excel file can store 9,000 lines of data; if you have more than 9,000 lines of data during monitoring, the software automatically creates a new Excel file.

3. **START Button:** This button is for the START monitoring operation; once pressed, the software will automatically test according to the total monitoring time and monitoring interval set.

4. **PAUSE Button:** This button is a PAUSE or continue monitoring action button. Once this key is pressed, the monitoring will be temporary, if you need to continue monitoring, then press this key can resume just operation.

5. **QUIT Button:** the Button is for the QUIT monitoring action. Press this button, will be directly out of the monitoring.

MonitorTime:0Hour47Minute48Second Channel 12 test Complete!

Channel	WaveA			WaveB			Time	Test
	Wave	IL	RL	Wave	IL	RL		
1	1310	0.09	-	1550	0.00	-	2017-08-23 18:39:43	Test
2	1310	-47.87	-	1550	-47.86	-	2017-08-23 18:39:44	Test
3	1310	0.51	-	1550	0.38	-	2017-08-23 18:39:46	Test
4	1310	-0.02	-	1550	-0.01	-	2017-08-23 18:39:47	Test
5	1310	-0.01	-	1550	0.00	-	2017-08-23 18:39:48	Test
6	1310	0.23	-	1550	0.33	-	2017-08-23 18:39:50	Test
7	1310	0.00	-	1550	0.00	-	2017-08-23 18:39:51	Test

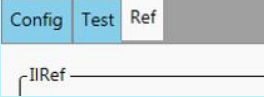
6. **Monitor status view:** above the multi-channel test area, is the progress information for monitoring the test. Easy to view, pause, cancel, and so on.

2. Software Application

2-4 Calibration

2-4-1 Calibration Overview

1: Calibration; Click on the calibration tab to enter the calibration interface of the instrument.



2: Under the calibration interface, there are two calibration areas, which are insertion loss calibration and echo loss calibration.

Channel	WaveA		WaveB		REF
	Wave	Value	Wave	Value	
1	1310	-6.77	1550	-6.59	REF
2	1310	-55.00	1550	-54.64	REF
3	1310	-6.87	1550	-6.55	REF
4	1310	-7.11	1550	-6.76	REF
5	1310	-7.39	1550	-6.92	REF
6	1310	-6.80	1550	-6.50	REF
7	1310	-7.25	1550	-6.91	REF
8	1310	-7.04	1550	-6.83	REF
9	1310	-7.27	1550	-6.81	REF
10	1310	-6.83	1550	-6.61	REF
11	1310	-6.96	1550	-6.75	REF
12	1310	-6.72	1550	-6.87	REF

The zero optical fiber access optical switch output port, please confirm the return to zero optical fiber end face for PC surface

dB m

- Note
- 1) About calibration, the academic define is takes the reference value, the normal define is returns to zero;
 - 2) For the IL calibration, its meaning is to obtain the output light power of the light source at the current wavelength, and take it as the reference value. During IL test, we use the reference value minus the real-time test to get the optical power value as the IL value.

2. Software Application

2-4 Calibration

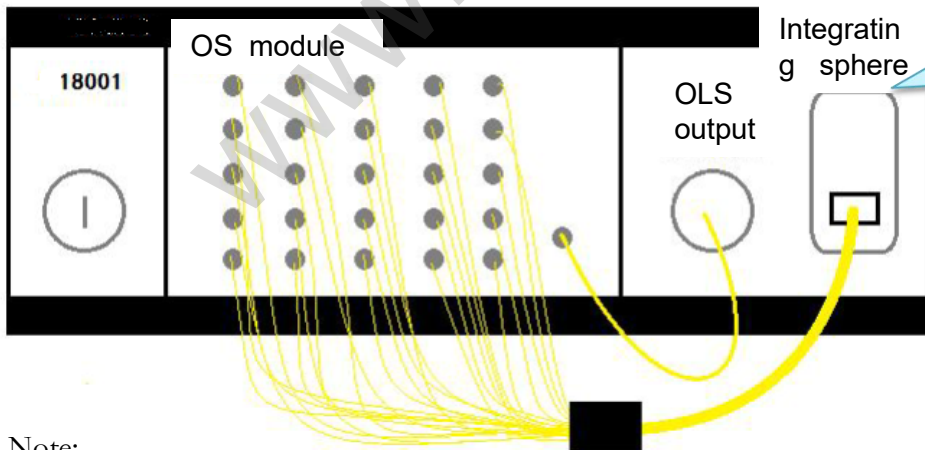
2-4-2 IL Calibration

Channel	WaveA		WaveB		REF
	Wave	Value	Wave	Value	
1	1310	-6.77	1550	-6.59	REF
2	1310	-55.00	1550	-54.64	REF
3	1310	-6.87	1550	-6.55	REF
4	1310	-7.11	1550	-6.76	REF
5	1310	-7.39	1550	-6.92	REF
6	1310	-6.80	1550	-6.50	REF
7	1310	-7.25	1550	-6.91	REF
8	1310	-7.04	1550	-6.83	REF
9	1310	-7.27	1550	-6.81	REF
10	1310	-6.83	1550	-6.61	REF
11	1310	-6.96	1550	-6.75	REF
12	1310	-6.72	1550	-6.87	REF

1: The total calibration key, press this key, can automatically calibrate the insertion loss of all channels.

2: Each channel has a separate REF key, which is dedicated to calibrating the current channel.

3: During the calibration process, each wavelength will produce a light power value; this data is the current channel wavelength reference value.



4: ST-18001 IL Calibration wiring diagram;

Note:

- 1) the key of IL calibration is to ensure that all optical fiber connectors of access equipment are clean and over 3D; for single mode MPO calibration, it is necessary to operate according to the diagram above. $IL = REF - \text{Current optical power value}$

2. Software Application

2-4 Calibration

2-4-3 Principle of RL test

Fibermart non-winding RL test adopts optical time domain reflection identification principle, which transmits a pulse light signal to an optical splitter through a laser, then the echo light signal is received by the detector through the

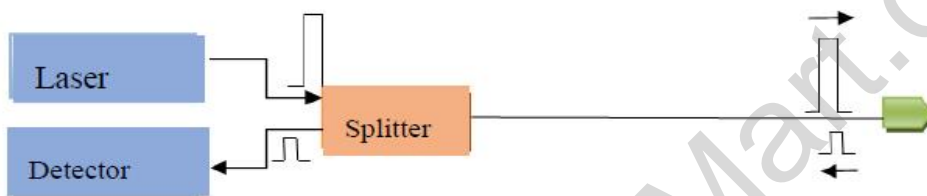


Figure 1-1 Schematic diagram of RL test principle

As shown in figure 1-1, a pulse from the laser generates a reflecting pulse at the reflecting terminal and is finally received by the detector.

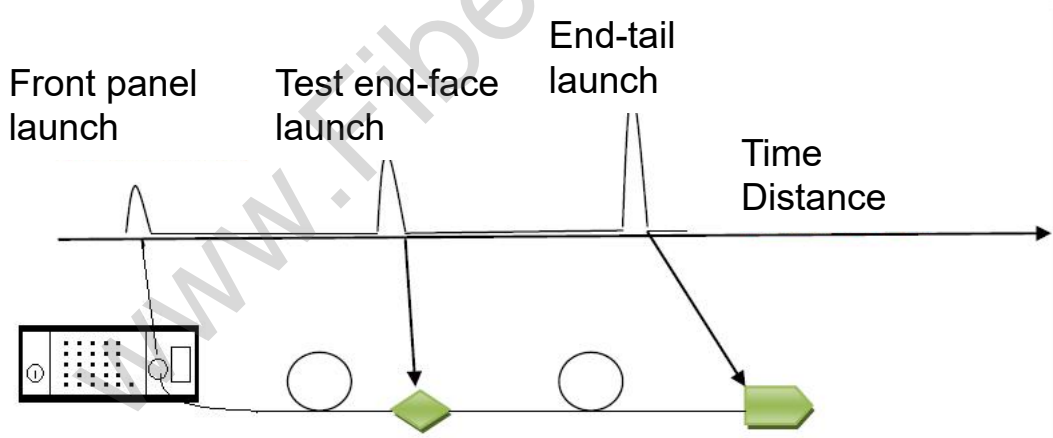


Figure 1-2 Time domain analysis curve of reflected signal

According to Fig. 1-2, the time domain curve of the received signal can be obtained, and the corresponding test distance or the signal amplitude of the measured connector at the corresponding time can be analyzed. The signal amplitude is proportional to the light reflection signal.

In fact, in figure 1-2, the front panel light output interface is reflective, especially if the interface is scratched or soiled. And the amplitude of the reflection produced by the measured connector is really needed to be sampled and tested, according to the calculation can get the reflection loss value of the reflector. In most cases, the end of the measured fiber will also produce a larger reflection. The equipment needs to analyze these different reflectors to get the correct value of return loss.

2. Software Application

2-4 Calibration

2-4-4 RL Calibration Principle

The position of the machine to be tested must be indicated before the return loss test. When the reference value of the return loss test is obtained, the equipment will look for a 1% ~ 4% reflector at the end of the cable. By pressing the REF key, the device will automatically scan reflection points within a range of 1M ~ 10M from the front panel. If a strong reflection point is not found within the specified range, the device will stop scanning and give an error message. If a desired reflection point is found, the device stores its location. See figure 1-3.



Figure 1-3 REF end face reflection

Calibration method of PC end face (reference on PC terminated cable)

An end face on a PC would ideally produce an inherent 4% reflection. This is the ideal case for getting to zero. The solution is to use an APC-PC fiber jumper to connect the clean APC end to the front panel and press the Ref key to obtain about 14.8 dB reflection and the distance of the reflection point.

Calibration method of APC terminal (APC Terminated Cable)

Usually the APC end face does not have enough echo reflection for the zeroing operation. You need to create a strong reflection on the APC face. There are two common approaches:

- 1) using an APC-PC fiber, connect the PC end face to APC end of the zeroing line, press REF key, get a reflection peak value of about 1%, its echo loss value is about 20dB.
- 2) using a APC-PC fiber jump, the cable is less than 10 cm, the APC end of the jump fiber and the standard fiber APC docking, REF calibration directly.

Note: If the instrument does not find a reflection value greater than -30 DB, the instrument display will indicate an error and declare that the reflection terminal is not found

2-4-5 RL Test

If Ref is successful, the value of echo loss at the acquisition position will be updated continuously on the display. At this time, the test jumper is connected, and the echo loss at the connection of the test fiber jumper can be displayed in real time.

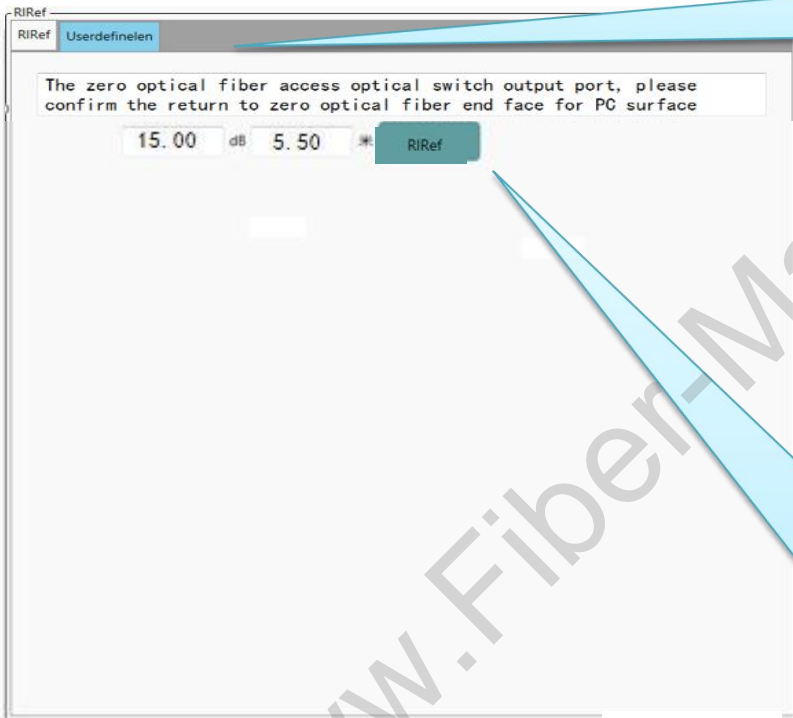


Figure 1-4 RL test schematic diagram

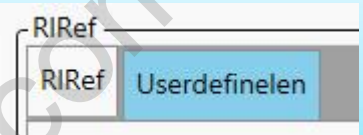
2. Software Application

2-4 Calibration

2-4-5 RL Calibration- Auto Calibration RL

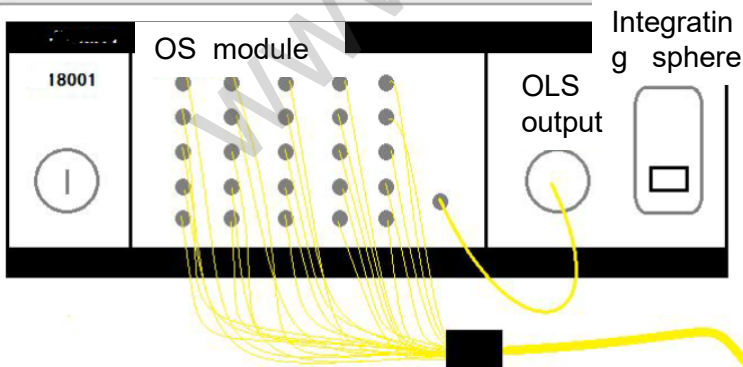


Zoom in



There are two methods to calibrate ST-18001's RL; one is through the RL calibration button under the RL calibration tab. The other is calibrated by entering the length directly under user-defined length tab.

2) Here the first method; in the RL calibration Tab, we press the RL calibration button, ST-18001 will automatically re-calibration, calibration will prompt the completion of the calibration values and distance. In this method, it is necessary to make sure that the end face of the fiber is PC or an end face with more than 1% reflection, usually the end of the PC is demarcated directly, the end of the APC is transferred by docking the PC face or adding 10cm short hop fiber See the APC calibration method on the previous page for details.



Note:

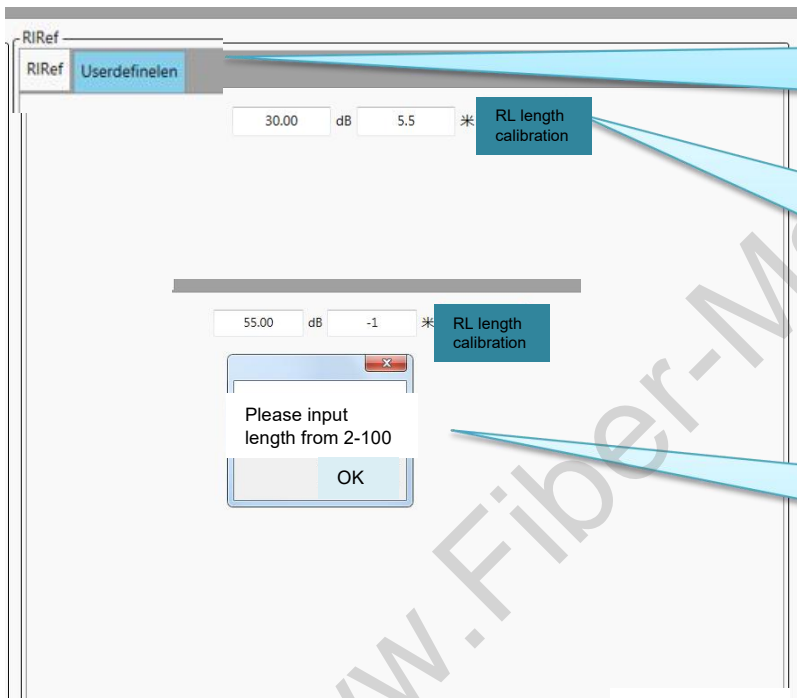
1) When ST-18001 RL calibration, the end face will be MPO/PC; if the end is APC end face, a short fiber from APC to PC (less than 10 cm) is usually used to calibrate; for APC calibration, there is another scheme, please see the next page.

UPC end face

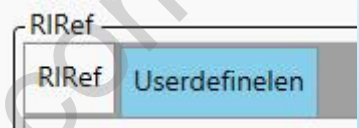
2. Software Application

2-4 Calibration

2-4-5 RL Calibration-Input length to calibrate



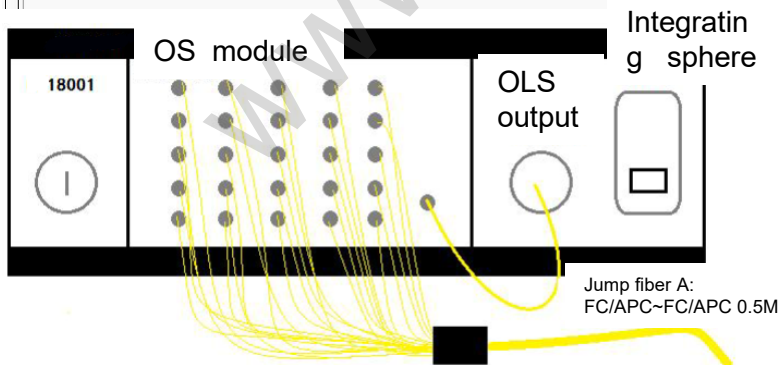
Zoom in



1) Here, we describe the second method of RL calibration. The input length must be between 2.0 m and 99.9 m, one decimal place. If the length is 5.5 m, input 5.5 m, click "RL length setting" .

2) Error cases: the input value must be between 2.0 and 99.9, and be a decimal place; if the input negative value or other non-conforming value, will be reported.

3) Optical fiber length calculation: Optical fiber length by jumping fiber a and MPO fiber B +0.5 m; as the Left Diagram, the actual length = jump fiber A + MPO fiber B + 0.5m = 0.5 + 4.5 + 0.5 = 5.5m



MPO Fiber B: FC/APC~MPO/APC 4.5M APC end face

Note:
1) the calibration method of manual input length provides a solution for the calibration of APC terminal, and also solves the problem that the measured point is not on the end face of some special devices.

3 Product terminology and calibration cycles

3 Product terminology and calibration cycles

3-1 Dynamic Range

The dynamic range, or detection range of optical power meter, it is the maximum power value can be measured from the instrument (maximum saturation of the detector) to the minimum power value (thermal noise of the detector is larger than the incident optical power). For accurate power measurements, do not measure power at any end of the dynamic range (you may refer to the definition of linearity).

3-2 Linearity

Photodetectors are linear in a large range of optical power input, but the electronic device of the optical power meter will affect the linearity of the whole system. For accurate insertion loss measurements, the input of the optical power should be controlled in the range of linearity (+ 0.04dB).

3-3 RL test range

The lower end of return loss (low return loss = high reflection) defines the instrument to reach saturation level because of a large reflection. The higher end of return loss (high return loss = weak reflection) is determined by the reflection ability of the instrument in expanding and solving the noise.

3-4 Turn-on stabilizing time

When turn-on, the optical system will be powered on. It should be preheated for some time and 30 minutes is recommended. In order to calibrate the instrument or to make a steady measurement, the instrument needs to be adjusted for 15 minutes for each 5 °C difference.

3-5 Calibration cycle

It is recommended that ST-18001 should be calibrated every 18 months. This calibration cycle is used to maintain instrument test parameters. We recommend that the calibration cycle should be determined based on statistical data on detector aging or the calibration cycle of the optical power meter in each company's metering strategies and procedures.

3-6 Instrument operating environment

Operating temperature: The operating condition of the instrument in this temperature range is in accordance with the specification (after the specified start-up preheating time).
Storage temperature: In this temperature range storage instrument (power-off state), will not cause any damage to the instrument or specifications change (instrument to work back to the normal operating temperature range).

4.Maintenance

4 Maintenance

4-1 Maintenance of the Detector (Integrating sphere)

Optical power meters (integrating spheres) are equipped with a system of optical detectors and adapters so that adapters can be exchanged to match the cable connectors to be measured. Remove the adapter and you will see the glass surface of the photodetector. In most cases, the detector glass surface is Ar (anti-reflection) coating, and easy to scratch.

If you need to clean the light detector surface, just use optical-grade lens cleaning paper. Carefully dust the detector by gently wiping the glass surface with a clean paper.

Based on our previous experience in the use of optical power meter adapters, we recommend that the adapters of optical power meter (integrating sphere) be replaced every 3 ~ 6 months to ensure the best adaptability and accuracy of the optical power meter adapters.

CAUTION: do not use cleaning fluid under any circumstances

4-2 Cleaning and maintenance of optical switch module

When the end faces of the optical switch modules leave the factory, the best polishing, insertion loss and return loss are controlled. The end face of the optical switch is easy to be dirty and scratched, so we provide several protection jump fiber when we come out of the factory. You need to make sure that the protection jump fiber is cleaned, and then connect with the optical switch module, it is also necessary to check the end face of the optical switch and the end face of the protection jump fiber.

4. Maintenance

4 Maintenance

4-3 Cleaning and maintenance of the optical connector

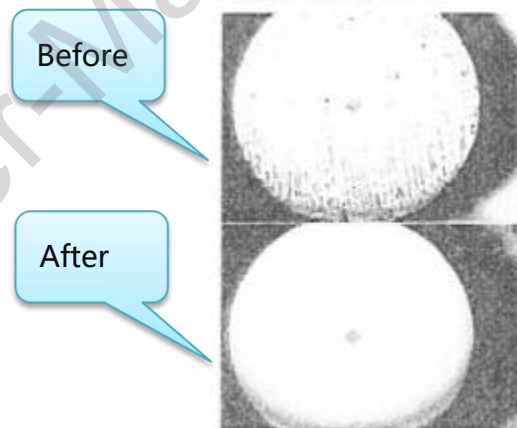
All optical connectors should be cleaned before pairing to ensure the longest lifetime and the best insertion loss and return loss parameters. If the optical connectors are not cleaned properly, the terminal polishing surface will be damaged. If the terminal polishing surface is used properly, the optical connectors can be used for more than 500 times.

4-4 The end face of optical connector before and after cleaning

The end face of optical connector before and after cleaning is as follows.

Cleaning tools

You can contact us if you have any requirements on the optical cleaning tools. We will try our best to provide you with a variety of professional cleaning tools.



5 Quality Assurance

5 Quality Assurance

5 .Quality Assurance

5-1. Caution: Repair ST-18001 in the field is Forbidden.

1) We warrant that ST-18001 will be free from defects in material and workmanship for 18 months. Should the device fail at any time during this warranty period, we will, at its sole discretion, replace, and repair or refund the purchase price of the product. The worth of the repair or replace will not be higher than purchasing price of this unit.

2) If the problems occurred can not be solved by the trouble shooting methods, please contact us or the local distributor directly.

3) This warranty is limited to defects in workmanship and materials and does not cover damages from accident, acts of god, neglect, wrong usage or abnormal conditions of operation.

5-2. This warranty of ST-18001 does not cover consumable accessories and problems / failures caused by the following reasons:

1) Unauthorized repairment or modification of the instrument .

2) Defects occurred under inappropriate use, negligence or accident.

ST-18001 Consumable accessories including

1) OPM (integrating sphere) adapter;

2) Protective fiber;

3) Fiber end face optical switch module;

5-3. Warranty

There is a warranty card along with the products, please fill-in the form and send back to us together with a copy of the invoice so we can have a record of your instrument maintenance, technical innovation, calibration and other things.

Appendix 1



Warranty Registration Card

Serial Number: ST-18001-IRL
Model Number: : _____
Date of Purchase: _____
Company Name: _____
Tel: _____ Fax: _____
Company Address: _____
Post Code: _____ E-mail: _____
Seal: _____

(Please keep this part, cut down the below and send back)
(cut down the below and send back .)

Serial Number: ST-18001-IRL
Model Number: : _____
Date of Purchase: _____
Company Name: _____
Tel: _____ Fax: _____
Company Address: _____
Post Code: _____ E-mail: _____

Note: Please fax this note within one month from the date of receiving units.

Appendix 2



Details of warranty terms and conditions

Warranty:

Free from defects in material and workmanship for a period of 18 months.

Warranty terms:

1. During the warranty period, we provide free repairment if something is wrong with the instrument when the product is used in the normal condition. The user should provide the warranty card and invoice or a copy of receipt.
2. Fibermart will charge corresponding fees for the cost of materials, repair and shipping in conditions of below:
 - 1) Defects occurred under normal use and service but out of the warranty period.
 - 2) Fail to provide this warranty card, warranty card omission, alteration or fail to fill in clearly.
 - 3) Abnormal conditions of operation or handling, such as artificial damage, or operating in abnormal conditions of like high temperature, high voltage, humidity and etc., We will charge depend on the actual failure rating.
 - 4) Failures and damages occurred do not because of defects in material and workmanship of products.
 - 5) Failures and damages occurred because of failing to comply with the Operation Instruction and necessary attention.
3. We will not maintain in following circumstances:
 - 1) unauthorized repairment or modification of the instrument without our company's consent.
 - 2) the products are not manufactured and sold by our company.

HTTP: www.fiber-mart.com

E-mail: sales@fiber-mart.com