

QUICK CARD

FTTA OTDR, Cell Tower Construction and Maintenance

This quick card explains 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 ONA-800 equipped with a 4100 series OTDR.

- ▶ ONA-800 equipped with the following:
 - Fiber Optics Software Release V21.04 or greater
 - 4100 Series OTDR Module
 - Software options for FTTA OTDR and SmartLink Mapper (SLM) icon-based OTDR results
 - Fiber optic cleaning and inspection tools
- ▶ 20-meter fiber optic patch cable (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

- ▶ Use the VIAVI P5000i or FiberChek Probe microscope to inspect both sides of every connection being used (OCC Port, Launch Cable, bulkhead connectors, patch cables, etc.)
- ▶ Focus 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.

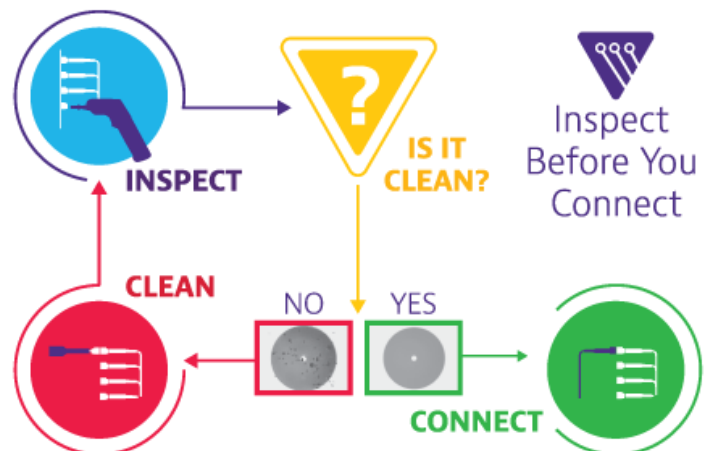


Figure 2: Inspect Before You Connect

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CONNECT TO FIBER UNDER TEST (FUT)

All fibers and connectors should be inspected and clean prior to connection, as described on page 1. The OTDR may be connected to the FUT as follows:

1. Inspect and clean (as needed) the OTDR port on top of the test set and all fiber end faces.
2. If the interface to the FUT is the BBU Jumper or Trunk Cable, connect the cable to an optical coupler with the same connector type.
3. Inspect and clean the FUT connected to the coupler or Optical Patch Panel (OPP).
4. Inspect and clean fiber end face of the Launch Cable.
5. Connect the Launch Cable to the OTDR port.
6. Inspect and clean the other fiber end face of the Launch Cable.
7. Connect the Launch Cable to the coupler or OPP leading to the RRU or tower top.



Figure 3: OTDR Port Inspection

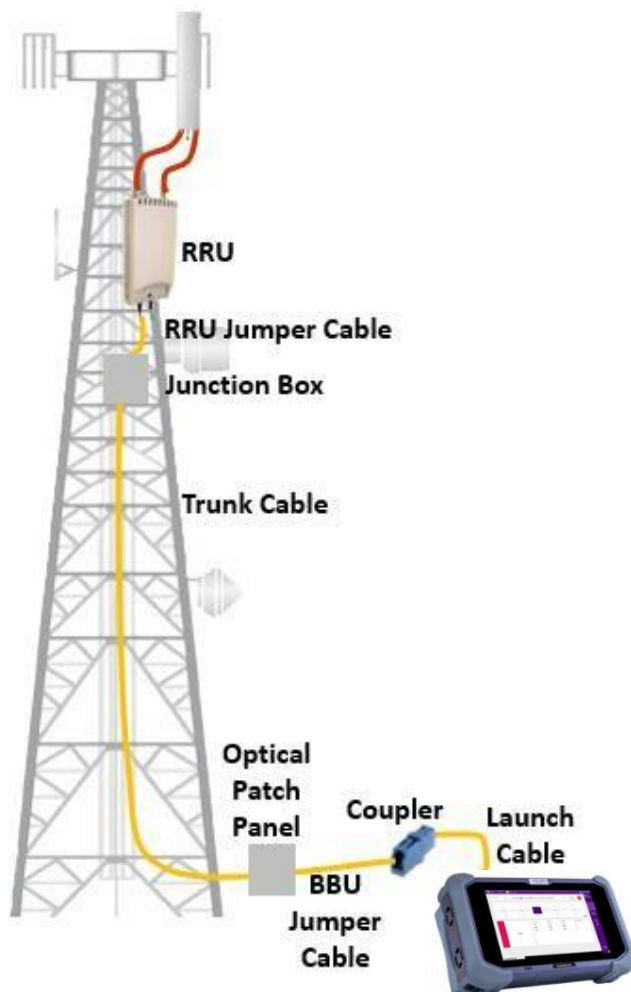


Figure 4: Tower Architecture with BBU Jumper

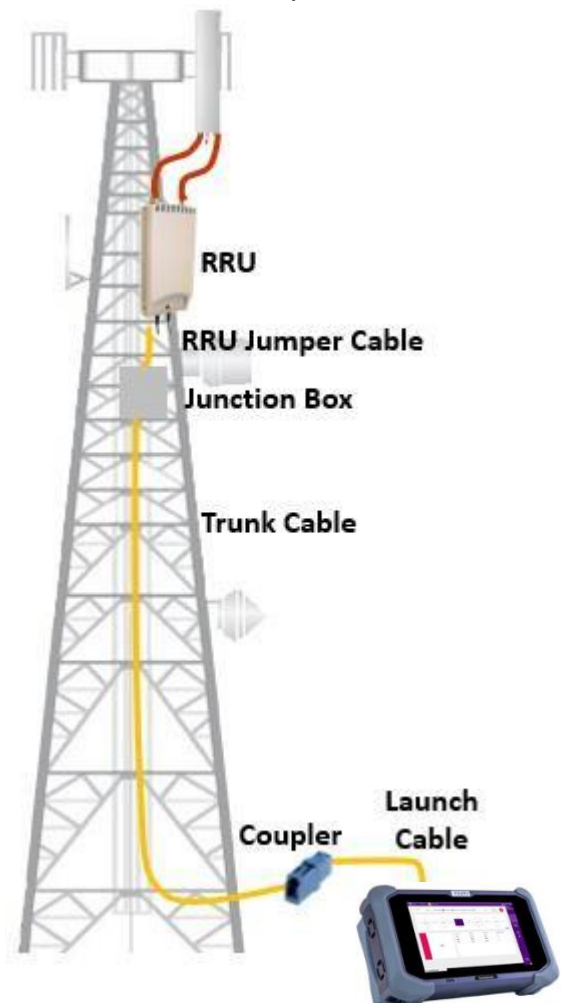


Figure 5: Tower Architecture, no BBU Jumper

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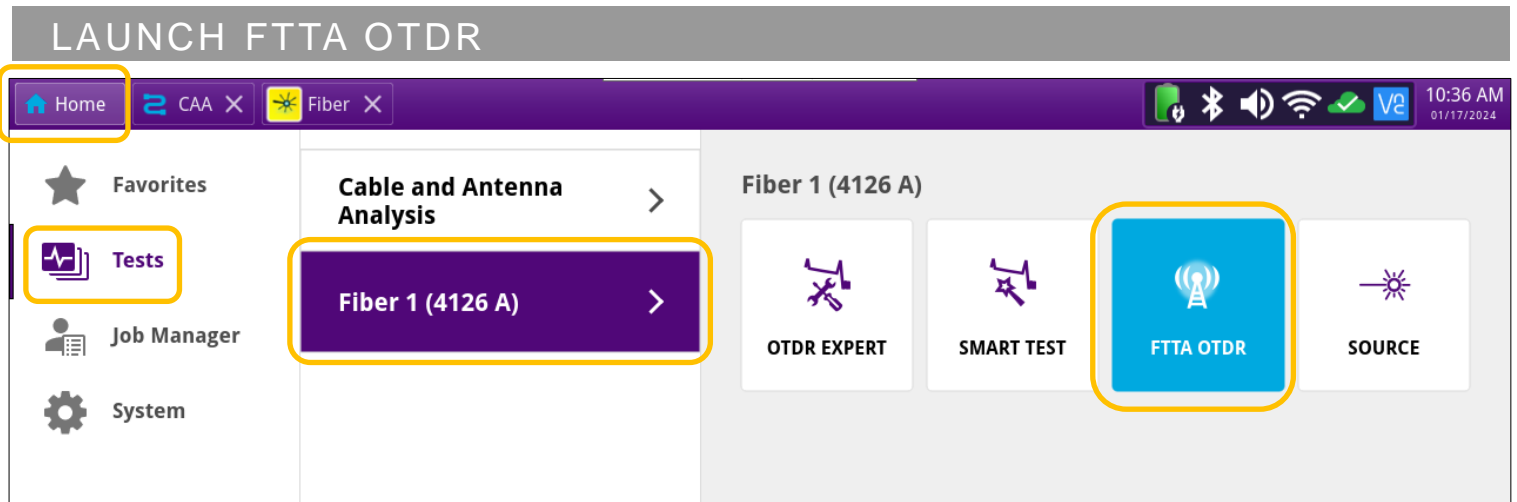


Figure 6: Home > Tests Screen

1. Press the Power button to start the test set.
2. Tap to display the Home screen.
3. Tap Tests to display test selections.
4. Tap the Fiber 1 selection to display OTDR module test selections.
Note: The Model number of your OTDR is displayed in the parenthesis.
5. Tap to launch the FTTA OTDR test application. It will turn blue when activated.

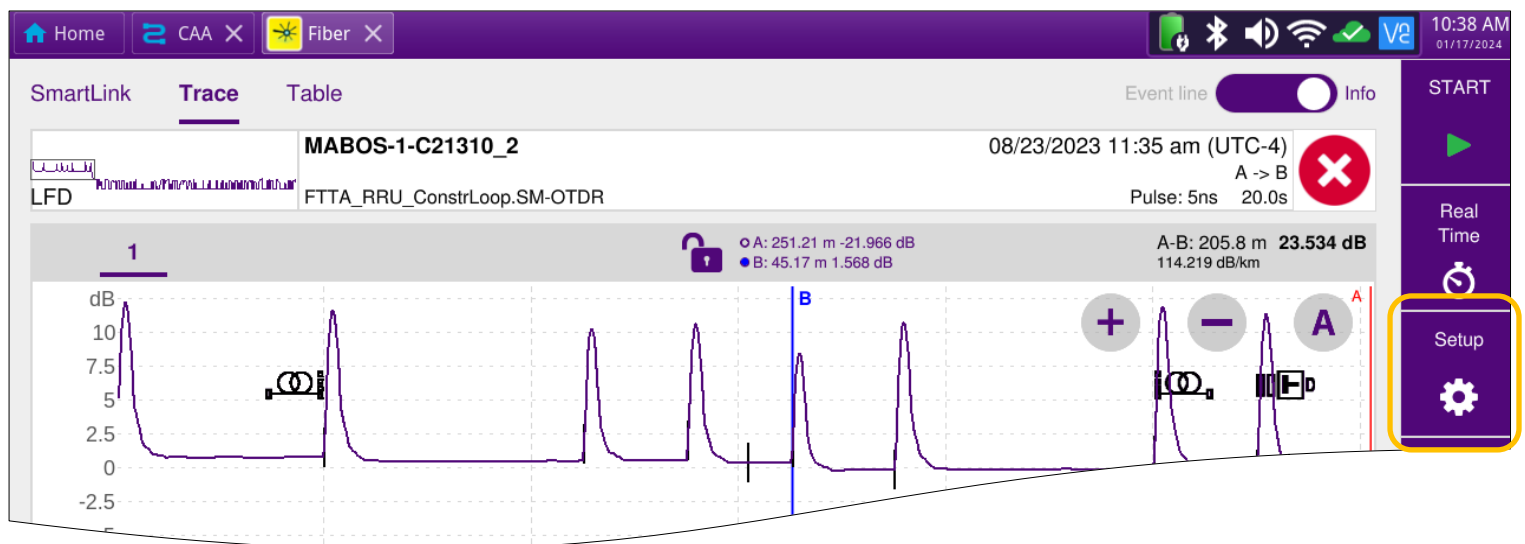


Figure 7: FTTA OTDR

6. Tap the Setup soft key and the Load softkey to access the File Explorer.

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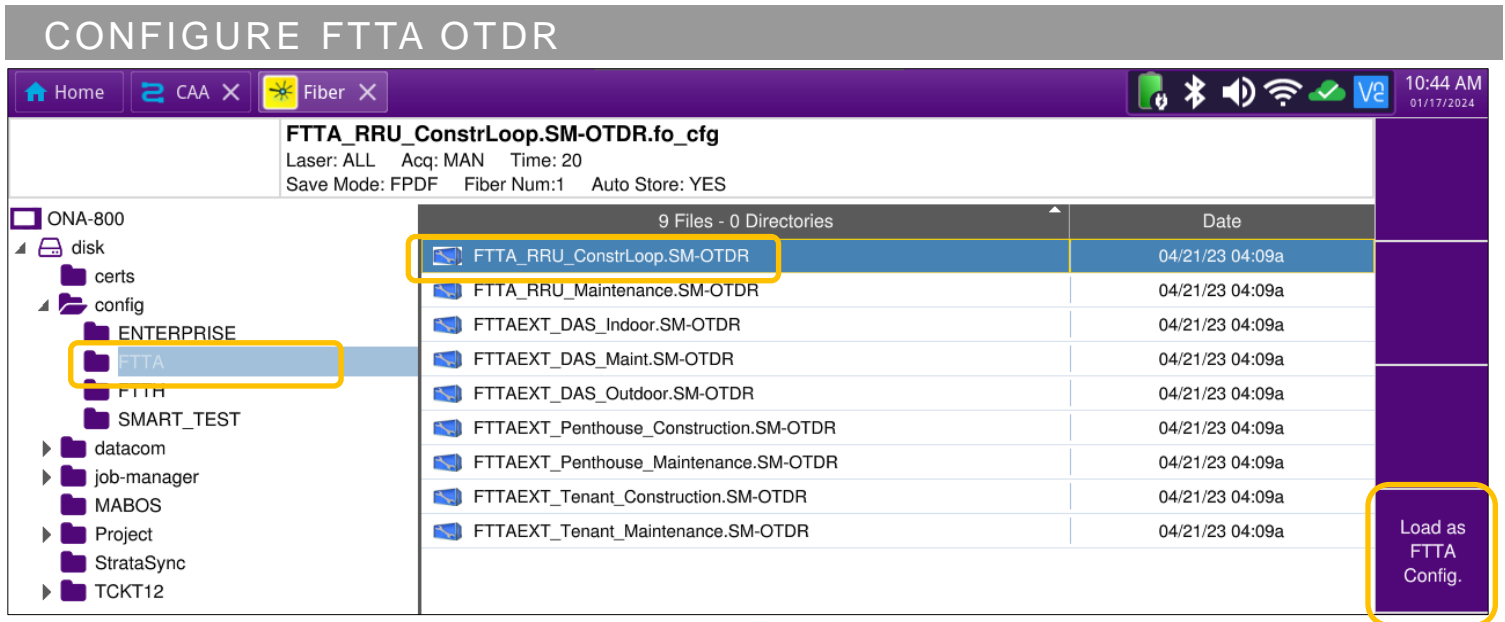


Figure 8: File Explorer

1. Select **FTTA_RRU_Maintenance.SM-OTDR** for testing to an RRU at the far-end, or **FTTA_RRU_ConstrLoop.SM-OTDR** for testing through a loopback or to a receive cable at the far-end.
2. Tap the **Load as FTTA Config.** soft key to load the configuration.
3. Tap the **Setup** soft key to display FTTA OTDR Setup.

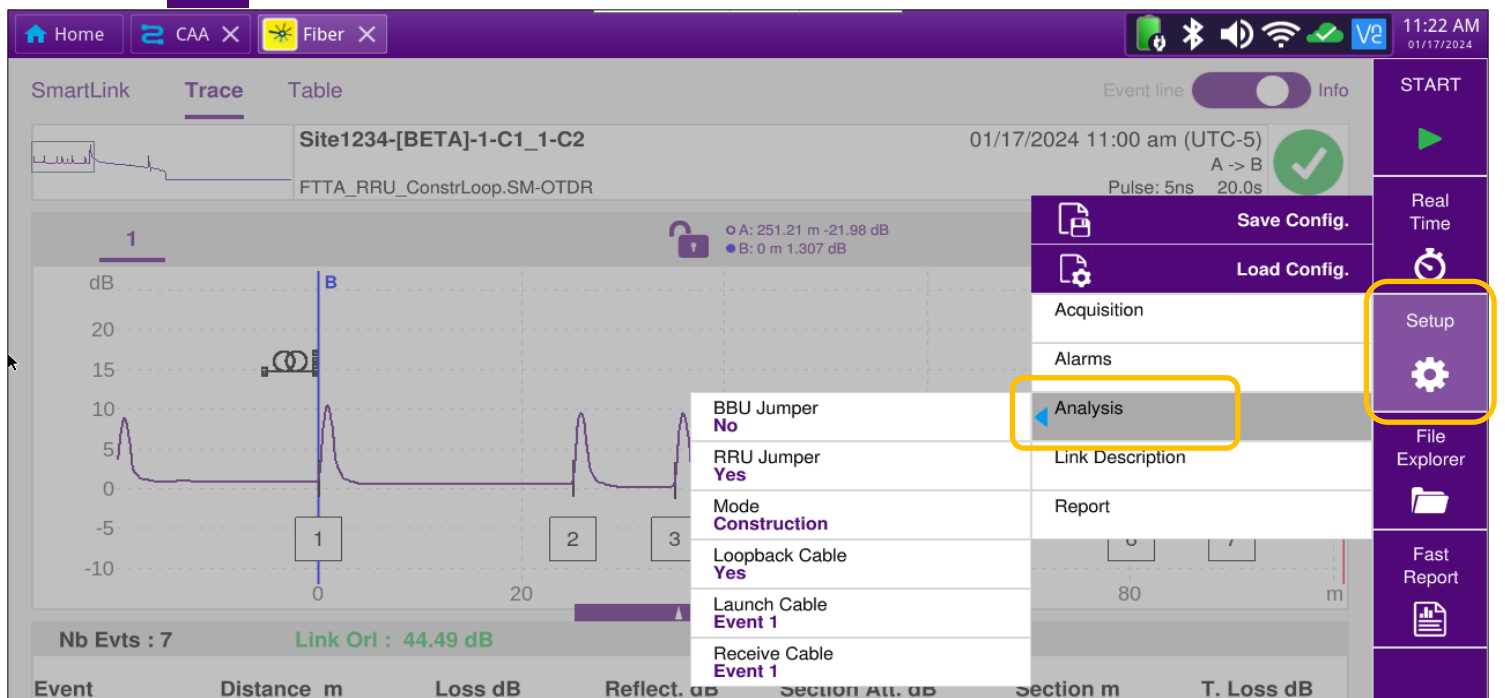


Figure 9: Setup example - BBU Jumper No, RRU Jumper Yes, and using loopback cable at tower

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CONFIGURE FTTA OTDR (Continued)

5. Configure Setup > Analysis (*Figure 9* above) settings as follows:
 - ▶ Set **BBU Jumper** to **Yes** if there is a BBU Jumper Cable between the Launch Cable (such as a ground based OVP between the BBU and the tower) and Trunk Cable; Set **BBU Jumper** to **No** if the Launch Cable is directly connected to the Trunk Cable.
 - ▶ Set **RRU Jumper** to **Yes** if there is a Junction Box/OVP/Squid 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.
 - ▶ Set **Mode** to **Construction** if there will be a loopback cable and/or receive cable employed.
 - ▶ Set **Loopback Cable** to **Yes** if there is a Loopback planned to test up and back down the tower; Set **Loopback Cable** to **No** if there will not be a loopback employed.
 - ▶ Set **Launch Cable End** to **Event 1** (always employ a launch cable: 20m recommended)
 - ▶ Set **Receive Cable Start** to **Event 1** if a receive cable will be employed
6. Configure **Link Description** (*Figure 10* below) settings as follows:
 - ▶ Set **Base Station ID** to the Test Location or BBU Identifier.
 - ▶ Set **RRU ID** to the RRU Identifier or the Cable Identifier or sector (e.g. Alpha, Beta, Gamma).
 - ▶ Set **Fiber Code** to the fiber number and polarity using the up and down arrows.
 - ▶ Set **Change Fiber Nbr** to **Increment**.
 - ▶ Set **Distance Unit** to **feet** or **meters** as desired.
 - ▶ Enter the **Technician ID** and **Job ID** as needed, or they could come from Job Manager.

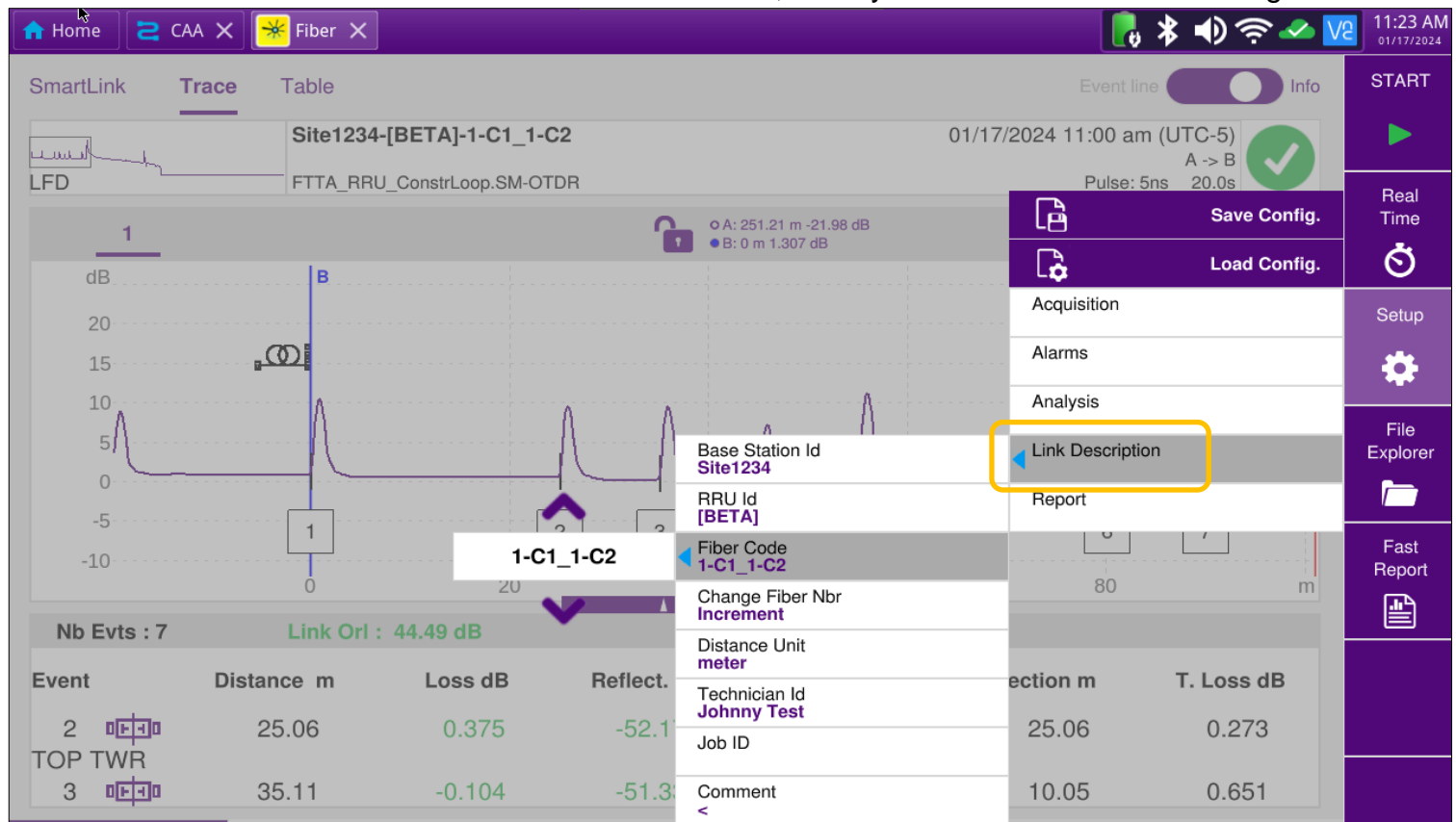


Figure 10: Setup example - Link Description

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CONFIGURE FTTA OTDR (Continued)

7. Configure **Report** (Figure 11 below) settings as follows:

- ▶ Set **Dir Naming** to **Current_Dir**. or select the item and create a new directory.
- ▶ Set **Filenaming** as desired and check the preview of the file name just below.
- ▶ Set **File Content** to **All Traces**.
- ▶ Set **Auto Store** to **Confirm if Alarm=fail**.
- ▶ Set **Report as** to **PDF**.
- ▶ Set **Report Layout** to **Standard** if you are using Job Manager OR if you want one per fiber measured. Set **Report Layout** to **Consolidated** if not using Job Manager and a single PDF report for many fibers is desired.

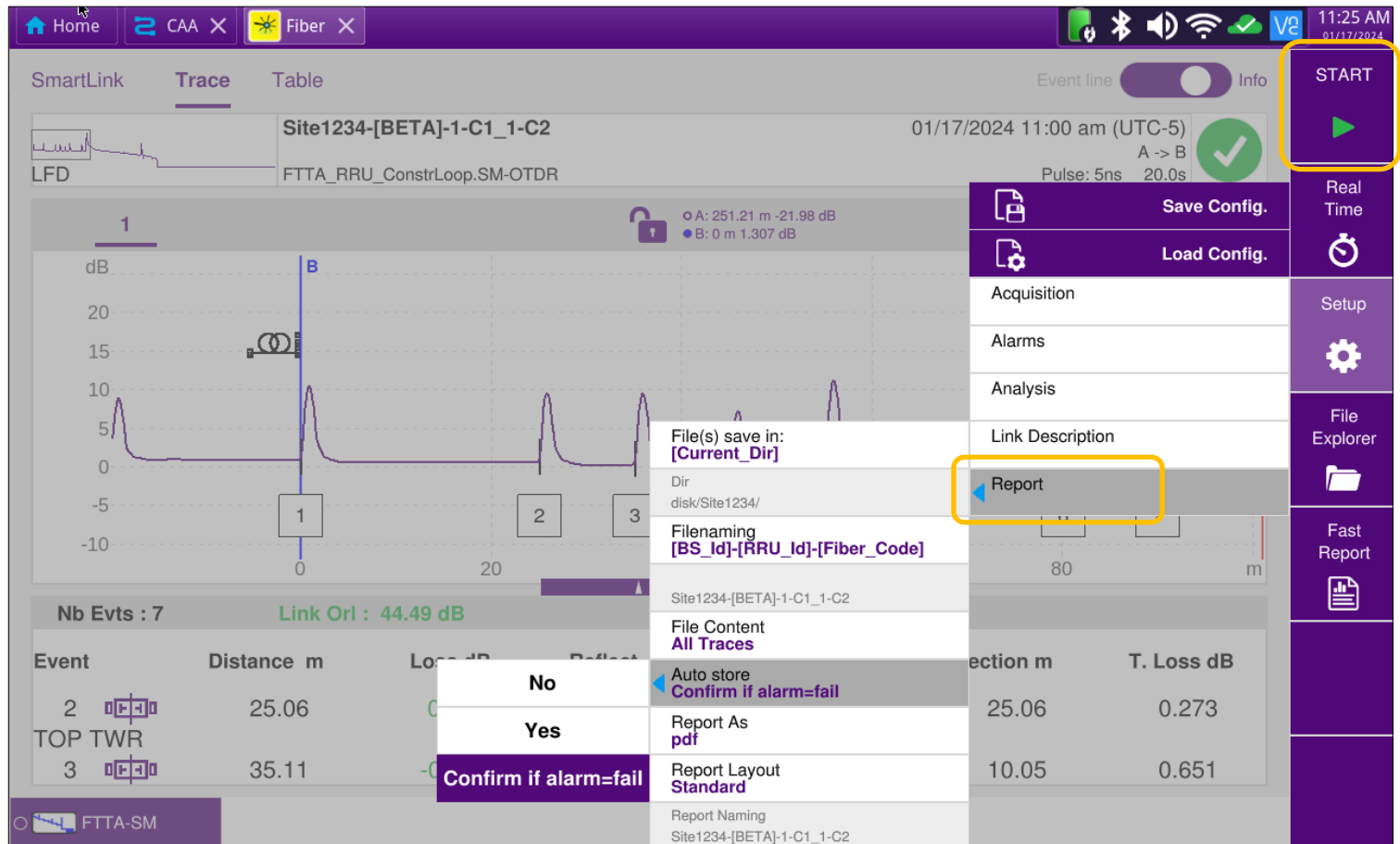



Figure 11: Setup example – Report Category

START TEST

1. Press the  soft key to start the test.
2. The OTDR will perform an auto-configuration, Connection Check, and Acquisition on each wavelength.
 - ▶ If the Connection is **Bad**, repeat steps 1 through 7 on page 2, to ensure the patch cable is clean and undamaged.
 - ▶ Passing results will be auto-stored to the current directory.

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VIEW RESULTS

Test results are viewable in 3 different formats: SmartLink, Trace, or Table. The view is selected at the top of the display.

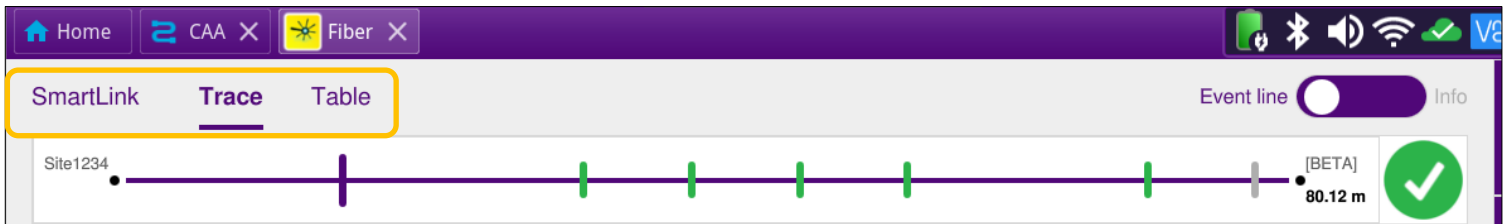


Figure 12: View Selections

1. SmartLink view: (see figure 13 below)

- The upper section can display the Event line or Trace Info. Switch via Event line Info
- The next section down displays the results as a series of icons representing events (launch cable, connector, end-of-fiber, etc.). Swipe left/right to display additional icons/events.
- The next section shows summary results per wavelength when no icons are selected.
- Tap on any icon (turns purple) to display event type and pass/fail status. This will also invoke the FTTA event naming scheme to help relate the event to its likely location at the tower:
 - **BBU**: Connection (coupler) between launch cable and BBU Jumper Cable or trunk
 - **BOT TWR**: Optical Patch Panel at bottom of tower
 - **TOP TWR**: Junction Box/Patch Panel at Top of tower
 - **RRU**: End of RRU Jumper Cable

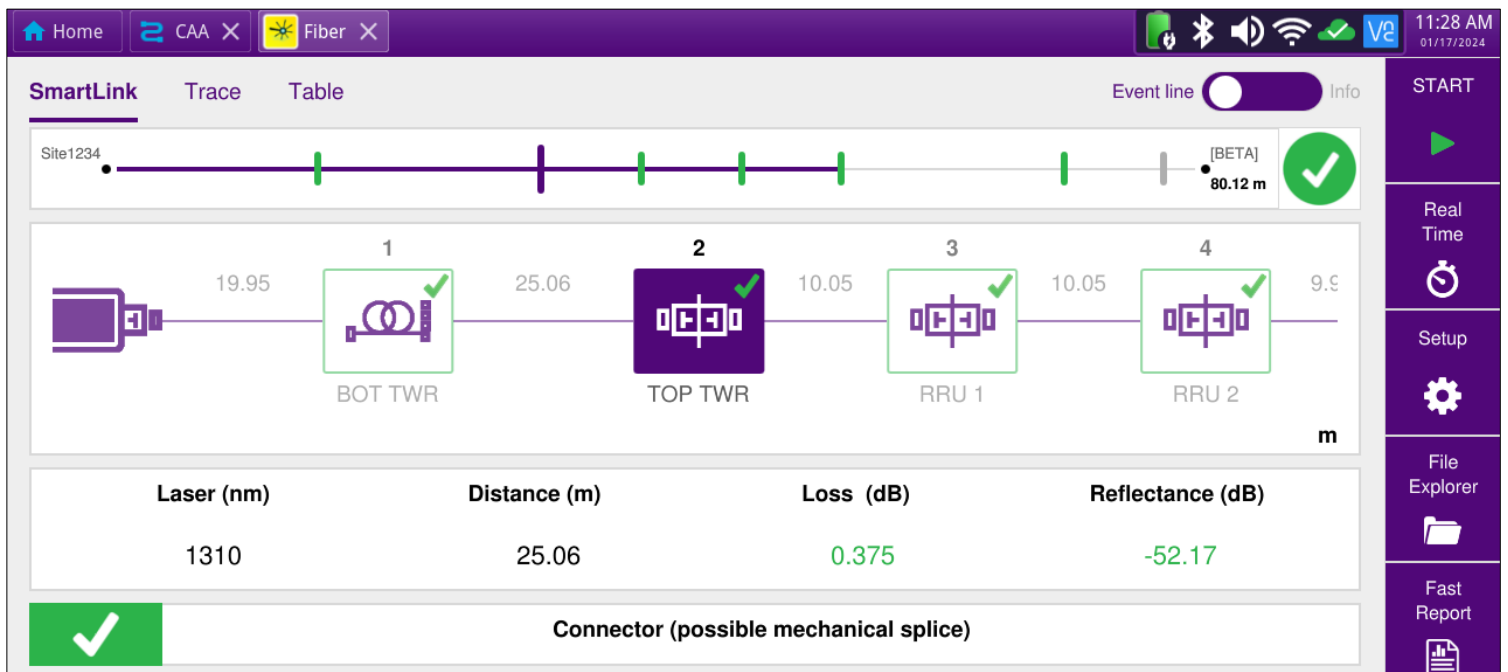


Figure 13: SmartLink View

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VIEW RESULTS (Continued)

2. Trace View:

- The upper section can display the Event line or Trace Info. Switch via Event line Info
- Results for each wavelength are shown in different colors in the display. They are overlaid. Use 1 2 to toggle between them.
- Tap the **A** icon to Auto-zoom the trace. Use cursor A or B and the +/- icons to zoom in/out on an event
- Each event is listed in the table below the trace. Any events that violate pass/fail thresholds for loss or reflectance are shown in **RED**. Passing parameters in green. Unjudged parameters (distance for example) in black text.

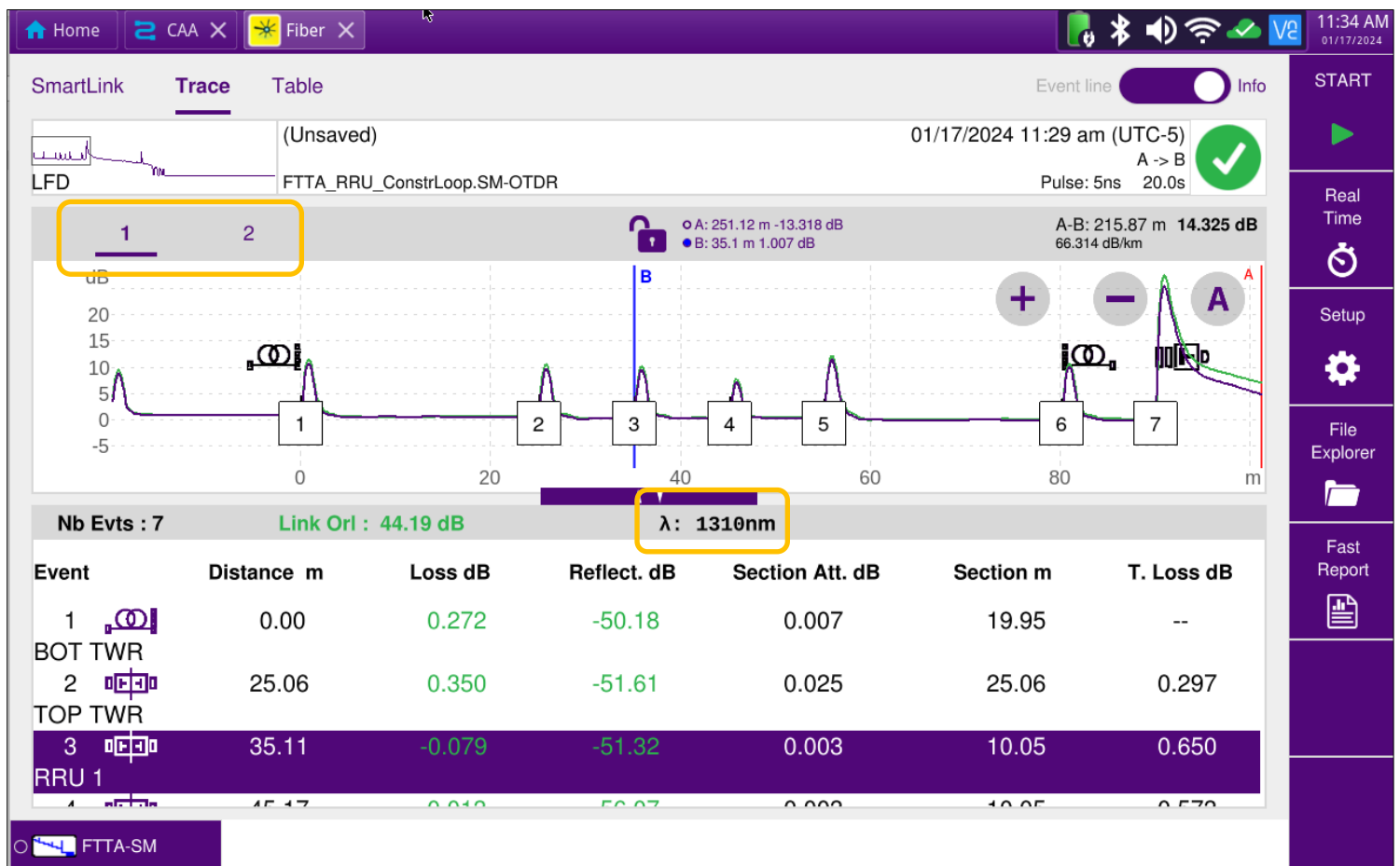


Figure 14: Trace View

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VIEW RESULTS (Continued)

3. Table View:

- Each event on the FUT is also displayed in tabular format.
- If desired, toggle to filter to just events that failed the thresholds.

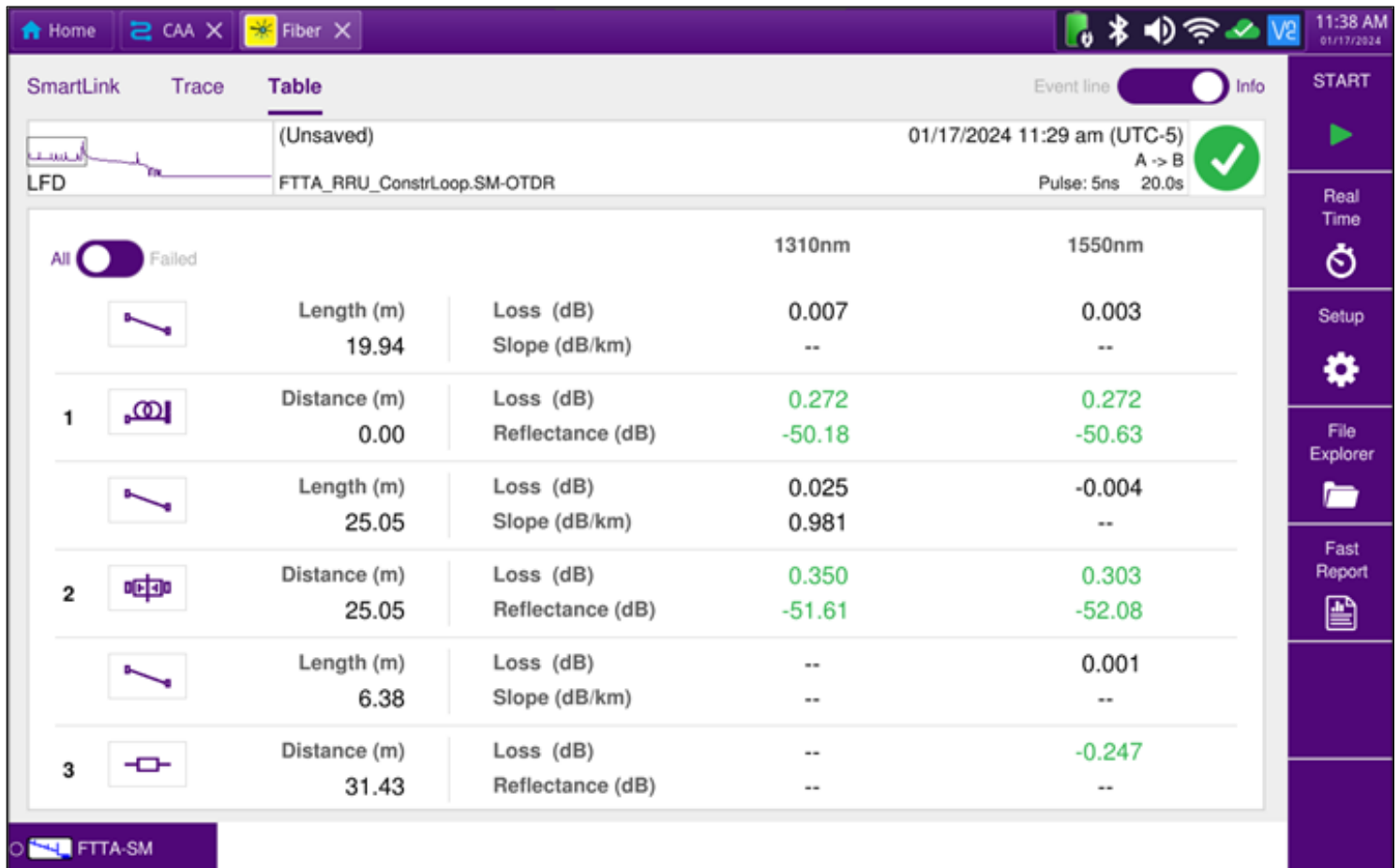


Figure 15: Table View