

Thor Fiber 1550nm Erbium-Doped Fiber Amplifier
<u>EDFA</u>

User's Manual

F-EDFA Series

Products Descriptions

Product Descriptions The Thor Fiber 1550nm series EDFA, with its core components adopting the world's top brand pump laser and erbium-doped fiber, ensures the best optical performance through optimized optical design and production process. The electronic controlled modes of APC (Automatic Power Control), ACC (Automatic Current Control), and ATC (Automatic Temperature Control) circuits are adopted to guarantee high stability and reliability of the output power, while also ensuring excellent optical path indices.

Optional dual fiber inputs, in fact, are built-in with a complete optical switch system, which can serve as a backup for A and B optical paths. Should the main optical line fail or fall below the threshold value, the device will automatically switch to the standby optical line, ensuring the device's continuous operation. This product is primarily used in optical fiber ring networks or redundant backup networks, characterized by short switching times (< 8ms), low loss (< 0.8dBm), and manual forced switching capability.

The MPU (Microprocessor) with high stability and precision is utilized in the system. Its optimized thermal structure and heat dissipation design ensure the device's long life and high reliability. Thanks to the powerful network management function based on the TCP/IP protocol, network monitoring, and head-end management can be carried out for the status of multiple node equipment via the RJ45 network management interface, supporting multiple power supply redundancy configurations which enhance the device's practicability and reliability.

Features

- 1. Adopts the world's top brand pump laser and erbium-doped fiber.
- Perfect APC, ACC, and ATC optical circuit design ensures low noise, high output, and high reliability of the device across the entire operating band (1530 ~ 1565nm).
- 3. Features automatic protection for low input or no input situations. When the input optical power is lower than the set value, the laser will automatically shut down to ensure laser safety protection.
- 4. Output is adjustable, with an adjustment range of 0~-4dBm.
- 5. Maximum output reaches 27dBm.
- 6. The optical switch's switching time is short, and the loss is small. It supports automatic switching and forced manual switching.
- 7. Fully automatic case temperature control and intelligent fans, which start operating when the case temperature reaches 35°C.
- 8. Built-in dual power supply, automatically switched, and supports hot plugging in/out.

9. The operating parameters of the whole machine are controlled by a microprocessor, and the LCD status display on the front panel offers functions such as laser status monitoring, parameter display, fault alarm, network management, etc. If the operating parameters of the laser deviate from the allowed range set by the software, the system will promptly alarm.

II. Installation

2.1 Preparation before Installation

Includes detailed instructions for preparation before installation, installation procedures, and operation guidance.

2.2 Installation

2.2.1 Please maintain a space of 1.75 inches (about 4.5 cm) between machines for ventilation and cooling of the device.

2.2.2 Ensure that the socket is functioning properly and is well-grounded, use a 110-220V power source with three cables, with the middle one connected to the ground. Incorrect grounding may damage the device or affect the quality of the signal.

2.2.3 Make sure the power supply button on the rear panel is turned to OFF before connecting the power supply cable.

2.2.4 Ensure the fiber interface is clean before connecting the fiber.

III. Operation

3.1 Diagram

Single Input



Dual Inputs



3. 2 Main Technical Parameters

Catagory	Itomo			Index		Bomorko
Category	nems	Unit	Min.	Тур.	Max.	Remarks
	Operating Wavelength	nm	1530		1565	
	Optical Input Range	dBm	-10		+10	
	Output Power	dBm	13		27	1dBm interval
	Output Adjustment Range	dBm	-4		0	Adjustable, each step 0.1dB
	Output Power Stability	dBm			0.2	
	No. of Output Ports		1		4	Specified by User
	Noise Figure	dB			5	Pin: 0dBm
Optical	Switching Time of Optical Switch	ms			8.0	Optional
Parameters	Insertion Loss of Optical Switch	dB			0.8	Optional
	PDL	dB			0.3	
	PDG	dB			0.3	
	PMD	ps			0.3	
	Remnant Pump Power	dBm			-30	
	Optical Return Loss	dB	50			
	Fiber Connector			SC/APC	;	
	Network Management Interface		SNMP	,WEB sup	oported	
General	Power Supply	V	90		265	AC
Parameters		v	-72		-36	DC
	Power Consumption	W			25	24dBm,dual power supply

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Operating Temp		°C	-5		+65	Fully automatic case temp control
Storage Temp		°C	-40		+85	
Operating Humidity	Relative	%	5		95	
Dimension		mm	3	860×483×	44	D、W、H
Weight		Kg		5.0		

3.3 Front Panel Instructions



Single Input



Dual Inputs

S/N	Identification	Name	Remarks
1	LCD	LCD Display	To display the parameters of the device
	2 STATUS Device Status	LED Green, Device working	
2		Device Status	LED Red, Device alarming or faulty
			LED Green, Input within requested range
3	INPUT	Fiber Input	LED Red, no input or out of the requested range or only single input connected in dual inputs model
4	OUTPUT	Fiber Output	LED Green, Fiber output is within normal range

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			LED Red, Fiber output is ou	t of normal range
_			LED Green, Dual power sup	ply working
5	POWER	Power Supply	LED Yellow, Single power si	upply working
6	CATV IN	CATV input	1550nm fiber input	Single input
7	CATV IN1	CATV input 1	1550nm fiber input 1	Dual Inputs
8	CATV IN2	CATV input 2	1550nm fiber input 2	Dual Inputs
9	OUT	Fiber Output	Fiber Output	
10	A V	Buttons	Start menu page turning and	set the device
11	ENT	Enter	Confirmation after menu device setting	page turning and
12	OFF/ON	Key	ON pump laser on ,OFF ;	oump laser off
13	RS232	RS232 Port	Local programming	
14	RJ45	RJ45 Port	Remote SNMP and WEB sup	oported

3.4 Rear panel Instructions

Power 1	Fan	Fan	Fan	Power 2

S/N	Identification	Items	Remarks
1	Fan	Fan	For the cooling of the device
2		Grounding Port	For Grounding
3	Power1	Power Socket1	Hot plug in/out supported
4	Power2	Power Socket 2	Hot plug in/out supported

3.5 Front Panel Operation

Press the ▼ to display the following menus in turn, and press the ▲ to reverse the cycle





IV. Products Series

Total Out	out Power		Output Power per
dBm	mW	No. of Output Port	Port
13	20	1	13.0
14	25	1	14.0
15	32	1	15.0
16	40	1	16.0
17	50	1	17.0
18	63	1	18.0
19	80	1	19.0
20	100	1	20.0
24	125	1	21.0
21 12:	125	2	17.5
22	100	1	22.0
22	160	2	18.5
22	200	1	23.0
23	200	2	19.5
24	250	1	24.0
24	250	2	20.5
		1	25.0
25	320	2	21.5
		4	18.0
		1 26.0	
26	400	2	22.5
		4	19.0
		1	27.0
27	500	2	23.5
		4	20.0

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V. Notes

5.1 A static-sensitive pump laser is used in the EDFA; please note that electrostatic protection should be employed during the storage of the EDFA, and it should not be stored with corrosive materials. The storage temperature should be between -40° C and $+85^{\circ}$ C.

5.2 Since the output power of the EDFA is high, do not turn on the power supply before the EDFA is connected to the system or before the output ports are equipped with protective sleeves. Do not plug in or unplug the patch cord while the device is operating; otherwise, it may damage the output interface, resulting in decreased output power.

5.3 Please do not attempt to look into the optical connectors when power is applied, as it may result in eye damage.

5.4 Do not block the cooling holes of the device and ensure it is well-ventilated.

5.5 If necessary, use anhydrous industrial alcohol instead of medical alcohol to clean the fiber connector after the power supply of the device is turned off.

5.6 For high-power EDFA, it is easy to damage the fiber output interface and decrease the output power, so the recommended maximum value on each port is lower than 19dBm.

5.7 Please do not test the EDFA repeatedly; otherwise, the fiber connector interface may be damaged and the output power decreased.

5.8 The change in input optical power significantly influences CNR. Higher input power results in a higher CNR, while lower input power results in a worse CNR, as illustrated in the figure below:



CNR loss value/Input Power

VI. Solution to some ordinary problems

S/N	Fault Phenomenon	Faulty Reason	Solution	Remarks
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1	Power Yellow	Single power supply working	Connect another power supply	
2	STATUS Red LASER IN Red LASER OUT Red	No input or input too low	Adjust the value of input power	
3	STATUS Red INPUT Green LASER OUT Red LCD Display "KEY OFF"	The key turned to OFF	Turn the key to ON	
		Fiber interface hurt caused by wrong operation such as plug in/out patch cord when the power supply is on, it will cause the output lower than LCD display	Replace the fiber connector	The advised optical power per port ≤19dBm
4	Output power LCD displays normal value, but low value by power meter	Output interface of EDFA or patch cord is dirty.	Clean the output interface with industrial anhydrous alcohol or dust-free paper	
		Power meter error	Change power meter	Top brand power meter is advised
		The wavelength deviation of input optical signal is far from 1550nm	Adjustthewavelengthofoptical transmitter	
5	LCD display shows output is about 0 ~ 4dB lower than specified value	Checking if the ATT attenuation in "Setting Info" is enabled	Turn off "ATT" function	
6	The optical power of the output end of the optical amplifier is normal, but the index of the user end is deteriorated	Optical power to fiber is high	Decrease the power to fiber under 19dBm	

VII. Warranty Terms

THOR FIBER F-EDFA-16 series EDFA is covered by a ONE-YEAR LIMITED WARRANTY, which begins on the initial date of your purchase. We provide lifetime technical support to our customers. If the warranty has expired, repair service will only charge for parts (if required). In the event that a unit must be returned for service, please note the following before returning the unit:

7.1 The warranty sticker on the housing of the unit must be in good condition.

7.2 A clear and readable document describing the model number, serial number, and issues should be provided.

7.3 Please pack the unit in its original container. If the original container is no longer available, please pack the unit with at least 3 inches of shock-absorbing material.

7.4 Returned unit(s) must be shipped prepaid and insured. COD and freight collect are not acceptable. NOTE: We do not assume responsibility for damage caused by improper packing of returned units.

The following situations are not covered by the warranty:

- 1. The unit fails to perform due to operator errors.
- 2. The warranty sticker is altered, damaged, or removed.
- 3. Damage caused by force
- 4. The unit has been altered or repaired without authorization.
- 5. Other issues caused by operator errors.

VIII. Web Server

Web Server management interface, users can directly check the basic operating and web parameters by Web. It's common to see the Microsoft's IE, Google's Chrome, Mozilla Foundation's Firefox, Norway Opera Software ASA Company's Opera, etc. in the computer. Web Server is the great support to these mainstream browsers. The following figures are explained by Opera.

8.1First, find the IP address in the LCD menu of the device that the default IP address is 192.168.0.22. Set the IP address of the network card of the computer to the same network segment as the device. Find the "network" icon on the Windows desktop, select the icon, click the right button of mouse, and select "properties" in the pop-up menu

	Open
Network	Map network drive Disconnect network drive
	Create shortcut Delete
	Properties

click to "local connection" in the pop up interface



select "Properties" in the pop up "Local Connection Status" and double click "Internet Protocol Version 4 (TCP/IPv4)"

Local Area Connection Status	Local Area Connection Properties
General Connection IPv4 Connectivity: No Internet access IPv6 Connectivity: No network access	Networking Connect using:
Media State: Enabled Duration: 00:31:50 Speed: 100.0 Mbps Details	Configure This connection uses the following items: Client for Microsoft Networks Glient for Microsoft Networks File and Printer Sharing for Microsoft Networks Link-Layer Topology Discovery Mapper I/O Driver Link-Layer Topology Discovery Mapper I/O Driver
Sent — 💐 — Received	Install Uninstall Properties
Bytes: 36,063 159,089	Description Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
Close	OK Cancel

set the IP address that makes the IP address the same segment as the device to enable a computer to access a device

eneral	
You can get IP settings assigne this capability. Otherwise, you i for the appropriate IP settings.	d automatically if your network supports need to ask your network administrator
Obtain an IP address auto	matically
• Use the following IP addre	ss:
IP address:	192.168.0.10
Subnet mask:	255.255.255.0
Default gateway:	192.168.0.1
Obtain DNS server addres	s automatically
Use the following DNS server	ver addresses:
Preferred DNS server:	
Alternate DNS server:	• • •
🔲 Validate settings upon ex	it Advanced

8.2 Open the Web, enter the IP address of the device in the browser address bar,

such as 192.168.0.22

O Menu III Speed Dial +	
< > C 88 🔀 192.168.0.22	ē

the browser will pop up a login box

2	Manager"
User Name:	
Password:	

Enter in the pop up login user box : **"admin**" (Note: all lowercase letters), password: "**123456**", then press the Enter key

8.3 The browser opens the device status by default

The second se	SNMP Agent WEB	Manager		
Device Status Device Settings Alarm Status Alarm Properties Network Settings Change Password Reset Settings	Device Status Device Model Serial Number Version Internal Temprature Input Power Output Power OUtput Power DC Power +5V DC Power +3.3V DC Power +12V Power Supply 1 Power Supply 2 1 20 mA 2 0 mA	THOR EDFA-16 0001 3.1.6 29.9 -60.0 5.0 3.2 11.4 Fault Normal TEMP 24.3 °C 24.2 °C	*C dBm dBm V V V V E E E 0.03 A 0.09 A	
				Copyright © All rights reserved.

Real-time parameter

8.4 The left side of page is a navigation menu, click to enter the corresponding menu page



Page Navigation Bar

and the second sec	SNMP Agent WEB Manager	
Device Status	Device Settings	
Device Settings	PUMP Status: PUMP ON Set Outout ATT: 0.0 dB	
Alarm Status		
Alarm Properties	Submit	
Network Settings		
Change Password		
Reset Settings		
	Copyright © All rights rese	rved.

Device Settings

IndexParameter NameAlam Satus1Output optical powerNominal2Input optical powerNominal3Power Supply 1Nominal4Power Supply 2Nominal5Internal TempNominal6Pump1 BIASNominal7Pump2 BIASNominal8Pump1 TECNominal9Pump2 TECNominal10Pump2 TempNominal11Pump2 TempNominal12DC +5VNominal13DC +3.3VNominal14DC +12VNominal	IndexParameter NameAlarm Satus1Output optical powerNominal2Input optical powerNominal3Power Supply 1Nominal4Power Supply 2Nominal5Internal TempNominal6Pump1 BIASNominal7Pump2 BIASNominal9Pump2 TECNominal10Pump2 TempNominal11Pump2 TempNominal12DC +5VNominal13DC +3.3VNominal14DC +12VNominal	IndexParameter NameAlam Satus1Output optical powerNominal2Input optical powerNominal3Power Supply 1Nominal4Power Supply 2Nominal5Internal TempNominal6Pump1 BIASNominal7Pump2 BIASNominal9Pump1 TECNominal10Pump1 TempNominal11Pump2 TempNominal12DC +5VNominal13DC +12VNominal	IndexParameter NameAlarm Status1Output optical powerNominal2input optical powerNominal3Power Supply 1Nominal4Power Supply 2Nominal5Internal TempNominal6Pump1 BIASNominal7Pump2 BIASNominal9Pump2 TECNominal10Pump2 TempNominal11Pump2 TempNominal12DC +5VNominal13DC +3.3VNominal14DC +12VNominal	Index Parameter Name Alam Status 1 Output optical power Nominal 2 Input optical power Nominal 3 Power Supply 1 Nominal 4 Power Supply 2 Nominal 5 internal Temp Nominal 6 Pump1 BIAS Nominal 7 Pump2 BIAS Nominal 8 Pump1 TEC Nominal 9 Pump2 TEC Nominal 10 Pump1 Temp Nominal 11 Pump2 Temp Nominal 12 DC +5V Nominal 13 DC +12V Nominal				
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9 Pump2 TEC Nominal 10 Pump1 Temp Nominal 11 Pump2 Temp Nominal 12 DC +5V Nominal 13 DC +3.3V Nominal 14 DC +12V Nominal	9 Pump2 TEC Nominal 10 Pump1 Temp Nominal 11 Pump2 Temp Nominal 12 DC +5V Nominal 13 DC +3.3V Nominal 14 DC +12V Nominal	9 Pump2 TEC Nominal 10 Pump1 Temp Nominal 11 Pump2 Temp Nominal 12 DC +5V Nominal 13 DC +3.3V Nominal 14 DC +12V Nominal	9Pump2 TECNominal10Pump1 TempNominal11Pump2 TempNominal12DC +5VNominal13DC +3.3VNominal14DC +12VNominal	9 Pump2 TEC Nominal 10 Pump1 Temp Nominal 11 Pump2 Temp Nominal 12 DC +5V Nominal 13 DC +3.3V Nominal 14 DC +12V Nominal		8	Pump1 TEC	Nominal
10Pump1 TempNominal11Pump2 TempNominal12DC +5VNominal13DC +3.3VNominal14DC +12VNominal	10Pump1 TempNominal11Pump2 TempNominal12DC +5VNominal13DC +3.3VNominal14DC +12VNominal	10Pump1 TempNominal11Pump2 TempNominal12DC +5VNominal13DC +3.3VNominal14DC +12VNominal	10Pump1 TempNominal11Pump2 TempNominal12DC +5VNominal13DC +3.3VNominal14DC +12VNominal	10 Pump1 Temp Nominal 11 Pump2 Temp Nominal 12 DC +5V Nominal 13 DC +3.3V Nominal 14 DC +12V Nominal		9	Pump2 TEC	Nominal
11 Pump2 Temp Nominal 12 DC +5V Nominal 13 DC +3.3V Nominal 14 DC +12V Nominal	11Pump2 TempNominal12DC +5VNominal13DC +3.3VNominal14DC +12VNominal	11 Pump2 Temp Nominal 12 DC +5V Nominal 13 DC +3.3V Nominal 14 DC +12V Nominal	11 Pump2 Temp Nominal 12 DC +5V Nominal 13 DC +3.3V Nominal 14 DC +12V Nominal	11 Pump2 Temp Nominal 12 DC +5V Nominal 13 DC +5.3V Nominal 14 DC +12V Nominal		10	Pump1 Temp	Nominal
12 DC +5V Nominal 13 DC +3.3V Nominal 14 DC +12V Nominal	12 DC +5V Nominal 13 DC +3.3V Nominal 14 DC +12V Nominal	12DC +5VNominal13DC +3.3VNominal14DC +12VNominal	12 DC +SV Nominal 13 DC +3.3V Nominal 14 DC +12V Nominal	12 DC +5V Nominal 13 DC +3.3V Nominal 14 DC +12V Nominal		11	Pump2 Temp	Nominal
13 DC +3.3V Nominal 14 DC +12V Nominal	13 DC +3.3V Nominal 14 DC +12V Nominal	13 DC +3.3V Nominal 14 DC +12V Nominal	13 DC +3.3V Nominal 14 DC +12V Nominal	13 DC +3.3V Nominal 14 DC +12V Nominal		12	DC +5V	Nominal
14 DC +12V Nominal	14 DC +12V Nominal	14 DC +12V Nominal	14 DC +12V Nominal	14 DC +12V Nominal		13	DC +3.3V	Nominal
						14	DC +12V	Nominal
						14	DC +12V	Nominal

Alarm Status

and the second s	SNMP	Agent WEB Mar	nager						
Device Status	- Alarm Pro	perties							1
Device Settings	Index	Parameter Name	ніні	н	LO	LOLO	Deadband	Action	
Alarm Status	1	Output optical power (dBm)	27.0	26.0	11.0	10.0	0.2	Set	
Alarm Properties	2	Input optical power (dBm)	✓ 10.0	☑ 8.0	-6.0	-10.0	0.2	Set	
Notwork Sottings	3	Internal Temp (`C)	85	70	5		2	Set	
Chappen Dessured	4	Pump1 BIAS (mA)	900	800	v 100	80	20	Set	
Change Password	5	Pump2 BIAS (mA) 900 800 100 80 20				Set			
Reset Settings	6	Pump1 TEC (A)	2.00	☑ 1.50	-1.50	-2.00	0.10	Set	
	7	Pump2 TEC (A)	2.00	☑ 1.50	-1.50	-2.00	0.10	Set	
	8	Pump1 Temp (`C)	35.0	30.0	20.0	15.0	1.0	Set	
	9	Pump2 Temp (`C)	☑ 35.0	30.0	20.0	15.0	1.0	Set	
	10	DC +5V (V)	6.5	☑ 6.0	4.0	3.5	0.2	Set	
	11	DC +3.3V (V)	✓ 4.2	3.8	2.8	2.4	0.2	Set	
	12	DC +12V (V)	✓ 14.0	✓ 13.0	11.0	10.0	0.2	Set	
		_			1				
	Index	Parameter Name Power Supply 1 Power Supply 0			Cont	rol	Action		
							Set		
	2	Fower Suppry 2				Епаріеічајог	~	Set	
									_
							Copyright	© All rights	s resei

Alarm Properties

The second se	SNMP Agent WEB I	Manager
Device Status Device Settings Alarm Status Alarm Properties Network Settings Change Password Reset Settings	Network Settings Device MAC Update Identifier Static IP Address: Subnet Mask Default Gateway: Trap Address 1: Trap Address 2: Trap Address 3: Trap Address 4: Trap Address 5: Trap Address 7: Trap Address 8: Read Community: Write Community: Trap Community: SINMP Version:	00: B9: A0: 12: 94: 9A CA138G05 V3.1.0 192: 168: 0. 22 255: 255: 0. 0 192: 168: 1. 1 0. 0. 0. 0 0. 0. 0. 0 0. 0. 0. 0 0. 0. 0. 0 0. 0. 0. 0 0. 0. 0. 0 0. 0. 0. 0 0. 0. 0. 0 0. 0. 0. 0 0. 0. 0. 0 0. 0. 0. 0 0. 0. 0. 0 0. 0. 0. 0 0. 0. 0. 0 public Y1 ~ Save
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Network Settings

	SNMP Agent WEB Manager	
Device Status Device Settings Alarm Status Alarm Properties Network Settings Change Password Reset Settings	Change Password Password Password New Usemame New Password Confirm Password Submit	
	Copyright © All rights reserve	d.



	SNMP Agent WEB Manager	
Device Status	Restore settings and Reboot device Reboot device	
Alarm Status Alarm Properties Network Settings	Restore factory settings Warning!!	Reboot device
Change Password Reset Settings	Click the restore button, all parameters will be restored to factory d	Restore Factory
	 IP Address: 192.168.1.8 Subnet Mask: 255.255.0 Gateway Address: 192.168.1.1 TRAP Address 1: 192.168.1.200 TRAP Address 2: 255.255.255 	
	 User name: admin Password: 123456 	Restore net
		Copyright © All rights reserved.

Restore Settings