OneAdvisor-800 Portable Network Tester



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



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 6: Home > Tests Screen

- 1. Press the Power button 10 to start the test set.
- 2. Tap A Home to display the Home screen.
- 3. Tap Tests to display test selections.
- Tap the Fiber 1 selection Fiber 1 (41xxxxx) > 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.

n Home 🔁 CAA 🗙 × Fiber X	10:38 AM
SmartLink Trace Table Event line Info	START
MABOS-1-C21310_2 08/23/2023 11:35 am (UTC-4) A -> B	
LFD FTTA_RRU_ConstrLoop.SM-OTDR Pulse: 5ns 20.0s	Real
1 • 0 A: 251.21 m -21.966 dB A-B: 205.8 m 23.534 dB 114.219 dB/km 23.534 dB	Time
	Setup
-2.5	
 6. Tap the Setup Explorer. 6. Figure 7: FTTA OTDR 6. Load Config. to access the File 	



CONFIGUR	E FTTA OTDR		
A Home CAA X	🖌 Fiber 🗙	📃 🖁 🗱 🜒 🔶 🚾	10:44 AM 01/17/2024
	FTTA_RRU_ConstrLoop.SM-OTDR.fo_cfg Laser: ALL Acq: MAN Time: 20 Save Mode: FPDF Fiber Num:1 Auto Store: YES		
ONA-800	9 Files - 0 Directories	Date	
 disk certs config ENTERPRISE FTTA 	FTTA_RRU_ConstrLoop.SM-OTDR	04/21/23 04:09a	
	FTTA_RRU_Maintenance.SM-OTDR	04/21/23 04:09a	
	STTAEXT_DAS_Indoor.SM-OTDR	04/21/23 04:09a	
	FTTAEXT_DAS_Maint.SM-OTDR	04/21/23 04:09a	
FTTH	FTTAEXT_DAS_Outdoor.SM-OTDR	04/21/23 04:09a	
SMART_TEST	STTAEXT_Penthouse_Construction.SM-OTDR	04/21/23 04:09a	
datacom	FTTAEXT_Penthouse_Maintenance.SM-OTDR	04/21/23 04:09a	
MABOS	STTAEXT_Tenant_Construction.SM-OTDR	04/21/23 04:09a	
Project	STTAEXT_Tenant_Maintenance.SM-OTDR	04/21/23 04:09a	Load as
StrataSyncTCKT12			FTTA Config.

Figure 8: File Explorer

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

10

3. Tap the setup soft key to display FTTA OTDR Setup.

	🔒 Home 🛛 🔁 C	AA 🗙 😽 Fiber 🗙					🕯 🜒 🤶 💊 🔽	2 11:22 AM
	SmartLink	Trace Table				Event line	Info	START
	Lund	Site1234-	[BETA]-1-C1_1-0	C2		01/17/2024 11:00 am	UTC-5) A -> B	
		FTTA_RRU	_ConstrLoop.SM-O1	rdr.		Pulse: 5n	s 20.0s	Real
	1			C	o A: 251.21 m -21.98 dB	le	Save Config.	Time
	dB	В			• B: 0 m 1.307 dB	G	Load Config.	Ŏ
	20					Acquisition		Setup
R	15	ത				Alarms		*
	10	·····		Δ Δ	BBU Jumper No	Analysis		File
	5/				RRU Jumper Yes	Link Description		Explorer
	-5				Mode Construction	Report		
	-10			2 3	Loopback Cable Yes			Fast Report
		0	20	A	Launch Cable Event 1	80	m	
	Nb Evts : 7	Link Orl :	44.49 dB		Receive Cable Event 1			
	Event	Distance m	Loss dB	Reflect. a	B Section All. 0B	Section m	T. Loss dB	

Figure 9: Setup example - BBU Jumper No, RRU Jumper Yes, and using loopback cable at tower OneAdvisor-800 Portable Network Tester



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.

A Home CA	A 🗙 <mark> </mark> Fiber 🗙					* 🜒 🤶 🛰 🔽	2 11:23 AM 01/17/2024
SmartLink T I	race Table					Info	START
	Site1234	-[BETA]-1-C1_1-	C2		01/17/2024 11:00 am	(UTC-5) A -> B	
LFD	FTTA_RRU	J_ConstrLoop.SM-O	TDR		Pulse: 5r	ns 20.0s	Real
1			6	o A: 251.21 m -21.98 dB	là	Save Config.	Time
dB	В			B: 0 m 1.307 dB	G	Load Config.	Ö
20					Acquisition		Setup
15					Alarms		
10	· · · · · · · · · · · · · · · · · · ·		Δ	A	Analysis		
5/	•••••••••••••••••••••••••••••••••••••••		[[]]	A () Base Station Id Site1234	Link Description	ı	File Explorer
-5		٦		RRU Id [BETA]	Report		
-10		1-C	1_1-C2	Fiber Code 1-C1_1-C2		/	Fast Report
	Ó	20		Change Fiber Nbr Increment	80	m	
Nb Evts : 7	Link Orl :	44.49 dB		Distance Unit			
Event	Distance m	Loss dB	Reflect.	Technician Id	ection m	T. Loss dB	
2 111-111	25.06	0.375	-52 1	Johnny Test	25.06	0.273	
TOP TWB	20.00	0.070	-52.1	Job ID	20.00	0.270	
3 11-10	35.11	-0.104	-51.3	Comment <	10.05	0.651	

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.

Home Z CAA	A X 🏼 🎢 Fiber X					🔻 🖤 🛜 🛩 🔽	01/17/2024	
SmartLink Tr	race Table					e 🚺 Info	START	
	Site1234	-[BETA]-1-C1_1	1-C2	01/	17/2024 11:00 am	і (UTC-5) А -> В		
LFD	FTTA_RRU	J_ConstrLoop.SM-	OTDR		Pulse: 5	ns 20.0s	Real	
1			ſ	• A: 251.21 m -21.98 dB • B: 0 m 1.307 dB	Le	Save Config.	Time	
dB	В				l 🔓	Load Config.	0	
20					Acquisition		Setup	
15					Alarms		•	
10			Δ Δ	Α	Analysis			
5/	·····		·····		A (1) File(s) save in: [Current Dir]	Link Descriptio	n	File Explorer
0				Dir	Report			
-5	1		2 3	disk/Site1234/			Fast	
-10		20		[BS_Id]-[RRU_Id]-[Fiber_Code]	80		Report	
Nh Euto i 7	Link Orl	44.40 dP	Å	Site1234-[BETA]-1-C1_1-C2	00			
ND EVIS: 7	Link On :	44.49 UD		File Content All Traces				
Event	Distance m	Loss dB	No	Auto store	ection m	T. Loss dB		
2 01-10	25.06	C		Confirm if alarm=fail	25.06	0.273		
TOP TWR			Yes	pdf				
3 0 0	35.11	⁻⁽ Confirm	n if alarm=fail	Report Layout Standard	10.05	0.651		
O TTA-SM				Report Naming Site1234-[BETA]-1-C1_1-C2				

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.

Info

QUICK CARD

VIEW RESULTS

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

🔒 Home		<mark> </mark> Fiber 🗙				📕 🖁 🗐 🗐	e 🛹 🔽
SmartLink	Trace	Table				Event line	Info
Site1234			+	 +	-+	 [BETA] 80.12 m	

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
 - > 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

🔒 Home 🛛 🔁 CAA 🗙 🧩 Fiber 🕻	×			- 🖪 🐐 🜒 🦷		АМ 024
SmartLink Trace Table				Event line	Info START	г
Site1234				[BETA]		
	•	2	3	4	Real Time	
19.95	25.06				9.9	
					Setup	
BC	DT TWR	TOP TWR	RRU 1	RRU 2	\$	
					m File	
Laser (nm)	Distance (m)	Loss (d	IB)	Reflectance (dB)		ər
1310	25.06	0.37	5	-52.17	Fast	
	Connecto	or (possible mechanica	I splice)		Report	t





VIEW RESULTS (Continued)

- 2. Trace View:
 - > The upper section can display the Event line or Trace Info. Switch via Event line



- Results for each wavelength are shown in different colors in the display. They are overlayed. 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



- 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.



🔒 Home	S CVV X	× Fiber 🗙			N 🗢 🔊 🖓 🖁	11:38 AM 01/17/2024
SmartLin	nk Trace	Table			Event line	START
Lund	- 1	(Unsaved)		0	1/17/2024 11:29 am (UTC-5)	
LFD	Th.	FTTA_RRU_ConstrL	.oop.SM-OTDR		Pulse: 5ns 20.0s	Real
AIIC	Failed			1310nm	1550nm	Time Š
	\mathbf{N}	Length (m)	Loss (dB)	0.007	0.003	Setup
		19.94	Slope (dB/km)	-		•
1	.യ	Distance (m) 0.00	Loss (dB) Reflectance (dB)	0.272 -50.18	0.272 -50.63	File
	\sim	Length (m)	Loss (dB)	0.025	-0.004	
		25.05	Slope (dB/km)	0.981		Fast
2		Distance (m)	Loss (dB)	0.350	0.303	Report
-	-	25.05	Reflectance (dB)	-51.61	-52.08	
	•	Length (m)	Loss (dB)		0.001	
	7	6.38	Slope (dB/km)			
	-	Distance (m)	Loss (dB)		-0.247	
3		31.43	Reflectance (dB)			
0 🔽 FT	TA-SM					

Figure 15: Table View