

# **CertiFiber™ Max**

## Length/Loss/Polarity Module

### Users Manual



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# Table of Contents

Title	Page
Introduction.....	1
Contact Fluke Corporation.....	2
Safety Information.....	2
The Product .....	2
The Main .....	3
Use the Touchscreen .....	4
The Remote .....	5
Remote LED Panel .....	6
Install and Remove a Module .....	7
Install a Strap .....	9
Home Screen.....	10
TOOLS Menu .....	12
Maintenance Tools Menu (General Settings) .....	12
CertiFiber Max Module.....	14
Remove and Install the Adapters .....	15
Do a Test.....	17
Requirements for Reliable Fiber Test Results .....	17
Set up a Project.....	17
Set up a Fiber Test.....	20
Use the CertiFiber Max Module Testing Tools Menu .....	22
Inspect Ports, Adapters, and Cable Endfaces .....	23
Set the Reference for Fiber Tests .....	25
Use a Test Reference Cord (TRC).....	25
Measure the Losses of a TRC.....	26
Reduce Damage to a TRC .....	26
About APC Connectors .....	27
How to Set a Reference .....	28
When to Set a Reference .....	30
Test Results Screens .....	31
Maintenance .....	34
Product Disposal.....	34
Battery .....	35
Product Specifications .....	35



## Introduction

The Fluke Networks CertiFiber™ Max Loss/Length/Polarity module attaches to a Versiv™ 2 Main or Remote to make a hand-held tester (the Product or the Tester). When needed, to differentiate a Main tester from a Remote tester, they are referred to as the Main or the Remote. The Product can certify, troubleshoot, and document optical fiber cabling installations.

- The Product measures optical power loss, length, and polarity on multi-fiber cables at 1310 nm and 1550 nm (CFM-SM).
- Connect Interchangeable Uniport™ adapters (adapters) to the input and output ports to make reference and test connections that meet ISO standards for MPO/MTP and MMC connectors for base 12-fiber, 16-fiber, and 24-fiber systems.
- Use the built-in visual fault locator (VFL) to find breaks, bad splices, and bends and verify fiber continuity.
- Use an optional FiberInspector™ video probe to inspect fiber endfaces and save the images in test reports.
- Use the ProjX™ management system to set up projects to monitor a job and make sure your work agrees with the requirements of the job. See [Set up a Project](#). Use a project to:
  - 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.
  - Do tests and use IDs that are not specified in the project if necessary.

## Contact Fluke Corporation

Fluke Corporation operates worldwide. For local contact information, go to our website: [www.flukenetworks.com](http://www.flukenetworks.com).

+1-425-446-5500 [info@flukenetworks.com](mailto:info@flukenetworks.com)

To register your product, or to view, print, or download the latest manual or manual supplement, go to our website. To register your product, go to <https://my.fluke.com/en-US/register-product/>. Register your product for access to information on product updates, troubleshooting tips, and other support services. If you purchased a Gold Support plan, registration also activates your plan.

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](http://www.flukenetworks.com), then select **SUPPORT > Knowledge Base**.

## Safety Information

General Safety Information is in the printed Safety Information document that ships with the Product and at [www.flukenetworks.com](http://www.flukenetworks.com). More specific safety information is listed where applicable.

A **Warning** identifies hazardous conditions and procedures that are dangerous to the user. A **Caution** identifies conditions and procedures that can cause damage to the Product or the equipment under test.


## The Product

For a list of the contents of your kit, see the list in the box or see the lists of models and accessories on our website.



## The Main

Table 1 shows the features of a Main.

**Table 1. Main Features**

Item	Description
1	Display with touchscreen. See <a href="#">Use the Touchscreen</a> .
2	Micro USB port: Use to connect the Product to a PC to upload test results to the PC or to install software updates on the Product.
3	USB-A port: Use to save test results on a USB flash drive or to connect a FiberInspector video probe to the Product.
4	Headset jack.
5	Push  to start a test.

**Table 1. Main Features (cont.)**

Item	Description
6	Push  to turn on or off the Product. On a Versiv 2 Main, the LED in the power button shows the battery-charge status.
7	Push  to go to the home screen.
8	Ac adapter port to charge the battery. The LED has these colors: <ul style="list-style-type: none"><li>• Red when the battery charges.</li><li>• Green when the battery is fully charged.</li><li>• Yellow if the battery will not charge.</li></ul>
9	RJ45 connector: Use to connect to a network for access to LinkWare™ Live cloud software or VNC.
--	Not shown: The connection port on the back of the Main where a module connects to the Main.

## Use the Touchscreen

To use the touchscreen, use your fingertip or a stylus that is made for projected capacitance touchscreens. To select an item on the screen, tap the item lightly with your fingertip. To scroll a screen, lightly touch the screen and move your fingertip in the direction you want the screen to move.

### Note

*The touchscreen does not respond if you tap the screen with a fingernail, use an incorrect type of stylus, or wear non-conductive gloves.*

### Caution

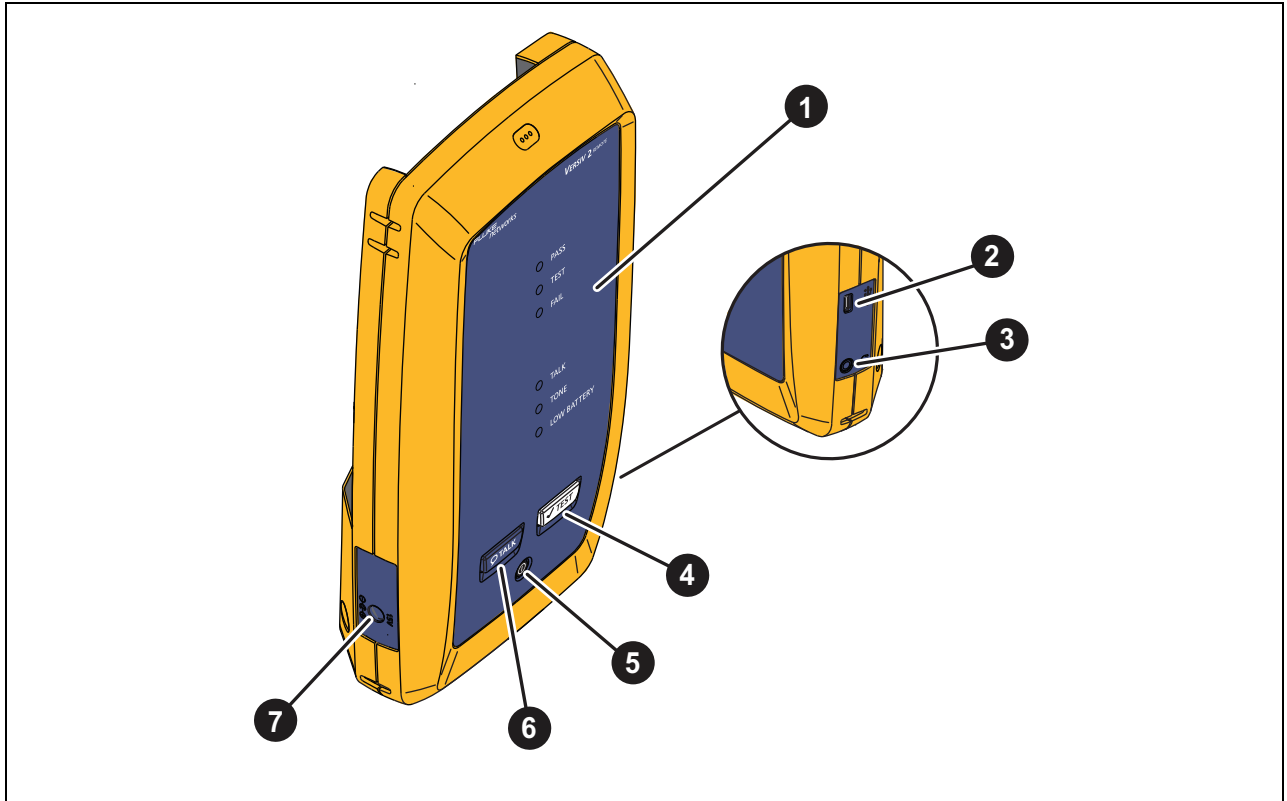
**For correct operation and to prevent damage to the touchscreen:**



- **Touch the screen only with your fingers or with a stylus that is made for projected capacitance touchscreens.**
- **Do not use too much force.**
- **Do not touch the screen with sharp objects.**

## The Remote



If you have two Main testers, you can use one as a Remote. To use a Main as a Remote: on the Main, tap **TOOLS > Main as Remote**. [Table 2](#) shows the features of a Remote.

**Table 2. Remote Features**



Item	Description
1	LED panel. See <a href="#">Remote LED Panel</a> .
2	Micro USB port: Use to connect the Product to a PC to upload test results to the PC or to install software updates on the Product.
3	Headset jack
4	Push  to start a test.
5	Push  to turn on or off the Product.

**Table 2. Remote Features (cont.)**

Item	Description
6	If available for the installed module, push  to use a headset to talk to the person on the end of a link connected to the Main. Push again to adjust the volume. Push and hold  to turn off the talk function.
7	Ac adapter port to charge the battery.
--	Not shown: The connection port on the back of the Remote where a module connects to the Remote.

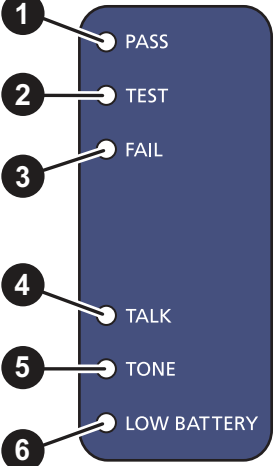
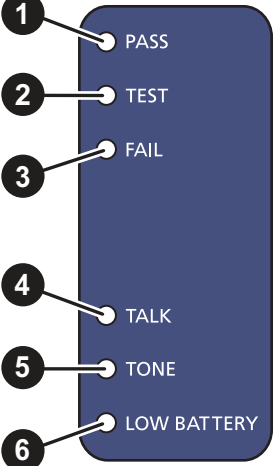
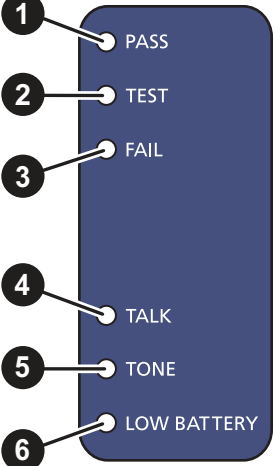
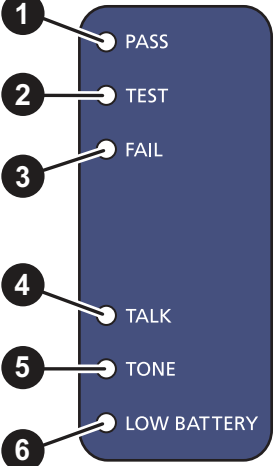
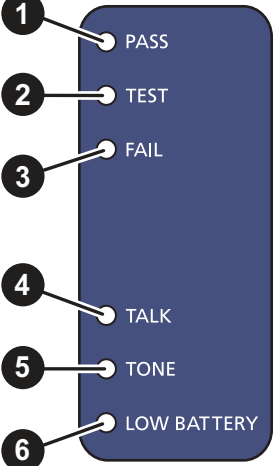
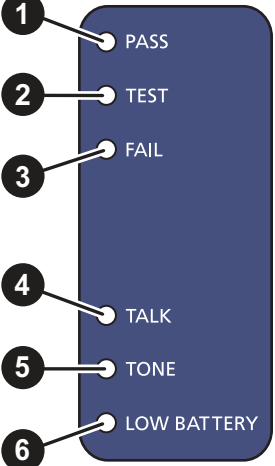
## Remote LED Panel

Table 3 describes the typical functions of the LEDs on the Remote.

The LEDs have additional functions:

- The battery level indicator when you first turn on the Remote.
- Volume indicator for the **TALK** function. (Only on select modules.)
- Software update progress indicators.

Table 3. Remote LED Panel

	Item	Description
	1	The <b>PASS</b> LED turns on when a test passes.
	2	The <b>TEST</b> LED turns on while a test is in progress or when you manually turn on the output port.
	3	The <b>FAIL</b> LED turns on what a test fails.
	4	When connected to a module that supports the TALK function. The <b>TALK</b> LED turns on when the talk function is on. The LED flashes until the Main accepts the request to talk. CertiFiber Max modules do not support this function.
	5	The <b>TONE</b> LED flashes and the tone generator turns on if you push <input checked="" type="checkbox"/> TEST on the Remote and a Main is not connected to the Remote. This feature is not available for use with all modules.
	6	The <b>LOW BATTERY</b> LED turns on when the battery is low.

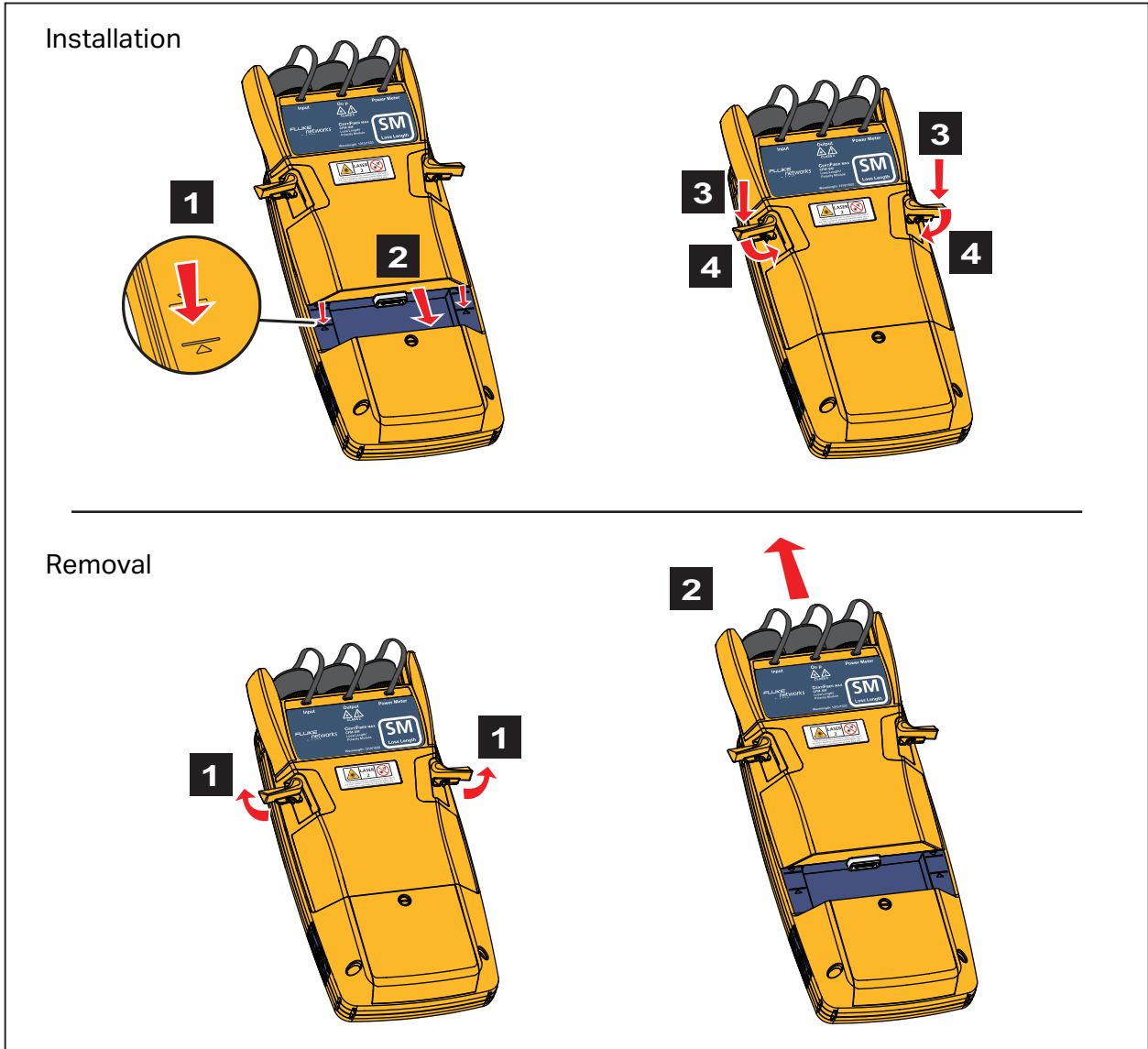
## Install and Remove a Module

Figure 1 shows how to install a module.

### Caution

To prevent damage to the Main or Remote, push the latches (3) down toward the front of the Main or the Remote before you turn them.

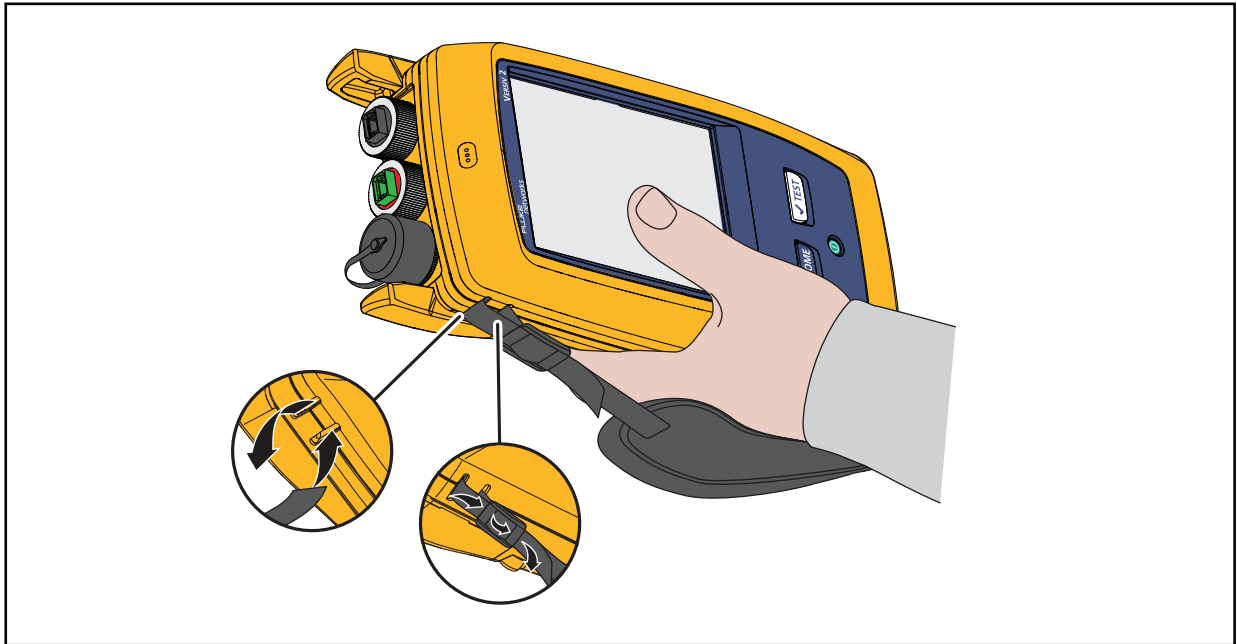
Figure 1. Install and Remove a Module



## Install a Strap

A hand strap and an optional carry strap are available. Use the hand strap to hold the Product. Use the carry strap to carry or hang the Product. [Figure 2](#) shows how to install a strap and how to use the hand strap.

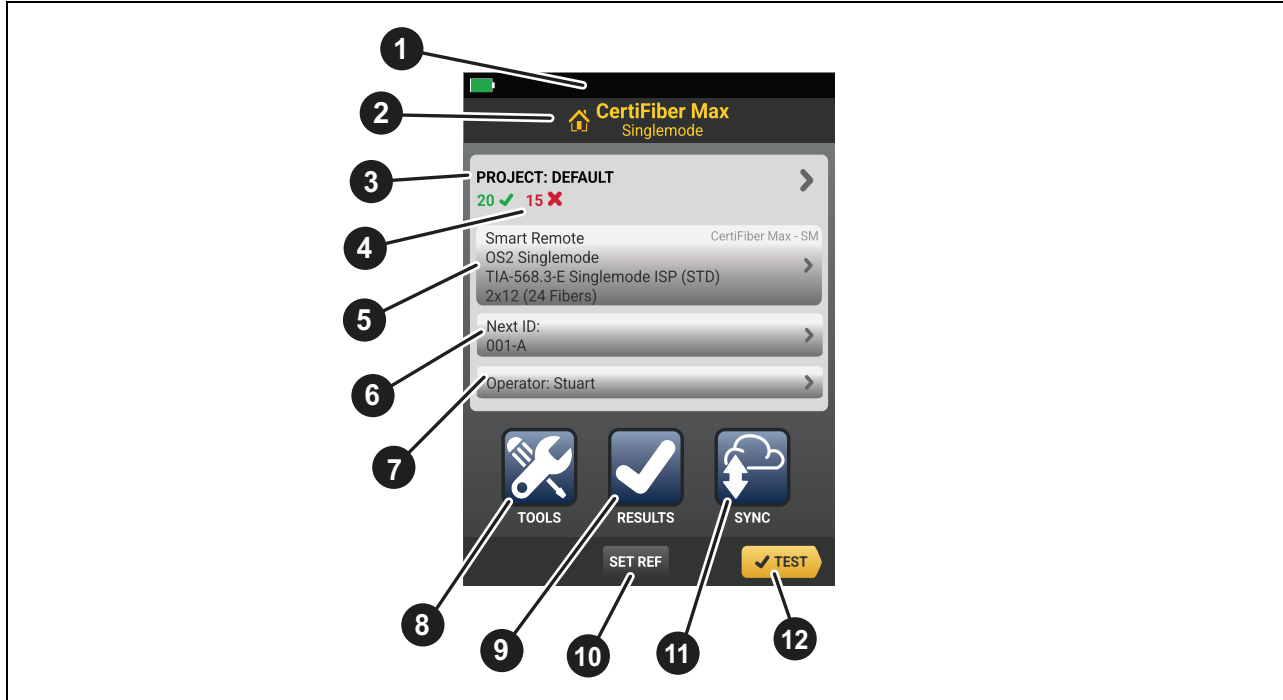
**Figure 2. Install a Strap and Use the Hand Strap**



## Home Screen




Table 4 shows the items that can show on the home screen.

**Table 4. Home Screen**



Item	Description
1	The header shows on all screens. The battery status, date, and time always show. Other icons may show on the header based on the user preferences selected in the TOOLS menu.
2	The type of module installed in the Product.
3	The <b>PROJECT</b> panel shows the name of the project. Tap the panel to edit the project settings, select a different project, or add a new project. See <a href="#">Set up a Project</a> . Test results save to the project.

**Table 4. Home Screen (cont.)**

Item	Description
4	<p>Shows a summary of the test results in the project:</p> <ul style="list-style-type: none"> <li> Indicates the number of tests that passed.</li> <li> Indicates the number of tests that failed.</li> <li> Indicates the result is for information only.</li> </ul>
5	<p>The test setup panel shows the settings the Product uses when you do a test. To change the settings, tap the panel to open the CHANGE TEST screen.</p>
6	<p>The <b>Next ID</b> panel shows the ID that the Product gives to the next test results you save.</p> <p>Tap <b>Next ID</b> to:</p> <ul style="list-style-type: none"> <li>• For bi-directional testing, save a test at <b>END 1</b> and <b>END 2</b> with the same Cable ID name to merge the results.</li> <li>• Enter an ID, select a different ID in the ID set, select a different set of IDs, or make a new set. The Product adds the IDs and ID sets you make to the project that shows on the home screen.</li> <li>• Turn on or off <b>Auto Save</b>.</li> </ul>
7	<p>The <b>Operator</b> panel shows the name of the person who does the job.</p> <p>You can enter a maximum of 20 operator names. For each operator you can also enter an email address that the operator uses as an ID to sign in to LinkWare Live software.</p>
8	<p>Tap <b>TOOLS</b> to set user preferences. See <a href="#">TOOLS Menu</a>.</p>
9	<p>Tap <b>RESULTS</b> to see and manage the test results that are saved on the Main.</p>

**Table 4. Home Screen (cont.)**

Item	Description
10	Tap <b>SET REF</b> to open the SET REFERENCE screen to set the reference for a test reference cord (TRC) and to verify the TRC for loss, length, and polarity.
11	While connected to a network, tap <b>SYNC</b> to connect to LinkWare Live software to import configurations and upload test results.
12	Tap to do a test.

## TOOLS Menu

To set general settings applicable to all modules, see [Maintenance Tools Menu \(General Settings\)](#). For tools specific to a module, see the set up a test section for the module.

### Maintenance Tools Menu (General Settings)

Table 5 is a list of general user settings. To access this menu: on the HOME screen tap **TOOLS** and scroll down.

**Table 5. Maintenance Tools Menu**

Setting	Description
<b>Sign In</b>	Sign in to LinkWare Live software.
<b>Network</b>	Configure the network information.
<b>Version Information</b>	View the serial number, version information, and calibration date of the Product.
<b>Battery Status</b>	View the status of the battery level.
<b>Memory Status</b>	View the status of the memory availability.
<b>Language</b>	Select the language to use on the display.
<b>Date/Time</b>	Tap to select options to set the date, time, date format, and time format.
<b>Number</b>	Set the decimal separator: <b>0.0</b> or <b>0,0</b> .
<b>Length</b>	Set the unit of measure for length tests: <b>ft</b> or <b>m</b> .

**Table 5. Maintenance Tools Menu (cont.)**

<b>Setting</b>	<b>Description</b>
<b>Timeout Period</b>	<p>Use to increase the battery life of the Product.</p> <p><b>Backlight:</b> Use to set the time before the backlight of the display dims. When the backlight timeout period ends, the brightness of the backlight decreases. After the timeout period, the display turns off. Touch the display to turn it back on.</p> <p><b>Power Down:</b> Use to set the time before the Product automatically turns off.</p> <p>To always keep the Backlight or the Product on, select <b>Disabled</b> in the time list.</p> <p>The Remote always turns off after 60 minutes of inactivity.</p>
<b>Audible Tone</b>	<p>Enable (<b>On</b>) or disable (<b>Off</b>) the tones the Product emits when you push keys.</p> <p>If you connect a Remote to a Main, the Remote uses the settings of the Main.</p>
<b>Power Line Frequency</b>	<p>Set the power line frequency to <b>50 Hz</b> or <b>60 Hz</b> to match the power frequency in the area where you use the Product.</p> <p>This setting decreases the effects of ac noise on the circuits in the Product. Not applicable to CertiFiber Max modules.</p>
<b>Display</b>	<p>Adjust the brightness of the display. Touch and slide the bar to the left to decrease the brightness or to the right to increase the brightness.</p>
<b>Change PIN</b>	<p>Change the PIN used to unlock the Product.</p>
<b>Factory Reset</b>	<p>Tap to delete all the test results and reset the Product to the factory default settings.</p>
<b>VNC</b>	<p>Use to enable or disable the VNC feature.</p>
<b>Regulatory Information</b>	<p>View the radio certificates for the Product.</p>

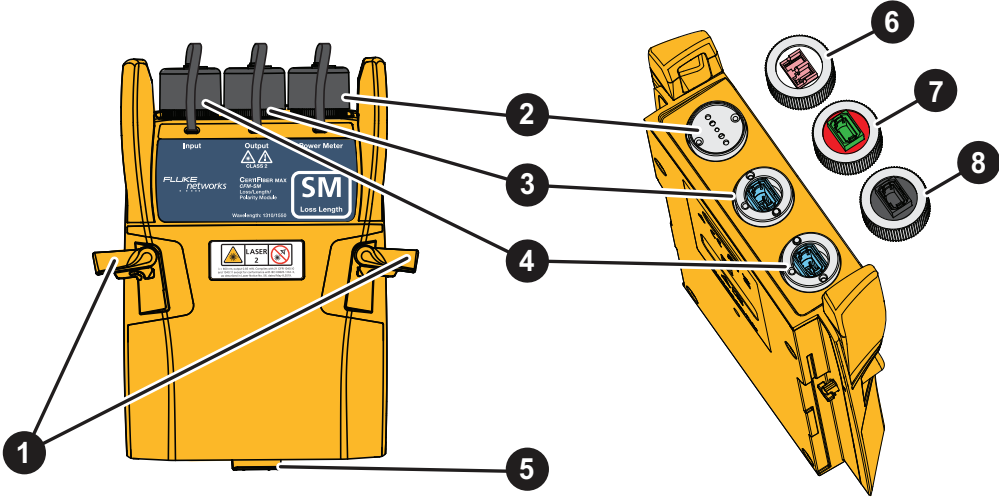
## CertiFiber Max Module

Table 6 shows the features of the CertiFiber Max module.

### ⚠ Caution

Do not connect Pinned connectors to Pinned Uniport™ adapters (adapters) (2 and 3). You can damage the connectors.

Table 6. CertiFiber Max Module Features



Item	Description
1	Latches: Use to securely attach a module to a Main or a Remote. See <a href="#">Install and Remove a Module</a> .
2	<b>Power Meter port</b> <ul style="list-style-type: none"> <li>The single-ferrule <b>Power Meter</b> port has a dust cap and a removable adapter.</li> <li>Use the port to measure power with single-ferrule connectors such as SC, LC, SN, and MDC at 1310 nm and 1550 nm.</li> </ul>
3	<b>Output port</b> <ul style="list-style-type: none"> <li>The singlemode <b>Output</b> port has a dust cap and a removable adapter.</li> <li>The port transmits optical signals for loss, length, polarity, and VFL measurements.</li> </ul>

**Table 6. CertiFiber Max Module Features (cont.)**

Item	Description
4	<b>Input port</b> <ul style="list-style-type: none"> <li>• The <b>Input</b> port has a dust cap and a removable adapter.</li> <li>• This port receives optical signals for loss, length, and power measurements.</li> </ul>
5	The module connector connects the module to a Main or a Remote.
6	<b>Power meter adapter</b> <ul style="list-style-type: none"> <li>• The inside or bottom of the adapter connects to the <b>Power Meter</b> port.</li> <li>• The fiber to test connects to the outside or top of the adapter.</li> </ul>
7	<b>Output adapter</b> <ul style="list-style-type: none"> <li>• The inside or bottom of the adapter connects to the <b>Output</b> port.</li> <li>• The transmit branch of a TRC cable connects to the outside or top of the adapter. See <a href="#">Use a Test Reference Cord (TRC)</a>.</li> </ul>
8	<b>Input adapter</b> <ul style="list-style-type: none"> <li>• The inside or bottom of the adapter connects to the <b>Input</b> port.</li> <li>• The receive branch of a TRC cable connects to the outside or top of the adapter. See <a href="#">Use a Test Reference Cord (TRC)</a>.</li> </ul>

## Remove and Install the Adapters

To connect the MPO or MMC fiber connectors, change the input adapter on the module to match the device under test (DUT). To use the **Power Meter** port, change the power meter adapter to match the end of the cable to test.

To remove an adapter (see [Table 6](#)):

1. Turn the collar of the adapter (6 through 8) counter-clockwise until it unscrews, then pull the adapter straight out.
2. To protect the adapter, put dust caps on each end of the adapter and put it in a protected carry case when not in use.

To install an adapter see [Table 6](#):

1. Make sure the adapters and the ports on the module are clean. See [Inspect Ports, Adapters, and Cable Endfaces](#) for guidance on how to use a video probe to inspect each port, adapter, and cable endface. See the *Versiv Series Users Manual* for how to clean the endfaces.
2. Align the keys and insert the adapter into the port.
3. Screw the collar clock-wise until fully seated.

*Note*

*Each adapter is keyed so that it will only fit into its appropriate port: **Power Meter, Output, or Input.***

*12-fiber adapters and 16-fiber adapters may be used on modules installed in a Main or a Remote. 24-fiber adapters used on a module installed in a Main are different than the 24-fiber adapters used on a module installed in a Remote. Make sure you use the correct 24-fiber adapter on the module.*

**⚠ Caution**

**To protect the Product:**

- **Keep adapters in their containers until you need to install them.**
- **Keep the adapter cover on the adapter until you need to install the adapter.**
- **To remove or install the adapter, turn only the collar on the adapter. Do not use tools to remove or install the adapters.**
- **Do not touch the photodiode lens.**
- **Put the key in the slot before you turn the adapter.**

## Do a Test

To do a test:

1. Follow the module specific requirements for reliable test results. See [Requirements for Reliable Fiber Test Results](#).
2. Set up a project, See [Set up a Project](#).
3. Set up a test in the project. [Set up a Fiber Test](#).
4. If necessary, select the module specific settings in the TOOLS menu. See [Use the CertiFiber Max Module Testing Tools Menu](#).
5. Push TEST or tap **TEST**.

## Requirements for Reliable Fiber Test Results

To get reliable fiber test results and make sure the Product meets the required accuracy specifications:

- Use proper inspection and cleaning procedures, if necessary, before connecting fibers. See [Inspect Ports, Adapters, and Cable Endfaces](#).
- Set the reference frequently. See [How to Set a Reference](#) and [When to Set a Reference](#).
- Use the latest version of the software for the Product. The latest software is available on our website.
- Select the correct fiber type and test limit for the job. See [Table 8](#).
- Select the correct index of refraction for the fiber. To do this, you may need to create a custom fiber type. See [Table 8](#).
- Charge the battery fully. See [Battery](#).
- Send the modules to a Fluke service center every 12 months for factory calibration.

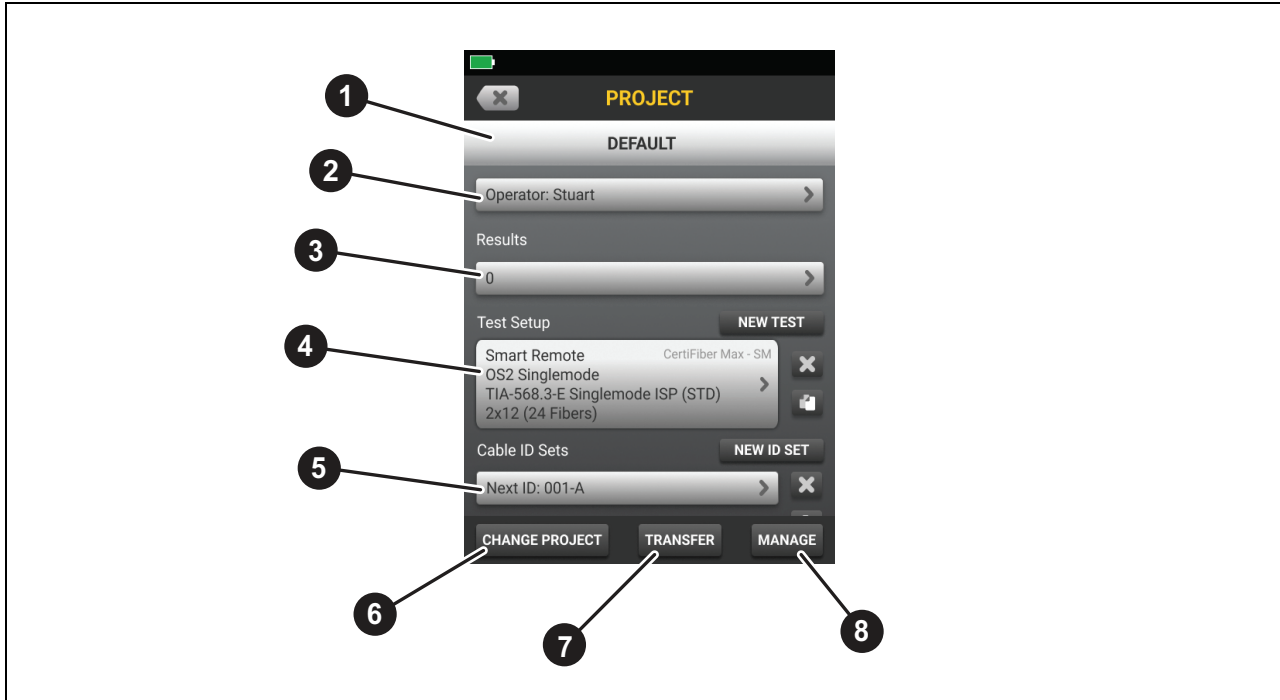
## Set up a Project

[Table 7](#) describe how to use the PROJECT screen to set up a project.

### Note





*You do not need to install a module to set up a project for the module. The project settings are saved in the Main. To manage projects in the cloud, use LinkWare Live software.*

**Table 7. PROJECT Screen**



Item	Description
<p>1</p>	<p>The name of the project.</p> <p>Projects created with LinkWare Live software include the organization name. Projects may also include a sub-project name.</p>
<p>2</p>	<p><b>Operator</b> panel</p> <p>The Operator panel shows the name of the person who does the tests. You may enter the email address the operator uses to sign into LinkWare Live software.</p>
<p>3</p>	<p><b>Results</b> panel</p> <p>The Results panel shows a summary of the test results in the project. Tap to open the RESULTS screen to see and manage results.</p> <ul style="list-style-type: none"> <li>✓ Indicates the number of tests that passed.</li> <li>✗ Indicates the number of tests that failed.</li> <li>i Indicates the result is for information only.</li> </ul>

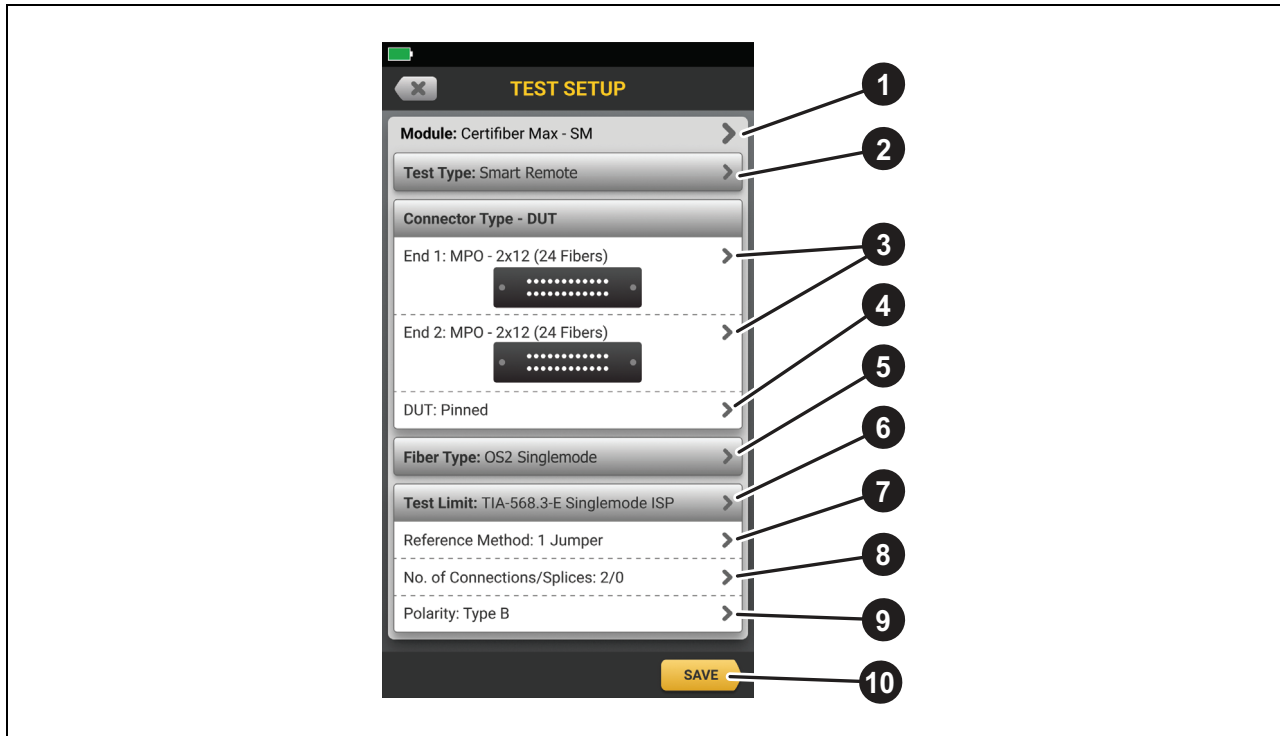
**Table 7. PROJECT Screen (cont.)**

Item	Description
4	<p><b>Test Setup</b> panel</p> <p>A test setup panel shows the settings the Product uses when you do a test. Tap a panel to open the TEST SETUP screen to edit the test.</p> <p>More than one test setup panel can show because a project may have more than one type of test. To add a test to a project, tap <b>NEW TEST</b>.</p> <p> Tap to delete a test setup.</p> <p> Tap to duplicate a test setup to edit it to make a new one.</p>
5	<p><b>Cable ID Sets</b> panel</p> <p>The sets of IDs the Product can use for the names of test results. Each ID set is either for a copper or fiber cable. The CertiFiber Max module only tests fiber cables. Tap to open the CABLE ID screen to edit the IDs.</p> <p>More than one cable ID panel can show because a project may have more than one set of cable IDs. To add a set of IDs to the project, tap <b>NEW ID SET</b>.</p> <p> Tap to delete a cable ID set.</p> <p> Tap to duplicate a cable ID set to edit it to make a new one.</p>
6	To use a different project or create a new project, tap <b>CHANGE PROJECT</b> .
7	<p>Use <b>TRANSFER</b> to:</p> <ul style="list-style-type: none"> <li>• Export or import projects to or from a USB drive and delete projects on the USB drive. The project data includes all project settings and test results.</li> <li>• Sync project setups and test results with LinkWare Live software.</li> </ul>
8	Use <b>MANAGE</b> to rename, copy, or delete a project saved in the Product.

## Set up a Fiber Test

Table 8 describes how to use the TEST SETUP screen to set up a fiber test. You may need to scroll on the screen to see all the options.

**Table 8. Fiber TEST SETUP Screen**



Item	Description
1	<b>Module:</b> Select the module to use.
2	<b>Test Type:</b> Use <b>Smart Remote</b> mode for tests on multi-fiber cabling.
3	<b>End 1/End 2:</b> Select the type of the connector, such as <b>MPO 12</b> or <b>MMC 24</b> , used on the endfaces of the DUT.  The Product saves this setting to record the type of connector you used. This setting does not change your test results.
4	<b>DUT:</b> Select <b>Pinned</b> or <b>Unpinned</b> based on the connector type of the DUT configuration.

Table 8. Fiber TEST SETUP Screen (cont.)

Item	Description
5	<p><b>Fiber Type:</b> Select a fiber type to use for a test. The screen shows the last 10 types of cables that were selected.</p> <p>To see a different group of fiber types, tap <b>MORE</b>, tap the name of a fiber group, then tap a fiber in the group.</p> <p>To make a custom fiber type, tap <b>Custom</b> in the <b>Fiber Groups</b> list.</p>
6	<p><b>Test Limit:</b> Select the correct test limit for the job. To see a different group of limits, tap <b>MORE</b>, then tap the name of a group.</p> <p>To make a custom limit, tap <b>Custom</b> in the <b>Limit Groups</b> list.</p>
7	<p><b>Reference Method:</b> Select the number of jumpers to use to set the reference. The dotted lines in the diagram on the screen show the parts of the link that are included in the test results.</p> <p>The number of jumpers you use effects the loss measurements:</p> <ul style="list-style-type: none"> <li>● <b>1 Jumper:</b> Loss measurements include the connections at both ends of the link. The figures in this manual show <b>1 Jumper</b> connections.</li> <li>● <b>3 Jumper:</b> Loss measurements exclude the loss of the first and last connector. The Product measures only the loss of the fiber.</li> </ul> <p>This setting does not change the loss measurements, but it can change the <b>PASS/FAIL</b> result for test limits that use a calculated loss limit. For all test limits, the tester saves this setting to show the reference method you used.</p> <p style="text-align: center;"><b>⚠ Caution</b></p> <p><b>Most cable manufacturers will give you a warranty on a fiber installation only if you use the 1 Jumper reference method when you certify the installation.</b></p> <p style="text-align: center;"><i>Note</i></p> <p style="text-align: center;"><i>Different standards use different names for the methods.</i></p>

**Table 8. Fiber TEST SETUP Screen (cont.)**

Item	Description
8	<p><b>Number of Connectors/Splices:</b> The <b>Total Connections</b> and <b>Splices</b> settings are applicable only if the selected test limit uses a calculated limit for loss.</p> <p><b>Total Connections:</b> Enter the total number of connections that are in each path of the link. Do not adjust the number for the <b>Reference Method</b> you use. For example, if the link has 3 connections, enter 3 regardless if you use the <b>1 Jumper</b> or <b>3 Jumper</b> reference method. When the Product calculates the loss limit, it automatically removes the losses of the connections you used to set the reference.</p> <p style="text-align: center;"><i>Note</i></p> <p style="text-align: center;"><i>The Product automatically adjusts the number of connections for the reference method you use.</i></p> <p><b>Splices:</b> Enter the number of splices in each path of the link.</p>
9	<p><b>Polarity:</b> Select the expected polarity of the cable system under test, such as <b>Type A</b> or <b>Type B</b>. Single or dual row connector styles have different polarity options.</p>
10	<p>Tap <b>SAVE</b> to save the test setup.</p>

## Use the CertiFiber Max Module Testing Tools Menu

Table 9 is a list of the options and functions that show in the TOOLS menu that are applicable to the CertiFiber Max module. To access this menu, on the HOME screen tap **TOOLS**.

**Table 9. CertiFiber Max Testing Tools Menu**

Option	Description
<b>Set Reference</b>	Use to open the Set Reference Wizard. Follow the instruction in the wizard. See also <a href="#">Set the Reference for Fiber Tests</a> .
<b>Power Meter/Light Source</b>	Use to measure the light at the <b>Power Meter</b> port.
<b>Main as Remote</b>	If you have two Mains, use to select one to use as a Remote.

**Table 9. CertiFiber Max Testing Tools Menu (cont.)**

Option	Description
<b>VFL</b>	The VFL transmits from the <b>Output</b> port. Select <b>CW</b> , <b>Pulse</b> , or <b>Off</b> .
<b>FiberInspector</b>	Start a fiber inspection test. Select a FiberInspector test to enable the analyze option.
<b>Test Counter</b>	<p>Use this option to keep track of the number of tests run on a TRC and/or the time elapsed between tests.</p> <p>With Test Counter enabled, tap <b>EDIT</b> to configure the TRC Test Count Limit and/or the Time Limit.</p> <p>When you connect a new TRC, push <b>Reset TRC Counter</b>.</p> <p>The Time Counter starts when you set the Reference and resets each time you do a test.</p> <p>The Product continues to make measurements even if the counters expire.</p>

## Inspect Ports, Adapters, and Cable Endfaces

**Table 10** lists the information needed to inspect the **Output** ports, the output adapters, and the endfaces of the transmit branch of the TRC

**Table 11** lists the information needed to inspect the **Input** port, the input adapters, and the endfaces of the receive branch of the TRC.

Connect the appropriate inspection tip to a video probe to do the inspections. The *FI-3000 Users Manual* shows how to do an inspection.

**Table 10. Output Port/Adapters and Transmit Branch Inspections**

Port Type	Port	Adapter Inside	Adapter Outside	Branch Endface
<b>MPO16 APC</b>				
Inspection Tip	AMPO 12-32 unkeyed	AMPO 12-32 unkeyed	AMPO 12-32 unkeyed	AMPO 12-32 unkeyed
End Type Setting	MPO16	MPO16	MPO16	MPO16
Coupler	NA	MPO12	NA	MPO16
Orientation	Normal	Normal	Normal	Normal

**Table 11. Input Port/Adapter and Receive Branch Inspections**

<b>Port Type</b>	<b>Port</b>	<b>Adapter Inside</b>	<b>Adapter Outside</b>	<b>Branch Endface</b>
<b>MPO12/16</b>				
Inspection Tip	AMPO 12-32 unkeyed	M12U UPC	AMPO 12-32 unkeyed	AMPO 12-32 unkeyed
End Type Setting	MPO16	MPO16	MPO12/16	MPO12/16
Coupler	NA	MPO12	NA	MPO12/16
Orientation	Reversed	Normal	Reversed	Normal
<b>MPO24</b>				
Inspection Tip	AMPO 12-32 unkeyed	M12U UPC	MPO UPC	AMPO 12-32 unkeyed
End Type Setting	MPO16	MPO16	MPO24	MPO24
Coupler	NA	MPO12	NA	MPO12
Orientation	Reversed	Normal	Normal	Normal
<b>MMC16</b>				
Inspection Tip	AMPO 12-32 unkeyed	MPO UPC	MMCE unkeyed	MMC ADP
End Type Setting	MPO16	MPO16	MMC16	MMC16
Coupler	NA	MPO12	NA	NA
Orientation	Reversed	Normal	Reversed	Normal
<b>MMC24</b>				
Inspection Tip	AMPO 12-32 unkeyed	MPO UPC	MMC UPC	MMC ADP
End Type Setting	MPO16	MPO16	MMC24	MMC24
Coupler	NA	MPO12	NA	NA
Orientation	Reversed	Normal	Normal	Normal

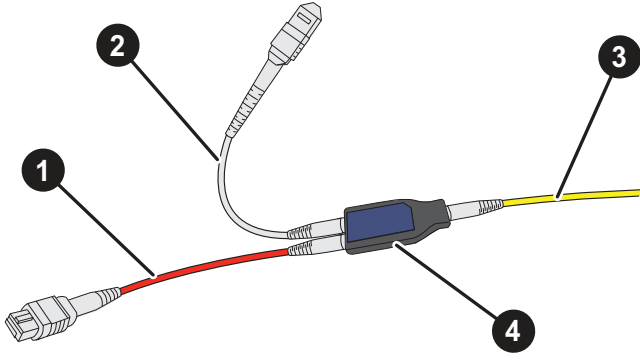
## Set the Reference for Fiber Tests

The reference procedure for fiber cable sets a baseline power level for loss measurements. If the power level that enters the fiber from the source changes, the reference and your loss measurements will be incorrect. The power level can change, for example, when the temperature at the job site increases or decreases or when you disconnect then reconnect a TRC from an **Output** port. So, it is important to set the reference frequently and to only use an approved TRC.

### Use a Test Reference Cord (TRC)

Use a low-loss TRC approved for use on Fluke tests. A Y-cable TRC is color-coded to help with identification. See [Table 12](#). MPO and MMC connectors use the same color codes. There are two different Y-cables: one for use with the Main and one for use with the Remote or for a second Main used as a Remote.

Table 12. A Y-Cable TRC



The diagram shows a Y-cable TRC with a central blue connector. A red cable (transmit branch) is connected to the left side, labeled with a circled '1'. A white cable (receive branch) is connected to the top side, labeled with a circled '2'. A yellow cable (output branch) is connected to the right side, labeled with a circled '3'. The central connector is labeled with a circled '4'.

Item	Description
1	The transmit branch is red and connects to the red output port on the module.
2	The receive branch connects to the input port on the module, and the color indicates the number of fibers on the DUT. <ul style="list-style-type: none"><li>• Black has 12 fibers.</li><li>• Gray has 16 fibers.</li><li>• White has 24 fibers.</li></ul>

**Table 12. A Y-Cable TRC (cont.)**

Item	Description
3	The DUT branch is yellow and connects to the DUT. This branch has 12 fibers, 16 fibers, or 24 fibers.
4	Cable body or bifurcation point: <ul style="list-style-type: none"><li data-bbox="331 457 1007 485">• Black indicates the cable attaches to the Main.</li><li data-bbox="331 506 1054 533">• Silver indicates the cable attaches to the Remote.</li></ul>

### Measure the Losses of a TRC

To measure the losses of each TRC you will use to do a test, use the **TRC VERIFICATION** wizard available for the **1 Jumper** and **3 Jumper** reference methods. The wizard saves the results of the TRC tests to show that each TRC is good. IDs for these results start with TRC, show the date and time of the test, and save automatically. Leave these results in your files with the other loss values to show that the TRC was in good condition and had continuity on all the fibers.

### Reduce Damage to a TRC

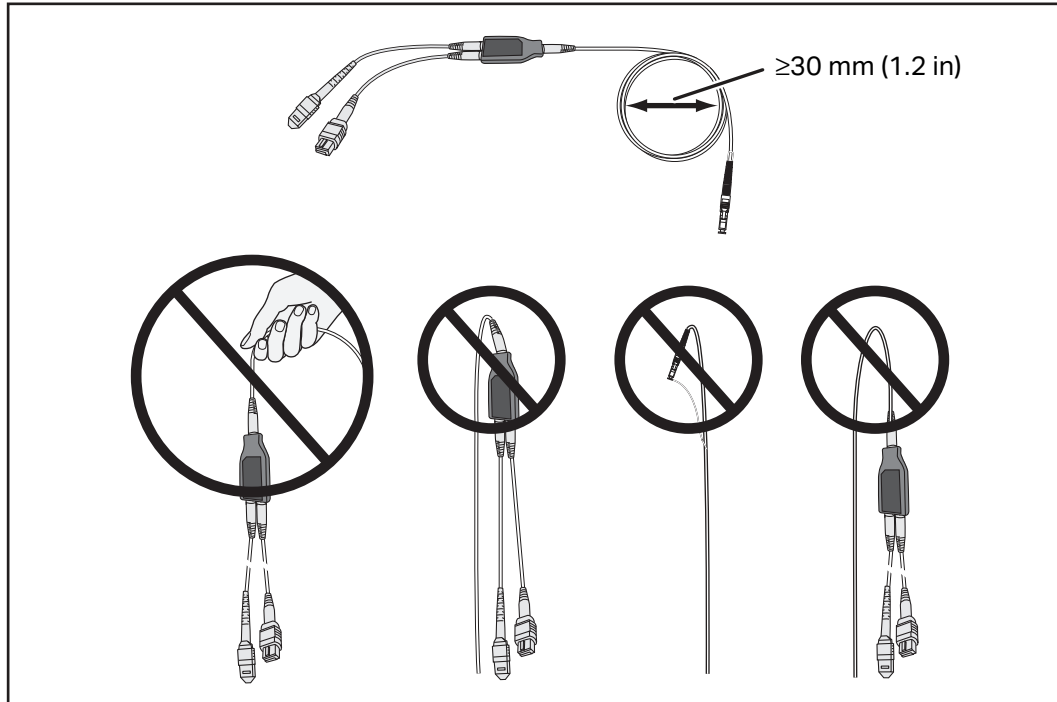
#### **Caution**

**To reduce the chance of damage to a TRC:**

- **Do not hold a TRC only by the fiber part of a branch.**
- **Make sure the bend diameter of the TRC is  $\geq 30$  mm (1.2 in).**

In [Figure 3](#), the top image shows the correct way to hold and store a TRC. The bottom images show incorrect ways to hold and store a TRC.

Figure 3. Reduce Damage to a TRC



## About APC Connectors

When you do tests on links with angled physical contact (APC) connectors, use APC connectors on the ends of a TRC that connects to the link. If you connect non-APC connectors to the link, the connectors will cause large reflections that make loss measurements inaccurate. For tests on links with APC connectors, use a TRC that also has APC connectors on the ends connected to the input ports of the module. This is necessary for the 1 jumper reference method. You can connect APC connectors to the **Input** port because the fiber does not touch the lens on the **Input** port.

### **⚠ Caution**

**Only connect pinned to unpinned connectors. If you connect two pinned connectors together, you can damage the pins or the endface of the connectors. If you connect two unpinned connectors, it will most likely cause an alignment issue with no connection or an unreliable connection.**

## How to Set a Reference

To set a reference on links with APC connectors (see [Figure 4](#)):

1. At the job site:
  - a. Connect a transmit branch of a TRC to the **Output** port of each Main and Remote you will use to do a test.
  - b. Turn on each Product you will use and let it sit for a minimum of 15 minutes before you set the reference. Let it sit longer if the temperature of a Product is more than or less than the ambient temperature.
2. Connect the DUT branch of the TRC to the **Input** port.
3. Use the Set Reference Wizard to set the reference.
4. Remove the DUT branch from the **Input** port and connect it to the DUT.
5. Connect the third branch (black/grey/white branch) to the **Input** port.

### **Caution**

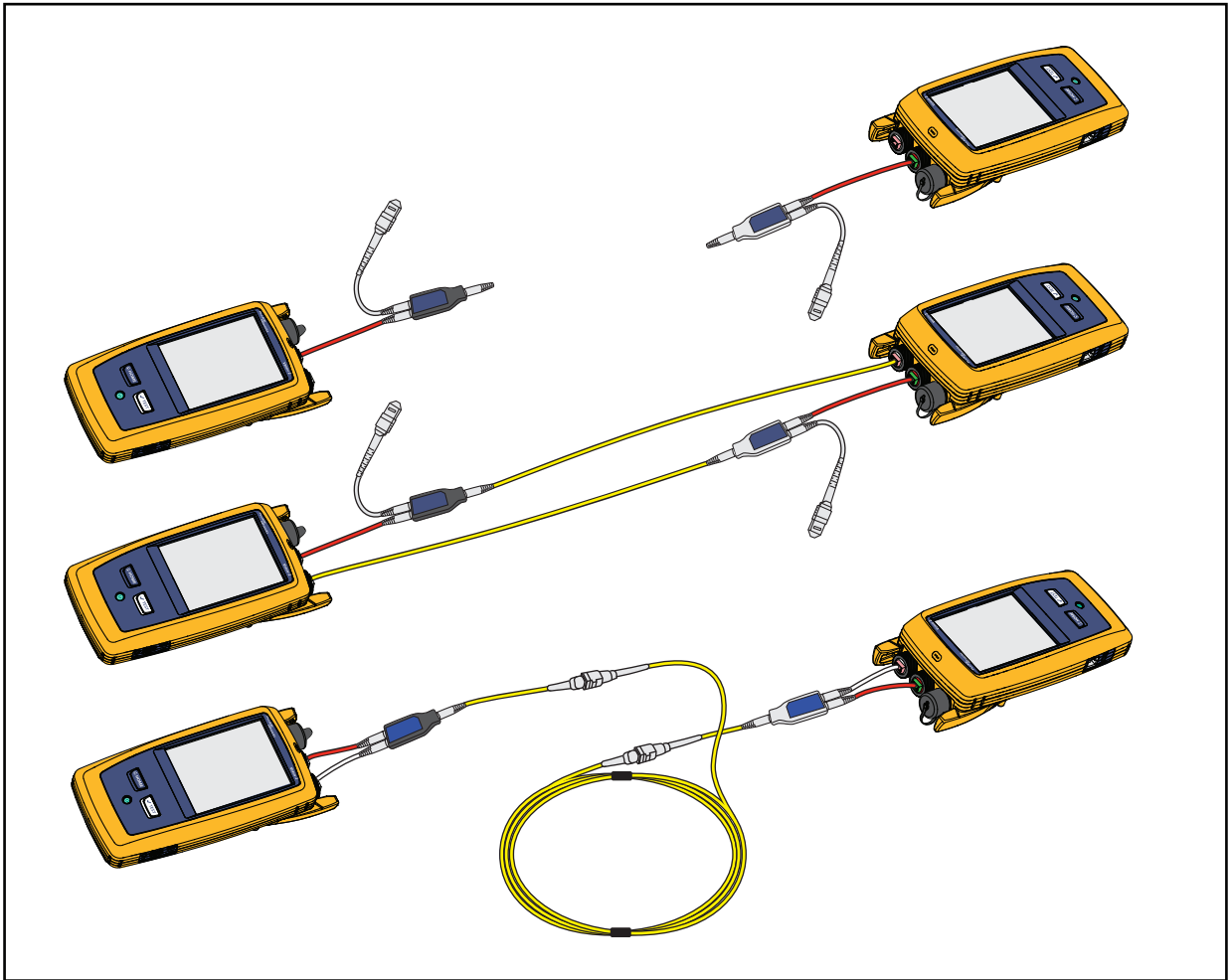
**After you set the reference, do not disconnect the TRC from the output port of the module. This can change the amount of optical power that enters the fiber and the reference might not be correct.**

6. To see the reference values:
  - After you set the reference, tap **View Reference** on the SET REFERENCE screen.
  - After you do an Autotest, tap the result window for a fiber, then tap **VIEW REFERENCE**.

For **Smart Remote** mode, the typical ranges for Singlemode fiber reference values are -11.0 dBm to -15.0 dBm.

If the reference value is outside of the applicable range, clean and inspect all connectors, then set the reference again. Do this even if the Product lets you use the value.

**Figure 4. Set Reference Configurations**



## When to Set a Reference

The Product requires you to set the reference when you:

- Change the test setup. See [Table 8](#). For example, when you change:
  - The **End 1** or **End 2** connector type of the DUT from **12 fibers** to **24 fibers**.
  - The **Reference Method** from **1 Jumper** to **3 Jumper**.
- Change the CertiFiber Max module in a Main or a Remote.
- Use a different Remote.

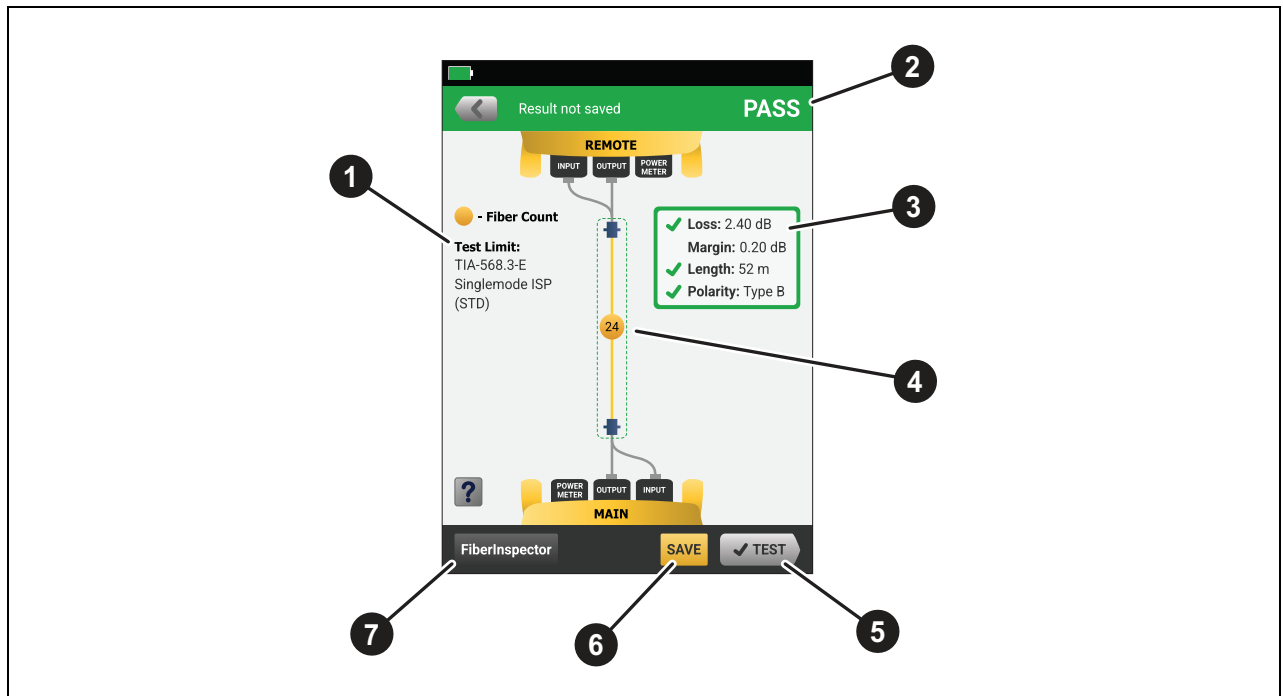
Additionally, set the reference:

- At the start of each day, at the job site, then at regular intervals during the day. For example, set the reference when you start tests on a different series of fibers.
- When you connect a TRC to the output port of the module or to another source, even if you connect the same TRC you connected previously.
- When a message shows on the display that says the reference is out of date.
- When a loss measurement is excessively negative. This occurs when there was a problem when you set the reference. For example, an endface was dirty or the Product was cold.

## Test Results Screens

Table 13 shows summary of the test results. Green indicates a PASS, Red indicates a FAIL  
Table 14 shows the details of the test results. Tap **SAVE** on the test result summary screen to save the results.

Table 13. Summary Test Results Screen



Item	Description
1	The test limit the Product used for the test.
2	The overall result for the test.

**Table 13. Summary Test Results Screen (cont.)**




Item	Description
<p>3</p>	<p>The test result summary section shows the worst loss, worst margin, length, and polarity.</p> <p> Indicates the sub-test passed.</p> <p> Indicates the sub-test failed.</p> <p> Indicates the sub-test is for information only.</p> <p>Tap to open the detailed test results screens. See <a href="#">Table 14</a>.</p>
<p>4</p>	<p>Visual information about the test setup. Dashed lines indicate the connectors and fiber that are included in the test. Connector icon shows the number of fibers used in the test setup.</p>
<p>5</p>	<p>Tap <b>TEST</b> to do a test.</p>
<p>6</p>	<p>Tap <b>SAVE</b> to save the test results.</p>
<p>7</p>	<p>Tap <b>FiberInspector</b> to open the endface inspection tool to use a video probe to inspect the endfaces. See the <i>FI-3000 Video Probe Users Manual</i>.</p>

Table 14. Detailed Test Results Screens



Item	Description
1	Tap on each tab to see detailed information about 1310 nm, 1550 nm, or Polarity and length data. (Singlemode)
2	<p>Shows the test details:</p> <ul style="list-style-type: none"> <li>● <b>Fiber:</b> The selected fiber number is highlighted in the table. The test direction shows as M (the Main end) and R (the Remote end) for example, M→R is from the Main to the Remote.</li> <li>● <b>Limit:</b> Shows the test limit.</li> <li>● <b>Margin:</b> Shows the difference between the limit and the loss.</li> <li>● <b>Loss:</b> Shows the loss value for that fiber.</li> <li>● A graphic of the fiber measurement.</li> </ul> <p>Tap on a new fiber to see detailed information about that fiber, or tap ◀ / ▶ to change the highlighted fiber.</p>

**Table 14. Detailed Test Results Screens (cont.)**

Item	Description
3	Tap to go to the Help screen
4	Tap to go to the VIEW REFERENCE screen
5	Tap to go to the configuration data for this test.
6	Tap to move the highlight to the fiber with the worst value.
7	<p>The polarity detail tab shows:</p> <ul style="list-style-type: none"> <li>● <b>Length:</b> Shows the measured length.</li> <li>● <b>Prop Delay:</b> Shows propagation delay.</li> <li>● <b>Limit:</b> Shows the test limits for length.</li> <li>● <b>Margin:</b> Shows the difference between the limit and the length.</li> <li>● <b>Polarity:</b> and <b>Expected:</b> Show the measured and expected polarity type, respectively.</li> <li>● A graphic of the measured polarity: Where M is the Main end, and R is the Remote end.</li> </ul>

## Maintenance

Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents. Dirt or moisture in the terminals can affect readings.

### Warning

**To prevent possible electrical shock, fire, or personal injury, have an approved technician repair the Product.**

## Product Disposal

Dispose of the Product in a professional and environmentally sound manner:

- Delete personal data on the Product before disposal.
- Remove batteries that are not integrated into the electrical system before disposal and dispose of batteries separately.
- If this Product has an integral battery, put the entire Product in the electrical waste.

## Battery

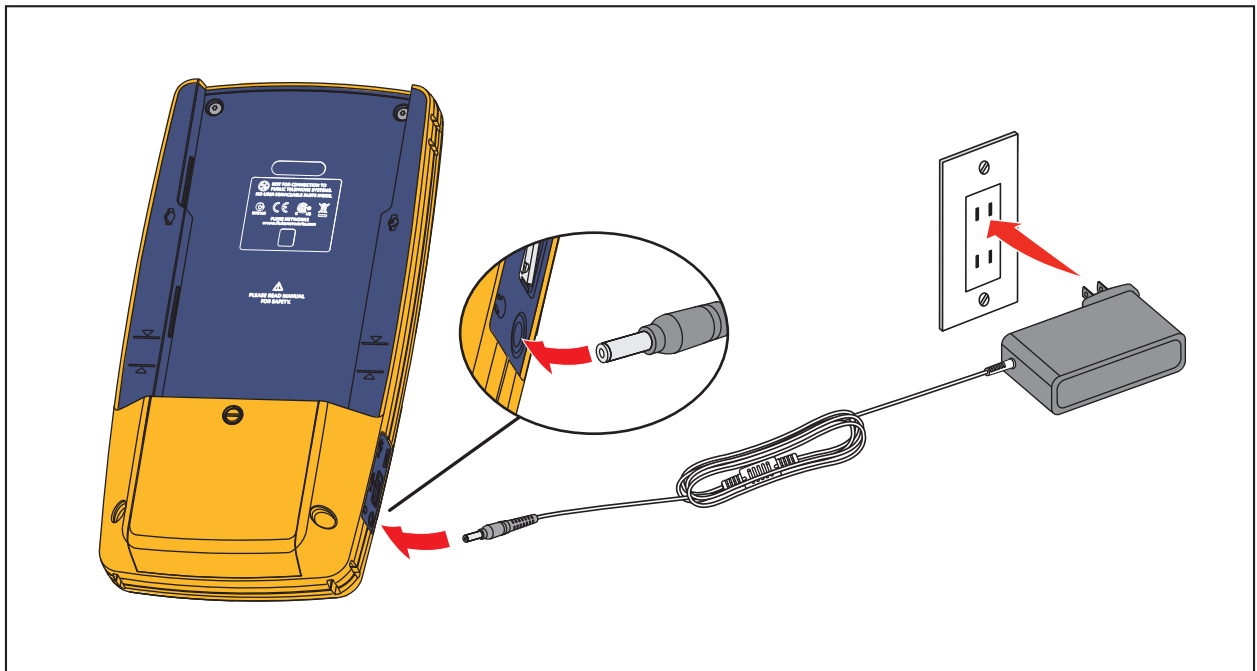
Before you use the battery for the first time, charge it for about 2 hours with the Product turned off. To charge the battery connect the ac adapter to the 15V jack on the left side of the tester. See [Table 5](#).

A fully-charged battery operates for about 8 hours of typical use. With the Product off, the battery takes about 4 hours to fully charge.

### Note

*You do not need to fully discharge the battery before you recharge it. The battery may not charge if its temperature is outside the temperature charging specification listed in the printed Safety Information that shipped with the Product. The LED is yellow if the battery will not charge.*

**Figure 5. Charge the Battery**



## Product Specifications

For complete product specifications go to our website.

