



SmartOTU (EOTU8000E)

Optical Test Unit

Rack-based optical test unit for RFTS (Remote Fiber Test System)

User's Guide

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Manual

This guide is a product of SmartOTU's Technical Information Development Department. This manual gives you the main information to install, start and use the SmartOTU.

WEEE Directive Compliance

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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. In the European Union, all equipment and batteries purchased from Viavi after 2005-08-13 can be returned for disposal at the end of its useful life. Viavi will ensure that all waste equipment and batteries returned are

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It is the responsibility of the equipment owner to return equipment and batteries to Viavi for appropriate disposal. If the equipment or battery was imported by a reseller whose name or logo is marked on the equipment or battery, then the owner should return the equipment or battery directly to the reseller.

Instructions for returning waste equipment and batteries to Viavi can be found in the Environmental section of Viavi's web site at www.viavisolutions.com. If you have questions concerning disposal of your equipment or batteries, contact Viavi's WEEE Program Management team..



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About This Guide

Topics discussed in this chapter are as follows:

- “Purpose and scope” on page xii
- “Assumptions” on page xii
- “Technical assistance” on page xii
- “Recycling Information” on page xii
- “Conventions” on page xii

Purpose and scope

The purpose of this guide is to help you successfully use the SmartOTU features and capabilities. This guide includes task-based instructions that describe how to install, configure, use, and troubleshoot the SmartOTU. Additionally, this guide provides a complete description of Viavi's warranty, services, and repair information, including terms and conditions of the licensing agreement.

Assumptions

This guide is intended for novice, intermediate, and experienced users who want to use the SmartOTU effectively and efficiently. We are assuming that you have basic computer and mouse/track ball experience and are familiar with basic telecommunication 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 key-strokes.	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.

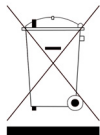


This symbol represents a risk of electrical shock.



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.

Description

This chapter describes the SmartOTU.

Topics discussed in this chapter are as follows:

- [“Introduction” on page 2](#)
- [“Monitoring view” on page 2](#)
- [“SmartOTU Setup” on page 4](#)

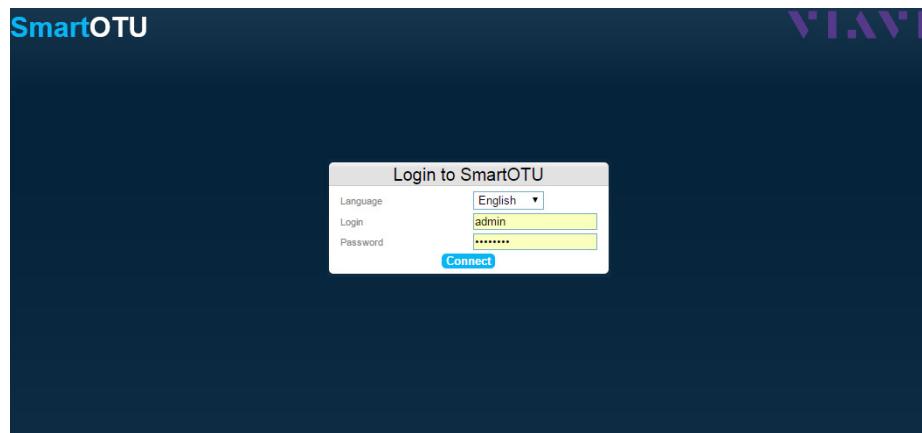
Introduction

Before using the SmartOTU web application, make sure your SmartOTU is correctly installed (see the "Quick guide").

Connect to the SmartOTU via your web browser (IE9 and higher, Chrome, Firefox) from your PC.

Open your web browser: fill your URL: `http://otu-8000e-xxxx` where `xxxx` is the serial number of your SmartOTU (your SmartOTU is in DHCP mode by default) or `http://xxx.xxx.xxx.xxx` where `xxx.xxx.xxx.xxx` is the SmartOTU IP address.

Figure 1 SmartOTU Login page



On the SmartOTU login page:

- 1 Select the language you wish to use, in the list.
- 2 Enter your Login: **admin**.
- 3 Enter your Password: **password**.
- 4 Click on **Connect**.

The monitoring view page is displayed by default

Monitoring view

The SmartOTU monitoring view is divided into 3 parts:




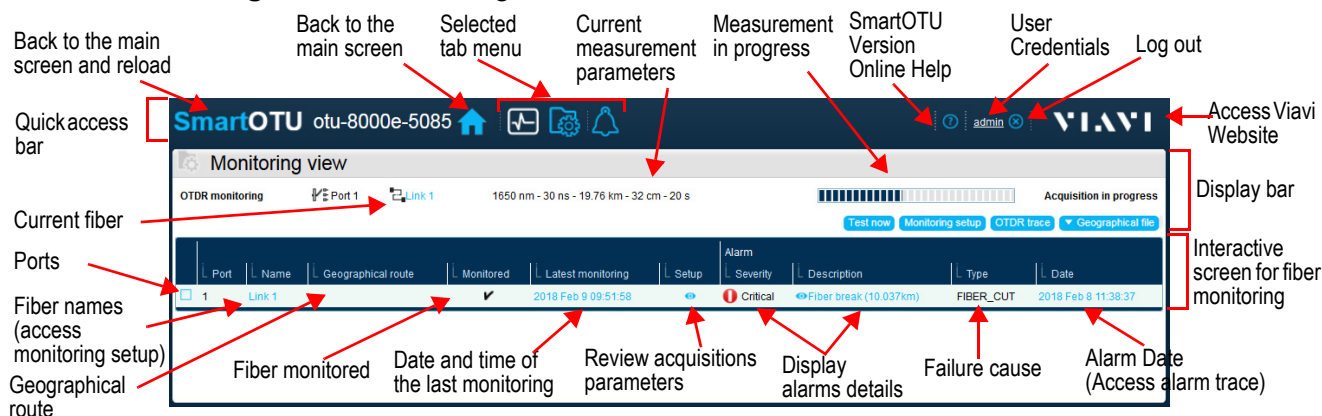
- The Quick access bar provides shortcuts to the main screens:
 - monitoring view 
 - SmartOTU Setup 
 - SmartOTU system alarms 
 - user credentials
- The display bar shows the current measure in progress with its parameter.
- The table lists all SmartOTU ports with their OTDR monitoring and optical alarms

Figure 2 Monitoring view



Quick access bar details

It offers a menu with the following actions:

SmartOTU Reload the page and display the main screen.



Display the main screen.



Selected tab menu: Monitoring view or Main Screen, SmartOTU Setup and SmartOTU System alarm: click on the icon, you should see a Pop up box with all SmartOTU system alarms

(Icon color changes from blue (unselected) to blue/light blue (hover) and white (current selected))



Help Icon: A menu pop-ups with Online help and About SmartOTU choice menu. The first gives access to SmartOTU Online Documentation and the second notifies the SmartOTU version

Click on **Close** to return to the main Screen (Monitoring view).



Edit user preferences.

Click on **Edit** for modifying login and password. Click on **Save** to confirm your selection.



Quick Access for Viavi website.

Display bar

It shows the OTDR Monitoring in progress with possibility of modifying and adjusting the current acquisition parameters.

- Direct access to the Monitoring setup tools of the current selected port.

NOTE

To activate the three right buttons Test now, Monitoring setup and OTDR trace, it is necessary to select one port in the interactive screen (grey buttons turn to blue).

SmartOTU Setup

Figure 3 SmartOTU configuration

Fiber monitoring is running Optical Switch Setup Maintenance Tool

The screenshot shows the SmartOTU configuration interface. The top bar includes the title 'SmartOTU', a user icon 'otu-8000e-sd', and a 'Maintenance' button. The main content area is divided into several sections: 'Network' (HostName, Firewall, IPv4, IPv6), 'OTDR module' (Position, Type, Serial Number, Wavelength), 'Email' (Email enabled, SMTP Server, Login, Password), 'SMS' (Sms enabled), 'Optical Switch' (Serial Number, Inputs, Outputs), 'Snmp' (Snmp v2 enabled, Download OTU MIB), and 'Autotest' (Autotest history, Start autotest, Daily autotest start time). Annotations with red arrows point to various elements: 'Display bar' points to the top bar; 'Ethernet Setup' points to the Network section; 'Firewall Setup' points to the Firewall section; 'OTDR module Setup' points to the OTDR module section; 'Email Setup' points to the Email section; 'SMS Setup' points to the SMS section; 'Edit to modify Setup' points to the 'Edit' button in the Snmp section; 'SNMP Setup' points to the 'Test' button in the Snmp section; and 'Refresh Auto test History' points to the 'Refresh' button in the Autotest section.

Display bar

Ethernet Setup

Firewall Setup

OTDR module Setup

Email Setup

SMS Setup

Edit to modify Setup

SNMP Setup

Refresh Auto test History

Firewall setup

Firewall Enabled: Only input Ports 80, 443, 22 are open

Fiber Monitoring

This chapter describes the SmartOTU.

Topics discussed in this chapter are as follows:

- “Principle” on page 6
- “Initial setting of the reference trace” on page 6
- “Change the reference trace” on page 9
- “Momentarily stop the monitoring” on page 11
- “Prohibit OTDR measurements” on page 11
- “View of the latest monitoring cycle trace” on page 12
- “Test a fiber immediately” on page 12
- “Short acquisition” on page 12
- “Peak Monitoring” on page 13

Principle

The monitoring is based on comparison between a reference acquisition and the current acquisition.

The reference trace is composed of two acquisitions (these dual acquisitions is called SmartAcq):

- An acquisition using a short pulse to minimize the front end dead zone
- An acquisition using an appropriate setting to cover the whole fiber or user's acquisition parameters



NOTE

After an upgrade from a software release that did not support "SmartAcq", SmartAcq can be enabled by executing the command "OTU:TOPAZ:MON:MOD HIGH" in Maintenance Window. Links will need to be deleted and re-created to be monitored with SmartAcq.

A first marker is placed after the front end dead zone and a last marker is placed at the end of the trace.

If a fault occurs before the first marker, it is classified "injection fault".

The deviations between the reference and the actual trace are compared against threshold.

If a threshold is crossed, an alarm is generated with a severity according to the type of level (minor, major, critical) which is crossed.



NOTE

For legacy monitoring principle, refer to ["Appendix A" on page 57](#).

Initial setting of the reference trace

To set up the reference trace, from the monitoring view window:

- 1 Select the switch port
- 2 Click on **Monitoring setup**.
A pop up window is displayed that proposes to setup the OTDR parameters automatically (Click on **Manual** to change it).
- 3 Click on **Start** to start the OTDR acquisition.

Figure 4 OTDR setup

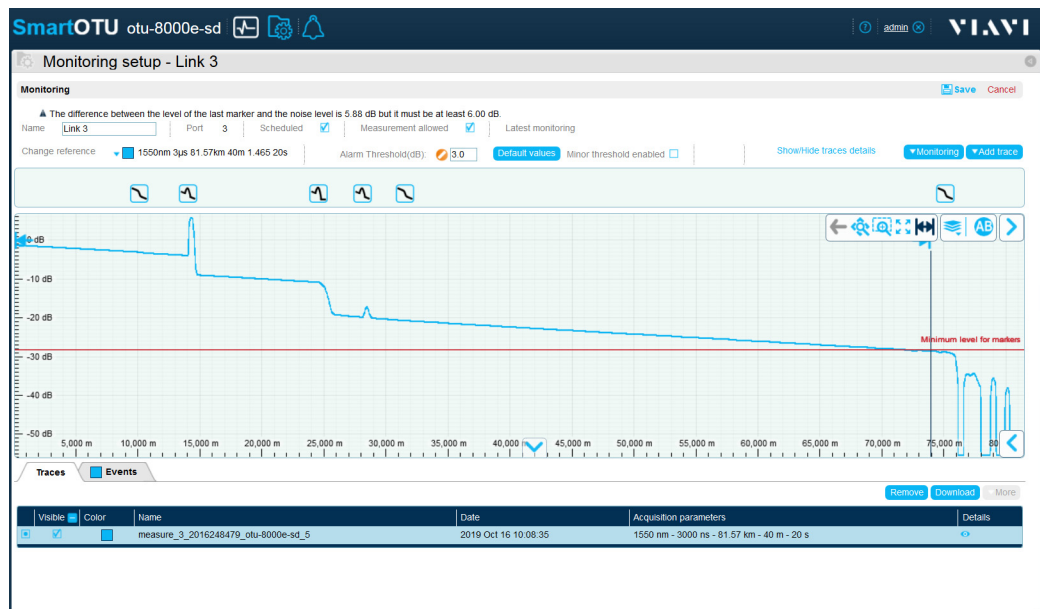
OTDR measurement - Port 3

Port	Port-3
Wavelength	1550 nm
Smart Acq	<input checked="" type="checkbox"/>
Acquisition mode	<input checked="" type="radio"/> Auto <input type="radio"/> Manual
Pulse Width	Auto
Range	Auto
Resolution	Auto
Fiber index	Auto
Acquisition time	Auto

Start
Close

After the OTDR acquisition is completed, it is displayed with the 2 markers automatically positioned.

Figure 5 OTDR acquisition





If desired the markers can be moved. Click on open menu  button at the right top corner of the trace then click on .

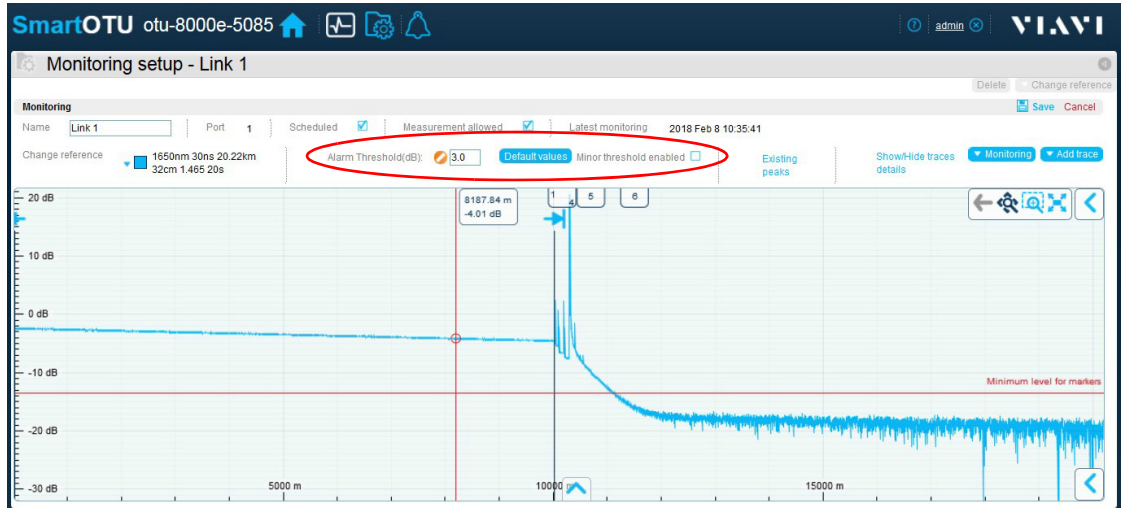
Figure 6 Moving a marker



The name given to the monitored fiber can be changed. By default it is set to **Link** followed by the switch port number (Ex: *Link 2* for *Port 2*)

The thresholds can be changed by setting the **major** and **minor** thresholds

Figure 7 Attenuation thresholds



Once the change is made click on **Save** on the top right of the window.



NOTE on DWDM Measurement Setup

With DWDM, monitoring principle doesn't change, only the measurement Setup differs: you have to select the DWDM canal instead of the wavelength.

Figure 8 DWDM Setup

Once the measurement ends, the OTDR trace displays for the corresponding canal.

Figure 9 DWDM acquisition



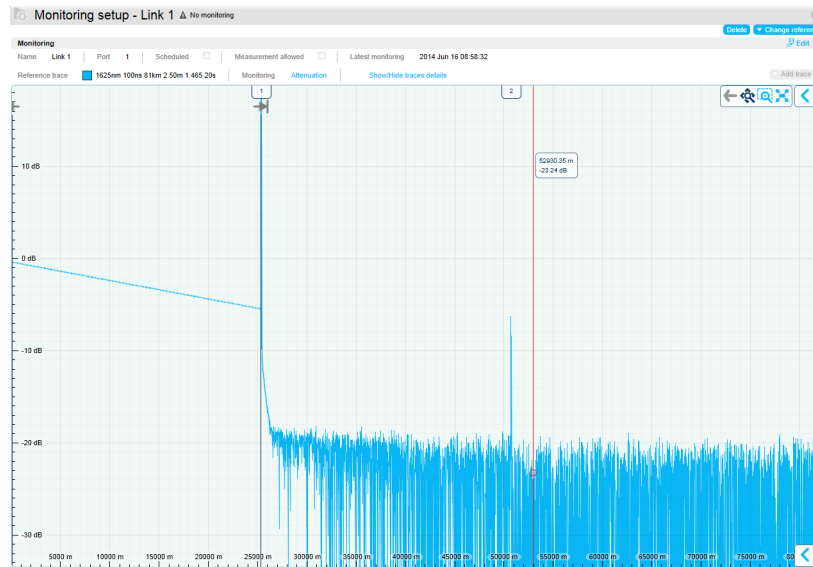
Then, proceed as described previously.

Change the reference trace

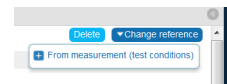
After the fiber is modified (repair, connection change) the reference trace must be modified to match the latest fiber change.

From the monitoring view window, click on the fiber name to display the current reference trace.

Figure 10 Reference Trace

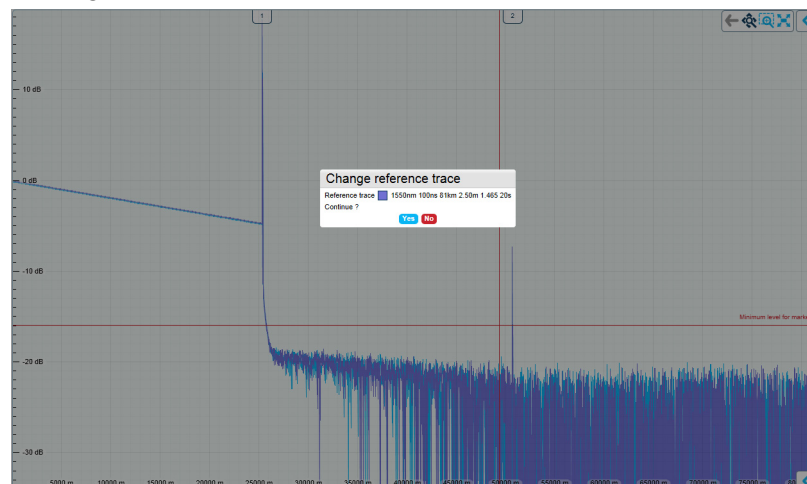


On the right top of the window click on **Change reference**. The current reference trace can be replaced by a new measurement



After the new trace is displayed in dark blue, the change needs to be confirmed:

Figure 11 Change reference trace confirmation



After it is confirmed, click on **Save** to finish the reference trace change.

If the change is not confirmed, additional OTDR traces can be displayed from the button **Add trace**. Among the displayed trace, the reference trace is selected with the button **Reference trace**.

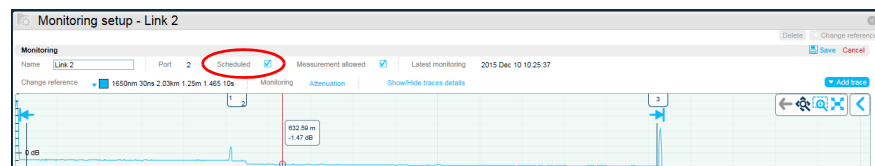


Momentarily stop the monitoring

To stop the monitoring, from the monitoring view window,:

- 1 Click on the fiber name to display the current reference trace
- 2 Click on **Edit**
- 3 Unmark **Scheduled** parameter.
- 4 Click on **Save** to register the modifications.

Figure 12 Monitoring Stop

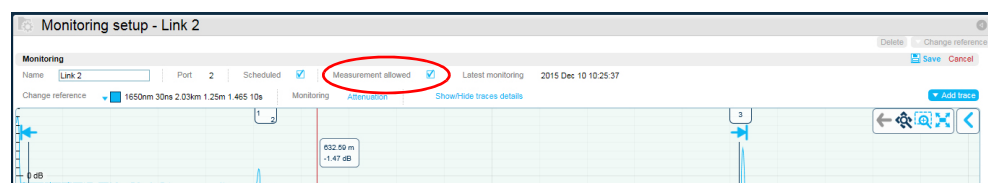


In the monitoring view the column **Monitored** is unmarked when the scheduling is stopped.

Prohibit OTDR measurements

When technicians work on the fiber, it may be safer to prohibit all the measurement on the fiber to prevent eye damage with the OTDR laser.

Figure 13 Prohibit OTDR measurements



To prevent the measurements (monitoring or manual) on a fiber, from the Monitoring view window, click on the fiber *Name* to display the current reference trace, then click on **Edit** and unmark **Measurement allow**. Click on **Save** to register the modifications.

In consequence:

- In the monitoring view the column *Monitored* is unmarked when the measurement is blocked.
- The button OTDR trace measurement is not displayed from OTDR trace window
- The button **Test now** is not available from the monitoring view

View of the latest monitoring cycle trace

The OTDR trace obtained from the latest monitoring test is kept. It can be displayed by clicking on the *Latest monitoring* timestamp from the Monitoring view window.

Figure 14 Latest monitoring test - OTDR trace

Port	Name	Monitored	Latest monitoring	Setup	Alarm Severity	Description	Type	Date
1	Link 1		2014 Jun 16 08:58:32					
2	Link 2		2014 Dec 10 10:31:23					
3	Link 3		2014 Jun 12 17:51:33		Critical	Fiber break (49.604km)	FIBER_CUT	2014 May 23 18:39:13
4								
5	Link 5	✓	2014 Jun 19 09:28:32					

It is useful to check the current trace after a repair or to understand why an alarm is not cleared.

Test a fiber immediately

To short cut the monitoring cycle:


- 1 Select the switch **Port**  to be tested.
- 2 Click on **Test now** button

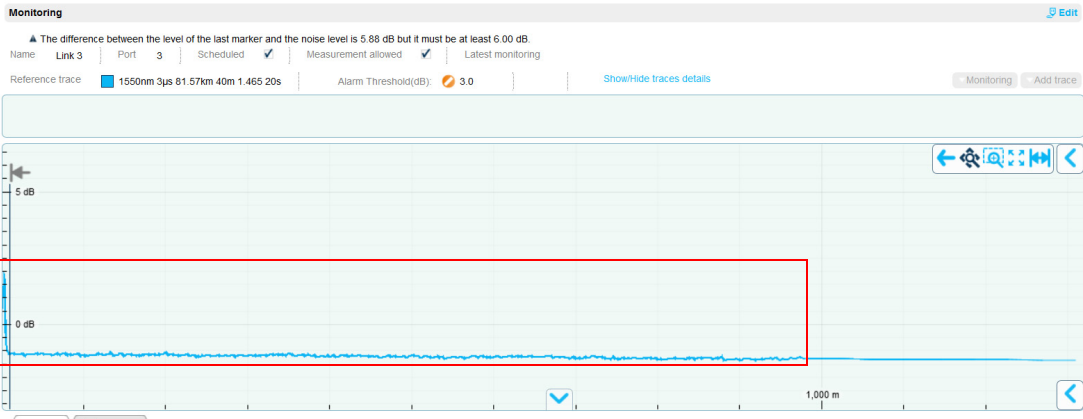
Figure 15 Test a fiber

Port	Name	Geographical route	Monitored	Latest monitoring	Setup	Alarm Severity	Description	Type	Date
1									
2	Link 2	Etoile_Congres_0	✓	2015 Dec 10 09:22:58		Critical	Fiber break (506m)	FIBER_CUT	2015 Dec 8 15:48:51
3									
4									
5									

Short acquisition

A short acquisition is included in the reference acquisition to monitor the beginning of the fiber.

Figure 16 Short acquisition



Peak Monitoring



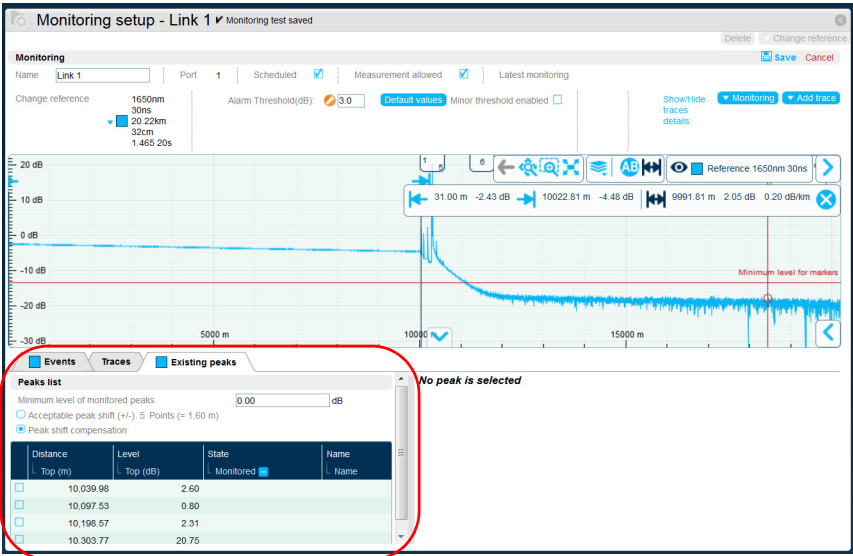
CAUTION

This monitoring is available with the software License peak monitoring (PEAK_MON).

Any peak shift or level change will trigger an alarm.

- 1 From the **Monitoring Setup** screen, click on **Edit**.
- 2 Click on **Monitoring > Existing peak** to open the configuration window.
- 3 Under the trace, the new tab **Existing peaks** is displayed.

Figure 17 List of monitorable peaks



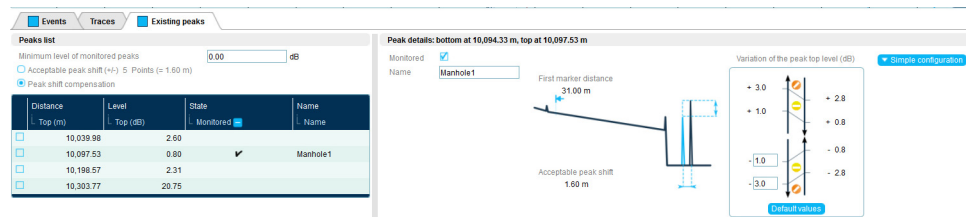
The peak list contains the peaks with a level greater than **Minimum level of monitored peaks**. If necessary, modify this parameter in order to reduce/raise the list of monitorable peaks.

Peak positions can move because of environmental effect (temperature) or network change (patch cord change). The two options below define how to manage this change.

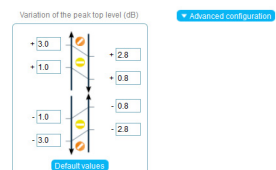
- "Acceptable peak shift" defines the tolerance of peak position change
- "peak shift compensation" adjusts the peak position automatically if it has not moved more than the acceptable shift. The latest peak position becomes the reference.

- 4 Select one peak on the table to define the name and a threshold for this peak and select the **Monitored** parameter.

Figure 18 Configuring the monitored peak threshold



- 5 Configure the threshold, in dB.
Default values: 1 dB for minor / 3 dB for major
- 6 Click on the right button and select **Advanced configuration** to manually define the hysteresis; if not selected the hysteresis is calculated automatically (0.2 dB).
- 7 Press **Save** to validate the peak monitoring configuration



High Sensitivity Monitoring



NOTE

This function is available with an OTDR D Module and the High Sensitivity license.

The aim of this function is to detect faults of 0.1 dB or less.

- 1 To configure the High Sensitivity monitoring test, click on Monitoring Setup > Monitoring Setup High Sensitivity.

A pop up window is displayed that proposes to setup the OTDR parameters automatically (Click on **Manual** to change it).

- 2 Click on **Start** to start the OTDR acquisition.

Figure 19 OTDR setup

OTDR measurement - Port 3

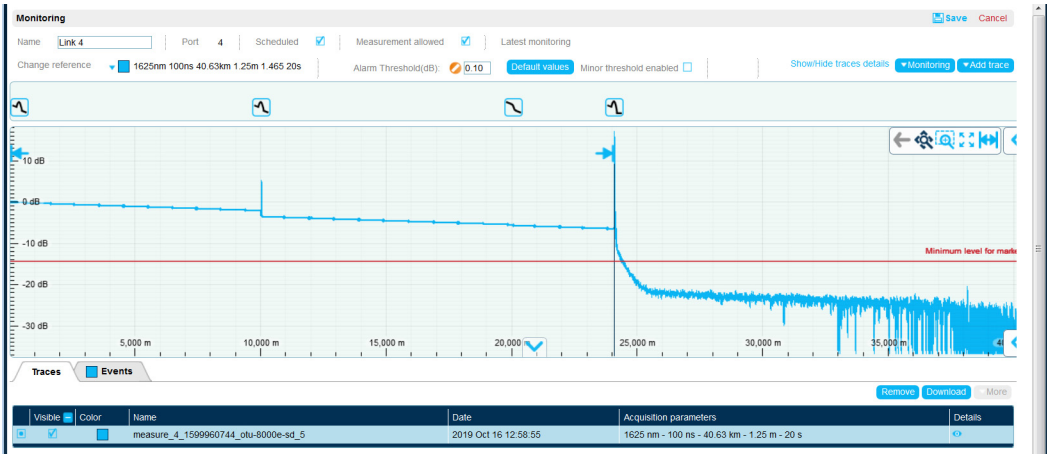
Port	Port-3
Wavelength	1550 nm
Smart Acq	<input checked="" type="checkbox"/>
Acquisition mode	<input checked="" type="radio"/> Auto <input type="radio"/> Manual
Pulse Width	Auto
Range	Auto
Resolution	Auto
Fiber index	Auto
Acquisition time	Auto

Start

Close

After the OTDR acquisition is completed, it is displayed with the 2 markers automatically positioned.

Figure 20 OTDR acquisition



The thresholds can be changed by setting the **major** and **minor** thresholds. By default, with High Sensitivity monitoring, major threshold is set to 0.1 dB. Once the change is made click on **Save** on the top right of the window.

Trace Viewer

This chapter describes the trace viewer on the SmartOTU.

Topics discussed in this chapter are as follows:

- [“OTDR trace color codes” on page 18](#)
- [“Overview” on page 18](#)
- [“Details on selected Trace” on page 20](#)
- [“Adjusting thresholds for reference trace” on page 22](#)

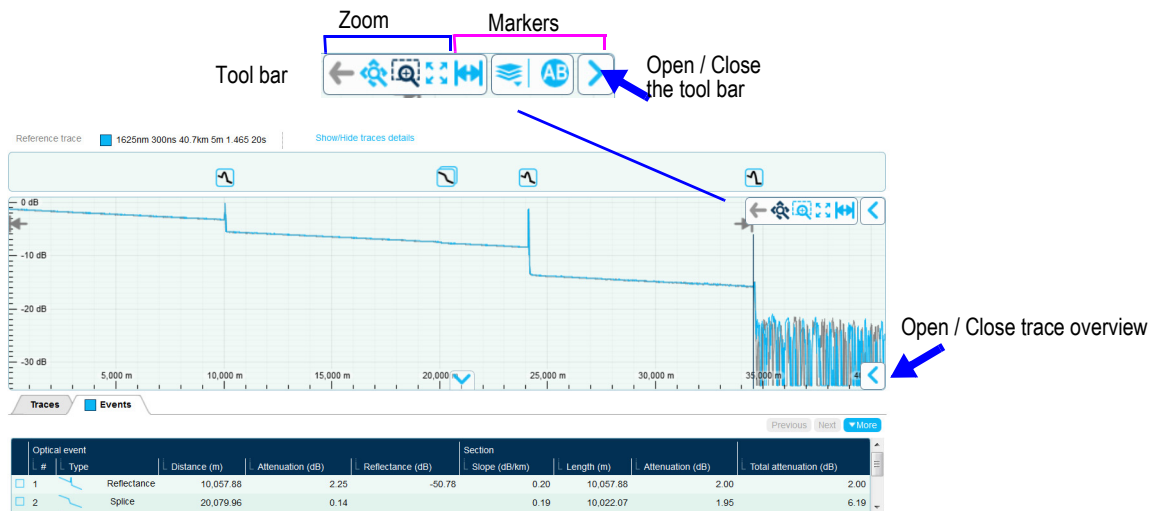
OTDR trace color codes

The color of the OTDR traces are different according to the type of trace:

- Light Blue: reference trace
- Dark blue: latest test
- Red: Alarm trace
- Grey: Measurement on demand

Overview

Figure 21 Trace overview



Zoom

The Zoom tool bar allows to apply different zooms on trace:



Fit to content (zoom release)

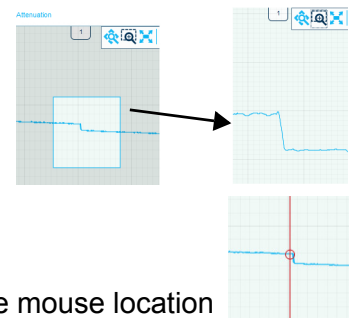


Fit to content (zoom release)



Pan and Zoom in/out with the mouse wheel

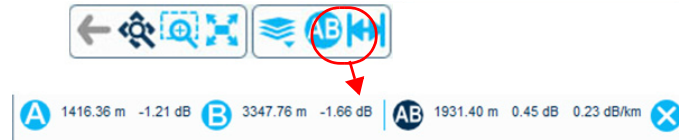
- With any zoom tool, zoom in or out around the mouse location



A & B markers

The markers tool bar allows to get details on markers A & B positions on trace.

Figure 22 Markers details

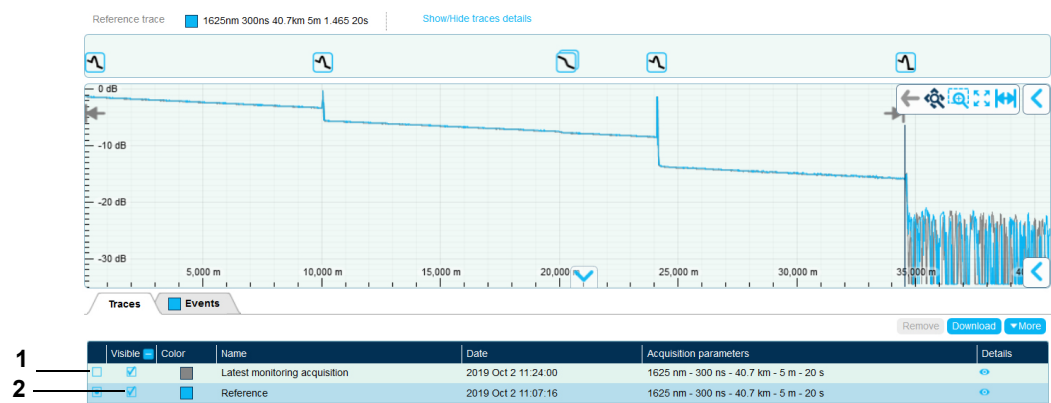


- A** **A** marker detail with distance from origin and level
Can select this tool to place **A** marker to a new position then drag and drop
- B** **B** marker detail with distance from origin and level
Can select this tool to place **B** marker to a new position then drag and drop
- AB** Distance, attenuation and slope between **A** and **B** markers

Multi trace

The multi-trace tool bar allows to change the active trace and to get details related to the selected trace.

Figure 23 Multi trace tool bar



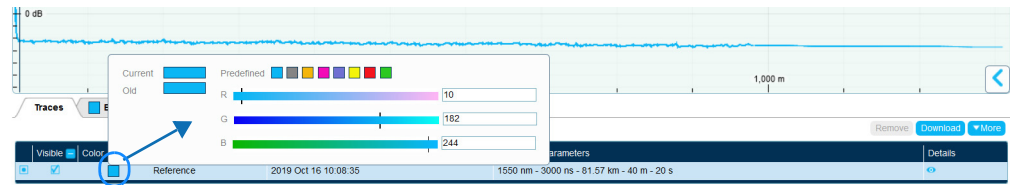
- 1 Click on the first check box to select the active trace.
- 2 Click on the **Visible** check box to display/hide the trace.

- Events, results, acquisition details related to the selected trace
- Can change selected trace by clicking in front of the colored square

Multi trace details

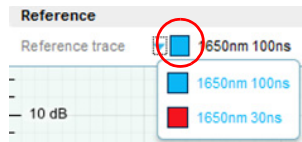
- Click on the color square to change the color of the trace.

Figure 24 Change trace color



- Click on the arrow to change the Reference trace.
This will be modify the running test configuration.

Figure 25 Change the reference trace



Details on selected Trace

Showing the events table



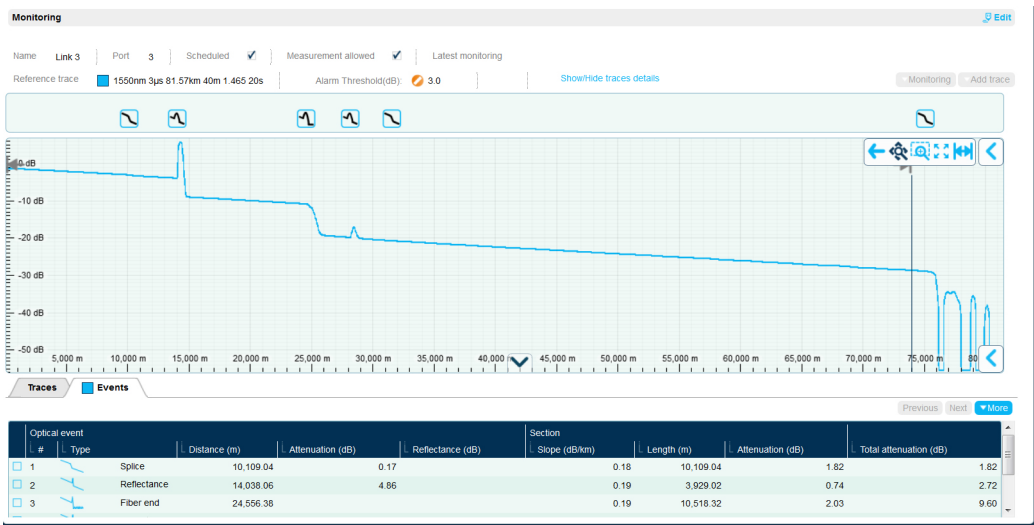
The Events table is accessible clicking on the icon  at the bottom of the trace (click on the icon  to hide the window).

Figure 26 Show the details on selected trace



Displaying the events details

Click on the event of the upper banner or in the event table.

Figure 27 Event details on trace

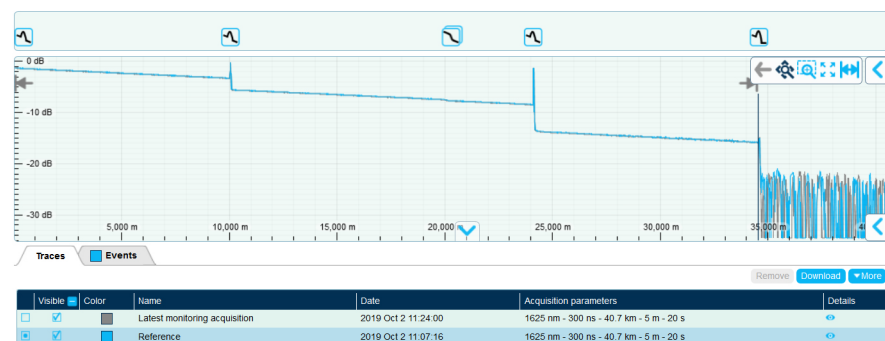


- When multiple events close, can move to the next event from the top box

Setup details

- To display the details on OTDR acquisition, click on the **Traces** tab.

Figure 28 Details on trace



All the acquisition parameters are displayed for all the traces on screen.

First and Last markers

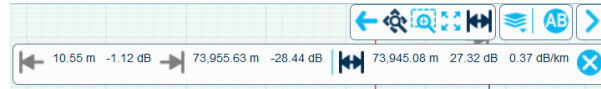


NOTE




This function is available exclusively for the reference trace.

Click on  to open the First and Last markers tool bar:

Figure 29 First and Last markers tool bar



This tool bar allows to get details on the first and last markers position on trace:

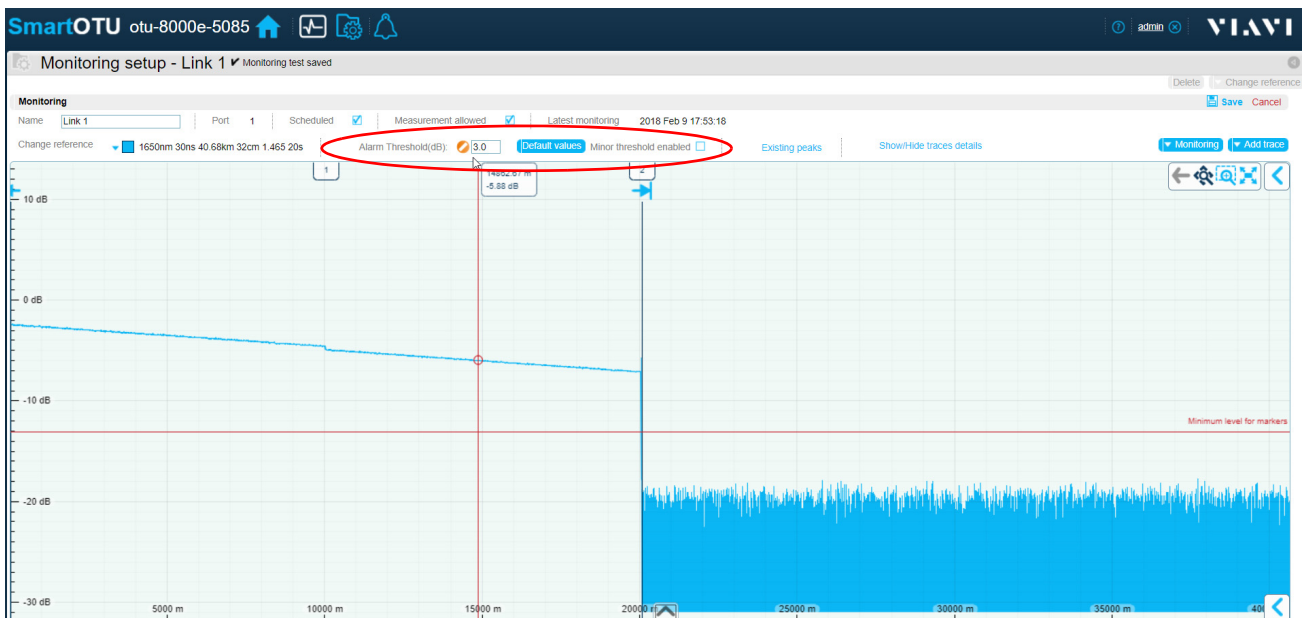
-  First marker detail with distance from origin and level
Can select this tool to place first marker to a new position then drag and drop it
-  Last marker detail with distance from origin and level
Can select this tool to place last marker to a new position then drag and drop it
-  Distance, attenuation and slope between first and last markers

Adjusting thresholds for reference trace

To modify the thresholds of attenuation for a reference trace, click on the link [Attenuation](#) on the upper part of the reference trace or on the **Attenuation** tab under the trace.

The attenuation thresholds displays on the tab Attenuation, under the trace.

Figure 30 Attenuation thresholds



- Default values are 1 dB for minor, 3 dB for major
- Positive and negative variation detected

Measurement on demand

This chapter describes how to start a measurement from the SmartOTU.

Topics discussed in this chapter are as follows:

- [“Measurement on a port without monitoring” on page 24](#)
- [“Measurement on a port with monitoring tests” on page 24](#)

Measurement on a port without monitoring

OTDR measurement can be used prior the addition of monitoring tests to check that fibers are correctly connected and spliced.

From the Monitoring view main screen:


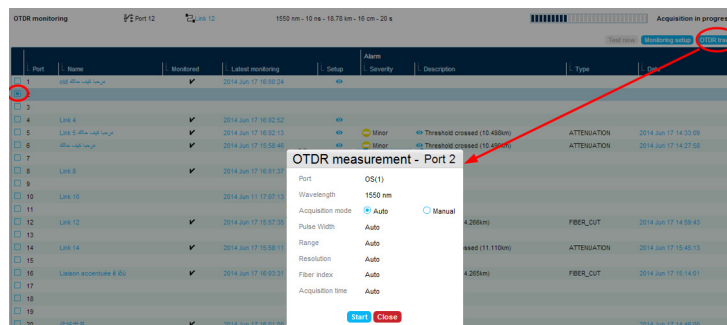
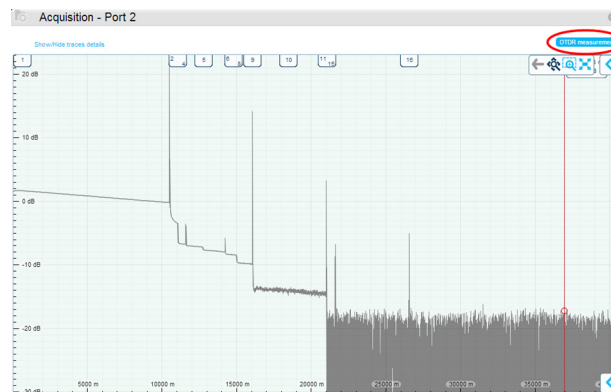
- 1 Select a monitored **Port** , without monitoring test
- 2 Click the button **OTDR Trace**.
- 3 Modify if necessary the OTDR parameters for the acquisition to be performed.

Figure 31 OTDR parameters for measurement on demand



- 4 Click on **Start** to launch the acquisition.
- When the measurement is completed, the OTDR trace is displayed and a new measurement can be launched by clicking on OTDR measurement button.

Figure 32 OTDR Measurement result

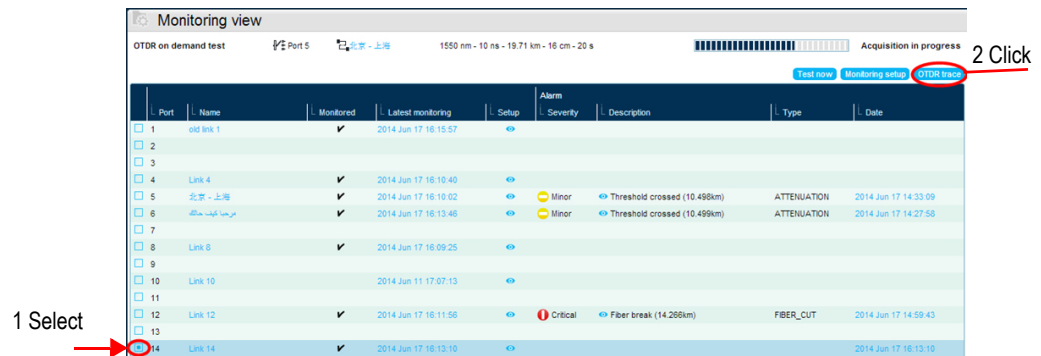


Measurement on a port with monitoring tests

From the monitoring view main screen:

- 1 Select a monitored **Port** .

Figure 33 Port selection



- 2 Click the button **OTDR Trace**.
The last acquisition performed by the monitoring on that port is displayed.
- 3 Start a new measurement by clicking on **OTDR measurement** button.

Figure 34 OTDR measurement



By default monitoring parameters are selected for the new measurement and can be modified.

Alarms Management

This chapter provides a description of the Alarms available from the SmartOTU.

Two kinds of alarms are available on the SmartOTU:


- the optical alarms
- the system alarms

Topics discussed in this chapter are as follows:

- [“Optical alarms” on page 28](#)
- [“System Alarm” on page 30](#)

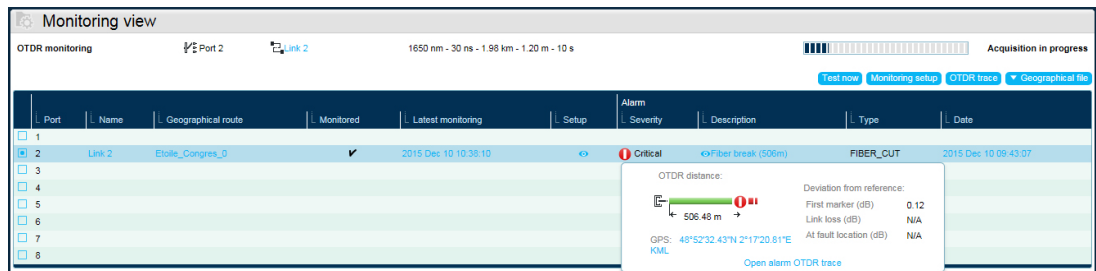
Optical alarms

The optical alarms are detected by the OTDR monitoring of the fibers.

When an optical alarm is triggered, the symbol  displays in the Monitoring view, onto the line of the link onto which an optical alarm occurred.

Click on the alarm icon to display a complete description of the alarm:

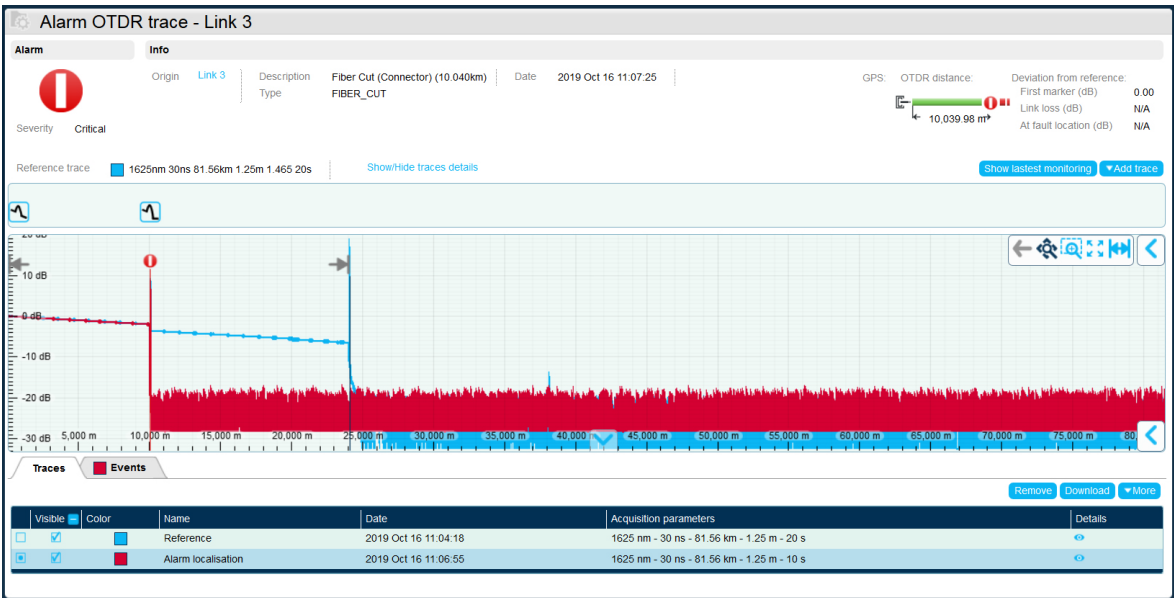
Figure 35 Optical Alarm in the Monitor view



Alarms are displayed in SmartOTDR Monitoring view and notified through Email, SMS and SNMP.

Attenuation alarms

Figure 36 Fiber Cut - Critical Alarm on connector



NOTE

Alarm probable cause: If a fault is located on a connector, the connector is identified in the alarm description.

Peak Monitoring alarm

SmartOTU monitors the peaks to detect peak degradations.

One peak monitoring alarm is raised for each peak degraded.

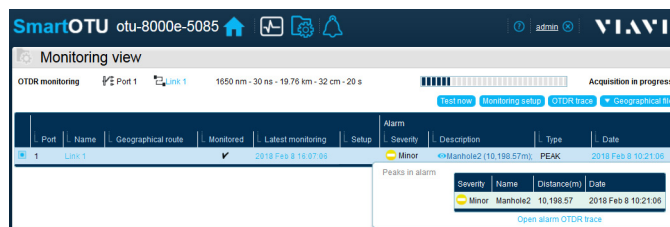


NOTE

The peak monitoring alarms are evaluated if no attenuation or fiber cut is detected before the last marker.

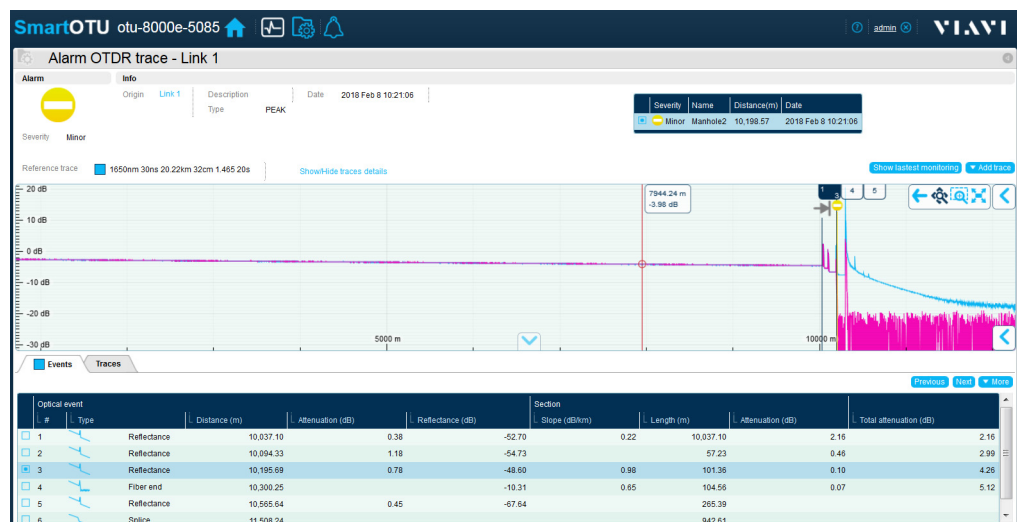
- 1 In Monitoring view, click on the **alarm description**.
A window with a short description of the peak in alarm displays

Figure 37 Peak in alarm description




- 2 In the **Peaks in alarm** window, click on **Open alarm OTDR trace** to display the detailed alarm.

Figure 38 Details of the Peak in alarm



System Alarm

From the Upper banner of the SmartOTU, click on the System Alarm icon  to display a list of system alarms. The available system alarms are:

Description	Severity
System file	MAJOR
Local mode (Connection on SmartOTU local port)	WARNING
SmartOTU inner application communication issue	MAJOR
Not enough hard disk space	MAJOR/CRITICAL
Module temperature	MAJOR/CRITICAL
Optical Switch internal error	MAJOR
OTDR Module internal error	MAJOR
OTDR Module auto configuration	MAJOR
Switch auto configuration	MAJOR
Missing reference file	MAJOR
Monitoring test drift	MAJOR
Initialization failure due to hardware	MAJOR
Initialization failure due to software	MAJOR
Sequencer stopped	CRITICAL
Alarm overflow	MAJOR

Alarm Geo localization

A kml file containing an unique geographical route can be associated to a SmartOTU port. The route must be made of an unique kml polyline "linestring" and not composed of different polylines.

That kml file can be generated from any geographical system supporting this format (Legacy GIS, Google Earth, mapinfo, etc).

**CAUTION**

There must be only one route in the kml file.

**CAUTION**

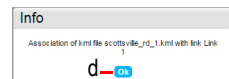
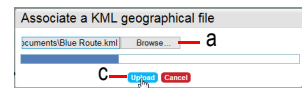
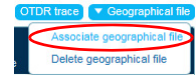
The origin of the route in the kml file must be set at the SmartOTU location.

Topics discussed in this chapter are as follows:

- [“Associating a kml file to a port” on page 32](#)
- [“Displaying the alarm on a map or in the kml file” on page 32](#)

Associating a kml file to a port

- 1 From the Monitoring view of the SmartOTU, select the port to which a kml file must be associated.
- 2 Click on the button **Geographical file** button and select **Associate geographical file**.
- 3 In the dialog box, select the kml file on your PC
 - a Click on **Browser** button
 - b Select the file
 - c Click on **Upload** button
 - d An **Info** dialog box is displayed to inform the association was successful.



Displaying the current kml of the link

From the Monitoring View of the SmartOTU, click on the link in the column «Geographical route» of the port wished.

The route opens via the application selected for kml file creation.

Figure 39 Link of the geographical route

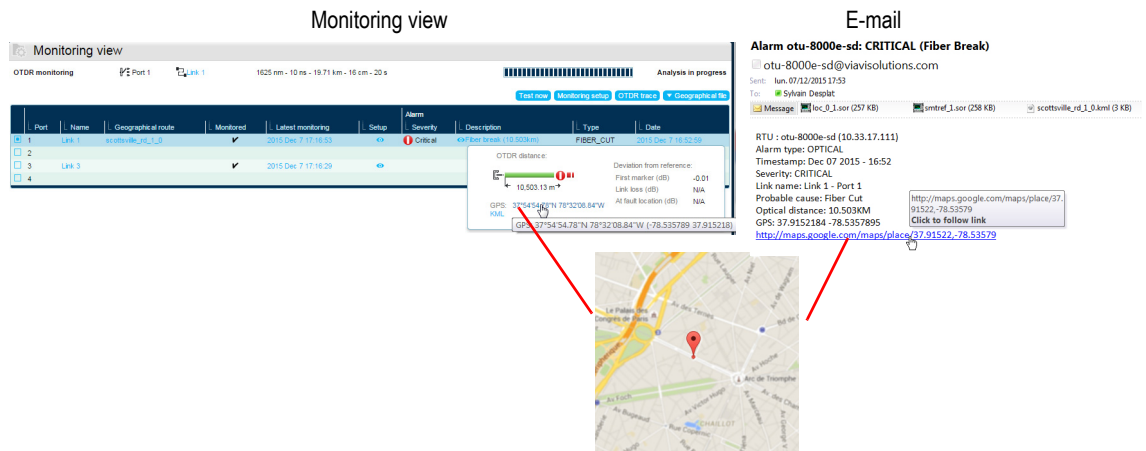
ID	Port	Name	Geographical route	Monitored	Latest monitoring	Setup	Alarm Severity	Description	Type	Date
1	Link 1	scottsvilleBlue_rd_1_0		✓	2015 Dec 7 17:21:00		Critical	Optical break (10.003km)	FIBER_CUT	2015 Dec 7 16:52:08
2	Link 2									
3	Link 3				17:20:35					
4	Link 4									

Displaying the alarm on a map or in the kml file

Once an alarm triggers on the link, this alarm can be geolocalized on any geographical system supporting kml format or in Google Map.

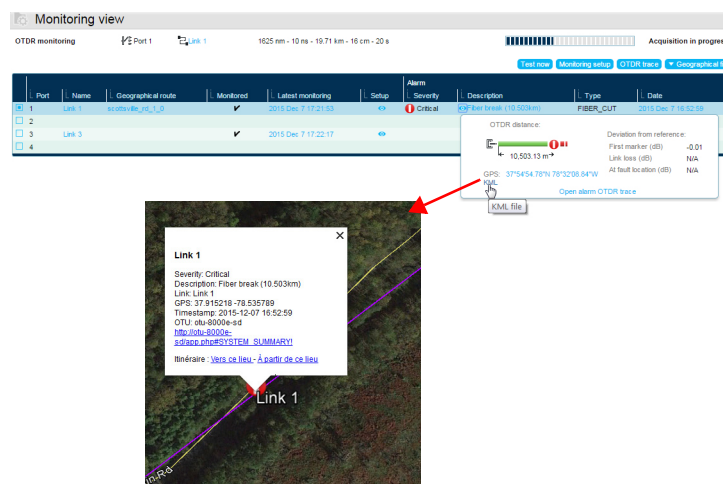
- 1 From the Monitoring View on SmartOTU, first click on the **Alarm severity** or **description** to display the details concerning the alarm.
- 2 From the Monitoring View, the e-mail or the SMS, click on the Google Maps link (GPS coordinates) to display the alarm position in Google Maps.

Figure 40 Alarm position in Google Maps



- From the Monitoring View, click on the KML link to display the alarm position in the geographical system supporting kml format or in Google Earth.

Figure 41 Alarm position in kml file



Configuration

This chapter describes the procedures for the SmartOTU configuration.

Topics discussed in this chapter are as follows:

- [“Configuring the LAN” on page 36](#)
- [“Configuring the SNMP” on page 37](#)
- [“Configuring Email” on page 40](#)
- [“Email configuration” on page 41](#)
- [“Configuring the Login and password” on page 44](#)
- [“Configuring the Read only user Login and password” on page 45](#)

Configuring the LAN

LAN settings are displayed in the Network Panel of the SmartOTU Setup:

- hostname (used if DHCP enabled)
- DHCP enabled
- IP settings


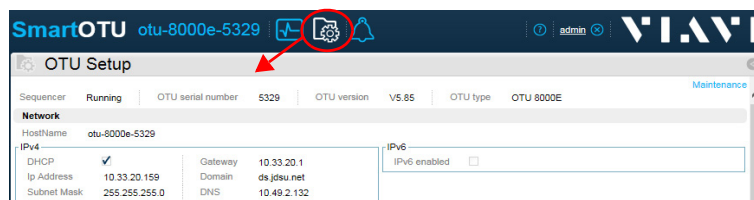
1 Click on the icon  on the upper banner to access to the Network configuration:

Figure 42 Network configuration



LAN setting edition

To change LAN settings:


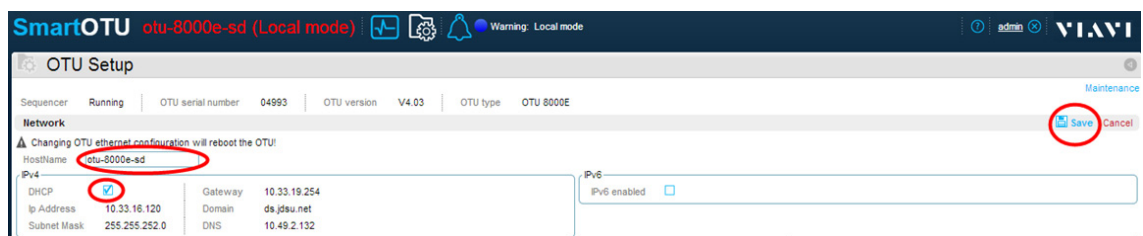
- SmartOTU must be in local mode: your PC with the web browser must be connected on SmartOTU local Ethernet interface (RJ45 "BCK/LOC") and you must push the Local button on SmartOTU.
- 1 Connect to SmartOTU application on your web browser with the url: <http://192.168.1.1>.
 - 2 Click on the icon  and click on **Edit** to configure Network Settings:
 - the SmartOTU hostname (used when DHCP is enabled)
 - DHCP can be enabled/disabled
 - If DHCP is disabled, IP settings can be modified
 - 3 Click on **Save** to save the settings.

Figure 43 Network settings



4 Push the Local button on SmartOTU to exit local mode.

Configuring the SNMP

Up to 5 SNMP managers can be defined.

SmartOTU sends traps according to SNMP V2c.

- 1 Click on the icon 
- 2 Click on **Edit** from the SNMP window to modify the parameters

Figure 44 SNMP settings



Snmp	Manager	Community	Port
1	stebx-desplat	OTU	162
2	Snmp manager name or addr	OTU	162

- 3 Setup your SNMP manager.
 - Download the SmartOTU SNMP V2 MIBs to add it to your SNMP manager
 - To setup SmartOTU SNMP trap, in SmartOTU setup screen:
 - a Activate SNMP V2 enabled
 - b You can activate the "I'm alive" trap to send an "I'm alive" trap every 10 minutes by default.
 - c Fill your SNMP V2 manager hostname or IP (only one SMTP manager)
 - d You can change the community and default port to use
- 4 **Save** the configuration and send a test trap with the **Test** button.

2 types of SNMP trap are sent:

- I'm alive trap (heartbeat): `jdsuOtuImAliveTrap`
- Optical and system alarms: `jdsuOtuAlarmEventTrap`

For a full description of the traps content please download the SmartOTU mib from the SmartOTU setup screen.

Traps description

Description of the `jdsuOtuImAliveTrap`

The trap has 2 fields: the SmartOTU serial number and the latest alarm sequence number.

The latest alarm sequence number is incremented for each new alarm and for "test" trap.

Example

- `jdsuOtuAlarmEventEntryOtuSerialNumber: 04993`
- `jdsuOtuImAliveLatestAlarmEventSequence: 11`

Description of the `jdsuOtuAlarmEventTrap`

Alarm event trap unicity is given by `jdsuOtuAlarmEventEntrySequence` and `jdsuOtuAlarmEventEntryOtuSerialNumber`.

Alarm identifier is given by `jdsuOtuAlarmEventEntryAlarmSpecificProblem`; `jdsuOtuAlarmEventEntryAlarmResource` and `jdsuOtuAlarmEventEntryOtuSerialNumber`.

To discriminate optical and system alarm use the `jdsuOtuAlarmEventEntryAlarmType` with its enum values `JdsuOtuAlarmType: optic(1) system(2)`.

The field `jdsuOtuAlarmEventEntryAlarmResource` give the name of the resource in alarm:

- for optical alarm: `port=portNumber`
- for system alarm:
 - `module=moduleNumber`
 - or `switch=switchNumber`
 - or `test=testNumber`
 - or `cpu`
 - or `componentName`
 - or `otu`

Specific problem for optical and system alarms in `jdsuOtuAlarmEventEntryAlarmSpecificProblem` is given by an enum `JdsuOtuAlarmSpecificProblem`:

For optical alarm specific problem:

`attenuation(1)`, `peak (22)`

For system alarm specific problem:

`missingOrCorruptedFile(2)`, `localMode(3)`, `innerApplicationCommunicationProblem(4)`, `harddiskSpace(5)`, `temperature(6)`, `switchProblem(7)`, `moduleProblem(8)`, `moduleCompatibility(9)`, `switchCompatibility(10)`, `communicationTest(11)`, `missingReferenceTrace(12)`, `hardwareProblem(13)`, `softwareProblem(14)`, `measurementCycle(15)`, `alarmOverflow(16)`, `genericAlarm(17)`, `rebuildClear(18)`, `harddiskFailed(19)`, `harddiskBackup(20)`, `powerfailure(21)`

For optical alarms:

- `jdsuOtuAlarmEventEntryOpticalAlarmSubProblem` give details about the optical problem given by an enum `JdsuOtuOpticalAlarmSubProblem`: `fiberCut(1)`, `injection(2)`, `attenuation(3)`, 0 if not applicable
- `jdsuOtuAlarmEventEntryOpticalAlarmProbableCauseText` gives the probable cause of the fault if it was identified: `connector` or empty if unknown

Notes

- jdsuOtuAlarmEventEntryTrapData field is only given for backward compatibility with previous mib.
- If a field is not available, its value is not set.

Example:

jdsuOtuAlarmEventEntrySequence: 12

jdsuOtuAlarmEventEntryOtuSerialNumber: 04993

jdsuOtuAlarmEventEntryTrapData: RTU: otu-8000e-sd (10.33.17.111):

Alarm type: OPTICAL:

Timestamp: Dec 07 2015 - 15: 51:

Severity: CRITICAL:

Link name: Link 1 - Port 1:

Probable cause: Fiber

Cut:

Optical distance: 10.503KM:

jdsuOtuAlarmEventEntryAlarmSpecificProblem: 1

jdsuOtuAlarmEventEntryAlarmResource: port=1

jdsuOtuAlarmEventEntryAlarmType: 1

jdsuOtuAlarmEventEntryAlarmSeverity: 5

jdsuOtuAlarmEventEntryAlarmTimestamp: 2015-12-7,15: 51: 15.0

jdsuOtuAlarmEventEntryOtuName: otu-8000e-sd (10.33.17.111)

jdsuOtuAlarmEventOpticalAlarmSpecificInfos.jdsuOtuAlarmEventEntryOpticalAlarmLinkName: Link 1

jdsuOtuAlarmEventOpticalAlarmSpecificInfos.jdsuOtuAlarmEventEntryOpticalAlarmSubProblem: 1

jdsuOtuAlarmEventOpticalAlarmSpecificInfos.jdsuOtuAlarmEventEntryOpticalAlarmLeveldB:

jdsuOtuAlarmEventOpticalAlarmSpecificInfos .jdsuOtuAlarmEventEntryOpticalAlarmDistanceKm: 10.503

jdsuOtuAlarmEventOpticalAlarmSpecificInfos.jdsuOtuAlarmEventEntryOpticalAlarmGpsLatLong: 37.9152184 -78.5357895

jdsuOtuAlarmEventOpticalAlarmSpecificInfos.jdsuOtuAlarmEventEntryOpticalAlarmProbableCauseText: Connector

jdsuOtuAlarmEventPeakAlarmSpecificInfos.jdsuOtuAlarmEventEntryPeakAlarmLinkName:

jdsuOtuAlarmEventPeakAlarmSpecificInfos.jdsuOtuAlarmEventEntryPeakAlarmPeakName:


```
jdsuOtuAlarmEventPeakAlarmSpecificInfos.jdsuOtuAlarmEventEntryPeakAlarmReferenceTopDistanceKm:
```

```
jdsuOtuAlarmEventPeakAlarmSpecificInfos.jdsuOtuAlarmEventEntryPeakAlarmReferenceTopLevelDb:
```

```
jdsuOtuAlarmEventPeakAlarmSpecificInfos.jdsuOtuAlarmEventEntryPeakAlarmMeasuredTopDistanceKm:
```

```
jdsuOtuAlarmEventPeakAlarmSpecificInfos.jdsuOtuAlarmEventEntryPeakAlarmMeasuredTopLevelDb:
```

```
jdsuOtuAlarmEventPeakAlarmSpecificInfos.jdsuOtuAlarmEventEntryPeakAlarmGpsLatLong
```

Configuring Email


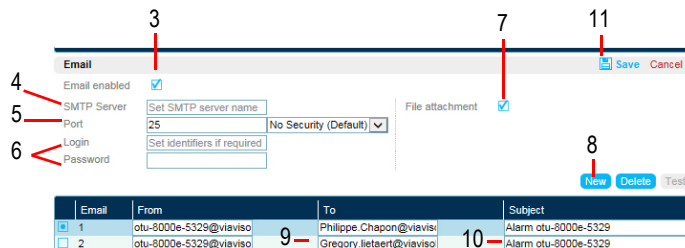
- 1 Click on the icon 
- 2 Click on **Edit** from the Email window to modify the parameters

Figure 45 Email configuration



The screenshot shows the 'Email' configuration window. Callout 3 points to the 'Email' title bar. Callout 4 points to the 'Email enabled' checkbox. Callout 5 points to the 'SMTP Server' field. Callout 6 points to the 'Port' field. Callout 7 points to the 'File attachment' checkbox. Callout 8 points to the 'New' button. Callout 9 points to the 'From' field in the email list. Callout 10 points to the 'Subject' field in the email list. Callout 11 points to the 'Save' button.

Email	From	To	Subject
1	otu-8000e-5329@viaiso	Philippe Chapon@viaiso	Alarm otu-8000e-5329
2	otu-8000e-5329@viaiso	Gregory Ieteert@viaiso	Alarm otu-8000e-5329

- 3 Enable Email
- 4 Fill your SMTP server hostname or its IP address (ask your IT); if you let it empty, it tries to find a smtp server on the network.
- 5 Set the SMTP server port (25 by default). If your SMTP requires secured protocol, you can select STARTTLS (port 587) or SSL/TLS (port 465).
- 6 If your SMTP server requires authentication, fill the login/password fields.
- 7 Select whether you want to attach OTDR traces to alarm sent by Email.
- 8 Add a new Email receiver by clicking on New button.
- 9 Fill his email address.
- 10 Update the Email alarm Subject.
- 11 Save the configuration and send a Test Email by clicking on Test button.

Email content example:

RTU : otu-8000e-sd (10.33.17.111)
Alarm type: OPTICAL

Timestamp: Dec 07 2015 - 16:52
Severity: CRITICAL
Link name: Link 1 - Port 1
Probable cause: Fiber Cut
Optical distance: 10.503KM
GPS: 37.9152184 -78.5357895
<http://maps.google.com/maps/place/37.91522,-78.53579>



NOTE

OTDR acquisition traces and optional kml file of the route are given as an attachment of the email, if email file attachment is enabled.

Email configuration

It is recommended to contact the IT before the following fields are entered.

1 Enter the parameters for email configuration

The examples below are given for simplified gmail and outlook.

Example of standard e-mail configuration

Figure 46 Example of standard email configuration

Email	From	To	Subject	Optical switch ports
1	otu-8000e-622@newco.com	john.smith@newco.com	Alarm otu-8000e-622	1,2

- **SMTP server:** SMTP Host
 - «serversmtp.newco.com»
- **Port / Encryption :** SMTP Port
 - The field can be left to default (Encryption type: No Security)
- **Login:**
 - The field can be left empty
- **Password:**
 - The field can be left empty

Example of configuration with Outlook

Figure 47 Example of email configuration with Outlook

Email	From	To	Subject	Optical switch ports
1	otu-8000e-622@newco.com	john.smith@newco.com	Alarm otu-8000e-622	1,2

- **SMTP server:** SMTP Host
 - The field can be left empty
- **Port / Encryption :** SMTP Port
 - The field can be left to default (Encryption type: No Security)
- **Login:**
 - The field can be left empty
- **Password:**
 - The field can be left empty

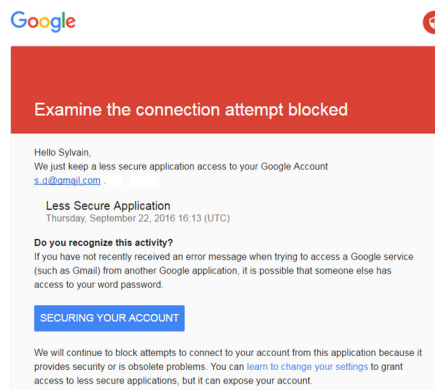
Example of configuration with Gmail

Figure 48 Example of email configuration with Gmail

Email	From	To	Subject	Optical switch ports
1	otu-8000e-622@viavisolutions.com	john.smith@gmail.com	Alarm otu-8000e-622	1,2

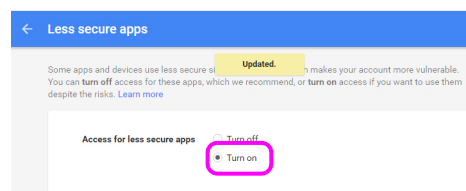
- **SMTP server :** SMTP Host
 - « smtp.gmail.com »
 - **Port / Encryption :** SMTP Port
 - Port: 587 / Encryption: STARTTLS
 - **Login:**
 - Gmail address
 - **Password:**
 - Gmail password
- 2 In case of gmail, in your google account, first email can be blocked.

Figure 49 Google message about email blocked



- 3 In Google account, enable access to less secure apps:

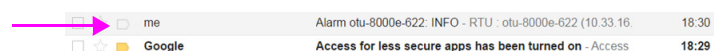
Figure 50 Turn on access to less secure apps



A confirmation email informs you the SmartOTU can send emails in your gmail account.



- 4 Click on **Test** button to send a test email on your gmail account.
The email is received in your Google mail box.



Email filtering

It is possible to define different email recipients according to the monitored fiber.

For example, for fiber connected on port 1 & 2, User1 is notified, for fiber connected on port 2,3 & 4, User 2 is notified, etc.

- 1 Select the recipient for which ports must be defined
- 2 Click on the button **Filter/Port**.
- 3 Select/Deselect the ports for which recipient is notified / not notified.
- 4 Click on **Ok** to validate the configuration.

Figure 51 Email Setup: ports assignation for different recipients

Configuring SMS

To setup the SMS, in SmartOTU setup screen:

- 1 Select the SMS **Edit** menu
- 2 Enable Sms.
- 3 Add a new Sms receiver by clicking on **New** button.
- 4 Fill his phone number.
- 5 **Save** the configuration.

Figure 52 SMS configuration

- 6 Send a test Sms by clicking on **Test** button

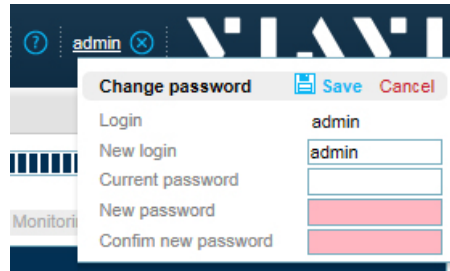
SMS content example

otu-8000e-622-OPTICAL-07Dec2015 10:13-CRITICAL-Link 1-Port 1-10503m-http://maps.google.com/maps/place/37.91522,-78.53579.

Configuring the Login and password

- 1 From the top menu bar, click on user name
- 2 Click on **Edit** to modify your credentials.

Figure 53 User credentials



NOTE

If user credentials are lost, in SmartOTU Local Mode, user credentials can be changed without giving the old password and current user login is retrieved.

Configuring the Read only user Login and password

NOTE

The read-only user has no access to Device configuration and Maintenance.

By default, Read-only user is disabled. Modify its credential to activate it.

- 1 From the top menu bar, click on user name.
- 2 Click on **Read-only user** > **Edit** to modify read-only user credential.

Figure 54 Read-only user configuration



NOTE

Default login / password: guest / password.
Command to enable/disable the read-only user:
`otu:api:user:enaguest TRUE/FALSE`

Device Configuration

That section is useful if you have to replace your OTDR module or your optical switch.

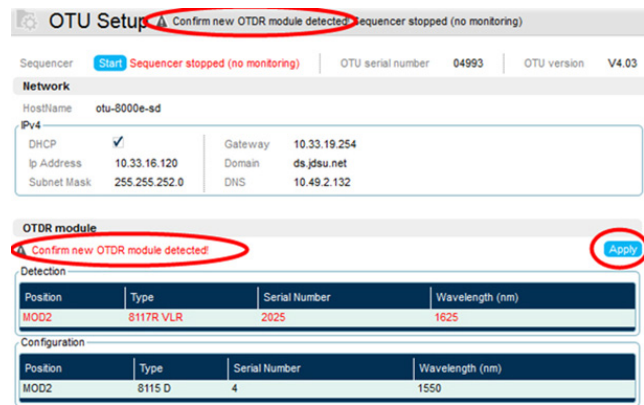
Topics discussed in this chapter are as follows:

- [“Apply a new OTDR module” on page 48](#)
- [“Apply a new optical switch” on page 48](#)

Apply a new OTDR module

If a new OTDR module is detected, an alarm **Module Autoconfig** is sent and the web application automatically displays the SmartOTU Setup screen with a warning:

Figure 55 New OTDR Module



You must confirm the new OTDR module by clicking on **Apply** button.

NOTE

If the OTDR type is changed, the reference trace has to be changed.
See Monitoring setup

Apply a new optical switch

If a new optical switch is detected, an alarm "Switch Autoconfig" is sent and the web application automatically displays the SmartOTU Setup screen with a warning:



You must confirm the new optical switch by clicking on **Apply** button.

Figure 56 Confirm optical switch detected





NOTE

If monitoring was already setup and you change the optical switch by a switch with fewer outputs, an **error message** will inform you that monitoring tests on ports no longer available must be removed.

LAN setting edition

To change LAN settings:


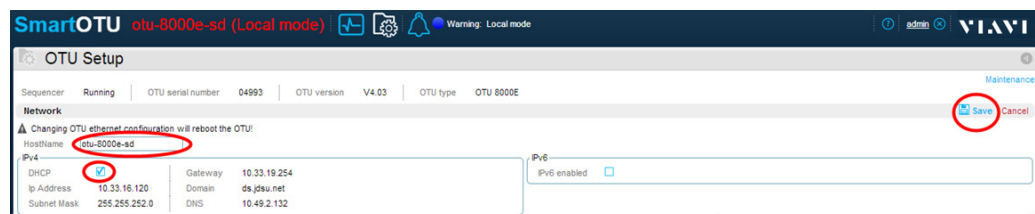
- SmartOTU must be in local mode: your PC with the web browser must be connected on SmartOTU local Ethernet interface (RJ45 "BCK/LOC") and you must push the Local button on SmartOTU.
- 1 Connect to SmartOTU application on your web browser with the url: <http://192.168.1.1>.
 - 2 Click on the icon  and click on **Edit** to configure Network Settings:
 - the SmartOTU hostname (used when DHCP is enabled)
 - DHCP can be enabled/disabled
 - If DHCP is disabled, IP settings can be modified
 - 3 Click on **Save** to save the settings.

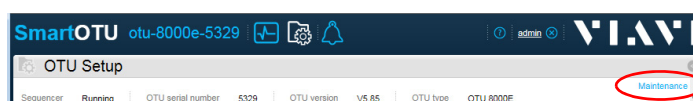
Figure 57 Network settings



Maintenance

This chapter describes the maintenance procedures for the SmartOTU.

To access the maintenance, click on Maintenance link from the Setup screen:



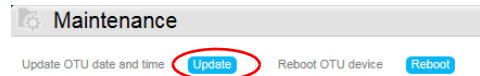
Topics discussed in this chapter are as follows:

- “Update SmartOTU date-time” on page 52
- “Software update” on page 52
- “SmartOTU Configuration backup” on page 53
- “SmartOTU configuration restore” on page 54
- “Add a License” on page 54
- “Enhanced Security option” on page 55
- “Alarms” on page 56

Update SmartOTU date-time

To update the SmartOTU date-time, from the SmartOTU Maintenance page:

- 1 Click the **Update** button on the parameter **Update OTU date and time**.



The date and time will be updated according to the computer date and time.

Software update

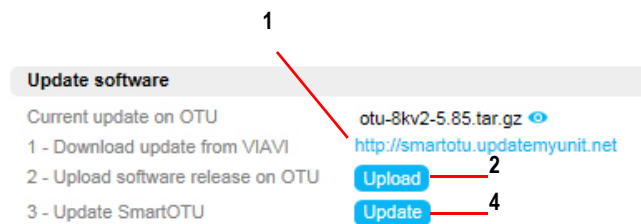
The SmartOTU software is composed of two softwares:

- SmartOTU application
- Rescue used in the extreme case there is a severe hardware or software issue.

These 2 softwares are included in a unique file but they need to be updated separately. There is below the procedure.

- 1 From the Software update section of the **Maintenance** screen, download on your PC the new SmartOTU release from Viavi <http://smartotu.updatemyunit.net> site.

Figure 58 Update software



- 2 Select the **Upload** button to upload the release from your PC to the SmartOTU. You are asked to select the release to upload to the SmartOTU with the **Browse** button.
- 3 Select the release (of the form *.tar.gz) and upload it.

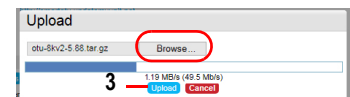
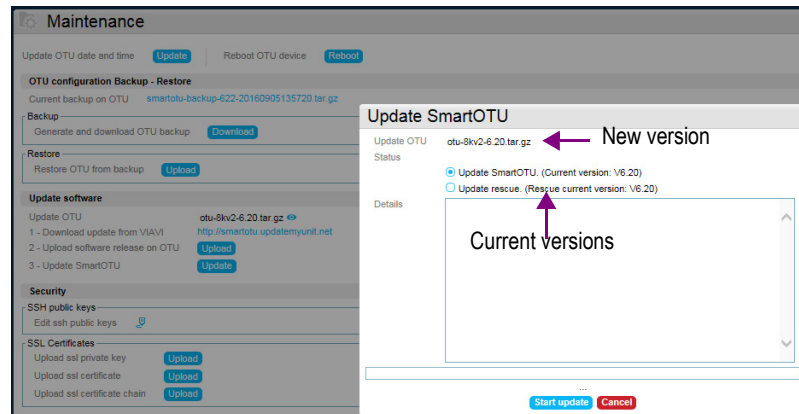


Figure 59 Update SmartOTU



- 4 When the upload is completed, close the upload dialog and select **Update** button. You are asked to start the update.
- 5 Select the **Start update** button.
The SmartOTU starts the update and will reboot at the end of the update.
- 6 After the reboot, the rescue needs to be updated:
 - a Go to the **Maintenance** window > **Update SmartOTU**
 - b Select «Update Rescue» and click on **Start update**.

SmartOTU Configuration backup

The full configuration of SmartOTU is backed up: monitoring setup, Email ,SMS, SNMP, Setup, Passwords...

- 1 From the **Backup/Restore** section of the Maintenance screen, click on the **Download** button.
- 2 Click on **Yes** in the dialog box to confirm the generation of the backup of the SmartOTU configuration (monitoring tests, full SmartOTU setup).

Figure 60 Backup download



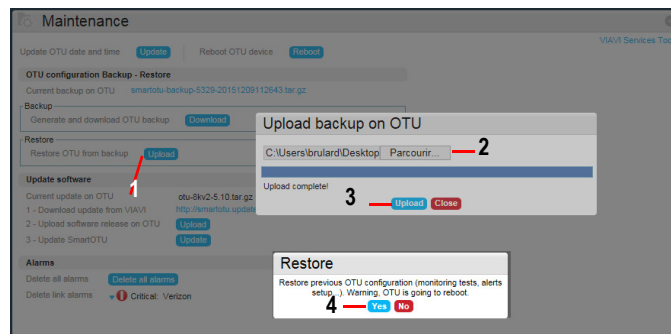
- 3 A dialog box informs the downloading is in progress. Click **Ok** to close the window.

When the download is finished, the browser proposes to save the file

SmartOTU configuration restore

- 1 From the **Backup/restore** section of the Maintenance, select the **Upload** button.
- 2 Click on **Browse** button to choose the backup file you want to restore on SmartOTU.
- 3 Click the **Upload** button.
- 4 When the upload is finished, click on **Yes** confirm the start of the restoration of the SmartOTU and the reboot.

Figure 61 Restore configuration



Add a License

Licenses are installed when the product is ordered.

They can also be added later if needed.

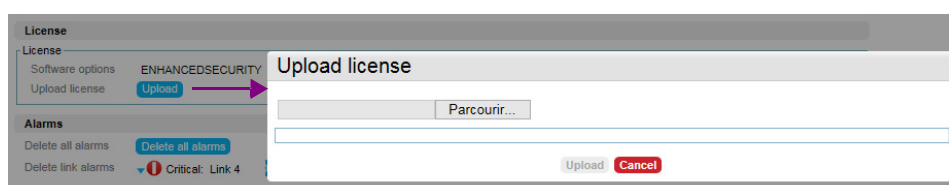
Current available licenses are:

- Enhanced security Pack (HTTPS) (Ref: E98SECPACK-UPG)
- OTU8000 PEAK MONITORING FOR SMARTOTU (Ref: E98-PEAK-MON)
- SMART ACCESS ANYWHERE
- OTU HIGH SENSITIVITY
- REST API

If the license needs to be added by yourself, click on **Upload**, to install the file provided by Viavi.

Please consult your sales representative to get it

Figure 62 Upload License file



Enhanced Security option

Enhanced security option enables the use of HTTPS instead of HTTP.

By default in “enhanced security” SmartOTU uses self signed certificates for HTTPS.

In order to change the self signed certificate, install the private key and the certificates through the SmartOTU web interface:

- 1 Upload the private key, the certificate and the chain certificates (or intermediate certificate).

Figure 63 Upload private key



- 2 Reboot the SmartOTU to use the new ssl configuration.
A reboot is required to take into account the certificates.



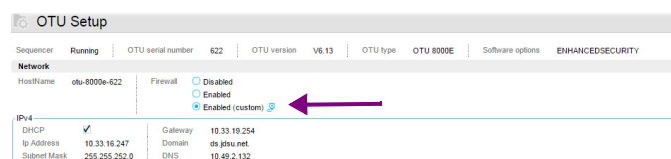
NOTE

The SAA (SmartAccesAnywhere) is not compatible with enhanced security

Firewall edition with enhanced security License

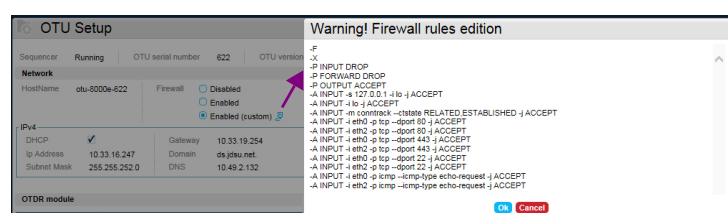
In the Firewall Setup, the parameter **Enabled (custom)** is available only with enhanced security license.

Figure 64 Firewall custom configuration



- This parameter must be configured by advanced users only.
- An incorrect syntax can make the product unusable.

Figure 65 Firewall rules edition



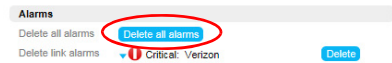
Alarms

Clear all alarms to force a full resynchro

From the **Alarms** section of the Maintenance, select **Delete all alarms**.

All SmartOTU alarms will be removed.

Optical alarms will be re-generated by monitoring.



NOTE

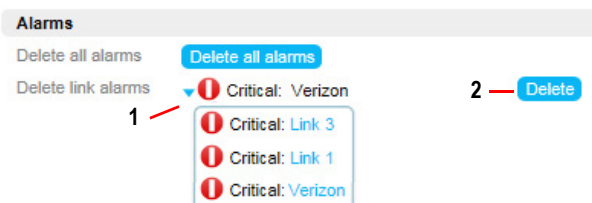
If you have a snmp manager you should also remove all alarms from your manager to be synchronized.

Individually clear an alarm to force its detection

From the **Alarms** section of the Maintenance screen, you can individually delete an optical alarm.

- 1 Click on the blue arrow and select an alarm in the parameter Delete link alarms.
- 2 Click on Delete button on the right of the screen.

Figure 66 Select one alarm and delete it



NOTE

If you have a snmp manager you should also remove that alarm from your manager to be synchronized

Appendix A

Topics discussed in this chapter are as follows:

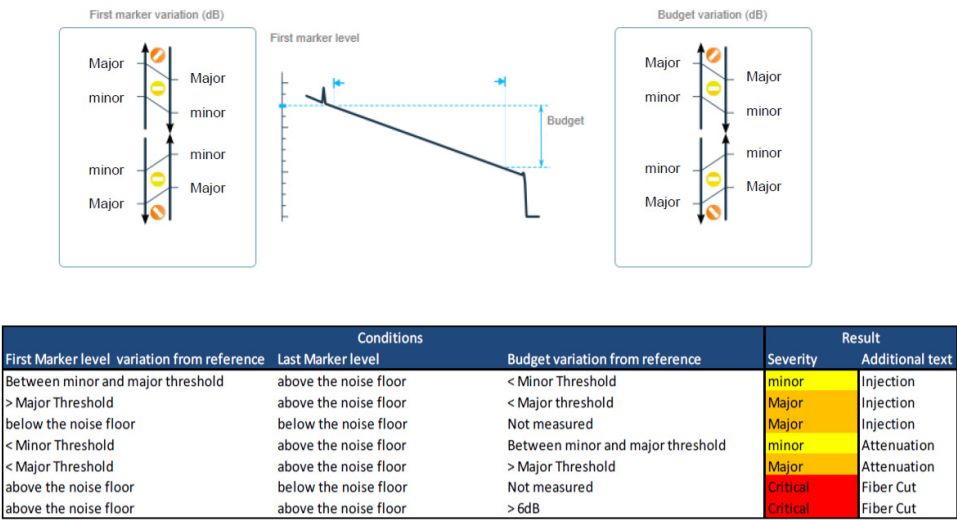
- [“Legacy monitoring principle” on page 58](#)

Legacy monitoring principle

These measurements are based on two markers: A first marker placed when the trace starts to be linear and a last marker placed at the end of the trace. The level of the 1st marker gives the level at the network input. The difference between the levels of the two markers gives the optical budget of the fiber.

The measurement deviation between the reference and the actual trace is compared against threshold. If a threshold is crossed, an alarm is generated with a severity according to the type of level (minor, major, critical) which is crossed.

Figure 67 Fiber Monitoring Principle





7OTU80091
Rev. 002
English



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