

DFB-CWDM-M Module User's Manual

Caution: The user must read this manual before operating the DFB module 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 Optilab DFB-CWDM-M module unit.

1.2 Product Overview

The Optilab DFB-CWDM-M series products are CWDM Distributed Feedback (DFB) laser sources in module housing. They are designed for general laboratory applications. DFB-CWDM-M is a reliable and cost effective DFB laser source for providing a variety of CWDM wavelength DFB diodes, from 1270nm up to 1610nm wavelengths. With its simple and intuitive panel interface, the user can control the DFB light source output power level by adjusting the laser drive current, as well as provide up to 1 GHz direct modulation RF signal, all enclosed with its inclusive AC/DC power supply.

1.3 Features

- Orderable in a variety of CWDM wavelengths
- 1 GHz RF direct modulation
- Panel power adjustment control and RS232 via USB monitoring
- Economical and user friendly

1.4 User Safety

1. The DFB-CWDM-M module unit emits high intensity 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.

2. Operation

2.1 Introduction

This chapter describes how to operate the DFB-CWDM-M module unit, and discusses the location and function of the controls and connectors.

2.2 Initial Inspection

Your DFB-CWDM-M module unit 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 Panel Diagrams and Controls

DFB-CWDM-M Module Panels



FEATURE	FUNCTION
① AC POWER SOCKET AND SWITCH	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 any 110 or 220 V main supply. This corresponding switch supplies power to the main unit, to enable and disable the laser respectively.
② POWER LED INDICATOR	This LED indicator is to ensure the proper 110/220 VAC supply voltage is active to the unit, and the internal DFB is operational.
③ RF INPUT PORT	This 50Ω SMA port is used to supply an appropriate RF signal for direct modulation of the DFB, up to 1 GHz bandwidth. Contact Optilab for details.
④ OPTICAL OUTPUT PORT	The optical output receptacle for the module unit. This particular receptacle is LC/UPC type.
⑤ POWER ADJUST KNOB	Turning this knob will increase (Clockwise) or decrease (Counter Clockwise) the output power of the internal DFB laser.
⑥ USB 2.0 PORT	Connecting this port to a PC device will allow for remote monitoring of the device for power on status.

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2.4 Operation Instructions

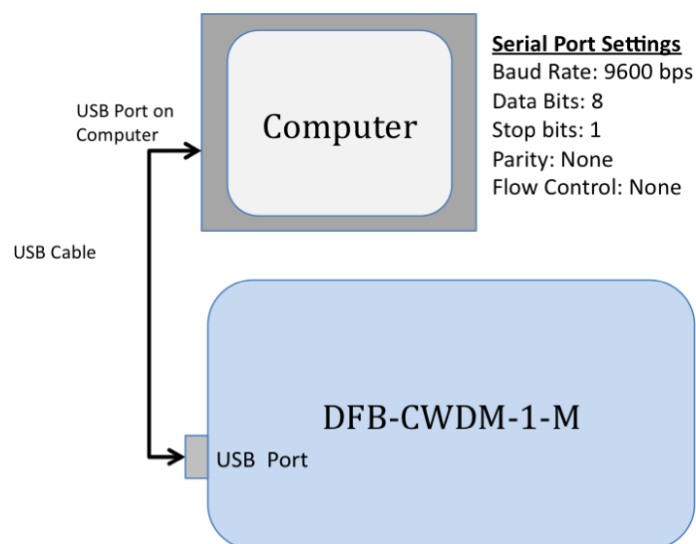
Start-up Procedure

1. After plugging in the appropriate power plug into the AC Power Socket, flip the Main AC Power Switch to the On position to enable electrical power to the unit. The Power LED will enable.
2. Connect the optical output port using the indicated connector patchcords to the appropriate signal destination to utilize the laser output signal.
NOTE: Make sure you use the correct type of patchcord to minimize losses when connecting the optical output to its destination.
3. Optionally, an SMA type RF cable can be connected for direct modulation of the internal DFB diode, up to 1 GHz bandwidth.
4. To adjust the output power, use the Power Adjust knob to increase (CW) or decrease (CCW) this level.

2.5 PC Connection Mode (OPTIONAL)

As an optional feature, the DFB-CWDM-M unit is capable connecting the module to an external PC to allow for parameter monitoring and laser diode current adjustments. If you have a DFB-CWDM-M unit with additional software control, please refer to the following below for the software connection option.

Using a USB cable, connect the DFB-CWDM-M to a PC using the following connection diagram and serial port settings:



2.6 RS232 Command Set

When the electrical connections have been made, and the software settings for serial port transmission are set correctly, you are now able to send commands to the module device. For the DFB-CWDM-M there is only one command available:

READ – Displays the current parameters and settings.

3. Troubleshooting

SYMPTOM	POSSIBLE CAUSE AND SOLUTION
OPTICAL OUTPUT POWER NOT HIGH ENOUGH.	C: Optical 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.
OPTICAL OUTPUT POWER UNSTABLE.	C: Insufficient optical output isolation. S: Connect isolator of corresponding wavelength to optical output connector. The use of angled patchcords (APC) will help minimize the light being reflected back into the laser and improve stability.
UNIT DOES NOT POWER UP.	C: Blown fuse. S: Contact Optilab, LLC for fuse replacement procedure.
	C: Insufficient electrical voltage. S: Check that the electrical supply is at least 110 VAC.
	C: Power cord is loose. S: Plug the power cord firmly into the unit.
UNIT RESETS OR BLINKS ON AND OFF.	C: Insufficient electrical voltage. S: Check that the electrical supply is at least 110 VAC.

4. Service and Support

4.1 Warranty

Optilab, LLC guarantees its DFB-CWDM-M module unit 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 DFB-CWDM-M module 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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Fax: (602) 343-1489
Email: sales@oequest.com

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.