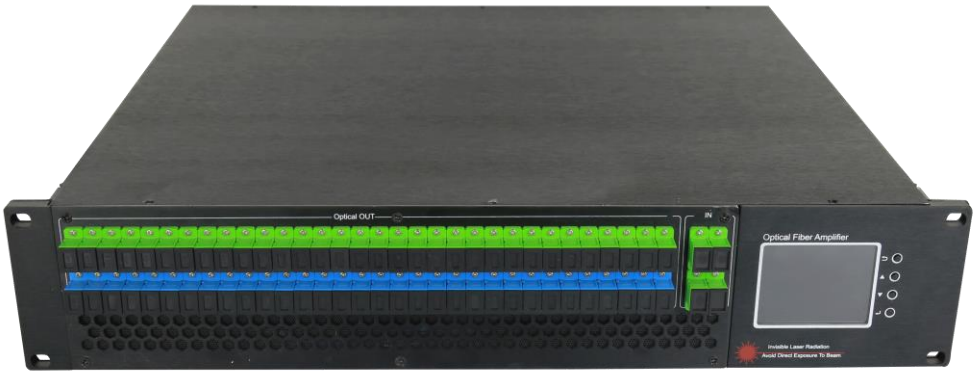
The User Guide

50EYA2U

High Power Optical Amplifier（V1.5）



Preface

This manual is applicable to the 50EYA2Uxx series optical amplifier, which mainly describes the performance characteristics, technical parameters, installation and debugging, and common fault processing and so on. In order to ensure that the equipment can be installed smoothly and safe operation, please users in the installation and commissioning of the equipment before, be sure to carefully read this manual, and strictly in accordance with the provisions of the manual steps of installation and commissioning, lest the equipment caused unnecessary damage, or injury to the operating personnel; if you have any questions, please contact us.

Special note：

- Ytterbium erbium-doped fiber amplifier is a high power laser device, its installation and commissioning must be performed by professional and technical personnel to operate, and to read the manual carefully before operation, so as to avoid misuse and damage to the equipment, or accidental injury to operating personnel.
- Before powering the device work, you should make sure the chassis ground terminal and the power outlet is properly grounded (grounding resistance should be <4Ω), in order to avoid electrostatic damage to laser devices, and to prevent the cabinet charged and cause harm to humans.
- Any operation of the output port patch cord should be performed with the pump laser turned off. Do not connect or remove the optical output port with optical signal input, Otherwise, the patch cord will be burnt out and the output power will drop.
- When installing the fiber optic connector, the force should be appropriate, otherwise it may cause the ceramic tube fragmentation within the adapter. Once the ceramic tube is broken, the output optical power will be greatly reduced, and even when the optical connector slightly rotated a bit, the output optical power will have a significant change.
- Equipment factory default pump threshold is-12dBm, input optical power ≤-12dBm, the device no power output. Local equipment without pump switch lock the front panel, in strict accordance with the installation steps to install!
- To ensure proper long-term stability in the grid voltage instability or voltage waveforms

- poor area, it is recommended to configure a dedicated AC power supply for the device, more user-configurable conditional uninterruptible power supply (UPS) systems; changes in ambient temperature is too high or poor room environment (temperature device ideal working environment for 25 ℃) area, it is recommended to configure a dedicated air-conditioning system for the device, to improve the working environment of the device.

Content

1, Application 1
2, Features 1
3, Principle drawing 1
4, Technical parameter 2
4.1 Technical parameter 2
4.2 Model 2
5, External function 3
5.1 Front pannel 3
5.2 Back pannel 4
6, Menu system 5
6.1 Display parameter 5
6.1.1 Navigation menu 5
6.1.2 Information display 6
6.2 Setting parameter 10
7, Installation 12
7.1 Unpacking 12
7.2 Equipment&Instruments 12
7.3 Installation 13
8, After-sales Service: 14
9, Cleaning and Maintenance Method of Optical connector 15
10, Disclaimer 16

1, Application

■ Single-mode

■ FTTH

■ CATV

2, Features

■ Using erbium ytterbium co-doped double-clad fiber technology.

■ Output power：2-10W(33-40dBm).

■ Built-in low-noise preamplifier, without EDFA cascading, greatly reducing system CNR, MER degradation.

■ Output port optional: SC connector 16 to 64 ports optional; LC connector 32 to 128 ports optional; optional WDM.

■ The front panel can be flexibly removed and replaced according to the number of output ports.

■ Optional built-in optical switch module to facilitate the expansion of equipment.

■ Front panel keys can be set to modify the performance parameters of the equipment to meet customer needs of different network design.

■ Cooling fan support online replacement.

■ Low noise figure: 0dBm input less than 5dB.

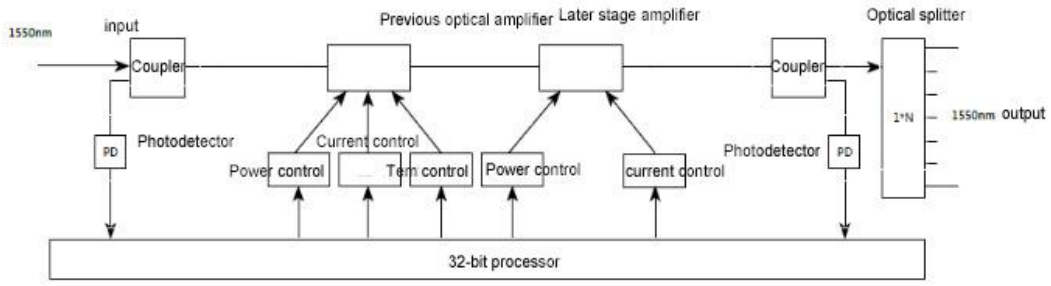
■ Perfect network management interface,national standard SNMP network management.

■ Using a dedicated server mature dual power supply hot backup structure, with only controlled by a microcomputer temperature control system, improve system reliability.

■ 0.5~-4dB adjustable output power.

■ 2.8-inch large TFT true color display.

3, Principle drawing



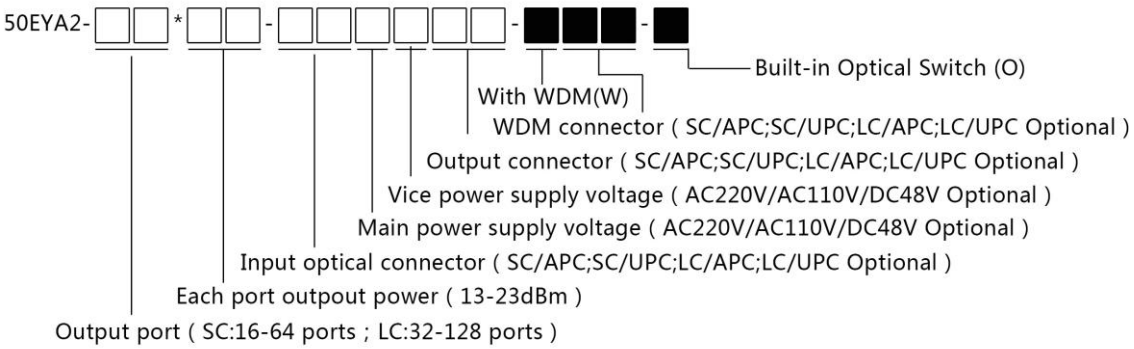
4, Technical parameter

4.1 Technical parameter

Item		Unit	Technical parameter	Supplement
Bandwidth		nm	1535~1565	
Input optical power		dBm	-5 ~ +10	
Max output power		dBm	40	
Output power stability		dBm	±0.1	
Noise		dB	≤ 5.0	Input power 0dBm，λ=1550nm
Return loss	Input	dB	≥ 45	
	Output	dB	≥ 45	
Optical connector			SC/APC,SCUPC,LCAPC,LCUPC	Can be Customized
C/N		dB	≥ 50	Test conditions according to GT / T 184-2002 implementation
C/CTB		dB	≥ 63	
C/CSO		dB	≥ 63	
Supply voltage		V	（PW80）AC220V(160V ~ 265V) / AC110V（90 ~130V）/ DC48V（38 ~ 58V） （PW300）AC220V(160V ~ 265V) / AC110V（90 ~130V）/ DC48V（38 ~ 58V）	
Consumption		W	≤ 105	
Working temperature		℃	-5 - +42	
Maximum working relative humidity		%	Maximum 95% non-condensing	
Maximum storage relative humidity		%	Maximum 95% non-condensing	
Storage temperature		℃	-30 ~ +70	
Devise size		mm	450(L)*482(W)*89(H)	
Package size		mm	640(L)*640(W)*200(H)	

4.2 Model

2U chassis high power optical amplifier series products naming method, 50EYA2-output port*each port power+input port optical connector+main power supply voltage+vice power supply voltage +output port optical connector+with WDM+WDM connector+with optical switch.

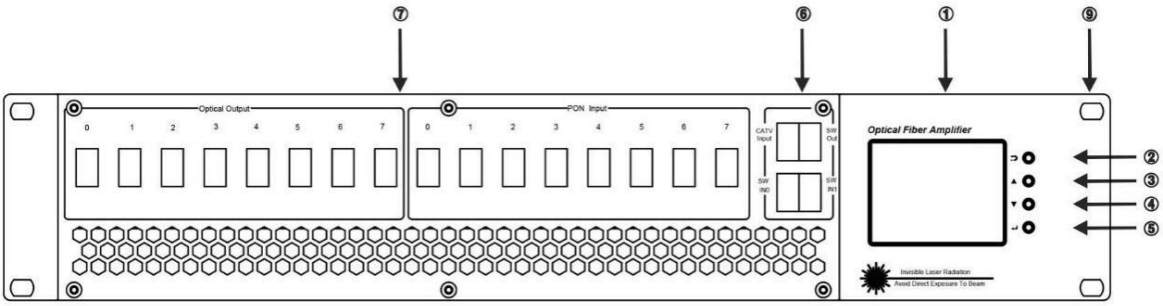


For example:50EYA2-16X22-SA24A-WSU-O

Explanation:This is 2U chassis optical amplifier device,16 output ports,each port output power is 22dBm,input optical connector is SCAPC,main power supply voltage is 220V. Vice power supply voltage is 48V,output port optical connector is SCAPC,with WDM,WDM connector is SCUPC,built in optical switch.

5, External function

5.1 Front panel



1) 2.8-inch large TFT true color display:To display all the parameters of this unit.

2) Display the setup menu's exit or cancel key.Move up.

3) Display up button of setting menu.

4) Display down button of setting menu.

5) Display menu OK button.

6) Optical signal input port and 2 * 1 optical switch function port: IN0 and IN1 are the optical switch main channel and backup input port, OUT is the optical switch output port, IN is the high power optical amplifier input port (such as non-optical switch configuration Only this port). The interface type default specification is SC / APC. If there are other specifications, the client specifies it.

7) Optical signal output port: This interface is the optical signal output port of the device. The default interface type is SC / APC and the port number is 16-64. If there are other specifications, specified by the customer.

Note: If built-in WDM, the upper row is the output port, the lower row is the PON port and corresponds to the output port above it. For example: 16 ports with WDM equipment, the 17th port is the No. 1 port PON port, the 18th port is the No. 2 port PON port.

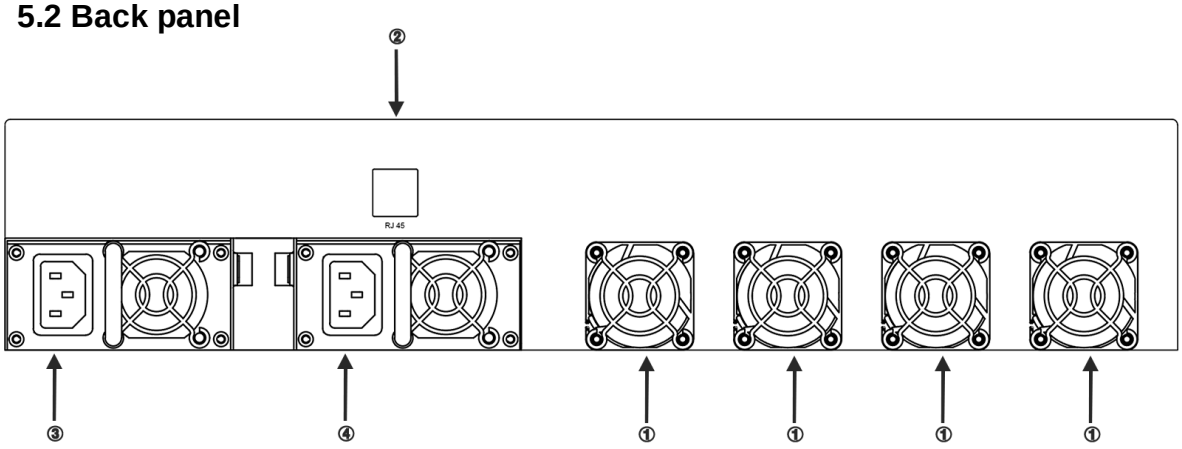
8) Honeycomb dust-proof cooling window: block the dust, the heat inside the machine in a timely manner.

9) Rack fixing hole: the machine room fixed installation.

Warning: A. After the device is working normally, there is an invisible laser beam coming out from the port. The port should be kept away from the human body or the naked eye to avoid accidental injury.

B, Remember not to connect the optical fiber jumper connection when the equipment is larger power output, so as to avoid damage, burn jumper connector.

5.2 Back panel



1) Cooling fan: 12V power supply of HX2.54-3P connector 4020 cooling fan.

2) LAN interface：For local network management.

3) Main power supply.

4) Sub power supply.

6, Menu system

6.1 Display parameter

6.1.1 Navigation menu

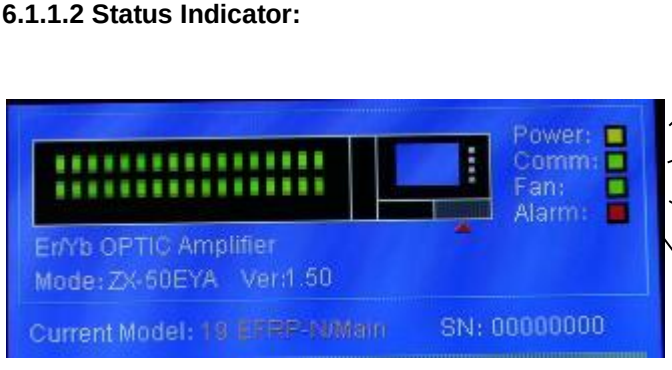
6.1.1

6.1.1.1 Module Component Selection:

Press ▲ or ▼ key to select the module in the device, and the module information will be displayed in the following message display screen. Specific component model and module functions as the following table

Module number	Module name	Display shows	Note
1	High-power optical amplifier box module	“Current module 1 50EYA****”	This module information is the default boot interface
2	High-power optical amplifier box module	“Current module 2 50EYA****”	Machine power ≤ 37, no this module
3	Optical switch	“Current module 3 OSW-200M”	
18	Central monitoring unit module	“Current module 18 MCU MOD”	
19	Main power module	“Current module 19 EFRP-N/Main”	For single power supply, only the corresponding module information is displayed
20	Auxiliary power module	“Current module 20EFRP-N/SUB”	

6.1.1.2 Status Indicator:



Yellow; single power supply working.

Green: dual power supply working

Normal communication,the green light flashes.

Red: The fan is not working properly,

Green: the fan is working fine.

Green: whole device no alarm.

Red: there is alarm of the device

6.1.1.3 Equipment information

Name：Er/Yb Optical Amplifier

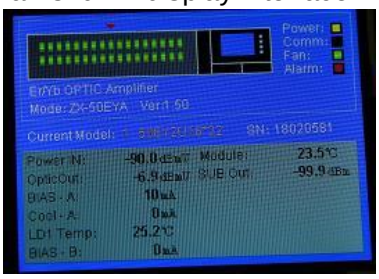
Model：50EYA

Version：1.50

6.1.2 Information display

6.1.2.1 Optical Gain Module Information Display

After the device is powered on, the initial display interface of the display is the optical gain module information display interface, Figure 6.1.2-1 is the total optical power less than or equaling to 37dBm display interface, and 6.1.2-1' is the total optical output power more than 37dBm display interface.



6.1.2-1

6.1.2-1'

1) Product information

Module Model: 50EY2U-32 * 19

Module serial number: 17121885

2) Module parameter display area

Display the main parameters of the module.

6.1.2.2 Optical switch information display

In the standby interface, press ▲ or ▼ key, the device is transferred to the below module "2 OSW-200M" display as shown in Figure 6.1.2-2

6.1.2-2

1) Product information

Module Model: OSW-200M

Module serial number: 17080741

2) Module parameter display area

A input: refering to the front panel IN0 optical input display;

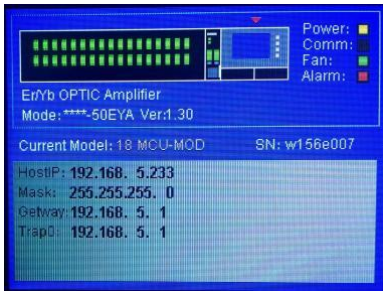
B Input: referinging to the front panel IN1 optical input display;

Switch Status: It shows whether the optical switch is working on A input or B input. When working on A input, the switch status displays "OFF". When working on B input, the switch status displays "ON". (The device works on A input when out off factory)

Control mode: AGC / MGC, AGC means optical switch A / B way automatically switching according to actual working conditions, MGC means optical switch A / B way selection is selected manually by key.

6.1.2.3 SNMP information display

Press ▲ or ▼ button on the device standby interface to adjust the current module of device to display "18 MCU-MOD" as shown in Figure 6.1.2-3:



6.1.2-3

1) Product information

Module Model: MCU-MOD

Module serial number: SN：00000000（The default is 0）

2) Module parameter display area

Display the main parameters of the module. The above parameters show the value of the factory default parameters.

3) Test way for SNMP connections (the following steps should be on the basis that the device has been powered on)

(1) Use network cable to connect the device network management interface to the computer network cable interface.

(2) Change the IP address on the computer to the address segment corresponding to the IP address of this device, but it can not be same as this device IP address (The default

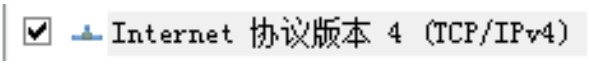
factory default IP address is 192.168.5.233 and the address is 192.168.5. * **. *** <255 but ≠ 233). The PC's subnet mask and gateway are the same as this machine.

The procedure is as follows:

①From the computer "Network and Sharing Center" to find the right side of the map "Local Area Connection" 6.1.2-4 display

6.1.2-4

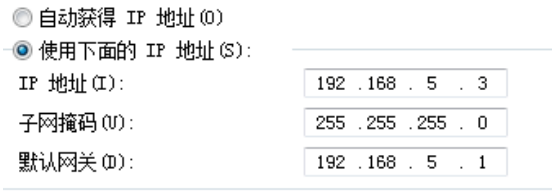
②After left-click, select the option shown in Figure 6.1.2-5 on the pop-up interface



6.1.2-5

Left-click pop-up Figure 6.1.2-6 interface, select "Properties" in this interface, click the left button, pop-up dialog box Figure 6.1.2-7, according to the figure is to fill in the content.

6.1.2-6



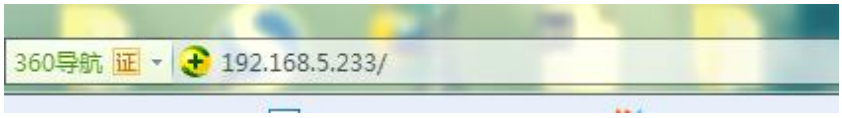
6.1.2-7

Note: The figure above the circle value <255 but ≠ 233

(3) After the setting is finished, click the OK button. At this time, you will find that the SNMP light is green and the orange is blinking at the same time.

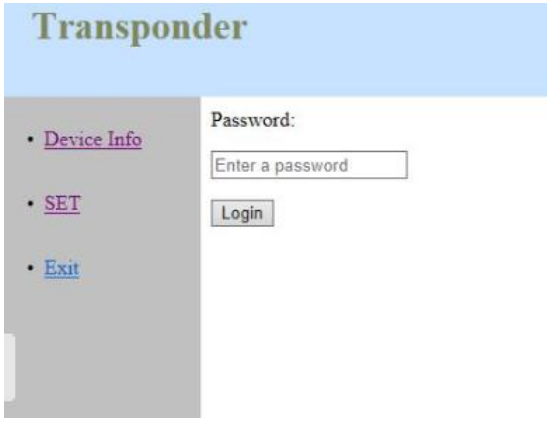
(4)Double-click the web login icon, as shown in Figure 6.1.2-8, input the IP address "192.168.5.233" in the URL input box as shown in Figure 6.1.2-9

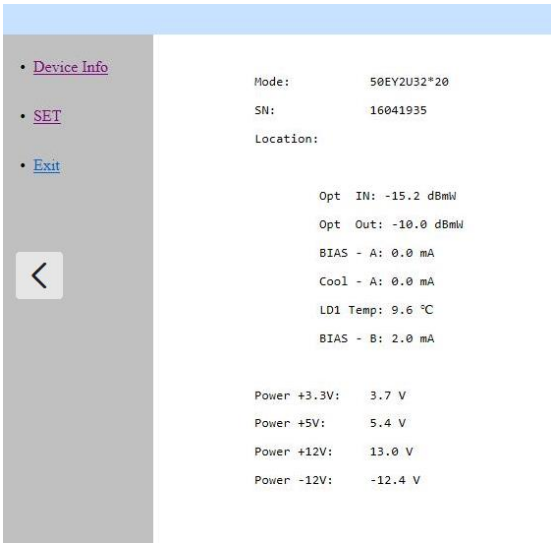
6.1.2-8



6.1.2-9

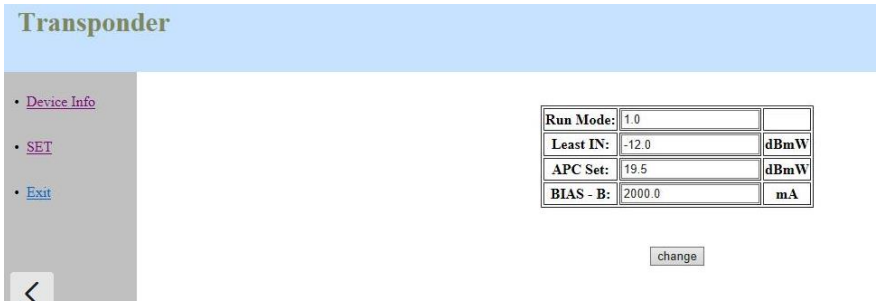
(5) Press [Enter] in 6.1.2-9 program interface. The dialog box as shown in Figure 6.1.2-10 appears. Enter the password "public" and click "Login" to view the device parameters as shown in Figure 6.1. 2-11.





6.1.2-10 6.1.2-11

Click "SET" in the menu bar on the left of Figure 6.1.2-11 will find the setting items, and then can make the settings and adjustments of the paraeters on online(If need to adjust the device parameters, be sure to operate under the guidance of a professional person). As shown in Figure 6.1.2-12:

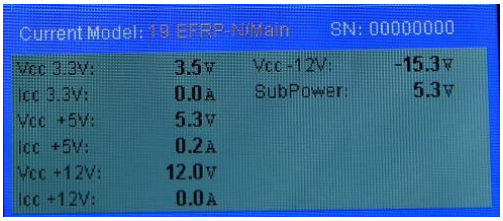


6.1.2-12

Note: If you do not get the corresponding parameters, please follow the above steps in order to check.

6.1.2.4 Power Information Display

(1) Main power module display: Press ▲ or ▼ key on the device standby interface to adjust the device to "current module 19 EFRP-N / Main" as shown in Figure 6.1.2-4



6.1.2-4

1) Product Information

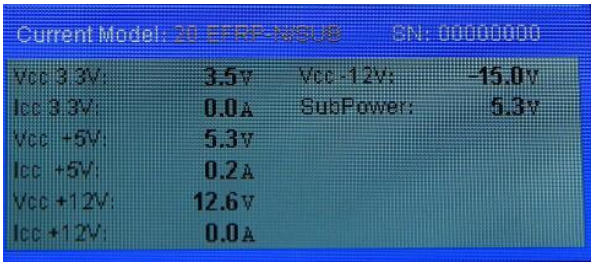
Module Signals: EFRP-N / Main

Module Serial Number: SN: 00000000 (default 0)

2) Module parameter display screen

Display the current output voltage of the main power supply and current corresponding to the key voltage of the current working status of the device.

(2) Sub-power module display: Press ▲ or ▼ key on the standby interface of the device to adjust the device to "current module 20EFRP-N / SUB" as shown in Figure 6.1.2-5



6.1.2-5

1) Product Information

Module signal: EFRP-N / SUB

Module Serial Number: SN: 00000000 (default 0)

2) Module parameter display area

Displays the output voltage value of the sub power supply and the corresponding working current of the key voltage under the current working status of this device.

6.2 Setting parameter

6.2.1 optical box module parameter settings

6.2-1

In the state of Fig. 6.1.2-1, press the "↵ " key to enter into the setting page (as shown in Fig. 6.2-1), press "▲ or ▼ key" to select the parameter to be set, and the parameters in the pink area will flash Move, it means it is selected. In this case, press " ↵" key to turn the parameter to black. Press ▲ or ▼ key to modify the parameter in this interface. When finished press " ↩" button to exit directly, modify the parameters will be automatically saved.

Note: Workinging modes: ACC (Automatic Current Control) and APC (Automatic Power Control) are available for selection.

Pump threshold: optical input power is higher than the setting value, the pump is turned on, the optical amplifier begin to work.

Power Settings: Set the output power in APC mode.

Bias Current: Set the back stage pump current in ACC mode.

6.2.2 Optical switch parameter setting

6.2-2

(1) Setting steps

In the state of Fig. 6.1.2-1, press the "↵ " key to enter the setting page (as shown in Fig. 6.2-1), press "▲ or ▼ key" to select the parameter to be set, and the parameters in the pink area will flash Move, it means it is selected. In this case, press " ↵ " key to turn the parameter to black. Press ▲ or ▼ key to modify the parameter in this interface. When finished press " ↩" button to exit directly, modify the parameters will be automatically saved.

(2) Setting parameter explanation

Control mode: AGC mode means that A and B ways automatically switch working according to "switching threshold". MGC mode refers to manual switching of working way A and B.

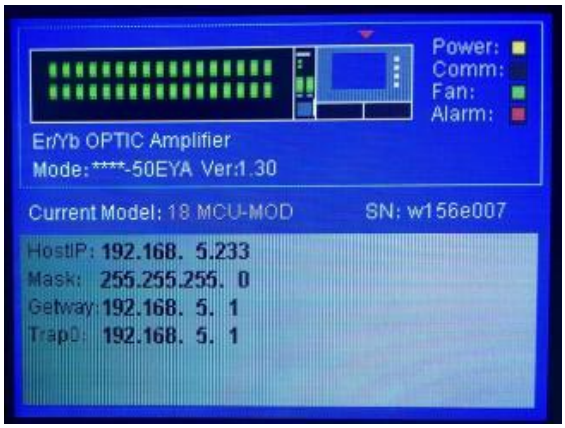
Switching threshold: The user set the threshold according to the actual demand, the setting range (-10 ~ + 15) dBm.

Output way: Manually select optical switch working way under MGC. 0 corresponds to A way; 1 corresponds to B way;

Power Correction: Adjust the deviation between the actual input power value and the display value. For example: the actual input power 0dBm, the screen displays -1dBm, the power correction is set to +1dBm, the display shows power at this time will show 0dBm, corresponding to the actual input. Corrected range -10dBm ~ + 10dBm.

6.2.3 Communication Setting Description

In the interface of Figure 6.1.2-3, press "↵ " to enter the following setting page.



6.2-3

Press "▲ or ▼" key to select the parameter to be set, then press "↵" key. When the parameter turns black, press "▲ or ▼" to set the parameter, the parameter will be saved automatically. When finished, press " ↩" key to exit directly.

7, Installation

7.1 Open and check

1, Make sure the packaging is good before opening, Once the package is damaged or outfitted with a water mark, please contact the carrier.

2, After opening the package, please check the packing list in accordance with the

equipment and accessories, if any questions, please contact us.

3, After opening the package, If you think the equipment is damaged, please do not give the power to the device so as not to cause more serious damage or cause accidental injury to operating person. And please contact us directly and immediately.

7.2 Equipment&Instruments

1, 1pc optical power meter; (range -50dBm ~ +26 dBm)

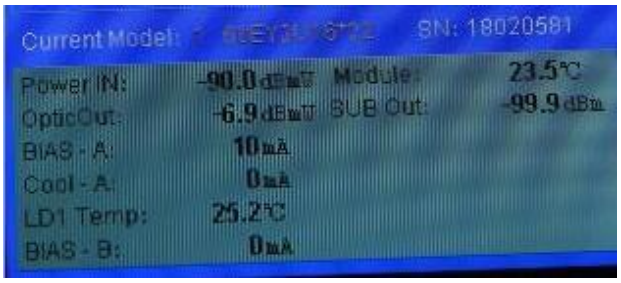
2, Several standard optical fiber test patch cord with matched optical connector to the equipment;

3, Anhydrous alcohol and medical absorbent cotton;

7.3 Installation Procedure

1, Take out the device from the box, fix it on the rack, and connect the device to the ground reliably (the grounding resistance should be <4Ω)

2, Confirm that the local voltage matches the power supply voltage required by the equipment power supply, and provide power supply to the equipment by the equipment. There will be a 3-second beep beep momentarily during power-up, and the fan will be powered on instantly when powered on. As shown in Figure 6.1.2-1, the power supply system of the device enters normal working state.



6.1.2-1

3. Test the optical input power with the optical power meter to ensure that the input optical power is within the range of (-5 ~ + 10) dBm. In order to optimize the performance index, our company recommends that the optical input power should be between (0 ~ +3) dBm. Factory default input optical power ≤-12dBm, there is no power out (the device works with C-band signal).

Note: If the equipment is with optical switch, connect the main way signal and sub way signal to the front panel IN0 and IN1 respectively, and connect the OUT port and IN port

with patch cord.

4, First, connect the optical output port to the back stage device, make sure that the plug is inserted vertically into the adapter, hear the "click" sound, that the connector has been in good contact. With WDM equipment, PON port access network, pay attention to its corresponding COM port in the PON port directly above the access position can not be reversed. As shown in Figure 7.3.1:

To test the output optical power of the device, connect the optical power meter to the output of the device using a standard fiber patch cord (SC / APC; SC / PC; LC / APC) as standard for the power output.

5, Step 3 measured input optical power connector into the device "IN" port, observe the front panel display input, output optical power display value. When the output optical power display value reaches the nominal power value, the device enters the normal working state. If you test the output optical power, observe the optical power displayed by the optical power meter at this time, and confirm the same as the value displayed on the front panel. At this time, the power test is finished. (Measurement of optical power, you should confirm the optical power meter placed in the 1550nm wavelength measurement file, optical fiber connector surface pollution).

6, the output optical power value test step, this time to remove the input optical signal, remove the fiber jumper and optical power meter, the device power output port access network. No output power test, this step can be omitted.

At this point, the equipment has been installed, tested, commissioning completed.

Note: After the equipment starts to work, do not take the light output port, otherwise it will lead to jumper burned.

Reminder: No pump switch lock on the front panel of the device, please strictly follow the above steps to install!

8, After-sales Service

1, This device warranty is 1 year ,If the problem is caused by the user's wrong operation or natural force majure, we will only be responsible for the maintenance and charge the appropriate material cost.

2, when the device is problem, please immediately contact us.

3, On-site maintenance of problem device should be operated by professional technical personnel to avoid causing more serious damage to the equipment.

Special Note: For users who have been demolished repaired equipment, our company will not be free warranty, will be charged a reasonable maintenance costs and materials costs.

9、Cleaning and Maintenance Method of Optical connector

Many times, we will misunderstand output power down for optical equipment breakdown, may actually be caused by the optical fiber connector is contaminated by dust or dirt, only proper cleaning and maintenance on the fiber optic connector, that is troubleshooting. The following are cleaning head of maintenance methods fiber optic connector.

1. To turn off the power, unscrew carefully from the adapter fiber optic connector.

2. With the texture of a good lens cleaning paper or medical skim alcohol cotton clean the optical connector carefully; Alcohol cotton alcohol content should not be too much, moist but squeezed without alcohol dripping is better.

3. After cleaning, wait for 1 to 2 minutes in order that the activities of the alcohol evaporates connector surface dry.

4. Connect the cleaned fiber optic connectors to the optical adapter. It should be noted that with appropriate force, so as not to force the ceramic tube adapter rupture.

5. After cleaning the fiber optic connector, if the output power is still low, remove the adapter, unscrew the other connector inside of the machine and use the same way to clean; If the optical power is still lower at this time, the optical adapter may have been contaminated and should clean the adapter. (Note: When removing the adapter should be careful so as not to damage the fiber inside of the machine)

6. The adapter can be cleaned by special compressed air cotton or degreasing alcohol cotton. When cleaning with compressed air cotton, align the nozzle of the compressed air

tank with the ceramic tube of the adapter and blow the compressed air into the ceramic tube for cleaning. When cleaning with the degreased alcohol cotton, carefully wash the alcohol cotton sliver through the ceramic tube. Note that the alcohol sliver penetration direction should always be consistent, otherwise it may not be able to achieve the desired cleaning effect.

Special Attention:

A, During the process of cleaning the fiber optic connectors, the connectors should be avoided with optical alignment of the human body or the human eye, so as not to cause permanent harm to humans or to cause permanent eye burns!

b, Please use the appropriate force When installing fiber optic connector, otherwise may lead to fragmentation of the ceramic tube inside the adapter. Once ceramic tube is broken, the optical output power will be greatly decreased. And even if the fiber optic connectors turn a little, the output optical power will be significant changed a lot.

c, Be sure that the pump laser is on off state before operating the optical fiber, otherwise will cause the optical fiber connector get burned and the power also will be dropped.

10.Disclaimer of liability

The Company reserves the right to change the product described herein without notice. The Company does not assume any responsibility and obligations arising from the use of the products herein, unless expressly written consent of the Company. Use and purchase this product does not transfer any of its patents, copyrights, trademarks or intellectual property rights of any license. Any patent in the manner described herein, the product does not infringe a third party, article no representations or warranties.