

THOR BROADCAST

User Manual

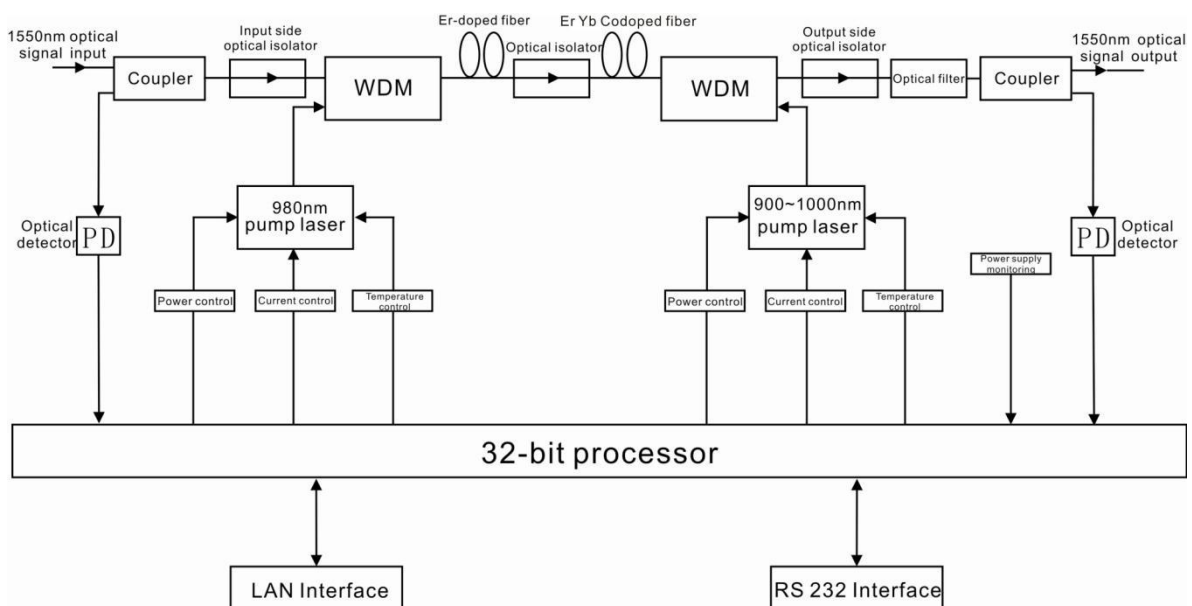
High-power Optical Amplifier



1 Product Overview

Optical amplifier uses well-known high-performance erbium-ytterbium co-doped double-clad fiber and low-noise pump laser. It has a reliable circuit design and efficient heat dissipation design. The maximum total output power of the whole machine can reach +39 dBm, and it supports up to 64 outputs, with optional optical switch, CWDM, and RF detection. It provides SNMP protocol network management software and WEB network management, suitable for amplified transmission of downstream 1550nm optical signal in FTTH network.

2 Block diagram

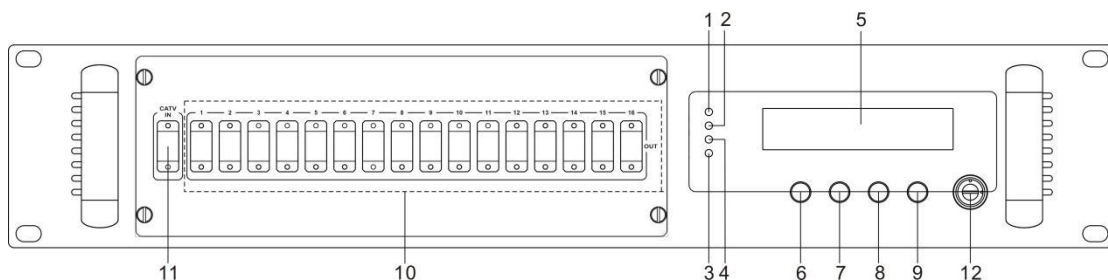


3 Technique Parameter

| Item | | Unit | Technique parameters | Remark |
|-------------------------------------|--------|------|--------------------------------------|--|
| Operating bandwidth | | nm | 1545 - 1565 | |
| Optical input power range | | dBm | -5 - +10 | |
| Maximum optical output power | | dBm | 39 | |
| Output power stability | | dBm | ±0.5 | |
| Noise figure | | dB | ≤ 6.0 | Optical input power 0dBm, λ=1550nm |
| Return loss | Input | dB | ≥ 45 | |
| | Output | dB | ≥ 45 | |
| Optical Connector Type | | | SC/APC or FC/APC | |
| C/N | | dB | ≥ 50 | Test condition according to GT/T 184-2002. |
| C/CTB | | dB | ≥ 63 | |
| C/CSO | | dB | ≥ 63 | |
| Power supply voltage | | V | A:AC160V - 250V (50 Hz) ; B:DC48V | |
| Power consumption | | W | ≤ 70 | |
| Operating Temperature Range | | °C | -10 - +45 | |
| Maximum operating relative humidity | | % | Max 95% No Condensation | |
| Storage Temperature Range | | °C | -30 - +70 | |
| Maximum storage relative humidity | | % | Max 95% No Condensation | |
| Dimension | | mm | 440(L)×403(W)×88(H) | |

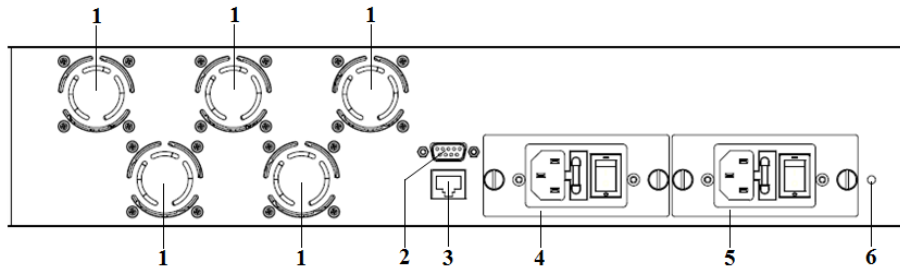
4 External Function Description

4.1 Front Panel Description



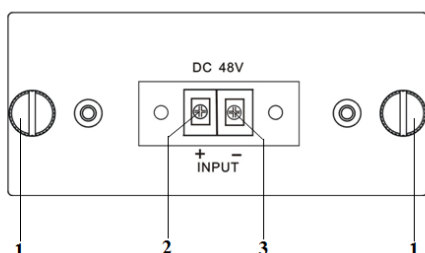
| |
|---|
| 1. Power indicator: One switching power supply is working – yellow; two switching power supplies are working – green. |
| 2. Optical input power indicator: This light turns on when the optical input power is > -10dBm. |
| 3. Pump working status indicator: Red light means the pump is not working, but the machine parameters are normal; flashing red light means the machine has broken down, related fault reason see the alarm menu of the display menu; green light means the pump is working normal |
| 4. Optical output power indicator: This light turns on when the optical output power is > +10dBm. |
| 5. 160x32 dot-matrix LCD screen |
| 6. Display the exit or cancel key of the setup menu. |
| 7. Display the up or increase key of the setup menu. |
| 8. Display the down or decrease key of the setup menu. |
| 9. Display the enter key of the setup menu. |
| 10. Optical signal output |
| 11. Optical signal input |
| 12. Pump laser switching key: “ON” means the pump laser is open and “OFF” means the pump laser is closed. Ensure the key is on “OFF” position before power on. After passing self-test, rotate the key to “ON” position according to the displayed message. |

4.2 Rear Panel Description



| | |
|-------------------|-------------------------------|
| 1. Fan outlet. | 2. RS232 interface. |
| 3. LAN interface | 4. Power supply 1 |
| 5. Power supply 2 | 6. Ground stud of the chassis |

4.3 DC Power Introduction



| | |
|---|---------------------------|
| 1 | Mounting screws |
| 2 | + Positive terminal block |
| 3 | - Negative terminal block |

5 Menu System

5.1 Main Menu

| Name | Display | Description |
|-----------------|---------------------------------|--|
| System Starting | xxxxxxx | Manufacturers' logo |
| | xxxxxxx | Equipment model |
| | xxxxxxx | Start countdown / lock status |
| Suspend Page | In: xx.x out: xx.x Unit: dBm | Display the optical input / output power |
| Main Page | 1.Disp Parameters | Entry of parameter display menu |
| | 2.Set Parameters | Entry of parameter setup menu |
| | 3.Alarm Status | Entry of alarm information menu |

5.2 Display Menu

| | |
|-----------------------------|--|
| Input Power: xx.x dBm | Input power, accurate to 0.1 dBm |
| Output Power: xx.x dBm | Output power, accurate to 0.1 dBm |
| Pump1 Power: xx.x dBm | Power of pump1, accurate to 0.1 dBm |
| Pump1 Bias: x.x A | Bias current of pump1, accurate to 0.1 A |
| Pump1 Temper: xx.x°C | Temperature of pump1, accurate to 0.1°C |
| Pump1 Cooling: x.xx A | Cooling current of pump1, accurate to 0.01 A |
| Pump2 Vol: x.x V | Drive voltage of pump2, accurate to 0.1 V |
| Pump2 Bias: x.x A | Bias current of pump2, accurate to 0.1 A |
| +5V Read: x.x V | +5V power supply voltage, accurate to 0.1 V |
| -5V Read: -x.x V | -5V power supply voltage, accurate to 0.1 V |
| Box Temper: xx.x °C | Box temperature, accurate to 0.1 °C |
| S/N: xxxxxxxx | Device serial number |
| IP Address: xxx.xxx.xxx.xxx | IP address |
| Subnet Mask:xxx.xxx.xxx.xxx | Subnet mask |
| Net Gateway:xxx.xxx.xxx.xxx | Gateway |

| | |
|-----------------------------|-------------------------|
| Mac: xxxxxxxxxxxx | Physical address |
| Trap1: xxx.xxx.xxx.xxx | trap1 address |
| Trap2: xxx.xxx.xxx.xxx | trap2 address |
| Software Version: Vx.xx.x.x | Firmware version number |

5.3 Setup Menu

| | |
|--------------------------|---|
| Set Low Input Threshold | Set the low optical input power alarm threshold, range -5.0~10.0dBm |
| Set High Input Threshold | Set the high optical input power alarm threshold , range -5.0~10.0dBm |
| Set Output ATT | Set the optical output power attenuation |
| Set Local IP Addr | Set IP address |
| Set Subnet Mask | Set subnet mask |
| Set Gateway | Set gateway |
| Set Trap1 Address | Set trap1 |
| Set Trap2 Address | Set trap2 |
| Set Buzzer cfg | Set the switch of beeper |
| Restore Factory config | Restore the factory configuration, set content as shown above |

5.4 Warning menu

| | | |
|--------------------|--------------|--------------------------------------|
| Input Status: xxx | xxx= LOLOW: | Very low optical input power alarm |
| | xxx= LOW: | Low optical input power alarm |
| | xxx= HIGH: | High optical input power alarm |
| | xxx= HIHIGH: | Very high optical input power alarm |
| Output Status: xxx | xxx= LOLOW: | Very low optical output power alarm |
| | xxx= LOW: | Low optical output power alarm |
| | xxx= HIGH: | High optical output power alarm |
| | xxx= HIHIGH: | Very high optical output power alarm |
| Pumpx Power: xxx | xxx= LOLOW: | Very low power of pump x alarm |

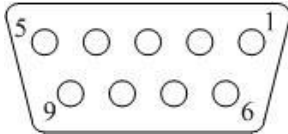
| | | |
|--------------------|--------------|---|
| | xxx= LOW: | Low power of pump x alarm |
| | xxx= HIGH: | High power of pump x alarm |
| | xxx= HIHIGH: | Very high power of pump x alarm |
| Pumpx Bias: xxx | xxx= LOLOW: | Very low bias current of pump x alarm |
| | xxx= LOW: | Low bias current of pump x alarm |
| | xxx= HIGH: | High bias current of pump x alarm |
| | xxx= HIHIGH: | Very high bias current of pump x alarm |
| Pumpx Temper: xxx | xxx= LOLOW: | Very low temperature of pump x alarm |
| | xxx= LOW: | Low temperature of pump x alarm |
| | xxx= HIGH: | High temperature of pump x alarm |
| | xxx= HIHIGH: | Very high temperature of pump x alarm |
| Pumpx Tec: xxx | xxx= LOLOW: | Very low cooling current of pump x alarm |
| | xxx= LOW: | Low cooling current of pump x alarm |
| | xxx= HIGH: | High cooling current of pump x alarm |
| | xxx= HIHIGH: | Very high cooling current of pump x alarm |
| +5V Status: xxx | xxx= LOLOW: | Very low +5V DC power supply alarm |
| | xxx= LOW: | Low +5V DC power supply alarm |
| | xxx= HIGH: | High +5V DC power supply alarm |
| | xxx= HIHIGH: | Very high +5V DC power supply alarm |
| -5V Status: xxx | xxx= LOLOW: | Very low -5V DC power supply alarm |
| | xxx= LOW: | Low -5V DC power supply alarm |
| | xxx= HIGH: | High -5V DC power supply alarm |
| | xxx= HIHIGH: | Very high -5V DC power supply alarm |
| Device Temper: xxx | xxx= LOLOW: | Very low chassis temperature alarm |
| | xxx= LOW: | Low chassis temperature alarm |
| | xxx= HIGH: | High chassis temperature alarm |
| | xxx= HIHIGH: | Very high chassis temperature alarm |

6.Communication Setup Descriptions

6.1 Communication Interface Description

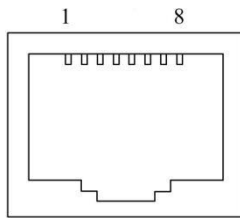
- 1) RS232 communication interface adopts DB9 standard connector, the pin definitions as follow:

The serial communication uses the standard NRZ form, 1 starts bit, 8 data bits, 1 stop bit and the baud rate is 38400.



| | | |
|---------------|---------------|---------------|
| 1: No Connect | 2: TX | 3: RX |
| 4: No Connect | 5: GND | 6: No Connect |
| 7: No Connect | 8: No Connect | 9: No Connect |

- 2) LAN communication interface adopts RJ45 standard connector, the pin definitions as follow:

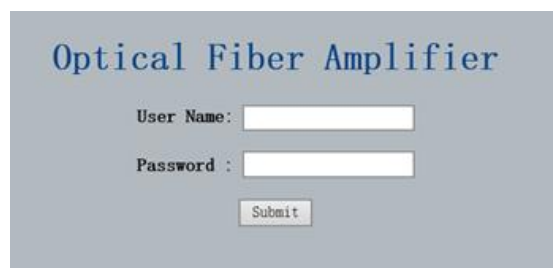


LAN

| | | |
|---------------|---------------|--------|
| 1: TX+ | 2: TX- | 3: RX+ |
| 4: No Connect | 5: No Connect | 6: RX- |
| 7: No Connect | 8: No Connect | |

6.2 WEB Network Management

1. Opening the IE browser and entering the equipment IP address leads to the following interface:



2. Enter the user name **admin** and password **123456** (factory default), to show the following interface:

Optical Fiber Amplifier

- [Display Parameter](#)
- [Set Parameter](#)
- [Modify Password](#)

Display Parameter

| Item | Value |
|---------------------|-------------------|
| Device Model: | |
| Serial Number: | 20111028 |
| Pump Number: | 2 |
| Input Power: | 7.6 dBm |
| Output Power: | -99.9 dBm |
| Pump1 Power: | -99.9 dBm |
| Pump1 Bias: | 0 mA |
| Pump1 Temperature: | 25.0 °C |
| Pump1 Cooling: | 0 mA |
| Pump2 Bias: | 0 mA |
| Pump2 Vol: | 19.7 V |
| +5V: | 5.0 V |
| -5V: | -5.2 V |
| Device Temperature: | 18 °C |
| MAC Address: | 30.71.b2.60.0c.fc |

There are 3 sub-interfaces:

1. **Display Parameter** interface: Describes the equipment display menu.
2. **Set Parameter** interface: Change the equipment parameters in this interface.
3. **Modify password** interface: Change the login password in this interface.

3. Click **Set Parameter** to open the following interface:

Optical Fiber Amplifier

- [Display Parameter](#)
- [Set Parameter](#)
- [Modify Password](#)

Set Parameter

Module Parameter

| Item | Current | New | Update |
|-------------|---------|--------|---------------------------------------|
| Output ATT: | 0.0 dB | 0 ▾ dB | <input type="button" value="Update"/> |

Set IP Parameter

| Item | Current | New | Update |
|----------------|--------------|----------------------|---------------------------------------|
| Trap Address1: | 192.168.1.58 | <input type="text"/> | <input type="button" value="Update"/> |
| Trap Address2: | 192.168.1.69 | <input type="text"/> | <input type="button" value="Update"/> |

The **Item** shows the changeable parameters, **Current**—the current parameters; **New**—select or enter the new parameters; **Update**—update the parameters.

The update steps: Find the item which needs to be changed, select a new value, and click the **Update** button.

7 Attention

- Ensure the package is not defaced. If the equipment is damaged due to transportation or other reasons, please don't electrify to avoid worse damage.
- Before powering on, make sure that the grounding terminals of the chassis and power socket are reliably grounded, and the grounding resistance should be $<4\Omega$, which can effectively protect against surges and static electricity.
- Optical amplifier is a highly technical professional equipment, its installation and debugging must be operated by professional technicians. Read this manual carefully before operating to avoid damage to equipment caused by fault operation or accident harm to the operator.
- When installing and debugging optical equipment, invisible laser beams may be emitted inside the fiber connector. Avoiding permanent harm to the body and eye, the fiber connector should not aim at the human body and human should not look directly at the fiber connector with the naked eye!
- There must be no shielding outside the ventilation holes of the device. Poor ventilation will cause the index to decrease, and in serious cases will cause damage to the device.
- When cleaning the fiber end face, you must confirm that the optical source is turned off.
- When the fiber connector is not in use, put a dust cover to avoid dust pollution and keep the end surface of the optical fiber clean.
- When installing the fiber connector, apply appropriate force to avoid damage to the adapter. Otherwise, the output optical power may decrease.

