



OneExpert DSL

User's Guide



OneExpert DSL

User's Guide



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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.

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

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





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About this Guide

This chapter describes how to use this guide. Topics discussed in this chapter include the following:

- [“Purpose and scope” on page xviii](#)
- [“Assumptions” on page xviii](#)
- [“Conventions” on page xix](#)

Purpose and scope

The purpose of this guide is to help you successfully use the features and capabilities of the OneExpert DSL.

Assumptions

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

Safety and compliance information

Safety information is contained in a separate guide and is provided in printed format with the product.

For information about CE compliance, see the Declaration of Conformity. A copy of the declaration is included in the shipping package.

Conventions

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

Table 1 Typographical conventions

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

Table 2 Keyboard and menu conventions

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

Table 3 Symbol conventions







	This symbol 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 4 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 4 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 4 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 4 for more information.

Table 3 Symbol conventions (Continued)



	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 4 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 4 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 3 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 3 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 3 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.

Introduction

This chapter provides a general description of the OneExpert DSL. Topics discussed in this chapter include the following:

- [“About the OneExpert DSL” on page 2](#)
- [“Features and capabilities” on page 3](#)
- [“What ships with the OneExpert DSL?” on page 4](#)
- [“Preparation for use” on page 5](#)
- [“Options” on page 6](#)
- [“Attaching or removing a module” on page 7](#)

About the OneExpert DSL

The OneExpert DSL is a product that addresses the emerging need for an installation tool for the service provider technicians installing triple play services. The OneExpert DSL is for technicians installing Broadband Data services at customer premises. It is used to test the broadband delivery to the home, the home wiring inside the home and the proper operation of services inside the home.

Figure 1 OneExpert DSL



OneExpert DSL is a modular test platform and with its DSL module, it supports DSL, copper, services and home networks. Its modularity will ensure years of use and the combination of its multi-touch user friendly interface with unique Viavi OneCheck automated tests provides more expertise and ease of use for complex task for field technicians. This enables technicians to fix problems the first time while improving access and home network quality.

In addition, providers can also improve their work process, data flow and OPEX by expanding field tester usage in a connected world with Strata-Sync and Mobile connectivity.

Features and capabilities

Features and capabilities of the OneExpert DSL include the following:

Copper

- Multimeter
 - AC volts
 - DC volts
 - Resistance
- TDR
- Opens (distance) and capacitance
- Balance
- Load coil detect
- POTS calls

xDSL

- Turn up and troubleshoot DSL services
- Provide packet statistics and analysis.
- Test ADSL2+/VDSL2 including bonded and vectored pairs
- SELT

Home Wiring

- Wire Map
- Tone Trace
- Hub Flash
- Port Discovery
- Ping Tool

Wifi

- Wifi Scan
- Wifi Access Point
- WiFi Advisor
 - Site Assessment Assistant
 - Single-Ended Troubleshooting

Coax

- Locate SmartIDs
- Single Ended Coax Map
- Dual Ended Coax Map
- Whole Home Check

HPNA

- Monitor mode
- Test mode

What ships with the OneExpert DSL?

When you unpack the OneExpert DSL, the following items are included as standard.

- ONX-580 mainframe
- Battery (installed in the unit)
- AC adapter and power cord

Preparation for use

This section explains how to start using the OneExpert DSL.

When you unpack the OneExpert DSL, do the following:

- Inspect the OneExpert DSL for damage.
- If undamaged, save the box and packing materials in case you need to ship the OneExpert DSL in the future.
- Remove the protective film from the LCD. This film is in place for protection during shipment. There is tab in the lower right corner for easy removal.

Before using the OneExpert DSL for the first time, do the following:

- Turn the OneExpert DSL ON (use the green button on the front of the unit), and then verify that it is operating properly by navigating through a few menus.
- If the Batt. LED is red, charge the battery.



NOTE:

This handheld instrument is not intended to be body worn, or operated while held against the body.

Options

The following sections list the options available for the OneExpert DSL base unit.



NOTE:

For additional information about OneExpert DSL options and services, contact your local Viavi representative or contact Viavi through the company web site, www.viavisolutions.com.

You can order software options to add functionality to the OneExpert DSL. [Table 5](#) lists the available software options and part numbers.

Table 5 Software options

Part Number	Description
ONX580-APPLE	Provides the ability to communicate with Apple mobile devices (iPad, iPod, iPhone) over Bluetooth.
ONX580-BONDED	Allows xDSL testing over two pairs
ONX580-BLUE-TOOTH	Allows wireless connectivity to either connect/communicate with mobile devices, to test with a Smart ID Plus probe, communicate with WiFi Advisor devices, or transfer files from the OneExpert DSL to a PC.
ONX580-HPNA	Allows testing of HPNA networks
ONX-TRUESPEED	Provides the ability to run the RFC 6349 TCP throughput test (“TrueSpeed”) against a Virtual TrueSpeed server.

If you received an option file from a Viavi representative, copy it to USB, insert the USB in the instrument, copy the file to the internal file system, then turn the power off then back on. For more information, refer to the Option Install Instructions.

Attaching or removing a module

When shipped from the factory, the module comes attached to the unit. If another module is ordered later, or if you have more than one module, this section describes how to replace the module.



NOTE:

Before removing or attaching a module, the unit must be powered down and all cables must be disconnected.



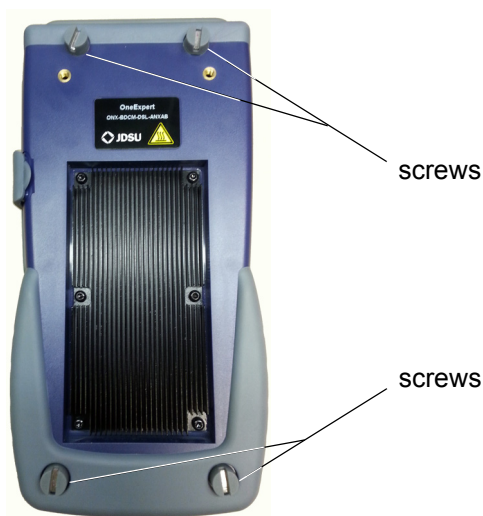
CAUTION: STATIC SENSITIVE

Static shock may damage the instrument. Observe anti-static precautions when handling the module.

Removing a module

Modules can be removed by loosening the four screws on the back of the unit (see [Figure 2](#)).

Figure 2 OneExpert DSL back panel



To remove the module

- 1 Loosen the four screws using a screwdriver or a coin.
- 2 Pull the module from the base. You may have to slightly wiggle the module to pull it from the gasket.

The module is removed.

Attaching a module

The following procedure describes how to attach a module.

To attach a module

- 1 Position the module so that the connectors on the module line up with the connectors on the back of the base unit. If correctly positioned, the four screws also line up.
- 2 Gently push the module to mate the connectors.
- 3 To tighten the four screws:
 - a Tighten by hand until the housing and screw contact each other.
 - b Turn the fastener one complete turn, using a screwdriver or a coin.

The module is connected.

Quick Tour

This chapter introduces the keypad, LEDs, connectors, and graphical user interface. Topics discussed in this chapter include the following:

- [“Exploring the front panel” on page 12](#)
- [“Exploring the bottom panel” on page 16](#)
- [“Exploring the connector panel” on page 17](#)
- [“Exploring the top panel” on page 20](#)
- [“Navigating the user interface” on page 21](#)

Exploring the front panel

The controls and LEDs on the front panel, shown in [Figure 3](#), are used to operate the OneExpert DSL, set up tests, and view data.

Figure 3 OneExpert DSL front panel



The following paragraphs describe each of the controls and LEDs on the front panel.

Status LEDs

These indicators report the status of the OneExpert DSL. The function of each LED is described in [Table 6](#).

Table 6 Status LEDs

LED	Function
Sync	Reports the status of modem synchronization. <ul style="list-style-type: none">– Blinking green indicates that the modems are training.– Solid green indicates that the modems are synchronized (reached Showtime).
Network	Indicates the status of network connectivity. <ul style="list-style-type: none">– Blinking green indicates that the unit is acquiring an IP address.– Solid green indicates frames an IP address has been acquired.– Blinking amber indicates a timeout - the unit was unable to acquire an IP address.– If the Frame LED is not illuminated, the network is not active (either the unit is not connected or it is logged off).
NOTE: The Sync and Network LEDs alternately blink green when in sleep mode (power saving mode).	
Error	Solid red indicates error and alarm conditions. The type of error varies depending on the application.

Table 6 Status LEDs (Continued)

LED	Function
Batt	<p>A multi-color LED that indicates the battery status.</p> <ul style="list-style-type: none">– Solid green indicates that either the battery charge is higher than 30%, or that an external source is powering the unit.– Solid amber indicates that the battery is getting low, the charge is between 10% and 30%.– Solid red indicates that the battery charge is critically low, less than 10%. An audible beep occurs 30 seconds before shutdown.

LCD

The LCD is a touchscreen that operates similar to a mobile device (such as an iPad or similar Android device), where you swipe to go to the next page or zoom in/out with pinching or opening your fingers.

Function keys

Use to select screen-specific options or to select pop-up menus associated with each key.

Arrow keys




Use the arrow keys to navigate through menu selections.

OK key

The **OK** key is used to accept a changed setting or to proceed to the next menu.

System keys

Under the Navigation arrow keys, there are three system keys:

Key	Description
	Back/Cancel – exit a menu or to go back to the previous menu.
	Home – Return to the main/home screen
	Tray – Launch the Tray menu. From the Tray Menu you can save test reports, turn on/off Bluetooth, or enable/disable Remote Operation.

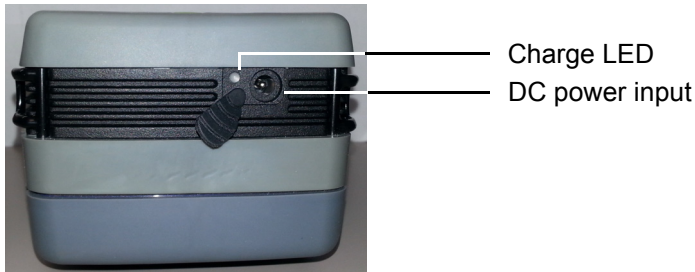
Power key

Use the power key to turn the OneExpert DSL power on or off. Press and hold until the unit beeps to turn on or off.

Exploring the bottom panel

The OneExpert DSL +12VDC connector is located on the bottom end of the instrument. This connector is used to power the OneExpert DSL and to charge the lithium battery inside.

Figure 4 OneExpert DSL bottom panel



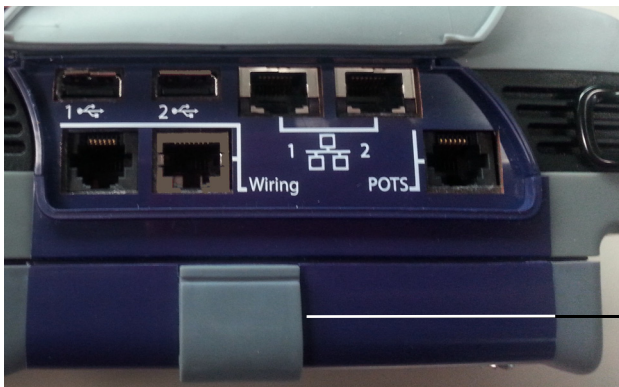
The Charge LED, located next to the charger connector, is a multi-color LED that indicates the charge status.

- Solid green indicates that charging is complete.
- Slow flashing red indicates that the battery charge is critically low, less than 10%.
- Fast flashing red indicates that the charging was suspended due to a fault and user intervention is necessary (for example, the wrong charger is attached).
- Solid red indicates that the charging was suspended due to overheating. The unit can continue to run, no user intervention necessary.
- Solid amber indicates that the battery is charging.

Exploring the connector panel

The connector panel is located on the right side of the instrument and under a rubber flap. When the connectors are not being used, place the rubber flap over the connector panel to keep out dust and rain. Use the connector panel to connect the OneExpert DSL to the line under test. [Figure 5](#) shows the connector panel.

Figure 5 OneExpert DSL connectors right panel



xDSL connector

USB connectors



The USB connectors are used for connecting Smart IDs, exporting test results to a flash drive, or for performing firmware upgrades from a flash drive.

POTS connector

The POTS connector is used for:

- HPNA testing on twisted pair
- POTS testing

Network connectors



Two Ethernet/Network ports are used to connect to Ethernet networks to allow Ethernet testing (such as hub flash, port discovery, and ping), synchronizing with StrataSync, upgrading software, and remotely connecting to the OneExpert DSL.

RJ45 Wiring connector

The RJ45 Wiring connector is used for:

- Ethernet Ping
- RJ45 wire ID
- RJ45 toning
- Wire mapping to smart remote

RJ11 Wiring connector

The RJ11 Wiring connector is used for:

- RJ11 wire ID
- RJ11 toning
- Coax wire ID (with supplied adapter cable)

- Coax toning (with supplied adapter cable)
- RJ11 wire mapping to smart remote
- Volt/Ohm measurements

DSL connector

The DSL connector, located on the bottom module, is used for testing VDSL or ADSL on twisted pair cable.



WARNING: ELECTRICAL SHOCK

Electrical shock may result in serious injury or death. Use care when connecting to telecommunications circuits, to be sure that you do not come in contact with exposed conductors or power mains. Connect TNV signals to TNV ports only.



CAUTION: FIRE HAZARD

To reduce the risk of fire, use only 26 AWG or larger telecommunications line cord between the DSL connector and the wall.



NOTE: ELECTROSTATIC DISCHARGE IMMUNITY

When using an Ethernet crossover cable, Viavi recommends using a shielded crossover cable for the best immunity to electrostatic discharge (ESD).

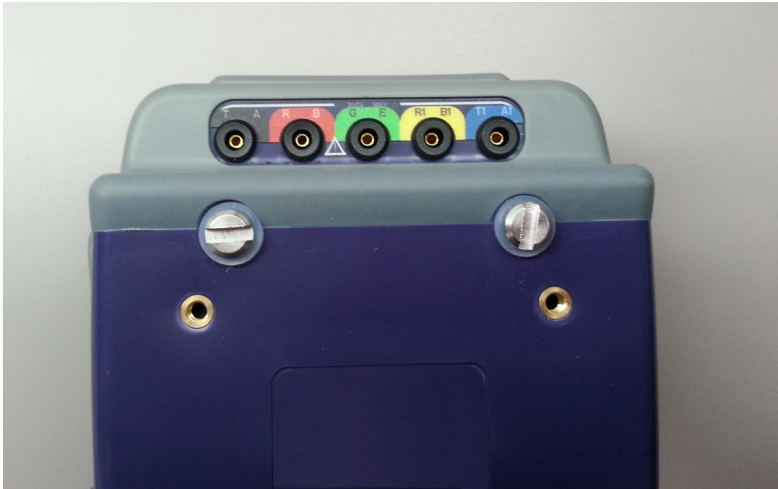
Rings

The rings on the corners of the instrument can be used to attach a carry strap.

Exploring the top panel

The Copper connectors are located near the top panel.

Figure 6 OneExpert DSL top panel



The upper area of the back panel houses the connectors for Copper testing or DSL testing

The copper connectors are used for:

- Multimeter
 - AC volts
 - DC volts
- TDR
- Opens (distance) and capacitance
- Balance
- Load coil detect
- POTS



CAUTION: INSTRUMENT DAMAGE

Connecting to circuits with voltage higher than 300V, compared to ground, may damage the internal components. Connect only to circuits with less than 300V.



WARNING: ELECTRICAL SHOCK

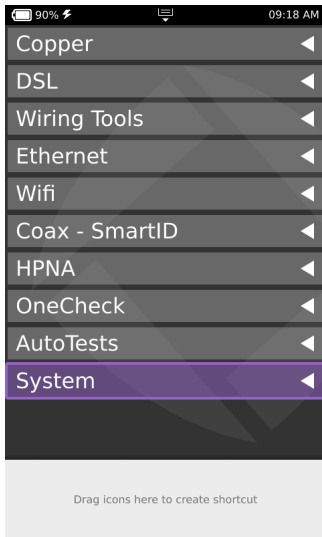
Electrical shock may result in serious injury or death. Use care when connecting to telecommunications circuits, to be sure that you do not come in contact with exposed conductors or power mains. Connect TNV signals to TNV ports only.

Navigating the user interface

The user interface of the OneExpert DSL is designed to be intuitive and easy to use. The LCD is a touchscreen that operates similar to a mobile device (such as an iPad or similar Android device), where you swipe to go to the next page or zoom in/out with pinching or opening your fingers. Using the interface, you can view test results, set up the OneExpert DSL, and configure test parameters.

When you power up the OneExpert DSL, the user interface appears (see [Figure 7](#)).

Figure 7 User interface - main menu



This is the main menu. The menu selections change depending on options enabled on your instrument.

The header area provides battery status (graphic of battery and battery percentage), indicates whether the adapter is plugged in (lightning bolt next to the battery percentage), and displays the time.

Each main item is a collapsible menu.

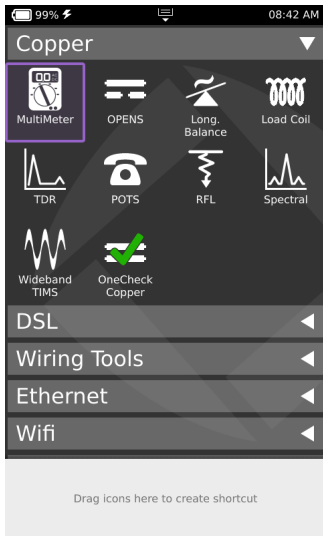


Figure 8 User interface - example of collapsible menus

To expand a menu

Do one of the following:

- Touch the triangle on the right (the triangle rotates from pointing left to pointing down)
- Use the arrow navigation keys to highlight the desired menu item (System is highlighted in [Figure 7](#) above) and then press the OK key.

To select a menu option

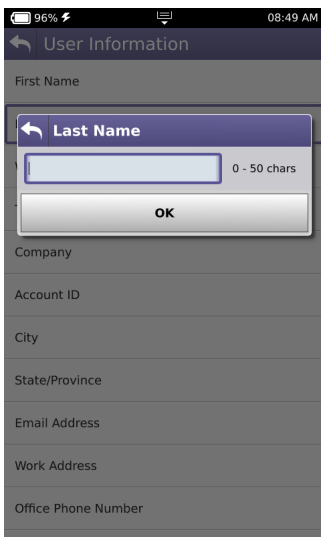
Do one of the following:

- Touch the item
- Use the arrow navigation keys to highlight the desired menu item and then press the OK key.

Some menus may require you to enter text or numbers (for example, test settings or user information). The process is similar to data entry on a mobile device.

To enter text or numbers

- 1 Touch the desired item.
A data entry box appears.
- 2 Tap in the box.
A keypad appears on the screen.



- 3 Use keypad to enter the data.
 - To switch from letters to numbers, use the button in the lower left (123 or ABC).
 - On the alphabetic keypad, the second key, the up arrow, is the shift key.

- On the numeric keypad, the second key (1/2) allows you to move among multiple numeric screens.
 - The left pointing arrow with the x in it is the backspace key.
- 4 Touch the enter/return key (the fourth system key) on the screen keypad or press the OK key.

If you have a test or function that you use frequently, you can make it a shortcut.

To create a shortcut

Touch and hold the icon for the function and then drag it to the bottom of the screen to create a shortcut. You can create up to four shortcuts.

To remove a shortcut

Touch and hold the icon and then drag it off of the shortcut bar.

Utilities

This chapter describes utilities found in the System menu and the Tray menu. These include system settings, upgrading software, specifying user information, saving test reports, capturing a screen shot, and other tasks. Topics discussed in this chapter include the following:

- [“Specifying system settings” on page 28](#)
- [“Setting the date and time” on page 29](#)
- [“Remotely operating a OneExpert DSL unit” on page 30](#)
- [“Enabling Bluetooth” on page 34](#)
- [“Configuring international settings” on page 35](#)
- [“Updating the instrument firmware over a network” on page 36](#)
- [“Updating firmware using USB Flash” on page 37](#)
- [“Viewing unit options and revisions” on page 38](#)
- [“Restoring factory defaults” on page 40](#)
- [“Changing screen and power settings” on page 40](#)
- [“Specifying user information” on page 41](#)
- [“Specifying network profiles” on page 42](#)
- [“Synchronizing to the StrataSync server” on page 44](#)
- [“Managing files” on page 47](#)
- [“Viewing the User’s Guide on the instrument” on page 52](#)
- [“Using the tray menu” on page 49](#)
- [“Setting the volume” on page 52](#)

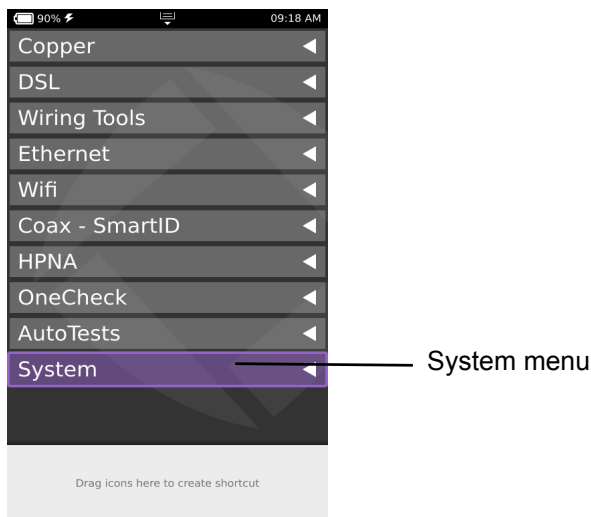
Accessing the System menu

The System menu is available on the main menu screen.

To access the System Settings menu

- From the main menu, touch the System menu item.
The collapsible menu opens (the triangle rotates from pointing left to pointing down).

Figure 9 The System menu

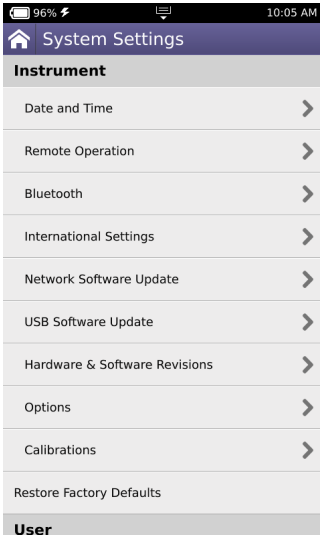


Specifying system settings

Using the System Settings menu, you can set the date and time, configure port settings, adjust print settings, adjust remote control settings, and configure international settings.

- 1 From the System menu (Figure 9 on page 28), touch the **System Settings** button.

The System Settings menu appears.



Setting the date and time

The first selection on the System Settings menu is Date and Time. The OneExpert DSL has an internal clock that you can set to provide accurate time stamps for test results.

The following procedure describes how to set the date and time.

To set the date and time

- 1 From the System Settings menu, select **Date and Time**.
The Date and Time Settings menu appears.

- 2 Set the time by touching **Time**, turning the dials, and then press the OK key.
- 3 Set the date by touching **Date**, using the arrows to set the month and year, touching the day on the calendar, and then touching **Set**.
- 4 Specify the Date Format by touching **Date Format** and then selecting either MM/DD/YYYY or DD/MM/YYYY format.
- 5 Specify the Time Format by touching **Time Format** and then selecting either 12 or 24 Hour.
- 6 To change the Time Zone, touch **Time Zone** and then select your time zone.
- 7 If Daylight Savings Time (DST) is used in your area, touch DST Used to add a check mark.
- 8 If Time Synchronization is needed, touch **Time Synchronization** and then select **NTP**. If not needed, set Time Synchronization to None. Network Time Protocol (NTP) synchronizes your system clock with a central time server.
- 9 If you selected NTP Time Synchronization specify the following:
 - **NTP Server Address type** (IPv4 Address, IPv6 Address, DNS Name)
 - **NTP Server** (the address of the server that the instruments gets the time from, for example 0.us.pool.ntp.org)
 - **NTP Synchronization State** (whether the NTP is synchronized with GMT)

The date and time are set.

Remotely operating a OneExpert DSL unit

The optional Remote Operation features allows you to access the OneExpert DSL user interface from a PC or laptop computer through a virtual network connection (VNC), connecting over an Ethernet interface.

To use this feature, you must have a VNC viewer program on the PC, the OneExpert DSL must be connected to the same network as the PC or laptop, and you must know the IP address of the OneExpert DSL.

Establishing a VNC connection involves the following tasks:

- Establishing an Ethernet LAN connection between the OneExpert DSL and a PC or laptop
- Enabling Remote Operation using VNC
- Control the OneExpert DSL using a PC keyboard

Each of these operations is described in the following sections.

Establishing an Ethernet connection

You must have an Ethernet LAN cable to establish an Ethernet connection to the OneExpert DSL.

To establish an Ethernet connection to the OneExpert DSL

- 1 Using an Ethernet cable, connect the OneExpert DSL to same Ethernet LAN as the PC or laptop you will use for the VNC:
 - a Connect one end of the Ethernet cable to the OneExpert DSL Ethernet connector located on the side panel (see [Figure 5 on page 17](#)).
 - b Connect the other end of the Ethernet cable to the LAN.

- 2 From the System Settings menu, select **Remote Operation**, and then do the following:
 - a Check **Enable VNC Server**.
 - b If you wish to specify a new password to access the OneExpert DSL, touch **VNC Password**, click in the text box, and then enter a new password.
 - c If you wish to use the OneExpert DSL as a **HTTP file server**, touch the checkbox.
- 3 Configure the Network Profile settings to match your LAN settings.
 - a From the System Settings menu, select **Network**.
If you are connected to the network and the Network is active, the profile settings appear in the box at the top of the menu.
 - b If the settings don't match your LAN touch **Edit Profile** and then modify the settings as needed.

The Ethernet connection is established.

Viewing the device interface on the PC

After you have established an Ethernet connection, you must launch the VNC program to view the device interface.

To view the device interface on the PC

- 1 Launch the VNC viewer on the PC.
- 2 In the viewer's server address field, type the OneExpert DSL's IP address, and then select **OK**.
A password entry box appears.
- 3 Enter the VNC password (found on the Remote Operation menu) and then select **OK**.
The OneExpert DSL user interface appears in the VNC viewer.

- 4 To use a PC or laptop keyboard with the OneExpert DSL's user interface, see ["Using a PC keyboard" on page 33](#).
- 5 If the message, "Failed to connect to server" appears, the VNC viewer was not able to communicate with the OneExpert DSL. If this happens, try the following solutions:
 - Make sure you are using the correct IP address for the OneExpert DSL.
 - From the PC or laptop, ping the OneExpert DSL IP address to verify the network link is working. If the link is not working, restart the OneExpert DSL and repeat [step 1](#) through [step 2](#).

Using a PC keyboard

After you have connected to the OneExpert DSL from a laptop or PC using the VNC viewer, you can use the computer's mouse or keyboard to control the OneExpert DSL. [Table 7](#) shows how the PC/laptop keys map to the OneExpert DSL keypad.

Table 7 PC/laptop to OneExpert DSL key map

PC/Laptop key	OneExpert DSL Keys
F1 through F4	Correspond to the OneExpert DSL system keys
F5	Home
F6	Tray menu
F7	AutoTest
Escape	Cancel
Enter	OK

VNC availability

The VNC program can control the following functions:

In Ethernet TE, you can do a ping, trace route and similar data tests, but *cannot change* any data settings.

In DSL, you can perform modem emulate tests with Data mode *off*.

Ending a remote operation session

To end a remote operation session, either exit the VNC session on the PC/laptop or turn the OneExpert DSL off and then on again (power cycle).

Enabling Bluetooth

The Bluetooth option allows communication with a mobile device or a SmartID+.

To enable Bluetooth

- 1 From the System Settings menu, select **Bluetooth**.
- 2 Touch the box next to **Enabled**. A check mark appears.

You can now use the OneExpert DSL with a mobile device or SmartID+. See [“Using the ONX with a mobile device” on page 177](#) or [“Testing with SmartIDs” on page 135](#).

If any devices are paired with the OneExpert DSL, they are listed on the menu.

To look for other Bluetooth devices, touch the **Scan for devices** system key.

To disable Bluetooth, touch the box to remove the check mark.



NOTE:

The Bluetooth and Wifi interfaces cannot be ON at the same time.

Configuring international settings

The International Setting menu is used to select the language, units of measurement, and other international settings. There are two ways to select international settings:

- Selecting a preset country. These selections automatically configure the settings as appropriate for that country.
- Configuring each setting individually. If you are not in one of the preset countries, or if the settings aren't appropriate for your situation, you can configure each setting individually.

These settings are stored when the unit is turned off.

To configure international settings

1 From the System Settings menu, select **International Settings**.
The International Settings menu appears.

2 *Optional.* Select **Country** to select a preset country.

Selecting a specific country will automatically change the settings as appropriate for that country. For example, selecting Spain will automatically set the language to Spanish, unit of distance to meters, unit of temperature to celsius, noise filter to CCITT, cable size to millimeters, TDR units to m/us, and numerical separator to a comma.

- 3 Change the settings as appropriate for Language, Measurement System, Temperature Units, Time Zone, and Cable Terminology. To change the settings, touch the menu item, and then select an item from the list.

The international settings are configured.

Updating the instrument firmware over a network

The OneExpert DSL firmware can be upgraded in the field using the Ethernet Network port.

To update over an intranet or network

- 1 Download the firmware from the Viavi OneExpert DSL downloads page <http://goo.gl/CkUCXJ>.
- 2 Obtain the IP or FTP address where the firmware file is located, as well as the User Name and Password.
- 3 Connect the OneExpert DSL to the AC charger adapter to ensure an uninterrupted supply of power during the update.



WARNING: ELECTRICAL SHOCK

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

- 4 From the System Settings menu, select **Network Software Update**.

- 5 Touch **Update URL** and then enter the complete IP address where the file is located.



NOTE:

In order for the update to work, you must enter the **complete** address, including the server and directory. For example, ftp://ftp.<your company>.com/<directory name>

- 6 Touch **Username** and then enter the User Name for the address.
- 7 Touch **Password** and then enter the Password for the address.
- 8 Select the **Update** system key.
The update status is displayed on the screen.



NOTE:

The update will take several minutes.

The unit powers down when done.

Updating firmware using USB Flash

The OneExpert DSL firmware can be upgraded in the field using the USB port.

To update over USB

- 1 Download the firmware from the Viavi OneExpert DSL downloads page <http://goo.gl/CkUCXJ>.

- 2 Connect the OneExpert DSL to the AC charger adapter to ensure an uninterrupted supply of power during the update.



WARNING: ELECTRICAL SHOCK

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

- 3 Connect a USB flash drive to the USB connector on the right panel. The OneExpert DSL will auto-detect the USB drive. This USB should contain the update file.
- 4 From the System Settings menu, select **Network Software Update**.
- 5 Touch **USB Update Path** and then select the update file.
- 6 If the update doesn't start automatically after selecting the file, select the **Update** system key.
The update status is displayed on the screen.



NOTE:

The update will take several minutes.

The unit powers down when done.

Viewing unit options and revisions

The following procedure describes how to view unit options and revisions.

To view unit revisions and options

- 1 From the System Settings menu, select **Hardware/Software Revisions**.

The revisions of the internal components and the software versions appear. The unit's unique ID number also appears on this screen. You will need the unit ID if you are adding options to the unit.

- 2 From the System Settings menu, select **Options**.
A list of the unit's options appear and reports whether the option is enabled.

Viewing revisions and options is complete.

Installing options

To install options

- 1 Before installing options, upgrade to the latest firmware (see [“Updating the instrument firmware over a network” on page 36](#) or [“Updating firmware using USB Flash” on page 37](#). You can find the firmware on Viavi's OneExpert downloads page <http://www.viavisolutions.com/en/products/network-test-and-certification/copper-dsl-wifi-and-broadband/oneexpert-dsl-modular-field-test-platform>.
- 2 If you received the option file by email (instead of a USB stick), save the option file to a USB drive.
- 3 Insert the USB drive into the ONX-580.
- 4 From the main menu, touch the **System** menu item.
The collapsible menu opens
- 5 Select USB File Browser.
- 6 Highlight the option file on the USB drive.
- 7 Select **File Option**, and then **Copy to Internal**.
The file is copied to the internal file browser.
- 8 Press the Home button.

- 9 *Optional.* Touch the **System** menu and then select **File Browser** to verify that the option file was copied to the unit.
- 10 Turn off the power and turn it back on.

Restoring factory defaults

The following procedure describes how to reset the OneExpert DSL to factory default settings.



NOTE:

Restoring factory defaults resets test application settings and system settings (such as brightness, contrast, and volume), and powers down the unit.

To reset to factory defaults

- 1 From the System Settings menu, select **Restore Factory Settings**.
- 2 At the prompt, press the **OK** key to restore the factory default settings. Press the **Cancel** to exit the prompt.

Changing screen and power settings

The Screen and Power Management menu allows you to adjust the brightness of the backlight, set the backlight timeout, and set the Power Off Delay.

To specify screen and power management settings

- 1 Select **Screen & Power Management**.
- 2 Select **Backlight** and then adjust the brightness of the backlight using the left or right arrow key.

- 3 Select **Backlight Timeout** and then select an amount of time to wait before the backlight dims.
- 4 Select **Power Off Delay** and then select the amount of idle time to wait before the unit automatically powers itself off.
Idle time refers to no key presses and no line activity. So, if you set the power off delay to 5 minutes and then begin a 15 minute test, the unit will not power down during the test because there is line activity.



NOTE:

The OneExpert DSL will not automatically power down when connected to the AC adapter.

The screen and power management settings are specified.

Specifying user information

The User Information menu allows you to enter specific information related to the technician using the OneExpert DSL. This includes the technician name, technician ID, location (city, county, state, country, postal code, and garage), and the account ID. This information is used when synchronizing with the StrataSync server.



NOTE:

A valid account ID must be entered in order to synchronize with the StrataSync server.

To specify user information

- 1 From the System Settings menu, select **User Information**.
- 2 Specify the user's first and last name, workgroup, company, email address, and other information.
- 3 Press the Back/Cancel function key to exit the menu.

Specifying network profiles

The network button is used to specify and store network profiles and to enable or disable a network profile.

To specify network profiles

- 1 From the System menu ([Figure 9 on page 28](#)), touch the **Network** button.
A list of network profiles appears. If you are currently connected to a network, that profile will appear at the top of the menu.
- 2 To modify a profile
 - a Highlight the profile and then select **Edit Profile**.
 - b Select **Profile Name** and then enter a name for the profile.
A descriptive name such as “Downtown IPv4/IPv6 Stateless” allows easier recognition by other technicians (vs “Garage1” or “Branch7”).
 - c Select **Network Mode** and then specify the network mode: IPv4, IPv6, or IPv4/IPv6 Dual Stack.
Depending on the Network Mode, you may have one or more additional settings to specify.
 - d If you selected IPv4, do the following:
 - Select **IPv4 Address Mode** and then select **Static** or **DHCP**.
If you selected DHCP, you are finished.
 - If you selected Static address mode, specify the following:
 - IPv4 Address** (The OneExpert DSL's IP address to the access the provider network),
 - IPv4 Netmask** (IP devices use a netmask IP address to determine if IP packets are to be routed to other networks or sub-networks)
 - IPv4 Gateway** (The OneExpert DSL OneExpert DSL's gateway address. When an IP device has determined that a packet is not addressed to it or devices on the same sub-network (subnet), it sends all

such packets to the gateway address for further routing to the correct address.

IPv4 DNS Server (If the IP Mode is Static enter the address of the DNS server.)

- e If you selected IPv6, do the following:
 - Select **IPv6 Address Mode** and then select **Manual/Static, Stateless or DHCPv6**.
If you selected DHCPv6, you are finished.
 - If you selected Stateless address mode, specify the following:
IPv6 DNS Address Mode (how the OneExpert DSL obtains the DNS address) and then select **Manual** or **DHCPv6**.
If you selected DHCPv6, you are finished.
If you selected Manual, enter the **IPv6 DNS Server** address (the address of the DNS server).
 - If you selected Manual address mode, specify the following:
IPv6 Global Address (The OneExpert DSL's IPv6 address to the access the global network).
IPv6 Local Address Mode (how to access the local network: manual or automatic. If you select manual, enter the **IPv6 Local Address**).
IPv6 Subnet Prefix Length (specify the length of the subnet prefix, from 0 to 128).
IPv6 Gateway (The IPv6 gateway address)
IPv6 DNS Address Mode (how the OneExpert DSL obtains the DNS address) and then select **Manual** or **DHCPv6**.
If you selected DHCPv6, you are finished.
If you selected Manual, enter the **IPv4 DNS Server** address (the address of the DNS server).
- f If you selected IPv4/IPv6 Dual Stack as the IP mode, do the following:
 - Select **IPv4 Address Mode** and then specify settings as described in [step d](#) above.
 - Select **IPv6 Address Mode** and then specify settings as described in [step e](#) above.
- g Press the Back/Cancel navigation key to return to the Profiles screen.

The network profile is updated.

- 3 To disable a network profile, highlight the profile, and then touch the **Network Off** button. The profile is disabled. NOTE: This only disables the profile from being loaded onto the unit; it will not disable the actual network.

Synchronizing to the StrataSync server

StrataSync® is a hosted, cloud-based software application that provides Viavi instrument asset, configuration, and test-date management. StrataSync manages inventory, test results, and performance data anywhere with browser-based ease and improves technician and instrument efficiency. This service is provided free of charge for the first year.

Features include the following:

- Tracking ownership of the OneExpert DSL
- Pushing certain configuration settings to the OneExpert DSL
- Receiving certain configuration setting from the OneExpert DSL
- Adding and/or removing software options on the OneExpert DSL
- Updating the software on the OneExpert DSL
- Updating the software on the modem
- Clone a device (create a “golden” unit)

To obtain the latest configuration settings, software options and updates, and ownership registration information, the OneExpert DSL can synchronize with a Viavi server via the internet. The synchronization also stores any user files saved on the unit to the StrataSync server. This procedure should be undertaken immediately upon receipt of the unit and on a regular (daily) basis thereafter to ensure that the unit is as up-to-date as possible and to allow all user information to be backed up. Before attempting to synchronize with StrataSync, please confirm your server settings with your manger or your company's IT organization.

To sync with StrataSync

- 1 If you haven't already done so, specify the user information on the User Info menu (see ["Specifying user information" on page 41](#)). A valid account ID must be entered in order to synchronize with the StrataSync server.
- 2 From the System menu ([Figure 9 on page 28](#)), touch the **StrataSync** button.
The StrataSync settings menu appears.
- 3 Specify the settings.

Setting	Description
StrataSync Account ID	Enter the account identification number. Only change this if necessary.
StrataSync Tech ID/ User ID	Enter the technician/user identification number.
Interface	Specify which connector to use - 10/100 Ethernet or xDSL.
Server Name	Enter the DNS name for the server. default name: "https://stratasync.viavisolutions.com"
Server Port	Enter the server port number. default port: 443

- 4 Touch the **Start** button.
As the process runs, the sync state is displayed on the screen.

- Upon synchronization with the StrataSync server, the unit will send to the server the following information:
 - The unit's serial number.
 - The unit's hardware information - constituent assemblies and their revision levels.
 - The unit's MAC address.
 - The unit's User settings - name (user/technician) and ID.
 - The last calibration date of the Copper board
 - Software update milestones (includes status and warnings, if applicable)
If the configuration information contained on the server is newer than that on the unit, the server will be considered to be the most up-to-date.
- The server will then send any files to the unit being synchronized that it determines are newer than those on the unit.
- The unit will then send any Reports, Configuration profiles, XML results, screen shots, etc. that have been saved on the unit since the last configuration.
- The server then applies any applicable Options to the unit.



NOTE:

If an Option Code was entered as a part of synchronization, power must be cycled to the unit to complete the process and initialize the option.

- Copy (“clone”) the configuration settings for the base unit, as well as any company-specific configurations such as custom filters, web bookmarks, and FTP passwords. This can be used to create a “golden” unit.
- Lastly, if any upgrades are available, the user will be informed of their availability and asked to verify their desire to receive the upgrade.

When synchronization is complete, the Status will indicate “Sync Complete”. The unit may be disconnected from the server.

Managing files

The OneExpert DSL file browser is used to open, rename, copy, or delete saved result files, screen shots, or other files.

To manage saved result files

- 1 From the System menu ([Figure 9 on page 28](#)), touch the **File Browser** button.
The File Manager screen is displayed with all files.



NOTE:

If you have a USB flash drive connected to the OneExpert DSL, there is a **USB File Browser** button on the System menu, in addition to the File Browser. Both browsers operate in the same manner.

- 2 Use the up and down arrow keys to move among folders and files.

Opening files or folders

To open a file or folder

- 1 To highlight the file or folder, either use the up/down arrows, or touch the item.
- 2 To open the file or folder, either touch the item or press the OK key. The contents of the folder appear or the file is displayed on the screen.

Copying and pasting files

To copy files

- 1 Using the up and down arrow keys, highlight the desired file, and then press the **File Options** system key.
- 2 Do one of the following:
 - Select **Copy**, navigate to another folder or drive, press the **File Options** system key, and then select **Paste**.
The file is pasted and the File Manager screen appears.
 - Select either **Copy to USB** if you are using File Browser or **Copy to Internal** if you are using the USB File Browser.
The file is copied and the File Manager screen appears.

Uploading files (FTP/HTTP)

To upload files

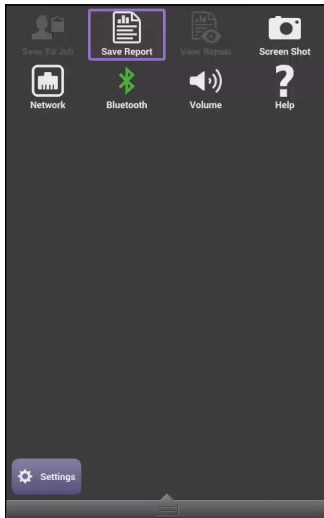
- 1 Using the up and down arrow keys, highlight the desired file.
- 2 Press the **File Options** system key, and then select **Upload FTP/HTTP**.
The Upload settings appear.
- 3 Specify the **Upload URL**, **Username**, and **Password**.
- 4 Touch **Apply**.
The upload starts.

When the upload finishes, a message appears stating that the selected files were uploaded. Press OK to close the message.

Using the tray menu

The tray menu, shown in [Figure 10](#), can be accessed either by pressing the Tray function key or by swiping downward from the top of the screen.

Figure 10 Tray menu



Saving a report

If you are currently running a test, you can save test results as a report.

To save a report

- 1 Access the Tray menu and then touch **Save Report**.
You must have an active test or the text will be gray.
A Save Report window appears.
- 2 Enter the name of the report.

- 3 Specify the format for the report.
- 4 Select whether to view the report after saving.
- 5 Touch **Save**.
The current test results are saved as a report.

Viewing a report

If you have a saved report, you can view the report.

To view a report

- 1 Access the Tray menu and then touch **View Report**.
You must have a saved report or the text will be gray.
A View Report window appears, showing all of the saved reports.
- 2 Select a report to view.
The report appears on the screen.

Capturing a screen shot

In addition to or instead of a report, you can capture an image of the current screen.

To capture a screen shot

- 1 Access the Tray menu and then touch **Screen Shot**.
- 2 Enter a name for the screen shot.
The PNG file is saved to the internal file manager.

To capture the tray menu or a popup menu

If you wish to capture the tray menu itself, or if you wish to capture a popup menu, do the following:

- Press and hold the tray key for 5 seconds.

Disabling the network

The tray menu allows you to disable the network profile.

To disable the network

- Access the Tray menu and then touch **Network: Disabled**.
NOTE: This only disables the profile from being loaded onto the unit; it will not disable the actual network.

Enabling Bluetooth

The tray menu offers a shortcut to enable or disable Bluetooth connection.

To enable or disable Bluetooth connection

- Access the Tray menu and then touch **Bluetooth**.
To verify whether Bluetooth is enabled, go to the System Settings menu and view the Bluetooth menu. A check mark appears when Bluetooth is enabled.

Setting the volume

The tray menu allows you to control the instrument volume.

- 1 Access the Tray menu and then touch **Volume**.
The volume scroll bar appears.
- 2 Either touch the + / - buttons on the screen or swipe your finger across the bar to move the line on the bar, adjusting the volume.

Accessing and Viewing the User's Guide

The User's Guide can be viewed on the instrument or viewed through StrataSync.

Viewing the User's Guide on the instrument

Using the instrument's PDF viewer, you can view the User's Guide on the instrument. The file must be on a USB stick or copied to the ONX.

- 1 Under the System menu, select **File Browser**.
- 2 Navigate to find the **22052280r00x_OneExpertDSL_Users-Guide.pdf** file.
- 3 Touch the file name to open it.

The PDF reader application launches with the User's Guide open.

Accessing the User's Guide through StrataSync

The User's Guide is available to view using StrataSync.

Do one of the following:

- Using a web browser, click on the link <http://goo.gl/B8HbYk>
- Manually enter the URL above.
- Use the following QR code:



StrataSync appears, with the Help menu open. Under **Contents**, select **Instrument Documentation**.

TrueSpeed DSL Testing

This chapter provides task-based instructions for using the OneExpert DSL to gather DSL (VDSL, ADSL2+/2/1) statistics and verify connectivity. Topics discussed in this chapter include the following:

- [“About xDSL testing” on page 56](#)
- [“Selecting the test mode” on page 56](#)
- [“Specifying test settings” on page 57](#)
- [“Testing the physical layer” on page 64](#)
- [“Testing line quality” on page 64](#)
- [“Terminating the loop \(SELT\)” on page 65](#)
- [“Testing the data layer” on page 66](#)

About xDSL testing

The purpose of the DSL tests are to assess the quality of the xDSL signal and to verify the xDSL rates achieved at various points in the network.

The tests involve three main steps:

- selecting the test mode and specifying test settings
- connecting to the line
- running the tests

There are two ADSL/VDSL modules: Annex A Single & Bonded, and Annex A/B Single.

The ADSL/VDSL Bonding Option, order number ONX580-BONDED, is available for purchase.

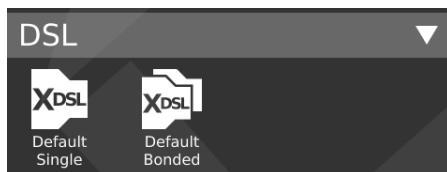
For additional information about OneExpert DSL options and services, contact your local Viavi representative or contact Viavi through the company web site, www.viavisolutions.com.

Selecting the test mode

Before running any DSL tests, you must specify the test mode and specify test settings.

To select the test mode

- 1 From the main menu, select **DSL**.



- 2 Select the test mode.
 - Single DSL (one pair) (available on both Annex A/B and Annex A Bonded modem)
 - Bonded DSL (two pairs) (only available on Annex A Bonded modem)The Connection Details menu appears.
- 3 Specify test settings. See [“Specifying test settings” on page 57](#).



CAUTION:

The modem has an exposed heat sink on the back of the instrument that must maintain unobstructed contact with ambient air. If the heat sink is blocked in any way it can become extremely hot, and modem performance can suffer. It is recommended that the unit not be operated flat on its back (heat sink down) in any DSL mode, for more than 15 minutes.

Specifying test settings

Before you begin testing, make sure the test settings on the OneExpert DSL match the settings of the line that you are testing.

- To access the setup screen, select the **Tests & Settings** system key or use the tray menu (swipe down from the top or press the tray system key).

Loading a test profile

If you have previously specified the settings and saved the test profile, you can load that profile so you don't have to specify all of the settings again.

To load a saved profile

- 1 Touch the **Load** button.
A list of Modem Settings profiles appears. (If no profiles have been saved, the list will be empty.)
- 2 Select the profile to load.
The settings are loaded.

Specifying DSL settings

- 1 From the Tests & Settings menu, touch the **Modem Settings** button.
- 2 Select **DSL Interface** and then specify whether to use the RJ45 connector or T/R/G (Tip/Ring/Ground) as the DSL interface.
- 3 Select **xDSL Technology**, and then select **VDSL**, **ADSL**, or **xDSL (Auto)**. The Auto setting queries the DSLAM for the technology.
- 4 Select **Analog Technology** and select xDSL over POTS or xDSL over ISDN. The Annex A Bonded modem is automatically set to xDSL over POTS.
- 5 Do one of the following:
 - If you selected ADSL as the Technology, select **Standard & Annex** and then specify the ADSL standard and annex (such as Auto + Annex J or ADSL2+ Annex M).
 - If you selected VDSL as the Technology, specify the **VDSL Profile** (such as 8A or 12B).
- 6 If you selected either VDSL or Auto as the Technology, select **VDSL Vectoring** and specify **Full**, **Friendly**, or **Off**.

Vectoring technology is used on VDSL2 connections to reduce FEXT from other pairs in a binder group resulting in higher downstream and upstream rates for all the pairs in the group. Vector mode is available for VDSL circuits only (not available for ADSL2). Vector Friendly mode is suggested when there is a need to emulate CPE incapable

of full vectoring, but which have been designed to synchronize to a vectoring DSLAM without losing sync. It is a special software that is downloaded to the VTU-R modem enabling it to respond to a vectored request from a VTU-O to allocate net data rates across all bearer channels and to minimize excess SNR per channel.

- 7 Select **Transport Mode**, and then specify ATM, PTM, or Auto. This specifies whether data is transported over Asynchronous Transfer Mode (ATM) or Packet Transfer Mode (PTM). The Auto setting queries the DSLAM for the transport.
- 8 Specify the **ATM Layer** settings. This section only appears if you specified Auto or ATM transport mode.
 - a Select **Encapsulation** and then select **LCC-SNAP** or **VC-MUX**.
 - b Set the **VC Count** between 1 and 4.
 - c Specify the VC settings for each virtual channel (VC 1 through VC 4): VPI, VCI, and VC Mode (**Tx Rx** or **Rx only**)
- 9 Select **Advanced DSL Settings** and then specify the following:
 - a Specify whether to use **DSL Retransmission** upstream or downstream. This setting is only available in non-bonded mode. This specifies whether the unit will advertise upstream or downstream G.INP support to the DSLAM. If the selection is changed, the modem resyncs in order to apply the new setting.



NOTE:

Enabling DSL Retransmission (adding the check mark) only *advertises* support to the DSLAM. It does not guarantee the connection will use DSL Retransmission (G.INP) because G.INP is specified in the CO configuration.

- b Specify whether to use **PhyR** (impulse noise protection technology) upstream or downstream.
 - c Specify whether to use **SRA**. Seamless Rate Adaptation changes the data rate while in operation without any interruption to data service.
 - d Specify whether to perform **Bitswapping**.
 - e If you selected VDSL or Auto as the Technology, select **V43 Tones** and enable or disable V43 tones. V43 tones are typically used during training, but your test requirements may include disabling these tones. This selection is not available if in ADSL mode. If vectoring is enabled, it is recommended that V43 tones are disabled.
 - f Select **24k Interlv Depth**, and then select **On** or **Off**. Interleaving splits data packets into smaller bits, and then rearranging them so that contiguous data is now spaced further apart into a non continuous stream (and re-assembled by the modem). This is effective for lines susceptible to bursts of noise.
- 10 Select **Network Settings** and then specify the following:



ALERT: FAULTY RESULTS

Any time the Network settings are changed, the network layer resets. If you change these settings during a test, you may cause errors in the test. Only change them before you begin a test.

- a Select **Network Type** and then specify Through-Bridge or Terminate
The two modes include the same testing capabilities, but the difference is in the IP addressing.
In **Terminate** mode, the OneExpert DSL replaces the modem and test interface.
In **Through-Bridge** mode, the OneExpert DSL replaces the modem, hub, and test interface. It does not use a DHCP server so it does not assign IP addresses to other equipment.

The end equipment uses either the service provider-supplied IP address or one that is on the same network (same netmask).

- b Select **Data Mode** and then specify **IPoE**, **PPPoE**, or **MultiVLAN**. **None** turns the data layer off.
- c Select whether to do **Automatic Login**.
- d Select **MAC Address Mode** and specify factory default or user defined.
- e Specify whether VLANs are used (a check mark indicates they are used).
- f If VLANS are used, specify the following:
 - Enter the **VLAN ID** and **Priority**.
 - Select **IP mode** and then specify the network mode: IPv4, IPv6, or IPv4/IPv6 Dual Stack.
 - Specify the network settings as described in [“Specifying network profiles” step 2d to g](#).

Press the Back/Cancel navigation key to return to the main screen.

Saving test profiles

After specifying the test settings, you can save them as a test profile.

To save test profiles

- 1 From the Setup & Tests screen, touch the **Save** button.
- 2 Enter a name for the profile.
- 3 Specify whether the profile will be shown on the Home screen
- 4 Touch **Save**.

The profile is saved.

Connecting to the line

The method used to connect to the line varies depending on the test mode and line configuration.

Connecting to a single twisted pair

To connect to a single twisted pair

- 1 Using the RJ-45 to telco clips cable, connect the **RJ-45 to bed of nails** test lead to the **DSL** connector on the right panel of the OneExpert DSL.
- 2 Connect the **RJ-45 to bed of nails** test leads to the desired pair, black to tip(A) and red to ring(B).

The line is connected.

Connecting to bonded twisted pairs

To connect to bonded twisted pairs

- 1 Using the RJ-45 to telco clips cable, connect the **RJ-45 to telco clips** test lead to the **DSL** connector on the right panel of the OneExpert DSL.
- 2 Connect the **RJ-45 to telco clips** test leads to the pairs: black to tip(A) and red lead to ring(B) for pair one; blue to T1 and yellow to R1.

The line is connected. The modems begin to train on the lines automatically.



NOTE:

You may see both lines sync, drop, and then re-sync again. This is typical for bonded lines. The modems include a test probe that syncs both pairs, drops, and then re-syncs in bonded mode.

If one of the pairs is not capable of bonding, or the pairs do not bond, a red error message box appears.

Connecting to a single pair at the NID/demarc

To connect to a single twisted pair using the “Y” cable

- 1 Connect the single end of the test cable to the jack on the side of the OneExpert DSL.
- 2 Connect the blue end of the cable to Modem on the NID/demarc.

The line is connected.

Connecting to bonded pairs at the NID/demarc

To connect to bonded twisted pairs

- 1 Using the RJ-45 “Y” cable, connect the single end of the “Y” test cable to the jack on the side of the OneExpert DSL.
- 2 Connect the blue end of the cable to Modem 1 and the orange end of the cable to Modem 2 on the NID/demarc.

The line is connected. The modems begin to train on the lines automatically.



NOTE:

You may see both lines sync, drop, and then re-sync again. This is typical for bonded lines. The modems include a test probe that syncs both pairs, drops, and then re-syncs in bonded mode.

Testing the physical layer

You can use the OneExpert DSL OneExpert DSL to test the physical layer of the xDSL link. The following procedure describes the basic test for the DSL link.

To perform a basic DSL link test

- Connect to the line and allow the unit to train on the line.

If the unit achieves sync, you have verified the physical layer.

Testing line quality

Once connected to the line, the OneExpert DSL OneExpert DSL gathers statistics for the line. These statistics are used to determine the line quality.

To test line quality

- 1 Connect to the line. See [“Connecting to the line” on page 62](#).
The modem begins the training process automatically. When it reaches show time, the OneExpert DSL begins gathering statistics.
- 2 Use the **Connection Details** and DSL Graph buttons to view different types of statistics.

If the unit achieves sync at the desired data rates, noise margins, and attenuation, the DSL link is good.

- 3 Use the Tray menu to save the results. See [“Saving a report” on page 49](#).

For more information on the results, see [“DSL Results” on page 185](#).

Terminating the loop (SELT)

Single End Loop Test (SELT) is used to test a copper loop when there is no equipment installed at the far end. It is typically used for pre-qualification, that is, testing whether a loop is capable of supporting DSL service. In some cases, SELT testing is aided by placing a termination at the far end of the line. This test sets the VDSL modem to provide a line termination where the modem is idle and not transmitting.

To run a SELT termination

- 1 On the right panel of the OneExpert DSL, connect one end of the test cable to the **DSL** connector, and the other end to the line under test.
- 2 From the main menu, select **DSL**, and then select **Single DSL**.
- 3 Access the Tray menu by either swiping downward from the top to the bottom of the screen or by pressing the Tray function key.
- 4 Select the **SELT** system key
After initializing the modem, the SELT verification screen is displayed.
- 5 The far end technician can continue testing.

Testing the data layer

Using the data layer tests, you can test for connectivity and throughput. See [Chapter 5 “Data Testing”](#).

After running the test

When you finish your test, you can put away the test cables in the glove.

- Wrap the cable in a circle and put into the pocket on the front of the glove.

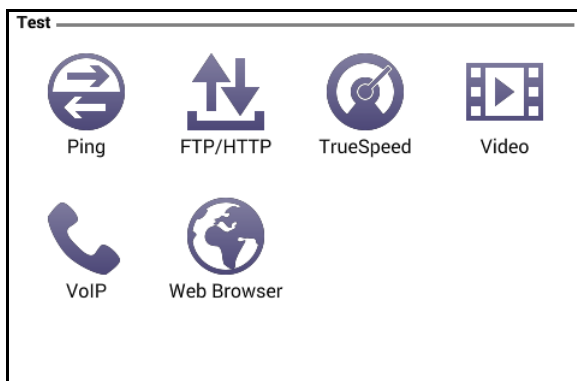
Data Testing

This chapter provides task-based instructions for using the Data testing features of the OneExpert DSL. The data layer tests allow you to test for connectivity and throughput. These tests can be performed on DSL or Ethernet circuits. Topics discussed in this chapter include the following:

- [“Ping testing” on page 68](#)
- [“Testing FTP throughput” on page 69](#)
- [“TrueSpeed testing” on page 70](#)
- [“Video testing” on page 72](#)
- [“VoIP Testing” on page 83](#)
- [“Browsing the web” on page 92](#)

About Data Tests

The Data Tests are available using the **Tests & Settings** system key when on Ethernet or DSL circuits.



Ping testing

The ping test sends a ping packet through the modem to an IP address or DNS name (could be a network switch or web address) to test for connectivity.

To perform a ping test

- 1 If you haven't done so, specify the settings for the DSL or Ethernet interface and then connect to the line.
- 2 Select the **Tests & Settings** system key.
- 3 Touch **Ping**.

- 4 Touch the **Settings** button and then specify the Ping Test settings.
 - a Select **Destination Type** and then select IPv4 Address, IPv6 Address, or DNS Name.
 - b Enter the **Destination** IP address or DNS name.
 - c Specify the **Transmit Count** (how many total ping packets to send), **Transmit Interval** (amount of time between packet transmissions), and **Transmit Size** (how many ping messages are in each packet).
 - d Touch the **Results** button.
- 5 Use the Tray menu to save the results. See [“Saving a report” on page 49](#) or [“Saving a report” on page 49](#).

The ping test is complete.

Testing FTP throughput

Using the FTP test, you can perform a file transfer to test the throughput of the circuit.

To test throughput

- 1 If you haven't done so, specify the settings for the DSL or Ethernet interface and then connect to the line.
- 2 Select the **Tests & Settings** system key.
- 3 Touch **FTP**.
- 4 Touch the **Settings** button and then specify the **Transfer Type**, **Concurrent Transfers**, **Repeat Transfer Count**, **Download Protocol**, **Download URL**, **Download Username**, **Download Password**, and **HTTP Auth Type**.
- 5 Touch the **Results** button.

The File Transfer Results appear on the screen.

See [“File Transfer results” on page 194](#) for information on interpreting the results.

TrueSpeed testing

The OneExpert DSL’s optional TrueSpeed test provides a repeatable, standards-based test methodology to resolve complaints about poor network performance. With TrueSpeed, you can quickly evaluate the customer experience of their network and provide actionable information to resolve problems.

Based on the IETF RFC 6349 TCP throughput testing methodology, TrueSpeed provides metrics that can be used to tune TCP parameters for obtaining maximum throughput.

To run a TrueSpeed test

- 1 If you haven’t done so, specify the settings for the DSL or Ethernet interface and then connect to the line.
- 2 Select the **Tests & Settings** system key.
- 3 Touch **TrueSpeed**
- 4 Do one of the following:
 - a Select an existing test profile.
 - b Specify a new test profile.
 - Enter the name of the profile.
 - Specify the up/download CIR (committed information rate). For each direction, this should be configured to either the physical line rate or the provisioned rate, whichever is lower.

The TrueSpeed test screen appears.

- 5 Select **Server Settings** and then specify the settings.
 - a Specify the Destination Type (IPv4 address or DNS name).
 - b Enter the server address.
 - c Enter the server password.
 - d If a fallback server is desired, check the box to enable the server.

Select the back arrow to return to the TrueSpeed test screen.

- 6 Touch **Start**.

The network diagram at the top of the screen indicates test status. As the test runs, the speedometer moves to indicate the measurement. Green indicates the ideal rate. Blue indicates the peak rate observed during the current measurement.



NOTE:

The green and blue measurements appear during the test only. The speedometer returns to 0 at the end of the test.

After the test finishes, the round trip time appears above the speedometer and the actual upload and download speeds appear below the speedometer. For more detailed results, select Results (see [“TrueSpeed results” on page 195](#)).

If the test fails, an error message appears (for example, Server Busy or Aborted Due to Excessive Loss).

- 7 If you wish to test again with a different profile, select the **Profiles** system key, select the profile, and then touch **Start**.

Managing TrueSpeed test profiles

When you enter the test, you can select an existing profile or create a new one, as described above. Additional profiles can be added, existing profiles can be edited, and profiles can be deleted.

- 1 From the TrueSpeed test screen, select the **Profiles** system key and then select **More**.
A list of profiles appears.
- 2 To add a profile, select **Add**, and specify the name and CIR.
- 3 To edit or delete a profile, select the check box next to the profile, and then do one of the following:
 - a To edit the profile
 - i Select **Edit**.
 - ii Change the profile as necessary.
 - iii Touch **OK**.
 - b To delete the profile, select **Delete**.

Video testing

The OneExpert DSL's optional IP video testing features allow verification of video service.

The capabilities of the IP video feature include the following:

- Physical medium test
- IP connectivity test
- Video service verification
 - IP multicast test - Broadcast video service
Generate IGMP "join" and "leave" requests, verifying stream flows, changing channels, and multi-cast communications are working.
 - IP unicast test - VOD video service

Generate RTSP client requests for access to VOD media server, verifying that program stream flows and uni-cast communications are working.

- UT Starcom Rolling Stream service

The IP Video tests are available if you purchase the IP Video test option:

Table 8 IP Video testing options

Option	Description	Order Number
IP Video	The IP Video application	ONX580-IPVIDEO

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

Specifying test settings

Before you begin testing, make sure the test settings on the OneExpert DSL match the settings of the line and network configuration you are testing.



TIP:

Test configurations can be stored for easy recall and use (see “Saving a report” and “Viewing a report” on page 50).

Specifying Video settings

The video settings specify general parameters.

To specify video test settings

- 1 If you haven't done so, specify the settings for the DSL or Ethernet interface.
- 2 Select the **Tests & Settings** system key.
- 3 Touch **Video**.
- 4 Access the system tray (swipe down from the top or press the tray system key).
- 5 Select **Video Settings**.

The following table describes the settings.

Setting	Description
Analysis Type	Select Normal or UT Starcom. Use UT Starcom when analyzing Rolling Stream video streams.
IPv4 IGMP Version	If you are in Terminate mode, specify the version of IGMP signaling being used on the circuit: version 2 or version 3.
RTSP Port	Enter the RTSP port number. This is the port where RTSP signaling communication takes place in a particular network.
RTSP Interoperability	Sets various interoperability tweaks for compatibility with certain RTSP servers. In most situations, Normal is used.
FEC Support	This selection controls whether the OneExpert DSL will try to detect PRO-MPEG FEC error correction for the stream.
IPv6 MLD Version	What version of MLD to use to join and leave multicast streams over IPv6 networks. Only applicable in terminate mode.

- 6 Specify **QoS Thresholds**.

The quality of service (QoS) measurement uses two thresholds – good and poor – to produce three quality ratings: good, poor, and fair. If the value is less than the good threshold, it is considered good and is indicated with a check mark. A value between good and poor is considered fair and is indicated by an exclamation mark. If the value is greater than the poor threshold, it is considered poor and is indicated by an X.

Additionally, RFC 2680 and RFC 3357 define enhanced analysis methods that are used to measure the quality of a media stream. There are two main statistics for this: Loss Period and Loss Distance. The following table describes the settings.

Setting	Description
Leave Latency Pass	Enter the Pass threshold, in milliseconds. Leave Latency is the amount of time between sending the “leave” message and receiving the last video packet on the receiver.
Leave Latency Fail	Enter the Fail threshold, in milliseconds.
Join Latency Pass	Enter the Pass threshold, in milliseconds. Join Latency is the amount of time between sending the “join” message and receiving the first video packet on the receiver.
Join Latency Fail	Enter the Fail threshold, in milliseconds.
Jitter Pass	Enter the Pass threshold, in milliseconds.
Jitter Fail	Enter the Fail threshold, in milliseconds.
Loss Rate Pass	Enter the Pass threshold, in milliseconds.
Loss Rate Fail	Enter the Fail threshold, in milliseconds.
Error Indicator Pass	Enter the Pass threshold.

Setting	Description
Error Indicator Fail	Enter the Fail threshold.
PID Timeout	Enter the PID Timeout. This is the amount of time to wait for a PID that has been declared as having video or audio data for traffic, since the last traffic was received. If this threshold is violated, then the PID Timeout result will increment.
PAT/PMT Timeout	Enter the PAT/PMT Timeout. This is the amount of time to wait after the last received PAT or PMT packet before declaring a timeout condition (which would then increment the PAT Errors or PMT Errors statistics)
Packet Gap	Enter the packet gap, in milliseconds. Packet gap is the time interval between subsequent packets in a video stream. When the packet gap exceeds the threshold set here, the "Gap Errors" statistic will increment.
Loss Distance	Enter the Loss Distance threshold, in number of packets. This triggers when RTP losses cause a RTP LD Error. "Loss Distance" measures the difference in sequence numbers of two loss events, with a "loss event" being the loss of one or more packets in a row. So for the following stream (1 x 3 4 5 x 8 9 10) the loss distance between the two events is 4. If the loss distance is less than the configured threshold, then the "Loss Distance Error" statistic will increment.

Setting	Description
Loss Period	Enter the Loss Period threshold, in number of packets. This triggers when RTP losses cause a RTP LP Error. "Loss period" is the length of a single loss event, that is, the number of lost packets between two successfully received packets. So for the following example stream (1 x x x 5 6 7 x x 10 x 12), there are three loss periods, with lengths of 3, 2, and 1.

You are finished specifying Video settings.

Specifying stream settings

The stream settings allow specifying details for a specific stream.

To specify stream settings

- 1 From the Video testing menu, tap on the stream.
- 2 Specify the following:

Setting	Description
Stream Name	Enter a name for the stream.
Stream Type	Select the video stream type.
Stream IP Address	Enter the IP address of the stream.

You are finished specifying stream settings.

Mapping channels

The channel map is similar to the stream settings because you can specify stream names and addresses, but the channel map allows you to customize your channel list using a spreadsheet program, such as Excel.

To specify a channel map

- 1 Insert a USB stick in a USB port on the ONX.
- 2 In the System menu, select File Manager.
- 3 Using the File Browser, locate the ChannelList.txt spreadsheet in the “documents” directory.
- 4 Copy the file to the USB stick.
- 5 Transfer the file to your PC.
- 6 Open the file from your PC using *Excel* or *OpenOffice.org Calc*.
- 7 Specify the channel information.

Field	Definition
Channel	The channel number
Short name	An abbreviated channel name, up to 10 characters in length. Extended (ie non-latin) characters are allowed, however all characters are not guaranteed to be in the display font set. If problems are encountered, switch to a latin character set based name.
Long name	A longer channel name. Extended (ie non-latin) characters are allowed, however all characters are not guaranteed to be in the font set. If problems are encountered, switch to a latin character set based name.

Field	Definition
Stream type	Valid stream types are described below.
– auto	Auto discover the stream type, works for all non-rtsp stream types.
– udp	An MPEG2-TS stream directly over UDP
– rtp	An MPEG2-TS stream over RTP then UDP
– tts	An MPEG2-TTS (timestamped TS) stream over RTP then UDP
– tts-udp	An MPEG2-TTS (timestamped TS) stream directly over UDP
– isma	A codec mapped directly into an RTP wrapper over UDP (no TS layer).
– roll	UT-Starcom rolling stream (Modified MPEG2-TS over RTP).
– rtsp	An RTSP negotiated unicast stream using MPEG2 TS-UDP or MPEG2-TS-RTP-UDP for transport.
– rtsp-tcp	An RTSP negotiated unicast stream using MPEG2 TS-TCP or MPEG2-TS-RTP-TCP (interleaved) for media transport.
– rtsp-isma	An RTSP negotiated unicast stream using ISMA over UDP for transport.
– rtsp-isma-tcp	An RTSP negotiated unicast stream using ISMA over TCP for transport.
Destination IP	The Destination IP of the stream. In the case of rtsp this will contain the complete RTSP URL.
Destination Port	The destination port number of the stream.

For more information on specifying the channel map details, refer to the “Instructions” sheet in the channel map file.

- 8 Save the channel list.
 - a If using Excel, do the following:
 - Make sure that the “Channel List” sheet is the active sheet.
 - Save the file in “Text (Tab delimited)” format. If prompted, select Ok or Yes.
 - The OneExpert DSL can automatically convert most UTF-16 files, however if you get conversion errors use an external editor (such as jedit) to convert the file to UTF-8 format.
 - b If using OpenOffice.org Calc, do the following:
 - Make sure that the “Channel List” sheet is the active sheet.
 - Save the file in “Text CSV (.csv)” format.
 - In the “Export of text files” dialog that will pop up:
 - Set the Character set to “Unicode (UTF-8)”
 - Set the Field delimiter to “{Tab}”
 - Set the Text delimiter to nothing (delete the quote character in the text box)
- 9 Transfer the ChannelList.txt file to the OneExpert DSL’s file system, in the “documents” directory.
- 10 Launch the Video feature.
- 11 Tap on a stream.
- 12 Select **Channel Selection** at the bottom of the screen.

Your saved channels appear in the Channel Map section of the list.

Connecting to the line

After specifying the test settings, you can connect to the line. The procedure is different depending on the access interface.

- For Ethernet connections, connect as described in [“Connecting to the line” on page 101](#).
- For DSL connections, connect as described in [“Connecting to the line” on page 62](#).

Analyzing video streams

The OneExpert DSL analyzes the video data packet flow at the packet level. Since the initial video quality is established by the source material and encoding process at the head end, and the decoding quality is established by the receiver, the effects of the transport and access networks on the video streams are the variables requiring analysis. Actual video content decoding is not performed.



NOTE:

The data connection must be established for video streams to be visible to the OneExpert DSL and the video statistics screens to show activity.

After the OneExpert DSL is setup, it can analyze video performance. Up to three streams can be simultaneously analyzed in Terminate mode. In monitor mode, up to 3 simultaneous streams can be analyzed at one time, with statistics available for up to 10 previous streams. To view statistics on another stream, use the up or down arrow keys.

Terminate mode

In the terminate mode, you can emulate a set-top-box and request broadcast programs.

To run IP video tests in Terminate mode

- 1 Verify that the network connection is established.
- 2 Select a stream.
- 3 Touch the Play/Stop button (triangle/square) to request the program material.
This initiates the IGMP signaling protocol sequence. The state of the IGMP messaging is shown on the screen. Typically, the status will change from `Idle` to `Media Wait` to `Stream Up`.
- 4 To view additional results, do one of the following:
 - Press the right arrow.
 - Touch the tab for the desired result (for example, touch “Loss” to view the loss results).
- 5 Use the Tray menu (swipe down from the top or press the tray system key) to save the results. See [“Saving a report” on page 49](#) or [“Saving a report” on page 49](#).

QoS Expert

The QoS Expert test compares the quality of service for two streams.

To run the QoS Expert test

- 1 From the Video Terminate screen, touch **QoS Expert**.
- 2 In the left channel box, specify the first channel to examine.
- 3 In the right channel box, specify the second channel to examine.
- 4 Touch the Play/Stop box (right-pointing arrow / square box) for each channel.
- 5 Touch Clear Stream 1 and Clear Stream 2 to reset any initial errors.

6 Compare the results.

See “Video results” on page 199 to learn what your results mean.

VoIP Testing

With the VoIP feature, you can perform the following tasks:

- Place and receive VoIP calls
- Emulate IP terminal equipment
- Trace the call route

Using the optional VoIP testing features, you can emulate a VoIP phone to place and receive VoIP calls.

You can expand your testing capability by purchasing additional VoIP testing options. The options available for purchase are as follows:

Table 9 VoIP testing options

Option	Description	Order Number
VoIP	VoIP application, using SIP signaling	ONX-VoIP
MOS	Mean Opinion Score (MOS) option (requires VoIP option)	ONX-MOS

For additional information about OneExpert DSL options and services, contact your local Viavi representative or contact Viavi through the company web site, www.viavisolutions.com.

To access the VoIP application

- Select an interface (Ethernet TE, Wifi, DSL-Bridge, or DSL-Modem/Router), and then select **VoIP**.

The VoIP phone test involves the following steps:

- Specifying test settings
- Connecting to the line
- Placing and receiving calls

Specifying test settings

Before you begin testing, make sure that the OneExpert DSL settings match the settings of the phone you are emulating.



TIP:

Test configurations can be stored for easy recall and use (see [“Managing test configurations” on page 30](#)).

To specify test settings

- 1 From the VoIP menu, select **Options**.



NOTE:

You must specify the interface settings before specifying VoIP settings. For example, you must configure the Network, LAN, and other applicable settings for a xDSL line.

- 2 Two common settings are available: Outbound Alias and Auto Answer.
 - a Touch **Outbound Alias** to change the Alias. Specify whether the Alias is a Phone Number or Name, and then enter the name or number.
 - b To automatically answer calls, click the **Auto Answer** box.
- 3 To specify additional settings, select **Options** and then **More Settings**.

The following table describes the settings.

Setting	Description
Auto Answer	Specify whether to automatically answer incoming calls. Yes means all incoming calls are answered automatically. No is the typical setup and means that calls will be answered manually.
Alias (Local and Outbound)	The phone number or name alias that will be associated with the phone that you are trying to emulate. This is included in the connection request messages that are exchanged with the Gatekeeper/Proxy or other endpoint devices. Depending on your network, the alias may specify the registrar. If you have a network that uses one server for registration (the registrar) and another for placing and receiving calls “Alias” specifies the registrar. (“Proxy Address” specifies the server used for placing and receiving calls.)
Use Proxy	If your network uses a Proxy server, check the Use Proxy box.
Proxy Address Type	Only appears if Use Proxy is checked. Select IPv4 Address, IPv6 Address, or DNS Name.

Setting	Description
Proxy Address	Only appears if Use Proxy is checked. Enter the IP Address or DNS Name Address of the proxy server. If you have a network that uses one server for registration and another for placing and receiving calls, the Proxy Address specifies the address for placing and receiving calls ("Alias" specifies the registrar address).
Proxy Port	Only appears if Use Proxy is checked. Enter the port number of the proxy server.
Username	Only appears if Use Proxy is checked. Enter the Proxy User name.
Password	Only appears if Use Proxy is checked. Enter the Proxy Password.
Call Control Port	Enter the Call Control Port number. This is a UDP port that is used for call control messages (for placing and receiving calls).
100Rel Supported	Specify whether 100rel is supported, required, or disabled. 100Rel provides reliable provisional response messages by appending the 100rel tag to the value of the required header of initial signaling messages.
SIP Interoperability	Specify whether standard SIP is used or other SIP interoperability.

Press the right arrow next to **Audio/Codec** to specify Audio Codec settings. The following table describes the settings.

Setting	Description
Audio codec	This selects which codec will be used.
Frame Interval	Set the speech per frame. This is the number of milliseconds of speech per transmission frame when using a sample based codec (such as G.711).
Jitter buffer	Set the jitter buffer size. This is the number of milliseconds of speech that will be collected before an attempt will be made to play the speech back. This allows lost, late, or out-of-sequence packets time to arrive and be reassembled before play-back.
Transmit Source	Select the source of transmission: Voice conversation (transmits and receives live voice), IP voice announce (the unit repeats a sequence of words including the calling party's IP address), Tone
Silence suppression	To enable, check the Silence Suppression box.
RTP IP TOS	The Type of Service field in the IP header.
RTP Port Minimum	Specify the RTP port minimum number. The real-time transport protocol (RTP) port number allows you to identify voice traffic versus other traffic. Some systems only accept RTP traffic on certain port numbers. (It must be a factor of 2.)
RTP Port Maximum	Specify the RTP port maximum number. (It must be a factor of 2.)

Press the right arrow next to **STUN** to specify STUN settings.

STUN (**S**imple **T**ransversal of **U**DP [User Datagram Protocol] Through **N**ATs [Network Address Translators]) allows VoIP calls across a NAT router. These settings should only be changed if necessary.

The following table describes the settings.

Setting	Description
STUN Enabled	To enable, check the STUN Enabled box.
Server Address Type	Select the type of server address: IP Address or DNS Name.
Server Address	Enter the server IP address or DNS Name.
Server Port	Enter the port number of the stun server.
Client Port	Enter the client port number.
NAT Refresh	Specify the NAT refresh rate. This is the number of seconds between messages to the STUN server to keep the NAT mapping alive.



NOTE:

If STUN is enabled, the VoIP network will not come up until the STUN client on the OneExpert DSL has determined the type of NAT used between the OneExpert DSL and the STUN server.

Press the right arrow next to **Quality of Service**, and then specify the QoS settings.

The quality of service (QoS) measurement uses two thresholds – good and poor – to produce three quality ratings: good, poor, and fair.

The following table describes the settings.

Setting	Description
Loss Good Threshold	Enter the Pass threshold, in milliseconds.

Setting	Description
Loss Poor Threshold	Enter the Fail threshold, in milliseconds.
Jitter Good Threshold	Enter the Pass threshold, in milliseconds.
Jitter Poor Threshold	Enter the Fail threshold, in milliseconds.
Delay Good Threshold	Enter the Pass threshold, in milliseconds.
Delay Poor Threshold	Enter the Fail threshold, in milliseconds.
MOS Scale	Select the scaling method. This selection affects the scaling of the CQ-MOS and LQ-MOS results (on the “Call Scores” result screen). This selection is only available if your unit is equipped with the MOS option.

The test settings are specified.

Connecting to the line

After specifying the test settings, you can connect to the line. The procedure is different depending on the access interface.

- For Ethernet connections, connect as described in [“Connecting to the line” on page 101](#).
- For DSL connections, connect as described in [“Connecting to the line” on page 62](#).

Placing and receiving calls

After specifying test settings and connecting to the line, you are ready to place and receive calls.

By placing and receiving calls you can do the following:

- If you can successfully register with the Gateway (or Call Agent/TPS/ Proxy/etc.) you have verified the provisioning.
- If you can successfully place and receive calls from internal and external networks, you have verified connectivity.
- During an active call, you can view statistics such as MOS, Loss, and Jitter, to measure the call quality.

Placing a call

The following procedure describes how to place a VoIP call.

To place a VoIP call

- 1 Select **Options** and then **Outbound Alias**.
This is the number that you are calling.
- 2 If this is not the desired phone number or name, enter the number or name.
- 3 Touch **OK**.
The telephone receiver icon becomes available after registering with the server.
- 4 Select the telephone receiver.
The unit goes off hook and places the call.
- 5 The Summary results appear. Additional results are available on other tabs. To view additional results, touch the tab or swipe right or left.

- 6 *Optional.* To save a report, use the Tray menu. See [“Saving a report” on page 49](#).
- 7 Use the telephone receiver to hang up.
The unit goes back on hook and ends the call.
- 8 To clear the call log, select the **Action** function key and then touch **Clear**.

See [“VoIP results” on page 139](#) to learn what your results mean.

Receiving a call

The following procedure describes how to receive a VoIP call.

To receive a VoIP call

- 1 When the OneExpert DSL signals an incoming call, touch the telephone receiver.
The unit goes off hook and answers the call.
After the call is connected, the results appear.
- 2 Additional results are available on other tabs. To view additional results, touch the tab or swipe right or left.
- 3 *Optional.* To save a report, use the Tray menu. See [“Saving a report” on page 49](#).
- 4 Use the telephone receiver to hang up.
The unit goes back on hook and ends the call.

See [“VoIP results” on page 139](#) to learn what your results mean.

Answering calls automatically

The Auto Answer feature allows you to verify incoming service as well as caller ID service. When the OneExpert DSL OneExpert DSL answers a call, it logs the following information: time the call was answered, caller's IP address, time the call ended.

The following procedure describes how to answer calls automatically.

To answer calls automatically

- 1 Select the **Options** function key, and then check the Auto Answer box.
- 2 Place a call to the OneExpert DSL from a VoIP phone (or a second OneExpert DSL).

The OneExpert DSL answers the call with a voice announcement, and then basic call statistics are provided.

Browsing the web

With the web browser feature, you can provide visual proof to customers that a circuit is correctly provisioned all the way to the Internet. The browser works over both DSL and Ethernet interfaces, allowing you to surf the web from the customer's NID or demarcation point using only the OneExpert DSL. For DSL applications, the browser is a separate mode that allows you to connect to any public web site on the Internet through an internet service provider. The browser can also be purchased as a general global application for use with the Ethernet port.

Because the browser's primary purpose is to demonstrate connectivity, it does not have all the capabilities of typical web browsers, such as Internet Explorer. The web browser has the following limitations:

- The browser does not cache web pages. The OneExpert DSL does not have sufficient memory to cache web pages. Each time a page is selected, the OneExpert DSL re-loads the page.
- The browser does not currently support data entry through the browser. For example, you cannot log into a web mail account.
- The browser does not currently support Java applets, and will not display web pages written in Java. Sites optimized for quick downloads, such as DSLReports.com, are not supported because they are based on Java.

The following sections in this chapter describe how to access and use the web browser.

Accessing the web browser

Like IP ping, you must have an established underlying network connection, such as PPP over Ethernet, before you can use the browser. After you have a successful network connection, the OneExpert DSL's Network LED illuminates green. If the LED is red, the underlying connection is not ready, and the web browser (and IP ping) will not work.

To access the web browser

- Touch the **Web Browser** button.
The web browser display appears.

Navigating the browser

You can navigate the browser as you would with a mobile device, with tapping in text boxes to display the keypad and enter the data, swiping your fingers to scroll, touching links to select them, and so on. In addition, you can connect a USB mouse or a USB keyboard/mouse combination to the OneExpert DSL to navigate the web browser as you would with a desktop computer. Going back or forward one page

Opening a web page

There are two ways to open a web page.

- Enter the address - tap the address box, and then use the keypad on the screen to enter the address.
- Use a bookmark - touch the Bookmarks button and then select a bookmark.

Adding bookmarks

If there is a specific page that you would like to view or if you visit a site frequently, you can bookmark it. There are six bookmark slots available: one for your Home URL and five others.

To add bookmarks

- 1 On the main Web Browser page, touch the **Bookmarks** button.
- 2 Select a bookmark and then enter the URL.

Exiting the browser

When you are finished demonstrating internet access to the user, you should exit the browser.

To exit the browser

- 1 Press the **Home** function key or tap the home icon on the browser menu.
The browser closes.

Ethernet TE Testing

This chapter provides task-based instructions for using the Ethernet TE testing features of the OneExpert DSL. Topics discussed in this chapter include the following:

- [“About Ethernet TE testing” on page 98](#)
- [“Specifying Ethernet settings” on page 98](#)
- [“Connecting to the line” on page 101](#)
- [“Viewing results” on page 101](#)
- [“Testing the data layer” on page 102](#)

About Ethernet TE testing

In Ethernet TE mode, you can use the OneExpert DSL to emulate Ethernet terminal equipment by connecting to an Ethernet LAN or to the Ethernet port on the customer's modem. After connecting to the circuit, you can then test for connectivity and throughput.

You can also ping through the modem to a network switch or web address to test for connectivity.

To select Ethernet TE mode

- From the Main Menu, select **Ethernet**.

The Ethernet tests involve the following steps:

- Specifying test settings
- Connecting to the line
- Performing tests
- Viewing results

Specifying Ethernet settings

Before you begin testing, make sure the test settings on the OneExpert DSL match the settings of the line that you are testing.

- To access the setup screen, select the **Tests & Settings** system key or use the tray menu (swipe down from the top or press the tray system key).

Loading a test profile

If you have previously specified the settings and saved the test profile, you can load that profile so you don't have to specify all of the settings again.

To load a saved profile

- 1 Touch the **Load** button. (If no profiles have been saved, the button is grayed out.)
A list of Setting profiles appears.
- 2 Select the profile to load.
The settings are loaded.

Specifying Ethernet settings

To specify Ethernet settings

- 1 From the Tests & Settings menu, touch the **Ethernet Settings** button.
- 2 Select **Data Mode** and then specify **IPoE**, **PPPoE**, or **MultiVLAN**.
None turns the data layer off.
- 3 Select whether to do **Automatic Login**.
- 4 Select **MAC Address Mode** and specify factory default or user defined.
- 5 Specify whether VLANs are used (a check mark indicates they are used).
- 6 If VLANS are used, specify the following:
 - Enter the **VLAN ID** and **Priority**.
 - Select **IP mode** and then specify the network mode: IPv4, IPv6, or IPv4/IPv6 Dual Stack.

- 7 Specify the network settings as described in “[Specifying network profiles](#)” step 2d to g.



CAUTION: FAULTY RESULTS

Any time the Network settings are changed, the network layer resets. If you change these settings during a test, you may cause errors in the test. Only change them before you begin a test.

You are finished specifying Ethernet settings.

Saving test profiles

After specifying the test settings, you can save them as a test profile.

To save test profiles

- 1 Touch the **Save** button.
- 2 Enter a name for the profile.
- 3 Specify whether the profile will be shown on the Home screen
- 4 Touch **Save**.

The profile is saved.

Connecting to the line

After specifying the test settings, you can connect to the line.

To connect to the line

- 1 Connect one end of an Ethernet cable to the Ethernet jack on the right side of the unit.
- 2 Connect the other end of the cable to an Ethernet jack.

Viewing results

After specifying test settings and connecting to the line, you can view results.

To view results

- 1 Touch the **Connection Details** button. Do one of the following:
 - Press the **Cancel** key to return to the Network menu, and then select Network Status or LAN Stats.
 - From the Network Setup menu, press the left arrow to move to the LAN Results menu, and then the left arrow again to move to the Network Status menu.
- 2 To save a test report, press the utility (i) key and then select **Save Report**, and then specify the report settings such as report name, report format, technician ID, location, and other settings as needed.
- 3 To clear the results, use the asterisk (*) key.

See [Chapter 14 “Test Results”](#) to learn what your results mean.

Testing the data layer

Using the data layer tests, you can test for connectivity and throughput. See [Chapter 5 “Data Testing”](#).

Wiring Tools

This chapter provides task-based instructions for gathering test statistics and verifying connectivity. Topics discussed in this chapter include the following:

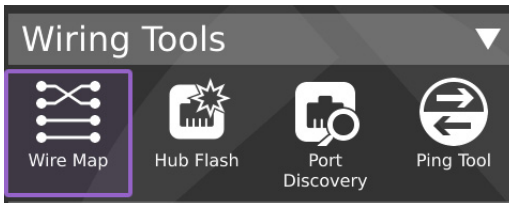
- [“About the Wiring Tools” on page 104](#)
- [“Wire Mapping” on page 104](#)
- [“Hub Flash” on page 108](#)
- [“Port discovery” on page 108](#)
- [“Ping Tool” on page 109](#)

About the Wiring Tools

The purpose of the Wiring Tools tests are to test and map CAT3 (POTS) and CAT 5/6 (Ethernet) cables/wires.

To access the wiring tools

- 1 From the main menu, select **Wiring Tools**.



Wire Mapping

These tests are used to test and map cables/wires. These tests require the use of the smart remote on the far end of the cable.

There are two wire mapping tests:

- Mapping - calculate cable length based on measured capacitance, using the user-specified length constant setting. This test also shows the wire mapping between any two pairs in the cable.
- Toning - mapping the wires by sending a tone across the cable.

Wire Mapping

To map wiring

- 1 Do one of the following:
 - a If testing a telephone cable, connect RJ-11 cable to the RJ-11 **Wiring** connector on the right panel of the unit.
 - b If testing a network cable, connect RJ-45 cable to the RJ-45 **Wiring** connector on the right panel of the unit.
- 2 From the Wiring Tools menu, select **Wire Map**.
The **Wiremap - Pin Mapping** screen appears. If Trace Toning appears, select either the **Cat3** or **Cat5/6** function key.
- 3 To adjust the Length Constant setting, either drag the line across the length constant bar or touch the + or - key.
If the Length Constant bar is not displayed, swipe down on the screen to view the tray menu. Select **Show Length...**

[Table 10](#) describes some typical constants.

Table 10 Typical data cable length constants

Cable type	pF/ft	pF/m
Data cable		
Cat3	19.0	62.5
Cat5, Cat5eCat, Cat6	15.0	49.0
Coaxial cable		
RG58	27.5	90.0
RG6, RG11, RG59	16.25	53.0
Security wire		
22AWG, Jacketed	24.0	78.5
22AWG, Unjacketed	14.0	46.0
20AWG, Unjacketed	16.0	52.5
18AWG, Unjacketed	17.0	55.5

To reset the Length Constant to the default, swipe down on the screen to view the tray menu. Select **Reset Length...**

To hide the Length Constant bar, swipe down on the screen to view the tray menu. Select **Hide Length Constant**.

- 4 For greatest accuracy, Viavi recommends that you perform a wiring compensation to remove the effects of the test leads.
 - a Swipe down on the screen to view the tray menu
 - b Select **Wiring Compensation**.
 - c Follow the instructions on the screen to connect or disconnect the leads to perform the compensation.
 - d Select **Compensate**.
 - e After the compensation stops, touch **Exit**.
- 5 Press the **Start** system key to begin the test.

[Table 11](#) describes the Wiremap test results.

Table 11 Wiremap results

Results	Description	Units	Range/ Values
Length Constant	This is the current SET length constant used to calculate cable length based on measured capacitance.	pF/ft	
Results	This shows the wire mapping between any two pairs in the cable.		
Length	Cable length calculated based on Length constant.	ft	10.1 - 39.3

The test is complete.

Sending tones

The purpose of this test is to send a tone on a network cable. By default, the OneExpert DSL sends tone on all the wires of a cable.

To trace cables using test tones

- 1 Do one of the following:
 - a If testing a telephone cable, connect RJ-11 cable to the RJ-11 **Wiring** connector on the right panel of the unit.
 - b If testing a network cable, connect RJ-45 cable to the RJ-45 **Wiring** connector on the right panel of the unit.
- 2 From the Wiring Tools menu, select **Wire Map**.
- 3 Select the **Toning** function key.
The Trace Toning screen appears.
- 4 To start toning the cable, select one of the following:
 - **High-Low** - sends a high tone follow by a low tone on all leads of the connected cable.
 - **Low Short High** - sends a low tone followed by a short high tone on all leads of the connected cable.
 - **High** - sends a continuous high tone on all leads of the connected cable.
 - **Low** - sends a continuous low tone on all leads of the connected cable.
- 5 After you finish the test, select Off.

Hub Flash

The hub flash function is used to send an intermittent link signal to flash the link status light on the Ethernet hub. Using this test, you can locate which port on the hub is being used. This is useful for troubleshooting when the test access port is in a different physical location than the hub.

To perform an Ethernet Hub Flash test

- 1 Connect an Ethernet cable from the Residential Gateway port to an **Ethernet** connector on the side of the OneExpert DSL.
- 2 From the Wiring Tools menu, select **Hub Flash**.
- 3 If needed, change the settings for **Cadence**, **Rate**, **Duplex**, or **NIC Wiring** by either touching the setting or using the arrow keys to highlight a setting and then press the OK key.
- 4 Select **Start** to begin the test.
- 5 Go to the location of the hub and observe the link activity LEDs. The port that is connected to the instrument will blink.
- 6 To end the Hub Flash test, press the **Stop** soft key.

Port discovery

The port discovery feature determines the capability of the port and established connection speed. In case of mismatch ensure the proper pin out or usage of cat 5/6 pair.

To run a Port Discovery test

- 1 Connect an Ethernet cable from the Residential Gateway port to an **Ethernet** on the side of the OneExpert DSL.
- 2 From the Wiring Tools menu, select **Port Discovery**.

- 3 Select **Start** to begin the test.
The Capability is displayed on the Left side of the screen, the Established Link is displayed on the right side of the display.
The table displays the Pair, Skew, and Polarity.

Ping Tool

The Ping Tool is used to verify connectivity to various network resources, and selected IP addresses.

To run a Ping test

- 1 Connect an Ethernet cable from the Residential Gateway port to an **Ethernet** connector on the side of the OneExpert DSL.
- 2 From the Wiring Tools menu, select **Ping Tool**.
- 3 If the unit is set up to DHCP, it automatically receives an IP Address and displays the Gateway and DNS.
- 4 To set a Ping Target, do the following:
 - a Select **Ping Target**.
 - b Select a target.
 - c Enter an address such as www.yahoo.com
 - d Select **OK**.
- 5 Press **Start**

The OneExpert DSL pings the Gateway, DNS and any specified Ping Targets.

Optical Tools

This chapter provides task-based instructions for using the optional USB accessories. Topics discussed in this chapter include the following:

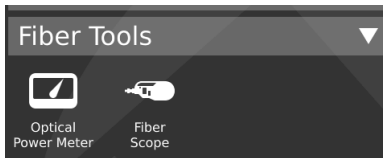
- [“Inspecting fiber” on page 113](#)
- [“Measuring optical power” on page 116](#)

About the optical tools

The following USB optical accessories can be used with the OneExpert DSL.

- Fiber Microscope
 - Inspect both the bulkhead (female) and patch cord (male) sides of fiber interconnect as well as optical devices located in hard-to-reach places (transceivers).
 - Inspect both simplex connectors.
 - Use with a comprehensive selection of precision FBPT tips.
- Optical Power Meter
 - Takes power measurements for all single-mode and multimode connectors via USB 2.0 connection.
 - Measures optical power with multiple pre-calibrated wavelengths (850, 980, 1300, 1310, 1490, 1550 and 1625 nm).
 - Integrates digital power measurements, fiber inspection, and analysis into a single, unified work sequence.

These features are available from the Fiber Tools menu.



NOTE:

The Fiber menu is not viewable until one of these tools is connected to the OneExpert DSL.

Inspecting fiber

The Viavi fiber microscope accessory is used to view a live video of a simplex fiber to determine if the fiber is clean. It can also capture a snapshot and provide pass/fail analysis.

To inspect fiber

- 1 Connect the fiber microscope to the USB connector on the side of the instrument.
- 2 Connect the microscope to the optical patch cord or bulkhead.

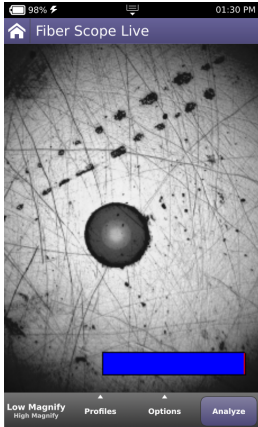


NOTE:

Although some microscopes can inspect multi-fiber or ribbon fiber (depending on the microscope and the tip used) the OneExpert DSL's microscope application supports simplex fiber only.

- 3 Tap **Fiber Scope**.
In order for the Fiber Scope selection to appear, a Fiber Microscope must be plugged into the USB connector.

The Fiber Microscope screen appears, showing live video of the fiber.



- 4 To change the magnification level, touch **Low Magnify/High Magnify**. The current selection is a larger text size.
- 5 To select the inspection profile, touch **Profiles**.
If you have a custom profile, you can use it on the OneExpert DSL by putting the file into the `configs/Microscope` folder. For more information on copying or transferring files using the file manager, refer to [“Managing files” on page 47](#).
- 6 Touch **Options** and then select any of the following:

Setting	Description
About Scope	Provides view details about the microscope, such as model number, firmware version and serial number.
Run Analysis	Specify whether to perform an analysis on the fiber or simply take a snapshot without an analysis (Freeze).

Setting	Description
Auto-center live	When checked, the live picture automatically centers on the fiber center. If not checked, the picture will center at the last location of a fiber center following an analysis. High magnification is always automatically centered.
Show Focus Meter	Specify whether to show the focus meter (the blue and white bar that appears on the right side of the screen).
Tip	Specify which tip is being used on the microscope: Standard Tips (with BAP1) or Simplex Long Reach (-L) Tips.

- 7 Do one of the following:
- a Manually inspect the fiber.
 - On the Options pop-up, verify that the **Run Analysis** checkbox is *not* checked. The Analyze button changes to Freeze.
 - Touch **Freeze**. This captures a still image of the fiber.
 - b Analyze the fiber.
 - On the Options pop-up, verify that the **Run Analysis** checkbox is checked. The Freeze button changes to Analyze.
 - Touch **Analyze**.

The test automatically centers the view (if specified to do so), captures an image, and then analyzes it. The test result shows defects and scratches.

- 8 To save the results, touch **Save** and then specify the file name for the still image. The filename can be up to 50 characters, so if desired, details such as the company name, technician, and location could be included.



NOTE:

If you have not yet moved the report file, you can view the screen capture portion of the result file using the File Manager. If the file has been moved — even if it was put back in the original spot on the OneExpert DSL — you can no longer view the file because there is a temporary capture file included with the save that goes away when the file is moved.

Measuring optical power

The Optical Power Meter is a Viavi accessory used to measure optical power.

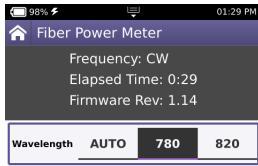
- The MP-60 meter measures 850, 1300, 1310, 1490, and 1550 nm wavelengths
- The MP-80 meter measures 980, 1310, 1480, and 1550 nm wavelengths

To measure optical power

- 1 Connect the Optical Power Meter to the USB connector on the side of the instrument.
- 2 Connect the optical patch cord to the power meter.
- 3 Tap **Optical Power Meter**.

In order for the Optical Power Meter selection to appear, an Optical Power Meter must be plugged into the USB connector.

The Fiber Power Meter screen appears.



-22.34 dBm

Max: -17.92
Avg: -28.13
Min: -67.30



The measurement begins as soon as the test is launched.

- 4 To measure a specific wavelength, choose the wavelength (in the Wavelength bar, swipe left or right). AUTO automatically detects the wavelength.
- 5 Tap **Settings** and then navigation key to display the Power Meter Settings, and then specify the settings.

Setting	Description
LED Threshold	Specify the LED threshold (in dBm). This specifies the threshold for the power LED on the Optical Power Meter. Solid indicates the power is below the threshold (low power), flashing indicates the power is above the threshold.
Pass/Fail Thresh.	Specify the pass/fail threshold (in dBm) for the test. If the measured power is below the threshold, it fails.
Pass/Fail Enable	Specify whether to run the pass/fail test.

Setting	Description
dBm	Absolute mode, displayed as dBm. The default setting.
mW	Absolute mode, displayed as mW.

- 6 Tap **Set Ref** to use the current power level as the reference value.
- 7 To save results, use the Tray menu to **Save To Job** or **Save Report**.

Wifi Tests

This chapter provides task-based instructions for using the optional Wifi testing features. Topics discussed in this chapter include the following:

- [“About the Wifi tests” on page 120](#)
- [“Scanning for Wifi networks” on page 121](#)
- [“Running Receiver Diagnostics” on page 122](#)
- [“Verifying IP connectivity” on page 123](#)
- [“Providing Wifi access” on page 123](#)
- [“Managing WiFi Advisor Devices” on page 125](#)
- [“Wifi Troubleshooting using a single ended application” on page 124](#)
- [“Site Assessment” on page 125](#)

About the Wifi tests

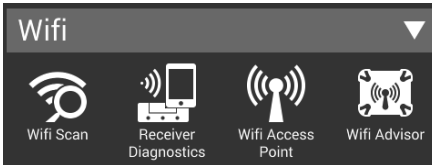
The Wifi testing features of the OneExpert DSL include the following:

- Quickly determine the available SSIDs, level and channel of Wifi networks visible from any location. The test set can attach to a customer's network and provide assessment of the signal strength throughout the premises.
- Receiver diagnostics. Provide a network bridge to allow the receiver to access a mobile device for running diagnostics
- Provide a Wifi access point to verify IP connectivity or access to the internet
- WiFi Advisor
 - Site Assessment Assistant
(Evaluate Wifi performance at critical locations within a site installation) see [“Assessing WiFi performance throughout a site”](#) in [Chapter 3 “Testing”](#).
 - Single-Ended Troubleshooting
(examine the surrounding 802.11 environment using a single test device) see [“WiFi Troubleshooting using a single ended application”](#) in [Chapter 3 “Testing”](#).
 - Device Management
(used to register devices, view device status, and manage firmware updates) see [Chapter 2 “Managing Devices”](#).

The Bluetooth Option is required in order to communicate with the WiFi Advisor.

To access the Wifi tests

- On the Main Menu screen, select Wifi.
The Wifi menu appears.



NOTE:

The Bluetooth and Wifi interfaces cannot be ON at the same time.

Scanning for Wifi networks

The Wifi Scan is used to determine whether any Wifi networks are available, and provides the SSIDs, level and channel of any networks detected.

To run a network scan

- 1 From the Wifi menu, select **Wifi Scan**.
The test searches for active Wifi networks. The Wifi search process may take a few minutes. After Wifi search is finalized, results are gathered and displayed.
The Wifi access points (AP) are listed, along with the following:
 - The MAC address of the access point.
 - The type of encryption used (WPA-EAP, WPA-PSK, Open).
 - Security status of the Wifi network, indicated by an open or closed padlock.
 - Wifi channel being used by the specific network
 - The power level of the selected Wifi Network. Indicated by the signal strength (in dBm) and a colored bar graph.

- 2 To see a graph of the channels, select the **Channel Graph** soft key.
- 3 To see a graph of signal strength over time, select the **Time Graph** soft key.

Running Receiver Diagnostics

If your unit is optioned and equipped to do so, the Receiver Diagnostics modes allow connection from a mobile device through the OneExpert DSL to the receiver for running a diagnostics application, such as MotoPLYR™. In this setup, the OneExpert DSL is providing a network bridge between the 802.11 interface and the Ethernet interface.

To run receiver diagnostics

- 1 Connect the OneExpert DSL to the receiver using an Ethernet cable.
- 2 From the Wifi menu, select **Receiver Diagnostics**.
- 3 Specify the manufacturer of the receiver: Motorola, Cisco, Other. If you select Other, enter the mobile device IP address.
- 4 Configure the mobile device's Wifi connection, and then wait for a wireless connection to be established between the OneExpert DSL and the mobile device. You must enter "jdsu" in the Client ID field for the Wifi connection in order for the mobile device to receive the correct IP address to run the diagnostic application.
- 5 Run the diagnostics application from the mobile device.
The receiver can now be power cycled per the receiver instructions to initialize the file transfer.

Verifying IP connectivity

The Wifi Access Point is used to provide a network bridge to the receiver or residential gateway (RG) and allow wireless access to the network. This allows you to ping or surf the web to verify IP connectivity behind the RG in the customer premise.

To verify IP connectivity

- 1 Connect the OneExpert DSL to the receiver or residential gateway using an Ethernet cable.
- 2 From the Wifi menu, select **Wifi Access Point**.
- 3 Configure the Wifi connection on the other instrument (for example, a mobile device, a PC, and so on).
The instrument will acquire an IP address from the receiver or residential gateway.
- 4 Run a ping or surf the web.

IP connectivity is verified.

Providing Wifi access

The Wifi Access Point is an Ethernet-to-Wifi bridge mode to create an access point for mobile devices such as Smart Phones, Tablets, Laptops, and so on. Connection to the internet comes from the broadband service behind the RG or router. This mode allows the mobile devices to verify internet connectivity without hunting for CPE passwords, running tests to the CO, or even configuring (or reconfiguring) the RG as required.

To provide wifi access

- 1 Connect an Ethernet cable from either of the OneExpert DSL's Ethernet jacks to the broadband access point.

- 2 If you haven't already done so, configure the Wifi connection on the mobile device.
- 3 From the Wifi menu, select **Wifi Access Point**.

The mobile device is now connected to the internet, using the OneExpert DSL as the Wifi access point.

Wifi Troubleshooting using a single ended application

The single-ended troubleshooting test includes the following:

- Quick, visually intuitive assessment of critical Wifi network factors reduces troubleshooting time
- Spectral insight within the same tool allows identification and isolation of common, non-802.11 interference.

The following procedure describes how to troubleshoot a single connection on a network. This test is typically run if the service is not working properly.

To troubleshoot a single connection

- 1 Bring the WiFi Advisor and OneExpert DSL to the location experiencing problems.
- 2 From the Wifi menu, select the WiFi Advisor application, and then select **Single-Ended Troubleshooting**.
- 3 Choose which WiFi Advisor device to use for the test.
If you have previously used a WiFi Advisor device with this OneExpert DSL, it appears in the list of devices. If it does not appear, you may need to register the device with the OneExpert DSL and pair to it. [“Registering and unregistering devices” on page 125](#).
- 4 Select a result tab at the bottom: BSSID, Channel, or Spectral.
These results are available for both 2.4 Ghz and 5 GHz bands. Use the far right button to switch between bands.

For more detail on the results, see [“WiFi Advisor results” on page 217](#).

Site Assessment

The **Site Assessment Assistant** provides connectivity through the access point for assessing Wifi performance. A WiFi Advisor and the WiFi Advisor mobile application are required for this test.

To assist with site assessment

- 1 Take a WiFi Advisor and mobile device to the location where Wifi performance is to be assessed.
- 2 Connect the OneExpert DSL to the residential gateway using an Ethernet cable.
- 3 Follow the procedure *“Assessing WiFi performance throughout a site”* in the *WiFi Advisor User’s Guide*.

Managing WiFi Advisor Devices

This section describes the Device Management menu which is used to register WiFi Advisor devices, view device status, and manage firmware updates.

Registering and unregistering devices

After pairing the device(s) with the OneExpert DSL, the device must be registered in the OneExpert DSL’s WiFi Advisor application.

To register WiFi Advisor devices with the OneExpert DSL

- 1 From the Wifi menu, select WiFi Advisor, and then select **Device Management**.
- 2 Find the desired “WFED300AC” WiFi Advisor device.

- 3 If no devices are detected, scan and pair the device(s).
 - a Verify that the WiFi Advisor is on and ready to pair. If it is, the blue LED is blinking; if not, long press the blue button until the light blinks
 - b Touch **Scan for devices**.
Any found devices are listed.
- 4 Enter the device label (A-Z)
- 5 Repeat [step 2](#) through [step 4](#) for each WiFi Advisor.

The registered devices appear in the Device Manager screen.

To unregister WiFi Advisor devices with the OneExpert DSL

- 1 From the WiFi Advisor application, select **Device Management**.
- 2 Select the WiFi Advisor with the label (or serial number) of your device.
- 3 In the pop-up menu, select **Unregister Device**.
A verification window appears.
- 4 Do one of the following:
 - If you do not wish to unregister the device, touch the back arrow button (either on the window or the physical key on the OneExpert DSL).
 - Select **OK** to unregister your device.
The device is unregistered and no longer appears in the Registered Devices list.

Changing the power off delay

The power off delay values associated with each registered WiFi Advisor are shown within the Registered Devices section of the Device Manager screen. These values define the amount of idle time that must transpire before the test device will automatically power down.

To change the power off delay for a WiFi Advisor

- 1 From the WiFi Advisor application, select **Device Management**.
- 2 Select the WiFi Advisor with the label (or serial number) of the desired device.
- 3 In the pop-up menu, select **Change Auto-Off Delay**.
- 4 Select the auto-off delay.
Disabled means it will not automatically power down regardless of expired time.

If you would like to dismiss the window without changing the current setting, touch the back arrow.

Updating the WiFi Advisor firmware

The firmware on the WiFi Advisor can be upgraded over Bluetooth using the OneExpert DSL. The WiFi Advisor must be paired and registered with the OneExpert DSL.

To update firmware on a registered WiFi Advisor

- 1 From the WiFi Advisor application, select **Device Management**.
- 2 Select the WiFi Advisor with the label (or serial number) of the desired device.
- 3 In the pop-up menu, select **Update Firmware**.
A confirmation screen appears.

- 4 Do one of the following:
 - If you do not wish to update the device, touch the back arrow.
 - Select **OK** to update the firmware.
- 5 Select **Yes**.

The update begins. The status bar at the top indicates the update progress.

HPNA Testing

This chapter provides task-based instructions for using the optional HPNA testing features. Topics discussed in this chapter include the following:

- [“About HPNA Testing” on page 130](#)
- [“Monitoring the HPNA network” on page 131](#)

Connecting to the line

After specifying the test settings, you can connect to the line.

To connect to the line

- 1 Connect one end of an Ethernet cable to the Ethernet jack on the right side of the unit.
- 2 Connect the other end of the cable to the Ethernet port of the CPE that is on the HPNA network (such as a set-top-box or residential gateway).

Monitoring the HPNA network

The following procedure describes how to monitor the HPNA network.

To monitor the HPNA network

- 1 On the Main Menu, select **HPNA**.
The Station List screen appears. See [“Node list” on page 205](#).
- 2 If desired, use the arrow keys to highlight a specific node and then press the OK key to view more detailed statistics for that node.

Testing the HPNA network

This test verifies that all installed devices are operating correctly.

To test the HPNA network

- 1 On the Main Menu, select **HPNA**.
A list of HPNA nodes appears.

Verify that all HPNA devices are present on the network before proceeding.

- 2 To specify the HPNA settings, press the Tray system key and then select Settings (the soft key in the lower left).
 - **Quick Test Payload Length** (the size of the packet being used for the Quick Test)
 - **Chronic Test Payload Length** (the size of the packet being used for the Quick Test)
 - **QuickTest Packet Count** (the number of packets to use for the Quick Test - typically around 5,000)
 - **Chronic Test Packet Count** (the number of packets to use for the Chronic Test - typically 100,000 packets or more)
 - **Minimum Rate** (the minimum rate, in Mbps, that will pass)
 - **Minimum SNR** (the minimum SNR, in dB, that will pass)
 - **Quick Max Packets Lost** (the maximum packet loss, in number of packets, allowed for the Quick Test)
 - **Chronic Max Packets Lost** (the maximum packet loss, in number of packets, allowed for the Chronic Test)
- 3 Select the **Start** soft key to select the type of test to run:
 - Quick** – Used to quickly test the HPNA network for common issues. (a small number of packets)
 - Chronic** – Used to exhaustively test the HPNA network for chronic trouble. (a large number of packets)



NOTE:

The size and number of packets may be adjusted from the default settings for each Quick or Chronic test prior to proceeding.

After the network test finishes, the screen updates to report the data rate, modulation, packet error rate, and signal to noise ratio on the current link.

If the packet error rate is zero and the data rate is over 112Mb, the screen will indicate a pass. If the packet error rate is non-zero, SNR is less than -34 dB, or the data rate is less than 112Mb, the screen will indicate a failure in red.

- 4 Use the up and down arrow keys to view the results.
- 5 Highlight a specific node and then press the OK key to view node-to-node link information, such as the MAC addresses and the received power.
- 6 Select the **Node Details** soft key to view live statistics between the selected HPNA nodes.
- 7 To save a test report, press the Tray system key and then select **Save Report**, and then specify the report settings such as report name, report format, technician ID, location, and other settings as needed.

For more information on the results, see [“HPNA results” on page 205](#).

Testing with SmartIDs

This chapter provides task-based instructions for gathering test statistics and verifying connectivity. Topics discussed in this chapter include the following:

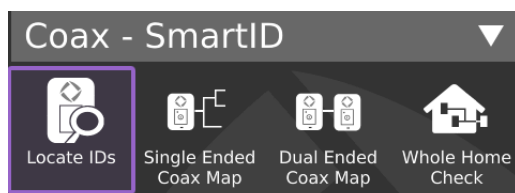
- [“About the SmartID tests” on page 136](#)
- [“Locating SmartIDs” on page 136](#)
- [“Coax Map test” on page 138](#)
- [“Whole Home Check” on page 144](#)

About the SmartID tests

The purpose of the SmartID tests are to test and map cables/wires, verify that the HPNA links and devices are installed and fully provisioned, and to verify that the entire HPNA network is operating correctly

To access the wiring tools

- From the main menu, select **Smart ID**.



Locating SmartIDs

The purpose of this test is to identify up to 16 the SmartIDs ([Figure 11](#)) on the network. The SmartIDs will work through splitters, and multiple SmartIDs can be detected simultaneously.

Figure 11 SmartID



To locate SmartIDs

1 Register the SmartIDs.

If this is the first test with the Smart IDs, a warning message appears asking you to register the SmartIDs.

- a If using the Bluetooth SmartID Plus, pair it with the OneExpert DSL and then connect to the SmartID Plus. (For more information, refer to the *SmartID Plus Quick Start Guide* that shipped with the SmartIDs.) The other SmartIDs need to be registered as described below.

The registration applies to the SmartID that the OneExpert DSL is physically connected to. You will need to repeat the procedure for each SmartID, connecting it directly to the OneExpert DSL.

- b If the Registration doesn't automatically come up, select the **Actions** system key and then touch **SmartID Registration**.
- c Do one of the following:
 - Use the up and down arrows to highlight the label letter for the SmartID and then press OK.
 - Touch the letter for the SmartID
- d Plug in the SmartID or enter the serial number (if the SmartID is plugged in, it will advertise its serial number to the OneExpert DSL).
- e Repeat [step b](#) through [step d](#) for each SmartID.
The SmartIDs are registered.

2 Connect a master probe. Do one of the following:

- If using the Bluetooth SmartID Plus, verify that it is paired and connected to the SmartID Plus. (For more information, refer to the *SmartID Plus Quick Start Guide* that shipped with the SmartIDs.)
- If using the USB SmartIDs, connect the USB cable from OneExpert DSL to one of the SmartIDs.

- 3 Connect SmartIDs (including the master probe) to the coax at any location in the home where network qualification or troubleshooting is desired, such as set top boxes or residential gateways (such as in [Figure 13 on page 144](#)).
- 4 On the SmartID menu, select **Locate IDs**.
- 5 If the test doesn't automatically start, press the **Start** system key.



ALERT!

The OneExpert DSL should not be moved while a SmartID test is running. It needs to stay within a reasonable distance of the Bluetooth master probe while the test remains active (10 feet or less preferred, no more than 15 to 20 feet).

NOTE: If testing with a mobile device, it does not affect the connection; you can move around with the mobile device. Similarly, if the mobile app loses connection to the OneExpert DSL, it will not affect the SmartID test in progress.

The test runs and then displays the IDs found.

- 6 Use the Tray menu to save a report.

Coax Map test

The purpose of this test is to map out the topology of a coax network, from a single point, without having to perform a two ended test using far end devices. This measurement can be used to locate devices in a coax cable such as barrels, splitter, and splices.

To run a Coax Map test

- 1 Connect to a SmartID Plus using Bluetooth.

- 2 On the SmartID menu, select **Single Ended Coax Map**.
The Coax Map screen is displayed.
Select the Mode system key and specify a Map Mode.
 - Single Ended Coax Map
 - Dual Ended Coax Map
 - VDSL Home Run Check
 - Whole Home Check (No Diplexer)
 - Whole Home Check (Through Diplexer)

[Table 12](#) describes the Coax Map results.

Table 12 Coax Map results

Results	Description	Units	Range/Values
Length	Total length of the coax leg from test instrument.	ft.	0-500
dBrl	Return loss of the coax leg.	dBrl	
Comment	Description of the event that was detected in the coax cable		Unknown, Open, Splitter, Barrel/Splice, Splitter *, and Low Quality Splitter (see Table 13 for descriptions)

Table 13 Comment result descriptions

Label	Description
Unknown	This label is used as a last resort when no other signatures can be identified.
Open	Indicates an event that has high return loss. <ul style="list-style-type: none">– A home run cable with no passive devices should indicate an open at close to 0 dBrl– A cable with a 2-way splitter may have two opens at close to -7 dBrl.– A cable with a 3-way splitter may have two opens at -14 dBrl and one open at -7 dBrl
Splitter	Indicates a passive splitter may be present at this length in the cable under test.
Low Quality Splitter	Indicates a low quality splitter may be present at this length. Low quality splitters can induce standing waves and cause poor performance. These low quality splitters can also cause conventional cable ID to function incorrectly since many are DC coupled causing the ID resistive values to be placed in parallel.
Splitter *	Indicates an assumed splitter. The instrument has not detected a splitter signature. However, based on the data signature the instrument has deduced that a splitter is likely present. NOTE: If the length to the splitter* and the first open are the same, it is likely a splitter with an open port.

Table 13 Comment result descriptions (Continued)

Label	Description
Barrel/Splice	<p>Indicates an event was detected followed by a single low loss open event. This can be caused by barrel splices, Low Quality Splitter with an open port, severely kinked or crimped cable (Stables), poor connector, etc....</p> <p>The return loss of the Barrel/Splice event should be considered when determining what action, if any, is required. Lower return loss (around -20 dBrl) values may not require action, but high values indicate an event that may be effecting cable performance.</p>



NOTE:

In the unlikely event that the legs of a splitter are the same length, the instrument will report a single event with a return loss value that approximately equals the sum of the events.

A cable ID is displayed above the system keys. The OneExpert DSL will only find an ID if it's connected to a single cable with an ID on the other end. The RFIDs, however, will work through splitters and multiple tags can be detected.



NOTE:

The cable ID won't work properly if there's a cable plugged into the side of the unit (must use only the coax connector on the top).

For any given coax cable, the coax map test locates each item and presents the results in an easy to read table. The table indicates the location of items in terms of a length in feet, from the test instrument. The table also indicates the return loss at each item in dBrl.

If possible, the OneExpert DSL will also identify items such as opens, splitters, barrels, or splices based on TDR measurements performed on the

cable. In some cases, based on reflection characteristics, the test set will indicate the presence of bad splitters. If unusual cable characteristics are measured, the OneExpert DSL will indicate an “unknown” item in the cable.

If the number of legs on a splitter are different than the number of RFIDs, a warning appears.

If the OneExpert DSL is used to measure a home-run cable, it will indicate an 0 dBrl open, and the full length of the cable.

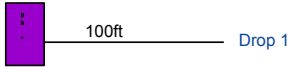


TROUBLESHOOTING TIP:

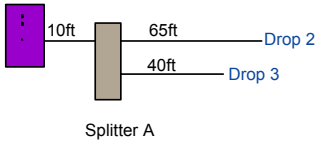
If the results table indicates four or more events, it may indicate a situation where a complex cable topology is causing multiple reflections. In this case, measurement accuracy can be improved by performing step by step sectionalization starting with the first item in the table.

Figure 12 shows several cable topologies on the left and the corresponding coax map table on the right. The dBrl level at each splitter will be relatively low and depend on the quality of the splitter. Lower return loss indicates a better splitter.

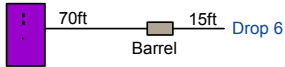
Figure 12 Cable topologies and coax map tables



Length (ft)	dBrl	Comment
100	0	Open



Length (ft)	dBrl	Comment
10	-20	Splitter
50	-7	Open
75	-7	Open

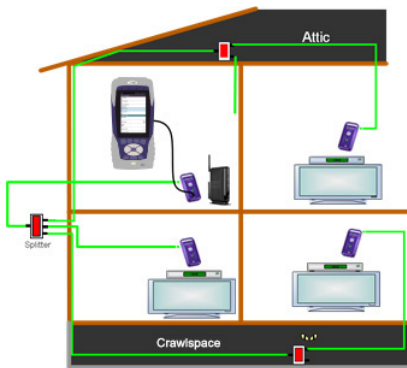


Length (ft)	dBrl	Comment
70	-20	Barrel/Splice
85	-3	Open

Whole Home Check

The SmartIDs allow the technician to connect the OneExpert DSL directly to any single SmartID device which then communicates with any other connected SmartID devices (as shown in [Figure 13](#)) in order to certify an in-home network and provide distances to found impairments.

Figure 13 SmartID connection



If a Diplexer is on the network, disconnect the VDSL connection.

The difference in the SmartIDs versus the other terminators is that the terminators only indicate their location; whereas the SmartIDs each also are used to identify their location, but also each SmartID does a broadband noise ingress measurement, dual-ended FDR for coax mapping and frequency sweeping to locate impairments.

There are three test modes

- Locate SmartIDs – finds and identifies all SmartIDs currently connected to the network.
- Home Run Check – a two-point (two SmartIDs) test across the cable connecting at the residential gateway and the diplexer locations.

- Whole Home Check – tests a complex cable network that may or may not include a Diplexer. It is intended to qualify the network for HPNA.

The Whole Home Check maps a coax network and provide distances to found impairments.

To run a Whole Home Check

- 1 Disconnect the cable or DSL feed. If using a diplexer, disconnect the feed to the diplexer (and leave it open).



NOTE:

All live network signals must be disconnect from the coax network under test.

- 2 Connect a SmartID at the point of entry and use the USB cable to connect the OneExpert DSL to the SmartID.
In order to map the network accurately, make sure that you connect to the primary SmartID (connected to the OneExpert DSL with a USB cable) on the main side of the residential gateway or splitter and not on a branch leg.
- 3 Place other SmartIDs at any location in the home wherever network qualification or troubleshooting is desired, such as TVs, set top boxes or cable modems.

There are three possible test configurations:

- a NID without diplexer: The primary SmartID (connected to the SCH with a USB cable) should be connected at the RG (in place of the RG), and the remaining SmartID probes should be connected at the receivers (in place of the receivers).
- b NID with diplexer: The primary SmartID (connected to the SCH with a USB cable) should be connected at the RG (in place of the RG), and the remaining SmartID probes should be connected at the receivers.

When a Diplexer is on the network, the VDSL connection must be disconnected.

- c INID: The primary SmartID (connected to the SCH with a USB cable) should be connected at the INID coax connection feeding into the home (disconnected from the INID), and the remaining SmartID probes should be connected at the receivers.

When connecting a SmartID to a wall plate, it is recommended to use a coax jumper cable of at least 3 feet in length.

Ensure that all devices except SmartIDs are disconnected from the network.

- 4 On the SmartID menu, select **Whole Home Check**.
- 5 On the Select SmartID Test Plan screen, select whether to test through a diplexer (RG - Through Diplexer) or not (RG - No Diplexer).
 - For the NID without diplexer configuration (configuration [a](#), above), select **RG - No Diplexer**.
 - For the NID with diplexer configuration (configuration [b](#), above), select **RG - Through Diplexer**.
 - For the INID configuration (configuration [c](#), above), select **RG - No Diplexer**.

- 6 Begin the test.

During the test, a pop-up message appears if any of the following is detected:

- Near-end connection issue (i.e. open, short, loose connection, poor fitting, poor barrel on SmartID)
- Far-end connection issue (i.e. poor connection, fitting barrel, etc; partial short)
- SmartID(s) detected but not mapped issue
- SmartID mapping placement questionable (due to processed FDR data producing ambiguous length/location data for the particular SmartID probe)

- Excessive noise ingress measured
- Network Map obscured message warning for diplexer, filter, amplifier, etc.
- Test FAILs if there is filter(s) or amplifier(s) present in the network

Note, that the “RG – Through Diplexer” test allows Diplexer in the network

After the test completes, the result test summary appears.

The test summary displays the paths between SmartIDs and indicates whether the quality of the path between the two points is passing or failing based on pre-set limits. The upper right area shows how many SmartIDs were detected and how many were mapped; it will be red if the numbers don't match. The left side of the screen will show the frequency sweep and noise ingress measurement results for each highlighted box, which corresponds to the two points between SmartIDs in the coax network.

- 7 To save the results to a report, use the Tray menu ([“Saving a report” on page 49](#)).

Copper Testing

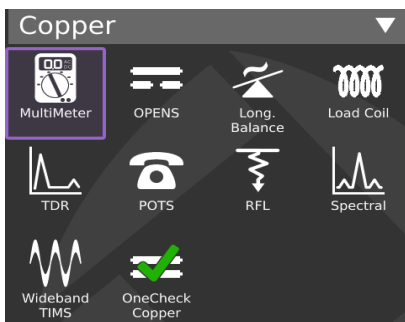
This chapter provides task-based instructions for using the optional OneExpert DSL copper testing features. Topics discussed in this chapter include the following:

- [“About copper testing” on page 150](#)
- [“Measuring voltage” on page 151](#)
- [“Measuring resistance and leakage” on page 152](#)
- [“Measuring the distance to a short” on page 153](#)
- [“Measuring current” on page 154](#)
- [“Locating faults using the TDR” on page 155](#)
- [“Measuring opens” on page 157](#)
- [“Measuring longitudinal balance” on page 159](#)
- [“Detecting load coils” on page 160](#)
- [“Testing voice service and Caller ID” on page 161](#)
- [“Locating faults using RFL” on page 163](#)
- [“Measuring spectral noise” on page 166](#)
- [“Testing TIMS” on page 167](#)
- [“Running a OneCheck Copper test” on page 173](#)

About copper testing

The OneExpert DSL Tester's copper features allow quick turn-up and basic troubleshooting of the copper local loop.

To access the copper tests, touch Copper from the main menu. The drop down menu appears.



You can perform specific measurements for the following tests:

- Multimeter
 - AC volts
 - DC volts
 - Resistance
- Opens (distance) and capacitance
- Balance
- Load coil detect
- TDR
- POTS
- RFL
- Spectral
- Wideband TIMS

- Narrowband Rx Tones
- Narrowband noise

Each of these tests is described in the following sections.

Measuring voltage

The multimeter function allows measuring of AC and DC voltage.

To measure voltage

- 1 Select Connect the Tip (A), Ring (B), and Ground (Earth) leads to the line under test.
- 2 From the Copper menu, touch the **Multimeter** button.
- 3 Select **AC Volts** in the lower right.
The AC Voltage menu appears.
- 4 To specify the connection, touch the connection:
 - Tip to Ring (A to B)
 - Tip to Gnd (A to E)
 - Ring to Gnd (Ground) (B to E)



NOTE:

You can also press the up or down arrow key to move among the connections.

- 5 To specify the termination, select **Options**, and then select the one of the following:
 - 1MEG-ohm Term
 - 100K-ohm Term
- 6 To measure DC, select **DC Volts** in the lower right.
The DC Voltage menu appears.

- 7 To switch between continuous and snapshot mode, use the left system key **Snapshot** or **Continuous**.
- 8 To save the results to a report, use the Tray menu (“[Saving a report](#)” on [page 49](#)).
- 9 To learn what your results mean, see “[AC voltage](#)” and “[DC voltage](#)” in [Chapter 14 “Test Results”](#).

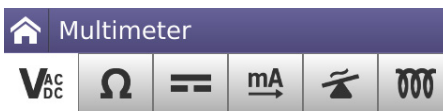
Measuring voltage is complete.

Measuring resistance and leakage

Using the Multimeter, you can measure resistance to identify shorts, grounds, and resistive faults.

To measure resistance and leakage

- 1 Connect the Tip (A), Ring (B), and Ground (Earth) leads to the line under test.
- 2 From the Copper menu, touch the **Multimeter** button.
- 3 Touch the Ω Omega tab.



The Resistance screen appears.

- 4 For greatest accuracy, Viavi recommends that you compensate the opens measurement to remove the effects of the test leads. To compensate the opens measurements
 - a Swipe downward on the screen to access the Tray menu.
 - b Select the **Compensate Resistance** system key
 - c Follow the instructions on the screen to connect the black, red, and green leads to perform test lead compensation.
 - d Touch **Compensate**.
The compensation stops automatically when finished.
- 5 To change the resistance measurement, touch **Continuous/Snapshot**. The current selection is a larger text size.
- 6 Touch **Leakage/Non-Leakage** button in the lower right. The Leakage measurement is basically a the high-voltage ohmmeter.
- 7 To save the results to a report, use the Tray menu (“[Saving a report](#)” on page 49).
- 8 To learn what your results mean, see “[Resistance](#)” in [Chapter 14 “Test Results”](#).

Measuring resistance and leakage is complete.

Measuring the distance to a short

The following procedure describes how to measure the distance to a short.

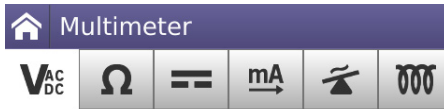


NOTE:

Use this feature only when the resistance is 4 k Ω or less (4 k Ω or less is almost always a hard short). If there is no hard short on Tip and Ring (A and B), the measurement will be inaccurate.

To measure distance

- 1 Connect the Tip (A), Ring (B), and Ground (Earth) leads to the line under test.
- 2 From the Copper menu, touch the **Multimeter** button.
- 3 Touch the Ω (Omega) tab.



The Resistance screen appears.

- 4 Select Options and then select **Distance To Short**.
The Distance to Short menu appears.
- 5 Touch + or - to change the temperature or wire gauge, if needed.



NOTE:

For the resistive distance to be accurate, it is critical that you enter the correct gauge and temperature.

You have measured the distance to a short.

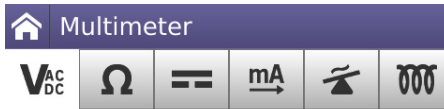
Measuring current

Using the Multimeter, you can test for proper loop current for POTS lines.

To measure current

- 1 Connect the Tip (A), Ring (B), and Ground (Earth) leads to the line under test.
- 2 From the Copper menu, touch the **Multimeter** button.

- 3 Touch the mA tab.



The DC Current screen appears with the results.

- 4 To measure on another pair, touch the pair.
- 5 To measure AC Current, touch AC Current.
- 6 To measure on another pair, touch the pair.
- 7 To change the current measurement, touch **Continuous/Snapshot**. The current selection is a larger text size.
- 8 To save the results to a report, use the Tray menu ([“Saving a report” on page 49](#)).
- 9 To learn what your results mean, see [“DC current” in Chapter 14 “Test Results”](#).

Locating faults using the TDR

The Time Domain Reflectometer (TDR) feature helps locate cable faults. The TDR identifies bridged taps, wet sections, load coils, shorts, opens, and splices on the span.

The following procedure describes how to locate cable faults using the TDR.

To locate cable faults using the TDR

- 1 Connect the Tip (A), Ring (B), and Ground (Earth) leads to the line under test.
- 2 From the Copper menu, touch the **TDR** button. The TDR graph appears.

- 3 To change the TDR mode, select the **Mode** system key, and then select **SmartGainTDR** (applies 0 gain to 24 AWG cable), **In Home TDR** (does not include Pulse Width), or **Standard TDR**.
- 4 If running **In Home TDR**, twist the cables for more consistent impedance.



- 5 To change the cable type, select the **Options** system key, and then select **Cable Type**.
- 6 To add a DC pulse in order to see changes in the graph, select the **Options** system key, and then select **Stress**. The spike or dip will shift when the pulse is applied.



NOTE:

The TDR must be running for Stress Mode to be available. It is greyed out when the TDR is stopped.

A warning appears during the stress pulse to indicate higher voltage is present.

- 7 Using the Peak Hold mode, the OneExpert DSL can display minimum, maximum, and current TDR traces over a test period. This feature is useful for analyzing faults that occur intermittently. To enable Peak Hold mode, select the **Options** system key and then check the **Peak Hold** checkbox.
- 8 To adjust the **Gain** or **Pulse Width**, either drag the line across the bar or touch the + or - key to adjust it.

Gain is used to identify small or distant faults. Using the + or - keys to gain the vertical axis and enhance the reflection of faults. Do not apply excessive gain. This makes a normal condition appear as a fault.

Pulse Width only appears when **Pulse Width** is selected on the Options pop-up menu (from the **Options** system key).

- 9 To help identify small or distant faults, use the up or down arrow keys to gain the vertical axis and enhance the reflection of faults. Do not apply excessive gain. This makes a normal condition appear as a fault.
- 10 If you are testing toward a FED, UFEDII, or UFEDIIB, use the **Options** menu, then select **TDR Helper** to continuously open and short the pair. On a TDR trace, you can then see the end of the copper pair by seeing the open trace (slope up) and the short trace (slope down) and these will flip flop for the amount of time you specify. This allows you to see where the FED is located.
- 11 To save the results to a report, use the Tray menu ("[Saving a report](#)" on page 49).
- 12 You can also view and compare current and saved TDR traces using the Results key. For information on saving your results in graphical form, see "[Saving results](#)" on page 184.
- 13 To learn what your results mean, see "TDR" in [Chapter 14 "Test Results"](#).

Locating cable faults with the TDR is complete.

Measuring opens

The opens feature measures the total electrical (capacitive) length of a pair.

To measure opens

- 1 Connect the Tip (A), Ring (B), and Ground (Earth) leads to the line under test.
- 2 From the Copper menu, touch the **Opens** button.

- 3 To change the cable capacitance, select **Options** and then do one of the following:
 - a Select a standard cable capacitance.
 - b Select **Custom Cable** to specify a custom capacitance:
The custom cable menu appears.
 - Enter a name.
 - Specify a value for the mutual conversion factor in $\mu\text{F}/\text{mile}$ (or other units depending on your configuration). This value is used for Tip-to-Ring (or A-B) capacitance.
 - Specify a value for the ground capacitance, in $\mu\text{F}/\text{mile}$ (or other units depending on your configuration). This value is used for capacitance between Tip (A) to Ground (E), and Ring (B) to Ground (E).
 - Press the **OK** key.
- 4 To specify the method to test opens/capacitance, press the tray button, select Opens Method, and then choose **2-terminal** or **3-terminal**.

The *two terminal* method is the default mode that measures the capacitance across the pair or from an earth reference to either wire in the pair using only two connections or terminals

The *three terminal* method measures the capacitance across the pair in the same way except the way it measures from an earth reference to either wire in the pair. Connect all the other unused pairs, screen (shield) if any, and ground or earth to the unused (not being tested) wire in the pair, using three terminals.



NOTE:

When using the three terminal method and no earth terminal is connected, you will get a non-zero result from each wire to earth.

Three terminal mode is useful when testing a pair inside a multi-pair cable since all pairs rotate or change their relative position inside the cable throughout the length of the cable to help control crosstalk.

- 5 For greatest accuracy, Viavi recommends that you compensate the opens measurement to remove the effects of the test leads. To compensate the opens measurements
 - a Swipe downward on the screen to access the Tray menu.
 - b Select the **Compensate OPENS** system key
 - c Follow the instructions on the screen to disconnect all test leads to perform test lead compensation.
 - d Touch **Compensate**.
The compensation stops automatically when finished.
- 6 Press the back navigation key to return to the Opens menu.
- 7 Do one of the following:
 - If you are on the Snapshot menu, select **Refresh** to restart the test.
 - If you are on the Continuous menu, select **Clear** to restart the test.
- 8 To save the results to a report, use the Tray menu ([“Saving a report” on page 49](#)).
- 9 To learn what your results mean, see [“Opens/Capacitance” in Chapter 14 “Test Results”](#)

You have measured Opens.

Measuring longitudinal balance

Balance is a number representing the quality of the telephone circuit and the degree to which the Tip (A) and Ring (B) conductors are electrically the same in their ability to cancel noise. The balance measurement is used to identify poor loop quality or cable bonding and grounding issues that allow excessive loop noise. Wideband background noise is covered in the WBTIMS section.

To measure longitudinal balance

- 1 Connect the Tip (A), Ring (B), and Ground (Earth) leads to the line under test.
- 2 From the Copper menu, touch the **Balance** button.
The test begins automatically.
Longitudinal balance and calculated balance results appear.
- 3 *Optional.* Press the **Ground Reference** soft key to check the ground reference.
- 4 Select **Clear** to restart the test.
- 5 To save the results to a report, use the Tray menu ("[Saving a report](#)" on page 49).
- 6 To learn what your results mean, see "[Longitudinal balance](#)" in [Chapter 14 "Test Results"](#).

Measuring balance is complete.

Detecting load coils

The OneExpert DSL can detect up to five load coils that may exist on the line, out to 27,000 (8,200 meters) feet. It will also report a short, open, or a high noise condition, if detected. For accurate load coil detection, test on a pair without voltage (supplied by a battery). Although the detector will work with voltage on a pair, accuracy will be compromised. In addition, the detector works best when the last coil is followed by 1200 feet (336 meters) of cable.

To detect load coils

- 1 Connect the Tip (A), Ring (B), and Ground (Earth) leads to the line under test.

- 2 From the Copper menu, touch **Load Coil**.
The Load Coil Detector menu appears.
The count appears in the box. If at least one load coil is detected, the distance to the first load appears.



NOTE:

The distance to first load measurement assumes no other impairments are present between the OneExpert DSL and the first load coil. If other impairments are present, accuracy is reduced.
If voltage greater than 50V peak is present, the test will abort.

If noise, a short, or an open is detected, it appears on this screen.

- 3 *Optional.* Select **Refresh** to restart the test.
- 4 To save the results to a report, use the Tray menu (“[Saving a report](#)” on page 49).
- 5 To learn what your results mean, see “[Load coil](#)” in [Chapter 14 “Test Results”](#).

Detecting load coils is complete.

Testing voice service and Caller ID

The POTS dialer allows you to place and receive voice calls to verify that the service is working properly. You can also use the dialer for the following tasks:

- to drop battery for opens testing
- to establish a quiet termination for balance and noise tests
- to determine if loss at 1004 Hz is acceptable
- to test incoming caller ID number and name

The following procedure describes how to test voice service and caller ID.

To test voice service and caller ID

- 1 Connect to the line under test using either the RJ-11 POTS connector or the Tip (A), Ring (B), and Ground (Earth) leads.
- 2 From the Copper menu, touch **POTS**.
The POTS Dialer menu appears.
- 3 Press the **Options** system key and then specify which interface (A/B or RJ-11) is connected to the line under test.
- 4 Place a call.
 - a Dial the number:
 - Use the keypad to dial manually.
 - Select **Phone Book** to select a saved number.
 - b To use pulse dialing, press the **Options** system key and then select **Pulse**.
 - c Touch the **Call** button to initiate the call.
 - d Speak into the microphone located at the bottom, near the power button.
 - e *Optional.* To mute the microphone, press the **Options** system key, and then select **Mute Microphone** (or **Un Mute Microphone** to return to the call).
The mute feature is only available when off hook.
 - f Press the **On Hook** system key to end the call.

- 5 Receive a call.
 - a Request someone to call you.
 - b When the OneExpert DSL indicates an incoming call, press the **Off Hook** system key.
 - c For lines that have caller ID, the name and number information appears in the box.
 - d *Optional.* To mute the microphone, press the **Options** system key, and then select **Mute Microphone** (or **Un Mute Microphone** to return to the call).

The mute feature is only available when off hook.
 - e Press the **On Hook** system key to end the call.
- 6 To save the results to a report, use the Tray menu ("[Saving a report](#)" on page 49).

Testing voice service and caller ID is complete.

Locating faults using RFL

The following procedure describes how to locate cable faults using the Resistive Fault Locator (RFL).

To locate a cable fault using RFL

- 1 Connect the Tip (A), Ring (B), and Ground (Earth) leads to the line under test.
- 2 From the Copper menu, touch the **RFL** button.

The RFL screen appears.

- 3 For greatest accuracy, Viavi recommends that you compensate the opens measurement to remove the effects of the test leads. To compensate the opens measurements
 - a Swipe downward on the screen to access the Tray menu.
 - b Select the **RFL Compensation**.
 - c Follow the instructions on the screen to connect the black, red, and green leads to perform test lead compensation.
 - d Touch **Compensate**.
The compensation stops automatically when finished.
- 4 To select the cable makeup, touch **Single Gauge** or **Multiple Gauge**.
 - a If you selected single gauge, specify the temperature and gauge.
 - b If you selected multiple gauge, do the following:
 - i Enter the length, gauge, and temperature for the cable section and then select **Add**.
 - ii You can delete an entire line by pressing the **Delete** soft key.
 - iii Repeat [step b](#) for each gauge of the cable.
- 5 To change the type of test to run, do the following:
 - a Touch **Mode**.
 - b Select **Single pair** or **K-Test**. If testing toward a UFED, touch the checkbox next to **UFED Enabled**.
The K-Test is typically used to test for fault location when there is no “known good” (reference) pair.
Use this test to find the approximate distance to faults on a single pair of wires when both wires have a fault on them and there is no known good spare pair or wire to use as a reference (when Single & Separate Pair RFL cannot be used).

In order to get the desired results make sure the following guidelines are met:

- The faults must occur at the same physical point on the pair to the same place or reference. For example both wires are faulted to the shield at the same location.
 - The fault ratio is 2:1. The fault size on one wire vs. the fault on the other is twice as large. For example one wire has a 10K ohm fault and the other has a 20K ohm fault.
 - The larger fault value should be at least 100 times greater than the loop ohms of the pair under test. For example if the loop ohms is 100 then the larger fault value should be > 10K ohms.
- c The K-Test is a two step measurement that starts with the far end open and does a series of resistance measurements to determine the faults present and if it is possible to solve the resistance to fault. Then with the far end shorted, the measurement finishes and calculates the results. It can be run manually or use a FED to automatically provide the correct conditions for the test.
- 6 Touch **Start**.
- The test runs then displays the results. The results for the specific fault appear.
- The OneExpert DSL assumes that the fault is on the red lead. If the fault is not on the red lead, it will automatically flip Tip (A) and Ring (B) and run the test again. Thus, your screen may show swapped leads.
- 7 To save the results to a report, use the Tray menu (“[Saving a report](#)” on page 49).
- 8 To learn what your results mean, see “[RFL](#)” in [Chapter 14 “Test Results”](#).

Locating a cable fault using the RFL is complete.

Measuring spectral noise

With the spectral test, the OneExpert DSL can detect and measure the existence of noise interference.

To measure spectral noise

- 1 Connect the Tip (A), Ring (B), and Ground (Earth) leads to the line under test.
- 2 From the Copper menu, touch **Spectral**.
- 3 The spectral noise graph appears.
- 4 To specify a technology, touch **Technology** and then do the following:
 - a Select a technology from the list.
 - b Specify a custom technology. Select **Custom** and then specify the range and termination.
- 5 To zoom in, touch the magnifying glass and then use the arrows on the screen to zoom on the x-axis or y-axis. You can also zoom using the arrow keys.
- 6 To zoom out, do one of the following:
 - Touch **Options** and then select Pull Back.
 - Use the arrows on the screen or the arrow keysThe graph in the lower area shows the world view.
- 7 To change the scale of the y-axis, touch **Options** and then select a scale: **dBm dBrn**, or **dBm/Hz**.
- 8 To use an external bridge, touch **Options** and then select the checkbox for **Use External Bridge**.
- 9 To use the trace as a reference, touch **Options** and then select **Set Reference**.

The reference trace is superimposed on the current trace.

Compare the traces to troubleshoot anomalies such as impulse noise or large noise spikes.

- 10 To superimpose a spectral mask for a specific technology, do the following:
 - a Touch **Options** and then select **Spectral PSD Mask**.
 - b Select a technology.
- 11 To save the results to a report, use the Tray menu (“[Saving a report](#)” on page 49).
- 12 To learn what your results mean, see “[Spectral](#)” in [Chapter 14 “Test Results”](#).

Spectral analysis is complete.

Testing TIMS

The transmission impairment measurement set (TIMS) is an optional suite of tests designed to troubleshoot copper problems associated with technologies that use both voice frequencies (narrowband) and above the voice range (wideband). These tests include the following:

- Noise - wideband and narrowband
- Impulse noise
- Impulse noise
- RX Tones - wideband and narrowband

For additional information about options, contact your Viavi representative or contact Viavi through the company web site, www.viavisolutions.com.

To access the WBTIMS feature

- 1 From the Copper menu, touch **Wideband TIMS**.
The WB Noise menu appears (or the last test used).

The following procedures describe how to use the WBTIMS feature.



NOTE:

For best results, do not use the battery charger while performing WBTIMS measurements, especially when measuring very low amplitudes.

Measuring noise

The noise measurement is used to identify interferences that may interrupt signal transmission.

To measure noise

- 1 Connect the Tip and Ring (A and B) leads to the line under test.
- 2 Select **Mode** and then select **Noise**.
The Noise Power menu appears.
- 3 To specify a technology, touch **Technology** and then do the following:
 - a Select a technology from the list.
Voice Frequency is narrowband; all others are wideband.
 - b Specify a custom technology. Select **Custom** and then specify the termination and filter.

- 4 If you selected Voice Frequency:
 - a Touch **Options** and then select **dB** or **dBrn** to specify the measurement in dB (decibels) or dBrn (decibels above the reference noise level)
 - b Touch **Options** and then select **Notch Filter**, Select either **820** Hz or **1020** Hz.
 - c To establish a quiet termination for the noise test, select **UFED Quiet Term**. This terminates the pair at the FED.
- 5 If you selected a wideband technology, do the following:
 - a To use an external bridge, touch **Options** and then select the checkbox for **Use External Bridge**.
 - b To specify a custom filter, do the following:
 - i Touch **Options** and then select **Custom Filter Book**.
 - ii Enter a name for the filter.
 - iii Enter a start frequency.
 - iv Enter a stop frequency.
- 6 To learn what your results mean, see “Noise” in [Chapter 14 “Test Results”](#).
- 7 Press the **Results** soft key to save or clear the results. For information on saving your results in graphical form, see “Saving results” on [page 184](#).
- 8 Press the **Stop** soft key.
- 9 To save the results to a report, use the Tray menu (“Saving a report” on [page 49](#)).
- 10 To learn what your results mean, see “RFL” in [Chapter 14 “Test Results”](#).

Measuring wideband noise is complete.

Measuring impulse noise

Impulse noise is spurious voltage spikes that can disrupt digital transmissions.

The following procedure describes how to measure impulse noise.

To measure impulse noise

- 1 Connect the Tip and Ring (A and B) leads to the line under test.
- 2 Press the **Display** soft key.
- 3 Select **Mode** and then select **Impulse Noise**.
The Impulse Noise menu appears.
- 4 To specify a technology, touch **Technology** and then do the following:
 - a Select a technology from the list.
 - b Specify a custom technology. Select **Custom** and then specify the termination and filter.
- 5 To select the type of test, touch **Options** and then select **Timed** or **Counter** (untimed).
- 6 Specify the **Dead Time**. This is how long the OneExpert DSL will wait before attempting to detect the next impulse event.
- 7 To use an external bridge, touch **Options** and then select the checkbox for **Use External Bridge**.
A count of impulse noise events appears on the Impulse Noise screen.
If an impulse noise “hit” occurs, a log file is generated that includes the date and time and the number of counts that occurred in that second. The log file also includes the termination, filter, threshold, and test start time.

- 8 To save the results to a report, use the Tray menu (“[Saving a report](#)” on page 49).
- 9 To learn what your results mean, see “[Impulse Noise](#)” in [Chapter 14 “Test Results”](#).

You have completed the test.

Impulse noise capture

Impulse capture works like an oscilloscope. It provides a graphic display of the signal.

- 1 Connect the Tip (A) and Ring (B) leads to the line under test.
- 2 Select **Mode**, and then select **Impulse Noise Capture**.
The Wideband Impulse Noise Capture menu appears.
- 3 To specify a technology, touch **Technology** and then do the following:
 - a Select a technology from the list.
 - b Specify a custom technology. Select **Custom** and then specify the termination and filter.
- 4 To specify the view, touch **Options** and then select **Time** or **Frequency**.
- 5 To specify the duration, touch **Options** and then select **Single Capture** or a **Continuous Capture**.
- 6 To specify the noise threshold, touch **Options** and then select **Trigger Threshold**. When this value is exceeded, an impulse noise event is be registered.
- 7 To specify a Capture Trigger, touch **Options** and then select **Capture Display**. This specifies the samples to capture relative to the impulse event detection: 10% (before), 50% (during), or 90% (after).

- 8 To specify dead time, touch **Options** and then select **Dead Time**. This is how long the OneExpert DSL will wait before attempting to detect the next impulse event.
- 9 To use an external bridge, touch **Options** and then select the checkbox for **Use External Bridge**.
As soon as the signal crosses the selected threshold, a time-domain graph will be displayed showing $\pm 10 \mu\text{s}$ of when the impulse occurred.
- 10 Use the **Zoom** or **Pan** button to view specific sections of the graph.
- 11 To save the results to a report, use the Tray menu ("[Saving a report](#)" on page 49).

You have completed the procedure.

Receiving wideband tones

The OneExpert DSL can receive tones to measure wideband loss.

The following procedure describes how to receive wideband tones.

To receive wideband tones

- 1 Connect the Tip and Ring (A and B) leads to the line under test. Do not connect the Ground (Earth) lead.
- 2 Select **Mode**, and then select **RX Tones**.
The OneExpert DSL begins measuring the frequency and level of each tone.
- 3 To specify the termination, touch **Technology**, and then select a **Termination**: 100 ohm, 120 ohm, or 135 ohm.
- 4 To specify the range, touch **Technology**, and then select 25 kHz - 30 MHz or 10 kHz - 2.2 MHz.

- 5 To change the display view touch **Options** and then select **Meter** or **List** (listed by frequency).
- 6 To use an external bridge, touch **Options** and then select the checkbox for **Use External Bridge**.
- 7 To save the results to a report, use the Tray menu ([“Saving a report” on page 49](#)).
- 8 To learn what your results mean, see [“TX/RX Tones” in Chapter 14 “Test Results”](#).

Receiving tones is complete.

Running a OneCheck Copper test

The OneCheck Copper test is a Viavi out-of-service pair quality test. It automatically performs a series of test including: DVOM (AC/DC volts, resistance), Opens/Capacitance, Balance, and Load Coil Detect. It also compares results to user-defined threshold values and provides a pass/fail indication.

To run a cable check

- 1 Connect the tip (A), ring (B), and ground (earth) leads to the line under test.
- 2 From the main menu, select **OneCheck Copper**.
The test begins to run.
As each test runs, the test summary is updated. The summary provides a simple pass/fail indication.
The test stops automatically when complete.
- 3 To view more detail, use the arrow keys to scroll through the result values.
To learn what your results mean, see [Chapter 14 “Test Results”](#).

- 4 To save the results to a report, use the Tray menu ([“Saving a report” on page 49](#)).

Performing a cable check is complete.

Routing the cables through the glove

The glove accessory is designed to hold the copper test leads so you don't have to disconnect them from the instrument.

To route the cables through the glove

- 1 Turn the OneExpert DSL over, onto the front panel.
- 2 Unzip the back flap of the glove.
- 3 Push the cables through the opening at the bottom and pull them up to the copper connectors.
- 4 Connect the cable leads to the connectors.
- 5 Pull the cables with the blue and yellow leads to the right side and use the velcro straps to hold the cables in place, as shown in [Figure 14](#).
- 6 Pull the cables with the red, black, and green leads to the left side and use the velcro straps to hold the cables in place, as shown in [Figure 14](#).

Figure 14 Cable routing through the back of the glove



- 7 Use the velcro strap in the glove hinge to hold the cables, as shown in [Figure 15](#).

Figure 15 Cable routing through the hinge of the glove



- 8 Wind the ends of the cable and fit them into the zippered pocket on the inside of the front of the glove.
- 9 Close the front of the glove and then pull the strap from the back over the top and into the connector just above the Viavi logo.

Using the ONX with a mobile device

This chapter provides task-based instructions for using the optional app that is available for mobile devices. Topics discussed in this chapter include the following:

- [“Getting Started” on page 178](#)
- [“Controlling the OneExpert DSL user interface” on page 178](#)

Getting Started

Before using the OneExpert DSL with a mobile device, verify the following:

- The mobile device must have the **OneExpert** app installed (available on the AppStore or from your Viavi representative).
- In order to use the OneExpert DSL with a mobile device, the OneExpert DSL must have the Apple option enabled.
- In order for the OneExpert DSL to communicate with the mobile device, the OneExpert DSL must have the Bluetooth option enabled.

To verify your options, go to the Options menu in the System Settings.

Controlling the OneExpert DSL user interface

To control the user interface of an OneExpert DSL, the mobile device must pair with the OneExpert DSL over Bluetooth. Then, using the OneExpert DSL app on the mobile device, you can connect to an OneExpert DSL and control the user interface.

To control the OneExpert DSL with a mobile device

- 1 On the OneExpert DSL, do the following:
 - a Select the System menu, and then System Settings.
 - b Select the Bluetooth menu and verify that the OneExpert DSL is not paired with any other device.
- 2 On the mobile device, do the following:
 - a Go to the Settings menu, then select Bluetooth.
 - b Verify that the device is not paired with **any** OneExpert DSL unit.
- 3 On the OneExpert DSL, verify that Bluetooth is enabled (verify that the box next to Enabled has a check mark).

- 4 On the mobile device, search the devices list to find the OneExpert DSL unit ID that you wish to connect to. (The unit ID can be found in the System Settings>Hardware & Software Revisions.)
- 5 On the OneExpert DSL, when a Pairing request message appears, select OK.
- 6 On the mobile device, launch the **OneExpert** app.



The Controller page appears.



- 7 Select Device Interface.

The OneExpert DSL interface appears on the mobile device. You can now control the instrument as if you were pressing the actual buttons on the device. You can run most of the tests that are available on the OneExpert DSL.



Near the bottom, the Back icon appears on the left and the Tray menu icon appears on the right. These function as if you pressed the function key on the device.

Across the bottom, icons are available for:

- Controller page – the screen above, allows control of the user interface
- Quick Cards – view quick cards (short documents of instructions)
- Manual – read the manual
- Videos – view instructional videos
- Accessories – view the OneExpert DSL accessories, including how to order

Updating the iOS application software

Updating the iOS application software allows you to have the latest application, including new features and company-specific procedures or applications.

To update the host application software

- 1 To download the application, do one of the following:
 - a If your company has an enterprise network, connect to your company enterprise network with the mobile device. If there is a new version, your application icon will include a badge (a circle in the upper corner that indicates updates are available). Using the browser, go to the site/location where the application is kept, then download the new version.
 - b Go to the Apple App Store.
- 2 As the process runs, the application icon has a circle inside that rotates.
- 3 When the update is finished, the rotating circle disappears and the icon has a “badge” (a blue dot next to the icon).

The iOS host application software is updated.

Test Results

This chapter describes the test results that are gathered when running a test. To view the different categories of statistics, use either the left and right arrows, or press the number for the desired result category. Topics in this chapter include the following:

- [“Saving results” on page 184](#)
- [“DSL Results” on page 185](#)
- [“IP Data results” on page 193](#)
- [“TrueSpeed results” on page 195](#)
- [“Video results” on page 199](#)
- [“VoIP results” on page 195](#)
- [“HPNA results” on page 205](#)
- [“SmartID results” on page 208](#)
- [“Copper results” on page 209](#)
- [“WiFi Advisor results” on page 217](#)

Saving results

After running tests you can save results **as a report** - save the file as text, HTML, or PDF and then export for viewing or printing using a PC.

To save results as a report

- 1 After your test is finished, use the Tray menu (swipe the screen from top to bottom) and then select **Save Report**.
- 2 Specify the report settings.

Setting	Description
Name	Specify a file name for the report. The default file name uses the type of test followed by a three digit number that increments with each file save (for example, cable-check001 or DSL002).
Format	Specify the file format for the report: Text, HTML, PDF.

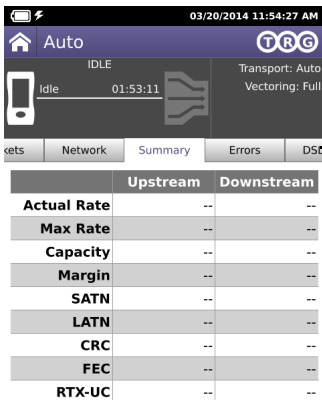
- 3 Touch **Save** to save the file to internal storage.

The test results are stored.

Use the File Browser to copy the file to USB for viewing or printing using a PC.

DSL Results

The following section describes the results available in DSL mode. Different result categories are available on different tabs on the screen. To view the different statistics, tap the tab on the screen.



Result category tabs

Summary

This category provides a summary of the most frequently used DSL test results. [Table 14](#) describes the DSL Summary results.

Table 14 DSL Summary results

Result	Description	Range
Training State	The state of modem synchronization (appears in the menu heading)	Booting, Idle, Init, Showtime

Table 14 DSL Summary results (Continued)

Result	Description	Range
Trained Mode	The DSL line format agreed upon during training (appears in the menu heading).	T1.413, READSL, ADSL2+, ADSL2, G.Lite, G.DMT, VDSL2
Connection Statistics		
Actual Rate	Current upstream and downstream connection rates	32 kB–3.3 MB ¹ (Up) 32 kB–25 MB ¹ (Dn) 64 kB–50 MB (Up) ² 64 kB–100 MB (Dn) ²
Max Rate	Maximum upstream and downstream connection rates	32 kB–3.3 MB ¹ (Up) 32 kB–25 MB ¹ (Dn) 64 kB–50 MB (Up) ² 64 kB–150 MB (Dn) ²
Capacity	The percentage of total bandwidth currently used by the actual connect rate upstream and downstream.	0–100%
Margin	SNR margin upstream and downstream	0–63.5 dB
ATN	The degradation of signal strength in dB upstream and downstream. It is the difference in Tx power from the transmitter to receiver.	0–126.95 dB (VDLS2) 0–254.9 dB (ADLS2)
Sync Time	The elapsed time (duration) since reaching Showtime.	n/a

1. These are ADSL2 rates.
2. These are VDSL2 rates.

In the saved test report, two additional statistics are included:

- **Start Time** is the time (time of day) when the DSL modem achieves Showtime. The Start time is updated if you clear errors.
- **Stop Time** is the time (time of day) when the report is generated or DSL sync is lost.

DSL statistics

For bonded mode, the same results are shown, but the bonded results are separated into different screens:

- Group - results for both pairs combined
- Pair 1 or Pair 2 - Same results as the non- screen, except the title.

Packet Statistics

Table 15 describes the LAN Statistics.

Table 15 LAN Statistics

Result	Definition
Link Status	Status of the connection.
RX Bytes	Total bytes received
RX Frames	Total frames received
RX Errors	Total errors received
RX Dropped	Total dropped frames received
TX Bytes	Total bytes transmitted
TX Frames	Total frames transmitted
TX Errors	Total errors transmitted
TX Dropped	Total dropped frames transmitted

Table 15 LAN Statistics (Continued)

Result	Definition
TX Collisions	Ethernet frames are transmitted “space-available” when there is a break on the signal on the cable; sometimes frames are transmitted at the same time as another transmitter, causing a “collision” of frames.

Network Status

Table 16 describes the Network Status results.

Table 16 Network Status results

Result	Description
Network Status	Status of the connection. If testing in Router mode, there are separate status indications for WAN and LAN.
LAN x	If using Multi-VLAN, reports the status of up to three LAN connections.
IP Address	The OneExpert DSL OneExpert DSL's IP address to the access the provider network. (IPv4)
Global	If using IPv6oE, this is the OneExpert DSL OneExpert DSL's IP address to the access the global network, beyond the router.
Local	If using IPv6oE, this is the OneExpert DSL OneExpert DSL's IP address to the access the local network.
Subnet prefix	If using IPv6oE, this is the length of the subnet prefix.
Netmask	The OneExpert DSL OneExpert DSL's netmask address. IP devices use a netmask IP address to determine if IP packets are to be routed to other networks or sub-networks. (IPv4)

Table 16 Network Status results (Continued)

Result	Description
Gateway	The OneExpert DSL OneExpert DSL's gateway address. When an IP device has determined that a packet is not addressed to it or devices on the same sub-network (sub-net), it sends all such packets to the gateway address for further routing to the correct address.
DNS	Domain Name Services. When using internet addresses such as www.jdsu.com, the OneExpert DSL OneExpert DSL (and all IP devices) must translate to an IP address (such as 157.234.12.20) in order to route the packets or data. To do so, it first requests a DNS server to translate an internet address into an IP address; then the OneExpert DSL OneExpert DSL can correctly route IP pings or other data. The DNS address must be that of a real DNS server, preferably in the provider network.
MAC Address	The MAC address of the LAN.

Errors

Table 17 describes the DSL Errors.

Table 17 DSL Errors

Result	Description
FEC	Forward Error Correction upstream and downstream for Fast Path and Interleave Path.
CRC	Cyclical redundancy check upstream and downstream for Fast Path and Interleave Path.
ES	Errored Seconds. Number of seconds during which a LOS, SEF, LPR, or CRC occurred since starting the test.

Table 17 DSL Errors (Continued)

Result	Description
SES	Severely Errored Seconds. Number of seconds during which one or more LOS, SEF, or LPR errors were present, or 18 CRCs occurred.
UAS	Unavailable Seconds. A count of the number of test seconds which met the ITU-T Rec. G.821 definition of unavailable time.
LOS	Loss of Signal. Number of errored seconds due to loss of signal.
LOF	Loss of Frame. Number of errored seconds due to loss of framing.
LOM	Loss of Margin Errors. Number of errored seconds due to loss of margin.

DSL RTX

Table 18 describes the RTX (DSL Retransmission) results.

Table 18 DSL RTX results

Result	Description
Status	The state of modem synchronization
RTX-TX	The number of retransmitted DTUs that were received.
RTX-C	The number of DTUs we received a correction for
RTX-UC	The number of DTUs that did not get a retransmission in time.
INP Rein	The effective INP that G.INP support is giving us.

Signal

This category provides statistics for the signal. [Table 18](#) describes the DSL Summary results.

Table 19 DSL Signal results

Result	Description
Sync Count	The number of synchronization attempts. It is possible that modems do not synchronize immediately and make multiple attempts before achieving synchronization.
Uptime	Amount of time the modems have been synchronized.
Path	RJ45, (T/R or A/B)
SATN	Signal attenuation. Attenuation average of the bins/tones that contain the actual signal (empty bins are not included).
LATN	Line attenuation. Attenuation average of <i>all</i> tones/bins (the entire line, including empty bins/tones).
Tx Power	Power level, in dB, of the VDSL signal, downstream (from the DSLAM) and upstream (transmitted by the OneExpert DSL OneExpert DSL).
INTLV Delay	Interleaving depth set by the DSLAM. This is a measure of latency introduced on the link due to the scrambling of DSL frames to protect data and create a more reliable link.
Actual INP	The INP (Impulse Noise Protection) values negotiated during training.

DSL Identity

Table 20 describes the DSL Identity results.

Table 20 DSL Identity results

Result	Description
HW Type	Type of modem hardware
HW Rev	Revision of the hardware
xTU-R SW Revision	SW revision of the local modem
xTU-R PHY Revision	PHY firmware revision for the local modem
xTU-O Vendor	CO vendor code
xTU-O Rev	CO revision number

DSL Graphs

The graphs provide a graphical representation of the following:

- SNR (signal to noise ratio) Per Tone
- Bits Per Tone (BPT)
- QLN (quiet line noise) Per Tone
- Hlog Per Tone

The SNR graph indicates line quality. The BPT graph indicates the total bit rate and is a useful tool for finding disturbers. Bits per tone is defined as bits assigned per DMT tone.

Examine the portions of the graphs where there are dips or breaks. These dips represent areas where interference is degrading the DSL signal.

Table 21 lists common noise sources and the corresponding frequencies and tones.

Table 21 Noise sources and tones

Noise Source	Noise Frequency (kHz)	Tone #	Tone Frequency (kHz)
ISDN BRI	40	9	38.8125
HDSL passband center	196	45	194.0625
HDSL passband max	392	91	392.4375
HDSL2	274	64	276
T1 passband center	772	179	772
E1 passband center	1024	237	1022

IP Data results

The following section describes the results available in IP Data mode. To view the different categories of statistics, use either the left and right arrows, or press the number for the desired result category.

Ping results

Table 22 describes the ping results.

Table 22 IP Ping results

Result	Definition
Destination	Destination address where the ping is being sent.
Message	Status message.
Echos TX	The number of ping messages sent.

Table 22 IP Ping results (Continued)

Result	Definition
Replies RX	The number of echo reply messages returned to the OneExpert DSL from the destination.
Replies Lost	The number of pings that did not return to the OneExpert DSL. This could be caused by an unresponsive target (destination) or by heavy congestion on the network; the more packets lost the more congested the network, indicating slow or poor throughput.
Replies Lost %	The percentage of lost echoes compared to echoes sent.
Echos RX	The number of ping messages sent to the OneExpert DSL from other devices on the network.
Ping Time	The current, minimum, maximum, and average time in milliseconds it has taken one transmitted ping to reach its destination and receive a reply back to the OneExpert DSL.

File Transfer results

Table 23 describes the File Transfer results.

Table 23 File Transfer results

Result	Description
Status	The status of the transfer.
Bytes Transferred	The number of bytes transferred.
Transfer Rate	The speed that the file was uploaded or downloaded.

TrueSpeed results

The summary result screen reports the round trip time and the actual upload and download rates. Pressing the **Results** soft key provides more detailed results. [Table 24](#) describes the TrueSpeed results.

Table 24 TrueSpeed results

Result	Description
Actual Rate	The actual measured upload and download rate.
Ideal Rate	The ideal upload and download rate, based on the specified CIR.
Server	The IP address and port number of the server.
RTT	The round trip time, specified in milliseconds
MSS	The maximum segment size, measured in bytes

The test report is available on both the ONX-VTS client and VTS-Server.

VoIP results

The following section describes the results available in VoIP mode. To view the different categories of statistics, use either the left and right arrows, or press the number for the desired result category.

Summary

The summary results provide a quick go/no go result for QoS, loss, jitter, and delay, as well as the MOS score, the audio codec used for the incoming call, and the call log.

QoS

This category provides quality of service (QoS) test results. The Local QoS reports what we receive (in the test set), while the Remote QoS reports what they receive (at the far end). [Table 14](#) describes the QoS results.

Table 25 QoS results

Result	Definition
Delay	End to end delay in milliseconds
Jitter	Deviation in packet arrival times, in milliseconds)
Loss	Packet loss based as a percentage lost divided by total packets

A green check mark appears next to the number to provides a quick good/bad indication (bad shows a red X)

MOS

[Table 26](#) describes the VoIP Audio Quality MOS (mean opinion score) results. These results relate to one call.

Table 26 MOS results

Result	Definition
Conversational MOS	Current conversation quality, between 1 (bad) and 5 (excellent)
Listener MOS	Current listener quality, between 1 (bad) and 5 (excellent)
Conversational R Factor	Current conversation quality R factor
Listener R Factor	Current listener quality R factor
G.107 R Factor	Current G.107 R factor

Table 26 MOS results (Continued)

Result	Definition
Burst R Factor	Current burst R factor
Gap R Factor	Current gap R factor
Maximum Possible	The best possible conversation quality R factor for the connection.
Maximum Codec	The best possible quality coming through the codec.
Packet Loss Degradation	Degradation factor due to Packet Loss.
Codec Degradation	Degradation factor due to the Codec.
Delay Degradation	Degradation factor due to Delay.
Recency Degradation	Degradation factor due to recent events.
Discard Degradation	Degradation factor due to Discard.

R-value is a number that indicates the quality of speech, displayed as a percentage (1=worst and 100=best).

Network results

[Table 27](#) describes the Network results.

Table 27 Network results

Result	Definition
Local Throughput Rate	Bit rate transmitted (TX) or received (RX) for the audio and video portions of the call
Local Throughput Bytes	Total number of bytes transmitted (TX) or received (RX)
Local Throughput Packets	Total number of packets transmitted (TX) or received (RX)

Table 27 Network results (Continued)

Result	Definition
Local Throughput Packets OOS	Total number of packets that arrive out of sequence
Remote Throughput Bytes	The number of Bytes that the remote entity reports that it has transmitted (sent via RTCP)
Remote Throughput Packets	The number of Packets that the remote entity reports that it has transmitted (sent via RTCP)
Network Delay	Time, in milliseconds, needed to travel the network (only displayed when a call is active)
Packetization Delay	Number of milliseconds needed to fill the frame(s) comprising one RTP data packet
Encoding Delay	Time, in milliseconds, needed to convert samples in selected codec form
Buffering Delay	Time, in milliseconds, that the data was held in a jitter buffer
Total Delay	Total of all delays

Call Information results

Table 27 describes the Call Information results.

Table 28 Call Info results

Result	Definition
Call Duration	Length of time for the current call. If the call duration continues beyond 59:59 (meaning, is more than an hour), the display changes from mm:ss to hh::mm (note the change from : to ::).
Far End Information	The IP address, Name, and Alias for the incoming call.
Audio Parameters	Whether RTCP is being used for the Audio path, the receive and transmit codec being used, Codec Packetization Interval RX and TX, whether silence suppression is enabled, and the number of jitter buffer replays or times the jitter buffer has dropped cells.

Video results

After the OneExpert DSL is setup and a data connection is established, video streams become available for analysis.

In the upper area of the screen, the graphic indicates the network status (up/down), the number of active streams, and the combined rate indicates the total video bandwidth (current and max). The total video bandwidth (“Combined rate”) peaks can be important in analyzing total bandwidth available. The total bandwidth is found on the DSL Summary screen. The difference in the two numbers is the bandwidth available for either Internet data or Internet data and VoIP data.

The system keys along the bottom to clear a stream, Play or Stop (right-pointing arrow / square box) a stream, or QoS Expert to compare streams,

The test results used for analysis are split among several categories, displayed on separate tabs. To view the different categories of statistics, touch the tab for the results that you wish to view.

Summary

Table 29 describes the Video Summary results.

Table 29 Video Summary results

Result	Description
Stream IDs	Numbered 1-6, identifies the stream
Each result provides the following four statistics:	
State	Status of the stream <ul style="list-style-type: none">– Stream Up - Active– Idle - No active stream– Failed - A stream is no longer detected. All streams brought up using RTSP protocol will eventually reach the Failed state. This is because the HST does not detect RTSP termination messages or RTSP messages used for special features such as pause.
IP address	The IP address of the stream.
Type	The type of media detected: <ul style="list-style-type: none">– udp (for MPEG-2 TS Video over UDP)– rtp (MPEG-2 TS Video over RTP)



NOTE:

The State, Type, IP address, and Port results refer to the media stream, *not* the signaling protocol (IGMP or RTSP) that brought up the stream.

QoS results

This category provides a summary of the video quality of the selected program flow. This screen varies depending on the stream type. [Table 30](#) describes the Stream QoS results.

Table 30 Stream QoS results

Result	Description
Err. Ind.	Number of MPEG2 bits with the error indicator bit set.
PCR Jitter	MPEG2 Program Clock Reference deviation, in milliseconds.
RTP Jitter	The current jitter, in milliseconds, when analyzing UDP, ISMA, or Rolling Stream video streams.
RTP Lost	Percentage of packets that were lost.
Cont. Err	MPEG2 Continuity Errors or lost packets, in percent.
IGMP Latency	The measure of time to complete a program change. For example, in broadcast video, it is the time between the IGMP join message is sent to the time the first video packet is received.
Leave Latency	Delay from when a stream is terminated (via an IGMP leave request) and when we receive the last media packet.
Overall	A rating (good, fair, poor) of the combination of jitter, latency, and cont.err. (FAIL if any one item is a fail status).

Loss results

This category provides information on lost packets.

Table 31 describes the Loss summary results.

Table 31 Loss summary results

Result	Description
Distance Err.	“Distance Errors” measured in the current measurement interval, which is 5 minutes.
Period Err.	“Loss Period Errors” measured in the current measurement interval, which is 5 minutes.
Min Distance	The minimum distance between two loss events, measured over the lifetime of the stream.
Max Period	The maximum loss period (i.e. greatest number of consecutive loss packets) measured over the lifetime of the stream.
RTP Lost	Number of RTP packets that were lost.
RTP OOS	RTP OOS Number of RTP packets that were out of sequence.
RTP Errors	RTP Errors Number of RTP packets with errors in the RTP header.
Video Continuity Err	Number of MPEG continuity errors detected.
ETHERNET RX Errors	Number of Ethernet errors received. (Appears only if testing on Ethernet interface)
ETHERNET RX Drops	Number of dropped Ethernet frames received. (Appears only if testing on Ethernet interface)

Packet statistics

This category provides statistics for the packets at the IP layer.

Table 31 describes the Packet statistics.

Table 32 Packet statistics

Result	Description
IP Packets Rx	Total number of IP packets received.
Jitter Current	The current jitter value.
Jitter Max	The maximum jitter value.
IGMP Latency	The measure of time to complete a program change. For example, in broadcast video, it is the time between the IGMP join message is sent to the time the first video packet is received.
Current Gap Errors	The current number of gap errors.
Max Gap Errors	The maximum number of gap errors received since the start of the test.
Total Gap Errors	The total number of gap errors received since the start of the test.
Max Gap	The maximum gap received.

Stream Rates

This category provides individual bit rates for each portion of the video stream. The “IP Total” statistics measure the bandwidth used by the video stream, including the UDP and IP headers.

Stream (TS) statistics

This category provides statistics for each test stream (TS) of video. Statistics are kept on up to three streams.

Table 33 describes the TS statistics.

Table 33 Stream statistics

Result	Description
Error Indicator	Number of MPEG2-TS packets with the error indicator bit set.
Continuity Errors	Number of MPEG continuity errors detected.
PAT Errors	Number of errors in the Program Association Table. Error conditions include any of the following: <ul style="list-style-type: none">– scrambling is ON– repetition rate is less than the configured threshold value– PAT not found
PMT Errors	Number of errors in the Program Map Table. Error conditions include any of the following: <ul style="list-style-type: none">– scrambling is ON– repetition rate is less than the configured threshold value– PMT not found
PID Timeouts	Number of occurrences when the PID for Video or Audio is not present for more than the configured threshold value.
Service Name	The name of the service as given by the “service name” string in the MPEG2-TS transport stream.
Program Name	The name of the program as given by the “program name” string in the MPEG2-TS transport stream.



NOTE:

The Error Indicator is set by the video stream encoder when it detects corrupted source content. Typically any count will result in an anomaly on the TV.

PID results

This category provides the PIDs (Packet Identifiers) for each piece (video, audio, and data) of the video program stream.



NOTE:

The PAT and PMT items are table data inserted into the stream to enable the decoder to perform correctly. These two items should always be present.

HPNA results

The following section describes the results available in HPNA mode.

Node list

Table 23 describes the Node List results.

Table 34 Node List results

Results	Description	Units	Range/Values
H	This column indicates the host/client of every HPNA device in the network		H: Host device
Id	The station identifier for the HPNA device.	numeric digit	0-9
Hpna MAC	The MAC address of the HPNA device in the network	aa:bb:cc:dd:ee:ff	Each field is 00-FF hex

Table 34 Node List results (Continued)

Results	Description	Units	Range/Values
Ver-Chip	The device's firmware version and Copper-Gate™ chip ID.	revision-chip id	Chip ID = Chipset 0 3010 1 3110 2 3210 3 3310 4 3320

Node details

Node details provides details for a particular node.

Network Test

Table 35 describes the HPNA results.

Table 35 HPNA results

Results	Description	Units	Range/Values
Station ID -> ID	This is a directional indication of each link denoted by each node ID		
Rate, Mod Mbps	This is the current data rate, and baud/constellation of the specific link.	Mbps, MBaud/ bits per symbol	0-112, 2-24/2-10
PER	The Packet Error Rate on the specific link.	Rate x.xxe+yy	0.00e0 - 1.00e0

Table 35 HPNA results (Continued)

Results	Description	Units	Range/Values
SNR	This is the Signal to Noise Ratio of the specific link.	dB	
Receive and Transmit Results			
bytes	The number of total (good and bad) transmitted or received bytes	Bytes	
packets	The number of total (good and bad) transmitted or received packets.	Packets	
bcast	The number of transmitted or received broadcast packets.	Packets	
mcast	The number of transmitted or received multicast packets.	Packets	
dropped	The number of transmitted or received packets dropped due to lack of resources.	Packets	
crc	The number of received packets that have had an invalid checksum. (NOTE: There is no count for transmitted packets)	Packets	
Protocol Messages			
ctrl_log_req	The number of control requests from the local host (CERT protocol.)		

Table 35 HPNA results (Continued)

Results	Description	Units	Range/Values
ctrl_log_rec	The number of control replies to the local host (CERT protocol.)		
ctrl_rem_req	The number of control requests from a remote host (CERT protocol.)		
ctrl_rem_rec	The number of control replies to a remote host (CERT protocol.)		

SmartID results

The following section paragraphs describes the results available in SmartID tests.

Test Summary

This category provides an overview of the results, including basic pass/fail indications of the links between the SmartIDs. Use the arrow keys to navigate and highlight a section. The details for that section appear. If you navigate to a section/link that failed, the results on the left update and you can see which measurement failed.

Detailed View

This category shows detail of the selected section/link of the network between two SmartIDs. Use the # key to reverse the direction (change the focus from the near end of the cable to the far end).

Network Map

This category shows the layout of the network. The SmartID connected to the OneExpert DSL is on the left and the home network cascades to the right. Use the up and down arrow keys to select different SmartIDs on the map. Press OK to see details of a particular segment.

Sweep Data

This category shows a graph of the frequency sweep. Use the # key to reverse the direction.

Copper results

The copper results are described in the tables below.

AC voltage

You measure AC volts to:

- detect the presence of hazardous voltage.
- measure stray or foreign voltages.
- measure ringer voltage level.

AC voltage results on Tip (A) to Ring (B) should be 0.0 volts. Tip (A) to ground and Ring (B) to ground should be equal to each other. Anything else indicates AC signal interference and/or an unbalanced line.

Table 36 describes the AC voltage result.

Table 36 AC Voltage result specifications

Range (VAC)	Resolution (V)	Accuracy
AC peak + [VDC] \leq 300	1	2% \pm 1.0V



WARNING: INSTRUMENT DAMAGE

Although the OneExpert DSL OneExpert DSL is designed to measure hazardous voltage, it is designed to do so on telecom circuits, not power mains. Hazardous voltages may be on the power lines. 220 mains (RMS) are equivalent to 308 peak. Connecting to these circuits may result in damage to equipment or serious injury.

DC voltage

You measure DC volts to:

- detect and measure CO/exchange battery voltage.
- detect crossed battery conditions.

To measure DC volts, remove the line battery and measure Tip (A) and Ring (B) to ground. It should be < 3.0 volts; anything else indicates crossed battery that inhibits digital signals.

Table 37 describes the DC voltage result.

Table 37 DC voltage result specifications

Range (VDC)	Resolution (V)	Accuracy
AC peak + [VDC] \leq 300	1	2% \pm 1.0V

Resistance

You measure resistance to test line continuity and quality, and to detect corrosion, shorts, opens, and faults.

The OneExpert DSL is able to measure resistance in the presence of noise and foreign voltage, but the accuracy may be reduced, depending on the noise level.

Resistance should be measured with the line disconnected, so that the battery voltage and CO/Exchange termination don't affect the measurement.

Normal resistance should be at least 5 M Ω ; lower values indicate the presence of faults.

Table 38 describes the resistance result.

Table 38 Resistance result specifications (no ambient)

Range (Ω)	Resolution (Ω)	Accuracy
0 to 999	1	2% \pm 2.5 Ω
1.0K to 9.99K	10	2%
10.0K to 99.9K	100	2%
100.0K to 999K	1K	2%
1.0M to 9.9M	10K	6.5%
10.0M to 100M	100K	10%

Distance to short

This result measure the distance to the short. A resistance measurement of 4 k Ω or less typically indicates a short. For values greater than 4 k Ω , this function is disabled.

Table 39 describes the distance to short result.

Table 39 Distance to short result specifications

Range (feet)	Resolution	Range (meters)	Resolution
0 to 3000	30 feet	0 to 999	9 meters
3000 to 30,000	100 feet	1000 to 10,000	30.5 meters

Leakage

Leakage is a resistance measurement using higher voltage.

Table 40 describes the leakage result.

Table 40 Leakage result specifications (no ambient)

Range (Ω)	Resolution (Ω)	Accuracy
0 to 49.99	1	2% \pm 2.5 Ω
50 to 999	1	5% \pm 2.5 Ω
1.0K to 9.99K	10	5%
10.0K to 99.9K	100	5%
100.0K to 999K	1K	5%
1.0M to 9.9M	10K	10%
10.0M to 100M	100K	15%

Opens/Capacitance

You measure opens/capacitance to:

- measure total electrical loop length (includes length of bridged taps).
- find wet sections, bridged taps or open faults.

Opens/Capacitance: < 3% difference between Tip (A) and Ring (B) values indicate an acceptably balanced loop. Anything greater indicates an unbalanced line or open fault, which inhibit digital signals.

Table 41 describes the opens/capacitance result.

Table 41 Opens/Capacitance result specifications (no ambient)

Range (feet)	Resolution (feet)	Range (meters)	Resolution (meters)	Range (capacitance)	Accuracy (applies to capacitance only)
0 to 2,999	1 foot	0 to 999	0.1 meter	0 to 47.1 nF	1% ± 15 pF
3000 to 66000	1 foot	1,000 to 20,000	0.1 meter	47.1 nF to 1.57 µF	2%

DC current

You measure DC current to verify if enough current is present to operate equipment including the phone or caller ID boxes.

DC current on Tip (A) to Ring (B) should be ≥ 23 mA at the NID. Anything less will not allow for differences in temperature and phone equipment will not operate during extremes.

Table 42 describes the DC current result.

Table 42 DC current result specifications

Range	Resolution	Accuracy
0 to 110 ma	1ma	2% ± 1ma

Longitudinal balance

You measure longitudinal balance to:

- measure the quality of the pair: a measurement of the degree to which the Tip (A) lead is electrically the same as the Ring (B) lead.

The more each lead is electrically identical (capacitance, inductance, impedance), the better the pair will resist induced noise.

The balance result should be >60 dB. Anything less indicates electrical differences between Tip (A) and Ring (B) that can lead to noise and other signal problems.

Table 43 describes the DC current result.

Table 43 Balance result specifications

Range	Resolution	Accuracy
28 to 70 dB	1 dB	± 2 dB
70 to 120 dB	1 dB	indication only

The calculated balance ($PI - Noise = Balance$) appears below the longitudinal balance.

Power influence (Tip to Ground [A to E] and Ring to Ground [B to E] noise) is the unwanted current inducted on the pair from power lines and other AC sources. Noise is the unwanted current that the pair has failed to cancel and which the customer hears as noise.

Load coil

You check for load coils to ensure there are no load coils present on a digital line (such as ADSL or ISDN). Load coil detection and elimination is essential in the installation of an xDSL circuit

Table 42 describes the load coil result.

Table 44 Load coil result specifications

Range	Resolution	Accuracy
Up to 27,000 ft (8229.6 m)	up to 5	± 1

TDR

A TDR (Time Domain Reflectometer) is used to identify and locate buried splices, shorts and low resistance faults, opens, bridge taps, load coils, and wet cables.

Velocity of Propagation (VoP) is the speed of the TDR signal traveling down the wire pair relative to the speed of light. The OneExpert DSL uses this value to convert reflections to distance. To ensure an accurate distance calculation at the cursor, the VoP should match the cable gage and fill. The default value is appropriate for 24–26 AWG (4–5 mm) telco aerial cable and provides sufficient accuracy in most situations.

Table 42 describes the TDR result.

Table 45 TDR specifications

Range	Accuracy
0 to 40,000 ft (12000 m)	± 0.5% of distance

RFL

You use an RFL to find resistive faults such as poor splices, water, shorts, and battery crosses by cable damage (caused by rodents, the weather, etc.).

Spectral

Radio frequency interference from digital services or AM radios can reduce the performance of a copper wire. The spectral test can detect and measure the existence of such interference.

Comparing traces is useful to troubleshoot anomalies such as excessive impulse noise on the copper loop, large noise spikes on a spectral graph, and DSL errors impacting performance.

Noise

You measure noise to determine the amount of noise in a frequency range used for digital services such as ADSL and VDSL (wideband) or in voice frequencies (narrowband).

Impulse Noise

Impulse noise is used to check for the presence of noise spikes that disrupt digital services.

TX/RX Tones

You use tones to check cable performance (attenuation) at higher frequencies used for digital services (wideband) or in voice frequencies (narrowband).

WiFi Advisor results

BSSID results

The BSSID results screen provides a listing of all detected BSSIDs along with their channel setting, current signal strength, and MAC address.

To view more details of a particular BSSID, select the desired BSSID, and then touch the right arrow. The details include Noise and SNR as well as general items like the MAC address and type of security.

The BSSID Details menu also includes trend graphs that show RSSI, Noise, and Channel Utilization over time for the selected BSSID.

Channel results

The Channel results include a RSSI view, a utilization graph, a noise graph, channel scores, and a best channel list.

To view other results, either scroll up or down, or touch a result to minimize or maximize the view.

RSSI view

The RSSI view provides quick visibility into the wireless networks active in the current environment. It provides a visual representation of overlap in the channels to help identify problem spots. It also shows signal strength for each BSSID. This view is useful for understanding an existing Access Point's channel configuration and signal strength.

Utilization graph

The utilization graph shows the channel utilization for all channels in the selected band which could indicate co-channel or adjacent channel interference. This allows you to select the best channels available in the current environment.

If the channel view shows utilization in the wrong channels, the likely issue is that a high energy 802.11 transmitter is very close to the OneExpert DSL. For example, a high energy 802.11ac transmitter is using channels 149, 153, 157, and 161. The channel view should show utilization in these channels only. Move the WiFi Advisor away from the high energy transmitter and test again.

Noise graph

The noise graph displays the noise per channel.

Channel Score

The channel score provides a score per channel which determines the best channels.

Best Channels

A table that identifies the current top 3 best channels based on channel width for the band being viewed. This helps determine which channel to select for a new access point.

Spectral results

The Spectral results provide a real-time spectral analyzer configurable by 802.11 band, channel, and channel width. It is helpful for finding signals that interfere with 802.11 networks by showing both 802.11 and non-802.11 RF signals within a given channel of interest.

The Spectral results screen includes the spectral graph area, where the real-time spectral data is displayed, and the controls area, where the user can configure the spectrum analyzer ranges and modes.



NOTE

The BSSID View and Channel View must be run first in order for the BSSID and Channel Snapshots to populate in Spectral.

The Spectrum Analyzer controls consist of the following:

- Channel width – specifies the width of the spectrum analyzer.
- Max Hold – the blue line above the standard spectral line that represents the peak value (in dBm) seen at each frequency point. Press OK to reset the Max Hold trace and restart the measurement.
- Averages – specifies the number of samples to be used for averaging of the real-time trace

The following are some common interferences that could show up in a spectral measurement.

Microwave ovens can interfere with an 802.11 signal. They are most prevalent in channels 10 and 11. If possible, it is a good idea to look at the spectral response while the microwave is running to determine its impact.

Bluetooth devices appear as spikes and appear to “roll” through the spectral view. They are fast moving and you may only see them occasionally. The systems are designed to be inter-operable, but Bluetooth will impact throughput.

Channels can “bleed over” into adjacent channels. The width of the signal (due to RF considerations) can affect nearby channels. This bleed over is treated as noise.

Maintenance and Troubleshooting

This chapter describes how to identify and correct problems related to the OneExpert DSL. Topics discussed in this chapter include the following:

- [“Cleaning the instrument” on page 222](#)
- [“Resolving problems” on page 222](#)
- [“Additional information” on page 227](#)
- [“Getting Technical Assistance” on page 227](#)

Cleaning the instrument

The instrument itself does not require any specialized cleaning. An occasional wipe with a damp cloth is sufficient.



NOTE:

When cleaning the instrument, Viavi recommends a damp cloth and water only. Cleaning with chemicals could cause damage to the plastic case, buttons, or removal of markings.

Resolving problems

If you are having trouble with the OneExpert DSL OneExpert DSL, the following sections describe common problems and solutions. You should verify whether your problem is listed here before contacting technical assistance.

The following section addresses questions that may be asked about completing tests with the OneExpert DSL OneExpert DSL. There are four sections included:

- General
- Copper tests
- Coax tests
- DSL tests
- Data tests

General testing

The following section addresses questions about testing in general using OneExpert DSL.

Issue

Inconsistent test results.

Resolution

Verify that your test leads are good and are connected properly for the test you are performing.

Copper testing

The following section addresses questions about Copper testing.

Issue

The Tip-Ring voltage is reading negative.

Resolution

The Tip and Ring test leads may be swapped. Check your test leads to verify that they are hooked up properly.

Issue

I am performing an Opens test. The mutual value looks good, but the Tip and Ring values are really short.

Resolution

Verify the ground. The module must be grounded to the same ground as the pair under test. The module must be grounded to the same ground as the pair under test.

DSL testing

The following section addresses questions about DSL testing.

Issue

The modem cannot achieve sync with the CO.

Resolution

Inability to sync can have many causes. Perform the following steps to troubleshoot:

- Disconnect the customer's DSL modem.
- Verify tester connection to the correct pair.
- Verify the Data mode.
- Verify that the Standard is correct (ADSL2+, G.DMT, Auto, etc.).
- Isolate premise wiring.
- Check for premise alarm system.
- Verify the copper pair is provisioned for ADSL at the CO.
- Test at the CO/Exchange on the customer pair.
- Check the DSLAM modem vendor and software version.

Issue

The modem achieves sync with the CO, but the rate is lower than expected.

Resolution

Verify that you are on an ADSL2, ADSL2+, or VDSL line, as appropriate.

Check the DSLAM configuration - the max rate may be limited there.

Check for premise alarm system on the same pair.

Avoid excessive loop length or high attenuation.

Make sure that you are connected on pins 3 and 4.

Verify the noise margin.

Check the attenuation.

Make sure that you are connected on pins 3 and 4 instead of 2 and 5.

Data testing

The following section addresses questions about Data testing.

Issue

The IP ping menu says pings are being sent, but the network statistics are not incrementing.

Resolution

Verify the IP address and netmask.

Make sure you are not behind a firewall; they can block ping responses from reaching the host.

The IP ping function only *attempts* to send a ping every second. Depending on certain conditions, a physical ping packet may not be sent.

If IPoE standards require that the device has to ARP the address first. If this fails eventually you will see a ARP HOST UNREACHABLE message. Check to see that the destination IP address and your configured IP parameters are correct.

Make sure that the Ethernet interface cabling is correct. If the Ethernet cable is not hooked up, or is hooked up incorrectly, a packet will not be sent. Thus the Ethernet statistics will not increment.

WiFi Advisor

Table 46 and Table 47 provide some typical issues and resolutions.

Table 46 Typical Wifi related problems

Problem	Action
Signal strength and coverage problems <ul style="list-style-type: none">– Attenuation with distance and materials in the home– 5GHz has shorter reach than 2.4GHz	Look for -35 to -70 dBm RSSI and ≥ 20 dB SNR
802.11 interference sources <ul style="list-style-type: none">– Co-channel interference (forces your AP to share the channel)– Adjacent channel interference (looks like noise to your AP)	Look for ≤ 4 co-channel interferers and ≤ 3 adjacent channel
Non 802.11 Interference sources <ul style="list-style-type: none">– Microwaves, AV transmitters, cordless phones, baby monitors, etc.	Observe spectrum for interferers in the channel of interest
High channel utilization <ul style="list-style-type: none">– The more APs in the channel, the higher potential utilization– High utilization, low noise = high 802.11 traffic on the channel– High utilization, high noise = potential non-802.11 interferer	Look for <35% utilization + low noise
802.11 a/b/g devices on your network <ul style="list-style-type: none">– Slow a/b/g PHY rates occupy the channel longer than modern PHY rates for the same amount of information transfer.– Old security types (WEP/WEPA1) limit connection to lower 802.11 rates	Detect and advise replacement of old gear

Table 47 Trouble with the WiFi Advisor

Problem	Action
Cannot connect the OneExpert DSL to the WiFi Advisor	Check that Bluetooth is ON (enabled) on the WiFi Advisor. Make sure that the WiFi Advisor and OneExpert DSL are within reasonable Bluetooth range of each other (ideally 0 to 20 feet)
The WiFi Advisor is unresponsive (locked-up)	Press and hold the power button for 5 seconds.

Additional information

For additional information, visit the OneExpert DSL section of the following web page:

<http://www.viavisolutions.com/en/products/network-test-and-certification/copper-dsl-wifi-and-broadband/oneexpert-dsl-modular-field-test-platform>

Getting Technical Assistance

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

Specifications

This appendix contains specifications for the OneExpert DSL DSL. Topics discussed in this appendix include the following:

- [“Physical specifications” on page 230](#)
- [“Physical specifications” on page 230](#)
- [“Environmental specifications” on page 231](#)
- [“Power specifications” on page 231](#)

Physical specifications

Table 48 provides the physical specifications for the OneExpert DSL.

Table 48 Physical specifications

Parameter	Specification
Height	9.8" (250 mm)
Width	4.68" (119 mm)
Depth	3.2" (82.4 mm)
Weight	4.05 lb. (1.84 kg)

Connector specifications

Table 49 provides the connector specifications.

Table 49 Connector specifications

Connector	Specification
USB	USB 2.0
AC Adapter	see "Power specifications"
T/A R/B Ground	mini-banana
POTS	8-pin modular (RJ-45)
Ethernet	8-pin modular (RJ-45)
Wiring	6-pin modular (RJ-11) and 8-pin modular (RJ-45)
2&4-Wire VDSL/ADSL	8-pin modular (RJ-45)

Environmental specifications

Table 50 provides the environmental specifications.

Table 50 Environmental specifications

Parameter	Specification
Operating Temperature	-0° to +50° C (32° to +122° F)
Storage Temperature	-10° to +60° C (14° to 140° F)
Humidity	10% to 90% RHNC
Maximum operating altitude	4000 meters (13,123 feet)
Vibration	sinusoidal vibration testing per IEC 60068-2-6 (Sinusoidal Vibration)
Shock	shock testing to IEC 60068-2-29 Ed. 2.0 "Continuous Bumps."

Power specifications

Although battery life varies depending on the type of test, Table 51 provides specifications for the battery life and the specifications for the AC adapter.

Table 51 Power specifications

Parameter	Specification
Operating time	>4 hours for typical use cases
Charging time	5 hours for a fast charge; for a full charge, allow to trickle charge overnight
Power supply input	100-240VAC, 1.5A, 50-60 Hz

Table 51 Power specifications (Continued)

Parameter	Specification
Power supply output	12VDC, 5.0A Max
Power supply operating temperature range	0° to +40° C (-22° to 104° F)



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