



OLTS-85/OLTS-85P

SmartClass™ Fiber Optical Loss Test Sets

Operating manual

BN 2325/98.21

2019.12

English

Please direct all inquiries to your local Viavi sales company. The addresses can be found at:

www.viavisolutions.com/en-us/contact-sales-expert

A description of additional instrument features can be found at:

www.viavisolutions.com/en-us/products/network-test-and-certification

Notice

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1 INTRODUCTION

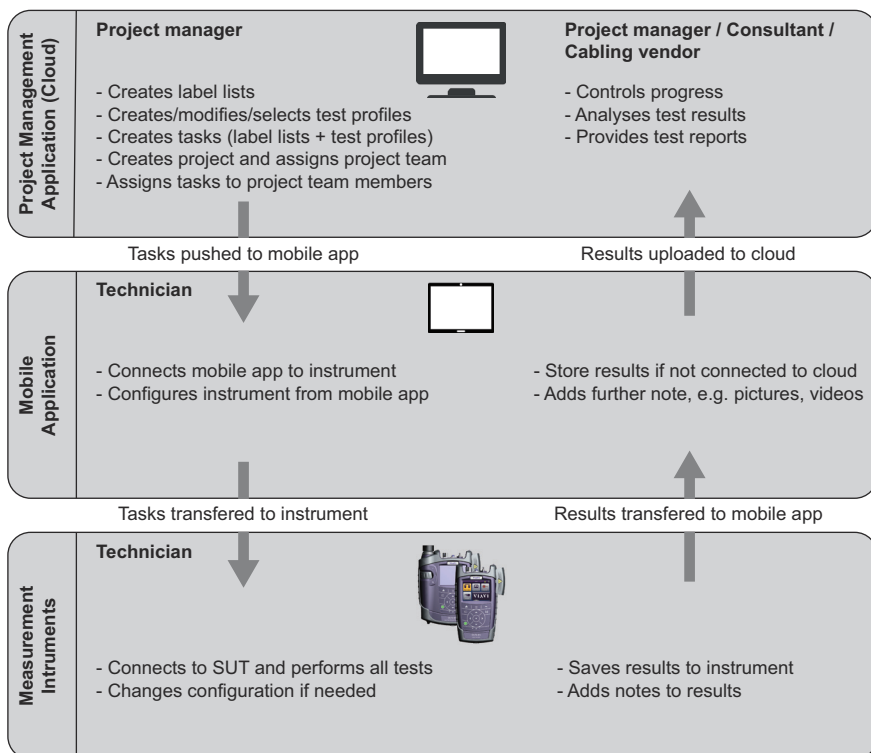
Enterprise Structured Cabling Workflow

With Enterprise Structured Cabling Workflow (ESCW) Viavi provides an integrated workflow environment for planning, distributing, performing, collecting, and evaluating measurement procedures of fiber infrastructures.

ESCW consists of three components:

- Project Management Application
- Mobile Application
- Measurement instrument (e.g. OLTS-85/OLTS-85P)

The cloud workflow overview



Project Management Application

The Project Management Application is a cloud- and browser-based application that allows a project manager to control the entire measurement process:

- Define enterprise specific workflows
- Assign tasks
- Develop label templates
- Set up test profiles
- Analyse results
- Manage crews

When finally set up tasks can be assigned to a field technician and provided via the cloud platform.

NOTE: For further information about the Project Management Application please refer to the help provided with the application.

Mobile Application

The Mobile Application allows the field technician to download assigned tasks from the cloud platform (push service) and to transfer the task to the measurement instrument.

After completing the tasks the results can be uploaded via the Mobile Application to the Project Management Application on the cloud platform for further analysis.

NOTE: For further information about the Mobile Application please refer to the help provided with the application.

Measurement instrument

Measurement instruments that support ESCW (OLTS-85/OLTS-85P, Certifier 10/40G, TB/MTS-2000) offer beneath the test application centric Test-Tool mode a Workflow mode. This Workflow mode allows the use of the ESCW functions like a structured, guided, and pass/fail-oriented execution of projects assigned to a specific field technician.

For key benefits of the Workflow mode see ["Workflow Mode" on page 31](#).

OLTS-85/OLTS-85P Loss Test Set

The SmartClass™ Fiber OLTS-85/OLTS-85P (optical loss test set) contents high-performance, easy-to-use instruments with a two or four wavelength light source and a power meter. They are universal instruments for Tier 1 certification of single-mode and multi-mode fibers, installation, maintenance, and troubleshooting. Automate pass/fail end-face analysis for all fiber types, and gain complete test visibility at both local and remote ends. Use pre-configured cabling specifications from all leading manufacturers.

Loss can be measured simultaneously at two wavelengths. Quick referencing for all built-in wavelengths can be effected independent of the current measurement mode.

Key Benefits of the OLTS-85/OLTS-85P Loss Test Set

Test-Tool mode

- Test application centric approach.
- Achieve complete network certification with the OLTS-85/OLTS-85P.
- Optimize productivity with the industry's fastest test workflow.
- Obtain comprehensive results for the latest TIA 568.3, ISO 11801, and ISO 14763-3 requirements.
- View test setup and results data and edit labels at both local and remote ends.
- Objective pass/fail testing for fiber end-face requirements.

Workflow mode

- Label list centric approach.
- Guided testing of large number of equal test points with predefined tests.
- Visual display of measurement progress.
- Quick overview of passed and failed test.

Features

- Multi-mode (850/1300 nm) and single-mode (1310/1550 nm) adapters for Tier 1 fiber certification (loss/length/polarity).
- Industry-leading P5000i Digital Probe fiber end-face inspection probe support.

OLTS-85/OLTS-85P Light Sources

The SmartClass™ Fiber OLTS-85/OLTS-85P light sources are professional, versatile, compact handheld instruments designed for qualification and certification of fiber optic networks. Carefully chosen combinations of available wavelengths make SmartClass™ Fiber OLTS-85/OLTS-85P light sources the optimum choice for link loss testing and characterization of long-haul, metro, and access telecommunication networks, as well as for data center and local area network testing.

Single-mode (SM) and multi-mode (MM) – The all-in-one solution

OLTS-85/OLTS-85P devices that have both single-mode and multi-mode light sources are the most flexible test instruments. These instruments are particularly suitable for rental and measurement service companies.

Fiber inspection ready – Inspect before you connect

The SmartClass™ Fiber OLTS-85/OLTS-85P instruments are prepared for fiber inspection. Connection of a P5000i Digital Probe to the OLTS-85/OLTS-85P enables a technician to perform best practices fiber inspection and automated Pass/Fail testing of optical connectors/adapters in order to ensure industry standard fiber end face quality and cleanliness.

No additional fiber microscope set required – simply plug in a P5000i Digital Probe.

Report generation – Do it the easy way

Of course, it is possible to make measurement reports with a PC tool.

FiberChekPRO™ is the ideal tool for generating your report. Please download FiberChekPRO™ for free on <http://updatemyunit.net>.

Rugged and portable

Battery operation with AA dry batteries, or with a rechargeable Li-Ion Battery Pack ensure a long operating time in the field and a robust, shock-proof design makes the SmartClass™ Fiber instruments the perfect choice for optical network field testing, even under tough conditions.

Remote controllable

Operation with an AC/DC power supply and remote control capabilities via USB 2.0 and Ethernet make the SmartClass™ Fiber instruments a perfect solution even for fixed installations in central offices, in production environments, and on the laboratory workbench.

Operating manual update

Continuing enhancement and further development of the SmartClass family may mean that this operating manual does not cover all the latest functions of your instrument.

If the operating instructions about features supported by your instrument are missing, please visit the Viavi web site to check if additional information is available.

To download the latest user manual:

1. Visit the Viavi web site at <http://updatemyunit.net>.
2. Select your SmartClass™ Fiber model from the product line.
3. Open the download area and download the latest user manual.

Symbols used in this operating manual

Various elements are used in this operating manual to draw attention to special meanings or important points in the text.

Symbols and terms used in warnings

The following warnings, symbols, and terms are used in this document in compliance with the American National Standard ANSI Z535.6-2011:

NOTICE

Follow the instructions carefully to avoid **damage to or destruction of the instrument**.

⚠ CAUTION

Follow the instructions carefully to avoid a low or medium risk of **injury to persons**.

⚠ WARNING

Follow the instructions carefully to avoid **severe injury** to persons.

⚠ DANGER

Follow the instructions carefully to avoid **death or severe injury** to persons.



High voltage

Follow the instructions carefully to avoid **damage** to the instrument or **severe injury** to persons.

This safety instruction is given if the danger is due to **high voltage**.



Laser

Follow the instructions carefully to avoid **damage** to the instrument or **severe injury** to persons.

This safety instruction is given if the danger is due to **laser radiation**. Information specifying the laser class is also given.

Warning format

All warnings have the following format:

WARNING

Type and source of danger

Consequences of ignoring the warning.

- Action needed to avoid danger.

The following elements are used in this operating manual:

✓	Requirement This requirement must be met first; e.g. ✓ The system is switched on.
► 1. 2. 3.	Instruction Follow the instructions given. An arrow indicates a single step, numbers indicate the order in which the instructions should be followed, e.g. ► Select mode.
<i>Italics</i>	Result Indicates the result of following an instruction; e.g. <i>The page opens.</i>
Boldface	Pages, controls, and display elements Screen pages, controls, and display elements are indicated in boldface .
Text in blue	Cross references Cross references are indicated in blue type. When using the PDF version, just click on the blue text to skip to the cross reference.
[H]	Instrument keys Instrument keys are indicated within square brackets.
[More]	Touchscreen buttons Touchscreen buttons are indicated within blue square brackets.

2 SAFETY INFORMATION

Warning symbols on the unit



Warning symbols indicating a potential hazard

- ▶ In all cases where the unit is labeled with a warning symbol, the operating manual must be consulted to learn more about the nature of the potential hazard and any action that must be taken.

Proper usage

This instrument is intended for measurements on optical fiber devices and systems.

- ▶ Please make sure the instrument is not operated outside the permitted ambient conditions.
- ▶ Always make sure that the instrument is in proper working order before switching it on.

Laser safety



WARNING

Dangerous laser radiation

Laser radiation can cause irreparable damage to eyes and skin.

This device is a Class 1 laser product according to DIN EN 60825-1:2007.

The maximum permitted power for the OLTS-85/OLTS-85P means that the optical input signals can reach hazard level. Bear this in mind when using the OLTS-85/OLTS-85P.

- ▶ Always be aware of the hazard level of the instrument to be connected.
 - ▶ Connect all optical fibers before switching on the radiation source.
 - ▶ Switch off the laser source before disconnecting the optical fibers.
 - ▶ Never look directly into the unconnected port of the instrument, the output of a laser source, or an optical fiber connected to a source or a system.
 - ▶ Always cover unused ports.
 - ▶ Be aware that the emitted light is not visible.
 - ▶ Heed the normal precautions for working with laser radiation and consider local regulations.
-

Battery operation

WARNING

Explosion danger

Short-circuiting the batteries can result in overheating, explosion, or ignition of the batteries and their surroundings.

- ▶ Never short-circuit the battery contacts by touching both contacts simultaneously with an electrical conducting object.
 - ▶ Only use AA size dry batteries or rechargeable batteries.
 - ▶ Make sure the batteries are inserted with the correct polarity.
-

Ventilation

NOTICE

Insufficient ventilation

Insufficient ventilation can damage the instrument or adversely affect its function and safety.

- Ensure adequate ventilation when operating the instrument.

PS4 Universal AC/DC Power Supply

Safety class

The PS4 Universal AC/DC Power Supply unit has a protective isolation that conforms with IEC 60950.

Environmental conditions

NOTICE

Ambient temperature too high/low

Temperatures outside the operating range of 0 to +40 °C can damage the PS4 Universal AC/DC Power Supply or adversely affect its function and safety.

- Only operate the PS4 Universal AC/DC Power Supply indoors.
The PS4 Universal AC/DC Power Supply must only be operated at ambient temperatures between 0 and +40 °C.

NOTICE

Insufficient ventilation

Insufficient ventilation can damage the PS4 Universal AC/DC Power Supply or adversely affect its function and safety.

- Ensure adequate ventilation when operating the PS4 Universal AC/DC Power Supply.

NOTICE

Condensation

Operation in the presence of condensation can damage the PS4 Universal AC/DC Power Supply or adversely affect its function and safety.

- ▶ Do not operate the PS4 Universal AC/DC Power Supply if condensation has formed.
 - ▶ If condensation cannot be avoided, such as when the PS4 Universal AC/DC Power Supply is cold and is moved to a warm room, wait until the PS4 Universal AC/DC Power Supply Unit is dry before plugging it into the AC power line.
-

3 GETTING STARTED

Unpacking the instrument

Packing material

We suggest that you keep the original packing material. It is designed for reuse (unless it is damaged during shipping). Using the original packing material ensures that the instrument is properly protected during shipping.

Checking the package contents

- Unpack the instrument and check the package contents. For more information see [“Included items” on page 129](#).

Checking for shipping damage

After you unpack the instrument, check to see if it was damaged during shipping. This is particularly likely if the packaging is visibly damaged. If there is damage, do not attempt to operate the instrument. Doing so can cause further damage. In case of damage, please contact your local Viavi sales company. Addresses can be found at www.viavisolutions.com.

Recovery following storage/shipping

Condensation can occur if an instrument that is stored or shipped at a low temperature is brought into a warm room. To prevent damage, wait until no more condensation is visible on the surface of the instrument before powering it up. Do not operate the instrument until it has reached its specified temperature range and wait until it has cooled down if the instrument was stored at a high temperature (see [“Ordering Information” on page 129](#)).

Instrument overview



Fig. 1 Front view OLTS-85/OLTS-85PP (left) and OLTS-85/OLTS-85P

1	Patch cord microscope (PCM) with FMAE adapter
2	PCM controls: focus control, automated Pass/Fail analysis, magnification control
3	Connector interface
4	Test head cover (green for APC- and gray for PC connectors)
5	3.5 inch touchscreen
6	Key pad (operator control panel)
7	Battery compartment and stand (on rear of instrument)
8	USB 2.0 device port (Type Micro-B)
9	USB 2.0 host port (Type A) and external power supply connector
10	Ethernet port (RJ-45)

Connector panel



Fig. 2 Connector panel

- | | |
|---|--------------------------------------|
| 1 | Optical connector 1, single-mode |
| 2 | Optical connector 2, multi-mode |
| 3 | Input port for broadband measurement |

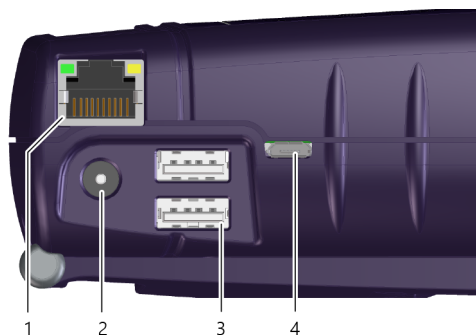


Fig. 3 External power supply connector and communication interfaces

- | | |
|---|------------------------------------|
| 1 | Ethernet port (RJ-45) |
| 2 | External power supply connector |
| 3 | USB 2.0 host port (Type A) |
| 4 | USB 2.0 device port (Type Micro-B) |

Power supply

The following power sources can be used to operate the OLTS-85:

- Eight 1.5 V dry batteries
(Mignon AA size, alkaline type recommended)
- Eight 1.2 V NiMH rechargeable batteries
(Mignon AA size, no internal charge)
- PS4 Universal AC/DC Power Supply (optional)
- RBP2 Li-Ion Battery Pack (optional)

NOTE: Best Measurement accuracy is achieved when the measurements are performed in battery mode (w/o AC adapter).

Battery operation

WARNING

Dangers when handling batteries

Handling batteries may be dangerous. Please note the following safety instructions.

- Please note the battery operation safety information in the chapter ["Battery operation" on page 14](#).

Replacing batteries

- Do not replace individual batteries. Always change all eight batteries at the same time.
 - Always use eight batteries of the same type; i.e. do not mix rechargeable and non-rechargeable batteries.
-

Replacing batteries



Fig. 4 Replacing the batteries

- | | |
|---|--------------------------|
| 1 | RBP2 Li-Ion Battery Pack |
| 2 | Latch lock |
| 3 | AA battery tray |

The battery compartment is on the back of the instrument.

1. Press down the latch to release and to open the lid of the battery compartment.
2. Insert new batteries in the tray or remove the used batteries from the tray and replace all eight with fresh ones.


NOTE: Take care to insert the batteries correctly. The correct polarity is indicated by a diagram inside the battery compartment.

– or –

Insert new or replace the RBP2 Li-Ion Battery Pack.

– or –

Switch from non-rechargeable batteries to rechargeable ones by replacing the battery tray with a new battery pack (or vice versa).

3. Close the battery compartment.
4. Press the  key to switch on.

Recharging the batteries

The rechargeable RBP2 Li-Ion Battery Pack recharges when the PS4 Universal AC/DC Power Supply is used to power the instrument. The instrument switches to trickle charging automatically as soon as the RBP2 Li-Ion Battery Pack is fully charged.

NOTE: Rechargeable AA batteries will not be recharged in the instrument. For AA-type rechargeable batteries please use an external charger.
It is not possible to charge the rechargeable AA batteries or the RBP2 Li-Ion Battery Pack via the USB interface.

If the PS4 Universal AC/DC Power Supply and the USB interface are both connected, the instrument is powered by the PS4 Universal AC/DC Power Supply.

Deep discharge

A rechargeable battery that appears to be dead (unit will not turn on even when connected to external power) may well be in a deep discharge state. It can be fully charged with the following charging cycle:

1. Plug in the power cord for 1–1.5 hours.
Battery should be partly charged now.
2. Switch the power on.
If the instrument starts: Let the battery fully charge.
– or –
If the instrument does not start:
Unplug power cord, plug it back in and repeat steps 1 and 2.

NOTE: If the battery is completely deep-discharged, this cycle might need to be repeated up to 3 times.

General tips on using batteries

- Always handle batteries with care.
- Do not drop or damage the batteries or expose them to excessively high temperatures.
- Do not store the batteries for more than one or two days at very high temperatures (e.g. in a vehicle), either separately or inserted in the instrument.
- Do not leave discharged batteries in the instrument for a long time if it is not being used.

Other basic safety precautions are as follows:

- Do not use PS4 Universal AC/DC Power Supply outdoors or in wet or damp locations.
- Connect the PS4 Universal AC/DC Power Supply to the correct mains voltage, as indicated on the rating label.
- Do not allow anything to rest on the power cord, and do not place the product where people can walk on the power cord.
- Avoid using this product during electrical storms. There may be a remote risk of electric shock from lightning.
- Do not use this product in the vicinity of a gas leak or in any explosive environment.
- Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous, high-voltage points, and other hazards. Contact qualified service personnel for all service.

Environmental protection

Please dispose of any unwanted dry batteries and rechargeable batteries carefully. They should also be removed from the instrument if it is to be discarded. If facilities in your country exist for collecting such waste or for recycling, please make use of these rather than throwing the batteries out with normal trash. You will often be able to return used batteries to the place where you purchase new ones. Any dry or rechargeable batteries that you purchased from Viavi can be returned to one of our Service Centers for disposal.

Operation with AC power

NOTE: Only the PS4 Universal AC/DC Power Supply may be used to operate the OLTS-85/OLTS-85P with AC power.

To fit the AC line plug adapter:

1. Select the appropriate AC line plug adapter.
2. Slide the AC line plug adapter into the slot.
The PS4 Universal AC/DC Power Supply is ready for use.

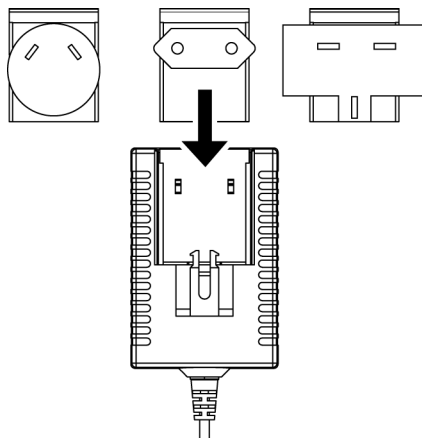


Fig. 5 PS4 Universal AC/DC Power Supply

To change the AC line plug adapter:

1. Squeeze both sides of the PS4 latch lock (see Fig. 5).
2. Push the AC line plug adapter upwards.
3. Slide a different AC line plug adapter into the slot (see Fig. 6).

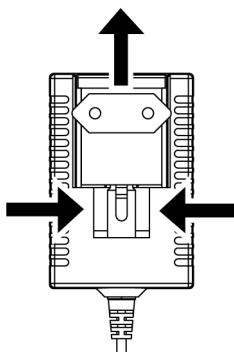


Fig. 6 PS4: Changing the AC line plug adapter

To operate the OLTS-85/OLTS-85P with AC power:

1. Connect the PS4 DC power cord to the OLTS-85/OLTS-85P external power supply connector.
(The connector is under the cover on the right side.)
2. Plug the PS4 into the AC line socket.
The OLTS-85/OLTS-85P switches on automatically when powered by the PS4.

NOTE: The PS4 provides power even if dry or rechargeable batteries are inserted in the instrument.
The OLTS-85/OLTS-85P cannot be powered via the USB interface.

Connecting optical cables

Mounting test adapters

Viavi provides a number of test adapters for connecting the OLTS-85/OLTS-85P to the interface to be tested.

You can connect all standard optical connector types to the instrument using these adapters. The test adapters are suitable for connectors with planar (PC) and angled end surfaces (APC). Contact your local Viavi sales company for available adapter types.

The OLTS-85/OLTS-85P connector type must match the cable connector type:

PC: BN 2325/01/05, BN 2326/01/05

The PC/APC versions are easily identified by the colors of the name labels on the front:

- PC = blue
- APC = green

To mount the SENKO test adapter:

- ✓ The optical connectors are properly cleaned (see ["Cleaning the test port" on page 115](#)).
- 1. Open the head cover and remove the protective cap (if still mounted).
- 2. Unscrew the SENKO test adapter and pull it off vertically.
- 3. Place the SENKO test adapter vertically on the optical connector.
- 4. Fix the SENKO test adapter with two screws.
- 5. Repeat the procedure if the instrument is equipped with two ports.
- 6. Fit the fiber optic cable to the test adapter or close the head cover.



Fig. 7 Mounting the SENKO test adapter

4 BASIC OPERATION

Switching the instrument on/off











To switch the instrument on:

- Press the [⏻] key to switch on the instrument.

To switch the instrument off:

- Press the [⏻] key to shift the instrument into hibernate mode.
– or –
- 1. Hold the [⏻] key to open the power off menu.
- 2. Tap the [Power Off] button or press the central key to switch off the instrument.

Operator control panel

	Press to go to the homescreen.
	Press to open menu.
	Press to go back within an application or cancel input.
	Press to toggle between the inspect view and the test view.
	Press to switch the instrument on and off. LED glows green when the instrument is on.
	Press an arrow key to: <ul style="list-style-type: none"> • navigate through the menus • change values in the menus Press the central key to: <ul style="list-style-type: none"> • confirm the selection
	Press to save results.
	Glows red when battery is low.
	Glows red when a measurement is running in the background.
	Glows orange when battery is charged; flashes orange when battery is charging. Turned off when dry batteries are used or battery bay is empty.

Menus and display elements

Home screen

The available menus and functions depend on the selected project type: Test-Tool project (TTP) or Workflow project (WP).

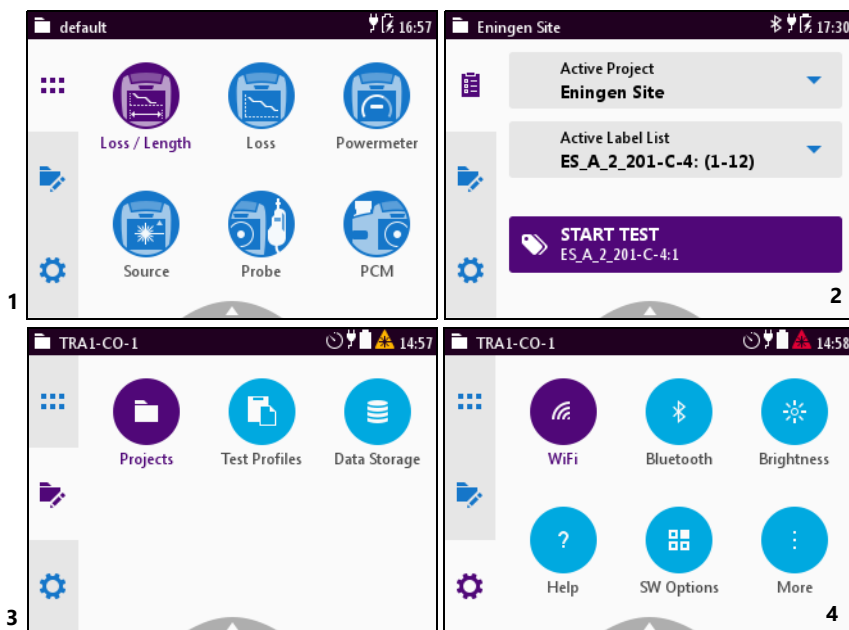






Fig. 8 Home screens: Test-Tool Mode (screen shows PCM version) (1), Workflow Mode (2), Management (3), Settings (4)

	Menu	See page
	Dashboard in Test-Tool Mode In this menu you can open test applications.	30
	Dashboard in Workflow Mode In this menu you can activate a label list and start a test.	99
	Management In this menu you can: <ul style="list-style-type: none"> • manage projects • define a test profile (not supported yet) • get access to stored data • Export and import results via USB 	42 and 105
	Settings In this menu you can: <ul style="list-style-type: none"> • manage WIFI and Bluetooth settings • change instrument settings • open the help • display instrument information • manage software options 	35

Test-Tool Mode

The Test-Tool Mode is enabled when a Test-Tool project is activated (for further information see [“Managing projects” on page 42](#)).

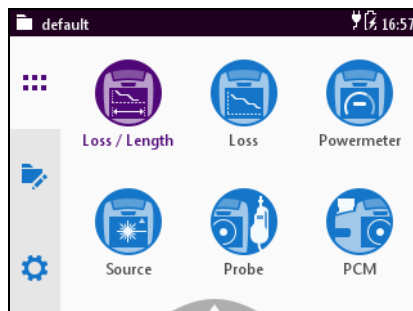








Fig. 9 Dashboard in Test-Tool Mode

	Application	See page
	Loss / Length To determine the total amount of loss or attenuation of a fiber link, the fiber length, and polarity. The selected mode is shown in purple.	48
	Loss To determine the total amount of loss or attenuation of a fiber link.	64
	Powermeter To install and maintain cables and networks with the broadband power meter.	72
	Source To edit the laser for maintenance and characterization of single-mode and multi-mode networks.	79
	Probe To view and inspect the bulkhead (female) connectors.	89
	PCM (Patch Cord Microscope) (only BN 2326) To view and inspect the patch cord connector of the fiber.	89

Workflow Mode

NOTE: A workflow project can be generated and downloaded to the device only with Viavi's Cloud-based Enterprise Workflow Management Tool CERTiFi. For more information please refer to www.viavisolutions.com

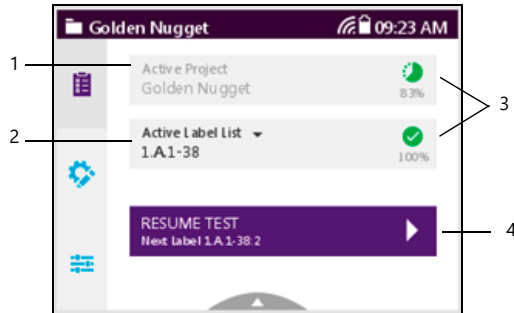


















Fig. 10 Dashboard in Workflow Mode

1	Active project The name of the active project is displayed. For more information about Workflow mode and to learn how to activate a project see "Selecting a project from the Job Management menu" on page 45 and "Workflow mode" on page 99 .
2	Active label list The name of the active label list is displayed. To activate a label list: Tap the black arrow to open the drop down menu and select a label list. For more information about Workflow mode and to learn how to activate a label list see "Selecting a label list" on page 47 and "Workflow mode" on page 99

3	<p>Status icons</p> <p>The status of the complete project, a certain label list, or a single label is shown by icons:</p> <div data-bbox="359 220 409 272">  </div> <p>Test not yet started.</p> <div data-bbox="359 284 409 336">  </div> <p>Test in progress. All completed tests have passed. The filled segment of the circle does not represent the actual progress.</p> <div data-bbox="359 376 409 429">  </div> <p>Test in progress. At least one complete task has failed. The filled segment of the circle does not represent the actual progress.</p> <div data-bbox="359 469 409 521">  </div> <p>All test completed and passed.</p> <div data-bbox="359 533 409 585">  </div> <p>All tests completed and at least one failed.</p>
4	<p>Start or resume a test</p> <p>Tap to start a new test or resume an already started test. For more information see "Workflow mode" on page 99.</p>

Elements in the top bar

	Project title Indicates the title of the active project
	WIFI Indicates that Wifi is installed. It does not indicate an active Wifi connection.
	Bluetooth Indicates that Bluetooth is installed. It does not indicate an active bluetooth connection.
	External power supply The OLTS-85/OLTS-85P is powered by the external AC adapter when this symbol is shown.
	Battery status Indicates the battery charge status. If it is not shown, only the AC adapter is active. <div>  Charge state = 100% </div> <div>  Charge state = 25% </div> <div>  Battery is charging. </div>
	Auto-off Indicates whether the instrument turns off within a certain time.
 	Active laser source Blinking yellow-red indicates that the built-in laser source is active.

Navigating in the menus

- ▶ Press the **[↵]** key to open the home screen.
Depending on the active project type the Projects tab shows the available test applications or the active Workflow project.
- ▶ Press the **[☰]** key to open the context-sensitive menu.
Depending on which application is selected, a different menu opens.

To select a menu item:

1. Press the arrow keys to highlight an item.
2. To confirm, press the center key within the arrow keys.
 - or –
 - Tap the desired button on the touchscreen.

To leave a menu without making any changes:

- ▶ Press the **[↶]** key.

NOTE: All actions can be operated via the operator control panel or the touchscreen. The following instructions describe only touchscreen operation.

To toggle between different display modes:

- ▶ Tap the display to toggle between the display modes (context-sensitive).

Displaying application information

The Info menu provides information about the displayed test application.


- ✓ The instrument is in the chosen application mode.
- 1. Press the **[☰]** key and tap the **[More]** button.
- 2. Tap the **[Info]** button.
The application information is displayed.

Changing System Settings

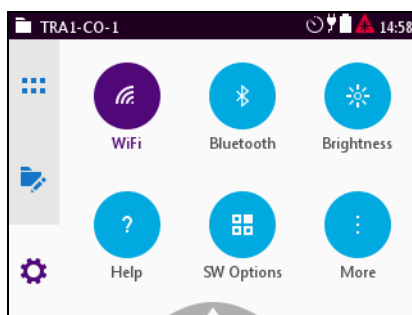
In the **Settings** menu you can change instrument settings, get information and help about the instrument, or update the firmware.

To open the Settings menu:

✓ The home screen is displayed.

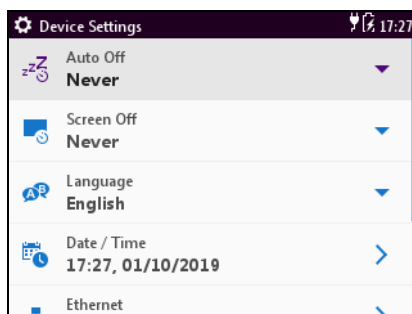
1. Select the  tab.

*The **Settings** menu opens:*









2. In the  menu tap the **[More]** button.


More setting options are displayed.



The following table gives a short overview of the menu items. These are explained in the following sections.

Icon	Function	See page
	WiFi To configure the wireless local area networks. The last selected item is displayed in magenta.	39
	Bluetooth To configure the Bluetooth interface.	39
	Brightness To adjust the display brightness.	36
	Help To show device information	36
	SW Options To check and install software options.	39
	More To access further instrument settings. See following sections.	36

Adjusting the display brightness

1. In the  menu tap the [Brightness] button.
2. Tap a symbol to change the display brightness.
3. Tap [OK].


Showing device information

- In the  menu tap the [Help] button.
Information about the hardware and software is displayed.

Setting the [Auto-Off] interval

When [Auto-Off] is set, the device will switch off after the selected interval without any user action.


NOTE: [Auto-Off] is only active when no external power supply is connected.

1. In the  menu tap the [More] button, then tap [Auto-Off].
2. Select the desired interval.

Setting the [Screen-Off] interval

When [Screen-Off] is set, the display will switch off after the selected interval without any user action.


NOTE: [Screen-Off] is only active when no external power supply is connected.

1. In the  menu tap the [More] button, then tap [Screen-Off].
2. Select the desired interval.


To switch on the display after it was switched off:

- ▶ Just tap the display to switch it on.

Selecting a language

1. In the  menu tap the [More] button, then tap [Language].
2. Tap the desired language.
After selecting a new language the instrument has to be restarted.
3. Tap [Yes] to restart the instrument.
– or –
Tap [No] to keep the previous language.

Setting date & time

- ▶ In the  menu tap the [More] button, then tap [Date & Time].

To set the date:

1. Tap [Date].
2. Tap [Day], [Month], or [Year].
3. Type in the desired value.
4. Tap [OK].

To set the date format:

1. Tap [Date Format].
2. Select the desired date format.


To set the time:

1. Tap [Time].
2. Tap [Hour], [Minute], or [Second].
3. Type in the desired value.
4. Tap [OK].

To set 24-hour or 12-hour time:

1. Tap [Time Format].
2. Select the desired time format.

Setting the Ethernet protocol

- In the  menu tap the [More] button, then tap [Ethernet].

To select the IP mode:

1. Tap the [IP Mode] button.
2. Select the desired Ethernet mode.

To set the IP address:

- ✓ The IP mode **Static** is selected.
- 1. Tap [IP Address].
- 2. Type in the desired IP address.
- 3. Tap [OK].

To set the gateway:


- ✓ The IP mode **Static** is selected.
- 1. Tap [Gateway].
- 2. Type in the desired gateway.
- 3. Tap [OK].

To set the netmask:

- ✓ The IP mode **Static** is selected.
- 1. Tap [Netmask].
- 2. Type in the desired netmask.
- 3. Tap [OK].


Calibrating the touchscreen

NOTE: Using a pen when calibrating the touchscreen will improve the calibration accuracy.


1. In the  menu tap the [More] button, then tap [Touchscreen Calibration].
2. Follow the given instructions.

Resetting to the factory default values


NOTE: Setting the factory default values does not affect your stored measurement results.

1. In the  menu tap the [More] button, then tap [Set to default].
2. Tap [Yes] to proceed.
 - or –
 - Tap [No] to cancel.



WiFi menu (optional)

- ▶ In the  menu tap the [WiFi] button.
Editable settings are displayed
 - Enabled: switch WiFi on/off
 - Mode: switch between Ad-Hoc / Access PointTap [Enabled] to switch WiFi on.
Information on enabled wifi connection is displayed
 - SSID:
 - IP Address
 - Netmask
 - MAC Address
 - Port

Bluetooth menu (optional)

- ▶ In the  menu tap the [Bluetooth] button.
editable settings are displayed
 - Enabled: switch Bluetooth on/offTap [Enabled] to switch Bluetooth on.
Information on enabled bluetooth connection is displayed
 - SSID
 - MAC Address
 - PIN Code for connection establishment

Installing a software option

1. Connect an USB stick with the corresponding option file.
2. In the  menu tap the [SW Options] button.
3. Press the  key.
4. Tap [Install from USB].
The license key is read in from the root directory of the USB stick.
The option(s) are installed.




Updating the firmware

The latest version of the firmware can be downloaded from the Internet.

To find the latest firmware version:

1. Visit the Viavi web site at <http://updatemyunit.net>.
2. Select your model from the product line.
3. Open the download area and download the latest firmware.
The downloaded update.exe file needs to be executed on a PC.
4. Unzip and save the individual update files to the root directory of an USB flash drive.




To start the firmware update:

- ✓ The update files have been extracted and are located on the USB flash drive.
 - ✓ The instrument is fully charged or the PS4 Universal AC/DC Power Supply is connected.
 - ✓ The instrument is switched off and not in hibernate mode.
1. Plug the USB flash drive with the extracted update files into one of the instrument USB ports.
 2. Hold down the  key and shortly press the  key to switch the instrument on.
The firmware update screen appears.
 3. Release the  key.
 4. Press the center key within the arrow keys to start the update procedure.
 5. After Startup, when the Homescreen is displayed, remove the USB flash drive.

Creating screenshots

Screenshots can be stored directly on an USB stick.

To create a screenshot:

1. Connect a USB stick to one of the USB ports on the right side of the device.
The  symbol is displayed at the top of the screen.
2. Long-press both the  and the  keys.
The Save New Screenshot screen is displayed.
3. Enter a file name and use the pencil button to edit the field.

4. Set the **Add Auto-Increment Number** function **ON** or **OFF**.
If the setting is **ON**, a number is added to the proposed name, ascending each time that a new screenshot is taken.
Edit the **Auto-Increment Number** field by tapping the pencil button if you want to change the current number.
5. If you are using both USB ports, select **USB1** or **USB2** by tapping the corresponding button.
6. Tap the [Save] button to store the screenshot on the USB stick.
A directory named
Screenshots_<device_type> <serial_number> is created and
the screenshot is saved in PNG format.
Tap the [Cancel] button to interrupt the creation of the
screenshot.

5 MANAGING PROJECTS

Stored Measurements are assigned to a project. Therefore a project first has to be created and set to active. As factory setting one Test-Tool project named **default** is available, which can be edited but not deleted. New projects can be created by copying and changing an existing project or by creating a new one.

With the project some basic information like the project name, a description of the project and how the label is build can be saved.

NOTE: Test-Tool projects can be created and edited on the device. Workflow projects can be created only in Viavi's Cloud-based Enterprise Workflow Management Tool CERTiFi. It needs to be downloaded to the device from a Mobile App. (see ["Workflow mode" on page 99](#)).

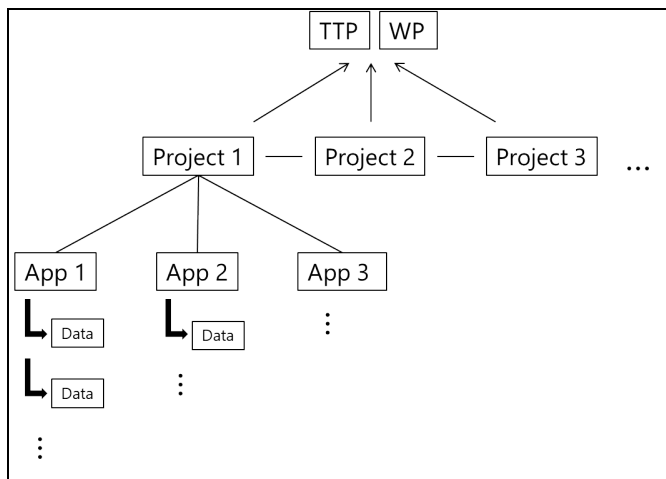



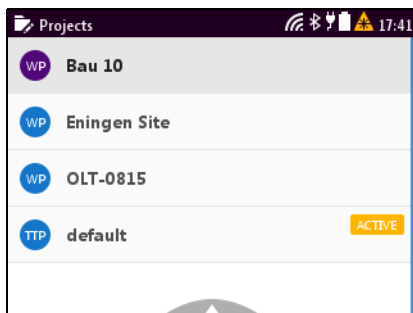
Fig. 11 Project assignments


Test-Tool mode

The Test-Tool mode is the "classic" mode when a specific test application is needed instead of executing a predefined test sequence. To start a test application a Test-Tool project first must be selected. Thus, at least one Test-Tool project is defined as default. This chapter just explains how to select a Test-Tool project and a test application. The various test applications are described in the following chapters.

Selecting a Test-Tool project


- ✓ The home screen is displayed.
- 1. Select the  tab, then tap the [Projects] button.
The projects available on the instrument are displayed.



- 2. Select a project, press the [≡] key and tap [Set Active].
- 3. Press the [⬆] key to open the dash board menu.
– or –
Press the [↶] key and select the  tab.
- 4. Open a test application by tapping it.

NOTE: Savings of measurement results are assigned to the selected project.

Creating a new Test-Tool project

- 1. Press the [⬆] key, select  and tap [Projects].
*The Projects list opens. As factory setting only the Test-Tool project **default** is available.*

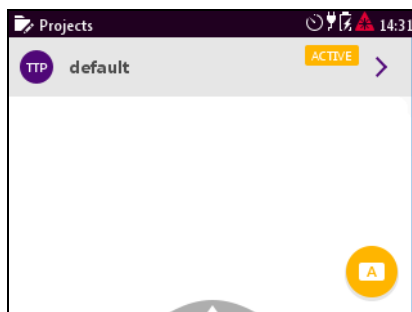
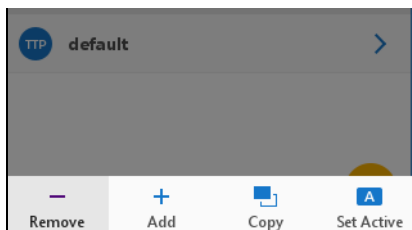


Fig. 12 Projects list with default project.

Adding a new project:

2. Press the [☰] key.
The edit menu opens.



3. Tap [Add].
The title edit menu opens.
4. Type in the project title and tap [✓].
The project is created and displayed in the list.

Copying an existing project:

1. Select the project you wish to copy.
2. Press the [☰] key and tap [Copy].
The title edit menu opens.
3. Type in the project title and tap [✓].
The project is created and displayed in the list.

Editing a Test-Tool project

1. Double click the project.
– or –
Select a project using the up/down arrow key and press the central key.
The edit menu opens:

Name	Project name
Description	Project description Will be shown in the projects list below the project name.
Label Prefix	Prefix that will be added to the label.
Label Index	Start index for the label
Auto Increment Label Index	When enabled label index will be incremented automatically with each storage.

2. Edit the fields.

The changes are immediately effective.

3. Press the [↩] button to close the edit menu.

Deleting a Test-Tool project

1. Select the project you wish to delete.
2. Press the [≡] key and tap [Remove].
3. Tap [Yes] to permanently delete the project.
The project is deleted and removed from the list.

Activating a Test-Tool project

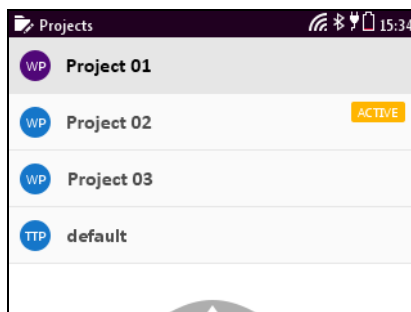
To assign measurements to a project, the project must be activated. There can always be only one active project.

1. Select the project you wish to activate.
2. Tap the [EA] button.
– or –
Press the [≡] key and tap [Set Active].
*Allow a few seconds until the label **ACTIVE** is displayed at the selected project.*

Workflow mode

Selecting a project from the Job Management menu

- ✓ The home screen is displayed.
1. Select the [🔧] menu, then tab the [Projects] button.
The projects available on the instrument are displayed.



2. Select a project and press the [ACTIVE] button.
– or –

Select a project, press the [≡] key and tap [Set Active]
If a Workflow project is already active you also can select a project from the Workflow dashboard (see next section).

Selecting a project from the Workflow dashboard

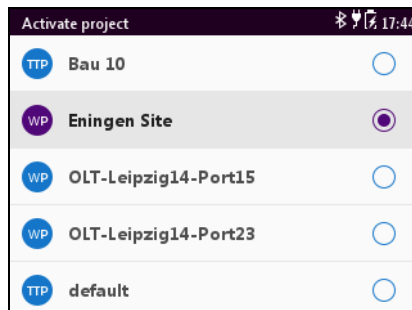
If a Workflow project is already active you can select another project directly from the Workflow dashboard instead of opening the Job Management menu.

To select a project:

- ✓ The Workflow dashboard is displayed.



1. Tap the displayed project.
The projects available on the instrument are displayed.




2. Tap a project to activate it.
The project is set to active immediately.

NOTE: You even can select a Test-Tool project from this menu. When selecting a Test-Tool project the project is set to active immediately and the dashboard is switched to Test-Tool mode.

NOTE: Savings of measurement results are assigned to the selected project.

Selecting a label list

1. Select the  menu.
The active project and the active label list are displayed.



2. Tap the displayed label list.
The available label lists are displayed.



3. Tap a label list to activate it.
The selected label list is set to active immediately.

6 LOSS/LENGTH TEST OPERATION

General information

Loss/Length mode is used to measure loss, length, and polarity of a fiber. Depending on your specific needs a great variety of test types and settings are available:

- Loopback test with one OLTS-85/OLTS-85P instrument
- Remote test with two OLTS-85/OLTS-85P instruments
- Guided referencing according to selected standard
- automated uni- and bidirectional tests
- for singlemode and multimode fibers

If remote measurement is requested **Loss/Length** test operation or Source/Powermeter operation is needed.

NOTE: The operation „Measuring Loss in Source/OPM Mode“ (see [“Powermeter Operation” on page 72](#)) can be an alternative to the Loss/Length test operation, to be chosen if attenuation is too high to ensure proper Loss/Length measurement or proper device communication under Loss/Length Test.

What operation mode to choose

Following table may help you to choose the right operation mode for your measurement task.

You want to ...	Loss/ Length	Loss	Source/ Powerm.
... measure loss and length	X		
... measure just loss with editing reference and limit		X	X
... measure margin	X	X	X
... specify cable parameters and calculate limits	X		
... measure loopback (e.g. Component Test)	X	X	
... measure remote	X		X

To open the Loss/Length test:

- Press the **[↗]** key, select **Loss/Length** and tap **Loss/Length**.

How to perform a Loss/Length test

A **Loss/Length** test consists of several steps to achieve reliable results. These steps are:

Step	Action	See page
1	"Adjusting general test settings" E.g. select the instrument or cable type.	49
2	"Defining a test configuration" Define settings like the test type, the referencing method or the limit specifications.	52
3	"Referencing"	55
4	"Running and viewing a Loss/Length test"	58
5	"Saving Loss/Length test results"	62

These steps are described in detail in the following sections.

Adjusting general test settings

For a loopback test the instrument must be set to the type **Local**. For a remote test, on the other hand, two instruments are required. One needs to be set to the type **Local**, the other to **Remote**.

Test setups can only be set on the local instrument. After connecting, the settings are transmitted to the remote instrument.

To distinguish the instruments stick adhesive labels:

Furthermore, there are adhesive labels with **Local** and **Remote** imprint, which serve to distinguish each instrument.

- Attach these adhesive labels on the designated recess of the dust cap of your instruments.



Fig. 13 Remote/Local adhesive labels

To change the instrument type:

✓ The instrument is in **Loss/Length** mode.

1. Press the [≡] key.
2. Tap the [Device Type] button and choose **Local** or **Remote**.

NOTE: In the measurement display Local and Remote are represented by the icons **L** and **R**. Blue and grey do not indicate a status like enabled and disabled.

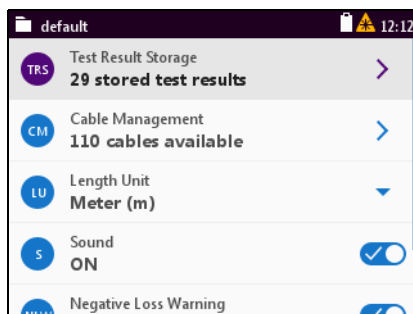


Fig. 14 More menu of Loss/Length test


To select the cable type:

Each fiber has its own specific parameters. Here you can define the name, type and index of refraction of your own cable.


Only cables defined here can be selected in the test.

✓ The instrument is in **Loss/Length** mode.


1. Press the [≡] key.
2. Tap the [More] button.
3. Tap the [Cable Management] button.

4. Tap the desired manufacturer and cable name.
– or –
- ▶ To add further cable types, change, or delete existing ones, press the  key and tap the desired button.


To change the length unit:

- ✓ The instrument is in **Loss/Length** mode.
- 1. Press the  key.
- 2. Tap the **[More]** button.
- 3. Tap the **[Length Unit]** button.
- 4. Tap the desired length unit.


To activate or deactivate the connection tone:

- ✓ The instrument is in **Loss/Length** mode.
- 1. Press the  key.
- 2. Tap the **[More]** button.
- 3. Tap the **[Sound]** button to activate or deactivate the connection tone.

To activate or deactivate the negative loss warning:

- ✓ The instrument is in **Loss/Length** mode.
- 1. Press the  key.
- 2. Tap the **[More]** button.
- 3. Tap the **[Negative Loss Warning]** button to activate or deactivate the warning.

To activate or deactivate the unsaved result warning:

- ✓ The instrument is in **Loss/Length** mode.
- 1. Press the  key.
- 2. Tap the **[More]** button.
- 3. Tap the **[Unsaved Result Warning]** button to activate or deactivate the warning.


Defining a test configuration

In **Loss/Length** mode a test configuration allows you to define various settings like the test reference method or the cable and connector settings. When performing a test a predefined test configuration can be recalled and set to active to assign it.

As factory setting one test configuration named **default** is available, which can be edited but not deleted. New test configurations can be created by copying and changing an existing project or by creating a new one.

NOTE: Test configurations can only be created, deleted, or edited if the instrument is configured as **Local** (see ["To change the instrument type:" on page 50](#)).

Creating a new test configuration

- ✓ The instrument is in **Loss/Length** mode and configured as **Local**.
- Press the  key and tap **[Test Configuration]**.
*The test configuration list opens. As factory setting only the test configuration **default** is available.*

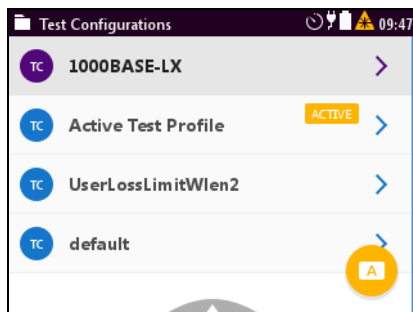

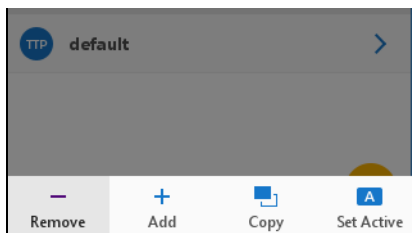


Fig. 15 Test configuration list.

To add a new test configuration:

1. Press the  key.

The edit menu opens:



2. Tap [Add].
The title edit menu opens.
3. Type in the title and tap ✓.
The test configuration is created and displayed in the list.

To copy an existing test configuration:


1. Select the test configuration you wish to copy.
2. Press the [≡] key and tap [Copy].
The title edit menu opens.
3. Type in the title and tap ✓.
The test configuration is created and displayed in the list.

Deleting a test configuration

- ✓ The instrument is in **Loss/Length** mode and configured as **Local**.
1. Select the test configuration you wish to delete
 2. Press the [≡] key and tap [Remove].
 3. Tap [Yes] to permanently delete the configuration.
The configuration is deleted and removed from the list.

Activating a test configuration

To assign a test configuration it must be activated. There can always be only one active test configuration.

1. Select the test configuration you wish to activate.
2. Tap the  button.
– or –
Press the [≡] key and tap [Set Active].
*Allow a few seconds until the label **ACTIVE** is displayed at the selected test configuration.*

Editing a test configuration

NOTE: You can not change the name of an existing test configuration. To change the name copy the configuration, type in the new name and delete the configuration you wished to change.

✓ The instrument is in **Loss/Length** mode and configured as **Local**.

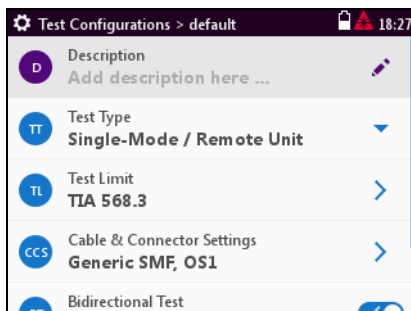
1. Press the [≡] key and tap the [Test Configuration] button.
The test configuration list opens.

2. Double tap an item.

– or –

Use the up/down arrow keys to select it and press the central key.

The Edit menu opens:



Description	Description of the test configuration The description will be shown in the test configuration list below the title
Test Type	The test type can be set to Loopback or Remote . Depending on your instrument hardware configuration the device can be configured for Single-Mode or Multi-Mode measurements. In Loopback mode you need only one instrument configured as Local . The measured cable pair needs to be looped with a jumper cable on the far end while in Remote mode the far end needs to be terminated with an OLTS-85/OLTS-85P(P) configured as Remote .
Test Limit	First select the limit specification from the drop down menu. Then edit the limit settings: <ul style="list-style-type: none"> • Length: Enter the length limit (to change the length unit see "To change the length unit:" on page 51). • Number of connections: Specify the number of connections in the fiber system under test. Don't count the reference connections. They are already considered in the loss test calculation. • Loss per connection: 0.1 to 0.75 dB • Number of splices • Loss per splice • Fiber loss Coeff.: at 1310 nm and 1550 nm
Cable & Connector Settings	Select the cable manufacturer and cable from the list. The list can be defined in the Cable Management menu (see "Adjusting general test settings" on page 49). Select the connector type from the list.
Bidirectional test	Specify the measuring direction per cable. In Bidirectional = OFF , tests are performed in only one direction. In Bidirectional = ON , both directions are measured for both cables. After the first measurement, the cables must be connected crosswise, as prompted on the touchscreen.
Test Reference Method	Select the reference method: 1 jumper cable, 2 jumper cables, or 3 jumper cables (for further information see "Loopback and Remote Referencing" on page 116).

Referencing

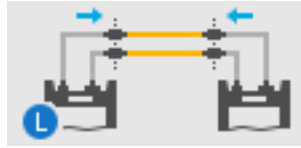
For referencing, only use the special test reference jumper contained as a standard assembly in your OLTS-85 test kit.

To perform the referencing

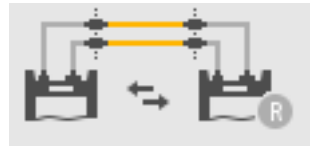
1. Set the desired test type (loopback/remote) and test reference method (1-jumper/2-jumper/3-jumper) in the test configuration.
2. Establish proper cabling according to your settings:
 - single-mode or multi-mode

- remote or loopback
- 1, 2, or 3 jumper cable

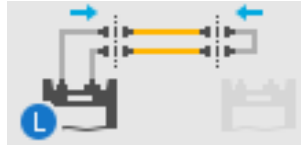
The icons in the top bar show the status of the connection.



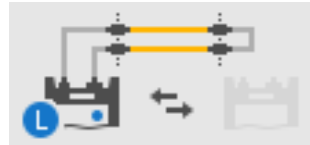
Remote, no connection



Remote, connection



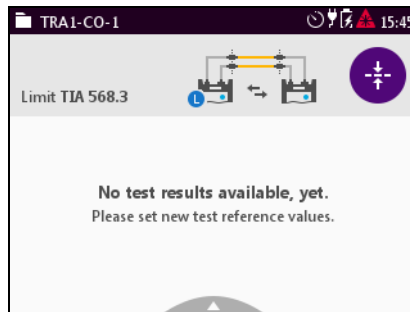
Loopback, no connection



Loopback, connection


L and **R** show local and remote instrument.

When cabling is accepted the referencing start button is displayed.

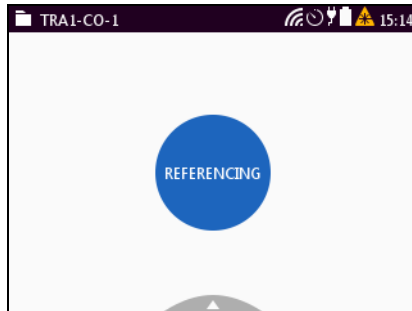


3. To start referencing tab  button.

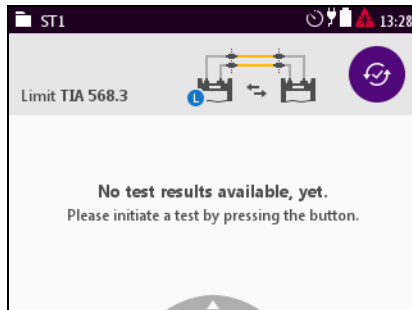
– or –

Press  and tab **[Set Reference]**.

The display shows that referencing is in progress.



After a successful referencing the start window and the [Auto Test] button are displayed.



NOTE: For more information about referencing see "[Appendix - Referencing Methods](#)" on page 116.

Example loss limit calculation

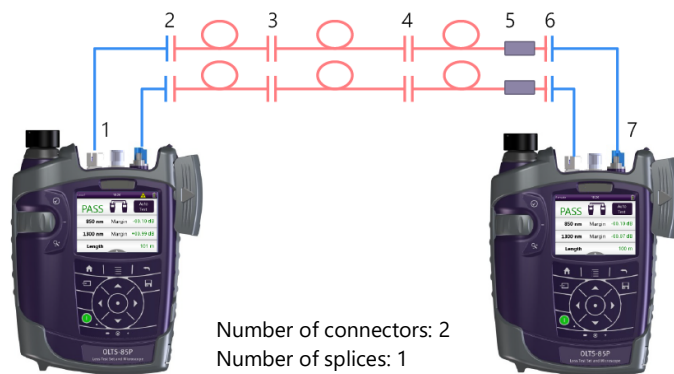




Fig. 16 Performing the single-mode or multi-mode measurement



DUT	Settings
<ul style="list-style-type: none">• 2 connectors• 1 splice• Multi-mode• Fiber length: 842 m	<ul style="list-style-type: none">• One jumper cable reference• Loss per connection: 0.45 dB• Loss per splice: 0.2 dB• Cable loss: 3.5 dB/km

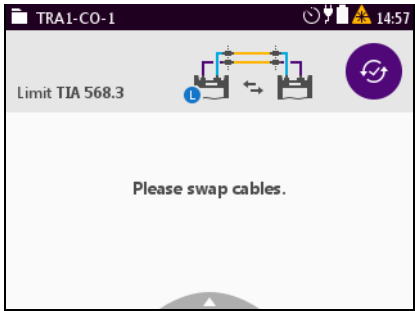
Limit	Length of fiber x Loss/km	+L _{conn2}	+L _{conn3}	+L _{conn4}	+L _{splice5}	+L _{conn6}	= Sum
14763-3	0.842 km x 3.5 dB/km	0.3 dB	0.45 dB	0.45 dB	0.2 dB	0.3 dB	4.65 dB
TIA/11801	0.842 km x 3.5 dB/km	0.75 dB	0.45 dB	0.45 dB	0.2 dB	0.75 dB	5.55 dB





Running and viewing a Loss/Length test

Running a Loss/Length test

1. Connect your fiber under test.
2. Tap the  button.
– or –
Press  and tap **[Auto Test]**.

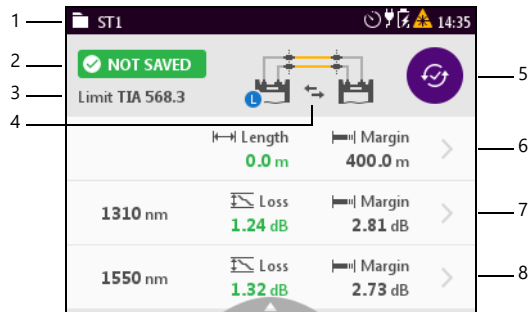
3. If bidirectional test is set, change the cords and tap  button.
– or –
Press  and tab [Auto Test].



- While running,  is displayed followed by briefly showing  when test has passed or failed. Then the test result overview is displayed.
4. To restart test tap the  button.
– or –
Press  and tab [Auto Test].
You will be asked to save the previous test.
 5. To view test results see next section.


Viewing test results

After running a test the test result overview is displayed.

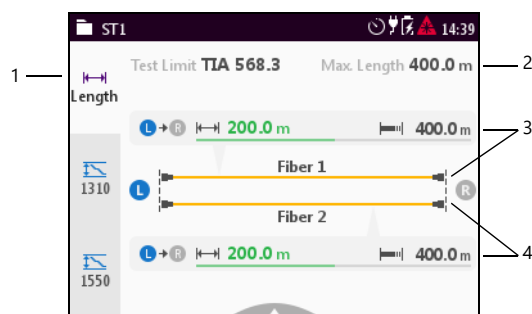


1	Active Test-Tool project
2	PASSED or FAILED indication. If test is not yet saved, label toggles to NOT SAVED
3	Selected test limit

4	Test configuration , in this case remote test, local side
5	Auto test start button
6	Measured length and margin . In this case margin shows the maximum length defined by the selected test limit.
7/8	Measured loss and margin of wavelength 1 / 2 When measured bidirectionally the larger loss of both measurement is displayed. Margin indicates the still available loss.

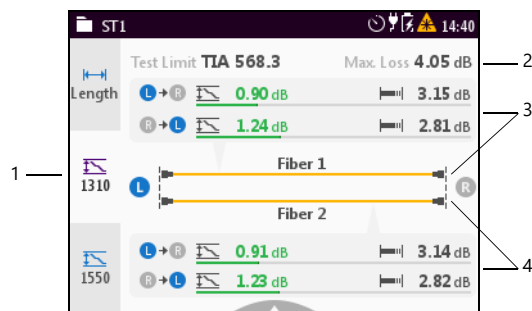
- Tap one of the display bars to show test result details.
- or –
- Press the  key and tap [\[Detail View\]](#).

Detail view example: Length



1	Selected tab: Length in this example
2	Maximum length as defined by selected test limit
3/4	Measured length of fiber 1 / fiber 2. Length is displayed as numeric value and as graphic bar.

Detail view example: Loss



1	Selected tab: Loss for 1310 nm in this example
2	Maximum loss as defined by selected test limit
3/4	Loss of fiber 1 / fiber 2 Due to bidirectional measurement both values for Local to Remote and Remote to Local are displayed. Length is displayed as numeric value and as graphic bar.

Pass/Fail indication

When performing fiber certification, the loss of the fiber system under test must be measured and compared to a calculated loss limit to provide a loss margin.

The calculated loss limit is the maximum allowable loss of the overall system and is based on the following factors:

- Length of the fiber
- Number of connections
- Number of splices

Each of the above factors has a loss associated with it. To assist your work, the standards and requirements for TIA 568.3, ISO 11801, and ISO 14763-3 are already specified in the instrument as preferences.

For loss limit calculation, associate the slope (loss per km) of your fiber under test to your fiber length. For loss per connection and splice, the technician must indicate how many connections and splices are present in the fiber system under test.

All connections to a reference cord are already considered by the OLTS-85. So, for the number of connections, please count all connections excluding the connections to a reference cord.

Pass indication

All measured losses are below or equal the calculated maximum loss **AND** the measured length is shorter or equal to the set length limit.

Fail indication

One or more measured losses are above the calculated maximum loss **OR/AND** the measured length is longer than the set length limit.

Saving Loss/Length test results

Before starting a measurement a project must be selected and set to active. Thus, all results are assigned to that project when saved. If no project was defined by the user, the instrument will use the Test-Tool project “default”, which is always present (see [“Managing projects” on page 42](#)).

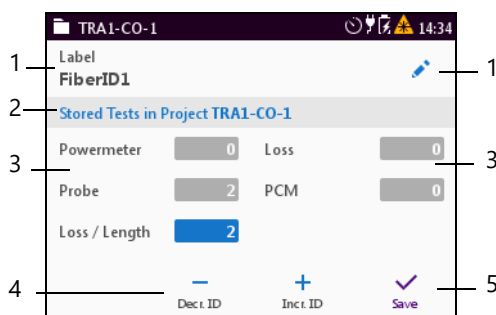
Results are stored simply by pressing the **[F]** key. Each time the key is pressed, the result just displayed will be saved.

NOTE: Test results are always stored on the local instrument, even when the storage is operated from the remote instrument. Hence stored test results can be recalled from the local instrument only.

To save results

✓ The instrument displays the test results (overview or details) to be stored.

1. Press the **[F]** key.
The Save dialog is displayed.



- 1 Label as defined in the test configuration.
► Tap pen to edit label.
- 2 Shows selected project. Results will be saved to this project.
- 3
 - Probe: Number of already saved probe results.
 - Powermeter: Number of already saved powermeter results.
 - PCM: Number of already saved PCM results.
 - Loss/Length: Number of already saved loss/length results.
 - Loss: Number of already saved loss results.
- 4 Decrease / increase label ID
- 5 Save results

2. Tap the pen in the [Label] field to type a new label. A number will be appended automatically, if not already provided by the user.
3. Tap the [Increment ID] or the [Decrement ID] button to adjust the label number, if needed.
4. Press the [R] key again or tap the [Save] button.
The measurement is stored.

NOTE: When measuring two wavelengths at a time both wavelengths are stored separately together with the length results. Thus, the ID is incremented by 2.

NOTE: If the label/fiber ID is not changed, the data set will be saved under the same title. Then the Data can be distinguished and sorted by the Timestamp.

7 LOSS TEST OPERATION

General information

The **Loss** test operation is used to measure loss of a fiber loop or any optical component connected to the loop. When running a loss test, the internal laser source and powermeter are locked.

Compared to the **Loss/Length** test operation the **Loss** mode allows real time measurement (values and changes are displayed while measuring) and can be run easily by setting up just a view parameters. On the other hand, limits must be entered manually (there are not calculates as for **Loss/Length**) and only loopback measurement is possible.

What operation mode to choose

Following table may help you to choose the right operation mode for your measurement task.

You want to ...	Loss/ Length	Loss	Source/ Powerm.
... measure loss and length	X		
... measure just loss with editing reference and limit		X	X
... measure margin	X	X	X
... specify cable parameters and calculate limits	X		
... measure loopback (e.g. Component Test)	X	X	
... measure remote	X		X

To open the loss test:

- Press the **[↗]** key, select **Loss** and tap **Loss**.

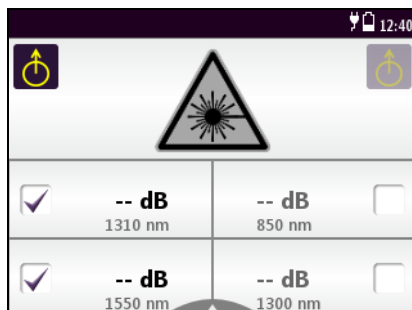


Fig. 17 Measurement display Loss Test

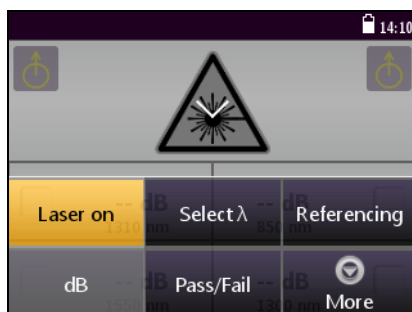


Fig. 18 Edit menu Loss Test

Selecting a port and wavelength

1. Tap the desired wavelength(s) in the measurement display (only single-mode or multi-mode can be selected).
– or –
Press the [≡] key, tap [Select λ] and select the desired wavelength(s) either by tapping the entry or by using the up/down arrow keys and pressing the central key.
2. Press the [↶] key to get back to the measurement display.

Selecting the measurement mode

Loss can be displayed as a dB value or as a Pass/Fail indication based on a customer limit (see ["Pass/Fail indication" on page 61](#) and ["Pass/Fail indication" on page 68](#)).

To switch between dB and Pass/Fail:

- From the measurement display press the [≡] key and tap [dB] or [Pass/Fail].

Referencing

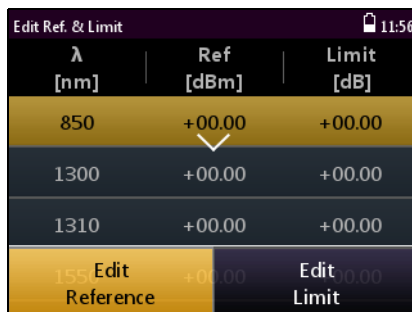
The actual measured power level relative to a reference value is displayed in relative power display mode. The reference value can be set by defining the actual power level as the reference value or can be edited manually.

To set the reference level in Loss Test mode (valid for all reference methods):

1. Decide for one of the Reference methods (see [“Loopback and Remote Referencing” on page 116](#)) and connect the laser source output directly to the Powermeter input with one, two or three jumper cable/s.
2. Switch the laser on (see [“Switching on/off the laser” on page 84](#)).
3. Press the [≡] key.
4. Tap the [Referencing] button to store the reference level.
The actual power level is set as the new reference level. The reference level is displayed underneath the wavelength. Reference power level display mode is activated.

NOTE: The reference level is stored for each wavelength and is saved even when the power is off.
In the **Loss Test mode**, the light source (two to four lasers) and the receiver of the OLTS-85 are activated. The wavelengths of the powermeter instrument are locked to the wavelengths of the source and can be selected independently.

Editing reference and limit values manually



Edit Ref. & Limit			11:56
λ [nm]	Ref [dBm]	Limit [dB]	
850	+00.00	+00.00	
1300	+00.00	+00.00	
1310	+00.00	+00.00	
1550	+00.00	+00.00	
Edit Reference		Edit Limit	

Fig. 19 Editing Reference and Limit

Editing a reference value

The reference values can be set for each wavelength manually.

✓ The instrument is in **Loss Test** mode.

1. Press the [≡] key, tap [More] and tap [Edit Ref. & Limit].
The edit reference and limit-table is displayed (see Fig. 19).
2. Select the desired wavelength, press the [≡] key and tap [Edit Reference].
3. Type in the desired reference value and tap [OK].
4. Press the [↶] key twice to get back to the measurement display.

Editing the limit for Pass/Fail indication

The limit values can be set for each wavelength manually.

✓ The instrument is in **Loss Test** mode.

1. Press the [≡] key, tap [More] and tap [Edit Ref. & Limit].
The edit reference and limit-table is displayed (see Fig. 19).
2. Select the desired wavelength
3. To edit the limit of the preselected wavelength, press the [≡] key and tap [Edit Limit].
4. Type in the desired value for the maximum permissible loss and tap [OK].
5. Press the [↶] key twice to get back to the measurement display.

Pass/Fail indication

Pass/Fail indication for losses is only available in Loss Test mode. When performing fiber certification, the loss of the fiber system under test must be measured and compared to a loss limit to provide a loss margin. The loss limit is the maximum allowable loss of the overall system and is based on the following factors:

- Length of the fiber
- Number of connections
- Number of splices

Each of the above factors has a loss associated with it. Remembering that standards and requirements vary, here are the generic Telecommunications Industry Association (TIA) maximums:

- 3.5 dB/km at 850 nm
- 1.5 dB/km at 1300 nm
- 1.0 dB/km at 1310 nm
- 1.0 dB/km at 1550 nm
- Loss per connection: 0.75 dB
- Loss per splice: 0.3 dB

For loss limit calculation, associate the slope (loss per km) of your fiber under test to your fiber length. For loss per connection and splice, the technician must indicate how many connections (reference method must be considered) and splices are present in the fiber system under test.

Starting the Pass/Fail indication

- ✓ The limit for the **Pass/Fail** indication is set.
- ▶ From the measurement display press the **[≡]** key and tap **[Pass/Fail]**.

Switching on/off the laser

The instrument is in **Loss Mode**.

- ▶ To switch on the laser, tap the **[Laser on/off]** field.
 - or –
 - Press the center key within the arrow keys.
 - or –
 - Press the **[≡]** key and tap the **[Laser on]** button.
- ▶ To switch off the laser, repeat one of the above mentioned actions.

Performing the measurement

- ✓ Laser is switched on.
- Connect your fiber system under test as shown below.

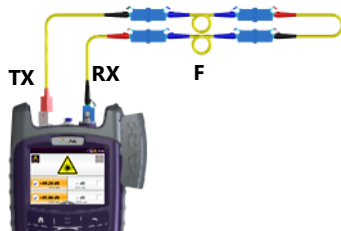


Fig. 20 Performing the measurement

TX	Laser source output (Transmitter)
RX	Powermeter input (Receiver)
F	Fiber system under test

Viewing test results

The measured loss is displayed in real time.

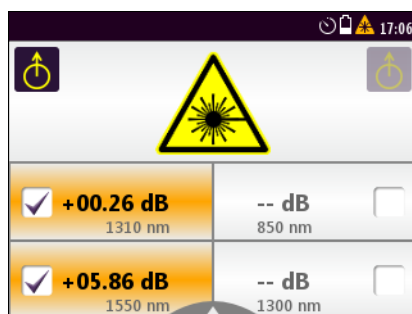


Fig. 21 Result overview

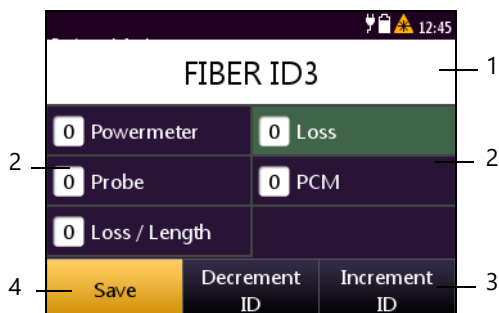
Saving Loss test results

Before starting a measurement a project must be selected and set to active. Thus, all results are assigned to that project when saved. If no project was defined by the user, the instrument will use the Test-Tool project “default”, which is always present (see [“Managing projects” on page 42](#)).

Results are stored simply by pressing the **[F]** key. Each time the key is pressed, the result just displayed will be saved.

To save current results:

- ✓ The instrument is in application mode and displays the test results (overview or details) to be stored.
- 1. Press the **[F]** key.
The Save dialog is displayed.
As file name the label prefix defined in the project settings is showed on top of the display.



- 1 Defined label name.
► Tap field to edit label name.
 - 2
 - Probe: Number of already saved probe results.
 - Powermeter: Number of already saved powermeter results.
 - PCM: Number of already saved PCM results.
 - Loss/Length: Number of already saved loss/length results.
 - Loss: Number of already saved loss results.
 - 3 Decrease / increase label ID
 - 4 Save results
2. To edit the label name, tap the field, edit the name and tap **[OK]**.
 3. To change the ID, tap **[Decrement ID]** or **[Increment ID]**.

4. Press the **[R]** key again or tap the **[Save]** button.

The measurement is stored in the current active project.

NOTE: When measuring two wavelengths at a time both wavelengths are stored separately. Thus, the ID is incremented by 2.

NOTE: If the label/fiber ID is not changed, the data set will be saved under the same title. Then the Data can be distinguished and sorted by the Timestamp.

8 POWERMETER OPERATION

General information

This chapter describes how to use the OLTS-85/OLTS-85P as a power meter. In Powermeter mode up to two wavelengths can be measured simultaneously. Results can be displayed as absolute level in dBm/Watt, relatively to a reference value in dB or as Pass/Fail indication based on predefined limits.

More information about measuring loss with two instruments set to source and powermeter mode can be found in the chapter [“Powermeter Operation” on page 72](#).

Setting and selecting wavelengths

The OLTS-85/OLTS-85P provides several ways to select a wavelength:

- Auto λ mode: When using an Auto λ capable laser source (like the OLTS-85/OLTS-85P), wavelengths can automatically be detect.
- By tapping the wavelength displayed in the measurement display until the desired wavelength is shown. The wavelengths offered in the table can be defined in the [\[Edit \$\lambda\$ Table\]](#) menu.
- By selecting a wavelength from the λ table in the menu. The wavelengths listed in this table are not affected by the **Show** settings in the [\[Edit \$\lambda\$ Table\]](#) menu.

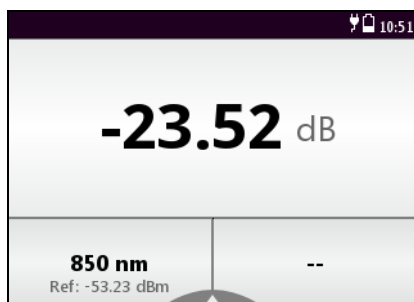


Fig. 22 Measurement display (screen shows actual power level (upper), selected wavelength (lower left) and modulation frequency (lower right))

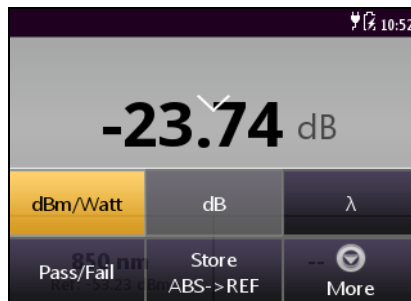


Fig. 23 Measurement display (screen shows the settings menu)

Creating and editing wavelengths in the λ table

In the [Edit λ Table] menu wavelengths can be added and deleted. Furthermore for each wavelength the reference value and the limit can be defined. The **Show** option defines, if the wavelength is available when tapping through the λ table in the measurement display.

To open the Edit λ Table:

- ✓ The instrument is in **Powermeter** mode.
 - 1. Press the [≡] key and tap the [More] button.
 - 2. Tap the [Edit λ Table] button.
- The λ table is displayed:*


λ [nm]	Ref [dBm]	Limit [dBm]	Show
1310	+00.00	-06.50	
1490	+00.00	+00.00	✓
1550	+00.00	-06.70	
1625	+00.00	+00.00	✓

To add a wavelength:

- ✓ The **Edit λ Table** menu in **Powermeter** mode is displayed.
- 1. Press the [≡] key and tap the [Add λ] button.
- 2. Type in the desired value.
- 3. Tap the [OK] button.


To delete a wavelength:

- ✓ The **Edit λ Table** menu in **Powermeter** mode is displayed.

1. Select the desired wavelength.
2. Press the  key and tap the [Delete λ] button.


To edit the reference value:

- ✓ The **Edit λ Table** menu in **Powermeter** mode is displayed.



 1. Select the desired wavelength.
 2. Press the  key and tap the [Edit Reference] button.
 3. Type in the desired value.
 4. Tap the [OK] button.

To edit the Pass/Fail limit for λ value:

- ✓ The **Edit λ Table** menu in **Powermeter** mode is displayed.

 1. Select the desired wavelength.
 2. Press the  key and tap the [Edit Limit] button.
 3. Type in the desired value.
 4. Tap the [OK] button.


To show or hide wavelengths:

NOTE: A wavelength with a checkmark can be selected by tapping the wavelength field on the measurement display. The wavelengths shown in the λ table accessed by the  menu ( > λ) are not affected by the settings.

- ✓ The **Edit λ Table** menu in **Powermeter** mode is displayed.

 1. Select the desired wavelength.
 2. To set/remove the checkmark, press the center key within the arrow keys.
– or –
Tap the desired wavelength.

Selecting a wavelength from the λ table

- ✓ The instrument is in **Powermeter** mode.
- Tap the lower left side of the touchscreen until the desired wavelength is displayed.
If you miss a wavelength you have to add it to the λ table or enable the Show option.
– or –
Press the  key, tap the [λ] button and tap a wavelength.

Enabling Auto- λ mode

Auto λ is a special feature developed by Viavi that allows you to identify wavelengths automatically (from OLS-XX, MTS-2k/4k/6k OTDR CW-source). To do this, the signal is modulated at a certain frequency (by a light source equipped with Auto λ), which can be detected by a Viavi OLTS-85/OLTS-85P.

In Auto λ mode, the detected wavelength is included in the λ table. As long as the detected wavelength is active, it cannot be deleted from the λ table.

Wavelengths cannot be reliably detected if:

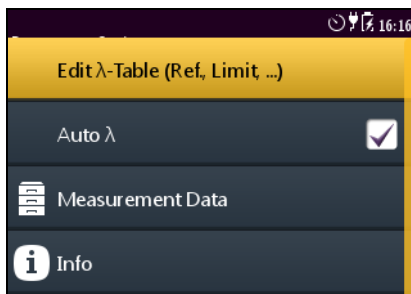
- the receive level is too low,
- wavelength encoding cannot be detected due to interference,
- you are measuring the absolute level of a system that does not have wavelength encoding matching Viavi power sources.

To switch Auto λ mode on/off:

✓ The instrument is in **Powermeter** mode.

1. Press the **[Menu]** key and tap the **[More]** button.

The menu opens:



2. Tap the **[Auto- λ]** button to switch Auto λ mode on/off.

The checkmark is set or removed.

Displaying modulated signals

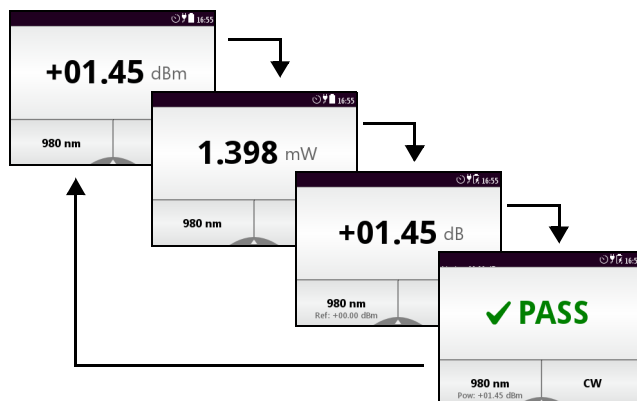
The OLTS-85/OLTS-85P automatically detects the modulation frequency of light signals modulated at the fixed frequencies of 270 Hz, 1 kHz, and 2 kHz. The detected frequency is shown in the lower right measurement display pane.

Selecting and changing the power display mode


The OLTS-85/OLTS-85P provides following display modes:

- absolute power level in dBm or Watt
- power level in dB relatively to a reference value
- Pass/Fail indication based on a limit

1. To toggle between the display modes, tap the power level in the measurement display.



– or –

2. Press the  key and tap the [dBm/Watt] button to toggle between both options.

– or –

Tap the [dB] button.

– or –


Tap the [Pass/Fail] button.

Displaying relative power level

The actual measured power level relative to a reference value is displayed in relative power display mode. The reference value can be set by defining the actual power level as the reference value or can be edited manually.

To set the actual power level as reference level:

- ✓ The instrument is in **Powermeter** mode.

1. Press the  key and tap the [Store ABS->REF] button.

The actual power level is set as the new reference level. The reference level is displayed underneath the wavelength. Reference power level display mode is activated.

NOTE: The reference level is stored for each wavelength and is saved even when the power is off.

Saving Powermeter test results

Before starting a measurement a project must be selected and set to active. Thus, all results are assigned to that project when saved. If no project was defined by the user, the instrument will use the Test-Tool project "default", which is always present (see ["Managing projects" on page 42](#)).

Results are stored simply by pressing the **[F]** key. Each time the key is pressed, the result just displayed will be saved.

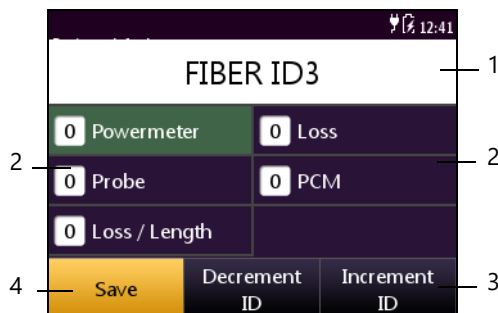
To save current results:

- ✓ The instrument is in application mode and displays the test results (overview or details) to be stored.

1. Press the **[F]** key.

The Save dialog is displayed.

As file name the label prefix defined in the project settings is showed on top of the display.



- | | |
|---|---|
| 1 | Defined label name.
► Tap field to edit label name. |
| 2 | <ul style="list-style-type: none"> Probe: Number of already saved probe results. Powermeter: Number of already saved powermeter results. PCM: Number of already saved PCM results. Loss/Length: Number of already saved loss/length results. Loss: Number of already saved loss results. |
| 3 | Decrease / increase label ID |
| 4 | Save results |

- To edit the label name, tap the field, edit the name and tap [OK].
- To change the ID, tap [Decrement ID] or [Increment ID].
- Press the [F] key again or tap the [Save] button.
The measurement is stored in the current active project.

NOTE: When measuring two wavelengths at a time both wavelengths are stored separately. Thus, the ID is incremented by 2.

NOTE: If the label/fiber ID is not changed, the data set will be saved under the same title. Then the Data can be distinguished and sorted by the Timestamp.

9 SOURCE OPERATION

General information

Various fiber optic tests (e.g. loss test, fiber identification) require a reliable and stable optical source. OLTS-85/OLTS-85P devices are high-quality optical sources, which in addition to a stable optical signal have other useful properties, which simplify and shorten the work processes and exclude potential sources of error in measurement setups.

OLTS-85/OLTS-85P devices include several light sources – i.e. lasers and/or LEDs – which are stabilized using an automatic gain control mechanism. LEDs are typically used for multi-mode fiber measurements. On the other hand, lasers are used for single-mode fiber measurements.

NOTE: In this manual, the word laser is used synonymously for laser and LED sources.

The output signals of the light sources may be either continuous wave (CW) or modulated at certain frequencies, i.e. 270 Hz, 1 kHz, or 2 kHz. Viavi power meters (e.g. OLP-3x, OLP-8x, MTS-2k/4k/6k) are capable of detecting these modulation frequencies. This method improves ambient light rejection in certain measurement setups. Additionally, the modulated signals can be used for fiber identification or for confirmation of continuity.

OLTS-85/OLTS-85P instruments provide the Auto λ feature. When activated, the OLTS-85/OLTS-85P embeds wavelength ID information into the emitted signal(s). This wavelength ID information can be utilized by a compatible Viavi power meter (e.g. OLP-85) for automatic wavelength setup and for simultaneous reception of multiple wavelengths. This minimizes test time and prevents common errors such as incorrect wavelength setting on the optical power meter.

Furthermore, all OLTS-85/OLTS-85P instruments provide Auto- λ -Multi and Auto- λ -Serial modes, which significantly reduce test time compared to manually switching wavelengths.

Display elements

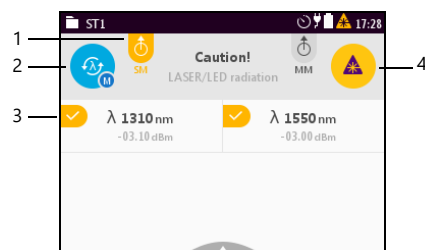


Fig. 24 Source operation display, laser off (left) and on.

1		Output port buttons Port not selected / port selected / port selected and laser on ▶ Tap to select/deselect.
2	 	Mode button (modulation) Constant wave > 270 Hz > 1 kHz > 2 kHz > ... ▶ Tab button to skip through options. Mode button (Auto-λ) Auto-λ (with one wavelength) > Multi-λ > Serial-λ > Auto-λ ▶ Tap button to skip through options.
3		Wavelength buttons Wavelength selected / wavelength selected and laser on ▶ Tap wavelength to select/deselect.
4		Laser button Laser off / on ▶ Tap button to switch laser on/off.

Selecting an output port and wavelength

1. To select output, tap SM or MM on top of the display.
– or –
Press the [≡] key, tap [Output Selection] and tap the desired output.
The menu is closed and the measurement display is shown.
2. To select a wavelength, tap the desired wavelength(s) on the measurement display.
– or –
Press the [≡] key, tap [Source Selection] and tap the desired wavelength(s).
If Auto-λ is not selected, only one wavelength can be selected. To select Auto-λ see "About Auto-λ mode".
3. Press the [↩] key.
4. To turn on the selected lasers, tap the [Laser on/off] button or press the central key.

About Auto-λ mode

When in one of the Auto-λ modes, the OLTS-85/OLTS-85P embeds wavelength ID information into the emitted signal(s). This wavelength ID information can be utilized by a compatible Viavi power meter (e.g. OLP-85) for automatic wavelength setup and for simultaneous reception of multiple wavelengths.

The OLTS-85/OLTS-85P provides two Auto-λ modes:

- **Multi-λ:** Multi-λ is a proprietary Viavi solution that reduces testing time to a minimum by simultaneously testing at both wavelengths. When activated both wavelength are measured and displayed simultaneously.
Auto-λ-Multi should be selected every time the optical powermeter supports the Auto-λ-Multi feature.
- **Serial-λ** automatically toggles between the selected wavelengths. Combined with a compatible power meter (e.g. OLP-3x, OLP-85), the power meter automatically sets up with correct wavelength settings.
Serial-λ should be selected when low levels are expected on the optical power meter or when the power meter doesn't support Multi-λ.

Wavelengths cannot be reliably detected in following situations:

- The receive level is too low.
- The wavelength encoding cannot be detected due to interference.
- You are measuring the absolute level of a system that does not have wavelength encoding matching Viavi power sources.

Selecting a modulation or Auto- λ mode

Modulation or Auto- λ mode can be selected by the mode button or via the menu. Both ways are described

Enabling modulation and selecting a frequency

Using the [Mode selection] button:

NOTE: A modulation frequency can only be selected when just one wavelength is selected.

1. When two wavelengths are selected first tap one of the wavelengths to deselect it.
2. Tap the [Mode selection] button to toggle between the modulation frequencies (and the Auto- λ mode):




Using the menu:

- Press the [≡] key, tap the [Modulation] button and tap the desired frequency.

The measurement display is shown and the selected frequency is enabled. If Auto- λ was active before, the mode is set to modulation now.

Enabling Auto- λ

Using the [Mode selection] button:

- ✓ A modulation frequency is selected.
- Tap the [Mode selection] button until Auto- λ  is displayed. *Auto- λ is enabled now for the selected wavelengths.*


Using the menu:

- ✓ A modulation frequency is selected.
- Press the [≡] key, tap the [Auto- λ] button and tap [Serial- λ].

Enabling Multi- λ or Serial- λ (two wavelengths)




NOTE: Multi- λ and Serial- λ can only be enabled when two wavelengths are selected.

Using the [Mode selection] button:

1. Tap the [Mode selection] button until Auto- λ  is displayed.
2. Activate more than one wavelength by tapping.
3. Tap the [Mode selection] button to select Multi- λ or Serial- λ :

 or .




Using the menu:

1. Press the  key, tap the [Auto- λ] button and select the desired Auto- λ mode.
The measurement display is shown, but still Auto- λ is enabled.
2. Press the  key, tap the [Source Selection] button and switch on both wavelengths.
3. Press the  key.
The measurement display is shown and the selected Auto- λ mode is enabled.

Setting the power level

The power level can be set for each wavelength separately and will be stored permanently.

Changing the power level

1. Press the  key and tap the [Level Adjustment] button.
2. Select SM or MM for single- or multi-mode and tap the level adjustment button of the desired wavelength.
The display changes to edit mode.
3. Press the arrow keys to increase or decrease the power level:
 - left/right arrow keys: change level in 1 dBm steps
 - up/down arrow keys: change level in 0.01 dBm steps.
4. Press the  key to leave edit mode of the selected wavelength.
5. Press the  key again to leave the edit menu.

Switching on/off the laser

- ▶ To switch on the laser, tap the [Laser on/off] button.
 - or –
 - Press the center key within the arrow keys.
 - or –
 - Press the [≡] key and tap the [Output On] button.
- ▶ To switch off the laser, repeat one of the actions mentioned above.

10 MEASURING LOSS WITH SOURCE/ POWERMETER

General information

The OLTS-85 offers three different measurement modes.

- **Source Mode:** The instrument works as a laser source.
- **Powermeter Mode:** The instrument works as an optical power meter.

Instead of using the **Loss** test mode which restricts the measurement to a fiber loop, two OLTS-85/OLTS-85P instruments can be used for remote operation. In this **Source/Powermeter Mode** one OLTS-85/OLTS-85P works as a laser source, while the other OLTS-85/OLTS-85P works as an optical power meter. Source and powermeter are not locked in this mode.

For information on measurement adjustments on your powermeter device see ["Powermeter Operation" on page 72](#).

Performing the measurement

1. Select the Source application on your source device and the Powermeter application on your powermeter device.
2. Perform the Referencing on the powermeter device:
 - a) Decide for one of the Reference methods (see ["Appendix - Referencing Methods" on page 116](#)).
 - b) Connect both devices accordingly.
 - c) Switch on the laser on your source device.
 - d) Press the **[≡]** key and tap the **[Store ABS->REF]** button.
3. Switch the laser source off.
4. Connect your fiber system under test as shown in figure [...].
5. Switch on the laser on your source device.
The loss is displayed on the powermeter device.

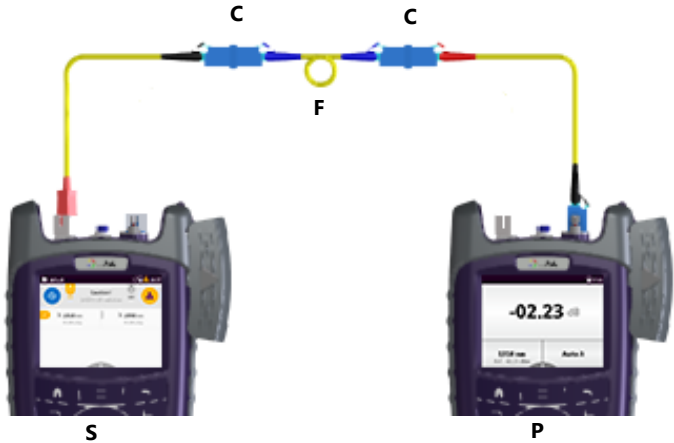


Fig. 25 Performing the measurement (for both directions by switching source and powermeter mode)

C	Connection
S	Source device
P	Powermeter device
F	Fiber system under test

Viewing test results

The measured loss is displayed in real time.

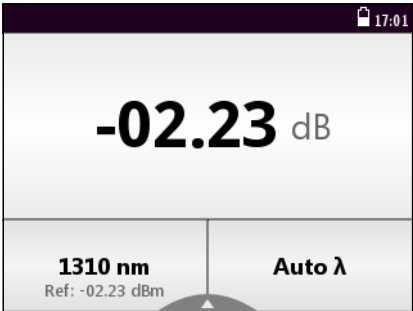


Fig. 26 Result overview over one wavelength

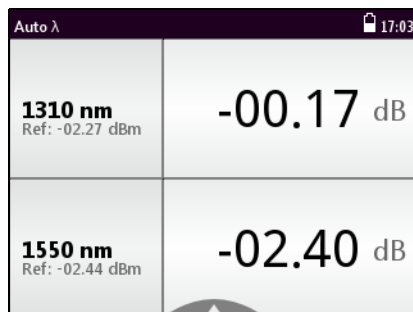


Fig. 27 Result overview over two wavelengths

Saving Loss test results

Before starting a measurement a project must be selected and set to active. Thus, all results are assigned to that project when saved. If no project was defined by the user, the instrument will use the Test-Tool project "default", which is always present (see ["Managing projects" on page 42](#)).

Results are stored simply by pressing the **[F5]** key. Each time the key is pressed, the result just displayed will be saved.

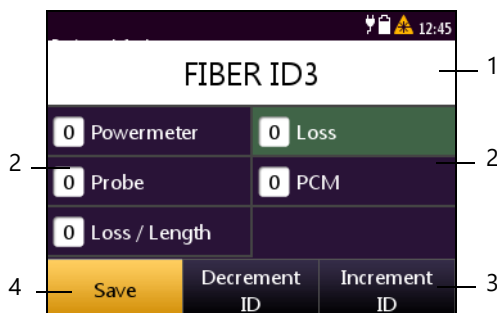
To save current results:

- ✓ The instrument is in application mode and displays the test results (overview or details) to be stored.

1. Press the **[F5]** key.

The Save dialog is displayed.

As file name the label prefix defined in the project settings is showed on top of the display.



-
- 1 Defined label name.
 - Tap field to edit label name.
-
- 2
 - Probe: Number of already saved probe results.
 - Powermeter: Number of already saved powermeter results.
 - PCM: Number of already saved PCM results.
 - Loss/Length: Number of already saved loss/length results.
 - Loss: Number of already saved loss results.
-
- 3 Decrease / increase label ID
-
- 4 Save results
-

2. To edit the label name, tap the field, edit the name and tap [OK].
3. To change the ID, tap [Decrement ID] or [Increment ID].
4. Press the [F] key again or tap the [Save] button.
The measurement is stored in the current active project.

NOTE: When measuring two wavelengths at a time both wavelengths are stored separately. Thus, the ID is incremented by 2.

NOTE: If the label/fiber ID is not changed, the data set will be saved under the same title. Then the Data can be distinguished and sorted by the Timestamp.

11 PROBE/PCM OPERATION

General information

Dirty and/or damaged connectors are often the root cause of optical network problems. The Probe and PCM applications enable industry standard inspection and automated Pass/Fail testing with report generation of optical connectors/adapters in order to ensure industry standard fiber endface quality and cleanliness.

For best workflow efficiency, there are two variants of fiber microscopes available in the SmartClass™ Fiber family. The integrated Patch Cord Microscope (PCM), which is best suited for inspecting fiber endfaces of patch cords, and the external P5000i Digital Probe (see [“Accessories” on page 130](#)), which may be used either for bulkhead inspection or patch cord inspection. The shortest inspection time is achieved when using one of the Oxx-8xP (e.g. OLP-85P) models with an integrated PCM for patch cord inspection and a P5000i Digital Probe for bulkhead inspection.

Both applications – Probe and PCM – behave essentially the same and are described together below.

NOTE: Only if a P5000i Digital Probe is connected to the instrument the Probe application is fully functional.
All instruments with a trailing "P" in their model name (e.g. OLT-85P) provide PCM functionality.

The build in Patch Cord Microscope (PCM)

The PCM is a microscope used to view and inspect patch cord (male) sides of fiber connectors.

In order to support a wide variety of fiber optic connectors, the PCM provides an exchangeable FMAE adapter. The dedicated QuickCapture key enables either instant triggering of a Pass/Fail test or freezing of the live image. For best workflow adaption, the key action is configurable. The dedicated Magnification Control key provides fast toggling between two microscope magnification levels: low magnification (around 23000 dpi) for overview inspection of the fiber endface, and high magnification (around 46000 dpi) for detailed inspection of the fiber endface.



Fig. 28 Patch cord microscope components

1	FMAE adapter
2	QuickCapture™ key
3	Focus Control
4	Magnification Control key

FMAE series adapters for the PCM

SmartClass™ Fiber devices with the PCM use FMAE series adapters to ensure consistent and accurate inspection for a wide variety of connectors and applications. All PCM configurations ship with a 2.5 mm interface included. Kitted configurations may include additional FMAE adapters.

The external P5000i Digital Probe

The P5000i Digital Probe is a portable handheld microscope used to view and inspect both the bulkhead (female) and patch cord (male) sides of fiber connectors, as well as other optical devices, such as transceivers.

The Digital Probe is specially designed to fit and operate comfortably and easily in-hand, allowing the user to inspect hard-to-reach connectors that are installed on the back side of patch panels or inside hardware devices. In order to support a wide variety of fiber optic connectors, the P5000i provides an exchangeable FBPT inspection tip. The dedicated QuickCapture key enables either instant triggering of a Pass/Fail test or freezing of the live image. For best workflow adaption, the key action is configurable. The dedicated Magnification Control key provides fast toggling between two microscope magnification

levels: low magnification (around 23000 dpi) for overview inspection of the fiber endface, and high magnification (around 46000 dpi) for detailed inspection of the fiber endface.

The P5000i Digital Probe kit sold with the OLTS-85/OLTS-85P contains the standard barrel assembly (FBPP-BAP1), standard patch cord tips, and standard bulkhead tips. See ["Accessories" on page 130](#).



Fig. 29 P5000i Digital Probe components

1	Inspection tip
2	Barrel assembly
3	QuickCapture™ key (see "Basic settings" on page 92)
4	Focus Control
5	Magnification Control key (on both sides)
6	USB 2.0 connector
7	1.83 m (6 ft) coil cable

FBPT series tips for the P5000i

The P5000i Digital Probe uses FBPT series inspection tips to ensure consistent and accurate inspection for a wide variety of connectors and applications. These connector-specific and universal inspection tips are interchangeable, which allows the P5000i Digital Probe to interface with different types of fiber connectors.

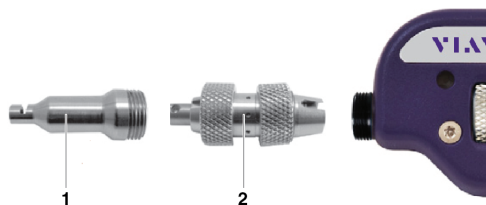


Fig. 30 FBPT series tips for the P5000i

1	Inspection tip
2	Barrel assembly

P5000i connection

The Probe application requires a P5000i Digital Probe in order to be fully functional (see the list of all accessories in [“Accessories” on page 130](#)).

NOTE: The P5000 series probe (the predecessor of the P5000i) is not supported.

To connect the probe:

1. Plug your P5000i into either USB port.
The initialization starts immediately.
2. Connect the P5000i to the fiber being inspected.
3. Press the **[↶]** key, then tap the **[PROBE]** button or use the arrows keys.
– or –
Press the **[⇄]** key to toggle between the measurement view and the inspection view.
After initializing the P5000i will display the live view.

NOTE: In order to save battery power the cameras are switched off 5 minutes after leaving the respective application.

Basic settings

- ✓ The digital probe is connected to the instrument (the PCM is always connected).
- ✓ The instrument is in **PCM** or **Probe** mode.

Auto center

When auto center is switched on, the high magnification detail view is automatically centered around the fiber endface center.

To switch on/off auto center:

1. Press the [≡] key.
2. Tap the [More] button.
3. Tap [PCM Settings] or [Probe Settings].
4. Tap [Auto Center] to toggle on/off.

QuickCapture™ key

In order to support different workflows, the functionality of the QuickCapture™ key is configurable. Pressing the key will either freeze the live image or start a test.

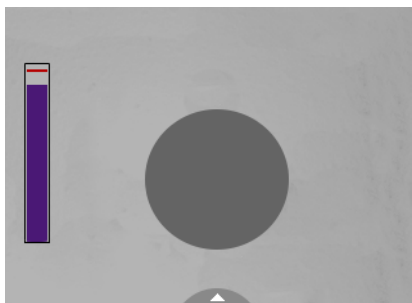
Test	Pressing the key will automatically freeze the live image and perform a test.
Freeze	Pressing the key will automatically freeze the live image.

To set the key:

1. Press the [≡] key.
2. Tap the [More] button.
3. Tap [PCM Settings] or [Probe Settings].
4. Tap [Device Button].
5. Tap the desired key function.

Focus quality bar

When switched on the focus quality is displayed graphically and in real time by a bar on the left side of the screen.

**To show/hide the focus quality bar:**

1. Press the [≡] key and tap the [More] button.
2. Tap [PCM Settings] or [Probe Settings].
3. Tap [Show Focus Quality] to show/hide the bar.

Selecting a profile and adapter/tip

About profiles

Profiles contain the analysis parameters from which pass/fail criteria are determined. A number of profiles are supplied with the instrument. Profiles cannot be created in the instrument but with the FiberChekPRO™ software and transferred to the instrument via remote control. Information about creating profiles can be found in the FiberChekPRO™ user manual.

To select a profile:

1. Press the [≡] key.
2. Tap the [Profile] button.
3. Tap the desired profile.

Table. 1 Examples for profiles stored in the instrument by default.

Profile	Pass/fail criteria for ...
E2000	... precision metal ferrule connectors
MM_	.. multi-mode connectors from IEC 61300-3-35
Ribbon_	... single- and multi-mode connectors from IEC 61300-3-35
SFP_	... small form-factor pluggables
SM-UPC	... single-mode UPC connectors from IEC 61300-3-35
SM-APC	... single-mode APC connectors from IEC 61300-3-35
SM_PC	... single-mode PC connectors from IEC 61300-3-35

About adapters/tips

When trying to select an adapter (PCM) or a tip (probe) only these adapters/tips are presented that are supported both by the selected profile and the camera in use. Therefore the profile must be selected prior to the adapter/tip.

Depending on the selected adapter/tip, the camera's illumination LED is set to a precalibrated brightness stored in the camera's memory.

If no matching adapter/tip is available, a standard brightness will still provide an image, while the pass/fail analysis algorithm might not work properly.

To select an adapter/tip:

1. Press the [≡] key.
2. Tap the [Tip]/[Adapter] button.
3. Select the suitable adapter/tip.

Operation

Adjusting the focus

- Use the focus control to adjust the sharpness.

NOTE: The focus quality bar helps you to find the best setting (see ["Focus quality bar" on page 93](#)).

Adjusting the magnification

- Press the Magnification Control key to modify the live display from high to low magnification and vice-versa.

In the high magnification mode, automatic centering is available.

Running a test

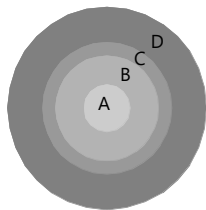
- Press the [≡] key and tap the [Test] button.
 - or –
 - Press the QuickCapture™ key if the button action is set to **Test**.
 - or –
 - Press the central key.

When the test procedure terminates, the information shown on the display depends on the current overlay setting.

Overlay

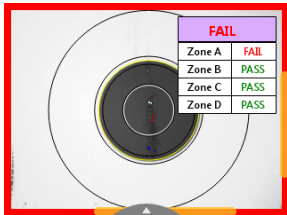
- Press the [≡] key and then the [Overlay] button to change the overlay view. Repeat the action until the desired view appears:
 - without overlay > with colored edges > with colored edges and legend > without overlay > ...

A summary of test results is displayed at the upper right of the screen (following figure is just an example and may vary).

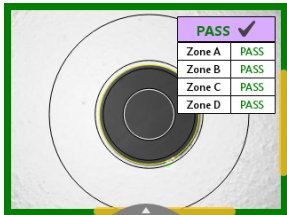


Zone	
A	Represents the core zone. It is the area surrounding the core.
B	Represents the cladding zone. It surrounds the majority of the fiber cladding.
C	Represents the epoxy ring.
D	Represents the ferrule zone. It identifies a portion of the ferrule near and around the fiber.

Test result displays and frame colores



Test failed



Test passed

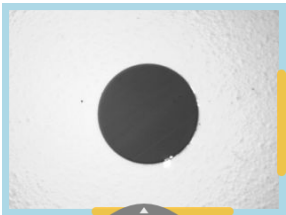


Image frozen

Fig. 31 Pass/Fail analysis, overlay and freeze view

To return to the live image:

- ▶ Press the QuickCapture™ key.
– or –
Press the [≡] key and tap the [Live] button.


Freezing the image

Once the image is acceptable, you may freeze it instead of running a test. This feature allows you to keep the current view and to store it for future reference. In Freeze mode, the picture has a blue colored frame.


To freeze a view:

- ▶ Press the QuickCapture™ key (if it is set to Freeze mode).
– or –
Press the [≡] key and tap the [Freeze] button.

To return to the live image:

- ▶ Press the QuickCapture™ key.
 - or –
 - Press the  key and tap the **[Live]** button.

Saving Probe/PCM results

Images can easily be saved by pressing the  key. Each time the key is pressed, the results will be stored.

NOTE: Instruments with an integrated patch cord microscope (“PCM”) use a specific app, also called “PCM”, to operate that microscope. Therefore, images taken by the PCM can easily be distinguished from images taken by an external digital probe.

NOTE: If the instrument with integrated patch cord microscope is connected to a Digital Probe, the images for the PCM and the Digital Probe will be stored in different folders.


Background

Every saving covers the complete image and overlay data available, regardless of the current screen contents:

- Two JPEG files for high and low magnification
- One XML file for test result description
- One PGM file (compressed) for failed locations
- One container file

When data is requested by the user (e.g. using SCPI), the provided jpg-file is created just in time by the software. This concept helps to save memory space and allows to maintain sharp zone rings for all resolutions (VGA, QVGA and QQVGA).

NOTE: Saved image and overlay data (JPEG, XML, PGM files) can be transferred, displayed and managed via the Smart Reporter software.

1. Select the desired overlay mode.
2. Press the  key.
In live view this action triggers the snapshot.

As file name the label prefix defined in the project settings is showed on top of the display.

The screenshot shows a mobile application interface with a dark theme. At the top, there is a status bar with icons for signal strength, battery, and time (10:40). Below the status bar, the file name "-RO-RA-01" is displayed in a large white font. Underneath, there is a grid of measurement data:

0 Powermeter	0 Loss
9 Probe	6 PCM
10 Loss / Length	

At the bottom of the screen, there are three buttons: "Save" (yellow), "Decrement ID" (grey), and "Increment ID" (grey).

3. To edit the file name, tap the name, edit it and tap [OK].
4. To change the ID, tap [Decrement ID] or [Increment ID].
5. Press [Save] to save the results.

The file is saved in the current active group directory.

12 WORKFLOW MODE

To work in the Workflow mode, tasks are first transferred via the Mobile Application from a mobile device to the OLTS-85/OLTS-85P. Then the tasks are just executed as set up by the project manager in the Cloud-based Project Management application CERTiFi.

Thus, this chapter just explains how to handle the tasks and routines as part of the Workflow-Mode. The measurements themselves are part of the Test-Tool mode and described in the corresponding chapters.

NOTE: The workflow mode can be enabled only through Viavi's Cloud-based Enterprise Workflow Management Tool CERTiFi. For more information please refer to www.viavisolutions.com

Performing a measurement in Workflow mode

A complete measurement in Workflow mode consists of following steps:

1. Define a project in the Cloud-based application CERTiFi. This is usually done by a project manager.
2. Transfer the project to the instrument via the Mobile App (please refer to the help provided with the App).
3. In the instrument select a project and set it to active.
4. Select a label list (if the project contains more than one) and set it to active.
5. Start the measurement and perform each measurement defined for each label.
6. Save the measurement.
When synchronized the progress of each measurement is displayed in the Mobile and Cloud Apps.
7. If a test has failed the device under test may be checked and tested again to get a passed result.

These steps are described in detail in the following sections.

Defining a project in the Cloud-based application CERTiFi

This is usually done by a project manager.

NOTE: For further information about the Cloud Application please refer to the help provided with the application.

Loading a project from the Mobile Application

Workflow projects can simply transferred via the Mobile App to the instrument.

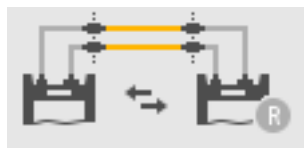
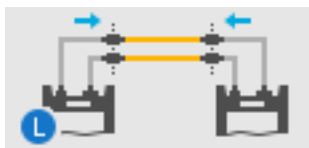
NOTE: For further information about the Mobile Application please refer to the help provided with the application.

Selecting a project on the instrument

For further information about selecting a workflow project and label list on the instrument see ["Workflow mode" on page 45](#).

Establishing a connection

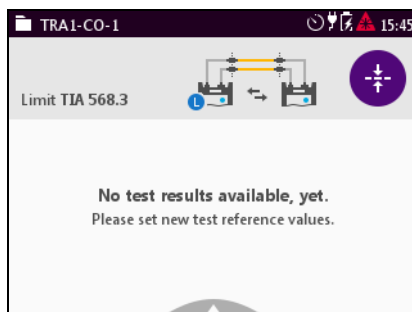
- Establish a connection.
The icons in the top bar show the status of the connection.




No connection established Connection established
L and **R** show which device is local and which is remote.

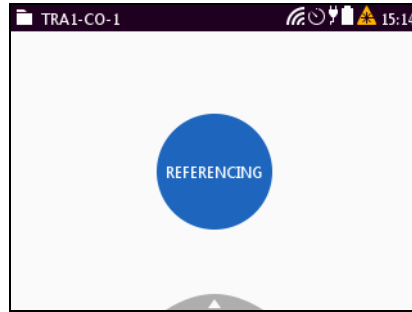
Referencing the test setup

When starting the test for the first time or when changing setup you have to run the referencing.




- Tab  button to start referencing.

Display shows that referencing is in progress.

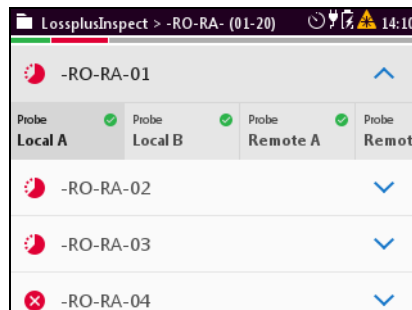


Running a test

1. In the  menu tap the [START TEST] button.
The labels of the active label list are displayed.

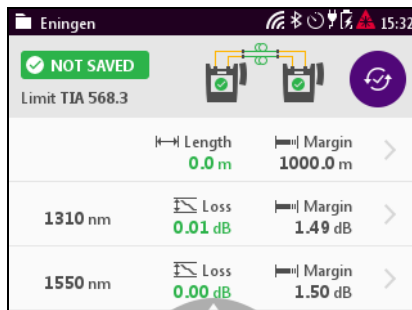


2. Tap the label to be tested.
The defined tests are displayed. The progress bar on the very top and various icon show the status of each label and the whole project (see [“Viewing the test progress” on page 103](#)).



3. Tab the test to be performed (.
The test is started. Buttons are showing the status: (see “Viewing the test progress” on page 103)

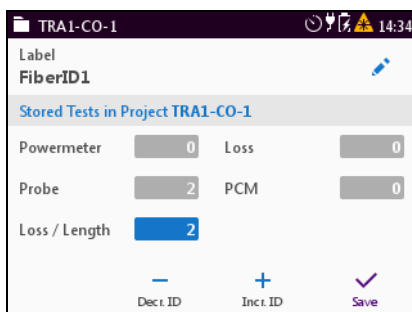
After completion of the measurement the results are displayed in the results overview window (e.g. of a Loss/length test).



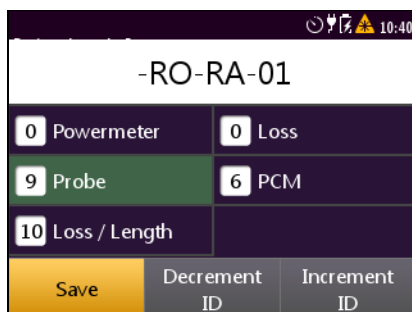
NOTE: To learn more about showing test result details see the descriptions of the test applications in the test tool chapter.

Saving a test

4. To save a test result press the **[F]** button.
The Save dialog is displayed.



Example: saving a **Loss/Length** test



Example: saving a **Probe** test

5. Tab **[Save]** to save the test results.




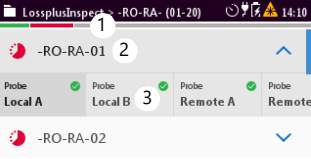
NOTE: Only saved results are reported to the mobile and cloud application. For more information about saving results see the descriptions of each application.

6. Proceed with the next test until all tests defined in the active project are run.

NOTE: A test can be run several times and saved again. If already reported the new results will substitute the previous results in the mobile and cloud app, but not be deleted in the instrument data storage.

Viewing the test progress

The progress of a project is displayed in several ways:

While test is running	
In the test screen: by the PASS or FAIL message	<div>  </div> <div>  </div>
In the label list: (1): Graphical bar showing overall progress of test (full bar = 100%, green = pass, red = fail) (2): Progress of label (3): Progress of test in selected label	

If a test has failed / repeating a test

When running a workflow project you usually aim to pass all tests. If a test failed or even if a passed test does not show the expected results you can restart the test (e.g. after you have improved the device under test).

To restart a test:

- Simply tap again the test in the active label.
The test is run again.
- Save the results if the test meets your requirements.
The results are stored in the instrument and the storage ID of the test type is incremented. Already saved results will not be overwritten. After synchronisation with the Mobile and Cloud App the results will be refreshed accordingly.

Managing Workflow projects

Workflow projects only can be created and managed from the web based Project Management Application. The OLTS-85/OLTS-85P does not allow to create or edit Workflow projects.

13 DATA MANAGEMENT

NOTE: Results are always stored under the currently selected (active) project. Thus, to display stored results the desired project must be set to active first (see [“Managing projects” on page 42](#)).

To select a project see [“Selecting a Test-Tool project” on page 43](#) and [“Selecting a project from the Workflow dashboard” on page 46](#).

Saving results

Saving results is explained in the descriptions of each application.

Selecting test results in Test-Tool or Workflow Mode

Test-Tool project:

1. Select a Test-Tool project containing test results of the desired application.
2. Select the desired application.

Workflow project:

1. Select a Workflow project containing test results of the desired application.
2. Tap **[START TEST]**, open a label from the list and select the desired application.

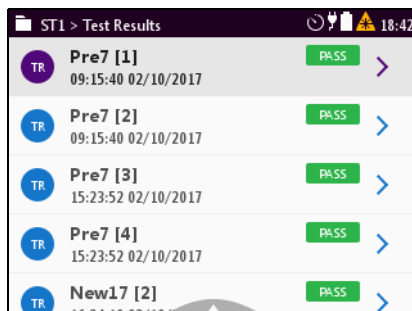
Data management of Loss/Length tests

Recalling stored test results

Stored test results are displayed directly from the menu in the **Loss/Length** application.

- ✓ The **Loss/Length** application is selected.
 - ✓ The instrument is configured as **Local**.
1. Press the **[≡]** key.
 2. Tap the **[More]** button.
 3. Tap the **[Test Result Storage]** button.

The list of stored test results is displayed.



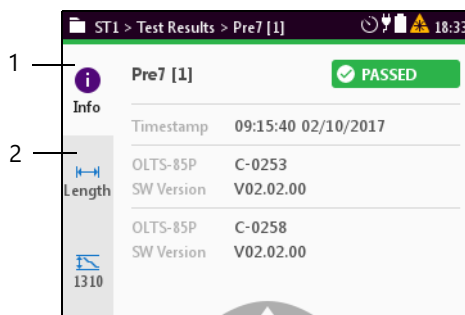
NOTE: When measuring two wavelengths at a time, both wavelengths are stored separately together with the length results. Thus, two entries can be found in the list for this test. See example above: Pre7 [1] and Pre7 [2] show the same timestamp.

4. To select a data set double tap the entry.

– or –

Use the up/down arrow keys to select an entry and press the central key.

The info page of the test results is displayed.



1 Information about the stored test results:

- Pre7 [1]: Test label name
- PASSED: Passed/failed label. Additionally the window has a green or red frame.
- Timestamp: Time and date of the test
- C-025x: Serial number of instruments
- V02...: Software version of instruments

2 Display of the stored test results

5. Select the length or wavelength tab to show the test results for length and loss measurement in detail. For more information about the test result details see ["Viewing test results" on page 59](#).
6. Press the right/left arrow keys to show the next/previous test results, e.g. for 1500 nm, when a second wavelengths was measured.

Deleting stored test results

To delete one data set:

- ✓ The list of stored test results is displayed.
- 1. Select the data set to be deleted.
- 2. Press the [≡] key and tap [Remove].
The selected data set is deleted and removed from the list.

To delete all stored test results:

- ✓ The list of stored test results is displayed.
- ▶ Press the [≡] key and tap [Remove all].
All stored data sets are deleted and removed from the list.

Data management of Loss and Powermeter tests

Recalling stored test results

Stored test results are displayed directly from the menu in the chosen application.

- ✓ The instrument is in the chosen application mode.
- 1. Press the [≡] key
- 2. Tap the [More] button.
- 3. Tap the [Measurement Data] button.
The list of stored test results is displayed.

Fiber ID	λ [nm]	Loss [dB]
FiberID1	1550	-09.4
FiberID1	1310	-09.50
FiberID1	1550	-09.31
FiberID1	1310	-09.35

Fiber ID	λ [nm]	Pow [dBm]
FiberID13	850	-67.9
FASER ID3	850	-71.3

Fig. 32 Measurement data overview: Loss Test (left), Powermeter Test (right)

To show all columns of the overview:

- Press the right/left arrow keys to show additional information. The displayed information depends on the selected application.

Measurement Data of Loss Test

Fiber ID	Test label name
λ [nm]	Wavelength
Loss [dB]	measured Loss value
Pass/Fail	Passed/failed label
Limit [dB]	Limit value
Ref [dBm]	Reference value
Timestamp	Time and date of the test

Measurement Data of Powermeter Test

Fiber ID	Test label name
λ [nm]	Wavelength
Pow [dBm]	measured Powermeter value
Pow [Watt]	
Pow [dB]	
Ref [dBm]	Reference value
Pass/Fail	Passed/failed label
Limit [dBm]	Limit value



Measurement Data of Powermeter Test

Auto λ	optional Auto λ mode
Tone	Tone value
Timestamp	Time and date of the test

Managing test results

To select/deselect a test result:

There are several ways to select and deselect test results:

1. Tap an entry once to highlight it, tap it again to select it.
2. Use the up/down arrows to highlight an entry and press the center key to select it.
3. Press the  key and tap the **[Select All]** button to select all.
4. Press the  key and tap the **[Deselect All]** button to deselect all.

NOTE: The selection state of the highlighted entry toggles. The check mark in the first column shows in light grey when an entry is deselected and in dark grey when it is selected.

To view test results in full screen:



- ✓ The measurement data overview is displayed.
- 1. Select one or more test results from the list.
- 2. Press the  key and tap the **[View Selected]** button.
The first selected result will be displayed.



Fig. 33 Powermeter test results

3. Press the  key and tap the **[Next]** or **[Previous]** button to display other results.

To sort the test results:

- ✓ The measurement data overview is displayed.
- 1. Press the [☰] key.
- 2. Tap the [More] button, then tap the [Sort Order] button.
- 3. Select the desired sorting order.

To show or hide the overview columns:

- ✓ The measurement data overview is displayed.
- 1. Press the [☰] key.
- 2. Tap the [More] button, then tap the [Show Columns] buttons.
- 3. Tap any column header to toggle its hide/show status.

To delete stored results from a project:

- ✓ The measurement data overview is displayed.
- 1. Select one or more test results.
- 2. Press the [☰] key.
- 3. Tap the [Delete Selected] button.
The selected test results are deleted.

Data management of Probe and PCM tests

Recalling stored test results

Stored test results are displayed directly from the menu in the **Probe/PCM** application.

- ✓ The **Probe** or **PCM** application is selected.
- 1. Press the [☰] key.
- 2. Tap the [More] button.
- 3. Tap the [Measurement Data] button.
The list of stored test results is displayed.

Fiber ID	Pass/Fail	Profile
FiberID1	--	MM (IE
FiberID2	FAIL	MM (IE
✓ Rem7	PASS	MM (IL
Rem7	--	MM (IE

To show all columns of the overview:

- Press the right/left arrow keys to show additional information. The displayed information depends on the selected application.

Fiber ID	Test label name
Pass/Fail	Passed/failed label
Profile	Profile label
Adapter	Typ of adapter
Timestamp	Time and date of the test

Selecting/Deselecting test results

Test results first must be selected before they can be viewed or deleted. A selected entry is flagged by the check mark in the first column.

To select one test:

1. To select a test, tap it twice.
– or –
Press the arrow keys to highlight the test and press the center key
The check mark shows the selected test.

Fiber ID	Pass/Fail	Profile
✓ -RO-RA-01	PASS	SM UPC (
-RO-RA-01	PASS	SM UPC (
-RO-RA-01	PASS	SM UPC (
-RO-RA-02	PASS	SM UPC (

To select multiple tests:

- ▶ Repeat step 1 to select multiple entries.

To select all tests:

- ▶ Press the [≡] key and tap [Select All].

To deselect all tests:

- ▶ Press the [≡] key and tap [Deselect All].

Displaying test results

NOTE: When selecting multiple tests, all selected tests can be viewed one after another without switching back to the list and selecting another test.

To display a test result:

1. Select one, multiple or all tests.
2. Press the [≡] key and tap the [View Selected] button.
The test results are displayed in full screen.

To view the next test result:

- ✓ The selected test result is displayed in full screen.
- 1. Press the center key.
– or –
- 2. Press the [≡] key and tap the [Next] button.

To view the previous test result:

- ✓ The selected test result is displayed in full screen.
- ▶ Press the [≡] key and tap the [Prev] button.

Sorting test results



- ✓ The measurement data overview is displayed.
- 1. Press the [≡] key.
- 2. Tap the [More] button, then tap the [Sort Order] button.
- 3. Select the desired sorting order.

Show/hiding the overview columns

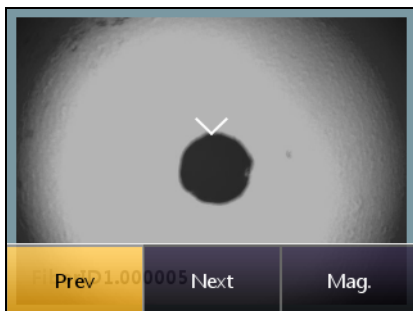
- ✓ The measurement data overview is displayed.
- 1. Press the [≡] key.
- 2. Tap the [More] button, then tap the [Shown Columns] button.
- 3. Tap any column header to toggle its hide/show status.

Deleting stored results from a project



✓ The measurement data overview is displayed.

1. Select one, multiple or all tests.
2. Press the  key.
3. Tap the  button.
The selected test results are deleted.

Actions when viewing images



To toggle the image magnification low/high

- ▶ Press the  key, then tap the  button.
– or –
Tap the image.


To move the image to the area of interest:


- ▶ Sweep the high magnification image with your finger.
– or –
Press the arrow keys to move the display to the desired direction.

Exporting results to USB

The export function allows to store CSV files and files used exclusively by the Smart Reporter on a USB stick.

To export files:

1. Connect a USB stick to one of the USB ports on the right side of the device.
The  symbol is displayed at the top of the screen.


2. Tap the  button.
3. Tap the [Data Storage] button.
4. Tap the [Export Results to USB] button.
The files are stored in the following directory structure:
`storage_<device_type><serial_number>`
`<current_date>T<current_time>Z.`
`<current_date>T<current_time>Z_<current_date>_001.csv`
`default`
`<Label>.<Test_No>.<Application>`

The CSV file contains the results of a measurement/of various measurements. The application file can be processed by the Smart Reporter.

Importing test results from another unit

Test results can be imported from a **Remote** unit to a **Local** unit.

To import test results:

- ▶ Connect your **Local** instrument using the Micro-USB connector of the **Remote** instrument.
 - ✓ The homescreen on the **Local** instrument is displayed.
1. Tap the  button.
 2. Tap the [DATA STORAGE] button.
 3. Tap the [Import Inspection Results] button and start the data transfer from **Remote** to **Local**.

Making a report

In order to make a report, please download the FiberChekPRO™ or SmartReporter software from the Viavi web site <http://updatemyunit.net>.

- ▶ Connect your instrument to your PC via the USB port and follow the instructions on the screen.

14 MAINTENANCE



⚠ WARNING

Dangerous voltage and invisible laser radiation

Maintenance or cleaning of the instrument while it is connected or operating may damage the instrument or injure you.

- ▶ Make sure that the instrument is switched off and disconnected from all power sources and optical radiation sources before maintenance or cleaning.

Cleaning the test port

It is a good idea to check that the optical connections are clean and clean them if necessary before starting measurements. Even very small dust particles on the end surfaces of the plugs or in the test adapters can adversely affect the accuracy of the measurement.

1. Switch off the instrument.
2. Remove the test adapter from the optical connection.
The plug end surface is now accessible.
3. Wipe off the plug end surface using a cotton bud soaked in isopropanol.
This cleaning method is very effective and leaves no residue.
4. Blow out the test adapter with clean compressed air (available in spray cans, e.g. anti-dust spray).

NOTE: Cover the optical connections with the dust cap whenever they are not in use. This prevents them from getting dirty.

Cleaning the instrument

If the instrument gets dirty through use, you can clean it using a soft cloth moistened with a mild solution of detergent.

NOTICE

Water and cleaning fluids

The instrument may be damaged or destroyed if water or cleaning fluids penetrate it.

- ▶ Make sure that water or cleaning fluids do not penetrate the instrument.

15 APPENDIX - REFERENCING METHODS

For a fiber loss measurement per length, connection, and splice, the technician must indicate the fiber length, the number of connections, and how many splices are present in the fiber system under test.

There are four additional connections required to perform a test:

- A connection at the local device to the local reference jumper.
- A connection from the local reference jumper to the fiber system under test.
- A connection from the fiber system under test to the remote reference jumper.
- A connection from the remote reference jumper to the remote device.

The reference method chosen (One, two or three jumper reference) will determine how many of these connections are included in the loss measurement and in the loss limit.

NOTE: In the following procedures, test-reference jumper cables are assumed to:

- be compliant to IEC 61280-4-1/4-2
- be high-quality and in good condition
- be equal in length and relatively short
- have no end-face damage or debris

Disconnecting the connection at the transmitter of the local or remote OLTS-85/OLTS-85P after a reference is performed invalidates the reference. Since the connection at the receiver is not glass-to-glass, it can be removed without affecting the reference. Any loss associated with the test-reference jumper cables is automatically considered in the test results.

Loopback and Remote Referencing

NOTE: The figures below display referencing methods (loopback/remote) for single-mode fibers. The contents described apply equally to measurements under multi-mode fibers.

Loopback Referencing

This mode is used to measure loss of a fiber loop or any optical component connected to the loop. The internal laser source and powermeter are locked.

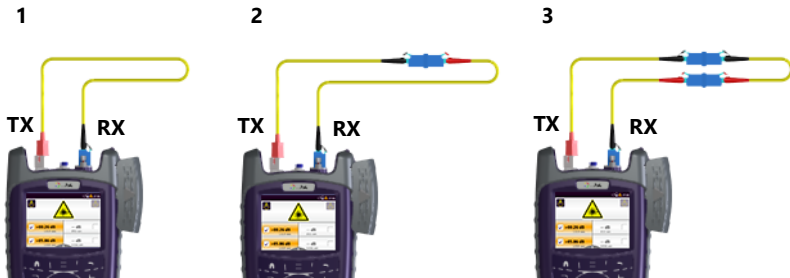


Fig. 34 Loopback Referencing: 1-jumper cable (1), 2-jumper cable (2), 3-jumper cable (3)

TX	Laser source output (Transmitter)
RX	Powermeter input (Receiver)

Remote Referencing

One jumper cable reference

This reference removes the losses at Connection 1 and Connection 4 from the measurement.



Fig. 35 One jumper reference - unidirectional

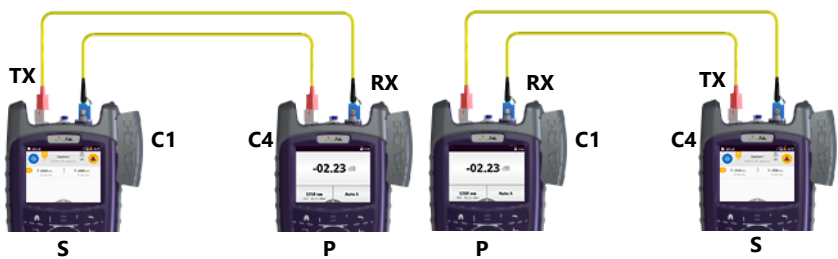


Fig. 36 One jumper reference - bidirectional (switching source and powermeter mode)

C1	Connection 1
C4	Connection 4
TX	Laser source output (Transmitter)
RX	Powermeter input (Receiver)
S	Source device
P	Powermeter device

Measured loss = $\Delta_{\text{Conn. 2}} + \Delta_{\text{FiberUnderTest}} + \Delta_{\text{Conn. 3}}$

This reference removes any loss at the connection between the instrument in source mode and the reference test jumper (both directions). However, the loss at the connection from instrument in source mode's reference jumper to the fiber under test and the connection from the fiber under test to the instrument in powermeter mode's reference jumper will not be referenced out.

Example for Loss Length Test mode (single-mode fiber):

- 0.2 dB Reference connector to reference connector mated loss
- 0.5 dB Reference connector to random connector ISO 14763-3
- 0.75 dB Reference connector to random connector TIA 568.3/ISO 11801
- 0.75 dB Random to random connector
- 0.3 dB Splice loss

Limit	Length of fiber x Loss/km	+L _{conn2}	+L _{conn3}	+L _{conn4}	+L _{splice5}	+L _{conn6}
14763-3	Length of fiber x Loss/km	(0.5dB)	0.75 dB	0.75 dB	0.3 dB	(0.5dB)
TIA/11801	Length of fiber x Loss/km	(0.75 dB)	0.75 dB	0.75 dB	0.3 dB	(0.75 dB)

Two jumper cable reference

This reference removes the losses at Connection 1, Connection 2, and Connection 4 from the measurement.

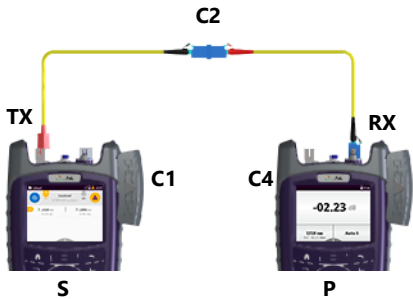


Fig. 37 Two jumper reference - unidirectional

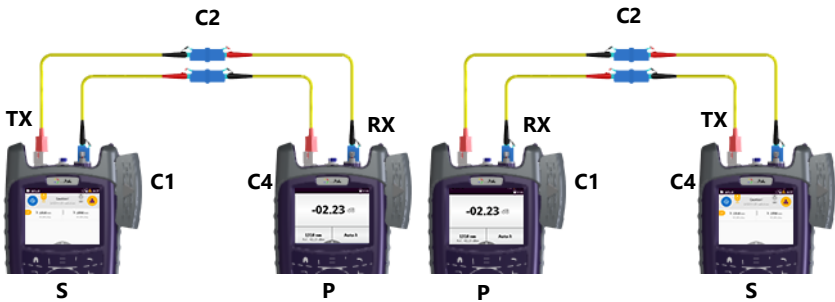


Fig. 38 Two jumper reference - bidirectional (switching source and powermeter mode)

C1	Connection 1
C4	Connection 4
C2	Connection 2

TX	Laser source output (Transmitter)
RX	Powermeter input (Receiver)
S	Source device
P	Powermeter device

The losses (Δ) at $\Delta_{\text{Conn. 1}}$, $\Delta_{\text{Conn. 2}}$ and $\Delta_{\text{Conn. 4}}$ are referenced out, so the loss measurement is as follows:

Measured loss = $\Delta_{\text{FiberUnderTest}}$ + $\Delta_{\text{Conn. 3}}$

This reference removes any loss at the connection between the transmitter of the instrument in source mode and a reference test jumper plus the loss at one connection plus a second reference test jumper (both directions). The loss at the second connection that must be present to measure the fiber system under test will not be referenced out.

By performing a two-jumper reference, the loss at this one connection is included in the measured loss.

Example for Loss Length Test mode (single-mode fiber):

0.2 dB	Reference connector to reference connector mated loss
not allowed	Reference connector to random connector ISO 14763-3
0.75 dB	Reference connector to random connector TIA 568.3/ISO 11801
0.75 dB	Random to random connector
0.3 dB	Splice loss

Limit	Length of fiber x Loss/km	+L _{conn2}	+L _{conn3}	+L _{conn4}	+L _{splice5}	+L _{conn6}
14763-3	Two jumper cable method not considered in ISO 14763-3.					
TIA/11801	Length of fiber x Loss/km	(0 dB)	0.75 dB	0.75 dB	0.3 dB	(0.75 dB)

Three jumper cable reference

This reference removes the losses at Connection 1, Connection 2, Connection 3, and Connection 4 from the measurement.

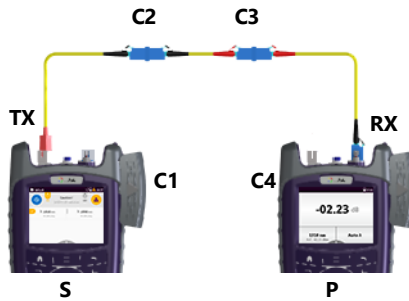


Fig. 39 Three jumper reference - unidirectional

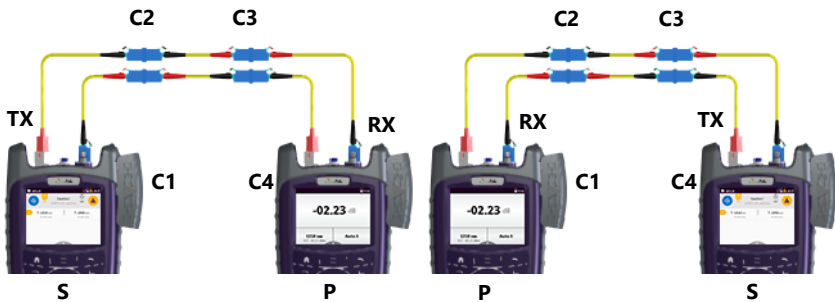


Fig. 40 Three jumper reference - bidirectional (switching source and powermeter mode)

C1	Connection 1
C4	Connection 4
C2	Connection 2
C3	Connection 3
TX	Laser source output (Transmitter)
RX	Powermeter input (Receiver)
S	Source device
P	Powermeter device

The losses (Δ) at $\Delta_{\text{Conn. 1}}$, $\Delta_{\text{Conn. 2}}$, $\Delta_{\text{Conn. 3}}$ and $\Delta_{\text{Conn. 4}}$ are referenced out, so the loss measurement is as follows:

$$\text{Measured loss} = \Delta_{\text{FiberUnderTest}}$$

This reference removes any loss at all the connections. A third reference jumper is used. Just as with the other test jumpers, the loss of this short reference jumper will not affect the loss measurement.

By using a three-jumper reference, no connection loss is added to the measured loss of the fiber under test.

Example for Loss Length Test mode (single-mode fiber):

0.2 dB	Reference connector to reference connector mated loss
0.5 dB	Reference connector to random connector ISO 14763-3
0.75 dB	Reference connector to random connector TIA 568.3/ISO 11801
0.75 dB	Random to random connector
0.3 dB	Splice loss

Limit	Length of fiber x Loss/km	+L _{conn2}	+L _{conn3}	+L _{conn4}	+L _{splice5}	+L _{conn6}
14763-3	Length of fiber x Loss/km	(0.2 dB) (0.5-0.2 dB)	0.75 dB	0.75 dB	0.3 dB	(0.2 dB) (0.5-0.2 dB)
TIA/11801	Length of fiber x Loss/km	(0 dB)	0.75 dB	0.75 dB	0.3 dB	(0 dB)

16 REMOTE CONTROL

Remote Command Documentation

- Please visit the Viavi web site at <http://updatemyunit.net> for the latest Remote Command Documentation "SCF RC Docs.exe" (self extracting zip-file).

17 ENVIRONMENTAL COMPLIANCE

This equipment was tested and found to comply with EN61326-1, IEC 61000-4-2, IEC61000-4-3, IEC/CISPR11. The limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

The authority to operate this equipment is conditioned by the requirements that no modifications be made to the equipment unless the changes or modifications are expressly approved by Viavi.

NOTE: To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons.

NOTE: This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Industry Canada (IC)

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

- 1) This device may not cause interference;
- 2) This device must accept any interference, including interference that may cause undesired operation of the device.

NOTE: Device operation in the band 5150-5250 MHz is for indoor use only.

EU Radio Equipment Directive

In accordance with Article 10.8 of the EU Radio Equipment Directive 2014/53/EU, the following table provides information on the frequency bands and the maximum RF transmit power of this product for sale in the EU:

Frequency range (MHz)	Channels used	Max. Transmit Power (dBm/mW)
2400-2483.5	1-13	ODFM: 19.9 dBm (97.7 mW) CCK: 17.9 dBm (61.7 mW)
5150-5250	36-48	22.9 dBm (195 mW)
5250-5350	52-64	22.9 dBm (195 mW) with TPC ¹⁾ 19.9 dBm (97.7 mW) with TPC
5470-5725	100-140	29.9 dBm (977 mW) with TPC 26.9 dBm (490 mW) non-TPC

1) TPC means Transmit Power Control

18 SPECIFICATIONS

General specifications

Fiber inspection	Via P5000i Digital Probe with auto Pass/Fail analysis
Live image	320 x 240 pixels, 8 bit gray, 10 fps
Display	High contrast 3.5" TFT color touchscreen
Display resolution	0.01 dB / 0.001 μ W
Measurement units	dB, dBm, W
Data memory	10000 measurement results
Data readout	Via client USB interface or Ethernet
Remote control capability	Via USB
Electrical interfaces	2 USB Type A, 1 USB Micro-B, Ethernet
Power supply	Four-way power: NiMH, dry batteries, RBP2 Li-Ion Battery Pack, PS4 Universal AC/DC Power Supply 12 V Internal charging for RBP2 Li-Ion Battery Pack
Optical connectors	2.5 mm UPP (1.25 mm UPP optional)
Recommended recalibration interval	3 years
Size (H x W x D) OLTS-85/OLTS-85P208	208 x 112 x 64 mm (8.2 x 4.4 x 2.5 in)
Size (H x W x D) OLTS-85/OLTS-85PP	208 x 153 x 64 mm (8.2 x 6.0 x 2.5 in)
Weight OLTS-85/OLTS-85P/OLTS-85/OLTS-85PP	750 g/850 g
Operating temperature range	-5 °C to +45 °C (23 °F to 113 °F)
Storage temperature range	-25 °C to +55 °C (13 °F to 131 °F)

Power meter specifications

Optical interface	Interchangeable adapter LC/PC, LC/APC (optional: SC, ST, FC, DIN, E2000 and UPP 2.5 mm and UPP 1.25 mm)
Adjustable wavelength range	800 nm to 1700 nm in 1 nm steps
Calibrated wavelengths	850 nm, 980 nm, 1300 nm, 1310 nm, 1490 nm, 1550 nm, 1625 nm
Photo diode	InGaAs
Fiber types	9/125 to 62.5/125
Power measurement range	-75 dBm to +15 dBm
Resolution	0.01 dB, 0.001 μ W
Maximum permitted input level	+15 dBm
Absolute measurement uncertainty ¹⁾	± 0.13 dB (± 3 %)
Linearity	0.1 dB
Automatic offset nulling	Yes
Measurement units	dB, dBm, Watt
Display resolution	0.01 dB/ 0.0001 μ W
Power meter functions	Absolute, relative, pass/fail, Auto λ
Warm-up time	None, instant-on
Wavelength detection ²⁾	Automatic switching and displaying up to 4 wavelengths simultaneously
Modulation detection ²⁾	270 Hz, 1 kHz, 2 kHz
Overall measurement uncertainty for calibrated wavelengths	± 0.5 dB, ± 3 pW (-75 dBm to +15 dBm at -5 °C to +45 °C)

1) Under reference conditions: -20 dBm (CW), at 1310 nm ± 1 nm, 23 °C ± 3 K, 9 μ m test fiber with SC/PC ceramic connector

2) With Viavi Optical Light Source
800 nm to 1650 nm: for levels > -50 dBm

Light Source specifications

	Multi-mode	Single-mode
Optical interface	Interchangeable adapter FC/PC (optional: SC, ST and LC adapters)	Interchangeable adapter SC/PC (optional: FC, ST and LC adapters)
Source type and wavelengths	LED source 850 nm ¹⁾ 1300 nm ¹⁾	Fabry-Perot laser diode 1310 nm ¹⁾ 1550 nm ¹⁾
Spectral width	50/170 nm	5/5 nm
Launch condition	Encircled Flux compliant to TIA-526- 14 and IEC 61280-4-1 ²⁾	

Output power (typical) settable in 0.1 dB steps	-25 to -22 dBm	0 to -3 dBm
Stability ³⁾ 15 min	±0.02 dB	±0.02 dB
Stability ³⁾ 8 h	±0.2 dB	±0.2 dB
Source modes	CW, Tone, Auto-λ, Multi-λ	
Tone generator	270 Hz, 1 kHz, 2 kHz	
Laser safety	IEC 60825-1:2007	
Laser classification	CLASS 1 LASER PRODUCT	

- 1) Typically ±20 nm
- 2) At the output of the EF-TRC. Variations between EF measurement equipment may occur but EF compliance can be expected with a 95 % confidence factor. Valid for IEC 61280-4-1 at 850 nm.
- 3) At constant temperature, after a 20 minute warm-up.

Tier 1 specifications

	Multi-mode	Single-mode
Testing speed ¹⁾		
Remote mode		< 6 s
Loopback mode		≤ 3 s
Pass/fail limit standards	TIA 568.3, ISO 11801 and ISO/IEC 14763-3, link validation	
Fiber type	50/125 μm	9/125 μm
Nominal test wavelengths	850/1300 nm	1310/1550 nm
Maximum length measurement	12 km	100 km
Length measurement accuracy ²⁾	± 1.5 m plus ± 1 % of length	
Loss measurement uncertainty ³⁾	< 0.2 dB	

- 1) Two wavelengths, one direction (excludes referencing and connection times).
- 2) For multi-mode up to 3 km range, for single-mode up to 10 km range. Link loss consists only of fiber loss, connector loss and splice loss.
- 3) After 20 min warm up, at constant temperature, no charging. For multi-mode loss measurements with 50/125 μm fibers (NA=0.20). For single-mode loss measurements with 9/125 μm fibers (NA=0.10).

Patch cord microscope specifications

Optical interface	FMAE LC duplex (many other adapters available)	
Auto pass/fail analysis standards	IEC 61300-3-35 and custom limits	
Live image	320 x 240 x 8 bit grey, 10 fps	
Light source	Blue LED, 100.000+ hours life	
Lighting technique	Coaxial	
Magnification	Horizontal	740/370 μm
field-of-view		
low/high		
	Vertical	550/275 μm
External USB connected P5000i Digital Probe supported.		

19 ORDERING INFORMATION

OLTS-85/OLTS-85P stand alone units

OLTS-85/OLTS-85P

Tier-1 SM Optical Loss Test Set	BN 2325/31
Tier-1 MM Optical Loss Test Set	BN 2325/34
Tier-1 Quad Optical Loss Test Set	BN 2325/35
Tier-1 Quad Optical Loss Test Set with Patch Cord Microscope and FMAE adapter	BN 2326/35

Included items

- SmartClass™ Fiber instrument
- Universal AC/DC Power Supply with Li-Ion Battery Pack
- Soft shoulder case for SmartClass™ Fiber
- Adapter 29: LC, F-3000 (-PC, -APC)
- Mating sleeves for LC/LC plugs
- USB cable
- Quick Start Manual and Safety Instructions
- The latest Operating Manual, and FiberChekPRO™ reporting software can be downloaded at the Viavi web site <http://updatemyunit.net>.

Additional items in SM Kit

- SM test reference cord SC-LC, and LC-LC

Additional items in MM Kit

- MM test reference cord FC-LC, and LC-LC

Additional items in Quad Kit

- SM test reference cord SC-LC, and LC-LC
- MM test reference cord FC-LC, and LC-LC

Additional items in Quad Kit with PCM

- FMAE duplex LC adapter
- SM test reference cord SC-LC, and LC-LC
- MM test reference cord FC-LC, and LC-LC

Accessories

P5000i Digital Probe Microscope with FiberChekPRO™ software	FBP-P5000I
Calibration report	BN 2325/ 90.01
UC4 hands free carrier for SmartClass™ Fiber	BN 2128/01
UC4P hands free carrier for SmartClass™ Fiber with PCM	BN 2128/02

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PRODUCT REGULATORY COMPLIANCE

Viavi Environmental Management Program

Superb performance and high quality have always characterized Viavi datacom and telecom measurement technology products. In this same world-class tradition, Viavi has an established, proactive program of environmental management.

Environmental management is an integral part of Viavi's business philosophy and strategy requiring the development of long-term, productive solutions to problems in the key areas of economics, technology, and ecology.

A systematic environmental management program at Viavi is essential in regard to environmental policy and enhances cooperation between ourselves and our business partners.

The Viavi Environmental Management Program considers:

Product design and manufacture

Environmental restrictions and requirements are taken into account during planning and manufacture of Viavi products. This attention ranges from the raw materials and finished components selected for use and the manufacturing processes employed, through to the use of energy in the factory, and right on up to the final stages in the life of a product, including dismantling.

Hazardous materials

Viavi avoids or uses with care any hazardous or dangerous material in the manufacturing process or the end product. If the use of a dangerous material cannot be avoided, it is identified in product documentation and clearly labeled on the product itself.

Packaging materials

Preference is given to reusable or biodegradable single-substance packaging materials whenever possible.

Environmental management partnerships

Viavi encourages our customers and suppliers who take this responsibility seriously to join Viavi in establishing their own environmental management programs.

EU WEEE and Battery Directives

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



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

Instructions for returning waste equipment and batteries to JDSU can be found in the WEEE section of **Viavi's Standards and Policies web page** (<https://www.viavisolutions.com/en-us/corporate/legal/policies-standards#sustain>).

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

EU REACH

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

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

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

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

California Proposition 65

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

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

"中国RoHS"

《电子信息产品污染控制管理办法》（信息产业部，第39号） 附录

本附录按照"中国RoHS"的要求说明了有关电子信息产品环保使用期限的情况，并列出了产品中含有的有毒、有害物质的种类和所在部件。本附录适用于产品主体和所有配件。

环保使用期限：



本标识标注于产品主体之上，表明该产品或其配件含有有毒、有害物质（详情见下表）。

其中的数字代表在正常操作条件下至少在产品生产日期之后数年内该产品或其配件内含有的有毒、有害物质不会变异或泄漏。该期限不适用于诸如电池等易耗品。

有关正常操作条件，请参见产品用户手册。

产品生产日期请参见产品的原始校准证书。

有毒、有害物质的类型和所在部件

元器件 (Component)	有毒、有害物质和元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR ⁶⁺)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
产品主体 (Main Product)						
印刷电路板组件 (PCB Assemblies)	X	○	○	○	○	○
内部配线 (Internal wiring)	○	○	○	○	○	○
显示器 (Display)	○	○	○	○	○	○
键盘 (Keyboard)	○	○	○	○	○	○
塑料外壳零件 (Plastic case parts)	○	○	○	○	○	○
配件 (Accessories)	○	○	○	○	○	○

○：代表该部分中所有均质材料含有的该有毒、有害物质含量低于SJ/T11363-2006标准的限值。
X：代表该部分中所有均质材料含有的该有毒、有害物质含量高于SJ/T11363-2006标准的限值。



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