

OF-500 OptiFiber Certifying OTDR

Users Manual

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OF-500 OptiFiber Certifying OTDR

Note

While this manual describes specific operating procedures for the OptiFiber tester, the fiber test methods described are provided only as quidelines. Your test methods may vary.

Overview of Features

The OF-500 OptiFiber™ Certifying OTDR (hereafter referred to as the tester) is a hand-held Optical Time Domain Reflectometer (OTDR) that locates and characterizes reflective and loss events in multimode and singlemode fibers. The tester is optimized for use on the shorter fiber runs typically installed in premises (building and campus) networks. Typical test ranges are up to 2 km for multimode fiber and up to 10 km for singlemode fiber.

The tester offers the following features:

- Automated OTDR trace and event analysis help you identify and locate faults on multimode (850 nm and 1300 nm; 50 μm and 62.5 μm) and singlemode (1310 nm and 1550 nm; 9 μm) fiber.
- Displays OTDR results in summary format, as a table of events, or as an interpretive OTDR trace.
 PASS/FAIL results are based on factory-installed limits or limits you specify.
- ChannelMap[™] function provides an intuitive diagram of the connectors and segment lengths in a channel.
- Optional FiberInspector[™] Video Probe lets you inspect fiber endfaces and save the images.

- Optional modules add power meter and loss/length test set functions to the standard OTDR.
- Saves hundreds of test results on a removable memory card or in internal memory.
- Context-sensitive online help gives you quick access to operating instructions and fiber troubleshooting information.
- LinkWare[™] software lets you upload test results to a PC and create professional-quality test reports.

Accessing the Technical Reference Handbook

The OF-500 OptiFiber Technical Reference Handbook provides additional information on the tester. The handbook is available on the OptiFiber Product Manuals CD included with your tester and on the OptiFiber product page on the Fluke Networks website.

Registration

Registering your product with Fluke Networks gives you access to valuable information on product updates, troubleshooting tips, and other support services. To register, fill out and return the postage-paid card provided, or fill out the online registration form on the Fluke Networks website at www.flukenetworks.com/registration.

Contacting Fluke Networks

Note

If you contact Fluke Networks about your tester, have the tester's software and hardware version numbers available if possible.

Visit the Fluke Networks website at www.flukenetworks.com. Send email to support@flukenetworks.com.

To call us:

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

Anywhere in the world: +1-425-446-4519

Visit our website for a complete list of phone numbers.

Unpacking

The OF-500 OptiFiber packages come with the accessories listed below. If something is damaged or missing, contact the place of purchase immediately.

- OF-500 OptiFiber tester with battery pack
- OFTM-5610 multimode OTDR module
- 62.5/125 μm multimode launch fiber, 100 m, SC/SC
- SC/SC adapter
- Carrying strap
- 16 MB memory card
- USB cable for PC communications
- AC adapter
- Users Manual
- Product Manuals CD
- LinkWare Software CD
- Warranty registration card

Model OF-500-02

- OF-500 OptiFiber tester with battery pack
- OFTM-5611 multimode OTDR module with power meter option
- 62.5/125 μm multimode launch fiber, 100 m, SC/SC
- One 62.5/125 μm multimode patch cord, 2 m, SC/SC
- One 62.5/125 μm multimode patch cord, 0.3 m, SC/SC
- SC/SC adapter
- Soft carrying case for tester
- Carrying strap
- 16 MB memory card
- USB cable for PC communications
- AC adapter
- Users Manual
- Product Manuals CD
- LinkWare Software CD
- Warranty registration card

- OF-500 OptiFiber tester with battery pack
- OFTM-5612 multimode OTDR module with power meter and loss/length options
- OFTM-5350 FiberInspector Video Probe with adapter tip kit
- 62.5/125 μm multimode launch fiber, 100 m , SC/SC
- One 2.5/125 μm multimode patch cord, 2 m, SC/SC
- One 62.5/125 μm multimode patch cord, 0.3 m, SC/SC
- SC/SC adapter
- Soft carrying case for tester
- Carrying strap
- Soft carrying case for accessories
- Hard carrying case for tester
- 16 MB memory card
- USB memory card reader
- USB cable for PC communications
- AC adapter
- Users Manual
- Product Manuals CD
- LinkWare Software CD
- Warranty registration card

- Two OF-500 OptiFiber testers with battery packs
- Two OFTM-5612 multimode OTDR modules with power meter and loss/length options
- Two OFTM-5350 FiberInspector Video Probes with adapter tip kits
- Two 62.5/125 μm multimode launch fibers, 100 m , SC/SC
- Four 62.5/125 μm multimode patch cords, 2 m, SC/SC
- Two 62.5/125 μm multimode patch cords, 0.3 m, SC/SC
- Two SC/SC adapters
- Two soft carrying cases for testers
- Two carrying straps

- Two soft carrying cases for accessories
- Two hard carrying cases for testers
- Two 6 MB memory cards
- USB memory card reader
- Two USB cables for PC communications
- Two ac adapters
- Two Users Manuals
- Two Product Manuals CDs
- LinkWare Software CD
- Warranty registration card

- OF-500 OptiFiber tester with battery pack
- OFTM-5611 multimode OTDR module with power meter option
- OFTM-5631 singlemode OTDR module with power meter option
- OFTM-5354 FiberInspector Video Probe with adapter tip kit
- 62.5/125 μm multimode launch fiber, 100 m , SC/SC
- 9/125 μm singlemode launch fiber, 130 m , SC/SC
- Two 62.5/125 μm multimode patch cords, 2 m, SC/SC
- One 62.5/125 μm multimode patch cord, 0.3 m, SC/SC
- Two 9/125 μm singlemode patch cords, 2 m, SC/SC
- One 9/125 μm singlemode patch cord, 0.3 m, SC/SC
- One SC/SC adapter

- Soft carrying case for tester
- Carrying strap
- Soft carrying case for accessories
- Hard carrying case for tester
- 16 MB memory card
- USB cable for PC communications
- AC adapter
- Users Manual
- Product Manuals CD
- LinkWare Software CD
- Warranty registration card

Safety Information

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To avoid possible eye damage caused by hazardous radiation and to avoid possible fire, electric shock, or personal injury:

- Never look directly into optical connectors.
 Some sources produce invisible radiation that can permanently damage your eyes.
- Never run any tests that activate the tester's outputs unless a fiber is attached to the output.
- Do not open the case; no user-serviceable parts are inside.
- Do not modify the tester.
- Do not use magnification to view the optical outputs without proper filtering.
- Use of controls, adjustments, or procedures not stated herein might result in hazardous radiation exposure.
- Use only the ac adapter provided to charge the battery or power the tester.
- Do not use the tester if it is damaged. Inspect the tester before use.

 If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Caution

To avoid damaging the tester or cables under test and to avoid data loss:

- Always turn the tester off before removing or installing a module.
- Never connect the OTDR port to an optical source. Doing so can damage the OTDR receiver.
- Never connect the tester to an active network, except when using the power meter. Doing so causes unreliable test results and can disrupt network operations.
- If the tester shows an error because the power reading is too high, immediately disconnect the source from the tester. The tester is not designed for measuring higher power levels, such as produced by CATV, optical amplifiers, and cellular systems.

- Avoid touching reflective surfaces (such as metal) to the end of a fiber cable plugged into the OTDR when the OTDR is operating. An open fiber connector end face has about a 4% reflection. Holding a reflective surface near the connector end face may cause much greater than a 4% reflection, which may damage the photodetector in the OTDR.
- Use proper cleaning procedures to clean all fiber connectors before every use. Neglecting this step or using improper procedures can cause unreliable test results and may permanently damage the connectors.
- Use a FiberInspector video probe to periodically inspect the tester's optical connectors for scratches and other damage.

- Read the instructions for splice machines before using the OTDR to monitor splicing procedures.
 The OTDR can interfere with the light injection detection techniques used by some splicers.
- To avoid unreliable test results, connect the ac adapter or replace the battery as soon as the low battery indication appears.
- You may use a PC to move or copy test record (.tst) files from a memory card, but do not rename the .tst files. Doing so may result in loss of data.
- Never remove the memory card while the memory card's LED is on. Doing so can corrupt the data on the card.

Powering the Tester

You can power the tester with the ac adapter included or with the removable lithium ion battery pack.

Press (1) to turn the tester on.

Charging the Battery

Before you rely on battery power for the first time, charge the battery for about 2 hours with the tester turned off.

You can also charge the battery when it is detached from the tester, as shown in Figure 1.

A fully-charged battery lasts about 8 hours during typical use. The battery typically takes about 4 hours to fully charge when the tester is turned off.

Notes

You do not need to fully discharge the battery before recharging it.

The battery will not charge if its temperature is outside the range of 32 °F to 113 °F (0 °C to 45 °C).

Checking the Battery Status

Many of the tester's screens show a battery status icon near the lower-right corner.

To see more information about the battery status, press for detailed information about the battery status screen.

Changing the Language

To change the tester's language, do the following:

- Press SETUP
- 2. Press () once to select the **System** tab.
- Press to select LANGUAGE; then press .
- 4. Use to select the desired language; then press

Additional languages for the tester may be available with software updates available on the Fluke Networks website. Use LinkWare software to install or remove languages. See "Updating the Tester's Software" on page 66 for details.

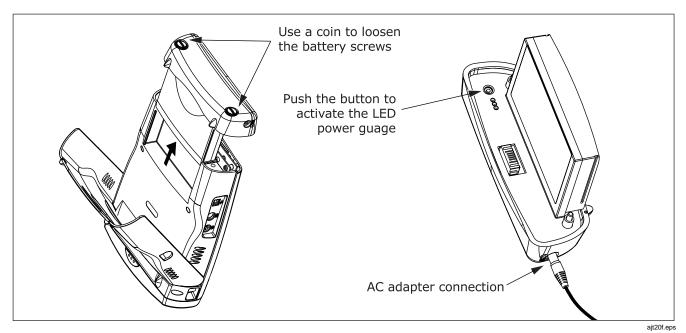


Figure 1. Battery Pack Features

10

Removing and Installing the Module

The tester's capabilities depend on which test module is installed. Figure 2 shows how to remove the module.

Caution

To avoid corrupting the tester's software, always turn the tester off before removing or installing a module.

Verifying Operation

The tester performs a basic self-test when you turn it on. If the tester reports an error or does not turn on, refer to "If Something Seems Wrong" on page 71.

The tester shows the model number of the installed module in the upper-right corner of the screen. If the screen shows **No Module Installed, Problem with Module,** or **The module needs a software update** refer to "If Something Seems Wrong" on page 71.

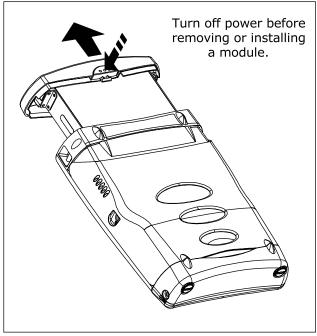


Figure 2. Removing the Module

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Basic Features

The following sections describe the tester's basic features and introduce the tester's menu system.

Front Panel Features

Figure 3 describes the tester's front panel features.

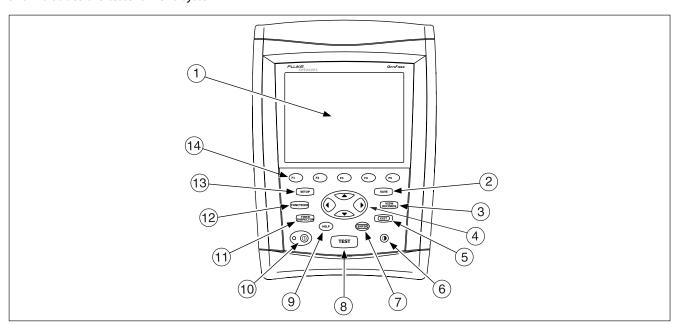


Figure 3. Front Panel Features

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- 1 LCD display with backlight and adjustable brightness.
- (2) SAVE: Saves test results on the removable memory card or in internal memory.
- (3) EXECUTE: Shows the test records saved on the memory card or in internal memory.
- 4 • Navigation keys let you move the cursor or highlighted area on the screen and increment or decrement alphanumeric values.
- (5) Exits the current screen.
- 7) Selects the highlighted item on the screen.
- (8) TEST: Starts the currently selected fiber test. The test that will run is shown in the upper-left corner of the display. To change the test, press (1) Change Test from the HOME screen or select a test from the FUNCTIONS menu.

- 9 HED: Shows a help topic related to the current screen. To see the help index, press HED again.
- ① ①: On/off key.
- 11 Activates the optional FiberInspector video probe, which lets you inspect fiber endfaces and save the images with test results.
- (12) Functions: Shows a list of additional test, configuration, and status functions.
- (13) SETUP: Shows the menus you use to configure the tester.
- (14) (12) (23) (44) (55): The five softkeys provide functions related to the current screen. The current functions are shown on the screen above the keys.

Figure 3. Front Panel Features (cont.)

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Side and Top Panel Features

Figure 4 describes the tester's connectors and other features on the side and top panels.

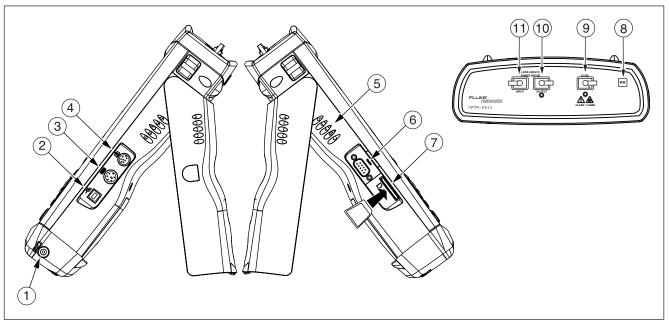


Figure 4. Connectors

ajt14f.eps

- Connector for the ac adapter. The LED turns on when the adapter is connected to ac power.
- USB port for uploading test reports to a PC and downloading software updates from a PC to the tester. See the LinkWare documentation for details on using the USB port.
- Six-pin mini DIN connector for an optional external PS2 keyboard.
- 4 Eight-pin mini DIN connector for the optional FiberInspector video probe.
- 5 Fan vents.
- 6 RS-232C serial port for uploading test reports to a PC and downloading software updates from a PC to the tester. See the LinkWare documentation for details on using the serial port.

- Slot for the removable memory card. The LED lights when the tester is writing to or reading from the memory card.
- 8 Multimode (MM) or singlemode (SM) label for the module.
- SC connector for the OTDR. The LED lights when the laser is active.
- (10) SC output connector. Transmits optical signals for loss/length tests.
- (1) SC input connector. Receives optical signals for power measurements and loss/length tests.

△AWarning

Never look directly into optical connectors. Some sources produce invisible radiation that can permanently damage your eyes.

Figure 4. Connectors (cont.)

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The HOME Screen

The **HOME** screen shows important test and job settings you might need to change to configure the tester for your needs. Figure 5 describes a typical home screen.

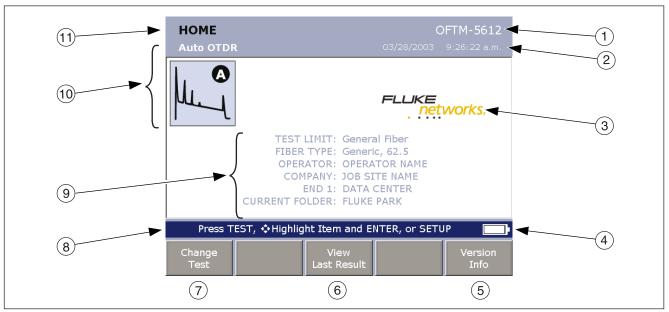


Figure 5. Home Screen for OTDR with Loss/Length Option

ajt13f.eps

- Model number of the installed module.
- The current date and time.
- 3 Owner's logo. See the OptiFiber Technical Reference Handbook (on the Product Manuals CD) or the LinkWare online help for information on changing the logo.
- 4 Battery status icon. For more information about the battery, press [UNICTIONS]; then select **Battery Status**.
- (5) Press (5) to see the hardware and software versions and calibration dates for the tester and the installed module.
- 6 If the last test run was not saved, you can press (3) View Last Result to see the test's results.
- 7 Press (1) Change Test to switch test modes. See (10).

- 8 Action prompts. For most screens, this area prompts you on what keys to press.
- 9 Important test and job settings. To change these settings, use (to highlight a setting; then press . Selecting TEST LIMIT or FIBER TYPE lets you change the item. Selecting the limit's or type's name lets you see that item's settings. You may also access the tester's settings by pressing SETUP.
- 10 The test mode, which determines what type of test will run when you press TEST. The available modes depend on which module is installed. To change the test mode, press (1) Change Test.
- (11) The name of the current screen.

Figure 5. Home Screen for OTDR with Loss/Length Option (cont.)

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Using the Setup Menus

To access the tester's settings, press (SETUP). Figure 6 introduces the **SETUP** menus.

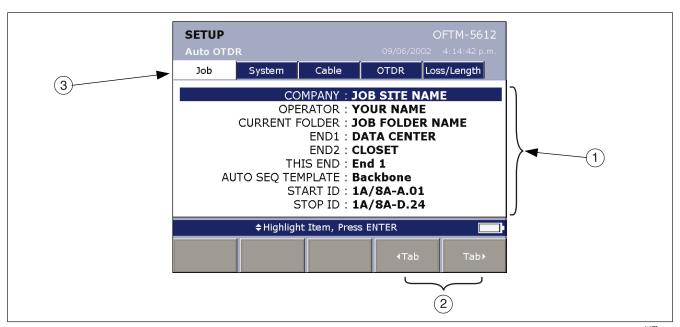


Figure 6. The SETUP Screen

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1) The settings available on the current tab.

Note

To see details about a setting, highlight the setting; then press | HEP.

- ② Use Tab and Tab to move among tabs on the SETUP screen.
- 3 Tabs for the setup menus:
- Job settings apply to the fiber installation you are testing and are stored with saved test results. Use these settings to identify the job site, set up cable ID lists, and identify which end of the cabling you are testing.
- System settings let you localize the tester and set other user preferences, such as the power down timeout and camera type.

The Cable tab lets you select the type of fiber cable you
will test and define some cable characteristics for
loss/length tests. You can also change the index of
refraction if you do not want to use the default values.

Note

Select a fiber type before selecting a test limit. The fiber type determines which test limits are available.

- The OTDR tab lets you select a test limit and wavelength for OTDR tests and enable launch fiber compensation. You can also change settings for Manual OTDR mode.
- The Loss/Length tab appears if the installed module includes the loss/length or power meter option (you can run loss tests in Far End Source mode with the power meter option). Use this tab to configure the loss/length test. See "Using the Loss/Length Option" on page 43 for details.

Different or additional tabs may be available depending on the installed module

Figure 6. The Setup Screen (cont.)

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Using the Online Help

When you press (the tester shows a help topic that relates to the current screen. Blue, underlined words are links to other topics.

Note

The help files are stored in the mainframe (rather than the module) and may describe features not present in the installed module

To go to a linked topic (blue, underlined words), use the left or right arrow keys to highlight the words; then press

To see an index of all help topics, press any time you are in the help system.

Fiber ID Options

You can create or select fiber IDs as follows:

- You can create an ID after you press SAVE. You can also highlight a used or unused ID in a list; then press to edit it into a new ID. The next time you press SAVE, the tester increments the last character of the ID you created (the auto increment feature).
- You can create a list of sequential fiber IDs by configuring a template on the Job tab in Setup.
 Select the IDs from the AUTO SEQ IDs list after you press SAVE.
- You can create ID lists in LinkWare software; then download them to the tester. Select the IDs from the DOWNLOAD IDs list after you press SAVE.
- After you press SAVE, you can use an ID already assigned to a record stored in the current folder. This lets you overwrite existing results or add new results to an existing record. Select the ID from the IDs IN CURRENT FOLDER list after you press SAVE.

Checking the Tester's Status

The following Quick Steps help you verify that the tester is ready for use.

Quick Steps: Checking the Tester's Status □ Check the battery status To view or delete stored records, press RECORDS. Look at the battery icon in the lower-left corner of the To format the memory card press FUNCTIONS; then select screen or press Functions; then select Battery Status. Format Memory Card. A fully-charged battery lasts about 8 hours during Verify that the installed module can run the tests you typical use. need ☐ Check the space available on the memory card The module's model number is shown in the upperright corner of the screen. Insert the memory card you will use, press Functions; then select Memory Status. To review module capabilities, press twice; then select "modules" in the OptiFiber online help index. To see the status of the internal memory, press **Memory** from the **MEMORY STATUS** screen.

Preparing to Save Tests

The following Quick Steps summarize how to configure settings that apply to saved test results.

Quick Steps: Preparing to Save Tests ☐ Set up a job folder Create a list of sequential fiber IDs (See "Fiber ID Options" on page 20 for other ID options.) 1. Insert a memory card into the tester. Select **AUTO SEQ TEMPLATE** on the **Job** tab. 2. Press (SETUP): then select **CURRENT FOLDER** on the Job tab. 2. Press (F1) Change Template to select an ID template. 3. Select an existing folder on the memory card, or press (1) New Folder to create a new folder. 3. Press (2) Edit Start or (3) Edit Stop to create the start and stop IDs; then press (5) Sample List to Enter COMPANY and OPERATOR names on the Job see what the list will look like. tab. 4. Press SAVE when you are finished. **COMPANY** is the customer name, job site, job work order, or other job identifier. Identify the ends of the cabling **OPERATOR** is the name of the OptiFiber user. 1. Enter names for END 1 and END 2 on the Job tab. For example, one end could be TELECOM ROOM and the other could be WORK AREA. 2. Set THIS END to the end you will test from first.

Cleaning and Inspecting Fiber Connectors and Adapters

Always clean and inspect fiber connectors before making connections. Use either of the following for cleaning:

- Lint-free swabs or wipes moistened with isopropyl alcohol
- Pre-moistened swabs or wipes approved for use on fiber connectors

Always dry connectors immediately after cleaning.

The optional FiberInspector video probe lets you inspect connectors and save endface images with test results. See "Using the FiberInspector Option" on page 38 for details.

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

Periodically clean fiber-to-fiber adapters with a clean, dry pipe cleaner and compressed air. Use isopropyl alcohol on a pipe cleaner to remove stubborn dirt. Use a clean, dry pipe cleaner and compressed air to dry the adapter and blow away any remaining particles.

Testing Your Patch Cords and Launch Fiber

For the most reliable test results, test your patch cords and launch fiber before each job. Use the tester's loss/length option in Loopback mode, if available, or a loss test set to measure loss; then compare the loss to previous measurements.

With the loss/length option, you can use the FindFiber[™] function in Loopback mode to quickly test patch cord and launch fiber continuity. See the tester's online help or the Technical Reference Handbook on the OptiFiber Product Manuals CD for details.

You should also use a fiber microscope, such as the FiberInspector video probe, to inspect the patch cord and launch fiber connectors for damage at least once a day.

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Using the OTDR

The OTDR helps you identify and locate faults on fiber cabling. It also measures length, event loss, and overall loss of the cabling and provides PASS/FAIL results based on a selected test limit.

About Launch and Receive Fibers

A launch fiber lets the tester measure the loss of the first connector in the cabling. If you connect the cabling directly to the OTDR, the backscatter before the first connector is unknown, so the tester cannot measure the connector's loss.

A receive fiber lets the tester measure the loss of the last connector on the cabling. Without a receive fiber, no backscatter is available after the last connector, so the tester cannot measure the connector's loss.

OVERALL LOSS and **FIBER LENGTH** include the loss and length of the launch and receive fibers, unless you use the launch fiber compensation function. See the online help or the Technical Reference Handbook for details on launch fiber compensation.

Launch and receive fibers should be of the same quality and should match the fiber to be tested. See the Technical Reference Handbook for details on choosing launch and receive fibers.

Selecting Auto or Manual OTDR Mode

Note

You should use Auto OTDR mode when certifying cabling with the OTDR.

From the HOME screen, press (1) Change Test. Select Auto OTDR or Manual OTDR from the popup menu.

In **Auto OTDR** mode, the tester automatically selects an appropriate range, resolution, and pulse width based on the length and overall loss of the cabling. This mode is the easiest to use, provides the most comprehensive view of the events on the cabling, and is the best choice for most applications.

Manual OTDR mode lets you change the range, resolution, and pulse width to optimize the OTDR for displaying specific events. See the online help or the Technical Reference Handbook for details.

Running the OTDR Test

Figure 7 shows the equipment needed for using the OTDR.

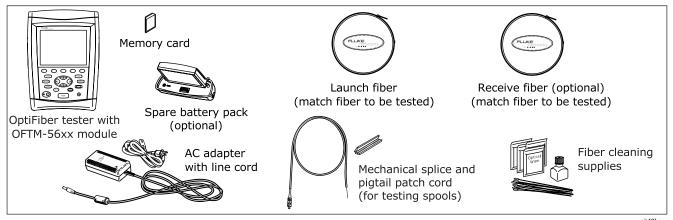


Figure 7. Equipment for OTDR Testing

ajt42f.eps

Quick Steps: Using the OTDR

- Select Auto OTDR mode: On the HOME screen, press
 Change Test; then select Auto OTDR.
- Compensate for the launch/receive fibers, if desired:
 Press (UNCTIONS); then select Set Launch Fiber Compensation.
 Press (III) for details on the compensation screens.
- 3. Choose settings for the fiber to be tested. Set the following on the **Cable** tab:
 - **FIBER TYPE:** Select the fiber type to be tested.
 - MANUAL SETTING FOR n (index of refraction):
 Disable to use the values defined in the selected fiber type, which are suitable for most applications.
- 4. Configure the OTDR test. Press (SETUP); then select the following on the OTDR tab:
 - TEST LIMIT: Select an appropriate limit.
 - WAVELENGTH: Select one or both wavelengths.
 - **LAUNCH COMPENSATION:** Enable if you want to use the launch fiber compensation settings.

- 5. Clean all connectors that will be used.
- Connect the tester's OTDR port to the cabling, as shown in Figure 8, 9, or 10.
- 7. Press TEST to start the OTDR test. Figure 11 describes the OTDR trace screen.
- 8. To save the results, press SAVE, select or create a fiber ID; then press SAVE again.

For bi-directional testing, do the following:

- 1. Set **THIS END** to **END 1** on the **Job** tab in Setup.
- 2. Test all the cabling from END 1.
- Change THIS END to END 2; then test all the cabling from the other end. Save the results with the same fiber IDs as results from the first test direction. The ID will be in the IDs IN CURRENT FOLDER list.

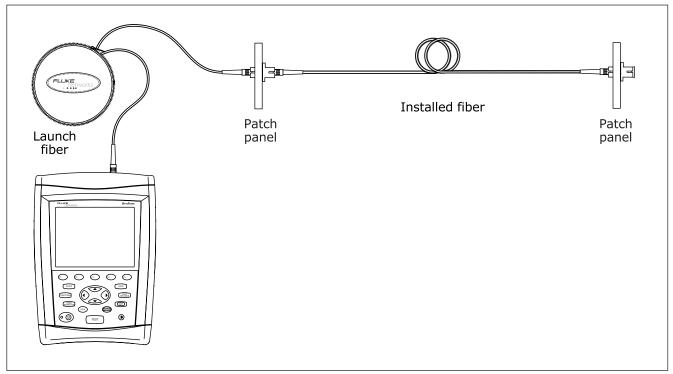


Figure 8. Connecting the OTDR to Installed Fiber (no receive fiber)

ajt32f.eps

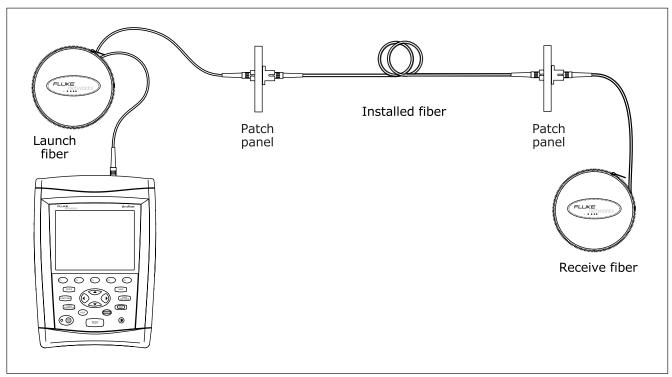


Figure 9. Connecting the OTDR to Installed Fiber (with receive fiber)

ajt01f.eps

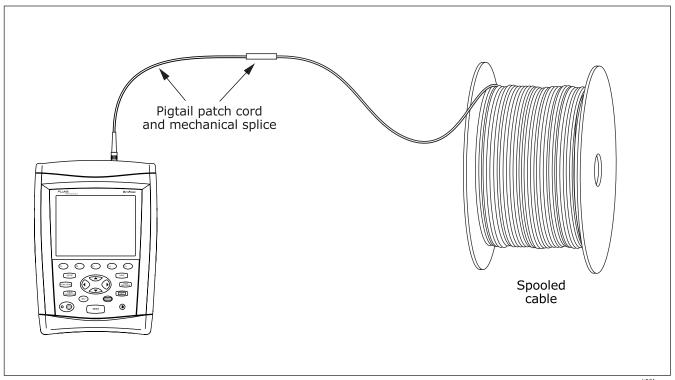


Figure 10. Connecting the OTDR to Spooled Cable

ajt33f.eps

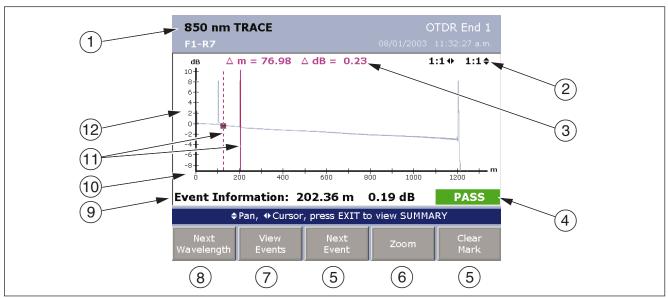


Figure 11. OTDR Trace Screen

ajt16f.eps

- Wavelength for the trace. If the test ran at two wavelengths, press to switch wavelengths. You can set the wavelengths on the OTDR tab in Setup.
- 2 Magnification factors for the trace. See the online help for details on zooming.
- 3 The distance (m or ft) and the power loss (dB) between the cursor and the measurement marker (11).
- PASS/FAIL status appears if the cursor is on an event. The status may refer to the event or the fiber segment before the event. If the event looks ok, press (3) View Details from the EVENT TABLE screen or the SUMMARY screen to see results for the segment.
- 5 Key for setting the measurement cursor.
- 6 Press (4) to switch between using the arrow keys for zooming and for moving the cursor.

- 7) Press (2) to see the event table.
- (8) For dual-wavelength tests, press (*) to switch wavelengths.
- 9 Event information appears if the cursor is on an event. Otherwise, the distance to the cursor is shown.
- (10) Scale for the distance along the cabling under test.
- **Tip:** The distance scale represents the distance along the fiber, which may be different from the distance along the cable jacket. To adjust the length measurements to represent cable jacket length, change the index of refraction until the measured length matches the jacket length.
- (1) Measurement marker and cursor.
- Decibel scale for the OTDR backscatter.

Figure 11. OTDR Trace Screen (cont.)

Using the ChannelMap Function

The ChannelMap™ function creates a map of the cabling under test. The map shows the fiber links and connections in the cabling. This function is optimized for resolving connections as close as 1 m apart on multimode fiber and 2 m apart on singlemode fiber.

Reflective events that do not appear to be connectors are not shown on the map. Loss events are also not shown.

Figure 12 shows the equipment needed for ChannelMap tests.

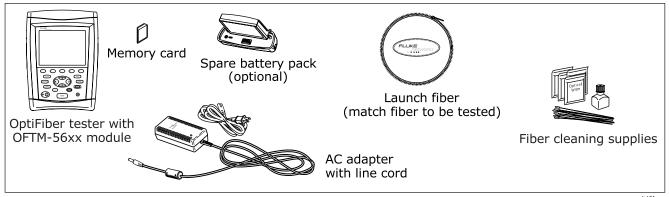


Figure 12. Equipment for ChannelMap Testing

ajt48f.eps

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Quick Steps: Using the ChannelMap Function

- 1. Select ChannelMap mode: On the **HOME** screen, press (F1) **Change Test**; then select **ChannelMap**.
- Select a fiber type on the Cable tab in Setup. You do not need to select a test limit for ChannelMap tests.
- 3. Clean all connectors that will be used.

- 4. Connect the launch fiber to the OTDR port and the channel to be mapped. Refer to Figure 13.
- 5. Press TEST. Figure 14 describes the features of the ChannelMap diagram.
- 6. To save the results, press SAVE, select or create a fiber ID; then press SAVE again.

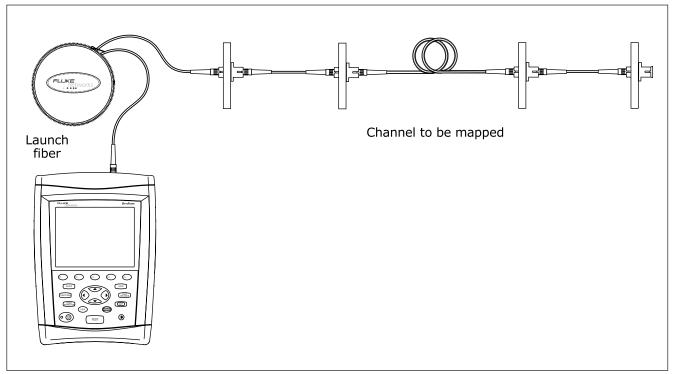


Figure 13. ChannelMap Test Connections

ajt55f.eps

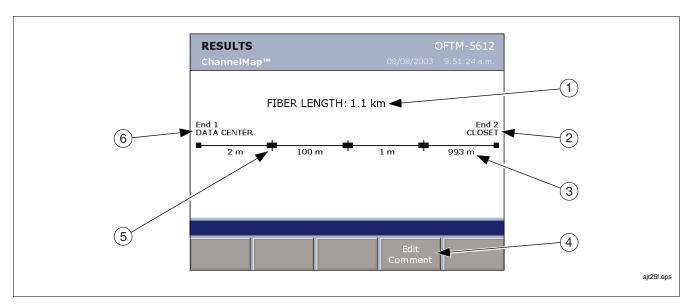


Figure 14. ChannelMap Diagram Features

1) The length of the channel, including the launch fiber.

Note

The **FIBER LENGTH** shown is the actual length of the channel rounded to the nearest meter or foot (not the sum of the displayed segment lengths).

2 The far end of the channel. The name is set by the END 1 or END 2 setting on the Job tab in Setup.

- 3 The length of a segment or patch cord rounded to the nearest meter or foot.
- 4 Press 4 to add a comment to the ChannelMap results.
- (5) A reflective event, usually a connector. Could also be a mechanical splice or a reflective fault such as a sharp bend or a crack in the fiber.
- 6 The near end of the channel. The name is set by the END 1 or END 2 setting on the Job tab in Setup.

Figure 14. ChannelMap Diagram Features (cont.)

Using the FiberInspector Option

The OFTM-535x FiberInspector™ Video Probe connects to an OptiFiber fiber tester to let you inspect the ends of fiber optic connectors. The probe's magnification reveals dirt, scratches, and other defects that can cause poor performance or failures in fiber optic networks.

Model OFTM-5350 provides 250X magnification, which is suitable for multimode fiber.

Model OFTM-5354 provides 400X magnification, which is suitable for multimode and singlemode fiber.

Figure 15 shows the equipment needed for using the FiberInspector probe.

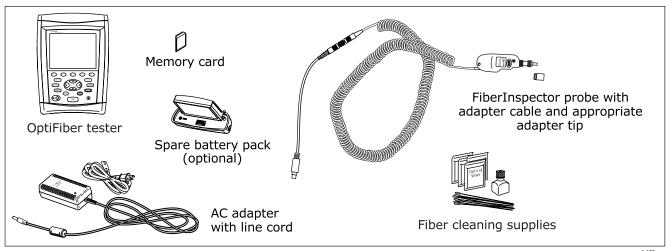


Figure 15. Equipment for FiberInspector Tests

ajt43f.eps

Quick Steps: Using the FiberInspector Probe

- On the System tab in Setup, set CAMERA TYPE to match the probe's magnification. This selects the correct size for the core size scale. Model OFTM-5350 is 250X; model OFTM-5354 is 400X.
- 2. Use the adapter cable provided to connect the probe to the video input jack on the side of the tester.
- 3. Screw an adapter tip that matches the connector type being inspected onto the fiber probe.
- 4. Clean the connector to be inspected.
- 5. Press Press If the message "Camera Image Unavailable" appears check the connections between the probe and the tester.

6. Place the probe on the fiber connector. To focus the image, turn the focusing ring on the probe. Refer to Figure 16.

The tester's softkeys provide additional functions. Press

1 More to see other softkey functions.

7. To save the image, press SAVE, select or create a fiber ID; then press SAVE again.

Figure 17 shows some typical FiberInspector images.

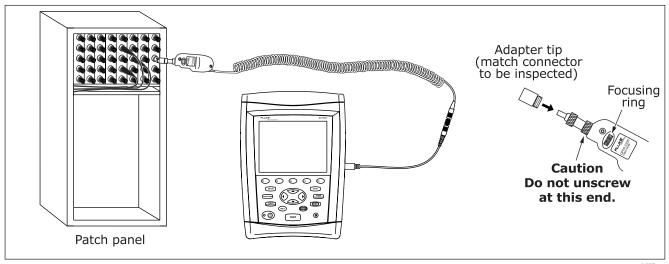
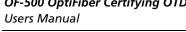


Figure 16. Using the FiberInspector Probe

ajt57f.eps



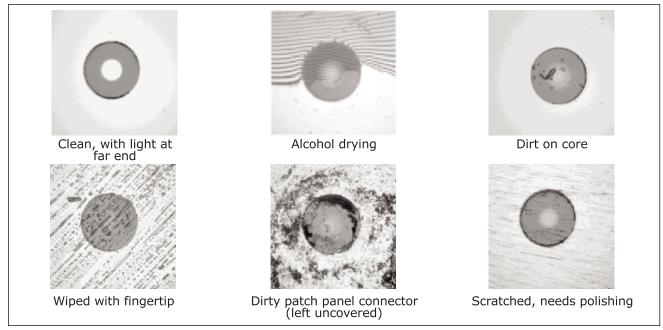


Figure 17. FiberInspector Image Examples (250X on multimode fiber)

ajt23f.eps

Using the Loss/Length Option

The loss/length measurement option provides the following features, in addition to the OTDR module features described earlier:

- Measures optical power loss, length, and propagation delay on dual-fiber cabling. Provides PASS/FAIL results based on limits you enter or on factory-installed limits.
- FindFiber[™] feature helps you identify and verify optical connections.

Note

The power meter option on the OFTM-5611 and OFTM-5631 modules also lets you run loss tests in Far End Source mode.

About Setting the Reference

Setting a reference lets the tester automatically subtract out the losses due to patch cords and the main and remote tester.

Note

Always let your test equipment warm up for 5 minutes before setting a reference.

For the most accurate test results, you should set the reference at these times:

- At the beginning of each day using the remote end setup (Figures 20 through 27) you will use that day. The tester reminds you to set the reference if the reference is more than 12 hours old.
- Anytime you reconnect a patch cord to the tester or other source.
- Anytime the tester warns you that the reference is out of date.

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The tester requires you to set the reference at these times:

- Anytime you change the loss/length module in the main or remote tester.
- Anytime you start using a different remote tester.
- Thirty days after the reference was previously set.

The tester warns you if the reference value is outside of an acceptable range.

To see the reference information for the current remote end setup, select **Set Loss/Length Reference** from the Functions menu; then press (**View Settings**.

See the sections "Testing in Smart Remote Mode", "Testing in Loopback Mode", and "Testing in Far End Source Mode" for details on setting the reference for each mode.

Setting the Number of Adapters and Splices

The **NUMBER OF ADAPTERS** and **NUMBER OF SPLICES** settings are on the **Loss/Length** tab in Setup. These settings do not apply to all test limits.

Test limits that include maximum values for the loss per km, loss per connector, and loss per splice use a calculated limit for loss. Only limits with all three values use a calculated loss limit. The **OVERALL LOSS** value should be **N/A** in these limits. If a loss value is entered, it is ignored.

To see the limit's values, select **TEST LIMIT** on the **Loss/Length** tab; then press **View Limit**.

If the selected limit uses a calculated loss limit, enter the number of adapters and splices that will be added to the fiber path after the reference is set.

Figure 18 shows an example of how to determine the **NUMBER OF ADAPTERS** setting.

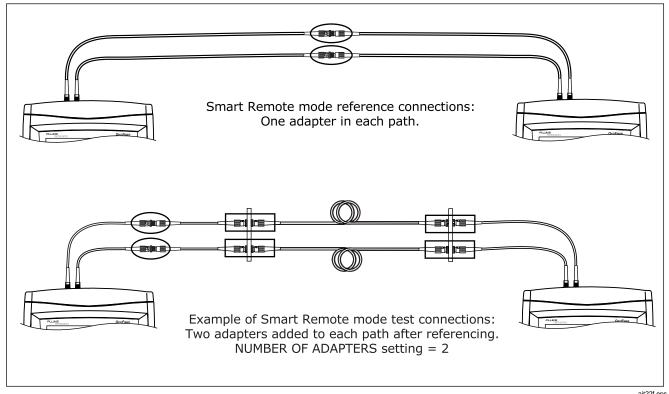


Figure 18. Example of How to Determine the NUMBER OF ADAPTERS Setting

ajt22f.eps

Users Manual

Using Mandrels for Testing Multimode Fiber

Your loss testing procedures for multimode fiber may include using mandrels to meet the launch conditions specified in TIA/EIA-568-B standards. Mandrels for 50 μ m/125 μ m and 62.5 μ m/125 μ m fiber with 3 mm jackets are available from Fluke Networks. See the accessories list for model numbers.

Mandrels are used on the tester's output fibers during referencing and testing. The tester's online help provides illustrations of how to use mandrels.

Testing in Smart Remote Mode

Use Smart Remote mode to test and certify dual-fiber cabling. In this mode, the tester measures loss, length, and propagation delay on two fibers at two wavelengths in one or both directions.

Figure 19 shows the equipment needed for testing in Smart Remote mode.

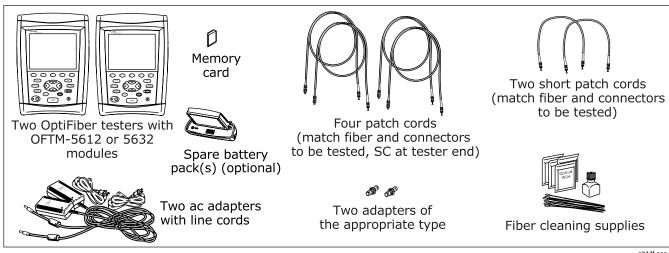


Figure 19. Equipment for Loss/Length Testing in Smart Remote Mode

ajt44f.eps

Quick Steps: Loss/Length Testing in Smart Remote Mode

- Turn on all test equipment and let it warm up for 5 minutes.
- On the main tester: On the HOME screen, press (Change Test; then select Loss/Length.
- On the main tester: press (SETUP); then set the following on the Cable tab:
 - CONNECTOR TYPE: Select connector type used in the cabling to be tested. Select General if the exact type is not listed.
 - NUMBER OF ADAPTERS and NUMBER OF SPLICES:
 Enter the number of adapters and splices that will be added to each direction of the fiber path after the reference is set. See "Setting the Number of Adapters and Splices" on page 44 for details.
 - FIBER TYPE: Select the fiber type to be tested.
 - MANUAL SETTING FOR n (index of refraction):
 Disable to use the values defined in the selected fiber type, which are suitable for most applications.

- 4. On the main tester: set the following on the Loss/Length tab in Setup:
 - TEST LIMIT: Select an appropriate limit.
 - REMOTE END SETUP: Set to Smart Remote.
 - THIS UNIT: Set to Main.
 - BI-DIRECTIONAL: Enable this if you want to save bidirectional results.
 - TEST METHOD: Refers to the number of adapters that are represented in the loss results. Select Method B (multimode) or A.1 (singlemode) if you use the reference and test connections shown in this manual. See the online help or the Technical Reference Handbook for details.
- On the remote tester: set the following on the Loss/Length tab in Setup
 - REMOTE END SETUP: Set to Smart Remote.
 - THIS UNIT: Set to Remote.

-continued-

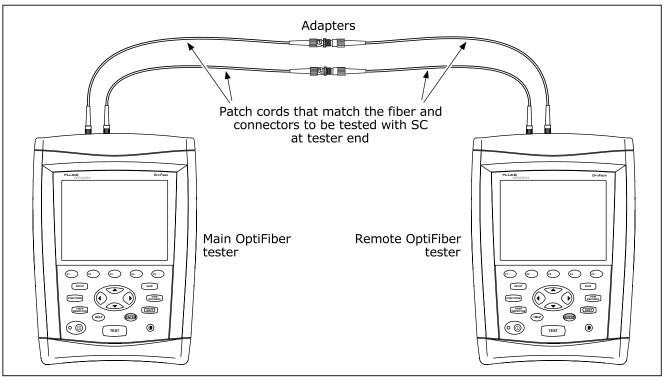


Figure 20. Smart Remote Mode Reference Connections

ajt05f.eps

Quick Steps: Loss/Length Testing in Smart Remote Mode (cont.)

- 6. Clean the connectors on the tester and the patch cords.
- 7. On the main tester: press FUNCTIONS; then select Set Loss/Length Reference. Connect the reference patch cords as shown on the screen and in Figure 20; then press (LITE).
- 8. Clean the connectors on the cabling to be tested; then connect the reference patch cords and the short patch cord(s) to the cabling, as shown in Figure 21.
- Press TEST to start the loss/length test.

If **Open** or **Unknown** appears as the status, try the following:

- Verify that all connections are good.
- Verify that the remote tester is set to **Remote** on its **Loss/Length** tab in Setup.

- Verify that the remote tester is still active. You may need to press () Start on the remote tester to reactivate the tester.
- Try different connections to the cabling until the test continues. See "Using FindFiber in Smart Remote Mode" in the online help or Technical Reference Handbook for details on FindFiber messages.
- Use a visible light source to verify fiber continuity.
- 10. To save the results, press SAVE, select or create a fiber ID for one fiber; then press SAVE.
- 11. Select or create a fiber ID for the other fiber; then press SAVE.

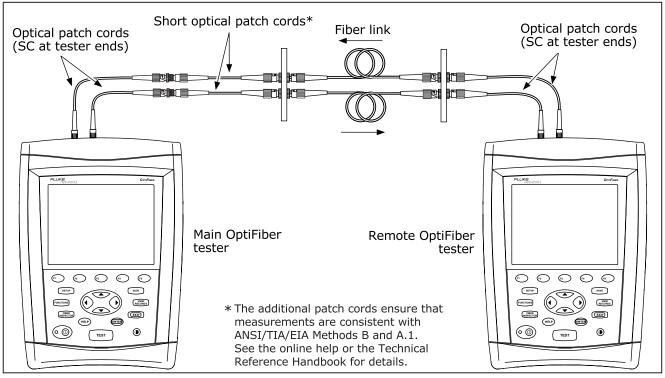


Figure 21. Smart Remote Mode Test Connections

ajt08bf.eps

OF-500 OptiFiber Certifying OTDR

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Testing in Loopback Mode

Use Loopback mode to test spools of cable, segments of uninstalled cable, patch cords, and launch fibers.

In this mode, the tester measures loss, length, and propagation delay at two wavelengths in one or both directions.

Figure 22 shows the equipment needed for testing in Loopback mode.

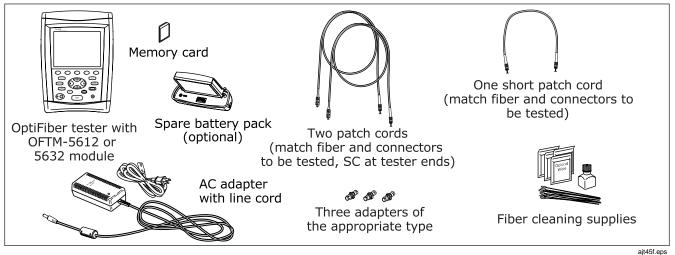


Figure 22. Equipment for Loss/Length Testing in Loopback Mode

Quick Steps: Loss/Length Testing in Loopback Mode

- 1. Turn on the tester and let it warm up for 5 minutes.
- On the HOME screen, press ⊕ Change Test; then select Loss/Length.
- 3. Choose settings for the fiber to be tested. Press SETUP; then set the following on the tester's **Cable** tab:
 - CONNECTOR TYPE: Select connector type used in the cabling to be tested. Select General if the exact type is not listed.
 - NUMBER OF ADAPTERS and NUMBER OF SPLICES:
 Enter the number of adapters and splices that will be added to the fiber path after the reference is set.
 See "Setting the Number of Adapters and Splices" on page 44 for details.
 - **FIBER TYPE:** Select the fiber type to be tested.
- Set the following on the tester's Loss/Length tab in Setup:
 - TEST LIMIT: Select an appropriate limit.
 - REMOTE END SETUP: Set to Loopback mode.

- THIS UNIT: Set to Main.
- BI-DIRECTIONAL: Enable this setting if you want to save bi-directional results.
- TEST METHOD: Refers to the number of adapters that are represented in the loss results. Select Method B (multimode) or A.1 (singlemode) if you use the reference and test connections shown in this manual. See the online help or the Technical Reference Handbook for details.
- 5. Clean the connectors on the tester and the patch cords.
- 6. Press (Loss/Length Reference. Connect the reference patch cords as shown on the screen and in Figure 23; then press (Loss/Length Reference.)
- Clean the connectors on the cabling to be tested; then connect the reference patch cords and the short patch cord(s) to the cabling, as shown in Figure 24.
- 8. Press TEST to start the loss/length test.
- To save the results, press SAVE, select or create a fiber ID; then press SAVE.

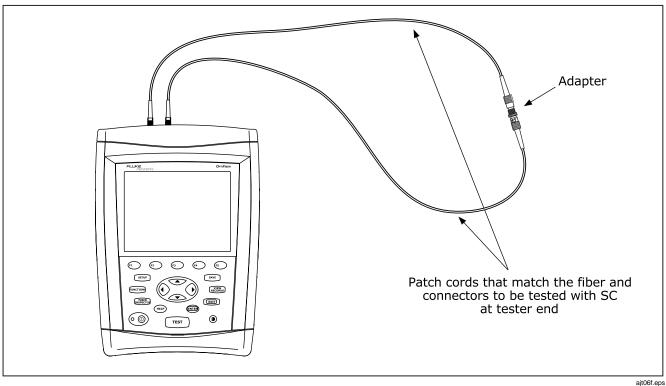


Figure 23. Loopback Mode Reference Connections

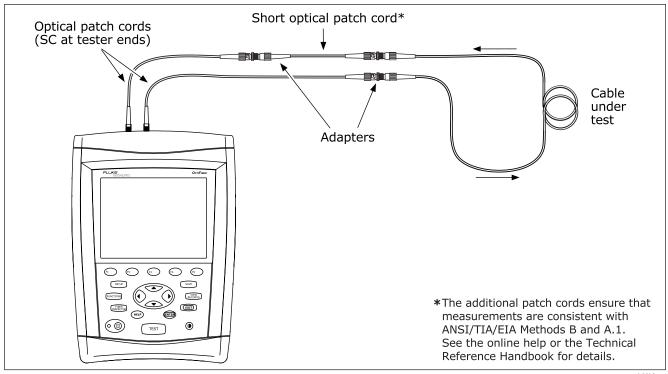


Figure 24. Loopback Mode Test Connections

ajt09bf.eps

Testing in Far End Source Mode

Use Far End Source mode to measure power or power loss at one wavelength on individual fibers. You can save results from one or both directions. This mode is available on the OFTM-5611 and OFTM-5631 modules.

Far End Source mode requires a stand-alone optical source, such as a Fluke Networks SimpliFiber® source or LS-1310/1550 Laser Source.

Figure 25 shows the equipment needed for testing in Far End Source mode.

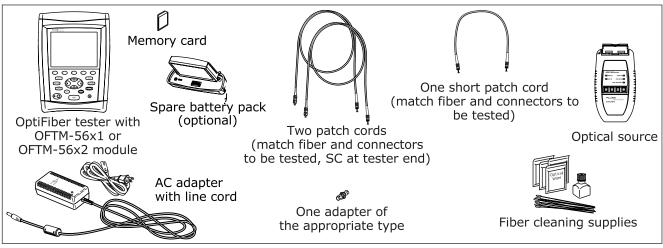


Figure 25. Equipment for Loss Testing in Far End Source Mode

ajt46f.eps

Quick Steps: Loss Testing in Far End Source Mode

- Turn on all test equipment and let it warm up for 5 minutes. Verify the source is set to the correct wavelength and to continuous-wave output.
- On the HOME screen, press ⊕ Change Test; then select Loss/Length.
- Choose settings for the fiber to be tested. Press (SETUP); then set the following on the Cable tab:
 - CONNECTOR TYPE: Select the connector type used in the cabling to be tested. Select General if the exact type is not listed.
 - NUMBER OF ADAPTERS and NUMBER OF SPLICES: Enter the number of adapters and splices that will be added to the fiber path after the reference is set. See "Setting the Number of Adapters and Splices" on page 44 for details.
 - **FIBER TYPE:** Select the fiber type to be tested.
- 4. Set the following on the **Loss/Length** tab in Setup:
 - TEST LIMIT: Select an appropriate limit.
 - REMOTE END SETUP: Set to Far End Source mode.

- THIS UNIT: Set to Main.
- BI-DIRECTIONAL: Does not apply to Far End Source mode.
- TEST METHOD: Select the method used for making reference and test connections. This setting does not affect test results, but is saved with results. See the online help or the Technical Reference Handbook for details.
- 5. Clean the connectors on the tester and the patch cords.
- 6. Press FUNCTIONS; then select **Set Loss/Length Reference**. Connect the reference patch cords as shown on the screen and in Figure 26; then press (NTE).
- 7. Clean the connectors on the cabling to be tested; then connect the reference patch cords and the short patch cord(s) to the cabling, as shown in Figure 27.
- 8. Press TEST to start the loss/length test.
- 9. To save the results, press SAVE, select or create a fiber ID; then press SAVE.

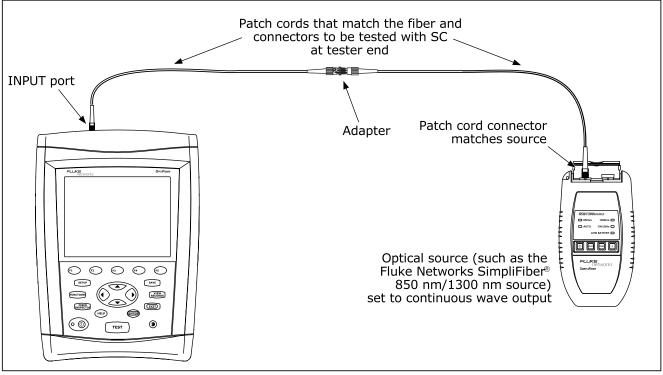


Figure 26. Far End Source Mode Reference Connections

ajt07f.eps

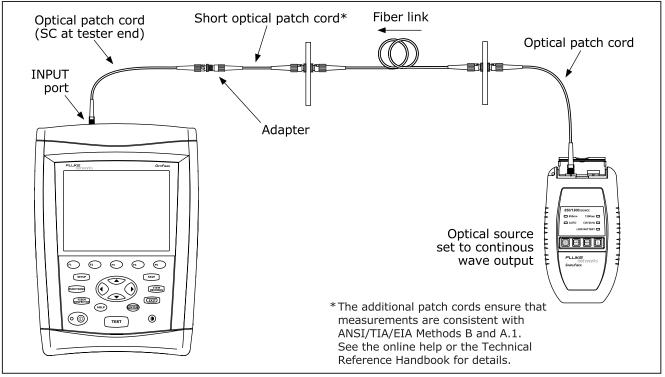


Figure 27. Far End Source Mode Test Connections

ajt10bf.eps

Using the Power Meter Option

The power meter option lets you monitor the output power produced by a source such as an optical network interface card or optical test equipment. You can also monitor the power received at the end of the cabling.

You can monitor power at 850 nm, 1300 nm, 1310 nm, and 1550 nm.

The power meter option is available with OFTM-5611, OFTM-5612, OFTM-5631, and OFTM-5632 modules.

Figure 28 shows the equipment needed for using the power meter.

Note

The power meter option also lets you measure loss in Far End Source mode.

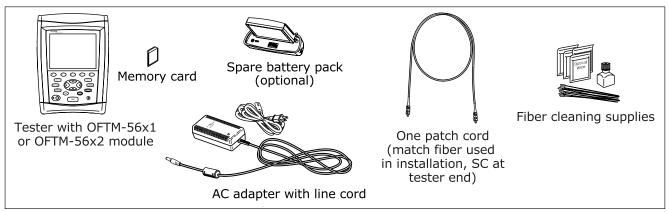


Figure 28. Equipment for Power Meter Tests

ajt47f.eps

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Quick Steps: Using the Power Meter

- Select Power Meter mode: On the HOME screen, press
 Change Test; then select Power Meter. You do not need to select a fiber type or test limit.
- Clean all connectors that will be used.
- Use the patch cord to connect the source to the tester's INPUT port as shown in Figure 29.
- 4. Turn on the source.
- Press TEST; then select the appropriate wavelength. To change the wavelength after starting the test, press
 Change Wavelength.

To save the results, press SAVE, select or create a fiber ID; then press SAVE again.

Caution

If the tester shows an error because the power reading is too high, immediately disconnect the source from the tester. The tester is not designed for measuring higher power levels, such as produced by CATV, optical amplifiers, and cellular systems.

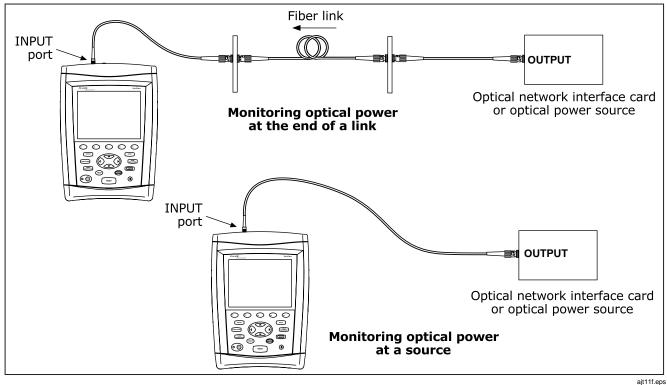


Figure 29. Connections for Monitoring Optical Power

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Overview of Memory Functions

You can save test results on a removable memory card or in the tester's internal memory. The tester can use multimedia cards (MMC) or secure digital cards (SD).

To select a location for saving tests, press serup then select **CURRENT FOLDER** on the **Job** tab.

Tip: To avoid confusion regarding the location of test records, save test results on a memory card whenever possible.

You can save results from any fiber test, except the real time trace.

Each test record can hold bi-directional results from each type of test (except ChannelMap, which you run in just one direction). The test direction assigned to saved results is determined by the **THIS END** setting (in Setup) used when the test was run.

You can save the last test you ran anytime before you run another test or view stored records. This excludes FiberInspector images and power meter results, which you must save at the time of viewing. The tester warns you if you are about to do something that will delete an unsaved test from temporary memory. The unsaved test is retained in temporary memory even if you turn off the tester or remove the battery pack.

Memory Capacity

The number of test records you can save in a given amount of memory space depends on what you save in the records. For example, records that include video probe endface images take more memory than records without images.

The maximum amount of internal memory available for test results depends on the space taken by the tester's software and custom limits.

Notes

Memory card folders can store a maximum of 500 records each.

Loss/length tests in Smart Remote mode take up two records—one for each fiber.

To see the memory space available, press FUNCTIONS; then select **Memory Status**. Press (1) **Memory** to switch between the memory card and internal memory status.

Clearing the Internal Memory

To clear the internal memory, which moves records to the memory card, do the following:

- On the System tab in Setup, set the CURRENT FOLDER to the desired location on the memory card.
- 2. Press FUNCTIONS; then select **Empty Internal Memory**.

About LinkWare Software

LinkWare™ Cable Test Management software lets you upload OptiFiber test records to PC, view test results, add ANSI/TIA/EIA-606-A administration information to records, and organize, customize, and print test reports.

Details about using LinkWare software are provided in the LinkWare Getting Started Guide and the online help available under Help on the LinkWare menu.

Maintenance

⚠ Warning

To avoid possible fire, electric shock, personal injury, or damage to the tester:

- Do not open the case. No user-serviceable parts are inside.
- Replacing electrical parts yourself will void the test tool's warranty and might compromise its safety features.
- Use only specified replacement parts for userreplaceable items.
- Use only Fluke Networks authorized service centers.

Caution

Replacing electrical parts yourself might void the test tool's calibration and compromise its accuracy. If the calibration is void, cable manufacturers might not extend their warranty to the cabling you install.

Users Manual

Updating the Tester's Software

Keeping your tester's software current gives you access to new features and the latest test limits. Software updates are available on the Fluke Networks website.

The software update procedure also lets you install or remove languages. Additional languages for the tester may be available with software updates.

To see the software version installed in your tester and module exit to the **HOME** display; then press **Version Info**.

To determine if your tester needs a software update visit the Fluke Networks website to see if an update is available.

You can update an OptiFiber tester's software with LinkWare via a PC or with the tester's software update function via a memory card.

Caution

To avoid unexpected loss of power, connect the ac adapter to the tester when updating the software.

Note

Updating the software does not affect test records saved in internal memory, but may affect factory-installed fiber types or test limits.

You may install multiple languages; however, adding languages decreases the internal memory available for saving test results.

Changes to the update procedure may be posted on the OptiFiber software page on the Fluke Networks website.

Updating via the USB or Serial Port

- Install the latest version of LinkWare software on your PC. LinkWare is available on the Fluke Networks website.
- Download the OptiFiber update file ("upgrade.ofu") from the Fluke Networks website, or contact Fluke Networks to get the update by other means. You can access the software page at www.flukenetworks.com/support. Save the file to your hard drive.
- Connect the tester's serial or USB port to the PC. Install a module in the OptiFiber mainframe, then turn on the tester.
- 4. Select Utilities > OptiFiber Utilities > Software Update from the LinkWare menu, locate and select the .ofu (OptiFiber update) file; then click Open. LinkWare makes initial choices on which software to install based on the versions currently installed in the mainframe and the module. Generally, you should not change these choices except to select languages to install or remove.
- 5. Click **Start** to start the update process.

- The OptiFiber tester reboots after the update is complete. To verify the update, press Version Info from the HOME screen.
- 7. If you have additional modules to update, install each module in the tester and repeat steps 4, 5, and 6.

Updating via a Memory Card Created with LinkWare

Caution

Do not use the Windows® operating system to copy the update file to a memory card. The file must be unzipped first. Use LinkWare software to create a memory card for updating the tester.

- Install the latest version of LinkWare software on your PC. LinkWare is available on the Fluke Networks website.
- Download the OptiFiber update file ("upgrade.ofu") from the Fluke Networks website, or contact Fluke Networks to get the update by other means. You can access the software page at www.flukenetworks.com/support. Save the file to your hard drive.
- 3. Put a memory card into the PC's memory card drive.

- On the LinkWare menu select Utilities > OptiFiber Utilities > Create Software Update MMC.
- Locate and select the .ofu file you downloaded; then click Open.
- Locate and select the memory card drive; then click OK. LinkWare unzips the update file and copies the files to the memory card.

Caution

If you remove the memory card from the MMC reader before the files are completely copied the Windows operating system may report an error and OptiFiber shows the message "Bad update file". If this happens, repeat steps 4 through 6; then leave the card in the reader for a minute or so to ensure the files are completely copied.

- 7. Put the memory card into the OptiFiber tester.
- 8. Install a module in the OptiFiber mainframe, then turn on the tester.

- Press wrose on OptiFiber; then select Install Software Update. The tester makes initial choices on which software to install based on the versions currently installed in the mainframe and the module. Generally, you should not change these choices except to select languages to install or remove.
- 10. Press (5) Start to start the update process.
- 11. The OptiFiber tester reboots after the update is complete. To verify the update, press Version Info from the HOME screen.
- 12. If you have additional modules to update, insert each module and repeat steps 9, 10, and 11.

Optical Connector Care

- Periodically clean and inspect the tester's optical connectors as described on page 23.
- Cover the connectors with the dust plugs when no cable is connected.
- Periodically clean the dust plugs with a lint-free swab or wipe and isopropyl alcohol.

Replacing Patch Cords and Launch Fibers

Choose replacement patch cords and launch and receive fibers that meet the following requirements:

- Core and cladding size: match the fiber to be tested
- Connector polish: PC or UPC for patch cords; UPC for launch fibers
- Patch cord length: minimum 2 m; maximum 5 m
- Launch and receive fiber length: 100 m minimum for multimode; 130 m minimum for singlemode

To ensure optimum performance from your tester, get replacement patch cords and launch fibers from Fluke Networks.

Replacing the Battery

Replace the lithium ion battery pack when its life becomes noticeably shorter. The battery is normally good for up to 400 charge/discharge cycles.



Dispose of the lithium ion battery pack in accordance with local regulations.

An internal lithium battery maintains the tester's clock when you remove the battery pack. This battery typically lasts about 5 years. When the battery begins to fail, the tester will lose the current date and time when you remove the battery pack. If the lithium battery fails, send the tester to a Fluke Networks service center for a replacement.

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Cleaning

Clean the display with glass cleaner or isopropyl alcohol and a soft, lint-free cloth. Clean the case with a soft cloth dampened with water or water and a mild soap.

Caution

To avoid damaging the display or the case, do not use solvents or abrasive cleansers.

Storage

- Before storing the tester or an extra battery for an extended period, charge the battery to between 70 % and 90 % of full charge (2 or 3 LEDs lit on the battery's gauge). Check the battery every 4 months and recharge if necessary.
- Keep a battery attached to the tester during storage.
 Removing the battery for long periods shortens the life of the lithium battery that maintains the clock.
- See "Environmental and Regulatory Specifications" on page 81 for storage temperatures.

Calibration

The tester requires a traceable calibration once a year to ensure that it meets or exceeds the published accuracy specifications. Contact an authorized Fluke Networks Service Center for information on getting your tester calibrated.

To see when the tester last received a traceable calibration, press **Solution** Version Info from the HOME display.

If Something Seems Wrong

If something seems wrong with the tester, refer to Table 1.

If the problem continues, refer to "Getting Help" below.

Tip: Online help is available for many error messages. Press when an error message appears to see information about the error.

Getting Help

If Table 1 does not help you solve a problem with the tester, contact Fluke Networks for additional help. If possible, have the tester's serial number, software and hardware versions, and calibration date available. Press Version Info from the HOME display to see this information.

For warranty information, refer to the warranty at the beginning of this manual. If the warranty has lapsed, contact Fluke Networks for repair prices.

Table 1. Troubleshooting the Tester

Symptom 1: The keypad does not respond.

Press and hold @ until the tester turns off. Then turn the tester on again. If the problem persists, try updating the tester's software.

Symptom 2: System error occurs.

Press OK, or press for more information. If the tester does not recover, press and hold until the tester turns off. If the error recurs, update the tester's software. If the tester already has the latest software, contact Fluke Networks for assistance.

Symptom 3: A module is installed, but the message "No Module Installed" or "Problem with Module" shows on the screen.

The module and mainframe may have incompatible software versions. Install the latest software version in the module and mainframe.

Verify that the module is pushed completely into the mainframe. Inspect the module and mainframe connectors for contamination or damage.

Symptom 4: The tester will not turn on, even with the ac adapter connected.

The battery may be completely discharged. Let the battery charge for a few minutes with the tester off.

Symptom 5: The tester will not turn on even though the battery is charged.

The battery's safety switch has tripped. Connect the ac adapter for a few minutes to reset the switch.

Table 1. Troubleshooting the Tester (cont.)

Symptom 6: The noise level on the OTDR trace has increased or the OTDR connector reflection has a large deadzone. (See Figure 30.)

The fiber endface in the OTDR connector may be dirty or damaged. Clean the connector and inspect the endface with a fiber video microscope. If an endface is damaged, contact Fluke Networks for service information.

Symptom 7: The reference patch cords and adapters are good, but the reference power level is too low.

Clean the tester's INPUT and OUTPUT connectors and use a fiber microscope to inspect the endfaces. If an endface is damaged, contact Fluke Networks for service information.

Symptom 8: A loss/length test produces a negative loss reading.

There is a problem with the reference. Set the reference and test the cabling again. See "Diagnosing Loss/Length Test Failures" in the online help or Chapter 6 of the Technical Reference Handbook for details.

Symptom 9: Test results appear to be incorrect.

The tester may not be configured correctly. If you are using Manual OTDR mode, try testing in Auto OTDR mode.

In the Technical Reference Handbook see "Diagnosing OTDR Test Failures" in Chapter 3, "Diagnosing Loss/Length Test Failures" in Chapter 6, and "Power Meter Results" in Chapter 7 for information on how misconfigurations may affect your test results. This information is also provided in the online help.

Symptom 10: The message "Selected test limit or fiber type is not valid with this test" appears.

You need to select a different test limit or fiber type. For details, press ••• when the message appears.

Signs of a Bad OTDR Connector

Figure 30 shows traces from OTDRs with good and bad connectors. Use a fiber microscope to inspect the tester's connectors for dirt and damage.

If a connector on the tester is damaged, contact Fluke Networks for service information.

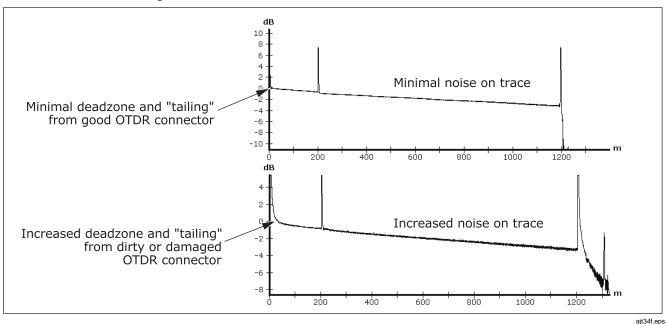


Figure 30. Traces Showing Good and Bad OTDR Connectors

Options, Accessories, and Replacement Parts

To order options, accessories, or replacement parts (Tables 2 through 4), contact Fluke Networks.

For the latest list of OptiFiber options and accessories and a complete list of fiber test accessories visit the Fluke Networks website at www.flukenetworks.com.

Table 2. Options

Option	Fluke Networks Model Number
Multimode OTDR module	OFTM-5610
Multimode OTDR module with power meter option	OFTM-5611
Multimode OTDR module with power meter and loss/length options	OFTM-5612
Singlemode OTDR module	OFTM-5630
Singlemode OTDR module with power meter option	OFTM-5631
Singlemode OTDR module with power meter and loss/length options	OFTM-5632
FiberInspector™ Video Probe, 250X	OFTM-5350
FiberInspector™ Video Probe, 400X	OFTM-5354

Table 3. Accessories

Accessory	Fluke Networks Model or Part Number
16 MB multimedia card	DSP-MMC16
32 MB multimedia card	DSP-MMC32
Memory card reader with USB interface	DSP-MCR-U
Launch fiber, multimode, 62.5 μm, 100 m	NFK1-LAUNCH
Launch fiber, multimode, 50 μm, 100 m	NFK2-LAUNCH
Launch fiber, singlemode, 9 μm, 130 m	NFK3-LAUNCH
Mandrel kit: two mandrels for 50 μ m/125 μ m fiber with 3 mm jackets; two mandrels for 62.5 μ m/125 μ m fiber with 3 mm jackets	NF-MANDREL-KIT
Mandrel for 50 μm/125 μm	NF-MANDREL-50
Mandrel for 62.5 μm/125 μm	NF-MANDREL-625
External keyboard	OPV-KB
12 V car battery adapter	800695
AC adapter with line cord (specify country)	OPV-PS

Table 3. Accessories (cont.)

Accessory	Fluke Networks Model or Part Number
Lithium ion battery pack	OFBP-LI
Soft carrying case	OFCC-SCASE
Hard carrying case	OFCC-HCASE
Memory card softcase	MMC-CASE
RS-232 serial interface cable	944806
9- to 25-pin serial interface adapter	929187
USB cable	1626219
Fiber optic cleaning kit	NF430
Fiber optic reference guide	NF460
MT-RJ adapter tip for FiberInspector Video Probe	NF360
LC adapter tip for FiberInspector Video Probe	NF362
MU adapter tip for FiberInspector Video Probe	NF364

Table 3. Accessories (cont.)

Accessory	Fluke Networks Model or Part Number
SimpliFiber® 1310 Source (SC)	8251-11
SimpliFiber® 1550 Source (SC)	8251-12
SimpliFiber® 850/1300 Source (SC)	8251-13
LinkWare [™] Cable Test Management Software CD	LinkWare
OF-500 OptiFiber™ Product Manuals CD (includes Technical Reference Handbook)	1779478
OF-500 OptiFiber™ Users manual, English	1779484

Table 4. Replacement Parts

Part	Fluke Networks Part Number
Line cord, North America	1552374
Line cord, UK	1552342
Line cord, continental Europe	1552388
Line cord, South Africa	1552363
Line cord, Switzerland	1552356
Line cord, Australia	1552339
Adapter cable for FiberInspector Video Probe	1638801
ST adapter tip for FiberInspector Video Probe	1587344
SC adapter tip for FiberInspector Video Probe	1587359
FC adapter tip for FiberInspector Video Probe	1587367
Universal 2.5 mm patch cord tip for FiberInspector Video Probe	1587371

Table 4. Replacement Parts (cont.)

Part	Fluke Networks Part Number
Bail	1608721
Carrying strap	1541888
Dust cap	1675689
Dust cap rivet	1675704
Dust cap tie	1675692

Specifications

Specifications apply at 23 °C (73 °F), unless otherwise noted.

Environmental and Regulatory Specifications

Operating temperature*	32 °F to 104 °F (0 °C to 40 °C)	
Storage temperature	-4 °F to +140 °F (-20 °C to +60 °C)	
Operating relative humidity (% RH without condensation)	95 % (50 °F to 95 °F; 10 °C to 35 °C) 75 % (95 °F to 104 °F; 35 °C to 40 °C) uncontrolled < 50 °F (< 10 °C)	
Vibration	Random, 2 g, 5 Hz-500 Hz	
Shock	1 m drop test with and without module	
Safety	CSA C22.2 No. 1010.1: 1992 EN 61010-1 1 st Edition + Amendments 1, 2	
Altitude	3000 m	
EMC	EN 61326-1	
Laser safety	Class I CDRH Complies to EN 60825-2	
FDA registration number	0220836	
* Pool Time Trace function used for no more than E-minutes in a 15-minute paried Maximum ambient temperature is 25 °C for		

^{*} Real Time Trace function used for no more than 5 minutes in a 15-minute period. Maximum ambient temperature is 35 °C for continuous use of the Real Time Trace function.

OTDR Specifications

Specification	OFTM-5610, 5611, 5612 Multimode Modules	OFTM-5630, 5631, 5632 Singlemode Modules
Testing speed	< 10 s for two wavelengths at 2 km with 25 cm resolution < 24 s for two wavelengths at 400 m with 3 cm resolution	< 22 s for two wavelengths at 10 km with 1 m resolution ¹ < 30 s for two wavelengths at 400 m with 3 cm resolution ¹
Output/input connector	SC with UPC polish	SC with UPC polish
Emitter type	Fabry-Perot laser diode	Fabry-Perot laser diode
Laser classification Class 1 Class 1		Class 1
Output wavelengths	850 nm ±20 nm 1300 nm ±20 nm	1310 nm ±20 nm 1550 nm ±20 nm
Fiber types tested	50/125 μm or 62.5/125 μm multimode	9/125 μm singlemode
1. For Auto OTDR mode. Manual OTDR mode: < 50 s.		

OTDR Specifications (cont.)

Specification	OFTM-5610, 5611, 5612 Multimode Modules	OFTM-5630, 5631, 5632 Singlemode Modules
Event deadzones ²	850 nm: 0.7 m typical; 1 m maximum 1300 nm: 1.5 m typical; 2 m maximum	1310/1550 nm: 2.5 m typical; 3 m maximum
Attenuation deadzones ³	850 nm: 4.5 m typical; 5.5 m maximum 1300 nm: 10.5 m typical; 15 m maximum	1310/1550 nm: 10.5 m typical; 15 m maximum
Maximum range⁴	2 km	10 km
Dynamic range⁵	850 nm: >10 dB 1300 nm: >10 dB	1310 nm: > 11 dB 1550 nm: > 9 dB

- 2. Event deadzones are measured to Telcordia standards for OTDR performance. Multimode: <-27 dB connector backreflection using -4.5 dB signal energy (4 ns pulse width) for 850 nm and 8 ns pulse width for 1300 nm. Singlemode: <-50 dB connector backreflection using -5 dB signal energy (8 ns pulse width).
- 3. Attenuation deadzones are measured to Telcordia standards for OTDR performance. < -50 dB connector backreflection using 0 dB signal energy (20 ns pulse width for multimode; 40 ns pulse width for singlemode) in Manual OTDR mode.
- 4. Manual mode provides a 4 km range for multimode and a 15 km range for singlemode; however, the tester's specifications apply only up to 2 km and 10 km respectively.
- 5. Effective dynamic range using Telcordia standards.

OTDR Specifications (cont.)

Specification	OFTM-5610, 5611, 5612 Multimode Modules	OFTM-5630, 5631, 5632 Singlemode Modules
Output power	850 nm: > 110 mW-pk 1300 nm: > 22 mW-pk	1310 nm: > 38 mW-pk 1550 nm: > 30 mW-pk
Loss threshold ⁶	0.2 dB	0.2 dB
Distance accuracy ⁷	± 1 m ± 0.005 % of distance ± 50 % of resolution \pm index of refraction error \pm event location error	± 1 m ± 0.005 % of distance ± 50 % of resolution \pm index of refraction error \pm event location error
Linearity ⁸	±0.07 dB/dB	±0.05 dB/dB
Sampling resolution	3 cm to 25 cm	3 cm to 1 m
Minimum pulse width ⁹	850 nm: 4 ns 1300 nm: 8 ns	8 ns

- 6. 6 dB above the noise floor.
- 7. Does not apply to event table.
- 8. Not applicable to OTDR tests at pulse widths of 4 ns or 8 ns for multimode and 8 ns for singlemode.
- 9. Pulse widths for Manual OTDR mode are given in the Technical Reference Handbook.

Power Meter Specifications: OFTM-5611, 5612, 5631, 5632

Testing speed, worst case	4.5 s (Far End Source mode)
Input connector	SC
Detector type	InGaAs
Calibrated wavelengths	850 nm, 1310 nm, 1550 nm
Power measurement range	1300/1310 nm and 1550 nm: 0 dBm to -60 dBm 850 nm: 0 dBm to -52 dBm
Display resolution	dB or dBm: 0.01 Linear (μW): >400: 1 >40: 0.1 >4: 0.01 >0.4: 0.001 ≤0.4: 0.0001

Power Meter Specifications: OFTM-5611, 5612, 5631, 5632 (cont.)

Power measurement uncertainty (accuracy)	± 0.25 dB ¹	
Measurement linearity (18 °C to 28 °C constant temperature)	1300/1310 nm and 1550 nm: ±0.1 dB ² 850 nm: ±0.15 dB ³	
Re-calibration period	1 year	
Display update rate	1 reading per second	
 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 °C 	 2. Linearity for 1300 nm, 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 -15 dBm and -52 dBm: ±0.15 dB typical performance Between 0 dBm and -15 dBm: ±0.5 dB typical performance 	

Loss/Length Specifications

Specification	OFTM-5612 Multimode Modules	OFTM-5632 Singlemode Modules
Testing speeds (excluding referencing times)	Far End Source mode: 4.5 s Loopback mode: 5 s typical Smart Remote detection: 3 s Smart Remote mode, unidirectional: 15 s Smart Remote mode, bi-directional: 30 s plus time to swap fibers	Far End Source mode: 4.5 s Loopback mode: 5 s typical Smart Remote detection: 3 s Smart Remote mode, unidirectional: 15 s Smart Remote mode, bi-directional: 30 s plus time to swap fibers
Output/input connectors	SC/SC	SC/SC
Fiber types tested	9 /125 μm to 62.5 /125 μm multimode	9 /125 μm singlemode
Output wavelengths	Multimode LED source: 850 nm and 1300 nm	Laser source: 1310 nm and 1550 nm
Laser classification	Class 1	Class 1
Maximum length measurement	2 km of 50 μm or 62.5 μm multimode fiber	10 km of 9 μm singlemode fiber

Loss/Length Specifications (cont.)

Specification	OFTM-5612 Multimode Modules	OFTM-5632 Singlemode Modules
Length measurement accuracy	±1.5 m plus ±2 % of length	±1.5 m plus ±2 % of length
Propagation time accuracy	± 15 ns plus ± 2 % of propagation time	± 15 ns plus ± 2 % of propagation time
Output power (nominal)	> -20 dBm	> -8 dBm
Output power stability over 8-hour period (after 5 minute warmup)	±0.1 dB at 73 °F (23 °C)	±0.1 dB at 73 °F (23 °C)
Detector type	InGaAs	InGaAs

Loss/Length Specifications (cont.)

Specification	OFTM-5612 Multimode Modules and OFTM-5632 Singlemode Modules		
Calibrated wavelengths	850 nm, 1310 nm, 1550 nm		
Power measurement range	850 nm: 0 dBm to -52 dBm 1300/1310 nm and 1550 nm: 0 dBm to -60 dBm		
Display Resolution	dB or dBm display: 0.01 Linear display (μW): >400: 1 >40: 0.1 >4: 0.01 >0.4: 0.001 ≤0.4: 0.0001		

Loss/Length Specifications (cont.)

Specification	OFTM-5612 Multimode Modules	OFTM-5632 Singlemode Modules
Power measurement uncertainty (accuracy)	± 0.25 dB ¹	± 0.25 dB ¹
Measurement linearity (18 °C to 28 °C constant temperature)	1300 nm: ±0.1 dB² 850 nm: ±0.15 dB³	±0.1 dB ²
Dynamic Range for main-remote communication and nominal length measurement	12 dB	22 dB
Re-calibration period	1 year	1 year
Display update rate	1 reading per second	1 reading per second

- 1. Under the following conditions:
 - Power level: -20 dBm, continuous wave
 - $\bullet~$ 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 °C

- 2. Linearity for 1300 nm, 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 -15 dBm and -52 dBm: ±0.15 dB typical performance
 - Between 0 dBm and -15 dBm: ±0.5 dB typical performance

Power

Battery type	Lithium ion battery pack, 7.2 V
Battery life	8 hr Auto OTDR operation with OFTM-5612 module, dual wavelength, 1 test run and saved every 5 minutes, no FiberInspector probe attached, 150 m of fiber
Charge time	6 hours maximum from total discharge

Traceable Calibration Period

To ensure maximum accuracy of test results, have the tester calibrated at a Fluke Networks authorized service center every 12 months.

Certifications and Compliance



Conforms to relevant European Union directives.



Listed by the Canadian Standards Association.

Memory for Test Results

Test results can be stored on a removable MultiMediaCard (MMC), Secure Digital (SD) memory card, or in internal memory. Memory card capacity depends on the type of records saved. Typical capacity for a 16 MB card is over 400 OTDR tests.

The amount of internal memory available for test results depends on the space used by the tester's software and custom test limits.

To see the memory space available for different record types on an installed memory card or in internal memory, press [wcross]; then select **Memory Status**.

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Serial Interfaces

The tester has a USB client interface and an EIA/TIA-232 (RS-232; DB9) interface for uploading test results to a PC and updating the tester's software.

The RS-232 serial port connects to a PC with a null-modem cable. Tables 5 and 6 and show the pin connections for the cable and the 9-to-25-pin adapter available from Fluke Networks .

Table 5. RS-232 Interface Cable Connections

Tester End (female DB9)			PC End (female DB9)	
Signal Name	Pin	Direction	Pin	Signal Name
Data carrier detect	1	←	4	Data terminal ready
Receive data	2	←	3	Transmit data
Transmit data	3	\rightarrow	2	Receive data
Data terminal ready	4	\rightarrow	1	Data carrier detect
Signal ground	5	\longleftrightarrow	5	Signal ground
Not connected	6		6	Not connected
Request to send	7	\rightarrow	8	Clear to send
Clear to send	8	←	7	Request to send
Not connected	9		9	Not connected

Table 6. 9-to-25-Pin Adapter

9-pin Connector	25-pin Connector
3	2
2	3
7	4
8	5
6	6
5	7
1	8
4	20
9	22
Shell	Shell

Keyboard Port

Six-pin mini DIN (PS/2)

Video Port for FiberInspector Probe

NTSC input jack

Dimensions (with module and battery installed)

10.6 in x 7.5 in x 2.5 in (26.9 cm x 19.1 cm x 6.4 cm)

Weight (with module and battery installed)

4.5 lb (1.9 kg)

Display

Six-inch diagonal, full VGA, passive color, transmissive LCD with backlight.

Fan

The fan turns on when the module temperature reaches about 95 °F (35 °C) and turns off at about 86 °F (30 °C).

FiberInspector Probe Specifications

Magnification	OFTM-5350: 250X; OFTM-5354: 400X
Camera type	0.33 in (8.38 mm) CCD with adjustable focus
Light source	LED
Connection to OptiFiber tester	8-pin mini DIN to NTSC video port
Power source	Powered by the OF-500 OptiFiber tester
Lighting technique	Coaxial
Dimensions	Probe: 1.3 in x 1.3 in x 4.3 in (3.3 cm x 3.3 cm x 10.92 cm) (length depends on adapter tip)
Weight	1.4 oz (40 g)
Temperature range	Operating: 32 °F to 104 °F (0 °C to 40 °C) Storage: 14 °F to 140 °F (-10 °C to +60 °C)
Humidity range	Operating: 0 % to 45 % RH non-condensing Storage: 0 % to 95 % RH non-condensing
Certifications	(when used with the OF-500 OptiFiber tester)

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