

# Fiber OWL 4 BOLT Series Test Kits

## Certification Testing

## Quick Reference Guide

For part numbers:

KIT-FO4B-D2st

KIT-FO4B-D2sc



## Optical Wavelength Laboratories

## **NOTICE TO NEW USERS:**

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 professional 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.

## **GETTING STARTED**

Thank you for your purchase of this OWL certification test kit. Included in this kit is a Fiber OWL 4 BOLT optical power meter and a WaveSource multimode fiber optic light source. This quick reference guide will assist you in setting up your test kit for a standards-based certification test.

## **BEFORE YOU TEST**

Prior to performing a certification test, there are a few things you need to know about your link:

- ▶ *Fiber Type*
- ▶ *Fiber Length*
- ▶ *Number of Connections (i.e. patch panels)*
- ▶ *Number of Splices*
- ▶ *Fiber Cabling Standard*
- ▶ *Connector Type*

It is also important to understand the definition of a fiber optic link as it pertains to the Fiber OWL 4 BOLT:

**A link is a group of fibers that have the same characteristics, and follow the same pathway from one end to the other.**

Also, ensure that your patch cable connectors match the patch panel ports on the link under test.

## REQUIRED ACCESSORIES

- ▶ (3) multimode patch cables
- ▶ mandrel (wrap patch cable 5-7 times around the appropriate mandrel)
  - 0.7" outside diameter for 62.5/125  $\mu\text{m}$  fibers
  - 0.9" outside diameter for 50/125  $\mu\text{m}$  fibers

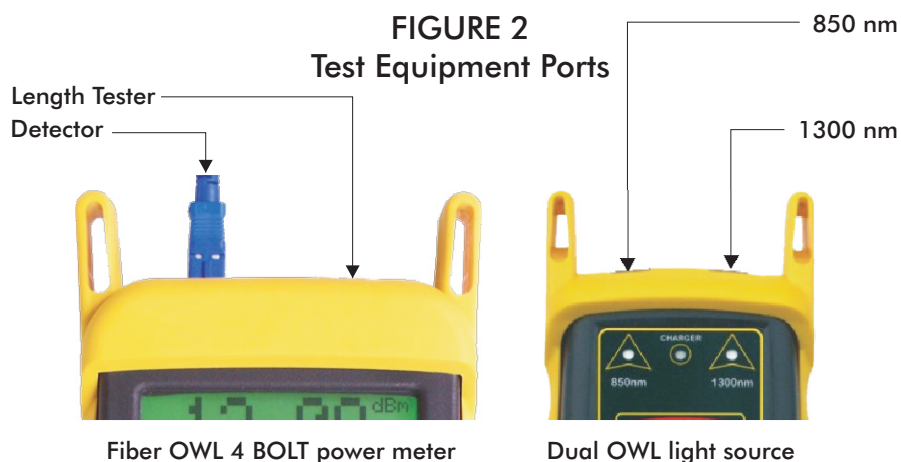


Multimode reference cables must be **wrapped** and **secured** around a mandrel as required by national and international Fiber Optic Test Procedures (FOTPs). See Figure 1 for a diagram of a mandrel wrap.

**NOTE:** if you are testing at both 850nm and 1300nm, each light source wavelength will require its own mandrel-wrapped patch cable.

## EQUIPMENT PORTS

Figure 2 shows the ports of the equipment used during this procedure. These ports may vary depending upon the model of equipment.



## VERIFY PROPER OPERATION OF THE EQUIPMENT

**STEP 1** Connect the power meter and light source together with one of the patch cables as shown in Figure 3.



**STEP 2** Power on the light source.

**STEP 3** Power on the Fiber OWL 4 BOLT.

**STEP 4** From the OPERATING MODE menu, select SIMPLE METER.

## VERIFY PROPER OPERATION OF THE EQUIPMENT, cont.

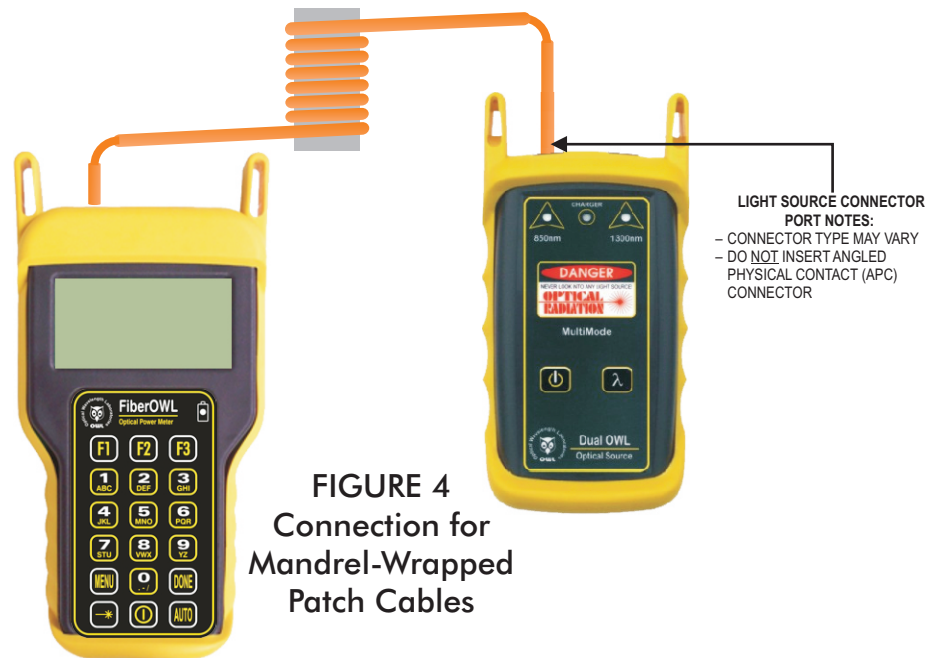
**STEP 5** Compare the reading on the Fiber OWL 4 BOLT display to Table 1 for acceptable power levels.

Core Size	Acceptable Power Level	Replace at
62.5/125 $\mu\text{M}$	-19.0 to -22.0 dBm	-22.00 dBm
50/125 $\mu\text{M}$	-22.0 to -25.0 dBm	-25.00 dBm

**TABLE 1**

**STEP 6** Once proper operation has been verified, remove the first patch cable from both units and set it aside.

**STEP 7** Connect the second patch cable between the Fiber OWL 4 BOLT and the Dual OWL (straight cable – use Figure 3; mandrel-wrapped cable – use Figure 4).



**FIGURE 4**  
Connection for  
Mandrel-Wrapped  
Patch Cables

**STEP 8** Compare the reading on the Fiber OWL 4 BOLT display to Table 1 for acceptable power levels.

**STEP 9** Once proper operation has been verified, remove the second patch cable from both units and set it aside.

**STEP 10** Connect a mandrel wrapped patch cable between the Fiber OWL 4 BOLT and the Dual OWL as shown in Figure 4.

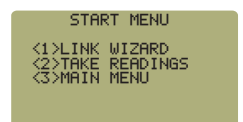
**STEP 11** Compare the reading on the Fiber OWL 4 BOLT display to Table 1 for acceptable power levels.

**STEP 12** Disconnect this cable from both units, and set it aside. Press **<DONE>** to return to the OPERATING MODE menu.

## RUN LINK WIZARD

**STEP 13** From the OPERATING MODE menu, select CERTIFICATION METER.

**STEP 14** From the START MENU, press **<1> LINK WIZARD**.



**STEP 15** From the STORED LINKS menu, highlight the stored link name you wish to use and press **<F2>** to select.



## RUN LINK WIZARD, cont.

**STEP 16** **OPTIONAL:** you may change the link name to something that better describes the group of fibers you are testing.

Press <DONE> to continue.

```
LINK NAME:
[Fiber Link #1 ]
<---|SHIFT|--->
```

**STEP 17** Change the LINK DATE to the date the fiber will be tested using the format MM-DD-YY.

Press <DONE> when you are finished entering the current date.



It is important to set the current date in order to ensure that the correct date appears on the certification reports.

```
DATE: [MM/DD/YY]
[03-20-08]
<---|SHIFT|--->
```

**STEP 18** Highlight the cabling standard to use for the set of fibers you are testing.

Press <F2> to select the chosen standard.

```
FIBER STANDARDS
USER DEFINED #1
USER DEFINED #2
[ITU-T G.652/OM3/OM4]
ISO/IEC 11801
-----
NEXT |SELECT|
```

**STEP 19** Highlight the fiber type of the network under test.

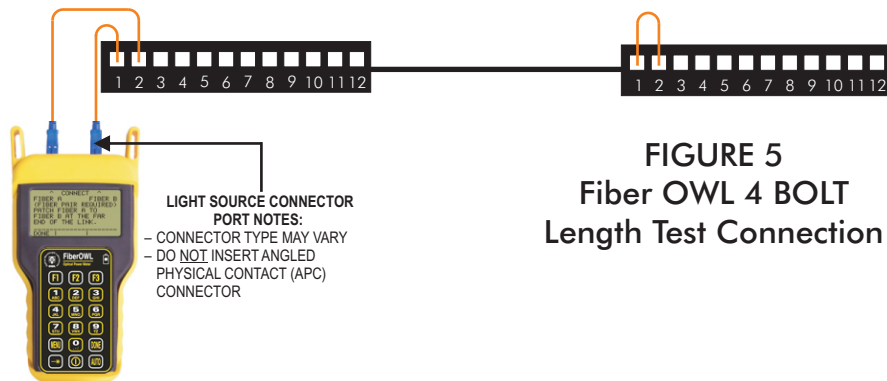
Press <F2> to select the fiber type.

```
FIBER TYPES
[50.0um Multimode]
50.0um Multimode
INDOOR SingleMode
OUTDOOR SingleMode
-----
NEXT |SELECT|
```

**STEP 20** Press <1> to use measure the fiber length with the Fiber OWL 4 BOLT.

```
FIBER LENGTH METHOD
<1> USE THE METER TO
MEASURE LENGTH
<2> ENTER LENGTH
MANUALLY
```

**STEP 21** Connect the Fiber OWL 4 BOLT to your fiber link as shown in Figure 5, then press <F1> to continue.



```
^ CONNECT ^
FIBER A FIBER B
(FIBER PAIR REQUIRED)
PATCH FIBER A TO
FIBER B AT THE FAR
END OF THE LINK.
DONE | |
```

**STEP 22** Review the end-to-end fiber length. In the example screenshot at right, the end-to-end fiber length could be within the range of 1000 to 1006 meters.

Press <F2> to continue.

```
FIBER LENGTH
01000 -0/+6 meters
1310nm Index<n>=1.490
TEST | DONE | INDEX
```

**STEP 23** The end-to-end length shown here is the length that will be entered into the Link Wizard configuration.

**OPTIONAL:** you may also enter the fiber length manually.

Press <DONE> to continue.

```
ENTER FIBER LENGTH:
[1 TO 65535]
[01000] METERS
<---|UNITS|--->
```



**NOTE:** Length testing is complete. You may now remove all of the patch cables from the link under test.

## RUN LINK WIZARD, cont.

**STEP 24** Enter the number of connections (i.e. patch panels) in the link under test. Typical fiber networks will have 2 connections – one for a patch panel located at each end of the link.

Press <DONE> to continue.

```
INLINE CONNECTIONS?  
<A CONNECTION IS WHEN  
TWO FIBER CONNECTORS  
MATE, USUALLY A PATCH  
PANEL>  
[ 2 ]  
-----  
<--- | SHIFT | --->
```

**STEP 25** Enter the number of splices in the link under test. Splices can be either fusion or mechanical. Typical multimode networks will have zero splices.

**NOTE:** some connectors use mechanical splice technology for termination. If the link under test is terminated with these “no-polish, no-epoxy” type connectors, they should be considered as mechanical splices.

Press <DONE> to continue.

```
ENTER THE NUMBER OF  
SPLICES IN THE FIBER  
BEING TESTED:  
[ 0 ]  
-----  
<--- | SHIFT | --->
```

**STEP 26** Review your Link Wizard setup.

If correct, press <F1> and continue on to the next step.

If changes need to be made, press <F3> and go back to STEP 16.

```
Standard Length > TIA-568B.3/CAN-T529  
> 01000 Meters  
Connections > 02 Connections  
Splices > 00 Splices  
Fiber Type > 62.5um MultiMode  
IS THIS CORRECT?  
YES | | NO
```

**STEP 27** Press <F1> until the asterisk (\*) is in front of 850nm (as shown at right).

Press <F2> to begin the SET REFERENCE procedure for 850nm.

```
SET SOURCE REFERENCES  
WAVELEN REF dBm TYP.  
* 850nm NOT SET (-20)  
1300nm NOT SET (-20)  
-----  
WAVE | SET | DONE
```

**STEP 28** Connect the detector port on the power meter and 850nm light source (left-hand port) together with the mandrel-wrapped cable as shown in Figure 4.

Press <F1> to continue.

```
CONNECT  
850nm  
SOURCE  
-----  
DONE | |
```

**STEP 29** Make sure that the 850nm light source port is powered ON and selected (the indicator LED on the left-hand side will be lit).

**STEP 30** Confirm setting the 850nm reference.

Pressing <F1> to continue. You will be returned to the SET SOURCE REFERENCES screen.

**NOTE:** if you are also testing at 1300nm, you will need to connect a separate mandrel-wrapped patch cable to the 1300nm port.

```
SET 850nm  
REFERENCE?  
YES | | NO
```

**STEP 31** For setting a 1300nm reference, repeat steps 27 through 30, except you will select 1300nm (as shown at right).

After the 1300nm reference is set, the REF dBm field will be filled in with a reference value.

```
SET SOURCE REFERENCES  
WAVELEN REF dBm TYP.  
850nm -20.00 (-20)  
*1300nm NOT SET (-20)  
-----  
WAVE | SET | DONE
```

**STEP 32** Press <F3> to complete the Link Wizard.

**STEP 33** Press <F1> to begin taking readings.

## TAKE READINGS

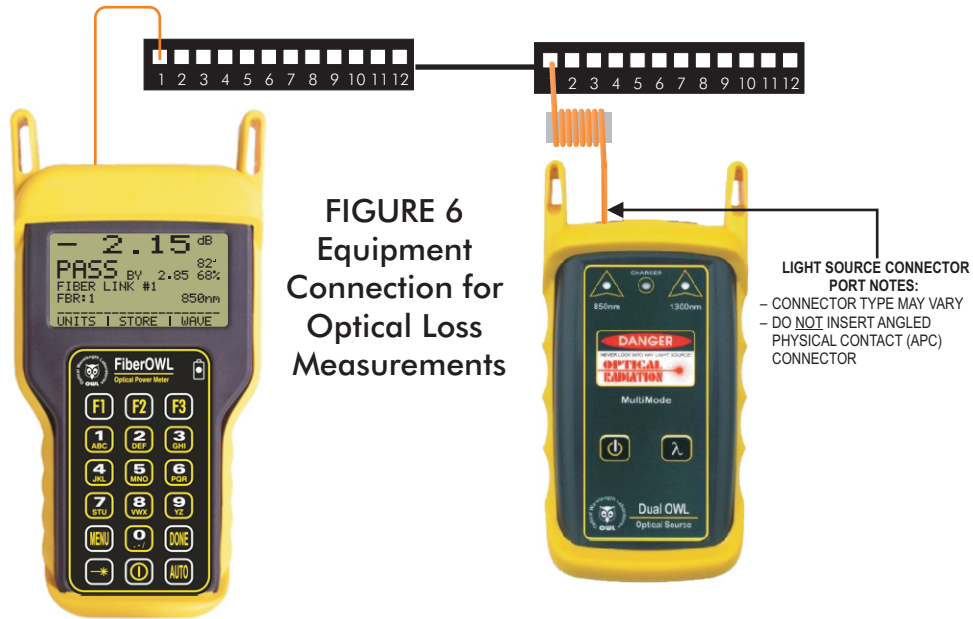
**STEP 34** Disconnect the mandrel-wrapped patch cable from the Fiber OWL 4 BOLT and take the units to opposite ends of the link.

**!** Do NOT disconnect the patch cable(s) from the light source at any time until all fibers have been tested.

**STEP 35** Connect the units to the first fiber to test as shown in Figure 6. Your readings will vary from the example below.

## TAKE READINGS, cont.

**STEP 35** Connect the units to the first fiber to test as shown in Figure 6. Your readings will vary from the example below.



**STEP 36** Press <F2> to store the data point. If this is the first data point in the link, you may be prompted to enter a new label.

**STEP 37** Press <F3> to save the data point.

**STEP 38** Disconnect the patch cables from the patch panels and move them to the next port in the patch panel, then repeat steps 36 through 38 until all fibers in the link have been tested at 850nm.

**STEP 39** If also testing at 1300nm, repeat steps 35 through 38, but this time use the mandrel-wrapped patch cable that is attached to the 1300nm port. Also, make sure that you set the Fiber OWL 4 BOLT and the Dual OWL to 1300nm.