



SWIFT TEST KIT **TEK-4**

TRAINING MANUAL TABLE OF CONTENTS

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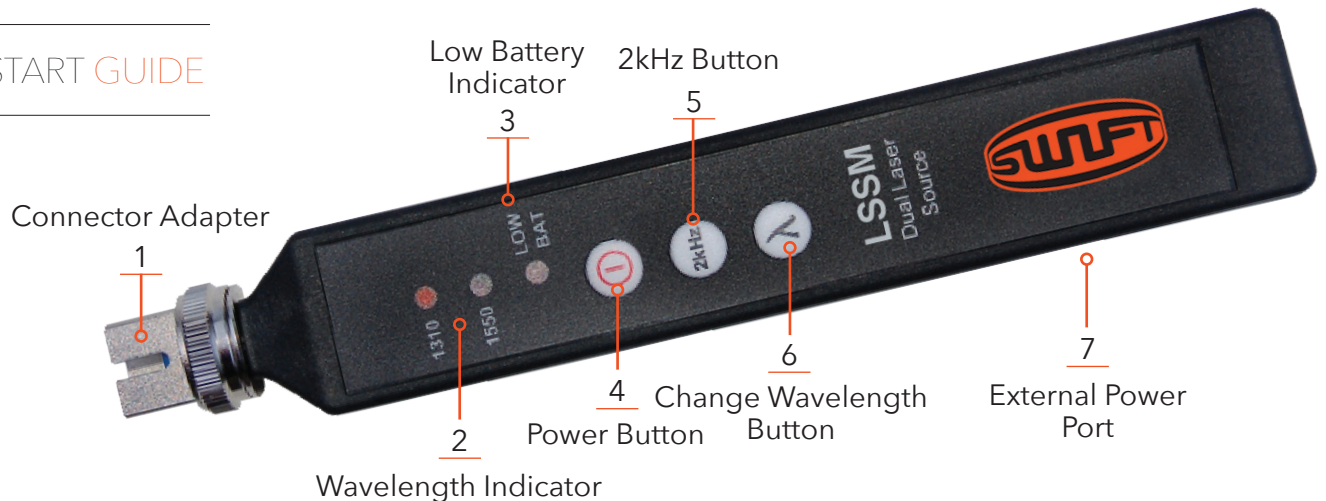


SECTION ONE

LSSM | LASER LIGHT SOURCE QUICK START GUIDE



QUICK START GUIDE



INTRODUCTION

The LSSM dual laser source is a singlemode test laser used for verifying the proper function of fiber optic networks. This document will serve as an overview of the major features and functions of the device and offer tips for troubleshooting common issues in optical networks.



FEATURES

- | | | |
|----------|---|--|
| <u>1</u> | CONNECTOR ADAPTER
(Interchangeable) | The LSSM comes with an SC screw-on adapter. Additional adapters are available from SWIFT. |
| <u>2</u> | WAVELENGTH INDICATOR | This unit offers 1310nm and 1550nm wavelengths. When the LSSM is turned on, the red light indicates which wavelength is selected. The red light blinks to indicate when the 2kHz modulation is turned ON. |
| <u>3</u> | LOW BATTERY INDICATOR | A red indicator light appears when the CR2 battery power is low. Replace or recharge the battery, depending on the battery type, to return to normal operation of the LSSM. |
| <u>4</u> | POWER BUTTON | Use to turn the LSSM ON and OFF. The unit will turn off automatically after 15 minutes. To bypass auto-shutoff, hold the power button for 5 seconds when turning ON. |
| <u>5</u> | 2 KHZ BUTTON | Toggles the modulation of currently-selected wavelength output. The laser flashes at 2000 times per second to provide a recognizable signal to a companion power meter. Output power of the laser is reduced by 3dB when the modulation is active. |
| <u>6</u> | WAVELENGTH BUTTON | Switches between the 1310nm and 1550nm wavelength. |
| <u>7</u> | EXTERNAL POWER PORT | The port accepts the PSD1 power supply. The power supply is not a battery charger - just a battery bypass. |



WARNING

Read and understand all of the instructions and safety information in this manual before operating this tool.



LASER HAZARD

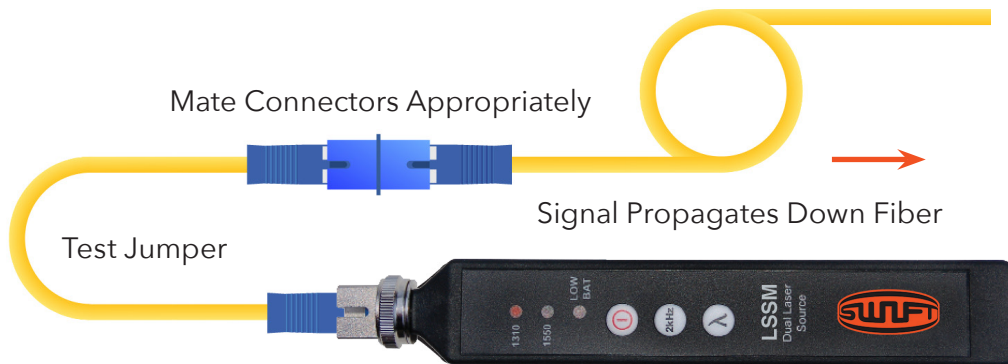
Please note that 1310nm and 1550nm wavelengths are not visible to the human eye. Do not look directly into the output port of the LSSM or directly into any fiber connector that may be live. Since the laser is invisible to the eye, the eye's natural blink reflex is suppressed. This can cause damage to the retina.



FDA 21 CFR 1040.10 & 1040.11
IEC 60825-1: 2007-03
Class 1 Laser Product

TRANSMITTING LIGHT

The LSSM transmits either the 1310nm or 1550nm wavelength on singlemode fiber. It is important to use a test jumper to mate the LSSM to the fiber-under-test.



OUTPUT POWER

The LSSM is calibrated to have an output power level of -5dBm. Variations in power level between -5dBm and -8dBm may be normal depending on the quality and age of the test jumper, the LSSM output port, and other factors.

Always ensure that the LSSM is transmitting an acceptable power level before performing an insertion loss test. Simply insert the test jumper (plugged into the LSSM) into a companion power meter set to the dBm mode. The power meter will indicate the measured output power of the laser.

Test Jumper Plugged
into Power Meter



Power Meter Displays
Output Power of Laser

OUTPUT PORT MAINTENANCE

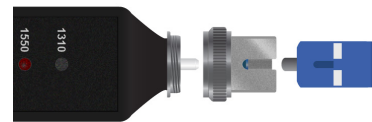
The LSSM utilizes a physical fiber connection at the output port. It ensures a steady power level for performing insertion loss tests.

Ensure that any test jumpers are inspected and cleaned before plugging into the LSSM unit. If soiled or damaged connectors are inserted, they can cause damage to the LSSM output port and the unit may need to be repaired.

Test Jumper has physical contact with the ferrule inside the LSSM

TO CLEAN THE FERRULE:

- Unplug the test jumper
- Unscrew the adapter until it spins freely, then pull
- Inspect the ferrule with an approved microscope, clean if necessary, and replace adapter



USING THE 2KHZ FUNCTION

When the LSSM's 2kHz modulation is active, the selected wavelength indicator will blink. The modulation is recognized by optical power meters further down the fiber and indicated by a 2kHz notification on the screen and a loud beep. The modulated tone can also be recognized through the fiber jacket when a Fiber Identifier is used.



The Fiber Identifier introduces a bend into the fiber which leaks light from the core onto the detector of the power meter. When using a Fiber Identifier, expect a 30 to 35dB offset in core power.

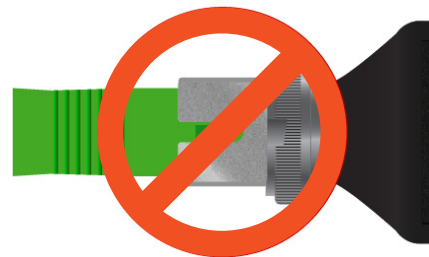
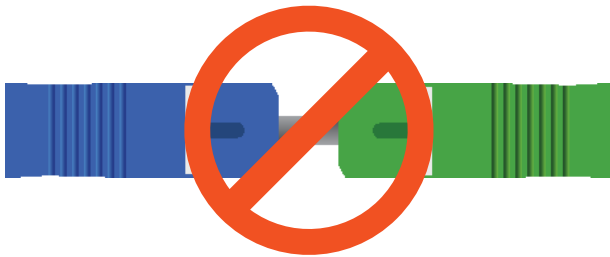


TESTING NOTES

Blue connectors (UPC) have a straight ferrule with a domed interface. Green connectors (APC) have an eight-degree angled ferrule with a domed interface.



UPC and APC connectors are not compatible. **NEVER** connect UPC and APC connectors together, OR plug an APC connector into the LSSM unit. This can cause irreparable damage to both connectors.



MAINTENANCE

UNPACKING & INSPECTION

The LSSM is supplied with a soft carry case, SC adapter installed on the unit, 3.0V CR2 battery, and an instruction card. Contact SWIFT immediately if any part of the unit or packaging is damaged, or otherwise unsatisfactory.

LOW BATTERY

The LSSM provides over 1000 operations under normal conditions. When the LOW BAT LED indicator is illuminated on the device, the CR2 battery should be replaced or recharged, depending on the battery type.

OPTICAL CONNECTOR INTERFACE

The LSSM is equipped with a SC/UPC connector adapter that is compatible with only SC/UPC optical connectors. The connector adapter interface should be kept covered and protected from contamination. Care must be taken to avoid objects that may damage the fiber inside the adapter mount. Always inspect and clean fibers before mating them to the device. If scratches or breaks occur on the fiber surface, please contact SWIFT for proper service.

CALIBRATION

All SWIFT brand products include a 2-year warranty. SWIFT recommends recalibration every two years to ensure adherence to NIST measurement standards. The first recalibration is free within the warranty period.

PSD1 BATTERY BYPASS

SWIFT offers the PSD1 wall plug for users who wish to leave their LSSM turned on for long periods of time. This is **NOT** a charger, but rather powers the unit from a wall outlet.



SPECIFICATIONS

DUAL SINGLEMODE LASER SOURCE

Wavelength	1310nm & 1550nm
Output Power	-5.0dBm
Output Stability	±0.05dB (1 hour) ±0.03dB long-term (15 min warm-up)
Spectral Width	5nm/5nm
Optical Interface	SC/FC/ST/LC interchangeable
Tone Output	2kHz
Power	Push button toggle/auto-off
Battery	CR2
Operating Temperature	-10° to +50°C
Storage Temperature	-30° to +60°C
Dimensions	6.1" x 0.94" x 0.75" (15.5 x 2.83 x 1.9cm)
Weight	3oz. (85.4g)



CK-01



Bag, 9x8x3 zippered
Swabs, package of 25
AquaKleen cleaner, 2 fl oz bottle
FiberKleen wipes, pk of 50 wipes
Brush
Screwdriver
Tweezers
Illuminated jeweler's loupe
Instruction sheet
Zipper pull
Sharpie, medium point

CK-02



Bag, 9x8x3 zippered
Swabs, package of 25
AquaKleen cleaner, 2 fl oz bottle
FiberKleen wipes, pk of 50 wipes
IBC-SC
IBC-LC
Optipop-R
Instruction sheet
Zipper pull

CERTIFICATIONS

This product conforms with health, safety, and environmental protection standards for products sold within the European Economic Area (EEA). This product was tested by an ISO 17025 accredited laboratory and complies with the following CE directives and standards listed below:



DIRECTIVES: Electromagnetic Compatibilities (2014/30/EU)



STANDARDS: EMC: EN 61326-1:2013 Industrial;
Safety: EN/IEC61010- 1:2010+A1:2016

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CONTACT

Contact us with any questions pertaining to this or any other SWIFT product.

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SECTION TWO

LSSM | LASER LIGHT SOURCE TECHNICAL GUIDE



TECHNICAL GUIDE



INTRODUCTION

The LSSM dual laser source provides stabilized optical power levels for accurate loss measurements on singlemode fiber systems. Technicians can utilize each of the wavelengths included in this light source to reference and test with UCL Swift's optical power meters and gather measurements to meet international standards.

The LSSM provides a 2kHz tone output which is recognized by optical power meters; the incoming 2kHz signal is identified and an audible alert is provided by the power meter. This 2kHz signal will also allow fiber identification when used with non-invasive fiber identifier devices, such as our FI2K.

Easy removal of the included SC adapter allows the light source ferrule to be cleaned, preventing contamination of test jumpers. Additional adapters are available.

This device maintains full compliance with all FDA and CFR standards for light-emitting products.



FEATURES

Small form-factor for fast, simple testing in the field

NIST-traceable laser output

Single output port ensures faster switching when testing at multiple wavelengths

Long-lasting battery



Combine LSSM with an optical power meter (OPM1 pictured) to perform insertion loss tests on singlemode fiber.



The 2kHz tone output of the LSSM can be recognized through the fiber jacket when a Fiber Identifier is used.

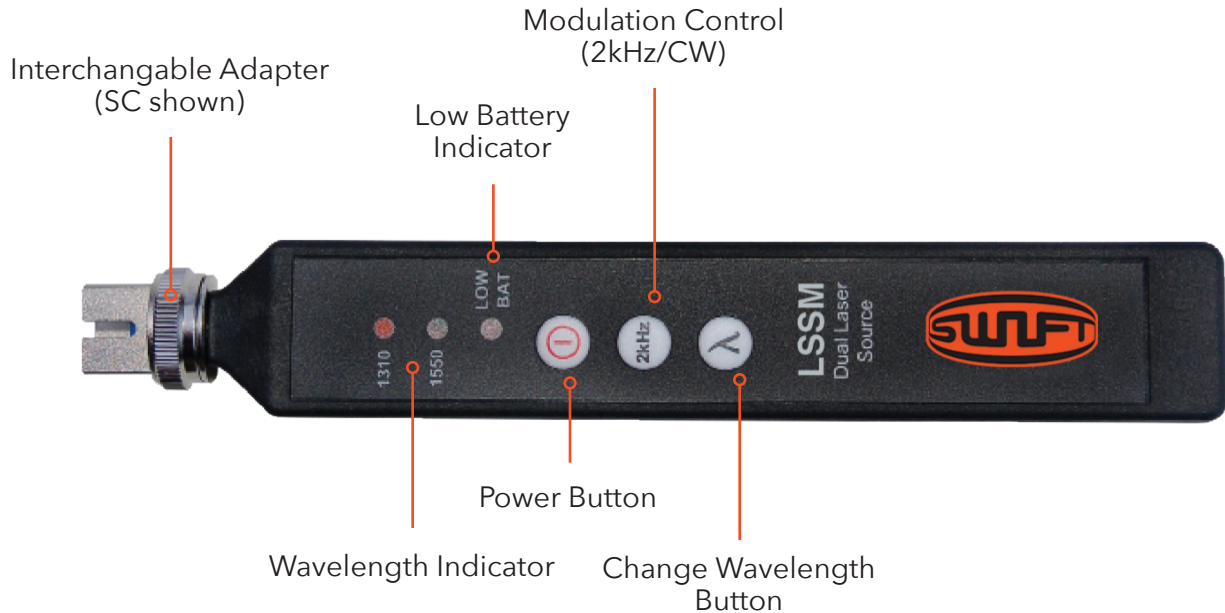


Quick-change adapters allow users to adjust the LSSM output to match their testing situation.

SPECIFICATIONS

DUAL SINGLEMODE LASER SOURCE

Wavelength	1310nm & 1550nm
Output Power	-5.0dBm
Output Stability	±0.05dB (1 hour) ±0.03dB long-term (15 min warm-up)
Spectral Width	5nm/5nm
Optical Interface	SC/FC/ST/LC interchangeable
Tone Output	2kHz
Laser Class	Class 1 (FDA 21 CFR 1040.11)
Power	Push button toggle/auto-off
Battery	CR2
Operating Temperature	-10° to +50°C
Storage Temperature	-30° to +60°C
Dimensions	6.1" x 0.94" x 0.75" (15.5 x 2.83 x 1.9cm)
Weight	3oz. (85.4g)



CK-01



Bag, 9x8x3 zippered
Swabs, package of 25
AquaKleen cleaner, 2 fl oz bottle
FiberKleen wipes, pk of 50 wipes
Brush
Screwdriver
Tweezers
Illuminated jeweler's loupe
Instruction sheet
Zipper pull
Sharpie, medium point

CK-02



Bag, 9x8x3 zippered
Swabs, package of 25
AquaKleen cleaner, 2 fl oz bottle
FiberKleen wipes, pk of 50 wipes
IBC-SC
IBC-LC
Optipop-R
Instruction sheet
Zipper pull

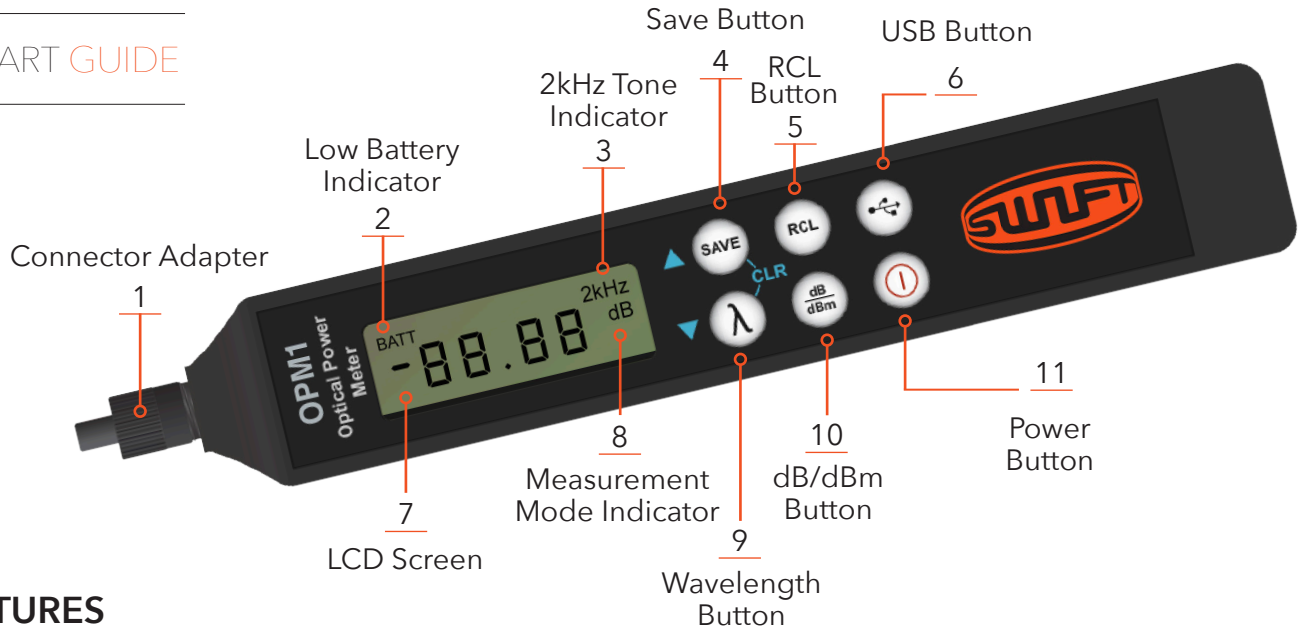


SECTION THREE

OPM1 | OPTICAL POWER METER QUICK START GUIDE



QUICK START GUIDE



FEATURES

- | | | |
|----------|---|---|
| <u>1</u> | CONNECTOR ADAPTER
(Interchangeable) | The OPM1 comes with a 2.5mm universal adapter. Additional adapters are available from SWIFT. |
| <u>2</u> | LOW BATTERY INDICATOR | "BATT" will appear on the LCD screen when the CR2 3V battery needs to be recharged or replaced, depending on the battery type. |
| <u>3</u> | 2KHZ TONE INDICATOR | A beep will sound and show "2 kHz" on the LCD once a 2 kHz modulated signal is recognized. |
| <u>4</u> | SAVE BUTTON | Over 4,000 readings may be saved on the OPM1. Each time the save button is pressed, the current reading will be saved to internal storage. The display flashes the indexed location where the reading has been saved. |
| <u>5</u> | RCL BUTTON | Toggles through the saved readings on the device. The indexed location, wavelength, and reading will flash on-screen. |
| <u>6</u> | USB BUTTON | When the OPM1 is connected via USB to a computer running SWIFT brand software, pressing this button will transfer all saved data points into the software for reporting. |
| <u>7</u> | LCD SCREEN | The screen displays the measured value, selected wavelength, and status indicators. |
| <u>8</u> | MEASUREMENT MODE INDICATOR - dB/dBm | dB is a loss measurement. dBm is an absolute power measurement. |

- | | | |
|-----------|-------------------|---|
| <u>9</u> | WAVELENGTH BUTTON | Hold the button to switch the OPM1 between the 850, 1300, 1310, 1490, 1550, 1611, and 1625nm wavelengths. Press the button once to immediately display the current wavelength. The selected wavelength will briefly appear on-screen every 8 seconds. |
| <u>10</u> | dB/dBm BUTTON | Press the button to toggle between dB and dBm modes. Hold the button down when in dBm mode to set a reference on the OPM1. |
| <u>11</u> | POWER BUTTON | Press the button once to turn the OPM1 on. Press once again to turn the OPM1 off. The OPM1 will automatically turn off after 5 minutes if inactive. |

IMPORTANT SAFETY INFORMATION



WARNING

Read and understand all of the instructions and safety information in this manual before operating this tool.



ELECTRIC SHOCK HAZARD

Contact with live circuits could result in severe injury or death. Pay attention to proper battery polarity. Do not mix battery types or manufacturers. Do not open the unit. Use this unit only for its intended purpose as outlined in this guide.



LASER HAZARD

Avoid eye exposure to open fiber connectors and interfaces when working with fiber systems. They may be connected to a live laser source. Do not look into the output port of a laser source. Point fiber endfaces toward non-reflective surfaces to prevent reflection of laser.



ITEM DAMAGE HAZARD

Do not leave the item in direct sunlight or near heat sources, submerge in water, or subject the unit to strong impact. Cover the fiber interface with the flip-cap when the unit is not in use.



DO NOT THROW THIS PRODUCT AWAY

Contact your local recycling station to dispose of properly.

FUNCTION TIPS

AUDIBLE ALERTS

The OPM1 emits an audible beep each time a major function is used. To disable most beeps, ensure that the unit is OFF. Press and hold the Save button, and turn the unit ON while holding the Save button. Perform the same procedure to turn the audible beeps back on.

CONTINUOUS USAGE MODE

The OPM1 turns off automatically if no buttons are pressed for 5 minutes. To bypass this feature, hold the Power button for 3 seconds when powering on. A series of beeps will indicate that the unit is now in Continuous Mode and will not turn off automatically.

REVIEWING SAVED READINGS

While in the RCL mode, use the Save and Wavelength buttons to navigate through the saved readings on the device. Each reading has a "location" indicated by a 4-digit number. Note the blue arrows on the Save and Wavelength buttons. The data cycles at either end. Scrolling "up" from the last data point will cycle back to the first location (0001) and vice versa.

DELETING SAVED READINGS

Press and hold the Save and Wavelength buttons simultaneously to delete all saved readings in the OPM1's internal memory. The screen flashes 0000 to indicate that the memory is empty.

NON-VOLATILE MEMORY

The OPM1 uses a non-volatile memory system. Data is not lost if the unit is turned off while testing, if the battery is removed, or if the unit is stored for long periods of time.

USB DOWNLOADS

Before transferring data from the OPM1 to the computer, download and install the SWIFT brand software, available online at uclswiftna.com

- Plug the OPM1 into the computer using the included USB cable. If this is the first time it has been plugged in, wait at least ten seconds for the drivers to install.
- Place the SWIFT brand software into Dump/Sync mode by navigating to Settings > Data Mode > Dump Mode.
- Press the USB button on the OPM1 to dump/sync all data points. The data from the OPM1 appears in the box on the left side of the window.
- Fill out the fields on the right side of the window (Customer, User, Test Site, etc).
- Navigate to Settings > Report Settings to identify a minimum and maximum value for the PASS/FAIL functionality. Choose a color code scheme from this window, if necessary.
- To create the final report, click File > Export to Excel.

DATA STREAMING

The OPM1 can be used in a live streaming mode with the SWIFT brand software.

- With the OPM1 plugged in via USB, place the SWIFT brand software into Active Mode by navigating to Settings > Data Mode > Active Mode.
- Click the Save button on-screen to save the live reading displayed in the window. Save as many readings as needed.
- To create the final report, click File > Export to Excel.

MAINTENANCE

UNPACKING & INSPECTION

The OPM1 is supplied with a 2.5mm adapter installed on the unit, a LC 1.25mm adapter is also included in the kit, 3.0V CR2 battery, USB cable, and an instruction card. Contact SWIFT immediately if any part of the unit or packaging is damaged, or otherwise unsatisfactory.

LOW BATTERY

The OPM1 provides over 1000 operations under normal conditions. When the BATT indicator is shown on the device screen, the CR2 battery should be recharged or replaced, depending on the battery type.

OPTICAL CONNECTOR INTERFACE

The OPM1 is equipped with a universal connector adapter that is compatible with many popular style connectors. The connector adapter interface should be kept covered and protected from contamination. Care must be taken to avoid objects that may damage the glass surface of the detector mount. If scratches or breaks occur on the surface, please contact UCL Swift NA for proper service.

CALIBRATION

All SWIFT brand products include a 2-year warranty. SWIFT recommends recalibration every two years to ensure adherence to NIST measurement standards. The first recalibration is free within the warranty period.



SPECIFICATIONS

OPTICAL POWER METER

Detector Type	-02: InGaAs/-04: Filtered InGaAs
Measurement Range	-02: +6 to -70dBm/-04: +23 to -45dBm
Wavelength Range	850nm to 1650nm
Selectable Wavelengths	850/1300/1310/1490/1550/1611/1625nm
Resolution	0.01dB
Absolute Accuracy	±0.25dB (23°C +/- 2°C at 0dBm)
Optical Interface	Universal 2.5mm (additional adapters available)
Display	LCD
Tone ID	2kHz
Storage	4000+ measurements
Data Transfer	Mini-USB (live readings or data dump)
Power	Push button toggle/auto-off
Operating Temperature	-10° to +55°C
Storage Temperature	-30° to +70°C
Battery	CR2
Dimensions	6.1" x 0.94" x 0.75" (15.5 x 2.83 x 1.9cm)
Weight	3oz. (85.4g)

CK-01



Bag, 9x8x3 zippered
 Swabs, package of 25
 AquaKleen cleaner, 2 fl oz bottle
 FiberKleen wipes, pk of 50 wipes
 Brush
 Screwdriver
 Tweezers
 Illuminated jeweler's loupe
 Instruction sheet
 Zipper pull
 Sharpie, medium point

CK-02



Bag, 9x8x3 zippered
 Swabs, package of 25
 AquaKleen cleaner, 2 fl oz bottle
 FiberKleen wipes, pk of 50 wipes
 IBC-SC
 IBC-LC
 Optipop-R
 Instruction sheet
 Zipper pull

CERTIFICATIONS

This product conforms with health, safety, and environmental protection standards for products sold within the European Economic Area (EEA). This product was tested by an ISO 17025 accredited laboratory and complies with the following CE directives and standards listed below:



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Safety: EN/IEC61010- 1:2010+A1:2016

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CONTACT

Contact us with any questions pertaining to this or any other SWIFT product.

uclswiftna.com

Office: 972.556.0916

Fax: 972.910.8384



SECTION FOUR

OPM1 | OPTICAL POWER METER REFERENCE & TEST GUIDE



REFERENCE & TEST GUIDE



INTRODUCTION

Performing a test for Insertion Loss (also commonly called dB Loss or Attenuation) on a fiber optic cable requires an Optical Power Meter (OPM) and an Optical Light Source (OLS). This document outlines the specific steps which must be taken with OPM1 optical power meter to perform insertion loss testing on a variety of fiber types and setups.

EXAMPLE TESTS

EXAMPLE 1: Singlemode Fiber, Point-to-Point, 1 Jumper	Page 2
EXAMPLE 2: Singlemode Fiber, Point-to-Point, 2 Jumpers	Page 4
EXAMPLE 3: Singlemode Fiber, Paired, Loopback Jumper	Page 6
EXAMPLE 4: Multimode Fiber, Point-to-Point, 1 Jumper	Page 8
EXAMPLE 5: Multimode Fiber, Paired, Loopback Jumper	Page 10

EXAMPLE 1: SINGLEMODE FIBER, POINT-TO-POINT, 1 JUMPER

Fiber Type	Singlemode
Connectors Used	LC
Test Jumper Setup	Simplex jumper SC/LC
OPM Used	OPM1
OLS Used	LSSM

FIBER-UNDER-TEST

The fiber-under-test is singlemode with LC connectors on each end. The fiber-under-test may be up to 250 kilometers long. In this example, the fiber-under-test is 400 meters long.

TEST JUMPER

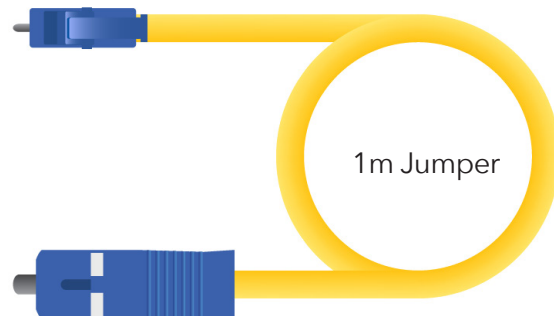
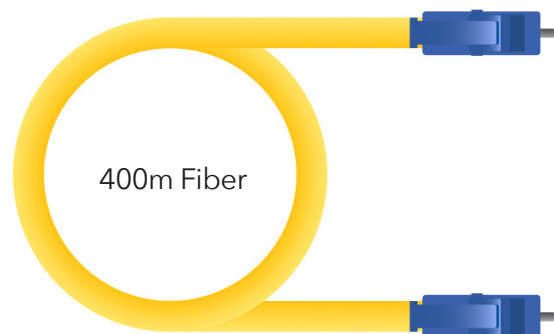
The test jumper is a one-meter singlemode fiber with SC and LC connectors. The SC connector will be plugged into the LSSM laser source and the LC connector will be used to interface with the fiber-under-test.

POWER METER

The OPM1 power meter is set to the 1550nm wavelength. The 1310nm wavelength may also be used. Always match the wavelength on the OPM1 to the wavelength on the LSSM. The adapter on the OPM1 is the OPAL LC adapter.

LIGHT SOURCE

The LSSM laser source is set to the 1550nm wavelength. The 1310nm wavelength may also be used. The adapter is the default OPAS SC adapter.



REFERENCING SETUP

The connectors on the Test Jumper should be cleaned to appropriate standards. Use an inspection scope to verify fiber cleanliness. Plug the connectors on the Test Jumper into the OPM1 and LSSM. The OPM1 should be in the dBm measurement mode. If it is not in the dBm mode, press the dB/dBm button once to put it into the dBm mode.



SETTING REFERENCE

The LSSM output power is calibrated to -5dBm. If the OPM1 screen displays between -5.00dBm and -7.00dBm, press and HOLD the dB/dBm button for 5 seconds. After 5 seconds, release the dB/dBm button. The OPM1 screen will display 0.00dB, with some minor variation. DO NOT switch the OPM1 back to the dBm mode.



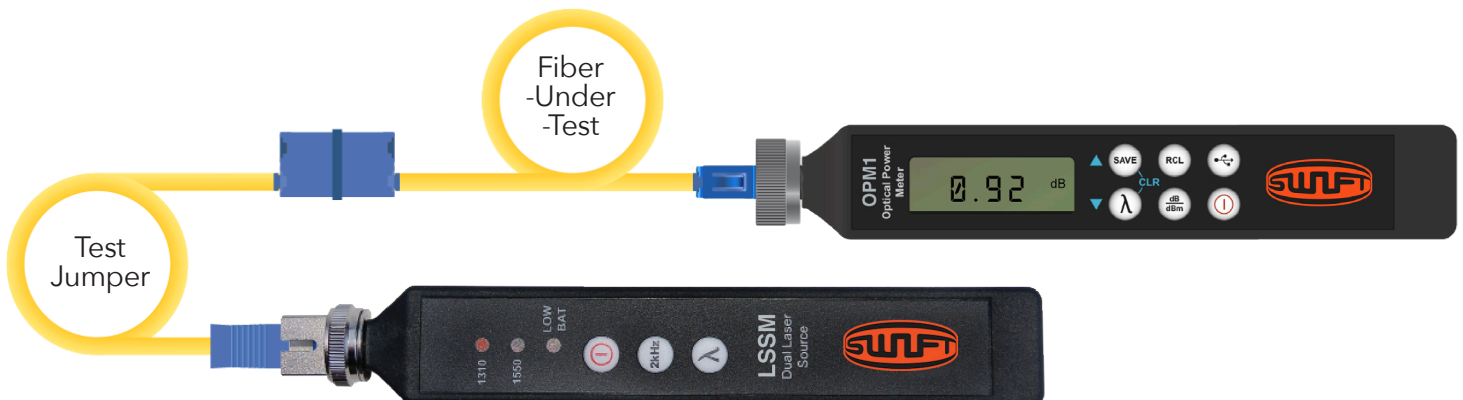
Between -5.00 and -7.00dBm

Hold for 5 seconds

Reference is set

LOSS TEST

The Test Jumper MUST remain attached to the LSSM. Do not remove the Test Jumper from the optical link. The connectors on the Test Jumper and the fiber-under-test should be cleaned to appropriate standards. Use an inspection scope to verify fiber cleanliness. Plug the Test Jumper into one end of the fiber-under-test using a bulkhead adapter as shown. Plug the other end of the fiber-under-test into the LC adapter on the OPM1. The Insertion Loss of the fiber-under-test will be shown on the OPM1 screen.



EXAMPLE 2: SINGLEMODE FIBER, POINT-TO-POINT, 2 JUMPERS

Fiber Type	Singlemode
Connectors Used	LC
Test Jumper Setup	(2) Simplex jumpers: (1) SC/LC + (1) LC/LC
OPM Used	OPM1
OLS Used	LSSM

FIBER-UNDER-TEST

The fiber-under-test is singlemode with LC connectors on each end. This method allows testing of connectors inside bulkheads. One or both ends of this fiber-under-test may be inside bulkheads. The fiber-under-test may be up to 250 kilometers long. In this example, the fiber-under-test is 400 meters long.

TEST JUMPER

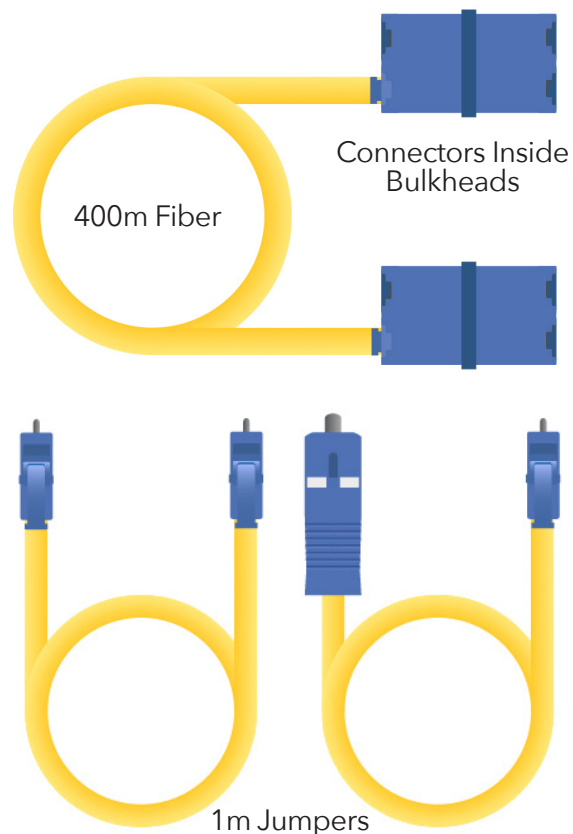
The test jumpers are both one-meter singlemode fiber. One has one SC and one LC connector, and the other has two LC connectors.

POWER METER

The OPM1 power meter is set to the 1550nm wavelength. The 1310nm wavelength may also be used. Always match the wavelength on the OPM1 to the wavelength on the LSSM. The adapter on the OPM1 is the OPAL LC adapter.

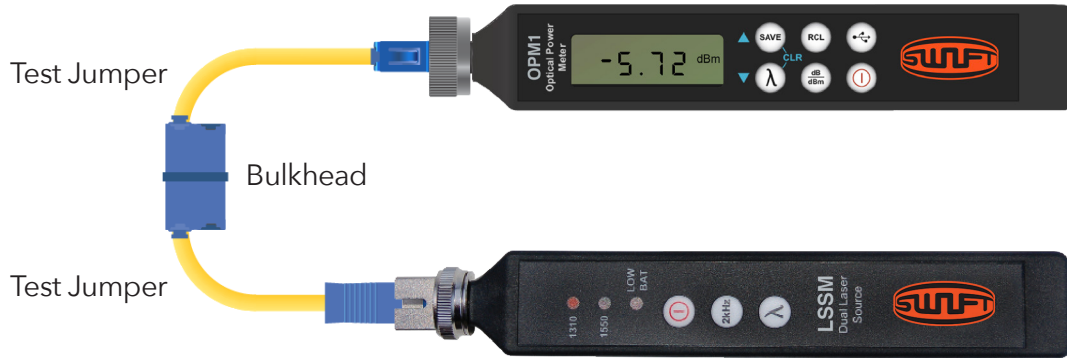
LIGHT SOURCE

The LSSM laser source is set to the 1550nm wavelength. The 1310nm wavelength may also be used. The adapter is the default OPAS SC adapter.



REFERENCING SETUP

The connectors on the Test Jumper should be cleaned to appropriate standards. Use an inspection scope to verify fiber cleanliness. Plug the connectors on the Test Jumper into the OPM1 and LSSM. The OPM1 should be in the dBm measurement mode. If it is not in the dBm mode, press the dB/dBm button once to put it into the dBm mode.



SETTING REFERENCE

The LSSM output power is calibrated to -5dBm. If the OPM1 screen displays between -5.00dBm and -7.00dBm, press and HOLD the dB/dBm button for 5 seconds. After 5 seconds, release the dB/dBm button. The OPM1 screen will display 0.00dB, with some minor variation. DO NOT switch the OPM1 back to the dBm mode.



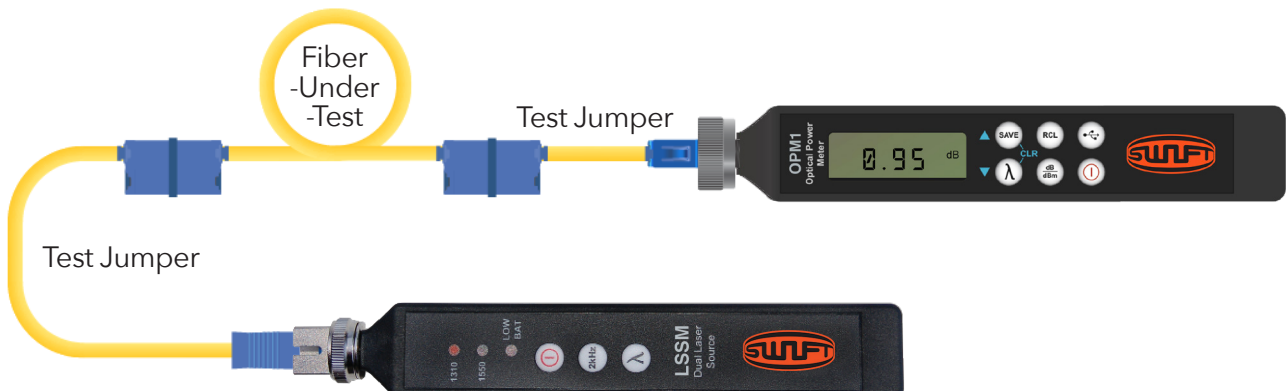
Between -5.00 and -7.00dBm

Hold for 5 seconds

Reference is set

LOSS TEST

The Test Jumper MUST remain attached to the LSSM. Do not remove the Test Jumper from the optical link. The connectors on the Test Jumper and the fiber-under-test should be cleaned to appropriate standards. Use an inspection scope to verify fiber cleanliness. Plug the Test Jumper into one end of the fiber-under-test using a bulkhead adapter as shown. Plug the other end of the fiber-under-test into the LC adapter on the OPM1. The Insertion Loss of the fiber-under-test will be shown on the OPM1 screen.



EXAMPLE 3: SINGLEMODE FIBER, PAIRED, LOOPBACK JUMPER

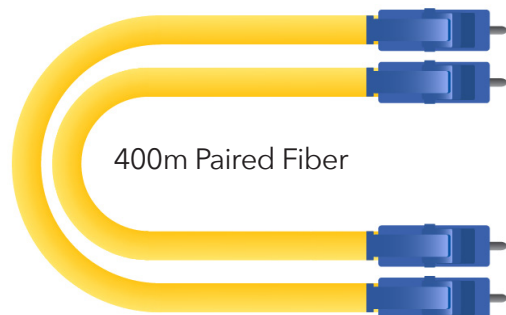
Fiber Type	Singlemode
Connectors Used	LC
Test Jumper Setup	Loopback
OPM Used	OPM1
OLS Used	LSSM

FIBER-UNDER-TEST

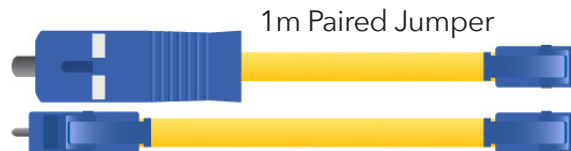
The fiber-under-test is paired singlemode with paired LC connectors on each end. The fiber-under-test may be up to 250 kilometers long. In this example, the fiber-under-test is 400 meters long.

TEST JUMPER

The test jumper is paired for loopback testing. One end has an SC connector and an LC connector, and the other end has two LC connectors clipped together. This method also uses a singlemode loopback adapter. It should be blue and have a duplex bulkhead on the end.



400m Paired Fiber



1m Paired Jumper



Singlemode Loopback

POWER METER

The OPM1 power meter is set to the 1550nm wavelength. The 1310nm wavelength may also be used. Always match the wavelength on the OPM1 to the wavelength on the LSSM. The adapter on the OPM1 is the OPAL LC adapter.



LIGHT SOURCE

The LSSM laser source is set to the 1550nm wavelength. The 1310nm wavelength may also be used. The adapter is the default OPAS SC adapter.



REFERENCING SETUP

The connectors on the Test Jumper and loopback should be cleaned to appropriate standards. Use an inspection scope to verify fiber cleanliness. Plug the connectors on the Test Jumper into the OPM1 and LSSM. Plug the loopback adapter on to the paired LC side of the Test Jumper. The OPM1 should be in the dBm measurement mode. If it is not in the dBm mode, press the dB/dBm button once to put it into the dBm mode.



SETTING REFERENCE

The LSSM output power is calibrated to -5dBm. If the OPM1 screen displays between -5.00dBm and -7.00dBm, press and HOLD the dB/dBm button for 5 seconds. After 5 seconds, release the dB/dBm button. The OPM1 screen will display 0.00dB, with some minor variation. DO NOT switch the OPM1 back to the dBm mode.



Between -5.00 and -7.00dBm

Hold for 5 seconds

Reference is set

LOSS TEST

The paired Test Jumper MUST remain attached to the LSSM and OPM1. Do not remove the Test Jumper from the optical link. The connectors on the Test Jumper and the fiber-under-test should be cleaned to appropriate standards. Use an inspection scope to verify fiber cleanliness. Plug the clipped LC end of the Test Jumper into one end of the fiber-under-test using the bulkhead as shown. Plug the loopback on to the other end of the fiber-under-test. The Insertion Loss of the fiber-under-test will be shown on the OPM1 screen.



EXAMPLE 4: MULTIMODE FIBER, POINT-TO-POINT, 1 JUMPER

Fiber Type	Multimode
Connectors Used	LC
Test Jumper Setup	(1) Simplex SC/LC
OPM Used	OPM1
OLS Used	LSMM

FIBER-UNDER-TEST

The fiber-under-test is multimode with LC connectors on each end. In this example, the fiber-under-test is 400 meters long.

TEST JUMPER

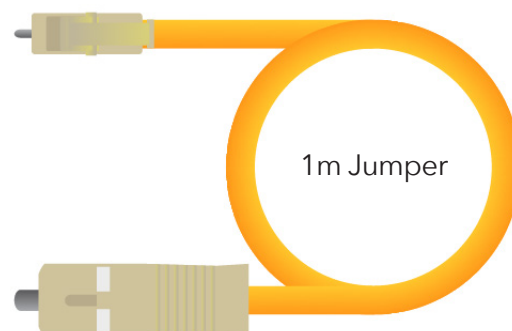
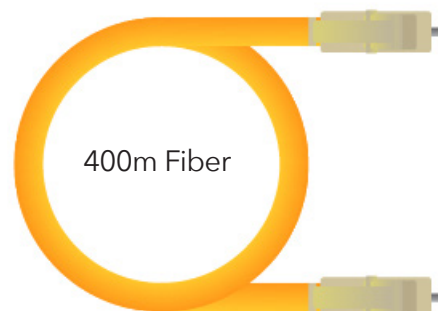
The test jumper is a one-meter multimode fiber with SC and LC connectors. The SC connector will be plugged into the LSMM LED source and the LC connector will be used to interface with the fiber-under-test.

POWER METER

The OPM1 power meter is set to the 850nm wavelength. The 1300nm wavelength may also be used. Always match the wavelength on the OPM1 to the wavelength on the LSMM. The adapter on the OPM1 is the OPAL LC adapter.

LIGHT SOURCE

The LSMM LED source is set to the 850nm wavelength. The 1300nm wavelength may also be used. The adapter is the default OPAS SC adapter.



REFERENCING SETUP

The connectors on the Test Jumper should be cleaned to appropriate standards. Use an inspection scope to verify fiber cleanliness. Plug the connectors on the Test Jumper into the OPM1 and LSMM. The OPM1 should be in the dBm measurement mode. If it is not in the dBm mode, press the dB/dBm button once to put it into the dBm mode.



SETTING REFERENCE

The LSMM output power is calibrated to -22dBm. If the OPM1 screen displays between -22.00dBm and -25.00dBm, press and HOLD the dB/dBm button for 5 seconds. After 5 seconds, release the dB/dBm button. The OPM1 screen will display 0.00dB, with some minor variation. DO NOT switch the OPM1 back to the dBm mode.



LOSS TEST

The Test Jumper MUST remain attached to the LSMM. Do not remove the Test Jumper from the optical link. The connectors on the Test Jumper and the fiber-under-test should be cleaned to appropriate standards. Use an inspection scope to verify fiber cleanliness. Plug the Test Jumper into one end of the fiber-under-test using a bulkhead adapter as shown. Plug the other end of the fiber-under-test into the LC adapter on the OPM1. The Insertion Loss of the fiber-under-test will be shown on the OPM1 screen.



EXAMPLE 5: MULTIMODE FIBER, PAIRED, LOOPBACK JUMPER

Fiber Type	Multimode
Connectors Used	LC
Test Jumper Setup	Loopback
OPM Used	OPM1
OLS Used	LSMM

FIBER-UNDER-TEST

The fiber-under-test is paired multimode with paired LC connectors on each end. The fiber-under-test may be up to 250 kilometers long. In this example, the fiber-under-test is 400 meters long.

TEST JUMPER

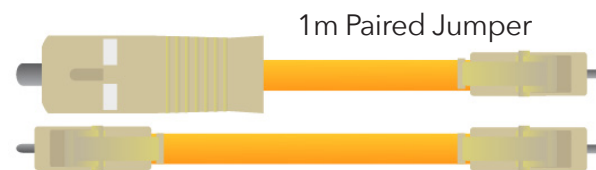
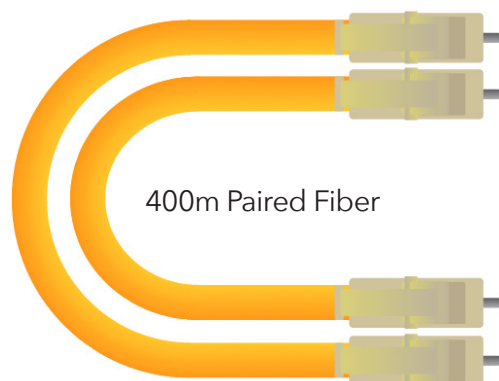
The test jumper is paired for loopback testing. One end has an SC connector and an LC connector, and the other end has two LC connectors clipped together. This method also uses a multimode loopback adapter. It should be black and have a duplex bulkhead on the end.

POWER METER

The OPM1 power meter is set to the 850nm wavelength. The 1300nm wavelength may also be used. Always match the wavelength on the OPM1 to the wavelength on the LSMM. The adapter on the OPM1 is the OPAL LC adapter.

LIGHT SOURCE

The LSMM LED source is set to the 850nm wavelength. The 1300nm wavelength may also be used. The adapter is the default OPAS SC adapter.



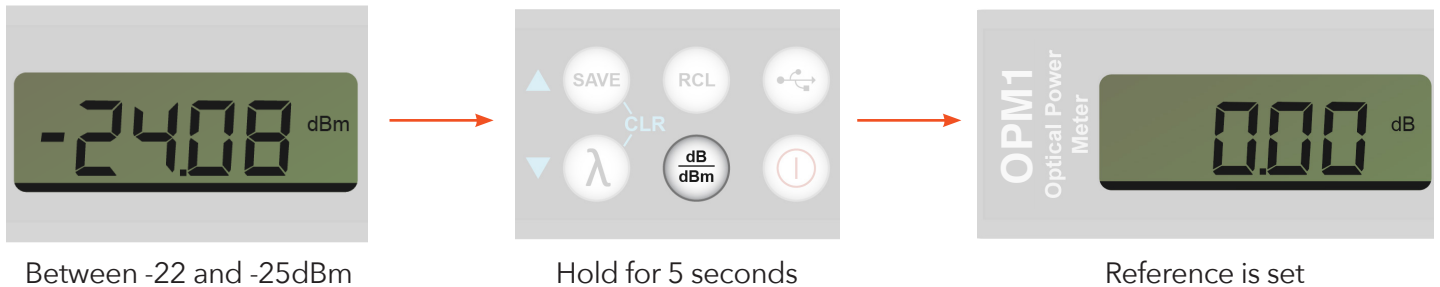
REFERENCING SETUP

The connectors on the Test Jumper and loopback should be cleaned to appropriate standards. Use an inspection scope to verify fiber cleanliness. Plug the connectors on the Test Jumper into the OPM1 and LSMM. Plug the loopback adapter on to the paired LC side of the Test Jumper. The OPM1 should be in the dBm measurement mode. If it is not in the dBm mode, press the dB/dBm button once to put it into the dBm mode.



SETTING REFERENCE

The LSMM output power is calibrated to -22dBm. If the OPM1 screen displays between -22.00dBm and -25.00dBm, press and HOLD the dB/dBm button for 5 seconds. After 5 seconds, release the dB/dBm button. The OPM1 screen will display 0.00dB, with some minor variation. DO NOT switch the OPM1 back to the dBm mode.



LOSS TEST

The paired Test Jumper MUST remain attached to the LSMM and OPM1. Do not remove the Test Jumper from the optical link. The connectors on the Test Jumper and the fiber-under-test should be cleaned to appropriate standards. Use an inspection scope to verify fiber cleanliness. Plug the clipped LC end of the Test Jumper into one end of the fiber-under-test using the bulkhead as shown. Plug the loopback on to the other end of the fiber-under-test. The Insertion Loss of the fiber-under-test will be shown on the OPM1 screen.

