Optical Wavelength Laboratories

OPERATIONS GUIDE

MPO OPTICAL SWITCHES





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

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OWL-INC.COM

TABLE OF CONTENTS

Introduction	
Before You Begin	3
About This Manual	3
Description	4
Precautions	5
Product Label	5
General Features	6
Specifications	6
Optical Ports	6
Applications	
OTDR Testing	7
VFL Testing	8
Light Sources	9
Power Meters	10
Tast Procedures	
Testing MPO Cables	11
Testing MFO Cables	11
Operation/Maintenance	
Activating Bluetooth Pairing	16
Cleaning the Optical Ports	16
Annendices	
Warranty Information	17
Contact Information	17
Re-charging the Device Battery	17
	17

BEFORE YOU BEGIN

All personnel testing optical fibers should be adequately trained in the field of fiber optics before using any fiber optic test equipment.

If the user is not completely familiar with testing fiber optics, they should seek competent training. Such training can be acquired from a variety of sources, such as local hands-on training classes.

Valuable information about fiber optic testing can also be gathered from reading printed literature carefully or by thoroughly reading supplied operations manuals.

Fiber optic testers vary from other types of test equipment due to issues such as:

1) standards-based testing

2) proper fiber optic test procedures (FOTPs)

3) "zeroing" or referencing of power levels

4) determining the correct link budget to pass or fail by

Complete understanding of each of these issues is critical for performing proper fiber optic tests.

ABOUT THIS MANUAL

Throughout this manual you will find various symbols that assist with understanding the procedures outlined in this manual. Below is a list of these symbols and a short description of their purpose:



Shows a helpful tip that will make a procedure go more smoothly



Tells the user some useful information about the successful completion of a procedure



Warns the operator of a potentially dangerous condition

DESCRIPTION

OWL optical switches enable fiber optic technicians to use their traditional single-fiber testers, such as OTDRs, VFLs, power meters, and light sources to conveniently test 12-fiber MPO/MTP[™] cabling without the need for bulky, confusing, and expensive breakout cables or cassettes. Models are available for multimode or singlemode fibers.

MPO optical switches act as a sort of "traffic cop", re-directing the optical signal from the input port to a specific MPO channel. MPO channel selection is manually controlled via channel up / channel down buttons, allowing users to target specific MPO channels to be tested. Channel number is indicated by a bright, easy-to-read 7-segment LED display.

OWL optical switches are also equipped with Bluetooth, allowing them to communicate wirelessly with certain Bluetooth-enabled OWL power meters and OTDRs. While in AUTO mode, the OWL tester will tell the MPO switch to the next MPO channel to test.

The MPO optical port is covered by a shuttered dust cover, in order to prevent debris from collecting in the MPO port.

The optical switches are powered by a re-chargeable Lithium Polymer battery, allowing for 12 hours of continuous use on a complete charge. The battery is charged via supplied USB charger and cable, and a battery indicator LED indicates low battery and charging status.

PRECAUTIONS

Safety - Exercise caution when working with any optical equipment. High-intensity fiber optic laser sources output potentially dangerous high energy invisible light, and could 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.

Operational - It is important to keep connector ferrules and optical connector ports clean. If dirt, dust, and oil are allowed to build up inside connector ports, irreparable damage may occur to the optics inside the port. For best results, replace dust caps after each use.

Input Connector - Do NOT insert APC (Angled Physical Contact) connectors into the input port of the MPO switch as this may damage the angled ferrule on the APC connector.

PRODUCT LABEL

On the back of each DataCenter 12 MPO Optical Switch are labels similar to the one shown below containing model number, serial number, power requirements, and special cautionary information.



DATACENTER 12 SERIES MPO OPTICAL SWITCH (MODEL #s: MPO-OSW-M12; MPO-OSW-S12)

GENERAL FEATURES



OTDR TESTING

Testing 12-fiber MPO cables with an OTDR and DataCenter 12 MPO Optical Switch

STEP1 Power ON both the OTDR and the MPO Switch.

STEP 2 Connect the OTDR and optical switch to the MPO cable under test using the accessories as shown below.

- SC/UPC-SC/UPC patch cable (ensure correct fiber type)
- 25-meter MPO OTDR launch cable (ensure correct fiber type; use Type B)
- MPO adapter (Type B)

OPTIONAL: if you want to include the far end MPO connector in the OTDR test, attach another MPO adapter (**3**) and MPO OTDR launch cable (**0**) to the end of the MPO cable under test



STEP 3 Set the MPO switch to the MPO channel that corresponds to the specific MPO fiber to be tested. Usually this will be MPO switch Channel 1 when testing all of the fibers in the MPO cable

IMPORTANT NOTE: the MPO cable under test will typically be tested from the right-most fiber (Channel 1) to the left-most (Channel 12) as seen from the perspective of the near-end MPO connector.

However, based on the polarity of the MPO cable under test, please be aware that the fibers may or may not be numbered the same on the opposite end of the MPO cable. Take this into account when testing in the opposite direction.

STEP 4 Run the OTDR test, and save the results.

STEP 5 Press the UP arrow button () to change to the next channel.

Repeat Steps 4 and 5 until all fibers in the MPO cable have been tested.

VFL TESTING

Testing 12-fiber MPO cables with a Visual Fault Locator and DataCenter 12 MPO Optical Switch

STEP 1 Power ON both the VFL and the MPO Switch.

- STEP 2 Connect the VFL and optical switch to the MPO cable under test using the accessories as shown below.
 SC/UPC-SC/UPC patch cable (ensure correct fiber type)
- STEP 3 Set the MPO switch to MPO switch Channel 1



IMPORTANT NOTE: based on what type of MPO cable is being tested, the light from MPO Channel 1 will appear in different places at the far end. This is helpful to visually verify the polarity of the cable under test. See diagram below for common standards-based MPO polarity arrangements.

For example, when the MPO optical switch is set to Channel 1, the light will be seen on Fiber 1 for Type A, Fiber 12 for Type B, and Fiber 2 for Type C.



STEP 4 Press the UP arrow button () to change to the next channel.

LIGHT SOURCES

Testing 12-fiber MPO cables with a Single-port Light Source and DataCenter 12 MPO Optical Switch

- **STEP 1** Power ON both the light source and the MPO Switch.
- STEP 2 Connect the light source and optical switch to the MPO cable under test using the accessories as shown below.
 SC/UPC-SC/UPC patch cable (ensure correct fiber type)
- STEP 3 Set the MPO switch to MPO switch Channel 1



IMPORTANT NOTE: based on what type of MPO cable is being tested, the light from MPO Channel 1 will appear in different places at the far end. See diagram below for common standards-based MPO polarity arrangements.

For example, when the MPO optical switch is set to Channel 1, the light will exit on Fiber 1 for Type A, Fiber 12 for Type B, and Fiber 2 for Type C.



STEP 4 Press the UP arrow button () to change to the next channel.

POWER METERS

Testing 12-fiber MPO cables with a Single-port Light Source and DataCenter 12 MPO Optical Switch

- **STEP1** Power ON both the power meter and the MPO Switch.
- STEP 2 Connect the power meter and optical switch to the MPO cable under test using the accessories as shown below.
 SC/UPC-SC/UPC patch cable (ensure correct fiber type)
- STEP 3 Set the MPO switch to MPO switch Channel 1



IMPORTANT NOTE: based on what type of MPO cable is being tested, the light from MPO Channel 1 will appear in different places at the far end. See diagram below for common standards-based MPO polarity arrangements.

For example, when the MPO optical switch is set to Channel 1, the light will be seen on Fiber 1 for Type A, Fiber 12 for Type B, and Fiber 2 for Type C.



STEP 4 Press the UP arrow button () to change to the next channel.

TESTING MPO CABLES

OVERVIEW

Fiber OWL 7 series power meters are configured with MPO testing capability.

MPO testing requires:

2) FIBER OWL 7 METER, MPO SOURCE, AND MPO SWITCH



REQUIRED ACCESSORIES

For best results, use the 3-jumper reference method (which requires the cables and adapter shown below)



NOTE: for automatic channel switching to function properly, the Bluetooth connection between the switch and the meter must be set up. The Fiber OWL 7 must also have a Bluetooth module installed.

To set up Bluetooth connection: MENU > UTILITIES MENU > BLUETOOTH SETUP

Power on both devices, then press OSW button. Pairing takes around 30-35 seconds.

TESTING MPO CABLES

GATHER LINK SETUP INFORMATION

To make the setup process go more smoothly, have the following information ready in advance.

Testing MPO cables uses a similar setup procedure to LOSS mode (see LOSS MODE - CONFIGURE JOB PARAMETERS) to set up the meter for MPO loss testing.

LINK NA	ME – general informa Project Location Meter End Injector End	tion about the job (user-definable) Name of the overall project Building or geographic area where the fiber link is located End of the fiber link where the meter unit will be used End of the fiber link where the light source unit will be used
FIBERT	EST MODE – how to Test Mode	go about testing the fiber link LOSS
	Standard	not required, since LOSS MODE does not determine PASS/FAIL
TEST C	ORD TYPE – defines (patch panels, wall SOURCE PORT OPM PORT	inter-connection loss at the very ends of the fiber link .where the test equipment connects in outlets) – Options: REFERENCE-grade or STANDARD-grade refers to the type of test cord attached to the light source refers to the type of test cord attached to the optical power meter
LINK INF	FORMATION – physio Fiber Type (see appendix for a Connections sleeves) NOT inclus Splices Reference Method	al configuration of the link under test Type of fiber used in the link under test; options may vary based on chosen cabling standard fiber type diagram) Number of inter-connections in the middle of the link under test (patch panels, other mating ling the connections at the far end of the link Number of splices in the link under test; can be either fusion or mechanical splices 1-jumper reference method
ENCIRC	LED FLUX – is EF co Consult cabling sta so, special mode co	mpliance required for this test: YES or NO (only required for multimode testing) ndard documentation or end user requirements to determine if EF compliance is required; if ntroller cables will be required for setting the optical reference (aka "zeroing").

 ${\sf RUNNAME-naming}\ of\ fiber\ test\ results\ within\ the\ job\ to\ uniquely\ identify\ individual\ fiber\ strands$

Name	The name used to ide	entify the group of individua	al fiber strands in the link	
Number	The starting fiber st	rand number in the link.	The number will be automatically	
incremented as the test results are saved.				

TESTING MPO CABLES

SET REFERENCE - 3-JUMPER REFERENCE METHOD

1) Once all the job parameters have been entered, connect the units together as shown on the display, and make sure all the units are powered on, and the light source is set to AUTO mode.



The meter screen will begin populating with reference levels for all fibers at all available wavelengths.

Press the UNITS button to view test results in dB (LOSS) mode if necessary.



TESTING MPO CABLES

TAKE LOSS MEASUREMENTS

2) Remove the center (unpinned-to-unpinned) cable



3) Insert the next cable under test, then press TEST.



The screen will begin populating with loss measurement data.

TESTING MPO CABLES

TAKE LOSS MEASUREMENTS

4) Review the test results for all fibers.



STORE TEST RESULTS

5) Press SAVE to store the test results, then modify the run name if necessary.



To test additional MPO cables, repeat steps 2 through 5 for each MPO cable to test and document.

To view the stored test results, see "WORKING WITH STORED DATA".

OPERATION/MAINTENANCE

ACTIVATING BLUETOOTH PAIRING

The MPO optical switch contains a Bluetooth module that can pair with certain Bluetooth-enabled OWL test devices for the purpose of automatically switching the MPO switch channel.

STEP 1 Press and hold the Bluetooth button on the optical switch. The green indicator LED will begin flashing.

STEP 2 Initiate the Bluetooth pairing procedure on the OWL device.

Once the devices have been paired successfully, the OWL test device will be able to automatically control the MPO channel switching. The indicator LED will blink slowly when switching the MPO channel.

CLEANING THE OPTICAL PORTS

Required Accessories:

- > SC port: 2.5mm cleaning swabs or one-click cleaner
- > MPO port: MPO one-click cleaner
- > Fiber optic inspection scope (400x magnification or greater recommended) with SC port probe tip and MPO port probe tip
- Compressed Air (optional)

APPENDICES

WARRANTY INFORMATION

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

Cleaning. For accurate readings, the optical connectors on the MPO optical switch and the connectors on all fiber cables should be cleaned prior to attaching them to each other. Minimize dust and dirt buildup by replacing the dust caps after each use.

Warranty. The MPO optical switch comes standard with a two-year factory warranty, which covers manufacturer defect and workmanship only.

CONTACT INFORMATION

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

RE-CHARGING THE DEVICE BATTERY

The Lithium Polymer battery in the optical switch is re-charged through the USB port.

A battery charger and USB cable is supplied for this purpose.

The device can either be recharged using the battery charger or a computer USB port.

A To avoid damage to the unit or harm to the user, only use approved battery chargers.

Battery charger electrical specifications:

INPUT:	100-240VAC 50-60Hz
OUTPUT:	DC 5.0V 100mA +/- 5%