A large, abstract graphic on the right side of the page. It features a large, light gray chevron pointing downwards, with a smaller, solid blue chevron nested inside it, also pointing downwards. The blue chevron has a gradient, transitioning from a lighter blue at the top to a darker blue at the bottom.

SmartOTU (E9E-COTU)

Optical Test Unit

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

User's Guide

SmartOTU (E9E-COTU)

Optical Test Unit

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

User's Guide



Viavi Solutions
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www.viavisolutions.com

Notice

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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

Viavi has established processes in compliance with the Waste Electrical and Electronic Equipment (WEEE) Directive, 2002/96/EC, and the Battery Directive, 2006/66/EC.

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

reused, recycled, or disposed of in an environmentally friendly manner, and in compliance with all applicable national and international waste legislation.

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 JDSU'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

JDSU 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.

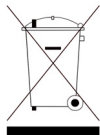


This symbol represents a risk of electrical shock.



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](#)

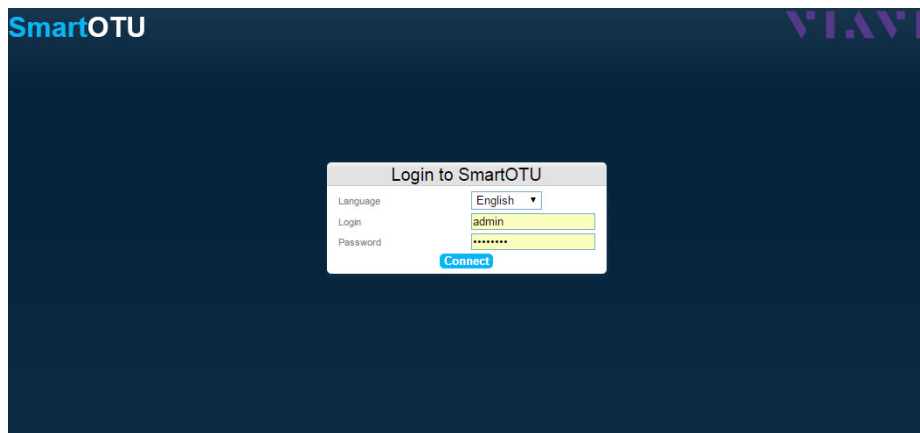
Introduction

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-5000-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:




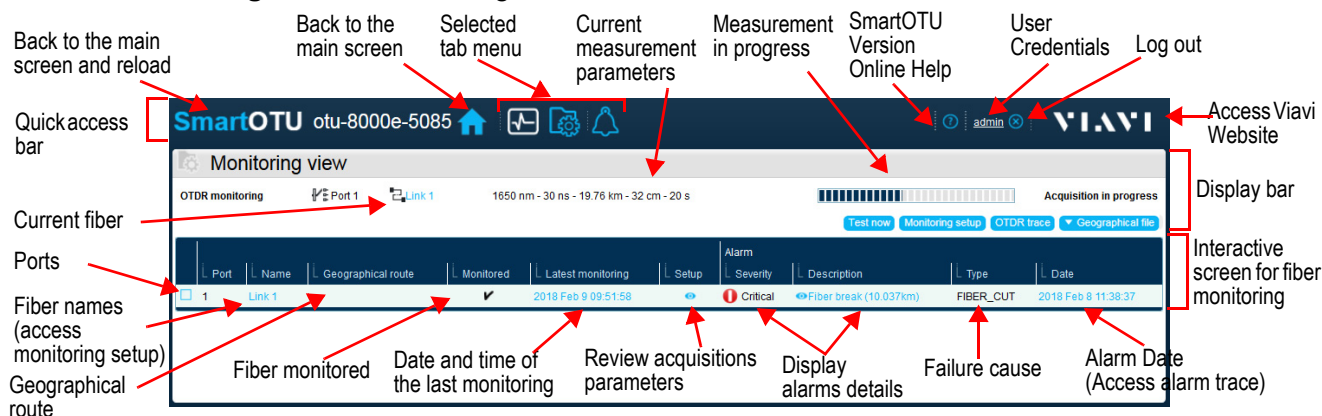
- The Quick access bar provides shortcuts to the main screens:
 - monitoring view 
 - SmartOTU Setup 
 - SmartOTU system alarms 
 - user credentials
- The display bar shows the current measure in progress with its parameter.
- The table lists all SmartOTU ports with their OTDR monitoring and optical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

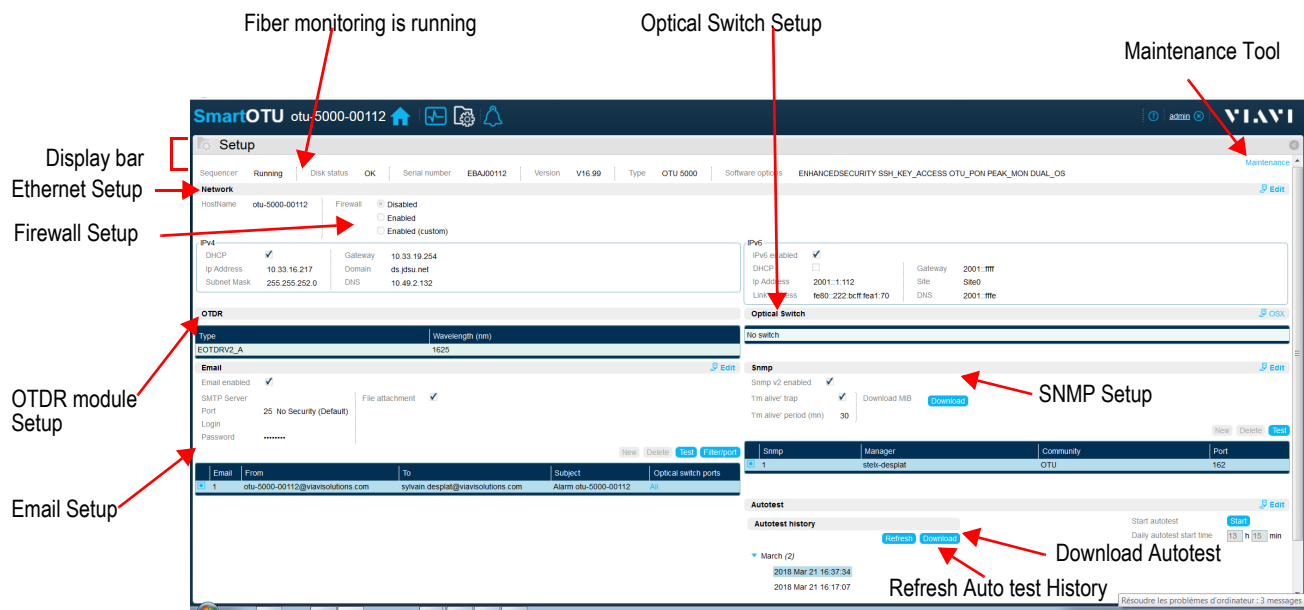
- Direct access to the Monitoring setup tools of the current selected port.

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



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 8
- “Momentarily stop the monitoring” on page 9
- “Prohibit OTDR measurements” on page 10
- “View of the latest monitoring cycle trace” on page 10
- “Test a fiber immediately” on page 10
- “Short acquisition” on page 11
- “Peak Monitoring” on page 11

Principle



NOTE

For legacy monitoring principle, refer to [“Appendix A” on page 55](#).

These measurements are based on comparison between a reference acquisition and the current acquisition.

A first marker placed when the trace starts to be linear and a last marker placed at the end of the trace. Those two markers define the monitored zone.

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 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.

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.

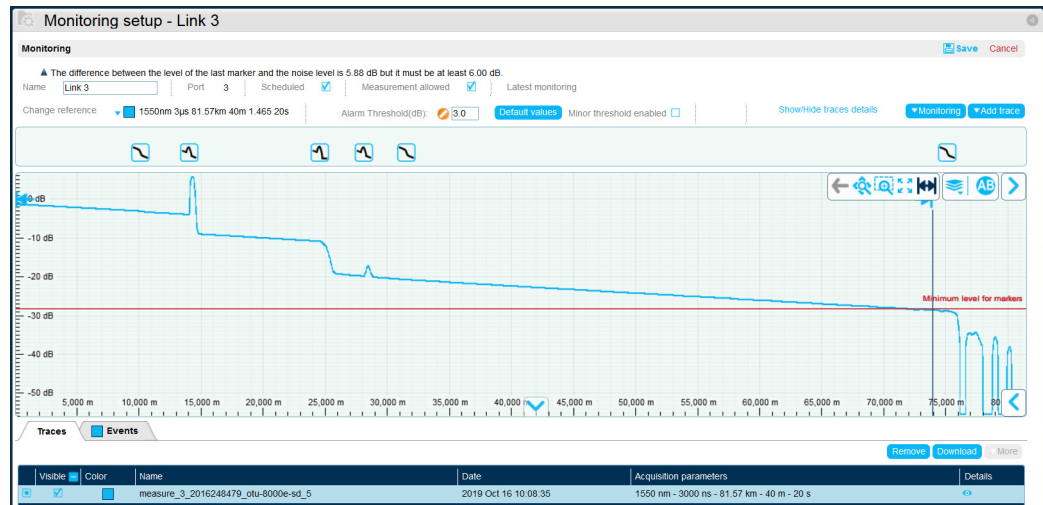
Figure 4 OTDR setup

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





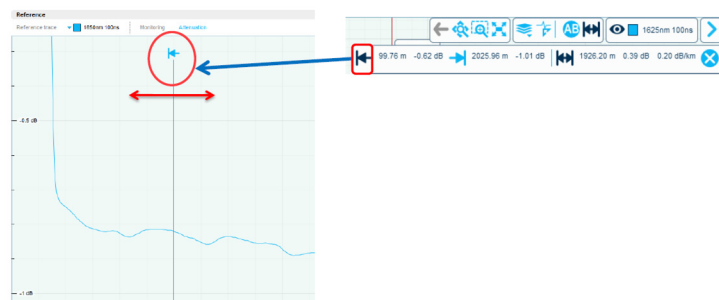
If desired the markers can be moved. Click on open menu  button at the right top corner of the trace then click on .

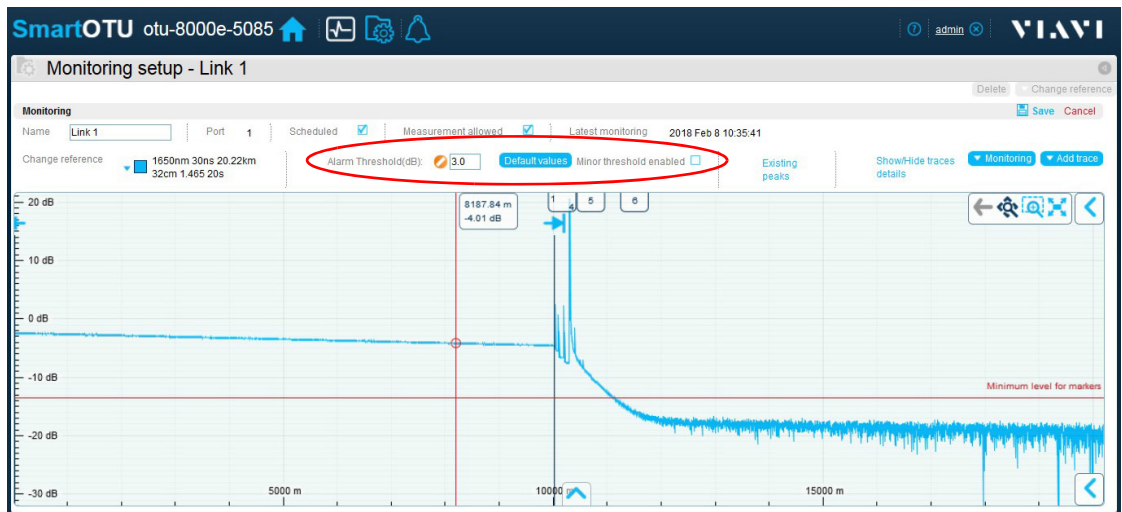
Figure 6 Moving a marker



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



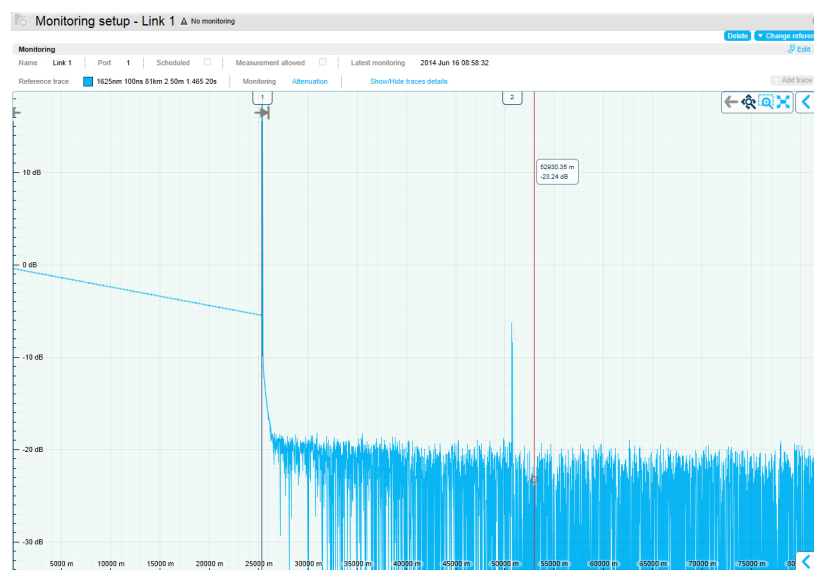
Once the change is made click on **Save** on the top right of the window.

Change the reference trace

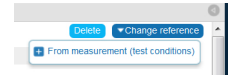
After the fiber is modified (repair, connection change) the reference trace must be modified to match the latest fiber change.

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

Figure 8 Reference Trace

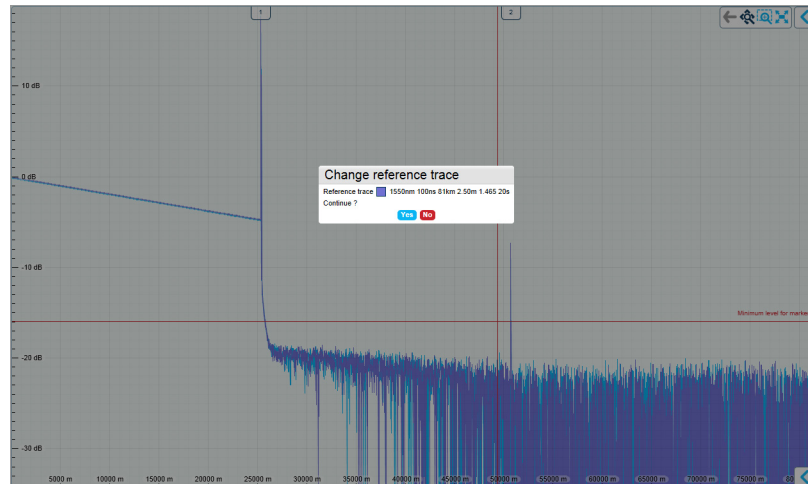


On the right top of the window click on **Change reference**. The current reference trace can be replaced by a new measurement.



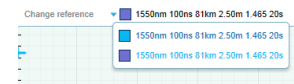
After the new trace is displayed in dark blue, the change needs to be confirmed:

Figure 9 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 **Change reference trace**.

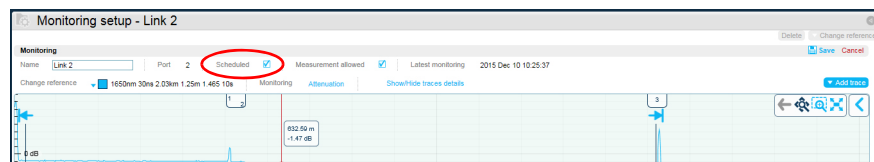


Momentarily stop the monitoring

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 10 Monitoring Stop

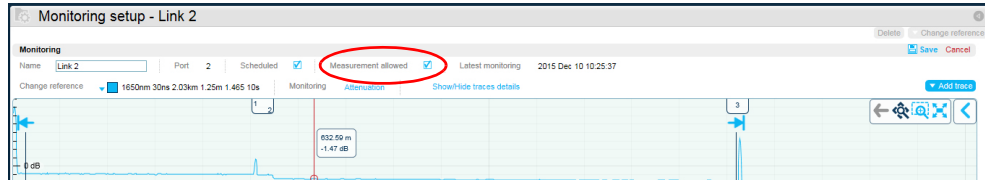


In the monitoring view the column Monitored is unmarked when the scheduling is stopped.

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 11 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 12 Latest monitoring test - OTDR trace

Monitoring view

OTDR monitoring

Port 7

Link 7

1310 nm - 300 ns - 79.76 km - 5 m - 20 s

</

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:


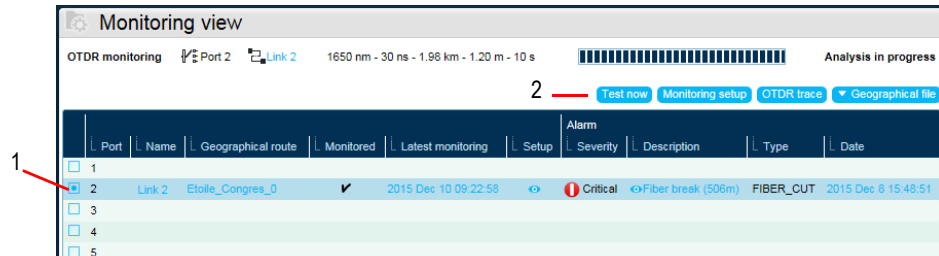
- 1 Select the switch **Port**  to be tested.
- 2 Click on **Test now** button

Figure 13 Test a fiber



Short acquisition

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

Figure 14 Short acquisition



Peak Monitoring



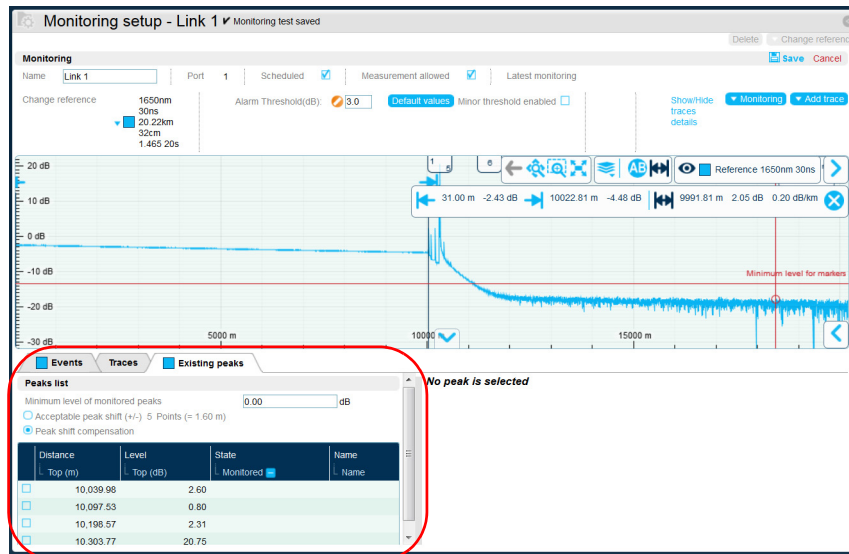
CAUTION

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 15 List of monitorable peaks



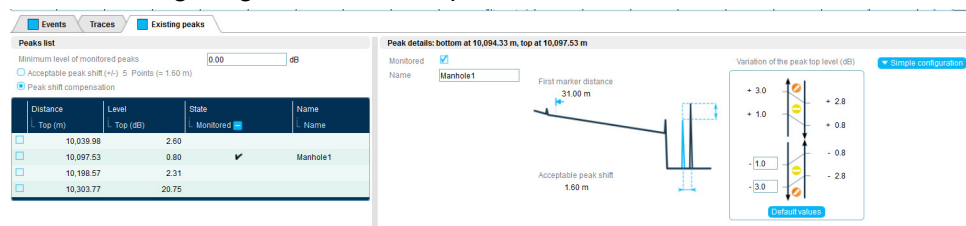
The peak list contains the peaks with a level greater than **Minimum level of monitored peaks**. If necessary, modify this parameter in order to reduce/raise the list of monitorable peaks.

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.

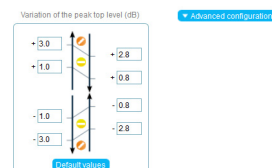
- "Acceptable peak shift" defines the tolerance of peak position change
- "peak shift compensation" adjusts the peak position automatically if it has not moved more than the acceptable shift. The latest peak position becomes the reference.

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

Figure 16 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 Click on **Save** to validate the peak monitoring configuration



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 14](#)
- [“Overview” on page 14](#)
- [“Details on selected Trace” on page 16](#)
- [“Adjusting thresholds for reference trace” on page 18](#)

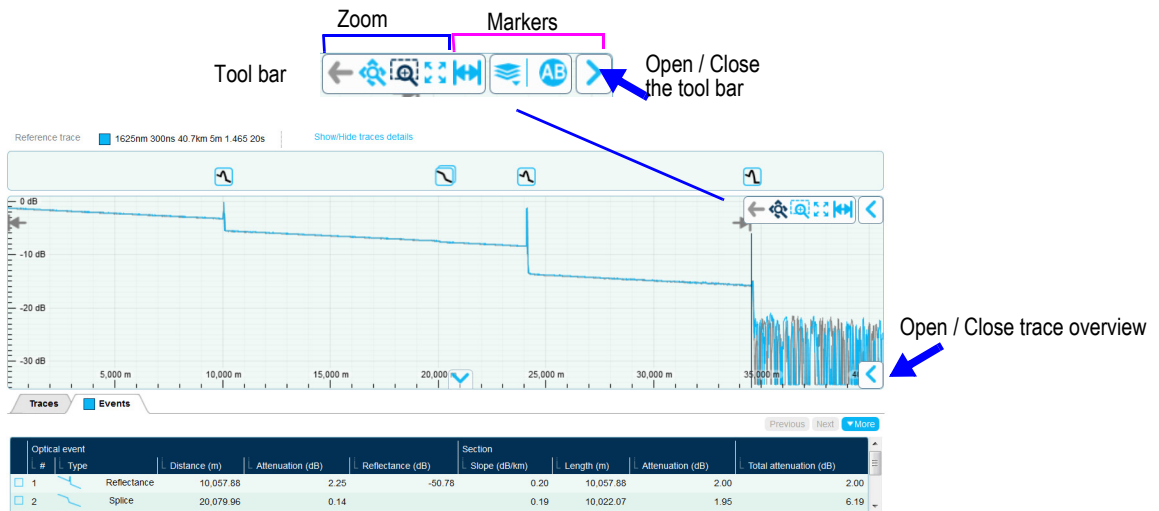
OTDR trace color codes

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 17 Trace overview



Zoom

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



Fit to content (zoom release)

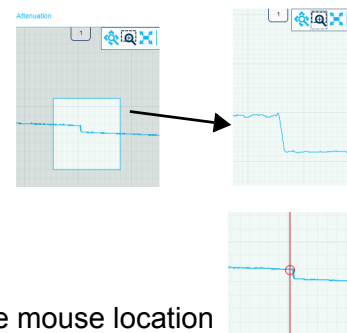


Fit to content (zoom release)



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 18 Markers details

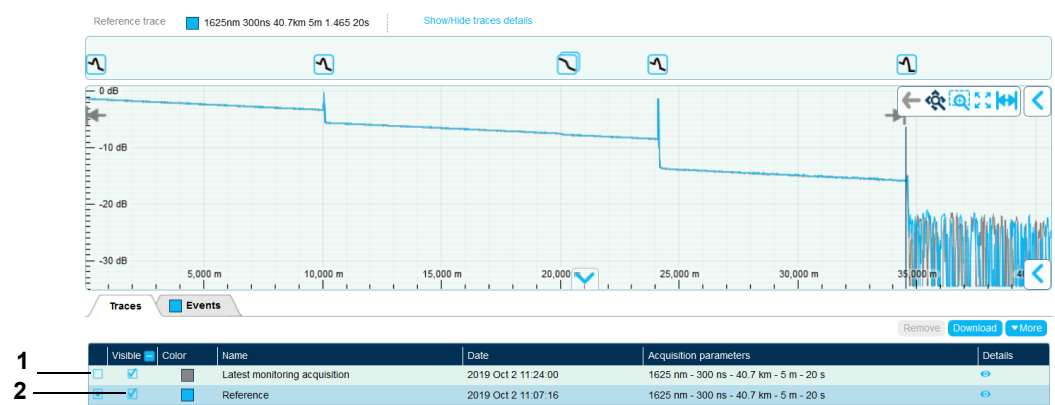


- A** **A** marker detail with distance from origin and level
Can select this tool to place **A** marker to a new position then drag and drop
- B** **B** marker detail with distance from origin and level
Can select this tool to place **B** marker to a new position then drag and drop
- AB** Distance, 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 19 Multi trace tool bar



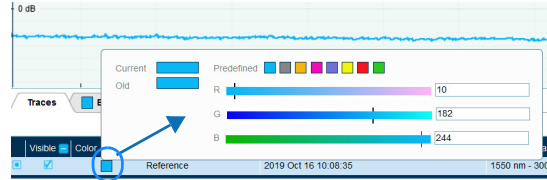
- 1 Click on the first check box to select the active trace.
- 2 Click on the **Visible** check box to display/hide the trace.

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

Multi trace details

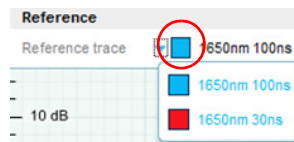
- Click on the color square to change the color of the trace.

Figure 20 Change trace color



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

Figure 21 Change the reference trace



Details on selected Trace

Showing the events table



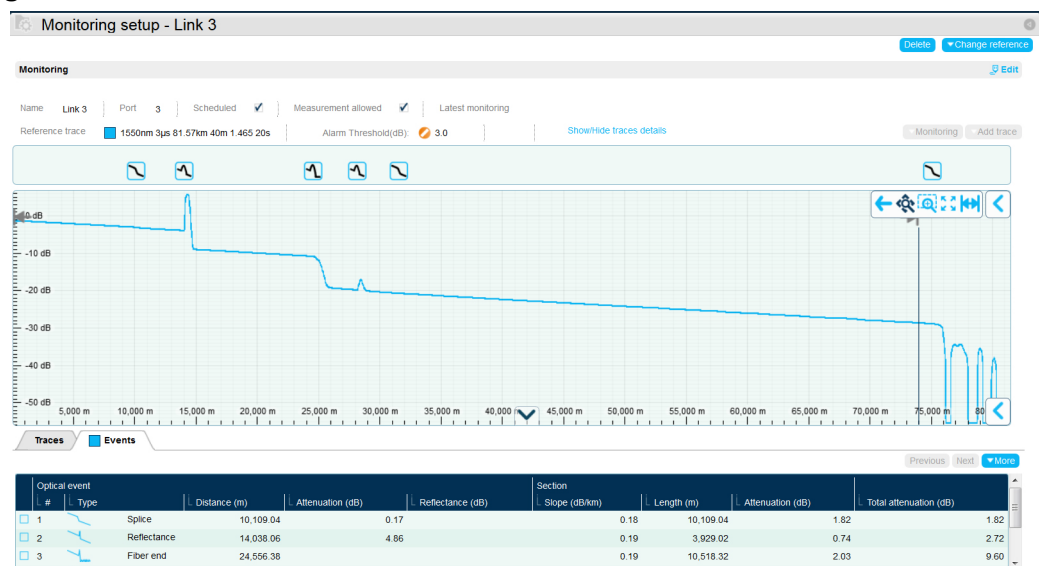
The Events table is accessible clicking on the icon  at the bottom of the trace (click on the icon  to hide the window).

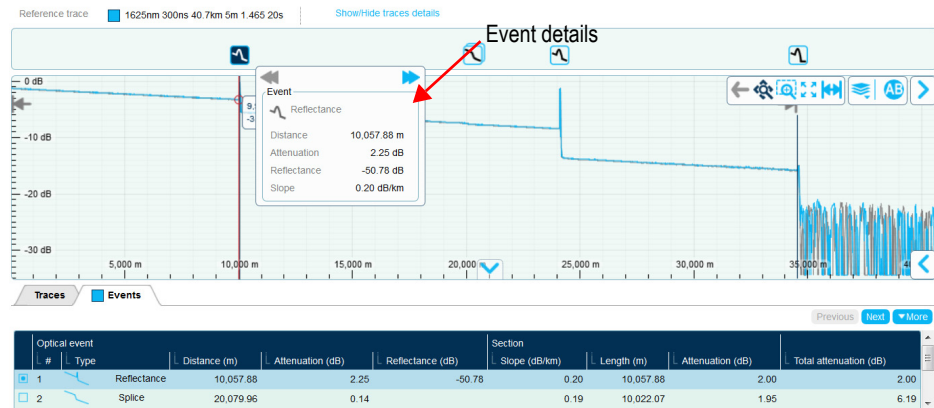
Figure 22 Show the details on selected trace



Displaying the events details

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

Figure 23 Event details on trace

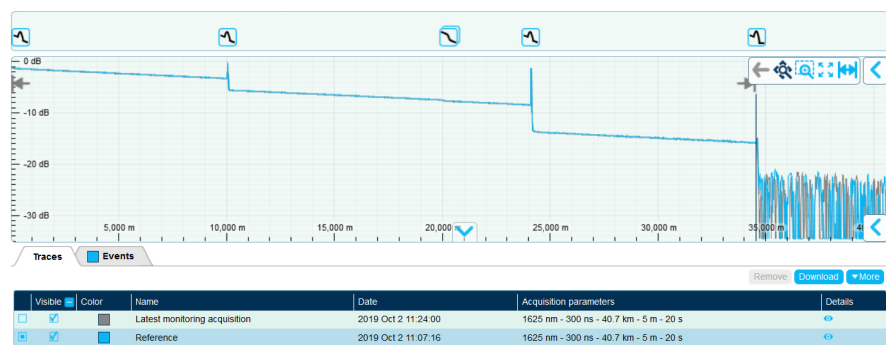


- When multiple events close, can move to the next event from the top box

Setup details

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

Figure 24 Details on trace



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

First and Last markers

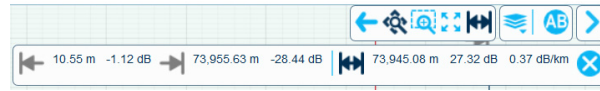


NOTE




This function is available exclusively for the reference trace.

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

Figure 25 First and Last markers tool bar



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

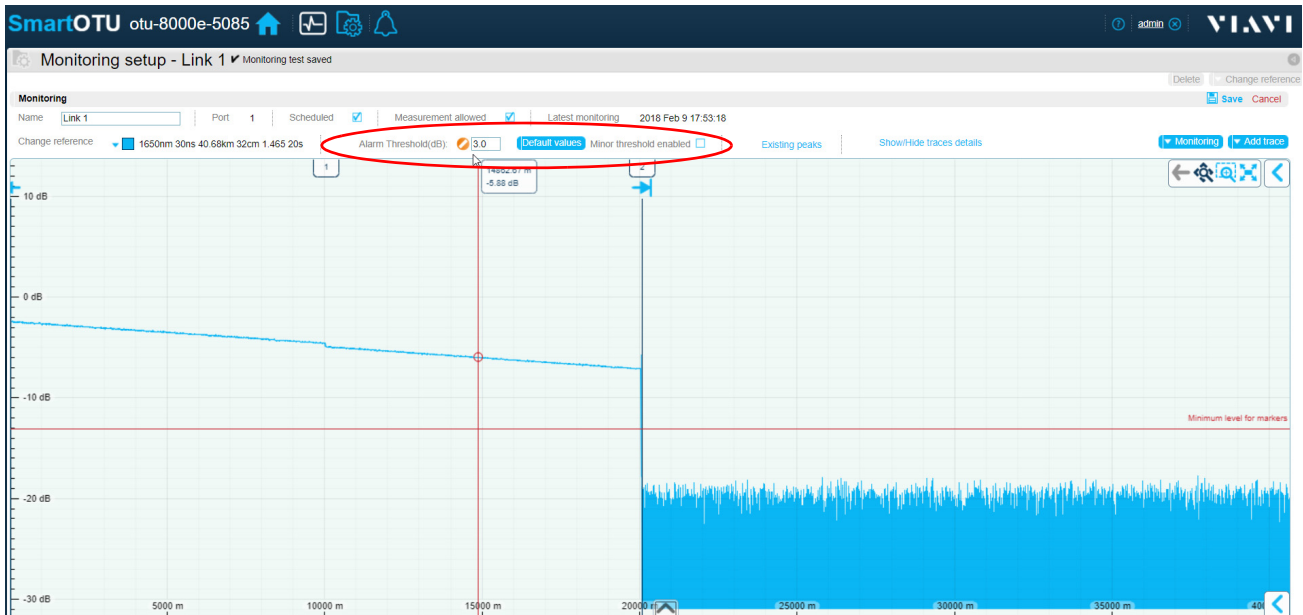
-  First marker detail with distance from origin and level
Can select this tool to place first marker to a new position then drag and drop it
-  Last marker detail with distance from origin and level
Can select this tool to place last marker to a new position then drag and drop it
-  Distance, attenuation 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 26 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 20](#)
- [“Measurement on a port with monitoring tests” on page 20](#)

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:


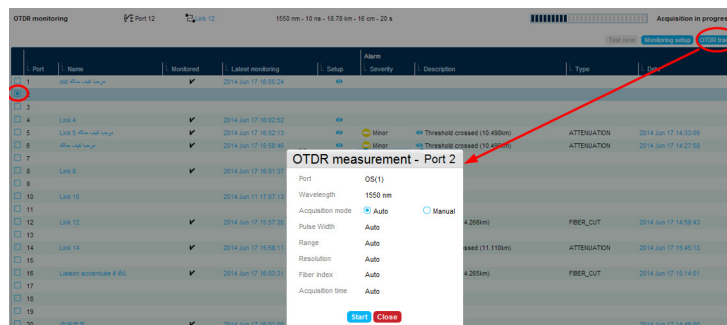
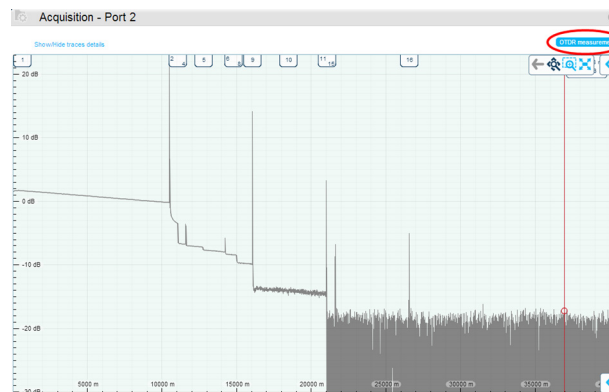
- 1 Select a monitored **Port** , without monitoring test
- 2 Click the button **OTDR Trace**.
- 3 Modify if necessary the OTDR parameters for the acquisition to be performed.

Figure 27 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 28 OTDR Measurement result

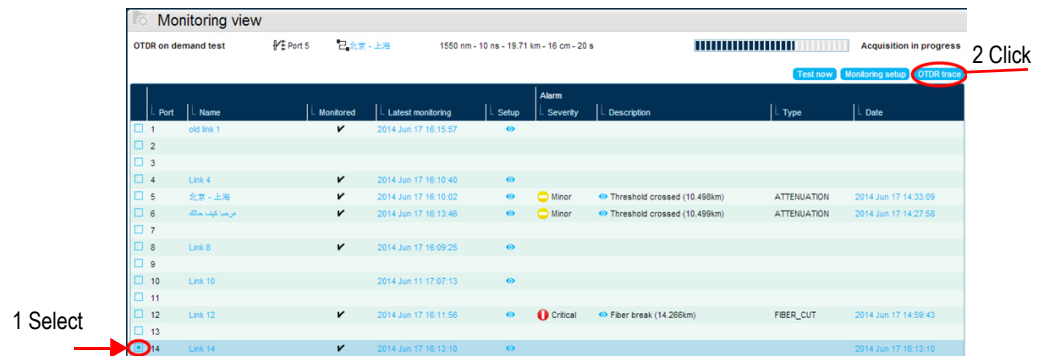


Measurement on a port with monitoring tests

From the monitoring view main screen:

- 1 Select a monitored **Port** .

Figure 29 Port selection



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

Figure 30 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 24](#)
- [“System Alarm” on page 26](#)

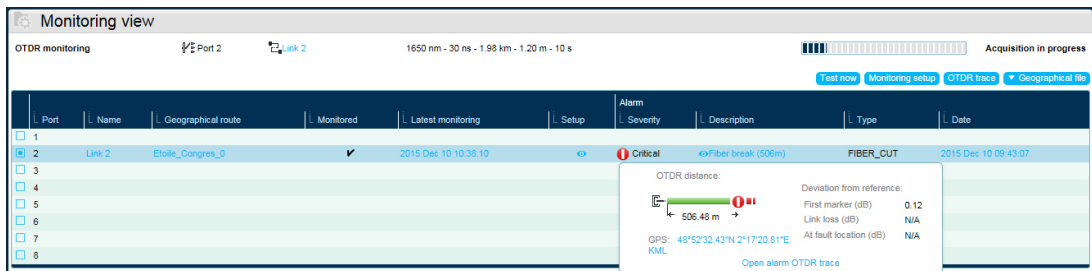
Optical alarms

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 31 Optical Alarm in the Monitor view



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

Attenuation alarms

Figure 32 Fiber Cut - Critical Alarm on connector



Alarm root cause

According to the value of the attenuation, the root cause is different:

- bending
- fiber cut or patchcord disconnected.

If the fault is located on a connector or a splice, the connector or the splice can be identified.

The following alarm root cause is provided in the alarm description:

Level difference / Location	Splice	Connector	Cable (not on connector or splice)
Break	Splice broken or APC patchcord disconnected	Patchcord disconnected or excessive bending	Fiber Break
Attenuation	Fiber bending on splice or on APC patchcord	Patchcord bending, dirty, loose	Fiber bending

Peak Monitoring alarm

SmartOTU monitors the peaks to detect peak degradations.

One peak monitoring alarm is raised for each peak degraded.

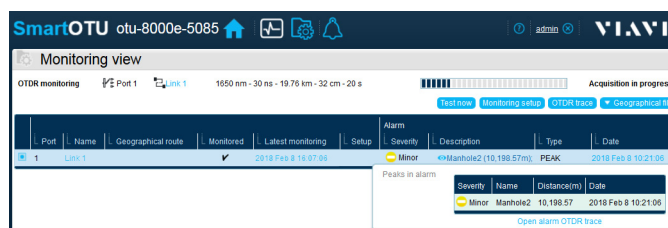


NOTE

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

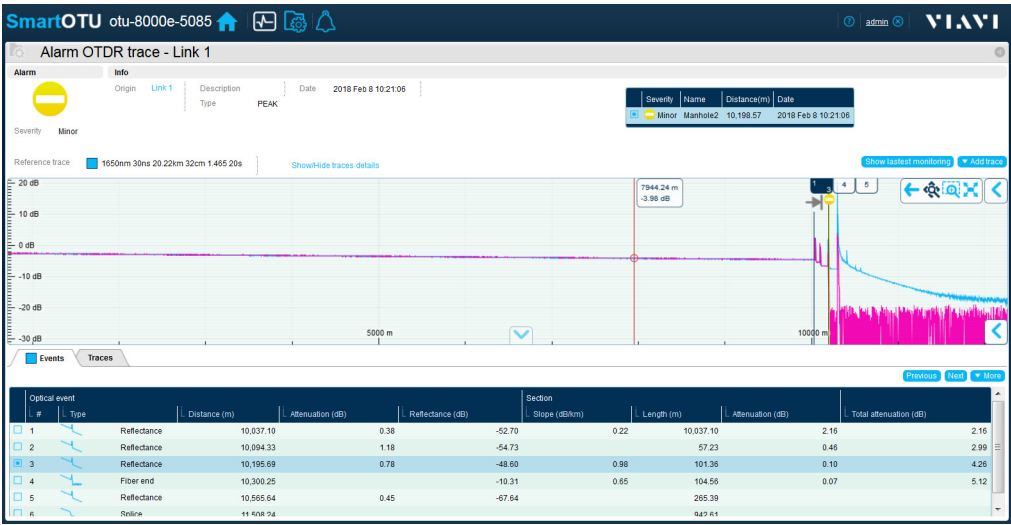
- 1 In Monitoring view, click on the **alarm description**.
A window with a short description of the peak in alarm displays

Figure 33 Peak in alarm description




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

Figure 34 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

Description	Severity
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**

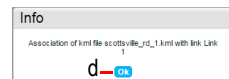
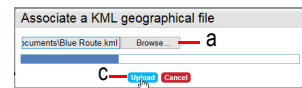
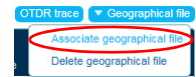
The origin of the route in the kml file must be set at the SmartOTU location.

Topics discussed in this chapter are as follows:

- [“Associating a kml file to a port” on page 30](#)
- [“Displaying the alarm on a map or in the kml file” on page 30](#)

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 35 Link of the geographical route

Monitoring view

OTDR monitoring

Port 3

Link 3

1625 nm - 2 ns - 0.48 km - 8 cm - 20 s

Acquisition in progress

Test now

Monitoring setup

OTDR trace

Geographic file

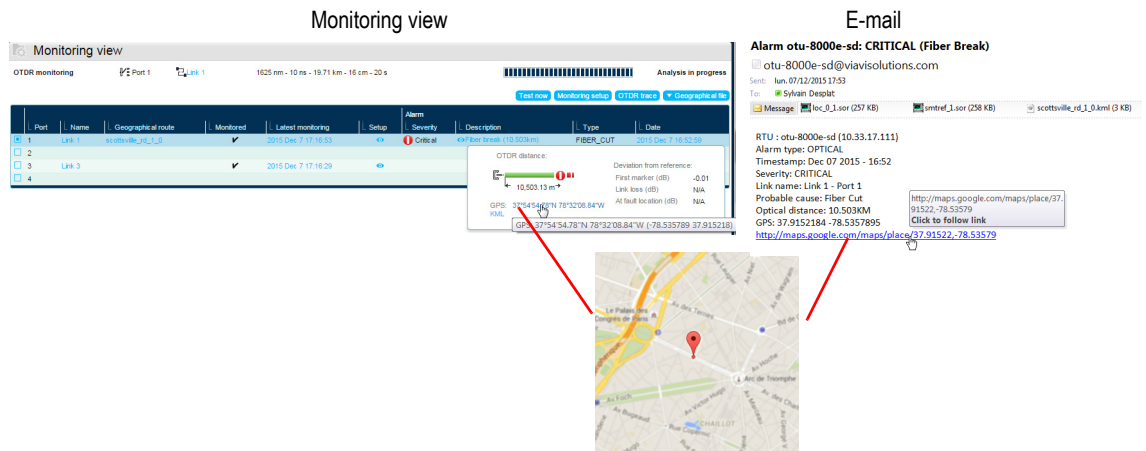
ID	Port	Name	Geographical route	Monitored	Latest monitoring	Setup	Alarm Severity	Description	Type	Date
1	Link 1	scottsvilleBlue_rd_1.0		✓	2015 Dec 7 17:21:00		Critical	Optical break (10.003km)	FIBER_CUT	2015 Dec 7 16:52:59
2	Link 2									
3	Link 3				17:20:35					
4	Link 4									

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.

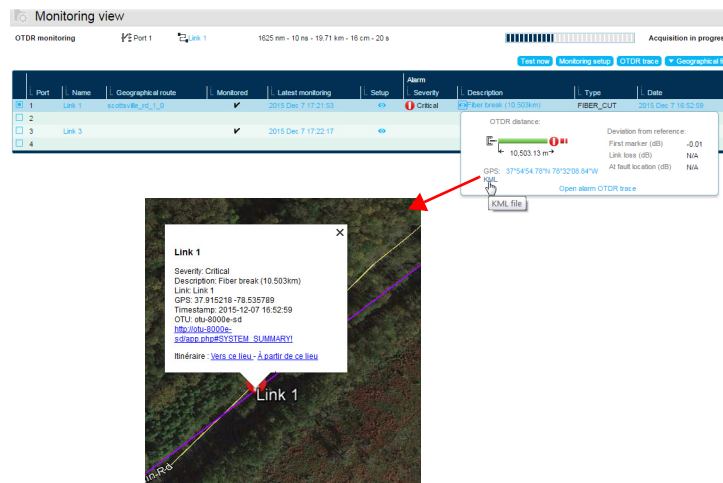
- 1 From the Monitoring View on SmartOTU, first click on the **Alarm severity** or **description** to display the details concerning the alarm.
- 2 From the Monitoring View, the e-mail or the SMS, click on the Google Maps link (GPS coordinates) to display the alarm position in Google Maps.

Figure 36 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 37 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 34](#)
- [“Configuring the SNMP” on page 35](#)
- [“Configuring Email” on page 39](#)
- [“Configuring the Login and password” on page 43](#)

Configuring the LAN

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

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


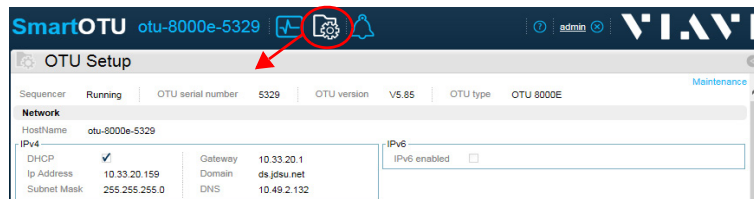
1 Click on the icon  on the upper banner to access to the Network configuration:

Figure 38 Network configuration



LAN setting edition

To change LAN settings:


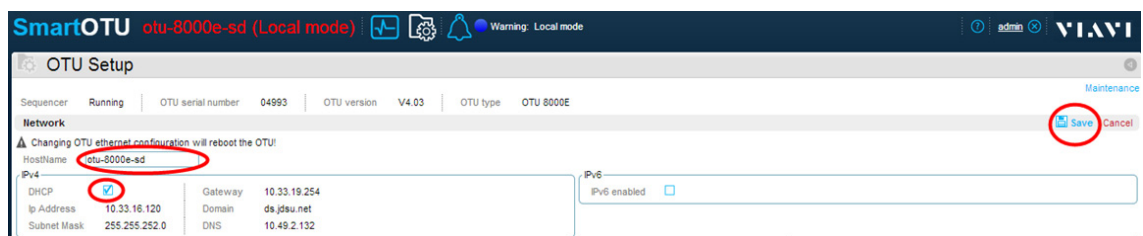
- SmartOTU must be in local mode: your PC with the web browser must be connected on SmartOTU local Ethernet interface (RJ45 "BCK/LOC") and you must push the Local button on SmartOTU.
- 1 Connect to SmartOTU application on your web browser with the url: <http://192.168.1.1>.
 - 2 Click on the icon  and 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 39 Network settings



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

Configuring the SNMP

Up to 5 SNMP managers can be defined.


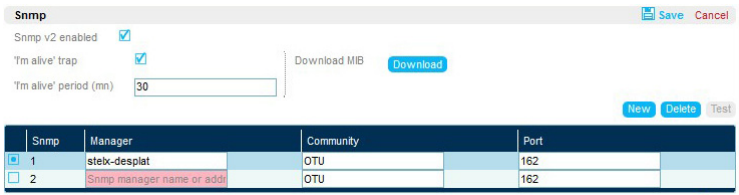
- 1 SmartOTU sends traps according to **SNMP V2c**.
 - a Click on the icon 
 - b Click on **Edit** from the SNMP window to modify the parameters

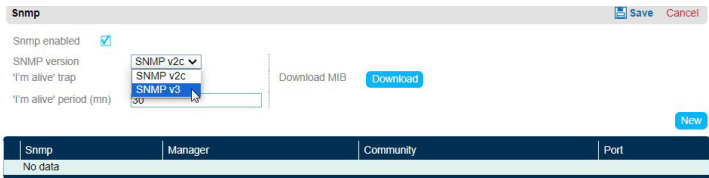
Figure 40 SNMP settings



The screenshot shows the 'Snmp' configuration window. It has a 'Save' button and a 'Cancel' button. Below the title bar, there are three checkboxes: 'Snmp v2 enabled' (checked), 'I'm alive' trap (checked), and 'I'm alive' period (min) (30). To the right of these is a 'Download MIB' button and a 'Download' button. Below this is a table with columns: Snmp, Manager, Community, and Port. The table has two rows: Row 1: Snmp=1, Manager=steb-desplat, Community=OTU, Port=162. Row 2: Snmp=2, Manager=Snmp manager name or add, Community=OTU, Port=162. At the bottom right of the table are 'New', 'Delete', and 'Test' buttons.

- c 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:
 - i Activate SNMP V2 enabled
 - ii You can activate the "I'm alive" trap to send an "I'm alive" trap every 10 minutes by default.
 - iii Fill your SNMP V2 manager hostname or IP (only one SMTP manager)
 - iv You can change the community and default port to use
- 2 SmartOTU sends traps according to **SNMP V3**.
 - a Click on **Edit** from the SNMP window to modify the parameters.
 - b Setup your SNMP manager.
 - Download the SmartOTU SNMP MIBs to add it to your SNMP manager.
 - To setup SmartOTU SNMP v3 traps, in SmartOTU setup screen:
 - i Activate SNMP enable
 - ii Choose SNMP v3

Figure 41 SNMP v3 selection



The screenshot shows the 'Snmp' configuration window with 'SNMP v2c' selected in the 'SNMP version' dropdown. The 'I'm alive' trap is checked, and the 'I'm alive' period (min) is 30. The 'Download MIB' button is highlighted. Below the table, there is a 'New' button. The table has columns: Snmp, Manager, Community, and Port. The table is currently empty, showing 'No data'.

- i You can activate the "I'm alive" trap to send an "I'm alive" trap every 10 minutes by default.
- ii Fill your SNMP v3 manager hostname or IP

- iii You can change:
- "SNMP USM User
 - "Default port to use
 - "Authentication algorithm none/MD5/SHA
 - "Authentication passcode (can be empty)
 - "Encryption none/AES
 - "Encryption passcode (can be empty)

Figure 42 SNMP v3 Configuration

Snmp	Manager	User	Port	Auth. MD5/SHA	Auth. Pwd	Encrypt. AES	Encrypt. Pwd
1	stebx-desplat	OtuUserXprv	162	MD5	password	AES	password

3 **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 root cause of the fault if it was identified, or empty if unknown. See table [page 37](#) for possible causes:

Location	Splice	Connector	Cable
Level difference			
Break	Splice break or connector disconnected	Connector disconnected or strong bend	Fiber break
Attention	Fiber bending on splice or connector	Connector bending, dirty, loose	Fiber bending

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-5000-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-5000-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


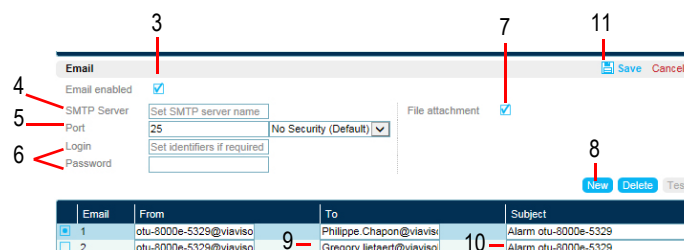
- 1 Click on the icon 
- 2 Click on **Edit** from the Email window to modify the parameters

Figure 43 Email configuration



The screenshot shows the 'Email' configuration window. It includes a table of email receivers and a form for SMTP settings. Numbered callouts indicate the following steps:

- 3: Click on the 'Email' tab.
- 4: Check 'Email enabled'.
- 5: Set 'SMTP Server' to 'Set SMTP server name'.
- 6: Set 'Port' to '25'.
- 7: Select 'No Security (Default)' for security.
- 8: Click 'New' to add a new email receiver.
- 9: Fill in the 'From' email address.
- 10: Update the 'Subject' of the email alarm.
- 11: Click 'Save' to save the configuration.

Email	From	To	Subject
1	otu-8000e-5329@viaiso	Philippe.Chapon@viaiso	Alarm otu-8000e-5329
2	otu-8000e-5329@viaiso	Gregory.lietaert@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-5000-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 44 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 45 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

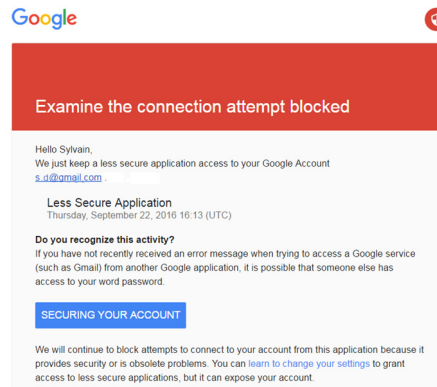
Figure 46 Example of email configuration with Gmail

Email	From	To	Subject	Optical switch ports
1	otu-8000e-622@visisolutions.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

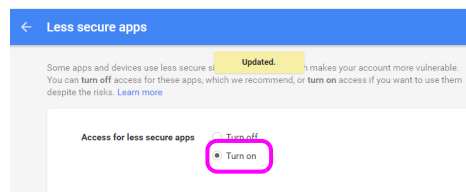
2 In case of gmail, in your google account, first email can be blocked.

Figure 47 Google message about email blocked

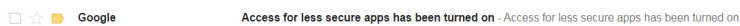


- 3 In Google account, enable access to less secure apps:

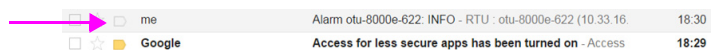
Figure 48 Turn on access to less secure apps



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 49 Email Setup: ports assignation for different recipients

The screenshot shows the 'SmartOTU otu-5000' configuration window. A modal dialog titled 'Email: john.smith@gmail.com' is open, displaying a table for port assignment:

Port	Link	Send email
1	Link 1	<input checked="" type="checkbox"/>
2	Link 2	<input checked="" type="checkbox"/>
3	Link 3	<input type="checkbox"/>
4	Link 4	<input type="checkbox"/>

Below the table are 'OK' and 'Cancel' buttons. The background shows the 'OTU Setup' configuration for 'otu-8000e-622', including network settings (IPV4, DHCP, IP Address: 10.33.16.247, Subnet Mask: 255.255.252.0) and email settings (Email enabled: ☒, SMTP Server: smtp.gmail.com, Port: 587, Login: john.smith@gmail.com, Password: [masked]).

Configuring the Login and password

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

Figure 50 User credentials

The screenshot shows the 'Change password' dialog box. It has a title bar with 'Change password', 'Save', and 'Cancel' buttons. The fields are:

- Login: admin
- New login: admin
- Current password: [empty]
- New password: [empty]
- Confirm new password: [empty]



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.

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:

- [“OTDR module” on page 46](#)
- [“Apply a new optical switch” on page 46](#)
- [“Adding external Optical switch” on page 46](#)

OTDR module

Figure 51 OTDR Module

OTDR	
Type	Wavelength (nm)
EOTDRV2_A	1625

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 52 Confirm optical switch detected

Optical Switch		
⚠ Confirm new internal switch detected!		
Detection		
Serial Number	Inputs	Outputs
104	1	4
Configuration		
Serial Number	Inputs	Outputs
1074	1	48



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.

Adding external Optical switch



NOTE

To get information on the OSX installation and available configurations, refer to the OSX8000/OSX5000 user manual, or to the OSX144 user manual.



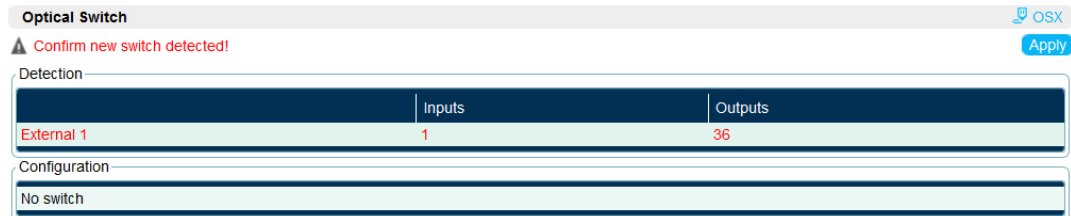
CAUTION

Pre-requisites for OSX configuration: no monitoring setup on OSX.
If some links are monitored on OSX, power off the OSX from the OSX menu and reboot the OTU.

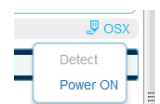
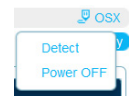
Setting up one OSX24/36 on the Web Interface

- 1 On the configuration menu, click on **OSX**.

Figure 53 OSX-5000 Setup



- 2 Click on **Power Off** button to add/remove OSX. OSX power supply is switched off.
- 3 Connect physically the OSX.
- 4 Once the OSX is physically connected to the OTU-5000, click on **Power On** button.



Setting up a second additional OSX24/36 on the Web Interface (configuration with 2 OSXs on SmartOTU-5000)

- 1 Power OFF OSX connector on OTU5K from **Setup** screen.
- 2 Connect physically the 2 OSXs on OTU5K device with cables
- 3 Power ON OSX connector from **Setup** screen.
- 4 Go to **Maintenance** screen.
- 5 Select **VIavi service tools**.
- 6 Set the second OSX in addressing mode:
On second OSX, press **Setup** button, LED must be solid green
- 7 From the SmartOTU maintenance GUI, set the OSX address: 2, with the following SCPI command: `OTU:SWITCH:OSXJ:ADDRESS 2.`
- 8 Click on **Execute**.

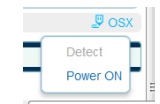
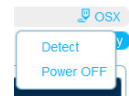
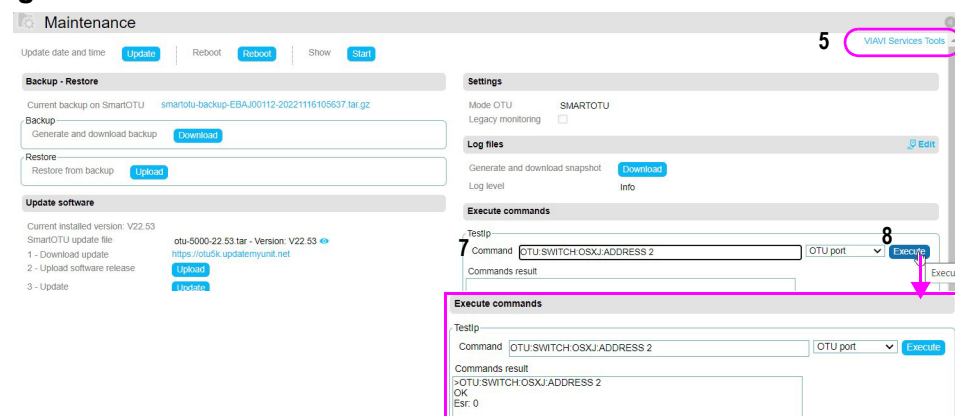


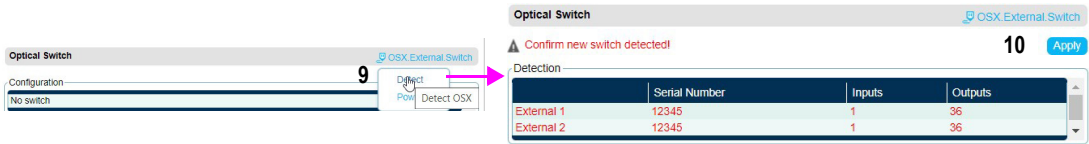
Figure 54 Second OSX command



On second OSX, LED must be flashing GREEN.

- 9 On second OSX exit addressing mode: press **Setup** button, LED must be turned off.
- 10 Go back to **Setup** screen, and **Detect** the OSX.
- 11 Apply the new switch configuration.

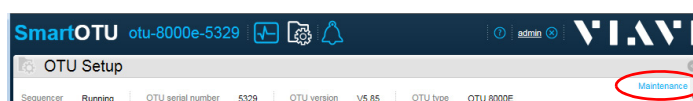
Figure 55 New switch detection



Maintenance

This chapter describes the maintenance procedures for the SmartOTU.

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



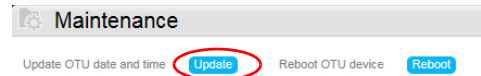
Topics discussed in this chapter are as follows:

- “Update SmartOTU date-time” on page 50
- “Software update” on page 50
- “SmartOTU Configuration backup” on page 51
- “SmartOTU configuration restore” on page 51
- “Add a License” on page 52
- “Enhanced Security option” on page 52
- “Alarms” on page 53

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**.

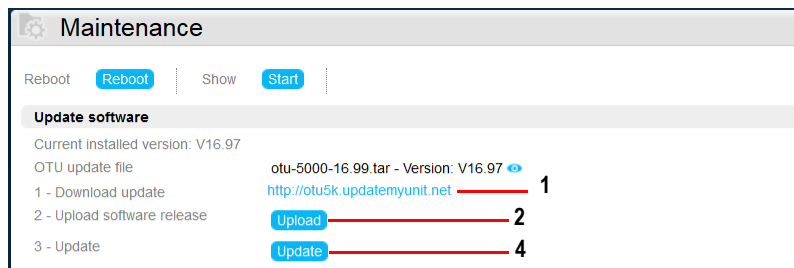


The date and time will be updated according to the computer date and time.

Software update

- 1 From the Software update section of the **Maintenance** screen, download on your PC the new OTU-5000 release from VIAVI <http://otu5k.updatemyunit.net> site.

Figure 56 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) and upload it.

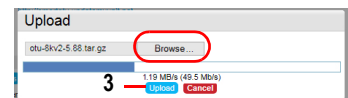
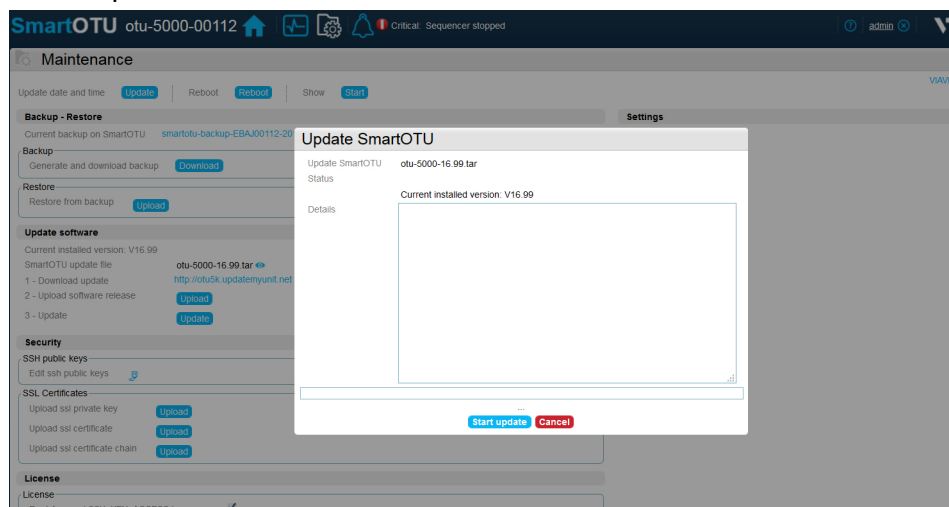


Figure 57 Update OTU-5000



- 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.

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 58 Backup download

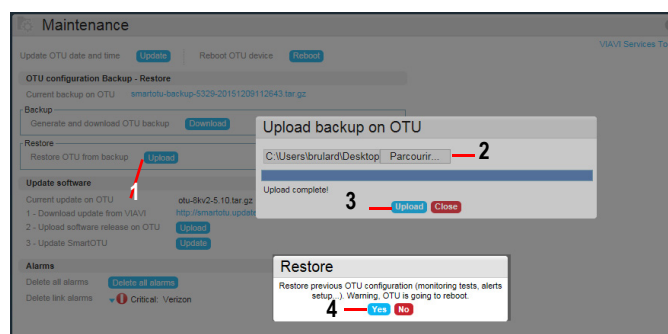


- 3 A dialog box informs the downloading is in progress. Click **Ok** to close the window.
When the download is finished, the browser proposes to save the file

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 59 Restore configuration



Add a License

Licenses are installed when the product is ordered.

They can also be added later if needed.

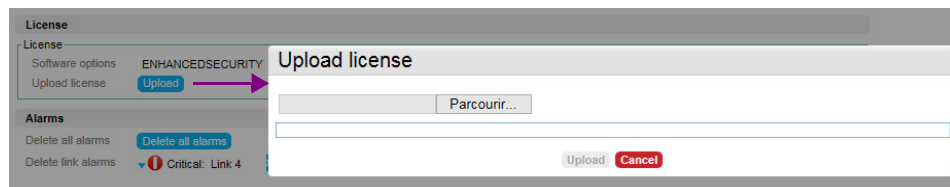
Current available licenses are:

- Enhanced security Pack (HTTPS)
- OTU5000 PEAK MONITORING FOR SMARTOTU (Ref: E9E-PEAK-MON)

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 60 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 61 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

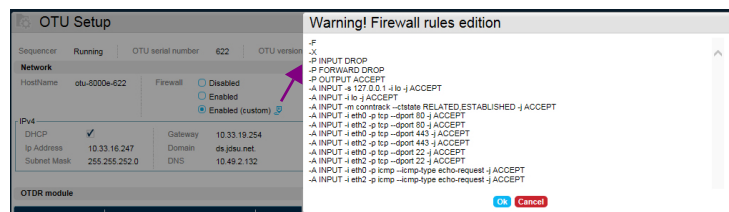
In the Firewall Setup, the parameter **Enabled (custom)** is available only with enhanced security license.

Figure 62 Firewall custom configuration



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

Figure 63 Firewall rules edition



Show SmartOTU

From the Maintenance screen, the user can make the LED **Status** blink onto the OTU-5000, in order to recognize which OTU-5000 is controlled by the Web Interface:

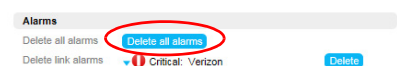
- 1 On the upper part of the screen, click on **Start** button of the **Show OTU** zone.
The LED Status of the concerned OTU-5000 starts blinking.

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

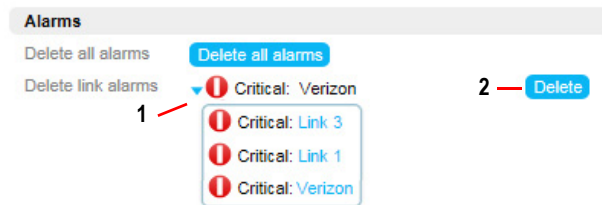
If you have a snmp manager you should also remove all alarms from your manager to be synchronized.

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 64 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:

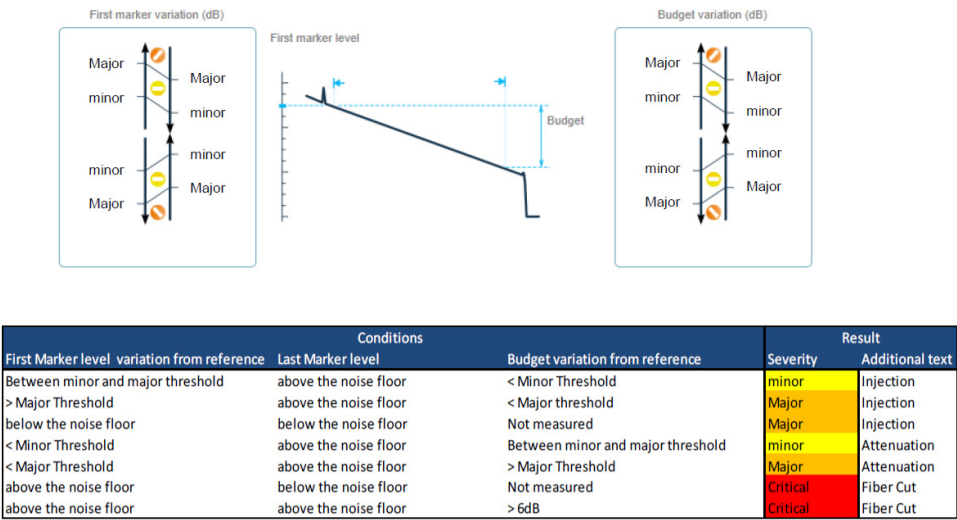
- [“Legacy monitoring principle” on page 56](#)

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 65 Fiber Monitoring Principle





78COTU060
Rev. 005, October 2023
English



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