FTTH Software Option

For T-BERD®/MTS-2000, -4000 V2, -5800, SmartOTDR, CellAdvisor 5G and OneAdvisor-800 Platforms

User Manual

FTTH Software Option

For T-BERD®/MTS-2000, -4000 V2, -5800, SmartOTDR, CellAdvisor 5G and OneAdvisor-800 Platforms

User Manual

Viavi Solutions
1-844-GO-VIAVI
www.viavisolutions.com

Notice

Every effort was made to ensure that the information in this document was accurate at the time of printing. However, information is subject to change without notice, and VIAVI reserves the right to provide an addendum to this document with information not available at the time that this document was created.

Copyright

Trademarks

VIAVI, MTS/T-BERD 4000 V2, MTS/T-BERD 2000, MTS/T-BERD 5800, SmartOTDR, CellAdvisor 5G and OneAdvisor 800 are trademarks or registered trademarks of VIAVI in the United States and/or other countries.

Microsoft, Windows, Windows CE, Windows NT, and Microsoft Internet Explorer are either trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries.

Netscape Navigator is a trademark or registered trademark of Netscape Communications Corporation in the United States and other countries.

Ordering information

This guide is a product of VIAVI's Technical Information Development Department, issued as part of the User Manual.

Product Regulatory Compliance

California Proposition 65

California Proposition 65, officially known as the Safe Drinking Water and Toxic Enforcement Act of 1986, was enacted in November 1986 with the aim of protecting individuals in the state of California and the state's drinking water and environment from excessive exposure to chemicals known to the state to cause cancer, birth defects or other reproductive harm.

For the VIAVI position statement on the use of Proposition 65 chemicals in VIAVI products, see the Hazardous Substance Control section of VIAVI's Standards and Policies web page.

EU WEEE and Battery Directives

This product, and the batteries used to power the product, should not be disposed of as unsorted municipal waste and should be collected separately and disposed of according to your national regulations.

VIAVI has established a take-back processes in compliance with the EU Waste Electrical and Electronic Equipment (WEEE) Directive, 2012/19/EU, and the EU Battery Directive, 2006/66/EC.

Instructions for returning waste equipment and batteries to JDSU can be found in the WEEE section of VIAVI's Standards and Policies web page.

If you have questions concerning disposal of your equipment or batteries, contact VIAVI's WEEE Program Management team at WEEE.EMEA@VIAVISolutions.com.

EU REACH

Article 33 of EU REACH regulation (EC) No 1907/2006 requires article suppliers to provide information if a listed Substances of Very High Concern (SVHC) is present in an article above a certain threshold.

For information on the presence of REACH SVHCs in VIAVI products, see the Hazardous Substance Control section of VIAVI's Standards and Policies web page.

EU CE Marking Directives (LV, EMC, RoHS, RE)

This product conforms with all applicable CE marking directives. Please see EU Declaration of Conformity for details.

Contents

About This Guide

The VIAVI equipments provide handheld, modular platforms designed for the construction, validation and maintenance of fiber networks.

The topics discussed in this chapter are as follows:

Purpose and scope

The purpose of this guide is to help you successfully use the equipment features and capabilities. This guide includes task-based instructions that describe how to configure, use, and troubleshoot the equipment with OTDR module.

Assumptions

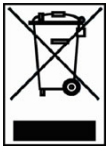
We are assuming that you have basic computer and mouse/track ball experience and are familiar with basic telecommunication and fiber optic concepts and terminology.

Technical assistance

If you require technical assistance, call 1-844-GO-VIAVI. For the latest TAC information, go to http://www.viavisolutions.com/en/services-and-support/support/technical-assistance.

Recycling Information

VIAVI recommends that customers dispose of their instruments and peripherals in an environmentally sound manner. Potential methods include reuse of parts or whole products and recycling of products components, and/or materials.



Waste Electrical and electronic Equipment (WEEE) Directive

In the European Union, this label indicates that this product should not be disposed of with household waste. It should be deposited at an appropriate facility to enable recovery and recycling.

Conventions

This guide uses naming conventions and symbols, as described in the following tables.

Table 1 Typographical conventions

Description	Example
User interface actions appear in this **typeface**.	On the Status bar, click **Start**.
Buttons or switches that you press on a unit appear in this **TYPEFACE**.	Press the **ON** switch
Code and output messages appear in this `typeface`.	`All results okay`
Text you must type exactly as shown appears in this **`typeface`**.	Type: **`a:\set.exe`** in the dialog box
Variables appear in this ***typeface***.	Type the new ***hostname***.
Book references appear in this ***typeface***.	Refer to ***Newton's Telecom Dictionary***
A vertical bar | means "or": only one option can appear in a single command.	`platform [a|b|e]`
Square brackets [ ] indicate an optional argument.	`login [platform name]`
Slanted brackets < > group required arguments.	<`password`>

Table 2 Keyboard and menu conventions

Description	Example
A plus sign + indicates simultaneous keystrokes.	Press **Ctrl+s**
A comma indicates consecutive key strokes.	Press **Alt+f,s**
A slanted bracket indicates choosing a submenu from menu.	On the menu bar, click **Start > Program Files**.

Table 3 Symbol conventions

	**This symbol represents a general hazard.**
	**This symbol represents a risk of electrical shock.**
	**NOTE** This symbol represents a Note indicating related information or tip.
	**This symbol, located on the equipment or its packaging indicates that the equipment must not be disposed of in a land-fill site or as municipal waste, and should be disposed of according to your national regulations.**

Table 4 Safety definitions

	**WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	**CAUTION** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

1

FTTH Principle and Configuration

This chapter describes the principle of the FTTH network (Fiber To The Home) and how to configure the test for this network.

The topics discussed in this chapter are as follows:

NOTE

Patented, as described at www.viavisolutions.com/patents.

Principle of FTTH

FTTH-SLM is an OTDR software application that is delivered as an option of the OTDR module, and is installed onto the mainframe as a license key (see the base-unit user manual for the instructions on license files installation).

FTTH-SLM application brings an FTTH user interface and a specific algorithm for OTDR measurements, especially through PON splitters (Passive Optical Network).

In a FTTH environment, the OTDR module, associated with the FTTH-SLM application:

- Selects optimized test parameters to conduct reliable measurements, especially through optical splitters, and to detect close events near the start (Central Office splices/ connectors) (OptiPulses Automatic Algorithm).
- Automatically identifies all network elements such as PON splitter types/ratios (Discover Mode).
- Iconically displays a map of OTDR trace results (SmartLink View)
- Guarantees measurements with automatic PASS/FAIL analysis to ITU-T/IEEE PON standards or customer-defined specifications.

Configuring the OTDR test for FTTH network

Once the OTDR module is set into the T-BERD/MTS, and the FTTH-SLM license installed:

1 Select the FTTH-OTDR icon 

.
The results page automatically displays.

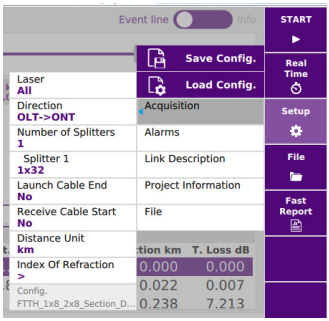
2 Press **SETUP** key to display the OTDR configuration menu for FTTH network.

FTTH setup

In the first screen, configure the following parameters:

Acquisition

Figure 1 Setup Acquisition



Laser

The acquisition will be carried out on the wavelength(s) selected (for multi-wavelength modules). In case of a multi-wavelength module, select **All** to perform a measurement for all the wavelengths available (only for single-port OTDR module).

Direction

Select the direction of the measurement:

- Downstream: from OLT to ONT (**OLT -> ONT**)
- Upstream: from ONT to OLT (**ONT -> OLT**)

Number of Splitters

If known, enter the number of splitters installed in the FTTH network.

It is preferred to know the number of splitters in order to get Pass/Fail status for the splitters' loss.

Discover: auto-detection and identification of PON splitter types.

NOTE

The **Discover** mode does not allow Pass/Fail analysis

1 / 2 / 3: select the number of splitters.

This selection opens a sub menu undernief. each splitter type must be set..

Splitters types

Define the splitter type amongst the list:

- 1x2 / 1x4 / 1x8 / 1x16 / 1x32 / 1x64 / 1x128
- 2x2 / 2x4 / 2x8 / 2x16 / 2x32 / 2x64 / 2x128

Launch Cable End / Receive Cable Start

No No launch or receive cable to offset from the measurement.

Length Touch **Length** to enter a distance (Min= 0 / Max=50 km / 164.042 kfeet / 31.075 miles) or touch the scale button to measure the launch and receive cables independently..

Distance Unit

Define the unit of the distances displayed: **km**, **kfeet**, **miles**, **meter**, **feet**.

Index of refraction

Choice of group refraction index of the whole fiber.

User set the refractive index between 1.30000 and 1.69999 for each wavelength (1310 SM, 1360-1510 SM, 1550 SM, 1590 - 1650 SM)

or,

If the actual distance between the cursors A and B is known, enter its value under **Section AB** to establish the index of the fiber.

Predefined It is possible to choose one of the predefined values given for certain cables.

Table 1 Predefined index values (Single Mode)

Wavelength (nm)	1310 SM	1360 - 1510 SM	1550 SM	1625 - 1650 SM
Generic G652 G657	1.46750	1.46800	1.46800	1.46850
Generic G653 G655	1.46750	1.46800	1.46800	1.46850
ATT SM	1.46600	1.46700	1.46700	1.46700
Corning SMF-28	1.46750	1.46810	1.46810	1.46810
Corning SMF-DS	1.47180	1.47110	1.47110	1.47110

Table 1 Predefined index values (Single Mode)

Wavelength (nm)	1310 SM	1360 - 1510 SM	1550 SM	1625 - 1650 SM
Corning SMF-LS	1.47100	1.47000	1.47000	1.47000
Corning-Leaf	1.46890	1.46840	1.46840	1.46900
Draka SMF	1.46750	1.46800	1.46800	1.46850
Draka Longline	1.46700	1.46700	1.46710	1.46750
Draka Teralight	1.46820	1.46820	1.46830	1.46850
Draka Benbright	1.46750	1.46750	1.46800	1.46850
Fitel Furukawa	1.47000	1.47000	1.47000	1.47000
OFS Lucent Allwave	1.46750	1.46750	1.46750	1.46850
Lucent Truewave	1.47100	1.47100	1.47000	1.47000
SpecTran SM	1.46750	1.46810	1.46810	1.46810
Sterlite	1.46700	1.46700	1.46750	1.46750
Sumitomo Litespec	1.46600	1.46600	1.46700	1.47000
Sumitomo Pure	1.46600	1.46600	1.46700	1.47000

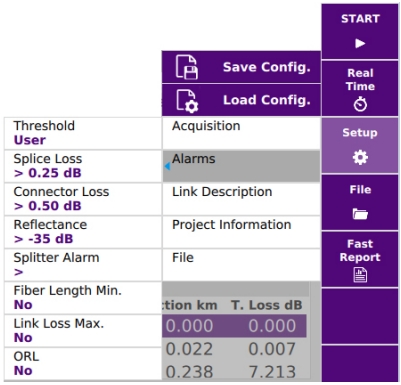
Config.

This parameter displays the configuration file selected for acquisition: select **Load config.** to change the config file to use.

Alarms parameters

Press the **Alarm** menu key to configure the alarm thresholds.

Figure 2 Alarms parameters



None The alarm function is not active.

User Define your own thresholds for one or several elements: Splice Loss / Connector Loss / Reflectance / Splitter Alarm / Fiber Length Min / Link Loss Max / ORL

Default / TIA-568 C / ISO/IEC 11801 / G.697/G.98x PON / G.697/IEEE PON

Select one of this parameter to configure the alarm thresholds with predefined values:

Table 2 Alarms thresholds

	Default	G.697/G.98x PON & G.697/ IEEE PON	TIA-568C & ISO/ IEC 11801
Splice Loss	> 0.20 dB	> 0.30 dB	> 0.30 dB
Connector Loss	> 0.50 dB	> 0.50 dB	> 0.75 dB
Slope	> 1.00 dB/km	-	> 1.00 dB/km
Reflectance	> - 35 dB	> - 35 dB	
ORL	< 27 dB	< 27 dB	
Splitter Alarm			
Splitter 1x2	> 5.0 dB	> 4.2 dB	
Splitter 1x4	> 8.0 dB	> 7.8 dB	

Table 2 Alarms thresholds

	Default	G.697/G.98x PON & G.697/ IEEE PON	TIA-568C & ISO/ IEC 11801
Splitter 1x8	> 11.0 dB	> 11.4 dB	
Splitter 1x16	> 14.0 dB	> 15.0 dB	
Splitter 1x32	> 17.0 dB	> 18.6 dB	
Splitter 1x64	> 21.0 dB	> 22.0 dB	
Link Loss Max		Select: **No**, **Manual** or: • for G.697/G.98x PON: **20 dB (A)** / **25 dB (B)** / **30 dB (C)** • for G.697/IEEE PON: **23 dB (PX-10)** / **26 dB (PX-20)**	

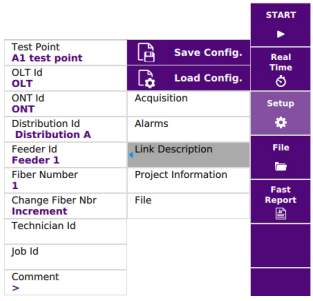
If results are above the thresholds, they will be highlighted in red in the table of results, and the icon will be displayed at the top right of the screen.

If all the results lie within the thresholds (no result is in red), results are displayed in green in the table and the icon is .

Link description

In the **Setup** menu, press **Link Description**.

Figure 3 Link Description parameters



The information entered in the **Link Description** window refer to the cable and fiber under test.. Loading a stored file without its configuration will not modify this menu..

Test Point / OLT Id / ONT Id / Distribution Id / Feeder Id

Those parameters allow to enter an identification for each element of the network using the Edition menu.

Fiber Number

Select the parameter **Fiber Number** and modify the number of the fiber to be tested.

The fiber number can be automatically incremented/decremented at each new file save if it has been configured in the **Change Fiber Nbr** parameter below.

Change Fiber Nbr

Increment	the fiber number is automatically incremented at each new file-save.
Decrement	the fiber number is automatically decremented at each new file-save
No	the Fiber number does not change unless manually modified.
User defined	Use **Edit Number** softkey to enter the increment/decrement value for fiber number.

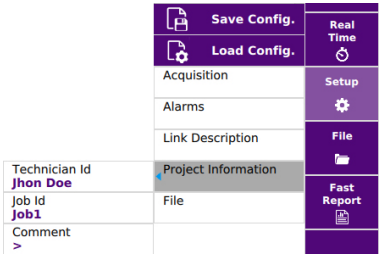
Note: to decrement the number, enter the sign «-» before the number. Example: -1.

Min: -999 / Max: 999 / Auto: 0

Project information

In the **Setup** menu, press **Project information**.

Figure 4 Project Information parameters



Technician Id

Touch to enter the name of the operator carrying out the measurement.

Job Id

Touch to enter a description of the measurement to be performed.

Comment

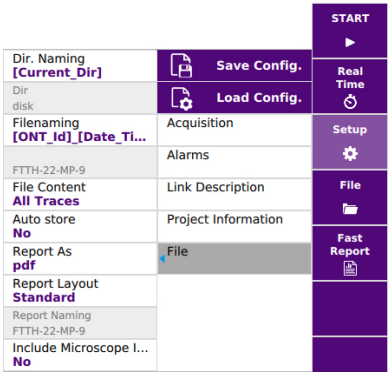
Touch to enter a specific comment to the project..

File information

The File storage parameters can be configured, in order to define how the results traces will be saved onto the equipment.

In the **Setup** menu, press **File**.

Figure 5 File parameters



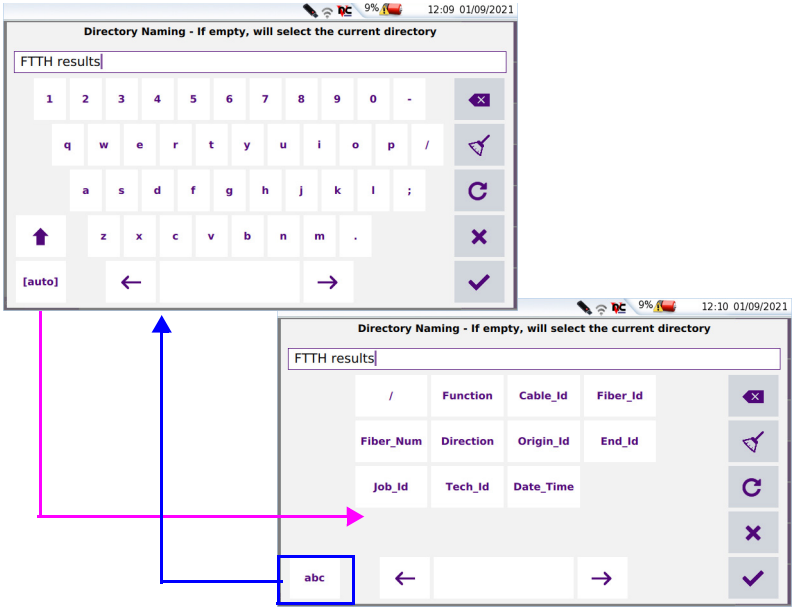
File(s) save in

Click on the text box to display the edition keypad and define the directory target for files saving

Use **/** to define subdirectories. the **[auto]** button allows to use predefined fields based on the link description..

Example: `disk/OTDR/Test`

Figure 6 Directory - Edition keypad



or

Click on  or leave the box empty to select the Current Directory for file saving.

Press  to validate.

Dir

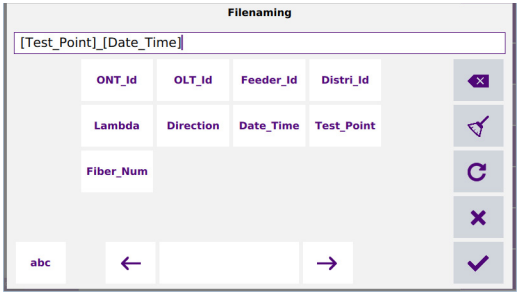
Display the directory path selected/created by default into which the file(s) will be saved.

Filenaming

Select **Filenaming** parameter and click on the text box to modify the name of the file for the result trace.

In the edition keypad, enter file name manually or touch the **[auto]** button to set predefined fields based on the acquisition parameters and the link description..

Figure 7 Filenaming - Edition keypad (auto)



or

Click on  to apply the name by default to the file:

`Fiber[Cable_Id]_[Fiber_Num]_[Lambda]_[Direction]`

The name of the file is displayed in grey under **Filenaming** parameter. Check to validate.

File Content

In this parameter, select the file content for traces saving:

One Trace each trace saved as a separate file (.sor extension).

All Traces all traces are saved in one single file (.msor extension).

One and All Traces
this option combines the two previous ones.

Auto Store

Select **Yes** to store automatically the trace or traces resulting from each acquisition according to the filenaming rules.

Select **Confirm if alarm = Fail** to display a confirmation dialog box if a value exceeds

alarm thresholds, and to be able to choose to save or not the trace.
If no alarm is detected on trace, it is automatically stored.

Report As

Select the report format to be generated:

txt file	select **Yes** to generate a txt file of the results.
pdf file	select **Yes** to generate a report in a pdf file.
json file	select **Yes** to generate a json file.

If all parameters are defined with **No**, only the .sor (or .msor) file will be saved.

Report Layout

This parameter allows to define the report page setting and is available exclusively if a **pdf file** has been defined in the **Report As** parameter.:

Standard	in multi-trace display, one pdf report page is generated for each trace.
Consolidated	in multi-trace display, one pdf report page is generated for all traces

Report naming

If **Consolidated** is defined for **Report Layout**, select **Report naming** parameter and click on the text box to modify the name of the report file for the result trace.

In the edition keypad, enter a name manually for the file and press  to validate.

If no name is entered, the report name by defaut applies: `Report_SM/MM-OTDR`.

Include Microscope Image

In the pdf report, an inspection scope image can be integrated. Select **Yes** to include the scope test result image into the report.

2

FTTH Acquisition and Results

This chapter describes the procedures to launch the FTTH acquisition and the results page content.

The topics discussed in this chapter are as follows:

NOTE

Patented, as described at www.viavisolutions.com/patents.

Launching the acquisition

Once the acquisition hs been correctly configured, the measurement can be started.

Inspect & clean all fiber connections prior connecting fiber cables into the ports (patch panels, OLT or ONT...).

1 Press **START** key to launch measurement.

The red **Test** indicator goes on to show that the equipment is in process of acquisition and the screen displays the trace in process of acquisition.

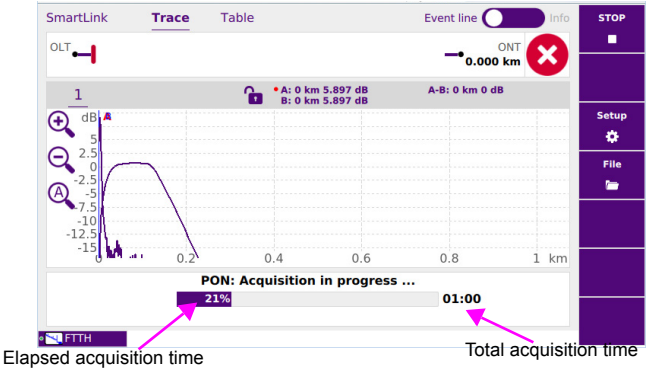
2 The quality of the connection is displayed for a few seconds.

Table 3 Connection indicator

State	Connection 
Good	The connection is OK
Bad	• There are several connectors close to the external connector of the equipment • One of the connectors is dirty or badly connected. Replace the launch cable, make the connection again properly or clean the connector of the OTDR or of the jumper. • No fiber is connected.

3 Then, a bar graph shows elapsed and remaining acquisition time.

Figure 8 Acquisition in progress



At the end of the acquisition, a beep is emitted, the trace is displayed and an automatic measurement is started.

Traffic detection

Traffic on the fiber under test is automatically detected and reported.

Press the **START** key to begin the measurement. A message indicates there is traffic on the fiber and asks you if you wish to continue or not:

- If you click on **NO**, the measurement is not launched.
- If you click on **YES**, the measurement is performed, despite the traffic.

NOTE

If the measurement is validated despite the traffic (key **Yes**), the next measurement will be automatically performed, even if traffic is still detected on fiber.

If the measurement is canceled (key **NO**), and the **START/STOP** pushed another time, the box asking if you wish to continue or not is displayed.

The functioning of Traffic Detection is then indicated in the scaled down representation of trace, on the upper left part of screen: LFD is flashing.

Acquisition with several lasers

If the module possesses several lasers, to perform successive acquisitions on all the wavelengths:

1. In the **SETUP** menu, check in **Laser** line, that several lasers are selected or select **All**.
2. Start the acquisition by pressing the **START/STOP** button.
3. Once the acquisition for the first wavelength is finished, the acquisition for the following wavelength starts automatically.

   or

   To stop manually the acquisition for current wavelength, click on **Stop**. This allows to automatically start the measurement for the following wavelength.

   A beep is emitted once the acquisitions on all lasers are completed.

The different traces appear in the same window and can be managed as traces in overlay (see OTDR User manual).

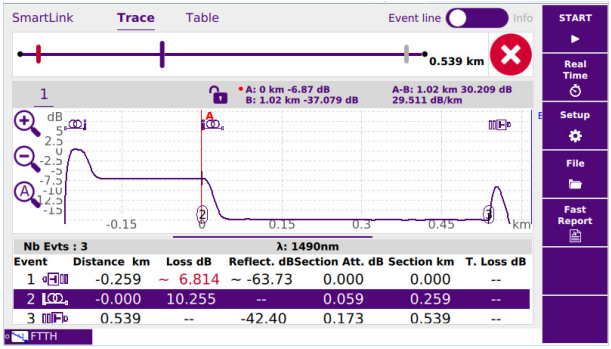
Results page

The trace(s) acquired or recalled from a memory is/are displayed on the Results page.

Trace View

The Trace view is displayed by default once OTDR acquisition is completed.

Figure 9 FTTH OTDR Trace



Press **SETUP** hard key to go back to FTTH Setup screen and modify the parameters before launching a new acquisition.

- On the upper right side, the alarm icon is displayed (if some alarm thresholds are defined in the pre-loaded configuration file).

Table 4 Alarms display

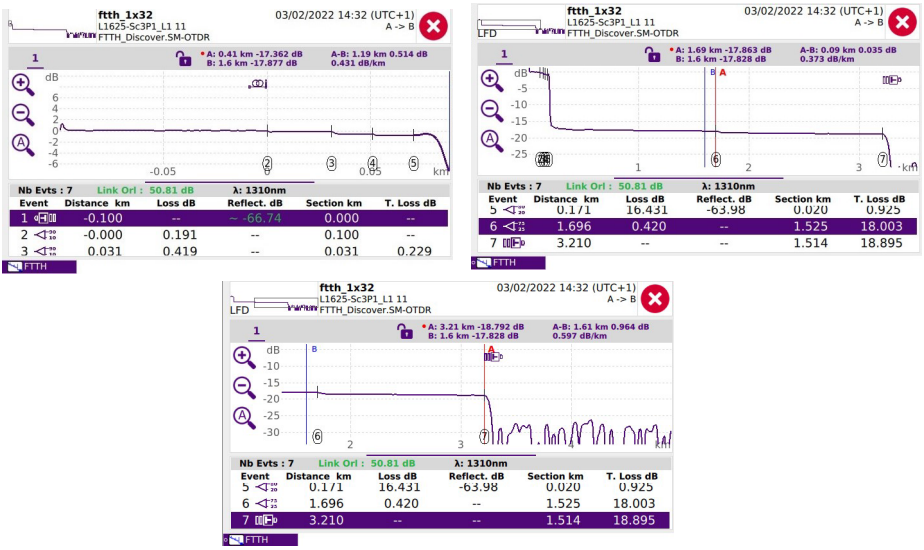
Fail	Indicates that at least one result exceeds the alarm thresholds defined in the configuration file used for acquisition Results are displayed in red in table.
Valid	Indicates that all the results lie within the thresholds (no result in red/yellow) Results are displayed in green in the table.

Multi-pulses traces

In case of multi pluses traces, the display is simplified to handle traces: only the “useful” traces and sections (cut section of traces) are displayed.

Ex: The 7 events detected in the example below are coming from 3 acquisitions, a **combined trace** is created showing only the 3 useful sections.

Figure 10 FTTH results traces in multi-pulses



Common functions on Trace View

Display of events on the trace

Each event detected is referenced under the trace by a serial number. The reflectometry trace is displayed with a dotted vertical line set on the start of launch cable (if the **Launch Cable End** parameter is defined in the **SETUP** menu)

The trace can also be displayed with a dotted vertical line on the end of fiber .

The icon is displayed on trace if the **Receive Cable Start** parameter has been defined in the Setup menu.

The results of the measurements of attenuation, reflectance and slope can be marked on the trace.

The reflectance of a ghost event is displayed in brackets on the trace.

Criteria for display of an event

An event will be displayed if its attenuation or its reflectance exceeds the corresponding threshold selected in the **SETUP** menu (see "Configuring the OTDR test for FTTH network" page 2). Attenuation and reflectance results for an event will be displayed if they can be calculated.

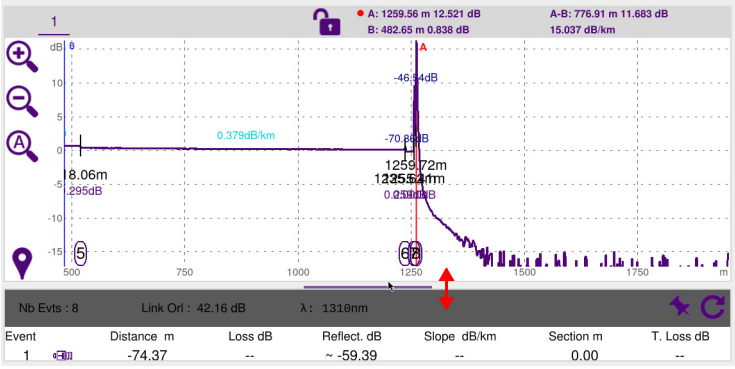
The reflectance of an event is always measured except when the event causes a saturated Fresnel peak or if it is drowned out by noise. In this case, the equipment displays **>** to show that the actual reflectance exceeds the value displayed.

Results table

Under the trace is displayed the results table with all the events detected during acquisition.

The line corresponding to the event nearest to the cursor is highlighted in purple. This highlighting moves if the cursor is moved.

To reduce or enlarge the size of the results table, click and maintain the bar between trace and table and move downward or upward.



At the top of the table, a line shows the generic parameters of the fiber: numbers of events present, total ORL of the link and the wavelength of the active trace in case of multi wavelengths acquisitions.

Each event is referenced under the trace by a number which is repeated in the first column of the table. The table then shows:

- icon symbolizing the type of the event:

	Receive cable Start
	Launch cable End: the attenuation and distances are measured on the basis of the corresponding marker.
	Non-reflective attenuation (e.g. splice).
	Splitter
	Mux/Demux
	Reflective event. (e.g. connector)
	Ghost reflection
	Slope of the fiber (when no fault follows the slope)
	End of fiber
	Front connector
	Bend
	Bend on OTDR Connector
	Unbalanced Coupler
	Manual ORL Measurement
	Front OTDR device
	Front Splitter 1N
	Front Splitter 2N
	Front Splitter N1
	Front Splitter N1
	Front PON first fiber
	Front bend splitter down

	Front bend splitter up
	Front expanded beam connector
	Unbalanced splitter
	Front clustered splitter

The event underlined in purple is the one the nearest of the cursor set on trace. To visualize an event, click on this event on the table to set the cursor on it onto the trace.

The following columns are then displayed next to each event icon:

Distance	The distance of the event from the beginning of the fiber, in meters (or miles)
Loss	The attenuation due to the event, in dB
Reflect.	The reflectance of the event, in dB
Section	The length of the section = the distance between the marker of the event and the previous marker.
T. Loss	The total attenuation of the fiber (total loss), in dB

Cursors

The cursors A and B are represented by vertical lines of different colors:

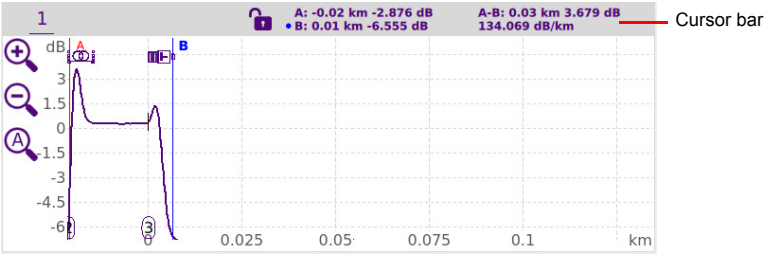
- The A cursor line is displayed in red
- The B cursor line is displayed in blue.

The Cursor position is displayed just above the trace: the active cursor is represented with a red/blue point in the cursor bar.

1 Touch the screen on the required location on trace where the active cursor must be set.

Above the trace is shown the 2-points loss measurement between the two cursors, together with the distance between the two cursors.

Figure 11 Cursors information



Click on the **Lock** icon in order to select both cursors and move it at the same time on the trace, keeping the current space between them:

Zoom function

The Zoom function is used to analyze part of the trace in greater detail.

The zoom is centered on the active cursor.

The position of the section of trace displayed with respect to the complete trace is represented by a rectangle on the mini-trace at the top left-hand corner of the screen, if the **Info** bar is selected.

Click as many times as necessary on the Zoom key or to zoom in or out on the trace.

Click on the **Automatic Zoom** key to swap from an automatic zoom to full trace and vice-versa

Specific functions of the zoom with a touchscreen

With the touchscreen:

- maintain your finger pressed on screen and shift the traces horizontally or vertically
- position your finger on a cursor and move it on trace maintaining your finger pressed and moving it toward left or right

Zooming on the different events in succession

1 Set the cursor on one event

2 Define a zoom on this event.

3 Click on another event in the results table.

The cursor is automatically positioned on this event, which is always centered on the screen, keeping the zoom level selected.

Shift function

The Shift function is used to displace the displayed section of the trace by directly clicking on the touchscreen.

The horizontal shift is performed maintaining the point of intersection between the trace and the selected cursor at the same level, scrolling the trace horizontally while following it vertically, so that it never goes off the screen.

To use this function:

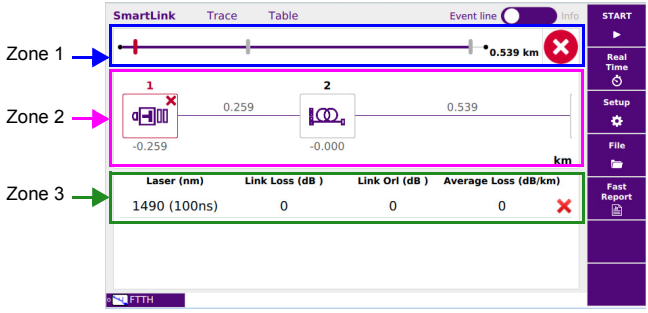
1 Click on the trace.and displace trace manually on touchscreen toward left/right or upward/backward.

SmartLink view

1 Click on **Smart Link** tab.

A screen as the following one is displayed:

Figure 12 SmartLink function



The screen is divided into three zones:

- **Zone 1**: the **Event line**, which is a bar representing the link, with a mark for the different events detected and the alarm status icon, or the **Info bar** with the acquisition parameters of the trace, together with a small-scale representation of the trace.

  This zone can be hided setting the button in the middle of the bar 

  .
- **Zone 2**: Graphical representation of the link, with icons symbolizing the different events detected.
- **Zone 3**: Link Table, which gives a summary of results for each wavelength, with results within/without thresholds in green/red (according to Alarm thresholds defined in the setup screen).

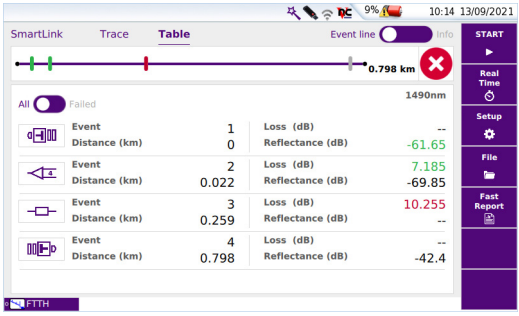
If several traces are displayed in overlay, with the same wavelength, then the Zone 2 indicates the results for each wavelength. The graphical representation of the Zone 1 is a combination of multiple pulses and wavelengths acquisitions.

Table View

1 Click on **Table** tab.

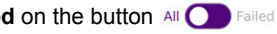
A screen as the following one is displayed:

Figure 13 Table view



The list of all the events detected during acquisition or manually measured are displayed in a table:

- The events exceeding alarm thresholds are displayed in red, whereas those lying withing the thresholds are displayed in green.

  Select **Failed** on the button 

to display exclusively the results exceeding the thresholds

Showing the detailed information of one event

The information concerning the event, its type and the alarm thresholds defined for this event, can be displayed from the SmartLink or Table screen.

1 In SmartLink view, select the event for which information must be displayed, on the graphic.

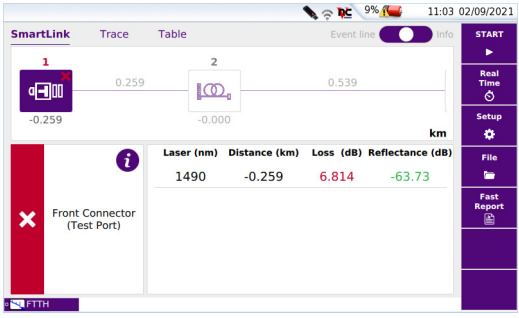
The event is highlighted in purple once selected.  .

A frame displays, and describes:

– the event type

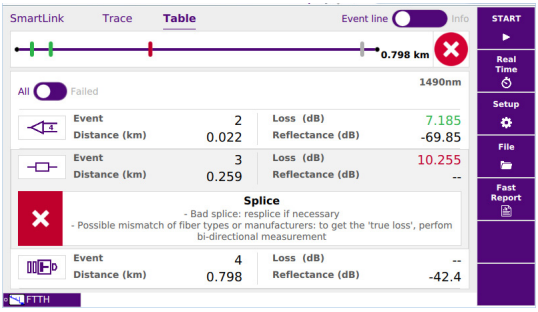
– the value above which it is on defect

Figure 14 Event Details



In **Table** view, click on one event line to display the information under this event

Figure 15 Event detailed



NOTE

The event is displayed with a red icon if it is above the alarm thresholds defined in the setup menu.
A green icon is displayed if it lies within the thresholds.

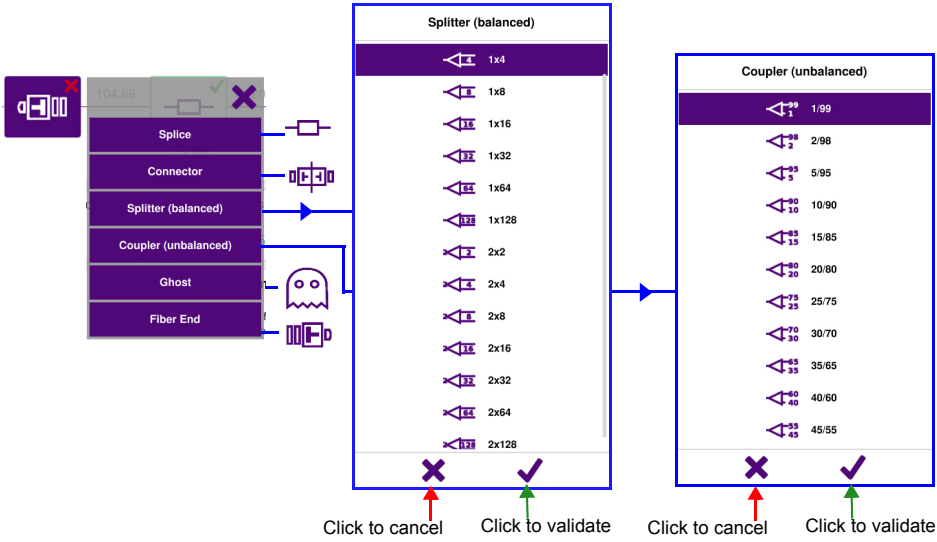
A yellow icon is displayed if the value is above a «Warning» threshold.
No icon is displayed if no alarm has been defined in the Setup menu

Changing the type of an event

The type of event can be modified, either from **Table** view or from **SmartLink** view:

1. Maintain pressed the icon to be modified.
2. In the menu open, select the new type of event to be applied.

Figure 16 Event Code



3 Click on ✓ to validate.

NOTE
The event modification is automatically applied on trace and in the results table.

Click on ✗ to cancel the modification.

3

Options of the FTTH-SLM Software

This chapter describes the options available with FTTH.

The topics discussed in this chapter are as follows:

NOTE
Patented, as described at www.viavisolutions.com/patents.

FTTH Premium software option

The FTTH-SLM Premium is a fully featured software for the characterization of any FTTH infrastructure.

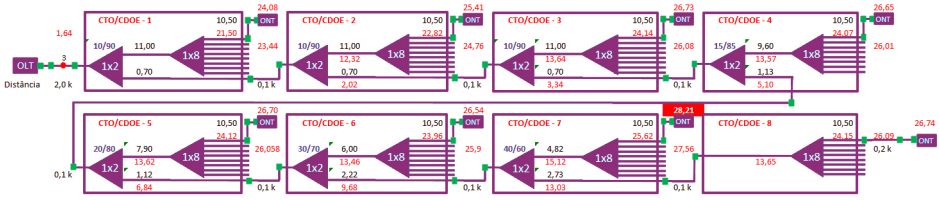
In addition to the auto multi-pulses measurement and PON splitter detection and identification, this option allows:

- the measurement of closely spaced cascaded splitters (< 100m)
- the PON discovery mode
- the management of unbalanced or Tapered splitters
- the compatibility with E2E-SLM (FCOMP).

The Premium software option allows to set the complete cascaded network which includes UNBALANCED or TAPERED optical splitters.
These elements are automatically detected and identified with their respective ratio, and their loss value compared to the setup thresholds.

In case of 2 closely spaced splitters, FTTH-SLM can identify a cluster of splitters, as dictated in the PON configuration settings, and applies the correct pass/fail criteria.

Figure 17 PON Topology



Configuring the FTTH-SLM optimum option

For generic configuration of FTTH measurement, see “Configuring the OTDR test for FTTH network” on page 2. With Premium software option, in FTTH Acquisition Setup page:

1 Define the **PON Config.** parameter to **Unbalanced** in order to configure the unbalanced couplers.

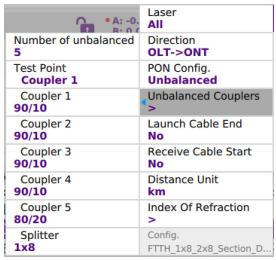
2 In the **Unbalanced Couplers** parameter:

a Set the **Number of unbalanced** couplers per the plan

– Set the ratio for each unbalanced coupler

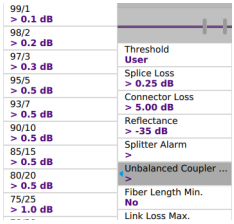
b Set the last **Splitter** ratio (usually 1x8 or 1x16)

c Set the test point: **Last splitter** or **Coupler 1...9**.



3 Once all acquisition parameters defined, click on **Alarms** to define the pass/fail loss thresholds for each **Unbalanced coupler**, if Alarm **Threshold** parameter is defined with **User**:

Select **Unbalanced Coupler Alarm** and define each coupler thresholds: click on left and right arrows to modify the value, or click on **Edit Number** and enter the value on the numeric keypad and validate.



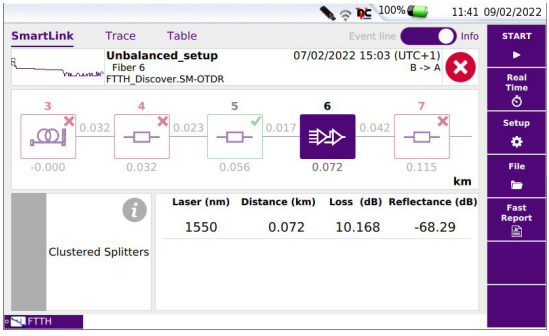
Launching the test and displaying results

1 Once all configuration is correctly defined for FTTH measurement with PON network, press **START/STOP** button to launch the acquisition.

2 Once the acquisition is completed, the SLM results display.

SLM Results

Figure 18 SLM View



The unbalanced or tapered optical splitters are identified with their respective ratio, and their loss value compared to the Alarm thresholds defined.

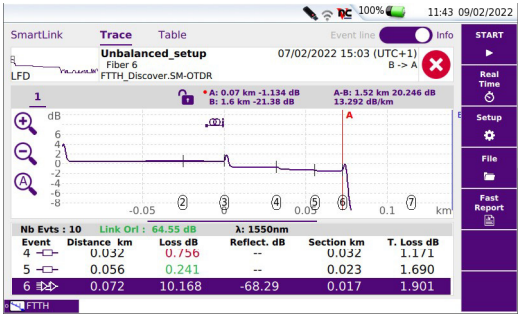
In case of 2 closely spaced splitters, a cluster of splitters is identified, as dictated in the PON configuration settings, and applies the correct pass/fail criteria.

For other SLM functions, see “SmartLink view” on page 23.

Results Trace

Press **Trace** tab to display the FTTH trace.

Figure 19 FTTH «Premium» results trace



For more information on trace features, see “Results page” on page 16.

Specific OTDR features with FTTH option

When the FTTH software option is installed (basic or Premium), the ExpertOTDR function allows to perform OTDR acquisitions for different networks.

1 On the Home page, select **ExpertOTDR** icon.

2 In the **Acquisition** > **Network Config.** parameter, define the network installed:
- **Point to Point**
- **PON**
- **Unbalanced** (only with FTTH Premium option).

In case of **Point to Point** configuration, the parameters are identical to the ExpertOTDR standard configuration.

In case of **PON** configuration, the **Number of Splitters** parameter can be defined: see "Splitters types" page 4).

In case of **Unbalanced** configuration, the **Unbalanced Couplers** parameter can be defined: see step 2 on page 31.

Refer to OTDR Module User Manual for the description of the OTDR Acquisition and results page.

FTTH Assistant

The software option FTTH assistant allows to perform FTTH acquisition with a simple step by step process.

Selecting the configuration file

1 On the **Home** page, select the FTTH icon.

The configuration file selection screen displays.

2 In the selection file screen, select the configuration file to be used for the acquisition.

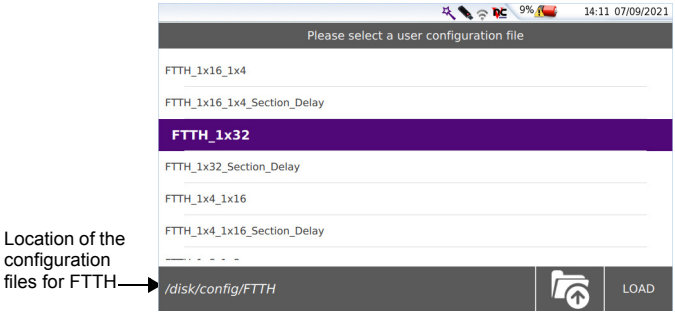
The file is underlined in purple.

NOTE

If necessary click on the key  to reach the upper level of directory.

3 Press **Load** to load the selected file and display the current parameters for this configuration.

Figure 20 Load file as FTTH Configuration

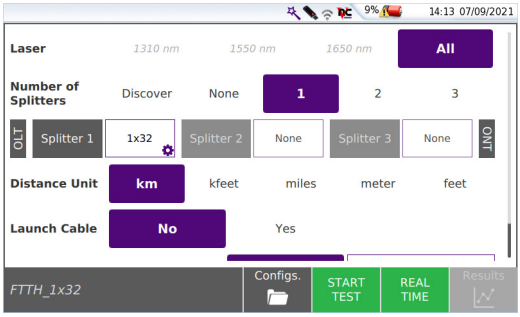


4 Once loaded, the configuration parameters that can be modified displays.

Modifying some parameters before the acquisition

In FTTH Assistant mode, the user have access to 5 parameters he can modified before launching the test.

Figure 21 FTTH-SLM Assistant Setup page

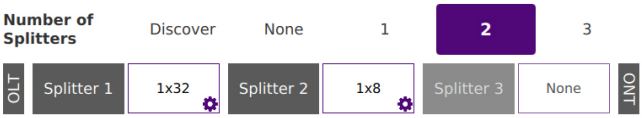


- **Laser** The acquisition will be carried out on the wavelength(s) selected (for multiple-wavelength modules). In case of a multi-wavelength module, select **All** to perform a measurement for all the wavelengths available (this parameter visible exclusively on modules with one single

OTDR port). The possible values depend on the module used.

- **Number of Splitters** see "Splitters types" on page 4.

  If at least one Splitter is defined, the Splitter sub-displays and allows to define the type of splitter:



  For Splitter 1: Discover / 1x2 / 1x4 / 1x8 / 1x16 / 1x32 / 1x64 / 2x2 / 2x4 / 2x8 / 2x16 / 2x32

  For Splitter 2 and 3: Discover / 1x2 / 1x4 / 1x8 / 1x16 / 1x32.

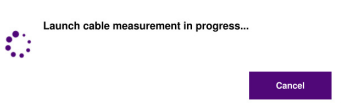
- **Distance unit** select the unit to be used for distance (**km** / **kfeet** / **miles** / **meter** / **feet** / **inch**).

- **Launch cable** Define if the Launch Cable must be taken into account for the acquisition: **No** / **Yes**.
  If **Yes** is selected, set the length clicking on text box and:

  – enter the distance using the numeric keypad.

  or

  – Click on  to perform a measurement of the launch cable: a dialog box informing to connect the launch cable displays. Press  once it is connected to start the measurement.

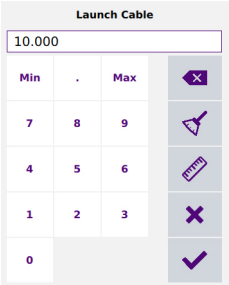


    The dialog box during the process is displayed.

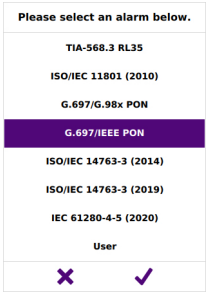
  Once the measurement is completed, the distance is entered in the numeric keypad.

  Click on  to validate (or on  to cancel)

-



- **Alarms** Define if alarms thresholds must be applied for the acquisition:
  Select **No** if no alarm thresholds must be applied.
  Select **Yes** to define alarms, and press **Alarm Level** to define the pre-defined thresholds for the acquisition.



See Table 2 to get the values for each pre-defined alarm thresholds.

The thresholds can be modified only in Expert mode and saved in a new configuration file.

Once all configuration parameters are correctly defined, the acquisition can be launched.

Press the **Config** key to return to configuration selection screen (see Figure 21 on page 34).

Performing a measurement

1 From the **Setup** page, press **Start Test** key START TEST to launch measurement (see Figure 21 on page 34).

or

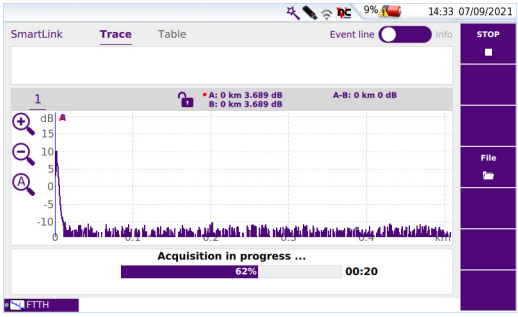
From the **Setup** page, press **Real Time** key REAL TIME (see Figure 21 on page 34).

The red **Testing** indicator goes on to show that the T-BERD/MTS is in process of acquisition and the screen displays the trace in process of acquisition.

2 The quality of the connection is displayed for a few seconds (see Table 3).

3 Then, a bar graph shows elapsed and remaining acquisition time.

Figure 22 Example of acquisition in progress



In «normal» mode, at the end of the acquisition, a beep is emitted, and the measurements are displayed, in SLM view, with a dialog box indicating the pass or fail verdict and asking if results must be saved.

NOTE

During acquisition, the traffic on fiber is automatically detected (see “Traffic detection” on page 15).

Real time acquisition specific features

During an acquisition in real time, several actions can be made on results in progress

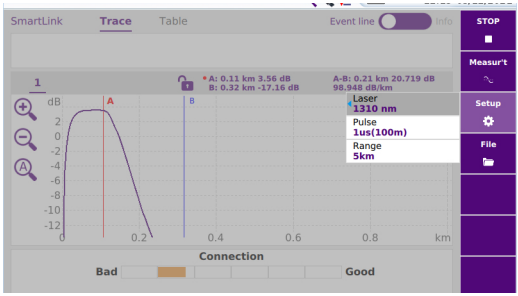
Modifying acquisition parameters (in Real Time mode only)

You can modify the acquisition parameters without returning to the **SETUP** menu.

1 Press the **Setup** key.

2 Use displayed keys to scroll through the possible values of the parameters.

Figure 23 Example of acquisition in Real Time



- To stop or interrupt an acquisition in real time mode, press the **STOP** key at any time.

Performing measurements during acquisition (Real Time mode only)

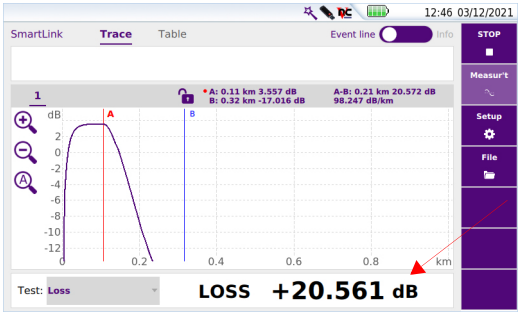
The real time mode allows to make Loss, ORL or Reflectance measurement using the A & B cursors and the key **Loss / ORL / Reflect.**:

1 Position A & B cursors on the trace

2 Click as many times as necessary on key 

to get the measurement between A & B cursors.

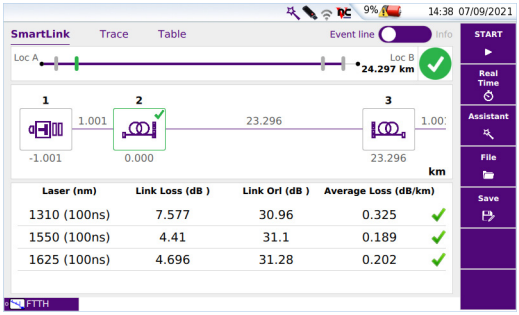
Figure 24 Example of loss measurement



Results display with FTTH-SLM Assistant option

Once the acquisition is completed, the SLM view automatically displays:

Figure 25 SLM View with FTTH-SLM Assistant

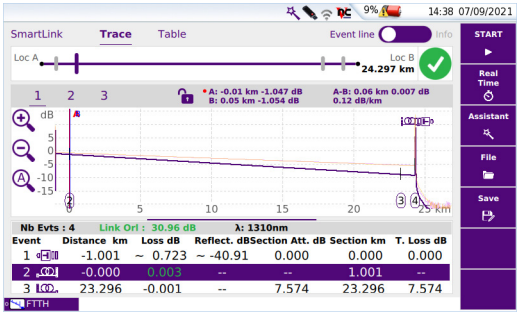


For the menu keys description, refer to the chapter “SmartLink view” on page 23.

Click on **Assistant** to return to configuration screen (see “FTTH-SLM Assistant Setup page” on page 34) and modify some parameters before launching a new acquisition.

Click on **Trace** menu key to display the trace:

Figure 26 Trace view with FTTH-SLM Assistant



Click on **Save** menu key to return to Recording Information screen (see Figure 27 on page 40).

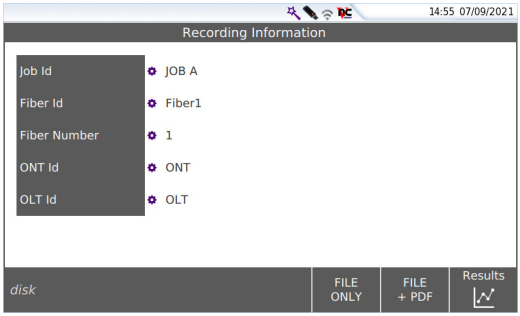
Saving results for FTTH-SLM Assistant

Once the acquisition is completed, the results trace displays, in Smart Link view, with the Save menu keys displayed.

1 Click on **Save** menu key 

to save the results in a file.
The Recording Information page displays

Figure 27 Save results in FTTH-SLM Assistant mode



2 Click on one parameter configuration (white background) to modify it using the edition or numeric keypad displayed:

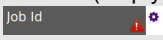
- **Fiber Id**: click on the fiber name currently defined to display the edition keypad and enter a new fiber name.
- **Fiber Number**; click on the fiber number currently defined to display the numeric keypad and enter a new fiber number.
- **ONT Id** / **OLT Id**: click on the ONT/OLT name currently defined to display the edition keypad and enter a new name.
- **Job Id**: click on the Job description currently defined to display the edition keypad and enter a new description.

NOTE

The file is saved automatically by default with the **Job Id** parameter.

Example: if the **Job Id** is defined with *Test Fiber 1*, the otdr filename will be *Test Fiber 1*.sor (name is indicated at the bottom of the screen).

CAUTION

If one of the parameters is not defined (empty), a red caution icon is displayed on the parameter field 

and the file saving is not possible (keys are deactivated).

3 Once the recording information are defined as wished, select the saving mode wished:

– Click on **FILE ONLY** 

to save exclusively the results trace to the .sor format

– Click on **FILE + PDF** 

to save the results trace in a .sor file and to generate a pdf report of the results.

Click on Results 

to return to Smart Test result view.

4

File saving and report generation

This chapter describes the FTTH results saving and the report generation.

The topics discussed in this chapter are as follows:

NOTE

Patented, as described at www.viavisolutions.com/patents.

Saving the trace(s) and generating a report

Once the results page is displayed, the trace(s) can be saved and a report can be generated directly from the results screen.

Saving and report can have been automatically generated if, in the file configuration, the **Auto Store** parameter has been set to **Yes** (see page 11) with the appropriate **Save Mode**.

NOTE

The Save process is different for FTTH-SLM Assistant option (see “Saving results for FTTH-SLM Assistant” on page 40), and the report generation is not available with this option.

Saving results and creating a report from results page

To save the trace and generate a report:

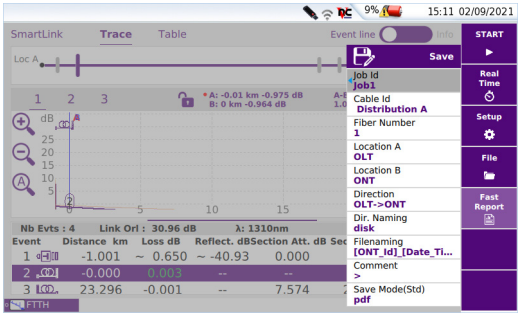
1 Press **Fast Report** key 

.

A menu displays under the trace.

2 In the menu, configure the file saving mode (and the report).

Figure 28 Fast report configuration



a Define a **Job Id** and **Cable Id**.

b Modify the **Fiber Number**.

c In the **Location A** and **Location B** parameters, enter/modify the name of Origin and Extremity.

d In the **Direction** parameter, select/modify the direction, to define if the measurement has been performed from Origin to Extremity (**A -> B**) or from Extremity to Origin (**B -> A**).

e Click on **Dir. naming** text box and enter the directory path (see "File(s) save in" page 9).

or

In the edition keypad, click on key to define the current directory as directory for file saving.

f Click on **Filenaming** text box and enter a name for the file in the edition keypad (see Figure 7 on page 11).

or

In the edition keypad, click on key to apply the auto filenaming (see "Filenaming" page 11).

g If wished, enter a **Comment** clicking in the text box to display the edition keypad.

h In the **Save Mode** parameter, select the report format to be generated:

- **txt file** select **Yes** to save the results in a .sor file and to generate a txt file of the results.
- **pdf file** select **Yes** to save the results in a .sor file and to generate a report in a pdf file.
- **json file** select **Yes** to save the results in a .sor file and to generate a json file.

If all parameters are defined with **No**, only the .sor (or .msor) file will be saved.

3 Once all the parameters are configured, press **Save** key Save.

4 Enter a name for the file in the edition keypad.

or

Click on to apply the file name defined in the Setup screen, in **Filenaming** parameter (see page 11).

5 Press **Enter** to validate

NOTE
The sor file and the txt or pdf file will have the same name.

Once saving is completed, a sound is emitted onto the Platform.

NOTE
The file and the report are saved in the last storage media and directory selected.

NOTE
To modify the directory into which the report will be saved, click on the header of the **Saving** Edition keypad to display the **Directory** keypad and enter a new path for the directory.

Opening a report

1. To open the report, press **File** menu key from results page.
2. In the **Explorer** page, in the directory selected, select the file/report.
   The file name is:
   For the txt file: *trace file_sor.txt*
   For the pdf file: *trace file.sor.pdf*
3. Press **Load**.
   The file opens on the T-BERD/MTS.

Figure 29 Fast Report with FTTH-SLM option

CAUTION

To modify the VIAVI logo, set by default on the header of the pdf report, save your logo in a jpg file called `logo.jpg` and place it to the root of the disk: `disk > logo.jpg`.

NOTE

A pdf report can also be generated from the File Explorer page onto the T-BERD/MTS (see OTDR User manual).

E4100M02/UM/02-22/AE
Rev 000, 03-22
English

VIAVI Solutions

North America:	**1.844.GO VIAVI / 1.844.468.4284**
Latin America	**+52 55 5543 6644**
EMEA	**+49 7121 862273**
APAC	**+1 512 201 6534**
All Other Regions:	**viavisolutions.com/contacts**
email	**TAC@viavisolutions.com**
address	**6001 America Center Drive, San Jose, CA, 95002, USA**