

Laser OWL Series

Operations Guide

Singlemode Light Sources



Optical Wavelength Laboratories

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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 wavelength. LED indicators highlight the selected source and verify that battery power is sufficient to maintain the calibrated output power.

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. Dual 1310 and 1550nm laser sources provide dual wavelength testing that conforms to international testing standards.

Each Laser OWL comes with a protective rubber boot, carrying strap, CD-ROM based operations manual, and a 9-volt battery.

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. 1310nm port - Houses a 1310nm singlemode source and can be either a ST, SC, or FC connector.
2. Charger Port - Allows for charging of re-chargable 9-volt batteries, as well as wall power operation. **NOTE: DO NOT USE BATTERY CHARGING PORT WITH NON-RECHARGEABLE BATTERIES. THERE IS THE POTENTIAL FOR EXPLOSION AND DAMAGE MAY OCCUR TO THE UNIT AND/OR THE USER.**
3. 1550nm port - Houses a 1550nm singlemode source and can be either a ST, SC, or FC connector.
4. 1310nm Indicator LED - Indicates the ON/OFF status of the 1310nm laser source.
5. 1550nm Indicator LED - Indicates the ON/OFF status of the 1550nm laser source.
6. Charger Indicator LED - Indicates the status of the charger port.
7. Power Button - Powers the unit ON or OFF.
8. Wavelength Select Button - Switches the unit between 1310nm and 1550nm.

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 replaced.

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: $L = P_a - P_r$

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 The battery compartment is covered by a sliding plate on the back of the unit. Remove the rubber boot to expose the back of the unit. One 9v battery is required for operation.
- 4.0.3 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.
- 4.0.4 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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6.0 SPECIFICATIONS

Launch Method	FP Laser
Connector	ST, SC, or FC
Center Wavelength (850nm)	1310 ±30nm
Center Wavelength (1300nm)	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 30 hrs (9v battery)
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.