

How to Use the CertiFiber® Pro to Test Installed Corning Multimode Pretium EDGE® Tap Modules

Overview

The Corning Pretium EDGE® Tap Module allows passive tapping into optical networks for monitoring purposes. The modules contain splitters that divide each optical signal into two outputs, one for network link traffic and one for monitoring. To ensure that the installed module operates correctly and to meet the requirements for Corning warranty coverage, you must measure the loss of the network links with the module installed. Optionally, you can also measure the loss of the tap links from the module to ensure that the links to your monitoring equipment operate correctly.

Note these important points regarding measuring loss through an EDGE Tap Module:

- Because the splitters in the tap module have low loss in one direction and high loss in the other direction, you measure loss through the module in one direction only (no bi-directional tests).
- The splitters in the multimode tap modules are optimized for 850 nm VCSEL (Vertical-Cavity Surface-Emitting Lasers), so you test at only 850 nm.
- The network links through the LIVE port on the tap module to the EDGE module at the far end are duplex, so you test them with the CertiFiber Pro in Smart Remote mode. The links through the TAP port are all outputs, so you test them with the CertiFiber Pro in Far End Source mode.

Required Equipment

- Versiv main and remote units
- Two CertiFiber Pro Multimode or Quad Optical Loss Test Set (OLTS) modules
- Two LC/LC 50 µm multimode test reference cords
- Two encircled flux test reference cords (EF-TRCs) for 50 µm/ 125 µm fiber, SC/LC connectors
- One duplex LC/LC adapter or two simplex LC/LC adapters
- One MTP/LC 12-fiber fan-out cable with Corning Universal polarity
- Fiber inspection microscope (such as the FiberInspector video probe) with LC adapter
- Fiber cleaning supplies for LC and MTP connectors

Calculating the Loss Budgets

The custom limit feature in the CertiFiber Pro tester can calculate length-based loss budgets for links with splices and one type of MTP/MPO module. Because

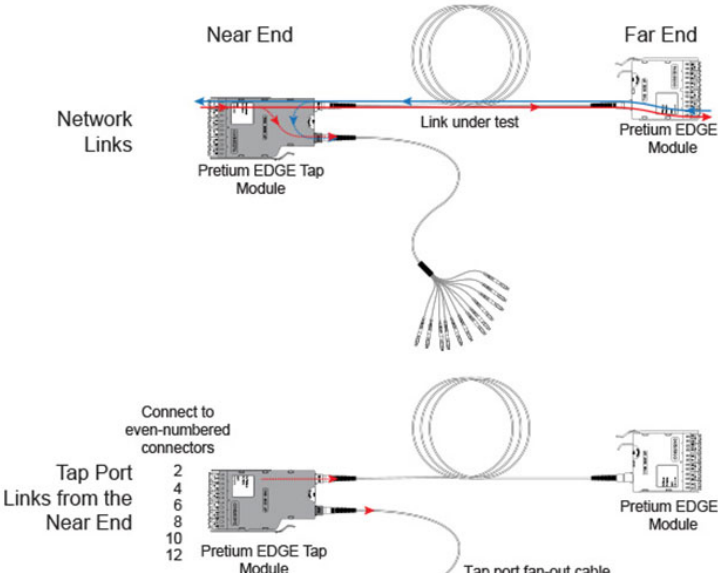
the EDGE Tap modules and EDGE modules have different losses, you must calculate loss budgets manually for links that have both types of modules. You calculate loss budgets for each of the three paths you will test in the EDGE system. Then you make a custom test limit with a fixed loss budget set to your loss budget values.

You calculate loss budgets for these three paths of each link, which are shown in Figure 1:

- The network link. Note that if the network links are different lengths, you will need to calculate a budget for each link.
- The tap port link from the near end (optional).
- The tap port link from the far end (optional). Note that if the network links are different lengths, you will need to calculate a budget for each link.

Table 1 shows the values to use for your loss budget calculations.

Table with 4 columns: Test Path, Prop Delay (ns), Delay Skew (ns), and Length* (ft). Rows include test results for paths 1,2; 3,6; 4,5; 7,8 and a LIMIT row. All tests passed.



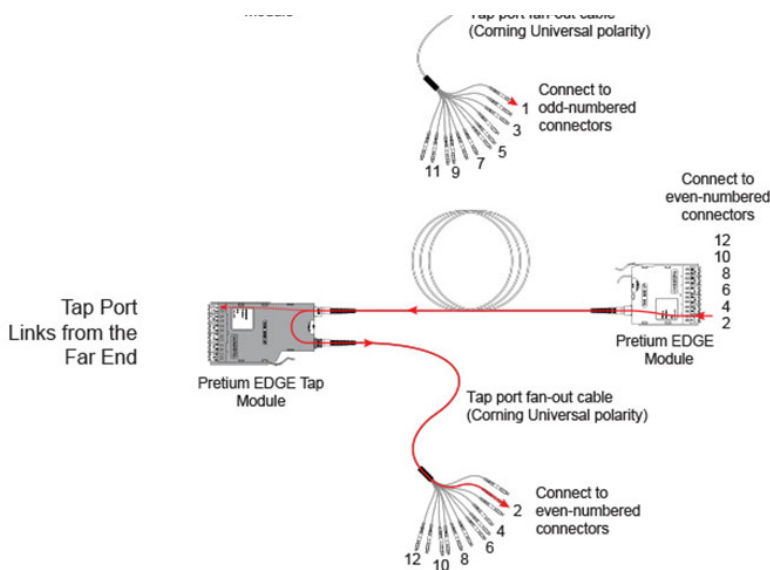


Figure 1. Three Paths for Loss Budget Calculations

Figure 2 shows an example of a loss budget calculation for a test from the far end through the tap port and through a fan-out cable. Note that the loss of the LC connection at the end of the fan-out cable is not included in this example.

The calculation includes the loss of a 600 m trunk fiber and a 10 m tap port fan-out cable:

- Loss for 600 m of OM4 EDGE trunk fiber for a network link: $2.8 \text{ dB/km} \times .6 \text{ km} = 1.68 \text{ dB}$
- Loss for 10 m of OM4 EDGE trunk fiber for a tap port harness: $2.8 \text{ dB/km} \times .01 \text{ km} = 0.028 \text{ dB}$

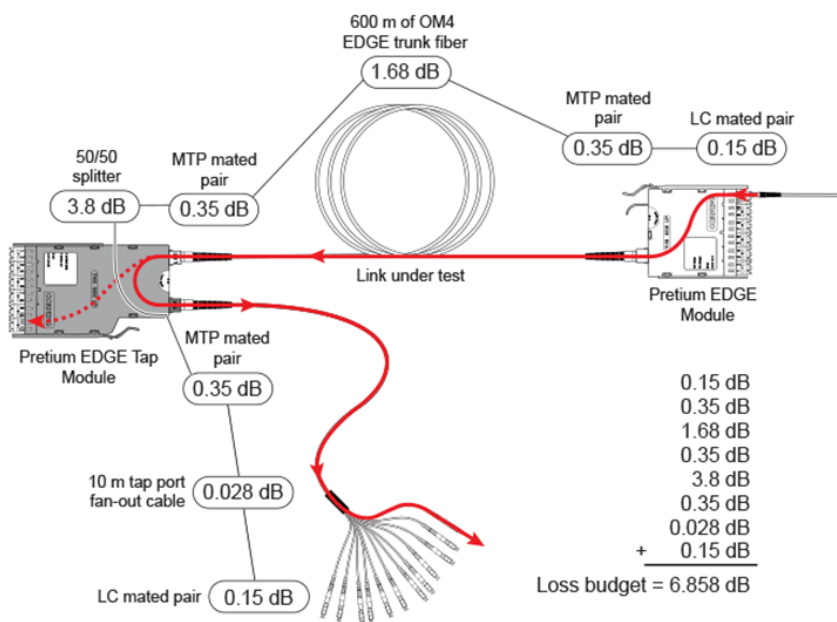


Figure 2. Example of a Loss Budget Calculation for Testing Network Links

For more examples of loss budget calculations, see the Corning Standard Recommended Procedure (SRP) document number 003-126 on the Corning web site.

Setting Up a Custom Test Limit

Next, make a custom test limit that will include your loss budget values and do tests only at 850 nm. The first loss budget value you enter will be for the first network link you will test.

- On the home screen, tap the test setup panel.
- On the CHANGE TEST screen, tap a CertiFiber Pro test, then tap EDIT.
- On the TEST SETUP screen, tap Test Limit, tap MORE, tap Custom, then tap MANAGE.
- On the MANAGE CUSTOM screen, tap the Create panel.
- On the NEW CUSTOM LIMIT screen, tap Enter New Limit Name, use the keyboard to enter a name, then tap DONE.
- On the NEW CUSTOM LIMIT screen, enter these settings:
 - Max length: Enter a value that is longer than the longest trunk in the fiber network.
 - Loss Budget: Select Fixed.
 - Wavelength specific settings: For Overall Loss @ 850 (dB), enter the calculated budget for the first network link you will test. Note that if the network links are different lengths, you will need to change this value accordingly before you test each link.
 - Leave the Overall Loss for all other wavelengths as N/A.
- Tap SAVE.
- On the TEST LIMIT screen, tap twice to go back to the TEST SETUP screen.
- Tap TEST LIMIT, tap MORE, tap Custom, then tap the custom limit you made.
- On the TEST SETUP screen, enter these settings:
 - Test Type: Smart Remote
 - Bi-Directional: Off
 - Fiber Type: Select a fiber type that is correct for the type you will test.
 - Reference Method: 1 Jumper. This is the number of jumpers you will use in each fiber path when you set the reference.
 - Connector Type: Select MPO Module. The tester saves this setting to record the type of connector you used. This setting does not change your test results or any of the diagrams that the tester shows.
 - No. of MPO Modules/Splices: The Total MPO Modules and Splices settings do not apply because you are using a fixed loss budget. Jumper Reference is 1.

- On the TEST SETUP screen, tap SAVE.

Testing the Network Links

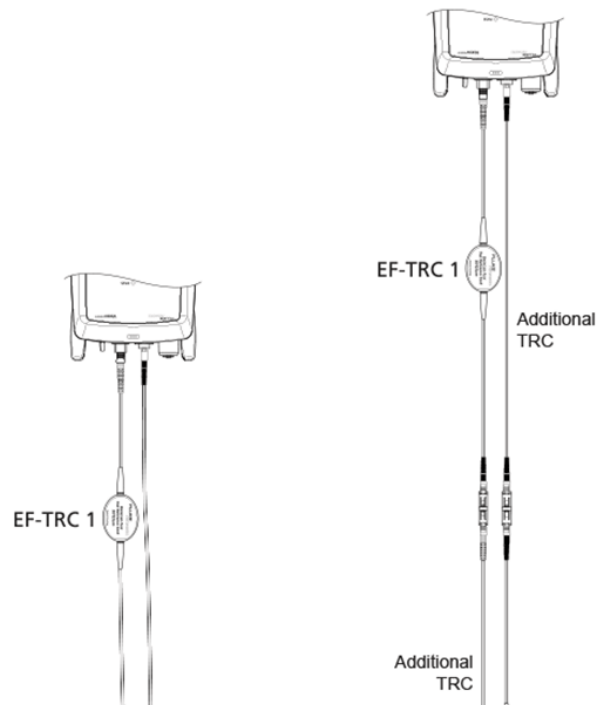
The network links are duplex connections, so you use Smart Remote mode to test both fibers in each link.

Set the Reference for Smart Remote Mode

Note

To only set the reference, and not measure the loss of your test reference cords, tap SKIP WIZARD on the SET REFERENCE screen.

- Turn on the tester and remote and let them sit for a minimum of 5 minutes. Let them sit longer if they are above or below ambient temperature.
- Clean and inspect the connectors on the tester, remote, and test reference cords.
- On the home screen tap SET REF.
- On the SET REFERENCE screen, tap RUN WIZARD.
- Make the connections to set the reference, as shown on the screen and in Figure 3, then tap NEXT to see the completed connections.
- To enter the length of the test reference cords you will add to connect to the link, tap TRC LENGTH on the SET REFERENCE screen. The length you enter does not change the test results. The tester saves the length with the results to meet TIA reporting requirements.
- Tap SET REFERENCE. If you did not use the connection wizard, go to “Test the Network Links in Smart Remote Mode” on page 8.



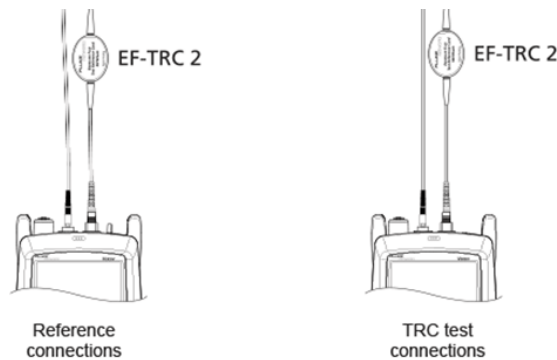


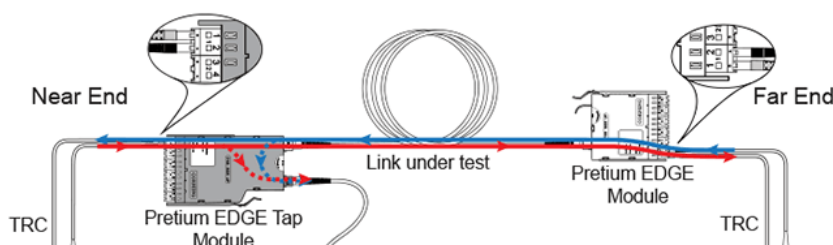
Figure 3. Reference and TRC Test Connections for Smart Remote Mode

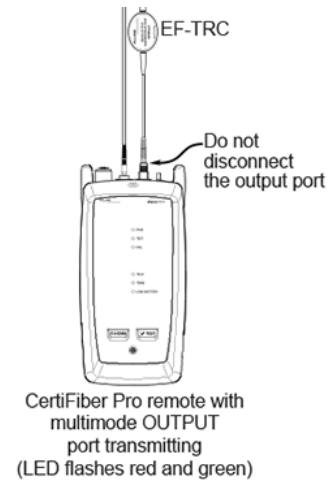
Next, if you used the connection wizard, verify that the test reference cord (TRC) you will add is good:

- On the SET PREFERENCE screen, when the reference procedure is completed, tap NEXT.
- Disconnect the test reference cord from the INPUT port on the tester, then use a test reference cord and adapter to make the connections to verify the TRCs, as shown on the screen and in Figure 6.
- Tap TRC VERIFICATION. The tester measures and saves the loss of the test reference cord you added. The ID for this results start with "TRC", show the date and time of the test, and have an for the test result. The tester shows a warning if the loss of a TRC is more than 0.15 dB. If the tester shows a warning, clean and inspect the connectors on the TRC, then set the reference and do the TRC verification again.

Test the Network Links in Smart Remote Mod

- Clean and inspect the LC connectors on the EDGE Tap and EDGE modules.
- Connect the TRCs to the near and far ends of the links, as shown in Figure 4.
- Press B.
- If the test passes, save the results. If it fails, clean and inspect the connections again, or troubleshoot as necessary, then test again.
- If the network links are different lengths, change the value for the Overall Loss @ 850 (dB) in your custom limit to the applicable loss budget value for the next link. (TEST SETUP screen > Edit > Test Limit > MORE > Custom > MANAGE > Edit.)
- Repeat steps 2-5 for all the links.





Testing the Tap Port Links

It's not necessary to test the tap port links to meet Corning's requirements for warranty coverage, but you may want to do so to make sure your tap port links are good.

Note that this article shows the TAP port connected to a Corning Universal polarity fan-out cable. You can also connect the TAP port to another Pretium EDGE module. In that case, you would add another MTP and LC mated pair loss to your loss budget, and you would connect the CertiFiber Pro tester to the LC ports in the module.

About Fluke Networks

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Descriptions, information, and viability of the information contained in this document are subject to change without notice.

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