



Optical Time Domain Reflectometer

Model LOT5200



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Preface

Thank you for purchasing LinkU OTDR (Optical Time Domain Reflectometer). This manual contains useful information about this instrument's function, setting, operating procedures and maintenance. To ensure correct use, please read this manual thoroughly before beginning operation. After reading the manual, keep it in a convenient location for quick reference whenever a question arises during operation.

The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functions.

Safety Precaution

1. AC/DC Adapter

Power supply spec.: Output DC: 12V, 3A~4A

Input AC: 100V ~ 240V, 50~60 Hz, 1.6A

Using an inappropriate charger adaptor may result in damage to the instrument.

2. Battery

In order to ensure the performance of batteries, please use internal batteries to supply power when using this instrument for the first time, deplete the battery power, and then recharge the battery. The first charging time should be no less than 4 hours. The charging temperature range is $-10 \sim 50^{\circ}$ C. When the ambient temperature is too high, please stop charging for your safety. When the instrument is idle for more than 2 months, it should be charged in time to maintain the battery power do not put the battery close to the source of fire. Do not open or damage the battery. The temperature range for long term storage is $-20 \sim 50^{\circ}$ C.

3. Laser Safety

The laser in this equipment is classified as Class 3B. It may result in serious damage to

the eyes. Never look directly into the connector on the equipment nor into the end of the cable connected to the equipment.

4. Before testing with OTDR module please ensure there is no active signal in optical network under test, any signal which power is higher than 0dBm will permanently damage this instrument and this damage is not covered by the warranty !



1. Overall Layout



No.	Name	Description
Ι	Optical interface	VFL, Power Meter, Laser Source, OTDR
Π	Electrical interface	Power supply, MINI USB
III	Electrical interface	USB2.0 (Type A), SD card
IV	Indicator light	Indicates which functional module is working
V	Key	Power Key

In Main Menu,press [$^{\otimes}$] to enter the quick menu, in which user can turn on/off Bluetooth and take screenshots



2. System Settings

In Main Menu,press [Setting] to enter the System Settings, press [System Info] to check system information of the OTDR, press [Upgrades] to upgrade the OTDR software and firmware.

System Settings	2021-12-16 10	\gg		
Language	English	Language		System Info
Back Light	Common	✓ English Español		Upgrades
Auto Poweroff	Never	Русский		
Date Settings		Français		
Date Settings		🔵 한국어		
Time Settings		Português		
		Italiano		
				Quit

3. OTDR Module

In Main Menu, press [OTDR] to enter OTDR module setup menu.

3.1 Setting

Press [Test Parameter] menu to enter the Test Parameter setting

Test Parameter	2021-12-16	12:35	
Test Wave	1550nm	Pulse Width	Manual Test
Test Range	2km	Sins 5	Test Parameter
Pulse Width	3ns	10ns 20ns	Threshold
Test Time	55	50ns	Settings Default
Refraction		200ns	Parameter
Launch Cable	None	500ns	Light Calibration
Receive Cable	None	2us 5us	
Unit	km	0 10us	Back

3.1.1 Parameters Settings

[Test Wave]: Select test wavelength

[Test Range]: Select test distance (selectable only in manual mode). In automatic mode, OTDR will adopt the most appropriate parameters for the current measurement automatically.

[Pulse Width]: Select proper Pulse Width.

Pulse width refers to the time width of the optical pulse signal, the wider the pulse width, the stronger the optical power injected into the optical fiber, the stronger the backscattering signal of the optical fiber, the farther the OTDR can effectively detect, but the wide pulse width will cause the saturation of the initial reflection signal and cause a large dead zone. Therefore, the choice of pulse width is related to the fiber length. The longer the fiber length is, the wider the pulse width is.

* OTDR will automatically select the most appropriate reference pulse width when manual test range is set in automatic mode. The range and pulse width can be adjusted in manual mode. The following suggestions is for your reference only:

Test Range Pulse Width	500m	2km	5km	10km	20km	40km	80km	120km	200km	240km
3ns	~	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ
5ns	~	~	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ
10ns	~	~	~	Δ	Δ	Δ	Δ	Δ	Δ	Δ
20ns	~	~	~	~	Δ	Δ	Δ	Δ	Δ	Δ
50ns	Δ	~	~	~	~	Δ	Δ	Δ	Δ	Δ
100ns	Δ	Δ	~	~	~	Δ	Δ	Δ	Δ	Δ
200ns	Δ	Δ	Δ	Δ	\checkmark	\checkmark	Δ	Δ	Δ	Δ
500ns	Δ	Δ	Δ	Δ	\checkmark	\checkmark	\checkmark	Δ	Δ	Δ
1us	Δ	Δ	Δ	Δ	Δ	\checkmark	\checkmark	\checkmark	Δ	Δ
2us	Δ	Δ	Δ	Δ	Δ	Δ	\checkmark	\checkmark	~	Δ
5us	Δ	Δ	Δ	Δ	Δ	Δ	\checkmark	~	~	~
10us	Δ	Δ	Δ	Δ	Δ	Δ	Δ	~	~	~
20us	Δ	Δ	Δ	Δ	Δ	Δ	Δ	~	\checkmark	~

[Test Time]: Select test time (Average Test) or [Real Time]

In average test mode, the longer test time is, the better the signal to noise ratio of the signal is and the more accurate the test results are.

In Realtime test mode, OTDR will keep running test until stopped by user, and display the last test result.

[Resolution]: Higher resolution will have more sampling points and higher accuracy, but also increase the amount of data collected.

[Refraction]: Edit the refraction index which is recommended by the fiber manufacture.

[Launch Cable]: Set the length of the Initial Fiber (Guide Fiber).

User could move the first connector out of the dead zone of the OTDR by using an initial fiber. Proper length of guide fiber is 100~1000m.

[Receive Cable]: Set the length of the receive cable.

[Unit]: Select distance unit: km, kfeet, mile

3.1.2 Threshold Settings :

The threshold settings allow user to set the threshold of Attenuation, Reflection, Terminal, Backscatter coefficient and Pass / Fail judgement.

3.1.3 Default Parameter: Press [Yes] to restore the factory settings.

3.1.4 Light Calibration: Press [Yes] to reset the baseline of the light detection, meanwhile, the OTDR output port must be covered.

3.2 Running Test

3.2.1 Real time Test Mode

In main menu, press [OTDR] >> [Parameter Settings] >> [Test Time] to choose [RealTime], then press [Manual Test] to run real time test.

3.2.2 Average Test Mode

In main menu, press [OTDR] >>[Parameter Settings] >> [Test Time] to choose Test time, then press [Manual Test] key to run averaging test.

3.2.3 Auto Test Mode

In main menu, press [OTDR] >> [Auto Test] to run auto test.

The measuring results could be auto saved once the measurement is finished.

3.3 Curve Operations

In main menu, press [OTDR] >> [Curve Operations]

- 3.3.1 [Cursor]: Select cursor A or B, and move the selected cursor which is highlighted in red color.
- 3.3.2 [Curve Operations]: Zoom in or zoom out the curve horizontally or vertically which is centered around the selected cursor (A or B, or between A and B)

3.4 File Operations

In main menu, press [File] or press [OTDR] >> [File Operations]

3.4.1 [Load]: To select and process saved files.

\sim File Operations 2021-12-16 12:41 OTDR-850-20ns-0001.sor 850nm 20ns 10000S IOR:1.4685 File Operation Storage Card 14 Files Date A., OTDR-850-20ns-0001.sor 2021-12-16 08:30 System Volume Informat Load 20211215 ... OTDR-850-20ns-0002.sor 2021-12-16 10:29 Software OTDR-850-3ns-0003.sor 2021-12-16 10:29 Save Settings 20211216 OTDR-1310-3ns-0004.sor 2021-12-16 10:29 SNAP OTDR-1310-50ns-0005.sor 2021-12-16 10:30 OTDR-1310-50ns-0006.sor 2021-12-16 10:30 OTDR-1310-3ns-0007.sor 2021-12-16 10:41 OTDR-1550-3ns-0008.sor 2021-12-16 10:42 OTDR-1550-3ns-0009.sor 2021-12-16 10:42 OTDR-1550-3ns-0010.sor 2021-12-16 10:42 > Quit OTDR-1550-10ns-0002.sor 2021-12-16 11:26 99.7% Free (14.50 G)

3.4.1.1 [File operation]: To copy, cut, paste, delete, rename the selected file 3.4.1.2 [Load]: To load the selected file to the screen

- 2.4.4.2 [Cove Cottingely To choose store to the selection
- 3.4.1.3 [Save Settings]: To choose storage device, edit file information
- 3.4.2 [Save]: To save current test result
- 3.4.3 [Switch]: To switch different curves, the selected curve will be highlighted
- 3.4.4 [Remove Current Trace]: To remove cutrrent curve
- 3.4.5 [Save Settings]: To choose storage medium, edit file information
- 3.4.6 [Event Analysis]: To select cursor, curve operations, add /remove event

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3.5 Event Map

In main menu, press [Event Map]



- 3.5.1 [Test]: to run test
- 3.5.2 [Cursor]: to select cursor A or B
- 3.5.3 [Setting]: to setup Test Mode, Test Wavelength, Test Range, Pulse Width, Pass/Fail Thresholds, Splitter Loss, and the lenth of Launch Cable / Receive Cable

The Pass/Fail threshold is used to judge whether the welding junction and flange connection point are within the acceptable range.

Event Map	2021-12-16 12	::53		\gg
Test Mode	Auto	Pass/Fail Threshold		Test
Test Wave	1550nm	Reflection Event	✓ ▲ 0.5 dB	Default Parameter
Test Range	500m	Non Reflection Event		
Pulse Width	10ns	Total Loss	0.1 dB	
Pass/Fail Threshold		. I	20 dB	
Splitter		Reflect	-40 dB	
Launch Cable	None	Average Loss(dB/km) 850nm	0.800	
Receive Cable	None	1300nm	0.500	Back
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There would be one or more 1*N splitters in PON network with different loss at each splitter point, so, it is necessary to preset the loss value of the splitter. If the loss value is set incorrectly, the accuracy of the event map will be affected.

Event Map	2021-12-16 12	2:53		\gg
Test Mode	Auto	Splitter		Test
Test Wave	1550nm	1*4Minimum 1*4Maximum	6.0 dB 7.5 dB	Default Parameter
Test Range	500m	1*8Minimum	9.0 dB	
Pulse Width	10ns	1*8Maximum 1*16Minimum	10.6 dB 12.0 dB	
Pass/Fail Threshold		1*16Maximum	13.8 dB	
Splitter				
Launch Cable	None			
Receive Cable	None			Back

- 3.5.4 [Load]: To load the selected file to the screen
- 3.5.5 [Save]: To save current event

3.6 AOFIL(Intelligent analysis of optical fiber link iLOM)

AOFIL is to use multi pulse width to intelligently identify various event types in optical fiber link, such as reflection event, attenuation event, 1: N splitter, etc.

AOFIL			202	22-02-17 15:	:15			\gg
1550r	nm							
Link Le	ngth: 202	25.16m Link	Loss: 10.0dB					Test
E	0.00r	n		1.04km		I 2.03k	m	Setting
				1:8		-		Save
		1	04km		984 00m	1		
No.	Туре	Distance km	Segment km	Loss dB	Total Loss dB		Reflect dB	
1		1.041	1.041 0.984	9.778	9.981 20.127	0.176	-42.26 -41.49	
		2.520						
								Quit

* Parameter Setting

The parameters must be preset before running AOFIL.

AOFIL	2022-02-17 18	i: 15	\gg
Test Wave	1550nm	PON Type	Test
PON Type	Manual Setting	No Splitter	
Primary Splitter	1*8	Automatic Setting	
Two Stage Splitter	1*8		
Pass/Fail Threshold			
Splitter			
Launch Cable	None		
Receive Cable	None		Back

AOFIL	2022-02-17 15	:16	\gg
Test Wave	1550nm	Test Mode	Test
PON Type	Manual Setting	No Splitter	
Primary Splitter	1*8	✓ 1*8	
Two Stage Splitter	1^8	 1*16 1*32 	
Pass/Fail Threshold		0 1*64	
Splitter			
Launch Cable	None		
Receive Cable	None		Back

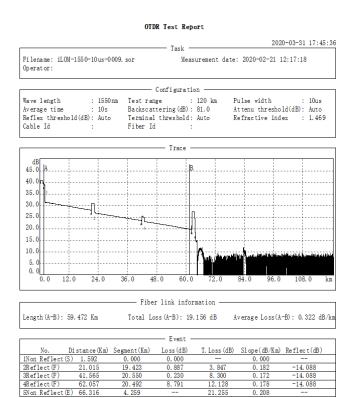
AOFIL	2022-02-17 15	:16	-	\gg
Test Wave	1550nm	Splitter		Test
PON Type	Manual Setting	1*4Minimum 1*4Maximum	6.0 dB 7.5 dB	
Primary Splitter	1*8	1*8Minimum	9.0 dB	
Two Stage Splitter	1*8	1*8Maximum 1*16Minimum	10.6 dB 12.0 dB	
Pass/Fail Threshold		1*16Maximum	13.8 dB	
Splitter				
Launch Cable	None			
Receive Cable	None			Back

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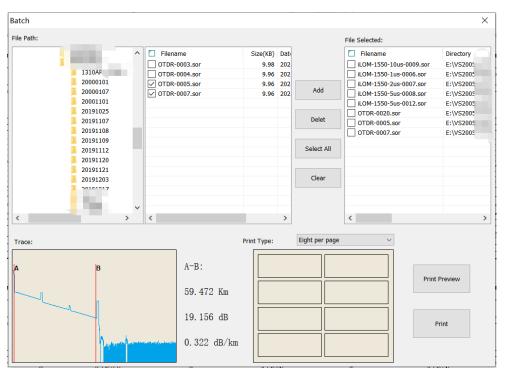
3.7 PC Software

User can carry out multi-trace comparison or analysis by using PC software after upload the traces to computer, and print the report easily.

Note: The software installation file and operation instructions are stored in the SD card of the device. The files can be transfered to computer through the mini USB cable.



Batch printing:



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OTDR Te	est Report 2020-03-31 17:09:		DR Test Report	2020-03-31 17:09:4		OTDR Test Report	2020-03-31 17:0		OTDR	Test Report	2020-00-81 17:09:
	Task 2020-03-31 17:08: Neasurement date: 2020-02-21 12:17:18	Filename: iLON-1000-1us-0008.s	or Neasurement			007. sor Xeasureme	2020-03-31 17:0 nt date: 2020-02-21 12:18:35			- Task	date: 2020-02-21 12:16:57
Cont Wave length : 1050nm Pulse width : 10us Refractive indax : 1.40 Reflex threshold(d8): Auto	figuration	Wave length : 1000nm Pulse width : lus Mafractive index : 1.409 Raflex threshold(d8): Auto	 Configuration — Test range Average time Attemu threa Terminal thr 		Yave length : 100 Pulse width : 2us Refractive index : 1.4 Reflex threshold(d8) : Aut	Average t 69 Attenu th	e : 120 km		: 1550nm : Sus : 1.469	nfiguration Test range Average time Attemu three Terminal the	
	Trace		Trace			Trace				- Trace	
		4.0 A	- 4 · · · · · • 5	84.0 98.0 108.0 im		38.0 48.0 80.0 72	Marca 1025 108.0	40. C A 40. C	24.0 38.0 48	B 3 0 80.0 72.0	1 81.0 90.0 100.0 k
	information(A-B) s: 19.108 dB Average Loss: 0.322 dB/km		er link information(A-8) tal Loss: 14.295 dB	Average Loss: 0.231 dB/km		Fiber link information() Total Loss: 14.380 dB	-8)	n Length: 61.294 Kn		nk information(X-B ss: 14.186 dB	0
No. Distance(Km)	Event	No. Distance		T.Loss(dB) Slope(dB/Xm)		Event	T. Loss (d8) Slope (d8/%)	No. 1Non Reflect(S)	Distance(Km) 0.764	Event	T. Loss (dB) Slope (dB/Km)
2Reflect (F) 21.015 3Reflect (F) 41.565	0.887 2.847 0.182 0.230 8.300 0.172	2Reflect(F) 1.029 3Reflect(F) 21.01	1.757	0.255 0.229		1.029 1.686 21.015 0.909	0.264 0.238	2Reflect(F) Smeflect(F)		1.910	0.204 0.000
	est Report . Task 2000-00-31 17:00: . Newsymmetr data: 2000-00-31 13:13.10	e	DR Test Report	2020-09-01 17:09:4		OTDR Test Report	2020-03-31 17:0			Test Report	2020-03-31 17:09:
Filename: iLOW-1000-Dus-0012.scr Operator:	Task 2000-03-31 17:00: Weasurement date: 2000-02-31 10:13:10 figuration -	41 Filename: OTDR=0020.sor Operator:	Task		Filename: OTDR-0000.sor Operator:		2020-03-31 17:0 nt date: 2020-03-28 15:17:10		7. sor	- Task	
Filename: iLOW-1000-Dus-0012.scr Operator:	Task	41 Filename: OTDR=0020.sor Operator:	Task Heasurement Configuration Test range Äverage time Ättemu three	2020-03-81 17:09:4 date: 2020-03-10 18:59:52 : 120 km	Filename: 0TDR-0005.sor	Configuration — Configuration — Otom Test rang ns Average t 49 Attemu M	2020-00-31 17:0 nt date: 2020-03-28 15:17:10 e : 20 km	Filename: OTDR-000 Operator: Wave length	7. sor : 1550em C : 550es : 1.489	- Task	2020-03-31 17:09: date: 2020-03-28 15:48:38 : 20 km
Pilemana: 11.DH-100-ber-0012.sor Operator: Nere length : 1500m Pile wich : 1500m Refractive index : 1.409 Refractive index : 1.409 Refeat threshold(dg): Auto	1000-01-01 17.08* Tearment der: 000+01-01 16-13-10 Tearment der: 000+01-18 16-13-10 Tear men 18 Tear men 19 Amerikant Stratter Tear men 18 Tear men 19	41 Piloame: OTOR-0020, sor Operator: Wave length : 1310mm Pulsa width : 20us Rafractiv index : 1.468	Task Heasurement	2020-03-31 17:09:4 date: 2020-03-10 18:59:52 : 120 km : 10s shold(dat): Auto	Filename: 0TDR-0008.sor Operator: Ware length : 155 Pulse with : 500 Refractive index : 1.4	Task Nessures	2020-00-01 17:0 nt date: 2020-03-28 15:17:10 e : 20 km ime : 15s reshold (80) : Auto	Pilesme: Ord=000 Guarant: Weise match Parls match Refraction index Refractions index Refractions index 0.0 cm The second Parls match Refractions index Refractions index Refractindex Refractindex Refractions index Refractindex Refractions index	7. sor : 1300m : 000ns : 1.489 B): Auto 	Task Heasurement	2020-00-31 17:09: date: 2020-03-28 15:48:38 : 20 km : 155 shold(38): Auto
1:sector 1:00/000-1000-1000-0001.ser Versition Cont News largeth 1:00/000 Refrective index 1:460 Refrective index 1:460 0:0	1000-00-01 20 00.01 Taxarrament des: 0000-01-01 20-01 20 Taxarrament des: 0000-01-01 20 Taxarrament des: 0000-01-01 20 Taxarrament des: 0000-01-01 20 Taxarrament des: 0000-01-01 20	6 Pisses: 0000000000000000000000000000000000	Tast Besurement - Configuration - Tartane Average too Average too	2000-02-01 11:00:04 dent: 2000-02-01 10:05:04 . : 100 hm maid dent: 500 . : : 100 hm maid dent: 500 . : : : : : : : : : : : : : : : : : : :	1 1	Task Task	2000-00-01 17:0 nt data 2000-00-01 15:00 n : 20 im ne : 20 im 1 : 20	Plicame: Oran-000 Pursur: The same Parts sight Partsis Parts sight<	7. sor 2. 1350cm 2. 200ms 2. 200m	Task Wessrener Wessrener Task Task Task Task Task Task Task Task total to	2009-03-10 17 08: den: 2009-03-10 17 08:10 2019-03-10 18:10 2019-03-10 18:10 2019-03-10 18:10 2019-03-10 18:10 2019-03-10 18:10 2019-03-10 18:10 2019-03-10 18:10 2019-03-10 201
1:sector 1:00/000-1000-1000-0001.ser Versition Cont News largeth 1:00/000 Refrective index 1:460 Refrective index 1:460 0:0	1000-00-01 21 001- Taxpromet des: 000-02-01 50:10 Terrary 100-02-01 50:110 Terrary 100-02-01 50:010 Terrary 100-02-01 50:010 Terrary 100-02-01 Terrary 1	61 Filmmer. 000F-000.srf Friender. 100f-000.srf Friender. 100f-000.srf Friender. 100f-000.srf Frieder. 100f-000.srf	Tall Reserved Configuration — Terring the terring the	2000-02-01 11 12:00-02 dars: 2000-02-01 31:00-02 	P1/sec:107=0006.sc P2/sec:00	Task Newstreme Configuration	2000-01-01 17:0 st date 2000-01-01 15:01 s : 20 lm ss : 20 lm s	P:issee OTH-000 Generation The issee Parts instands Franking Faile State State Image: State State State Image: State State	7. sor 2. 1350cm 2. 200ms 2. 200m	- Task	2009-03-01 17 08: data: 2009-03-01 19:108 : 20 3m : 20

4. Other Modules

4.1 Visual Fault Locator (VFL) Module

The 650nm VFL module is used to identify fiber and locate a break (or macrobend) point. It works in 2 selectable modes: CW and 2 Hz modulation.

The VFL can be turned off by pressing [Shutdown] or [Quit]. When the VFL module is activated, do not stare into the beam directly, otherwise it may cause irreversible injury !



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4.2 2 SW L3FRDZOHOUHWHU 230 0 RGXOH

7KH230KDV WKH IUHTXHQFIXQQGFMROQFRAQJLFND-WJLNR-QJ 3UH¥67WDUW 6H64KXWUGQFDEXQQF302WK2H30 3UHVV >λ 6ZLWFK@toEXDYNHDHKIQVWKHKtest 3UHVV ±ko5s(H)402 WKH FXUDUH402WKHYD19DKH-UHQFH YDOXH 3UHVV >= HUR@torHVHW WK41HUF4[HUHQFH YDOXH WR

Power Meter		2021-12-16 10:32		\gg
				Shutdown
	1550nm		CW	λ Switch
	_1	3.9	9	REF
			dBm	Zero
	Linearity power	Reference power	Relative power	
	39.89uW	0 dBm	-13.99dB	
				Quit

4.3 / D 1/H 1/6 R 1/2 / 6 0 R G X O H

7KH 2/6 PRGXOWSBREUKIVGS%XP"G% DKHBVZDYHOHDQYJ2W7K5/ DQG XVH/DW7KK1SHWLFDO SRUW

3 U H V V > 6 W D U W X6 KU X2 WORGORS ZWQ K22H160 t

3UHVV >λ6ZLWFK@tosZLWFKWKHFXUUHQWZDYHOHQJWK 3UHVV >)UHT6ZLWWFKMRH@WobGSL22H/27WXFFHKQF\RI&: +]N+]N+]



4 / R V 17/ H V Win2og/ 7 0 R G X O H

7 KH2/7 PRGXZOLHEDHODFWLYZDXWHEBHRSW2/K6 DQG 230 PRGXOHV DUH DYDLO 3 UHVV > 6 W DUW X6 K0 X2 WORGOORSZWQ K22H7rot 3 UHVV > λ 6 Z LZWLFWKF®E tolvsK H FXUUHQW ZDYHOHQJWK 3 UH¥57()@tblowWikFHXUUYHDQOVDXWH/KUHHIHUMIDQOFMIH 3 UHVV > = HURW28000bHiHHWUHHWQFWHR3YHDUORXH

Loss Test	2021-12-16 10:33			\gg
				Shutdown
	LS	{ 3 { O nm		λ Switch
	OPM	-13.63 _{dBm}		REF
		-13.	Zero	
	Linearity power	Reference power	Relative power	
	43.39uW	-13.64dBm	0.01dB	
				Quit

5. Softwareware Upgrade

Upgrading can be done by inserting an U disk in the USB port (the upgrade file must be in the root directory).

Upgrade Steps:

- 1) Put the software upgrade file in the U disk root directory
- 2) Turn on the instrument and insert the U disk into the USB port.
- 3) In main menu, press [Settings] >>[Software Upgrade] >>[OK]
- 4) Upgrading will be done automatically

Note: Do not turn off the instrument during the upgrade, do not unplug the U disk, these wrong operations may cause system software damage and instrumentation cannot start normally, once this situation occurs, please contact the manufacturer or the authorized after sales service agent for system repair.

6. Instrument Maintenance

6.1 Connector Cleaning

The output interface of the LOT5100 series OTDR is an interchangeable 2.5mm universal interface, which must be kept clean. When the test results are inaccurate or abnormal, the first action is to check and clean the connector. When cleaning, make sure that OTDR and VFL modules are turned off. Unscrew the output interface and wipe the end face with a dust free paper towel or cotton swab wetted by alcohol.

Also, please keep the dust cap clean and put on the output interface after use.

6.2 Screen Cleaning

The LOT5200 series OTDR comes with a 7-inch TFT color LCD capacitive touch screen. Don't stab the LCD screen with sharp object. To clean the LCD screen, please use soft paper cloth. Do not use organic solvent to wipe the LCD screen.

6.3 Instrument Calibration

It is suggested that the OTDR should be calibrated every two years.

Users are strictly forbidden to dismantle the machine without permission, otherwise the manufacturer has the right to refuse to provide the warranty service.