

technetix

AIMA3000.EDFA

Erbium Doped Fibre Amplifier

Product User Manual



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1 About This Manual

1.1 Related Documentation

The following documents may be used in conjunction with this manual:

- AIMA.3000 - Product User Manual
- AIMA ASMM - Product User Manual
- AIMA3000 NMS Web Management System Product User Manual
- Technetix.NMS3-EPSM - Basic Inventory Management
- Technetix.NMS3-EPSM - Basic Alarm Management
- Technetix.NMS3-EPSM - Basic System Management
- Technetix.NMS3-EPSM - Basic Template Management

1.2 Technical Support

If you need help in the process of setting up and maintaining EDFA, please contact Technetix technical support staff:

Europe:

Technetix BV
Kazemat 5
NL-3905 NR Veenendaal
P.O. Box 385
NL-3900 AJ Veenendaal
The Netherlands

Phone: +31 318 58 59 59

Email: customer.service.vdl@technetix.com

2 Precautions



WARNING!

This equipment is intended for indoor applications. To prevent fire or electrical shock, or damage to the equipment, do not expose units to water or moisture.

- You should carefully read and thoroughly understand the contents of the manual before installing and using this equipment.
- A typical connector is SC/APC 8°. Note: 8° angle polished optical connectors must be used.
- At any time, there may be dangerous voltage inside the device.
- Do not power up before the cover and the panels of the equipment are installed and the enclosure is closed.

Cleaning

Only use a damp cloth to clean the front panel. Use a soft dry cloth to clean the top of the unit. Do not use any spray cleaners or chemicals of any kind.

Outage or overload requiring service and repairs

Unplug the unit and refer the servicing to Technetix qualified service personnel only.

Servicing and repairs

DO NOT attempt to service this unit yourself. Refer all servicing needs to Technetix qualified service personnel only.

WARNING!

Exposure to class 3A laser radiation is possible. Access should be restricted to trained personnel only. Do not view exposed fibre or connector ends when handling optical equipment.

3 Overview

3.1 Product Description

The Erbium Doped Fibre Amplifier (EDFA) is designed to plug into Technetix latest generation Advanced Intelligent Multi-services Access platform - the AIMA3000.

Technetix AIMA3000 EDFA module works in conjunction with 1550 nm optical transmitter modules to meet client requirements for different environments and transmission distances.

The EDFA employs a highly reliable pump laser with an advanced design to ensure that the unit can achieve a very low noise profile and high pump efficiency. The unit uses single or dual-pump lasers designed with inter-stage isolators. Its output power ranges from 13 dBm (19.95 mW) to 30 dBm (251.18 mW). The EDFA supports a fixed gain setting for dense wave division multiplexing (DWDM) applications, as well as a number of user-selectable output ports.

The EDFA can also be conveniently monitored and controlled through a computer connected to one of the Ethernet ports via the ASMM module

3.2 Product Key Features

- Plug-and-play AIMA platform optical signal amplifier
- Single/Dual 980 nm and 1480 nm pump amplifier models
- Suits 1550 nm DWDM applications
- Adjustable optical outputs for dynamic link configurations
- Low noise profile with a Noise Figure (NF) of less than 5 dB and gain flattening
- Suitable for large scale FTTx deployment
- Automatic power control (APC) for a consistent optical output power (A-EDFA-x-x-P-x only)
- Automatic Gain Control (AGC) for maintaining a consistent amount of power amplification for each wavelength (A-EDFA-x-x-G-x only)
- Automatic thermo-cooler control (ATC) for a consistent laser temperature
- Remote firmware upgrade and auto upload/download of configuration files through ASMM web interface or using Technetix NMSE
- Bulk firmware update through Technetix NMSE
- FCC, CE and RCM⁽¹⁾ compliant

⁽¹⁾ See Declaration of Conformity for current status.

3.3 Specifications

Optical Performance

Optical wavelength	1529 ~ 1564 nm		
Input Power	Min	Typical	Max
	For A-EDFA-x-x-P-x	0 dBm	10 dBm
	For A-EDFA-x-x-G-x	11 dBm	14 dBm
Optical output per port	13 ~ 24 dBm (optional)		
Number of output ports	1 ~ 6 (optional)		
Adjustable output optical power	-3 ~+0.2 dBm (for A-EDFA-x-x-P-x only)		
Optical return loss	> 50 dB		
Noise figure	< 5 dB		
Typical Input Isolation	30 dB		
Typical Output Isolation	30 dB		
Optical output level accuracy	±0.5 dB		
Multi-tone gain flatness	±0.5 dB (1548 ~ 1562 nm) ⁽²⁾		
(for A-EDFA-x-x-G-x only)	±0.75 dB (1538 ~ 1562 nm) ⁽³⁾		
Pump laser	980 nm and/or 1480 nm		
Remnant pump power	-30 dBm		
Polarisation-dependent gain	< 0.3 dB		
Optical connector	SC/APC ⁽²⁾ , FC/APC, LC/APC, E2000/APC		

General

Power consumption	Total power less than 20 dBm < 15 W Total power less than 24 dBm < 20 W
Operating temperature	-5 ~ 55 °C
Operating humidity	90 % (Non-condensing)
Storage temperature	-25 ~ 70 °C
Storage humidity	90 % (Non-condensing)
Dimensions (W*D*H)	24.6 * 410 * 152.5 mm
Weight	0.95 kg
Supported network management options	Technetix ported network management options x-x-G-

Note:

- (1) The recommended input power for an A-EDFA-1-17-G-S with 11 dBm optical input with a 6 dB gain typically has an output of 17 dB
 (2) Standard option. Contact a Technetix Sales Representative for availability of other options.

3.4 Block Diagram

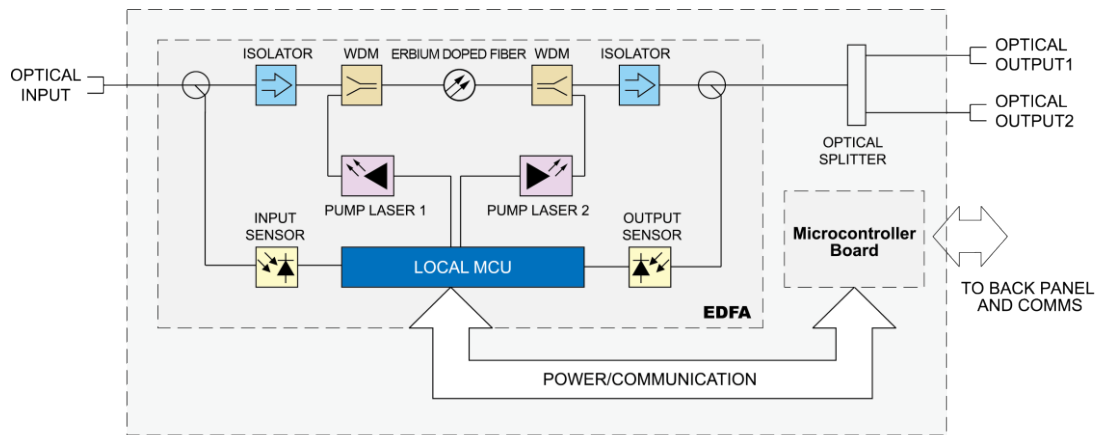


Figure 3-1 EDFA Block Diagram

Table 3-1 EDFA Block Diagram Glossary

Parameters	Glossary
OPTICAL INPUT	OPTICAL INPUT
ISOLATOR	ISOLATOR
WDM	Wavelength Division Multiplexer
ERBIUM DOPED FIBRE	ERBIUM DOPED FIBRE
PUMP LASER	PUMP LASER
INPUT SENSOR	INPUT SENSOR
LOCAL MCU	Local Micro Control Unit
OUTPUT SENSOR	OUTPUT SENSOR
OPTICAL OUTPUT	OPTICAL OUTPUT
TO BACK PLANE AND COMMS	BUS

3.5 Order Details

A-EDFA-[W]-[X]-[Y]-[Z] Erbium Doped Fibre Amplifier

Options:

W	Optical Ports	
	1	(max 24 dBm per port)
	2	(max 21 dBm per port)
	4	(max 17 dBm per port) ⁽¹⁾
	6	(max 13 dBm per port) ⁽¹⁾
X	Power per port	
	13	13 dBm
	16	16 dBm
	17	17 dBm
	18	18 dBm
	19	19 dBm
	20	20 dBm
	21	21 dBm
	22	22 dBm
	23	23 dBm
24	24 dBm	
Y	Working mode	
	P	Constant Power
	G	Constant Gain
Z	Optical Connector Type	
	S	SC/APC ⁽²⁾
	E	E2000/APC
	F	FC/APC
	L	LC/APC

Notes:

(1) LC/APC connector only.

(2) Standard option. Contact a Technetix Sales Representative for availability of other options.

Product Code Examples	Description
A-EDFA-1-20-P-S	AIMA3000 1-Slot EDFA Module with 1 output port, 20 dBm each, Constant Power, SC/APC connector
A-EDFA-2-21-G-E	AIMA3000 1-Slot EDFA Module with 2 output port, 21 dBm each, Constant Gain, E2000/APC connector
A-EDFA-4-17-P-L	AIMA3000 1-Slot EDFA Module with 4 output port, 17 dBm each, Constant Power, LC/APC connector
A-EDFA-6-13-P-L	AIMA3000 1-Slot EDFA Module with 6 output port, 13 dBm each, Constant Power, LC/APC connector

4 Module Characteristics

4.1 Module Appearance and Port Layout

4.1.1 Overview

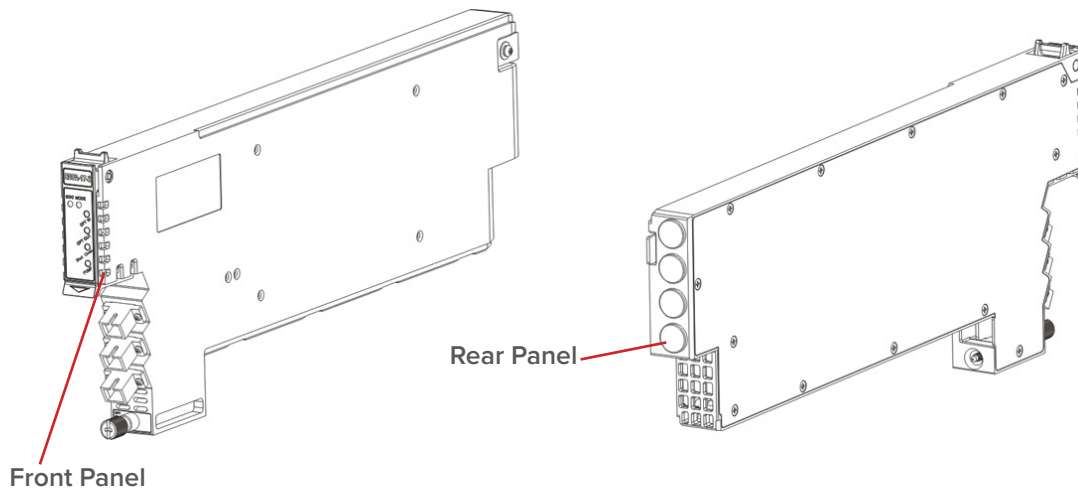


Figure 4-1 Module Appearance

4.1.2 Front Panel Layout

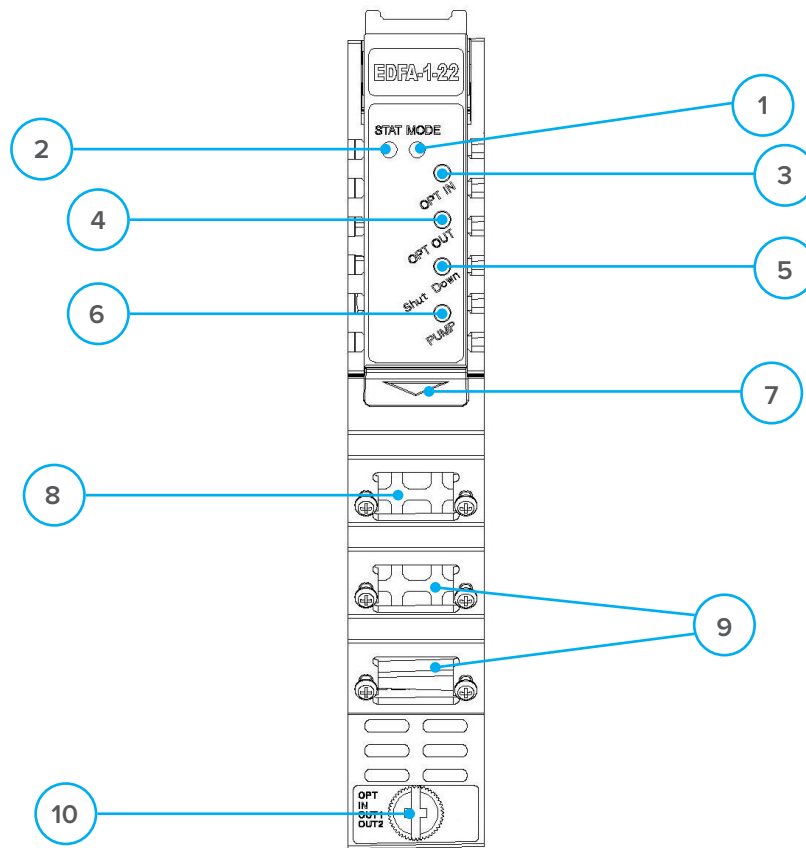


Figure 4-2 EDFA Front Panel Layout

Table 4-1 EDFA Front Panel Functions

Item Number	Item	Description
1	MODE LED	Module power indicator Normal: Green
2	STAT LED	Module status indicator Normal: Green Minor Alarm: Amber Major Alarm: Red
3	OPT IN	Optical Input mode indicator Normal: Green Input signal is high or low: Amber Input signal is too high or too low: Red
4	OPT OUT	Optical Output mode indicator Normal: Green (When installing the module, the green light blinks) Output signal is high or low: Amber Output signal is too high or too low: Red
5	Shut Down	Laser output status indicator Normal or laser output is ON: Green Laser output is OFF: Amber
6	PUMP	Pump laser working mode indicator Normal: Green (When installing the module, the green light blinks)
7	Orange tab-retaining clip	Used to plug and anchor the module The tab-retaining clip will pop-up after pressing the release and plug module.
8	Optical input port	Optical Input
9	Optical output port	Optical output
10	Mounting Screw	Module fastening screw

CAUTION!

“OPT OUT” emits a non-visible laser radiation when working.

4.1.3 Rear Panel Layout

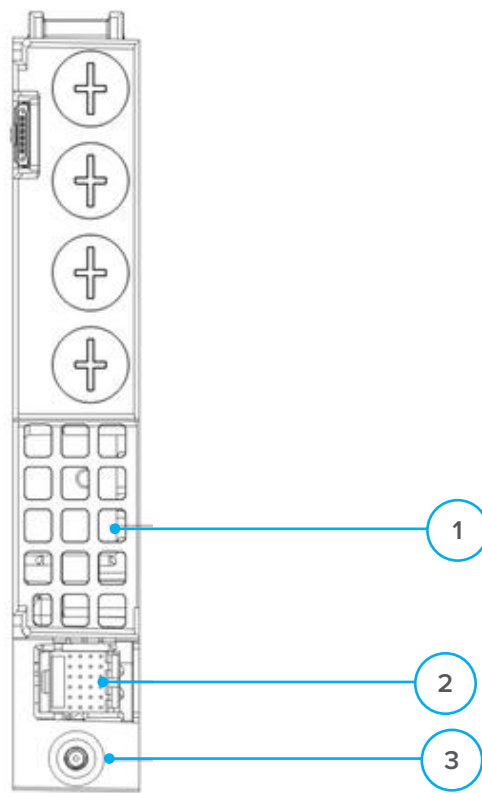


Figure 4-3 Rear Panel Layout

Table 4-2 EDFA Rear Panel Functions

Item Number	Item	Description
1	Air vent	Air vent allowing air to flow out of the module
2	Multi-pin connector	Power and communication port
3	Placement pin	Used to position the module in the chassis

5 Installation

5.1 Preparatory Work for Installation

Before installing this device, you must ensure that the unit is intact and ready for installation. Unpack and check the unit: Open the box to check for any damage that may have occurred during shipment.

If damage is found, please contact a **Technetix customer support representative**.

Necessary equipment and tools for installation:

Table 5-1 Necessary equipment and tools for installation

Tools/Modules	Description
Phillips screwdriver PH1/PH2	For use with the AIMA3000 chassis
EDFA Module	The module to install into the AIMA3000 chassis

5.2 Unpacking

Unpack the module. Keep the packaging materials for future transport needs.

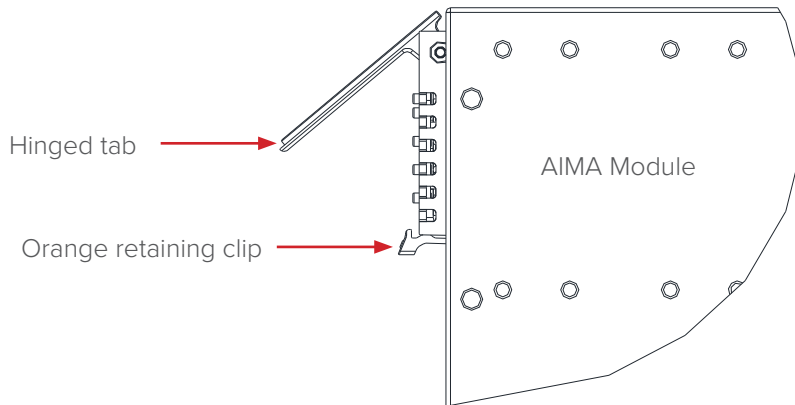
Check the package manifest, record the product module type, serial number, purchase date, and any other relevant information to facilitate later management and maintenance.

Table 5-2 Packing Manifest

No.	Description	Qty
1	EDFA module	1
2	Individual test sheet (Certificate of Performance)	1

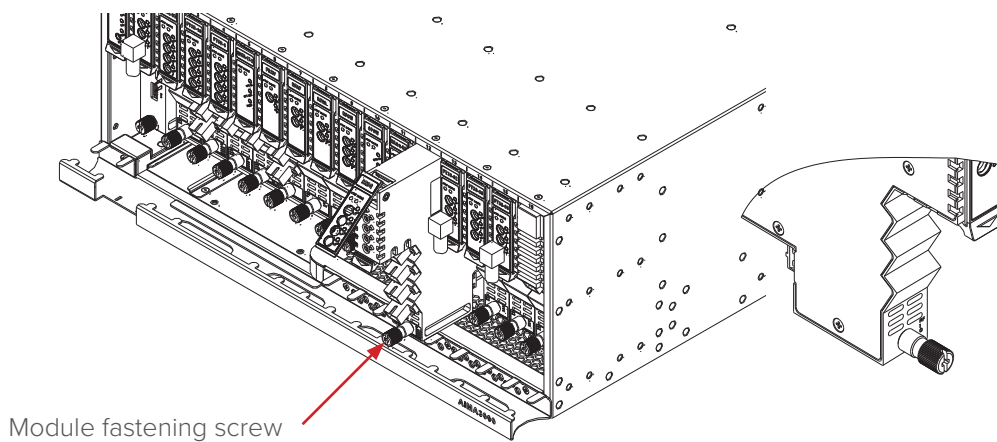
5.3 Module Installation

1. Gently depress the orange retaining clip and release the hinged tab



2. Hold the AIMA module casing upright, align it with the AIMA3000 slide rails for the correct slot, and insert the module until it reaches the multi-pin connector.

DO NOT use excessive force when inserting the module, but ensure the RF connectors at the rear of the module are securely connected with the chassis's RF connectors.



CAUTION!

The module **MUST** be installed correctly to ensure a proper connection of the module's multi-pin connector and the backplane.

Tip:

When inserting the module into the guide rails, vertically tilt the module slightly to check that the guides are properly seated on the rails. The module is guided to the correct position using the large metal fastening screw on the lower part of the front panel.

3. After the module is inserted, gently push the hinged tab until it snaps into the orange retaining clip. While pushing down on the hinged tab, the AIMA module will mate with the power bus and will lock in into the chassis.

CAUTION!

If force is required to insert a module, then it may not be correctly seated on the slide rails, or the mounting screw may be misaligned.

4. When the module is fully seated within the chassis, on the bottom of the AIMA module, fasten the spring-loaded mounting screw. Only use fingers to fasten the mounting screw. DO NOT use a screwdriver.

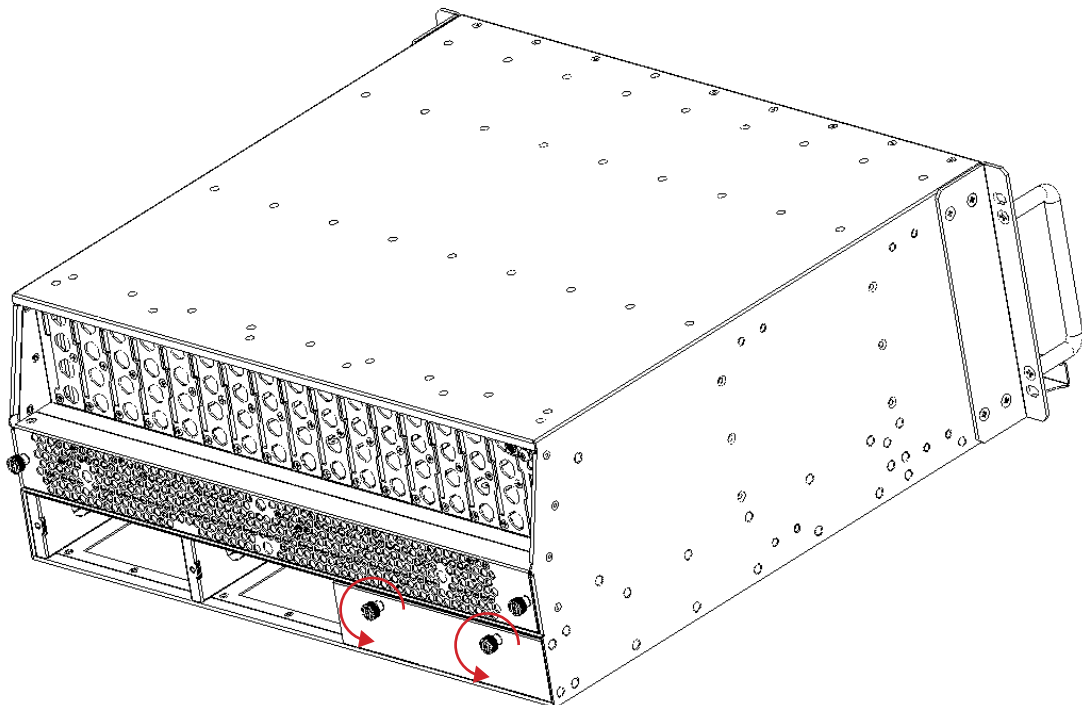
5.4 Connecting Optical Cables

For the convenience of the user, the AIMA3000 Chassis has a Sliding Fibre Guide to help the operator to arrange the cables. For the specific steps to connect the fibre, please refer to the instructions in section 5.4.1.

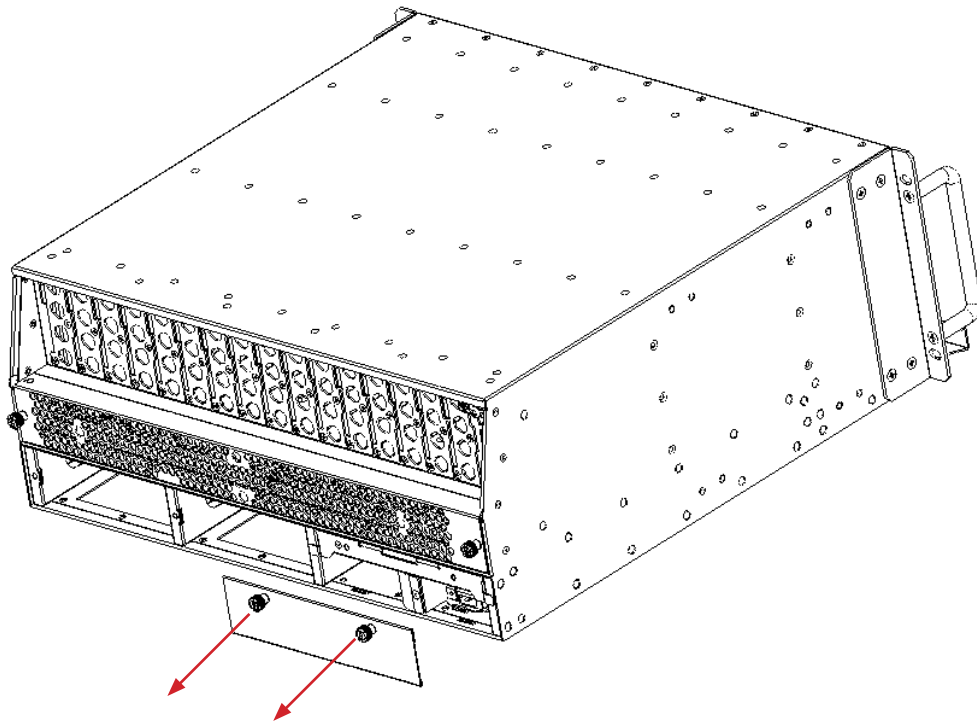
5.4.1 Using the Sliding Fibre Guide

The sliding fibre guide is located in the lower-left corner of the chassis if looking at the front of the chassis, and is designed to help installation of the optical fibre cabling. To access the sliding fibre guide you will need to first remove the rear panel located on the back of the chassis.

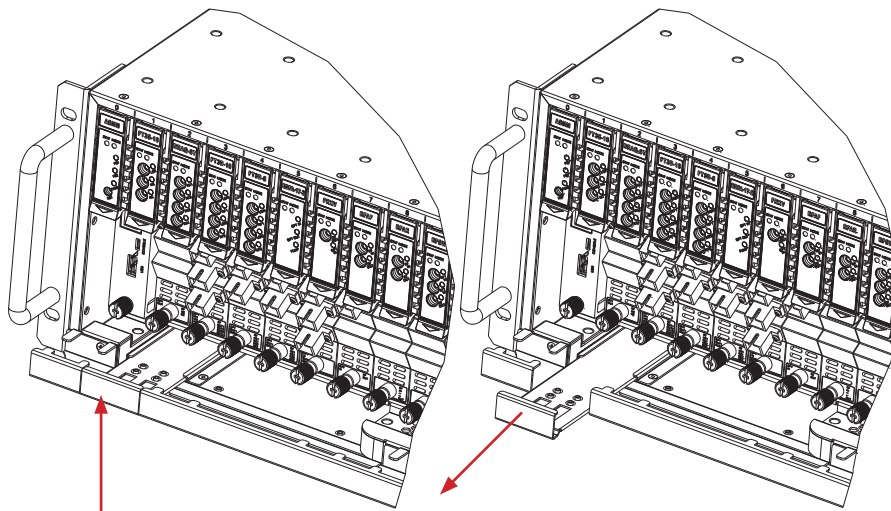
1. Unscrew the two thumbscrews on the rear panel.



2. Then, pull the panel forward.

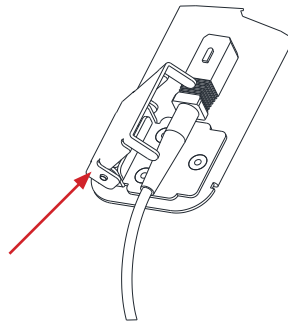


3. Then lift up the handle and slide the fibre guide out of the front of the chassis.



DO NOT remove the dust cap from the fibre connector until right before connecting it to the input port.

4. Raise the clip, insert the fibre connector, and then lower the clip over the connector.



When using the sliding guide, put the fibre connector in the clip and slide it in from the rear to the front, through the chassis. Ensure that the optical fibre tail does not become trapped or pulled tightly.



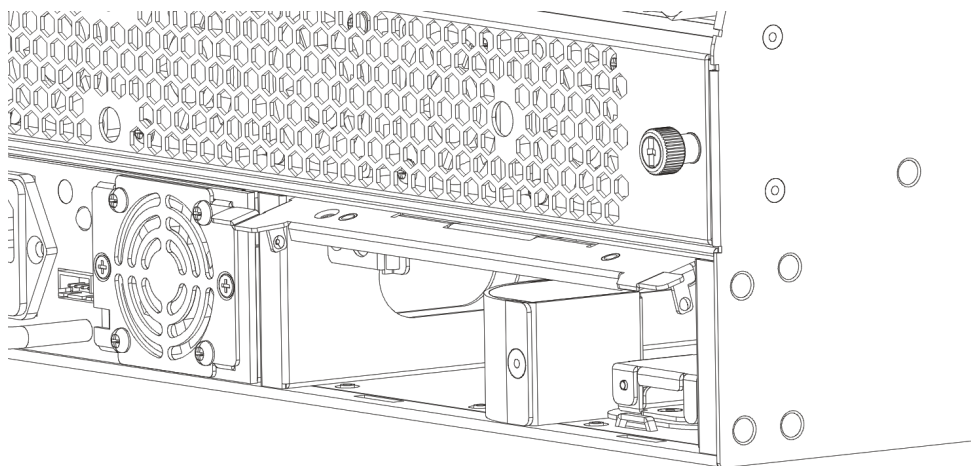
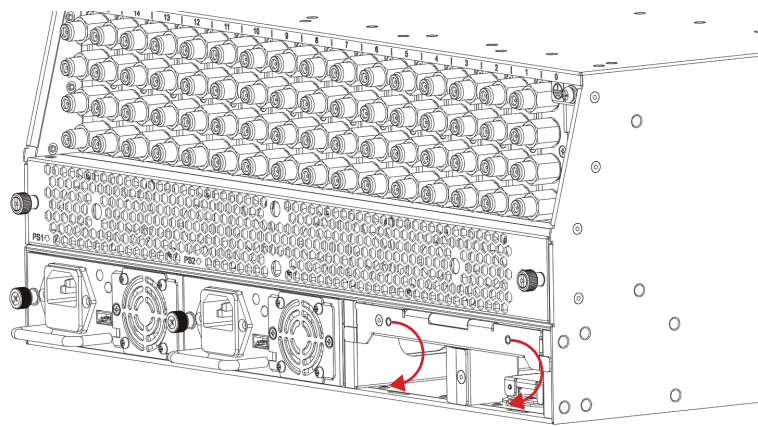
Fibre clip (at rear, for up to two connectors)

Handle (at front)

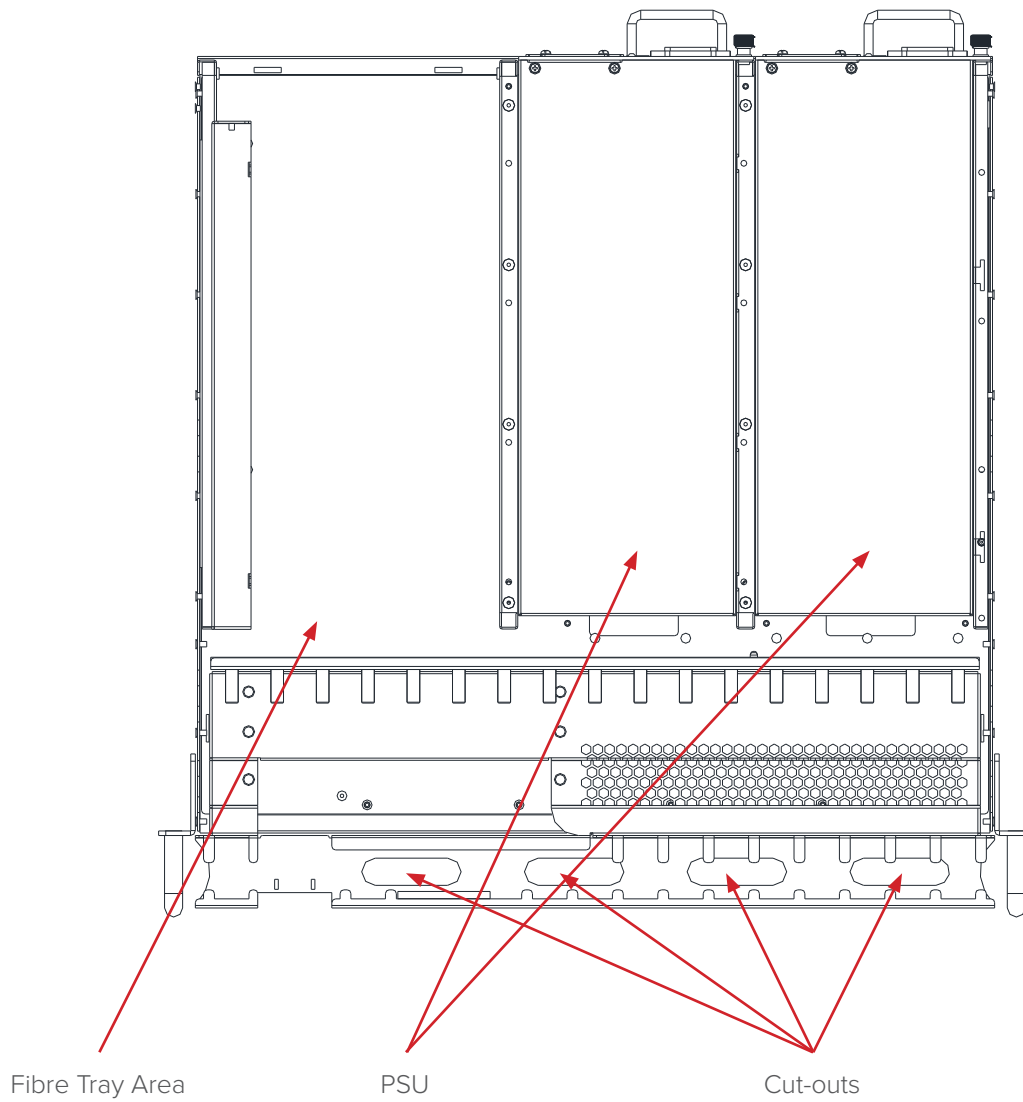
5.4.2 Using the Fibre Tray

All optical fibres must be organised in a tidy manner in the chassis's fibre tray, which provides enough space for up to 64 optical fibres. This allows for easy positioning and future replacement of optical fibres. Along the front of the chassis, there are cut-outs for keeping the optical fibres in position.

1. When organizing the optical fibres, lift up the metal flap at the rear of the panel above the sliding guide. This will allow fibre cables to be moved away from the sliding guide rails.

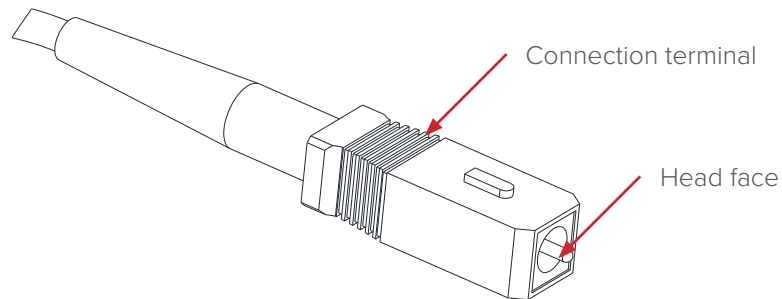


2. Use the Fibre Guide Tool to organise the cables and wires in the fibre tray to prevent tangles and the blocking of the guide rails.



5.4.3 Cleaning the Fibre Connector Ends and Front-panel Optical Ports

To obtain a good quality optical input signal, optical fibre input ports and fibre connector ends must be carefully cleaned.



When cleaning the optical fibre-connector end, remove the dust cap and then use a lint-free cloth dampened with a static dissipative solvent to clean the angled surface. Dry the surface using a dry lint-free cloth.

To clean the front-panel optical port, use a special lint-free swab that is designed for this purpose. Dampen it with a static dissipative solvent. Apply slight pressure to the internal angled surface of the optical port, while rotating the swab 90 degrees back and forth. You may need to remove excess solvent using a dry lint-free swab. Alternatively, a cleaning pen such as the one click cleaner can be used.

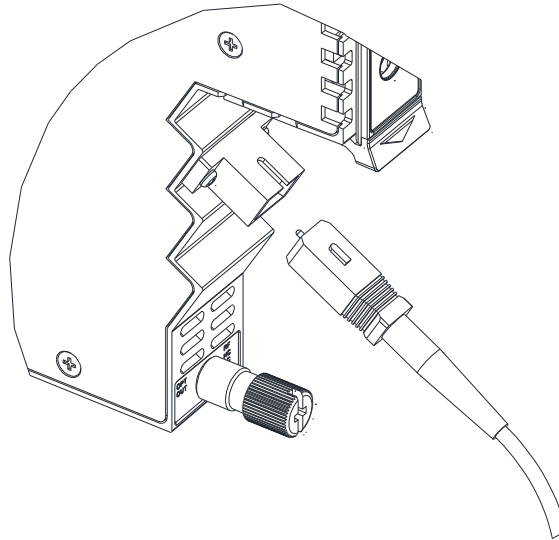
SC one click cleaning pen



www.oneclickcleaner.com

5.4.4 Connecting the Optical Fibres

Carefully lift up the hinged cover of the optical input port, align the raised tab on the connector with the slot in the port. Insert the connector until the connector is securely held in place indicated by a clicking sound.



5.5 Check Module LEDs

When the module has been installed, if the chassis is powered, all LED indicators on the front panel will show a blinking green light, indicating the module is initiating.

If the input signal and output signal are normal, the “STAT” LED indicator will cease to blink in about 5 seconds and remain constant green afterwards. At the same time, “OPT IN” and “OPT OUT” LED indicators will also remain constant green when the signals are normal.

If the input signal is out of the expected range, the “STAT” and “OPT IN” LED indicators will show constant orange or red. If the output signal is out of the expected range, the “STAT” and “OPT OUT” LED indicators will show constant orange or red.

5.6 Test the RF Input Signal

Test the optical input before configuring the module. First, confirm the optical input signal by using the optical signal power meter according to the technical specifications. This step ensures the device receives an input signal within specified dBm input range of -6 to +10 for constant power models and 0 to 14 for constant gain models. Then access the optical signal to the module, at the same time the module optical input indicator should show a green light.

5.7 Test the Optical Output Signal

Connect the optical input to the EDFA using a clean optical fibre cord. Connect the optical power metre to the optical amplifier output port by using the optical fibre cord. Ensure the difference of the power metre's reading and the module's certificate of performance is not more than ± 0.5 dBm.

6 Module Configuration & Alarms

The module’s configuration settings can be managed by using a web browser and NMS. This manual only provides the information regarding the ASMM’s web interface. For NMS configuration methods please refer to Technetix NMSE manual.

6.1 Port Configuration screen

After logging in to the AIMA ASMM controller, select the “Modules” tab and then the “EDFA” to configure the EDFA module. After selecting “EDFA”, the “Port” option will appear.

The screenshot displays the web interface for configuring the EDFA-1-15-G module. The navigation menu on the left lists various modules, with '8 EDFA-1-15-G' selected. The main content area is divided into several sections:

- Module Information:** Displays details such as Model (A-EDFA-1-15-G-S), Serial No. (14022745), HW Assembly No. (A05053_0), FW Part No. (S09144), and FW Version (V01.00.06). A 'Refresh' button is present.
- Configuration:** Includes an 'Alarm Control' dropdown set to 'Enable' and a 'Module Alias' input field. A 'Submit' button is located at the bottom right.
- Alarm Settings:** A table with columns for Parameter, Current Value, HiHi, Hi, Lo, LoLo, and Deadband. The table contains settings for Temperature, +12V Input Voltage, +5V Input Voltage, and Amplifier Voltage.
- Commands:** Includes 'Factory Defaults' and 'Reboot' buttons, each with an 'Apply' button and a warning message.

Parameter	Current Value	HiHi	Hi	Lo	LoLo	Deadband
Temperature(°C)	26.3	<input checked="" type="checkbox"/> 70.0	<input checked="" type="checkbox"/> 65.0	<input checked="" type="checkbox"/> 0.0	<input checked="" type="checkbox"/> -5.0	2.0
+12V Input Voltage(V)	11.7	<input checked="" type="checkbox"/> 13.5	--	--	<input checked="" type="checkbox"/> 10.5	0.1
+5V Input Voltage(V)	4.9	<input checked="" type="checkbox"/> 6.0	--	--	<input checked="" type="checkbox"/> 4.4	0.1
Amplifier Voltage(V)	5.1	<input checked="" type="checkbox"/> 6.0	--	--	<input checked="" type="checkbox"/> 4.4	0.1

FIGURE 6-1

On the EDFA main page, alarms events can be enabled. Alarms settings for DC voltages can be enabled or disabled.

When selecting “Port” from the left column, it will open up the web GUI to configure the operation of the EDFA.

Alarm Settings	Factory Default Setting (bold) and range if applicable
Output Status Alarm	Enable Major Enable Minor Disable

Table 6-1

Parameters	Description
Unit Control	ON / Off control for toggling the EDFA module
Gain per wavelength	When operating in “Constant Gain” mode, the appropriate gain between optical input and output level can be set for all inputs.

Table 6-2 for A-EDFA-x-x-G-x

Items	Sub Items	Description	
		Effect and Configuration Method	Configuration
Module Information	Slot	-	-
	Module Type	-	-
Status	Output Status	Green indicates output status red indicates no output	-
	Laser Type	-	-
Configuration	Unit Control	Control Unit Switch	ON / OFF
	Output Power Set	Set the optical output power based on customer needs	16 ~ 24 dBm
	Gain Per Wavelength		
Alarm Settings	Output Status Alarm	-	-
	Critical High	Alarm level setting, alarm parameters can be changed	
	Warning High		
	Warning Low		
	Critical Low		
	Dead Band		

Loading factory defaults can restore the device to the original default settings.

Parameters	Units	Critical High (HIHI)	Warning High (HI)	Normal	Warning Low (LO)	Critical Low (LOLO)	Dead Band	Threshold changeable by user	Default alarm enable
Input power	dBm	16.0	15.0	-	-1.0	-2.0	0.1	Y	ON
Output power	dBm	19.0	18.0	-	1.0	0.0	0.1	Y	ON
Laser output power	dBm	19.0	18.0	-	1.0	0.0	0.1	Y	ON
Laser Temperature	°C	35.0	30.0	-	20.0	15.0	0.1	Y	ON
Laser Bias Current	mA	1300	1200	-	30	20	5	Y	ON
Laser TEC Current	mA	2000	1500	-	-1500	-2000	20	Y	ON

Detailed operations:

Click “Modules” tab and click the module to be configured as shown in Figure 6-2. Click the “Apply” button under “Factory Defaults”. When finished, the device configuration will be reset. For more detailed information, refer to the factory restore and upgrade configuration parameter table shown in **Table 6-3**.

Note:

All the powers displayed on the web page are total power.

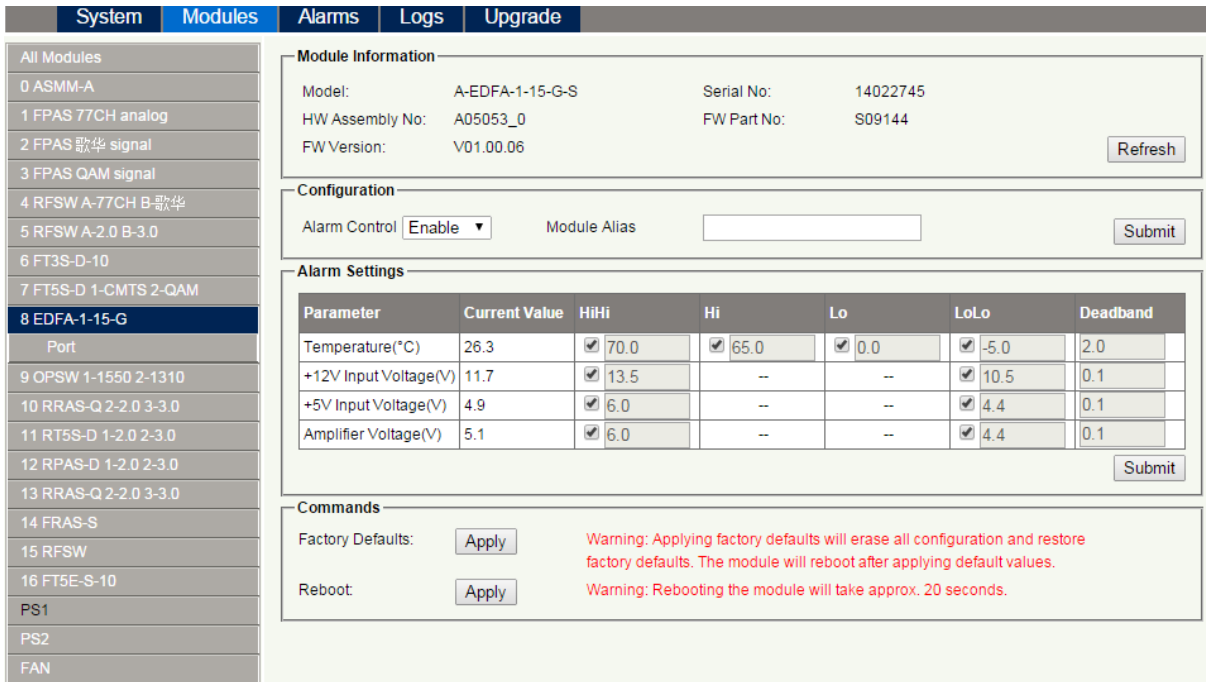


FIGURE 6-2

Table 6-3 Factory default and upgrade configuration parameters table

Parameters	Configuration	Factory default value	After software upgrade
Alarm Detection Control	ON / OFF	ON	Retained
Unit Control (PUMP ON / OFF)	ON / OFF	OFF	Retained
Output Gain Type	Constant Power / Constant Gain	Constant Power (EDFA-x-x-P) and Constant Gain (EDFA-x-x-G)	Retained
Output Status Alarm	Major/Minor/Disable	Minor	Retained
Gain Per Wavelength	8-12	6	Retained

6.2 Reboot

The module can be rebooted remotely, see **Figure 6-4**.

Detailed operations:

Click the “**Modules**” tab, select the “**EDFA**”, and then click the “**Apply**” button next to “**Reboot**”. Next, click on “**Submit**” to confirm, and then the module will automatically restart. The configuration of the module will be retained after rebooting.

The screenshot displays the web interface for the AIMA3000.EDFA module. The 'Modules' tab is selected, and module '8 EDFA-1-15-G' is highlighted in the left-hand menu. The main content area shows the configuration for this module, divided into several sections:

- Module Information:** Displays details such as Model (A-EDFA-1-15-G-S), Serial No. (14022745), HW Assembly No. (A05053_0), FW Part No. (S09144), and FW Version (V01.00.06). A 'Refresh' button is present.
- Configuration:** Shows 'Alarm Control' set to 'Enable' and a 'Module Alias' input field. A 'Submit' button is located at the bottom right.
- Alarm Settings:** A table with columns for Parameter, Current Value, HiHi, Hi, Lo, LoLo, and Deadband. The table contains data for Temperature, +12V Input Voltage, +5V Input Voltage, and Amplifier Voltage, with checkboxes for enabling each parameter's alarm.
- Commands:** Includes 'Factory Defaults' and 'Reboot' buttons, both with 'Apply' sub-buttons. Red warning text is displayed next to each button.

Parameter	Current Value	HiHi	Hi	Lo	LoLo	Deadband
Temperature(*C)	26.3	<input checked="" type="checkbox"/> 70.0	<input checked="" type="checkbox"/> 65.0	<input checked="" type="checkbox"/> 0.0	<input checked="" type="checkbox"/> -5.0	2.0
+12V Input Voltage(V)	11.7	<input checked="" type="checkbox"/> 13.5	--	--	<input checked="" type="checkbox"/> 10.5	0.1
+5V Input Voltage(V)	4.9	<input checked="" type="checkbox"/> 6.0	--	--	<input checked="" type="checkbox"/> 4.4	0.1
Amplifier Voltage(V)	5.1	<input checked="" type="checkbox"/> 6.0	--	--	<input checked="" type="checkbox"/> 4.4	0.1

Figure 6-4

6.3 Alarms Monitoring

All the module alarms are shown on the alarm page. If an alarm occurs, the operator can view the associated pages to find more detailed alarm information.

6.3.1 Alarm Status Pages

Click the “Alarms” tab on the top menu bar to display an overview of the alarm status for all the installed modules as shown in **Figure 6-5**.

The alarm status has three states:

- Normal: Green
- Major Alarm: Red

System	Modules	Alarms	Logs	Upgrade
All Modules				
0	ASMM-A	0	ASMM-A	●
1	FPAS 77CH analog	1	FPAS-S	●
2	FPAS 歌华 signal	2	FPAS-S	●
3	FPAS QAM signal	3	FPAS-S	●
4	RFSW A-77CH B-歌华	4	RFSW	●
5	RFSW A-2.0 B-3.0	5	RFSW	●
6	FT3S-D-10	6	FT3S-D-10	●
7	FT5S-D-10	7	FT5S-D-10	●
8	FT5S-D 1-CMTS 2-QAM	8	EDFA-1-15-G	●
9	EDFA-1-15-G	9	OPSW	●
10	OPSW 1-1550 2-1310	10	RRAS-Q	●
11	RRAS-Q 2-2.0 3-3.0	11	RT5S-D-10	●
12	RT5S-D 1-2.0 2-3.0	12	RPAS-D	●
13	RPAS-D 1-2.0 2-3.0	13	RRAS-Q	●
14	RRAS-Q 2-2.0 3-3.0	14	FRAS-S	●
15	FRAS-S	15	RFSW	●
16	RFSW	16	FT5E-S-10	●
PS1	FT5E-S-10	PS1	--	--
PS2	PS	PS2	PS	●
FAN	FAN	FAN	FAN-A	●

Figure 6-5

6.3.2 Module operating voltage and temperature alarm

Click on the corresponding module, as shown in **Figure 6-6**, to view the module alarm information. After clicking on EDFA in "Modules" tab, the operator can view the module temperature and power supply voltage alarms. The operator can view the status indicators to check if the module is functioning properly.

The status indicators have three states:

- Normal: Green
- Minor Alarm: Amber
- Major Alarm: Red

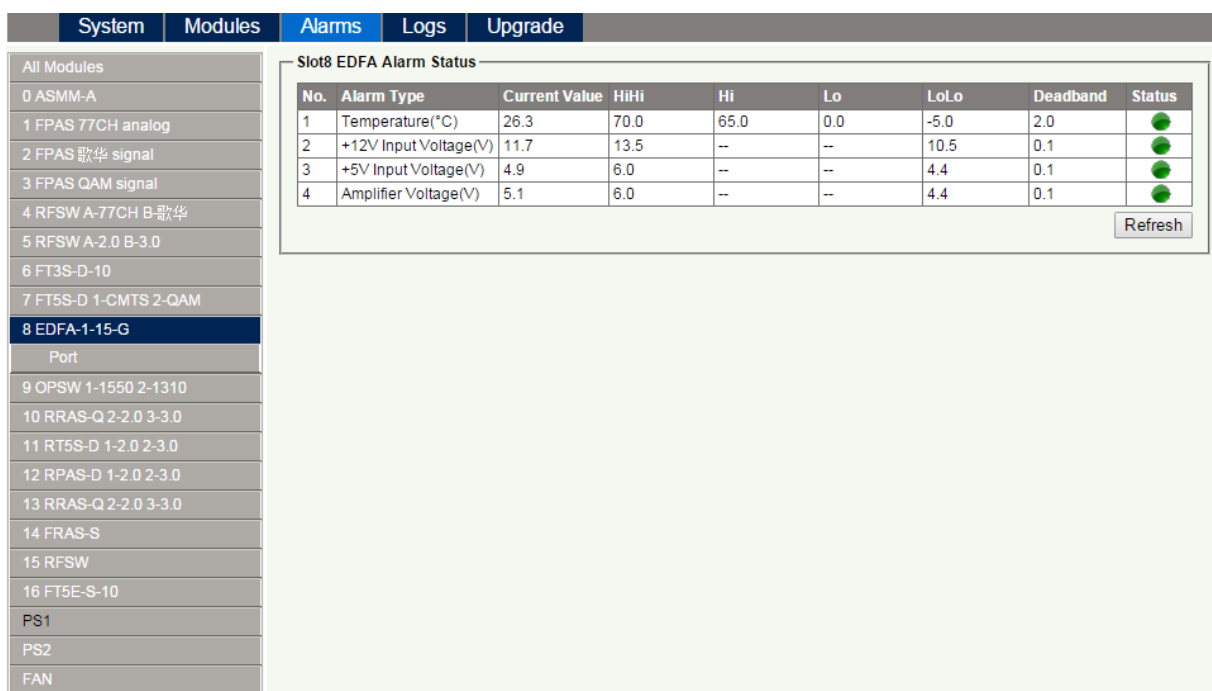


Figure 6-6

Use the status indicators to determine if the module is working properly. If the device is replaced or reset, click on "Refresh" to update the alarms information.

6.3.3 Module Port Alarms

Click on the Module’s “Port” label on the left column, as shown in Figure 6-7. The Input, Output, laser output Total Power, Laser Bias current, Laser TEC current can be viewed from this page.

Status indicator has three states:

- Normal: Green
- Minor Alarm: Amber
- Major Alarm: Red

No.	Alarm Type	Current Value	HiHi	Hi	Lo	LoLo	Deadband	Status
1	Output Status	On	--	--	--	--	--	
2	Input Power(dBm)	9.0	12.0	11.0	-1.0	-2.0	0.1	
3	Output Power Each Port(dBm)	15.0	21.2	21.0	7.0	6.0	0.1	
4	Laser Output Power(dBm)	15.0	21.2	21.0	7.0	6.0	0.1	
5	Laser Temperature(*C)	25.0	35.0	30.0	20.0	15.0	0.1	
6	Laser Bias Current(mA)	309	1300	1200	30	20	5	
7	Laser TEC Current(mA)	275	3000	2500	-2500	-3000	20	

Figure 6-7

6.3.4 Alarm Settings Configuration

Monitoring Function ON / OFF

In the Configuration section on the Modules page, click the “Alarm Control” pull down menu to toggle the monitoring function.

Temperature, +12V, +5V Voltage Alarm Levels Management

By default, the temperature and voltage alarms are enabled. The check box, , as shown in **Figure 6-8**, toggles the alarms. When the check box is checked, the associated alarm is enabled and the text in the text box will be solid black. When the check box is unchecked, (detection OFF), the text in the text box will be light grey and cannot be changed. The default alarm parameters are shown below.

The screenshot shows the configuration interface for the EDFA module. The 'Alarm Settings' section is expanded, showing a table of parameters with their current values and threshold settings. The 'Output Status Alarm' is set to 'enableMinor'. The table below summarizes the data from the screenshot:

Parameter	Current Value	HiHi	Hi	Lo	LoLo	Deadband
Input Power(dBm)	9.0	<input checked="" type="checkbox"/> 12.0	<input checked="" type="checkbox"/> 11.0	<input checked="" type="checkbox"/> -1.0	<input checked="" type="checkbox"/> -2.0	0.1
Output Power Each Port(dBm)	15.0	<input checked="" type="checkbox"/> 21.2	<input checked="" type="checkbox"/> 21.0	<input checked="" type="checkbox"/> 7.0	<input checked="" type="checkbox"/> 6.0	0.1
Laser Output Power(dBm)	15.0	<input checked="" type="checkbox"/> 21.2	<input checked="" type="checkbox"/> 21.0	<input checked="" type="checkbox"/> 7.0	<input checked="" type="checkbox"/> 6.0	0.1
Laser Temperature(°C)	25.0	<input checked="" type="checkbox"/> 35.0	<input checked="" type="checkbox"/> 30.0	<input checked="" type="checkbox"/> 20.0	<input checked="" type="checkbox"/> 15.0	0.1
Laser Bias Current(mA)	309	<input checked="" type="checkbox"/> 1300	<input checked="" type="checkbox"/> 1200	<input checked="" type="checkbox"/> 30	<input checked="" type="checkbox"/> 20	5
Laser TEC Current(mA)	285	<input checked="" type="checkbox"/> 3000	<input checked="" type="checkbox"/> 2500	<input checked="" type="checkbox"/> -2500	<input checked="" type="checkbox"/> -3000	20

Figure 6-8

Parameter	Units	HIHI	HI	Normal	LO	LOLO	Dead Band	Threshold changeable by user	Default alarm enable
Temperature	°C	70	65	-	0	-5	2	N	ON
+12V Input voltage	Vdc	13.5	-	-	-	10.5	0.1	N	ON
+5V Input voltage	Vdc	6	-	-	-	4.4	0.1	N	ON
Amplifier voltage	Vdc	6	-	-	-	4.4	0.1	N	ON

6.3.5 Input/ Output Status Monitoring

To setup Input/ Output Status Monitoring, select the associated module's "Port" page from the left column. The monitoring parameters are listed under "Alarm Settings", click the check box to toggle the various parameters. The monitoring thresholds can be changed. See below.

System
Modules
Alarms
Logs
Upgrade

All Modules

0 ASMM-A

1 FPAS 77CH analog

2 FPAS 歌华 signal

3 FPAS QAM signal

4 RFSW A-77CH B 歌华

5 RFSW A-2.0 B-3.0

6 FT3S-D-10

7 FT5S-D 1-CMTS 2-QAM

8 EDFA-1-15-G

Port

9 OPSW 1-1550 2-1310

10 RRAS-Q 2-2.0 3-3.0

11 RT5S-D 1-2.0 2-3.0

12 RPAS-D 1-2.0 2-3.0

13 RRAS-Q 2-2.0 3-3.0

14 FRAS-S

15 RFSW

16 FT5E-S-10

PS1

PS2

FAN

Port Information

Slot: 8 Module Type: EDFA Refresh

Status

Output Status: ● Laser Type: CATV+BA

Configuration

Unit Control: On Gain Type: Constant Gain

Output Power Set: dBm Gain Per Wavelength: (8.0-12.0)dB Submit

Alarm Settings

Output Status Alarm: enableMinor

Parameter	Current Value	HiHi	Hi	Lo	LoLo	Deadband
Input Power(dBm)	9.0	<input checked="" type="checkbox"/> 12.0	<input checked="" type="checkbox"/> 11.0	<input checked="" type="checkbox"/> -1.0	<input checked="" type="checkbox"/> -2.0	0.1
Output Power Each Port(dBm)	15.0	<input checked="" type="checkbox"/> 21.2	<input checked="" type="checkbox"/> 21.0	<input checked="" type="checkbox"/> 7.0	<input checked="" type="checkbox"/> 6.0	0.1
Laser Output Power(dBm)	15.0	<input checked="" type="checkbox"/> 21.2	<input checked="" type="checkbox"/> 21.0	<input checked="" type="checkbox"/> 7.0	<input checked="" type="checkbox"/> 6.0	0.1
Laser Temperature(°C)	25.0	<input checked="" type="checkbox"/> 35.0	<input checked="" type="checkbox"/> 30.0	<input checked="" type="checkbox"/> 20.0	<input checked="" type="checkbox"/> 15.0	0.1
Laser Bias Current(mA)	309	<input checked="" type="checkbox"/> 1300	<input checked="" type="checkbox"/> 1200	<input checked="" type="checkbox"/> 30	<input checked="" type="checkbox"/> 20	5
Laser TEC Current(mA)	285	<input checked="" type="checkbox"/> 3000	<input checked="" type="checkbox"/> 2500	<input checked="" type="checkbox"/> -2500	<input checked="" type="checkbox"/> -3000	20

Submit

Figure 6-9

6.3.6 Default Port Page Alarm Thresholds (EDFA-1-17-G)

Parameter	Units	HIHI	HI	Normal	LO	LOLO	Dead Band	Threshold changeable by user	Default alarm enable
Input power	dBm	16.0	15.0	-	-1.0	-2.0	0.1	Y	ON
Output power	dBm	19.0	18.0	-	1.0	0.0	0.1	Y	ON
Laser output Power	dBm	19.0	18.0	-	1.0	0.0	0.1	Y	ON
Laser temperature	°C	35.0	30.0	-	20.0	15.0	0.1	Y	ON
Laser Bias current	mA	1300	1200	-	30	20	5	Y	ON
Laser TEC current	mA	2000	1500	-	-1500	-2000	20	Y	ON

Table 6-4 Module Alarm Indicator Definitions

Parameters (Common)	Description	Definitions	Related Indicators	Lighting Conditions
Power OFF	Power OFF	Power OFF	All	All OFF
Initiating AM	Power ON	During Module Power ON	All	Blinks green ¼ second
No Alarm	Normal operation	Normal	All	Green
AM-Critical-ALM	Critical Alarm	Critical Alarm	STAT	Red
AM-Minor-ALM	Warning Alarm	Warning Alarm	STAT	Amber
Optical-input-Critical-ALM	Optical Input Critical Alarm	Input Power is too high/ too low	STAT OPT IN	Red
Optical-input-Minor-ALM	Optical Input Warning Alarm	Input Power is higher/ lower	STAT OPT IN	Amber
Optical-output-Critical-ALM	Optical Output Critical Alarm	Optical Output Power is too high /too low	STAT OPT OUT	Red
Optical-output-Minor-ALM	Optical Output Warning Alarm	Optical Output Power is higher/lower	STAT OPT OUT	Amber
Laser Output On	Laser Output On	Laser On	Shut down	Green
Laser Shut down	Laser Shut down	Laser Off	Shut down	Amber
Pump-Critical-ALM	Pump Output Critical Alarm	Pump Output is too high/ too low	STAT Pump	Red
Pump-Minor-ALM	Pump Output	Pump Output is higher / lower	STAT Pump	Amber

6.4 Logs Management

The operator can view all the alarms of the modules in the chassis on the Logs Management page. Click “**Logs**” on the top menu to enter the Logs Management page. See **Figure 6-10**.

System		Modules		Alarms		Logs		Upgrade	
All Logs									
No.	Slot	Port	Type	Alarm Value	State	Time	Content		
1	14	1	Output Power	99.0dBμV	LoLo	2016-05-16 14:26:19	RF Output Power Alarm		
2	14	--	Module Status	FRAS-S	Normal	2016-05-16 14:26:19	FRAS-S is inserted in sync		
3	14	--	Module Status	FRAS-S	Warning	2016-05-16 14:26:15	FRAS-S is discovering		
Total Pages: 1 Current Page: 1 First Page Page Up Page Down Last Page Goto: <input type="text" value="1"/> <input type="button" value="Delete All"/>									

Figure 6-10

6.5 Device Upgrade

The Module supports firmware upgrade function.

Via the following **Figure 6-11** page, upload the local upgrade file, and then click **start upgrade** to begin with the upgrade process. At the same time, you will be automatically redirected to the Network Management page. The upgrade operation is then complete.

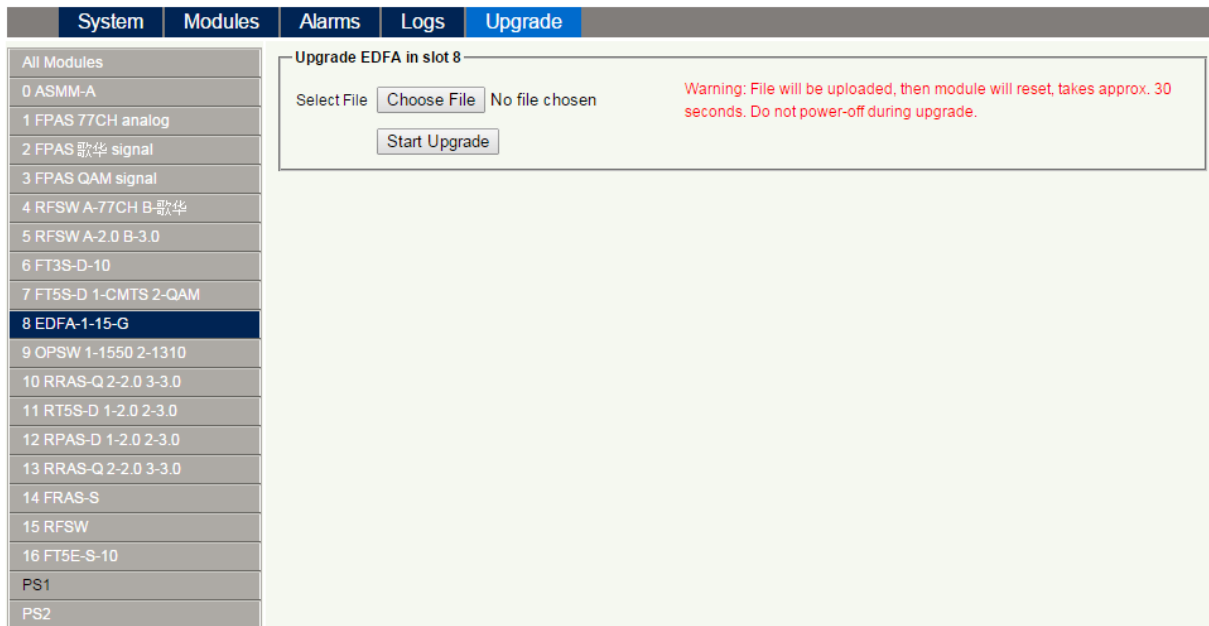


Figure 6-11

- * The upgrade file needs to be located in the PC that is connecting to ASMM
- * The Web GUI above only supports the manual operation from a local PC.
- * The EDFA supports automated firmware updates and automatic backup & restore features via TFTP when managed via Technetix NMSE management software. Please refer to the NMSE Product User Manual for more information.

7 Troubleshooting

Indicator for determining faults

If there is an error, the operator can use the status LEDs to determine the location and condition of the fault. See Table 7-1.

Table 7-1 Fault Indication Table

Alarm Indicator status	Common Faults	Troubleshooting
OPT IN/OUT Red	Input, Optical Output Power is too high or too low	Clean optical port and fibre end, measure input and optical output power; ensure input and output optical power are within normal range. If input and optical output power are normal, contact Technetix technical support.
STAT Red	Abnormal optical input power	Abnormal bias current. Contact Technetix technical support.
	Power failure	Contact Technetix technical support.
	Operating environment temperature is too high	Lower the room temperature. If the temperature is normal, contact Technetix technical support.
	Laser temperature or voltage is too high	Contact Technetix technical support.

8 Declaration of Conformity

According to ISO/IEC Guide 22 and EN45014

Manufacturer's Name: Technetix

Manufacturer's Address: Technetix Ltd, Innovation House, Technetix Business Park,
Albourne, West Sussex, BN6 9EB

**Declares, that the product
Product Name:** EDFA– Erbium Doped Fibre Amplifier

Conforms to the following standards:

FCC: FCC Part 15 Subpart B: 2012

CE: EN 50083-2: 2012; EN 5504: 2010; EN 61000-3-2: 2006+A1: 2009+A2: 2009; EN
55022:2010; EN 61000-3-3: 2008

RCM: AS/NZS CISPR22: 2009+A1: 2010 (Pending)



Appendix A: Default Alarm Limit Settings

Parameter	Units	HIHI	HI	Normal	LO	LOLO	Dead Band	Threshold changeable by user	Default alarm enable
Temperature	°C	70	65	-	0	-5	2	N	ON
+12V Input voltage	Vdc	13.5	-	-	-	10,5	0.1	N	ON
+5V Input voltage	Vdc	6	-	-	-	4,4	0.1	N	ON
Amplifier voltage	Vdc	6	-	-	-	4,4	0.1	N	ON

Appendix B: Factory Default Settings

Parameters	Configuration	Factory default value	After software upgrade
Alarm Detection Control	ON / OFF	ON	Retained
Unit Control (PUMP ON / OFF)	ON / OFF	ON	Retained
Output Gain Type	Constant Power / Constant Gain	Constant Power (EDFA-x-x-P) and Constant Gain (EDFA-x-x-G)	Retained
Output Status Alarm	ON / OFF	ON / OFF	Retained
Gain Per Wavelength	10 to 25 dBm	ON	Retained

