

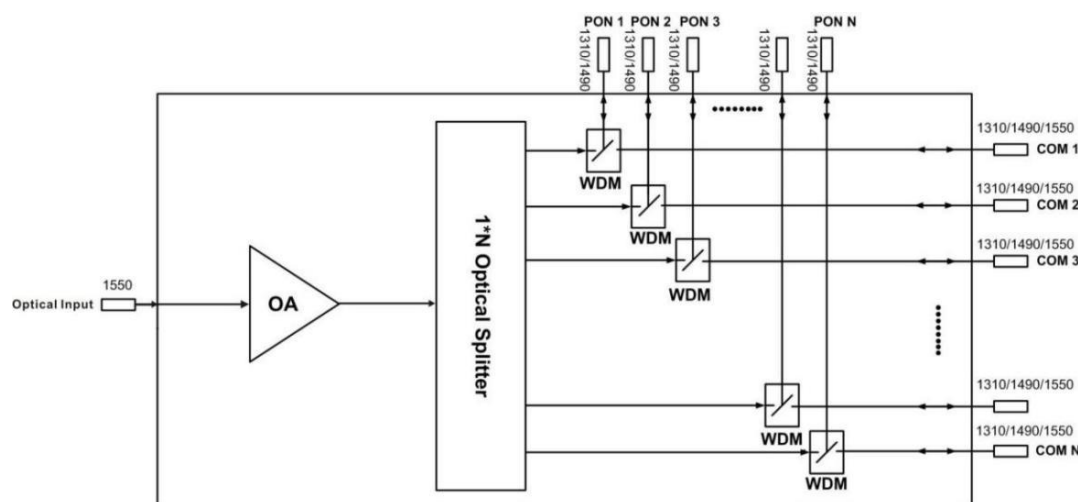
**OP-EDFA-08/15-WDM Erbium Doped Fiber Amplifier (EDFA) + CWDM**



**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. It supports 8 outputs, with CWDM. 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**



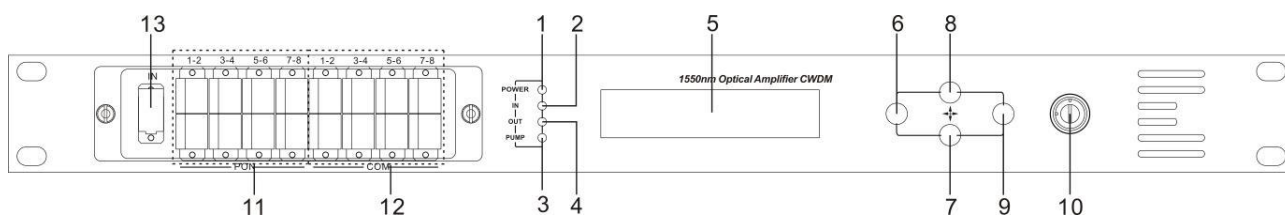
**3 Technique Parameter**

Item	Unit	Technique parameters	Remark
CATV pass through wavelength	nm	1545 - 1565	
PON pass through wavelength	nm	1260 – 1360 & 1480 - 1500	
PON insertion loss	dB	<0.8	
Isolation	dB	>30	
Optical input power range	dBm	-5 ~ +10	
Port number& each output power		8*15	Per OUT Port
Total optical output power	dBm	27	Total Power
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		INPUT port: SC/APC PON port: SC/UPC COM port: SC/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	DUAL PSU
Consumption	W	≤ 65	
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	437(L)× 442(W)×44(H)	

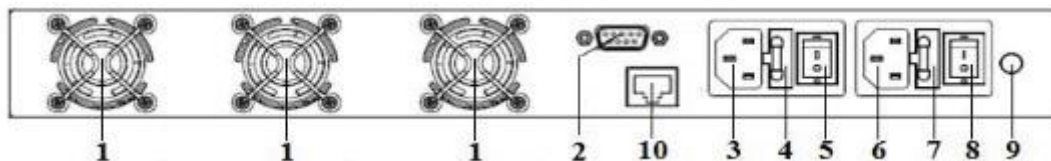
## 4 External Function Description

### 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; Flashing red light means the machine has broken down; 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. 160×32 dot-matrix LCD screen
6. Display the exit or cancel key of the setup menu.
7. Display the down or decrease key of the setup menu.
8. Display the up or increase key of the setup menu.
9. Display the enter key of the setup menu.
10. 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.
11. PON port
12. Public port (COM port)
13. Optical signal input

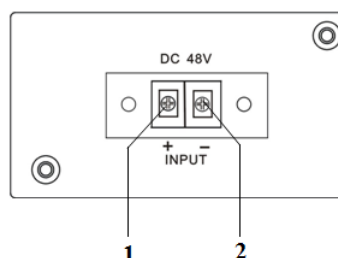
## 4.2 Rear Panel Description



1. Fan outlet.	2. RS232 interface.
3. The AC 220V input port of power supply 1.	4. The fuse of power supply 1.
5. The switch of power supply 1.	6. The AC 220V input port of power supply 2.
7. The fuse of power supply 2.	8. The switch of power supply 2.
9. Ground stud of the chassis	10. LAN interface

## 4.3 DC Power Introduction

1	+ Positive terminal block
2	- 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
Pump2 Temper: xx.x °C	Temperature of pump2, accurate to 0.1 °C
Pump2 Tec Vol: x.x V	Cooling voltage of pump2, accurate to 0.1 V
Pump2 Cooling: x.xx A	Cooling current of pump2, accurate to 0.01 A

TEC Vol: x.x V	The first stage voltage of pump2 cooler, 0.1 V
+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

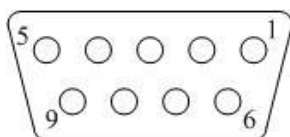
	xxx= LOW:	Low temperature of pump x alarm
	xxx= HIGH:	High temperature of pump x alarm
	xxx= HIHIGH:	Very high temperature of pump x alarm
Pumpx Tec: xxx	xxx= LOLOW:	Very low cooling current of pump x alarm
	xxx= LOW:	Low cooling current of pump x alarm
	xxx= HIGH:	High cooling current of pump x alarm
	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

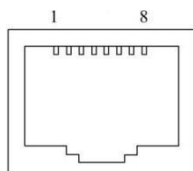
- 1) RS232 communication interface adopts DB9 standard connector, the pin definitions as follow:

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 Set Up the Super Terminal

If you have not setup the Hyper Terminal in your Windows system, follow these steps:

Click "start menu →program→ accessory→communication→ Hyper Terminal":

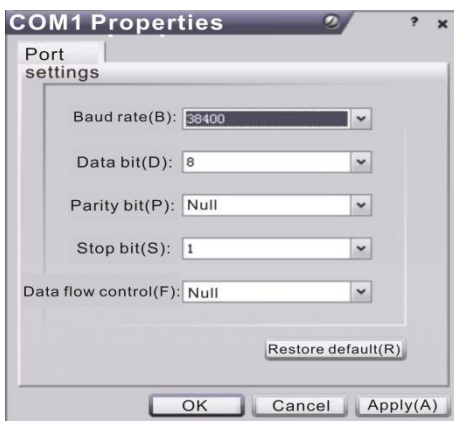
This results in the following screen:



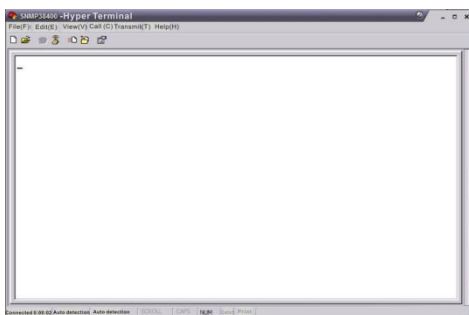
Then input your connection name, such as "SNMP38400", and choose the serial port to connect with your equipment. As follows:



Press the "OK" button shows the configuration page of serial port. As follows:



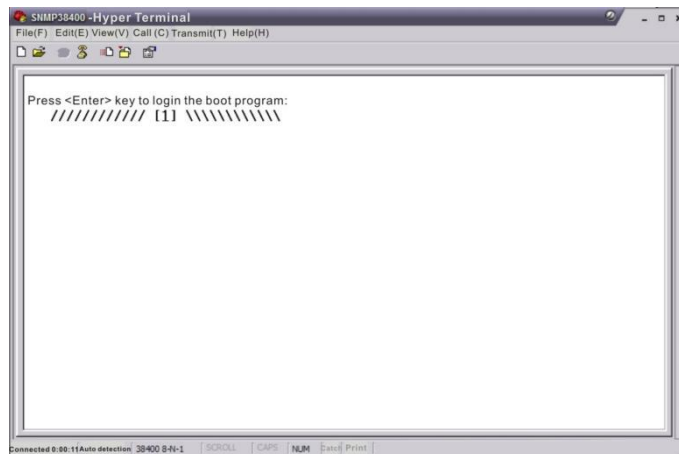
Change the serial port configuration to 38400-baud rate, 8 data bits, no parity bit, 1 stop bit, no data flow control, press the "OK" button, you have set up the Windows serial port Hyper Terminal.



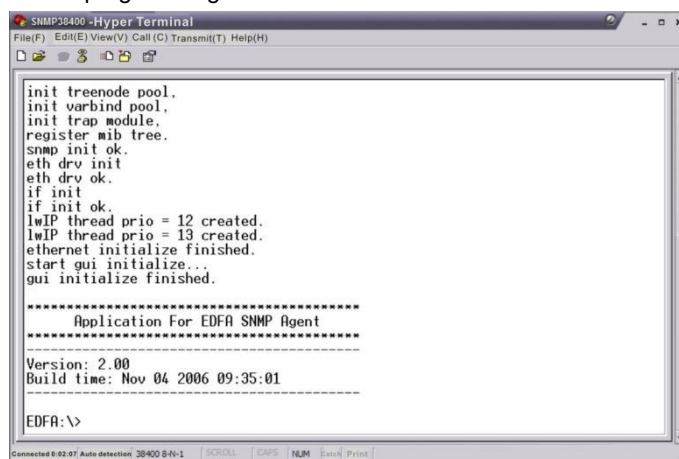
You can click "file→save" menu to save this configuration of Hyper Terminal for later using.

### 6.3 Operating Parameters Configuration

Under the condition of EDFA power off, please use the Serial Port Lines to connect the RS232 port of EDFA with the computer port. Open the Windows Hyper Terminal which you have set up. Then turn on the EDFA's power, you will see the page as follows, at this time, you can press the "OK" button into the boot program and do some advanced configuration. Boot program is like the BIOS setting program of PC. Generally speaking, users do not have to enter the boot program to configure the parameter, so we set the password to avoid damaging the properly configuration.



Skip the boot program and the application program begins as follows:



You can input your command in this page, and then configure the operating parameter of the application program.

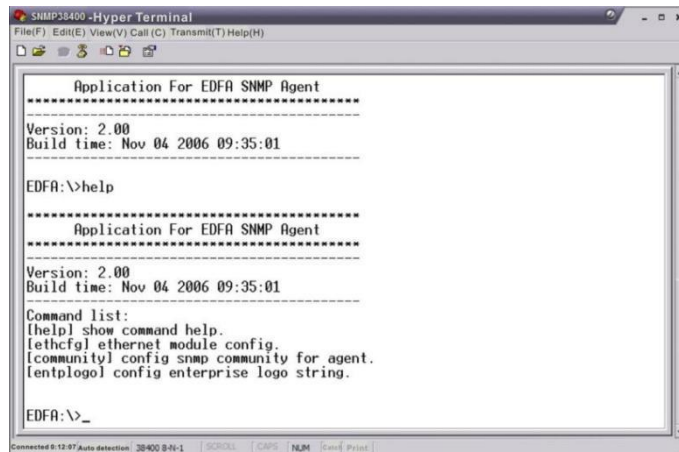
**System supports the following commands:**

<b>help</b>	<b>List internal commands of the system;</b>
<b>ethcfg</b>	<b>Configure the Ethernet operating parameters;</b>
<b>community</b>	<b>Configure the SNMP group name;</b>

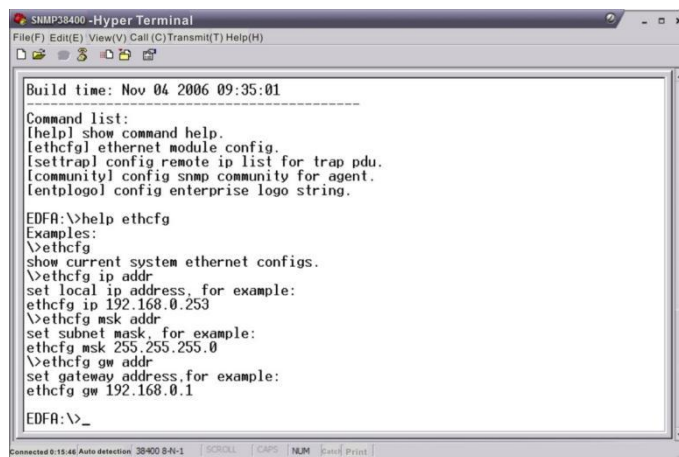
**Specific using as follows:**

**help**

This command shows current application program version, program name and the internal commands list of the system as follows:



You can also use the “help” command to show help information of other commands, such as “help ethcfg”, ethcfg’s help information appears as follows:



**ethcfg**

This command configures the Ethernet parameters, including IP address, subnet mask and gateway. You can refer to the help information for its usings.

**community**

This command configures the read-only group name and read-write group name. “Group name” is the concept of SNMP agreement like the password. Use the command “community ro xxxxx” to configure the read-only, and “community rw” for the read-write. For example, input “community rw public”, “public” is the read-write group name. The group name for read-only and read-write are both “public” as the equipment default setting from factory.

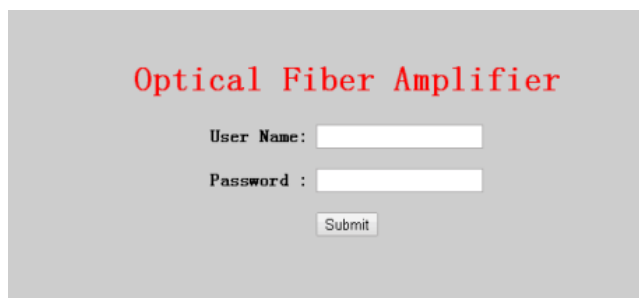
The commands of EDFA are shown as follows:

Command	Descriptions	Default
ethcfg ip xx.xx.xx.xx	Set ip address	
ethcfg msk xx.xx.xx.xx	Set submask	
ethcfg gwt xx.xx.xx.xx	Set gateway	
community ro xxxxx	Set read-only group name	public
community rw xxxxx	Set read-write group name	public
setpswd xxxxxxxx	Set login password	123456



### 6.3 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**

- *Display Parameter*
- *Set Parameter*
- *Modify Password*

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**

Set Module Parameter

Item	Current	New	Update
Output ATT:	dB	0 dB	Update

Set Trap Parameter

Item	Current	New	Update
Static IP Address:		[ ][ ] . [ ][ ] . [ ][ ] . [ ][ ]	Update
Subnet Mask:		[ ][ ] . [ ][ ] . [ ][ ] . [ ][ ]	Update
Default Gateway:		[ ][ ] . [ ][ ] . [ ][ ] . [ ][ ]	Update
Trap Address1:		[ ][ ] . [ ][ ] . [ ][ ] . [ ][ ]	Update
Trap Address2:		[ ][ ] . [ ][ ] . [ ][ ] . [ ][ ]	Update
Trap Address3:		[ ][ ] . [ ][ ] . [ ][ ] . [ ][ ]	Update
Trap Address4:		[ ][ ] . [ ][ ] . [ ][ ] . [ ][ ]	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.

4. Click Modify Password to open the following interface:

Modify Login Password

Current User Name:

Current Password :

New User Name :

New Password :

Confirm Password :

## 7 SNMP MIB

### NSCRTV standard and relevant MIBs

Description	Specifications	Conditions / Comments
NSCRTV hfcemsCommonMIB	support	
NSCRTV hfcemsPROPERTYMIB	support	
NSCRTV hfcemsOPTICAAMPLIFIERMIB	support	
NSCRTV hfcemsALARMSMIB	support	

### r-read-only; w-write; a-alarm

Description	Comments	MIB Variable	Alarm Severity	Alarm Description
Model number	r	entPhysicalModelName		
Serial number	r	entPhysicalSerialNum		
Firmware version	r	entPhysicalFirmwareRev		
Input power	r, a	heOpAmpInputPower	Major	Input Power Alarm
Input power alarm threshold	r, s (-10 to +10dBm)	analogAlarmLO. heOpAmpInputPower		
Output power	r, a	heOpAmpOutputPower	Major	Output Power Alarm
System temperature	r, a	heCommonTemperature	Major	System Temperature Alarm
Pump laser current	r, a	heOpAmpLaserBiasCurrent	Major	Pump Laser Current Alarm
Pump laser power	r, a	heOpAmpLaserOutputPower	Major	Pump Laser Output Alarm
Pump laser temperature	r, a	heOpAmpLaserTemp	Major	Pump Laser Temperature Alarm
Power supply voltage	r, a	hePsOutputVoltage	Major	Power Supply Alarm
System Name	r, w	sysName		

Description	Comments	MIB Variable	Alarm Severity	Alarm Description
System Location	r, w	sysLocation		
System Contact	r, w	sysContact		
Pump laser switch off	r, a	hlEdfaExtPUnitLaserSwitch	Major	Pump Laser Switch Off Alarm

## 8 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.

