

**OLS Series Light Sources,
OPM Series Optical Power Meters,
and Related Test Kits
User's Guide**



A Division of **AFL Telecommunications**

Limited Warranty

One Year Limited Warranty

All Noyes products are warranted against defective material and workmanship for a period of one year from the date of shipment to the original customer. Any product found to be defective within the warranty period will be repaired or replaced by Noyes. In no case will Noyes liabilities exceed the original purchase price of the product.

Exclusions

The warranty on your equipment shall not apply to defects resulting from the following:

- Unauthorized repair or modification
- Misuse, negligence, or accident

CE Information



These instruments have been designed and tested to comply with the relevant sections of

any applicable specifications including full compliance with all essential requirements of all applicable EU Directives.

Returning Equipment

To return equipment, please contact Noyes to obtain additional information and a Service Request (S.R.) number. To allow us to serve you more efficiently, please include a brief description specifying the reasons for the return of the equipment.

AFL Telecommunications

Noyes

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Safety Information

Important Safety Information



WARNING! Use of controls or adjustments other than those specified herein may result in hazardous radiation exposure.



The OLS1 optical light source is a **CLASS I LED PRODUCT**.



WARNING! To avoid the danger of fire and electrical shock:

- Never use a voltage that is different from that for which the AC adapter is rated.
- Do not plug the unit into a power outlet that is shared by other devices.
- Never modify the power cord or excessively bend, twist, or pull it.
- Do not allow the power cord to become damaged. Do not place heavy objects on the power cord or expose it to heat.
- Never touch the AC adapter while your hands are wet.
- Should the power cord become seriously damaged (internal wiring exposed or shorted), contact the manufacturer to request servicing.



WARNING! Use only the specified AC adapter. Use of another type of AC adapter can damage the instrument and create the danger of fire and electrical shock.



CAUTION! To avoid serious eye injury, never look directly into the optical outputs of fiber optic network equipment, test equipment, patch cords, or test jumpers. Always assume that optical outputs are on.



NOTICE! Noyes power meters and light sources contain no user serviceable parts. Except for changing batteries and cleaning optical ports, these units must be returned to Noyes or authorized agents for repair and calibration.

IMPORTANT! Proper care in handling should be taken when using any precision optical test equipment. Scratched or contaminated optical connectors can impact the performance of the instrument. It is important to keep the dust caps in place when the unit is not being used.

Section 1: General Information

The purpose of this User's Guide is to explain how to use and maintain Noyes test equipment. Please check our web site at www.AFLtele.com/go/Noyes for updates to this manual, software updates, and additional application information. If you have any questions about your instruments and recommended accessories, or if you need technical or sales support, please contact Noyes Customer Service.

Contacting Noyes Customer Service

You may call Noyes Customer Service between 8 a.m. and 5 p.m., United States Eastern Time, as follows:

Phone: 800-321-5298 (North America)

603-528-7780

Fax: 603-528-2025

E-mail: NoyesTechSupport@AFLtele.com

Unpacking and Inspection

These instruments have been carefully packed in accordance with standard shipping procedures. Examine the equipment for damage that may have occurred during shipment. If you find any damage, please contact Noyes.

Recommended Accessories

You will need fiber optic test jumpers to connect instruments to the fiber optic system under test. A test jumper must have the same core and cladding size as the fiber under test. The connector at one end of the test jumper must mate with the optical port on each instrument. The connector on the other end must mate with the fiber optic system under test.

A Connector adapter is required to mate fiber optic test jumpers.

An OPM1 optical port must be equipped with an adapter cap. A variety of adapter caps, connector adapters, and test jumpers with a variety of lengths and connector styles are available from AFL - Noyes.

Optical ports and connector end faces must be kept free from dirt or other contaminants to ensure accurate measurements and operation.

For cleaning connector end faces on OLS light sources, test jumpers, and in fiber frames or adapters, use optical quality cleaning fluid such as AFL FCC2 connector cleaning fluid and AFL CCT molded cleaning tips.

For cleaning OPM1 optical ports and adapter caps, use lint-free optical cleaning wipes such as AFL FiberWipes and optical quality cleaning fluid such as AFL FCC2 connector cleaning fluid (or IPA - Reagent Grade Isopropyl Alcohol 99% or better) and a can of filtered compressed air.

Visit our web at www.AFLtele.com/go/Clean for more information.

Section 2: Functional Description

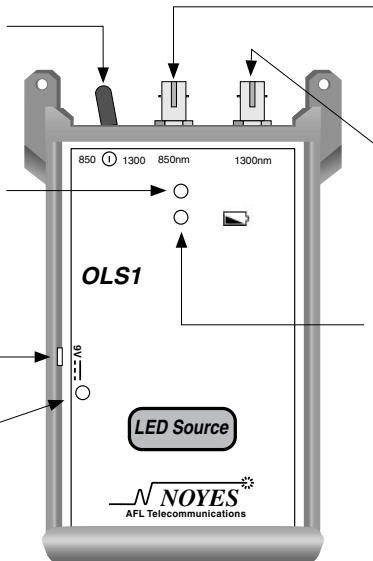
OLS1 LED Light Source

[Wavelength/ Power Off] switch - selects optical wavelengths or disables unit (ⓐ position).

[Active Output] indicator - Lights up when one of the output ports is [ON].

Power port - Interface for an AC power adapter.

[Power] indicator - Lights up when the correct AC power adapter is connected.



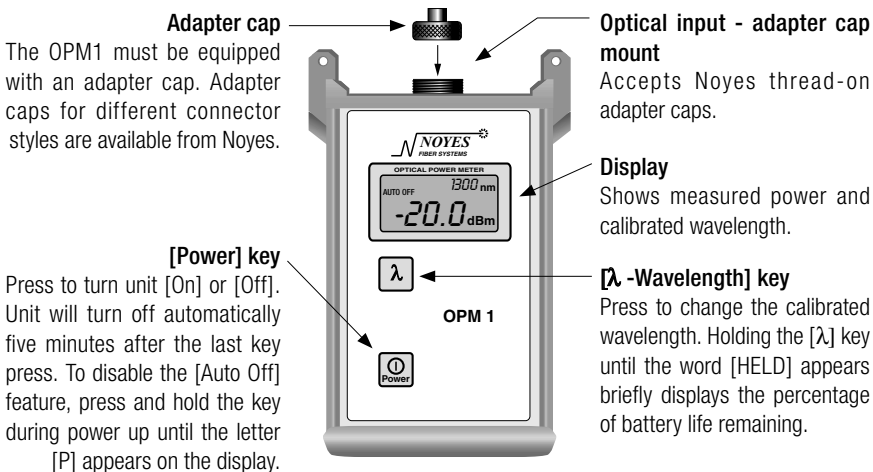
Model	Output port
OLS1-1C	660 nm
OLS1-2C	850 nm

Model	Output port
OLS1-1C	850 nm
OLS1-2C	1300 nm

[Low battery] indicator - when [ON], indicates a low battery condition; battery replacement is required.

OPM1 Power Meter

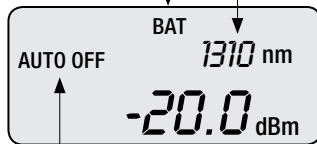
Front Panel Features



Display Readings

[Low battery] indicator
If shown, indicates a low battery condition. Replace the battery.

[Wavelength] indicator
Displays the currently selected test wavelength.



[AUTO OFF] indicator
If shown, indicates that the unit will automatically turn off five minutes after last key press. To disable this power-saving feature, turn the unit off, then press and hold the [Power] key until the letter [P] appears on the display.

Power reading
Displays measured power [dBm]. If power is too high or low for the OPM1 to measure, this field will show [HI] or [LO].

Section 3: Applications



It is important to keep all optical connections and surfaces free from dirt, oils, or other contaminants to ensure proper operation. Always clean all test jumpers before conducting the test procedures outlined in this Guide.

Measuring Optical Power

Figure 3-1 illustrates the following procedures.

- 1 Turn on the OPM1 optical power meter.
- 2 Select the appropriate fiber optic test jumper. The fiber type of this jumper must be the same as the fiber type normally connected to the output being measured.
- 3 Mount the appropriate adapter cap on the OPM1 optical input. This adapter cap must match the connector on the end of the test jumper you will connect to the OPM1.
- 4 Connect one end of the test jumper to the OPM1 (adapter cap) and the other end to the optical output to be measured.
- 5 Press the λ key to select the calibrated wavelength that matches the nominal wavelength of the source being measured.
- 6 Read the displayed power measurement (dBm).

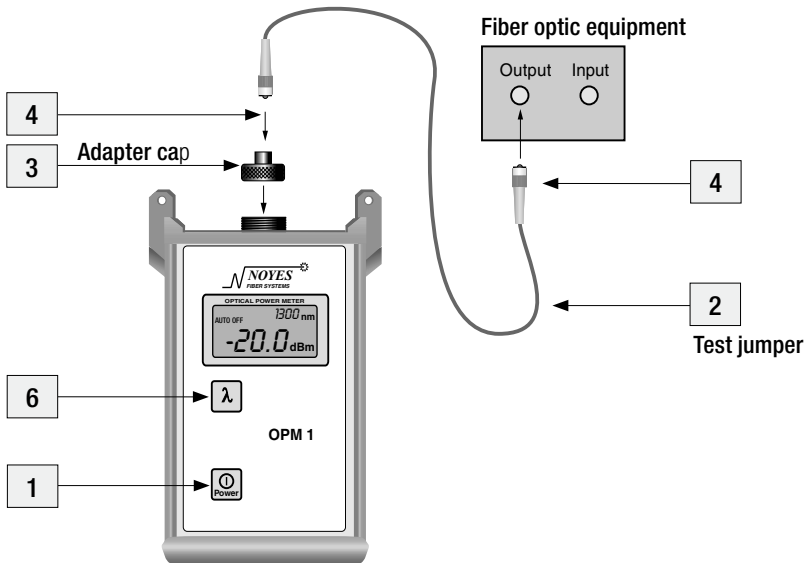


Figure 3-1: Measuring Optical Power.

Testing Multimode Links

Step I - Set the Reference (One Jumper Method)

Figure 3-2 illustrates the following procedures.

- 1 Turn on the OPM1 optical power meter and OLS optical light source. Allow the light source to stabilize (minimum of 2 minutes).
- 2 Set both instruments to the desired test wavelength.
- 3 Select the appropriate fiber optic transmit and receive test jumpers. The fiber type of these jumpers must match the fiber type of the link to be tested.
- 4 Wrap and secure the transmit jumper five times around the appropriate diameter mandrel.
Note: Use optical wipes to clean both ends of the transmit jumper.
- 5 Connect the transmit jumper to the multimode output port of the OLS.
- 6 Mount an adapter cap on the OPM1 that matches the free connector on the transmit jumper.
- 7 Connect the free end of the transmit jumper to the OPM1. The OPM1 will measure and display optical power in dBm.
- 8 If measured output power is outside of the normal range (specified by manufacturer), clean all fiber connections or replace the transmit jumper. Repeat steps 4 - 7.
- 9 If the displayed power level is acceptable, record it. This is the reference power level at the

current wavelength.

Proceed to Step II - Verify Test Jumpers

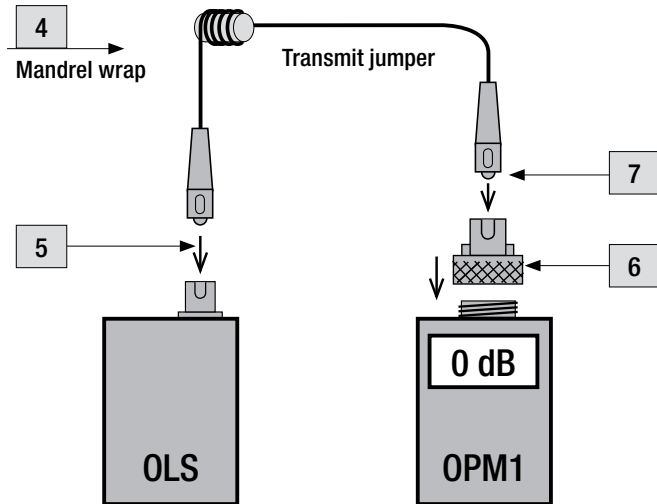


Figure 3-2: Set the Reference.

Step II - Verify Test Jumpers

Figure 3-3 illustrates the following procedures.

- 10 Disconnect the transmit jumper from the OPM1.

Note: Do not disturb the transmit jumper at the OLS end.

- 11 If necessary, change the OPM1 adapter cap to match the connector on the receive jumper that will be connected to the OPM1.

Note: Use optical wipes to clean both ends of the receive jumper.

- 12 Connect the receive jumper to the OPM1.

- 13 Mate the free ends of the transmit and receive jumpers using the appropriate adapter.

- 14 Record the displayed power level. The difference between the reference power level (from Step 9) and the displayed power level will be the test jumper loss in dB.

Verify that the insertion loss of this mated connector pair is under 0.75 dB, the maximum allowed by the TIA (Noyes recommends 0.4 - 0.5 dB typical).

If the insertion loss is not acceptable, disconnect the transmit and receive jumpers at the adapter, clean the free ends of both test jumpers and repeat step 13 & 14.

- 15 If the insertion loss is acceptable, disconnect the transmit and receive jumpers at the adapter.

- 16 Move the OPM1 and OLS to opposite ends of the link to be tested.

Proceed to Step III- Measure Multimode Link Insertion Loss

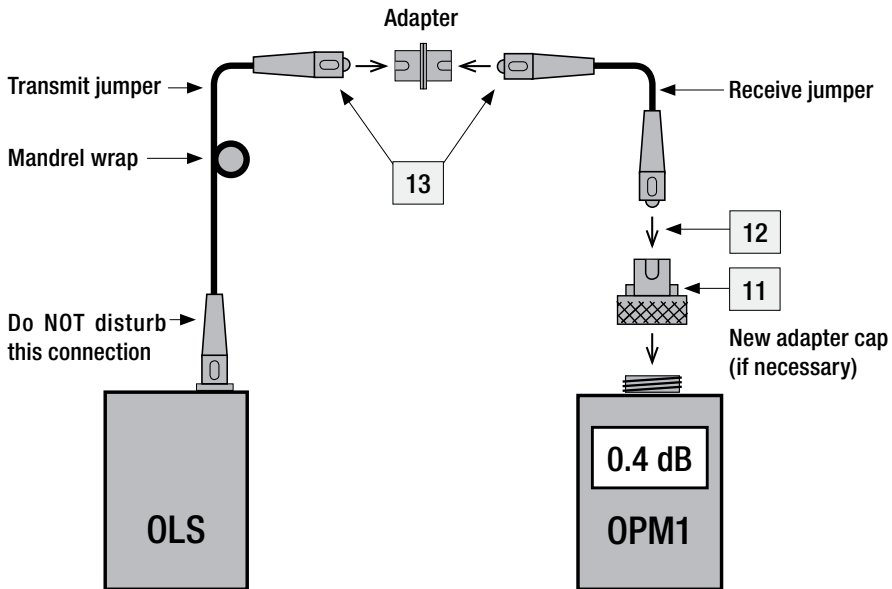


Figure 3-3: Verify Test Jumpers.

Step III - Measure Multimode Link Insertion Loss

Figure 3-4 illustrates the following procedures.

17 Connect the free ends of the transmit and receive jumpers to the multimode link under test.

Note: Clean jumper end that connects to patch panel prior to every test.

18 Record the displayed power level. The difference between the reference power level (from Step 9) and the displayed power level will be the link insertion loss in dB.

19 Record link insertion loss at the current test wavelength.

20 Repeat steps 17-19 for all links to be tested at the current wavelength.

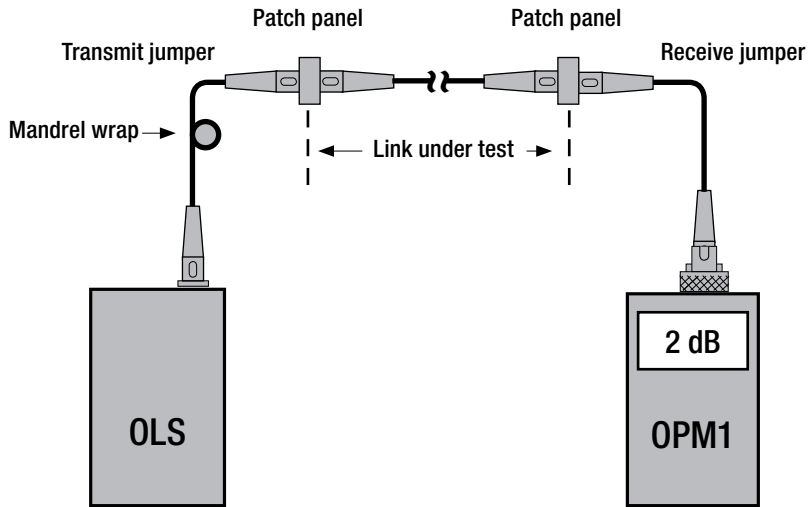


Figure 3-4: Measure Multimode Link Insertion Loss.

Section 4: Maintenance

Battery Replacement

To replace a battery:

- 1 Remove the protective rubber boot from the instrument.
- 2 Remove the battery compartment cover located on the back of the instrument.
- 3 Replace the discharged battery.
- 4 Replace the battery compartment cover and rubber boot.

Cleaning Optical Ports



CAUTION! Before conducting the following procedures be sure to have the instruments turned OFF.

Optical ports must be kept free from dirt or other contaminants to ensure accurate measurements and operation. Always clean all test jumpers before conducting the test procedures outlined in this Guide. It is important to keep dust caps in place when instruments are not being used.

For cleaning connector end faces on OLS light sources, test jumpers, and in fiber frames or adapters, Noyes recommends using our exclusive FCC2 non-hazardous cleaning fluid and CCT molded cleaning tips. For cleaning OPM optical ports and adapter caps, a supply of optical cleaning wipes and IPA (Reagent Grade Isopropyl Alcohol 99% or better) and a can of filtered

compressed air may be used.

To Clean the OPM1 Optical Port

- 1 Unscrew the adapter cap from the adapter cap mount.
- 2 Use lint-free optical cleaning wipes such as AFL FiberWipes and optical quality cleaning fluid such as AFL FCC2 connector cleaning fluid.

Note: if using isopropyl alcohol (IPA), be sure to use 99% pure IPA that has not been contaminated.

- Dampen a portion of the wipe with the cleaning fluid.
- Gently wipe the exposed OPM port starting with the wet section of the wipe and pulling it to the dry section.

Note: Starting with the wet cleaning and finishing in the dry improves cleaning action, reduces static buildup, and finishes with the end-face dry.

- 3 Using a can of filtered compressed air (held vertically), blow out any contaminants from the adapter cap.
- 4 Replace the adapter cap once the cleaning is complete.

To Clean the OLS1-1C and OLS1-2C Ports

- 1 Using a can of filtered compressed air (held vertically), blow out any contaminants from the optical output port.

Repair and Calibration

Repair of the Noyes test equipment in the field is NOT recommended.

Calibration is recommended every 12 months. Noyes Calibration Department is in compliance with ANSI/NCSL Z540-1, ISO 10012-1, MIL STD 45662A, ISO Guide 25 and traceability to the National Institute of Standards and Technology. Call Customer Service to obtain a Return Authorization Number (RMA) before sending units in for calibration.

Section 5: Specifications and Accessories

OLS1 LED Light Source Specifications

Optical Specifications	OLS1-1C	OLS1-2C
Output wavelength	660 nm - red, 850 nm + 35/-40	850 nm + 35/-40 1300 nm +50/-10
Spectral width (FWHM)	30, 40 nm (typ)	40, 120 nm (typ)
Output power	>-10*, >-20 dBm	>-20, >-20 dBm
Fiber size	1000, 62.5** μ m	62.5** μ m
Output connector	ST	ST
Emitter type	LED, Class I FDA 21 CFR 1040.10 and 1040.11, IEC 60825-1: 2007-03	
Stability	\pm 0.1 dB over 8 hours (after 5 min. warm-up)	
General Specifications		
Power	Typical 60 hours with 9V battery, optional AC adapter	
Operating temperature	-10 to 50°C	
Storage temperature	-30 to 60°C	
Size (H x W x D)	14.0 x 8.1 x 3.8 cm (5.5 x 3.2 x 1.5 in)	
Weight	0.29 kg (0.65 lb)	

* -10 dBm output is into 1000 micron fiber.

** May be used to test 50 or 62.5 μ m fiber with supplied mandrels.

All specifications at 25°C

OPM1 Optical Power Meter Specifications

Optical Specifications	OPM1-2C	OPM1-3C
Calibration wavelengths	850, 1300, 1310, 1550 nm	850, 1300, 1310, 1550 , 1625 nm
Detector type	Germanium (Ge)	InGaAs
Measurement range	+6 to -60 dBm	+6 to -70 dBm
Accuracy*	±0.25 dB	
Measurement units	dBm	

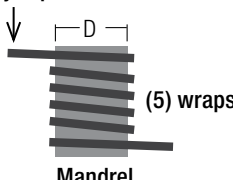
General Specifications

Power	Typical 60 hours with 9V battery
Operating temperature	-10 to 50°C
Humidity	0 to 95% (non-condensing)
Storage temperature	-30 to 60°C
Size (H x W x D)	14.0 x 8.1 x 3.8 cm (5.5 x 3.2 x 1.5 in)
Weight	0.26 kg (0.58 lb)

- * Accuracy measured at 25°C and -10 dBm per N.I.S.T. standards.
All specifications at 25°C

Mandrels for Multimode Transmit Jumpers

When testing multimode links using an overfilled LED source, always wrap the transmit jumper five (5) times around the proper diameter mandrel. This is specified by TIA/EIA-568-B and will improve insertion loss measurement repeatability and accuracy. Do NOT use mandrels on multimode receive jumpers or single-mode jumpers.

Available mandrels for test jumpers with 3 mm jackets		Diameter (D) for other jacket diameters	Multimode transmit jumper 
Fiber type	Part #	(mm)	
62.5µm	5400-00-0201	D = 20 mm minus jacket diameter	
50µm	5400-00-0202	D = 25 mm minus jacket diameter	
Kit with both mandrels	5400-00-0900		

Thank you for choosing Noyes Test & Inspection

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