



DSP TDR
Quick Start Guide



Notice

Every effort was made to ensure that the information in this manual was accurate at the time of printing. However, information is subject to change without notice, and VIAVI reserves the right to provide an addendum to this manual with information not available at the time that this manual was created.

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Copyright release

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Ordering information

This guide is a product of the VIAVI Technical Publications Department, issued as part of the product. The catalog number for a published guide is Catalog Number - printed. The catalog number for an electronic guide on USB is Catalog Number - electronic.

Terms and conditions

Specifications, terms, and conditions are subject to change without notice. The provision of hardware, services, and/or software are subject to VIAVI standard terms and conditions, available at www.viavisolutions.com/en/terms-and-conditions.

Federal Communications Commission (FCC) Notice

This product was tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this product in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

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

CAUTION:

- To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons.
- This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

EU WEEE and Battery Directives

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

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

Instructions for returning waste equipment and batteries to VIAVI can be found in the WEEE section of the [VIAVI Standards and Policies web page](#).

If you have questions concerning disposal of your equipment or batteries, contact the VIAVI WEEE Program Management team at **WEEE.EMEA@ViaviSolutions.com**.

EU REACH

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

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

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

This product conforms with all applicable CE marking directives. For details, please see the EU Declaration of Conformity included in the shipping package.

California Proposition 65

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

For the VIAVI position statement on the use of Proposition 65 chemicals in VIAVI products, see the **Hazardous Substance Control** section of the [VIAVI Standards and Policies web page](#).

Conventions

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

Typographical conventions

Description	Example
User interface actions	On the Status bar, press 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>

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, press Start > Program Files .

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 "[Safety Definitions](#)" on [page vi](#) 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 "[Safety Definitions](#)" on [page vi](#) for more information.



This symbol represents a risk of explosion. It may be associated with either a DANGER, WARNING, CAUTION or ALERT message. See "[Safety Definitions](#)" on [page vi](#) 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 "[Safety Definitions](#)" on [page vi](#) for more information.



This symbol represents a risk associated with fiber optic lasers. It may be associated with either a DANGER, WARNING, CAUTION or ALERT message. See "[Safety Definitions](#)" on [page vi](#) 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.

Safety definitions

Term	Description
DANGER	Indicates a potentially hazardous situation that, if not avoided, will result in death or serious injury. It may be associated with either a general hazard, high voltage, or other symbol.
WARNING	Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. It may be associated with either a general hazard, high voltage, or other symbol.
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. 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.

Precautions



WARNING:

The maximum “RF” input voltage to the meter is 125 Volts (AC or DC). A larger voltage will damage the meter.



WARNING:

Pursuant to FCC 15.21 of the FCC rules, changes not expressly approved by VIAVI might cause harmful interference and void the FCC authorization to operate this product.



WARNING:

The antenna used for this instrument is installed at the VIAVI factory or by VIAVI-approved repair facilities. During operation of the device, a distance of 20 cm or more should be maintained between the antenna in this device and person. To ensure compliance, do not operate at closer distances than this. The antenna on the unit is located inside the device at the top of the unit attached to the back plastic case. Do not use any antenna other than the installed antenna.



CAUTION:

Do not use the instrument in any manner not recommended by the manufacturer.



CAUTION:

A strong electromagnetic field may affect the measurement accuracy of the meter.

Precautions (continued)



CAUTION:

Use only the battery charger supplied with the meter. Use of any other charger may damage the battery.



NOTE:

Damage caused by improper cleaning of the display screen will void the warranty of the unit.



NOTE:

Never use abrasive pads, paper towels, tissue paper, or clothing to wipe the screen. If you do, these non-ultrasoft materials can cause permanent damage by scratching the screen or stripping the anti-glare coating off the screen.



NOTE:

Never use any type of window cleaner, soap, scouring powder, or any cleanser with solvents such as alcohol, benzene, ammonia, or paint thinner. These chemicals can react with the materials used to construct the display which can lead to hazing, yellowing, brittleness, or other types of damage.



ALERT:

Never spray liquid directly on the display screen as it could run inside the unit and cause damage.



Before You Begin

Thank you for purchasing the DSP TDR. This guide provides setup and operating instructions to get you up and running as soon as possible.

Technical Assistance

If you require technical assistance, call 1-844-GO-VIAVI / 1.844.468.4284.

Outside US: +1-855-275-5378

Email: Trilithic.support@viavisolutions.com

For the latest TAC information, visit
<https://support.viavisolutions.com/welcome>

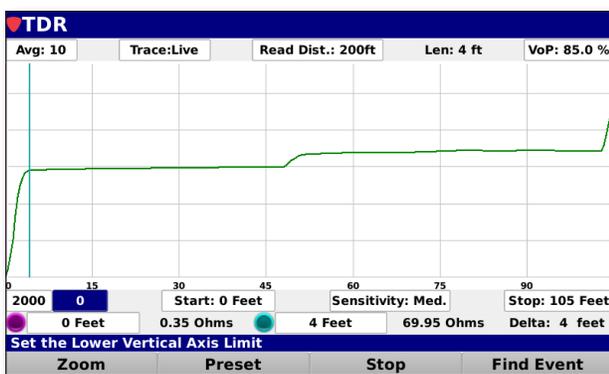
About the DSP TDR

In the event of a cable break or fault, the DSP TDR enables cable service provider maintenance teams and contractors to quickly find the location to get service back online as soon as possible. Since a cable break likely means an outage, pin-pointing it quickly is very important. Length measurement accuracy is also critically important, as often the cable is underground and must be dug out to make the splice. A lack of precision in this measurement means a bigger hole must be dug. A TDR is needed to find breaks and faults, to keep the operator from paying for unnecessary span replacements.

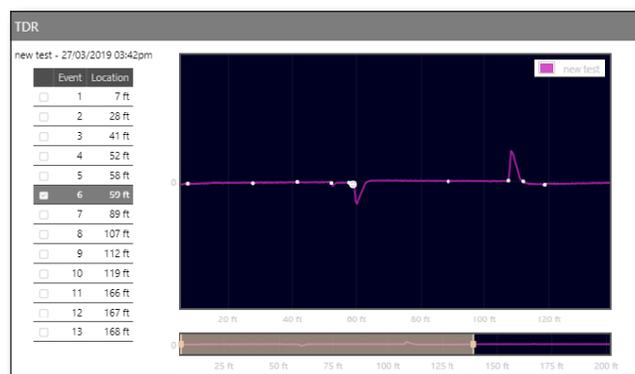
The DSP TDR is designed for field use and has step technology, which enables it to show smaller faults, has no blind spot, and maintains accuracy for detecting impedance over the entire length of the cable. Automatic impedance matching allows for faster trace results without pulse width adjustments. In addition to the ability to find faults closer to the TDR (no blind spot) the TDR has a resolution of less than 1 foot (0.3m). The higher energy step TDR has an improved signal-to-noise ratio and digital averaging, eliminating noise interference, and producing a much more detailed cable image than available with a pulse TDR.

Benefits

- Reduce outage and line problem troubleshooting time
- Features fast, complete, and precise measurements without blind spots
- Data upload and retention with StrataSync
- Built to last design for use in the real environment of Network Technicians
- Long battery life



TDR screen, showcasing step technology



Events listed with trace in StrataSync

A Guided tour of the DSP TDR

Front View



Top view

**Internal Wi-Fi Antenna
(2 dB Gain)**

TDR Connector



Bottom view

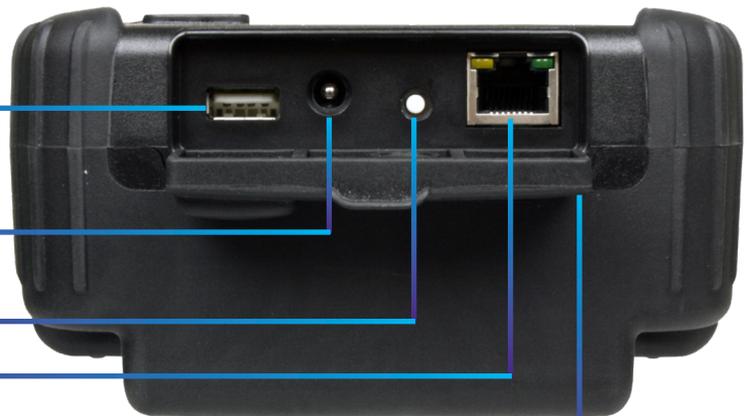
**USB 2.0 Port
(Type A)**

DC Charge Port

System Reset Button

**Ethernet Port
(10/100 Mbit/s)**

**Protective Rubber Door
with Magnetic Closure**



NOTE:



In the image above, the protective rubber door is in the open position for illustrative purposes. This door should remain closed when not using any of these ports.

Rear view

TDR Connector

**Internal Wi-Fi Antenna
(2 dB Gain)**

**Identification Label
(S/N, FCC ID & Notice)**



Battery charging

On-Screen charging status

The Title Bar at the top of the screen displays the battery voltage and the following charging status icons:

	Charging – Displayed when the battery is charging. When charging, the battery voltage will be shown between 12 and 14 VDC (dependent on charging source).
	100% Charge – Displayed when the battery is charged from a minimum of 7.50 VDC or approximately 100% of battery capacity.
	75% Charge – Displayed when the battery is charged from a minimum of 7.25 VDC or approximately 75% of battery capacity.
	50% Charge – Displayed when the battery is charged from a minimum of 7.00 VDC or approximately 50% of battery capacity.
	25% Charge – Displayed when the battery is charged from a minimum of 6.50 VDC or approximately 25% of battery capacity. When the battery charge drops to this level, it is recommended that the battery is charged soon.
	0% Charge – Displayed when the battery is charged to less than 6.50 VDC or approximately 0% of battery capacity. When the battery charge drops to this level, it is recommended that the battery is charged immediately.

Battery status

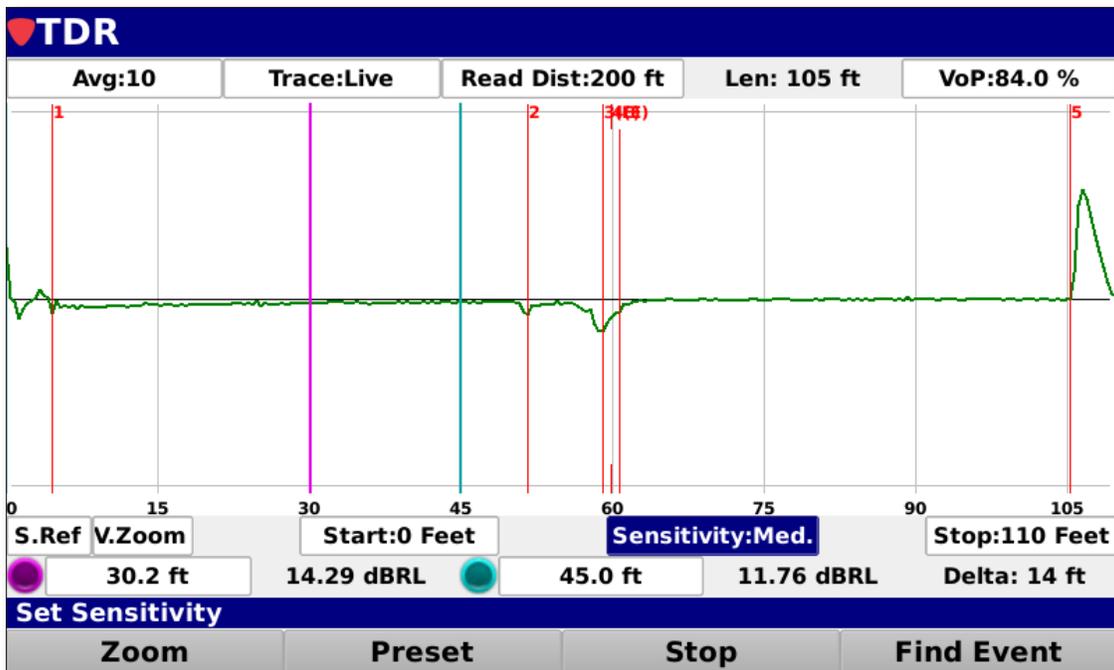
Three Battery Status Indicators are located on the front panel. These indicators represent the status of each of the three internal batteries and their charging status.

The indicators will illuminate when the charger is connected and the following conditions are met:

- A solid Green indicator is displayed when the corresponding battery is fully charged.
- A solid Red indicator is displayed when the corresponding battery is charging.
- A flashing Red indicator is displayed when the corresponding battery or charging circuit has a fault. In this case, the meter will need to be serviced by a Certified Repair Center. Before sending in the unit for repair, contact VIAVI for an RMA.
- The indicators are not displayed when there is no power supplied to the charger.

Getting started with the DSP TDR

1. Power on the unit by pressing and releasing the **Power** button.
2. Select the **Test** softkey at the bottom of the screen.
3. Select the **TDR** icon on the screen.
4. Connect the cable to be tested to the F-81 port on the top of meter labeled TDR. Make sure there is no RF signal on the cable.
5. Navigate using the left and right arrows to the VoP field and press **Enter**.
 - A pop-up keyboard will allow you to select the desired value for the cable type being tested
 - Preset VoPs are available for selection from the yellow soft keys at the bottom of the screen
6. Enter the VoP value and select the **Done** softkey.
7. Navigate using the left/right arrows to the **Read Dist** field.
 - Use the up/down arrows to change the read distance setting
 - Adjust to a distance that is longer than the suspected length of cable being tested
8. Select **Start**. The TDR will show a trace of the cable being tested.



9. Adjustments can be made to the following;

Avg – 1–100 samples

S.Ref – Ref +1 to 2000

V.Zoom – 0 to Ref-1

Sensitivity – Low (200 Ω), Med (60 Ω) or High (50 Ω)

Zoom – Allows for adjustments to zoom

Zoom in – Zooms in on center of screen

Zoom out – Zooms out from center of screen

Full – Zooms out to preset read distance setting

To Markers – Zooms to fill screen from marker to marker

Center Marker – moves marker and trace to center of screen

Lock view range – Locks viewing distance to start and stop distances currently set

Start distance – Sets the viewing distance at the left edge of screen

Stop distance – Sets the viewing distance at the right edge of screen

Purple marker – Movable marker that can be placed at user-defined distance

Blue marker – Movable marker that can be placed at user-defined distance. Marker moves to event location when selecting an event from the event list.

Trace – Live or single trace

Function menu

Screen Capture – Stores a PNG file of current screen display

Save Data Log – Stores all TDR data needed to rebuild display in StrataSync

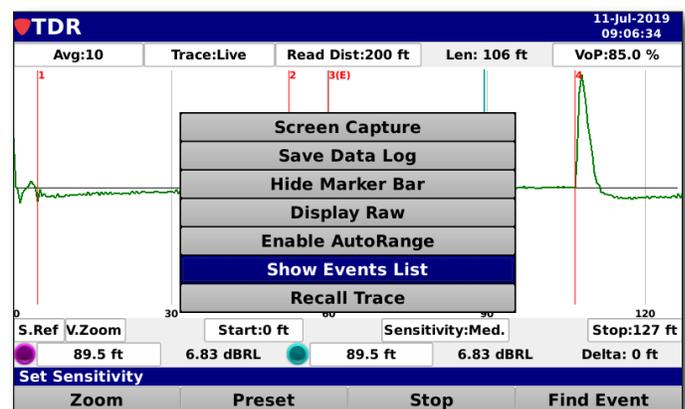
Hide Marker Bar – Removes marker info from bottom of display screen

Display Raw/Events – Used to toggle display from Raw view to Events view

Enable/Disable Auto Range – Enabled causes auto range to zoom to first event from start

Show Events List – Enables pop-up screen with events list showing events and distance

Recall Trace – Recalls and displays a previously saved TDR trace



Viewing results

Open – Displays as an upward spike on the screen. The larger the reflected signal, the larger the spike

Short – Displays as a downward spike on the screen. The larger the reflected signal, the larger the spike

Splice – Displays as a sideways "S" where the waveform starts with a small open, immediately followed by a small short

Water – Displays as a small short followed by slightly distorted waveforms following

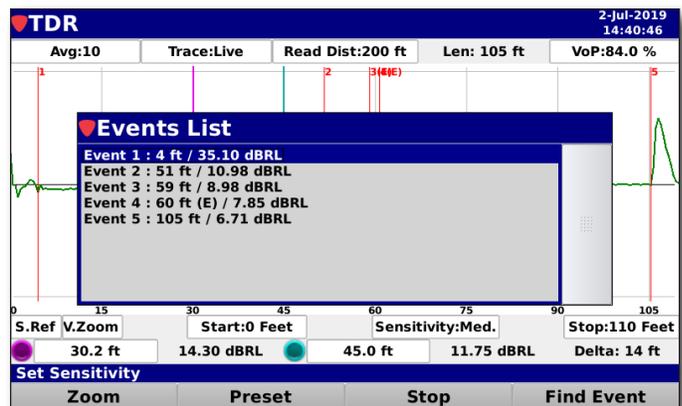
Tap – Displays as a sideways "Z" where the waveform starts with a small open, immediately followed by a small short

Amplifier – Large reflection followed by ever reducing amplitude reflections

Displaying the events list

1. While viewing results, select the **Function** button to bring up the Function menu.
2. Navigate to **Show Events List** using the up/down arrows, and press **Enter**.
3. A pop-up screen will show the list of events, distances, and measurements.

When you select an event, the marker moves to the event location.



Saving results

Screen Capture

1. While viewing results, select the **Function** button to bring up the Function menu.
2. Navigate to **Screen Capture** using the up/down arrows, and press **Enter**.
3. A pop-up screen will ask if the capture should be added to a job.
 - If you want to add to a job, you will be prompted to select from the available open jobs or create a new job
 - If not, you will be prompted to give the capture a file name and select **Done**.
4. The stored file will save as .PNG and can be viewed, exported to USB, or uploaded to StrataSync.

Data Log

1. While viewing results, select the **Function** button to bring up the Function menu.
2. Navigate to **Save Data Log** using up/down arrows, and press **Enter**.
3. A pop-up screen will ask if the data log should be added to a job.
 - If you want to add to a job, you will be prompted to select from the available open jobs or create a new job
 - If not, you will be prompted to give the log a file name and select **Done**.
4. The stored file will save and can be uploaded to StrataSync.

Uploading results to StrataSync

1. Prior to attempting data upload, ensure that the Tech number, StrataSync account ID, and URL are entered in the **Setup>Config>User** menu.
2. From any main menu, select the **Function** button to connect to the network.
3. From the pop-up menu, navigate up or down to **Network Manager** and select **Enter**.
4. Navigate using the arrow buttons to either **Ethernet** or **Wi-Fi**, and select **Enter**.

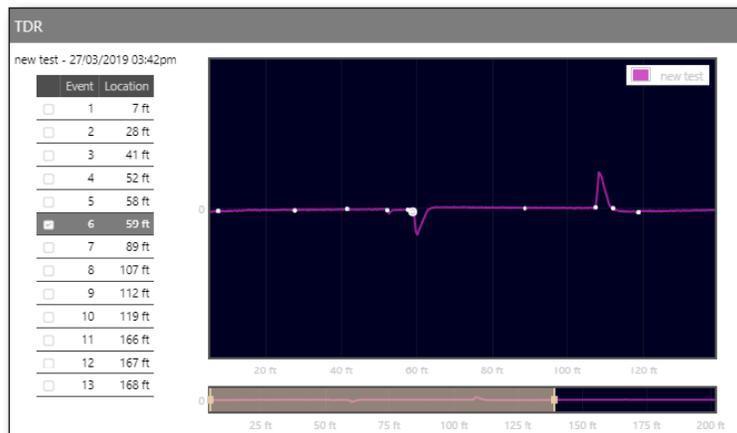
User	
User Name	5453
Company	Company
Tech ID	ko123456
StrataSync Account ID	45123456
StrataSync URL	https://stratasync.viavisolutions.com

Enter your name



NOTE:

For more information on syncing your meter to StrataSync, see the "StrataSync Setup for DSP Field Meters" guide or contact Trilithic.support@viavisolutions.com.



To connect via Ethernet

1. Connect one end of the ethernet cable to the ethernet port under the bottom cover of the DSP TDR.
2. Connect the opposite end of the ethernet cable to the modem, router, or switch that has the active connection to the internet.
3. From the ethernet pop-up window, navigate to **Login** and select **Enter**.
4. The DSP TDR will activate the connection, configure the device, and assign an IP address.
5. Once the ethernet icon is visible in the blue bar at the bottom right side of screen and the IP address is displayed, press the **Test** softkey.
6. Navigate using the arrow buttons to the **StrataSync** icon and select it.
7. The DSP TDR will auto connect to StrataSync and upload all screen captures and data logs.
8. On the right side of the StrataSync screen under **Sent**, a list of the number of screen shots and tests uploaded will be displayed.

To connect via Wi-Fi

1. From the Wi-Fi settings pop-up window, wait for the access point list to populate.
2. Using the up/down arrows, navigate the list of SSIDs to the preferred access point.
3. Use the right/left arrows to highlight the current password, and select **Enter**.
4. Use the virtual keyboard to enter the password.
5. Once the password is entered, select the **Done** softkey.
6. Navigate to the **Current Security** window and use the up/down arrows to change the security type.
7. Navigate to **Login** using the left/right arrows, and select **Enter**.
8. The TDR will power up the Wi-Fi module, configure the device, and assign an IP address.
9. Once the Wi-Fi is connected, the pop-up screen will disappear, and the Wi-Fi icon will display in the blue bar at the bottom right side of screen along with the IP address.
10. Navigate using the arrow buttons to the **StrataSync** icon and select it.
11. The DSP TDR will auto connect to StrataSync and upload all screen captures and data logs.
12. On the right side of the StrataSync screen under **Sent**, a list of the number of screen shots and tests uploaded will be displayed.

Jobs

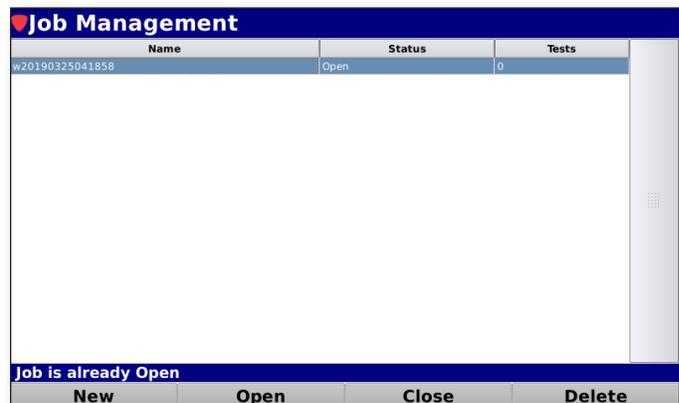
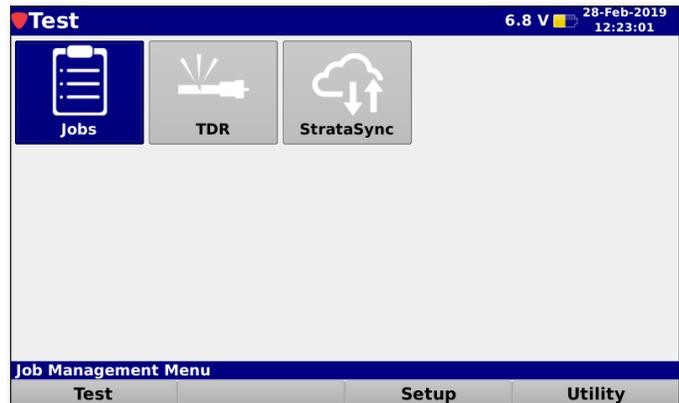
1. From the **Test** menu, select the **Jobs** icon.
2. The **Job Management** screen will show the current job names, status, and number of tests saved to each job.

- To create a new job, select the **New** softkey and enter the job ID using the virtual keyboard.
- To open a closed job, highlight the job to open and select **Open**.
- To close a job, highlight the job to close and select **Close**. A pop-up will ask you to confirm. Select **OK** to close.

A virtual keyboard will appear so that comments can be added. Type comments up to 32 characters and select **Done**. Select **Cancel** to cancel.

- To delete a job, highlight the job to delete and select **Delete** from the yellow soft keys. A pop-up will ask you to confirm. Select **OK** to delete. Select **Cancel** to cancel.
- To change comments, highlight the job and select the **Function** button. Navigate to **Change Comment** and select **Enter**.

A virtual keyboard will display on screen. Enter the new comments, and select **Done** when finished.



Utility menu

Browser – Used to verify internet connectivity. Does not support Flash or ActiveX

Wi-Fi – Used to conduct Wi-Fi survey

USB OPM – Interface for the VIAVI MP60/80 optical power meter

Fiber scope – Interface for the VIAVI P5000i fiber scope



Setup menu

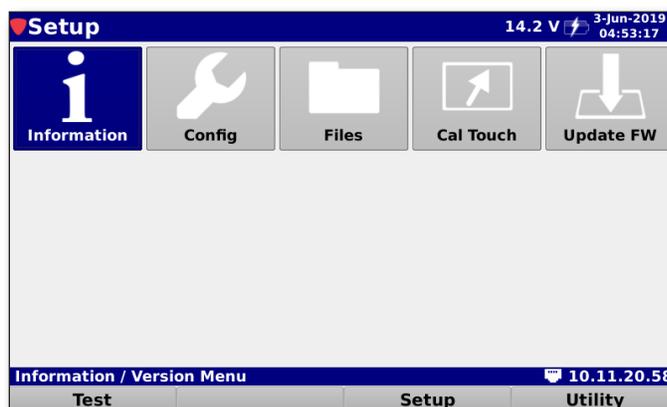
Information

General tab – Displays the package (firmware) version

Network tab – Displays the MAC IDs for CPE and Wi-Fi

Memory tab – Displays available and used memory

Options tab – Displays the installed options



Config

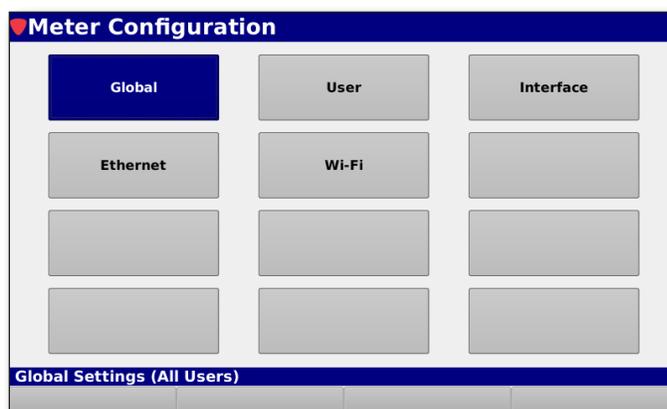
Global – Settings for time/date, language, and operating level (normal, cal, logging)

User – Settings for username, company, tech ID, StrataSync account ID, and StrataSync URL

Interface – User comfort settings like distance units (ft/m), timers, and U1/U2 function keys

Ethernet – Settings for ethernet connectivity

Wi-Fi – Settings for SSIDs and Passwords



Files

Lists saved files and allows for viewing and exporting saved data.

Cal Touch

Used to calibrate touch screen.

Update FW

Used to update firmware via web or USB.

Limited Warranty

For the latest warranty information, visit

<https://www.viavisolutions.com/literature/viavi-solutions-inc-general-terms-en.pdf>

<https://www.viavisolutions.com/en-us/literature/viavi-manufacturer-warranty-nse-products-en.pdf>

Specifications

TDR Measurements	
Maximum Distance	15954ft (4862m)
Distance Accuracy	<1ft (0.3m)
Noise Filter / AVG	1 to 100 samples
Measurement Time	<2 Seconds
VoP (Velocity of Propagation) Range	60-99%
Storage	>1,000 measurement sets
Physical	
Construction	Rubber over-molded plastic housing
Control	Glow in the dark keypad and LCD touchscreen and/or via a wireless connection to a mobile device such as a laptop, tablet, iPad® or iPhone®, or Android® handset
Display	Color LCD touchscreen, 800 x 480 pixels (approx 4.5" x 2.75")
Annunciators	Audible annunciator for key strokes
Dimensions w/o Case (H x W x D)	8.6 x 6.1 x 2.00 in (21.84 x 15.94 x 5.08 cm)
Dimensions w/ Case (H x W x D)	9.6 x 7.1 x 3.00 in (24.38 x 18.03 x 7.62 cm)
Weight w/o Case	3.75 lbs (1.70 Kg)
Weight w/ Case	4.75 lbs (2.15 Kg)
Interface Types	
TDR Test Port	75 Ohm Replaceable F-Type Connector
Ethernet	RJ45 (10/100 Mbps)
WiFi	802.11 b/g/n 2.4/5 GHz WiFi Adapter
USB	USB 2.0 Type-A Standard Port
Battery and Power	
Operating Time	12 hours plus, dependent on use
Charge Time	4 hours
Battery	Three 2600 mAh batteries
Power Adapter	Input: 100 to 240 VAC ~ 50 to 60 Hz, 1.2A Max Output: 15 VDC, 3.34A
Environmental	
Storage and Operating Temperature	-18° to +50° C (0° to 122° F)



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English

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