WaveSource Pro
Operations Guide
Fiber Optic Light Sources

Optical Wavelength Laboratories

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CONTENTS

FIGURES

1.0 GENERAL

Thank you for your purchase of an Optical Wavelength Labs (OWL) WaveSource Pro fiber optic light source.

WaveSource Pro series fiber optic light sources offer the fiber optic professional a wide range of options for their testing needs. Different combinations of multimode, singlemode, and VFL ports are available:

WPMS -- quad-wave (MM: 850/1300nm; SM: 1310/1550nm)
WPMX -- Multimode 850/1300nm
WPMV -- Multimode 850/1300nm; VFL
WPSX -- Singlemode 1310/1550nm
WPSV -- Singlemode 1310/1550nm; VFL

VFLs can be used in both multimode and singlemode fibers.

All versions of the WaveSource Pro have two transmission modes: Continuous Wave (CW) for accurate temperature-stabilized fiber optic tests; and modulated mode.

In addition, WaveSource Pro light sources speed up the testing process through an advanced feature called AUTO mode when used with a Fiber OWL 7 optical power meter.

While in AUTO mode, both the WaveSource Pro and Fiber OWL 7 automatically switch between two wavelengths, so that both wavelengths can be measured simultaneously. This eliminates much of the guesswork during testing, and saves valuable time.

WaveSource Pro light sources come configured with SC connector ports. ST or FC connector ports are available upon request.

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

2.0 FUNCTIONAL DESCRIPTIONS

Figure 1 - WaveSource Pro
Fiber Optic Light Source

2.0.1 CONNECTIONS

1. Light source connector port (left)
   SC connector (ST or FC available upon request)

2. Battery charging port (USB)

3. Light source connector port (right)
   SC connector (ST or FC available upon request)

2.0.2 INDICATOR LEDS

4. Port selection LED (left)
   Lit when the left-hand port is active

5. Power/Battery charger LED
   Lit when unit is powered on
   Battery/charging status

GREEN	battery fully charged
ORANGE	battery charging
RED	problem with battery and/or charger

6. Port selection LED (right)
   Lit when the right-hand port is active

7. Wavelength display LED
   Displays current output wavelength when lit
   Powers off after 3 seconds; press power button to show wavelength

2.0.3 BUTTONS

8. CW / MOD button
   Press: toggle source between CW (continuous wave) and MOD (modulated) mode.

9. Power button
   Hold: power on and off
   Press: display wavelength

10. λ / AUTO button
    Press: toggle between wavelengths in the selected port
    Hold: set AUTO mode; source alternates wavelengths within the active port for automatic dual-wavelength testing

11. PORT button
    Press: toggle between light source ports

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 any 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 emitting surface of the light 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 WaveSource Pro 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. 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 WaveSource Pro to the system under test for optical loss measurement. The connector styles on the patch cord must match the type on the WaveSource Pro 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 the test cords to the system under test.

3.3 TYPICAL APPLICATIONS

WaveSource Pro 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.

WaveSource Pro fiber optic light sources are designed to emit a temperature-stabilized source of light to be used for optical loss measurement. The WaveSource Pro 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 The re-chargeable battery is fully enclosed inside the unit. A battery charger is provided for re-charging.

4.0.3 For accurate readings, the optical connectors on the WaveSource Pro 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 WaveSource Pro 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

Optical Specifications	Multimode	Singlemode	VFL
Source Type	LED	Laser	Laser
Calibrated Wavelengths	850, 1300nm	1310, 1550nm	650nm
Output Power (CW)	-20 dBm (into MM fiber)	-10 dBm (into SM fiber)	~0 dBm
Accuracy	±0.10 dB @ 25°C	±0.10 dB @ 25°C	
Light Source Drift (1 hour)	±0.05 dB (850nm)	±0.05 dB (1310nm)	
	±0.05 dB (1300nm)	±0.04 dB (1550nm)	
Spectral Width (FWHM)	50nm (850nm)	2nm (1310nm)	
	180nm (1300nm)	3nm (1550nm)	
Modulation Frequencies	300 Hz = 850nm	1 kHz = 1310nm	
	600 Hz = 1300nm	2 kHz = 1550nm	

General Specifications	
Battery Life	up to 150 hours normal usage (lithium polymer)
Optical Connector	SC (ST or FC available upon request)
Operating Temperature	-20°C to +70°C
Storage Temperature	-40°C to +85°C
Dimensions	2.87 x 4.42 x 1.25 in
Weight (with battery)	10 ounces

7.0 CONFIGURATIONS

	Multimode		Single-mode	
Part Number	Wavelengths	Connectors	Wavelengths	Connectors
WPMS	850, 1300	SC	1310, 1550	SC
WPMX	850, 1300	SC	N/A	N/A
WPMV	850, 1300	SC	***650nm VFL****	SC
WPSX	N/A	N/A	1310, 1550	SC
WPSV	***650nm VFL****	SC	1310, 1550	SC

Part Number Legend
WP(*source1*)(*source2*)
M = 850/1300 MM
S = 1310/1550 SM
V = 650nm VFL
X = no additional source installed

* VFL stands for Visual Fault Locator. VFLs will work in both multimode or single-mode fibers.