

Testing LC Fiber Optic Links

Fluke Networks has teamed up with manufacturers of SFF (Small Form Factor) fiber optic connectors to provide an effective method of testing, certifying, and documenting fiber optic links that use SFF connectors. To simplify testing links that use SFF connectors, Fluke Networks provides SFF accessory kits that work with the DSP-4000, DSP-4100, and DSP-4300 and their Fiber Test Adapters to perform highly automated dual-fiber testing and certification, including documentation of test results. This application note shows you how to use the Fluke Networks LC Accessory Kit to test fiber optic links that use LC connectors.

Required Equipment

LC Accessory Kit Contents

- ① Two patch cords, dual LC plug to single SC plugs
- ② Test jumper, dual LC plug to dual LC plug
- ③ Adapter, dual LC to dual LC

The kit also contains other pieces for spares or for additional testing needs.

Test Equipment

- Fluke Networks DSP-4000, DSP-4100, or DSP-4300 CableAnalyzer
- Fluke Networks DSP-FTA Fiber Test Adapter Set

About Core Diameters

Multimode fiber is available with a 50 μm or 62.5 μm core diameter. Always use patch cords that match the core diameter of the link you are testing.

Directions

Setting Up the DSP-4x00

- On the DSP-4x00 SETUP menu, set the NUMBER OF ADAPTERS to 2. This is required for conformance to ANSI/TIA/EIA-526-14A, Method B.
- On the SETUP menu, set the ADAPTER TYPE to LC.

Refer to the DSP-FTA users manual if you have questions regarding setup.

Setting the Reference

1. Attach one DSP-FTA Fiber Test Adapter to the DSP-4x00 main unit and a second DSP-FTA Fiber Test Adapter to the DSP-4x00 Smart Remote.
2. Make the connections shown in Figure 2 for setting a reference.
3. Turn the DSP main unit's rotary switch to SPECIAL FUNCTIONS; then select Set Fiber Reference.

Important: Do not disconnect the patch cords from the DSP-FTA ports after setting the reference. If you do, you should reset the reference before testing a link.

Refer to the DSP-FTA users manual if you have any questions about setting a reference.

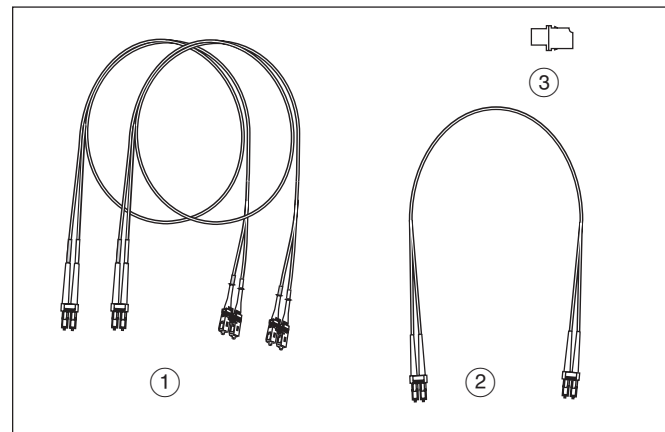


Figure 1. LC Accessory Kit Contents

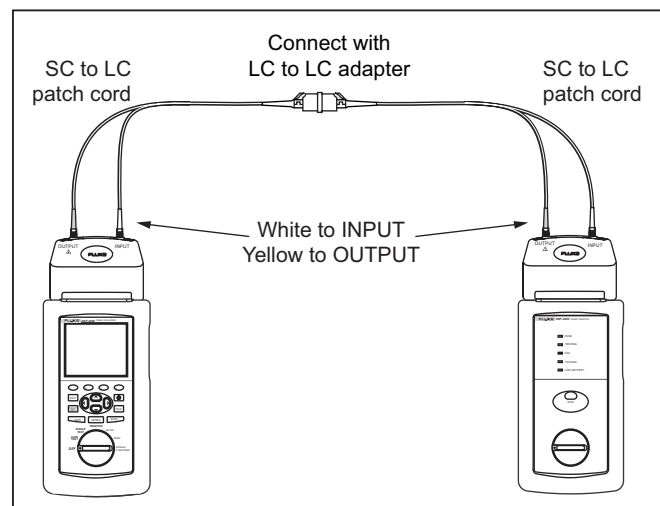


Figure 2. Reference Connections

Testing a Link

Now make fiber connections as shown in Figure 3 for testing a fiber link.

1. Disconnect the reference connections shown in Figure 2 at the dual LC adapter, leaving the adapter connected to the patch cord on the main unit.
2. Connect the short test jumper to the adapter.
3. Connect the other end of the short test jumper to one end of the fiber link to be tested.
4. Connect the SC to LC patch cord from the Remote unit to the other end of the fiber link to be tested.
5. Run an Autotest using the AUTOTEST position of rotary switch on the DSP-4x00 main unit. The Autotest measures the loss and length of both fibers in the link.

Refer to the DSP-FTA users manual if you have any questions about this test.

6. Press the SAVE key on the DSP-4x00 main unit to save the results of the test.

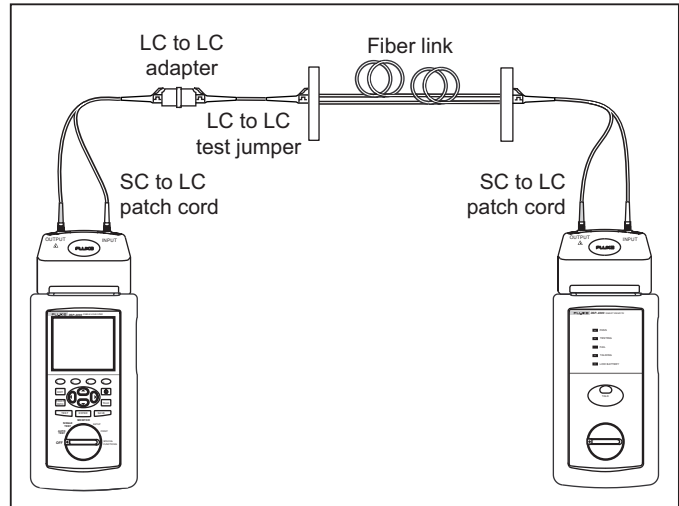


Figure 3. Test Connections

Why Use the Extra Test Jumper?

Make the correct loss measurements.

The above procedure for testing SFF fiber links is consistent with the specifications given in ANSI/TIA/EIA-568-A, thereby giving loss results that conform to ANSI/TIA/EIA-526-14A, Method B. The use of an additional test jumper is an adaptation of the single-jumper reference connections for Method B. Method B allows the use of hybrid patch cables, such as the short test jumpers, to connect test equipment to links that use SFF connectors. According to Method B, measuring link loss correctly requires the test path to have two more adapters than the reference path. The test procedure described in this application note adheres precisely to this requirement. With the extra jumper, the measured loss is the loss of the fiber in the link plus the loss of a connector at each end of the link. This value of loss is the real value encountered by network application hardware.

Preserve the integrity of your test.

This procedure also makes it unnecessary to disconnect the patch cords from the test equipment, thereby reducing the possibility of errors caused by reconnecting the patch cords or by contaminating or damaging the test equipment fiber interfaces.

Simplify SFF connector testing.

While single-fiber sources and power meters have been used effectively for testing fiber links containing single-fiber connectors, testing dual-fiber connectors with single-fiber testers is awkward and prone to errors. Dual-fiber testers are the best tools for testing duplex connectors and, therefore, are recommended for SFF testing. The Fluke Networks DSP-4x00 with its Fiber Test Adapters is perfect for SFF link testing because of its built-in SFF support and graphic Help screens that remind you what the proper connections are for setting a reference and testing a fiber link.

