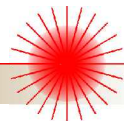




**O.W.L.**

MANUFACTURER OF QUALITY OPTICAL FIBER TEST EQUIPMENT

**OPTICAL WAVELENGTH LABORATORIES**



## Laser OWL Dual Wavelength Fiber Optic Laser Source For Single Mode Fiber Testing

Operations Manual  
Version 1.0  
August 23, 2001  
OWL Part LO-1

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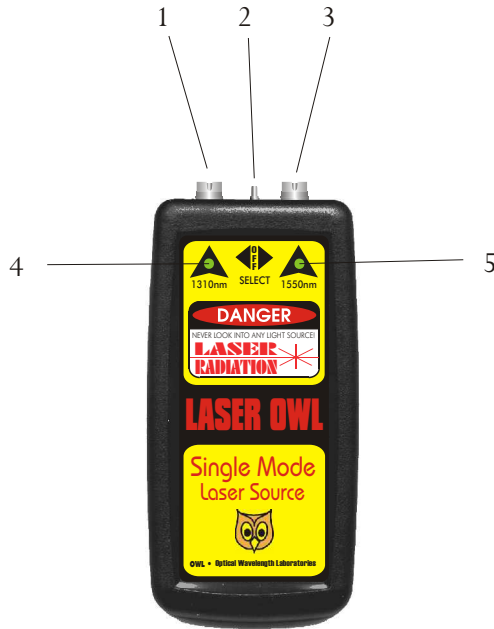
## GENERAL

This manual describes the operation of the Laser OWL Dual Wavelength Fiber Optic Laser Source.

The Laser OWL provides high output and stability. The laser diodes use temperature compensated outputs, and are calibrated to couple -10dBm of optical power into single mode fiber. The source is simple to operate with a single switch controlling power and 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 single mode fiber optic links. The LED indicator shows whether the unit is ON or OFF, and whether the battery has enough power to maintain its calibrated output power. Dual 1310 and 1550nm light sources provide dual wavelength testing that conforms to international testing standards.

## FUNCTIONAL DIAGRAM



### **(1) 1310nm Laser Light Source Connector**

This port houses a laser diode that emits a continuous beam of 1310nm laser light that couples -10 dBm into a single mode fiber.

### **(2) Power/Wavelength Selector Switch**

This switch toggles to 3 positions. Center position is OFF, the left position powers on the 1310nm laser, and the right position powers on the 1550nm laser.

### **(3) 1550nm Laser Light Source Connector**

This port houses a laser diode that emits a continuous beam of 1550nm laser light that couples -10 dBm into a single mode fiber.

### **(4) 1310nm Indicator LED**

This LED indicates the ON/OFF status of the 1310nm laser diode.

### **(5) 1550nm Indicator LED**

This LED indicates the ON/OFF status of the 1550nm laser diode.

# OPERATION

## PRECAUTIONS

**Safety** - Caution must be exercised when operating the Laser OWL single mode light source. Lasers such as the ones in the Laser OWL produce intense beams of infrared optical energy that are invisible to the eye.

**NEVER LOOK INTO A LIGHT SOURCE OR THE END OF A FIBER THAT MAY BE ENERGIZED BY A SOURCE!**

Exposure to direct or reflected optical energy can cause serious and permanent retina damage.

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

## REQUIRED ACCESSORIES

**Cleaning Supplies** - Fiber ferrules should be cleaned before each insertion with 99% or better isopropyl alcohol and a lint free cloth. A can of compressed air should be available to dry off the connector after wiping, and to blow out dust from bulkheads.

**Patch Cords** - A single mode patch cord is required 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.

## APPLICATIONS

**Fiber Attenuation Testing** - The Laser OWL emits a stable -10dBm beam of laser light into single mode fibers for the purpose of testing the fiber for attenuation. An optical power meter is required for this type of test.

Typical systems able to be tested include telecommunications networks, data networks, cable television, and industrial equipment control.

## FIBER ATTENUATION MEASUREMENT



Figure 1 - Setting a reference

**Setting a Reference** - The following steps demonstrate how to set a reference using the Laser OWL. A power meter such as the Fiber OWL II shown in Figure 1 is necessary for setting the reference value.

Follow these steps for each wavelength you wish to set a reference for.

**Step 1** - Connect the light source to the power meter via two single mode patch cords and a barrel adapter as shown in Figure 1.

**Step 2** - Toggle the wavelength selector switch to the wavelength you are

setting a reference for. Allow the laser source to stabilize at least 1 minute.

**Step 3** - Power on the power meter, and set it to the wavelength you are setting a reference for.

**Step 4** - Press the '0' key on the meter. This sets the reference, or “zeroes” the meter for the wavelength you are setting a reference for.

**NOTE:** Do not remove the patch cord from the laser source until you have completed testing all of the fibers under test. Disconnecting the patch cord from the source before you complete testing will invalidate the reference value you just set.

**Taking Power Readings** - Once your reference is set, you may test fiber links according to the set reference. Easy PASS/FAIL readings can be taken with the Fiber OWL II optical power meter using REL (relative) mode.

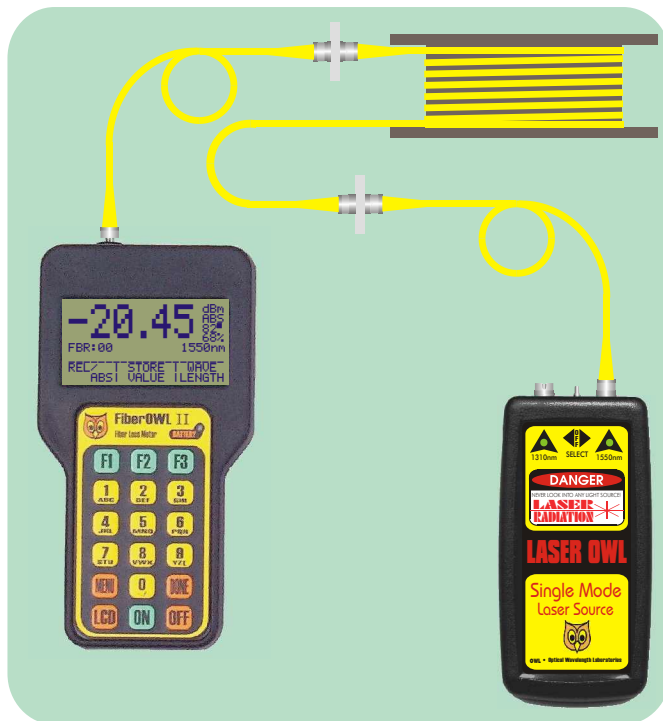


Figure 2 - Testing a link

**Step 1** - Without disturbing the connection to the light source, disconnect the patch cords from the barrel adapter, and attach the power meter and light source to the fiber link as shown in Figure 2.

**Step 2** - Press the 'F1' key to set the meter in REL mode. Notice the upper right hand corner of the display. dBm changed to dB, and ABS changed to REL. The display now shows a reading of -1.34 dB. This means that the link is losing 1.34 dB of optical power.

**Step 3** - Record the value shown on the display. The reading can be recorded by hand, or can be stored in the meter. Consult the meter manual for instructions on how to store data.

Repeat these steps for all the fibers under test.



Figure 3 - Using REL mode



## MAINTENANCE AND CALIBRATION PROCEDURES

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

**Battery Replacement.** The battery compartment is covered by a sliding plate on the back of the unit. One 9v battery is required for operation.

**Cleaning.** 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. Minimized dust and dirt buildup by replacing the dust caps after each use.

**Calibration.** It is recommended to have Optical Wavelength Laboratories calibrate this unit once per year.

**Warranty.** The Laser OWL comes standard with a one-year factory warranty, which covers manufacturer defect and workmanship only.

## CONTACT INFORMATION

**Address:**

Optical Wavelength Laboratories  
N9623 Hwy 12  
Whitewater, WI 53190

**Phone:**

(262) 473-0643

**Web:**

<http://owl-inc.com>

## SPECIFICATIONS

Launch Method:----- FP Laser  
Center Wavelength (1310nm):----- 1310nm  $\pm$ 30nm  
Center Wavelength (1550nm):----- 1550nm  $\pm$ 30nm  
Spectral Width (FWHM;1310 & 1550):----- 2nm  
Output Power:----- -10.0 dBm  
1 hr Drift (Typ. in dB):----- .05@1310 .04@1550  
12 hr Drift (Typ. in dB):----- .05@1310 .06@1550  
Fiber Type:----- Single Mode  
Connector Type:----- FC  
Initial Accuracy:----- 0.1 dBm  
Operating Temperature:----- 0 to 55B C  
Battery Life:----- 25 hours  
Width:----- 2.75"  
Height:----- 4.94"  
Depth:----- 1.28"  
Weight:----- 102g

## WARNING AND SERIAL NUMBER INFORMATION

The serial number and model number can be found on the back of the unit, as well as the laser source information.

**DANGER**

Invisible Laser Radiation When  
Power Switch Is Set To The ON  
Position -- Avoid Eye Or Skin  
Exposure To Direct Or Scattered  
Radiation

Fiber Laser: 1310 nm 0.1 mW  
Fiber Laser: 1550 nm 0.1 mW  
Class IIb Laser Product

IEC 60825-1

**Optical Wavelength Laboratories**

Whitewater, WI 53190 (262) 473-0643

**MODEL# LO-1**  
**SERIAL# LOxxxxx**  
**DATE: 08/15/01**  
**POWER: 9V DC**  
**Made in USA**