EDFAMUX 10G, 100G, & Simplex

User & Installation Manual

Version 2.6

April 2024

Contents

1. Introduction

Please note that reading this entire manual is mandatory for a full understanding of the correct use of this product.

This manual is written with the intent to fully inform the user as to the specific installation instructions and safety requirements of the ProLabs EDFAMUX product line.

ProLabs' EDFAMUX products undergo extensive internal testing procedures in order to meet our strict quality control standards and are in full compliance with CE (including RoHS and REACH), WEEE, and FCC regulations.

This manual will first give an overview of specific warning symbols, prior to instructing the user on the technical aspects of the ProLabs EDFAMUX. The manual will then cover specific installation procedures while using the ProLabs EDFAMUX. Next, the manual will cover the specific risks and considerations when using, installing, or altering the ProLabs EDFAMUX. Finally, the manual covers what to do when a malfunction occurs or when maintenance needs to be performed. For contact details, please refer to the end of this manual.

Please be advised that the ProLabs EDFAMUX is specifically designed and sold to customers in the business-to-business market. Only trained and experienced network professionals should install, remove, or service the ProLabs EDFAMUX. For any questions regarding the ProLabs EDFAMUX, including installation, malfunction, or maintenance - please contact our Technical Support Department at the email addresses and phone numbers listed in the end of this manual. This manual is not intended as part of any agreement and is merely used to provide the customer with general information regarding the installation of the ProLabs EDFAMUX.

Please read this manual carefully and ensure that you comply with all strict warnings provided herein. For specific product information, please refer to the datasheet of your respective ProLabs EDFAMUX. The latest version of each datasheet is published on our website and contains important technical requirements and other product specific information.

Should you have any comments on this manual, please direct them to:

ProLabs US

US: +1 877 957 9144

Email: support@prolabs.com

ProLabs EMEA

UK: +44 8081 893212

France: +33 80 59 81 282

Italy: +39 800 69 4256

India: +91 80091 91173

Email: support@prolabs.com

2. Revision History

Version	Author	Description	Dates
2.3.1	Haley Pierson	Revised copy.	10/04/21
2.3.2	Haley Pierson	Updated contact information.	04/06/22
2.3.3	Haley Pierson	Added 100G 120km data.	05/26/23
2.4	Haley Pierson	Updated document format and "Recommended EDFA Values."	10/24/23
2.5	Haley Pierson	Added power surge guidelines.	10/31/23
2.6	Haley Pierson	Added warranty, liability, & compliance information, additional safety information, physical installation requirements and guidance, additional maintenance information, and a simplex channel diagram.	4/29/24

3. Warranty, Liability, & Compliance

We guarantee that the product you receive has been thoroughly tested to ensure that it meets its published specifications. The warranty included in the conditions of delivery is valid only if the product has been installed and used according to the instructions supplied by the company. We shall, in no event, be liable for incidental or consequential damages, including (without limitation): lost profits, loss of income, loss of business opportunities, loss of use and other related exposures, however caused, arising from the faulty and incorrect use of the product.

We offer a 3-year warranty for normal usage of the EDFAMUX, provided that the user has not altered the EDFAMUX in any way or used it contrary to its intended purpose. For specific information regarding our warranty, please visit our website for our general terms and conditions.

This document is written with the utmost care. Specifications, figures, data, and illustrations provided in this document are based on information that is believed to be reliable and accurate. We do not accept any liability for damages derived from incomplete, inaccurate, outdated, and/or otherwise incorrect specifications, figures, data, and/or illustrations. We do not intend to suggest that we are the creators or trademark owners of any other manufacturers' products. Information is subject to change without notice.

Compliance Statement

The EDFAMUX complies with relevant Directives and Regulations of the European Union (EU) and the United States of America (US) such as the EMC- and ROHS Directive, as well as the Reach Regulation. Please consult your sales agent or our office for further detailed information on compliance and conformity statements. For safety reasons, the EDFAMUX should not be switched on or in operation/processing data/running measurements when installing or removing it. Only trained and qualified network professionals should install, replace, or service the EDFAMUX.

ProLabs

4. Safety Information

⚠️	**CAUTION: IMPORTANT SAFETY INSTRUCTIONS** This warning symbol indicates that the reader should be cautious. Please take notice of the fact that when you use an item labelled with this symbol, improper use may cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.
⚠️	**CAUTION: CLASS 1 LASER PRODUCT** This warning indicates caution is necessary. There is visible laser radiation present. Avoid long-term viewing of the laser.
🗑️	**DO NOT DISPOSE** This symbol indicates that you may not dispose the equipment as unsorted municipal waste as per 2002/96/EC (WEEE directive). For proper recycling, return the equipment to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information, see: www.recyclethis.info.
♻️	**RECYCLING** This symbol indicates that the equipment (packaging) may require recycling in accordance with you own local laws. Contact your local regulatory authorities for more information.
CE	**CE MARK** This symbol indicates that the company tested the equipment in accordance with applicable standards, and it is safe. The CE-symbol indicates that this product also complies with the requirements of Directive 2014/30/EU. It does not generate, or is not affected by, electromagnetic disturbance.
FC	**FCC MARK** This symbol indicates that the company tested the equipment in accordance with the applicable Federal Code Of Regulation (CFR) FCC 47 Part 15, subpart B, and it is safe. The FCC-symbol indicates that the electromagnetic interference from the product is under limits approved by the Federal Communications Commission. It does not generate, or is not affected by, electromagnetic disturbance.

RoHS	**HAZARDOUS GOODS** This symbol indicates that the equipment complies with Directives 2011/65/EU (RoHS II) and 2002/95 EC (RoHS I).
Class 3B Laser	**LASER CLASS 3B** This symbol indicates that the equipment complies with 21 CFR 1040.10 and 1040.11, except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.
	ESD This symbol indicates that the user should only (dis)connect the equipment in an EPA (ESD Protected Area), while using only certified equipment and taking all necessary precautions.
ANATEL	**ANATEL** This symbol indicates that the company has tested the equipment in accordance with the relevant Brazilian standard, ensuring its safety. The Anatel symbol confirms compliance with Anatel regulations, indicating that the product does not generate electromagnetic disturbance or is affected by it.

Warnings

The intra-building port(s) of the equipment or subassembly is suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly MUST NOT be metallically connected to interfaces that connect to the OSP or its wiring for more than 6 meters (approximately 20 feet). These interfaces are designed for use as intra-building interfaces only (Type 2, 4, or 4a ports as described in GR-1089) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to an OSP wiring system.

When removing or uninstalling fiber-optic cables/EDFAMUX, please note the following warnings:

	Warning CLASS 1 Laser Product Do not look directly into an EDFAMUX or into the ends of fiber optic cables. EDFAMUX and fiber-optica cables that are connected to a transceiver emit laser light that can damage your eyes.

⚠️	Do not leave an EDFAMUX uncovered except when inserting or removing a cable. The safety cap keeps the port clean and prevents accidental exposure to laser light.
⚠️	Only trained and qualified personnel should be permitted to install, replace, or service the EDFAMUX.

General Guidelines

When removing or (un)installing fiber-optic cables/EDFAMUX, please note the following warnings:

- If the EDFAMUX is not connected through a conditioned power source such as a UPS, surge protection up to 6kV is recommended.
- Use the EDFAMUX only for the purpose it was designed for.
- The EDFAMUX must be installed in an indoor rack or cabinet within a controlled network telecommunications facility environment. The EDFAMUX may also be installed in outdoor cabinets with controls that maintain the operating environment as specified in the model-specific datasheet.
- To minimize shock hazard, the EDFAMUX must be connected to a properly grounded receptacle. Not properly grounding the EDFAMUX is considered dangerous and may lead to damage. Please see "Section 6 - Physical Installation."
- The communication ports on the EDFAMUX are designed for intra-building use only and require isolation from an exposed OSFP cable.
- Do not use the EDFAMUX in the presence of flammable gases or fumes.
- Do not allow unqualified persons to remove covers.
- Do not allow unqualified persons to replace components.
- Do not allow unqualified persons to make any internal adjustments.
- Always disconnect power, discharge circuits, and remove external voltage sources before touching any components.
- Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the EDFAMUX. In the case of malfunction and/or maintenance, please follow the guidelines of this manual.

Regarding Fiber-Optic Cables

The ProLabs EDFAMUX is designed to include fiber-optic components/products, including optical connectors to connect optical cables. Unlike electrical wires, the insides of optical cables contain a fiber made of glass. Due to the different properties of optical fiber when compared to the copper used in electrical wires, some additional precautions must be taken as detailed below:

- Avoid bending fiber-optic cables beyond their minimum bend radius. An arc smaller than a few inches in diameter can damage the cable and cause problems which are difficult to diagnose.
- Do not let fiber-optic cables hang free from the connector.
- Do not allow fastened loops of cable to dangle. If the loops dangle, the cables can become stressed at the fastened point.
- Secure cables in the cable management system so that they are not supporting their own weight.
- Place excess cable out of the way in a neatly coiled loop, using the cable management system. Placing fasteners on a loop helps to maintain its shape.

Regarding the Laser

The ProLabs EDFAMUX includes a Class 3B Laser which is generally harmless; however, extra precaution is still advised. These precautions are noted below:

- Take care when connecting or disconnecting optical fiber cabling or optical transceivers.
- Follow the instructions provided in the manuals of those products.
- Do not open the casing of the EDFAMUX, especially when in operation.
- Never look directly into the end of the fiber or in any opening of the EDFAMUX.
- Never use a microscope, magnifying glass, or any kind of eye loop to observe a fiber end or in any opening of the EDFAMUX.
- Always wear appropriate safety eyewear when working with the EDFAMUX.

End-of-Life Disposal

Please follow all local and national laws and regulations when disposing of the ProLabs EDFAMUX after deinstallation.

5. Applicable Models and Technical Description

The ProLabs EDFAMUX is an all-in-one optical transmission device which incorporates the functions of a Mux/Demux, Amplifier/s, and a Dispersion Compensator in order to aggregate multiple optical channels over long distances. It utilizes a non-harmful, Class 3B Laser which sends out light in the non-visible infrared spectrum. This equipment can operate with 110v AC, 220v AC and 48v DC, depending on which power supplies are installed. Please refer to the following list of part numbers to view our capabilities. Please visit our website for the datasheet(s) related to your specific ProLabs EDFAMUX model.

- C-EDFAMUX-16X100G-20-40
- C-EDFAMUX-16X100G-20-80
- C-EDFAMUX-16X100G-43-40
- C-EDFAMUX-16X100G-43-80
- C-EDFAMUX-8X100G-20-120
- C-EDFAMUX-8X100G-20-80
- C-EDFAMUX-8X100G-28-80-DC
- C-EDFAMUX-8X100G-36-120
- C-EDFAMUX-8X100G-36-80

- C-EDFAMUX-8X100G-44-120
- C-EDFAMUX-8X100G-44-80

- C-EDFAMUX-10X10G-28-200
- C-EDFAMUX-10X10G-28-140
- C-EDFAMUX-16X10G-20-140

- C-EDFAMUX-8X100G-29-36-S-80
- C-EDFAMUX-8X100G-42-49-S-80

6. Physical Installation

1. Requirements

Before proceeding, make sure you have the following items:

- Console cable conforms to Cisco specification using a speed of 115200
- Ethernet cables
- Compatible transceivers
- LC patch cables to connect transceivers
- OTDR report of the dark fiber
- One-click cleaner tools (LC Connector).

2. *Installation*

1. Unbox the EDFAMUX and its accessories.
2. Mount the EDFAMUX onto the standard 19-inch rack and establish a grounding connection between the device and the rack.
3. Power:
    - 6.3.1. AC Power – utilize the provided power cord to connect each power supply to the primary power source.
    - 6.3.2. DC Power –

6.3.2.1   Employ 12 to 24AWG cables to connect the included DC block (reference images of the DC Block and DC Power Supply).

6.3.2.2   Connect the Input PWR (-) of the Power Supply to the -48V of the DC Feed.

6.3.2.3   Connect the Input PWR (+) of the Power Supply to the 0V of the DC Feed.

6.3.2.4   Establish a connection between the Power Supply's GND and the GND of the DC Feed. If the DC Feed lacks a GND terminal, connect to the rack ground.

6.3.2.5   Please refer to the AC and DC Power drawings later in this document.

4. Connect the console port (marked as CON) to the computer using a rollover RJ45 to RS232 or USB console cable.
5. Connect the Ethernet port (marked as ETH) to the switch using a straight RJ45 cable (CAT5 or greater).
6. Before connecting the optical patches from the transceivers, perform cleaning and inspection, then connect each patch to the corresponding port.
7. Prior to connecting the dark fiber to the COM port, conduct cleaning and inspection procedures.

7. Configuration

1. *Initial Configuration*

For safety reasons, the EDFAMUX should not be switched on or in operation/processing data/running measurements when installing or removing it. Only trained and qualified network professionals should install, replace, or service the ProLabs EDFAMUX. To ensure a smooth installation process, please follow these steps.

Before you begin:

- For further guidance on installation, please contact our Technical Support team.
- For pairing EDFAMUX Simplex channels, please refer to the latter portion of this document.

To install the EDFAMUX, please follow the steps below:

1. Before making any connections, ensure that all fiber cable ports and transceivers are thoroughly cleaned.
2. Connect the dark fiber cable o both ends to the EDFAMUX COM Port.
3. Ensure electrical redundancy by connecting the EDFAMUX to two separate power sources.
4. Connect the console and ethernet cable.
5. Power up all devices.
6. Begin the CLI initial configuration:
   - 7.6.1. Configure (use "admin" as the password).
   - 7.6.2. Set ethernet to static.
   - 7.6.3. Set ethernet IP, mask, and gw.
   - 7.6.4. Set system password ("admin" will no longer function as the password).
   - 7.6.5. Commit changes and reboot (this will not interrupt the functionality of the EDFA DCM).
7. Repeat these steps at the corresponding site of the network.
8. If continuing with the CLI, refer to the "Command Line Reference" section of this document.
9. Alternatively, access the EDFAMUX management website by typing the previously assigned IP address into a web browser that you created in the previous step to continue in the EDFAMUX management website:
   - 7.9.1. Navigate to settings and select "optical" submenu.
   - 7.9.2. Use default "admin" or newly assigned password from the CLI configuration.
   - 7.9.3. Enter the "Fiber Length" in the TDCM box (aggregate damage threshold of the optic).

7.9.4. Click "Apply changes."

10. Using Single-Mode Fiber patch cables, connect each DWDM optical transceiver to the corresponding channel on the EDFAMUX.

11. After connecting each DWDM optic, verify the Rx values. Please be aware that the booster and pre-amp will change automatically according to the fiber distance.

7.11.1. For 100G EDFAMUX, between 2 and 6dBm.

7.11.2. For EDFAMUX Simplex & Next Generation, between -5 and 3dBm.

7.11.3. For 10G EDFAMUX, between -21 and -7dBm.

12. If adjustments are needed, follow these steps:

7.12.1. Click on the slide button to enable – "Manually override amplification values."

7.12.2. Modify values accordingly. If values are too high, adjust the pre-amp first then the booster amp. If values are too low, adjust the booster amp then the pre-amp.

7.12.3. Apply changes and repeat the process at the corresponding site of the network, if necessary.
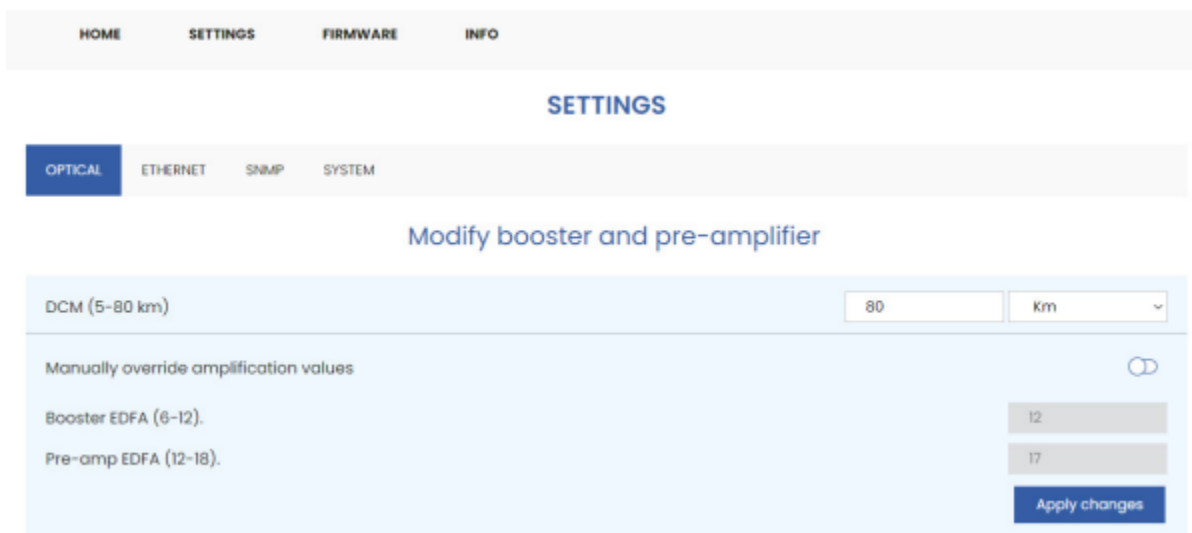
Figure 1

2. *Network Configuration*

Ethernet Configuration

Access the EDFA web browser and navigate to settings. Click on the Ethernet configuration submenu to perform the following operations:

1. Enable Static IP (EDFAMUX will use DHCP by default) by clicking on the slide button.
   - 7.1.1. Configure IP Address, Gateway, and Subnet mask.
   - 7.1.2. Click "Save."
2. Perform a Ping (for troubleshooting or verification).
   - 7.2.1. Enter the destination IP address.
   - 7.2.2. Click "Ping."

SNMP Configuration

Access the EDFA web browser and navigate to settings. Click on the SNMP submenu to perform the following operations:

3. Configure System contact and System location, port, and the community string, as necessary.
4. To configure SNMP traps:
   - 7.4.1. Enable SNMP traps by clicking on the slide button.
   - 7.4.2. Set the destination IP address.
   - 7.4.3. Click "Save."

The EDFAMUX uses SNMP version 2c – you can download the MIB file from the EDFA web browser in the SNMP submenu.

Figure 2

3. Firmware Upgrade

For Firmware updates, navigate to the EDFA management site and select the Firmware menu to perform the following operations:

1. Click on the download button to access the download page where you can find the latest Firmware version.
2. Once on the download page, scroll down and locate the version labeled "NMUv2."
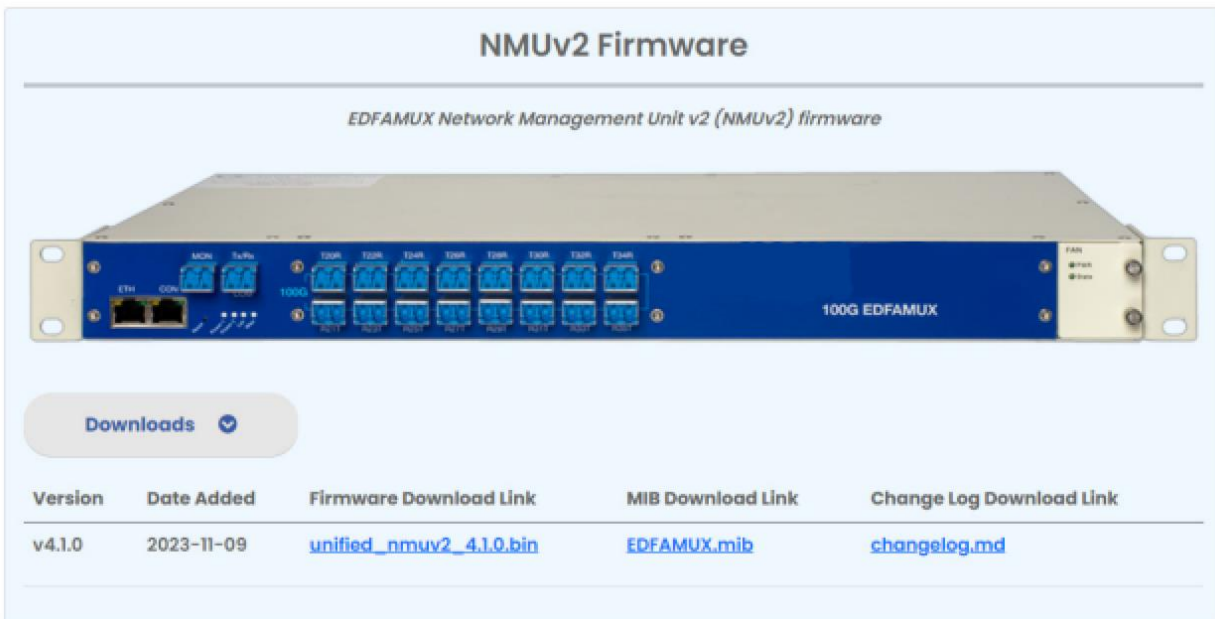
Figure 3

To update your Firmware, follow these steps:

3. Return to the Firmware menu on the EDFA management site.
4. Click on "Choose File" to upload the Firmware file.
5. Click on "Update."

FIRMWARE MANAGER

Update firmware

Current firmware version:	v3.0.0
Firmware download page	Download
Upload new .bin	Choose File No file chosen
	Update
Note: after upgrade, password reverts to "admin"	

Figure 4

4. Password Configuration

The password grants access to the Settings and Firmware menu with a timeout period of 15 minutes.

To change the password, follow these steps:

1. Navigate to the EDFA management site.
2. Access the Settings menu and select System.
3. Scroll down to locate the section for changing the settings password.
4. Input the old password, new password, confirm the new password, and click "Change."

5. Command Line Reference

The serial console connector adheres to Cisco specifications, Baud rate 115200, 8 bits, 1 stop bit, no parity or flow control. The available commands are as follows: commands in red require authentication, commands in green are to read only, and all other commands are get/set. All set commands require the user to be in configure mode. Exit can be used to leave configure mode without committing changes.

```
-  get | show        optical  ↴                          system  ↴
-  set                 pre          <float>                 ntp  ↴     <enable | disable>
-  configure           booster      <float>                 ip          <ip address>
-  commit              dcm distance <integer>               timezone    GMT <-12 – +14>
                                                            dst         <enable | disable>
-  exit              ethernet ↴                             time        <d/m/y H:M:S>
-  ping                static     <enable | disable>        timeformat <12 | 24>
-  clear | cls         ip         <ip address>              dateformat  <dmy | ymd>
-  reboot              mask       <mask>                    status
-  help | ?            gw         <gateway>                 apikey
                       dns        <dns>                     passwd
                       mac                                  hostname
                       autonegotiate  <enable | disable>
                     monitor ↴
                       snmp ↴
                           port         <0-65535>
                           sysdescr     <string>
                           syscontact   <string>
                           sysname      <string>
                           syslocation <string>
                           community <string>
                       syslog ↴
                           port         <int>
                           ip           <ip address>
```

Figure 5

6. HTTP API Specification

All API requests are unsecured. Only the reboot command is protected with a basic authentication key which must be passed with the header, "Authorization" c.q. "Authorization: xxxxxxxx." The authentication key is generated from the system password and can be found here: the EDFA management site page > Settings > System.

Furthermore, the http API can be used for monitoring the EDFAMUX - http://<edfamux_IPaddress>/api/setting/get?type=<number>.

The base request URL must be filled out with <edfamux_IP_address> in the beginning and <number> that stands for the specific information by the end. Below you can find the numbers that you can use in the request. All data is returned as JSON objects.

1- Device data (serial number, firmware version, power supply status, and uptime).

2- WLAN data (Wi-Fi status, SSID, and password).

5- EDFA data (readings, min/max values, tunable/static, and DCM status).

6- Reboot device (see above).

10- SNMP data.

22- Sensor data (same data as in API 5/readings, but keyed as floating-point values for easy readouts).

8. Recommended EDFA Values

The following recommended values are to be considered while using the maximum fiber length of your network. Booster values may need to be adjusted if a shorter fiber length is used.

The following values are based on a 10G SFP+ sending +1dBm of light power for the 10G 140km and 10G 200km ProLabs EDFAMUX models and a 100G QSFP sending -6.5dB of light power for the 100G ProLabs EDFAMUX models. The fiber attenuation values in this table are assuming a fiber without splices and a loss of 0.2dB/km.

EDFA Booster	Symbols	100G 80km	100G 120km	10G 140km	10G 200km
Input Power Range	dBm	-15 - +8	-15 - +8	N/A	-15 - +8
Input Power Range	dBm	-13 (1 Channel) / -4 (8 Channels)	/	/	-4 (1 Channel) / +6 (10 Channels)
Output Power Range	dBm	+3 (1 Channel) / +12 (8 Channels)	/	/	+16 (1 Channel) / +20 (10 Channels)
Typical Pump Power	dB	Adjustable 14-20	Adjustable 14-20	N/A	Adjustable 14-20
EDFA Operating Mode		AGC	AGC	N/A	AGC
Typical Noise Figure	dB	4.5	4.5	N/A	4.5
Saturation	dBm	20	20	N/A	20
Dark Fiber	**Symbols**	**100G 80km**	**100G 120km**	**10G 140km**	**10G 200km**
Theoretical Attenuation	dB	18	/	26	40
EDFA Post Amp	**Symbols**	**100G 80km**	**100G 120km**	**10G 140km**	**10G 200km**
Input Power Range	dBm	-15 to +8	-30 to -5	-30 to -5	-30 to -5
Input Power Range	dBm	-13 (1 Channel) / -4 (8 Channels)	/	-29 (1 Channel) / -18 (10 Channels)	-24 (1 Channel) / -20 (10 Channels)
Output Power Range	dBm	+5 (1 Channel) / +16 (8 Channels)	/	-9 (1 Channel) / +2 (10 Channels)	-1 (1 Channel) / +3 (10 Channels)
Typical Pump Power	dB	Adjustable 14-20	Adjustable 27-33	+20	+21

|					
EDFA Operating Mode		AGC	AGC	AGC	AGC
Typical Noise Figure	dB	4.5	4.5	4.5	4.5
Saturation	dBm	20	20	20	20
Dispersion Compensator	**Symbols**	**100G 80km**	**100G 120km**	**10G 140km**	**10G 200km**
DCM Type		Fiber Bragg Grating	Fiber Bragg Grating	Fiber Bragg Grating	Fiber Bragg Grating
Dispersion Compensating	ps/nm	0 to -1300	-1000 to -2300	-1000	-2000
Insertion Loss	dB	4	6.5	3	3
Enclosure	**Symbols**	**100G 80km**	**100G 120km**	**10G 140km**	**10G 200km**
Input Power	AC/V	100-240	100-240	100-240	100-240
	DC/V	36-72	36-72	36-72	36-72
Dimensions	mm	482.6*300*44	482.6*300*44	482.6*300*44	482.6*300*44
Operating Temperature	ºC	-5~60	-5~60	-5~60	-5~60
Power Consumption	W	<11	<8	<8	<12
Airflow		Side-to-Side	Side-to-Side	Side-to-Side	Side-to-Side

9. Drawings, Circuit Diagrams, & Simplex Channels
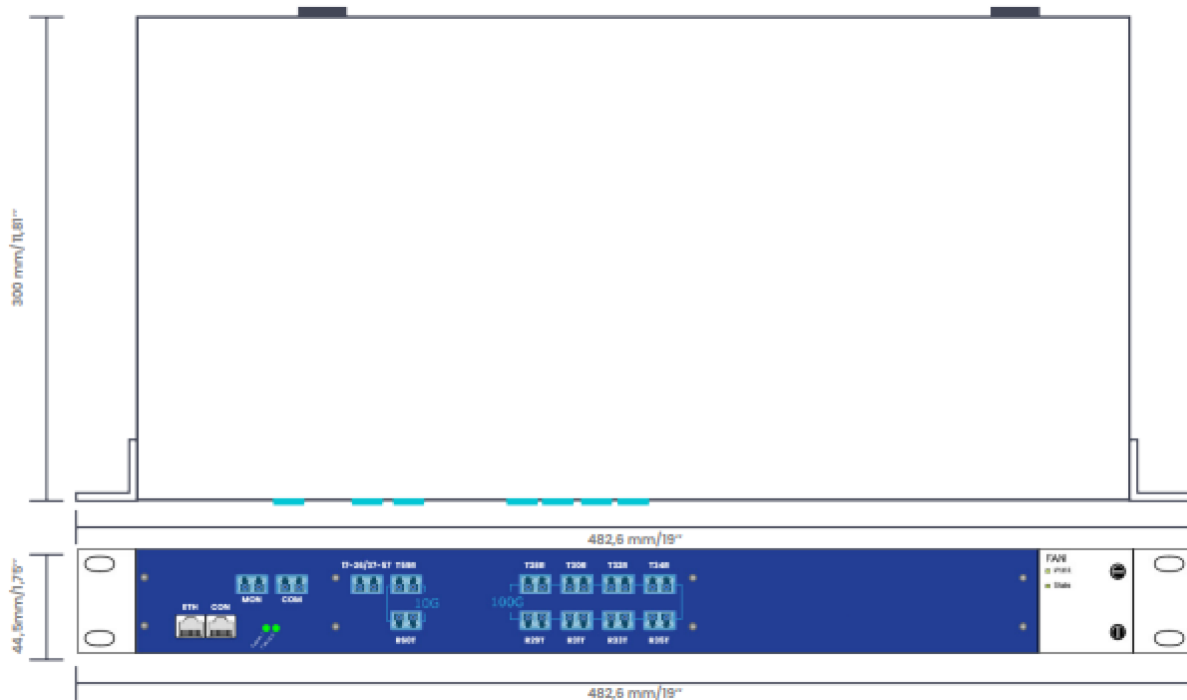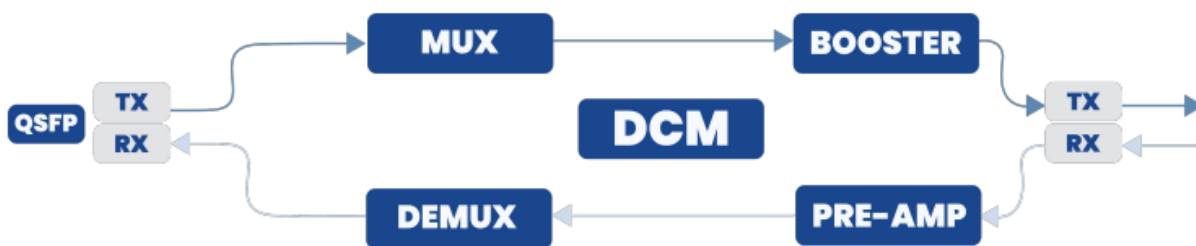

Figure 6

EDFAMUX Interface Block Diagram

Figure 7

*QSFP included for connection clarification.

Simplex Channels

10 x 10G	80km	CH28-37	──	10 x 10G	80km	CH42-51	8 x 100G	80km	CH29-36	──	8 x 100G	80km	CH42-49
		CH28	──	CH42					CH29	──	CH42		
		CH29	──	CH43					CH30	──	CH43		
		CH30	──	CH44					CH31	──	CH44		
		CH31	──	CH45					CH32	──	CH45		
		CH32	──	CH46					CH33	──	CH46		
		CH33	──	CH47					CH34	──	CH47		
		CH34	──	CH48					CH35	──	CH48		
		CH35	──	CH49					CH36	──	CH49		
		CH36	──	CH50									
		CH37	──	CH51									

10 x 10G	140km	CH28-37	──	10 x 10G	140km	CH42-51
		CH28	──	CH42		
		CH29	──	CH43		
		CH30	──	CH44		
		CH31	──	CH45		
		CH32	──	CH46		
		CH33	──	CH47		
		CH34	──	CH48		
		CH35	──	CH49		
		CH36	──	CH50		
		CH37	──	CH51		

Figure 8

10.   In Case of Malfunction

If you encounter difficulties with the ProLabs EDFAMUX, please recheck the instructions and specifications as outlined in the previous pages of this manual.

Also, verify the following:

1. Check that all cables/connectors have been properly connected.
2. Check that the unit is receiving power.
3. Replace the EDFAMUX with a known working EDFAMUX to see if the issue resolves.

In case a malfunction is not resolved, do not open the unit or attempt to alter or repair the EDFAMUX yourself. It contains no user-serviceable parts and may contain hazardous substances.

ProLabs' EDFAMUX units that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

For Technical Support, please refer to the final page of this manual.

11. Maintenance

No regular maintenance is required for the EDFAMUX when placed in a normal clean environment compliant to the requirements set forth in the specific datasheet applicable to the chosen EDFAMUX model.

When connecting or disconnecting, follow the procedures as detailed in the "Configuration" section of this manual.

When connecting or disconnecting the EDFAMUX, caution is advised.

For specific warnings, please refer to the "Drawings, Circuit Diagrams, & Simplex Channels" section of this manual.

In case of faulty fan tray or power supply, please proceed with the below sets of instructions.

Fan Tray Replacement

1. Please have the replacement fan tray on hand.
2. Unscrew the fan tray and take it out.
   11.2.1. Please keep in mind that you only have 30 seconds to replace the tray.
3. Insert the replacement and screw it in.
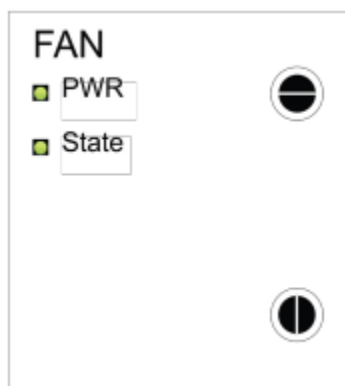
Power Supply Replacement

1. Please have the replacement power supply on hand.
2. Unscrew the power supply and take it out.
3. Insert the replacement and screw it in.
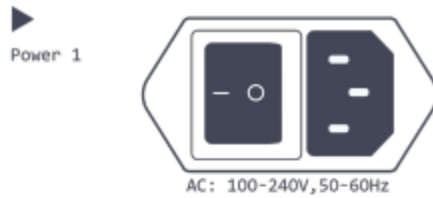
AC Power

DC Power

12.   Technical Support Contact Information

ProLabs US

US: +1 877 957 9144
Email: support@prolabs.com

ProLabs EMEA

UK: +44 8081 893212
France: +33 80 59 81 282
Italy: +39 800 69 4256
India: +91 80091 91173
Email: support@prolabs.com

For the latest product information, contact your local supplier below or visit us online at **https://www.prolabs.com/**.