



ONA-800 Getting Started Guide

R018





ONA-800 Getting Started Guide

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Regulatory compliance

This section covers the following information:

- “Safety and compliance information” on page vi
- “California Proposition 65” on page vi
- “Federal Communications Commission (FCC)” on page vi
- “EU WEEE and Battery Directives” on page vii
- “EU REACH” on page viii
- “EU CE Marking Directives (LV, EMC, RoHS)” on page viii
- “Korea Certification” on page ix
- “Pollution Degree 2 Category under IEC 61010-1” on page ix

Safety and compliance information

Safety information is provided in the document *Safety Instructions - ONA-800*, 22142810, which is shipped with the ONA-800. Compliance information is listed below.

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 the [VIAVI Policies & Standards](#) web page.

Federal Communications Commission (FCC)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The equipment was tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These 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.

This product complies with 47 CFR Part 15 through the use of a modular component authorized under a grant of certification:

- FCC ID: WUW-SPB209A

Caution:

- This equipment complies with the FCC RF radiation exposure limits set forth for an uncontrolled environment.
- To comply with FCC RF exposure compliance requirements, a separation distance of at least 0 cm must be maintained between the antenna of this device and all persons.

- To ensure RF exposure compliance while the equipment is body-worn, please use only VIAVI part numbers EHARNESS or ONA-800-HN and avoid using other body-worn accessories containing metallic components.
- This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Innovation, Science and Economic Development Canada (ISED)

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(s). 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.

Le présent appareil est conforme aux d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- 1 l'appareil ne doit pas produire de brouillage,
- 2 l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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

Dans la bande de fréquence 5150-5250 Mhz, l'utilisation du produit doit être uniquement en intérieur.

EU WEEE and Battery Directives

The equipment, and the batteries used to power it, 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 VIAVI can be found in the **WEEE** section of the [VIAVI Policies & Standards](#) web page.

If you have questions concerning the disposal of your equipment or batteries, contact the VIAVI WEEE Program Management team at weee.emea@viavisolutions.com.

EU REACH

Article 33 of EU REACH regulation (EC) No 1907/2006 requires product suppliers to provide information when a substance included in the list of Substances of Very High Concern (SVHC) is present in an product above a certain threshold.

For information about the presence of REACH SVHC in VIAVI products, see the **Hazardous Substance Control** section of the [VIAVI Policies & Standards](#) web page.

EU CE Marking Directives (LV, EMC, RoHS)

The equipment conforms with all applicable CE marking directives. Please request an EU Declaration of Conformity for further details.

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)
2412-2472	1-13	20.5 dBm (112 mW)
5170-5240	34-48	23.5 dBm (224 mW)
5260-5320	52-64	20.5 dBm (112 mW)
5500-5700	100-140	26.5 dBm (446 mW)
5745-5825	149-165	13.5 dBm (23 mW)

Korea Certification

A급 기기 (업무용 방송통신기자재)

Class A Equipment (Industrial Broadcasting & Communications Equipment)

이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

This equipment is **Industrial (Class A) electromagnetic wave suitability equipment** and seller or user should take notice of it, and this equipment is to be used in the places except for home.

Japan Radio Law

.当該機器には電波法に基づく、技術基準適合証明等を受けた特定無線設備を装着している。

電波法により5.2/5.3 GHz帯は屋内使用に限ります

Safety standards compliance

The equipment meets the following standards and requirements:

- UL 61010-1 / CAN/CSA-C22.2 No.61010-1-12 Safety Requirements for Electrical Equipment for Measurement Control, and Laboratory Use - Part I: General Requirements; 3rd edition, Rev 7/19/2019
- IEC 61010-1:2010/AMD1:2016 / EN 61010-1:2010/A1:2019 Safety Requirements for Electrical Equipment for Measurement Control, and Laboratory Use - Part I: General Requirements
- IEC 60825-1:2014 / EN 60825-1:2014 Safety of laser products - Part 1: Equipment classification and requirements
- Installation Category (Over voltage Category) II under IEC 60664-1
- Pollution Degree 2 Category under IEC 61010-1

Laser Safety

The provisions contained in two standards define the safety procedures to be observed both by users and by manufacturers when utilizing laser products:

- IEC 60825-1:2014 – Safety of laser products – Part 1: Classification and requirements

- FDA 21 CFR § 1040.10 – Performance standards for light-emitting products - Laser products.

Due to the range of possible wavelengths, power values, and injection characteristics of a laser beam, the risks inherent in its usage vary. The laser classes form groups representing different safety thresholds.

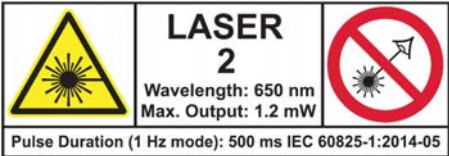
Laser classes

Standards IEC 60825-1:2014 and FDA 21 CFR § 1040.10:

- VFL option: Class 2
- OTDR modules: Class 1, Class 1M
- All plug-in fiber optic transceiver modules: Class 1

Warning labels for the laser classes

Due to the reduced dimensions of the optical modules, it is not possible to attach the required warning labels to them. In line with the provisions of Article 7.1 of the IEC 60825-1 standard, the laser class identification labels are shown below:

Reference standard	IEC 60825-1	FDA 21 CFR § 1040.10
Class 1		
Class 1M		
Class 2	 	

The user must take the necessary precautions concerning the optical output of the instrument and follow the manufacturer's instructions.

Additional safety information

Safety information is provided in the document *Safety Instructions - ONA-800 Base Unit*, 22137678, which is shipped with the ONA-800.



About this Guide

This section explains how to use this *Getting Started Guide*.

- [“Purpose and scope” on page xiv](#)
- [“Assumptions” on page xiv](#)
- [“Conventions” on page xiv](#)
- [“Technical assistance” on page xvi](#)

Purpose and scope

The purpose of this manual is to help you successfully use the features and capabilities of the ONA-800 . This manual includes task-based instructions that describe how to configure, use, and troubleshoot the general functions of the base unit.

Assumptions

This manual is intended for novice, intermediate, and experienced users who want to use the test instrument effectively and efficiently. VIAVI assumes that you have basic computer experience and are familiar with basic telecommunication concepts, terminology, and safety.

Conventions

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

Table 1 Text formatting and other typographical conventions

Item(s)	Example(s)
Buttons, keys, or switches that you press or flip on a physical device.	Press the On button. – Press the Enter key. – Flip the Power switch to the on position.
Buttons, links, menus, menu options, tabs, or fields on a PC-based or Web-based user interface that you click, select, or type information into.	Press the On button. – Click File > Properties. – Click the Properties tab. – Type the name of the probe in the Probe Name field.
Directory names, file names, and code and output messages that appear in a command line interface or in some graphical user interfaces (GUIs).	<code>\$NANGT_DATA_DIR/results</code> (directory) – <code>test_products/users/defaultUser.xml</code> (file name) – <code>All results okay.</code> (output message)
Text you must type exactly as shown into a command line interface, text file, or a GUI text field.	– Restart the applications on the server using the following command: <code>\$BASEDIR/startup/npui_init restart</code> Type: <code>a:\set.exe</code> in the dialog box.
Command line option separators.	<code>platform [a b e]</code>
Optional arguments (text variables in code).	<code>login [platform name]</code>
Required arguments (text variables in code).	<code><password></code>

Table 2 Symbol conventions

	This symbol indicates a note that includes important supplemental information or tips related to the main text.
	This symbol represents a general hazard. It may be associated with either a DANGER, WARNING, CAUTION, or ALERT message. See Table 3 for more information.
	This symbol represents an alert. It indicates that there is an action that must be performed in order to protect equipment and data or to avoid software damage and service interruption.
	This symbol represents hazardous voltages. It may be associated with either a DANGER, WARNING, CAUTION, or ALERT message. See Table 3 for more information.
	This symbol represents a risk of explosion. It may be associated with either a DANGER, WARNING, CAUTION or ALERT message. See Table 3 for more information.
	This symbol represents a risk of a hot surface. It may be associated with either a DANGER, WARNING, CAUTION, or ALERT message. See Table 3 for more information.
	This symbol represents a risk associated with fiber optic lasers. It may be associated with either a DANGER, WARNING, CAUTION or ALERT message. See Table 3 for more information.
	This symbol, located on the equipment, battery, or the packaging indicates that the equipment or battery must not be disposed of in a land-fill site or as municipal waste, and should be disposed of according to your national regulations.

Table 3 Safety definitions

Term	Definition
DANGER	Indicates a potentially hazardous situation that, if not avoided, <i>will</i> result in death or serious injury. It may be associated with either a general hazard, high voltage, or other symbol. See Table 2 for more information.
WARNING	Indicates a potentially hazardous situation that, if not avoided, <i>could</i> result in death or serious injury. It may be associated with either a general hazard, high voltage, or other symbol. See Table 2 for more information.
CAUTION	Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury and/or damage to equipment. It may be associated with either a general hazard, high voltage, or risk of explosion symbol. See Table 2 for more information. When applied to software actions, indicates a situation that, if not avoided, could result in loss of data or a disruption of software operation.
ALERT	Indicates that there is an action that must be performed in order to protect equipment and data or to avoid software damage and service interruption.

The user must take the necessary precautions concerning the optical output of the instrument and follow the manufacturer's instructions.

Technical assistance

For technical assistance, call the VIAVI Technical Assistance Center (TAC) at 1-844-GO-VIAVI. For the latest TAC information, go to <http://www.viavisolutions.com/en/services-and-support/support/technical-assistance>.



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Getting started

This chapter explains how to use this *Getting Started Guide*.

The topics discussed in this chapter are as follows:

- [“About the ONA-800” on page 2](#)
- [“Unpacking and inspection” on page 3](#)
- [“ONA-800 base” on page 3](#)
- [“Additional Modules” on page 5](#)
- [“Attaching the screen” on page 6](#)
- [“Attaching modules” on page 7](#)
- [“Powering the base unit” on page 13](#)

About the ONA-800

The ONA-800 is a modular communications test and measurement instrument that may be used both indoors and outdoors. Modules with specific test capabilities can be added and removed as required. The unit features an 8-inch touchscreen for quick access to the touch-based user interface. Powered by either external AC power or batteries in the field, the ONA-800 is both rugged and portable. Capabilities such as WiFi and Bluetooth are optional.



WARNING

The equipment is not intended to be used outdoors during unattended operation, in inclement weather, or using the supplied AC/DC adapter.

Figure 1 shows the front panel touchscreen.

Figure 1 Front panel touchscreen



The ONA-800 base is available in several variants. Table 1 describes the ONA-800 base variants.

Table 1 ONA-800 base variants

Variant	Features
ONA-800A-MF	– Modularity; dual-bay, detachable or plug-in (via Fiber Module Carrier) capability
ONA-800A-MF2	– Modularity; dual-bay, detachable or plug-in (via Fiber Module Carrier) capability – Support for Power Expansion Module (PEM)
ONA-800A-MF2-T	– Modularity; dual-bay, detachable or plug-in (via Fiber Module Carrier) capability – Support for Power Expansion Module (PEM) – For transport configurations
ONA-800A-MF2-F	– Modularity; dual-bay, detachable or plug-in (via Fiber Module Carrier) capability – Support for Power Expansion Module (PEM) – For fiber configurations

Table 1 ONA-800 base variants

Variant	Features
ONA-800A-MF2G-T	– Modularity; dual-bay, detachable or plug-in (via Fiber Module Carrier) capability – Support for Power Expansion Module (PEM) – No Bluetooth® – No WiFi – For transport configurations
ONA-800B	– Modularity; dual-bay, detachable or plug-in (via Fiber Module Carrier) capability – Support for Power Expansion Module (PEM) – USB 3.0 – Support for external display

Unpacking and inspection

VIAVI typically ships our instruments using anti-static packing material to stabilize the components inside the box. When unpacking the components, verify that all the items you ordered are included in the package. Accessories may be shipped in a separate box.

After you unpack the components, examine the top, bottom, front, and side panels, including ports, LEDs, and the touchscreen for damage.

If any component shows signs of damage, contact VIAVI Customer Care at 1-844-GO-VIAVI. For the latest TAC information, go to <http://www.viavisolutions.com/en/services-and-support/support/technical-assistance>. For information about returning equipment, see “Returning equipment to VIAVI”.

Consider saving shipping boxes and packing materials in case you need to repackage the components for shipment.

Base unit contents

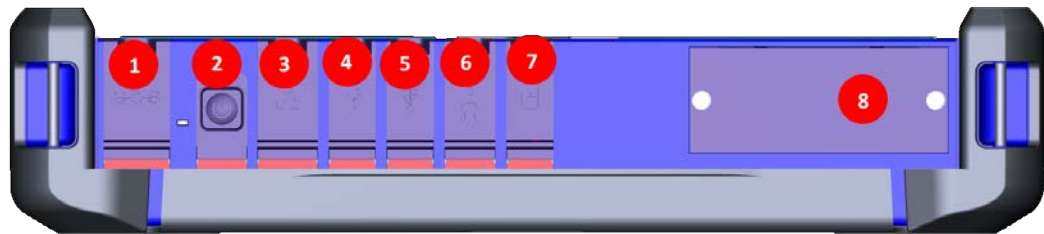
The ONA-800 base unit consists of the following equipment:

- One field-replaceable Lithium Ion battery:
 - C5BATTERY98 or
 - BAT-96WHR for Transport applications
- AC adapter and cord:
 - G700050127 or
 - PS-330W24V for Transport applications
- A back cover or up to two dummy modules, depending on the number of solution modules ordered
- LCD screen protector

ONA-800 base

Figure 2 shows the top panel of the ONA-800A-MF.

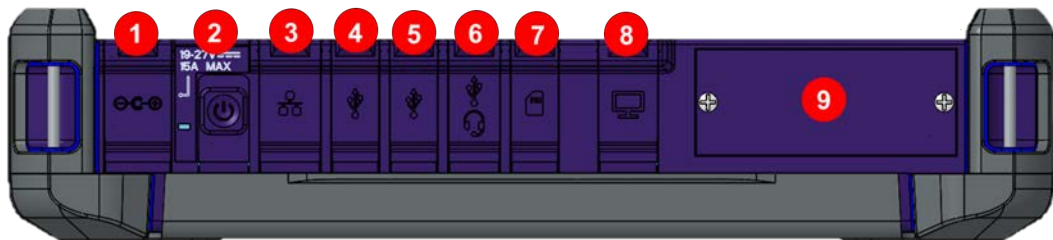
Figure 2 ONA-800A-MF base top panel



1	AC/DC power adapter port (19-27 V, 15A Max)
2	Power button
3	LAN port (use shield cable)
4	USB port
5	USB port
6	USB-C port (device only)
7	Micro SD card port
8	Optional module slot

Figure 2 shows the top panel of the ONA-800B base.

Figure 3 ONA-800 base top panel



1	AC/DC power adapter port (19-27 V, 15A Max)
2	Power button
3	LAN port (use shield cable)
4	USB port
5	USB port
6	USB-C port (device only)
7	Micro SD card port
8	External display connector (Type-D micro HDMI)
9	Optional module slot

Figure 3 shows the left and right side panels.

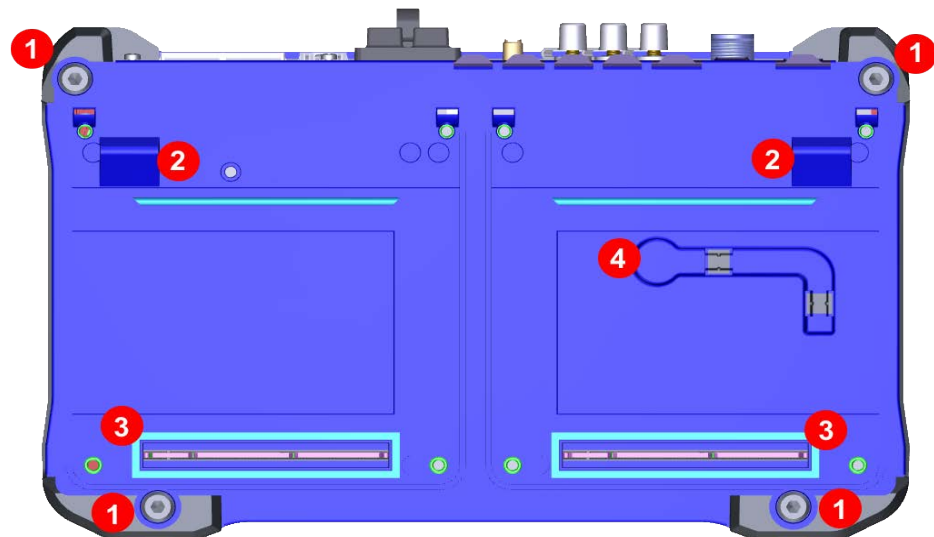
Figure 4 Left and right side panels



- | | |
|---|---------------------|
| 1 | Cooling fans |
| 2 | Battery access door |

Figure 4 shows the back panel without the backplate or modules attached.

Figure 5 Back panel, no modules or backplate



- | | |
|---|------------------------|
| 1 | Screws |
| 2 | ESD ground |
| 3 | Module connector ports |
| 4 | Hex key |

Additional Modules

You can add additional modules to the ONA-800 base.

Full-sized modules

Refer to the user documentation that came with your module for information about the features, capabilities, and operation of your specific Solution or Fiber Module Carrier modules.

PEM



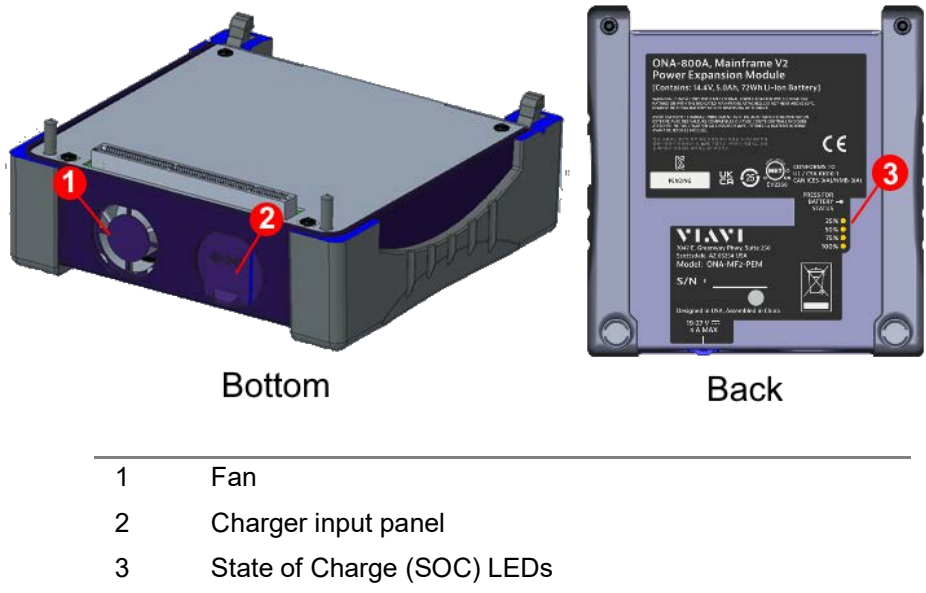
NOTE

The PEM is not supported on the ONA-800A-MF.

The ONA-800B and ONA800A-MF2 variants support the addition of the ONA-MF2-PEM Power Expansion Module (PEM), allowing additional batteries to be added to the ONA-800 for an extended battery runtime. Attach up to two PEMs, providing the ONA-800 with 3 batteries (2 external/1 internal) for a total of 244Wh.

Figure 5 shows the PEM.

Figure 6 PEM bottom and back views



Charging the PEM

Charge the PEM:

- On its own using the charger input, using the same adapter that ships with the ONA-800.
- When connected to the ONA-800.

Hot Swapping of PEM

If using a PEM, you must perform the initial installation of the PEM in either of the two slots on the back of the ONA-800 before turning on or rebooting the unit. Once the unit is on, you can hot swap to another PEM in the same physical slot. When using two PEMs, both must be initially installed with the ONA-800 unit powered off.

With additional fully charged PEMs, you can continuously extend the battery operation for a long period of time.

Attaching components

The following sections describe how to install components to the ONA-800 base.

Attaching the screen

The following procedure describes how to attach the screen to the ONA-800 base unit.

To attach the screen to the base unit

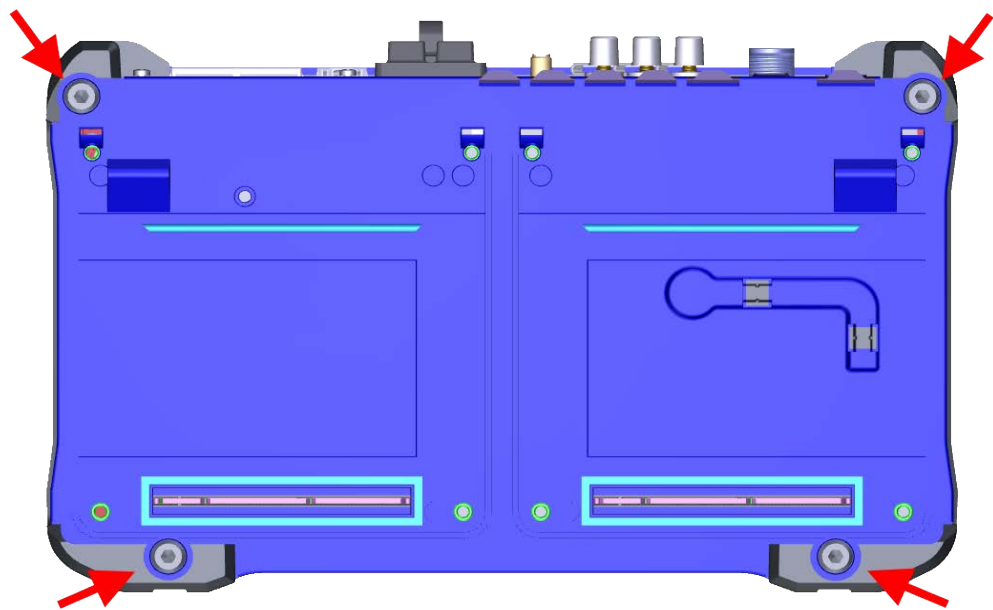
- 1 Set the screen onto the base, ensuring the mating connectors between the two pieces are aligned, as shown in [Figure 6](#).

Figure 7 Set screen to base



- 2 Set unit so you have access to the back. Using the Hex Key located in the groove on the back panel of the screen, tighten the four fasteners, as shown in [Figure 7](#).

Figure 8 Fastener locations



Attaching modules

This section describes how to attach modules to the ONA-800.

Solution and Fiber Module Carrier modules

Table 2 lists the Solution modules you can attach to the ONA-800 base.

Table 2 Solution Modules

Module	Description
SPA06MA	Spectrum Analyzer with 6 GHz RF and 25 Gbps Optical hardware.
SPA06MA-O	Spectrum Analyzer with 6 GHz RF
RA09MB-O	Radio Analysis Module (9 GHz RF)
RA18MB-O	Radio Analysis Module (18 GHz RF)
RA32MB-O	Radio Analysis Module (32 GHz RF)
RA44MB-O	Radio Analysis Module (44 GHz RF)
RA44MA-O	Radio Analysis Module (44 GHz)
RA18MA-O	Radio Analysis Module (18 GHz)
E81FMC1	Fiber Module Carrier module that allows you to install Fiber Modules. See Table 4 on page 11 for a list of supported Fiber Modules.
TM100GB	100G Module for ONA 800 with one QSFP-DD port and one OSFP port.

Table 2 Solution Modules

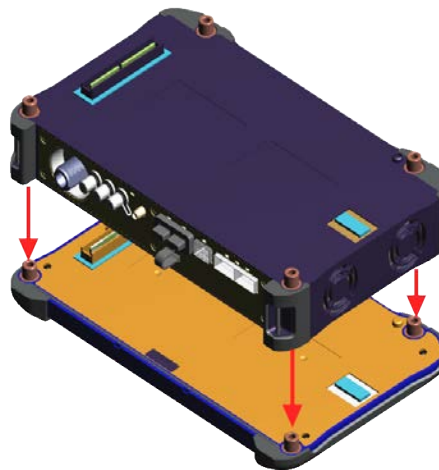
Module	Description
TM400GB-QO	400G Module for ONA 800 with one QSFP-DD port and one OSFP port.
TM400GB-QQ	400G Module for ONA 800 with two QSFP-DD ports.
TM800GB	800G Module for ONA 800 with two of the following ports: – QSFP-DD – OSFP – SFP-DD

The following procedure describes how to attach a Solution or Fiber Module Carrier module to the ONA-800.

To attach a Fiber Module carrier or Solution module

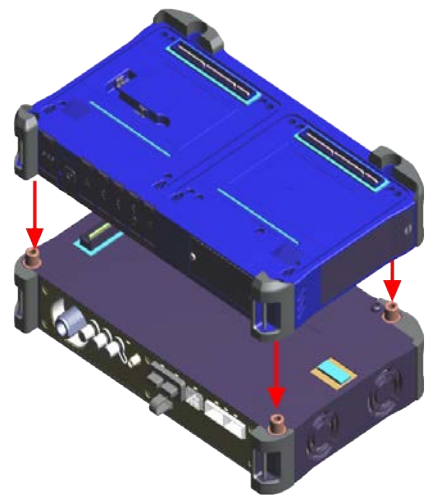
- 1 Power down the ONA-800 and disconnect from AC power.
- 2 Place the unit so that you have access to the back and remove the termination cover by removing the screws that hold it in place.
- 3 Set the module onto the screen, ensuring the mating connectors between the two pieces are aligned, as shown in [Figure 8](#).

Figure 9 Module to screen



- 4 Insert the hex key in the brass fittings on the rear of the module and tighten the internal captive fasteners to secure the module to the display.
- 5 Place the ONA-800 base onto the module, ensuring the mating connectors are aligned, as shown in [Figure 9](#).

Figure 10 ONA-800 base to module



- 6 Using the hex key, tighten the captive fasteners on the rear of the base that secure it to the module.
- 7 Re-attach the expansion modules or back cover.

Expansion modules

You can attach the following expansion modules to the ONA-800:

Table 3 lists the expansion modules you can attach to the ONA-800 base.

Table 3 Expansion modules

Module	Description
CAA	Provides cable and antenna analysis
OTDR and MPO Switch	Optical Time-domain Reflectometer and Multi-Fiber Switch
OSA/OCV/OCC	Optical Spectrum Analyzer/Optical Channel Verifier/Optical Channel Checker
TEM	Timing Expansion Module
PEM (ONA-800A-MF2 only)	Power Expansion Module

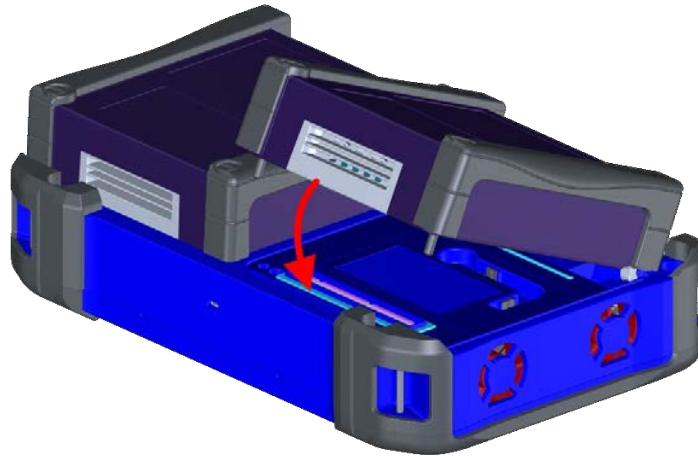
The following procedure describes how to attach expansion modules to the ONA-800.

To attach expansion modules

- 1 Power down the ONA-800 and disconnect from AC power.
- 2 Place the unit so that you have access to the back and remove the termination cover by removing the screws that hold it in place.
- 3 Locate the hinges on the module and insert them into the base at a 45 to 60 degree angle

- 4 Pivot the module down towards the connector, as shown in [Figure 10](#).

Figure 11 Pivot module down



- 5 Seat the module into the connector with slight pressure.
- 6 Tighten the screws on the module.

The following procedure describes how to remove CAA/OTDR modules.

To remove expansion modules

- 1 Power down the ONA-800 and disconnect from AC power.
- 2 Place the unit so that you have access to the back.
- 3 Remove the screws on the module.
- 4 Remove the module from the ONA-800.

Plug-in modules



NOTE

The Fiber Module Carrier module must be installed before you can install plug-in modules. See [“To attach a Fiber Module carrier or Solution module”](#) on page 8 for more information.

[Table 4](#) lists the plug-in modules supported on the ONA-800.

Table 4 Supported plug-in modules

Catalog Number	Description
OSA modules	
2304-8491.027	OSA-110M PC
2304-8491.030	OSA-110H, Compact, High Power, PC
2304-8491.137	OSA-110H, Compact, High Power, APC

Table 4 Supported plug-in modules

Catalog Number	Description
2304-8491.043	OSA-110R PC Compact with In-Band OSNR
2304-8491.140	OSA-110R APC Compact with In-Band OSNR
EOSA610B-APC	HIGH RESOLUTION OSA MODULE VERSION B
EOSA610B-APCFC	HIGH RESOLUTION OSA MODULE VERSION B
EOSA610B-PC	HIGH RESOLUTION OSA MODULE VERSION B
OTDR modules	
E8123AV-PC	High Resolution OTDR Module AV 850/1300nm PC connector - SC adapter Std
E8146A-PC	OTDR Module A EF-850/1300nm and 1310/1550nm PC connector - SC adapter Std
E8156A-PC	OTDR Mod. A EF-850/1300nm and 1310/1550/1625nm PC conn. - SC adapter Std
E8126C-APC	OTDR Module C 1310/1550nm APC connector - SC adapter Std
E8126C-PC	OTDR Module C 1310/1550nm PC connector - SC adapter Std
E8136C-APC	OTDR Module C 1310/1550/1625nm APC connector - SC adapter Std
E8136C-PC	OTDR Module C 1310/1550/1625nm PC connector - SC adapter Std
E8126D-APC	OTDR Module D 1310/1550nm APC connector - SC adapter Std
E8126D-PC	OTDR Module D 1310/1550nm PC connector - SC adapter Std
E8129D-62-APC	OTDR Module D 1550/Filtered 1625nm APC connector - SC adapter Std
E8129D-62-PC	OTDR Module D 1550/Filtered 1625nm PC connector - SC adapter Std
E8136D-APC	OTDR Module D 1310/1550/1625nm APC connector - SC adapter Std
E8136D-PC	OTDR Module D 1310/1550/1625nm PC connector - SC adapter Std
DTS modules	
EDFOS-DTS-SM	Single Mode Raman OTDR module
ODM modules	
E81MRODM2-APC	Medium range Optical Dispersion Measurement module with APC connector
E81MRODM2-PC	Medium range Optical Dispersion Measurement module with PC connector
E81LRODM2-APC	Long range Optical Dispersion Measurement module with APC connector

Table 4 Supported plug-in modules

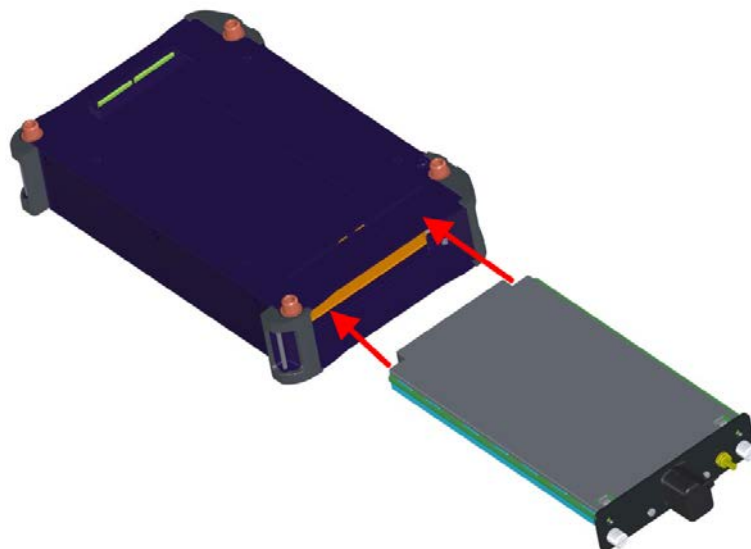
Catalog Number	Description
E81LRODM2-PC	Long range Optical Dispersion Measurement module with APC connector

The following procedure describes how to install a plug-in module into the Fiber Module Carrier attached to the ONA-800.

To install a plug-in module

- 1 Power down the ONA-800 and disconnect from AC power.
- 2 If you have not already done so, install the **Fiber Module Carrier** module, as described in [“To attach a Fiber Module carrier or Solution module” on page 8.](#)
- 3 Slide the plug-in module into the Fiber Module Carrier module, as shown in [Figure 11.](#)

Figure 12 Insert plug-in module



- 4 Tighten the thumb screws.

Connecting an external display



NOTE

Connecting to an external display is only supported on the ONA-800B.

The ONA-800 can be connected to an external display using the Type-D micro HDMI connector, as shown in **FIGURE**.

Figure 13 HDMI connection location

[IMAGE TO COME]

The external display is automatically detected and configured with a resolution of 1920X1080. Figure shows an ONA-800 connected to an external display.

[IMAGE TO COME]

Powering the base unit

Power is supplied to the instrument by the battery or the AC power adapter. For the ONA-800, the adapter is supplied with the instrument. Use of AC power adapters or batteries other than those supplied with your ONA-800 is not recommended as other slices/modules may be supplied with incompatible adapters or batteries. When supplying power using the AC power adapter, you need to verify that you have the correct adapter.



CAUTION:

Do not attempt to run the ONA-800 in an enclosure such as the soft-shell travel case. Doing so may damage the unit.

Battery Installation

The base unit can operate supplied by the AC power adapter shipped with the unit or by battery. Figure 12 and Figure 13 show the battery labels.

Figure 14 ONA-800 battery label



Figure 15 ONA-800 Battery label (for transport)



CAUTION:

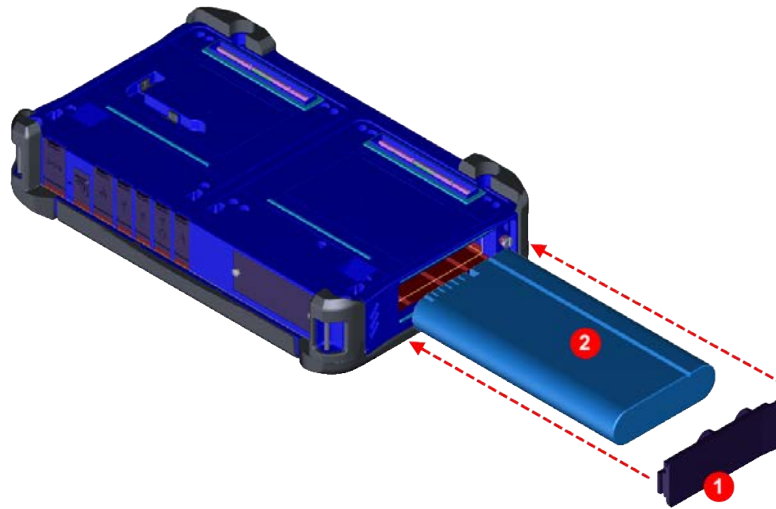
The Lithium Ion batteries shipped with the unit can explode if incorrectly installed. When replacing the battery, ensure that you only use VIAVI approved battery types, as shown in Figure 7, and that they are properly installed. Always dispose of batteries according to your local safety and environmental regulations.



NOTE:

VIAVI recommends that you either power off the unit or switch to AC power before replacing the batteries.

To install the battery



- | | |
|---|---------------------------------------|
| 1 | Battery access door |
| 2 | Field-replaceable Lithium Ion battery |

AC power adapter

The base unit with all applications installed operates from 19-27V DC and can operate supplied by the 19V DC, 160W AC, or 24V DC 330W AC power adapter shipped with the unit. The nominal input ratings of the power adapter are 100-240V AC, 50-60Hz, and it auto-ranges between 90-264V AC and 47-63Hz. The mains supply cord used with the power adapter must be grounded with a connection to protective earth.



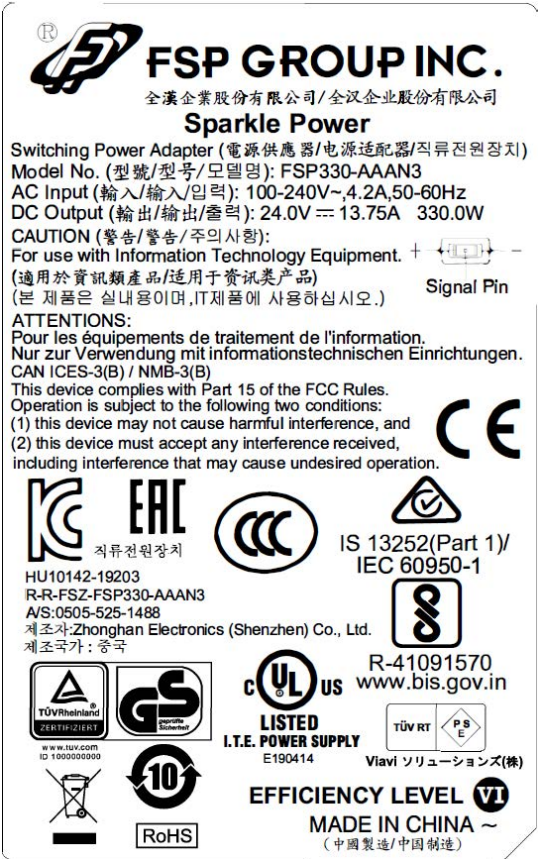
NOTE:

Before connecting an AC power adapter to the base unit, refer to the label on the adapter ([Figure 15](#)) to confirm that it is the correct adapter for use with the unit. AC power adapters supplied with modules might not be compatible for use with the ONA-800.

Figure 16 ONA-800 AC power adapter label



Figure 17 ONA-800 AC power adapter label (Transport)



Setting up the system

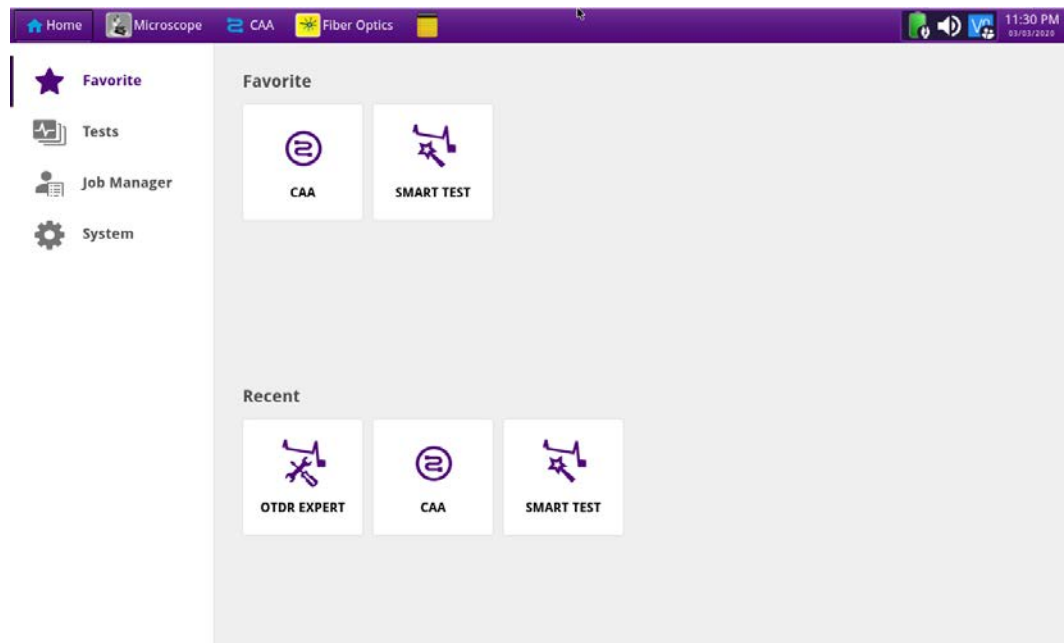
This chapter covers the following information:

- “Home Screen” on page 18
- “Favorites” on page 18
- “Setting up remote access” on page 25
- “Connecting to a Wi-Fi network” on page 25
- “Setting up a Bluetooth connection” on page 25
- “Setting up the GNSS” on page 26
- “Transferring files using FTP and SFTP” on page 29
- “Using Smart Access Anywhere” on page 29
- “Enabling software options” on page 29
- “Updating the system software” on page 30
- “Job Manager” on page 33
- “Synchronizing to the StrataSync server” on page 37

Home Screen

When you first start the ONA-800, the **Home** Screen appears, as shown in [Figure 16](#).

Figure 16 Home Screen



The **Home** screen provides access to the **Tests**, **Job Manager**, and **System** pages. You can return to the **Home** screen at any time by clicking the **Home** button in the top left corner of the screen. [Figure 17](#) shows the **Home** button.

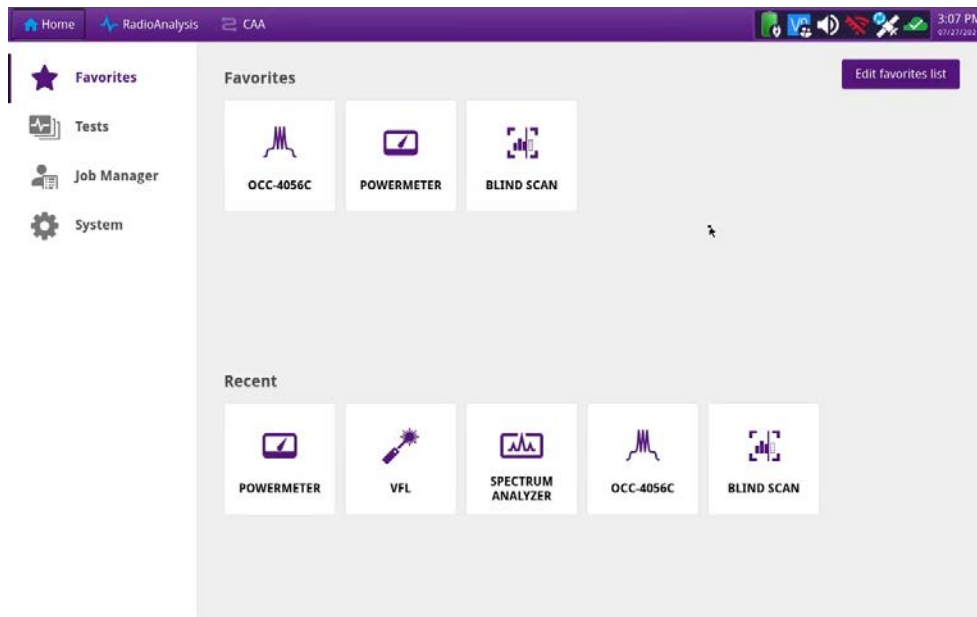
Figure 17 Home button



Favorites

The **Favorites** page provides access to test pages identified as Favorites and the most recently visited test pages. [Figure 18](#) shows the Favorites page.

Figure 18 Favorites



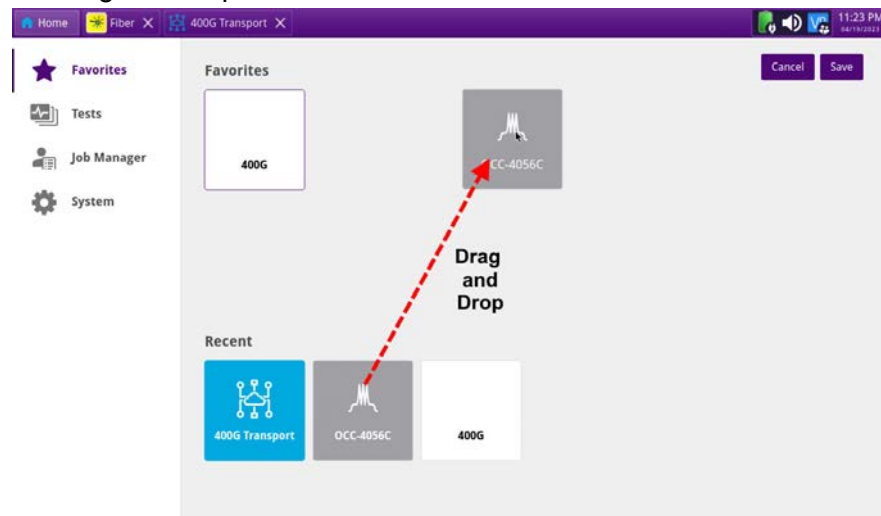
Editing Favorites

You can add, edit, and remove items from Favorites. The following procedures describe how to add, edit, and remove items.

To add an item to Favorites from the Favorites page

- 1 Open the **Favorite** page by pressing **Home**, then pressing **Favorites**.
- 2 Press the **Edit favorites list** button.
The items in Favorites are outlined in purple, signifying they are now able to be edited.
- 3 Click and hold, then drag the test from Recent to Favorites, as shown in [Figure 19](#).

Figure 19 Drag and drop



To add an item to Favorites from a test page

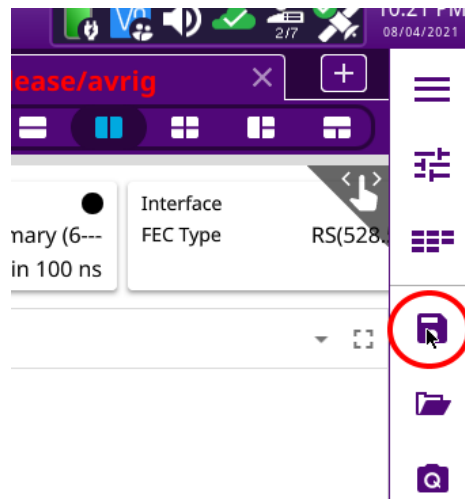


NOTE

This procedure is only available on certain solution modules.

- 1 On the test page you want to add, select the **Save** button from the side menu, as shown in [Figure 20](#).

Figure 20 Save button



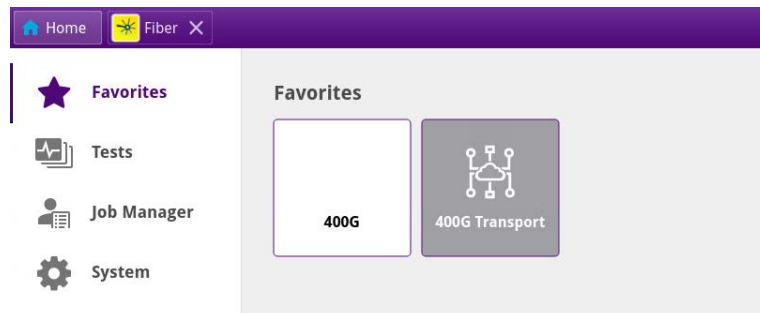
The **Save** screen appears.

- 2 Click the **Create Favorite** tab.
The **Create Favorite** screen appears.
- 3 Press the **Create** button.
The item will appear on the **Favorites** page.

To edit an item in Favorites

- 1 Open the **Favorite** page by pressing **Home**, then pressing **Favorites**.
- 2 Press the **Edit favorites** list button.
The items in Favorites are outlined in purple, signifying they are now able to be edited.
- 3 Click the item you want to edit to select it. The icon is darkened, as shown in [Figure 21](#).

Figure 21 Item selected



- 4 Double-click the selected icon to enter into Edit mode, as shown in [Figure 22](#).

Figure 22 Edit mode

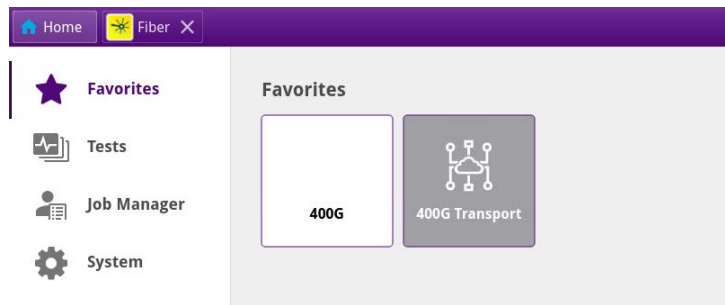


- 5 Edit the item:
 - a To change the name, click the item's name and enter a new one using the on-screen keyboard.
 - b To change the icon:
 - i Click the icon. The Load Icon window appears.
 - ii Select the new icon, then press the Load Icon button.
 The item's icon has been changed.

To remove an item from Favorites

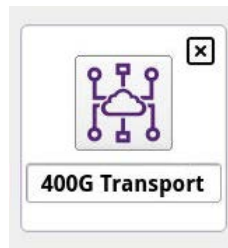
- 1 Open the **Favorite** page by pressing **Home**, then pressing **Favorites**.
- 2 Press the **Edit favorites** list button.
- 3 The items in Favorites are outlined in purple, signifying they are now able to be edited.
- 4 Click the item you want to edit to select it. The icon is darkened, as shown in [Figure 23](#).

Figure 23 Item selected



- 5 Double-click the selected icon to enter into Edit mode, as shown in [Figure 24](#).

Figure 24 Edit mode



- 6 Click the **X** in the top right corner of the item.

To set auto launch preference

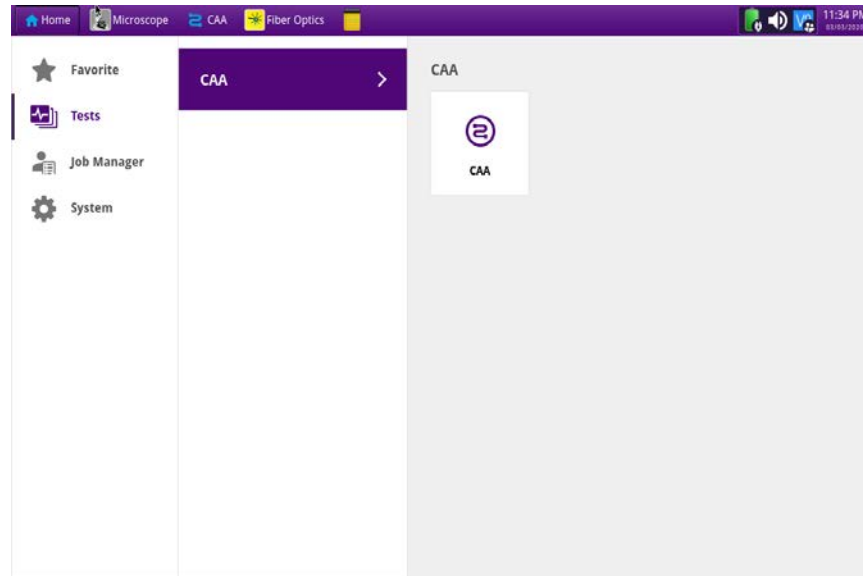
You can launch the measurement mode you were last operating.

- 1 Open the **Favorite** page by pressing **Home**, then pressing **Favorites**.
- 2 Press the **Auto launch preferences** button.
- 3 Press **Last running state** in the list.

Tests

The Tests page provides access to the available tests.

Figure 25 Tests page



Job Manager

The Job Manager allows you to specify the information to be included whenever you run a test and generate a report. Each time you generate a report, your instrument will automatically insert the Customer Name, Job Number, Technician ID, and Test Location that you specified in the Job Manager into the report heading.

See [“Job Manager” on page 33](#) for more information.

System

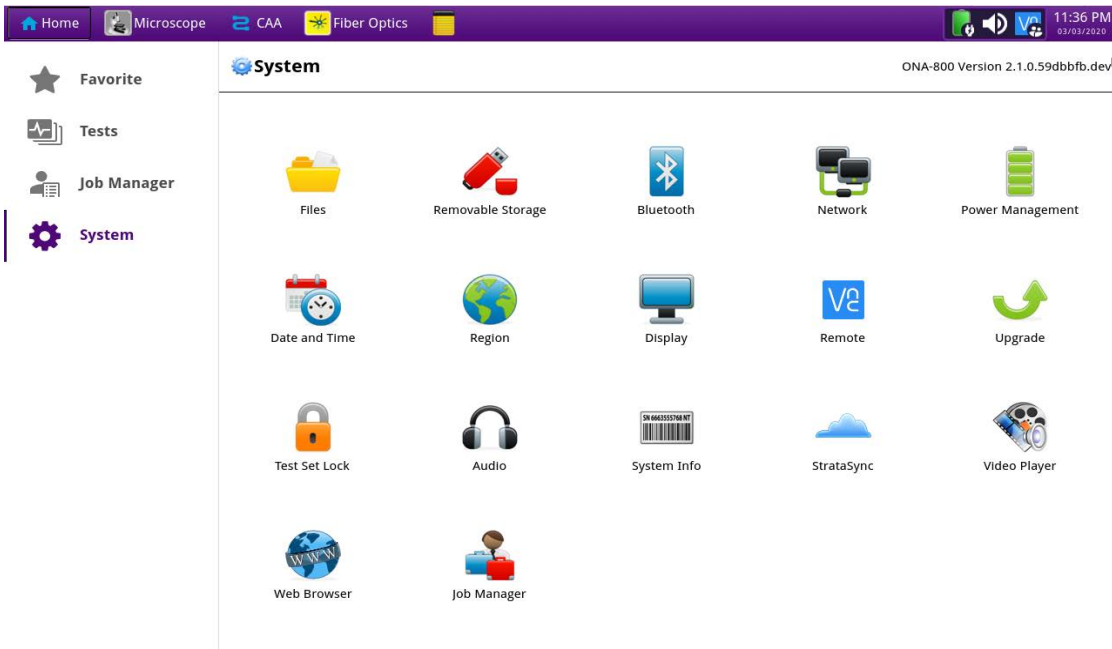
The **System** screen provides access to tools for viewing system information and performing other tasks as required.



NOTE

Additional tools might be available on the **System** screen when optional software features are installed.

Figure 26 System screen



The tool bar also provides access to certain system tools, including and power management.



Table 5 System tools

Tool	Description
Files	Access files saved to the unit.
Removable Storage	Access the USB plugged into the unit.
Network	Configure Ethernet connectivity and, optionally, Wi-Fi connectivity.
Power Management	View power supply information and manage power settings.
Date and Time	Specify date and time settings.
Region	Specify international settings, including the language of the user interface.
Display	Adjust the brightness level of the touchscreen, enable the screen saver, and, when required, calibrate the touchscreen display.
Remote	View and manage remote access settings, including, when required, VNC and Smart Access Anywhere settings.
Upgrade	Perform system software updates.
Test Set Lock	Manage lock options that prevent unauthorized access to the unit.
Audio	Manage speaker and microphone volume settings.
Clock Source	Set up a reference frequency and timing source.
System Info	View and manage system information.
StrataSync	Connect to the StrataSync server for synchronization.
Video Player	Access the video player on the unit.

Table 5 System tools (Continued)

Tool	Description
Web Browser	Access the World Wide Web.
Job Manager	Specify the information to be included whenever you run a test and generate a report.

Setting up remote access

- 1 Select **System** on the menu bar, and then select **Remote**.
- 2 Type a password in the **Remote access password** field.
This password applies to all remote-access tools; for example, VNC, FTP, and SSH.
- 3 Optionally, do any of the following:
 - Enable or disable VNC access by selecting or deselecting, respectively, the **Enable VNC access** check box.
 - Enable or disable a password for VNC by selecting or deselecting, respectively, the **Require password for VNC access** check box.

Connecting to a Wi-Fi network



NOTE

Wi-Fi connectivity is optionally available. Contact your VIAVI sales representative for more information.

- 1 Select **System** on the menu bar, and then select **Network**.
- 2 Select **Wi-Fi**, and then select the **Enable Wireless Adapter** check box to display a list of available wireless networks.
- 3 Select a network, and then enter the access credentials.

Setting up a Bluetooth connection



NOTE

Bluetooth connectivity is an option that must be available on the unit before this procedure can be performed. Contact your VIAVI sales representative for more information.

- 1 Select **System** on the menu bar, and then select **Bluetooth**.
- 2 Enable the following check boxes:
 - **Enable Bluetooth**
 - **Allow other devices to pair with this device**

- 3 Optionally, enter a name for the unit.
- 4 Activate Bluetooth on the remote device to be paired with the unit.
- 5 On the unit, select **Start Scanning** to locate detectable devices in range.
The names of newly detected devices appear in the **Discovered Devices**, and the names of previously detected devices appear in the **Paired Devices** list.
- 6 Select the remote device.
- 7 On the remote device, enter a pairing code if prompted, and then select **Pair** to pair it with the unit.

Setting up the GNSS



NOTE

GNSS is an option that must be available on the unit before this procedure can be performed. Contact your VIAVI sales representative for more information.

If your device is licensed to do so, you can configure the GNSS setting by clicking the GNSS icon on the System screen. You are required to configure GNSS settings of you need the GNSS location or need to use it as a frequency and clock source.

To turn on GNSS

- Select the **System** icon, then select **GNSS**.

Specifying GNSS settings

You can configure the GPS settings depending on what is needed, however turning GNSS and Antenna Power on should make it work in most cases.

To specify GNSS settings

- 1 In GNSS, turn on **Antenna Power** if required. The antenna power setting enables the external antenna power, depending on what you have plugged into the instrument. If you have an externally powered antenna, you do not need to turn on the antenna power.
- 2 Select the required **Fix Type**:
 - **2d Mode**: A 2D (two dimensional) position fix that includes only horizontal coordinates. This mode requires a minimum of three visible satellites.
 - **3D Mode**: A 3D (three dimensional) position fix that includes horizontal coordinates. This mode requires a minimum of four visible satellites.
 - **Any**: Calculates a 3D position if possible, but reverts to 2D position if necessary.
- 3 Turn the **GNSS** value to On if using GNSS.

- 4 Select the **GNSS System** supported in the region where you intend to conduct testing. If using a Satellite Based Augmentation System (SBAS) to augment the GNSS system, select the option that provides SBAS (indicated with **+SBAS**).
- 5 Select the desired **Survey Mode** from the following choices:
 - **Dynamic**: Continuously calculates positioning for continuous location information
 - **Auto**: Calculates positioning until accurate location information is determined and switches to fixed position using accurate location information, and switches to determine timing accuracy
- 6 In **Elevation Limit (deg)**, specify the elevation limit in degrees. This value represents the lowest point on the horizon on which the receiver will try to locate and obtain information from GNSS satellites. The default elevation is set to 10 degrees. Using satellites near the horizon may degrade performance.
- 7 In **Minimum C/No (dBHz)**, specify the minimum Carrier to Noise Ratio (C/ No) for the satellite signals that will be used by the module's GNSS receiver. The C/No is an indication of signal strength ranging from 0 to 50 dBHz. The default value is 9 dBHz. Using satellites with a weak C/No may degrade performance.
- 8 Specify the **Antenna Time Bias** value. The default Antenna Time Bias value is 28 (the optimal value for the VIAVI qualified antenna). If you are using a different antenna, determine the optimal bias value by referring to the vendor specifications for the antenna (and, if applicable, splitter or amplifier), then specify the bias value in nanoseconds. This value represents the bias that is used to compensate for the delay introduced by your antenna, the antenna's cable, and if applicable, an inline splitter or amplifier where absolute accuracy of PPS is important.

Sky Plot

The Sky Plot illustrates the satellites that were identified using the GNSS receiver attached to the instrument. The ID is provided for each satellite, and colors are used to indicate the satellite's status (No Signal, Signal, Ready, or Used). [Figure 27](#) shows the Sky Plot.

Figure 27 Sky Plot

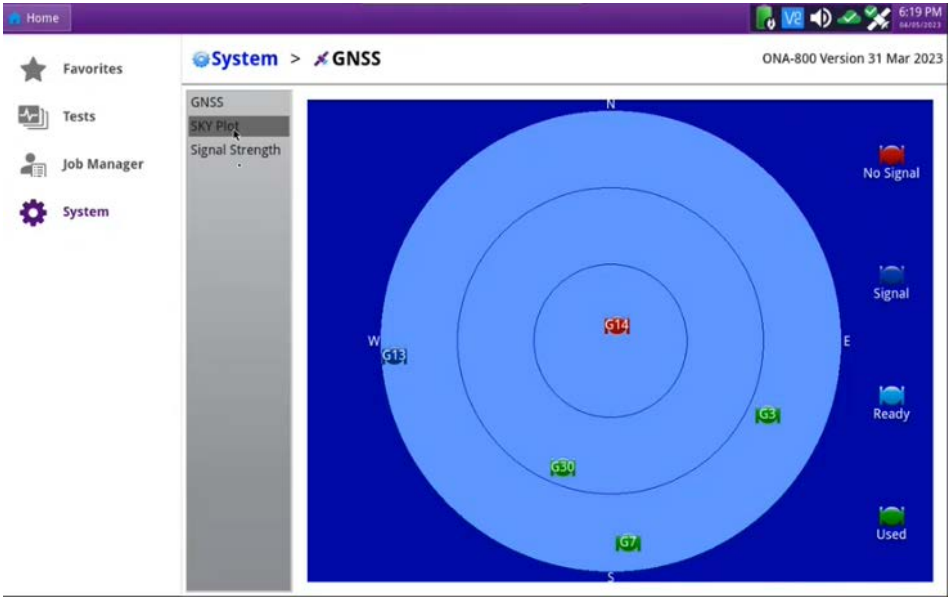


Table 6 describes each color used to communicate the satellite status.

Table 6 Satellite status

Color	Status	Indicates
Red	No Signal	A signal from the satellite is not available, but the satellite's presence is known based on information provided in the Almanac (and broadcast by other satellites within the constellation).
Dark Blue	Signal	The signal from the satellite has been acquired and the GNSS receiver is receiving data.
Light Blue	Ready	The GNSS receiver is receiving position information from the satellite, but the information is unusable because the satellite is: - below the Elevation Limit (specified as a GNSS configuration setting) - less than the Minimum C/No (specified as a GNSS configuration setting) - offline
Green	Used	The signal from the satellite is being used to provide GNSS timing.

Signal strength

The signal strength for each received channel for used satellites is illustrated in the signal strength category, and represents the Carrier to Noise Ratio (C/No or CNO) on

a scale of 0-50, with 50 representing the optimal signal strength. Each bar is color coded to communicate the satellite's status per descriptions provided in [Table 6](#).

Transferring files using FTP and SFTP

You can transfer files to and from the ONA-800 using File Transfer Protocol (FTP) or Secure File Transfer Protocol (SFTP). Connect using an FTP or SFTP client with the following credentials:

- Account ID: advisor
- Password (default): VIAVI

Using Smart Access Anywhere

Smart Access Anywhere allows you to view and control the instrument's user interface from a remote location using a workstation. In addition to configuring the instrument and performing tests, you can transfer files to and from the instrument using the instrument's file manager utility. You can also rename and delete files, or create, rename, and delete directories.

See ["Using Smart Access Anywhere" on page 13](#) for more information.

Enabling software options

Software options may be available on the unit or purchased separately. For information about purchasing software options, contact the VIAVI Solutions Sales Office for your region.

Viewing available software options

To view available software options, select **System** on the menu bar, and then select **System Info**. Available options are listed in the **Base Options** pane. An icon indicates the status of each option.

Table 7 Software Option Status Icons

Icon	Status
	Option is enabled.
	Free-trial period for an option is expiring. When the trial period ends, a warning message appears. If a test is running when the trial period ends, the test will continue, but an expiration warning appears continuously until a license code is entered or a reset is performed.

Table 7 Software Option Status Icons

Icon	Status
	Option is not enabled. Contact the VIAVI Solutions Sales Office for the region for information about enabling it.

Enabling purchased software options



IMPORTANT

Before beginning this procedure, ensure that the USB stick on which software option files are saved is available.

- 1 Select **System** on the menu bar, and then select **System Info**.
- 2 Connect the USB stick to a USB port on top panel of the unit.
- 3 Select **Import Options from USB** below the **Base Options** pane.
A confirmation message appears when the options are installed.
- 4 Restart the instrument, access the **System Info** tool, and then confirm that each software option appears in the **Base Options** pane and is enabled ([Table 7 on page 29](#)).

Updating the system software

System software and solution firmware can be updated from storage media, such as a USB drive, or over the network.

This section describes the following tasks:

- [“Updating the system software using a USB drive” on page 30](#)
- [“Updating the system software over the network” on page 32](#)

Updating the system software using a USB drive

Download the system software to a PC and then extract it to a USB drive with at least 1 GB available space. VIAVI recommends that the USB drive have no other content stored on it.

The update process when using a USB drive involves the following procedures:

- [“Downloading the software and extracting to a USB drive” on page 31](#)
- [“Performing a software update using a USB drive” on page 31](#)

Downloading the software and extracting to a USB drive

- 1 Using a Web browser on a personal computer (PC), go to [VIAVI Software Updates and Downloads](#).
- 2 Locate and then click the link for the latest version of the self-extracting system software file for the unit.
- 3 Save the software file to a location on the PC.
- 4 Plug a USB drive into the PC.
- 5 Using Windows Explorer, navigate to the software file, double-click the file, and then click **Run**.
- 6 In the dialog that appears, click **Browse** to navigate to and select the USB drive.
- 7 Click **Extract** to initiate extraction of the system software files to the USB drive. Do not unplug the drive from the PC while the files are extracting.
- 8 When all the files are extracted, navigate to the USB drive, right-click the name of the drive, and then click **Eject**.
- 9 Unplug the USB drive from the PC.
- 10 If required, go to [“Performing a software update using a USB drive”](#).

Performing a software update using a USB drive

- 1 Confirm the following:
 - The unit will have an uninterrupted supply of power during the software update. If necessary, connect the AC power adapter to the unit.



WARNING:

Electrical shock may result in serious injury or death. Be sure the AC power adapter is connected to the correct voltage mains. Do not use the adapter outdoors or in wet locations. Use only the AC power adapter supplied with the unit.

- A USB drive on which the extracted system software files are saved is available.
- 2 Plug the USB drive into the USB connector on the top panel of the unit.
 - 3 Select **System** on the menu bar, select **Upgrade**, and then select **USB**.

The release number of the software available on the USB drive appears. Note the following symbols that may appear beside the release number on the USB stick:

 - An equals symbol indicates that the software on the USB stick and the software on installed on the unit are the same (that is, have the same release number).
 - A down-arrow symbol indicates that the software on the USB stick is an earlier release than the software installed on the unit.
 - An up-arrow symbol indicates that the software on the USB stick is a later release than the software installed on the unit and the system software can be upgraded to the later release.
 - 4 To upgrade to a later release, select **Start Upgrade**.

A dialog box appears with prompts to either exit all tests that are running or cancel the update if the tests cannot be stopped.

- 5 Select **OK** to proceed with the software update. Do not unplug the USB drive from the unit during the update.

The unit automatically restarts when the update is completed.

- 6 After the unit has restarted, unplug the USB drive.

Updating the system software over the network

The system software on the unit can be updated over a network connection to a server where the updated software file is located, such as ona-800.updatemyunit.net. Before beginning the update, review the following recommendations:

- Use a wired network connection.
 - A unit that is behind a firewall might not be able to access the server where the system software is located. Connect the unit over a public network instead.
- 1 Ensure that the unit will have an uninterrupted supply of power during the update. If necessary, connect the AC power adapter to the unit.



WARNING:

Electrical shock may result in serious injury or death. Be sure the AC power adapter is connected to the correct voltage mains. Do not use the adapter outdoors or in wet locations. Use only the AC power adapter supplied with the unit.

- 2 Select **System** on the menu bar, select **Upgrade**, and then select **Network**.
- 3 Do one of the following:
 - a Enter the server address where the update is located.
 - b Enter the address where the software file is located; for example, the FTP address, server IP address or host name, and the proxy server address (if necessary), as well as the access credentials.
- 4 Select **Connect**.
- 5 After the unit accesses the server, select the link for the software file for the unit. Note the following symbols that may appear beside the release number of the software file:
 - An equals symbol indicates that the software on the USB stick and the software on installed on the unit are the same (that is, have the same release number).
 - A down-arrow symbol indicates that the software on the USB stick is an earlier release than the software installed on the unit.
 - An up-arrow symbol indicates that the software on the USB stick is a later release than the software installed on the unit and the system software can be upgraded to the later release.
- 6 Select **Start Upgrade**.

A dialog box appears with prompts to either exit all tests that are running or cancel the update if the tests cannot be stopped.

- 7 Select **OK** to begin the software update.

The unit automatically restarts when the update is completed.



NOTE

The software update can take several minutes, depending on the speed and reliability of the network.

Job Manager

The Job Manager provides Test Process Automation, including Technician Guidance. A Step-by-step walk-through of the testing tasks associated with the job includes being able to launch the job or review a job guide for a specific task. When all tasks are completed, the technician is notified and prompted to return to the Job Manager.

Generated reports automatically insert the Customer Name, Job Number, Technician ID, and Test Location that you specified into the report heading.



NOTE:

The Job Number specified in the Job Manager will be provided as the default Work Order Number when applicable to specific reports.

Test plans

The **Test Plan** section provides a list of planned test items associated with a job, including the test type to be performed, reference information, and the pass/fail status.

Creating test plans

The following procedure describes how to create a test plan using the on-line tool.

To create a test plan

- 1 Using a browser on a PC or laptop, log in to <https://jobmanager.stratasync.viavisolutions.com/>.
- 2 In the Job Information section, enter the:
 - Job Number
 - Customer
 - Location (A)
 - Technician ID
 - Report Logo File (optional)

- 3 In the Test Plan section, add tests to the test plan.
 - a In Select a test type, select a test type from the drop-down list.
 - b In Info, enter information about the test.
- 4 If applicable, enter the file name of a configuration file to automatically load for the test. This file should already be on the instrument.
- 5 Click Save.
- 6 Add the test plans to the instrument using StrataSync. See [“Synchronizing to the StrataSync server” on page 37](#) for more information.

Running jobs

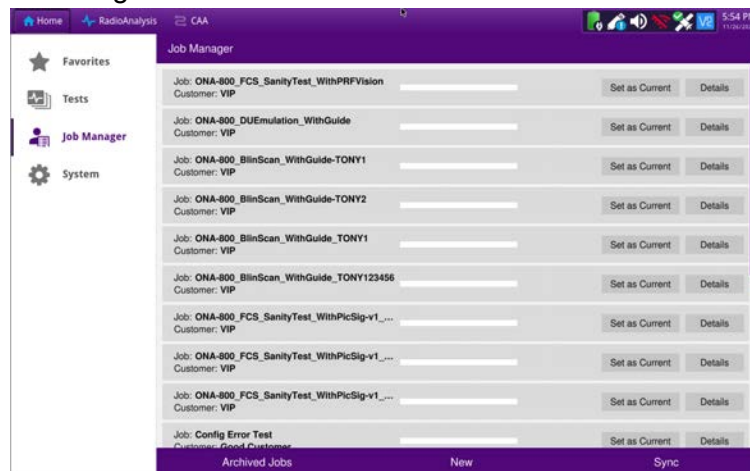
The following procedures describe how to run jobs.

To run a job

- 1 Tap **Job Manager** in the left hand menu.

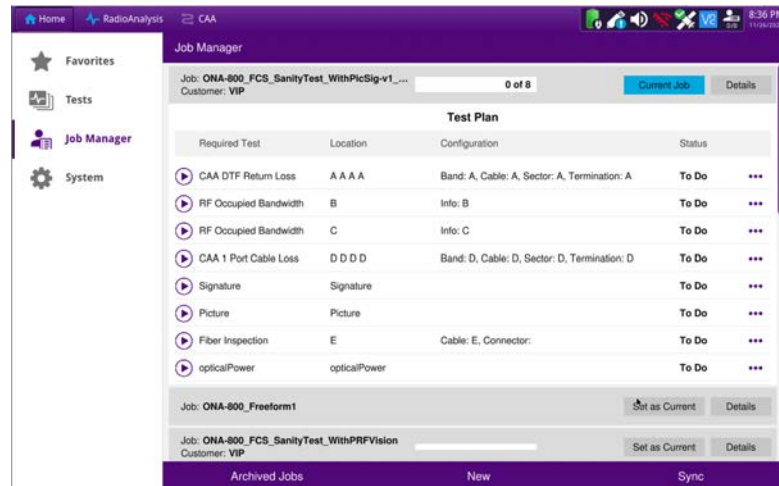
The Job Manager screen appears, listing the jobs loaded onto the device, as shown in [Figure 28](#).

Figure 28 Job Manager screen



- 2 Select the Job you want to run by tapping **Set as Current**. The Job moves to the top of the list, expanded to show the test plan, as shown in [Figure 29](#).

Figure 29 Current Job



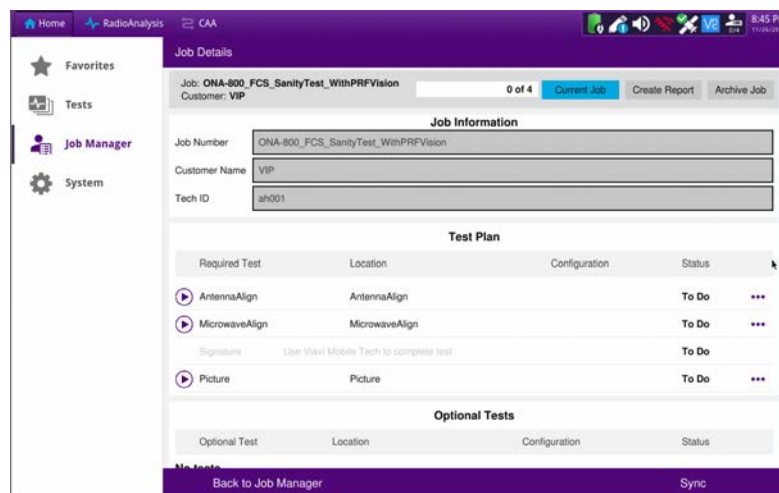
- 3 Press the  button for each test you want to run.
When the Job is complete, you can create a report.

The following procedure describes how to create a Job report.

To create a Job report.

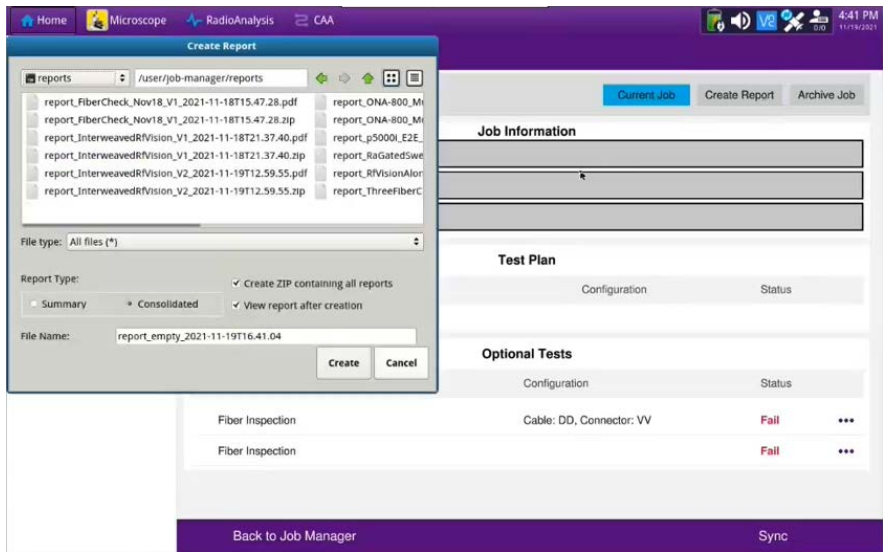
- 1 Press the **Details** button. The **Job Details** screen appears, as shown in [Figure 30](#).

Figure 30 Job Details screen



- 2 Tap the **Create Report** button. The Create Report screen appears, as shown in [Figure 31](#).

Figure 31 Create Report screen



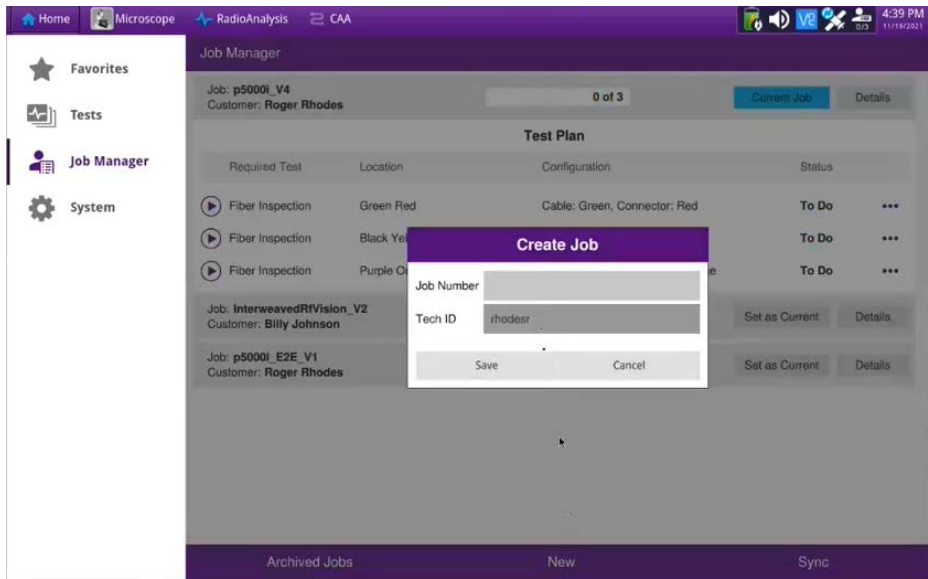
Freeform jobs

You can use the Job Manager to create an empty Freeform job that allows you to run ad-hoc tests and record the results in a consolidated report. The following procedure describes how to use an empty job.

To create and use empty jobs

- 1 Tap **Job Manager** in the left hand menu.
The Job Manager screen appears.
- 2 At the bottom of the screen, tap **New**.
- 3 The Create Job window appears, as shown in [Figure 32](#).

Figure 32 Create Job window



- 4 Enter a job number using the on-screen keyboard and tap **Save**.

- 5 Perform the tests you want, saving the results.
- 6 Return to the Job Manager. The tests you ran appear in the **Optional Tests** section.
- 7 Tap the **Create Report** button to create the consolidated report of the tests.

Synchronizing to the StrataSync server

To automatically obtain the latest configuration settings, software options, updates and ownership registration information, the unit should be synchronized with a VIAVI server via the Internet using an optional subscription-based service called StrataSync.

In addition to the latest operating software, synchronization also uploads user files saved on the unit to the StrataSync server. A connection to the Internet would be provided upon receipt of the unit and on a regular (daily) basis thereafter to ensure that the most currently issued options and updates are available to the unit and to allow all user information to be backed up.

The unit must be able to connect to the Internet over Ethernet or Wi-Fi. When an Internet connection is available and the unit is connected to the StrataSync server, a request to initiate the syncing process appears.



NOTE

Ensure that network settings are configured on the unit via the **Network** system tool. VIAVI recommends setting the IP mode to DHCP.

- 1 Select **System** on the menu bar, and then select **StrataSync**.
- 2 Verify that the server address appears in the **Server Address** field. The default server address is stratasync.viavisolutions.com.
- 3 Enter the ID of the unit in the **Account ID** field.
Synchronization cannot occur without the entry of a pre-approved, unique account ID obtained from VIAVI. Ensure that an account ID is available before attempting to access the StrataSync server.
- 4 Optionally, enter an ID in the **Technician ID** field.
A default technician ID is provided. This ID can be modified at any time.
- 5 Select **Start Sync** to initiate a connection to the StrataSync server.
Synchronization begins when a connection to the server is established.



NOTE

During Synchronization, icons indicating the progress and either the failure or completion of the process are displayed.

When an error or failure occurs, a message appears, detailing the possible issue.

Powermeter and VFL

This chapter describes the Powermeter and VFL.

The topics discussed in this chapter are as follows:

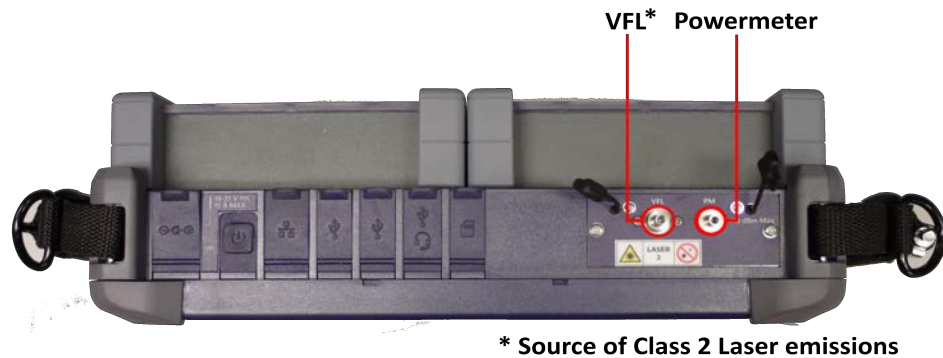
- [“Connection to the power meter and VFL” on page 40](#)
- [“Using the power meter” on page 40](#)
- [“Storing and reloading results” on page 48](#)
- [“VFL function” on page 49](#)
- [“Characteristics of the options” on page 50](#)

Connection to the power meter and VFL

The optical connector type used for the Powermeter and the VFL is UPP (Universal Push Pull), which is compatible with all 2.5 mm diameter connectors (FS, SC, DIN, E2000, etc.) 1.25 mm diameter connectors (LC) are supported with an adapter for the Powermeter.

Figure 33 shows the location of the Optical connectors on the ONA-800.

Figure 33 Optical connectors



Using the power meter

The power meter functions an option chosen at the time of order and incorporated into the ONA-800 platform in the factory.

To activate the function:

- 1 Press the **HOME** button.
- 2 Press the **Tests** button and then select **Fiber 1 (ONA-PMVFL) >**.
- 3 Press the **Powermeter** button of the Platform. Figure 34 shows the Powermeter button.

Figure 34 Powermeter button

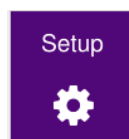


Configuring the power meter

To access the configuration parameters of the Powermeter

- 1 Press the **Setup** softkey, as shown in Figure 35.

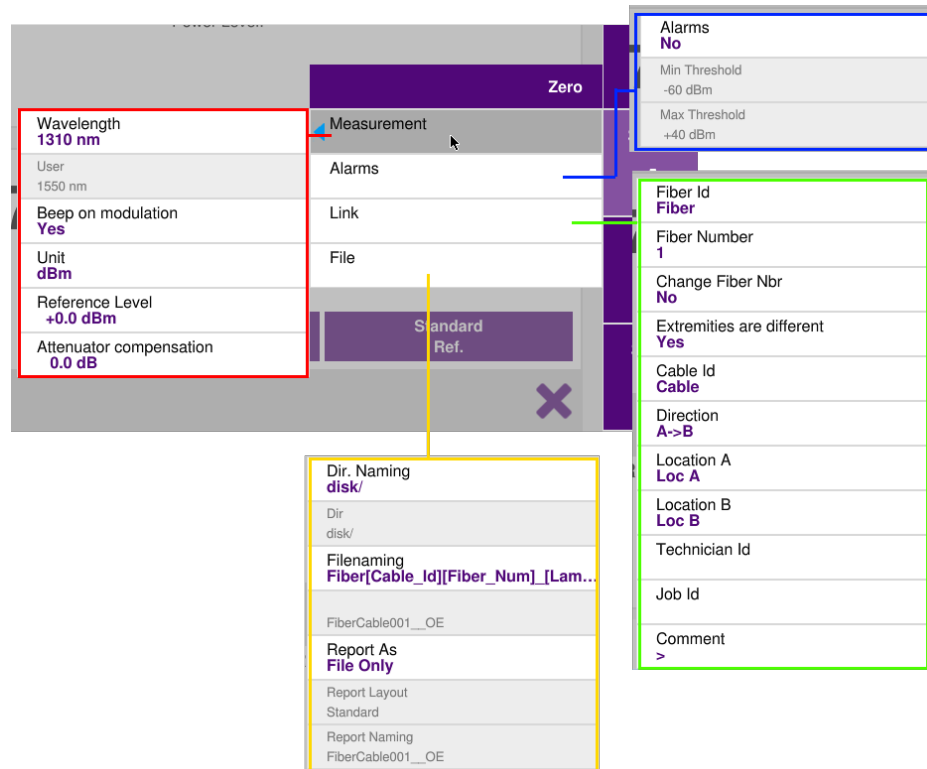
Figure 35 Setup softkey



- 2 Select either:
- Measurement
 - Alarms
 - Link
 - File

Figure 36 shows the configuration options.

Figure 36 Powermeter configuration



Configuring the Measurement parameters

In the **Setup** menu, select **Measurement**.

Table 8 describes the parameters.

Table 8 Measurement parameters

Parameter	Description
Wavelength	Select wavelength: – Auto: The wavelength of the input signal will be automatically detected and selected to perform the measurement. – Note: The source must also be in Auto mode – 850, 980, 1300, 1310, 1420, 1450, 1480, 1490, 1510, 1550, 1578, 1625 or 1650 nm: Measurement performed at specified wavelength. – User: Choice of wavelength on the next line.

Table 8 Measurement parameters

Parameter	Description
User choice	Applicable if User option was selected in the Wavelength line. Selection of the wavelength between 800 nm and 1650 nm, by clicking on Edit Value to use the numeric keypad to enter a wavelength.
Beep on modulation	Select to hear a sound when a modulation occurs. Options: – Yes – No
Unit	Unit of power displayed: – Watt, dBm: displays absolute power – dB: displays a result relative to a reference (link loss.)
Reference Level	If dB units were chosen as the Unit, specifies the reference value for the wavelength selected: 1. Select the wavelength. 2. Select the displayed reference level. 3. Enter the new Reference Level value. 4. Confirm the value by clicking the check mark button. This reference is also automatically available in the Results page, using the Standard Ref soft button.
Attenuator compensation	Choice of level to be applied to the wavelength chosen for the measurement to compensate for the loss due to the external attenuator (+XX.XX dB): 1. Select the wavelength. 2. Select the displayed value. 3. Enter the new Attenuator Compensation value. 4. Confirm the value by clicking the check mark button.

Configuring the alarm parameters

In the **Setup** menu, select **Alarms**.

Table 9 describes the Alarms parameters.

Table 9 Alarms parameters

Parameter	Description
Alarms	Activation of the alarm function. Any result below the lower threshold or above the upper threshold is displayed in red on the Results page.
Min Threshold Max Threshold	Choice of lower and upper thresholds for each available wavelength, from -60 to +40 dBm (selected with the direction keys.)

Configuring the Link parameters

In the **Setup** menu, select **Link**.

Table 10 describes the **Link** parameters.

Table 10 Link parameters

Parameter	Description
Fiber ID	Specifies the name for the fiber
Fiber Number	Specifies the fiber number.
Change Fiber Nbr	Changes the Fiber number: – No: The Fiber Number is not automatically modified. – Increment: The fiber number is automatically incremented at each new file save. – Decrement: The fiber number is automatically decremented at each new file save. – User Defined: Use the Edit Number softkey to enter the increment/decrement value for fiber number. Note: To decrement the number, enter the sign “-” before the number. For example: -1. Min: -999/Max: 999/Auto: 0
Extremities are different	In some cases, you may want to save different information for the origin and the extremity of the cable. To display/modify the data specific to the fiber (name and code), the direction must be temporarily changed. In the O->E direction, the information on the origin can be edited, and in the “E->O” direction, that on the extremity.
Cable ID	Allows the entry of an identification of the cable using the Edition menu.
Direction	The direction shows if the acquisition has been made from the origin to the extremity (A>B) or from the extremity to the origin (B>A). When different extremities are handled, changing direction makes it possible to see the parameters of the fiber for the other extremity.
Location A	Specifies the name of the Location A of the link.
Location B	Specifies the name of the Location B of the link.
Technician Id	Specifies the name of the operator carrying out the measurement.
Job Id	Allows a description of the measurement to be performed.
Comment	The Comment is specific to a fiber. This line is used to enter a new comment and not to display it. The comment appears at the top of the screen with the other parameters of the fiber. The comment will remain available for the next acquisition unless it is deleted. It is also saved when a trace is saved with a comment.

Configuring the File parameters

The File storage parameters must be configured in order to define how the results will be saved on the platform.

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

Table 11 describes the **Directory Configuration** parameters.

Table 11 Directory Configuration parameters

Parameter	Description
Dir. Naming	Specifies the directory where files are saved. 1. Select File > Dir. Naming > [displayed directory] 2. Enter the directory. If left empty, the current directory is selected. 3. Press the Checkmark to validate.
Dir	Displays the directory selected by default into which the file(s) are saved (the last directory selected.) This parameter cannot be modified.
Filenaming	Specifies the name of the file. 1. Select File > Filenaming > [displayed file naming format] 2. Using the keypad, either: – Select the pre-defined parameters – Enter a file name manually – Press Auto to apply the name to the file by default: Fiber [Cable_Id][File_- Num]_[Lambda]_[Direction] The name of the file is displayed in gray under the Filenaming parameter.
Report As	Specifies report types. – txt file: A '.txt' report file is also generated. – pdf file: A '.pdf' report file is also generated. – json file: A '.json' file is also generated. If you select No for all the report types, only the Powermeter results are saved in a file with the '.lts' extension.
Report Layout	Displays the report layout. If the txt, pdf, or json report is generated with the results file, the Report Layout parameters turn active. The options are: – Standard — The report is saved in a standard text file. – Consolidated — The results are consolidated and the report is saved in a text and/or PDF file.
Report Naming	Displays the report naming format.

Saving the configuration in a file

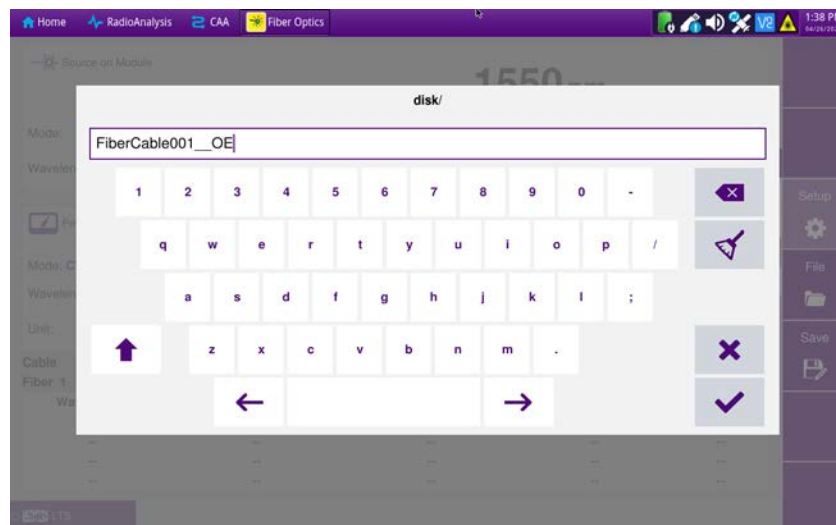
Once **File** and **Measurement** parameters have been configured, those parameters can be saved to a configuration file. This configuration file can then be recalled in order to be applied when the Powermeter measurements are performed.

To save parameters in a configuration file:

- 1 Press the **Save** softkey.

A keypad is displayed, as shown in [Figure 37](#).

Figure 37 Save keypad



- 2 Enter a name for the configuration file (max 20 characters).
- 3 Press the Checkmark button to validate.

The configuration file is saved with the extension `'.fo_cfg'` and can be recalled at any time from the **File Explorer** page.

Loading an existing configuration

You can load a configuration file previously created or available on the platform.

To load an existing configuration from the File Explorer:

- 1 Select the **File** softkey.
- 2 Select the desired configuration file.
- 3 Press **Load > Load Trace + Config**.
- 4 Press the **Exit** key, then select **Setup** to display the configuration parameters saved in the selected configuration file.

You can modify some acquisition or file storage parameters and save them in a new configuration file. See [“Saving the configuration in a file” on page 45](#) for more information.



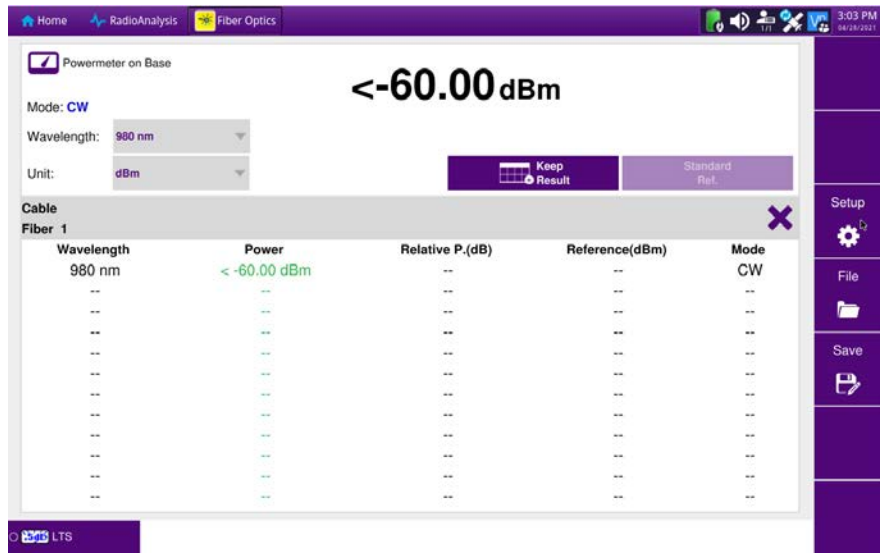
NOTE

Most of the configuration files are available in `disk/config`.

Results page

The results page provides the information relating to the measurement in progress, previously saved results, and the available commands for measuring and saving. Figure shows the Results page.

Figure 38 Results page



Result of the measurement in progress

The power measured by the power meter is displayed in large characters in the units selected in the configuration menu, along with:

- The mode of transmission of the signal measured
- The wavelength of the signal measured
- The reference level expressed in dB
- The level of Attenuation Compensation

Table of results

For each fiber being tested, the power meter displays a table of nine results corresponding to the different possible wavelengths. The first four results are displayed on the screen. To scroll through the other results, use the direction key. The table shows the power measured in dBm, the relative power in dB, and the reference level in dBm (if units = dB), together with the mode.

- When **Keep Result** is pressed, a measurement result is displayed in the table.
- The **X** softkey deletes all the results displayed in the table.
- If the Alarm function has been activated, any result that exceeds the selected thresholds appears in red in the table. Otherwise, the results are shown in green in the table.
- Results in the table are kept when the instrument is switched off.

Commands of the power meter parameters

When the Power meter function is selected, the following softkeys are available on the results page:

- **Wavelength** — Selects the wavelength
- **Unit** — Choice of the unit

On the results page, the following actions are available:

- **Standard Reference** — Selects the current result as a reference value to measure the insertion of a link. This reference is displayed under the measurement result until a new reference is performed.
- **Keep Result** — Keeps the result on the corresponding line of the table.
- **Clear Table** — Deletes all the results displayed in the table. **Clear Table** appears as an **X**.

Performing a measurement

The Powermeter is started as soon as the function is activated in the **Home** menu.



CAUTION

Power measurement is automatically updated. The value <-60dB is displayed when the laser is switched off and if the source output is looped on to the power meter input.

Power measurement

The following procedure describes how to perform a power measurement.

To perform a power measurement

- 1 Connect the light source to be tested to the Powermeter connector, as described in [“Connection to the power meter and VFL” on page 40](#).
- 2 In the configuration menu, choose the units
 - dBm
 - dB
 - Watts.

The measurement begins, and the results appear in the **Results** page and can be retained in the table. See [“Table of results” on page 46](#) for more information.

Optical link loss

The following procedure describes how to set the zero value of the power meter.

Setting the zero value of the power meter



CAUTION

Set the zero of the power meter before performing any low power level measurement when accuracy is critical, as the noise from the photodiode may fluctuate over time and with temperature.

- 1 Fix the plug or cap over the optical input of the power meter so that no light can reach the photodiode of the power meter. If the zero adjustment is made without this plug, an error message may be displayed, as the photodiode will detect too much light.
- 2 On the Results page, press **Setup > Zero** and validate.

To carry out the reference measurement (1-jumper reference)

- 1 Fix the adapter corresponding to the jumper to the optical connector of the power meter.
- 2 Connect the jumper between the input of the power meter and the output of the source.
- 3 Configure the same wavelength on the source and the power meter.
The power measured is displayed on the results page of the power meter.
- 4 Press the **Standard Ref** softkey to save the result displayed as reference value.

After defining the reference value, proceed to the next procedure.

To perform measurements on the fiber under test

- 1 Fix the jumpers and connectors needed to connect the fiber to be tested between the source output and the power meter input.
- 2 In the set-up menu, select **dB** units.
The power displayed in the Power Meter window corresponds to the optical loss of the link tested. It can be displayed in the table, as described in [“Table of results” on page 46](#).

Storing and reloading results

The following sections describe storing and reloading results.

Storing results

To save the results of a measurement, click on **Save**. The results are saved as configured in “[Configuring the File parameters](#)” on page 44

VFL function

The following sections describe the VFL function.

Visual Fault Locator function (VFL)

This function is used to emit a red light signal with a frequency of 1Hz or in continuous mode into a fiber to detect any defects in the dead zone of the reflectometer, or to identify it. This function is suitable for short fibers (length < 5 km) or the first few meters of a long fiber.



NOTE

Identification is facilitated by the blinking light in the fiber.

To emit a light signal into a fiber



CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

- 1 Connect the fiber to the VFL port on the connectors panel.
- 2 Press the **Tests** button and then select **Fiber 1 (ONA-PMVFL) >**.
- 3 Press the **VFL** button of the Platform to activate the VFL. [Figure 39](#) shows the VFL button.

Figure 39 VFL button



The **Laser On** icon appears in the system tray, as shown in [Figure 40](#).

Figure 40 Laser On icon



Laser On icon

- 4 To deactivate the VFL, press the VFL button for 3 seconds. The **Laser On** icon disappears from the system tray.

Characteristics of the options

The following sections describe the specifications of the Powermeter and VFL options.

Powermeter option

Specifications given for 25°C, after 20 minutes stabilization time and after zero setting.

- Wavelength range: 800 to 1650 in steps of 1 nm
- Calibrated wavelengths: 850/1310/1490/1550/1625/1650 nm¹
- Accuracy at calibrated wavelengths: ± 0.2 dB (at -30 dBm)
- Input power range: -60 dBm to +10 dBm
- Maximum resolution: 0.01 dB/0.01 nW
- Measurement range: +5 to -50 dBm (-45 dBm from 800 to 1250 nm)
- Linearity within the measurement range: ± 0.2 dB

VFL option

- Wavelength: 650 nm
- Maximum power: 1.2 mW
- Length of fiber: up to 5 km
- Class 2 laser standards: IEC 60825-1 and FDA 21 CFR part 1040.10

1.Specifications guaranteed to the calibrated wavelengths, except for 1650 nm

Smart Access Anywhere

This chapter explains how to configure and use the Smart Access Anywhere utility.

The topics discussed in this chapter are as follows:

- “About Smart Access Anywhere” on page 52
- “Licensing” on page 52
- “Downloading and extracting the utility” on page 52
- “Establishing a connection” on page 52
- “Launching the utility” on page 54
- “Displaying the instrument’s user interface” on page 56
- “Transferring files” on page 56
- “Displaying and modifying connection settings” on page 57

About Smart Access Anywhere

Smart Access Anywhere allows you to view and control the instrument's user interface from a remote location using a workstation. In addition to configuring the instrument and performing tests, you can transfer files to and from the instrument using the instrument's file manager utility. You can also rename and delete files, or create, rename, and delete directories.

Licensing

To use Smart Access Anywhere, you must have a license. Contact your VIAVI sales representative for more information about obtaining a license.

Downloading and extracting the utility

The **Smart Access Anywhere** utility must be downloaded and extracted on the workstation that you intend to use to connect remotely to the test instrument.



NOTE:

You do not need administrator privileges to install the utility on your workstation. The utility will be downloaded as a zip file.

To download the utility

- 1 On your workstation, open a browser and type the following address:
<http://smartaccess.updatemyunit.net>
- 2 Click on the **SmartAccessAnywhere_Vxx.xx.xx.zip** link.
- 3 Select **Save** in the dialog box.
After the download is complete, the browser can be closed.
- 4 Go to the download directory, then extract the files in the zip file into the desired destination directory.

The utility is downloaded and extracted.

Establishing a connection

You can connect remotely to your test instrument using a 1) wired Ethernet connection, 2) WiFi connection, or 3) Smartphone with Data Tethering. Before establishing a

connection to the instrument, verify that port 22 (SSH) or 443 (HTTPS) is open on your workstation.



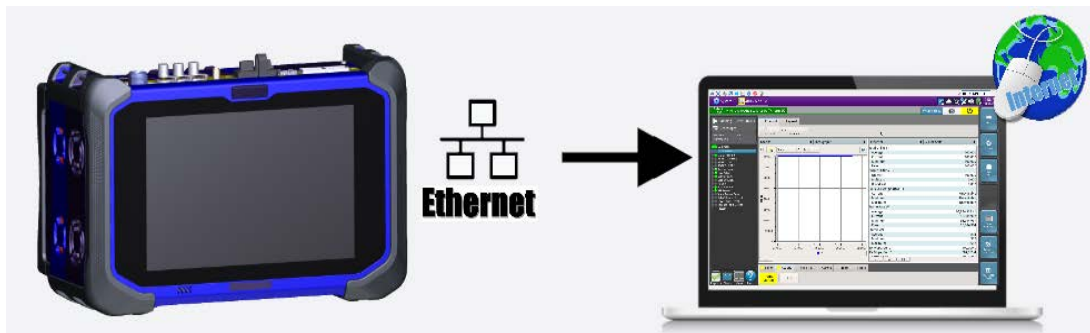
NOTE:

To connect using WiFi, the WiFi option must be installed on the target test instrument. To order the option, or to determine whether a particular Smartphone has been qualified by Viavi for the purpose of establishing remote connections to the instrument, contact VIAVI Customer Care at 1-866-228-3762 or www.viavisolutions.com.

Wired Ethernet Connection

Figure 41 illustrates a test instrument connected to a workstation via a wired Ethernet connection to the Internet. Before establishing a wired connection, you need to 1) determine the instruments IP address and, 2) configure the network proxy (if a proxy is used).

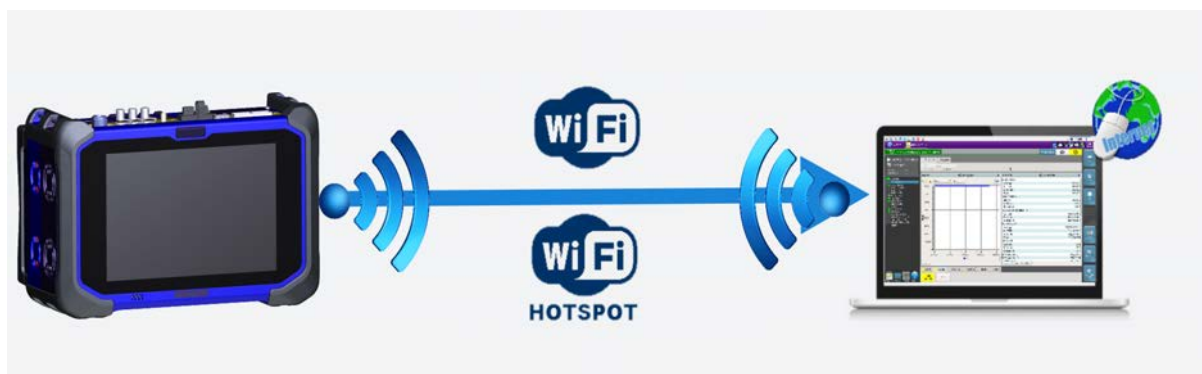
Figure 41 Wired Ethernet Connection



WiFi Connection

Figure 42 illustrates a test instrument connected to a workstation using a WiFi connection.

Figure 42 WiFi Connection



Smartphone with Data Tethering

You can remotely connect to a test instrument using a Smartphone capable of data tethering and a WiFi hotspot or USB cable.

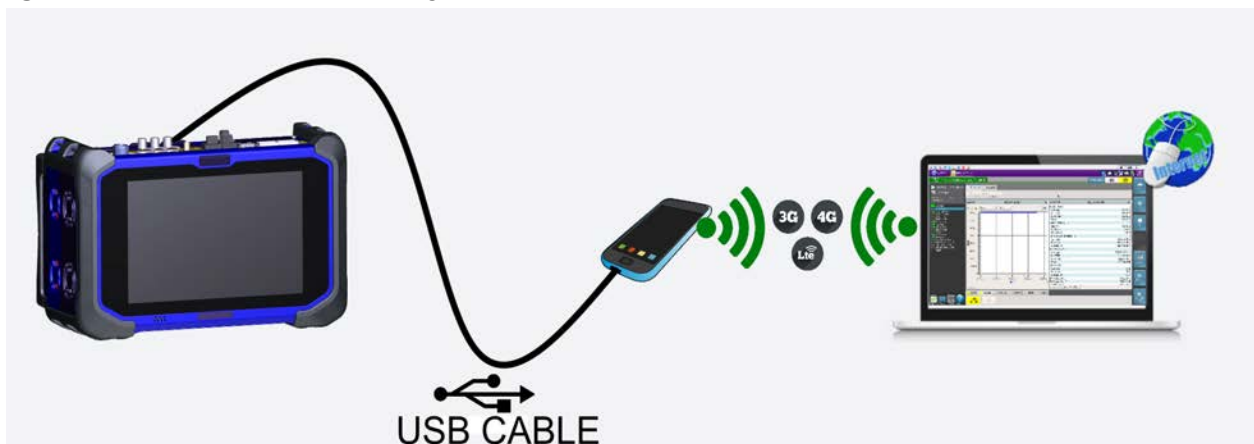
Figure 43 illustrates a test instrument connected to a workstation using a WiFi hotspot provided by a Smartphone that supports data tethering.

Figure 43 WiFi Connection using Smartphone



Figure 44 illustrates a test instrument connected to a workstation using a USB connection to a Smartphone that supports data tethering.

Figure 44 USB Connection using Smartphone



Launching the utility

To use the Smart Access Anywhere utility, you must 1) establish a connect from your PC or mobile device to the test instrument, 2) launch the utility on the test instrument to obtain the required remote access code, and then 3) launch the utility on your PC or mobile device, and enter the remote access code that was obtained from the instrument.

Launching the utility on the instrument

To launch the utility on your instrument

- 1 On the **System** page, select **Remote**.
- 2 Press **Connect** next to the SmartAccess Anywhere icon.
The connection to SmartAccess Anywhere Server will initiate.
- 3 After a connection is established to the server, the instrument displays a message with the code that is required to access to the equipment remotely.
- 4 If you will be accessing the instrument remotely from your workstation, write down or capture the code in some manner so you have it when you return to your workstation. If another individual will be accessing the instrument remotely, provide the code to the individual.

Testing your connection

Before launching the utility on your workstation, you can also optionally test the connection between the workstation and target test instrument.

To test your connection

- 1 On your workstation, launch the Smart Access Anywhere utility.
- 2 Select **Test connection**.
The test automatically launches.
- 3 To display connection log details in real time, select the **See full logs** button.
The connection log appears, and provides the following information:
 - Upload and Download speed (in Kbyte/s) from Device to server.
 - Latency between Device and server (in ms).
- 4 After analyzing the results, do one of the following:
 - Select the **Clear test results** button to delete the current table, and retest the connection if desired.
 - If connection is deemed to be valid, enter the access code and establish connection.

Launching the utility on your PC or mobile device

After you establish a connection to your test instrument, you can launch the Smart Access Anywhere utility to update your instrument.

- 1 Launch the Smart Access Anywhere utility:
 - On your PC, go to the directory where you installed the utility, then double click **SmartAccessAnywhere.exe**.
 - On your mobile device, press the **Smart Access Anywhere** icon.The utility opens.
- 2 Enter the access code that was provided to you in the field provided on the upper part of the screen.
- 3 Click **Connect** to validate the code.

The Smart Access Anywhere screen appears.



NOTE:

After upgrading or rebooting a remote instrument, please wait at least two minutes before re-establishing the link between your workstation and the test instrument.

Displaying the instrument's user interface

After you launch the utility on your PC or mobile device, you can display the remote instrument's user interface on your workstation's display.

To display the instrument's user interface

- On the Introduction page, click **Remote Screen**.
The user interface for the instrument appears on your workstation's display.

The VNC icon in the system tray indicates that the remote screen is active.

Transferring files

Single files can be transferred one by one from your PC or mobile device to the instrument, or from the instrument to your PC or mobile device.

To transfer a file to or from the workstation or instrument:

- 1 On the Introduction page, click **File Transfer**.
A two-pane window appears, showing the PC or mobile device directories (or storage devices) in one pane, and the instrument directories (or storage devices) in the other pane.
- 2 In the "source" pane (the pane that has the file that you want to transfer), double click on the directory or storage device, then select the file to be transferred.
- 3 In the "destination" pane (the pane with the directory that you want to transfer the file to, select the destination directory for the file.

4 Do one of the following:

- If you are transferring a file from your PC or mobile device to the instrument, click **Upload**.
- If you are transferring a file from your instrument to the workstation, click **Download**.

A dialog box appears asking you to verify the destination that you selected for the transferred file. If it is the correct destination, click OK.

5 Click **Save** to transfer the file.

A message will appear at the bottom of the screen providing details concerning the status of the file transfer. After the transfer is complete, the message disappears and the transferred file is underlined in the workstation or instrument's file manager.

Displaying and modifying connection settings

You can review information about the current remote session at any time.

To display session information

- Select the **Session icon** key.

Session details appear. This page gives information on the connection in real time.

To modify connection settings

1 Select the **Session** icon.

2 Disconnect the session using the **Disconnect** button.

3 On the session screen, select the **Network Settings** icon.

The connection settings screen appears. The default connection is defined as **Smart-guess (default)**.

4 To modify the settings, select **Forced settings**, and then modify **SSI tunnel port** and/or **Internet proxy** as needed.

The **Internet proxy** configuration is available exclusively if the port selected is **Alternative port (443)** and if **HTTPS packing** is selected.



NOTE:

If the default parameters need to be modified, it is recommended you discuss it with your local network administrator.

5 After configuring the settings, select **Back to main page**.

Physical Specifications

This appendix lists the physical specifications of the ONA-800. Topics covered include:

- [“ONA-800A-MF2/MF2” on page 60](#)
- [“Optional modules” on page 60](#)

ONA-800A-MF/MF2 and ONA-800B

Table 12 describes the physical specifications of the ONA-800A-MF/MF2.

Table 12 Physical Specifications — ONA-800A-MF/MF2

Parameter	Specification
Dimensions	
Height	170 mm (6.7 in)
Width	269 mm (10.6 in)
Depth ¹	
With expansion modules	91 mm (3.6 in)
Without expansion modules	58 mm (2.3 in)
Weight	2.0 kg (4.4 lb)
Battery²	
Type	14.4 V, 6.7 A-h, 92 Wh, Lithium Ion
Charging Time	
One battery, 100%	> 2.2 hours
Charging Temperature	0 to 45°C (32 to 113°F)
Discharging Temperature	0 to 60°C (50 to 240°F)
Operating Temperature ³	0 to 40°C (32 to 104°F) AC power condition 10 to 40°C (50 to 104°F) Battery power condition
Storage Temperature	-20 to 60°C (-4 to 140°F) IMPORTANT: VIAVI strongly recommends storing the battery pack in a low-humidity ≤80% RH, low-temperature <21°C (70°F) environment.
Environment	
Maximum Humidity	95% RH non-condensing
Shock and Vibration	MIL-PRF-28800F
Drop	MIL-PRF-28800F, ETSI EN 300 019-2-7
Altitude	2000 m (6,652 ft)

1. Depth will vary depending on the solution module.
2. Battery life and charging time depend on the types of tests performed. Specified temperatures are internal to battery.
3. Operating Temperature is for base only. See the module documentation for more information.

Optional modules

The following sections describe the specifications of optional modules.

Solution modules

You can attach the following solution modules:

- SPA06MA
- SPA06MA-O
- RA09MB-O
- RA18MB-O
- RA32MB-O
- RA44MB-O
- RA44MA-O
- RA18MA-O
- TM100GB
- TM400GB-QO
- TM400GB-QQ

For:

- SPA06MA, SPA06MA-O, RA44MA-O, and RA18MA-O specifications, refer to the *OneAdvisor 800 Radio Analysis Module User's Guide*.
- RA09MB-O, RA32MB-O, and RA44MB-O specifications, refer to the *RA00MB-O User's Guide*
- 400G Module specifications, refer to the *OneAdvisor 800/1000 400G Module User's Guide*
- 800G Module specifications, refer to the *OneAdvisor 800 800G Module User's Guide*
- Supporting data sheets are available at www.viavisolutions.com.

Fiber modules

The following sections describe fiber modules that plug into the optional Fiber Module Carrier module.

OSA and OTDR

For OSA and OTDR module specifications, refer to the *8100 V2 Modules Series User Guide*. Supporting data sheets are available at www.viavisolutions.com.

DTS

For Distributed Temperature Sensing (DTS) module specifications, refer to the *DTSS and STS Module User Manual*. Supporting data sheets are available at www.viavisolutions.com.

ODM

For Optical Dispersion Measurement (ODM) module specifications, refer to the *ODM Module User Manual*. Supporting data sheets are available at www.viavisolutions.com.

Expansion Modules

The following sections describe Expansion modules.

CAA modules

For Cable and Antenna Analyzer (CAA) modules, refer to the *CAA06M Cable and Antenna Analyzer Quick Start Guide*. Supporting data sheets are available at www.viavisolutions.com.

OTDR and MPO Switch

For Optical Time Domain Reflectometer (OTDR) and Multi-Fiber Push On (MPO) Switch specifications, refer to the *OTDR Functions, Options and Software Applications User Manual*. Supporting data sheets are available at www.viavisolutions.com.

OSA, OCV, and OCC modules

For Optical Spectrum Analyzer (OSA), Optical Channel Verifier (OCV), and Optical Channel Checker (OCC) specifications, refer to the corresponding user manuals. Supporting data sheets are available at www.viavisolutions.com.

Timing Expansion Module (TEM)

For TEM specifications, refer to the *T-BERD/MTS/MAP-2100 GNSS and Timing Expansion Module V2 User Manual*. Supporting data sheets are available at www.viavisolutions.com.

Power Expansion Module (PEM)

Table 13 describes the physical specifications of the PEM.

Table 13 ONA-MF2-PEM physical specifications

Parameter	Specification
Dimensions	
Height	130 mm (5.1 in)
Width	138 mm (5.4 in)
Depth	41 mm (1.6 in)
Battery	

Table 13 ONA-MF2-PEM physical specifications

Parameter	Specification
Type	14.4 V, 6.7 A-h, 92 Wh, Lithium Ion
Charging Time	> 2.2 hours
Charging Temperature	0 to 45°C (32 to 113°F)
Discharging Temperature	0 to 60°C (32 to 140°F)
Storage Temperature	-20 to 60°C (-4 to 140°F) IMPORTANT: VIAVI strongly recommends storing the battery pack in a low-humidity ≤80%RH, low-temperature <21°C (70°F) environment.
Environment	
Maximum Humidity	95% RH non-condensing
Shock and Vibration	MIL-PRF-28800F
Drop	MIL-PRF-2880, ETSI EN 300 019-2-7
Storage Temperature	-20 to 60°C (-4 to 140°F)
Altitude	2000 m (6,652 ft)



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Started Guide
22142812 R018**

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