FLUKE networks

OptiFiber® Pro
OTDR

Users Manual

February 2012 (English) Rev. 2, 5/13

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4/04

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Chapter 1: Get Acquainted

Overview of Features

The OptiFiber® Pro Optical Time Domain Reflectometer (OTDR) module attaches to a Versiv™ main unit to make a rugged, hand-held tester that lets you locate, identify, and measure reflective and loss events in multimode and singlemode fibers. Typical maximum test ranges are 35 km maximum at 1300 nm for multimode fiber and 130 km maximum at 1550 nm for singlemode fiber. The tester includes these features:

- Automatic analysis of OTDR traces and events helps 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) fiber.
- Shows OTDR results as an intuitive map of events, a table of events, and an OTDR trace.
- Gives a PASS or FAIL result based on a test limit that you specify.
- "Document Only" test limit is available if PASS/FAIL results are not necessary.
- Touchscreen lets you quickly navigate through different views of the results and see more information about events.
- DataCenter OTDR™ test gives optimal performance when you do tests on fiber installations that have short links, many connections, and possibly large reflections.
- FaultMap™ test lets you make maps of your cable plant, see patch cords as short as 0.5 m, and see events that have poor reflectance.
- Visual fault locator helps you verify the continuity of fibers and locate faults in fibers and connectors.

- Optional video probe lets you inspect fiber endfaces and save the images in test reports.
- Saves approximately 2000 OTDR tests on fiber links with an average length of 2 km, and up to 5000 tests for lengths less than 2 km.
- Lets you set up projects to specify the types of tests and the cable IDs necessary for a job and monitor the progress and status of the job.
- LinkWare™ software lets you upload test results to a PC and make professional-quality test reports.
- LinkWare Stats software makes browsable, graphical reports of cable test statistics.

⚠ Safety Information

Table 1 shows the international electrical symbols used on the tester or in this manual.

ⓘ: This key turns the tester on and off.

Table 1. International Electrical Symbols

	Warning: Risk of fire, electric shock, or personal injury.
	Warning or Caution: Risk of damage or destruction to equipment or software. See explanations in the manuals.
	Warning: Class 1 (OUTPUT port) and Class 2 (VFL port) lasers. Risk of eye damage from hazardous radiation.
	Do not put products containing circuit boards into the garbage. Dispose of circuit boards in accordance with local regulations.

⚠Warning: Class 1 and Class 2 Laser Products

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

- **Do not look directly into optical connectors. Some optical equipment emits invisible radiation that can cause permanent damage to your eyes.**
- **Do not run any tests that activate the outputs on the tester unless a fiber is attached to the output.**
- **Do not open the case; no user-serviceable parts are inside.**
- **Do not modify the tester.**
- **When you inspect fiber endfaces, use only magnification devices that have the correct filters.**
- **Use of controls, adjustments, or procedures not stated herein can possibly result in hazardous radiation exposure.**
- **Use only AC adapters approved by Fluke Networks for use with the tester to supply power to the tester and charge the battery.**
- **Do not put the battery pack in a fire or an environment with temperatures more than 140 °F (60 °C).**
- **Do not use the tester in damp or wet environments.**
- **Do not short-circuit or disassemble the battery pack.**
- **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 can possibly be impaired.**

⚠ Caution

To prevent damage to the tester or cables under test and to prevent data loss:

- **Do not connect the OTDR port to an optical source. Doing so can cause damage to the OTDR receiver.**
- **Do not connect the tester to an active network. Doing so causes unreliable test results, can disrupt network operations, and can cause damage to the OTDR receiver.**
- **Do not touch reflective surfaces (such as metal) to the end of a fiber cable connected to the OTDR when the OTDR is operating. An open fiber connector endface has about a 4% reflection. Holding a reflective surface near the connector endface can cause more than a 4% reflection, which can 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. See Chapter 2.**
- **Use a video probe to periodically inspect the OTDR 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 prevent unreliable test results, connect the AC adapter or replace the battery as soon as the low battery indication appears.**
- **Do not remove the USB flash drive while the LED on the drive flashes. Doing so can corrupt the data on the drive.**

- **You can lose a USB flash drive, cause damage to it, or accidentally erase the contents of the drive. Thus, Fluke Networks recommends that you save no more than one day of test results on a flash drive.**

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- Japan: 03-6714-3117
- Korea: 82 2 539-6311
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- USA: 1-800-283-5853

Register Your Product

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 the online registration form on the Fluke Networks website at **www.flukenetworks.com**.

Technical Reference Handbook

The *Versiv Technical Reference Handbook* has more information about the tester. The Handbook is on the Versiv Product Manuals CD included with your product, and on the Fluke Networks website.

Additional Resources

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 **SUPPORT** > **Knowledge Base**.

Kit Contents

The OptiFiber Pro kits come with the accessories in the lists below. If something is damaged or missing, contact the place of purchase immediately.

Model OFP-100-Q

- Versiv unit with battery pack
- OptiFiber Pro Quad OTDR module (multimode/singlemode)
- Two SC adapters for the OTDR module
- Carrying case for the tester
- Carrying/hanging strap for the tester
- USB cable for PC communications, type A USB to Micro-B USB
- AC adapter/charger
- Getting Started Guide
- Product Manuals CD
- LinkWare Software CD

Model OFP-100-QI

- Versiv unit with battery pack
- OptiFiber Pro Quad OTDR module (multimode/singlemode)
- Two SC adapters for the OTDR module
- Two 50 µm multimode launch/tail cords, 105 m, SC/LC
- One 50 µm multimode launch/tail cord, 105 m, SC/SC
- Two singlemode launch/tail cords, 130 m, SC/LC
- One singlemode launch/tail cords, 130 m, SC/SC
- One SC/SC adapter
- One LC/LC adapter
- Two ToolPak™ kits (used to hang the launch/tail cords)
- USB Video Probe
- Tips for the Video Probe:
  - SC tip for bulkhead connectors

  - LC tip for bulkhead connectors
  - 2.5 mm universal tip
  - 1.25 mm universal tip
- IBC™ OneClick cleaner for 1.25 mm LC and MC connectors
- IBC™ OneClick cleaner for 2.5 mm SC, ST, and FC connectors
- Carrying case for the tester
- Carrying/hanging strap for the tester
- Hand Strap
- USB cable for PC communications, type A USB to Micro-B USB
- AC adapter/charger
- Getting Started Guide
- Product Manuals CD
- LinkWare Software CD

Model OFP-100-M

- Versiv unit with battery pack
- OptiFiber Pro multimode OTDR module
- One SC adapter for the OTDR module
- Carrying case for the tester
- Carrying/hanging strap for the tester
- USB cable for PC communications, type A USB to Micro-B USB
- AC adapter/charger
- Getting Started Guide
- Product Manuals CD
- LinkWare Software CD

Model OFP-100-MI

- Versiv unit with battery pack
- OptiFiber multimode OTDR module
- One SC adapter for the OTDR module
- Two 50 µm multimode launch/tail cords, 105 m, SC/LC
- One 50 µm multimode launch/tail cord, 105 m, SC/SC
- One SC/SC adapter
- One LC/LC adapter
- Two ToolPak™ kits (used to hang the launch/tail cords)
- USB Video Probe
- Tips for the Video Probe:
  - SC tip for bulkhead connectors
  - LC tip for bulkhead connectors
  - 2.5 mm universal tip
  - 1.25 mm universal tip
- IBC™ OneClick cleaner for 1.25 mm LC and MC connectors
- IBC™ OneClick cleaner for 2.5 mm SC, ST, and FC connectors
- Carrying case for the tester
- Carrying/hanging strap for the tester
- Hand Strap
- USB cable for PC communications, type A USB to Micro-B USB
- AC adapter/charger
- Getting Started Guide
- Product Manuals CD
- LinkWare Software CD

Model OFP-100-S

- Versiv unit with battery pack
- OptiFiber Pro singlemode OTDR module
- One SC adapter for the OTDR module
- Carrying case for the tester
- Carrying/hanging strap for the tester
- USB cable for PC communications, type A USB to Micro-B USB
- AC adapter/charger
- Getting Started Guide
- Product Manuals CD
- LinkWare Software CD

Model OFP-100-SI

- Versiv unit with battery pack
- OptiFiber singlemode OTDR module
- One SC adapter for the OTDR module
- Two singlemode launch/tail cords, 130 m, SC/LC
- One singlemode launch/tail cord, 130 m, SC/SC
- One SC/SC adapter
- One LC/LC adapter
- Two ToolPak™ kits (used to hang the launch/tail cords)
- USB Video Probe
- Tips for the Video Probe:
  - SC tip for bulkhead connectors
  - LC tip for bulkhead connectors
  - 2.5 mm universal tip
  - 1.25 mm universal tip
- IBC™ OneClick cleaner for 1.25 mm LC and MC connectors
- IBC™ OneClick cleaner for 2.5 mm SC, ST, and FC connectors
- Carrying case for the tester
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- Hand Strap
- USB cable for PC communications, type A USB to Micro-B USB
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- LinkWare Software CD

Connectors, Keys, and LEDs

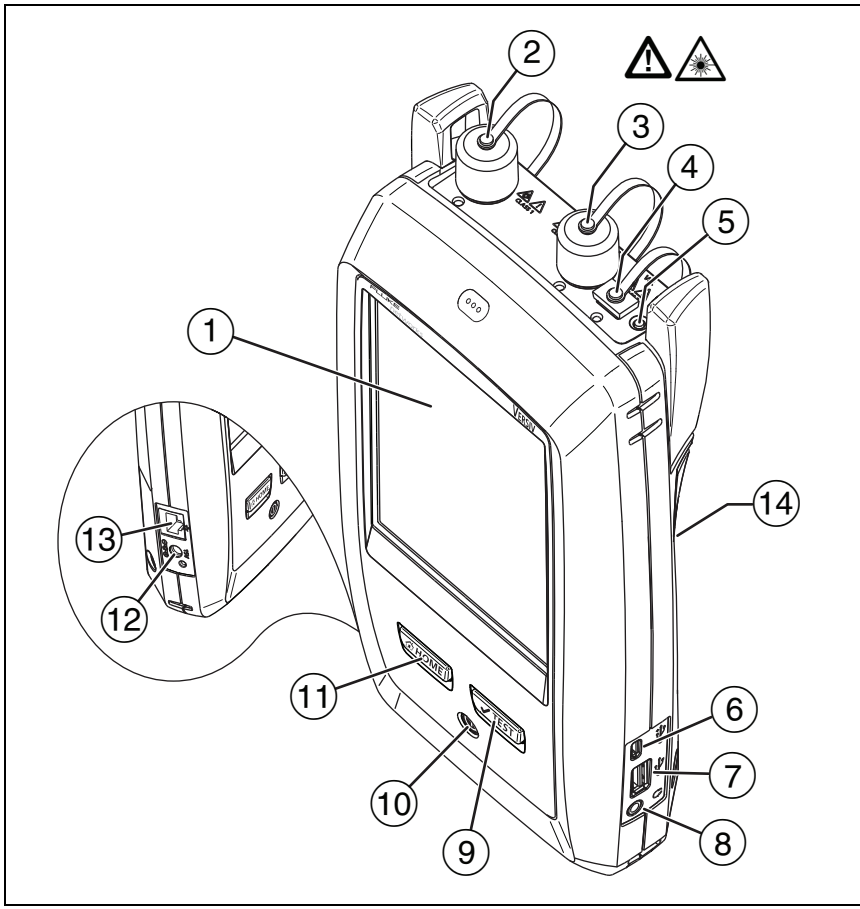


Figure 1. Connectors, Keys, and LEDs (OptiFiber Pro Quad OTDR shown)

① LCD display with touchscreen.

② Singlemode OTDR port with interchangeable SC adapter and protective cap. The LED in front of the port turns on when the port emits an optical signal.

③ Multimode OTDR port with interchangeable SC adapter and protective cap. The LED in front of the port turns on when the port emits an optical signal.

④ Visual fault locator port and protective cap. The LED in front of the port turns on when the port emits an optical signal.

⚠Warning⚠

Do not look directly into optical connectors. Some sources emit invisible radiation that can cause permanent damage your eyes.

⑤ Button that controls the VFL.

⑥ Micro-AB USB port: This USB port lets you connect the tester to a PC so you can upload test results to the PC and install software updates in the tester.

⑦ Type A USB port: This USB host port lets you save test results on a USB flash drive or connect a video probe to the tester.

⑧ Headset jack.

⑨ TEST: Starts a test. To start a test, you can also tap **TEST** on the display.

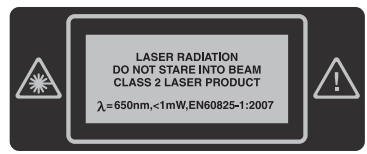
⑩ ⏻: Power key.

⑪ HOME: Press HOME to go to the home screen.

⑫ Connector for the AC adapter. The LED is red when the battery charges, and green when the battery is fully charged. The LED is yellow if the battery will not charge. See “Charge the Battery” on page 14.

⑬ RJ45 connector: For functions available in future software releases.

⑭ Decal with laser safety information:



AC Adapter and Battery

You can use the AC adapter (model VERSIV-ACUN) or the lithium ion battery (model VERSIV-BATTERY) to supply power to the tester.

To remove the battery, see “Remove the Battery” on page 101.

To turn on the tester, press ⏻.

Charge the Battery

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

To charge the battery

Connect the AC adapter to the tester. See item ⑫ in Figure 1. The LED near the AC adapter connector is red when the battery charges, and green when the battery is fully charged.

A fully-charged battery operates for approximately 8 hours of typical use. The battery takes approximately 4 hours to fully charge when the tester is turned off.

Notes

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

The battery will not charge if its temperature is outside the range of 32 °F to 104 °F (0 °C to 40 °C). The LED near the connection for the AC adapter is yellow if the battery will not charge.

Check the Battery Status

The battery status icon is in the upper-left corner of the screen:

 Battery is full.

 Battery is approximately half full.

 If the AC adapter is not connected, the red bar shows that the battery is very low. Connect the AC adapter to charge the battery and make sure the tester continues to operate.

The red bar also shows if the AC adapter is connected, but the battery is not installed.

To see more information about the battery status

Tap **TOOLS**, then tap **Battery Status**.

When the AC adapter is not connected, the screen shows the **Time Remaining,** which is the approximate battery life at the present rate of use.

How to Use the Touchscreen

The touchscreen lets you use fingertip gestures to control the tester. You can also operate the touchscreen with a stylus that is made for projected capacitance touchscreens.

⚠Caution

For correct operation and to prevent damage to the touchscreen:

- **Touch the screen only with your fingers. Do not use too much force.**
- **Do not touch the screen with sharp objects.**

Note

The touchscreen will not respond if you tap it with your fingernail or an incorrect type of stylus or if you wear non-conductive gloves.

To use the touchscreen

- To select an item on the screen, tap the item lightly with your fingertip.
- To scroll a screen, lightly touch the screen then move your fingertip in the direction you want the screen to move.
- On screens that show a trace or a FiberInspector image, use the pinch and reverse-pinch gestures to change the magnification on the screen. See Figure 2.
- On screens that show a trace or a FiberInspector image, you can drag some items, such as the measurement cursor on the trace.

To clean the touchscreen, turn off the tester, then use a soft, lint-free cloth that is moist with a mild detergent.

⚠Caution

When you clean the touchscreen, do not let liquid get under the plastic around the touchscreen.

To zoom in and out on the touchscreen

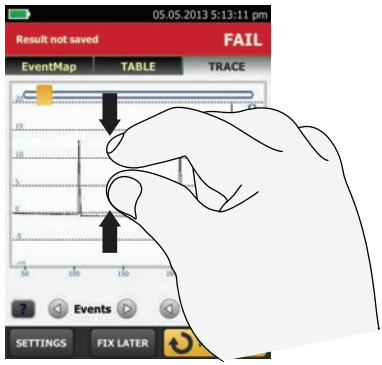
To zoom in and out on an OTDR trace or FiberInspector image, use the pinch and reverse-pinch gestures on the touchscreen. See Figure 2.

When you zoom an OTDR trace, horizontal and vertical zoom controls show on the screen. These controls let you change the magnification on the distance and decibels scales independently.

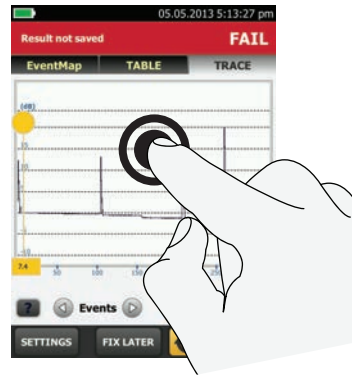
You can zoom in to a maximum magnification factor of 128:1.

To zoom in, use the reverse-pinch gesture or the horizontal and vertical zoom controls.

To move the image, drag it in any direction.



To zoom out, use the pinch gesture or the horizontal and vertical zoom controls.



To quickly go back to 1:1 magnification, double-tap the screen.

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Figure 2. How to Zoom the Screen

The Home Screen

The home screen (Figure 3) shows important test settings. Before you do a test, make sure these settings are correct.

Figure 3. The Home Screen

① **PROJECT**: The project contains the settings for a job and helps you monitor the status of a job. When you save test results, the tester puts them in the project. Tap the **PROJECT** panel to edit the project settings, select a different project, or make a new project.

② Shows a summary of the test results in the project:

✔: The number of tests that passed.

✖: The number of tests that failed.

③ The test setup panel shows the settings the tester will use when you tap **TEST** or press ✔TEST.

To change these settings, tap the panel, select the test on the **CHANGE TEST** screen, tap **EDIT**, select different settings on the **TEST SETUP** screen, then tap **SAVE**.

Note

You can set up tests for any module that the tester can use, even when no module is attached.

④ **Next ID**: The **Next ID** panel shows the ID that the tester gives to the next test results you save.

Tap **Next ID** to do these tasks:

- Enter an ID, select a different ID in the ID set, select a different set of IDs, or make a new set. The tester adds the IDs and ID sets you make to the project that shows on the home screen.
- Turn **Auto Save** on or off.
- Select **End 1** or **End 2** for OTDR and FiberInspector tests.
- Enter a name for **End 1** and **End 2**.

⑤ **Operator**: The name of the person who does the job.

⑥ **TOOLS**: The **TOOLS** menu lets you set up the compensation function for the launch/tail cords, use tools such as the real-time trace and the FiberInspector test, see the status of the tester, and set user preferences such as the language and the display brightness.

⑦ **RESULTS**: Tap **RESULTS** to see and manage the results that are saved in the tester.

⑧ **TEST**: Tap **TEST** to do the test shown in the test setup panel.

⑨ The percentage of the tests in the project that are completed. The tester uses the number of available IDs and the tests you selected on the **CABLE ID SETUP** screen to calculate this percentage. See Figure 30 on page 90. **% Tested** does not show if your project contains only a **Next ID** list. See "About Next ID Sets" on page 94 for more information about the **Next ID** list.

⑩ The type of module attached to the tester. If no module is attached, this screen shows **HOME**.

Verify Operation

The tester does a self test when you turn it on. To do the self test again, tap the **TOOLS** icon, then tap **Self Test**.

If the tester shows an error or does not turn on, refer to "If the Tester Does Not Operate as Usual" on page 103.

Change the Language

On the home screen, tap the **TOOLS** icon, tap **Language**, then tap a language.

Buttons to Do Tests and Save Results

When a test is completed and more than one button shows at the bottom of the screen, the tester highlights one in yellow to recommend which one to tap. Figure 4 shows the buttons you will see.

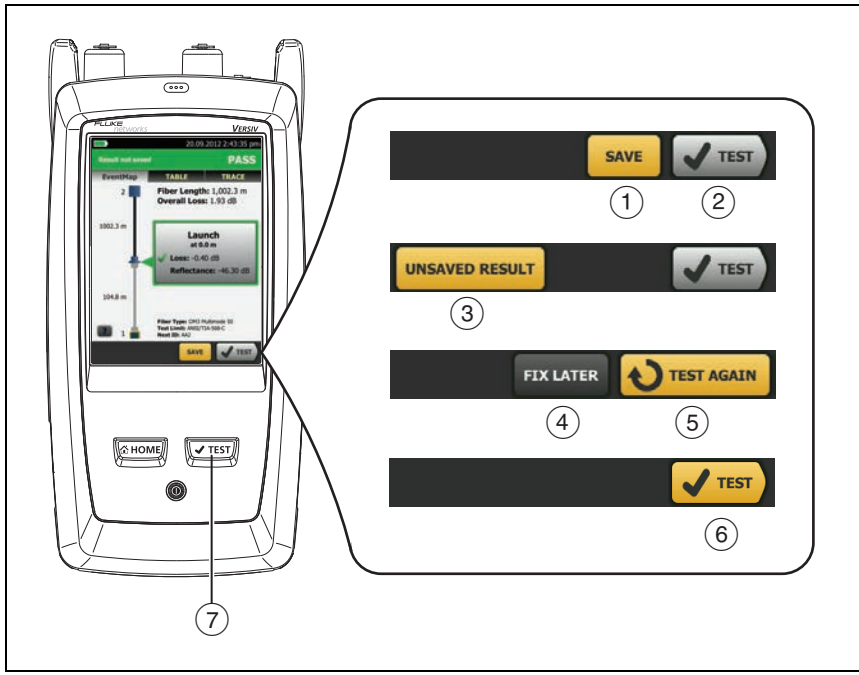

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Figure 4. FIX LATER, TEST AGAIN, and TEST Buttons and the TEST Key

① **SAVE** (yellow), ② **TEST** (gray)**:** These buttons show if the test passed and **Auto Save** is off. When you tap **SAVE**, you can save the results with an ID that you make or select. When you tap **TEST**, you can select to save the results or do the test again and not save the results.

③ **UNSAVED RESULT**: This button shows if **Auto Save** is off and you go to the home screen when a test is completed. Tap this button to see the result.

④ **FIX LATER:** This button shows if the test failed and **Auto Save** is off. Tap **FIX LATER** to save the results with an ID that you make or select.

⑤ **TEST AGAIN:** This button shows if the test failed. Tap this button to do the test again for the same ID. If **Auto Save** is on, the tester saves subsequent results with the same ID. If **Auto Save** is off, you can save the result if necessary. When you look at a result that failed, tap **TEST AGAIN** to do the test again for the same ID and with the same test settings as the saved result.

⑥ **TEST** (yellow)**:** This button shows if the test passed and **Auto Save** is on. When **Auto Save** is on, the tester saves results with the next available ID when the test is completed. When you tap **TEST**, the tester does a test for the next available ID.

⑦ ✔TEST: Press ✔TEST to do the the test shown on the home screen for the **Next ID**.

Overview of Memory Functions

Typical capacity for the memory in the Versiv unit is approximately 2000 OTDR tests on fiber links with an average length of 2 km, and up to 5000 tests for lengths less than 2 km. The capacity available for test results depends on the space used by the software and custom test limits in the tester.

The number of test results you can save decreases if you save more tests in each record, or if you save tests that use more memory. For example, records that include OTDR tests and images from the video probe use more memory than records that include OTDR tests and FaultMap tests.

To see the memory status

On the home screen, tap the **TOOLS** icon, then tap **Memory Status**.

To make more memory available, you can upload results to a USB flash drive, then delete the results in the tester.

Options for Cable IDs

When you save the test results for a cable, you usually give the results the name that is the ID for the cable. There are several methods you can use to make IDs for test results:

- You can use the **CABLE ID SETUP** screen to make a set of sequential IDs. The tester uses the IDs in sequence as the names for the results you save. When **Auto Save** is on, the tester automatically saves each result with the next available ID in the set. See Chapter 8.

  A cable ID set also lets you use IDs again so you can add different results to tests you saved before.

- You can enter an ID each time you do a test. To do this, turn off the **Auto Save** function (see page 24). Each time a test is completed, tap **SAVE** (if the test passed) or **FIX LATER** (if the test failed), then enter an ID manually.

- You can use LinkWare software to make a set of IDs, download the set to the tester, then import it into a project.

- After you do a test, you can enter the ID for a test you saved before. This lets you replace results or add different results to a test you saved before.

- If the test failed before, and you saved the results, you can select it on the **RESULTS** screen, then press **TEST AGAIN** to replace the results for that ID.

Notes

Cable IDs are case-sensitive. For example, the tester saves result with the names "A0" and "a0" in two different records.

A cable ID can have a maximum of 60 characters.

If you delete all the ID sets in a project, the tester makes a default set that starts with 001.

To turn the Auto Save function on or off

1. On the home screen, tap the **Next ID** panel.
2. On the **CHANGE ID** screen, tap the **On/Off** control next to **Auto Save**.
3. Tap **DONE**.

How to Install a Strap

Two types of straps are available for the tester: an optional hand strap that helps you hold the tester, and a carrying strap that lets you carry and hang the tester. Figure 5 shows how to install a strap and how to use the hand strap.

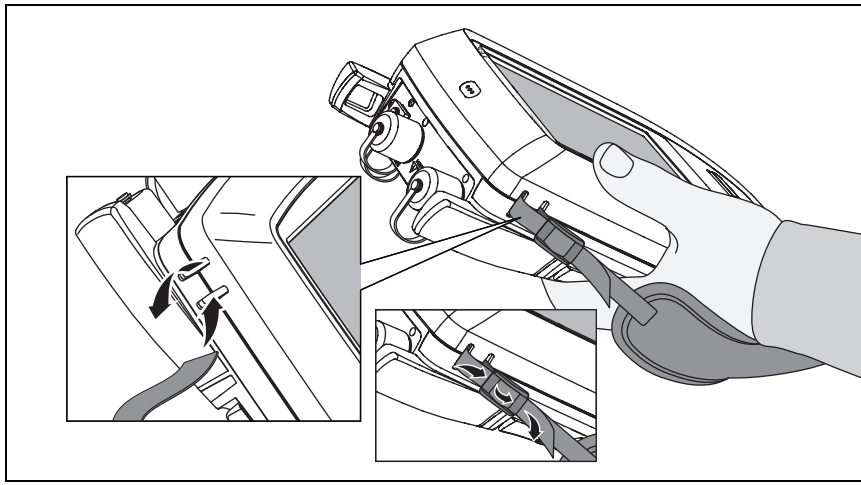

Figure 5. How to Install a Strap and Use the Hand Strap

How to Remove or Install a Module

Figure 6 shows how to remove and install the module.

Note

It is not necessary to turn off the tester before you remove or install a module.

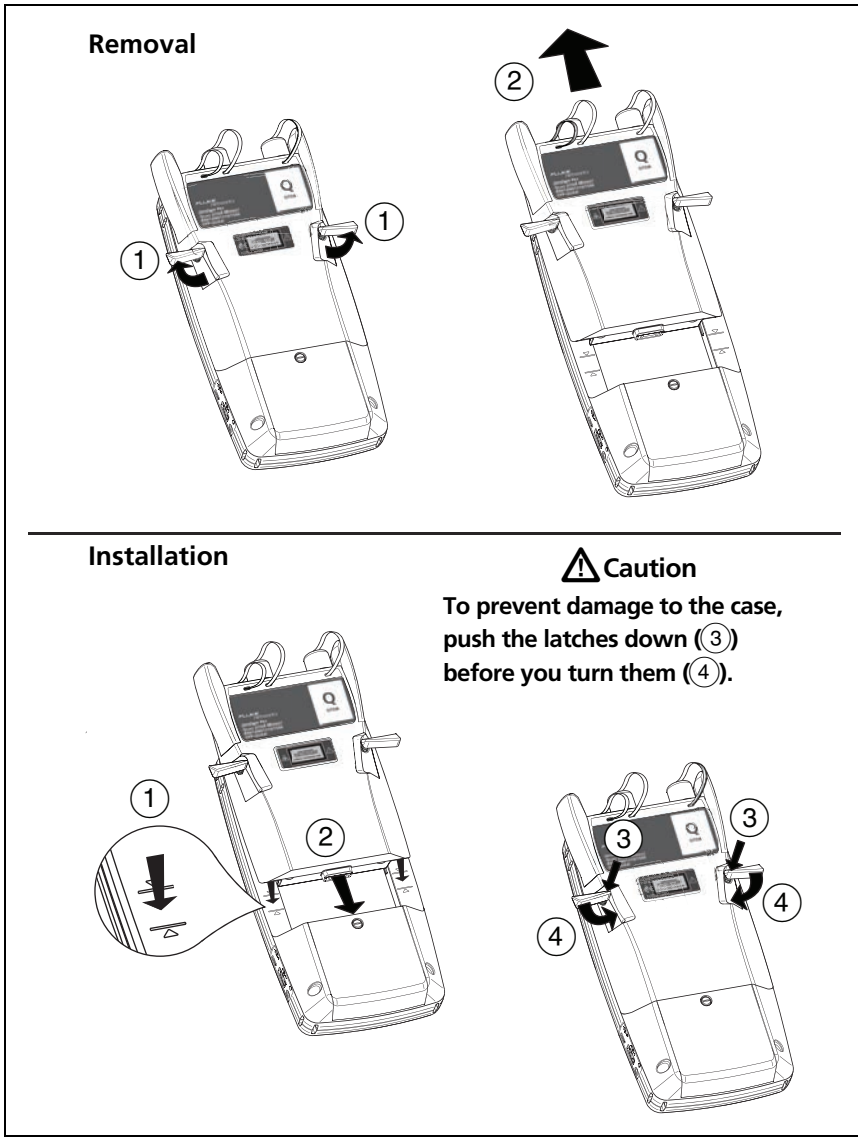

Figure 6. How to Remove and Install the Module

How to Retract the Launch/Tail Cord

When you do not use the launch/tail cord, retract the cord and use the strap to hold the connectors against the case. See Figure 7.

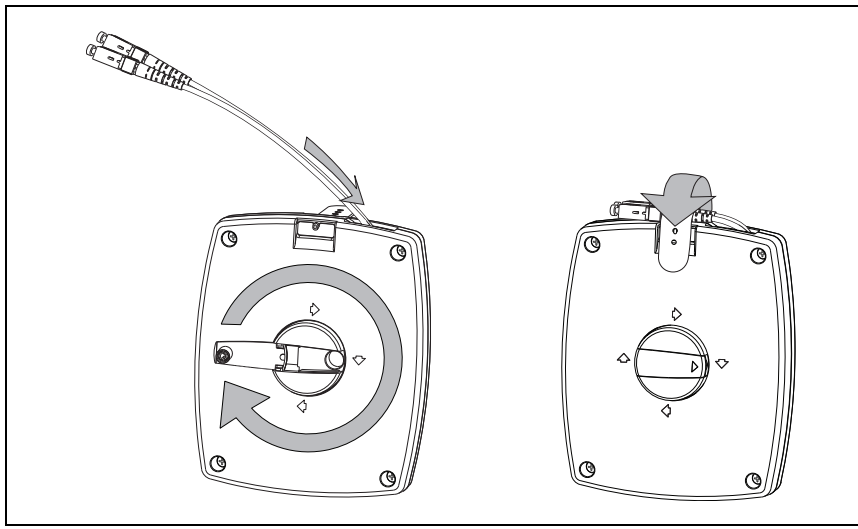

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Figure 7. How to Retract the Launch/Tail Cord

About LinkWare and LinkWare Stats Software

The LinkWare™ Cable Test Management software included with your tester lets you do these tasks:

- Upload test records to a PC.
- Examine test results.
- Use new or different test limits to re-certify existing test results.
- Add results from other Fluke Networks testers to records you uploaded from a OptiFiber Pro tester.
- Make reports for bi-directional results from OTDR tests.
- Do bi-directional averaging for OTDR tests.
- Add ANSI/TIA/EIA-606-A administration information to records.
- Organize, customize, and print professional-quality test reports.
- Update the software in the tester.
- Export OTDR traces to files that use the Bellcore SR-4731 format.

Updates to LinkWare software are available on the Fluke Networks website.

The LinkWare Stats Statistical Report software that is included with LinkWare software provides statistical analysis of cable test reports and generates browsable, graphical reports.

For instructions about LinkWare and LinkWare Stats software, see the guides for getting started and the online help available under **Help** on the LinkWare and LinkWare Stats menus.

Chapter 2: How to Clean Fiber Endfaces

When a fiber optic link does not operate correctly, the cause is frequently a dirty endface in a connector. Figure 8 shows examples of dirty endfaces and an endface that has been correctly cleaned and polished.

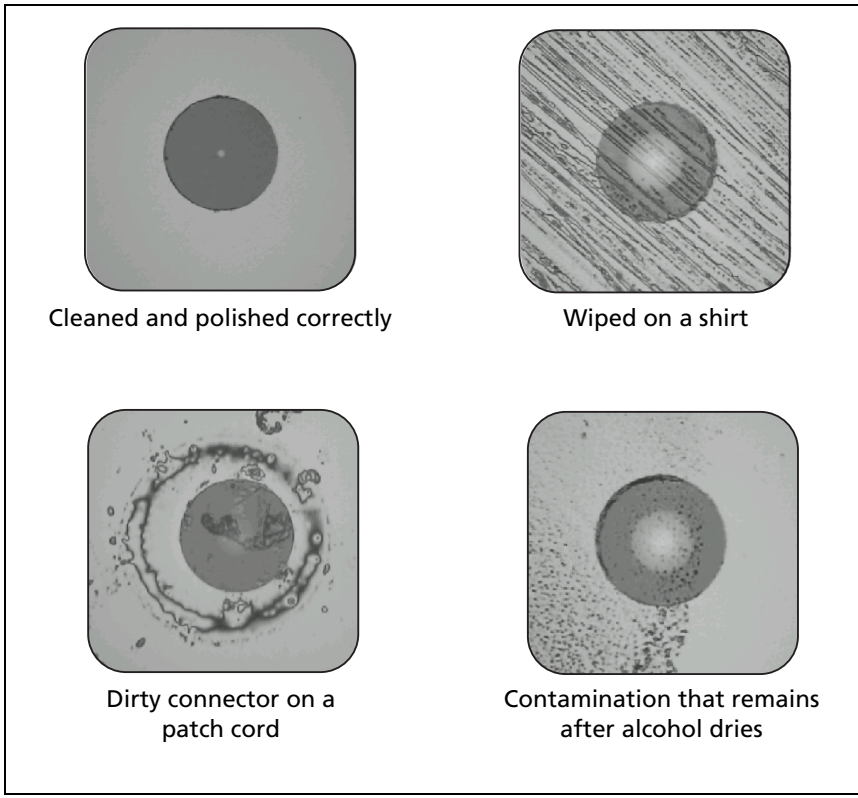


Figure 8. Examples of Clean and Dirty Fiber Endfaces

Always clean and inspect the endfaces in fiber connectors before you make connections. Fluke Networks recommends that you use a mechanical device, such as the Fluke Networks IBC OneClick Cleaner, to clean connectors. If you do not have such a device, or if the device does not clean the connector sufficiently, use other optical-grade supplies to clean connectors.

Figure 9 shows the equipment you use to clean and inspect fiber endfaces.

⚠Warning

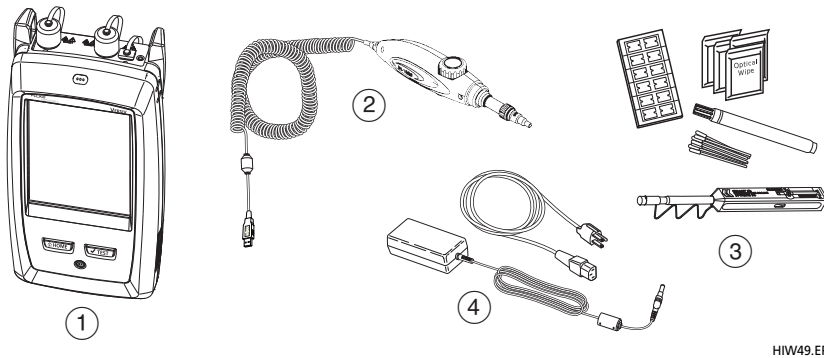
To prevent possible eye damage caused by hazardous radiation:

- **Do not look directly into optical connectors. Some optical equipment emits invisible radiation that can cause permanent damage your eyes.**
- **Before you clean an endface, turn off any optical sources (laser or LED) that are connected to the fiber.**
- **When you inspect endfaces, use only magnification devices that have the correct filters.**

⚠Caution

To prevent damage to connectors and to keep contamination off of endfaces:

- **Always cover unused connectors and adapters with protective caps.**
- **Always keep unused protective caps in a clean, sealed container to prevent contamination.**



1. Versiv unit with OTDR module installed
2. Video probe with USB connector (DI-1000 shown)
3. Fiber cleaning supplies
4. AC adapter with line cord (optional)

Figure 9. Equipment to Clean and Inspect Fiber Endfaces

How to Use a Fluke Networks IBC OneClick Cleaner

⚠ Caution

To prevent damage to the device and to connectors and to keep contamination off of endfaces, read all instructions and obey all safety precautions given in the instructions for the device you use to clean connectors.

To clean the connectors on test reference cords, use wipes and solvent. The OneClick cleaner cleans the fiber core, but can leave contamination around the core. The contamination can move to the core when you make connections. See "To Clean Connector Ends" on page 36.

1. Use the video probe to inspect the connector. If it is dirty, continue to step 2.
2. To clean a bulkhead connector, remove the cap. To clean the connector on a fiber cable, remove only the tip of the cap.
3. If necessary for a bulkhead connector, extend the tip of the device.
4. Push the device straight into the connector until you hear a loud click. See Figure 10. Then remove the device.
5. Use the video probe to inspect the connector. If necessary, clean and inspect the connector again.

   If the mechanical device does not clean the connector sufficiently, use a swab and solvent to clean the connector.

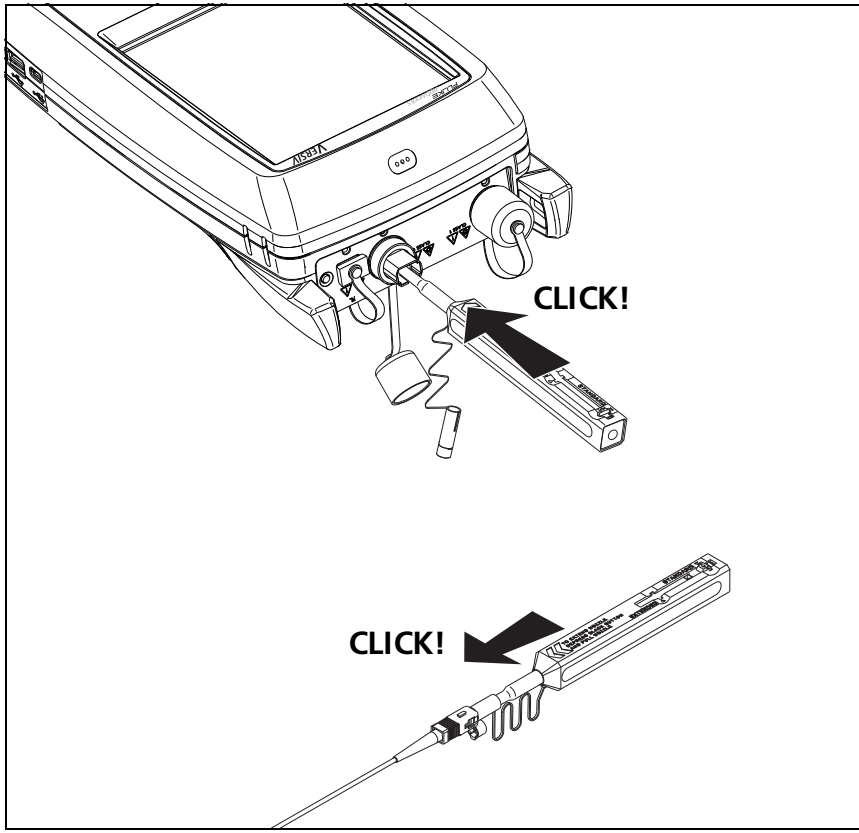


Figure 10. How to Use the IBC OneClick Cleaner

How to Use Wipes, Swabs, and Solvent

⚠ Caution

To prevent damage to connectors and to keep contamination off of endfaces:

- **Always discard wipes or swabs after you use them.**
- **Do not let solvent dry on an endface. Some solvents leave a residue after they dry.**
- **If you must use alcohol as a solvent, make sure you use 99%-pure, anhydrous alcohol.**

To Clean Bulkhead Connectors

1. Use a video probe to inspect the connector. If it is dirty, continue to step 2.
2. Touch the tip of a fiber optic solvent pen or swab soaked in solvent to a lint-free dry wipe or fiber cleaning card.
3. Touch a new, dry swab to the solvent spot on the wipe or card. Push the swab into the connector, twist it around 3 to 5 times against the end-face, then remove and dispose of the swab.
4. Dry the connector with a dry swab by twisting it around in the connector 3 to 5 times.
5. Use a video probe to inspect the connector. If necessary, clean and inspect the connector again.

To Clean the Optical Connectors on the Modules

To clean the optical connectors on the modules, first use the procedure given under “To Clean Bulkhead Connectors”.

If a connector is very dirty or the procedure above does not make it clean, use this procedure:

1. Unscrew the adapter on the connector.
2. Clean the ferrule with a dry, optical-grade wipe made for fiber optic connectors.
3. Use a video probe to inspect the connector. If necessary, clean and inspect the connector again.
4. If the endface is very dirty, use a wipe that is moist with optical-grade solvent to clean the endface. Dry the ferrule with a dry wipe.

Note

*If the OTDR **Port Connection Quality** gauge stays in the **Poor** range after you clean the OTDR connector, remove the adapter from the module and inspect the adapter for damage. Make sure that the white plastic ring inside the center tube shows no damage.*

To Clean Fiber Adapters

At regular intervals, clean fiber adapters with a swab and fiber optic solvent. Dry with a dry swab.

To Clean Connector Ends

1. Use a video probe to inspect the connector. If it is dirty, continue to step 2.
2. Touch the tip of a fiber optic solvent pen or swab soaked in solvent to a lint-free dry wipe or fiber cleaning card.
3. Wipe the connector end-face across the solvent spot, then back and forth once across the dry area of the wipe or card.
4. Use a video probe to inspect the connector. If necessary, clean and inspect the connector again.

Note

For some connector types, such as VF-45, it is necessary to use a different method to clean the endface.

Chapter 3: The OTDR

Before you use the tester, read the safety information that starts on page 2.

Settings for OTDR Tests

Table 2 gives descriptions of the settings for OTDR tests. To set up a project, which includes the settings in Table 2, cable IDs, and operator names, see Chapter 8.

To set up an OTDR test

1. On the home screen, tap the test setup panel.
2. On the **CHANGE TEST** screen, select an OTDR test to change, then tap **EDIT**.

   Or to set up a new OTDR test, tap **NEW TEST** then tap **Auto OTDR**, **Manual OTDR**, or **DataCenter OTDR**.
3. On the **TEST SETUP** screen, tap the panels to change settings for the test. See Table 2.
4. On the **TEST SETUP** screen, tap **SAVE** when your test setup is completed.
5. On the **CHANGE TEST** screen, make sure the button next to the test is selected, then tap **USE SELECTED**.

Table 2. Settings for OTDR Tests

Module	Select the OTDR module you will use. To select a different module, tap the **Module** panel on the **TEST SETUP** screen, then tap a module.
Test Type	When you turn on the tester, the **Test Type** shows the test that was last selected. **Auto OTDR**: The tester automatically selects settings that give you the best view of the events on the cabling. This mode is the easiest to use and is the best choice for most applications. To see the settings the tester used for an **Auto OTDR** test, tap **SETTINGS** on the trace screen. *Note* *Some unusual faults can cause the **Auto OTDR** test to show an unsatisfactory trace. If this occurs, use the **Manual OTDR** test to get a better trace.* **Manual OTDR**: This mode lets you select settings to control the qualities of the trace. **DataCenter OTDR**: This test is optimized for fiber installations that have short links, many connections, and the possibility of large reflections. *Notes* *By default, the **DataCenter OTDR** test uses 850 nm for multimode fiber and 1310 nm for singlemode fiber. These are the wavelengths typically used in data centers. You can select other wavelengths if necessary.* *You must use launch compensation when you do a **DataCenter OTDR** test.*

Table 2. Settings for OTDR Tests (continued)

Manual OTDR Settings	This item shows only if you select **Manual OTDR** for the **Test Type**. Manual OTDR mode lets you select settings to control the qualities of the trace. See the Technical Reference Handbook.
Launch Compensation	Tap the control to turn the launch compensation function on or off. See"About Launch and Tail Cords" on page 40.
Wavelength	Select the wavelengths you want to use. You can do tests at one or all of the wavelengths supported by the module you selected.
Fiber Type	Select a fiber type that is correct for the type you will test. To see a different group of fiber types, tap **MORE**, then tap a group. *Note* *Select a fiber type before you select a test limit and wavelengths. The tester shows only the test limits and wavelengths that are applicable to the selected fiber type.*
Fiber Type Settings	**IR**: The tester uses the index of refraction to calculate the optical length of the fiber. Each fiber type includes the value specified by the manufacturer. To use a different IR, make a custom fiber type. See the Technical Reference Handbook. **Backscatter**: Backscatter is the backscatter coefficient. The tester uses this value to calculate the reflectance of events for OTDR tests and the overall ORL for the link. Each fiber type includes the value specified by the manufacturer. To use a different backscatter value, make a custom fiber type. See the Technical Reference Handbook.

(continued)

Table 2. Settings for OTDR Tests (continued)

Test Limit	Select the correct test limit for the job. Generic limits, such as **General Fiber** and **Document Only**, let you do tests when no industry-standard limit is applicable and you do not want to make a custom limit. These limits are in the **Miscellaneous** group. To see a different group of limits, tap **MORE**, then tap the name of a group. Some test limits use the measured length of the fiber to calculate a limit for loss.
Test Limit Settings	This item shows only if the selected test limit calculates a loss limit for each link. For such limits, enter the number of connectors and splices in the link. See the Technical Reference Handbook.

About Launch and Tail Cords

Launch and tail cords let the tester measure the loss and reflectance of the first and last connectors in the cabling and also include them in the measurement of overall loss. Without launch and tail cords, no backscatter is available before the first connector nor after the last. To measure the properties of a connector, the tester must measure the backscatter before and after the connector.

Fluke Networks recommends that you use launch and tail cords. You should also use the launch/tail cord compensation function to remove the lengths of these fibers from the OTDR measurements.

If you select a test limit that requires you to use launch and tail cords, the tester shows a warning message when you try to do an OTDR test without launch and tail cords.

⚠ Caution

For tests on cabling that has angled physical contact (APC) connectors, use only launch/tail cords that have APC connectors at the ends connected to the cabling. Other connector types cause large reflections that can cause unreliable test results.

Notes

Do not use hybrid patch cords to connect the launch or tail cords to the cabling under test. Use launch and tail cords with the correct connectors to connect directly to the cabling under test. This gives the best measurement of the first and last connectors in the link. Launch and tail cords with different types of connectors are available from Fluke Networks.

***Launch + Tail** compensation usually gives the most accurate measurements.*

How to set up the launch compensation function

1. Select launch and tail cords that have the same type of fiber as the fiber you will test.
2. On the home screen, tap the test setup panel. On the **CHANGE TEST** screen, select an OTDR test to change, then tap **EDIT**. Or to set up a new OTDR test, tap **NEW TEST** then tap **Auto OTDR**, **Manual OTDR**, or **DataCenter OTDR**.
3. On the **TEST SETUP** screen, tap the **Launch Compensation** control to set it to **On**.
4. On the **TEST SETUP** screen, make sure the **Fiber Type** is correct. Change it if necessary.
5. On the **TEST SETUP** screen, tap **SAVE**.
6. On the home screen, tap the **TOOLS** icon, then tap **Set Launch Compensation**.

(continued)

7 On the **SET LAUNCH METHOD** screen tap the type of compensation you want to do.

8 Clean and inspect the OTDR port and the launch/tail cord connectors.

9 Make the connections for the type of compensation you selected, as shown on the **SET LAUNCH METHOD** screen.

10 Tap **SET**.

11 When the **SET LAUNCH COMP** screen shows, select the event or events that are the end of the launch cord and the start of the tail cord (if you used a tail cord).

12 Tap **SAVE**.

Figure19 shows an example of an OTDR trace with launch and tail markers enabled.

Note

If you change the launch or tail cord, do the compensation procedure again.

OTDR Port Connection Quality

When you do an OTDR test, the test shows the quality of the OTDR port connection (Figure 11). If a test takes more than approximately 3 seconds, the **PROGRESS** screen also shows a preview of the OTDR trace. The trace is black for one wavelength and blue for the other wavelength.

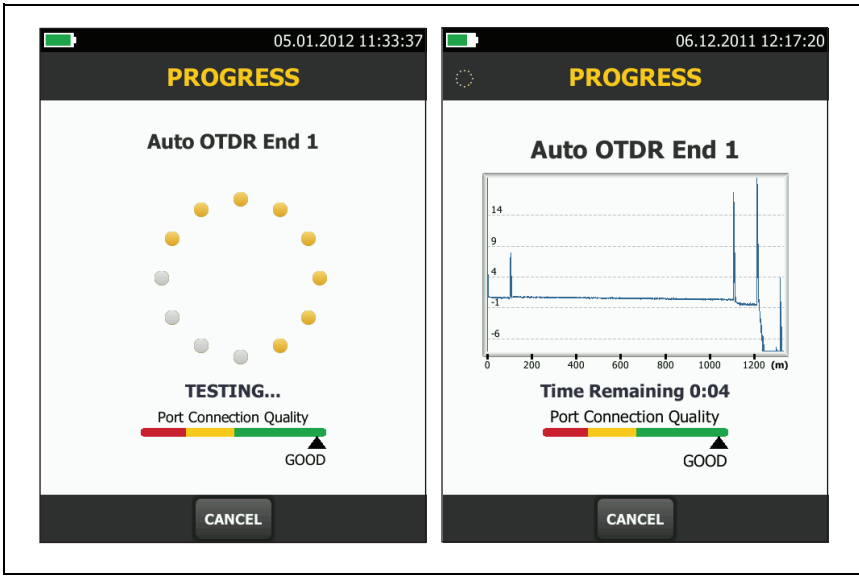
If the gauge is not in the Good range

- Clean the OTDR port and the fiber connector. Use a video probe to inspect the endfaces in the port and fiber connector for scratches and other damage. If an endface on the tester shows damage, contact Fluke Networks for service information.
- If the gauge stays outside the **Good** range, remove the adapter from the module and inspect the adapter for damage. Make sure that the white plastic ring inside the center tube shows no damage.

A poor OTDR connection increases the dead zone at the connector. The dead zone can hide faults that are near the OTDR connector.

A poor connection also decreases the strength of the signal from the OTDR. The weaker signal causes more noise on the trace, which can cause the OTDR to miss events. It also decreases the dynamic range.

When the test is completed, the quality gauge shows in the details for the **OTDR Port** event on the EventMap screens. The tester includes the gauge with the test results you save.



GPU17.EPS

Figure 11. The OTDR Port Connection Quality Gauge and Progress Screen

How to Do an OTDR Test

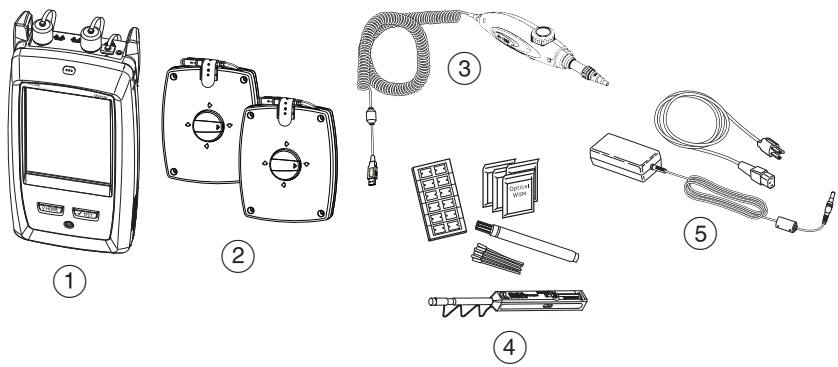
Figure 12 shows the equipment for OTDR tests.

To do an OTDR test

1. Make sure that the home screen shows the correct settings for the job. If it is not necessary to use specific settings, set the test type to **Auto OTDR** to make sure the results show all of the events on the fiber.
2. Clean and inspect the connectors on the launch and tail cords and the fiber to be tested.
3. Connect the tester to the link as shown in Figure 13, 14, or 15.
4. Tap **TEST** or press TEST.

Note

The tester shows a warning if there is an optical signal on the fiber.



1. Versiv unit with OTDR module installed
2. Launch and tail cords (match the fiber to be tested)
3. Video probe with USB connector (DI-1000 shown)
4. Fiber cleaning supplies
5. AC adapter with line cord (optional)

Figure 12. Equipment for OTDR Tests

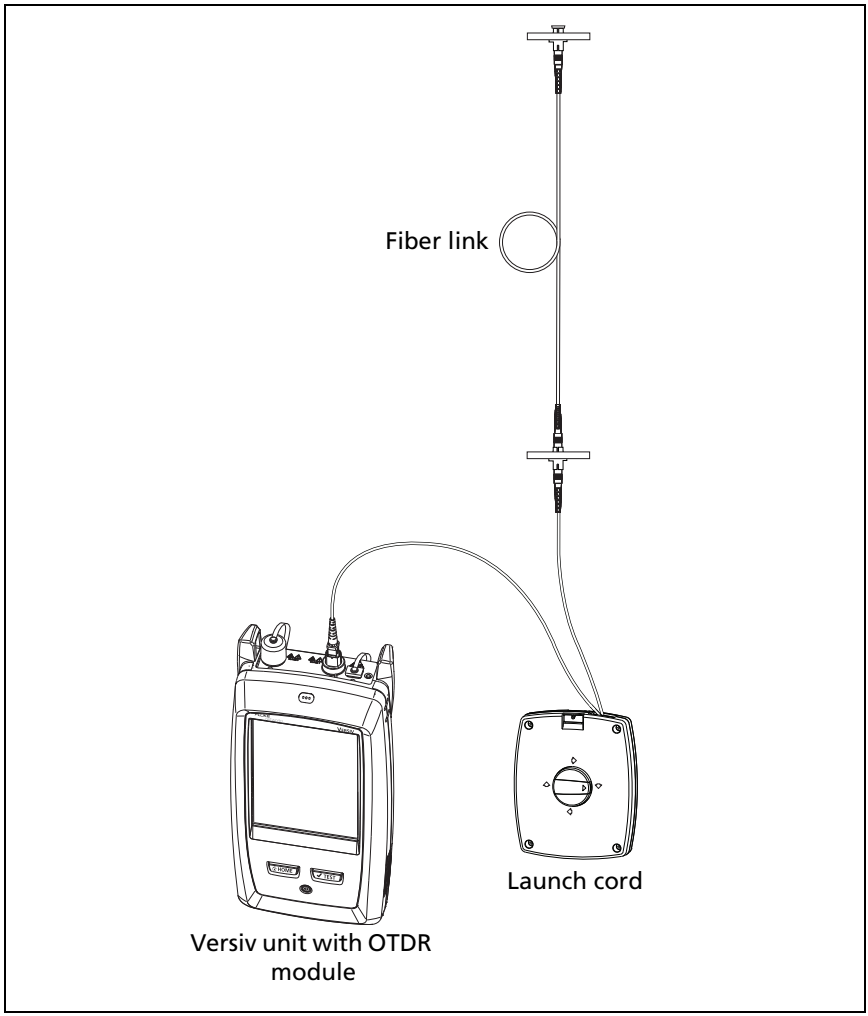


Figure 13. OTDR Connected with a Launch Cord

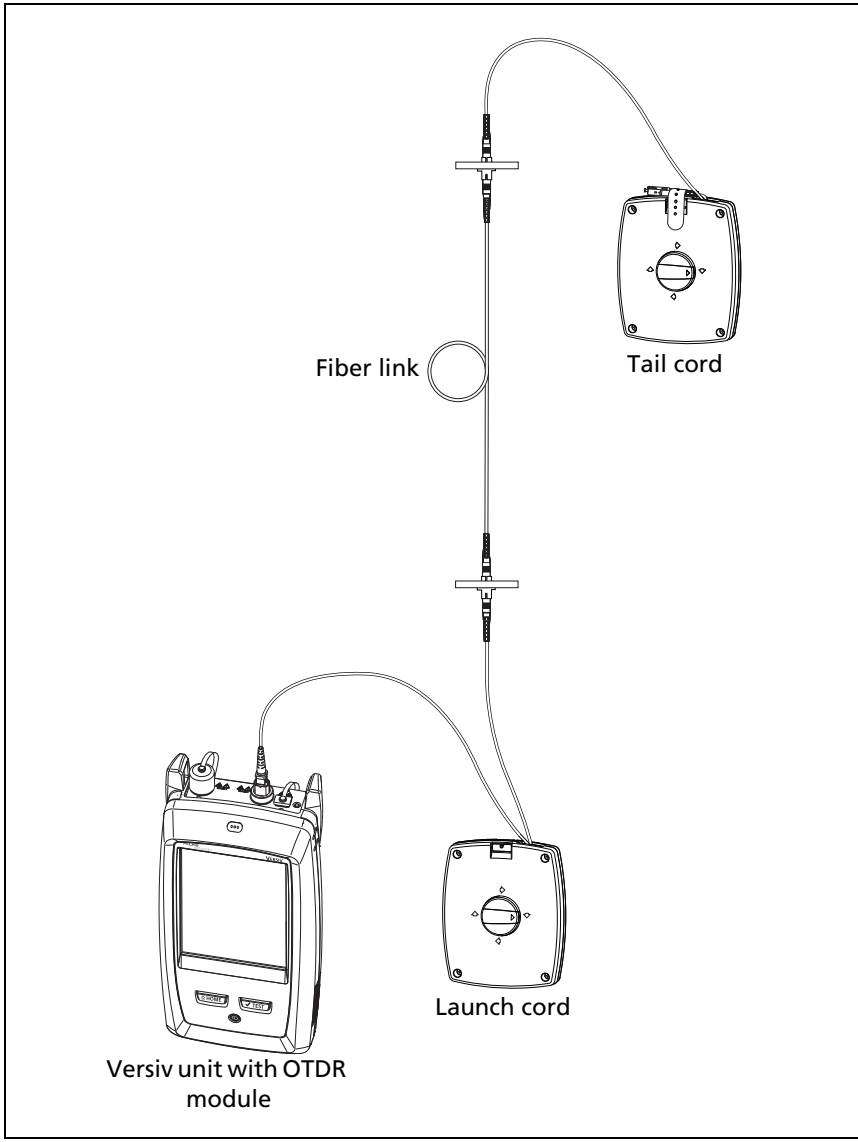


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Figure 14. OTDR Connected with Launch and Tail Cords

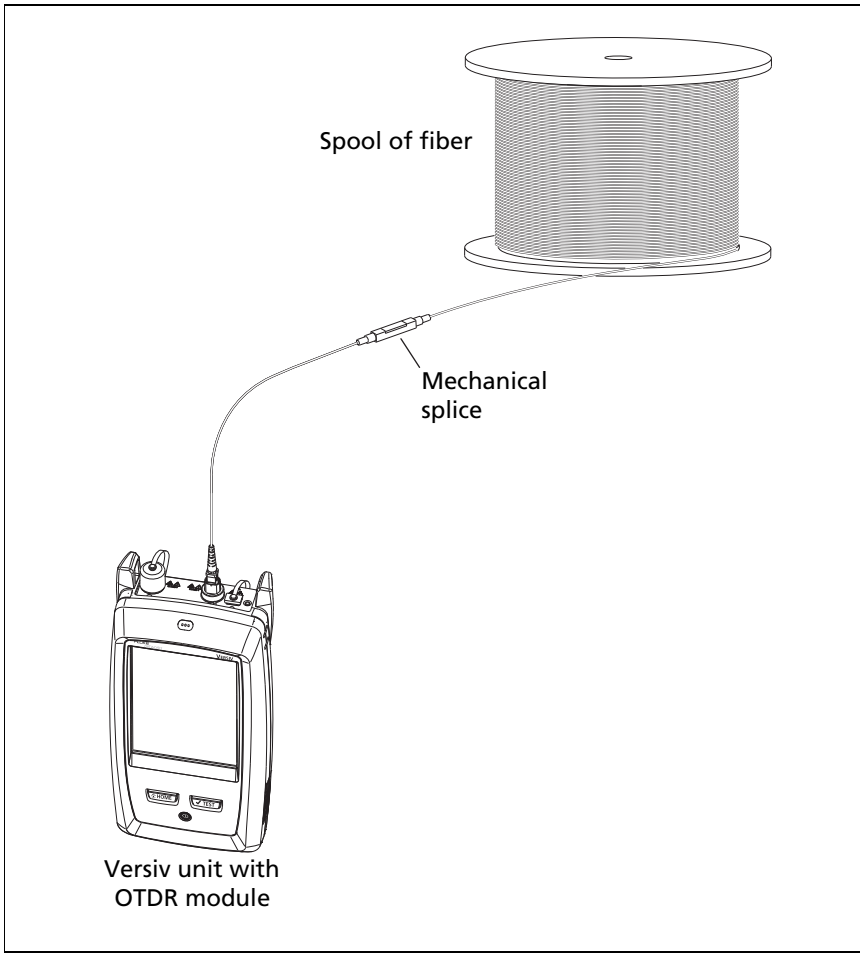


Figure 15. OTDR Connected to a Spool of Fiber

OTDR Results

Notes

The tester shows measurements with ">" or "<" when the actual value is possibly more or less than the value shown. For example, this can occur for hidden events or for measurements that are out of the range of the tester.

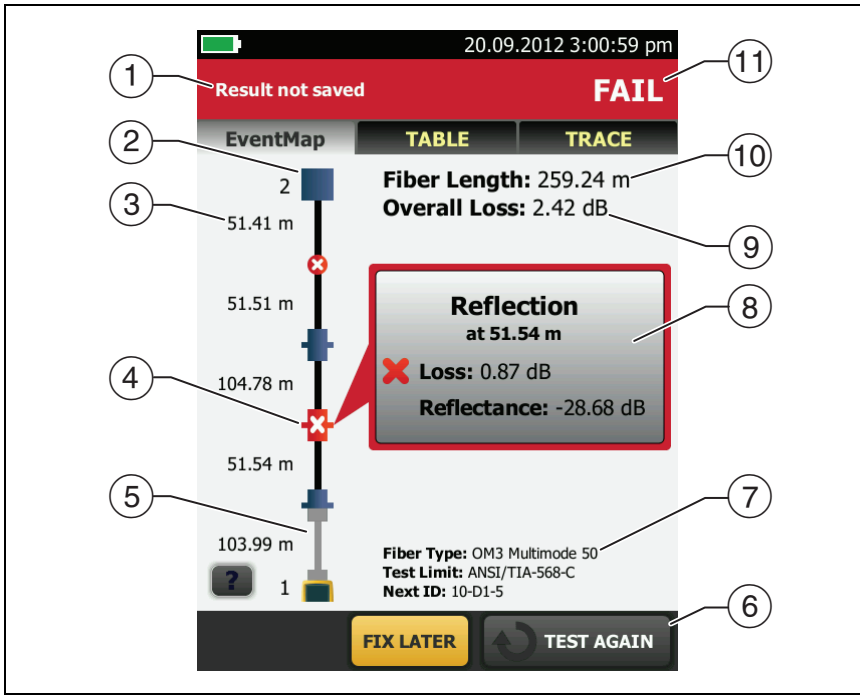
*When a test is completed, the type of screen the tester shows first (**EventMap**, **TABLE**, or **TRACE**) is the type you looked at last.*

EventMap

Notes

The EventMap combines the results for all wavelengths used for the test. If an event on the EventMap does not show on the event table or OTDR trace, change the wavelength on those screens.

The EventMap does not show ghosts.



GPU11.EPS

Figure 16. EventMap Example 1

① The ID for the results. If **Auto Save** is off, **Result not saved** shows.

② The end of the fiber.

③ The length of the fiber segment between two events.

④ A reflective event:

: A reflective event, which is usually a connector. Measurements for the event are all within the test limits.

: One or more measurements for the event exceeds the limit.

⑤ : Launch and tail cords and their connectors show in gray. The map shows these if **Launch Compensation** is on and the cords are connected.

 : The arrow icon shows when there are more events that do not show on the screen. To see the events, tap the icon or scroll the map.

⑥ When more than one button shows at the bottom of the screen, the tester highlights one in yellow to recommend which one to tap. See "Buttons to Do Tests and Save Results" on page 20.

⑦ The fiber type and test limit the tester used for the test, and the ID the tester will use for the next results that you save.

⑧ When a test is completed, the window shows information for the event that has the worst measurement. The information windows show the worst results of the wavelengths used for the test.

If the window border is green, the measurements for the event do not exceed the limits.

If the window border is red, a measurement exceeds the limits.

If the window border is blue, the tester does not give a pass or fail result to the event because it cannot do a full analysis of the event. This occurs for **OTDR Port**, **Hidden**, and **End** events. This occurs for all events if you use the **Document Only** test limit because **Document Only** does not have values for limits.

When you use a test limit that has a reflectance limit, **Hidden** events show a fail status if their reflectance exceeds the limit.

 : The measurement exceeds the limit.

 : The measurement is within the limit.

To see details for the event, tap the window.

To see information for another event, tap another icon on the map.

Note

Events before the launch cord connector and after the tail cord connector do not have a pass or fail status.

⑨ **Overall Loss**: The loss of the cabling. This does not include the OTDR connection and the loss of the last event. If **Launch Compensation** is on, the overall loss includes the launch and tail connectors, but not the launch and tail fibers.

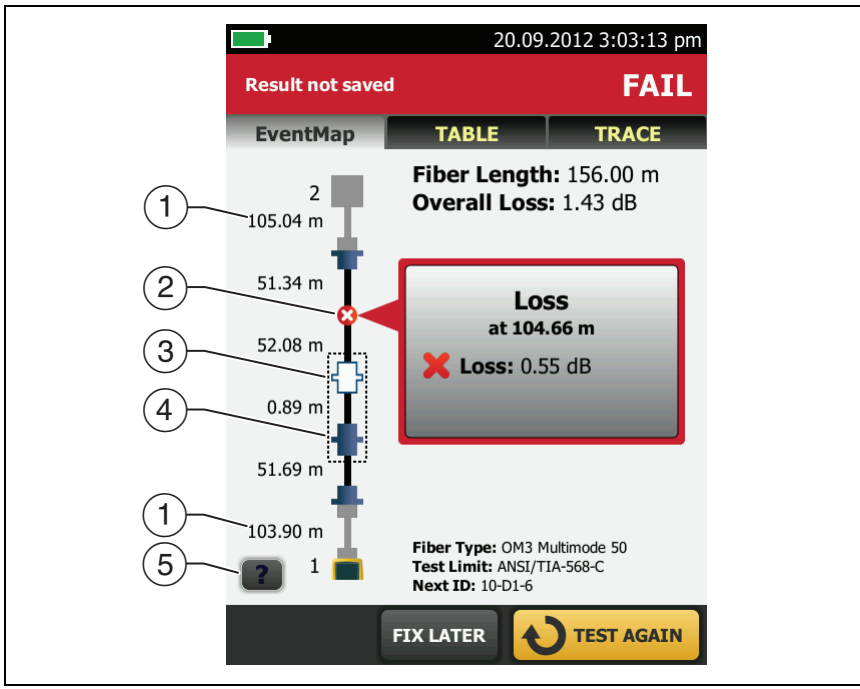
If you did the test at two wavelengths, the tester shows the highest loss of the two wavelengths.

N/A shows for the **Overall Loss** if the tester cannot measure the loss. This can occur when events are too close together or when there is a large reflective event near the end of the fiber.

⑩ **Fiber Length**: The length of the fiber. The units show in meters (**m**) or feet (**ft**). If **Launch Compensation** is on, the length does not include the length of the launch and tail cords.

⑪ **PASS/FAIL**: The overall result for the fiber.

- **PASS**: All measurements are within the test limits.
- **FAIL**: One or more measurements exceed the limit.



GPU22.EPS

Figure 17. EventMap Example 2

① Length of the tail cord (top) and launch cord (bottom).

② A loss event, such as a splice or bend:

: Measurements for the event are all within the test limits.

: One or more measurements for the event exceeds the limit.

③ : The event is hidden by a previous event.

The map shows a dotted line around hidden events and the event that causes them to be hidden. The tester combines the loss of all the events that are in the dotted line. To see the combined loss, tap the event that causes the hidden event (④). The tester does not show loss measurements for hidden events.

: The event is hidden by a previous event. The reflectance of the event exceeds the limit. This icon shows only when the test limit has a limit for reflectance.

④ The cause of the hidden event. In this example, the cause is a connector on a short patch cord. The loss of the second connector is hidden in the attenuation dead zone of the first connector.

⑤ Tap ? to see information about the selected event.

Event Table

The event table shows a list of the events on the fiber. To see the event table, tap **TABLE** on the OTDR results screen. Figure 18 shows an example of an event table.

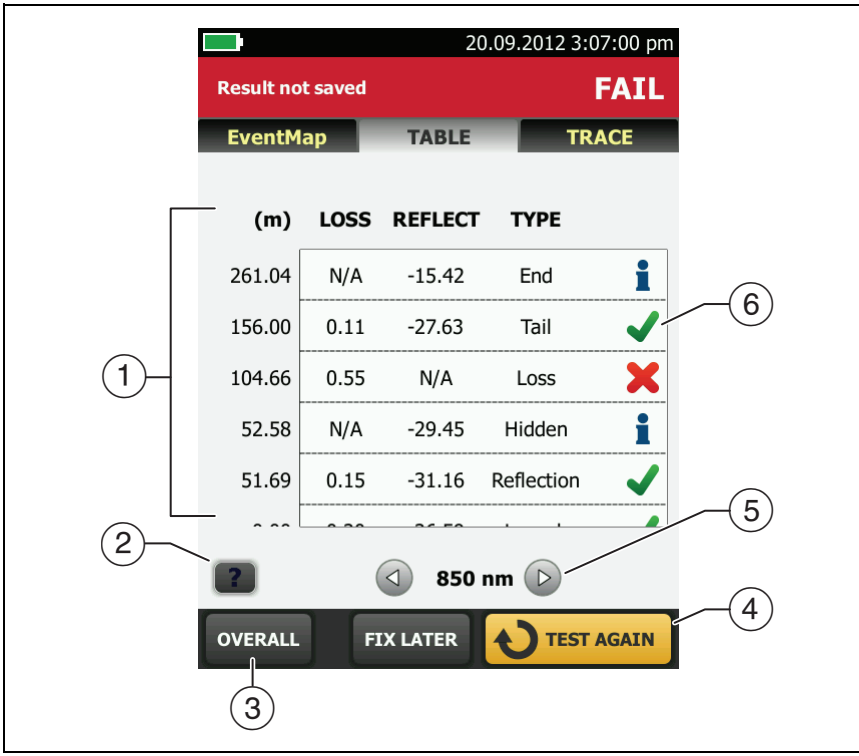


Figure 18. Event Table

(1) To see details for an event, tap the event in the table. Scroll the table if necessary to see all the events.

- **(ft)** or **(m)**: The distance to the event
- **LOSS**: The loss of the event.
- **REFLECT**: The reflectance of the event.
- **TYPE**: The event type.

Note

*The **OTDR Port** and **End** events always show **N/A** for loss because backscatter measurements are not available on both sides of those events.*

② Tap ? to see help for this screen.

③ **OVERALL**: Tap this button to see overall measurements of length, loss, and optical return loss for the fiber.

④ When more than one button shows at the bottom of the screen, the tester highlights one in yellow to recommend which one to tap. See "Buttons to Do Tests and Save Results" on page 20.

⑤ If the tester made measurements at two wavelengths, tap the arrow buttons to see results for the other wavelength. Possibly, some events show only at one wavelength.

⑥ ✓: The measurement is within the limit.

✗: The measurement exceeds the limit.

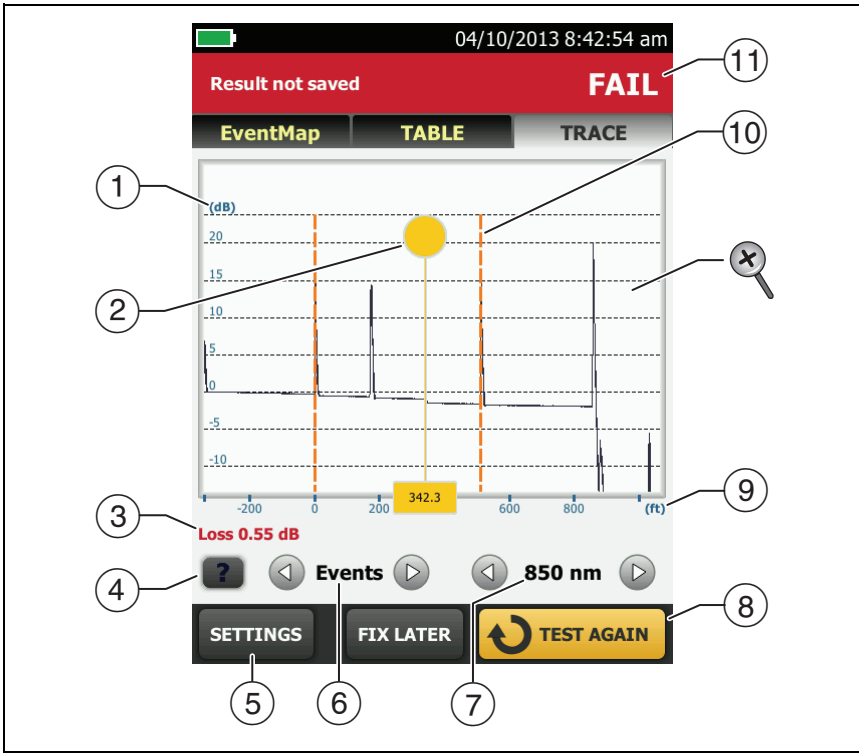
ℹ: The tester does not give a pass or fail result to the event. This occurs for **OTDR Port**, **Hidden**, and **End** events. This occurs for all events if you use the **Document Only** test limit because **Document Only** does not have values for limits.

When you use a test limit that has a reflectance limit, **Hidden** events show a fail status if their reflectance exceeds the limit.

To see details for an event, such as limits for measurements and the **SEGMENT ATTENUATION** coefficient, tap the event in the table.

OTDR Trace

To see the OTDR trace, tap **TRACE** on the OTDR results screen. Figure 19 shows an example of an OTDR trace.



GPU14.EPS

Figure 19. OTDR Trace

① The decibel scale shows the level of backscatter. The tester sets the backscatter level at the start of the trace to approximately 0 dB.

② The measurement cursor. To measure loss and distance, tap the yellow circle so that **MARK** shows, drag the cursor to the start of the measurement, tap **MARK**, then drag the cursor to the end of the measurement.

③ When the cursor is on an event, this area shows the event type. The text is green if the event passed, red if the event failed, or black is there is no limit for measurements. The event type does not show after you tap **MARK** to use the measurement cursor.

④ Tap ? to see help for this screen.

⑤ Tap **SETTINGS** to see the settings the tester used for the OTDR test. The tester saves the settings with the result.

⑥ Tap ◁ or ▷ to move the cursor to another event.

⑦ The wavelength the tester used for the test. If the tester used more than one wavelength, tap ◁ or ▷ to see the other wavelength. Possibly, some events show only at one wavelength. You can select wavelengths on the **TEST SETUP** screen.

⑧ When more than one button shows at the bottom of the screen, the tester highlights one in yellow to recommend which one to tap. See "Buttons to Do Tests and Save Results" on page 20.

⑨ The distance scale shows the distance along the fiber.

⑩ Markers for the end of the launch cord and the beginning of the tail cord are orange, dashed lines.

⑪ **PASS**: All measurements were within the limits.

FAIL: One or more measurements exceeded its limit.

To zoom in and out, use the pinch, reverse-pinch, and double-tap gestures on the touchscreen. You can also use the zoom controls to change the magnification on the distance and decibels scales independently. See Figure 2 on page 17.

Chapter 4: The FaultMap Test

The FaultMap test helps you record the connections in a fiber link and identify bad connections. It can show short patch cords and find connections that have high reflectance. The FaultMap test gives you these results:

- Shows a map of the connectors in the link that possibly do not show on the OTDR EventMap. The map includes connectors that are hidden in the dead zones made by previous events. The FaultMap test shows patch cords as short as 0.5 m for lengths < 2 km.
- Shows connections that are poor because they have high reflectance (> -35 dB).

Reflective events that are apparently not connectors do not show on the FaultMap diagram. Loss events are also not shown.

The FaultMap test finds events that have a reflectance larger than approximately -50 dB on multimode fiber and -60 dB on singlemode fiber. (More negative values mean less reflectance and a better connection. For example, a connector with a reflectance of -40 dB is better than one with -35 dB.)

Notes

Since the FaultMap test finds only reflections, do not use it to look for fusion splices or angled physical contact (APC) connectors.

*FaultMap results do not include a **PASS**/**FAIL** status. The results are only for your documentation of the link.*

FaultMap tests on singlemode fiber usually take more time than OTDR tests. The test uses very narrow pulses on singlemode fiber to make the smallest event dead zones possible, and does more analysis on the reflections in the link.

How to Do the FaultMap Test

Notes

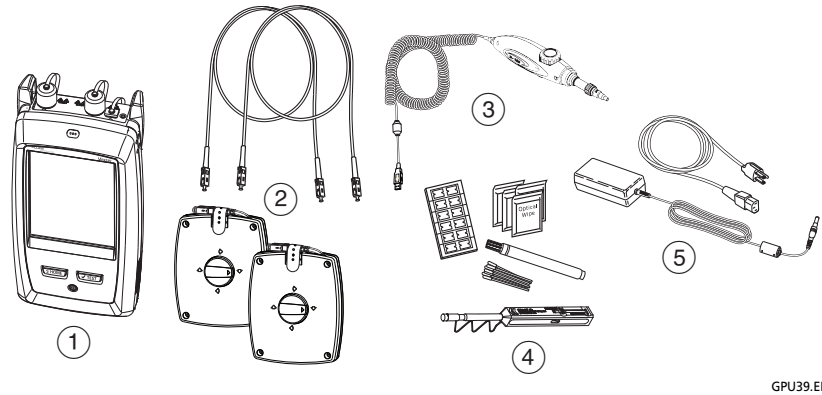
The FaultMap test does not use the launch compensation settings.

The FaultMap test uses the wavelength that gives the best results.

Figure 20 shows the equipment for the FaultMap test.

1. Clean and inspect the connectors on the launch and tail cords or patch cords and the link to be tested.
2. Connect the launch cord to the OTDR port and the link to be tested, as shown in Figure 21. Connect a tail cord to the far end of the link if necessary.

   Or, you can use a patch cord that is 1 m long at minimum to connect the tester to the link. To see results for the far-end connector, connect a tail cord or patch cord (>1 m) to the far end of the link.
3. On the home screen, tap the test setup panel.
4. On the **CHANGE TEST** screen, tap the button next to the **FaultMap** test, then tap **USE SELECTED**. If a FaultMap test is not available, tap **NEW TEST** to add one to the project.
5. Tap **TEST** or press ✔TEST.



1. Versiv unit with OTDR module installed
2. Launch and tail cords or patch cords (match the fiber to be tested)
3. Video probe with USB connector (DI-1000 shown)
4. Fiber cleaning supplies
5. AC adapter with line cord (optional)

Figure 20. Equipment for FaultMap Tests

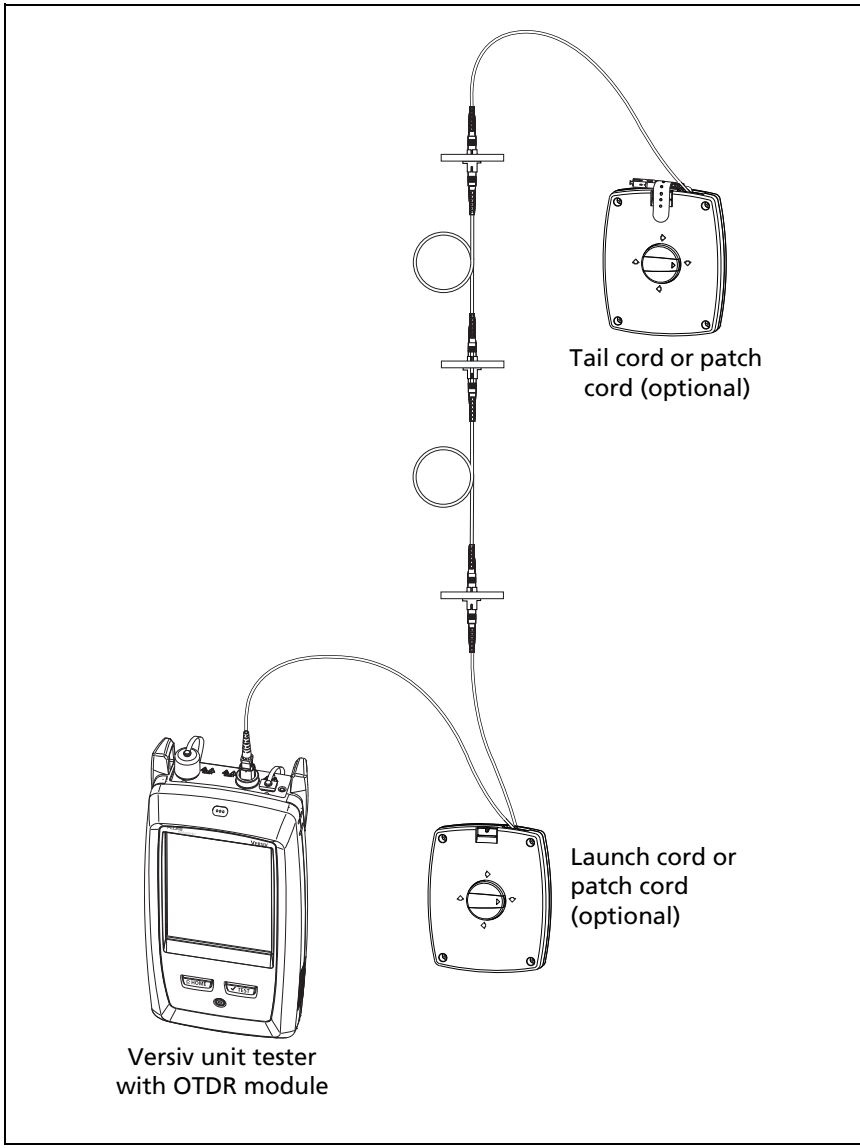


Figure 21. FaultMap Test Connections

FaultMap Screen

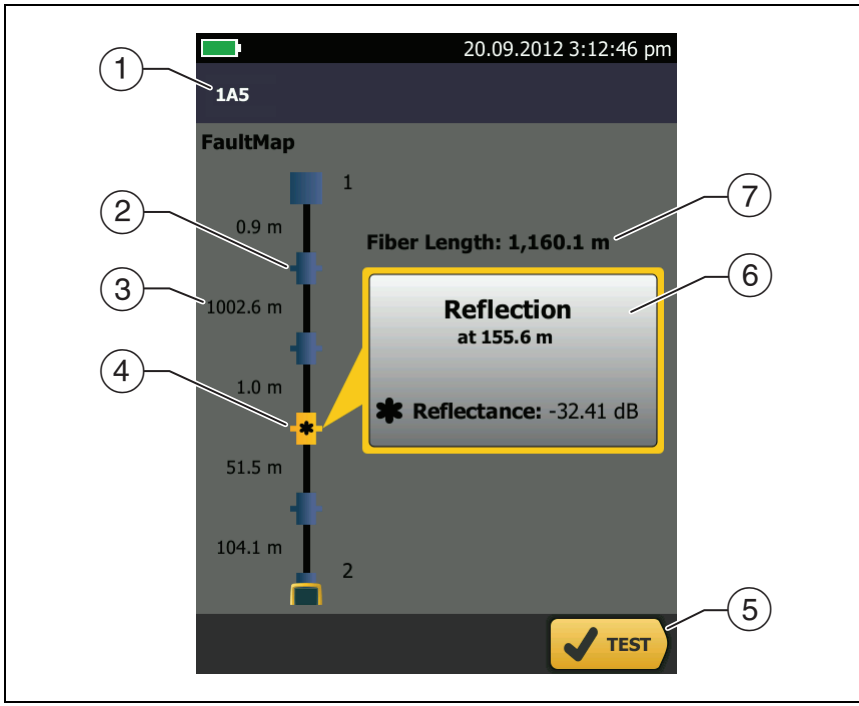


Figure 22. FaultMap Screen

Note

The FaultMap test does not use the launch compensation settings. The results show the launch and tail cords and their connectors in the same colors as other cords and connectors.

① The ID for the results. If **Auto Save** is off, **Result not saved** shows.

② : An event that has a reflectance smaller than -35 dB.

③ The length of the fiber segment between two events.

④  : An event that has a reflectance larger than -35 dB. It is possibly a connector that is dirty, poorly polished, scratched, cracked, misaligned, unseated, worn, or the wrong type.

 : The arrow icon shows when there are more events that do not show on the screen. To see the events, tap the icon or scroll the screen.

⑤ When more than one button shows at the bottom of the screen, the tester highlights one in yellow to recommend which one to tap. See “Buttons to Do Tests and Save Results” on page 20.

⑥ If the window is blue, the reflectance of the event is smaller than -35 dB. If the window is orange, the reflectance is larger than -35 dB.

To see the window for another event, tap another icon on the fiber.

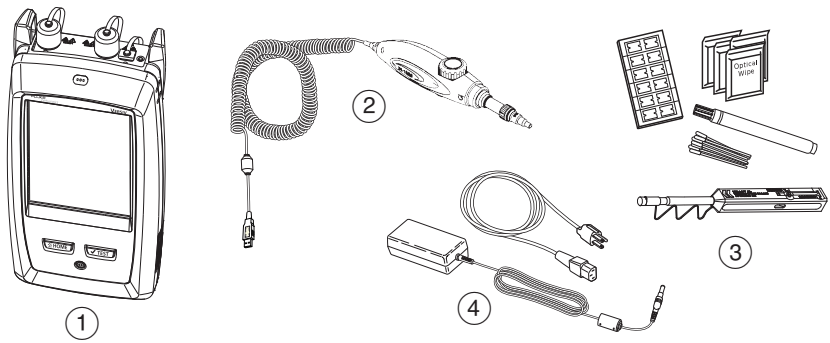
⑦ **Fiber Length**: The length of the fiber. This includes the lengths of the launch and tail cords, if you used them.

Chapter 5: The FiberInspector Test

The optional DI-1000 video probe connects to the type A USB port on the Versiv unit to let you inspect the endfaces in fiber optic connectors. The probe lets you see dirt, scratches, and other defects that can cause unsatisfactory performance or failures in fiber optic networks.

How to Do the FiberInspector Test

Figure 23 shows the equipment for a FiberInspector test.



1. Versiv unit with OTDR module installed
2. Video probe with USB connector (DI-1000 shown)
3. Fiber cleaning supplies
4. AC adapter with line cord (optional)

Figure 23. Equipment for the FiberInspector Test

To do the FiberInspector test

1. Connect the probe to the type A USB port on the side of the tester.
2. Make sure the correct tip is on the probe.
3. Clean the connector that you will inspect.
4. Do the FiberInspector test:

   To do the FiberInspector test when it is in the project

   a. On the home screen, tap the test setup panel.

   b. On the **CHANGE TEST** screen, tap the button next to the **FiberInspector** test, then tap **USE SELECTED**.

   c. Tap **Test** or press TEST. Figure 24 shows an example of the FiberInspector screen.

   To do the FiberInspector test when it is not in a project

   On the home screen, tap the **TOOLS** icon, then tap **FiberInspector**. Figure 24 shows an example of the FiberInspector screen.

5 Insert the probe into the connector.

6 To adjust the focus, turn the knob on the probe clockwise or counterclockwise.

Note

The button on the DI-1000 probe has no function when you use the probe with the Versiv unit.

7 To save the image, tap **SAVE**.

8 On the **SAVE RESULT** screen, select **End 1** or **End 2**, make sure the **Cable ID** and **End** name are correct, then tap **SAVE**.

Saved FiberInspector results show these icons for **End 1** and **End 2**: 

Notes

*The **Auto Save** function does not operate with the FiberInspector test.*

Continuous use of the video probe decreases the battery life. To increase the battery life, connect the AC adapter when you use the probe for more than a few minutes.

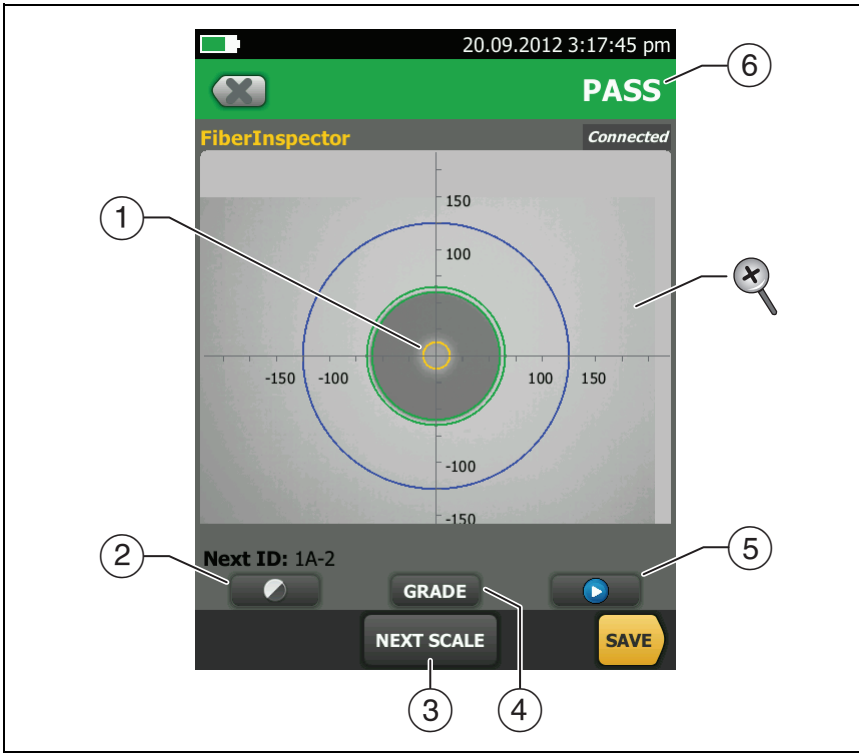


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Figure 24. FiberInspector Image with Measurement Scales (fiber with 50 µm core shown)

Note

To see the buttons for the measurement axes and core scales and to change the magnification of the screen, you must first tap ⏸ *to put the screen in still mode.*

(1) You can use the round, horizontal, and vertical scales to measure the size of the fiber core and cladding. You can also measure the size of particles, scratches, and other defects on the endface.

To show the scales, tap **SCALE ON** (③).

- Outer, blue ring: 250 µm cladding
- Middle, green rings: 120 µm and 130 µm
- Inner, yellow rings: 25 µm and 62.5 µm (to change the size, tap **NEXT SCALE**)

② To adjust the brightness or contrast of the image, tap , then move the bars on the controls. To hide the controls, tap again.

③ To show the scales (①), tap , then tap **SCALE ON**. To change the size of the measurement ring for the fiber core, tap **NEXT SCALE**.

④ To give a **PASS** or **FAIL** grade to the image, tap **GRADE**. See ⑥.

⑤ To put the screen in still mode and turn off the probe, tap . Tap to turn on the probe again.

⑥ To give the image a grade of **PASS** or **FAIL**, tap **GRADE** (④). If you set the grade to **FAIL**, then save the image, the ID for the image is in the list of tests to do again.

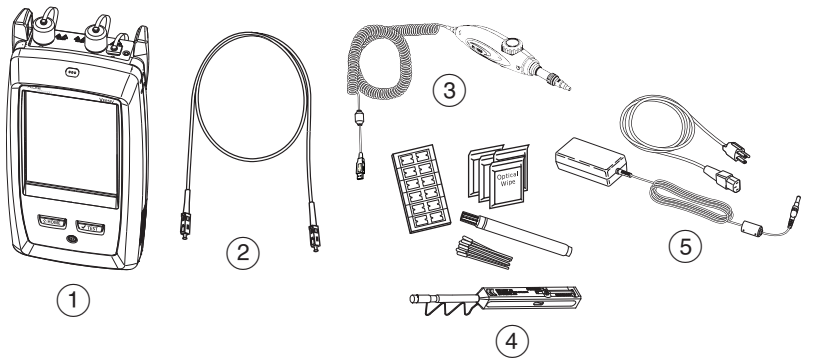
To zoom in and out, tap to put the screen in still mode, then use the pinch, reverse-pinch, and double-tap gestures on the touchscreen. See Figure 2 on page 17.

Chapter 6: The Visual Fault Locator

The OTDR modules include a visual fault locator that sends a red light down the fiber. The VFL helps you quickly verify the continuity of fibers, identify connectors, and find faults along fibers and in connectors. The red light shows at the end of the fiber and at breaks, cracks, and sharp bends along the fiber.

How to Use the VFL

Figure 25 shows the equipment you use with the visual fault locator.



1. Versiv unit with OTDR module installed
2. One patch cord to connect the tester to the fiber (optional)
3. Video probe with USB connector (DI-1000 shown)
4. Fiber cleaning supplies
5. AC adapter with line cord (optional)

Figure 25. Equipment for Visual Fault Locator Tests

To use the visual fault locator

Note

You can connect the visual fault locator to connectors that have 2.5 mm ferrules (SC, ST, or FC). To connect to other ferrule sizes, use a test reference cord with the correct connector at one end and a SC, ST, or FC connector at the tester end.

1. Clean and inspect the connectors on the patch cord, if used, and the fiber to be tested.
2. Connect the fiber directly to the VFL port or use the patch cord to connect to the port.
3. Use the VFL button to turn on the visual fault locator (refer to Figure 26).

   Or, on the home screen tap **TOOLS**, then tap **Visual Fault Locator (VFL)**. You can tap the **PULSE/OFF/CW** (continuous wave) button on the screen to change the modes of the VFL, or use the button as shown in Figure 26.
4. Look for the red light as shown in Figure 26.
5. To see the light that comes out of a connector, hold a white paper in front of the fiber connector.

Note

The light from the VFL is possibly not visible through dark-colored fiber jackets.

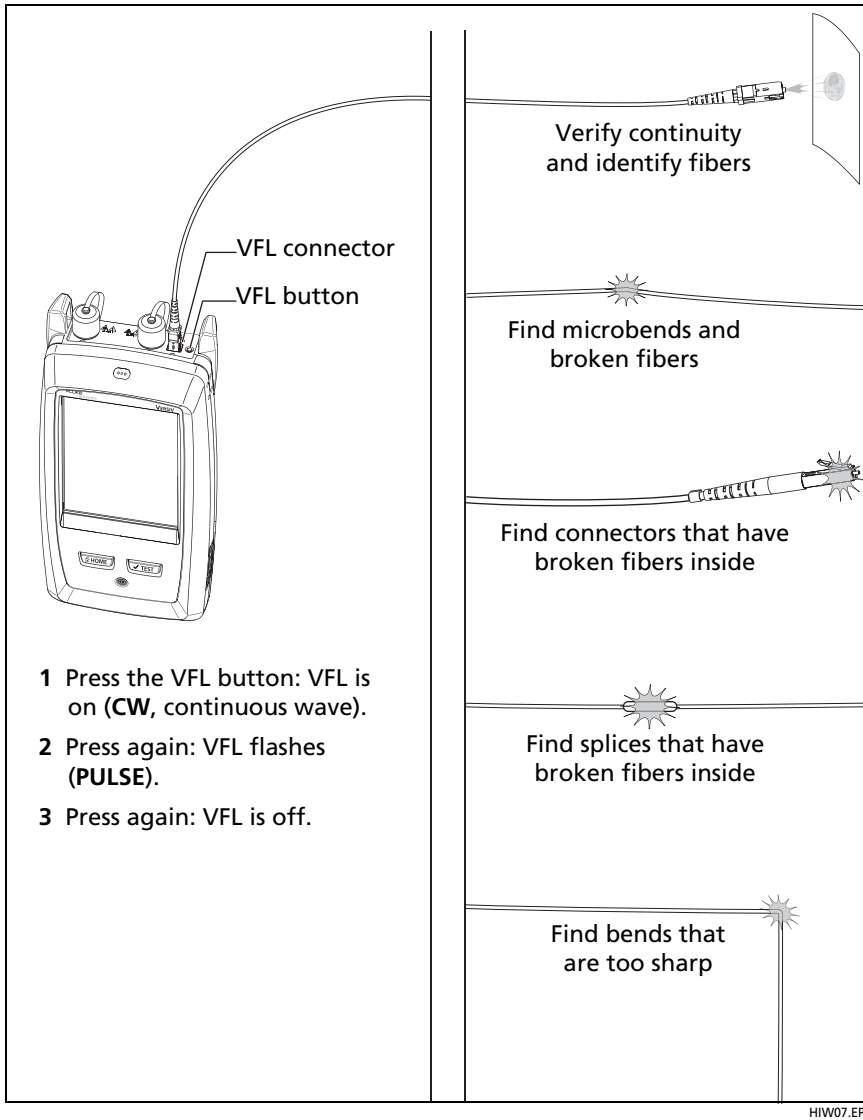


Figure 26. How to Use the Visual Fault Locator

Chapter 7: Test Results

View Saved Results

You can view the results in a project, or see a summary of the results in all projects.

On the home screen, tap the **RESULTS** icon. The **RESULTS** screen shows the results in the active project. See Figure 27.

Note

*When you look at a saved result, the type of screen the tester shows first (**EventMap**, **TABLE**, or **TRACE**) is the type you looked at last.*

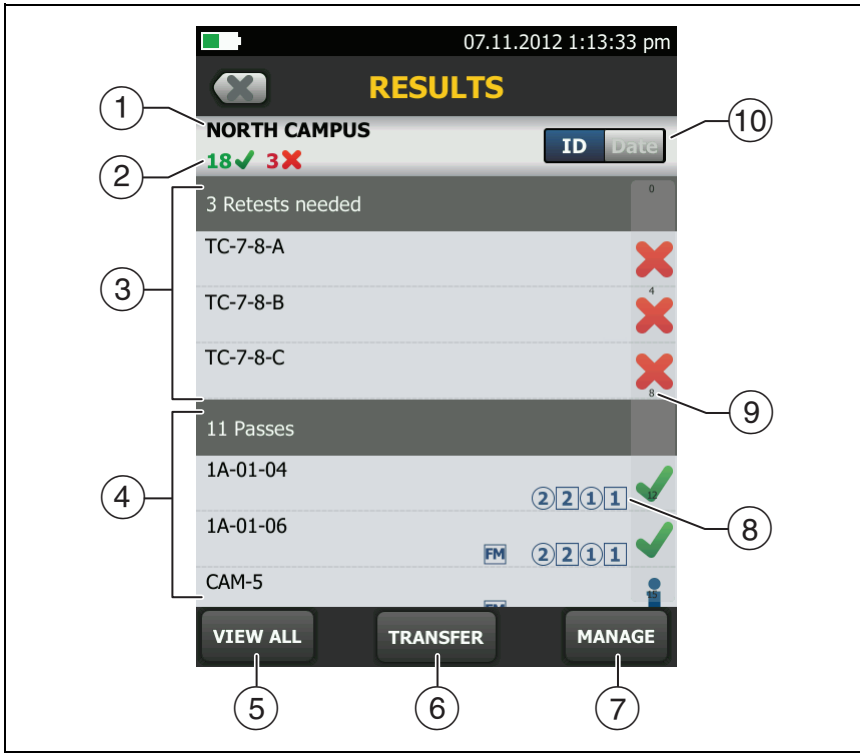


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Figure 27. RESULTS Screen

① The name of the active project.

② ✓: The number of results that passed.

✗: The number of results that failed.

③ The cable IDs that have **FAIL** results and must be tested again. Because some IDs can have one or more tests that failed, the number at the top of this screen (②) can be more than the number of retests needed.

④ The cable IDs that have **PASS** results or results with an ℹ. Because some IDs can have one or more tests that passed or have an ℹ status, the number at the top of this screen (②) can be more than the number of passes.

⑤ Tap **VIEW ALL** to see a summary of the results in all the projects in the tester.

⑥ **TRANSFER** lets you export or import results to or from a flash drive and delete results on the flash drive.

⑦ **MANAGE** lets you move results to a different project, rename results, or delete results that are in the tester.

⑧ The icons show the types of test results that the result contains:

2 1 : OTDR results from End 2 and End 1..

② ①: FiberInspector results from End 2 and End 1.

FM: FaultMap results.

R2 R1: Real Time Trace results from End 2 and End 1.

⑨ The scroll bar shows when the list of results is long. To use the scroll bar, tap on the bar or slide your fingertip on the bar.

⑩ Tap the **ID/Date** control to sort the results by cable ID or by date. When you sort by ID, the results show in ascending order. When you sort by date, the latest result is at the top of the list.

How to Add a Result to a Saved Result

You can save the results from different tests in one cable ID. For example, you can save the bi-directional OTDR results and FiberInspector results together in one ID.

When you add results, these settings used to get the results must agree with the settings in the saved result:

- Test limit
- Fiber categories (singlemode/multimode, core size, category)
- Index of refraction (makes a warning you can override)

If the settings do not agree, the tester shows a warning.

To add results, select an **End** setting and a test as necessary, make sure the **Next ID** is correct, then do the test and save the result.

To add results for a different End setting

1. On the home screen, tap the **Next ID** panel.
2. On the **CHANGE ID** screen, tap the **End 1**/**End 2** control to make it show the correct end.
   - If the ID set has a **Last ID**, the ID list under **IDs Untested** shows the IDs that do not have results for the end you selected.
   - If the ID set does not have a **Last ID**, tap the **Next ID** box, then enter the first ID for the set of saved results.
3. On the **CHANGE ID** screen, tap **DONE**.
4. Tap **TEST** or press ✔TEST, then save the result.

To add results from a different test

1. On the home screen, tap the test setup panel.
2. On the **CHANGE TEST** screen, tap the button next to a test, then tap **USE SELECTED**.

- If the ID set has a **Last ID**, the home screen shows the first ID in the set that does not have results for the test you selected.
- If the ID set does not have a **Last ID**, tap the **Next ID** panel, tap the **Next ID** box on the **CHANGE ID** screen, enter the first ID for the set of saved results, then on the **CHANGE ID** screen, tap **DONE**.

3 Tap **TEST** or press TEST, then save the result.

How to Replace a Saved Result that Failed

To use the same test settings that were used for the saved result

1 On the home screen, tap the **RESULTS** icon.

2 On the **RESULTS** screen, tap a result that failed.

3 Tap **TEST AGAIN**.

4 When the test is completed, and if **Auto Save** is on, the tester asks you if you want to overwrite the results. Tap **Yes**.

If **Auto Save** is off, tap **FIX LATER** (if the test failed) or **SAVE** (if the test passed) to save the result.

To replace a result with a result that uses different test settings

1 Turn off **Auto Save**.

2 Make sure that the home screen shows the project that contains the result you want to replace.

3 Select the necessary test settings.

4 Do the test, tap **FIX LATER** (if the test failed) or **SAVE** (if the test passed), then enter the ID of the saved result.

5 The tester asks you if you want to overwrite the results. Tap **Yes**.

Delete, Rename, and Move Results

Before you delete, rename, or move results, select the project that contains the results and go to the **MANAGE RESULTS** screen:

1. On the home screen, tap the **RESULTS** icon. The **RESULTS** screen shows the results in the active project.
2. To see the results in another project, tap **VIEW ALL**, then tap a project.
3. Tap **MANAGE** to see the **MANAGE RESULTS** screen.

To delete results

1. On the **MANAGE RESULTS** screen, select the results you want to delete.

   To select all the tests that failed or all the tests that passed, tap **Select All Retests** or **Select All Passes**.
2. Tap **DELETE**, then tap **DELETE** in the confirmation dialog.

To rename results

1. On the **MANAGE RESULTS** screen, select one result to rename.
2. Tap **RENAME**.
3. Enter a new name, then tap **DONE**.

To move results to a different project

1. On the **MANAGE RESULTS** screen, select the results you want to move.
2. Tap **MOVE**.
   - To move the results to a project shown in the list, tap the project name, then tap **MOVE** in the confirmation dialog.
   - To make a new project and move the results to the new project, tap **NEW PROJECT**, enter a project name, tap **DONE**, then tap **MOVE** in the confirmation dialog.

Note

When you move results to a different project, that project becomes the active project.

Manage Results on a Flash Drive

You can export or import results to or from a flash drive, and delete results on the flash drive.

⚠ Caution

- **Do not remove the USB flash drive while the LED on the drive flashes. Doing so can corrupt the data on the drive.**
- **You can lose a USB flash drive, cause damage to it, or accidentally erase the contents of the drive. Thus, Fluke Networks recommends that you save no more than one day of test results on a flash drive.**

Note

The tester reads only USB drives that use the FAT format.

1. Connect a USB flash drive to the type A USB port. The tester makes a bell sound when it detects the drive.
2. On the home screen, tap the **RESULTS** icon.
3. The **RESULTS** screen shows the results in the active project. To export results from a different project, tap **VIEW ALL** then tap a project.
4. Tap **TRANSFER**.
5. On the **TRANSFER RESULTS** screen, select a function:
   - **Export**: On the **EXPORT RESULTS** screen, select **New** or **All**, select the project that contains the results you want to export to the flash drive, then tap **EXPORT**.

New: Export only results that do not have the same IDs as results that are already on the flash drive. **All**: Export all the results from all projects in the tester.

Note

Cable IDs are case-sensitive. For example, the tester saves result with the names "A0" and "a0" in two different records.

If you select the active project, the **EXPORT RESULTS** screen shows the percentage of tests completed for the project and the percentage of results already exported to a flash drive.

- **Import**: On the **IMPORT RESULTS** screen select the project that contains the results you want to import from the flash drive, then tap **IMPORT**.
- **Delete**: On the **DELETE RESULTS** screen select the project that contains the results you want to delete on the flash drive, then tap **DELETE**.

Upload Results to a PC

To upload results to a PC from the tester or a flash drive, use LinkWare software.

1. Install the latest version of LinkWare software on the PC.
2. Turn on the tester and start LinkWare on the PC.
3. Use the USB cable supplied to connect the Micro-AB USB port on the tester to a type A USB port on the PC. See Figure 28.
4. On the LinkWare toolbar, click , then select **OptiFiber Pro** to upload from a tester, or **Test Files (.tst)** to upload from a flash drive.
5. In the **Import** dialog box in LinkWare, select options for the location and the number of results to import.

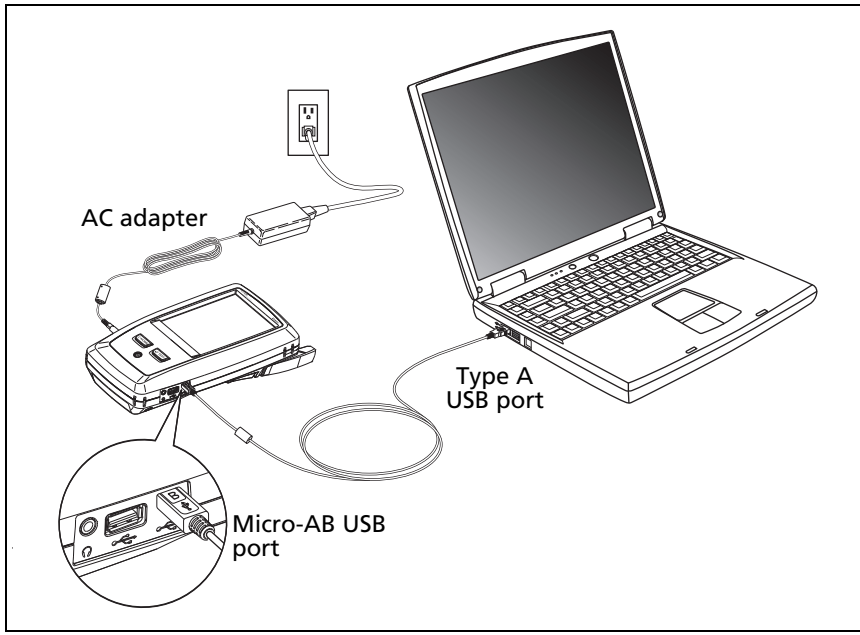

Figure 28. How to Connect the Tester to a PC

View the Memory Status

To see the memory status

On the home screen, tap the **TOOLS** icon, then tap **Memory Status**.

The **MEMORY STATUS** screen shows these values:

- The percentage of memory available
- The number of test records that are saved
- The number of ID sets that have been downloaded to the tester from LinkWare
- The memory space taken by other files, such as the databases for projects and limits

For information on memory capacity, see “Internal Memory for Test Results” on page 117.

Chapter 8: Projects

Why Use Projects?

Projects help you monitor the status of a job and make sure that your work agrees with the requirements of the job.

You can use a project to do these tasks:

- Specify the tests that are necessary for a job.
- Specify settings for tests.
- Specify an operator for the job.
- Make sets of sequential IDs to use as names for test results.
- Automatically save test results with IDs from a set.
- Add the results from other necessary tests to each saved result in the project.
- See which IDs do not have results for a specified test.
- See what percentage of a job is completed.
- See how many links passed and how many failed.
- Keep the test results from a job in one place for easy access.

When you use a project, you can do tests and use IDs that are not specified in the project if necessary. You can also easily change the settings in a project if necessary.

Note

It is not necessary to install a module to set up a project for the module. The tester keeps all settings in the main Versiv unit.

Set Up a Project

Refer to the **PROJECT** screen in Figure 29 on page 87.

1. On the home screen, tap the **PROJECT** panel, tap **CHANGE PROJECT**, then tap **NEW PROJECT**.
2. On the **NEW PROJECT** screen, enter a name for the project, then tap **DONE**.
3. On the **PROJECT** screen, tap the **Operator** panel to enter an operator name for the project.
4. On the **PROJECT** screen, tap the **NEW TEST** button to enter the tests and test settings necessary for the project.
5. On the **PROJECT** screen, tap the **NEW ID SET** button to make one or more sets of cable IDs for the project. See the **CABLE ID SETUP** screen in Figure 30 on page 90.
6. On the **PROJECT** screen, tap **DONE**.

The PROJECT Screen

To start a new project, tap the **PROJECT** panel on the screen. Figure 29 shows the **PROJECT** screen and describes the items you enter to make a project.

Figure 29. PROJECT Screen

① The name of the project. See also item ⑧.

② **Operator**: The name of the person who will do the tests for the project.

③ The date range for the results in the project.

④ **Results**: A summary of the test results in the project:

✗: The number of tests that failed.

✓: The number of tests that passed.

⑤ **Test Setup**: The tests that are necessary for each cable in the project. To make the **% Tested** value on the home screen show the percentage of the tests you have completed, select these tests when you make an ID set for the project. See item ③ for Figure 30 on page 90.

To add a test to the set of tests you can do for the project, tap **NEW TEST**.

For information about OTDR test settings, see Chapter 3.

⑥ **Cable ID Sets**: The sets of IDs the tester can use for the names of test results.

To add a set of IDs to the project, tap **NEW ID SET**. See Figure 30.

⑦ To use a different project, tap **CHANGE PROJECT**, then tap a project.

To make a new project, tap **CHANGE PROJECT**, then tap **NEW PROJECT**.

⑧ **TRANSFER** lets you export or import projects to or from a flash drive and delete projects on the flash drive. The project data includes all project settings and test results.

⑨ **MANAGE** lets you rename, copy, or delete a project that is in the tester.

⑩ To delete the test setup or ID set, tap  . To copy the test setup or ID set so you can edit it to make a new one, tap  .

Notes

If you delete an imported ID set from a project, the ID set is still available in the tester. To delete imported ID sets from the tester, use LinkWare software.

*A project must have at least one **Test Setup** and one **Cable ID** set. If you delete them all, the tester makes a default **Test Setup** and **Cable ID** set.*

The CABLE ID SETUP Screen

To see the **CABLE ID SETUP** screen, tap the **PROJECT** panel on the home screen, then tap **NEW ID SET** on the **PROJECT** screen.

When you make cable ID sets, you set up these items for the project (see Figure 30):

- Sets of IDs to use when you save test results. For example, you can make one set of IDs for singlemode fibers and another for multimode fibers. Usually, the IDs are the same as the IDs of the cables in the installation.
- Specify the tests to do for each ID. As you use the project, the tester shows the percentage of the necessary tests you have completed. It also shows the IDs that do not have results for each test.

Each project can have up to 5000 IDs. If an ID set does not have a **Last ID**, the tester counts the set as one ID. An ID can have a maximum of 60 characters. Symbols, such as the asterisk, and accented characters do not increment.

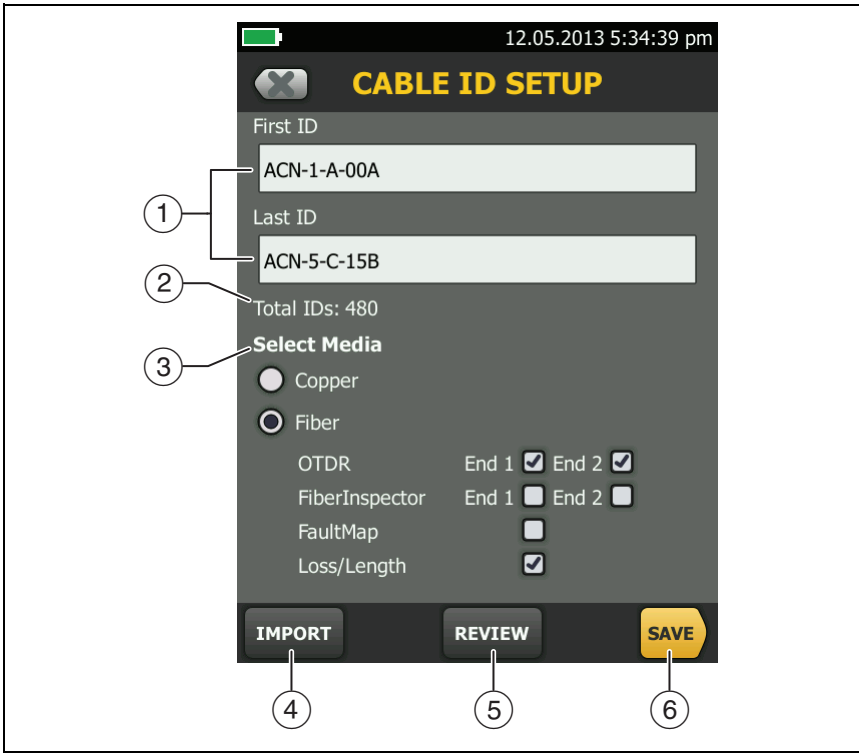

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Figure 30. CABLE ID SETUP Screen (after you enter the first and last IDs)

① **First ID** and **Last ID**: The first and last IDs in a set of sequential IDs.

If you do not enter a **Last ID** when you make an ID set, the tester will increment the **First ID** to make subsequent IDs.

Note

The tester does not increment symbols or accented characters.

When you use an ID set that does not have a **Last ID**, the set under **IDs Untested** on the **CHANGE ID** screen shows only the next ID.

② **Total IDs**: The number of IDs in the set. This section does not show for ID sets that do not have a **Last ID**.

③ **Select Media**: Select the tests that are necessary for each cable in the ID set.

For example, you can specify that you must do an **OTDR** and a **FiberInspector** test for each ID. After you do both tests for all the IDs in the set, the tester shows **100% Tested** on the home screen. If no IDs include FiberInspector results, the tester shows **50%**. To see the IDs that need FiberInspector results, select a **FiberInspector** test in the project, then look at the list under **FiberInspector IDs Untested** on the **CHANGE ID** screen (item ⑤ in Figure 31).

Notes

When you select a test here, be sure to add that test to the project. See item ⑤ in Figure 29 on page 87.

*If you select **Copper**, the ID set will not be available when you do a fiber test.*

*The **Select Fiber Tests** section does not show for ID sets that do not have a **Last ID**.*

④ Tap **IMPORT** to use an ID set that you downloaded to the tester from LinkWare software.

⑤ Tap **REVIEW** to see the **CABLE ID REVIEW** screen, which shows the ID set an the total number of IDs.

Note

*The **REVIEW** button does not show if you do not enter a **Last ID**.*

⑥ **SAVE**: To save the ID set, tap **SAVE**.

The CHANGE ID Screen

To see the **CHANGE ID** screen (Figure 31), tap the **Next ID** panel on the home screen.

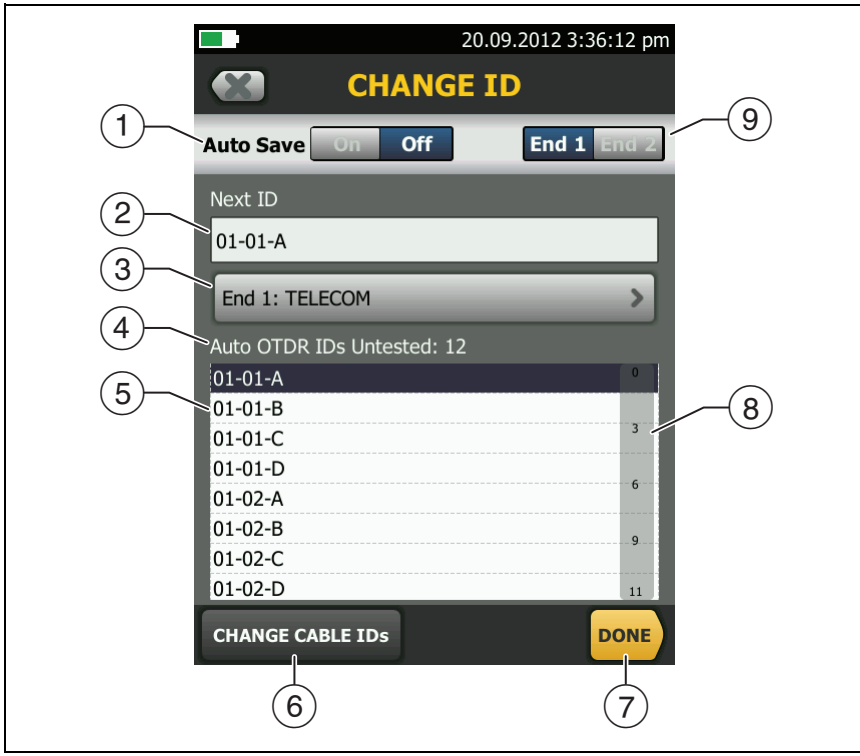


Figure 31. CHANGE ID Screen

① **Auto Save**: When a test is completed, the tester automatically saves the results with the next ID from the ID set. If the test failed, you can do the test again for the same ID, or go to the next cable. If you go to the next cable, the tester shows the failed test at the top of the list of results for the ID set.

② **Next ID**: The **Next ID** is the ID that the tester gives to the next results you save.

- To edit the ID, tap the ID, use the keyboard to edit the ID, then tap **DONE**. If the ID is not in the current set, the tester will make a new ID set that uses the ID as the first ID.
- To select a different ID from the set of untested IDs, tap the ID in the set (④).

③ **End 1:**, **End 2**: This panel shows the name for the ends of the fiber. The tester uses the names when you save OTDR and FiberInspector results for each end of the fiber. To edit the name for the end shown, tap the panel. To change the end that is shown, tap the **End 1/End 2** control (item ⑨).

④ **IDs Untested**: The number of IDs that do not have results for the test shown.

⑤ This list shows IDs that do not have results for the test shown and the **End** selected (item ⑨). On the home screen, the tester shows **100% Tested** when this list shows no IDs for all test types specified in the project.

When you use a **Next ID** set, which does not have a **Last ID**, the tester does not know how many IDs are necessary for the ID set. For **Next ID** sets, this list shows only the next ID.

⑥ Tap **CHANGE CABLE IDS** to select a different ID set to use or to edit an ID set.

⑦ Tap **DONE** to save your changes and go back to the previous screen.

⑧ Tap this bar or move your finger up or down the bar to scroll to a different place in the list.

⑨ **End 1/End 2** control: Lets you select an end of the fiber so you can enter a name for the end (item ④) and do tests on that end of the fiber.

About Next ID Sets

If you do not enter a **Last ID** when you make an ID set, the tester uses the **First ID** as the **Next ID**. The tester increments the Next ID each time you save a result.

- Numbers increment sequentially:

  1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, ... 99, 100, 101...

- Letters increment through the English alphabet:

  A, B, C, D, ... Z, AA, AB, AC, AD, ... AZ, BA, BB, BC...

- Numbers and letters do not cause each other to increment:

  1Y, 1Z, 1AA, 1AB, ... 1ZZ, 1AAA, 1AAB...

- The tester does not increment symbols or accented characters.

When you use a **Next ID** set, the set under **IDs Untested** on the **CHANGE ID** screen shows only the next ID. To save the next test with a different ID, tap the **Next ID:** panel, then enter a different ID.

Each project can have one **Next ID** set.

If your project has only a **Next ID** set, the tester cannot calculate the percentage of the project that is completed, so the **% Tested** value does not show on the home screen.

If your project has both a **Next ID** set and sets with first and last IDs, the **% Tested** value includes tests you saved with **Next ID**. For example, if you have one **Next ID** set and one set with 10 IDs, and you save 10 results with next IDs, the **% Tested** shows 50% (10 saved results divided by 20 IDs).

Manage Projects on a Flash Drive

You can export or import projects to or from a flash drive, and delete projects on the flash drive. The project data includes all project settings and test results.

⚠ Caution

- **Do not remove the USB flash drive while the LED on the drive flashes. Doing so can corrupt the data on the drive.**
- **You can lose a USB flash drive, cause damage to it, or accidentally erase the contents of the drive. Thus, Fluke Networks recommends that you save no more than one day of test results on a flash drive.**

Note

The tester reads only USB drives that use the FAT format.

1. Connect a USB flash drive to the type A USB port. The tester makes a bell sound when it detects the drive.
2. On the home screen, tap the **PROJECT** panel.
3. On the **PROJECT** screen, tap **TRANSFER**.
4. On the **TRANSFER PROJECTS** screen, select a function:
   - **Export**: On the **EXPORT PROJECTS** screen, select the projects you want to export to the flash drive, then tap **EXPORT**.
   - **Import**: On the **IMPORT PROJECTS** screen select the projects you want to import from the flash drive, then tap **IMPORT**.
   - **Delete**: On the **DELETE PROJECTS** screen select the projects you want to delete on the flash drive, then tap **DELETE**.

Copy Project Settings to Other Testers

To copy the settings in a project to other Versiv units, use the **Read Project Setups** and **Write Project Setups** utilities in LinkWare software. You can use LinkWare to read project settings from a tester or from a project you exported to a flash drive.

Chapter 9: Maintenance

Maintenance

⚠Warning⚠

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

- **Do not open the case. You cannot repair or replace parts in the case.**
- **Use only replacement parts that are approved by Fluke Networks.**
- **If you replace parts that are not specified as replacement parts, the warranty will not apply to the product and you can make the product dangerous to use.**
- **Use only service centers that are approved by Fluke Networks.**

⚠Caution

If you replace electrical parts yourself, the tester will possibly not have the correct calibration and can give incorrect test results. If the calibration is not correct, cable manufacturers can remove their warranty from the cabling you install.

Clean the Tester

To clean the touchscreen, turn off the tester, then use a soft, lint-free cloth that is moist with water or water and a mild detergent.

To clean the case, use a soft cloth that is moist with water or water and a mild detergent.

⚠ Warning ⚠

Do not put the tester or the battery pack in water.

⚠ Caution

To prevent damage to the touchscreen or the case, do not use solvents or abrasive materials.

When you clean the touchscreen or the case, do not let liquid get under the plastic around the touchscreen.

To clean the connectors on the module, see the instructions in Chapter 2.

Update the Software

New software gives you access to new features and the latest test limits and fiber types. Software updates are available on the Fluke Networks website.

To see the software version installed in your tester and module

1 On the home screen, tap the **TOOLS** icon, then tap **Version Information**.

2 To see information about an attached module, tap **MODULE**.

To update the software in the tester and attached module

⚠ Caution

To prevent unexpected loss of power, connect the AC adapter to the tester when you update the software.

Note

The software update procedure does not delete the test records, project settings, or user preferences in the tester, but can possibly change the factory-installed fiber types or test limits.

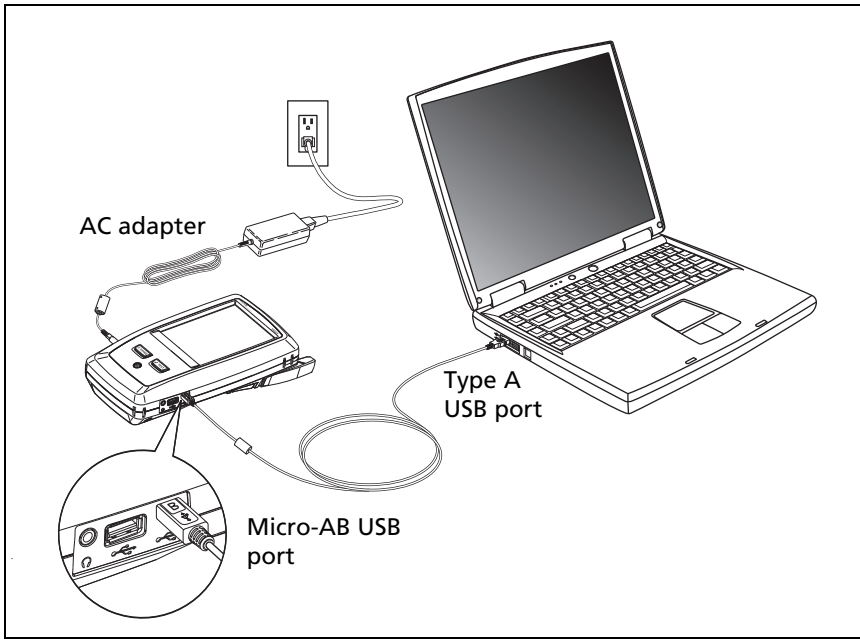
1 Install the latest version of LinkWare software on your PC. LinkWare is available on the Fluke Networks website.

2 Download the Versiv update file from the Fluke Networks website, or contact Fluke Networks to get the update by other methods. Save the file to your hard drive.

3 Connect the Micro-AB USB port on the tester to a USB port on the PC. See Figure 32.

4 On the LinkWare menu, select **Utilities > OptiFiber Pro > Software Update**, find and select the update file, then click **Open**. LinkWare saves the update file on the tester, then the tester installs the file.

5 The tester reboots when the update is completed. To make sure the update was installed correctly, tap the **TOOLS** icon on the home screen, tap **Version Information**, then make sure the Versiv unit and the module show the correct version.



HGD46.EPS

Figure 32. How to Connect the Tester to a PC

To update the software in a module

To update the software in a module, attach it to a Versiv unit that has the latest software. The main unit automatically installs the software in the module.

Note

If a Versiv unit has older software than the module, the Versiv unit puts the older software into the module. This lets you use the Versiv unit and the module together.

Extend the Life of the Battery

- Do not frequently let the battery discharge completely.
- Do not keep the battery at temperatures below -20 °C (-4 °F) or above +50 °C (+122 °F) for periods longer than one week.
- Before you put a battery into storage, charge it to approximately 50 % of full charge.

Store the Tester

- Before you store a tester or an extra battery for a long period, charge the battery to approximately 50 % of full charge. The discharge rate of the battery is 5 % to 10 % each month. Check the battery every 4 months and charge it if necessary.
- Keep a battery attached to the tester during storage. If you remove the battery for more than approximately 24 hours, the tester will not keep the correct time and date.
- See “Environmental and Regulatory Specifications” on page 107 for storage temperatures.

Remove the Battery

Figure 33 shows how to remove the battery.

Notes

If you remove the battery and do not connect the AC adapter, the clock keeps the current date and time for a minimum of 24 hours.

The screw does not come out of the battery door.

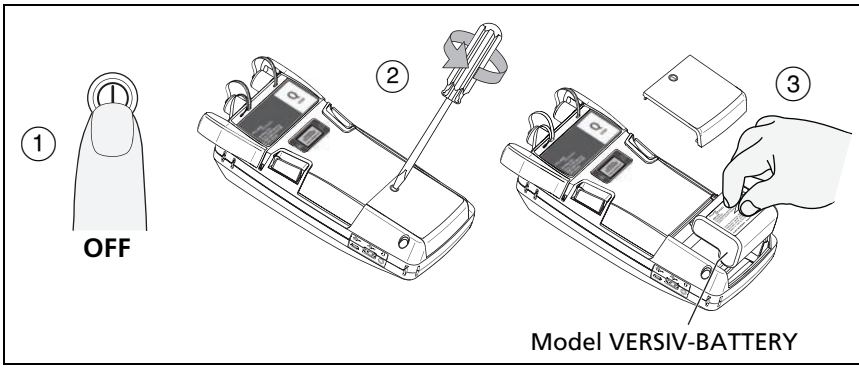


Figure 33. How to Remove the Battery

Calibration

To make sure that the modules operate within the published specifications for accuracy, have them calibrated at a Fluke Networks authorized service center every 12 months. To get information on factory calibration, contact an authorized Fluke Networks Service Center.

To see when the tester last received a factory calibration, tap the **TOOLS** icon on the home screen, then tap **Version Information**.

If the Tester Does Not Operate as Usual

If the tester does not operate as usual or if it shows an unusual message, see Table 3 for possible explanations and solutions to some conditions that can occur.

If the condition continues, contact Fluke Networks for assistance, or search the Fluke Networks Knowledge Base for a solution.

If you contact Fluke Networks, have available the serial number, software and hardware versions, and calibration date for the tester, if possible. To see this information, tap the **TOOLS** icon on the home screen, then tap **Version Information**.

You can also use LinkWare software to upload the system log from the tester. This file contains information that can possibly help Fluke Networks find a solution to an unusual problem.

Table 3. Possible Solutions for Unusual Behavior

The touchscreen or the keys do not respond. Press and hold ⏻ until the tester turns off. Then turn on the tester. If the problem continues, install the latest version of software in the tester.
The tester will not turn on even though the battery is charged. The fuse in the battery is possibly open. Connect the AC adapter. The tester can operate on AC power if the battery does not operate.
The OTDR Port Connection Quality gauge is not in the "Good" range. • The fiber endface in the OTDR connector is possibly dirty or damaged. Clean the connector and inspect the endface with a video probe. If an endface is damaged, contact Fluke Networks for service information. • Remove the fiber adapter from the module and inspect the adapter for damage. Make sure that the white plastic ring inside the center tube shows no damage.

-continued-

Table 3. Possible Solutions for Unusual Behavior (continued)

Test results appear to be incorrect. • The tester possibly has incorrect settings. Make sure you selected the correct fiber type and test limit. If you did a **Manual OTDR** test, do an **Auto OTDR** test to see if you get the correct results. • The tester is connected to the link with the wrong type of fiber. Make sure you use the correct type of launch/tail cords. See the Technical Reference Handbook for information on how incorrect settings and connections can possibly affect your test results.
The message "Selected test limit or fiber type is not valid with this test" shows. • The test limit requires two wavelengths, but you selected only one. Select the both wavelengths on the **TEST SETUP** screen. • The installed module does not support the selected fiber type or test limit. For example, the test limit has a singlemode fiber type, but a multimode module is installed. Select a different fiber type or test limit or install a different module.

Clean the DI-1000 Video Probe

To clean the case, use a soft cloth that is moist with a mild detergent.

⚠ Caution

To prevent damage to the case, do not use solvents or abrasive materials.

To clean the lens, remove the adapter tip, then wipe the lens with an optical-grade cloth that is moist with an optical-grade cleaning solution.

Options and Accessories

For a complete list of options and accessories go to the Fluke Networks website at **www.flukenetworks.com**.

To order options and accessories, contact an authorized Fluke Networks distributor.

Chapter 10: Specifications

Note

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

Environmental and Regulatory Specifications

Operating temperature[1]	0 °F to 113 °F (-18 °C to 45 °C)
Storage temperature[2]	-22 °F to +140 °F (-30 °C to +60 °C)
Operating relative humidity (% RH without condensation)	0 % to 90 %, 32 °F to 95 °F (0 °C to 35 °C) 0 % to 70 %, 95 °F to 113 °F (35 °C to 45 °C) Uncontrolled: 0 °F to 32 °F (-18 °C to 0 °C)
Vibration	Random, 2 g, 5 Hz-500 Hz
Shock	1 m drop test with and without module
Safety	CSA 22.2 No. 61010 IEC 61010-1 2nd Edition + Amendments 1, 2
Operating altitude	13,123 ft (4,000 m) 10,500 ft (3,200 m) with AC adapter
Storage altitude	39,370 ft (12,000 m)
Pollution degree	2
EMC	EN 61326-1

1. Using battery power. With AC power: 0 °C to 45 °C. 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.
2. Do not keep the battery at temperatures below -20 °C (-4 °F) or above +50 °C (+122 °F) for periods longer than one week. If you do, the battery capacity can decrease.

Multimode and Singlemode Modules

	Multimode	Singlemode
OTDR Port	Cleanable and Interchangeable UPC polish	Cleanable and Interchangeable UPC polish
Wavelengths	850 nm ±10 nm 1300 nm +35 / -15 nm	1310 nm ±25 nm 1550 nm ±30 nm
Compatible Fiber Types	50/125 µm 62.5/125 µm	Singlemode
Event Dead Zone[1]	850 nm: 0.5 m typical 1300 nm: 0.7 m typical	1310 nm: 0.6 m typical 1550 nm: 0.6 m typical
Attenuation Dead Zone[2]	850 nm: 2.2 m typical 1300 nm: 4.5 m typical	1310 nm: 3.6 m typical 1550 nm: 3.7 m typical

1. Measured at 1.5 dB below non-saturating reflection peak with the shortest pulse width. Reflection peak < -40 dB for multimode and < -50 dB for singlemode.
2. Measured at ± 0.5 dB deviation from backscatter with the shortest pulse width. Reflection peak < -40 dB for multimode and < -50 dB for singlemode.

	Multimode	Singlemode
Dynamic Range[3, 5, 6]	850 nm: 28 dB typical 1300 nm: 30 dB typical	1310 nm: 32 dB typical 1550 nm: 30 dB typical
Maximum Distance Range Setting	40 km	130 km
Distance Measurement Range[4, 5, 7, 8, 9, 10]	850 nm: 9 km 1300 nm: 35 km	1310 nm: 80 km 1550 nm: 130 km
Distance Measurement Accuracy[11]	±1 ±(0.00005 x distance) ± (0.5 x resolution) meters typical	±1 ±(0.00005 x distance) ±(0.5 x resolution) meters typical

3. For typical backscatter coefficient for OM1 fiber: 850: -65 dB, 1300: -72 dB
4. Typical backscatter and attenuation coefficients for OM2-OM4 fiber: 850 nm: -68 dB; 2.3 dB/km: 1300 nm: -76 dB; 0.6 dB/km
5. Typical backscatter and attenuation coefficients for OS1-OS2 fiber: 1310 nm: -79 dB; 0.32 dB/km; 1550 nm: -82 dB; 0.19 dB/km
6. SNR=1 method, 3 minute averaging, widest pulse width
7. 850 nm: 9 km typical to find the end or 7 km typical to find a 0.1 dB event (with a maximum of 18 dB attenuation prior to the event)
8. 1300 nm: 35 km typical to find the end or 30 km typical to find a 0.1 dB event (with a maximum of 18 dB attenuation prior to the event)
9. 1310 nm: 80 km typical to find the end or 60 km typical to find a 0.1 dB event (with a maximum of 20 dB attenuation prior to the event).
10. 1550 nm: 130 km typical to find the end or 90 km typical to find a 0.1 dB event (with a maximum of 18 dB attenuation prior to the event).
11. Does not include index of refraction error and does not include automatic event location error.

	Multimode	Singlemode
Linearity[12, 13]	±0.03 dB/dB typical maximum	±0.03 dB/dB typical maximum
Reflectance Range[14,15]	850 nm: -14 dB to -57 dB typical 1300 nm: -14 dB to -62 dB typical	1310 nm: -14 dB to -65 dB typical 1550 nm: -14 dB to -65 dB typical
Reflection Accuracy[13]	± 4 dB typical maximum	±2 dB typical maximum
Sample Resolution	3 cm to 400 cm	3 cm to 400 cm
Pulse Widths (nominal)	850 nm: 3, 5, 20, 40, 200 ns 1300 nm: 3, 5, 20, 40, 200, 1000 ns	3, 10, 30, 100, 300, 1000 ns 3000, 10000, 20000 ns
Loss Threshold Setting	0.01 dB to 1.5 dB Adjustable in 0.01 dB increments	0.01 dB to 1.5 dB Adjustable in 0.01 dB increments
Units of Measure	m, ft	m, ft

12. dB variation per 1 dB step.
13. Applies along the trace backscatter within the distance range in which the OTDR can find a 0.1 dB event.
14. Typical backscatter and attenuation coefficients for OM2-OM4 fiber: 850 nm: -68 dB; 2.3 dB/km: 1300 nm: -76 dB; 0.6 dB/km
15. Typical backscatter and attenuation coefficients for OS1-OS2 fiber: 1310 nm: -79 dB; 0.32 dB/km; 1550 nm: -82 dB; 0.19 dB/km

	Multimode	Singlemode
Test time per wavelength		
Auto	5 seconds (typical)	10 seconds (typical)
Quick Test	2 seconds (typical)	5 seconds (typical)
Best Resolution	2 to 180 seconds	5 to 180 seconds
FaultMap	2 seconds typical 180 seconds maximum	10 seconds typical 180 seconds maximum
DataCenter OTDR	1 second typical at 850 nm 7 seconds maximum	20 seconds typical 40 seconds maximum
Manual	3, 5, 10, 20, 40, 60, 90, 120, 180 seconds	3, 5, 10, 20, 40, 60, 90, 120, 180 seconds
Laser classification	Class I CDRH Complies to EN 60825-2	Class I CDRH Complies to EN 60825-2
Real Time Trace refresh rate	2 updates per second typical	2 updates per second typical

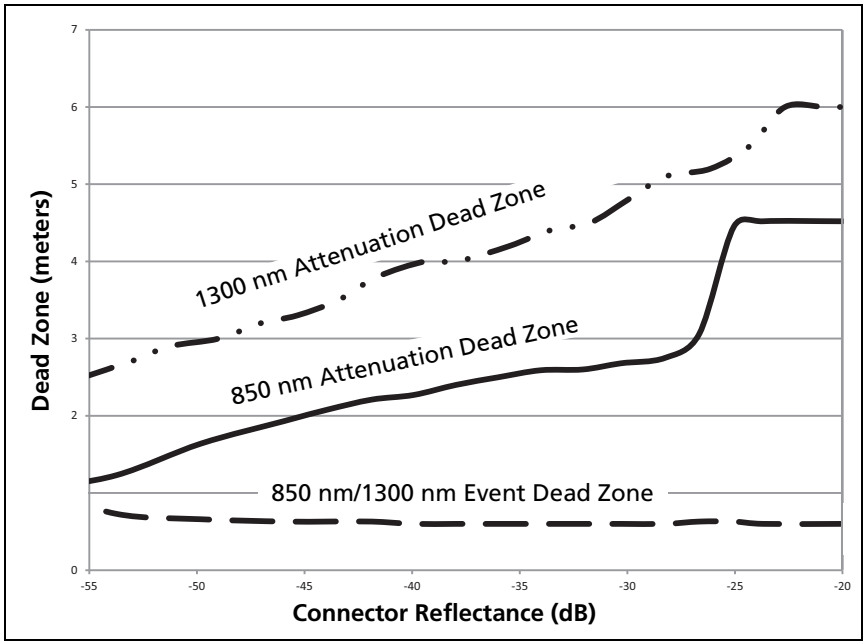


Figure 34. Typical Dead Zone Performance of Multimode Modules

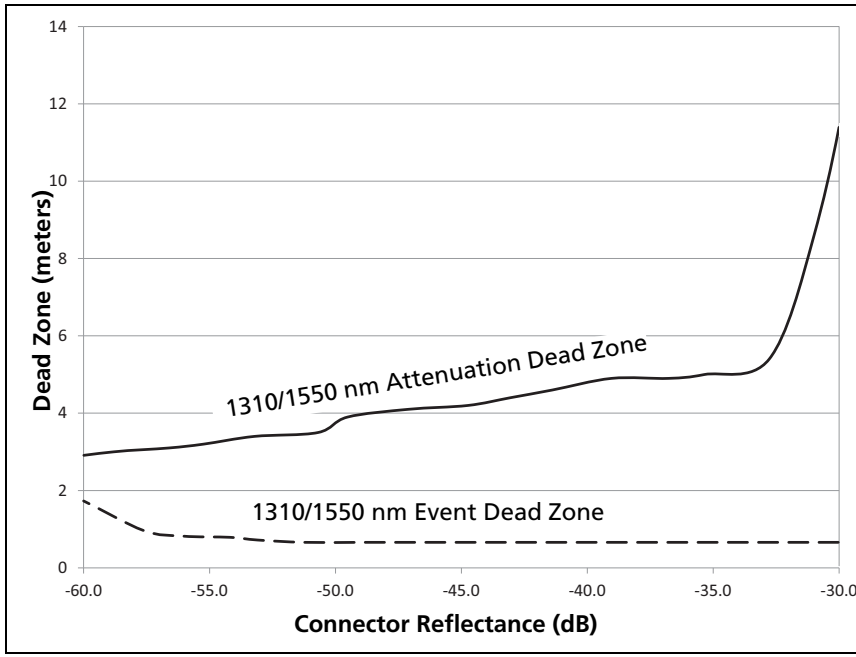


Figure 35. Typical Dead Zone Performance of Singlemode Modules

Visual Fault Locator

On/off control	Mechanical switch and a button on the touchscreen
Output power (into SM fiber)	316 µw (-5 dBm) ≤ peak power ≤ 1.0 mw (0 dBm)
Operating wavelength	650 nm nominal
Spectral width (RMS)	± 3 nm
Output modes	Continuous wave and pulse mode (2 Hz to 3 Hz)
Connector adapter	2.5 mm universal
Laser safety	Class II CDRH Complies to EN 60825-2

DI-1000 Video Probe

Magnification	200X with Versiv display
Light source	Blue LED
Connection to the tester	Type A USB plug
Power source	Power supplied by the Versiv unit
Field-of-view (FOV)	Horizontal: 425 µm Vertical: 320 µm
Minimum detectable particle size	<0.5 µm
Dimensions	Approximately 6.75 in long x 1.5 in diameter (1175 mm x 35 mm) without adapter tip
Weight	7 oz. (198 g)
Temperature range	Operating: 32 °F to 122 °F (0 °C to +50 °C) Storage: -4 °F to +158 °F (-20 °C to +70 °C)
Certifications	CE (when used with the Versiv unit)

Power

Battery type	Lithium ion battery pack, 7.2 V
Battery life	8 hr Auto OTDR operation, dual wavelength, no video probe connected, 150 m of fiber
Charge time	Tester off: 4 hours to charge from 10 % capacity to 90 % capacity. Tester on: 6 hours to charge from 10 % capacity to 90 % capacity.

Traceable Calibration Period

To make sure that the modules operate within the published specifications for accuracy, have them calibrated at a Fluke Networks authorized service center every 12 months.

Certifications and Compliance

CE	Conformite Europeene. Conforms to the requirements of the European Union and the European Free Trade Association (EFTA).
C SA US	Listed by the Canadian Standards Association.
N10140	Conforms to relevant Australian standards.
	Conforms to relevant Russian standards.
	KCC-REM-FKN-012001001: EMC approval for Korea Class A Equipment (Industrial Broadcasting & Communication Equipment) This product meets requirements for industrial (Class A) electromagnetic wave equipment and the seller or user should take notice of it. This equipment is intended for use in business environments and is not to be used in homes. A 급 기기 (업무용 방송통신기자재) 이 기기는 업무용 (A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며 , 가정외의 지역에서 사용하는 것을 목적으로합니다 .

Internal Memory for Test Results

Typical capacity for the internal memory is approximately 2000 OTDR tests on fiber links with an average length of 2 km, and up to 5000 tests for lengths less than 2 km. The capacity available for test results depends on the space used by the software and custom test limits in the tester.

The number of test records you can save decreases if you save more tests in each record, or if you save tests that use more memory. For example, OTDR results for long fibers use more memory than results for shorter fibers. Records that include OTDR tests and FiberInspector images use more memory than records that include OTDR tests and FaultMap tests.

USB Flash Drive

You can upload test results to a USB flash drive to make more internal memory available.

Note

The tester reads only USB drives that use the FAT format.

Serial Interfaces

- USB host interface with type A USB port
- USB interface with Micro-AB USB port

RJ45 Connector

For functions available in future software releases.

Headset Jack

3.5 mm, 4-conductor jack

Weight

Versiv unit with module and battery installed: 3 lbs, 5 oz (1.28 kg)

Dimensions

Versiv unit with module and battery installed: 2.625 in x 5.25 in x 11.0 in (6.67 cm x 13.33 cm x 27.94 cm)

Display

5.7 in LCD display with a projected capacitance touchscreen.

Regulatory Information

This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15, Subpart J of the FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of the equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

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