T-BERD®/MTS-5800 Modular Test Set
FTTA OTDR, Cell Tower Maintenance

With the VIAVI Fiber to the Antenna (FTTA) OTDR test, you can troubleshoot cabling component problems such as fiber breaks or high loss and reflective defects (dirty connectors, fiber mismatches, misalignment, macro-bends/kinks, etc.) This quick card describes how to connect to a fiber under test, configure Fiber to the Antenna (FTTA) OTDR test setups, run tests, and analyze results with a VIAVI T-BERD/MTS-5800 equipped with a 4100-series OTDR module.

Equipment Requirements:
- T-BERD/MTS-5800 equipped with the following:
  - E4100 Series OTDR Module
  - Fiber Optics Software Release V21.0 or greater
  - Software option for FTTA SmartLink Mapper (OTDR FTTA_SM)
- Fiber optic cleaning and inspection tools
- 20-meter Fiber optic patch cord (Launch Cable) with connectors that match the OTDR Port and Fiber under Test (SC UPC, SC APC, LC UPC, etc.)
- Optical Coupler to connect Launch Cable to BBU Jumper Cable or Trunk Cable

Figure 1: Equipment Requirements

The following information is required to complete the procedure:
- Tower architecture:
  - Is there a BBU jumper cable?
  - Is there an RRU jumper cable?
- RRU and BBU/Base Station IDs
- Fiber Code (1-Rx, 1-Tx, …, 24-Tx)

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.
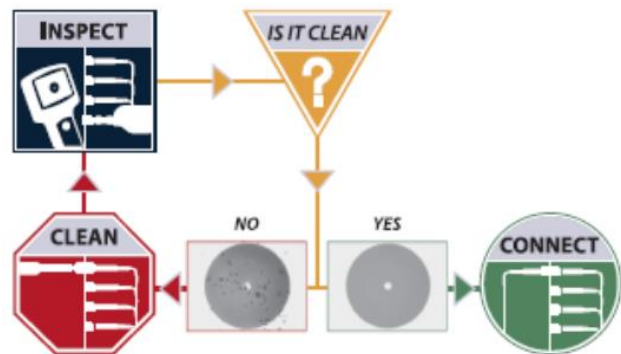- If it fails, clean the fiber and re-run inspection test. Repeat until it passes.

Figure 2: Inspect Before You Connect (IBYC)

Connect Launch Cable to OTDR port:
1. Inspect the OTDR port on top of the test set.
2. Inspect the fiber end face of Launch Cable.
3. Connect Launch Cable to the OTDR port.

Figure 3: OTDR Port Inspection

Connect to Fiber Under Test (FUT):
The OTDR may be connected to the FUT via an Optical Patch Panel (OPP) or an optical coupler:
1. If the interface to the FUT is the BBU Jumper or Trunk Cable, connect the Jumper Cable to an optical coupler with the same connector type.
2. Inspect the FUT connected to the coupler or OPP.
3. Inspect the fiber end face of the Launch Cable.
4. Connect the Launch Cable to the coupler or OPP leading to the RRU.
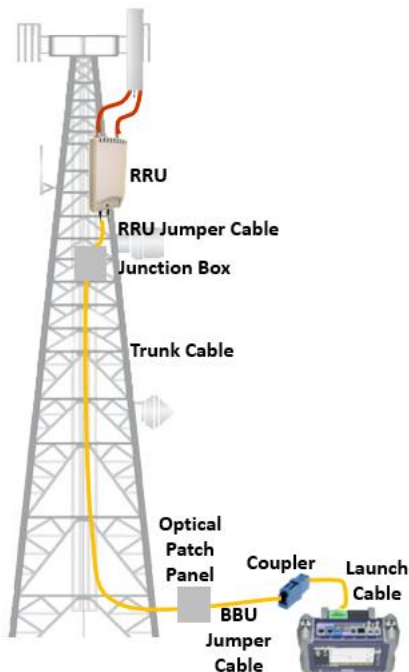
Figure 4: Tower Architecture with BBU Jumper
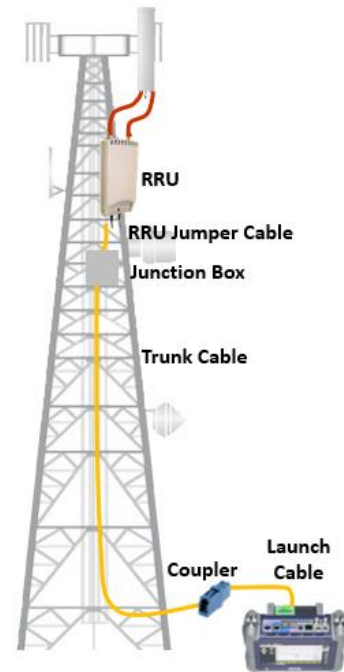
Figure 5: Tower Architecture, no BBU Jumper

Launch FTTA OTDR:
1. Press the Power button ![power] to start the T-BERD/MTS test instrument.
2. Tap the **Fiber Optics** icon ![Fiber Optics] in the Status Bar at the top of the screen.
3. Tap the purple **>** on the left screen side ![>] to display the Fiber Optics Home screen.
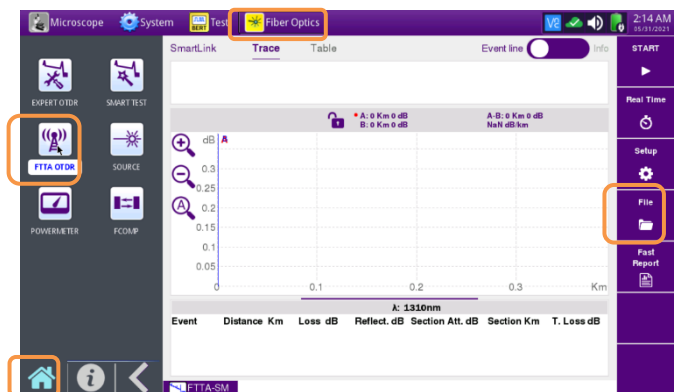4. Tap the **FTTA OTDR** icon ![FTTA OTDR].

Figure 6: Fiber Optics Home screen

Configure Test:

1. Tap the **FILE** soft key and browse to the **fiber/config/FTTA** folder.
2. Select the **FTTA_RRU_Maintenance.SM-OTDR** file and tap the **Load** soft key .
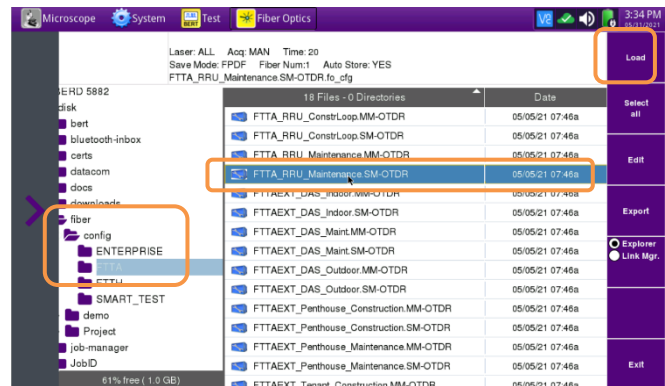3. Tap the **Load as FTTA Config** soft key .

Figure 7: File Explorer

4. Tap **Acquisition:**
   - Set **Laser** to **1310/1550 nm** to enable bend detection.
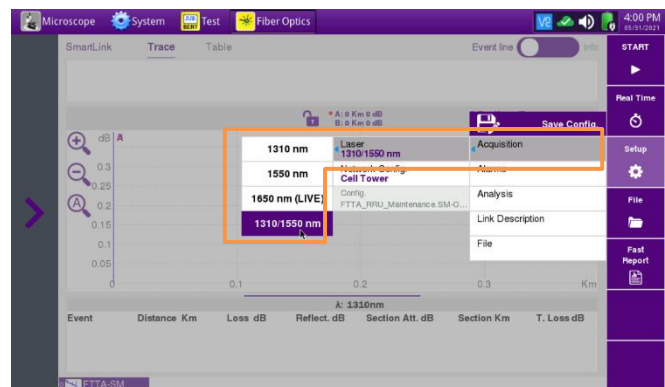

Figure 8: Acquisition Setup

5. Tap **Analysis**:
   - Set **BBU Jumper** to **Yes** if there is a BBU Jumper Cable between the Launch Cable and OPP.
   - Set **BBU Jumper** to **No** if the Launch Cable is directly connected to the OPP.
   - Set RRU **Jumper** to **Yes** if there is a Junction Box/OPP at the top of the tower between the Trunk Cable and RRU.
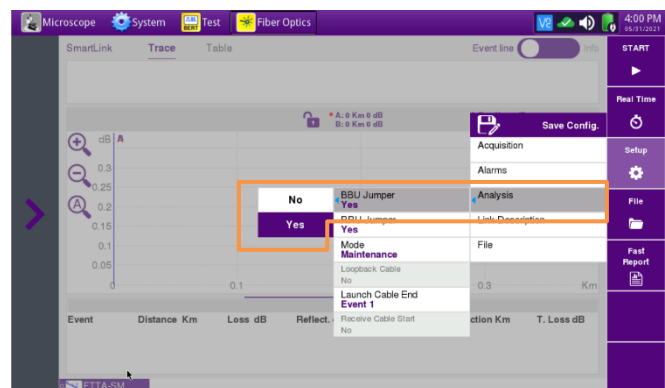   - Set **RRU Jumper** to **No** if there is no Junction Box or no RRU Jumper.

Figure 9: Analysis Setup

6. Tap **Link Description**:
   - Set **Base Station ID** to the Base Station or BBU Identifier.
   - Set **RRU ID** to the RRU Identifier or sector (Alpha, Beta, Gamma).
   - Set **Fiber Code** to the fiber number and polarity using the up and down arrow buttons.
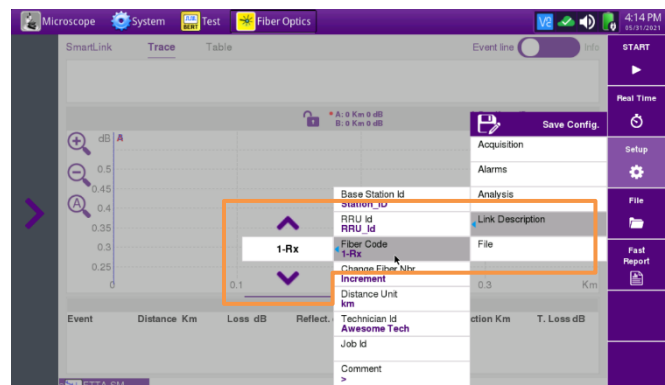   - Set **Change Fiber Nbr** to **Increment.**
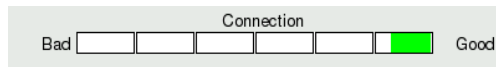   - Set **Distance Unit** to **Feet** or **Meters.**

Figure 10: Link Description setup

Run Test:

- Press the **START** soft key [START ▶] to start the test. After auto-configuration, the OTDR will perform a connection check to ensure that the connection is **Good**.

- If the Connection is **Bad**, disconnect the launch cable and reconnect as described on pages 1 and 2, cleaning every end-face that fails the inspection test. Also, inspect and clean the fiber end faces in any patch panels or connectors near the OTDR.
  After the connection check, the OTDR will perform 1310 nm and 1550 nm acquisitions.
- The top section of the screen can be set to display an **Event line**, or **Trace Information** by tapping the toggle switch at the top right side of the display.
- Results may be displayed in three views: **SmartLink, Trace** or **Table**.

SmartLink view:

- The Fiber under test is displayed as a series of icons representing each event (connector, splice, bend, etc.). Swipe left to display additional icons.
- In the center display, view summary results per wavelength or pulse width for the entire span. Acquisitions for which all events are acceptable are marked with a green check ✓. Acquisitions with events that exceed pass/fail thresholds for loss or reflectance are marked with a red ✗.
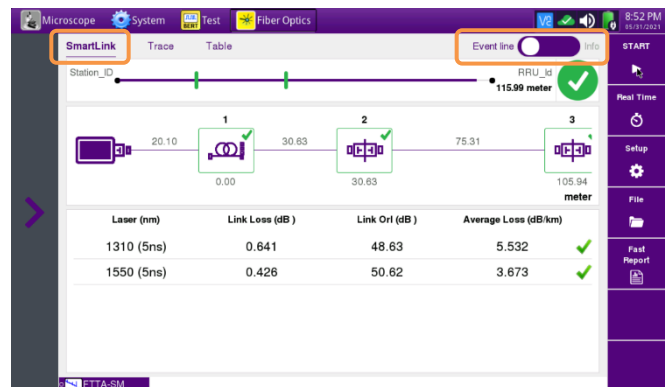

Figure 11: SmartLink view

- In the lower display, view each event that exceeds thresholds.
- Tap on an event icon to the view detailed results for the event and to label events according to the tower architecture:
  - **BBU:** Connection (coupler) between launch cable and BBU Jumper Cable
  - **BOT TWR**: Optical Patch Panel at the bottom of tower
  - **TOP TWR**: Junction Box/Patch Panel at the top of tower
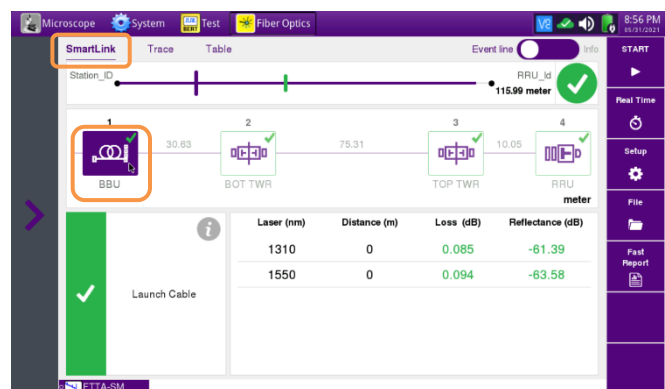 - **RRU**: End of RRU Jumper Cable

Figure 12: SmartLink Event View

Trace view:

- Graphical results for each wavelength or pulse width are shown in different colors in center display. Tap **1** or **2** to select the wavelength or pulse width for results display.
- **Distance**, **Loss**, and **Reflectance** for the first event is listed in the lower display. Swipe up to see additional events. Values that violate loss or reflectance pass/fail thresholds are shown in RED.
- Tap the magnifying glass icons to zoom in 🔍, zoom out 🔍, or auto-zoom 🔍 the display. You can also pinch and zoom with your fingers.
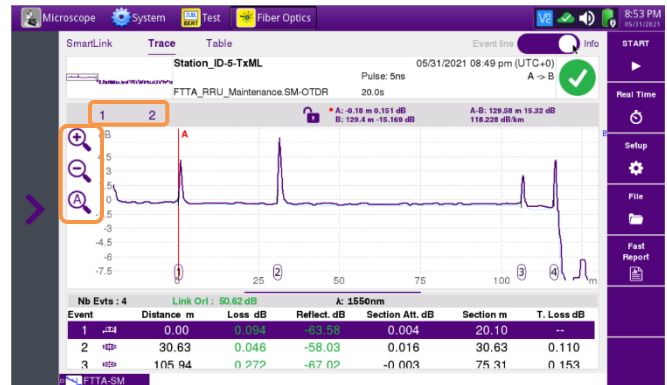
Table View:

- **Distance**, **Loss**, and **Reflectance** are shown for each event. Values that violate loss or reflectance pass/fail thresholds are shown in RED.
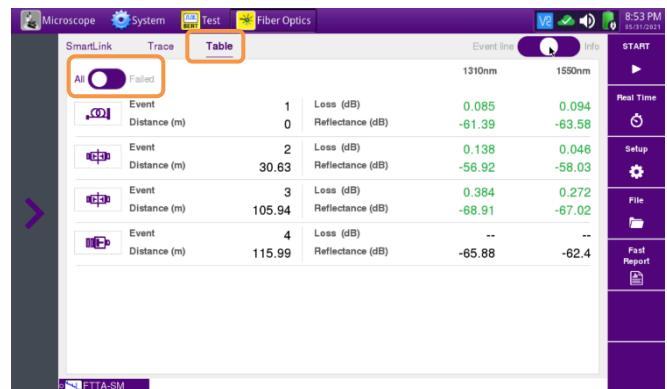- Tap the toggle switch to **All** events of **Failed** events.

**Save Report:**

1. Tap the **FILE** soft key 📁 and tap the **fiber** folder.

2. Tap the **Create Directory** soft key and enter a name for your new folder. All trace files will be saved to this directory.

3. Tap the **Exit** soft key.

4. Tap the **Fast Report** soft key.
5. Set **Save Mode(Std)/pdf file** to **Yes.**

6. Tap **Save and** tap ✓ to accept the default filename and save test results.

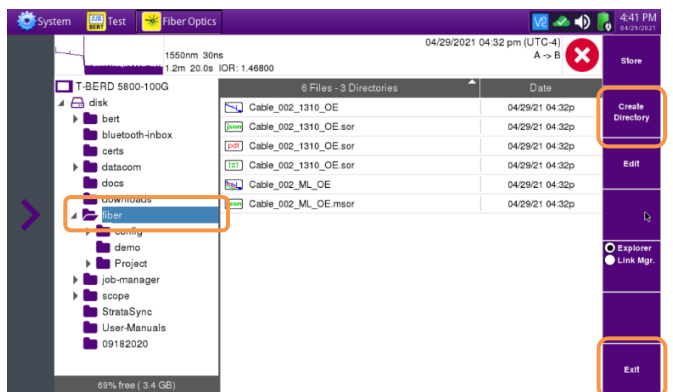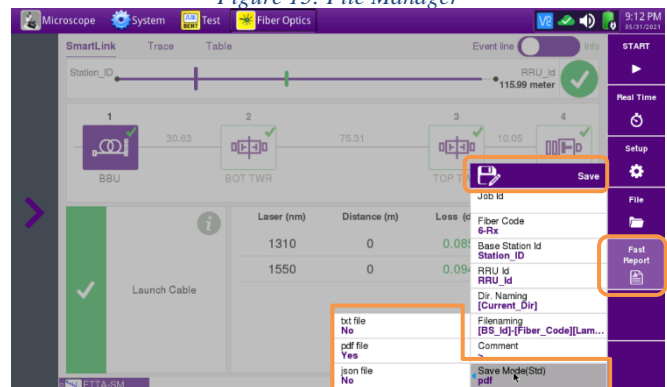7. Tap the **Fast Report** soft key again to return to the results display.

Figure 13: Trace View

Figure 14: Table View

Figure 15: File Manager

Figure 16: Fast Report

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