EDFA Amplifier Equipment

Directory

1 Overview of EDFA

The main function of EDFA(Erbium Doped Fiber Amplifier) optical amplification equipment is to compensate the power of signal light in the transmission link, and can simultaneously amplify the optical signals of up to 48 channels (channel interval is 100GHz) or 96 channels (channel interval is 50GHz) in C- band. It has the characteristics of flat gain, adjustable gain and small noise index, it is an indispensable part of DWDM system and future high-speed system, all-optical network long-distance transmission.

EDFA amplifier from the application position can be divided into: power amplifier, line amplifier, preamplifier;

BA power amplifier: It has the characteristics of high input power, high gain and high output. It is mainly used at the transmitting end of DWDM system to improve the optical power of DWDM system;

LA line amplifier: It has the characteristics of low input power, high gain, high output, etc. It is mainly used in the middle of two network nodes in DWDM system to improve the transmission power of DWDM system;

PA preamplifier: It has the characteristics of low input power, high gain and low output. It is mainly used for DWDM system terminal to improve the received optical power of DWDM system.

2 Product features

(1) Support C- band DWDM system optical amplification;(2), support optional with OSC signal input amplification function;(3), support power amplification, line amplification (two optical amplification), pre-amplification;(4) Can monitor: pump drive current, pump output power, pump switch, pump temperature, input optical power, output optical power, module temperature;(5), support can be set to pump switch, AGC mode and APC mode (input and output optical power adjustable). (6) Support optical monitoring port (MON).

(7), the use of LCD display, very intuitive display data, user-friendly operation.

3 Product Specifications

Function	Description	
Operating wavelength range	**Standard type:** 1529nm ~ 1561nm **Extended** type: 1528nm ~ 1568nm	
EDFA Type	OBA Power Amplification	OPA Power Amplifier

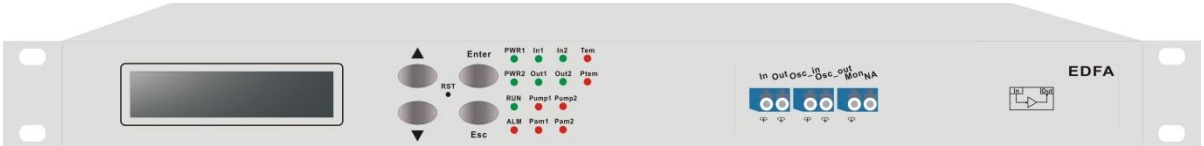
Minimum input optical power	-22dBm	-32dBm
Maximum output optical power	+ 20dBm	+ 16dBm
Maximum Gain	17dB	20dB
Noise factor	<5.5dB	
gain flatness	<1.5dB	
Specific technology	Support gain lock, gain adjustable, transient control technology, output optical power automatic shutdown	
Network Management Function	● Support real-time monitoring of EDFA working status, including: optical power, pump, temperature, etc. ● Support pump off threshold and automatic recovery time setting function	
Optical Interface	LC/UPC (customizable)	
MTBF	> 100000 hours	

4 Instructions for use

4.1 Chassis Structure Description

Designed with a standard 19-inch 1U rack structure, with two power slots in a single chassis; The front panel fiber outlet mode is adopted, and all optical interfaces are designed on the front. The air duct is designed with right air inlet and left air outlet. The right side of the chassis is designed with air inlet. The cold air is absorbed into the chassis through the cooling fan unit, and then exported from the air outlet on the left side of the chassis.

4.2 Front Panel Description



Description:

1） Optical interface description: the flange on the equipment panel is the light outlet, laser

output, it is strictly prohibited to look directly at the naked eye.

2） Dust-proof cap shall be applied when removing the optical fiber connection line from the light output port to prevent hard objects, dust or other dirt from touching, damaging and polluting the light output port.

3） LCD display: input and output optical power and other related information display.

4） ▲ -- move up key; ▼ -- move down key; Enter -- OK key; Esc -- cancel key.

📖 **Description:**

1） The power supply (PIU) slot is on the back of the device and supports AC (APU)/DC (DPU) optional, power supply 1+1 hot backup.

2） Indicator light: PWR: on: normal power supply; off: no power supply or abnormal.

5） RJ45 Ethernet interface, RS-232 serial port: communication interface for equipment monitoring data information.

4.3EDFA Device Interface Definition

Interface screen printing	Name	Features/Links
In	EDFA input interface	Small signal optical power input port.
Out	EDFA output interface	EDFA Amplified Output Optical Port.
OSC_IN	Monitoring channel input port	Link network management card SFP TX to transmit network management information.
OSC_Out	Monitoring channel output	Link network management card SFP RX, transmission network management information.
MON	Monitoring port	EDFA performance monitoring interface, link OPM or spectrometer.

4.4EDFA Device Indicator Description

Indicator light screen printing	Name	Description
PWR	EDFA power indicator	On, EDFA power supply is normal; off, power supply failure.
RUN	EDFA Operation Indicator	On, EDFA operates normally; off, operating failure.
In	EDFA Input Alarm Indicator	Bright, abnormal reception; off, normal reception.
Out	EDFA output alarm indicator	On, the output is not normal; off, the output is normal.
Tem	EDFA module temperature alarm indicator	On, EDFA module temperature is not normal; off, the module temperature is normal.
Ptem	Pump temperature alarm indicator	Bright, the pump temperature is not normal; off, the pump temperature is normal.
Pump	Pump alarm indicator	On, the pump is off; off, the pump is on.
Pam	Pump current alarm indicator	Bright, pump current is not normal; off: pump current is normal.

4.5 single disk monitoring information

- Online real-time monitoring of EDFA single disk working status;
- Real-time monitoring of EDFA input optical power, output optical power;
- Real-time monitoring of EDFA Pump working status,
- Real-time monitoring of EDFA working current, power consumption, die temperature, cooling current, etc,
- Can set the input and output light threshold, set the EDFA working mode, output power threshold, gain, etc;

4.6EDFA Device Settings

1. Input and output power alarm threshold setting

The amplifier input and output power alarm threshold can be set through the network management, when the input power is lower than the threshold, EDFA alarm, at this time EDFA pump is turned off, EDFA does not work, EDFA output below the threshold will prompt alarm;

2. Working mode setting

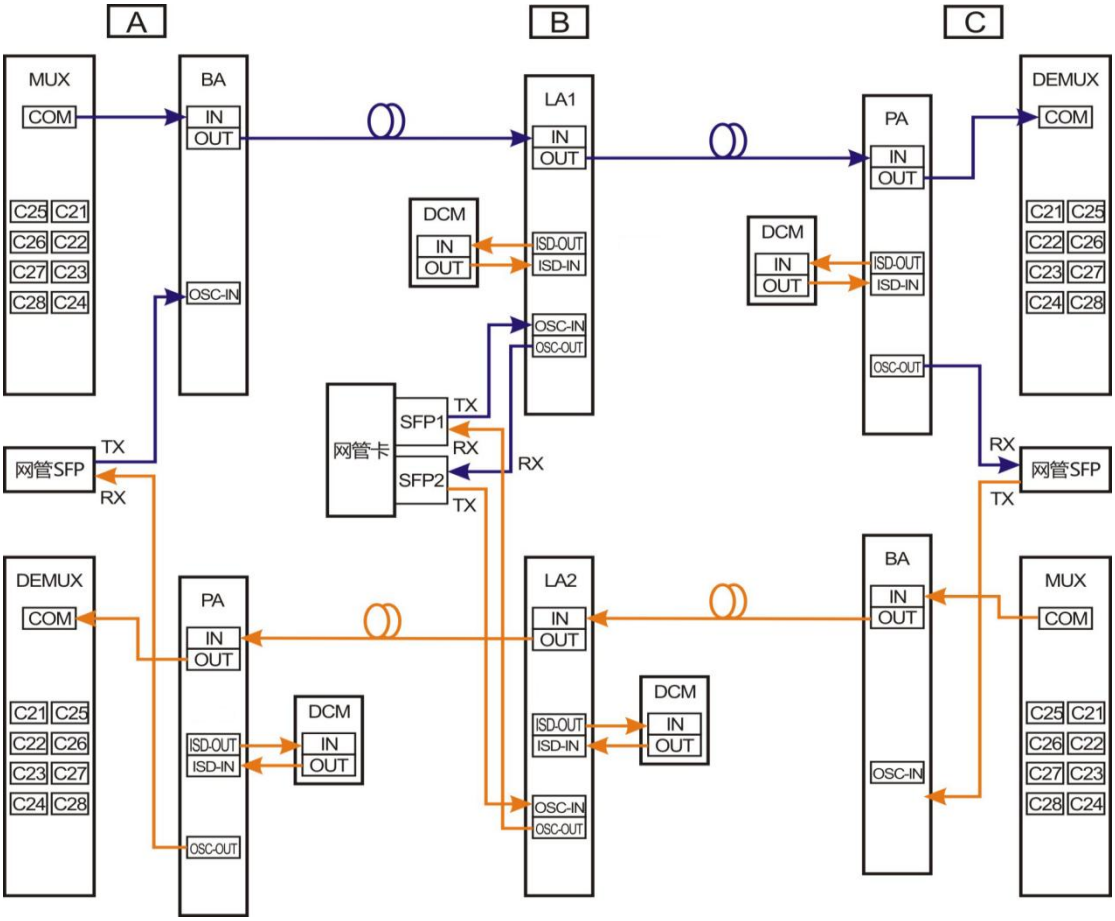
The amplifier working mode can be set through the network management: AGC constant gain mode, APC constant output mode and ACC constant current mode. The gain can be set in AGC mode with the best setting range of ± 1db. The output power can be set in APC mode with the best setting range of ±

1dBm;

3. Setting of eye protection mode

When installing, debugging or dealing with faults, the amplifier eye protection mode can be opened through the network management to reduce the output power of EDFA and avoid harming maintenance personnel;

Connection diagram of 4.7 works



Description:

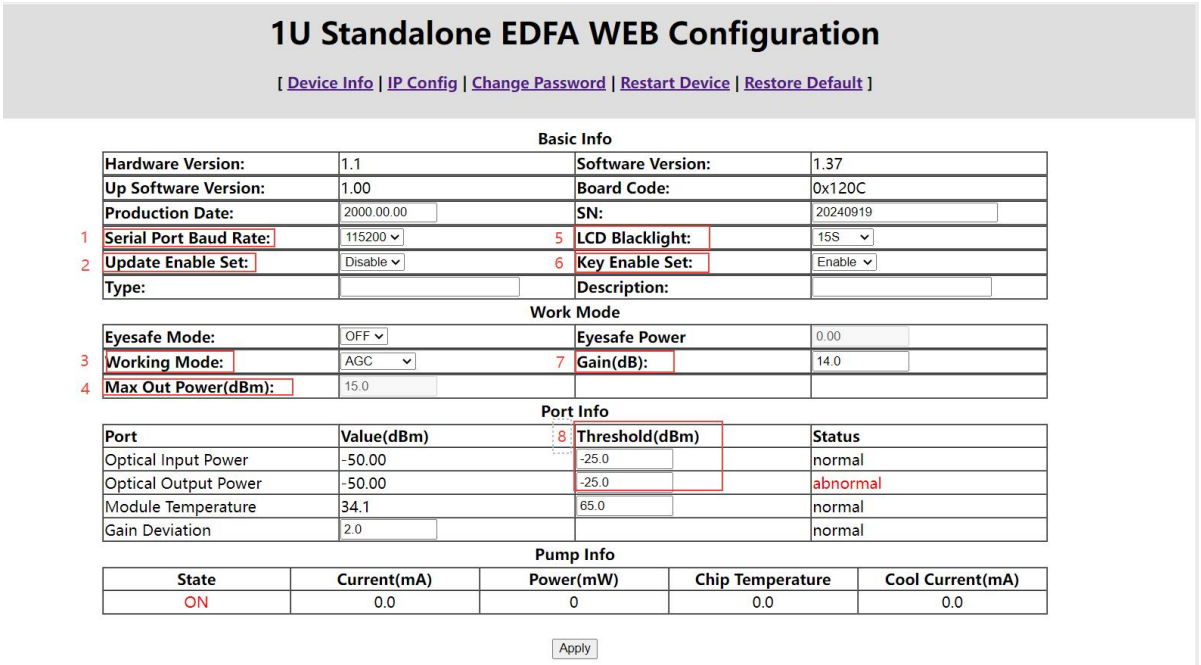
1. MUX coupler COM port is connected to BA input port IN,BA output port OUT is connected to long-distance optical cable to transmit large signal light, and OSC-in port is connected to network pipe card optical port Tx transmitting port;

2. The network management card SFP TX is connected to the OSC-IN interface of BA OSC channel, and RX is connected to the OSC-OUT interface of PA OSC channel;

3. The OSC channel OSC-IN and OSC-OUT of LA1 are respectively connected to Rx of SFP1 and Tx of SFP2 of network pipe card optical port, and the OSC channel OSC-IN and OSC-OUT are respectively connected to Tx of SFP1 and Rx of SFP2 of network pipe card optical port to realize cascaded bidirectional transmission of network pipe card;

5 Equipment Network Management Usage Information

Enter the IP address of the device in the browser to enter the web interface. Account number: admin password: 888888. Web-side settings and key panel settings are mostly the same, whether on the panel settings, or web-side settings, both ends will be synchronized.



1U Standalone EDFA WEB Configuration

[Device Info | IP Config | Change Password | Restart Device | Restore Default]

Basic Info

	Hardware Version:	1.1	Software Version:	1.37
	Up Software Version:	1.00	Board Code:	0x120C
	Production Date:	2000.00.00	SN:	20240919
1	Serial Port Baud Rate:	115200	5 LCD Blacklight:	15S
2	Update Enable Set:	Disable	6 Key Enable Set:	Enable
	Type:		Description:	

Work Mode

	Eyesafe Mode:	OFF	Eyesafe Power	0.00
3	Working Mode:	AGC	7 Gain(dB):	14.0
4	Max Out Power(dBm):	15.0		

Port Info

Port	Value(dBm)	8 Threshold(dBm)	Status
Optical Input Power	-50.00	-25.0	normal
Optical Output Power	-50.00	-25.0	abnormal
Module Temperature	34.1	65.0	normal
Gain Deviation	2.0		normal

Pump Info

State	Current(mA)	Power(mW)	Chip Temperature	Cool Current(mA)
ON	0.0	0	0.0	0.0

Apply

1、 Baud Rate Set

Web side and key screen can be set to change the size of the baud rate.

2、 Update Enable Set

Divided into disable (disable) and enable (enable), switch to disable mode, the system can not be updated, update the need to set the enable mode (E nable).

3、 Working Mode Working Mode Setting

AGC constant gain mode, APC constant output mode and ACC constant current mode. The gain can be set in AGC mode, and the setting range is the best ± 1db. The output power can be set in APC mode, and the setting range is the best ± 1dBm. DISABLE mode setting indicates no output light.

4、 Max Out Power Set

5、 LCD black screen setting (LCD Blacklight)

Press "▲" or "▼" to adjust the time, and press Enter to set it successfully. The screen lighting time can be set on the web side and the "LCD Blacklight" on the key panel.

6、 Key Enable Set

There are two setting modes: disable and enable. When disable, the buttons on the device panel interface cannot be used (enable is opposite).

7、 Gain Set

The default value is 10dBm, you can adjust the gain value, and then press Apply.

8. Set the low light threshold (Threshold Set)

Set the low light threshold of the port, and set the low light threshold of the IN and OUT ports. When the set power is less than the low light threshold, an alarm will be triggered, and the default is-30dBm.

6 Precautions and maintenance

6.1 considerations

(1) When using this equipment, each port must be correctly connected according to the optical path connection instructions.

(2) The equipment shell should be grounded and the input power supply voltage should be within the range required by the equipment.

(3) If there is sudden interference and the host is abnormal, it should be shut down before processing.

(4) The optical input port must be connected and positioned accurately, otherwise the measurement result and insertion loss may be incorrect.

(5) When switching the optical path channel, it is normal to have a slight vibration or sound.

6.2 equipment maintenance

Reasonable use and proper storage of equipment can maintain good performance indicators for a long time and extend its service life, so proper maintenance is required:

(1) The equipment should avoid strong mechanical vibration, collision, drop and other mechanical damage. Transport must have good packaging and vibration, rain and waterproof measures;

(2) should always keep the equipment clean, the working environment should be free of acid, alkali and other corrosive gases. Use a clean towel with water or soapy water to gently scrub the chassis and panels. It is forbidden to scrub with solvents such as alcohol.

(3) remove the fiber cable should be timely cover the dust cap, in order to prevent hard objects, dust or other dirt touch the fiber end face.

For matters not covered, please contact us. We will be very happy to hear your valuable comments.

7 Common fault handling

Fault performance	Solution
Power-on power indicator does not light	Reconnect the power supply and turn it on.
The input alarm indicator is on	Turn off the power and check whether the optical power at the optical input port is within the input range of the erbium-doped fiber power amplifier. If it still cannot be solved, please confirm whether the input and output optical ports of the equipment are connected in reverse. Whether the optical signal wavelength is within the operating wavelength range of the device.
Temperature alarm	Please confirm whether the ambient temperature around the device is too high.