

SNR-EDFA-1550 Erbium Doped Fiber Amplifier

Foreword

This manual is applicable to 1550 Erbium-Doped Fiber Amplifier. Mainly expatiate the product's function characteristics, technique parameters, installation and debugging. For insuring the equipment can be successfully installed and safely work, please carefully read the manual before using it, and proceed it strictly according to the prescriptive operation steps of manual for installation and debugging, in order to preventing equipment or operator to unnecessary damage or harm. If there is question, please contact with our company timely.

Special Notice:

- a. Erbium-Doped Fiber Amplifier is a slap-up professional equipment, and its installation and debugging must be operated by special technician. User should read this manual before operating to prevent damaging the equipment by fault operation or harming to human's body.
- b. There is invisible laser beam from Fiber output, which direct shining at eye will cause permanence burn.
- c. Earthing first before turning on the power and being sure that the rack mount and the outlet earth well (Earthing resistance should be less than 4Ω), prevent to damaging the laser by static and harming user.
- d. For insuring equipment can stable work of long-term, in voltage unsteady or voltage wave bad region, suggestion equipping the appropriation AC manostat power, even UPS. In the environment temperature bad variety (the equipment's suitable work environment temperature is $25 \square$) region, suggestion to install air-condition for the ameliorative work environment of the equipment.

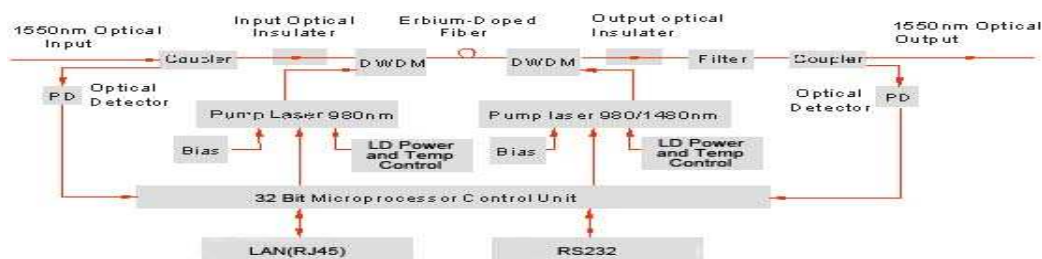
1. Summary

1550 Erbium-Doped Fiber Amplifier is the important transmission equipment in the 1550nm fiber optic communication. It is used for long-distance optical transmission of TV image signal, digital TV signal telephone sound signal and data (or compressed data) signal. With high steady imported Erbium-Doped Fiber, international famous low-noise pump laser and automatic control system inside, ensuring the excellent qualification of this equipment.

2. Performance Characteristics

- Imported famous low-noise pump laser, which is low pre-distortion, broad channels and high output optical power.
- Steady imported Erbium-Doped Fiber, high efficiency of power transmission.
- Advanced Microprocessor with perfect automatic control circuit monitor the various operating status of the optical output power and pump laser timely and correctly. Dependability and stability are better.
- Front panel blue 160×32 display, shows various main work status parameters.
- 19" 1U high-standard framework type installation
- Support GB/T 20030-2005HFC Network control management

3. Principle Drawing



4. Technique Parameter

4.1 Link path test condition

Special Explanation: Equipments technique parameter the manual given is according to the test method of GY/T184-2002 CATV system amplitude modulation laser transmitter and receiver enter the net technique condition and measure method, and gained under its prescriptive test condition.

Test condition:

Test link path is formed of standard laser transmitter, standard optical receiver and 10km of standard fiber. Under the condition of prescriptive link loss, set 59 PAL-D imitate TV channels signal at 550MHz, transmit digital modulated signal at the range of 550MHz-750(862) MHz, level of digital modulated signal (8MHz bandwidth) is lower 10dB than of imitate signal carrier wave, when optical receiver input optical power being 0dBm, measure C/ CTB, C/ CSO, C/ N.

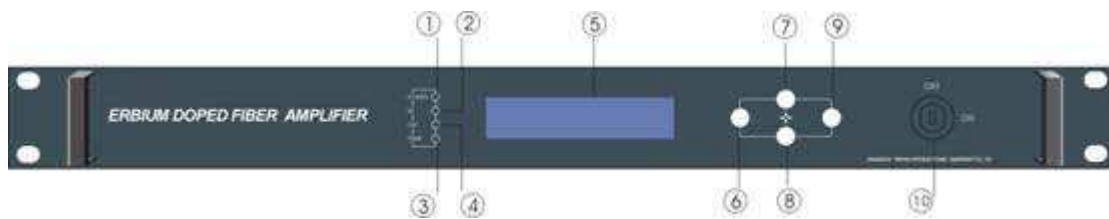
4.2. Technique Parameter Table:

Item	Unit	Technique Parameter	Remark
Operating Wideband	nm	1535 - 1565	
Input Optic Power	dBm	-3 - +10	Input Optical Power 0 - +5dBm
Output Optic Power	dBm	13 - 24	
Output Power stability	dBm	±0.5	
Noise Figure	dB	≤ 5.0	Output Optical Power 0dBm
Return Loss	Input End	dB	≥ 45
	Output End	dB	≥ 45
Power of Pump leak	Input End	dBm	≤ -30
	Output End	dBm	≤ -30
(C/N)	dB	≥ 52	
(C/CTB)	dB	≥ 63	
(C/CSO)	dB	≥ 63	
Connector Type		FC/APC or SC/APC	
Supply Voltage (50 Hz)	V	AC160V - 250V or DC48V	it can be set with Dual-power hot-backup supply

Operating Temperature	°C	-5 - +55	
Max Relative Humidity	%	Max95% No Condensation	
Storage Temperature	°C	-30 - +70	
Max Relative Humidity for Storage	%	Max95% No Condensation	
Dimension	mm	483 (W) x340 (L) x44 (H)	

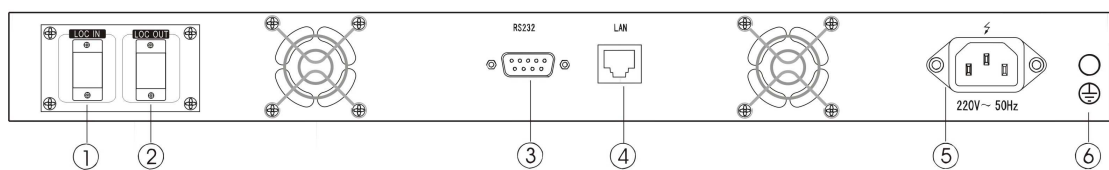
5.Exterior Function Explanation

5.1 Front panel explanation



- 1) Power indicator: when the power inside is working, the light is on.
- 2) Input optical power indicator: when the input optical power is more than -10dBm, the light is on,
- 3) Pump operating status indicator: red light shows that the pump does not work and each parameter is normal; when the red light is twinkling, it shows that this equipment is at fault. The faulted reason can be looked into the alarm list of the show menu. When the green light is on, it shows that pump is working normally.
- 4) Output optical power indicator: when the output optical power is more than +10dBm, the light is on.
- 5) The 160×32 crystal liquid display: Show the all parameter.
- 6) Withdraw or cancel key.
- 7) Up and increase key.
- 8) Down and decrease key.
- 9) Confirmation key
- 10) Pump switch key: Control the Pump work status. When turn on power, the key must be OFF, after self-examine, according to the message displayed, switch the key to ON.

Back panel explanation



- 1) Optical signal input port: FC/APC and SC/APC (common)
- 2) Optical signal output port: FC/APC and SC/APC (common). When the equipment working,

this port will emit a visible laser beam, please avoid this laser beam direct to body and eye in case accidental injury.

- 3) RS232 interface: used for set the parameters of NMS.
- 4) LAN interface: compliant to IEEE802.3 10Base-T interface, used for local equipment network management.
- 5) Power input
- 6) Chassis grounding stud: used for equipment and grounding wire connection.

5.3 Display Parameter Explanation

1) Lock is off



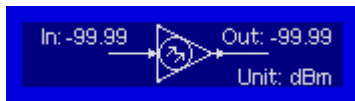
Shows product's Logo and model

2) Lock is on



Countdown

3) Enter the system



Current Input optic power and output optic power

4) Push ENT key into menu



1. Parameter menu 2.Setting menu 3. Alarm menu

5) Sub-menu of parameter



Push ENT key into menu

Content	Function
	Current Input Power
	Current Output Power
	Pump bias current
	Pump Temperatures

Pump1 Bias: 222 mA Pump1 Temp: 24.94 °C Pump1 Cooling: 0.14 A	Operating Cooling Current in Pump
Pump3 Temp: 24.94 °C Pump3 Cooling: 0.27 A +5V Read: 4.78 V	Current +5V Supply Voltage
Pump3 Cooling: 0.27 A +5V Read: 4.78 V -5V Read: 4.88 V	Current -5V Supply Voltage
+5V Read: 4.78 V -5V Read: 4.87 V S/N: 061103123	S/N
+5V Read: 4.78 V S/N: 061103123 Box Temperature: 25.25 °C	Box Temperature
S/N: 061103123 Box Temperature: 25.25 °C IP Address: 192.168.0.97	IP Address
Box Temperature: 25.25 °C IP Address: 192.168.0.97 Subnet Mask: 255.255.255.0	Subnet mask
IP Address: 192.168.0.97 Subnet Mask: 255.255.255.0 Net Gateway: 192.168.0.1	Net Gateway
Subnet Mask: 255.255.255.0 Net Gateway: 192.168.0.1 Mac: 00-80-95-34-35-55	Mac Address
Net Gateway: 192.168.0.1 Mac: 00-80-95-34-35-55 Software Version: 2.00	Software Version

6) Setting menu

1. Disp Parameters
2. Set Parameters
3. Alarm Status

Push ENT key into menu

Content	Function
Set Optic Power Unit Set Buzzer Alarm Set Input OptPower Low Alarm	Set Optic Power Unit
Set Optic Power Unit Set Buzzer Alarm Set Input OptPower Low Alarm	Set Buzzer Alarm

Set Optic Power Unit Set Buzzer Alarm Set Input OptPower Low Alarm	Set Input Optic Power Low Alarm
Set Buzzer Alarm Set Input OptPower Low Alarm Set Input OptPower High Alarm	Set Input Optic Power High Alarm
Set Input OptPower Low Alarm Set Input OptPower High Alarm Set Out OptPower Low Alarm	Set Output Optic Power Low Alarm
Set Input OptPower High Alarm Set Out OptPower Low Alarm Set Out OptPower High Alarm	Set Output Optic Power High Alarm
Set Out OptPower Low Alarm Set Out OptPower High Alarm Set Pump Temp Low Alarm	Set Pump Temp Low Alarm
Set Out OptPower High Alarm Set Pump Temp Low Alarm Set Pump Temp High Alarm	Set Pump Temp High Alarm
Set Pump Temp Low Alarm Set Pump Temp High Alarm Set +5V Low Alarm	Set +5V Low Alarm
Set Pump Temp High Alarm Set +5V Low Alarm Set +5V High Alarm	Set +5V High Alarm
Set +5V Low Alarm Set +5V High Alarm Set -5V Low Alarm	Set -5V Low Alarm
Set +5V High Alarm Set -5V Low Alarm Set -5V High Alarm	Set -5V High Alarm
Set -5V Low Alarm Set -5V High Alarm Set Local IP Address	Set Local IP Address
Set -5V High Alarm Set Local IP Address Set Subnet Mask	Set Subnet Mask
Set Local IP Address Set Subnet Mask Set Gateway	Set Gateway
Set Subnet Mask Set Gateway Restore Factory Config	Restore Factory Config

7) Alarm menu

- 1. Disp Parameters
- 2. Set Parameters
- 3. Alarm Status

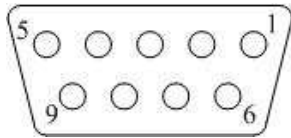
Push ENT key into menu

4. Network controlling management explanation

6.1 Interface explanation

1) RS232 communication connector

Adopt DB9 standard connector .

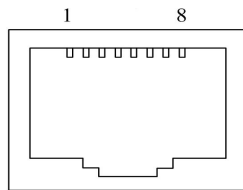


- 1 : No Connect 2 : TX 3 : RX 4 : No Connect 5 : GND
- 6 : No Connect 7 : No Connect 8 : No Connect 9 : No Connect

The serial communication uses the standard NRZ form, 1 start figure, 8 data figure, 1 stop figure and the baud rate is 38400.

2) LAN communication interface

The LAN communication uses the RJ45 standard port as the connector.



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 do not setup the super terminal, follow the steps.

1. Click “ start menu →program→ accessory→communication→super terminal”;
2. Display the page:



(2)

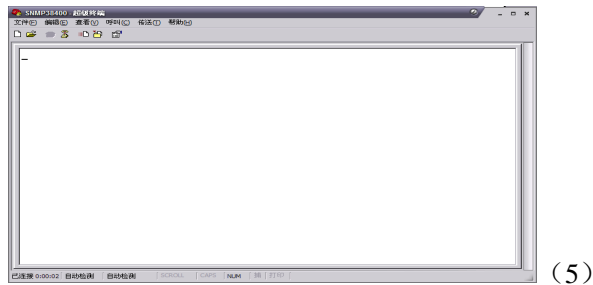
Then you input your connector name, such as “SNMP38400”, and choose the serial port to connect with your equipment. As follows;



Push the “OK” button; show the allocation page of serial port. As follows;



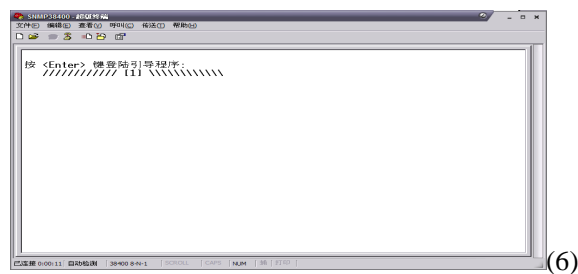
Change the serial port configuration to 38400-baud rate, 1 stop bit, no number control, **no data control**,(map 4), push the “OK” key, you have set up the Windows serial port super terminal. (map 5):



You can click “file→save” menu to save this configuration of super terminal for latter using.

6.3 Operating Parameter Configuration

Under the condition of power off, use the serial port lines to connect the RS232 port with the computer port. Open the Windows super terminal, which you have setup. Then turn on the power, you will see the page as follows, at this time, you push the “Enter” key to the boot program. Boot program is like the PC’BIOS setting program. Generally speaking, users do not have to enter the boot program to configure the parameter, so we have to set the password to avoid damaging the properly configuration.



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


```

SNMP32000 应用管理
文件(F) 编辑(E) 查看(V) 帮助(H) 系统(S) 网络(N) 帮助(H)

init treenode pool.
init vorbind pool.
init tree module.
register mib tree.
snmp init ok.
eth drv init
eth drv ok.
if init
if init ok.
help thread prio = 12 created.
help thread prio = 13 created.
ethernet initialize finished.
start qui initialize.
qui initialize finished.
-----
Application For EDFA SNMP Agent
-----
Version: 2.00
Build time: Nov 04 2006 09:35:01
EDFA:\>

```

(7)

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

System support the following orders:

- help** **List the system internal order**
- ethcfg** **Configure Ethernet operating parameter**
- settrap** **Configure the aim host IP address of the SNMP Trap'**
- community** **Configure the SNMP group name**
- entplogo** **Configure LOGO information**

Specific using as follows

help

This order shows current application program version, program name and the list of the system' internal orders as follows:

```

SNMP32000 应用管理
文件(F) 编辑(E) 查看(V) 帮助(H) 系统(S) 网络(N) 帮助(H)

Application For EDFA SNMP Agent
-----
Version: 2.00
Build time: Nov 04 2006 09:35:01
EDFA:\>help
-----
Application For EDFA SNMP Agent
-----
Version: 2.00
Build time: Nov 04 2006 09:35:01
Command list:
[help] show command help.
[ethcfg] ethernet module config.
[settrap] config remote ip list for trap pdu.
[community] config snmp community for agent.
[entplogo] config enterprise logo string.
EDFA:\>

```

(8)

you can use the "help" order to show other orders' help information, such as "help ethcfg", ethcfg's help information appear as follows:

```

SNMP32000 应用管理
文件(F) 编辑(E) 查看(V) 帮助(H) 系统(S) 网络(N) 帮助(H)

Build time: Nov 04 2006 09:35:01
Command list:
[help] show command help.
[ethcfg] ethernet module config.
[settrap] config remote ip list for trap pdu.
[community] config snmp community for agent.
[entplogo] config enterprise logo string.
EDFA:\>help ethcfg
Examples:
\sethcfg
show current system ethernet configs.
\sethcfg ip addr
set local ip address, for example:
ethcfg ip 192.168.0.253
set ethcfg gw addr
set subnet mask, for example:
ethcfg mask 255.255.255.0
\sethcfg gw addr
set gateway address, for example:
ethcfg gw 192.168.0.1
EDFA:\>

```

(9)

ethcfg

This order configures the Ethernet parameter, including IP address, subnet mask and net gateway. You can reference the help information.

settrap

this order shows or modifies the SNMP devil to IP address lists settrap -l order display, settrap -m order modify; as follows:

(10)

IP address of 0.0.0.0 and 255.255.255.255 don't exist. **SNMP devil** does not send these two address.

community

This order configures the read-only group name and read-write group name. “Group name” is the concept of SNMP agreement like the password. Use the order “community ro” 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.

entplogo

This order modifies the product's LOGO information which is the model number series of factory showed in display . This product permit to configure two LOGO character, the max length is 31byte, which displays in the first line and second line of the crystal liquid screen. Use the order “entplogo -1 xxxx” to configure the first line LOGO, and the second line uses the “entplogo -2 xxxx”. Xxxx is the LOGO character sting. The spaces of the xxxx must be used the underline “_”, otherwise, the order is failed.

7. Installation and Debugging

7.1 Unpack and Check

1. Insure the package not is defaced. If have any damnification or water mark, please contact local franchiser or conveyancer.
2. After unpacking, check equipments and accessories according to package list. Any question, please contact local franchiser or our company.
3. If you think equipment has been damaged, please don't electrify avoid worse damage. Please contact local franchiser or our company.

7.2 Instruments and tools

An optical power meter

A digital multimeter

A standard fiber test jumper (FC/APC or SC/APC)

Some waterless alcohol and nosocomial degrease cotton

7.3 Installation steps

- 1、 Before installing the equipment, please read the operation manual carefully and install the equipment according to the operation manual. Notice: install the equipment is not according to the operation manual, which leads to man-made faults and other results, our company will not take the responsibilities and the service of free fix.
- 2、 Fix equipment on rack mount and earthing. (earthing resistance <math>< 4\Omega</math>=.
- 3、 Check voltage by digital multimeter whether accord with requirement and to be sure laser lock is OFF. Then turn on power.
- 4、 Connect optical signal and turn key to ON, till laser work LED turns to green, then the

equipment began to work. This time you can push STATUS keys on front panel to watch parameters.

- 5、 Connect optical power meter to optical output of the equipment with a standard test jumper, then measure optical output power, affirm optical output power is same to value shown on front panel; remove standard fiber test jumper and optical power meter; connect the equipment to network. The equipment has been installed.

8. Service

1. Our company's promises: Guarantee for thirteen month (start from the production date showed on S/N), fix all the life. Equipment at fault is resulted from the users' improperly operation and unavoidable environment reasons, our company will fix, but collect suitable material cost.
2. If the equipment at fault, immediately contact local distributor or our company customer service centre.
3. Equipment at fault locale fix must be operated by special technician, avoid worse damage.
4. Special caution: if the user has fixed the equipment, our company will stop the service of free fix. But we will fix it, and you must pay for the cost of fix and material.

Methods of the fiber optic connector cleanness and maintenance

At most of the time, we misjudge the drop of output optical power as optical equipment at fault. In fact, the fiber optic connector is polluted by the dust and dirt, we can remove the fault through the cleanness and maintenance of fiber optic Connector

- 1、 Turn off the power, screw off the fiber optic connector from the adaptor.
- 2、 Use good quality sweep paper or nosocomial degrease cotton to clean the connector carefully; if you use the nosocomial degrease cotton, you should wait for 1~2 minutes after cleanness to volatize the alcohol in the surface of the connector
- 3、 For insuring the fiber optic connector is clean, Connect the connector with an optical power meter and measure the output optical power.
- 4、 Connect the clean fiber optic connector with the adaptor. Notice: user should use proper energy in order to prevent the ceramic tape in the adaptor from breaking.
- 5、 If the fiber optic connector is clean, but the output optical power is also abnormal, takedown the adaptor and clean another connector in the equipment. After cleanness, optical is also low, maybe the adaptor has been polluted and clean it. (notice: takedown the adaptor carefully, avoid break the optical fiber.
- 6、 Clean the adaptor using the special compressed air or absorbent alcohol cotton. When you use the compressed air, the nozzle aim at the ceramic tape, blow the compressed air into ceramic tape. When you use the absorbent alcohol cotton, put the alcohol cotton through ceramic tape. Notice: the direction of alcohol cotton through ceramic tape should be same, or it can not reach the ideal effect.

Special notice:

- a. In the process of clean the fiber optic connector, you should avoid direct shining at eye, which will cause permanence burn!!!!
- b. Use proper energy to install the fiber optic connector, or the ceramic tape in the adaptor will lead to break. Once the ceramic tape is broken, the output optical power will decrease rapidly. If

you turn the **fiber optic connector** slightly, the output optical power changes obviously.

c. Please operate the optical fiber under the condition of close the pump laser. Or the big output power will lead to burn the joint of the output optical fiber, which will reduce the output power.