

EYDFA-37-R USER'S MANUAL

37 dBm EYDFA, Rackmount

Caution: The user must read this manual before operating the EYDFA-37-R unit. Operations other than those described in this manual may result in personal injury and damage to the unit.

Note that any attempt to open or fix the equipment without prior approval by Optilab, LLC voids the warranty.

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1. General Information

1.1 Introduction

This manual contains information on the installation and operation of the EYDFA-37-R rack-mount erbium doped fiber amplifier (EYDFA) unit.

1.2 Product Overview

EYDFA-37-R is an ultra-stable high power optical amplifier unit designed for applications requiring high efficiency optical amplification. It is a self-contained, 1U rack-mount unit designed to supply high and stable gain across the C-band range of the communications window. The EYDFA-37-R is optimized for optical input power from -8 to +12 dBm.

The Optilab EYDFA-37-R comes in several output power levels and multiple output ports. Please visit www.Optilab.com for more details.

1.3 Features

- High saturation output power
- High gain
- High stability
- Low noise
- Low polarization dependence

1.4 User Safety

1. The EYDFA-37-R unit emits high intensity invisible light from the optical output receptacle. Avoid direct exposure to skin and eyes.
2. The equipment case is fully certified for EMS protection. The user should never open the equipment case; any attempt will void the warranty and may result in electric shock and EMS attack to equipment in the vicinity.
3. The user should avoid using any solvent or vaporizing chemical to clean the equipment panel or case. It may result in damage to the surface and internal circuits.

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2. Operation

2.1 Introduction

This chapter describes how to operate the EYDFA-37-R unit, and discusses the location and function of the controls and connectors.

2.2 Initial Inspection

Your EYDFA-37-R was carefully inspected before it left the manufacturer. It should be in proper working order upon receipt. You should, however, inspect the unit for any damage that may have occurred in transit. If the shipping container or the packing material is damaged, keep it until the contents of the shipment have been checked to be free of mechanical and electrical damages. Notify Optilab, LLC promptly if any notable damage is found.

2.3 Controls

EYDFA-37-R Front Panel



Feature	Function
① Main Display	The LCD display shows the parameters, warning messages and optical powers of the EYDFA-37-R unit.
② LED Indicators	These LED indicators give you the current status of the laser amplification of your EYDFA-37-R: RED: Parameter Abnormal GREEN: Parameter Normal
③ Display Selectors	These arrow buttons scroll through the various output screens of the main display.
④ Laser Power Switch	Turning this key switch enables / disables the laser amplification of the EYDFA-37-R.
⑤ Optical Ports	The optical PA INPUT, PA OUTPUT, INPUT and OUTPUT receptacles. These receptacles are Corning SMF-28 FC/APC type. Output port is pigtailed by default for high power amplifier models (>1W). For PM model, key is aligned to the slow axis.
⑥ USB Female Socket	Using a USB cable, this port allows for remote control and monitoring through a PC workstation.

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EYDFA-37-R Rear Panel



Feature	Function
① AC Power Sockets	The AC power socket is the input for the AC power source. A three-pin standard power cord should be used to connect this equipment to either a 120V or 220V main supply. Please see the label on each unit for the proper input voltage.
② Main Switch	The main switch is the master AC power switch for the unit including the optical output.
③ Ventilation Fans	The ventilation fans ensure proper ventilation inside the unit. The back panel of this equipment should be placed at least 3 inches from the wall to dissipate heat efficiently.

An external optical isolator at specified wavelength should be used to protect the EYDFA from optical feedback and to improve stability

2.4 Front Panel Display and Control

There is an LCD display and five-button control interface on the front panel. To scroll over pages on the LCD, press UP or DOWN button. To change the settings, first press the center button to enter editing mode. A short dash line under the editable digits will start to flash. Use the RIGHT button to move the selection of editable items. The selection will rotate through left to right digits. Use UP button to toggle over numbers from 0 to 9 or ON /OFF. When editing is finished, press the CENTER button again to complete the editing.

OPTILAB, LLC EYDFA-37-R
INPUT: 14.85 dBm OUTPUT: 37.55 dBm
PUMP1 LIMIT: 1000mA PUMP1 CURRENT: 1000mA
PUMP2 LIMIT: 1000mA PUMP2 CURRENT: 1000mA
TEMP: 25°C
MN: EYDFA-37-R SN: xxxxxxxxxxxx

The home screen displays the input and output optical power. The second page displays the input and output optical power. The following pages display the drive current limits and current setting for each pump laser. Toggle through pages and set the desired current for each pump lasers. Refer to the test report for the recommended current settings. Please note that the current can only be set when key switch is enabled.

2.5 Operation Instructions

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Start-up Procedure

1. Ensuring the input signal is turned off, and the EYDFA is not electrically powered, connect the optical signal for amplification via the PA IN optical receptacle using the indicated connector patchcords.
2. Connect the PA OUT optical receptacle using the indicated connector patchcords to the INPUT optical receptacle to utilize the amplified optical output signal.
3. After checking all physical patchcord connections, turn the input signal laser source on.
4. After plugging in the appropriate power plug into the AC Power Socket (120V or 220V), flip the main switch to the On position to enable electrical power to the unit. The LCD display will turn on.
5. Once you are receiving proper optical input to the EYDFA and all optical output port connections have been made, turn the Laser Power Switch to the ON position to begin optical amplification.
Note!! Some units will enable even without the Laser Power Switch enabled, so ensure all proper optical connections before enabling electrical power or damage to optical circuitry may occur!!
6. The EYDFA is now enabled for proper operation. The laser output will then be activated, as indicated by the Indicator LED turning green on the front of the unit.
7. To adjust the optical output power level, use the front panel display selectors to decrease or increase PUMP1 or PUMP2 current.

Patchcord Swapping Procedure

1. Turn the Rear Panel Main Switch to the OFF position to disable the EYDFA-37-R output.
2. Swap patchcords as desired. Only connect the indicated connector patchcords to the optical input/output receptacles, cleaning them as necessary.
3. Turn the Rear Panel Main Power Switch back to the ON position; normal operation will resume after a few seconds, though may take as long as 3 minutes for the EYDFA to reach optimum stabilization.

Over-temperature Procedure

1. When the **Temp Overheat** warning appears the pump laser will shutdown automatically and the system will freeze up.
2. Flip the main switch to the Off position.
3. Restart the unit using the Start-up Procedure described above.

2.6 Warning Messages

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There are two warning messages that may appear on the LCD screen: **Temp. WARNING** and **Temp. Overheat**.

Temp. WARNING

When the pump laser temperature approaches the upper limit, the **Temp. WARNING** message appears on the LCD screen to warn the user. The system will continue to operate normally, as long as the temperature does not go over the limit.

Temp. Overheat

The **Temp. Overheat** message appears on the LCD screen when the pump laser temperature has exceeded the upper limit. The pump lasers will shutdown immediately and the system will freeze up. In such case, the unit should be switched off and restarted.

2.7 PC Connection Mode

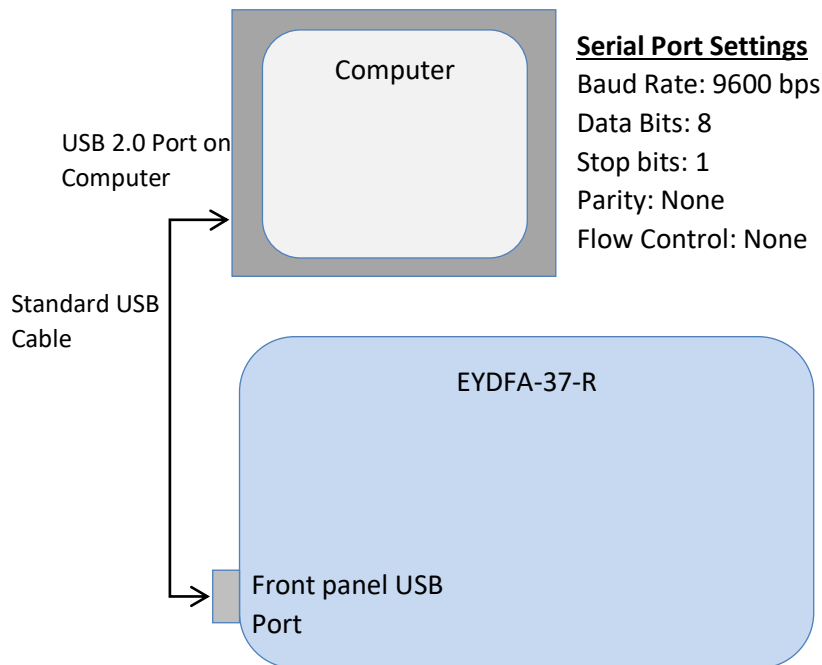
1. Using the USB port on the front panel, connect the unit to a PC, directly to the USB port with an appropriate USB to USB cable.

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2. By using the Device Manager (or other similar PC device tool), the EYDFA should be recognized as COM Port device. If the EYDFA does not appear as a COM Port device, you may need to install the necessary RS232 drivers included on the software package.
3. Once the unit is recognized by the PC interface, check to see if the operating PC has a COM port communication software installed.



The following commands can then be executed, with a corresponding confirmation of the command afterwards (Syntax is CMD:XX, case sensitive)

READ: This command displays system status, including the Input/Output power level, Case temperature, current settings of each pump and maximum current setting of each pump

SETC1:#### This command allows adjustment of the pump diode drive current in the unit of mA. Range: 0001 to limit (See test datasheet)

SETC2:#### This command allows adjustment of the pump diode drive current in the unit of mA. Range: Range: 0001 to limit (See test datasheet).

3. Troubleshooting

Symptom	Possible Cause and Solution
Optical output power not high enough.	C: No optical input or optical input power too small. S: Check optical input present or check optical input power is correct.
	C: Optical input/output connectors dirty. S: Disable optical output and clean optical connectors.
	C: Use of incorrect optical adapters or connectors. S: Use only the indicated optical adapters and connectors. If measurement instruments accept different connector type, then use hybrid patchcords.
	C: Optical output connector damaged. S: Measure optical output power with power meter and compare with readout on Main Display. Return to Optilab for repair if the difference is high (>4 dB) and cannot be corrected by cleaning or replacing the optical connectors. Always apply dust cover plugs to unused optical receptacles to prevent the damage of internal optical connectors.
	C: Adjustment Knob improperly placed S: Use a small flathead screwdriver on the front panel to increase the 2 nd stage optical output power by rotating it counter-clockwise.
	C: Static electrical discharge. S: Wait 10 to 30 seconds for the display to refresh.
Main Display goes blank	C: Insufficient ventilation. S: Place unit in well ventilated area or supply additional fans for ventilation.
Optical output power unstable.	C: Insufficient optical output isolation. S: Connect isolator of corresponding wavelength to optical output connector.
Unit does not power up.	C: Blown fuse. S: Check fuse and replace if it has blown.
	C: Insufficient electrical voltage. S: Check that the electrical supply is at least 220 VAC.
	C: Power cord is loose. S: Plug power cord is firmly into the unit.
	C: Insufficient electrical voltage. S: Check that the electrical supply is at least 220 VAC.
Unit resets or blinks on and off.	C: Insufficient electrical voltage. S: Check that the electrical supply is at least 220 VAC.

4. Service and Support

4.1 Warranty

Optilab, LLC guarantees its EYDFA-37-R unit is guaranteed to be free of defects for 1 year from the date of shipment. The guarantee does not cover any damages resulting from the misuse or improper handling of the equipment, or any incidental or consequential loss. Note that the warranty will be void upon any attempt to open or to fix the equipment by the user without prior approval of Optilab, LLC

4.2 Service and Calibration

Your EYDFA-37-R unit has been designed to provide years of trouble-free operation. No internal maintenance is required provided that the equipment is properly handled, operated and kept away from contamination. For any questions regarding the operation and performance of the unit, please contact Optilab, LLC at:

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4.3 Care of Fiber-optic Connectors

Damage to optical connectors account for more than 70 percent of equipment performance degradation. To avoid such damage, the user should use only industrial grade 99% pure isopropyl alcohol and follow the procedures below to keep the connectors, adaptors and receptacles clean.

Cleaning Optical Connector End-face with Wipe and Alcohol

To properly clean optical connectors utilizing lens tissue grade wipes and alcohol follow the procedure below. The moist wipe removes dust particles, oil and contaminants that may damage or blot the end-face of the connector during connection. The dry wipe removes residual alcohol that may be ignited by optical emission.

1. Disable the optical output and turn off unit to prevent accidental exposure or damage to the optical connector by optical emission.
2. Moisten a wipe with alcohol by placing on top of the alcohol dispenser and push down to saturate the wipe.
3. Place the moist wipe on a work surface, and place a second dry wipe next to it.
4. Wipe the optical connector, end-face down on the moist wipe 3 times and then repeat on the dry wipe.
5. Visually inspect the end-face of the optical connector with an optical microscope to verify cleanliness. Repeat steps 2 to 5 as needed.

Cleaning Optical Connector Sides, Receptacles, Adaptors with Swab and Alcohol

Dust or particles can adhere to the insides of receptacles and adaptors or the sides of the optical connector ferrule. Their presence can affect the alignment of the optical fiber connectors and increase connection loss. To properly clean optical connectors, receptacles, and adaptors utilizing a swab and alcohol follow the procedure below:

1. Disable the optical output and turn off unit to prevent accidental exposure or damage to the optical connector by optical emission.
2. Moisten the swab by placing it on top of the alcohol dispenser and push down to saturate the swab.
3. For receptacles, adapters, or other connection points, insert the moistened swab and rotate the tip 1/2 turn clockwise and counter-clockwise 6 times while applying light but firm pressure.
4. For fiber connectors, rotate the tip of the moistened swab 5 revolutions around the connector while applying light but firm pressure.
5. Visually inspect the end face of the connector with an optical microscope to verify cleanliness. Clean end-face as needed.