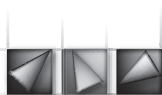




# Fiberlink® 6650 Series

Optical Power Meter

The Fiberlink® 6650 Optical Power Meter is a high accuracy, high resolution, microprocessor controlled optical power meter.



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Contents

Welcome ..... 3

Features ..... 3

Package Contents..... 3

Technical Specifications ..... 4

Applications for Fiberlink® 6650 ..... 5

Functions..... 6

Measuring Optical Loss..... 8

Warranty ..... 10

Operating Pointers..... 11

Troubleshooting ..... 11

Maintenance and Repairs ..... 11

## Welcome

The Fiberlink 6650 Optical Power Meter is a high accuracy, high resolution, micro-processor controlled optical power meter. It has a wide 65 dB dynamic range, and is calibrated to measure 850, 1300, 1310, and 1550nm, making it ideal for both single mode and multimode fiber testing, as well as 1490nm for measurement of FTTx PON networks.

## Features

- InGaAs photodetector with 2.5mm universal adapter for ST, SC, FC, and other 2.5mm connectors, 1.25 mm universal adapter for LC connectors
- 65 dB dynamic range; calibrated to measure 850, 1300, 1310 and 1550nm
- Works with multimode and single mode fiber
- Graphical LCD display with intuitive user interface
- Simple 2-key operation
- Power measurements shown in dBm, dB, or microwatts
- Display resolution of 0.01 dB
- Long battery life - up to 250 hours on one 9v battery
- On screen battery indicator
- Comes equipped with a rugged and durable rubber boot to protect the instrument from drops and other hazards
- Optional ruggedized carrying cases available to accommodate 3 or 6 test devices

## Package Contents

- One Fiberlink® 6650
- This User's Manual
- One Non-Rechargeable Lithium Battery (Pre-installed in unit)
- 2.5mm universal adapter (Pre-Installed on unit)
- 1.25 mm universal adapter for LC connectors

Technical Specifications

Specifications	
Measurement Range:	+5 to -60 dBm
Absolute Accuracy:	+/- 0.15 dB
Resolution:	0.01 dB
Linearity:	+/- 0.20 dB
Wavelengths:	850, 1300, 1310, 1490, 1550nm
Fiber Types:	Single Mode and Multimode
Connector:	InGaAs photodetector with 2.5mm universal adapter (ST, SC, FC, and other 2.5mm connectors), and 1.25mm universal adapter (LC connectors)
Power Requirements:	9 Volt battery or optional Power Supply for use with rechargeable battery
Dimensions:	4.94 x 2.175 x 1.28 (inches)

## Applications for Fiberlink® 6650 Optical Power Meter

Below is a list of test and measurement applications that can be performed using the Fiberlink 6650 optical power meter.

### Active Equipment Optical Power Measurements:

Active equipment should be measured periodically for correct power levels.

The transmitters in this equipment have a known power value. The Fiberlink 6650 can be directly attached to this equipment via a patch cord to check whether the transmitter is within the manufacturer's specified power range.

### Fiber Continuity Testing:

Continuity can be measured with the Fiberlink 6650 by placing a calibrated light source on one end of the fiber and the Fiberlink 6650 on the other end. This is also a simple way to measure the attenuation of the fiber.

### Patch Cord Testing:

Optical links that are producing incorrect or poor results may have bad patch cords. The Fiberlink 6650 can be used to test the attenuation of a patch cord to see if it is usable, or should be replaced.

### Attenuation (Optical Loss) Measurements:

After a fiber cable has been installed and terminated, it must be tested to determine if the fiber is installed according to standards and specifications. A comparison of the actual power measurement and the reference value determines if the installation will pass or fail.



**1****Battery Charger Port:**

Allows for charging of rechargeable 9 Volt batteries, as well as wall power operation (Power Supply optional and not included. 9 Volt re-chargeable battery not included).



**Do not use battery charging port with non-rechargeable batteries. There is the potential for explosion and damage may occur to the unit and/or the user.**

**2****1.25/2.5mm Universal Connector Port:**

Accepts many popular 1.25mm and 2.5mm ferrule connectors, including ST, SC, FC and LC.

**3****LCD Screen:**

Shows optical power/loss levels, power units, wavelength, and battery status.

**4****Wavelength Selector / Power Button:**

Single press changes wavelength; holding the button powers the unit ON or OFF.

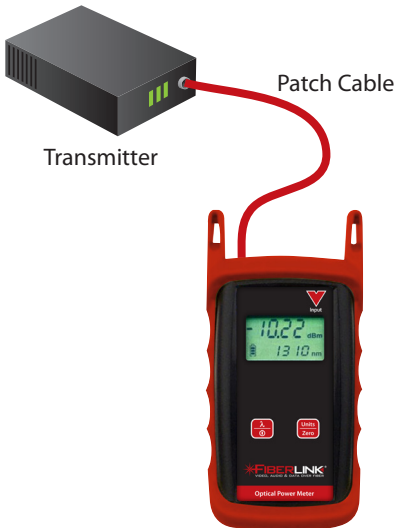
**5****Unit Selector / Zero Button:**

Single press toggles the measurement units between dBm, dB, and uW.

When in the “dB” mode, holding the button will zero the meter reading. This sets the current light level at the input detector port **2** as the zero reference level for subsequent measurements. *If you are setting this reference level to zero you must first make sure that the light source at the input detector port is the desired reference.*

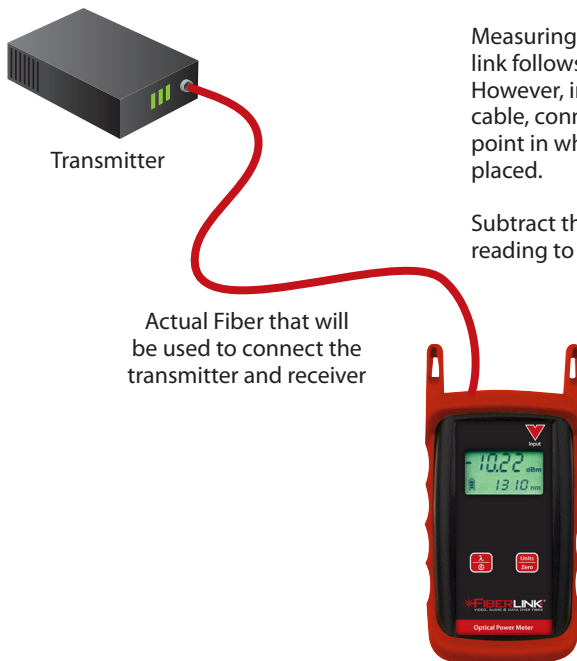
As one example, this technique is useful for measuring relative loss or gain in a link as follows:

- Set the meter to read in “dB”
- Set the meter for the wavelength being used by the Transmitter
- Connect a short fiber cable from the output of an active Transmitter
  - unit to the meter's input detector port **2**
- Press and hold the Zero button until the meter reading is zero
- The Transmitter's output power is now the reference level
- Disconnect the meter from the Transmitter and connect the fiber cable under test to the Transmitter
- Connect the meter's input detector port to the other end of the fiber cable under test
- The meter will now read, in dB, any loss introduced by the fiber cable under test



### Transmitter Output Power Measurement:

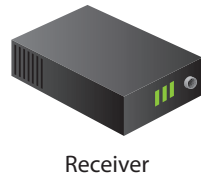
- 1) Connect a short single mode or multimode fiber to the Fiberlink 6650 and to the transmitter port on the active equipment under test.
- 2) Determine the output wavelength of the active equipment and then press the Wavelength button on the Fiberlink 6650 to select the correct wavelength
- 3) Power on the active equipment
- 4) Monitor the reading on the screen for a few seconds. This reading may fluctuate if the signal is digital. In this case, estimate the average power level.



### Receive Signal Power Measurement:

Measuring the optical power at the receive link follows the same procedure as above. However, instead of using a short patch cable, connect the Fiberlink 6650 at the point in which the optical receiver will be placed.

Subtract this new reading from the previous reading to calculate your loss.



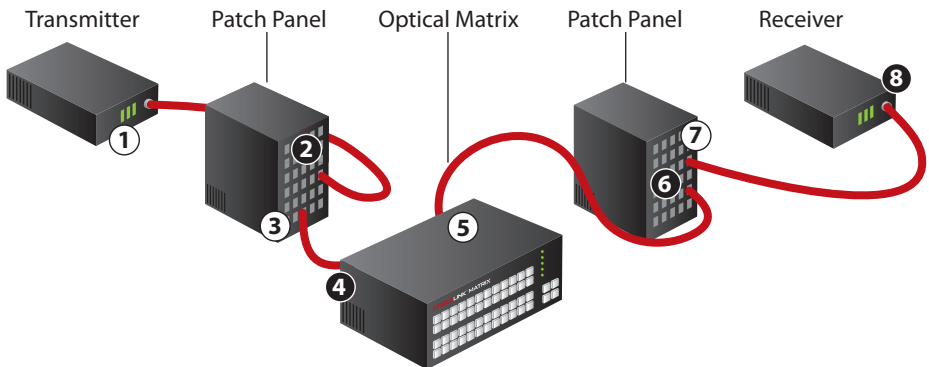


## Measuring Optical Loss in a Complete System

The use of the Fiberlink 6650 can be extremely helpful in diagnosing trouble spots in complex fiber optic systems. The process of calculating loss for each point in the system is identical to the procedure described on the previous page.

In the example system below, use a short jumper instead of the actual fiber at points 1, 3, 5 and 7 (white circle, black number) to determine the optical loss occurring within the equipment or patch panel. You will use the actual fiber at points 2, 4, 6 and 8 (black circle, white number) to determine optical loss occurring within the fiber optic cable.

Subtract the new reading from the previous reading to calculate the loss that has occurred at that point in the system.





Communications Specialties, Inc. (CSI) warrants that, for a period of three years after purchase by the Buyer, this product will be free from defects in material and workmanship under normal use and service. A Return Material Authorization (RMA) number must be obtained from CSI before any equipment is returned by the Buyer. All materials must be shipped to CSI at the expense and risk of the Buyer.

CSI's obligation under this warranty will be limited, at its option, to either the repair or replacement of defective units, including free materials and labor. In no event shall CSI be responsible for any incidental or consequential damages or loss of profits or goodwill.

CSI shall not be obligated to replace or repair equipment that has been damaged by fire, war, acts of God, or similar causes, or equipment that has been serviced by unauthorized personnel, altered, improperly installed, or abused.

RMA numbers and repairs can be obtained from:

**Communications Specialties, Inc.**

125 Comac Street

Ronkonkoma, New York 11779 USA

Tel: (631) 273-0404

Fax: (631) 273-1638

RMA numbers can also be obtained from our web site: **[commspecial.com](http://commspecial.com)**

**Please have your serial number available.**

## Operating Pointers

Remember to check attenuation of the fiber optic cable. The system will only operate properly if these specifications fall within the range of the system's loss budget.

## Troubleshooting

Multimode fiber optic cable contains an optical fiber with a light carrying "core" that is only .0025 inches (62.5 microns) in diameter. Single mode fiber optic cable has an even smaller "core," only .00032 to .0004 inches (8-10 microns). This is smaller than a human hair! Therefore, any minute particles of dirt or dust can easily block the fiber from accepting or radiating light. To prevent this from happening, always use the provided dust caps when ever optical connectors are exposed to air. It is also a good idea to gently clean the tip of an optical connector with a lint-free cloth moistened with alcohol whenever dust is suspected.

The status of the LED screen should provide the first clue as to the origin of any operational failure. If these are off, it usually means that the battery has failed in the unit.

If, after reviewing the above possibilities, the system is still not operating, please contact the Customer Service Department for further assistance. If you suspect your problem is caused by the optics or the fiber optic cable, and you have an optical power meter, please take the appropriate measurements prior to contacting support.

## Maintenance and Repairs

The Fiberlink® 6650 Series has been manufactured using the latest semiconductor devices and techniques that electronic technology has to offer. They have been designed for long, reliable and trouble-free service and are not normally field repairable.

Should difficulty be encountered, Communications Specialties maintains a complete service facility to render accurate, timely and reliable service of all products.

The only maintenance that can be provided by the user is to ascertain that optical connectors are free of dust or dirt that could interfere with light transmission and that connections are secure and accurate.

All other questions or comments should be directed to our Customer Service Department. It should be noted that many "problems" can easily be solved by a simple telephone call.



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