Laser OWL Series
Operations Guide
Singlemode Light Sources

Optical Wavelength Laboratories

Operations Guide

Laser OWL and Laser OWL HP
Singlemode Light Sources

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Optical Wavelength Laboratories (OWL)
N9623 West US Hwy 12
Whitewater, WI 53190
Phone: 262-473-0643
Internet: OWL-INC.COM

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FIGURES

1.0 GENERAL

Thank you for your purchase of an Optical Wavelength Labs (OWL) Laser OWL singlemode laser 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.

The Laser OWL is a laser-based light source designed to test singlemode fiber optic links. The laser outputs are temperature compensated and are calibrated to couple -10dBm of optical power (or 0 dBm in the case of High-Power models) into singlemode 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. Laser OWL series light sources contain stabilized 1310 and/or 1550nm Lasers that conforms to international testing standards, and single-wave versions may include a VFL.

Each Laser OWL comes with a protective rubber boot, carrying strap, 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

Figure 1 - Laser OWL
Singlemode Laser Source

1. **Port A** - Houses either 1310nm or 650nm VFL.
2. **USB Charger Port** - Allows for charging internal Lithium Polymer battery.
3. **Port B** - either 1550nm 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.

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 (1310nm only or 1550nm only) will only have a single optical port.

Model	Port A	Port B	Output Power
LO2-13	1310nm	–	-10dBm (0.1mW)
LO2-13V	1310nm	***650nm VFL****	-10dBm (0.1mW)
LO2-15	–	1550nm	-10dBm (0.1mW)
LO2-15V	650nm VFL	1550nm	-10dBm (0.1mW)
LO2	1310nm	1550nm	-10dBm (0.1mW)
LO2-13-HP	1310nm	–	0dBm (1.0mW)
LO2-13V-HP	1310nm	***650nm VFL****	0dBm (1.0mW)
LO2-15-HP	–	1550nm	0dBm (1.0mW)
LO2-15V-HP	650nm VFL	1550nm	0dBm (1.0mW)
LO2HP	1310nm	1550nm	0dBm (1.0mW)

3.0 APPLICATIONS

3.1 PRECAUTIONS

3.1.1 Safety - Exercise caution 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 laser source, 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 Laser OWL as this may damage the light source inside the ports.

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 Laser OWL to the system under test. The connector styles on the patch cord must match the type on the Laser OWL and the type of the system under test.

NOTE: do NOT insert APC (Angled Physical Contact) connectors into the optical ports on the Laser OWL as this may damage the light source inside the ports.

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

The Laser OWL singlemode laser source can be used as a diagnostic and measurement tool of optical transmission systems and fiber optic links. These applications can be found in several industries, including premise, LAN, CATV, and Telco.

The Laser OWL singlemode laser source is designed to emit a temperature-stabilized source of light to be used for optical loss measurement. The optical power emitted by the Laser OWL 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: $\mathbf{L = P_a - P_r}$

where **L** is the amount of optical loss in dB, $\mathbf{P_a}$ is the absolute power in dbm, and $\mathbf{P_r}$ 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 the Laser OWL 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 the Laser OWL 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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N9623 Old Highway 12
Whitewater, WI 53190
Internet: owl-inc.com
Phone: 262-473-0643
Fax: 262-473-8737

6.0 SPECIFICATIONS

Launch Method	FP Laser
Connector	ST, SC, or FC
Center Wavelength (1310nm)	1310 ±30nm
Center Wavelength (1550nm)	1550 ±30nm
Spectral Width (FWHM; 1310 nm)	2 nm
Spectral Width(FWHM; 1550nm)	2 nm
Output Power	-10.0 dBm (standard) 0 dBm (High-Power)
Initial Accuracy	0.1 dB
Fiber Type	singlemode
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	ST, SC, or FC