

Quick Card

T-BERD®/MTS-5800 Modular Test Set

Measuring Optical Insertion Loss with a 4100-series OTDR Module

This procedure describes how to use a 4100-series OTDR module as an Optical Power Meter (OPM) and measure optical insertion loss (OIL). If optioned, the OTDR module can operate as an OPM or Optical Light Source (OLS), but not at the same time. Light Source is a standard feature on most new OTDR modules, while Power Meter is an option.

Equipment Requirements:

- T-BERD/MTS-5800 equipped with the following:
 - Fiber Optics Software Release V21.0 or greater
 - E4100 Series OTDR Module
 - E41OTDRPM Power Meter option
- Fiber optic cleaning and inspection tools
- Reference Cable (patch cord) with connectors matching the OTDR port and Fiber Under Test
- Optical Coupler to connect Reference Cable to Fiber Under Test



Figure 1: Equipment Requirements

The following information is required to complete the test:

- Type of Fiber (Multimode or Single Mode)
- Type of Connectors (SC UPC, SC APC, LC UPC, etc.)
- Wavelength(s) to be tested (850nm, 1300nm, 1310nm, 1550nm, etc.)

Fiber Inspection Guidelines:

- Use the VIAVI P5000i or FiberChek Probe microscope to inspect both sides of every connection being used (OTDR Port, Reference Cable, bulkhead connectors, patch cords, etc.)
- Focus the fiber on the screen. If dirty, clean the end-face.
- If it appears clean, run inspection test.
- If it fails, clean the fiber and re-run inspection test. Repeat until it passes.

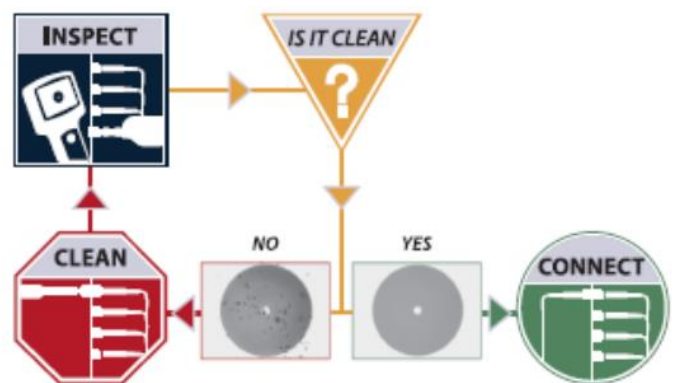
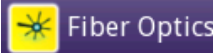


Figure 2: Inspect Before You Connect (IBYC)

Launch the Power Meter:

1. Press the Power button  to turn on the T-BERD/MTS-5800.
2. Tap the **Fiber Optics** icon  in the Status Bar at the top of the T-BERD/MTS-5800.
3. Tap the purple > on the left screen side  to display the Fiber Optics Home screen.

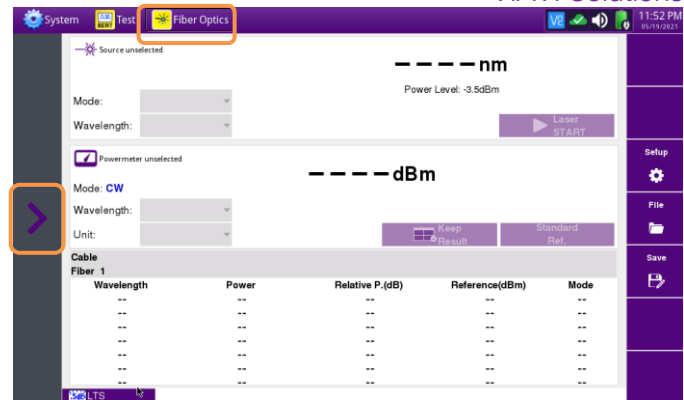


Figure 3: Fiber Optics Screen

4. Tap the **POWERMETER** icon until it is yellow and highlighted:

-  for Single Mode fiber
-  for Multimode fiber

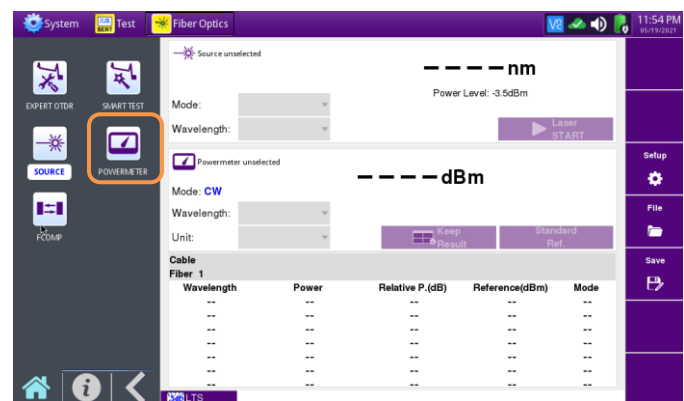


Figure 4: Fiber Optics Home screen

Reference the Power Meter and Light Source:

1. Inspect the OTDR port on top of the test set.
2. Inspect the fiber end face of the Reference Cable.
3. Connect the Reference Cable to the OTDR port.
4. Inspect the other fiber end face of the Reference Cable.
5. Inspect the fiber end face of the Reference Cable of the OLS.
6. Connect the Reference Cable to the reference cable of the OLS via a coupler.



Figure 5: OTDR Port Inspection

Note: "Two-Cable References", as pictured, are commonly used for Telecom applications. "One-Cable" or "Three-Cable" referenced are used in Enterprise and FTTA applications for increased accuracy on short spans.

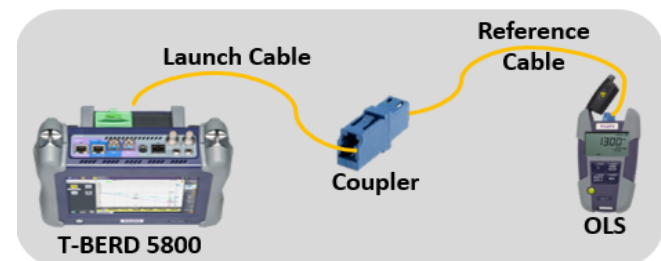


Figure 6: Connecting OTDR to OLS for Reference

7. Tap the **Unit** drop down and select **dB**.
8. Tap the **Wavelength** drop down in the **Powermeter on Module** section and select the wavelength to reference.
9. Confirm that the OLS laser is on and sourcing the selected wavelength.
10. Tap the **Standard Ref.** button to reference the Power Meter to the OLS. The signal level will change to **00.00 dB**.
11. Repeat steps 8 through 10 for all wavelengths to be tested.
12. Disconnect the reference cables from the coupler. Do not disconnect the reference cable from the OTDR port or power off the T-BERD/MTS until all OIL testing is complete. If the T-BERD/MTS is powered off or the Fiber is disconnected from the OTDR, you should reference the Power Meter and OLS again.

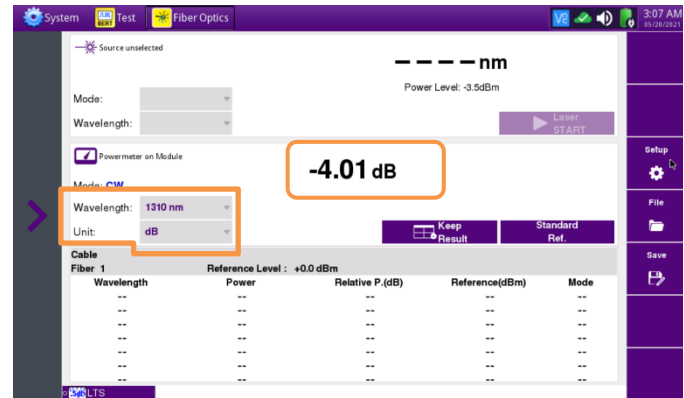


Figure 7: Source and Power Meter screen

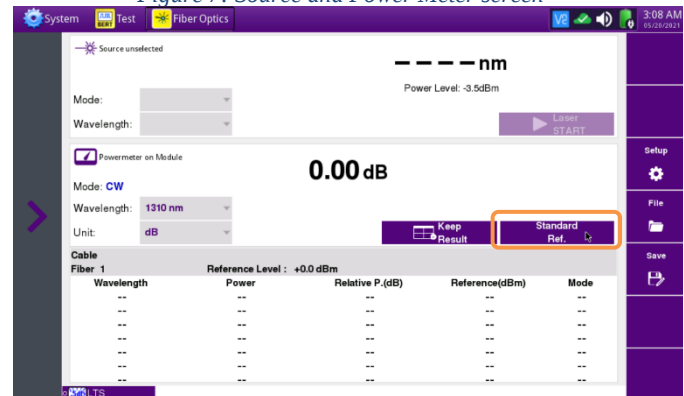


Figure 8: Reference

Connect to Fiber Under Test (FUT):

The Reference Cable may be connected to the FUT via an optical patch panel (OPP) or an optical coupler:

1. If the interface to the FUT is a patch cord, connect the patch cord to an optical coupler with the same connector type.
2. Inspect the FUT connected to the coupler or OPP.
3. Inspect the other fiber end face of the Reference Cable.
4. Connect the Reference Cable to the coupler or OPP.

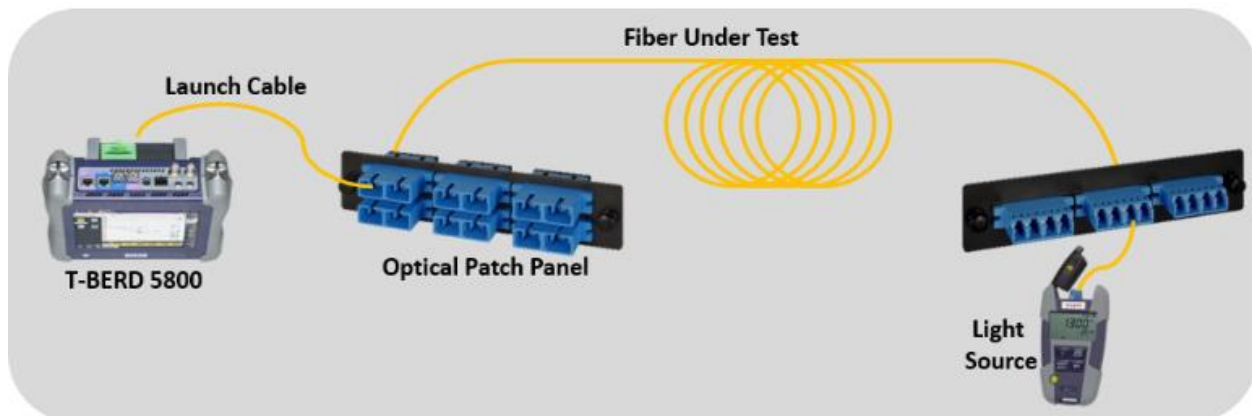


Figure 9: Connecting Reference Cable to OPP

Measure Insertion Loss:

1. Tap the **Wavelength** drop down in the **Powermeter on Module** section and select the wavelength to test.
2. Confirm that the OLS laser is on and is sourcing the selected wavelength.
3. View the Relative Power Level (dB) in the **Powermeter on Module** results display in the center screen.
4. Tap the **Keep Result** button to add the measurement to the Results table.
5. Repeat steps 1 through 4 for all wavelengths to be tested.
6. Disconnect the reference cable from the FUT. Do not disconnect the reference cable from the OTDR port or power off the T-BERD/MTS until all OIL testing is complete. If the T-BERD/MTS is powered off or the Fiber is disconnected from the OTDR, you should reference the Power Meter and OLS again.

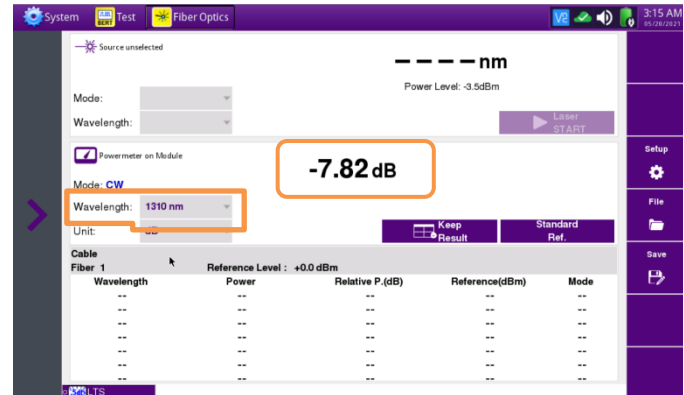


Figure 10: Optical Insertion Loss results

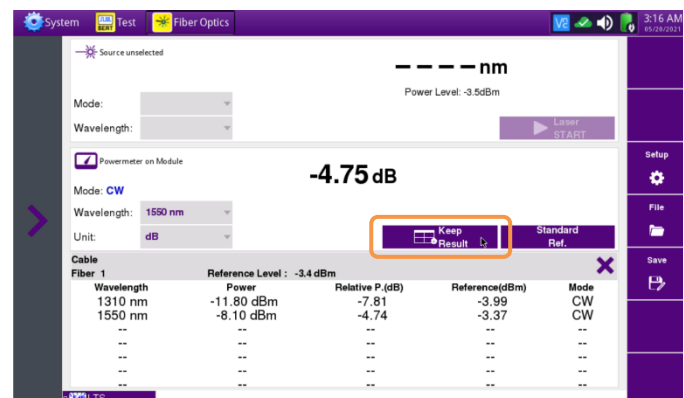


Figure 11: Results Table

Setup Report:

1. Tap the **Setup** soft key.
2. Tap **Link** to view Link Settings.
3. Configure **Link settings** to match FUT.
 - a. Tap the setting to edit.
 - b. Tap to clear existing text.
 - c. Enter new value on the keypad.
 - d. Tap to return.

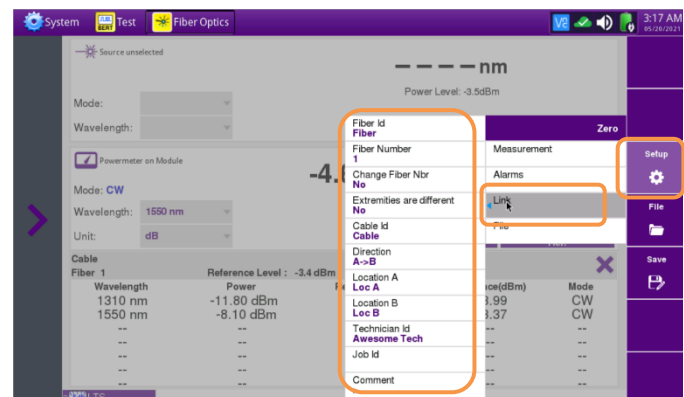


Figure 12: Link Settings

4. Tap **File** to view file settings.
5. Set **pdf file** to **Yes** in **Report As** settings.

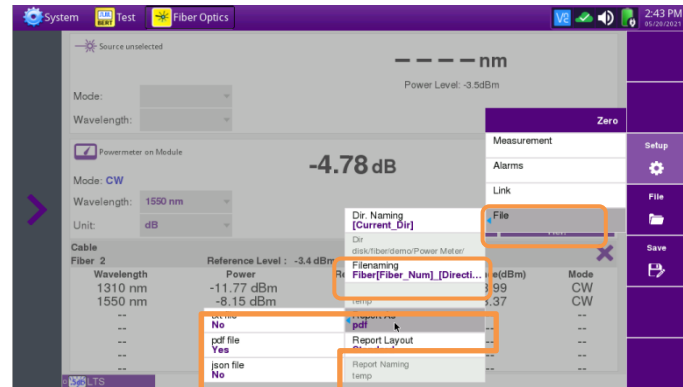


Figure 13: Report As settings

6. Set desired **Filename** format in **File** settings.
 - a. Tap the setting to edit.
 - b. Tap  to clear existing text.
 - c. Enter new value on the keypad.
 - d. Use **[auto]/abc** button to toggle between text and automatic insertion of configured **Link** settings.
 - e. Tap  to return to the Results view.

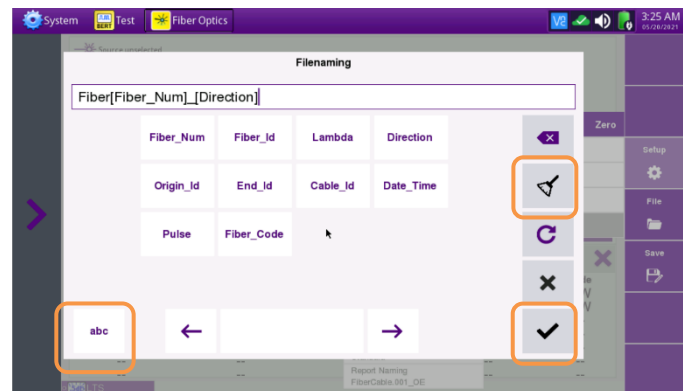


Figure 14: Filenaming setting

Save Report:

1. Tap the **File** soft key to view the File Explorer.
2. Browse to or **Create Directory** for report storage.
3. Tap **Exit** to return to the Results view.

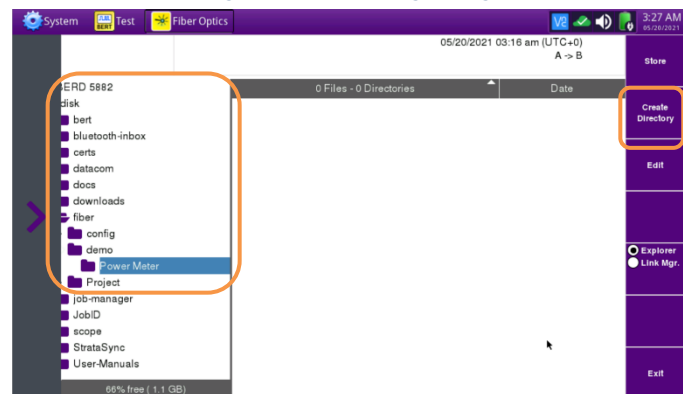


Figure 15: File Explorer

4. Tap the **Save** soft key and tap  to save the report.
5. Tap the **X** in the top right corner of the Results table to clear results before testing next fiber.

Cable					
Fiber 1					
Reference Level : -3.4 dBm					
Wavelength	Power	Relative P.(dB)	Reference(dBm)	Mode	
1310 nm	-11.77 dBm	-7.78	-3.99	CW	
1550 nm	-8.15 dBm	-4.78	-3.37	CW	

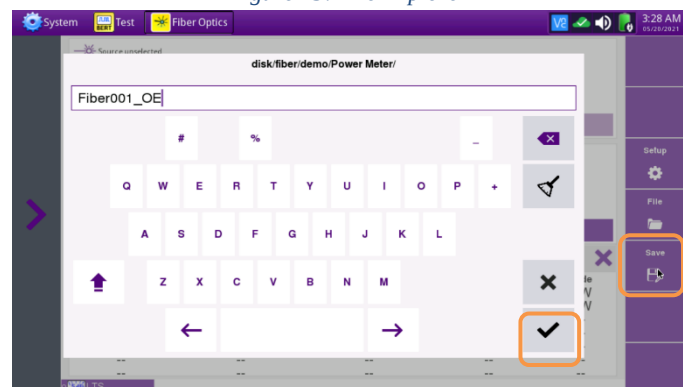


Figure 16: Save report