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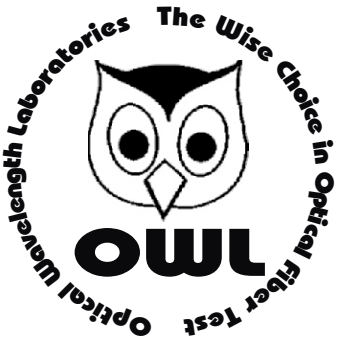
DIREKTRONIK
Dataprodukter utöver det vanliga

BOLT-NL
Operations Guide
Beaming Optical Length Tester



Optical Wavelength Laboratories

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UNIT 1 Introduction

Description

This manual describes the operation of the BOLT-NL (Beaming Optical Length Tester). The BOLT-NL is designed to measure the length of both singlemode and multimode cables. It uses a "round robin" technique for fiber measurement; in other words, it uses two optical fibers in the same fiber cable looped back with a patch cord at the far end of the link. The round trip time is converted to kilometers, then the BOLT-NL automatically divides the round-trip length by two to give the end-to-end length of the fiber cable. There is no need to measure the length of every fiber; the length will be the same for all fibers in the cable, so this test only needs to be run once for each cable. This technique allows the BOLT-NL to be very accurate (up to ± 2.5 meters).

Many network cabling standards require the fiber cable length to be recorded along with attenuation measurements. Optical measurement of fibers provides a quick and easy alternative to check the fiber jacket for markings or estimating the length by using a measuring wheel, and often provides a greater degree of accuracy.

The BOLT-NL also includes a pulse mode feature for fiber location (when used with a fiber identifier).

NOTE: To avoid confusion, the BOLT-NL is NOT designed to measure distance to a fault like an OTDR.

The BOLT-NL is designed to measure the end-to-end length of a fiber cable. A pair of terminated fibers, looped back at the far end of the cable, are required for end-to-end fiber cable length measurement.

General Features

1 LASER TRANSMITTER - this ST connector port houses a laser diode that emits invisible light into an optical fiber.

2 CONTINUOUS WAVE/TEST SELECTOR SWITCH - this 3-way switch selects between OFF (center), length testing / fiber identification mode (right), and continuous wave mode (left).

3 DETECTOR PORT - this ST connector port houses a photodiode used to receive light from an optical fiber.

4 POWER LED - this LED indicates that the tester is powered on. During normal operation, if this LED is very dim or is not lit, this indicates that the battery may not have sufficient power for accurate testing, and should be replaced.

5 LED DISPLAY - this 7-segment LED is used to display the length of the fiber link in kilometers. If the display shows all dashes, the BOLT-NL is not receiving enough light to make a measurement. This means that either the link is too long to be measured or there is a problem with one of the fibers used for length measurement.

UNIT 1 Introduction

Precautions

Safety. Extreme caution must be exercised when operating the BOLT-NL. It produces an intense beam of invisible light that can cause permanent damage to the eye with prolonged exposure.

NEVER LOOK INTO A LIGHT SOURCE OR THE END OF A FIBER THAT MAY BE ENERGIZED BY A SOURCE!

Operational. In order to insure accurate and reliable readings, it is vitally important to clean the ports on the tester, as well as the ferrules on the patch cords, before each use. If dirt, dust, or oil are allowed to build up inside the connector, the surface of the laser diode may become scratched, producing erroneous results. Replace the dust caps on the tester ports and patch cords when not in use.

Required Accessories

Cleaning Supplies. Fiber ferrules, connector ports and bulkheads should be cleaned with 99% or better isopropyl alcohol and a lint-free cloth. A can of compressed air should be available to dry off the ferrules, and to blow dust from the connector ports and bulkheads.

Patch Cords. Two identical patch cords are required to connect the BOLT-NL to the system under test, and a third patch cord is required to loop back the two fibers being used for the test. The connector styles on the patch cords must match the type on the BOLT-NL and the type of the bulkheads in the system under test.

Applications

Fiber Length Measurement. The BOLT-NL uses a “round robin” technique for fiber measurement; in other words, it uses two optical fibers in the same fiber cable looped back with a patch cord at the far end of the link. The round trip time is converted to kilometers, then the BOLT-NL automatically divides the round-trip length by two to give the end-to-end length of the fiber cable. It is not necessary to test each fiber for length; the length measurement applies to all fibers in the cable.

Fiber Identification. The BOLT-NL provides a pulsed mode for easy fiber identification. Fibers are identified by clamping a fiber identifier onto a jacketed fiber, which produces a tone to indicate presence of a signal. This is useful for locating fibers that are marked incorrectly or not marked at all.

UNIT 2 Operation

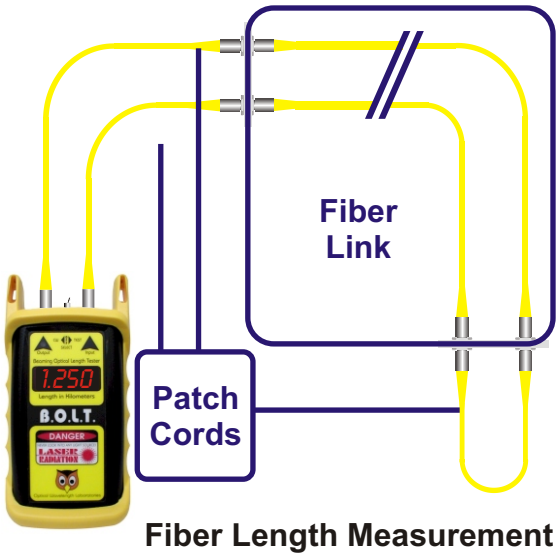
Fiber Length Measurement

1 - On one end of the fiber cable, loop back two of the fibers with one of the patch cords.

2 - On the other end of the fiber cable, connect one patch cord to each of the fibers being used for the test. Connect the other end of the patch cords to the receiver and transmitter ports on the BOLT-NL. It does not matter which patch cord connects to which fiber.

3 - Power on the BOLT-NL into length test mode by flipping the switch to TEST. In a few seconds, the display will show the length of the fiber in kilometers. In the example at right, the link is 1.250 kilometers.

NOTE: If the green indicator LED does not light up, the battery has insufficient power for a valid test, and must be replaced before continuing.



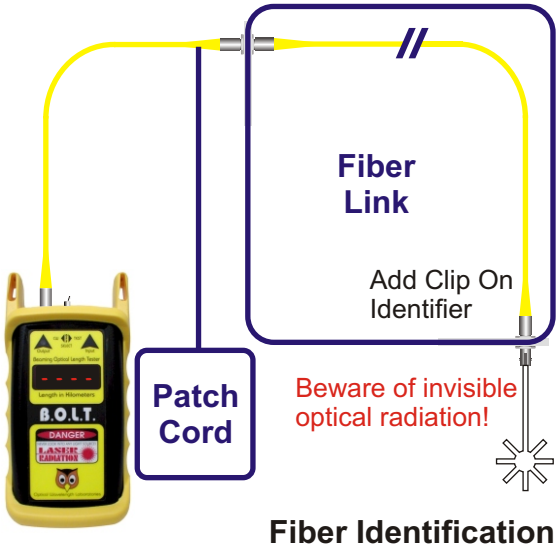
Fiber Length Measurement

Fiber Identification

1 - Connect the BOLT-NL to the fiber you are testing via a patch cord as shown at right.

2 - Power on the BOLT-NL into fiber identification mode by flipping the switch to TEST. This mode emits a flashing beam of invisible light into the fiber.

3 - Identify the fiber by clamping a fiber identifier to the fibers until you locate the fiber being tested. Many identifiers produce an audible tone.



Fiber Identification

UNIT 3 Appendices

Maintenance and Calibration Procedures

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

Battery Replacement. The battery compartment is covered by a sliding plate on the back of the unit. One 9v battery is required for operation.

Cleaning. For accurate readings, the optical connectors on the BOLT-NL and the connectors on the patch cords should be cleaned prior to attaching them to one another. Minimize dust and dirt buildup by replacing the dust caps after each use.

Warranty. The BOLT-NL comes standard with a two-year factory warranty, which covers manufacturer defects and workmanship only.

Specifications

Launch Method:	FP Laser
Output Power (singlemode; approximate):	0.1 milliwatts
Resolution:	up to 0.001 kilometers
Accuracy:	± 2.5 meters
Measurement Range:	25 kilometers
Battery Life:	10 hours
Operating Temperature:	0 to 55° C
Storage Temperature:	0 to 75° C
Low Battery Indicator:	Yes
Connector Style:	ST
Width:	2.75 inches
Height:	4.94 inches
Depth:	1.28 inches
Weight (with battery):	154 grams

Contact Information

Address:
Optical Wavelength Laboratories
N9623 Hwy 12
Whitewater, WI 53190

Phone:
(262) 473-0643

Internet:
OWL-INC.COM

Conversion Factors

The BOLT-NL displays fiber length in kilometers. At times it may be necessary to convert the fiber length to a different unit of measurement. The table below provides conversion factors for various units of measurement.

To calculate the units you need, multiply the number on the BOLT-NL display by the conversion factor listed in the table below:

1 kilometer	**1000 meters**
1 kilometer	**0.6214 miles**
1 kilometer	**3281 feet**

Here are some examples of converting the BOLT display into different units of measurement. For these examples, let us assume a fiber length of 1.25 kilometers as shown by the display at right.

kilometers to meters
1.250 x 1000 meters = 1250 meters

kilometers to miles
1.250 x 0.6214 miles = 0.777 miles

kilometers to feet
1.250 x 3281 feet = 4101.25 feet