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℃ ~ 50℃**
Storage Temp.	**-20℃ ~ 70℃**
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

	Power Range				Note
Calibration Wavelengths :	**Min.**	**Typ.**	**Max.**	**Unit**	
1310nm , 1490nm , 1550nm	**-70**		**+5**	**dBm**	**@ 25℃ 9 / 125 µm fiber**
CWDM 1270nm ~ 1450nm	**-70**		**+5**	**dBm**	**@ 25℃ 9 / 125 µm fiber**
CWDM 1470nm ~ 1610nm	**-70**		**+5**	**dBm**	**@ 25℃ 9 / 125 µm fiber**
CWDM 1270 ~1610nm	**-70**		**+5**	**dBm**	**@ 25℃ 9 / 125 µm fiber**
VCSEL 850 nm	**-50**		**+5**	**dBm**	**@ 25℃ 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**	
Center Wavelength λC		**650**		**nm**	@ 25℃ 62.5 / 125 μm fiber

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

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

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

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

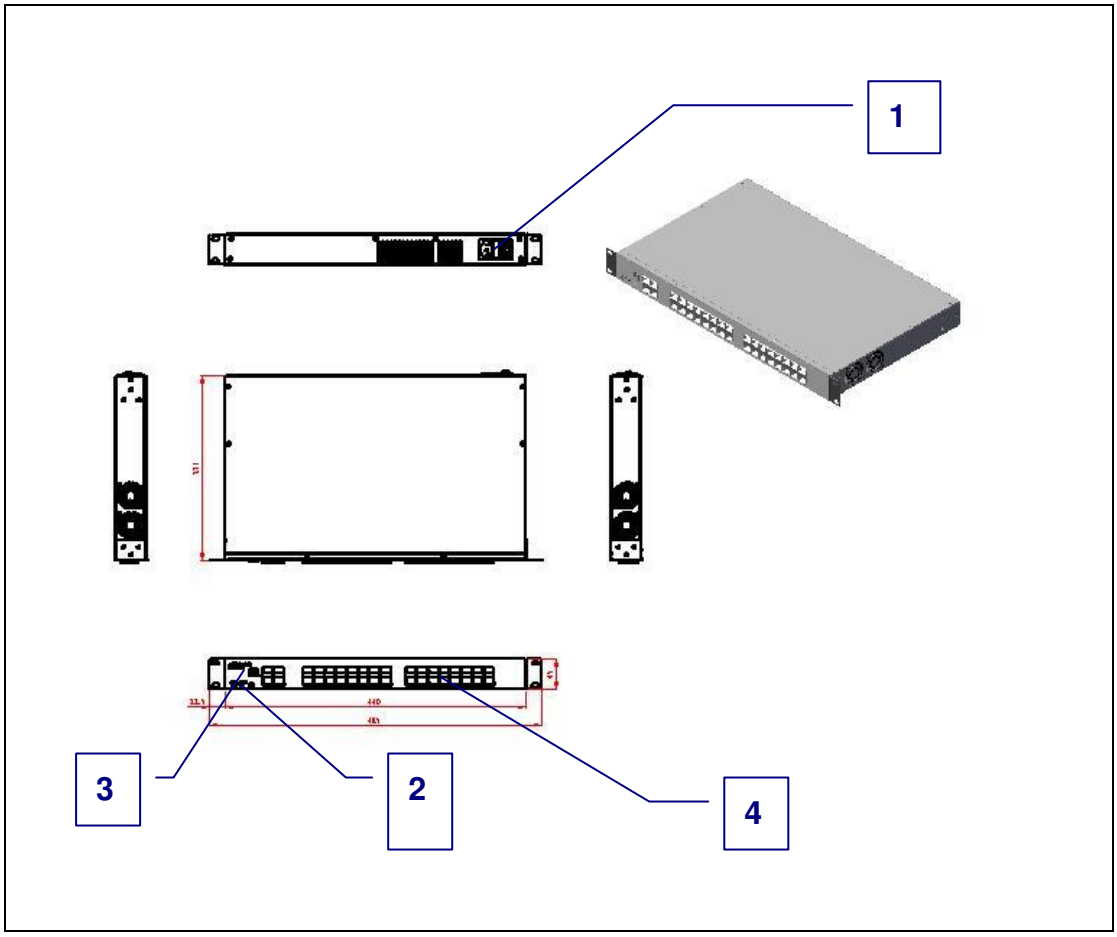
P/N: S201334X1550	Min.	Typ.	Max.	Unit	Note
DFB LD Output Power	**-3**	**0**	**+3**	**dBm**	@ 25℃ 9 / 125 μm fiber
Center Wavelength λC	**1530**	**1550**	**1570**	**nm**	@ 25℃ 9 / 125 μm fiber
Spectral Width Δλ			**<1**	**nm**	@ 25℃ 9 / 125 μm fiber

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

X=2 , SC Connector

*CWDM LD λC: 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.

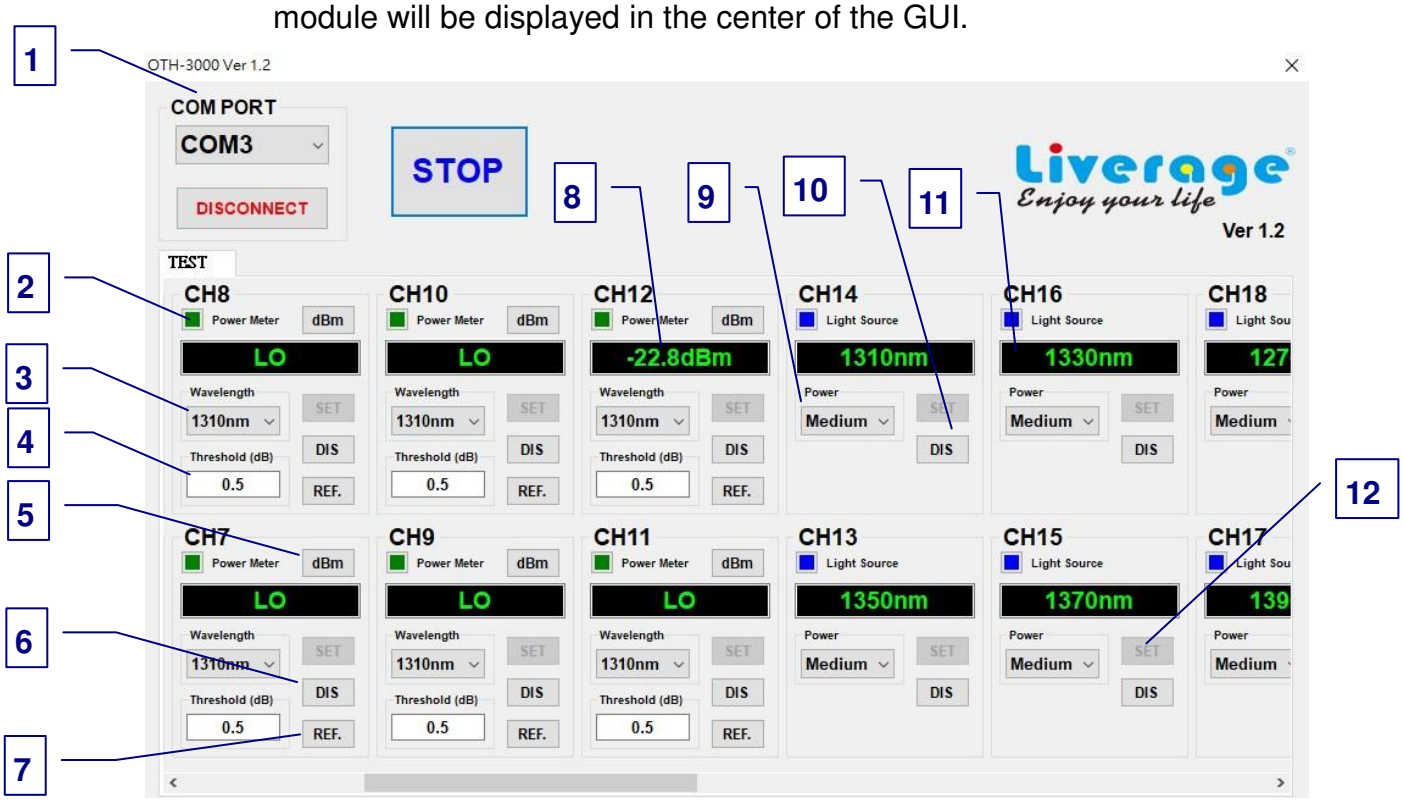


Illustration 1

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 0123456789 >nnn_bb			
		aaa 001 | 036		Write CH_"001" to "036".
			String String 0123456 >nnn_bb 0123 0123 >nnn >001 456789 456789	Read CH_"001" to "256".

			_bb _PM _LS _LS650 _NC	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 0123456 >nnn_bb			
		aaa 001 | 036		Write CH_"001" to "036".
			String String 0123456 >nnn_bb 0123 0123 >nnn >001 >036	Read CH_"001" to "036".

			456 _bb	456 _SC _LC	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 01234 >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 01234567 >nnn_bbb			
		aaa 001 | 036		Write CH_"001" to "036".
			String String 01234567 >nnn_bbb 0123 0123 >nnn >001 >036 4567 4567 _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 01234567890 >nnn_bbbbbb			
		aaa 001 | 036		Write CH_"001" to "036".
			String String 01234567890 >nnn_ bbbbbb 0123 0123 >nnn >001 >036 4567890 4567890 _bbbbbb _+xx.xx _-xx.xx _DBM HI	Read CH_"001" to "036". Power Meter Positive Value.(dBm) Power Meter Negative Value.(dBm) Power is hi.

			_DBM LO _DBM CA	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 01234 >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		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.

		1370		Power Meter wavelength Set 1370nm.
		1390		Power Meter wavelength Set 1390nm.
		1410		Power Meter wavelength Set 1410nm.
		1430		Power Meter wavelength Set 1430nm.
		1450		Power Meter wavelength Set 1450nm.
		1470		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 012345678 >nnn_bbbb			
		aaa 001 |		Write CH_"001" to "036".

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		036		
			String String 01234567890 >nnn_ bbbbbb 0123 0123 >nnn >001 >036 45678 45678 _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 012345678 >nnn_bbbb			
		aaa 001 | 036		Write CH_"001" to "036".
			String String 01234567890 >nnn_ bbbbbb 0123 0123 >nnn >001 >036 45678 45678 _bbbb _xxxx	Read CH_"001" to "036". 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 01234 >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 0123456			

	>nnn_bb			
		aaa 001 | 036		Write CH_"001" to "036".
			String String 0123456 >nnn_bb 0123 0123 >nnn >001 >036 456 456 _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 01234			

	>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 012 > bb			
			String String 012 > bb 012 012 _bb _CW _PS	Read Read Light source module frequency is CW mode. Read Light source module frequency is PULSE mode.

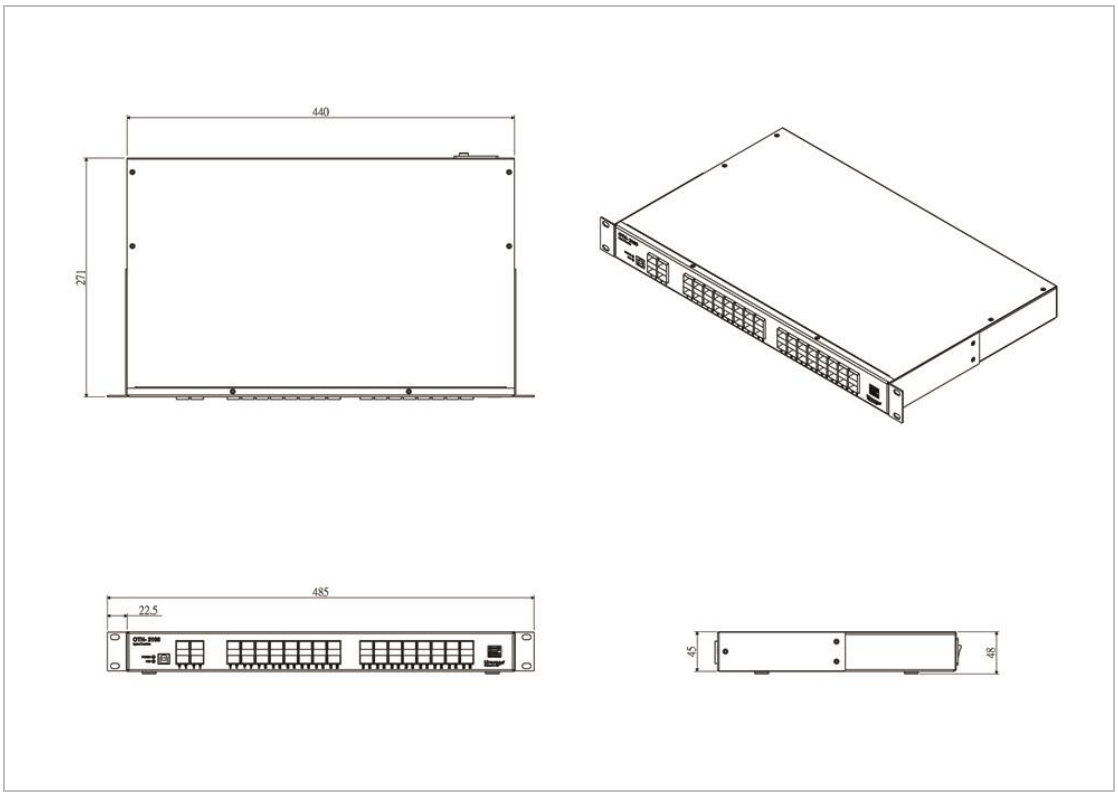
Command	Output format	Input Description	Output Description	Note
LIGHT_FREQ_bb				Sets the Light source frequency used in more than 850 nm.
	String 01234 >DONE >FAIL			Setting Light source frequency is Success. None option.
		bb CW 27 2K		Write Set Light source module frequency : CW mode. Set Light source 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 012 > bb			
			String String 012	Read

			> bb 012 012 _bb _CW _27 _2K	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
*RST				Resets the setting values in the working memory and microprocessor.
	String 01234 >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 :

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10. Record of Revisions

RECORD OF REVISIONS		
VERSION	**Date**	**Description**
VER A	2020.04.23	Initial Released