FLUKE networks

DTX
Fiber Test Kit

Users Manual

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Fluke Networks
PO Box 777
Everett, WA 98206-0777
USA

Table of Contents

List of Figures

List of Tables

DTX Fiber Test Kit

Introduction

The DTX Fiber Test Kit is comprised of two instruments: the DTX Fiber Optic Meter (DTX-FOM) and the SimpliFiber 850/1300 Source. These instruments are engineered to work together to measure optical power and insertion loss in fiber optic cabling.

The DTX-FOM is an optical power loss meter that measures the power of light emerging from fiber. The meter is calibrated to measure power loss at any of the following wavelengths: 850 nm, 1300 nm, 1310 nm, and 1550 nm. The DTX-FOM is inserted directly into the mainframe of a DTX CableAnalyzer. It does not interfere with the DTX CableAnalyzer's copper test interface; therefore, you can easily switch between testing copper and fiber by pressing a softkey to select the desired cable type. To test 1310 nm or 1550 nm wavelengths, use the optional SimpliFiber laser sources (listed in Table C-1).

The SimpliFiber 850/1300 serves as the optical source. In this capacity, the tester provides a consistent dual wavelength light at 850 nm and 1300 nm.

This manual shows you how to set up and use the DTX Fiber Test Kit to measure loss and optical power in fiber optic cabling.

DTX Fiber Test Kit Features

The DTX Fiber Test Kit, hereafter referred to as the DTX-FTK, provides the following features and functions:

- Enables you to verify that cabling is correctly installed by measuring insertion loss that can be compared with a user-defined standard
- Helps you troubleshoot faulty devices by measuring the power emitted from an optical source that can be compared against the manufacturer's specifications
- Stores and organizes test records in internal memory or on a removable Secure Digital Multimedia Card (SD MMC)
- Manages and prints test results on a PC (using included LinkWare software).

Package Contents

Take a moment to check the shipping container to make sure that the contents match the supplied items listed below. If any item is damaged or missing, contact your place of purchase.

- DTX Fiber Optic Meter (DTX-FOM)
- SimpliFiber 850/1300 LED optical source
- This Users Guide
- CD-ROM with the Getting Started Guide in multiple languages
- Registration card.

Registration

Please take the time to register your DTX-FTK. Registering your product with Fluke Networks gives you access to valuable product update information, troubleshooting tips, and other support services.

To register, go to the Fluke Networks website at www.flukenetworks.com/registration and fill out the online registration form.

Additional Answers to Your Cable Testing Questions

The Fluke Networks Knowledge Base answers common questions about Fluke Networks products and provides articles on cable testing techniques and technology.

To access the Knowledge Base, log on to www.flukenetworks.com, then click the **knowledge base** link at the top of the page.

The website www.cabletesting.com also answers common questions about cable testing and provides articles on standards, testing, documentation, and other reference information.

Contacting Fluke Networks

www.flukenetworks.com

support@flukenetworks.com

+1-425-446-4519

- Australia: 61 (2) 8850-3333 or 61 (3) 9329 0244
- Beijing: 86 (10) 6512-3435
- Brazil: 11 3044 1277
- Canada: 1-800-363-5853
- Europe: +44 1923 281 300
- Hong Kong: 852 2721-3228
- Japan: +81-3-3434-0181
- Korea: 82 2 539-6311
- Singapore: +65-6738-5655
- Taiwan: (886) 2-227-83199
- USA: 1-800-283-5853

Visit our website for a complete list of phone numbers.

The DTX Fiber Optic Meter

The DTX Fiber Optic Meter (DTX-FOM) enables you to measure optical power when used with a far end source, such as a SimpliFiber 850/1300. The meter is inserted into the DTX CableAnalyzer's main module cavity (see Figure 3) and connects to the tester through the digital interface.

Figure 1 shows a diagram of the DTX-FOM. This instrument has a single SC input connector that receives optical signals for loss and power measurements. Make sure that when the instrument is not in use that you cover the **INPUT** connector with the dust cap.

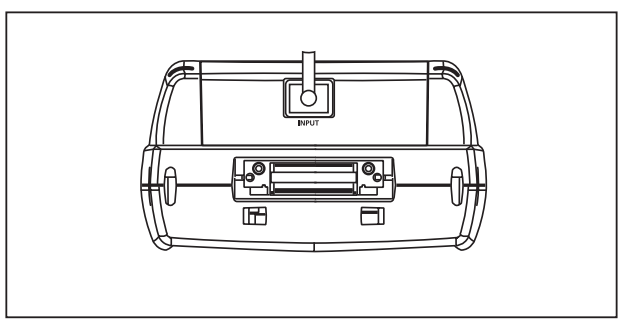

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Figure 1. DTX FOM

Taking Care of Your DTX-FOM

This section describes how to care for your DTX-FOM and provides important safety information and precautions for use.

Safety Precautions

⚠ Warning

To avoid possible exposure to hazardous invisible LED radiation and to prevent eye damage:

- **Do not open the case. There are no user-serviceable parts inside.**
- **Use of controls, adjustments, or procedures not stated herein might result in hazardous radiation exposure.**

Care and Usage Instructions

To obtain reliable test results, always follow proper cleaning and maintenance procedures:

- Always inspect the fiber connectors before making connections.
- Clean the case with a soft cloth and mild detergent. Do not use abrasives or solvents.
- Periodically clean the fiber optic meter and source connectors with optical-grade tissue and optical-grade alcohol or with filtered, compressed air.
- Protect the **INPUT** connector with the dust cap when the unit is not in use.

Calibration and Service

Once a year, the DTX-FOM requires calibration at a service center to ensure that it meets or exceeds the published accuracy specifications. Contact an authorized Fluke Networks Service Center for information on getting the instrument calibrated.

The SimpliFiber 850/1300 Source

The SimpliFiber 850/1300 Source provides a consistent dual wavelength light signal that is injected into fiber cable. Figure 2 shows the tester's front panel. Following the figure, Table 1 provides descriptions of the numbered items in the diagram.

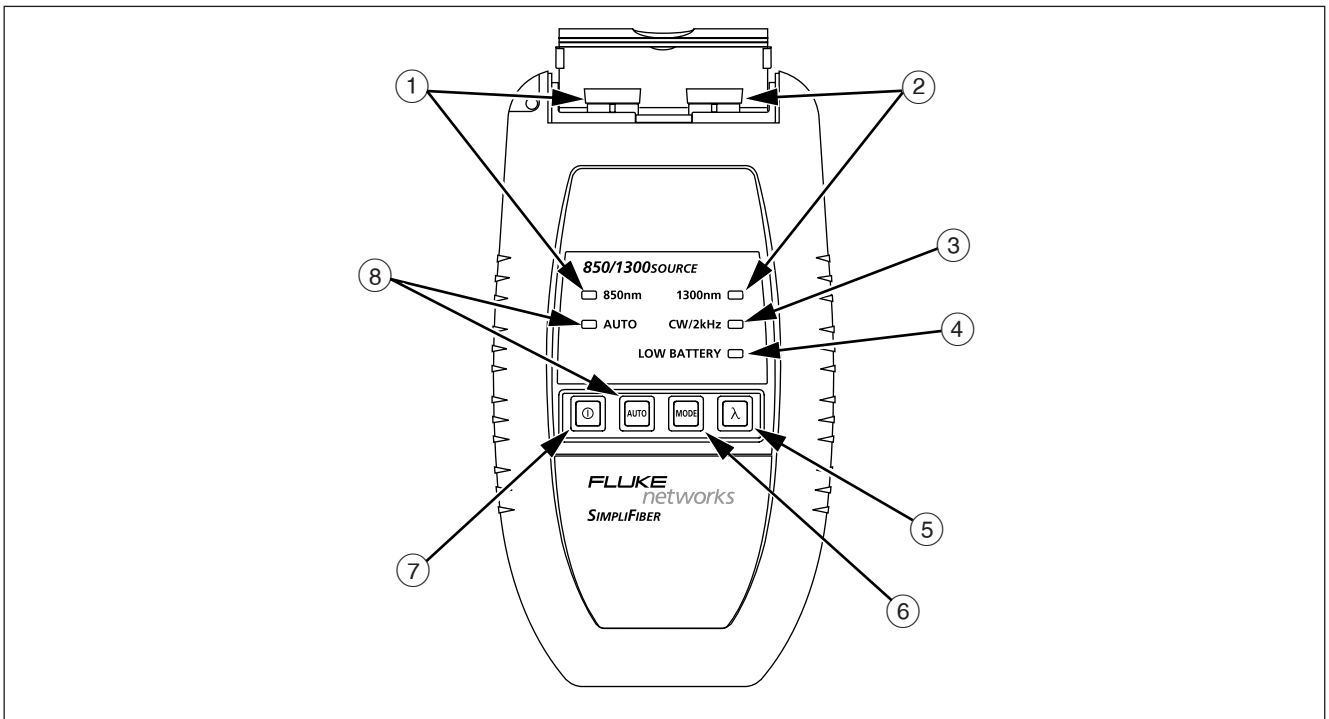

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Figure 2. SimpliFiber 850/1300 Source Front Panel

Table 1. Description of Items on the SimpliFiber 850/1300 Source Front Panel

Item	Description
①	850 nm port with SC connector. The **850 nm** LED lights when the port is active.
②	1300 nm port with SC connector. The **1300 nm** LED lights when the port is active.
③	**Cw/2kHz** LED. This LED lights steady when the output is in continuous wave (CW) mode and blinks when the output is modulated at 2 kHz. Press MODE to switch modes. Use continuous wave (CW) mode for making loss or power measurements with a meter other than the DTX-FOM. Use the 2 kHz modulated mode for identifying fibers with a fiber identifier.
④	**LOW BATTERY** LED. Lights when the battery power is low (see "Replacing the Batteries").
⑤	Switches the output from 850 nm to 1300 nm.
⑥	Switches the output from continuous wave (CW) to 2 kHz modulated modes.
⑦	**On/off** key.
⑧	Switches the output to **Auto** mode, which is used only with the DTX-FOM. In **Auto** mode, the output is encoded to tell the DTX-FOM which wavelength is being transmitted. Press MODE to exit **Auto** mode.

Taking Care of Your SimpliFiber 850/1300 Source

This section describes how to care for your SimpliFiber 850/1300 Source and provides important safety information and precautions for using your tester.

Safety Precautions

Please observe the following safety regulations when using the SimpliFiber 850/1300 Source.

⚠ Warning Class 1 Laser Product

To avoid possible eye damage caused by hazardous radiation:

- **Never look directly into the optical output connectors. Some sources produce invisible radiation that can permanently damage your eyes.**
- **Do not open the case, except to change the batteries. There are no user-serviceable parts inside.**
- **Do not modify the source.**
- **Do not magnify the source output. Use only approved connectors and adapters.**
- **Do not use controls, adjustments, or procedures not documented or approved by Fluke Networks.**

Care and Usage Instructions

Treat the SimpliFiber 850/1300 Source with care to ensure the best performance.

- Clean the case with a soft cloth and mild detergent. Do not use abrasives or solvents.
- Always clean the fiber optic connectors before use. Use lint-free swabs, wipes moistened with isopropyl alcohol, or pre-moistened swabs or wipes approved for use on fiber connectors. Always dry the connectors immediately after cleaning.
- Periodically inspect the endfaces of the connector with a fiber microscope, such as a Fluke Networks FiberInspector Video Microscope. If an endface is damaged, contact Fluke Networks for service information.

Before testing, let the SimpliFiber 850/1300 Source stabilize for five minutes after you turn it on.

Replacing the Batteries

The SimpliFiber 850/1300 Source uses two AA alkaline batteries. When the **Low Battery** LED lights, replace the batteries. The battery compartment is located on the back panel of the tester.

Calibration and Service

The SimpliFiber Source should be calibrated annually with specialized equipment. Contact an authorized Fluke Networks Service Center for service requirements and information on getting the tester calibrated.

Getting Started

Before you begin any job, you need to do the following:

Warning

Read all "Safety Precautions" and "Care and Usage Instructions" before using the SimpliFiber 850/1300 Source and the DTX-FOM.

- Clean the connectors and adapters.
- Test your patch cords.

Cleaning the Connectors and Adapters

Clean and inspect the fiber connectors. Use 99 %-pure isopropyl alcohol and optical-grade wipes or swabs to clean connectors as follows:

- Connector ends: Wipe the end of the ferrule with a swab or wipe lightly moistened with alcohol. Dry with a dry swab or wipe.

Note

Use a 2.5 mm foam swab for cleaning the tester's optical connectors.

- Bulkhead connectors: Dip the tip of a foam swab in alcohol; then touch the swab to a dry wipe. Touch a new, dry swab to the alcohol spot on the wipe. Push the swab into the connector; twist it around three to five times against the endface, then remove and dispose of the swab. Dry the connector with a dry swab by twisting it around in the connector three to five times.
- Inspect connectors with a fiber microscope, such as the Fluke Networks FiberInspector Video Microscope before making connections.

Periodically clean fiber adapters with a swab and alcohol. Dry the adapters with a dry swab before use.

Always cover unused connectors with dust caps or plugs. Clean dust plugs periodically with a swab or wipe and alcohol.

Testing Your Patch Cords

You should make it a habit to test your patch cords before each job. To do this, use another set of known-good patch cords to set a reference and run an autotest on each patch cord. For detailed instructions on verifying the performance of your patch cords, see Appendix A.

If you need to replace your patch cords, choose replacements that meet the following requirements:

- Core and cladding size: match the fiber to be tested
- Connector polish: PC or UPC
- Patch cord length: maximum 5 m

To ensure optimum performance from your testers, obtain replacement patch cords from Fluke Networks.

Setting Up and Making Connections

To set up the DTX-FTK up for testing, you need do the following:

- Insert the DTX-FOM into the DTX CableAnalyzer
- Configure the DTX CableAnalyzer's **Fiber** settings
- Set the reference level for the test
- Connect the testers to the fiber-link-under-test.

Inserting and Removing the DTX-FOM

The DTX-FOM is inserted directly onto the mainframe of the DTX CableAnalyzer. Figure 3 shows you how to insert and remove the meter.

Caution

Turn off the CableAnalyzer before inserting or removing the DTX-FOM.

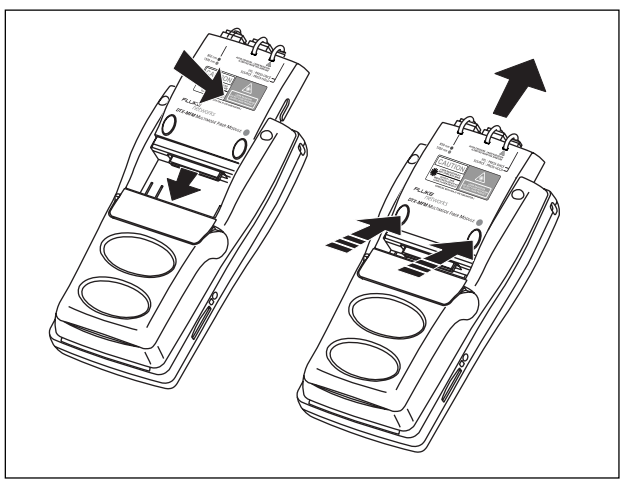

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Figure 3. Inserting and Removing the DTX-FOM

Configuring the Fiber Settings

To configure the **Fiber** settings, complete the following:

Warning

Read all "Safety Precautions" and "Care and Usage Instructions" before using the SimpliFiber Source and the DTX-FOM.

1. Turn on the DTX CableAnalyzer.
2. Turn the rotary dial to **SETUP**.
3. Select **Fiber** then press ENTER to display the **Fiber** menu.

   Refer to Table 2 for a list and description the settings on this menu.
4. Select settings for the parameters on the **Fiber** menu.

   The menu has three tabs. Use ◄► to display the different tabs.

Table 2. Test Settings for Fiber

Setting	Description
Fiber Type	Choose the type of fiber you will test. Selecting **Custom** allows you create a fiber type. See the *DTX Technical Reference Handbook* for details.
Test Limit	Select the appropriate test limit for the job. The tester compares the fiber test results to the selected test limit to produce **PASS** or **FAIL** results. Selecting **Custom** lets you create a test limit. See the *DTX Technical Reference Handbook* for details.
Remote End Setup	Set to **Far End Source**. The other settings do not apply to the DTX-FTK.

Table 2. Test Settings for Fiber (continued)

Setting	Description
Bi-Directional	This setting does not apply to Far End Source mode.
Number of Adapters **Number of Splices**	These settings do not apply to Far End Source mode.
Connector Type	Select the type of connector used in the cabling. This setting affects only the diagram shown for reference connections. If the connector type used in the cabling is not listed, select **General**.

Table 2. Test Settings for Fiber (continued)

Setting	Description
Test Method > Method A, B, C	Loss results include connections added after referencing. The reference and test connections determine which connections are included in the results. The **Test Method** refers to the number of end connections included: **Method A**: Loss results include one connection at one end of the link. **Method B**: Loss results include connections at both ends of the link. The reference and test connections shown in this manual produce Method B results, but are modified versions of connections shown in the standards. The modified connections let you connect to links that do not use SC connectors, while ensuring Method B results. For links with small form-factor (SFF) connectors or different connector types at each end, use hybrid patch cords or alternate reference and test connections. See the *DTX Technical Reference Handbook* or visit the Fluke Networks Knowledge Base for suggestions. **Method C**: Loss results exclude connections at the ends of the link. Only fiber loss is measured. Different standards have different names for the three test methods. See Appendix A for details. The *DTX Technical Reference Handbook* provides additional information on test methods. This setting does not affect loss results. It is only saved with the results to record which method you used.
Index of Ref. Source (n) > User Defined or Default	This setting does not apply to Far End Source mode.

Setting the Reference

Accurate repeatable measurements of optical power and signal loss are essential for the installation and maintenance of fiber optic cabling. To make accurate measurements, you first need to set the reference.

The reference you set serves as the baseline power level for insertion loss measurements. Regular setting of the reference helps account for minor variations in source power and connection integrity.

Reference values should not change by more than a few tenths of a dB from day to day. If you observer larger changes, it may indicate a problem with the patch cords or connections (see "Testing Your Patch Cords").

You *should* set the reference at these times:

- At the beginning of each day
- Any time you reconnect a patch cord to the module's input or to another source
- Any time the tester warns you that a reference value is out of date
- Any time you see a negative loss measurement.

You *must* set the reference at these times:

- Any time you start using a different SimpliFiber Source.
- Any time you change the **Test Method** setting in the Fiber Setup (see "Configuring the Fiber Settings").

The Importance of Using Mandrels (for use with an LED source only)

When making reference connections and actual connections to fiber, you should use standardized mandrels. The use of mandrels is strongly recommended when you are measuring optical insertion loss or optical power with an LED source.

The mandrels act as mode filters. They remove unwanted high-order modes from the optical signal when you are testing with an LED source that overfills the fiber. The resulting launch condition is more uniform, which generally improves instrument-to-instrument measurement consistency and loss measurement repeatability.

TIA/EIA-568-B-compliant multimode mandrels for 3 mm test jumpers are available for purchase from Fluke Networks.

Table 3 provides a partial list of mandrel requirements for TIA and ISO standards.

Table 3. TIA/EIA-568 B.1 and ISO/IEC TR 14763-3 Mandrel Requirements

Fiber core size	Standard	Number of Wraps Around Mandrel	Mandrel Diameter for 250 µm Buffered Fiber	Mandrel Diameter for 3 mm (0.12) Jacketed Cable
50 µm	TIA/EIA-568 B.1 7.1	5	25 mm (1.0 in)	22 mm (0.9)
	ISO/IEC TR 14763-3 6.22	5	15 mm (0.6)	15 mm (0.6)
62.5 µm	TIA/EIA-568 B.1 7.1	5	20 mm (0.8)	17 mm (0.7)
	ISO/IEC TR 14763-3 6.22	5	20 mm (0.8)	20 mm (0.8)

Figure 4 below shows you how to wrap the fiber around a mandrel. Place mandrels on the tester's output fiber, as shown in the reference diagram (Figure 5) and the test connection diagram (Figure 6). In both of these diagrams, mandrels are indicated by a loop in the fiber.

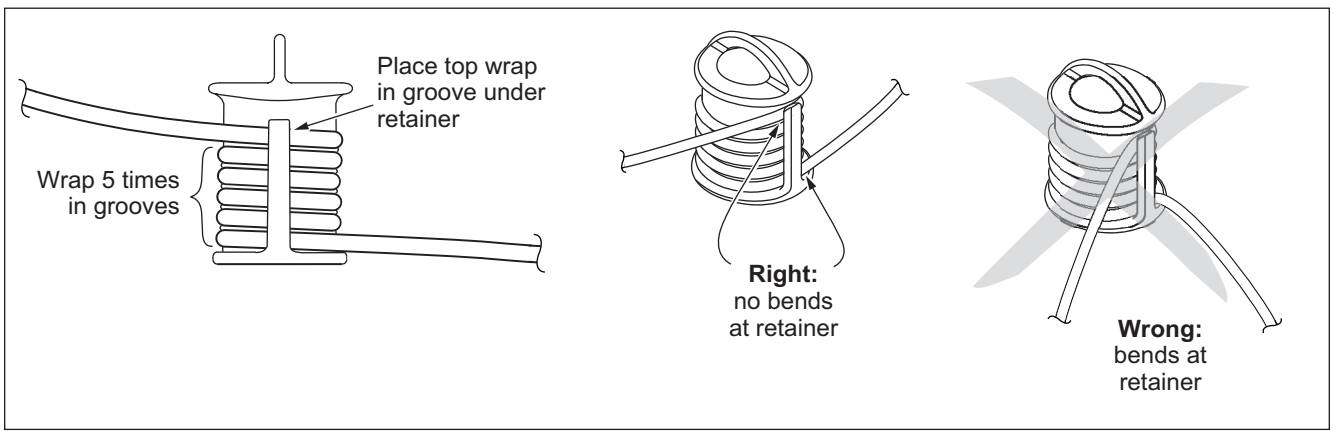

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Figure 4. Wrapping a Patch Cord around a Mandrel

To set the reference, do the following:

Warning

Read all "Safety Information" and "Care and Usage Instructions" before using the SimpliFiber 850/1300 Source and the DTX-FOM.

1. Make sure that both the DTX CableAnalyzer and the SimpliFiber 850/1300 Source are turned off.
2. As shown in Figure 5, connect one end of a patch cord to the output port on the SimpliFiber 850/1300 Source, making sure that you connect it to the port that matches the desired wavelength. Wind the patch cord around the mandrel (as shown in Figure 4).
3. Connect a second patch cord to the **INPUT** port on the DTX CableAnalyzer (see Figure 5).
4. Connect the two patch cords together with the adapter, as shown in Figure 5.
5. Turn on the DTX CableAnalyzer and the SimpliFiber 850/1300 Source.

Note

Let both instruments sit for one minute before setting the reference. Set the reference only after both testers have reached an ambient temperature between 10 °C and 40 °C (50 °F and 140 °F).

6. On the SimpliFiber 850/1300 Source, do the following:

    a. Press λ to select the desired wavelength (**850** or **1300**).

    b. Make sure that the tester is in **Auto** mode. If the **Auto** LED is not lit, press AUTO.

7. On the DTX CableAnalyzer, turn the rotary dial to **SPECIAL FUNCTIONS**. Select **Set Reference**, then press ENTER.

    The **Set Reference** screen is displayed. This screen shows a reference diagram.

8. Verify that the diagram matches your setup.

9. Press TEST.

    The tester sets the reference and displays the value on the **Set Reference** screen.

10. Press **F2(OK)**.

You can now disconnect the instruments from the adapter and reconnect them to the fiber to be tested (see "Connecting to the Fiber-Link-Under-Test").

Figure 5 shows the reference connections for testing in far end source mode:

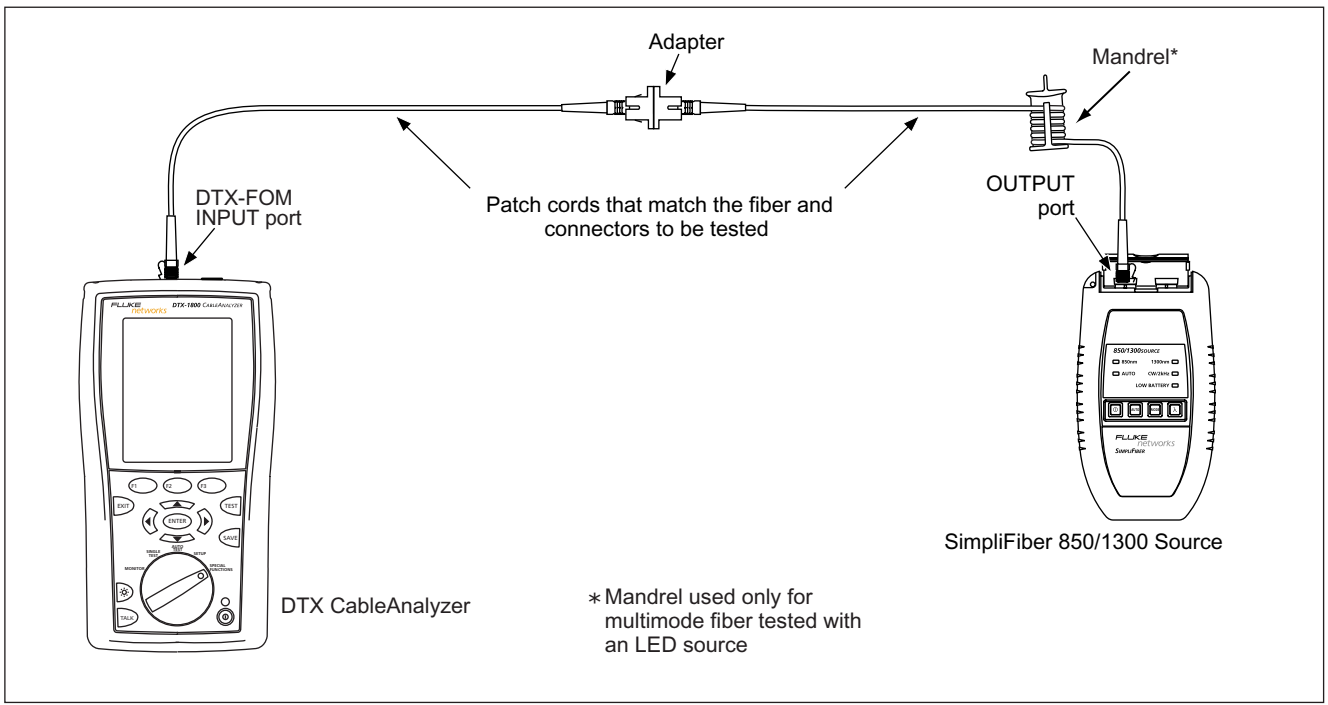

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Figure 5. Reference Connections

Connecting to the Fiber-Link-Under-Test

Figure 6 shows how to connect the instruments to the fiber optic cable when measuring insertion loss.

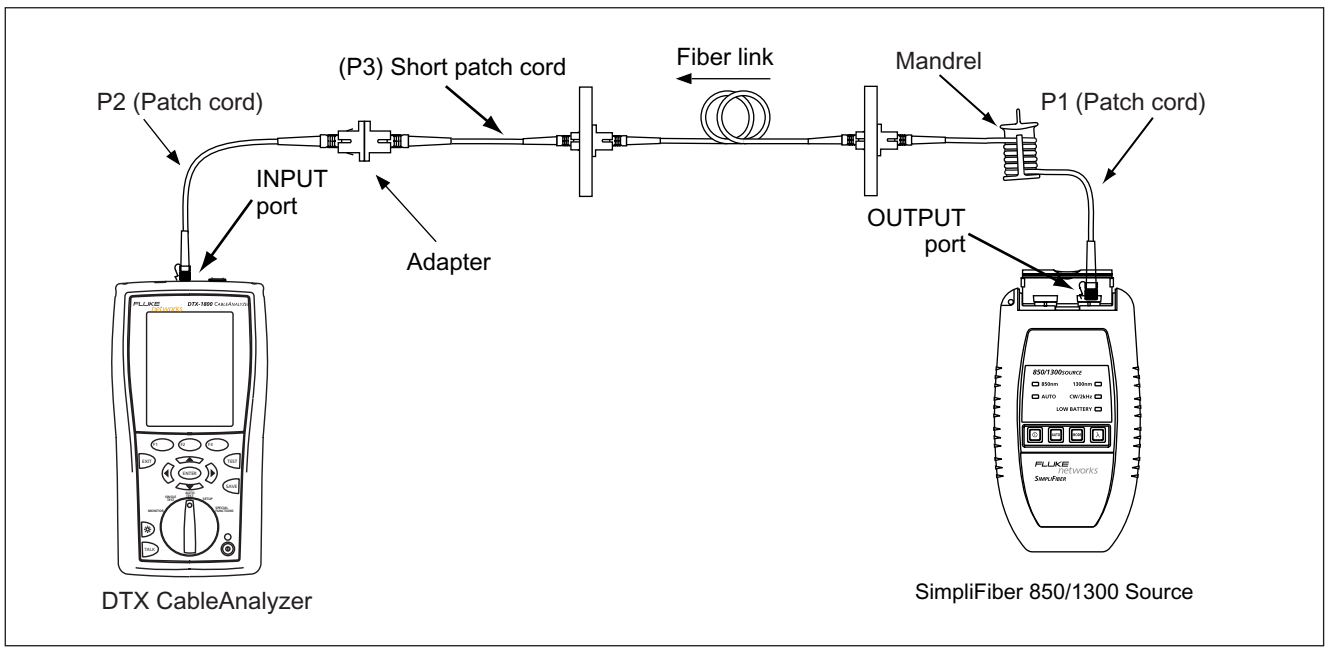

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Figure 6. Connection Diagram: Far End Source Mode

Figure 7 below and Figure 8 on the next page each show a different type of connection for monitoring optical power.

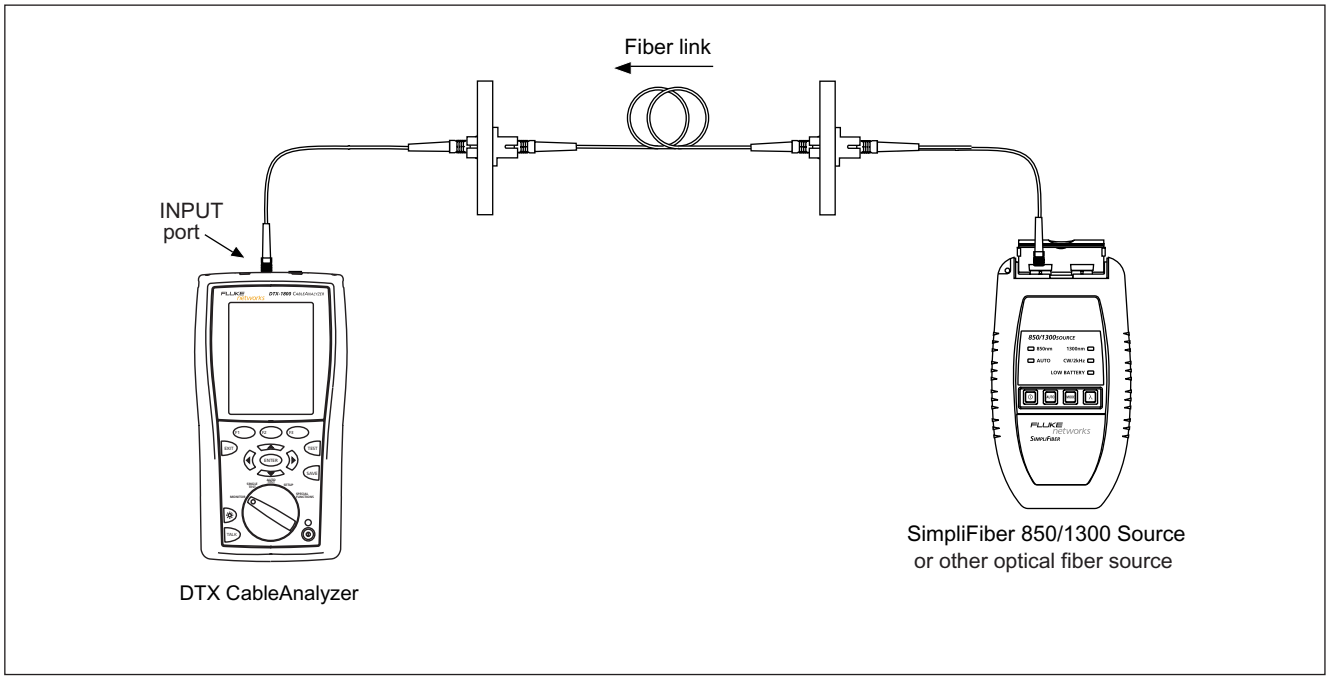

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Figure 7. Connection Diagram: Monitoring Optical Power at the End of a Link

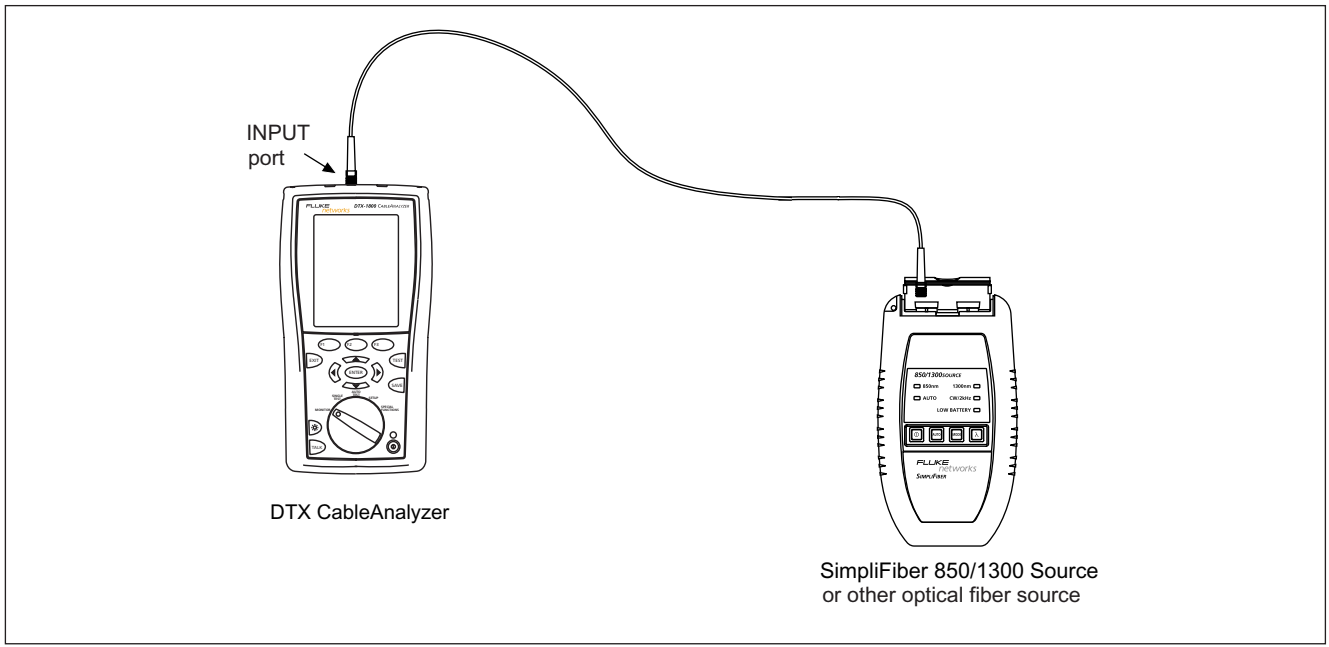

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Figure 8. Connection Diagram: Monitoring Optical Power at a Source

Measuring Loss

Loss measures the signal degradation in fiber optic cabling. In this test, the SimpliFiber 850/1300 Source injects a signal into the fiber cable, and the DTX-FOM measures the received signal at 850 nm or 1300 nm.

You can measure loss in autotest mode or in single test mode. Both methods are documented in this section. When you are using the DTX-FOM, autotest mode is the recommended method.

Running an AutoTest in Far End Source Mode

To run an autotest, follow these steps:

Caution

If the patch cord was disconnected from the SimpliFiber 850/1300 Source's output since the reference was set, you must set the reference again to ensure that the measurements you obtain are valid. See "Setting the Reference" for details.

1. Connect the testers to the fiber-link-under-test, as shown in Figure 6.
2. Turn on the DTX CableAnalyzer and the SimpliFiber 850/1300 Source.

Note

Let both instruments sit for five minutes. Allow additional time if the DTX-FOM has been stored above or below room temperature.

3. On the SimpliFiber 850/1300 Source, do the following:

   a. Press λ to select the desired wavelength (**850** or **1300**).

   Note

   *The wavelength you select must match the output port (**850** or **1300**) that you connected the patch cord to in Step 1.*

   b. Make sure that the tester is in **Auto** mode. If the **Auto** LED is not lit, press AUTO.

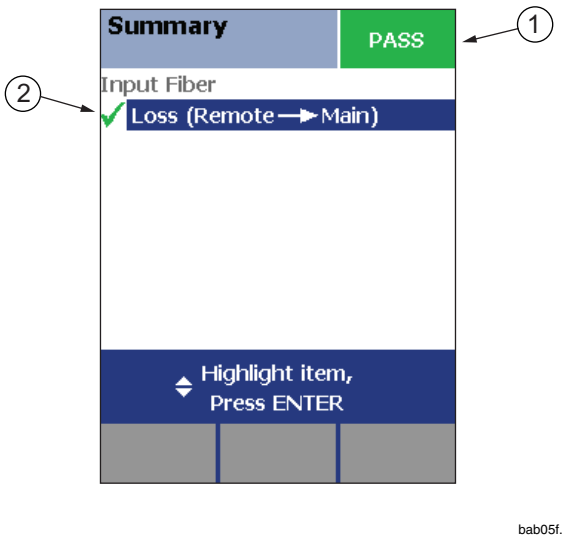
4. On the DTX CableAnalyzer, turn the rotary dial to **AUTOTEST**.

5. Press TEST to run an autotest.

   Autotest results are displayed when the test ends. See "Viewing Autotest Results" for details.

Viewing AutoTest Results

When the autotest is completed, the **Summary** results screen, shown in Figure 9, is displayed:



① Overall result for the fiber (either **PASS** or **FAIL**).

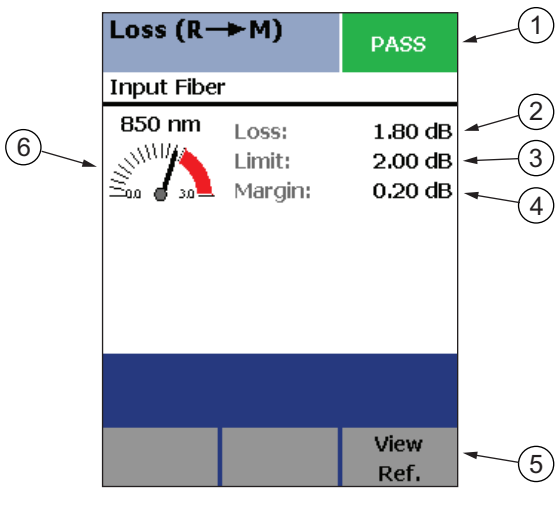
② **Loss (Remote → Main)**: Overall loss on the fiber connected between the output and input ports.

A ✔ indicates **PASS** while an ✘ indicates **FAIL**.

Figure 9. Autotest Summary Results Screen

To view the detailed measurements behind the overall **PASS** or **FAIL** summary press ⌵ to select a measurement. Then, press ENTER.

Figure 10 shows an example of detailed results for the **Loss** test:



① Overall result for the loss measurement, either **PASS** (✔) or **FAIL** (✘).

② Measured loss for fiber. If the value for **Loss** is negative, you should set the reference again and retest the cabling.

③ Maximum loss allowed by the selected test limit.

④ The difference between the limit and the measured loss. The value for **Margin** is negative if the value for **Loss** exceeds the limit.

⑤ Press **F3**(**View Ref.**) to view the reference information used for the test.

⑥ Loss measurement meter. Values in the red zone exceed the selected test limit.

Figure 10. AutoTest Detailed Results Screen

Saving AutoTest Results

To save the **Loss** results data as a test report, press SAVE while the **Summary** or detailed **Loss** results screen is displayed.

Single Test Mode

To run a loss test in single test mode:

1. Connect the SimpliFiber 850/1300 Source and the DTX-FOM as shown in Figure 6.
2. Turn on the DTX CableAnalyzer and the SimpliFiber 850/1300 Source.

   Note

   Let both instruments sit for five minutes. Allow additional time if the DTX-FOM has been stored above or below room temperature.

3. On the SimpliFiber 850/1300 Source, do the following:

   a. Press λ to select the desired wavelength (**850** or **1300**).

   Note

   The wavelength you select must match the output port that the patch cord is connected to.

   b. Make sure that the tester is in **Auto** mode. If the **Auto** LED is not lit, press AUTO.

4. On the DTX CableAnalyzer, turn the rotary dial to **SINGLE TEST**. Then, select **Loss**.
5. Press TEST.

   Loss test results, shown in Figure 10, are displayed as soon as the test ends.

Saving Single Test Results

To save the **Loss** results data as a test report, press SAVE while the **Loss** results screen is displayed.

Monitoring Optical Power

The power meter function enables you to monitor the optical power produced by a source, such as the SimpliFiber 850/1300 or another optical fiber source.

The DTX CableAnalyzer provides two ways to do this:

- **SINGLE TEST** mode: measures power in the current remote end configuration. Takes one power measurement at 850 nm or 1300 nm. If you monitor power in this mode, you can save the power measurement.
- **MONITOR mode**: monitors power continuously at the **INPUT** port at 850 nm or 1300 nm. If you monitor power in this mode, you cannot save the power measurement.

To monitor optical power, do the following:

1. Depending on your particular test scenario, use a patch cord to connect the SimpliFiber 850/1300 Source to the **INPUT** jack on the DTX-FOM.

   Refer to the connection diagram in Figure 7 if you are monitoring optical power at the end of a link or the diagram in Figure 8 if you are measuring optical power at a connection.

2. Power on the SimpliFiber 850/1300 Source and do the following:

   a. Press AUTO.

   b. Press λ to select the desired wavelength (**850** or **1300**).

3. Power on the DTX CableAnalyzer, and do one of the following:

   - Turn the rotary dial to **SINGLE TEST**. Select **Power**, then press TEST to start monitoring.

     OR

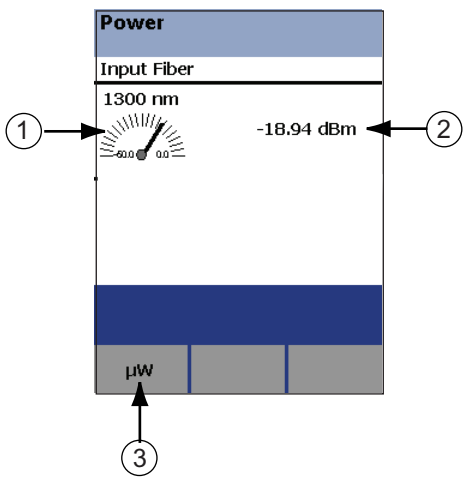
   - Turn the rotary dial to **MONITOR**. Select **Power Meter**, then press TEST to start monitoring.

   When the test ends, optical power measurements are immediately displayed on the **Power Meter** screen:

   - If you ran this test in **SINGLE TEST** mode, the **Power Meter** screen shown in Figure 11 is displayed.
   - If you ran this test in **MONITOR** mode, the **Power Meter** screen shown in Figure 12 is displayed.

Optical Power Measurements

If you monitored power in **SINGLE TEST** mode, optical power measurements like those shown in Figure 11 are displayed:



① Meter shows the power reading taken at the specified wavelength.

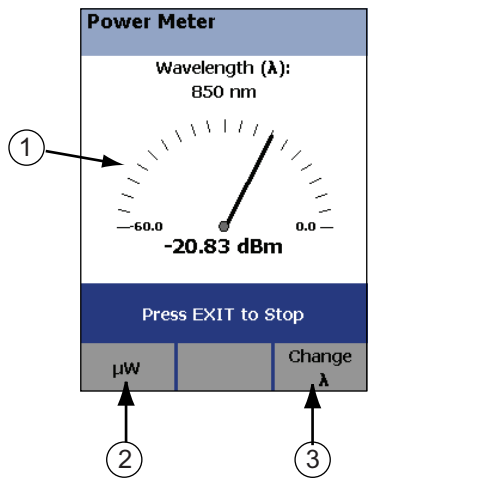
② Power reading in decibels (dBm) or microwatts (µW).

③ Press **F1(µW)** to switch between power readings in decibels and microwatts.

Figure 11. Power Meter Measurements for SINGLE TEST Mode

You can save these measurements. To do so, press SAVE.

If you monitored power in **MONITOR** mode, optical power measurements like those shown in Figure 12 are displayed:



① Meter showing the power reading. The displayed reading is continuously updated until you press EXIT.

② Press **F1(µW)** to switch between power readings in decibels (dBm) and microwatts (µW).

③ Press **F3(Change λ)** to change the wavelength of the far end source.

Figure 12. Power Test Measurements for MONITOR Mode

Because optical power is read continuously, you cannot save power measurements when the tester is in **MONITOR** mode.

Appendix A
Verifying the Performance of Patch Cords

It is good practice to test your patch cords before each job. There are two verification procedures documented in this appendix. The first procedure is a routine one. You will use it regularly to verify that the patch cord you want to use for your measurements is a good one. If you suspect that a patch cord you want to use is faulty, use the second procedure to determine if it is defective.

Verifying the Performance of a Patch Cord

To verify that the patch cord (P3 in Figure 6) you plan to use for link testing is in acceptable condition, complete the following:

1. Obtain fiber cables that are of the type appropriate for your testing situation.

2. Clean both ends of each fiber cable (see "Cleaning the Connectors and Adapters" for details).

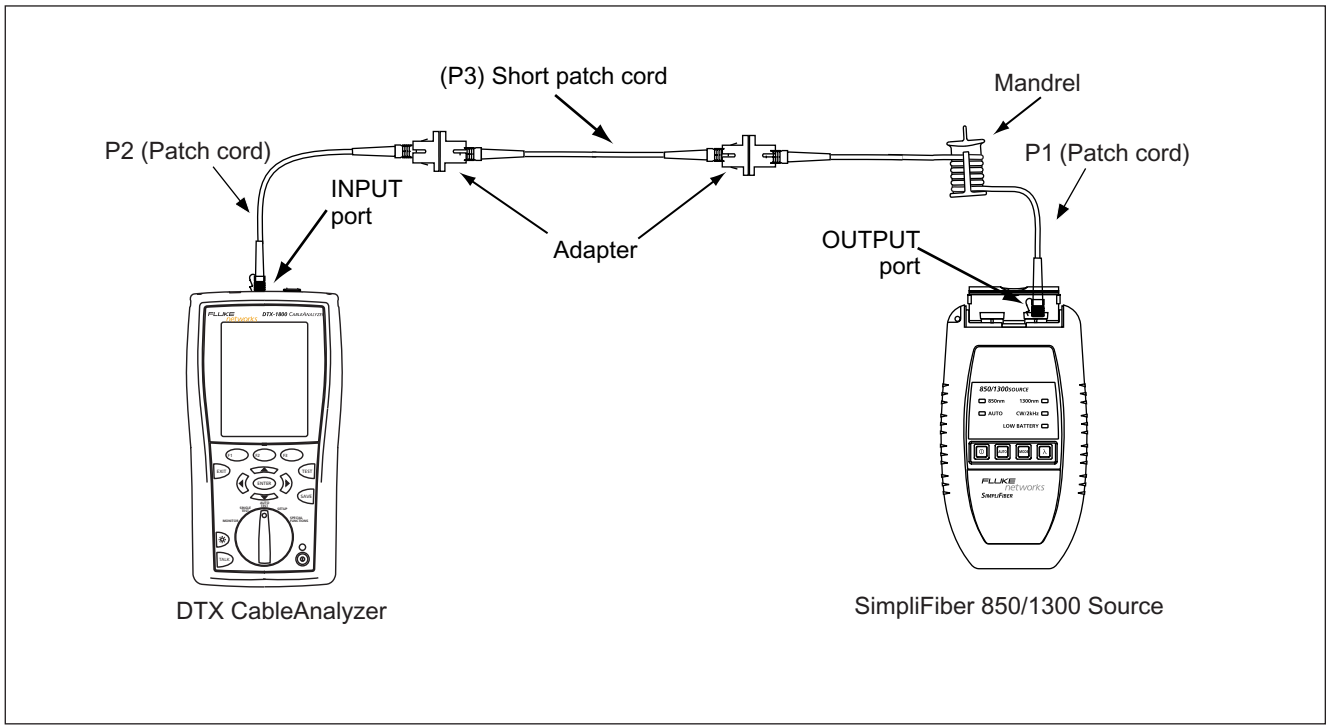
3. Set the reference value (follow the procedure under "Setting the Reference" earlier in this manual).

4. Disconnect the two reference patch cords (P1 and P2) and connect a short patch cord (P3) between the two, as shown in Figure 13.

5. On the DTX CableAnalyzer, turn the rotary dial to **AUTOTEST**. Then, press TEST to run an autotest.

6. Look at the results and verify that the loss reading is less than 0.35 dB (or whatever you decide is appropriate).

   If loss is higher than this value, clean the ends of patch cord 3 (P3) and repeat the autotest. If the loss reading remains too high, replace the patch cord (P3).



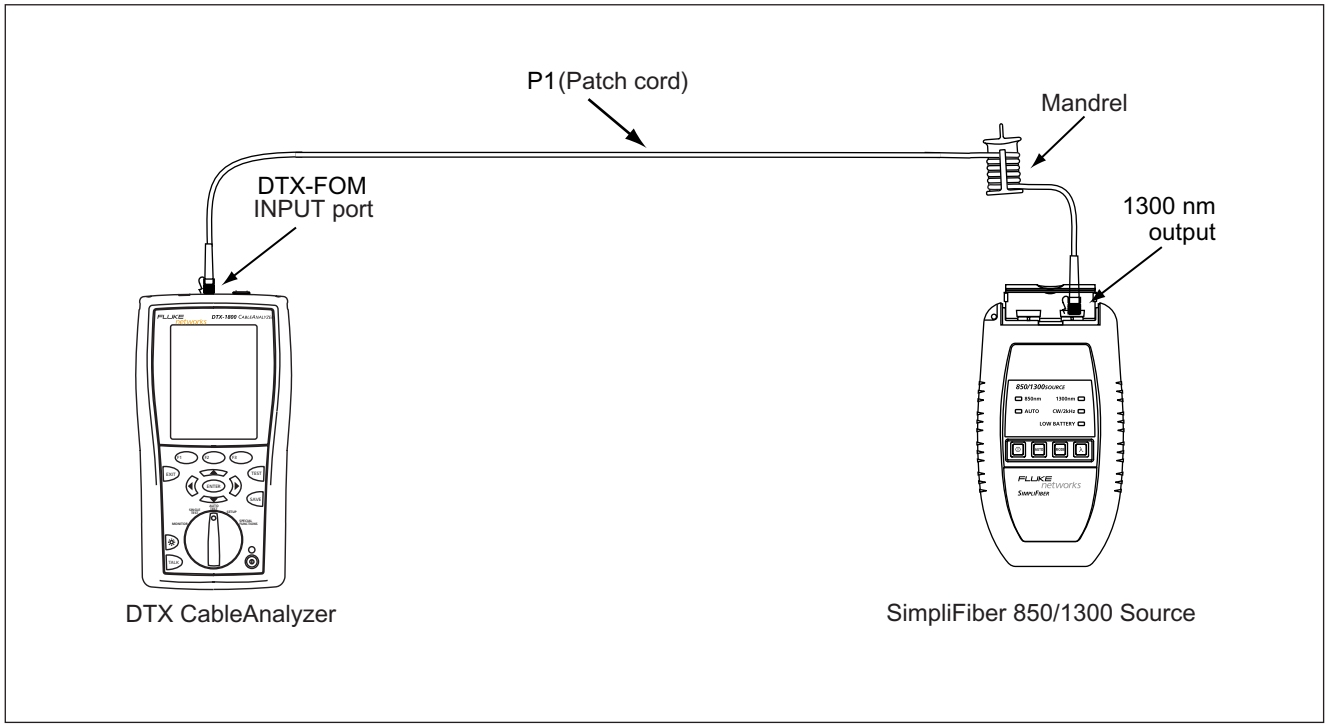
bab13f.eps

Figure 13. Connecting the Test Patch Cord (P3)

Checking a Patch Cord You Suspect is Defective

If you think that a patch cord is defective, use this procedure to verify its performance:

1. Obtain two fiber cables that are of the type appropriate for your testing situation.
2. Clean both ends of each cable (see "Cleaning the Connectors and Adapters" for details).
3. Wind a known-good patch cord (P1) around a mandrel (refer to Figure 4).
4. Connect one end of the patch cord (P1) to the SimpliFiber 850/1300 Source and the other end to the **INPUT** port on the DTX-FOM (refer to the diagram in Figure 14).



bab16f.eps

Figure 14. Connecting a Known-Good Patch Cord

5. Power on the SimpliFiber 850/1300 Source. Then, do the following:

    a. Press λ to select the desired wavelength (**850** or **1300**).

    b. Make sure that the tester is in **Auto** mode. If the **Auto** LED is not lit, press AUTO.

6. Power on the DTX CableAnalyzer and set the reference value. To do this:

    a. Turn the rotary dial to **SPECIAL FUNCTIONS**. Select **Set Reference**, then press ENTER.

    The **Set Reference** screen is displayed. This screen shows a reference diagram.

    b. Verify that the diagram matches your setup.

    c. Press TEST.

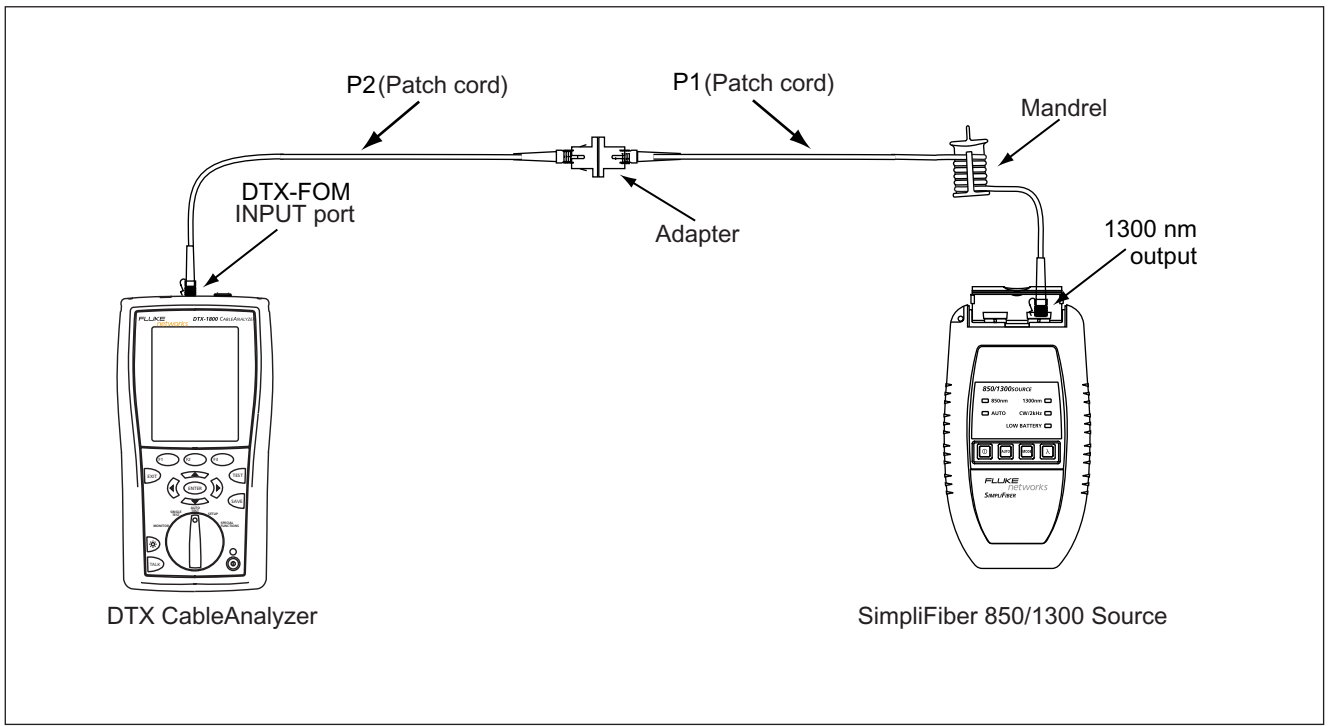
    The tester sets the reference and displays the value on the **Set Reference** screen.

    d. Press **F2**(**OK**).

    Note

    After you set the reference, do not remove the patch cord (P1) from the SimpliFiber 850/1300 Source.

7. Connect a suspect patch cord (P2), as shown in Figure 15.



bab17f.eps

Figure 15. Connecting a Suspect Patch Cord (P2)

8. On the DTX CableAnalyzer, turn the rotary dial to **AUTOTEST**. Then, press TEST to run an autotest.

9. Look at the results and verify that the loss reading is less than 0.5 dB.

   If loss is higher than this value, clean the ends of the patch cord P2) and repeat the autotest. If the loss reading remains too high, the patch cord (P2) is defective and should be replaced.

Appendix B
Test Method Reference Tables

Industry standards use different names for equivalent test methods. Table B-1 shows the names used in this manual and by four common industry standards for the three fiber test methods.

Table B-1. Test Method Names

Link End Connections Included in Loss Results	This Manual	TIA/EIA-526-14A (multi-mode)	TIA/EIA-526-7 (single mode)	IEC 61280-4-1 (multi-mode)	IEC 61280-4-2 (single mode)
1 connection	Method A	Method A	Method A.2	Method 1	Method A2
2 connections	Method B	Method B	Method A.1	Method 2	Method A1
None	Method C	Method C	Method A.3	Method 3	Method A3

Table B-2 shows the test methods required by standards.

Table B-2. Test Methods Required By Standards

Standard or Application	Test Method (as named in this manual)
TIA-568-B	B
ISO 11801	B
EN50173	B
10BASE-FB	A
10BASE-FP	A
10BASE-FL	A
10/100BASE-SX	B
100BASE-FX	B
1000BASE-LX	B
1000BASE-SX	B

Standard or Application	Test Method (as named in this manual)
10GBASE-S	B
10GBASE-L	B
10GBASE-LX	B
10GBASE-E	B
Fibre Channel	B
ATMl	B
FDDI	B
Token Ring	B
Fluke Networks General Fiber	B

Appendix C
Options and Accessories

This appendix lists the options and accessories that are available for the SimpliFiber Source and the DTX Series CableAnalyzers. For the complete list, visit the Fluke Networks website at www.flukenetworks.com. To order options or accessories, contact Fluke Networks as described under "Contacting Fluke Networks".

Table C-1. Options and Accessories

Option or Accessory	Model Number
SimpliFiber 1310 Source (ST Connector)	8251-01
SimpliFiber 1310 Source (SC Connector)	8251-11
SimpliFiber 1550 Source (ST Connector)	8251-02
SimpliFiber 1550 Source (SC Connector)	8251-12
SimpliFiber Source yellow holster with connector cover	1705523
SimpliFiber Source battery door	1704450
DTX-MFM Multimode Fiber Module, 850 nm/1300 nm	DTX-MFM
DTX-GFM Gigabit Fiber Module, 850 nm/1310 nm	DTX-GFM

Table C-1. Options and Accessories (continued)

Option or Accessory	Model Number
DTX-SFM Singlemode Fiber Module, 1310 nm/1550 nm	DTX-SFM
DTX-FTK Fiber Test Kit Fiber optic meter module and 850 nm/1300 nm SimpliFiber Source. Measures power and loss at 850 nm/1300 nm (1310 nm/1550 nm with optional source).	DTX-FTK
DTX-FOM Fiber Optic Meter Module Measures power and loss at 850 nm/1300 nm and 1310 nm/1550 nm.	DTX-FOM
Fiber Jack Accessory Kit, 62.5 µm multimode	NFK1-FJ
LC Accessory Kit, 62.5 µm multimode	NFK1-LC

Table C-1. Options and Accessories (continued)

Option or Accessory	Model Number
MT-RJ Accessory Kit, 62.5 µm multimode	NFK1-MTRJ
MT-RJ Accessory Kit, 50 µm multimode	NFK2-MTRJ
VF-45 Accessory Kit, 62.5 µm multimode	NFK1-VF45
VF-45 Accessory Kit, 50 µm multimode	NFK2-VF45
ST Cable Kit, 50 µm multimode	NFK2-ST
Fiber Optic Cleaning	Kit NF430
ST/ST Singlemode Fiber Optic Adapter	NF300SM
Fiber Optic Adapter, SC/SC for singlemode and multimode connectors	NF310SM
ST/FC Simplex 62.5 µm 1m patch cord	FOC-ST/FC
ST/ST Simplex 62.5 µm 1m patch cord	FOC-ST/ST
ST/SC Simplex 62.5 µm 1m patch cord	FOC-ST/SC

Table C-1. Options and Accessories (continued)

Option or Accessory	Model Number
ST/SMA Simplex 62.5 µm 1m patch cord	FOC-ST/SMA
ST/FC Simplex Singlemode 1m patch cord	NF120SM
ST/ST Simplex Singlemode 1m patch cord	NF100SM
ST/SC Simplex Singlemode 1m patch cord	NF110SM
SC/SC Simplex 62.5 µm 1m patch cord	NF215
ST/ST Simplex 62.5 µm 1m patch cord	NF230
Red Multimode Fiber Mandrel for 50 µm fiber with 3 mm jackets	NF-MANDREL-50
Gray Multimode Fiber Mandrel for 62.5 µm fiber with 3 mm jackets	NF-MANDREL-625
Multimode Fiber Mandrel kit containing two red 50 µm mandrels and two gray 62.5 µm mandrels	NFK1-MANDREL-KIT

Appendix D
DTX-FTK Specifications

This appendix lists the specifications for the DTX-FTK.

DTX Fiber Optic Meter (DTX-FOM)

General

Compatibility	DTX-LT, DTX-1200, DTX-1800 Main unit only
Dimensions (L x W x D)	4.2in x 3.0in x 1.1in (106mm x 76mm x 28mm)
Weight, nominal	0.31lb (0.14kg)

Environmental

Operating temperature	0 °C to 40 °C
Storage temperature	-20 °C to +60 °C
Operating relative humidity (% RH without condensation)	95 % (10 °C to 35 °C) 75 % (35 °C to 40 °C) uncontrolled < 10 °C
Vibration	Random, 2 g, 5 Hz - 500 Hz
Shock	1 m drop onto all corners and faces, test cables not attached
Safety	CE Conforms to relevant European Union directives. c SP us Listed by the Canadian Standards Association
Altitude	Operating: 3000 m
EMC	EN 61326-1

Optical

Input/output (meter/source) connectors	SC/SC
Power meter type	InGaAs detector
Power meter calibrated wavelengths	850 nm, 1310 nm, 1550 nm
Power measurement range	0 to -60 dbm (1310 nm and 1550 nm) 0 to -52 dbm (850 nm)
Power measurement uncertainty[1]	± 0.25 dB
Measurement linearity	±0.1dB[2] (1310 nm and 1550 nm) ±0.2 db[3] (850 nm)
Display resolution, dB or dBm **µW >400, >40, >4, >0.4, ±0.4**	0.01 1, 0.1, 0.01, 0.001, 0.0001
Display update rate	1 reading per second
Re-calibration period	1 year

1. Under the following conditions: Power level -20 dBm, continuous wave
   - at 850 nm: 62.5/125 µm fiber with 0.275 NA
   - at 1310 nm and 1550 nm: 9/125 µm
   - Ambient temperature: 23 C ± 5
2. Linearity for 1310 nm and 1550 nm: between 0 dBm and -55 dBm: ± 0.1 dB < -55 dBm: ± 0.2 dB.
3. Linearity for 850 dBm: between 0 dBm and -45 dBm: ±0.2 dB < -45 dBm: ±0.25 dB

SimpliFiber 850/1300 Source

General

Dimensions (L x W x D)	15.3 x 8.9 x 3.2 cm (6.0 x 3.5 x 1.3 in)
Weight, nominal	0.18kg (0.4 lb)
Battery life (2 replaceable AA alkaline batteries)	850/1300 Source: 10 – 50 hours typical optional 1310 Source: 20 – 100 hours typical optional 1550 Source: 20 –100 hours typical

Environmental

Temperature range, operating	0 to +45 C
Temperature range, storage	-20 to +60 C
Humidity range, operating	10 to 90% RH, non-condensing
Humidity range, storage	0 to 95% RH, non-condensing
Certifications	CE Conforms to relevant European Union directives. Listed by the Canadian Standards Association

Optical

Connector	SC
Emitter type	850/1300 Source: LEDs optional 1310 Source: laser optional 1550 Source: laser
Emitter wavelengths	850/1300 Source: 850 and 1300 nm optional 1310 Source: laser optional 1550 Source: laser
Power output (minimum)	850/1300 Source: -20 dBm optional 1310 Source: -10 dBm optional 1550 Source: -10 dBm
Power output stability (8 hours)	+/- 0.25 dB at 23 C

Index