

Dual OWL Series Operations Guide Multimode Light Sources



Optical Wavelength Laboratories

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1.0 GENERAL

Thank you for your purchase of an Optical Wavelength Labs (OWL) Dual OWL series multimode light source.

The source is simple to operate with two buttons: one for controlling power and one for selecting the output port. LED indicators highlight the selected port and verify that battery power is sufficient to maintain the calibrated output power, and wavelength is indicated by 7-segment LED display.

Dual OWL series light sources are LED-based light sources designed to test multimode fiber optic links. The LED outputs are temperature compensated and are calibrated to couple -20dBm of optical power into multimode fiber. The LED indicators show whether the unit is ON or OFF, and whether the battery has enough power to maintain its calibrated output power. Dual OWL series light sources contain stabilized 850 and/or 1300nm LEDs that conforms to international testing standards, and single-wave versions may include a VFL.

Each Dual OWL series light source comes with a protective rubber boot, CD-ROM based operations manual, and USB battery charger and cable.

Typical uses include telecommunications networks, data networks, cable television, and industrial equipment control.

2.0 FUNCTIONAL DESCRIPTIONS



1. **Port A** - Houses either 850nm or 650nm VFL.
2. **USB Charger Port** - Allows for charging internal Lithium Polymer battery.
3. **Port B** - either 1300nm or 650nm VFL.
4. **Port A Indicator LED** - Indicates the ON/OFF status of the source installed in Port A.
5. **Port B Indicator LED** - Indicates the ON/OFF status of the source installed in Port B (if installed).
6. **Charger Indicator LED** - Indicates the status of the charger port.
7. **Power Button** - Powers the unit ON or OFF.
8. **Port Select Button** - Press to switch between Port A and Port B.
Hold to toggle CW/MOD mode for selected port.

During loss measurement, make sure that the selected source is set to CW (continuous wave) mode. The indicator LED will stay lit.

MOD (modulated) mode is used for generating a modulated tone through the fiber that can be detected by fiber identifiers. During MOD mode, the selected indicator LED will flash. Do NOT use MOD mode during loss measurement, as the modulated tone will result in invalid loss readings.

Figure 1 - Dual OWL Multimode Light Source

NOTE: During normal operation, if the indicator LEDs are not lit, this indicates that the battery has insufficient power to provide accurate readings and must be recharged.

NOTE: Single wavelength versions (850nm only or 1300nm only) will only have a single optical port.

Model	Port A	Port B
DO2-85	850nm	—
DO2-85V	850nm	650nm VFL
DO2-13	—	1300nm
DO2-13V	650nm VFL	1300nm
DO2	850nm	1300nm

3.0 APPLICATIONS

3.1 PRECAUTIONS

3.1.1 Safety - Caution must be exercised when working with optical equipment. Most transmission equipment and light sources use light that is invisible to the human eye. High energy light is potentially dangerous, and can cause serious, irreparable damage to the eye. Thus, it is recommended to **NEVER** look into the connector port of a light source or the end of a fiber.

3.1.2 Operational - In order to ensure accurate and reliable readings, it is vitally important to clean ferrules containing optical fibers and optical connector ports. If dirt, dust, and oil is allowed to build up inside connector ports, this may scratch the surface of the LED diode, producing erroneous results. Replace dust caps after each use.

3.1.3 Connector - Do NOT insert APC (Angled Physical Contact) connectors into the optical ports on the Dual OWL as this may damage the light source inside the port.

3.2 REQUIRED ACCESSORIES

3.2.1 Cleaning Supplies - It is recommended to clean fiber ferrules before each insertion with 99% or better isopropyl alcohol and a lint free cloth, or a special in-adapter ferrule cleaner. A can of compressed air should be available to dry off the connector after wiping, and to blow out dust from bulkheads.

3.2.2 Patch Cords - Patch cords may be needed to connect the Dual OWL series light source to the system under test. The connector styles on the patch cord must match the type on the light source and the type of the system under test.

3.2.3 Optical Fiber Adapters - Optical fiber adapters are used to connect two connectorized fibers together, and may be necessary to adapt your patch cords to the system under test.

3.3 TYPICAL APPLICATIONS

Dual OWL series multimode light sources can be used as diagnostic and measurement tools of optical transmission systems and fiber optic links. These applications can be found in several industries, including premise, LAN, CATV, and Telco.

Dual OWL series multimode light sources are designed to emit a temperature-stabilized source of light to be used for optical loss measurement. The optical power emitted by the light source serves as an optical reference, which is otherwise known as the “zero” point when a power meter is “zeroed”. Optical loss measurements are useful for measuring the attenuation, or loss, of a fiber link. The loss value can then be compared to a pre-calculated link budget, which is used to determine if the fiber link will operate within the parameters of the transmission equipment.

The formula for calculating loss in a fiber link is:

$$L = P_a - P_r$$

where **L** is the amount of optical loss in dB, **P_a** is the absolute power in dbm, and **P_r** is the reference power in dBm.

Optical loss measurements can also be used for fiber optic link certification. Link certification is a process where optical loss measurements are compared to a link budget calculated using fiber optic cabling standards.

4.0 MAINTENANCE / CALIBRATION

4.0.1 Repair of this unit by unauthorized personnel is prohibited, and will void any warranty associated with the unit.

4.0.2 For accurate readings, the optical connectors on Dual OWL series light sources and the connectors on the patch cords should be cleaned prior to attaching them to each other. Minimize dust and dirt buildup by replacing the dust caps after each use.

4.0.3 It is recommended to have Optical Wavelength Laboratories calibrate Dual OWL series light sources once per year.

5.0 WARRANTY

5.0.1 Optical Wavelength Labs products have a **two-year** factory warranty, which covers manufacturer defect and workmanship only, valid from the date of shipment to the original customer.

5.0.2 Products found to be defective within the warranty will be either repaired or replaced, at the option of Optical Wavelength Labs.

5.0.3 This warranty does not apply to units that have been repaired or altered by anyone other than Optical Wavelength Labs, or have been subjected to misuse, negligence, or accident.

5.0.4 In no way will Optical Wavelength Labs liabilities exceed the original purchase price of the unit.

5.0.5 To return equipment under warranty, please contact Optical Wavelength Labs for a RMA number. To ensure quick turnaround, please include a short description of the problem and a phone number where you can be reached during normal business hours.

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6.0 SPECIFICATIONS

Launch Method	LED
Connector	SC
Center Wavelength (850nm)	850 $\pm$ 20nm
Center Wavelength (1300nm)	1290nm min 1350nm max
Spectral Width (FWHM; 850 nm)	35 nm
Spectral Width(FWHM; 1300nm)	170nm
Output Power	-20.0 dBm
Initial Accuracy	0.1 dB
Fiber Type	multimode
Battery Life	up to 120 hrs (Lithium Polymer)
Battery Capacity Display	Yes
Operating Temperature	0 to 55° C
Storage Temperature	0 to 75° C
Dimensions	2.75" x 4.94" x 1.28"
Weight	154g

Conforms to the Harmonized European Standards EN 61326-1 and EN 61010-1.

Optional VFL Specifications

Wavelength	650nm Laser
Output Power	1 mW (0 dBm)
Operating Modes	CW, Modulated
Connector	SC