# High Power 1550nm
# 5*EYA1U Series Optical Amplifier
# Instructions | V1.0═

ZX-SMS-Y013

# Preface

This manual is applicable to the 5*EYA1U series optical amplifier which mainly describes the performance characteristics, technical parameters, installation, debugging, common fault processing and so on. In order to ensure the equipment can be installed correctly and safe operation, please read this manual carefully before installation and debugging the equipment so that avoiding the damage to the equipment or injury to the operating person; Please contact us if have any questions .

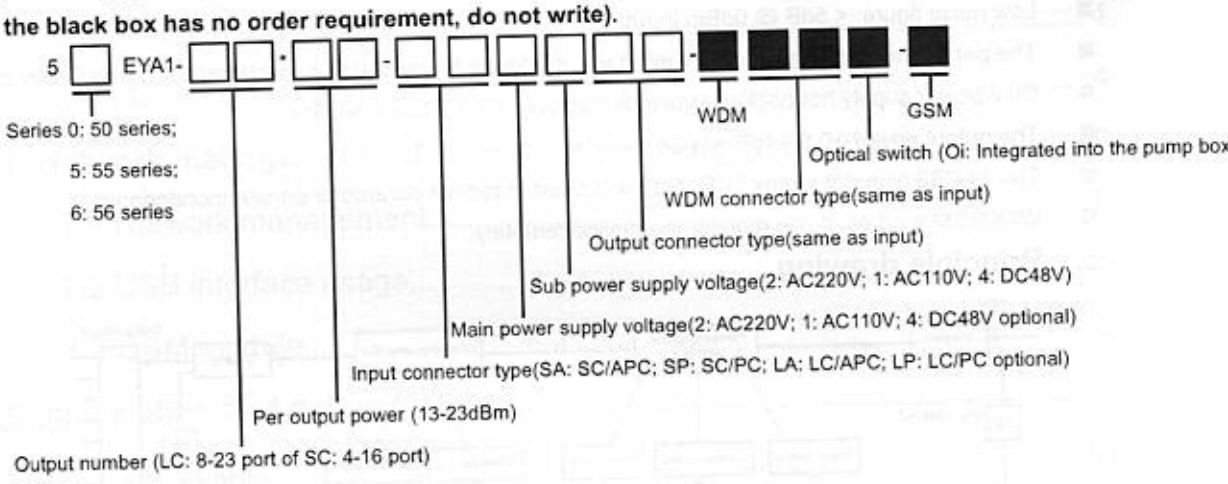
**Special note:**

- 5*EYA1U series optical amplifier is a high-power laser device. The installation and debugging must be performed by professional technicians. Read this manual carefully before operation to avoid damage to the device due to incorrect operation or to cause accidental injury to the operator.
- When the optical fiber amplifier is working, an invisible laser beam will be emitted from the optical signal output adapter located on the rear panel, the optical signal output port should be prevented from being aligned with the human body and the optical output port cannot be directly viewed with the naked eye so as to avoid the permanent damage to human body and the human eye.
- Patchcord should be performed in the condition of pump laser turned off for any operation of the output , otherwise, the patchcord head will be burnt and the output power will drop.
- When install the optical fiber moveable connector, the force should be appropriate, otherwise it may cause the ceramic tube in the adapter to crack. Once the ceramic tube is fragmented, the output optical power will be greatly reduced, the output optical power will change significantly if the optical fiber connector isl rotated slightly.
- The factory default pump opening threshold is -12dBm, the device has no power output if the input optical power $\leqslant$ -12dBm.
- Before the equipment is powered on, it should be confirmed that the grounding terminal of the chassis and the power socket has been reliably grounded (the grounding resistance should be < 4 Ω ) to prevent the static electricity from damaging the laser device and prevent the chassis from being electrified and causing harm to the human body.
- In order to ensure long-term stable operation of the equipment, in areas where the grid voltage is unstable or where the voltage waveform is poor, users are advised to configure a dedicated AC power supply for the equipment, users can also configure uninterrupted power supply (UPS) systems if possible. In regions where the ambient temperature is too large or the equipment room environment is poor (the ideal operating ambient temperature of the device is 25 ° C), it is recommended that the user configure a dedicated air conditioning system for the device to improve the device's working environment.

| | | | |
|---|---|---|---|
| Supply voltage | V | AC220V(160V ~ 265V) /AC110V（90 ~130V）/DC48V（38 ~ 58V） | |
| Equipment power consumption | W | ≤ 50 | |
| Working temp range | ℃ | -5 - +42 | |
| Max relative humidity | % | Maximum 95% without condensing | |
| Storage tempe range | ℃ | -30 ~ +70 | |
| Max storage relative humidity | % | Maximum 95% without condensing | |
| Product size | mm | 357(W)*482(L)*44(H) | |
| Packing size (1 set) | mm | 595(W)*490(L)*120(H) | |
| Packing size (2 sets) | mm | 595(W)*490(L)*230(H) | |

## 4.2 Model

5*EYA1-Output port*Per port output power-Input optical connector+Main power supply voltage+Sub power supply voltage+Output connector-with WDM+WDM connector +Optical switch-GSM **(Note:When the black box has no order requirement, do not write).**




For example: 55EYA1-16*22-SA24SA-WSA

Explanation: This 1U device is the erbium and ytterbium Co-doped high power fiber amplifier with 16 port output, each output 22dBm, input connector SC/APC, main power supply,220V, sub power supply 48V, output connector SC/APC, with WDM, WDM connector SC/APC.

# 5. External function

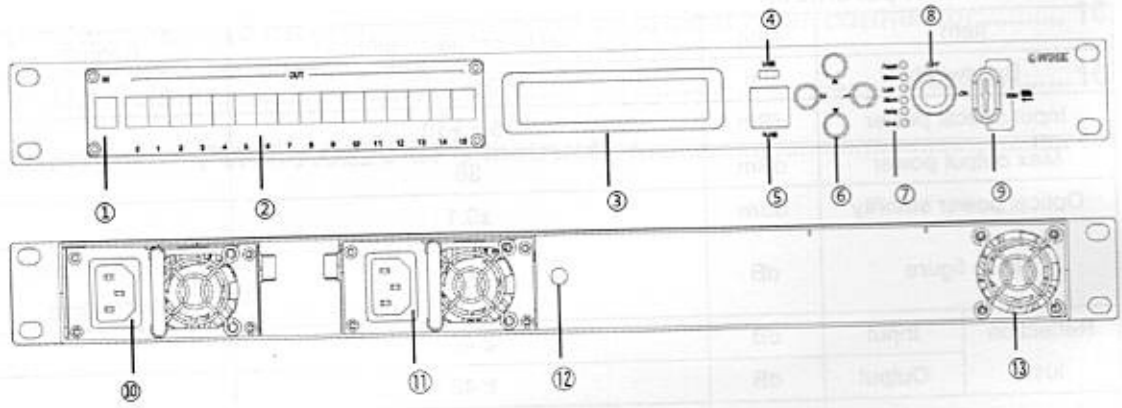



Figure 5.1 55/56EYA Front and rear panel

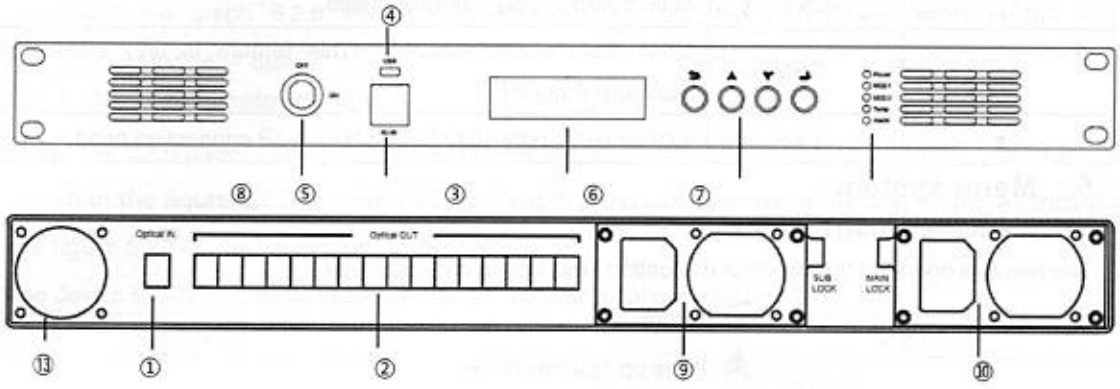



Figure 5.2 50EYA Front and rear panel

## 5.1 Front panel

| No. | | Item | Functional description |
|---|---|---|---|
| ① | | IN | Input power port. |
| ② | | OUT | Optical power output port. Please confirm the type of optical fiber connector before connecting. Remember using the dust cap to cover the fiber connector if there is no finer connection. Noted: laser is not allowed to enter the user's eyes so as to avoid accidental injury. |
| ③ | | LCD Display | Display function menus, parameters and other information. |
| ④ | | USB | The Micro USB2.0 interface, it can realize serial communicate through connecting computer directly by using data line. |
| ⑤ | | RJ45 | SNMP connector. |
| ⑥ | Key | ↩ | Return key. |
| | | ▲ | Page up / parameter +. |
| | | ▼ | Page down / parameter -. |
| | | ↵ | Enter key. |
| ⑦ | Status Indicator | Power | Power indication, green light indicates power on. |
| | | Status | Module online indicator, green light is normal (module communication loss if no light). |
| | | Lock | Pump lock indicator, turn on:green light, turn off: red light |
| | | Alarm | Module working status indicator ( red light when module abnormal operation). |
| | | Temp | The system temperature indicator (<35℃ green light on, 35℃~50℃ orange light on, >50℃ red light on). |
| | | Link | GSM module wireless signal indication, light is green when there is a signal, light is red when there is no signal. |
| ⑧ | | ON/OFF | Pump switch.Turn "on" with the key, the pump laser will be powered.Turn "off"with the key,the power of the pump laser will be cut off. |
| ⑨ | | SIM | SIM card interface. (This feature is only available for individual models) |

Note: The internal CPU system can monitor the working status of the equipment and deal with the various problems arising from the equipment. When an alarm occurs, it indicates that the machine has serious faults. The alarm parameters should be recorded and contact our company immediately.

## 5.2 Rear panel

| Item | Project | Functional description |
|---|---|---|
| ⑩ | SUB Lock | Sub power supply interface shield. |

enters a set state immediately.

(3) Setting for the output power and multi-mode pump working current parameters. Under the 6.2.12 interface, press the ▼ key, the "*" will follow down, showing that the interface is like figure 6.2.13, the 3-3, 3-4 can be set according to the operation steps of 6.2.4 (2). 3-3 steps into the 0.1dBm, the 3-4 step into the 10mA.

3-3 Output power

3-4 Bias current of pump laser B

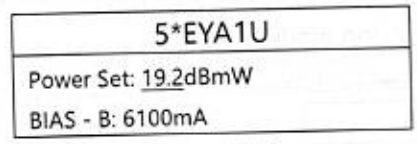



Figure 6.2.13

### 6.2.5 MOD2 parameter setting

Under the 6.2.8 page, press the ▼ key to enter the fourth main menu "4.Module_2 Set" interface, as shown in figure 6.2.14: this device MOD2 is a reserved module,no parameters can be set. press ↵key, enter in the sub-menu,as shown in the figure 6.2.7-2, dispaly "no module" .

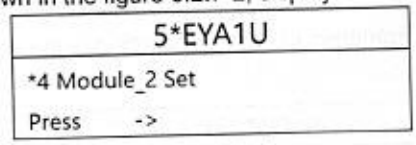



Figure 6.2.14

### 6.2.6 Network parameter setting

Under the 6.2.14 page, press the ▼key to enter the fifth main menu "Network Set" interface, as shown in figure 6.2.15, when the ↵ button is pressed under the interface, the display interface enters figure 6.2.16.

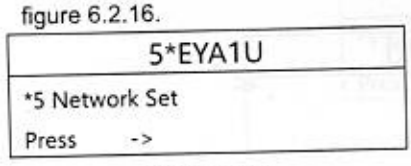



Figure 6.2.15

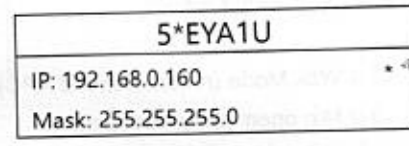



Figure 6.2.16

(1) IP address modification: under the display of figure 6.2.16, the "*" and 5-1 are in the same horizontal line. At this time, press ↵ key, the underline will appear under the first set of data,and the user can modify the first set of data according to the "▲ ▼"according to the actual requirements. At the end of the modification, press the ↵ key, the underline is automatically transferred to second sets of data. According to the first set of data modification methods, the whole IP address can be modified. After pressing the ↵ key, reset the data and save it automatically. (factory default IP:192.168.0.160).

(2) Gateway and subnet mask modification: press the ▼ key, when the "*" is moved in the relevant menu, as shown in figure 6.2.17 and 6.2.18. Other parameters can be set up according to 6.2.6 (1) setting method,. (factory default gateway 255.255.255.0; default subnet mask: 192.168.0.1) press ↩ to return to 6.2.15 interface once finish modifying.

Mask

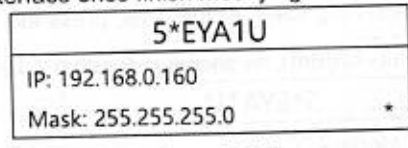



Figure 6.2.17

GW

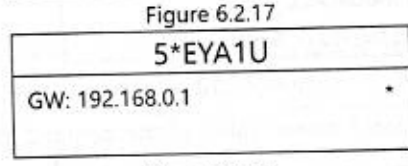
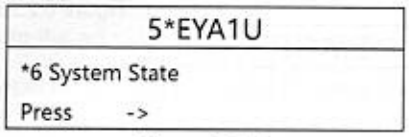



Figure 6.2.18

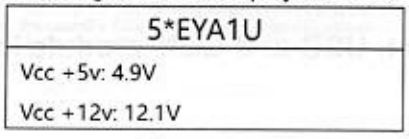
### 6.2.7 System state display

Under the display of figure 6.2.15, press the▼key to enter the sixth main menu "*6.System State" interface, as shown in figure 6.2.19.

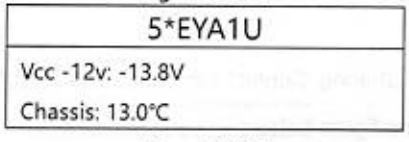



At this time, press the ↵ key to display 6-1, 6-2, as shown in figure 6.2.20, continue pressing ▼ key to display 6-3, 6-4 , as shown in figure 6.2.21.At this time, the 6 menu display item is completely checked. Press the ↩ key, it will return to the figure 6.2.19 display interface.

6-1 +5V voltage
6-2 +12V voltage

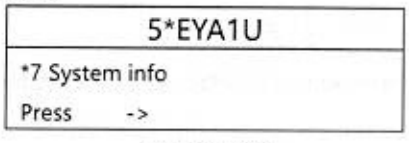



6-3 -12V voltage
6-4 Equipment temp



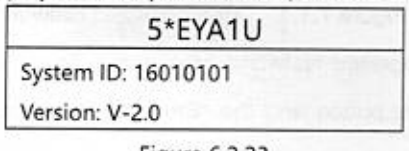

### 6.2.8 System information display

Under the 6.2.19 display interface, press the▼ A key to enter the seventh main menu "*7.System info" interface, as shown in figure 6.2.22.

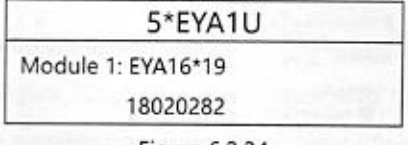



At this time, press the ↵ key to display 7-1, 7-2, as shown in figure 6.2.23, press ▼ key to show 7-3 "Module 1 parameters", as shown in figure 6.2.24. Continue to press the ▼ key to display 7-4 "Module 2" parameters (same with 7-3 display contents). At this time, 7 menu display items are checked.

7-1 System ID
7-2 Version

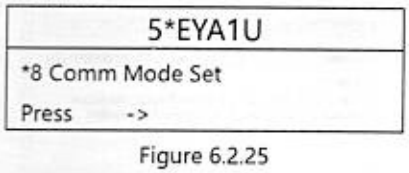



7-3 Module 1 model
7-4 MOD1Equipment No




### 6.2.9 GSM communication management (This feature is only available for individual models)

Under the figure 6.2.22 interface, press▼key, enter in to the eighth main menu "*8.Comm Mode Set" interface, as shown in the figure 6.2.25:




Press↵key, showing 8-1, 8-2, as shown in the figure 6.2.26:

| 5*EYA1U | |
|---|---|
| 8-1 GSM card number of this equipment | GSM NO: 15898712275 * |
| 8-2 SIM card number of receiving | Alarm NO: 15264313023 |

Figure 6.2.26

| 5*EYA1U | |
|---|---|
| 8-3 GSM Restart | Reboot: OFF |

Figure 6.2.27

The SIM card will not be recognized by this equipment if plug in this SIM card in the condition of this equipment power on; at this time, the 8-3 GSM restart parameter must be changed to "ON"so that the SIM card can be recognized by this module.

# 7. Network management, USB and GSM module instructions

## 7.1 Network management

7.1.1 Network management connection test method (the following operations are based on the premise that the device is powered on)

(1) Enter into the "Network and Sharing Center" setting interface of the PC and find the"View Active Network" area, as shown in the figure below:

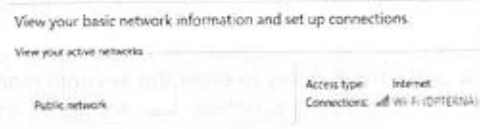



Figure 7.1.1

(2) Connect the device network management interface to the network cable interface of the PC with the network cable. After the connection, the green indicator of the device network management interface is always on and yellow indicator is blinking; if the green indicator is not bright or the yellow indicator is not flashing, it indicates that the connection line between the device and PC is not plugged in.

(3) After the device is connected to the PC, new network connection will be added to the "View Active Network" area, as shown in Figure 7.1.1, "Unrecognized Network" . Left-click on the "Ethernet" on the right side of the "Unrecognized Network" area in the figure, and the "Ethernet Status" dialog appears. Click the Properties button and the "Ethernet Properties" dialog appears, as shown in Figure 7.1.2. Shown


Figure 7.1.2

(4) Click "Internet Protocol Version 4 (TCP/IPv4)" in the "This connection uses the following items" drop-down list box in Figure 7.1.2 above and then click the "Properties" button below, and "Internet Protocol Version 4 (TCP/) appears. The IPv4) Properties dialog box is shown in Figure 7.1.3 below. Change this IP address to the address segment corresponding to the local IP address, but it cannot be duplicated with the local IP address (the default factory default IP address is 192.168.0.160, and the setting address is 192.168.0.***.** *<255 but ≠160). The sub net mask and gateway of the PC are set to be the same as this unit.


Figure 7.1.3

(5) Click the OK button after the setting is over.

(6) Left double click on the web page login icon, as shown in Figure 7.1.5; view the IP address of the equipment through the display as shown in Figure 6.2.16; take the factory default IP address "192.168.0.160" as an example, as shown in the figure. As shown in 7.1.6:


Figure 7.1.5


Figure 7.1.6

(7) In the 7.1.6 interface, enter the device's local IP address in the web address bar and press Enter. The dialog box shown in Figure 7.1.7 appears (if the dialog box is not displayed, press F5 on the keyboard to refresh the page and try again), then enter After the password "public", click "Login" to view the device parameters, as shown in Figure 7.1.8:

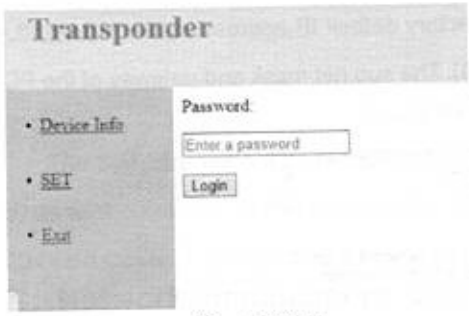



Figure 7.1.7

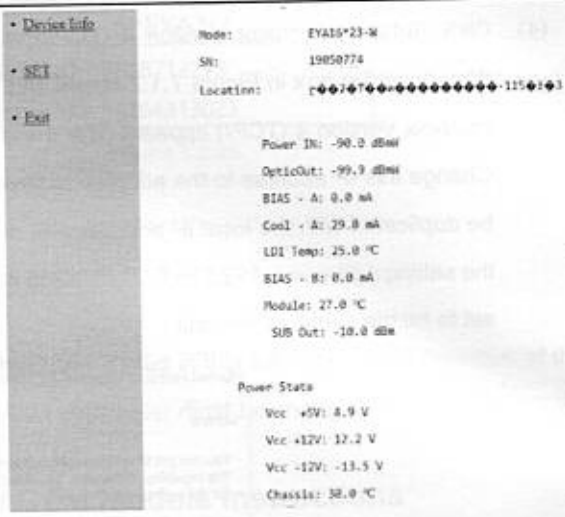



Figure 7.1.8

Click "SET" in the menu bar on the left side of Figure 7.1.8, and the related items will appear. You can adjust the parameters of the equipment through the computer. (If you need to adjust the equipment parameters, please be sure to do it under the guidance of professionals.) . As shown in Figure 7.1.9:

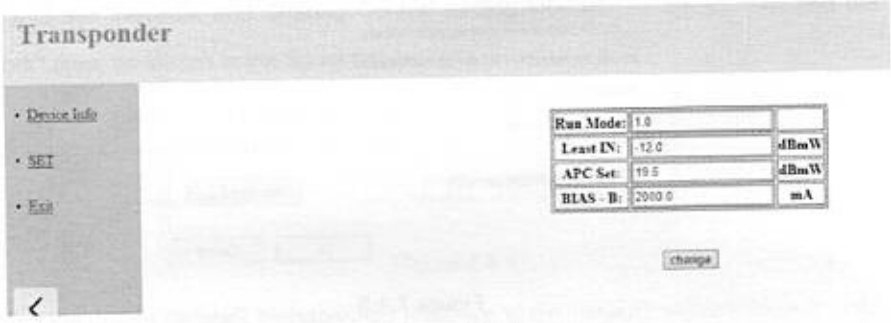



Figure 7.1.9

## 7.2 USB interface usage

This interface can modify the model display character line of the display interface, as shown in the figure below:

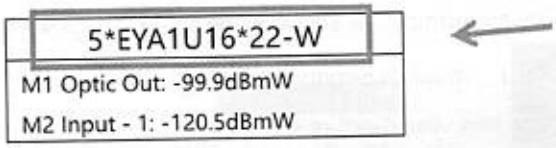



Figure 7.2.1

For example, If want to change "55EYA1U16*22-W" to "55EYA1U16*22-WDM" , as shown below:

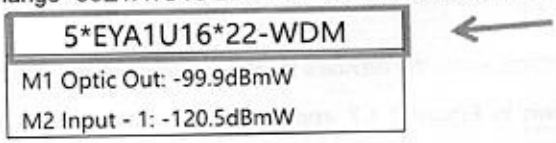



Figure 7.2.2

According to different types of equipment, two modification methods are available:

7.2.1 50EYA MicroUSB2.0 interface connection steps:

1. Power the equipment.
2. Connect the USB port of the host computer with the USB port in the front panel of the equipment through USB2.0 interface data line.
3. On the computer monitor, right-click the computer icon, as shown in Figure 7.2.1 .
4. Right-click the management menu and pop up the dialog box, as shown in figure 7.2.2.


Figure 7.2.1


Figure 7.2.2

5. On the 7.2.2 interface, left click the device manager and pop up the 7.2.3 interface. Click the triangle number on the left side of the red rectangle icon, and pop up the 7.2.4 interface. The newly added "COM1" is the USB interface.


Figure 7.2.3


Figure 7.2.4

6. Find the "front panel display settings tool" icon, as shown in figure 7.2.5, open the software, as shown in figure 7.2.6,then click the"change Serialport Number", Figure 7.2.7 is shown, fill the "Serialport Number" as shown in Figure 7.2.4 :


Figure 7.2.5

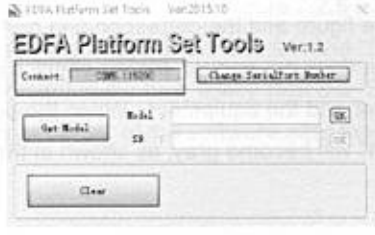



Figure 7.2.6

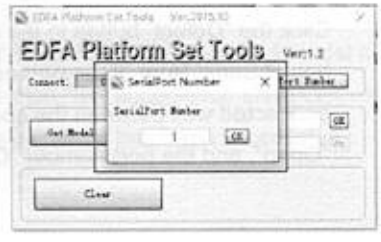



Figure 7.2.7

7. Modify port: according to the port number displayed in figure 7.2.4, modify the port number in the red rectangle box on the 7.2.7 interface, click the OK button
8. Change the equipment Model display: click the "Get Model" button, on the right side of the "model" will display the current equipment model. As shown in figure 2.7.3.


Figure 7.2.3


Figure 7.2.4

9. Delete the current model displayed in the "Model" box, then fill the required model No. of the equipment in the box, click the "OK" button after the change is finished.

7.2.2 55/56EYA MicroUSB2.0 interface connection steps:

1. Because of the software "Section16ProductDebugTool.EXE" characteristics, the anti-virus software will report the virus or automatically delete or isolate the software when open it in the computer. Please trust the software to ensure that the software can run normally.
2. Prepare a Micro-USB cable and "Section16ProductDebugTool.EXE" software, use the micro USB cable to connect the computer with the USB port on the equipment, double-click the running software, the software interface is as shown below:

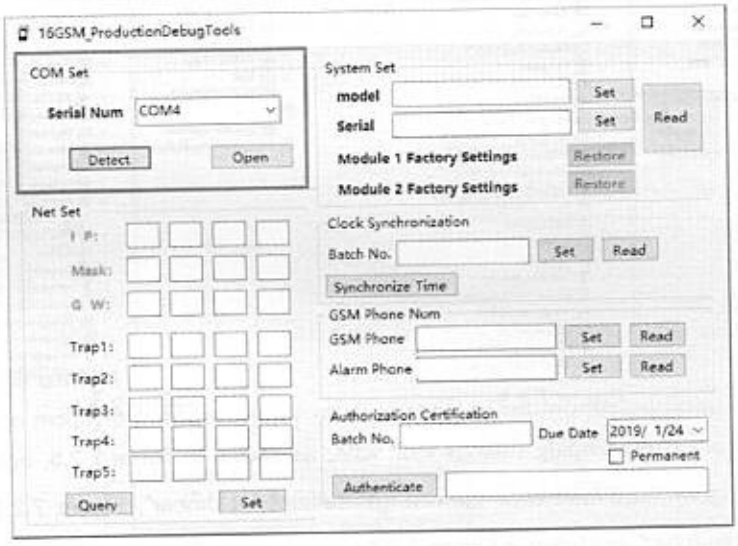



Figure 7.2.3

3. Click the "Detect" button in the above figure and the corresponding port number will appear in the box of Serial Num. If the port number does not appear, please check if the Micro-USB line is connected well between the computer and the equipment . When the port number appears, click "Open", and the port number "COM4" will become gray, as shown in the figure below:

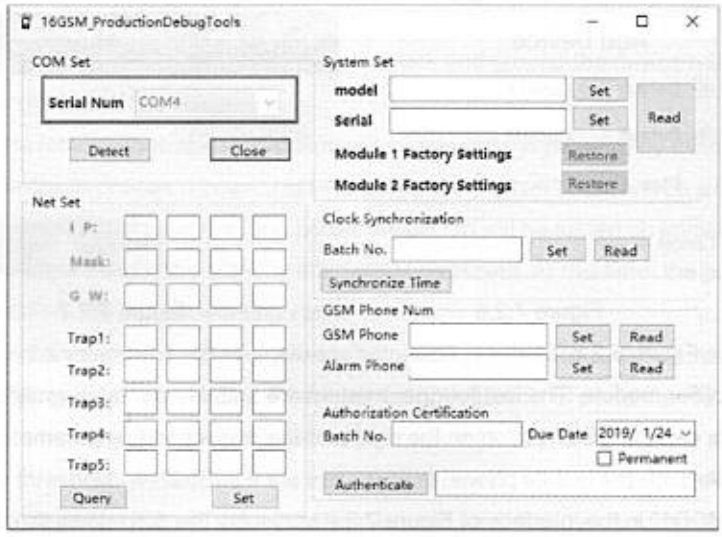



Figure 7.2.4

4. Click the "Read" button in the "System Set" function part. The model number and serial number of the equipment will appear in the corresponded boxes of the "model" and "Seria", as shown in the following figure:

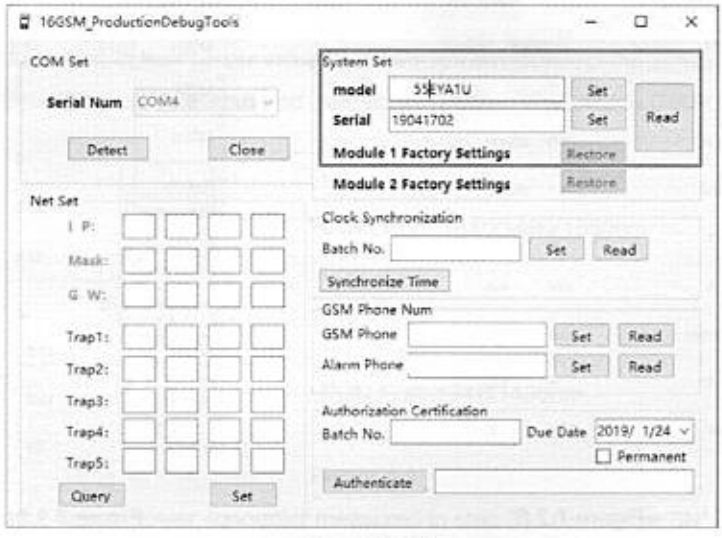



Figure 7.2.5

5. Delete the current model displayed in the "Model" and "Serial" box, then fill the required model and serial No. of this equipment in the box, finally click the "Set" button."Set successful" character will appear in the lower right corner of the software after the this equipment has been successfully modified.

## 7.3 GSM module

The Android software "Network Management" can remotely view the operating parameters of the equipment and set the parameters related to this equipment.The steps of this function are as follows:

(1) Insert the prepared SIM card into the slot in the lower left corner of the equipment and re-power the equipment to complete the card identification;

(2) Open the Android software "Network Management", click the "Add Device" button on the home page, the Add Device interface will appear, as shown in Figure 7.2.6. Enter the SIM card number which was installed in the equipment ,then click "OK" , this equipment has been added to the software at this time.

(3) Click "Manage"in the next interface, as shown in Figure 7.2.7 , then click "Refresh" in the next interface shown in Figure 7.2.8, wait a moment, the module parameter information will be displayed on this interface.

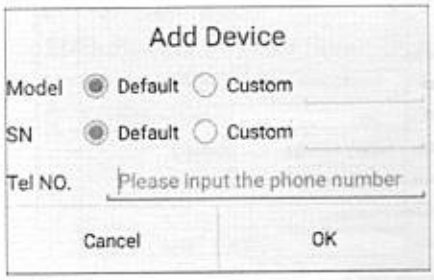



Figure 7.2.6

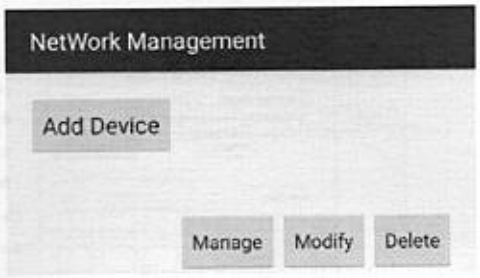



Figure 7.2.7

(4) As shown in Figure 6.2.8 interface: This interface displays the parameter information of module 1: optical amplifier module. The last four parameters are settable parameters. After modifying the parameters, click the "Set" button on the right and the corresponding parameters of this equipment will be set through the mobile phone.

(5) Click the "MOD1" in the interface of Figure 7.2.9 to display the drop-down list, the parameters of the other two modules MOD2 and System can be viewed and set .

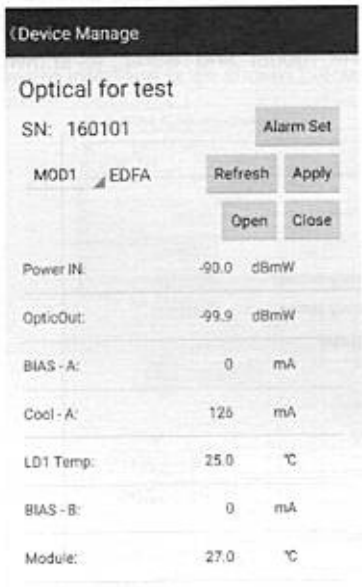



Figure 7.2.8


Figure 7.2.9

# 8. Installation and debugging

## 8.1 Unpacking

1. Please confirm that the outer packaging is intact before unpacking the equipment;, please contact the local dealer or carrier immediately if it is found that the outer packaging is damaged or water marks.
2. After unpacking, please check the equipment and accessories according to the packing list. please contact your local dealer or call our company directly.
3. If you think the equipment is damaged after unpacking, do not power on so as to avoid more serious damage to the equipment or accidental injury to the operator; please contact local dealer or call our company immediately.

## 8.2 Testing Instruments

1. 1 piece optical power meter; (range -50dBm~+26dBm).
2. Standard patchcord that match the fiber exit model of the device.
3. Absolute alcohol and medical absorbent cotton.

## 8.3 Installation

1. Remove the device from the box, secure it on the rack and ground the device reliably (grounding resistance should be <4Ω).
2. Confirm that the local voltage matches the power supply voltage required by the device power supply and use the device to provide a power cable to power the device. There will be a beeping sound for 3 seconds at the moment of power-on and power supply fan will be turned on immediately. As shown in Figure 6.2.1 or Figure 6.2.1, the standby interface is displayed. At this time, the power supply system of the device enters the normal working state.
3. Use the optical power meter to measure the input optical power to ensure that the input optical power value is in the range of (-5~+10)dBm. To ensure the optimization of performance indicators, our company recommends the best input optical power value (0~+3). dBm. Factory default input power of open pump threshold ≥-12dBm, if the input optical power is lower than this threshold, the equipment has no power output (this equipment is used for C-band signal transmission).
4. First connect the output of the device to the corresponding rear-end transmission device, make sure that the plug is inserted vertically into the adapter and hear"click" to prove that the connector is in good contact. For devices with WDM, when the PON port is connected to the network, note that the corresponding COM port is directly above the PON port and the location cannot be reversed when accessing. As shown in Figure 8.3.1:

If need to test the output optical power value of the equipment, connect the optical power meter to the output of the equipment by using a standard patchcord (SC/APC; SC/PC; LC/APC) that matches the power output port.

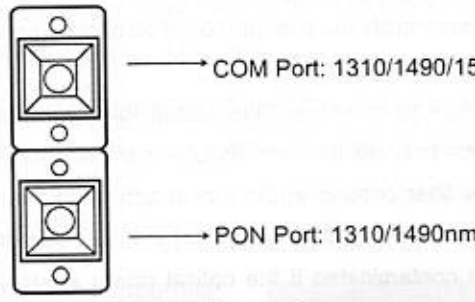



Figure 8.1

5. Connect the input optical power connector measured in step 3 to the device "IN" port and observe the input and output optical power display values of the front panel display. If test output power, the optical power value in the optical power meter is confirmed to be the same as the display value in the front panel, at this time, the power test is finished (When measuring the optical power, make sure the optical power meter is placed in the measurement range of the appropriate wavelength and the surface of the fiber connector is clean).
6. Remove optical signal,patchcord and optical power meter after finishing the output power test, then connect the device output to the network. This step can be omitted if no output power test .

Note: Turn the pump switch to OFF before connecting each COM port and optical power meter with patch cord(very important)when testing the output power.

Until now,the equipment has been finished installing, testing and debugging.

Note: After the device starts working, do not plug in/out the output otherwise the optical fiber connector will be burnt.

## 9. After sales service

1. The warranty of the equipment is 1 year. For equipment failure caused by user misoperation or irresistible natural factors, our company will be responsible for maintenance and material cost needs to be collected.
2. Please contact the local dealer immediately or apply our company's technology support when the equipment fails.
3. The troubleshooting for on-site maintenance should be operated by professional and technical personnel, so as to avoid more serious damage to the equipment.

Note: Our company will not offer free warranty if the users disassemble and repair equipment personally, reasonable maintenance fee and material fee will be collected.

## 10. Cleaning and maintenance method of optical fiber connector

In many cases, we will misjudge the optical power drop of the output port as a malfunction of the equipment. Actually, the fiber optic connector may be contaminated by dust or dirt. It is only to clean and maintain the fiber optic connector properly. The following describes the cleaning and maintenance operations of the fiber connector.

1. Turn off the power to the equipment and unscrew the fiber optic connector from the adapter carefully .
2. Use good quality lens paper or medical degreased cotton to clean the optical joint carefully; the specific end of the cleaning joint is oriented obliquely downward, the amount of alcohol in the alcohol cotton should not be too much, moist, but extruded without alcohol drops is better.
3. Please wait 1-2 minutes to allow the alcohol on the surface of the movable joint to evaporate and dry after cleaning. (You can accelerate the evaporation of alcohol by gently shaking the joint but avoid blowing the fiber connector with mouth!)
4. Pay attention to proper force when connect the optical fiber connector back to the adapter so as to avoid using too much force to break the ceramic tube in the adapter.

1. After cleaning the optical fiber connector, the output optical power is still not normal. At this time, remove the adapter and unscrew another connector in the equipment to clean it; The inside of the adapter may have been contaminated if the optical power is still low after cleaning,the adapter should be cleaned. (Note: Be careful when removing the adapter, so as not to damage the optical fiber in the machine.)
2. The adapter can be cleaned with dedicated compressed air or degreased alcohol tampon. When cleaning with compressed air, use the nozzle of the compressed air tank to aim at the ceramic tube of the adapter and blow the compressed air into the ceramic tube for cleaning; when cleaning with degreasing alcohol tampon, insert the alcohol tampon into the ceramic tube carefully for cleaning. Note that the direction of penetration of the alcohol tampon should be always the same, otherwise the ideal cleaning effect may not be achieved.

## 11. Disclaimer

The company reserves the right to change the products described herein at any time without notice. The company does not assume any responsibility or liability arising from the use of the products described herein, unless there is a clear written consent from the company. The use and purchase of this product does not transfer any licenses, copyrights, trademarks or any intellectual property rights of the company. The use of the product in the manner described herein does not infringe any patent of third party and is not stated or guaranteed in this article.

## Attachment: PW50-AC220-UPS Instruction

1. UPS Configuration and Charging Instructions.

UPS specifications: 12V8AH or 12V12AH lead-acid batteries

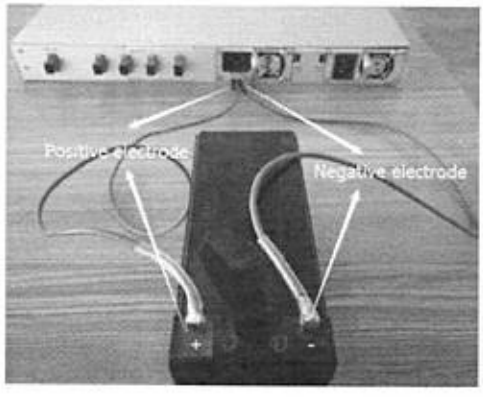

The upper limit voltage is 14.8V, the discharge cut-off voltage is 11.5V, and the max charging current is 0.8A.

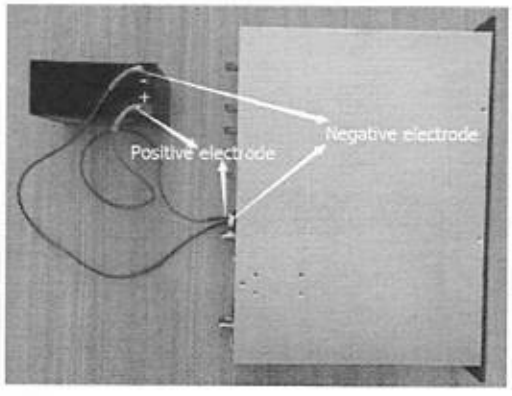
After AC power on, the power supply will turn on the boost chip and wait for 5 seconds. After 5 seconds, it will gradually start to boost. The standard of boost voltage is that the charging current is stable at 0.8A. When the charging voltage rises to 15V, the voltage will not rise again, and the voltage will remain stable until the current decreases to below 0.3A, the boost chip will gradually reduce the voltage to 13.5V

2. Installation

The battery is connected to the power supply through the XT60 interface. The red wire is the positive pole and the black wire is the negative pole.

Firstly, the battery is connected to the power supply. Before connecting the battery, it is necessary to confirm the normal performance of the battery, the battery voltage is not less than 10.8V.It is recommended to replace the healthy battery if the battery voltage is less than 10.8V then connect the battery to 220VAC after confirming that the battery is norma




3. Parameters

| | | | | |
|---|---|---|---|---|
| AC Input | 100V-240V | | | |
| | 1A 47Hz-63Hz | | | |
| DC Output | +5V | | +12V | -12V |
| | 2A | | 3A | 0.5A |
| Battery Parameters | Max Charging Current | Max Charging Voltage | Output Current | Protection Voltage |
| | 0.8A | 14.8V | <5A | 10.8V |

4. Operating Instruction

The default power supply is 220 VAC and the UPS power supply is charged at the same time.The power supply will be switched to UPS power supply within 0.5 seconds when 220 VAC power supply disappears, realize UPS function.

The buzzer whistles every 2 seconds to alert when there is no AC power supply and UPS power supply

5. Over Current Protection

The 5A fuse is installed on the discharge circuit of the battery to protect the safety of the battery.

6. Operation Parameter

| Model | Power（Pump Working Mode） | UPS Supply Current | Operating Time |
|---|---|---|---|
| EDFA 23dBmW(27℃) | 8W | 0.6A | 8 hr(s) |
| EDFA 23dBmW(50℃) | 9.6W | 0.8A | 6.6 hr(s) |

Note:Parameter testing under standard 12V8AH lead-acid batteries