

Technical Specification

for

OTH - 3000

(Optical Test Hub)

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1. General Introduction

1.1 Description

The Optical Test Hub (OTH) is an instrument which provides an optical stable light sources and optical power meters. The universal main frame provides up to 36 Channels (OTH-3000) accordingly for installing power meter or light source module.



The Optical Test Hub is ideal for field or laboratory testing of optical network testing by changing the interchangeable module.

1.2 Features

- 1U 19" rack mount design (OTH-3000)
- +5 ~ -50 dBm optical power meter measurement range with general SC connector.
- +5 ~ -70 dBm optical power meter measurement range with general SC connector. Design for measuring Return Loss
- +3 / 0 / -3 dBm optical power adjustable for light source with SC connector.
- Low cost and hot swap for both the light source and power meter module.
- Simple USB interface with friendly Graph User Interface (GUI)
- Remote commands for controlling and accessing data.

1.3 Application

- Maintenance CATV / Telecom / FTTH fiber optical networks.
- Standard laboratory applications.
- Passive component fabrication. Return Loss measurement.
- Optical fiber network traffic monitoring systems.
- Optical analog sensing system.

2. Specification

Operating Temp.	0°C ~ 50°C
Storage Temp.	-20°C ~ 70°C
Resolution	0.01 dB
Accuracy for Singlemode	±0.3 dB under calibrated condition
Accuracy for Multimode	±0.5 dB under calibrated condition
Power Supply	100~240VAC / 50,60Hz
Dimension	168 * 108 * 36 mm
Weight	1.5 Kg

2.1. Power Meter Module selection guide

Calibration Wavelengths :	Power Range				Note
	Min.	Typ.	Max.	Unit	
1310nm , 1490nm , 1550nm	-70		+5	dBm	@ 25°C 9 / 125 μm fiber
CWDM 1270nm ~ 1450nm	-70		+5	dBm	@ 25°C 9 / 125 μm fiber
CWDM 1470nm ~ 1610nm	-70		+5	dBm	@ 25°C 9 / 125 μm fiber
CWDM 1270 ~1610nm	-70		+5	dBm	@ 25°C 9 / 125 μm fiber
VCSEL 850 nm	-50		+5	dBm	@ 25°C 62.5 / 125 μm fiber

2.2. Light Source Module selection guide

X=2 , SC Connector

P/N: S20133320650	Min.	Typ.	Max.	Unit	Note
FP LD Output Power		-3		dBm	@ 25°C 62.5 / 125 μm fiber
Center Wavelength λC		650		nm	

P/N: S201336X0850	Min.	Typ.	Max.	Unit	Note
VCSEL LD Output Power		0		dBm	@ 25°C 62.5 / 125 μm fiber
Center Wavelength λC		850		nm	
Spectral Width Δλ			<0.85	nm	

P/N: S201333X1310	Min.	Typ.	Max.	Unit	Note
FP LD Output Power	-3	0	+3	dBm	@ 25°C 9 / 125 μm fiber
Center Wavelength λC	1290	1310	1330	nm	@ 25°C 9 / 125 μm fiber
Spectral Width Δλ			<4	nm	@ 25°C 9 / 125 μm fiber

P/N: S201333X1550	Min.	Typ.	Max.	Unit	Note
FP LD Output Power	-3	0	+3	dBm	@ 25°C 9 / 125 μm fiber
Center Wavelength λC	1520	1550	1570	nm	@ 25°C 9 / 125 μm fiber
Spectral Width Δλ			<4	nm	@ 25°C 9 / 125 μm fiber

P/N: S201334X1310	Min.	Typ.	Max.	Unit	Note
DFB LD Output Power	-3	0	+3	dBm	@ 25°C 9 / 125 μm fiber
Center Wavelength λC	1290	1310	1330	nm	@ 25°C 9 / 125 μm fiber
Spectral Width Δλ			<1	nm	@ 25°C 9 / 125 μm fiber

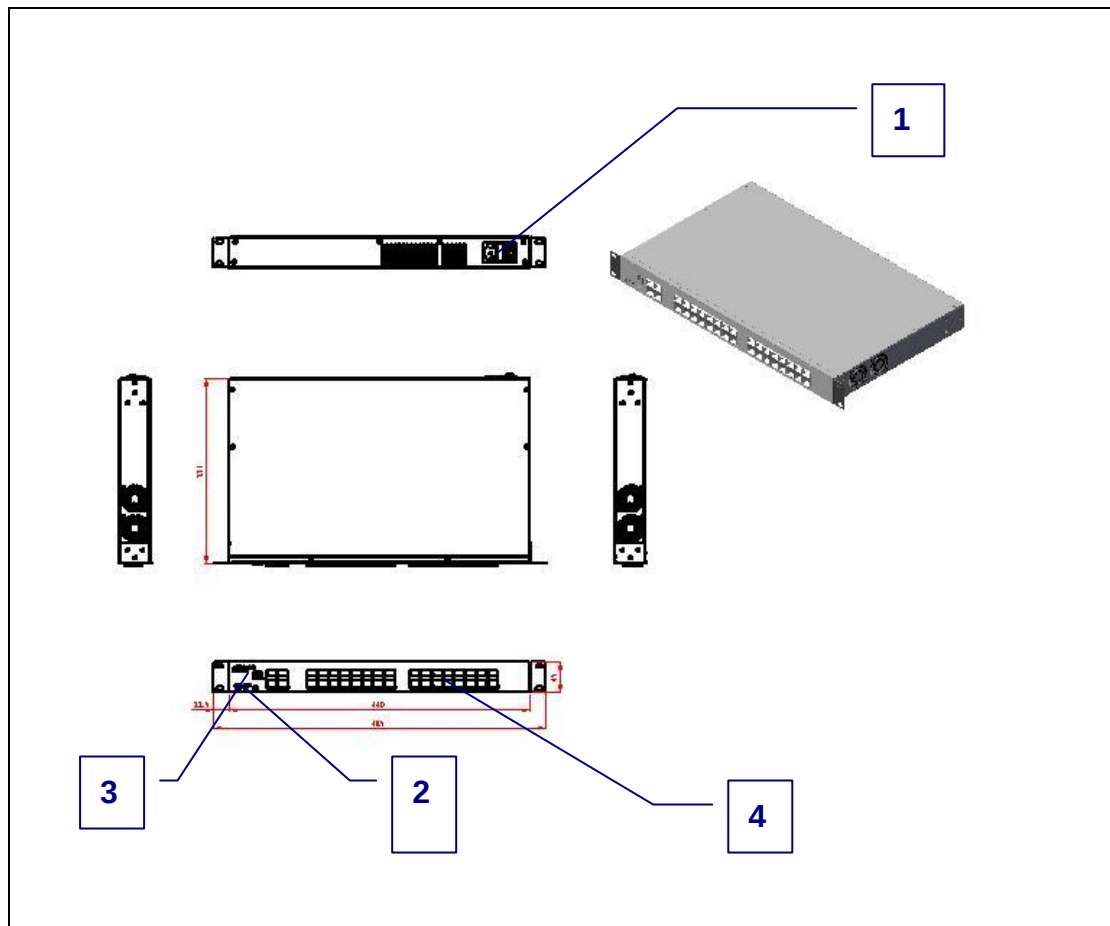
P/N: S201334X1550	Min.	Typ.	Max.	Unit	Note
DFB LD Output Power	-3	0	+3	dBm	@ 25°C 9 / 125 μm fiber
Center Wavelength λC	1530	1550	1570	nm	@ 25°C 9 / 125 μm fiber
Spectral Width Δλ			<1	nm	@ 25°C 9 / 125 μm fiber

P/N: S201335Xxxxx	Min.	Typ.	Max.	Unit	Note
CWDM LD Output Power	-3	0	+3	dBm	@ 25°C 9 / 125 μm fiber
Center Wavelength λC	λC *- 3	λC *	λC *+3	nm	@ 25°C 9 / 125 μm fiber
Spectral Width Δλ			<1	nm	@ 25°C 9 / 125 μm fiber

X=2 , SC Connector

*CWDM LD λ C: S200835Xxxxx= 1270 nm / 1290 nm / 1310 nm / 1330 nm / 1350 nm / 1370 nm / 1390 nm / 1410 nm / 1430 nm / 1450 nm / 1470 nm / 1490 nm / 1510 nm / 1530 nm / 1550 nm / 1570 nm / 1590 nm / 1610 nm / 1625 nm

3. Elements & Operating Instructions



■ **Elements:**

1. AC Power Adaptor : 110VAC or 220VAC, 50 or 60 Hz.
2. Power LED indicator : In Operation indicator is shown Green.
3. USB interface : To connect the optical power data to you PC.
4. module Pug-In Cage : for Light Source or Power meter module installation.

3.1. Operating Instructions

1. The Optical Test Hub is powered by 110V AC or 220V AC (OTH-3000).
2. The power indicator LED in front panel will turn green after install power meter or light source module.
3. Connect the Optical Test Hub to the PC by connecting the USB cable.
4. DO NOT plug power meter module without dust cap.
5. Execute GUI
6. Select the COM port
7. Plug in the power meter Module or Light source module.
8. The ON/OFF and output power can be selected for light source and wavelength can be selected for power meter.
9. The status of light source module and optical power of power meter module will be displayed in the center of the GUI.

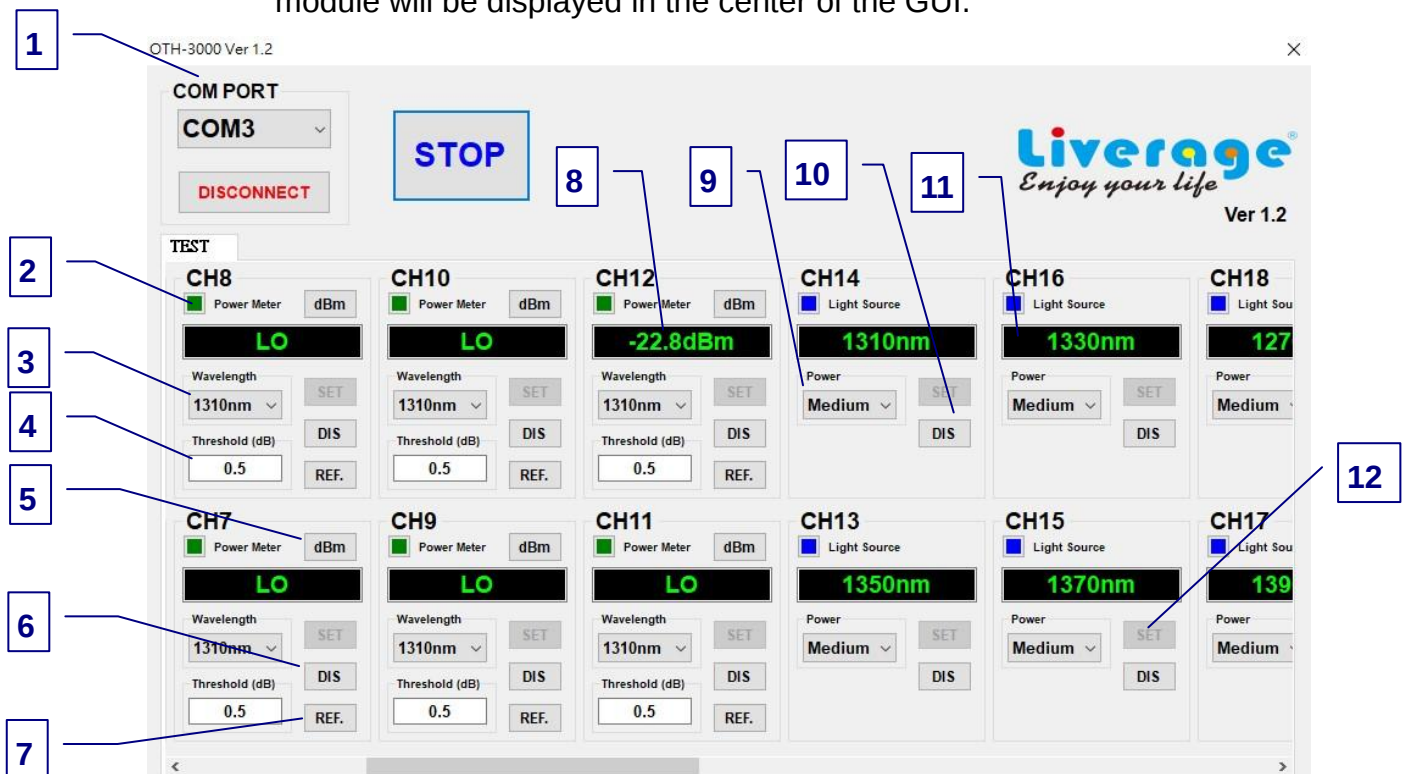


Illustration 1

1. **COM PORT:** Connect to the corresponding COM port via USB.
2. **Module instructions:** When the module is not plugged in, "Not Connected" is displayed. When the Light Source or Power Meter module is plugged in, the corresponding value of the module is displayed, as described in 8.11.

3. **Wavelength selection:** The wavelength measured by the Power Meter module can be selected
4. **Threshold of scope:** The range can be set, and the value is higher or lower than this value, the Power Meter module indicates the value will display a red font, otherwise it will display a green font. (Note: Click the REF. button to activate the function).
5. **Unit selection:** “dBm” or “W”
6. **Turn off/on the module:** Turn off/start using the module function with Power Meter.
7. **Reference:** Return the current value of the Power Meter module to zero and check whether it is below the threshold.
8. **Power Meter module indication:** Display the current optical power. When the optical power exceeds +5dBm or is lower than -70dBm, it will display Hi or Lo.
9. **Optical power selection:** The optical power of the Light Source module can be selected, divided into high, medium and low.
10. **Turn off/on the module:** Turn off/start using the module function with Light Source.
11. **Light Source module instructions:** Display the current wavelength.
12. **Setting:** When changing the wavelength, optical power or threshold, you must click SET to execute the function.

4. **Maintenance**

Compliance with other type of electronic equipments, this OTH should be kept away from water, high humidity, dust, electricity, and environments of extreme temperatures.

Do not drop this tool on any hard surface!

Internal modification of any of the OTH components can cause a malfunction and will invalidate the manufacturer’s warranty.

5. Remote Commands

Command	Output format	Input Description	Output Description	Note
?CH_aaa				Read all connectors are power meter, light source or not connector.
	String >nnn_bb			
		aaa 001 036		Write CH_"001" to "036".
			String String >nnn_bb >nnn >001 _bb _PM _LS _LS650 _NC	Read CH_"001" to "256". The connector is Power Meter. The connector is Light Source. The connector is Light Source.(for 650nm) The connector is Not Connector.

Command	Output format	Input Description	Output Description	Note
?CONN_aaa				Read Power Meter or Light Source current connector type.
	String >nnn_bb			
		aaa 001 036		Write CH_"001" to "036".
			String String >nnn_bb >nnn >001 >036 _bb _SC _LC	Read CH_"001" to "036". The connector type is SC. The connector type is LC.

Command	Output format	Input Description	Output Description	Note
CHSTA_aaa_bbb				Set Enable or Disable Power Meter or Light Source.
	String >DONE >FAIL			Setting Enable or Disable is Success. None option or not connector.
		aaa 001 036 bbb ENA DIS		Write CH_"001" to "036". Set Enable. Set Disable.

Command	Output format	Input Description	Output Description	Note
? CHSTA_aaa				Read Enable or Disable Power Meter or Light Source.
	String >nnn_bbb			
		aaa 001 036		Write CH_"001" to "036".
			String String >nnn_bbb >nnn >001 >036 _bbb _ENA _DIS	Read CH_"001" to "036". Read Enable. Read Disable.

Command	Output format	Input Description	Output Description	Note
? POWER_aaa				Read the current power meter value.
	String >nnn_bbbbbbb			
		aaa 001 036		Write CH_"001" to "036".
			String String >nnn_ bbbbbbb >nnn >001 >036 _bbbbbb _+xx.xx _-xx.xx _DBM HI _DBM LO _DBM CA	Read CH_"001" to "036". Power Meter Positive Value.(dBm) Power Meter Negative Value.(dBm) Power is hi. Power is low. Clear dark current for Power Meter.

Command	Output format	Input Description	Output Description	Note
POWER_WAVE_aaa_bbbb				The wavelength of a power meter is chosen.
	String >DONE >FAIL			Setting Power Meter wavelength is Success. None option, not Power Meter or not connector.
		aaa 001 036 bbbb 0850 1290 1310 1330 1350 1370 1390 1410 1430 1450 1470		Write CH_"001" to "036". Power Meter wavelength Set 850nm. Power Meter wavelength Set 1290nm. Power Meter wavelength Set 1310nm. Power Meter wavelength Set 1330nm. Power Meter wavelength Set 1350nm. Power Meter wavelength Set 1370nm. Power Meter wavelength Set 1390nm. Power Meter wavelength Set 1410nm. Power Meter wavelength Set 1430nm. Power Meter wavelength Set 1450nm. Power Meter wavelength Set 1470nm.

		1490		Power Meter wavelength Set 1490nm.
		1510		Power Meter wavelength Set 1510nm.
		1530		Power Meter wavelength Set 1530nm.
		1550		Power Meter wavelength Set 1550nm.
		1570		Power Meter wavelength Set 1570nm.
		1590		Power Meter wavelength Set 1590nm.
		1610		Power Meter wavelength Set 1610nm.

Command	Output format	Input Description	Output Description	Note
?POWER_WAVE_aaa				Read Power Meter wavelength current setting.
	String >nnn_bbbb			
		aaa 001 036		Write CH_"001" to "036".
			String String >nnn_bbbbbbb >nnn >001 >036 _bbbb _xxxx	Read CH_"001" to "036". Read Power Meter wavelength current setting.

Command	Output format	Input Description	Output Description	Note
?POWER_WAVELIST				Read Power Meter wavelength current setting.
	String >0850_1270_1290_1310 1330_1350_1370_1390_1410 1430_1450_1470_1490_1510 1530_1550_1570_1590_1610			Read Show Power Meter wavelength list.

Command	Output format	Input Description	Output Description	Note
?LIGHT_WAVE_aaa				Read the current Light Source wavelength.
	String >nnn_bbbb			
		aaa 001 036		Write CH_"001" to "036".
			String String >nnn_ bbbbbb	Read

			>nnn	>001	CH_"001" to "036".
				>036	
			_bbbb	_xxxx	Read the current Light Source wavelength.

Command	Output format	Input Description	Output Description	Note
LIGHT_STRE_aaa_bb				Sets the light source module output power.
	String >DONE >FAIL			Setting light source output power is Success. None option, not light source or not connector.
		aaa 001 036 bb HI MI LO		Write CH_"001" to "036". Set high power. Set mid power. Set low power.

Command	Output format	Input Description	Output Description	Note
?LIGHT_STRE_aaa				Read Enable or Disable Power Meter or Light Source.
	String >nnn_bb			
		aaa 001 036		Write CH_"001" to "036".
			String String >nnn_bb >nnn >001 >036 _bb _HI _MI _LO	Read CH_"001" to "036". Read Light source power is high. Read Light source power is mid. Read Light source power is low.

Command	Output format	Input Description	Output Description	Note
LIGHT_MOD_ bb				Sets the light source module output power.
	String >DONE >FAIL			Setting light source output power is Success. None option.
		bb CW PS		Write Set Light source module frequency : CW mode. Set Light source module frequency : PULSE mode.

Command	Output format	Input Description	Output Description	Note
?LIGHT_MOD				Read Enable or Disable Power Meter or Light Source.
	String > bb			
			String String > bb _ bb _ CW _ PS	Read Read Light source module frequency is CW mode. Read Light source module frequency is PULSE mode.

Command	Output format	Input Description	Output Description	Note
LIGHT_FREQ_bb				Sets the Light source frequency used in more than 850 nm.
	String >DONE >FAIL			Setting Light source frequency is Success. None option.
		bb CW 27 2K		Write Set Light source module frequency : CW mode. Set Light source module frequency : 270Hz mode. Set Light source module frequency : 2KHz mode.

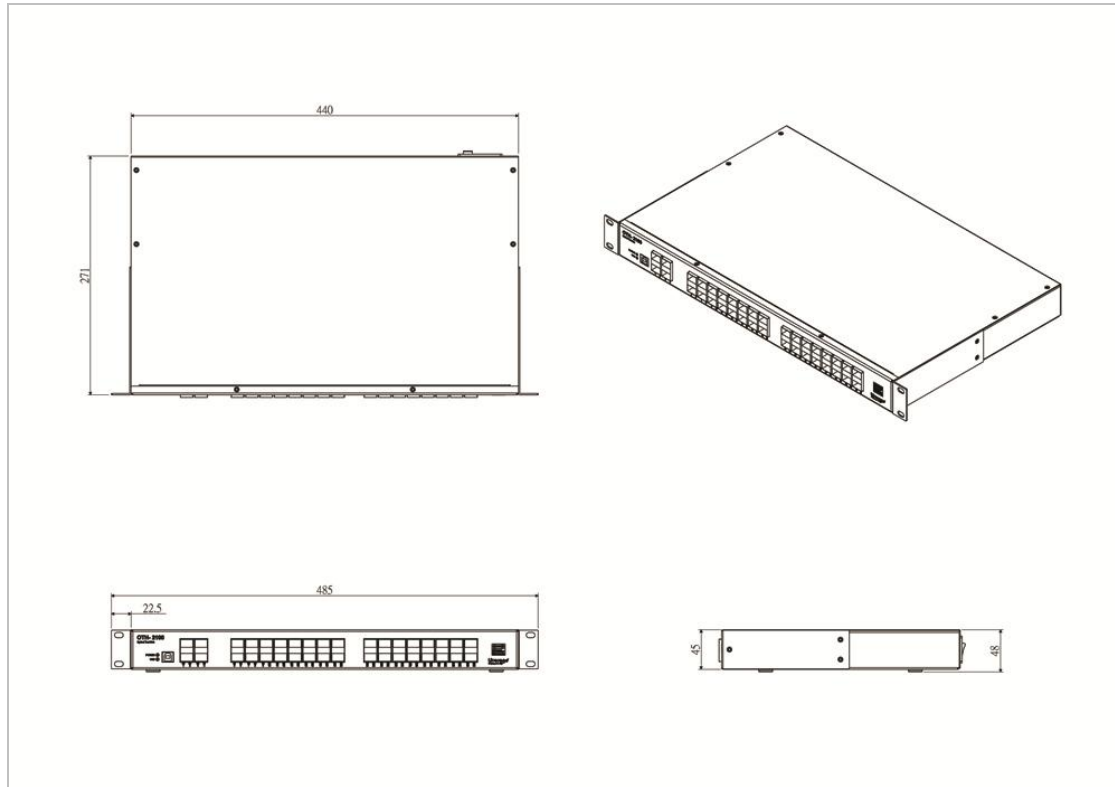
Command	Output format	Input Description	Output Description	Note
? LIGHT_FREQ				Read Enable or Disable Power Meter or Light Source.
	String > bb			
			String > bb _bb _CW _27 _2K	Read Read Light source module frequency is CW mode. Read Light source module frequency is 270Hz mode. Read Light source module frequency is 2KHz mode.

Command	Output format	Input Description	Output Description	Note
? LSPM_aaa				Read Enable or Disable Power Meter or Light Source.
	String > nnn_aa_bbbb_ ccc_dd or > nnn_aa_bbbb_ ccc_ddddd_eeee	aaa 001 036		
			String > nnn_aa_bbbb_ccc_dd >nnn _aa _LS _PM _NC _bbbb _xxxx _ccc _ENA _DIS	Read CH_"001" to "036". The connector is Light Source. The connector is Power Meter. The connector is Not Connector. Read the current wavelength. Read Enable. Read Disable.

			_dd _HI _MI _LO Or _dddddd _+xx.xx _-xx.xx _DBM HI _DBM LO _DBM CA _eeee _2000 _2010	Read Light source power is high. Read Light source power is mid. Read Light source power is low. Power Meter Positive Value.(dBm) Power Meter Negative Value.(dBm) Power is hi. Power is low. Clear dark current for Power Meter. The Power Meter is InGaAs PD.. The Power Meter is Si PD.
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Command	Output format	Input Description	Output Description	Note
*RST				Resets the setting values in the working memory and microprocessor.
	String >RESET			Reset system.

6. Dimension (in mm)



7. Ordering Information

OTH Main Frame					
Part Number		Description			
S20112009999		36 ports	1U 19" rack OTH Main frame 3000 Type		
Light Source Module					
Part Number	Media	Wavelength	Description		
S20113320650	SC MM	650 nm	Visible LD Light Source Module		
S20113620850	SC MM	850 nm	VCSEL LD Light Source Module		
S20113321310	SC SM	1310 nm	FP LD Light Source Module		
S20113321550	SC SM	1550 nm	FP LD Light Source Module		
S20113421310	SC SM	1310 nm	DFB LD Light Source Module		
S20113421550	SC SM	1550 nm	DFB LD Light Source Module		
S2011352xxxx	SC SM	1270 nm ~ 1610 nm	CWDM LD Light Source Module		
Power Meter Module					
Part Number	Receiving Wavelength		Connector	Rang	Accuracy
S20114122-553	1310 / 1490 / 1550 nm		SM SC	-50 ~ +5 dBm	+/- 0.3 dB
S20114123-553	CWDM 1270~1450 nm		SM SC	-50 ~ +5 dBm	+/- 0.3 dB
S20114124-553	CWDM 1470~1610 nm		SM SC	-50 ~ +5 dBm	+/- 0.3 dB
S20114125-553	CWDM 1270~1610 nm		SM SC	-50 ~ +5 dBm	+/- 0.3 dB
S20114221-455	VCSEL 850 nm		MM SC	-40 ~ +5 dBm	+/- 0.5 dB
Part Number	Receiving Wavelength		Connector	Rang	Accuracy
S20114122-753	1310 / 1490 / 1550 nm		SM SC	-70 ~ +5 dBm	+/- 0.3 dB
S20114123-753	CWDM 1270~1450 nm		SM SC	-70 ~ +5 dBm	+/- 0.3 dB
S20114124-753	CWDM 1470~1610 nm		SM SC	-70 ~ +5 dBm	+/- 0.3 dB
S20114125-753	CWDM 1270~1610 nm		SM SC	-70 ~ +5 dBm	+/- 0.3 dB

8. Warranty

The manufacturer warrants this product to be free of defects in workmanship and materials for a period of 1 year after purchase. This warranty (excluding batteries) is solely limited to the repair or replacement of the original parts. All other costs are the sole responsibility of the owner. This warranty does not cover any defects, damage, or deterioration due to misuse, alteration, or negligence.

9. Service Contacts

Please contact us :

Liverage Technology Inc.
3F-5, No. 30 Taiyuan Street,
Chupei City, Hsinchu County 302,
Taiwan

TEL: +886-3-5525268

FAX: +886-3-5525388

e-mail: sales@liverage.com.tw

<http://www.liverage.com.tw>

10. Record of Revisions

RECORD OF REVISIONS		
VERSION	Date	Description
VER A	2020.04.23	Initial Released
VER G	2023.08.02	Add "? LSPM_aaa" Command List