Settings for HDR OTDR Tests

Table 2 gives descriptions of the settings for Auto and Manual HDR OTDR tests.

The Manual settings in Table 2 apply to these tests:

- **Manual PON OTDR**
- **Manual OTDR**
- **SmartLoop OTDR (Manual)**

To set up an OTDR test

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

2 On the **CHANGE TEST** screen, tap an OTDR test to change, then tap **EDIT**.

Or to set up a new OTDR test, tap **NEW TEST**.

- If no module is installed, the **MODULE** screen shows. Tap the correct OptiFiber Pro module. Then on the **TEST TYPE** screen, tap a test.
- If the correct module does not show on the **TEST SETUP** screen, tap **Module**, then on the **MODULE** screen tap the correct OptiFiber Pro module.

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**.

Note

*For all **Test Types** except **FaultMap** and **FiberInspector**, you can use the **SETUP** button on the **TRACE** screen to change some OTDR settings manually after a test.*

Table 2. Settings for HDR OTDR Tests

Module	Select the OptiFiber Pro 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 PON OTDR**: The tester automatically selects settings that give you the best view of the events on PON links. The tester automatically uses the **DISCOVER** function to locate splitters and identify their ratios. This mode is the easiest to use and is the best choice for most applications. To see the settings the tester used for a test, tap **SETUP** on the trace screen, then tap **CURRENT**. *Note* *For links that have splitters with 1:64, 2:64, 1:128, or 2:128 ratios, use a **Manual PON OTDR** test.* **Manual PON ODTR**: This mode lets you select settings to control the test parameters for the trace. You can also enter the ratios of splitters that you know are on the link, or use the **DISCOVER** function to locate splitters and identify their ratios. If you do not enter splitter ratios, the tester identifies splitters as large loss events. Manual settings are described in this table. **Auto OTDR**: This is the same as the **Auto PON OTDR** test, except that the tester does not identify splitters. If the link has splitters, the tester identifies them as large loss events. *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 is the same as the **Manual PON OTDR** test, except that the tester does not identify splitters. If the link has splitters, the tester identifies them as large loss events. Manual settings are described in this table. **DataCenter OTDR**: This test is optimized for fiber installations that have short links, many connections, and the possibility of large reflections. The maximum range for this test is 5 km for singlemode. -continued-

Table 2. Settings for HDR OTDR Tests (continued)

Test Type (continued)	*Notes* *By default, the **DataCenter OTDR** test uses 1310 nm for singlemode fiber. This wavelength is typically used in data centers. You can select other wavelengths if necessary.* *If you use only one wavelength, the **Macrobend Detection** function will not identify bends.* *You must use launch compensation when you do a **DataCenter OTDR** test.* **FaultMap**: The FaultMap test can show connections that do not show on the OTDR EventMap and connections that are poor because they have high reflectance. **SmartLoop OTDR (Auto)** and **SmartLoop OTDR (Manual)**: The SmartLoop test lets you connect the far ends of the two fibers in a link so that one OTDR test gives you results for both fibers. The Auto and Manual settings operate the same as for the OTDR test. **FiberInspector**: The FiberInspector test lets you use an optional FI-7000 FiberInspector™ video probe to inspect the endfaces in fiber optic connectors.
Manual Settings, PON OTDR only: **Splitter Setup**	**Splitter Ratios**: Enter the ratios for up to three splitters. You can enter ratios of **1x2** to **1x128** and **2x2** to **2x128**. The tester uses the ratios to estimate how the loss and other effects of the splitter will affect the OTDR test results. If you do not enter ratios, the tester identifies splitters as large loss events. **DISCOVER**: When you tap **DISCOVER**, the tester looks for splitters on the fiber and uses their losses to identify their ratios.

Table 2. Settings for HDR OTDR Tests (continued)

Manual Settings: **Range**	The **Range** is the maximum distance shown on the trace. Select the range that is nearest to, but not less than, the distance to the event you want to examine. If the tester does not correctly identify the end event, select the next higher range, then do the OTDR test again. **Auto**: The tester selects a range that gives the best possible view of the events on the fiber. The range is not limited to the fixed ranges provided. For the manual SmartLoop OTDR test, the maximum range setting applies to the longest fiber in the pair, including the loopback and launch/tail fibers. The maximum setting is 60 km for singlemode.
Manual Settings: **Pulse Width**	Adjust the pulse width to a wider setting to see farther down the fiber or to a narrower setting for better resolution. Narrower pulses let you see more detail in and around reflective events and help you see events that are close together (hidden events). But narrower pulses reduce the range of the OTDR and make traces that have more background noise between events. When you use narrower pulses, small loss events can possibly be hidden in the noise on the trace. Wider pulses increase the backscatter level, which gives a better signal-to-noise ratio around non-reflective events. This helps you see smaller loss events and measure their loss more accurately, but increases the dead zones of events. Wider pulses can also hide small reflections. **Auto**: The tester selects the narrowest pulse that still lets you see loss events.

Table 2. Settings for HDR OTDR Tests (continued)

Manual Settings: **Averaging Time**	The averaging time is the time the tester uses to make measurements and calculate averages of the measurements. **Auto**: The tester adjusts the test settings to give a good view of events on the trace while it keeps the test time to a minimum. **Quick Test:** The tester adjusts the test settings to keep the test time to a minimum. This setting decreases accuracy, increases dead zones, and can give a trace that shows fewer details. Use this setting to do a test quickly when it is not necessary to see small details on the trace. A **Quick Test** can possibly take up to 3 minutes if the fiber length is near the maximum range for the tester for the selected pulse width. *Note* *The **Quick Test** may not give good results for links with splitters that have ratios greater than 1:4. The tester may need long test times to give good results on such links.* **Best Resolution**: The tester adjusts the test settings to keep dead zones to a minimum. This setting lets you see more events in and around reflective events. The test usually takes longer than a test with **Auto** or **Quick Test** selected. Tests with **Auto** or **Best Resolution** selected can take up to 3 minutes per wavelength for some fibers. **3, 5, 10, 20, 40, 60, 90, 120,** and **180 seconds per wavelength**: Longer times give these results: • The trace has less noise, which increases the dynamic range and increases the accuracy of measurements. • You can see small events, such as splices, more clearly on the trace. • The tester makes more measurements, so the test takes more time. Shorter times give these results: • The trace has more noise, which decreases the dynamic range. • The increased noise hides small events on the trace. • The tester makes fewer measurements, so the test takes less time.

Table 2. Settings for HDR OTDR Tests (continued)

Manual Settings: **End Threshold**	Lets you set the threshold (in decibels) for detection of the end of the fiber. An event that is above the threshold is shown as the end of the fiber. The range for this setting is 1 dB to 30 dB inclusive. *Note* *If the loss of a splitter is more than the **End Threshold**, the tester identifies the splitter as the end of the fiber.* To set the threshold to **Auto**, tap **Auto** on the **END THRESHOLD** screen. For the SmartLoop OTDR test, the **End Threshold** is for unconnected end of the tail fiber (not for each fiber).
Manual Settings: **Loss Threshold**	Lets you set the threshold (in decibels) for loss (non-reflective) events. Events at or above the threshold are included in the event table. The range for this setting is 0.01 dB to 1.50 dB inclusive. When you select smaller threshold values (0.01 dB to 0.3 dB), the tester makes a trace with less noise. To do this, the tester makes more measurements to be averaged or uses wider pulse widths. Thus, smaller values can possibly increase test times or dead zones. **Auto** sets the threshold to a value based on the selected test limit, usually 0.10 dB. To set the threshold to **Auto**, tap **Auto** on the **LOSS THRESHOLD** screen. *Notes* *When you set a loss threshold, you cannot be sure that the tester will find all events that are at or above the threshold. The characteristics of the fiber and the use of a manual **Averaging Time** or **Pulse Width** can possibly reduce the number of events the tester finds.* *If you set the loss threshold to less than 0.1 dB, the tester can possibly find many false events caused by imperfections in the fiber.*

Table 2. Settings for HDR OTDR Tests (continued)

Manual Settings: **Macrobend Setup**	Enter the threshold for the difference in an event's loss between the two wavelengths shown. To identify a loss event as a bend, the tester compares the event's loss at two wavelengths, such as 1310 nm and 1550 nm. If the loss is more at the longer wavelength and is more than the macrobend threshold, the tester identifies the event as a bend. The default threshold for the loss difference is 0.50 dB. If the tester does not show a bend, and you suspect that a bend is increasing the attenuation of a link, you can decrease the threshold to look for bends that have a larger radius. In some cases, the tester can falsely identify a bend when other events cause a larger loss at longer wavelengths. For example, a group of hidden events can cause a larger loss at longer wavelengths. In this case, you can increase the macrobend threshold to keep the bend event out of your results. To use the bend detection function, make sure that **Macrobend Detection** on the **TEST SETUP** screen is set to **On**.
Bi-directional	This setting shows only if you select **SmartLoop OTDR (Auto)** or **SmartLoop OTDR (Manual)** for the **Test Type**. **Off**: The tester does the SmartLoop test in only one direction. **On**: The tester does the SmartLoop test in both directions and automatically calculates bi-directional averages of loss. *Note* *The tester will not calculate bi-directional averages for test results that include splitters.*
Launch Compensation	Tap the control to turn the launch compensation function on or off. This setting does not show for the SmartLoop test because it is always enabled for that test.

Table 2. Settings for HDR OTDR Tests (continued)

Macrobend Detection	**On**: The tester identifies bends. For the **Auto OTDR** test, the threshold for the loss difference is 0.50 dB. To use a different threshold, set up a **Manual OTDR** test. See "Macrobend Setup" above in this table. This setting is **On** by default. *Note* *A bend always causes a **FAIL** result. If you want a **PASS** result for a link that has a bend, turn off **Macrobend Detection**.* **Off**: The tester does not identify bends. Bends show as loss events in the results.
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. The **FaultMap** and **FiberInspector** tests do not have this setting. **⚠ Caution** **To avoid disruption of service, use only 1625 nm when you do tests on live fibers.** *Note* *If you use only one wavelength, the **Macrobend Detection** function will not identify bends.*
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.
Fiber Type Settings	**IOR**: The tester uses the index of refraction to calculate the optical length of the fiber. Optical length usually differs slightly from the length of the fiber jackets in a link. This occurs because fibers are often curved inside their jackets and because there are small variations in the IOR of the fibers. Each fiber type includes a default value, which is the IOR specified for the fiber by the manufacturer. To use a different IOR, make a custom fiber type. -continued-

Table 2. Settings for HDR OTDR Tests (continued)

Fiber Type Settings (continued)	*Note* *If you use a length-based test limit, the* **IOR** *value has an effect on the loss limit that the tester calculates.* **Backscatter**: Backscatter is the backscatter coefficient. This is a measurement of the quantity of light that the fiber reflects back to the OTDR when the OTDR uses a 1 ns pulse. 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 a default value, which is the backscatter coefficient specified for the fiber by the manufacturer. To use a different backscatter value, make a custom fiber type.
Test Limit	Select the correct test limit for the job. Generic limits, such as **General PON** and **Document PON**, 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.
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.