

FX150+ User Manual

Mini OTDR for FTTx and Metro Fiber Networks



P/N D07-00-169P RevB00

Please direct all questions to your local VeEX® Sales Office, Representative, or Distributor. Or, contact VeEX technical support at www.veexinc.com.

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General Information

This user manual is suitable for novice, intermediate, and experienced users and is intended to help use the features and capabilities of VeEX Inc. products successfully. It is assumed that the user has basic computer experience and skills, and is familiar with telecommunication and other concepts related to VeEX Inc. product usage, terminology, and safety.

Every effort was made to ensure that the information contained in this user manual is accurate. Information is subject to change without notice and we accept no responsibility for any errors or omissions. In case of discrepancy, the web version takes precedence over any printed literature. The content in this manual may vary from the software version installed in the unit. For condition of use and permission to use these materials for publication in other than the English language, contact VeEX Inc.

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Customer Support

For more technical resources, visit www.veexinc.com.

For assistance or questions related to the use of this product, go to www.veexinc.com/company/contactus. You can also call or e-mail our customer care department for customer support. Before contacting our customer care department, have the product model, serial number, and software version ready. Please locate the serial number on the back of the chassis. Please provide this number when contacting VeEX Inc. customer care.

Support hours may vary depending on the product.

Product Technical Support Contact Information

Hours: Support is generally available 8:00 AM to 8:00 PM, Eastern Standard Time, Monday to Friday.

Phone: +1 510 651 0500

E-mail: customercare@veexinc.com

Warranty

For warranty information on VeEX Inc. products, go to www.veexinc.com.

To activate the warranty, please register your product at www.veexinc.com/Support/ProductRegistration.

Patent Information

VeEX Inc. product hardware and software may be protected by one or more patents on file with the United States Patent Office.

Documentation Conventions

Icons used in this manual:

	Marks a helpful tip (action or method), which can save time and improve usability of the product.
	Provides important information needed to use this product and avoid mis-steps.
	Cautions against an action or inactivity, which can hinder productivity.
	Strongly warns against a condition, an action, or inactivity which can lead to a health hazard, injury, equipment damage, data loss, and/or financial losses.
	Stop and read before continuing.

Safety Information



Safety precautions should be observed during all phases of operation of this instrument. The instrument has been designed to ensure safe operation; however, please observe all safety markings and instructions. Do not operate the instrument in the presence of flammable gases or fumes or any other combustible environment. VeEX Inc. assumes no liability for the customer's failure to comply with safety precautions and requirements.

Lithium-Polymer Battery Precautions

Li-Po batteries are intended to be used with compatible VeEX products only. Any damaged caused by misuse or modifications will void the warranty and can cause serious injury.

The test set unit's battery pack is also fitted with a safety connector to prevent accidental short circuits and reverse polarity.

General Safety Guidelines

- NEVER use any other charger (e.g., for NiCd, NiMH, or Li-ion) other than the one supplied by VeEX to charge the Li-Po batteries in this product. Only use chargers designed for Lithium Polymer (Li-Po) batteries.
- NEVER attempt to service or remove the battery from this product.
- NEVER let the battery's positive and negative leads to touch. This can cause the battery to short and lead to a FIRE. If for any reason you need to cut the terminal wires, it will be necessary to cut each wire SEPARATELY, to make sure the wires do NOT touch each other.
- NEVER charge a swollen or ballooned battery (even if swollen upon purchase). Continuing to charge a battery that has begun to swell will result in a fire. Follow these steps:

- STOP the charging process and disconnect battery immediately.
 - Disconnect battery from the device immediately.
 - Place it in an open non-flammable area.
 - Watch it for approx. 30 minutes from a safe distance.
 - Follow proper procedure to dispose of battery, according to local laws or ordinances.
 - After impact, drop or high shock, check the product for dents, punctures or cracks on its back.
- Do not leave the product unattended while charging, after a high impact event.

Lithium Polymer Battery Handling & Storage Advice

- Keep Li-Po battery packs out of reach of children or pets.
- ALWAYS store equipment containing Li-Po batteries in cool, dry places between 40-80° F (below 0C or above 50C).
- Do not put battery packs in pockets or bags where they can short circuit.
- Do not store or transport batteries where they can come into contact with sharp or metallic objects.
- The speed at which a Li-Po battery ages during storage is based on both storage temperature and state of charge. For optimum battery life always store your Li-Po batteries partially charged at room temperature. This will maintain their performance levels over time and there's no need to cycle them unless stored for periods longer than 3-6 months.
- Never store a RC Li-Po in a hot car fully charged for an extended period of time, this will cause damage.
- When storing batteries for extended periods, store at a half charged state.

Optical Connectors

The test sets display a laser warning icon when the laser source is active to alert the user about a potentially dangerous situation. It is recommended to:

1. Deactivate the laser before connecting or disconnecting optical cables or patchcords.
2. Never look directly into an optical patchcord or an optical connector interface (SFP+) while the laser is enabled. Even though optical transceivers are typically fitted with Class 1 or 2 lasers, which are considered eye safe, optical radiation for an extended period can cause irreparable damage to the eyes.
3. Never use a fiber microscope to check the optical connectors when the laser source is active.

Electrical Connectors

Telephone lines may carry dangerous voltage. Always connect the electrical test ports to known test interfaces which carry low level signals.

Getting Started

Introduction to FX150+

Mini OTDR for FTTx and Metro Fiber Networks

Standard OTDR or PON optimized OTDR with up to 256,000 data points and 3 cm resolution, the FX150+ mini OTDR offers superior measurement accuracy for installation, maintenance and troubleshooting of FTTx, Mobile FrontHaul/BackHaul and Metro fiber networks. The compact, lightweight test set can be incorporated with power meter, light source, fiber inspection probe and VFL test options which add exceptional versatility to the unit.

The operator is assumed to have received basic training in fiber optics and related testing and measurement practices.

Platform Highlights

- Robust, handheld design for demanding field test conditions
- Linux operating system
- High resolution, 5" TFT color touch-screen suitable for both indoor and outdoor use
- Fast boot-up for fiber troubleshooting and restoration
- Intuitive display, function keys and touch-screen for fast navigation and easy operation
- Internal data storage
- Micro-USB OTG interface for flash drives, fiber inspection probe connection and test data transfer
- Rechargeable Lithium Polymer battery with capacity indicator low voltage alarm and Auto-off function
- Continuous operation >9 hours without recharging batteries
- Built-in Wi-Fi option:
 - Perform software upgrades using Windows® PC
 - Upload test data to Fiberizer® Cloud via Internet connection
 - Connect wirelessly to Fiber Inspection Microscope
- Built-in Bluetooth® option:

- Pair with mobile devices/Windows® PC to transfer test results
- Remote measurement using EZ Remote, VNC, or built-in web based software

Product Specifications

The most recent product specifications can be downloaded from the product page of the VeEX Inc. website (www.veexinc.com).

Package Contents

- FX150+ OTDR device
- AC/DC adaptor
 - Input: 100-240 VAC (50/60 Hz), 1.5A max
 - Output: 12VDC
- 10Ah smart Li-Polymer battery
- Nylon Soft Carry case (optional)

Basic Operation



To power on the FX150+ test set, press  for approximately two seconds, until the test set beeps once. See ["Hard Buttons and Interfaces" on page 23](#) for more information on the test set's buttons and interface.

LEDs

Power LED: A single LED indicates the power state of the unit

- The LED is off when the unit is powered off.
- The LED is **green** when the unit is powered on.
- The LED is **orange** when the unit is connected to the AC Mains and powered off (charging).

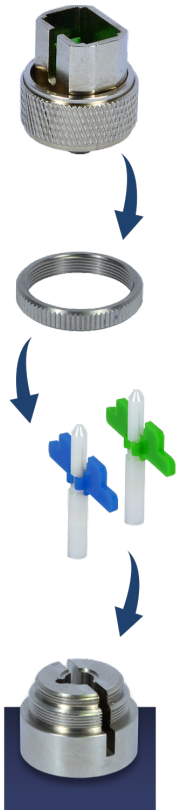
Test Ports and Interfaces

OTDR: The optical fiber under test is connected to either the **OTDR** or **AUX** (Filtered SM or MM) port on the top panel. The type of the optical fiber connector must correspond to the OTDR connector or adaptor type, including the connector polish.

Optical Power Meter (OPM): The optical fiber is connected to the non-contact **OPM** port on the top panel. Depending on fiber connector type, use interchangeable adaptors. The SC adapter is supplied as standard.

Visual Fault Locator (VFL): *(optional)* The optical fiber is connected to the **VFL** port on the top panel. The VFL interface is fitted with universal 2.5mm sleeve accepting all 2.5 mm connector ferrules. A 2.5mm to 1.25mm converter is available for the LC type connector.

Field-Replaceable Optical Ferrule System



The innovative, patent pending field-replaceable optical ferrule system¹ adds an extra layer of protection to the internal end-face of calibrated optical test ports, preventing contamination and accidental damage.

Quickly replace the ferrule² without the need for any tool while maintaining the integrity of the instrument's factory calibration. This novel approach eliminates the downtime, logistical hurdles and high cost associated with sending test sets to a service center for repair and recalibration.

All components in the system are reusable, with the exception of the small replaceable ferrule, helping to reduce environmental waste.

Universal Adapter

The universal connector adapter allows users to change the optical connector type conveniently whenever needed. Available in FC, SC, ST and LC.

Locking Ring

To secure the replaceable ferrule at its optimum location for the best performance.

Replaceable Ferrule with APC or UPC End-face

The self-aligned field-replaceable ferrule can be changed out in seconds. Users can select between APC or UPC end-face, ensuring compatibility with any test application requirement.

Optical Connector Protector Base

The panel mount protector base is made from high-grade stainless steel using a precision CNC process. This achieves proper alignment of the replaceable ferrule, minimizing insertion loss.

¹Patent pending

²Spare ferrules available in pack of 4 for APC or UPC



Optical Connections

Connector contamination/damage is the main reason test sets have to be returned for repair. Daily inspection and cleaning of test ports is recommended. Always clean test ports and patchcord connectors prior to connecting to the fiber under test. Dust, dirt, and pollution severely impact optical performance. Inspect/Clean connectors when excessive Loss or Reflectance/ORL is observed in measurements. In the Setup tab, activating Front Panel Check can alert you to abnormal connection to meter.

For more information on fiber handling procedures and tip cleaning, see ["CLIC" - Clean to Maintain Optical Connector Quality](#).

FX150+ Connector Panel



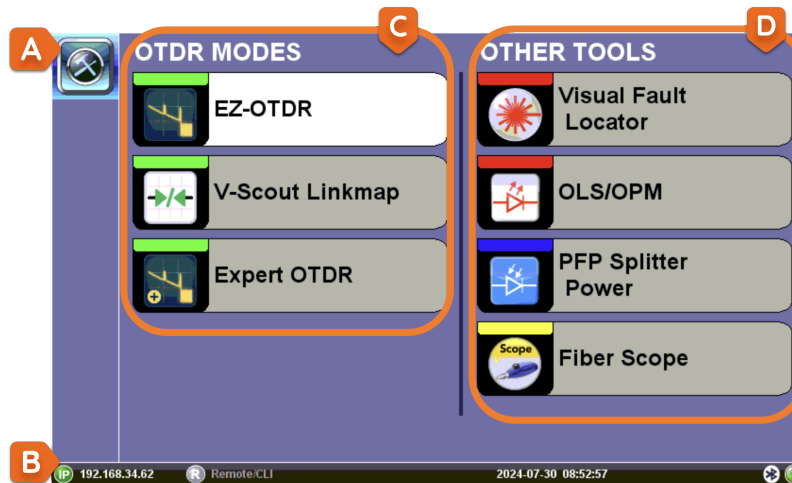
Standard OTDR or PON optimized OTDR

- Supports up to 4 wavelengths max MM or SM
 - MM: 850, 1300 nm
 - SM: 1310, 1490, 1550, 1625 and 1650 nm
- Dynamic range up to 46 dB
 - Testing long Point-Point fiber links up to 200 km (124 miles)
 - Testing single or cascaded PON up to 1:256 splitter ratios using balanced, unbalanced, or taps
- Optimized dead zones (DZ) for FTTx/PON applications

- Event 0.8 m, Attenuation 3.5 m typical
- PON ≤ 16.5 m (13 dB loss, 25 ns PW, non-reflective splitter)
- Filtered OTDR port for in-service testing at 1625 or 1650 nm
- Live fiber detection with embedded power meter
- Telcordia SR-4731.sor file format
- Generate and save results in sor, png or pdf formats
- Auto mode - setup, events detection, and trace diagnostics
- V-Scout option – displays intuitive icons derived from multiple test acquisitions
- PON OTDR for different PON link configurations - balanced, unbalanced, and/or taps
- Markers for distance, attenuation, reflectance and splice loss measurements
- Fixed or Universal interface option with interchangeable optical adapters (SC, ST, FC) for OTDR port
- Power meter, light source, fiber inspection probe, and VFL
- Remote measurement using EZ Remote, VNC, or built-in web based software

Understanding Fiber Menu GUI

The default Fiber Menu is loaded by default when the test set is powered on. The UI and language settings are configured in Global Settings. Refer to ["Customize Tester" on page 21](#).



A. Platform Menus: Each platform menu (Results & Files, Test Tools, LAN & Connectivity, and System Utilities) displays submenu options.

B. System Information: Test set IP address, system date and time, and GPS status (optional).

C. OTDR Modes

- **EZ-OTDR:** Select this option for OTDR Automatic single pulse test mode.
- **V-Scout Link map (optional):** Default Auto V-Scout Multi-test mode. Select this option to use factory or user defined multi-pulse test profiles with summary results on a link map.
- **Expert OTDR:** Select this "Expert" option to customize OTDR setups and/or manually override the default options. Realtime, Manual, Auto, and V-Scout are all available from this option.

D. Other Tools

- **Visual Fault Locator (VFL):** If optional Visual Fault Locator (VFL) built into unit, select to trace and visually identify breaks in ODFs, bare fibers (900µm), and patch cords that are typically hidden in the OTDR dead zone.
- **OLS/OPM (Optical Light Source/Optical Power Meter):** Select to access optional Optical Power Meter (OPM) if built into unit or external OPM connected via Micro-USB port. Use to test average output power from a light source and can be used to measure the span loss in dB of an optical fiber

systems. On the test set display, view measurement loss in real-time.

- **PFP Splitter Power** : Select to access the Splitter Power Analysis application. Used to document power levels for all ports at PON distribution cabinets
- **Fiber Scope**: Select after connecting Fiber Scope to test set to capture the image and qualify the connector endface for cleanliness and damage per IEC 61300-3-35.

Refer to "[OTDR Screen Navigation](#)" on [page 32](#) for information on OTDR test screen navigation.

Customize Tester

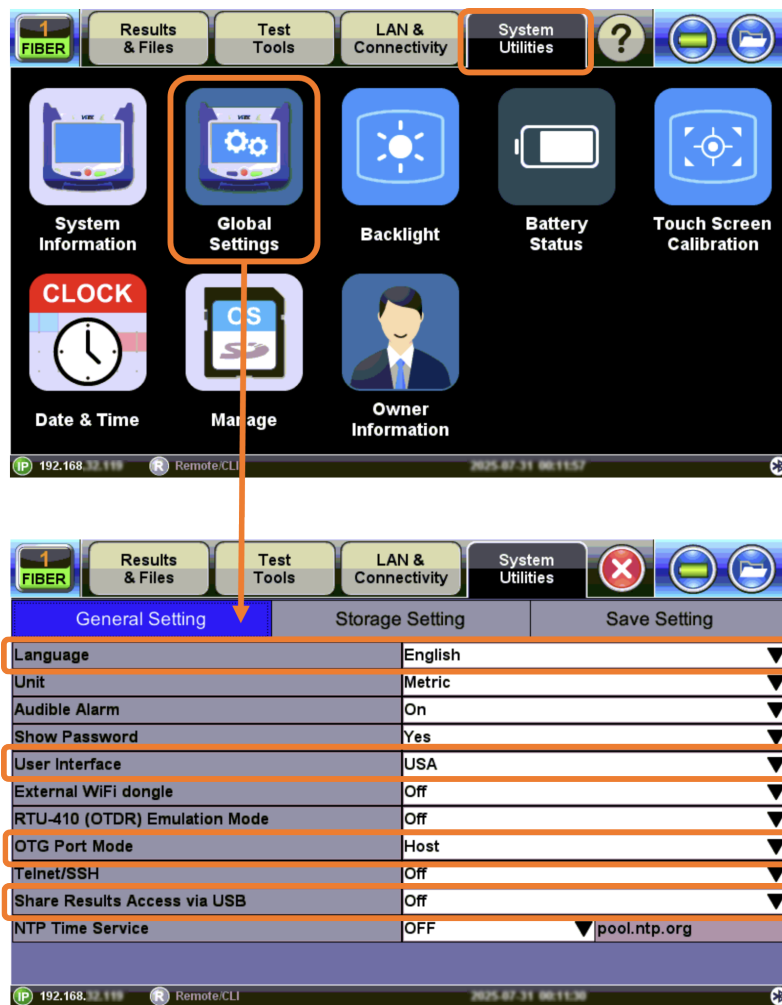
The following information is to assist in the initial setup of the test unit. Refer to "Basic Operation" on page 15 and "Platform Functions" on page 174 for more comprehensive information.

Change Language/User Interface Style

Before using the test unit, set the language and user interface style as needed. By default, the user interface style is set to **USA** (imperial units) if the unit is shipped to North America and to **International** (metric units) if the unit is shipped to outside North America.



The device must be rebooted to fully activate Global changes.



To change the GUI language and user interface style:

1. Select the [System Tools and Utilities](#) icon  and then select **System Utilities**.
2. Select the **Settings** option.
3. Select the language from the **Language** dropdown.
4. Select the user interface style from the User Interface dropdown.
 - **International:** Provides configuration menus with access to detailed settings. It also sets the default measurement units to metric.
 - **USA:** Provides simplified application-based menu with more automation. It also sets the default measurement units to imperial.
5. To transfer stored files between device and PC, select option from the **OTG Port mode** dropdown.
6. To connect with a PC, select ON from the **Share Results Access via USB** dropdown.



The device must be rebooted to fully activate Global changes.

Change Date and Time

To manually change the Date & Time:

- Select the [System Tools and Utilities](#) icon  and then select **Date & Time**. Tap **Apply** to save your changes.

For automatic time of day (ToD) synchronization using a NTP server, see "[Using NTP Server](#)" on page 239 for more information.

Refer to "[Date and Time](#)" on page 238 for more details on the Date & Time screen.

Basic Operation

Hard Buttons and Interfaces



A. Save: Saves current test results in the unit's memory and provides automatic naming and time stamping function.

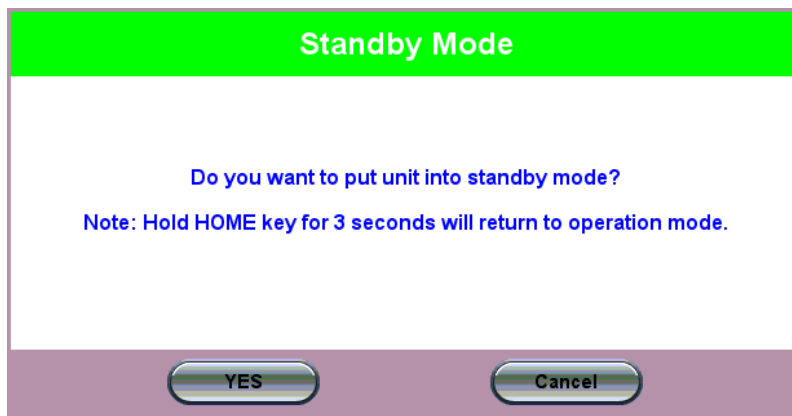
B. Power: Press for 2 seconds to turn the test set ON or OFF.

C. Home: Returns the screen to the home menu. Pressing the Home key for 3 seconds puts the unit in sleep mode. Once in Sleep Mode, press the Home key for 3 seconds to return to normal operation.

More about sleep mode



This is not full power shutdown.



Standby/Sleep Mode

D. LED: Power ON and battery charge LED indicator

- **Off** - Power is OFF, not charging.
- **Orange** - Battery is charging.
- **Green** - Power is ON.

E. Micro-B USB: Use an USB-A [OTG cable](#) (optional with purchase) to connect a USB to the micro-B USB port. The port supports memory drives and USB add-on devices such as fiberscopes. An optional Micro-B OTG to Ethernet adapter is also available for network connection. *(Only VeEX approved OTG to Ethernet Cables can be used.)*

F. Side Buttons: Side buttons on the left and right side of the unit provide additional feature-specific functionality. Button functions vary depending on individual applications (e.g., scroll left/right or up/down, capture screenshots). Refer to "[Hard Buttons](#)" on page 27 for the Quick Guide displayed during boot-up sequence.

Side Button Shortcuts

General:

- **Right side + Save:** Saves the screen (bmp).

OTDR:

- **Link map**
 - **Right side:** Scrolls through each section of the link map displaying the related information.
- **Events**
 - **Right side:** Scrolls through each event in the event table, jumping to the event on the trace.
 - **Left side:** Zooms in and out of the trace centering on the red event bar.

- **Measure**

- **Right side:** Moves the selected red measurement bar left and right.
- **Left side:** Zooms in and out of the trace, centering on the selected red measurement bar.

- **Traces and Results**

- **Right side:** Scrolls through each open trace layer option.

Fiber Scope:

- **Results**

- **Right side:** Scrolls through each open trace layer option.

More about side buttons



G. Test port connector:

VFL: Visual Fault Locator. Red (650 nm) light source

OPM: Optical Power Meter for OPM measurement

OTDR-Aux (Auxiliary OTDR): Function depends on hardware configuration:

Optional Live (Filtered) OTDR testing port with filtered 1625 or 1650 nm wavelengths.

Optional multi-mode 850 and 1300 nm.

OTDR (Main OTDR): Traditional P2P and PON-capable OTDR port, with selectable single-mode 1310, 1490, 1550 nm wavelengths. (High dynamic range versions support PON with up to two splitters with 1x32 splits total.) Can also act as continuous or pulsed Optical Laser Source (OLS). OTDR and OLS functionalities are mutually exclusive modes of operation.

H. Touch screen LCD

I. Stylus: Use when finer touch screen control is required.

J. DC power socket: Use VeEX-supplied AC/DC chargers only.

Special Functions

Hard Buttons

The test set buttons provide additional functions when using specific combinations.

Front & Side Buttons			Quick Guide	GUI Icons
				
				
				
				
				
				
				
				
				
				
 System Tools & Configuration Menu Active			 Test Port & Test Mode Selection	
			 Applications Toolbox	

Button Quick Guide

Power ON/OFF: Press and hold  for approximately two seconds, until the test set emits one beep to turn it **ON**, and two beeps to turn it **OFF**, then wait for the power LEDs to turn **OFF**.



Wait at least 10 seconds before turning the test set back on.

Forced Power OFF: In the unlikely event that the test set becomes non-responsive or behaves improperly, press and hold  for approximately six seconds to force the test set off.



No results will be saved when forcing the test set to power down.

Standby/Sleep Mode: This mode is used to conserve battery when the test set is required to “boot up” and be ready to test faster.

First, release any active test application. Then, press and hold the  for approximately three seconds to activate the Sleep or Standby mode. Once activated, the power LEDs will flash green to indicate that the test set is in standby mode (the fans may stay on until all electronics cool down).



After switching to Standby mode, the fans may stay on until all electronics cool down.

While in Standby mode, quickly press  to see the current standby time and remaining battery charge. Press the button again for three seconds to bring the test set back to full operation.

Save Results: Press  save the current test results.

Home Menu: Press  to go back to the Main Menu. Tap  on the screen to return to the previous menu level.

Screen Capture: Press  + **right slider buttons** simultaneously to store a picture of the current screen (screenshot). The test set will emit a confirmation beep/tone when the screen is captured. The images are named with a date + time code. Go to



>Results & Files to manage, view, or transfer captured screens. Refer to "[Working with Saved Results, Profiles, Images](#)" on page 178 for more details.

Touch Screen Calibration: If the touch screen becomes non-responsive, press  +  simultaneously to invoke the touch screen calibration procedure. Refer to "[Touch Screen Calibration](#)" on page 236 for more details.

Clean Software Install: With the test set OFF, press  +  buttons simultaneously to initiate a clean software install from an USB memory stick. Refer to "[Software Update Process](#)" on page 243 for more details.



All settings, test results and user data will be erased when performing a Clean Software Install. Backing up all data to a USB memory stick is recommended. To back up to

USB, go to  >Results & Files and tap . Refer to "[Working with Saved Results, Profiles, Images](#)" on page 178 for more details.

Touch-Screen Display

The LCD supports touch-screen operation. To operate the touch-screen, use the stylus located in the top cover to navigate the menus and tabs. Please observe the following precautions:

- Never use excessive pressure on the touch-screen as this may damage its functionality.
- Never use sharp objects such as a pen, screwdriver etc. as this may damage the surface.
- Clean the surface of the touch screen using a soft cloth and mild detergent only. Do not use alcohol.

See "[Touch Screen Calibration](#)" on [page 236](#) for instructions on how to recalibrate the touch-screen.

Platform Screen Icons



File: Provides general internal storage information, indicates the presence/detection of compatible USB memory stick, and provides proper memory stick ejection function (before removing).



Exit: Returns to the previous screen. When in a test application screen, this icon



Home: Returns to the Home Menu.



Help: Displays product help.



Active Test Application: Provides access to test applications or test application menu which varies depending on the test set mode.



Application Tools: Accesses applications, depending on the test set and options purchased i.e., [Flow®](#), [OLTS](#), etc.



OLS/OPM: Launches the [OLS/OPM](#) applications.



PFP Power Splitter: Launches the [PFP Power Splitter](#) application.



Utilities Test Application: Opens the [System Tools and Utilities](#) menu.



Battery Full and AC Charging: The unit is plugged into external AC power and the battery is fully charged. Tap to see [battery charge status](#).



AC Charging: The unit is plugged into external AC power and charging. Tap to see [battery charge status](#).



Battery Powered: The unit is powered by the battery. Tap to see [battery charge status](#) and estimated autonomy time.



Fiberscope: Indicates that a fiberscope is connected to the unit. Select the icon to launch/switch to the [Fiberscope](#) application.



OTDR: Launches the [OTDR application](#).

Battery

The test set platform is equipped with a 10 Ah smart rechargeable Lithium Polymer battery with capacity indicator, low voltage alarm and Auto-off function.

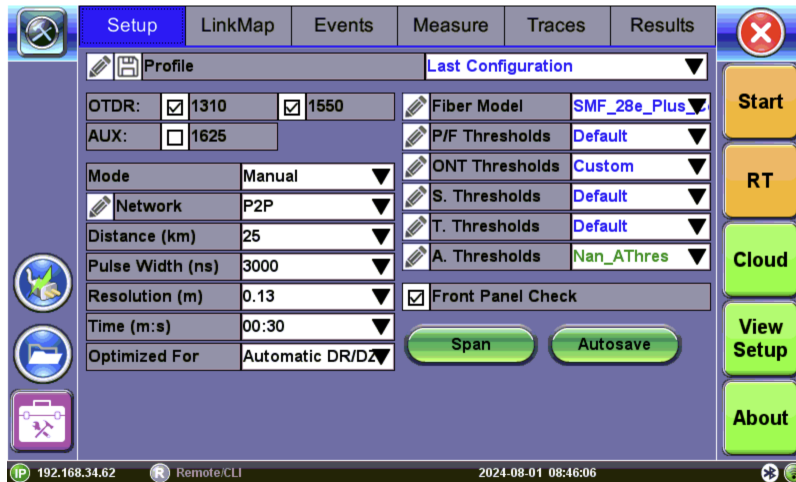
It has continuous operation >9 hours without recharging batteries (application dependent).

For more information on accessing battery and power options on the unit, see ["Battery Status" on page 234](#).

Battery Safety Precautions

For more information on safety precautions for batteries, see [Lithium-Polymer Precautions](#) in [Safety Information](#).

OTDR Screen Navigation



OTDR Screen

Use the top tabs to access test measurement controls and view results.

The bottom bar displays:

- IP address, when connected
- Remote control connection status
- Date and time
- Bluetooth and Wi-Fi network connection indicators

Icon Descriptions



Escape/Exit: Tap to close the Fiber test application and return to the Main Fiber Menu.



Start: Begin trace.



RT: Real Time OTDR - See trace in real time. If button isn't on interface, turn on by selecting **View Setup**.



Cloud: Connects to cloud storage.



View Setup: Display settings (distance units, RealTime button display, grid color, etc.)



About: Shows software version and options to setup as server.



Autosave: Settings so results that are saved automatically contain default information in the file-name.

Span

Span: Settings for the offset length of an external launch fiber or patchcord connected to the fiber under test so that it does not become part of the fiber span and analysis.



Application Tools: Access applications, depending on the test set and options purchased i.e. [OTDR](#), [Flow®](#), [OLTS](#), etc.



Fiber Scope – Shortcut key to access [Fiber Scope](#), accessible from the Test Applications Toolbox menu.



OLS/OPM: Launches the [OLS/OPM](#) applications, accessible from the Test Applications Toolbox menu.



PFP Power Splitter: Launches the [PFP Power Splitter](#) application, accessible from the Test Applications Toolbox menu.



OTDR : Launches the OTDR application, accessible from the Test Applications Toolbox menu.



Flow®: Launches [Flow® application](#), accessible from the Test Applications Toolbox menu. Saves a series of tests and compiles them into a full Flow® Test Report.

Fiber Testing

Theory of Operation

OTDR

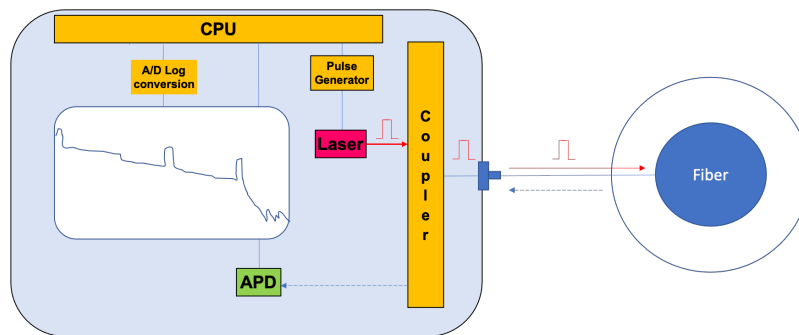
The principle of operation is based on measuring the Rayleigh back scattering signal when powerful optical light pulses pass through an optical fiber. The weak back scattering signal is registered by an optical receiver, converted into digital form and averaged many times.

The test set calculates distance using the following formula:

$$\text{Distance} = c * t / (2 * n)$$

where c – light speed in vacuum, n – optical fiber index of refraction, t – time delay between pulse emitted and signal returned to the receiver

Each sample converted by ADC into digital form is registered in the RAM. To measure the back-scattering signal precisely, repeated triggering of optical pulses is performed. The processor averages samples, corresponding to the same points of the optical fiber that leads to the increasing signal-noise ratio. After several cycles, the obtained signal values are transferred from RAM and displayed. Then, the process of measuring, averaging, and cleaning RAM registers is repeated again.



Principle of Operation

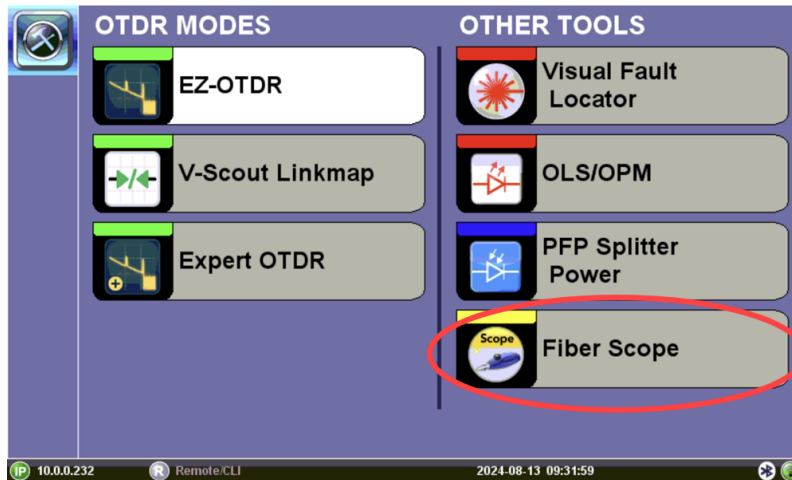
Light Source

An optional light source is available and designed for generating continuous optical radiation. The light source output is the same as the OTDR port and uses the same laser diodes and optical splitter. The radiation power is stabilized with the help of external photodiode and power stabilization circuit.

The light source has two operation modes: Continuous and Modulated/tone (270, 330, 1000 and 2000Hz).

The average power output in modulation mode is 2 times lower (3dB) than in continuous mode of operation.

Fiber Scope



- "DI-1000 Digital Fiber Inspection Microscope" on page 37
- "DI-1000MPO Digital Fiber Inspection Microscope for Single and Multi-Fiber Connectors" on page 38
- "DI-3000 Auto-Focus Digital Fiber Inspection Microscope" on page 43

The VeEX digital fiber inspection scopes evaluate fiber optic connectors for dirt and end face quality. The hand-held probe design enables easy inspection of patch cords and connector panels. Extended tips are available for hard to reach bulkhead or patch panel connectors. Clear images are displayed on the test sets for immediate analysis and can be saved for record keeping.

The Fiberscope test application can be used in conjunction with any VeEX Digital Fiber Inspection Microscope.

All DI series fiberscopes can auto freeze image when focus is achieved to capture the image and qualify the connector endface for cleanliness and damage per IEC 61300-3-35. For more information about available connector tips, see the [DI-1000/DI-1000MPO/DI-3000 Digital Fiber Inspection Microscope Adapter Tips Guide](#).

All wired fiber inspection scopes are powered via a USB Type-A connection with a host device or the VeEX Power Bank/Wi-Fi Bridge. For host devices that have Micro-B or Micro-C input ports, USB Type A to Micro-B or Micro-C OTG dongle adapters are available as an add-on order from VeEX.

The Importance of Fiber Connector Inspection

Dirty or scratched connectors introduce loss, increase ORL and/or damage other connectors (Loss and Return Loss becomes more critical at higher data rates). End-face contamination is a leading cause of fiber link failures in data centers, corporate networks, MSOs and Telecom environments.

Fiber Inspection Scopes provide a magnified image of the fiber optic connector's end face, focusing on the contact areas (most likely to impact network performance or permanent damage by mating of contaminated connectors). Images, visual inspection, and automated tools are often used to grade the health and cleanliness of connectors, after polishing or cleaning and before being used.

To achieve maximum power and prevent false readings, clean the optical fiber connector interfaces before inserting them into the test port.

For more information on Best Practices, see ["CLIC" - Clean to Maintain Optical Connector Quality](#).



Please ensure the correct fiber connector type is used before inserting it into the test port or connector. Mismatched connector types will damage the optical end faces and the test set.

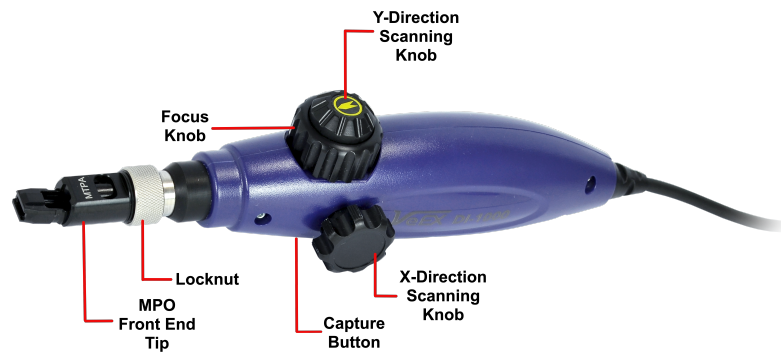
DI-1000 Digital Fiber Inspection Microscope



DI-1000 Digital Fiber Inspection Microscope

- **Locknut:** a threaded fastener that secures the tips in place.
- **Inspection Tip:** a front-end component inserted to view the connector endface
- **Capture Button:** a button that starts and stops (play or pauses) the video stream of the fiber end-face to save an image at the current frame.
- **Focus Knob:** a rotating dial that can be turned clockwise or counterclockwise to view clearer image. Make sure connector is properly seated in the adapter tip.
- **USB Type A output:** USB connector to plug into host power source to enable operation.

DI-1000MPO Digital Fiber Inspection Microscope for Single and Multi-Fiber Connectors



DI-1000MPO Digital Fiber Inspection Microscope for Single and Multi-Fiber Connectors



- WiFi support requires VeEX Power Bank/WiFi Bridge accessory and host device/test set has built-in WiFi capability. See the test set's data sheet on www.veexinc.com or contact [VeEX Customer Care](#) for more information.
- To work with single fiber tips, the front end tip should be replaced with the collar provided with the scope. For more information adapter tips, see the [DI-1000/DI-1000MPO/DI-3000 Digital Fiber Inspection Microscope Adapter Tips Guide](#).



www.veexinc.com.

For more information on using the DI-1000MPO, see the [DI-1000MPO Quick Guide](#) on www.veexinc.com.

DI-1000MPO Fiber Analysis

There are two methods to inspect MPO fibers using the DI-1000MPO:

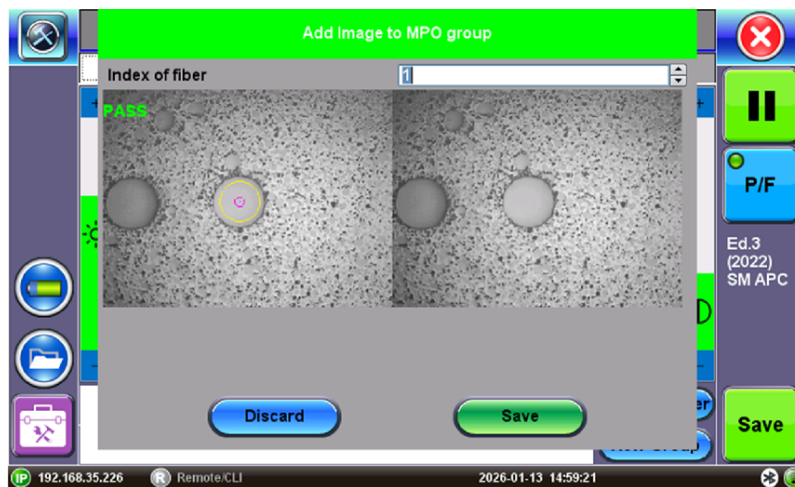
1. Touchscreen (standard)

Press the **Capture Fiber** button on the touchscreen for every MPO fiber that has been properly focused, analyzed, and scoped. Press **Save** in the pop-up window to confirm the MPO fiber number and add the fiber screenshot to the list. Then, adjust the camera position using the scope's x-y axis controls to navigate to the next fiber.

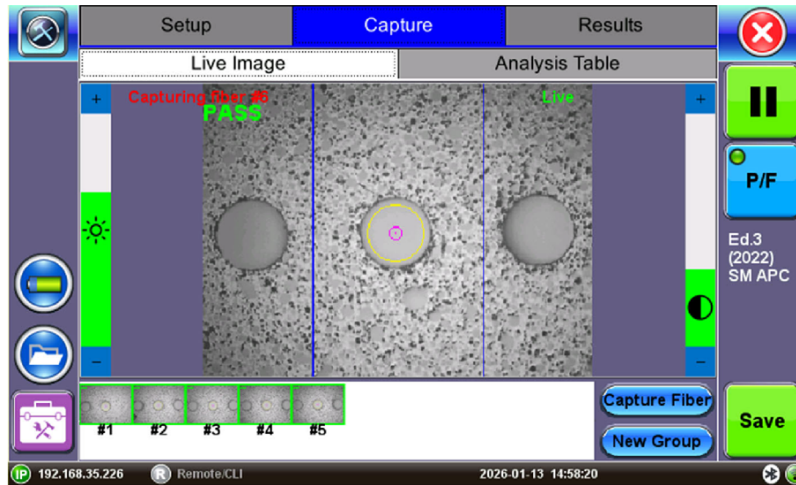
2. Fiber Scope button (fast)

Press the **Capture** button (located on the bottom of the DI-1000MPO fiberscope) successively to capture, confirm the MPO fiber number, and add the fiber screenshot to the list. Then, adjust the camera position using the scope's x-y axis controls to navigate to the next fiber.

At any time, press **New Group** to create a new set of MPO images (this will remove all scope images from the capture window and delete any unsaved images).



MPO Group - Add Image

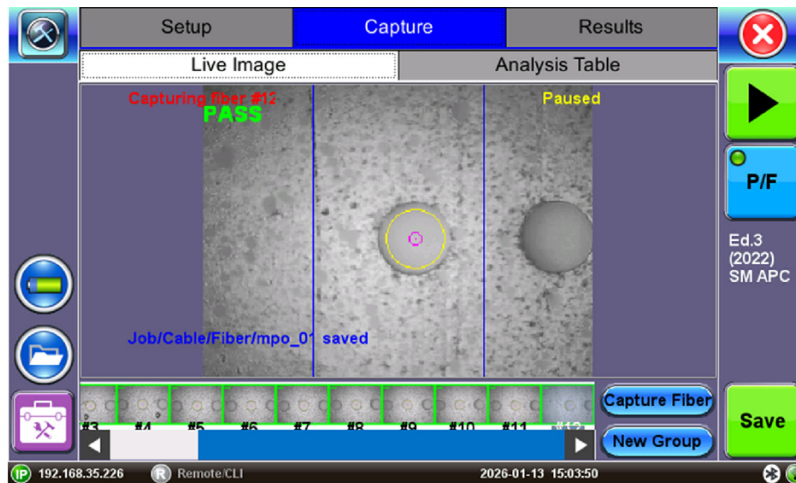


Aligning Fiber for Analysis

When using a DI-1000MPO+, which has a wider field of view, align the correct fiber between the two lines for analysis.

The example below shows a completed MPO-12 cable inspection.

The key-up and key-down adapter that comes with the DI-1000MPO standard package is a straight-through connection so the MPO fiber # at the start matches the MPO fiber # at the end (not flipped). When using the adapter, fibers will be in the opposite orientation of the camera. In the below example, fiber #1 is on the right.



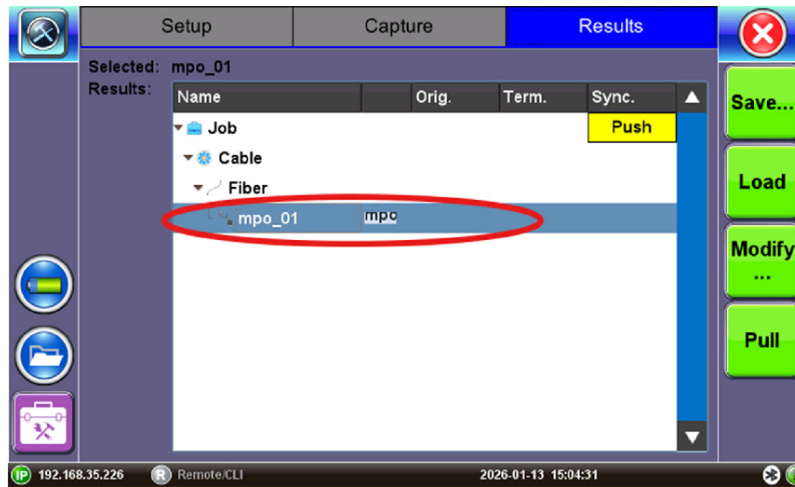
MPO Group - Completed (PASS)

To save MPO results, navigate to the **Results** tab once all fibers have been captured and press the **Save** button.

There are two ways to save MPO results:

1. On the **Capture** screen, select **Save** and confirm the results information (e.g. Job ID, etc.) by selecting **OK**. The results will be added to the **Results** tab.
2. Once all fibers have been captured, navigate to the **Results** tab and select **Save**. Then, press either **Save** or **Auto Save** and confirm the results information by selecting **OK**. The results will be added to the **Results** tab.

To view results on the unit, on the **Results** tab navigate to the **mpo** heading on the saved trace and press **Load**. Tap each individual screenshot to view the individual MPO fibers.



MPO results

Report

File

D:\VEEX_SOR_EXPORTS\mpo_01-[Fiber]-[Cable]-[Job]-[SCOPE]\mpo_01.html

Update ...

The Verification Experts

MPO Fiberscope Test Report

PASS

Job Information

Job ID	Job
Cable ID	Cable
Fiber ID	Fiber
Test ID	mpo_01
Operator A	default
Operator B	default
Location A	default
Location B	default
Elevation	A-B
Connector ID	default

Company Information

Company Name	default
Customer	default

MPO Connector

1 2 3 4 5 6 7 8 9 10 11 12

Test Characteristics

IEC 61300-3-35	Edition 3 (2022) SM APC
Connector Type	MPO Female
Connector Material	Ceramic (typical)
Connector Type	MPO/MTP
Number of strands	12
Strand Diameter	2.5
Optical tip/polish	MPO APC 2

Fiber 1 of 12

PASS

Zone	Width	Scratches		Defects	
		Max number	Count	Max number	Count
A: Core 0-25 µm	< 2 µm	No Limit	-	< 2 µm	No Limit
	2-4 µm	4	0	2-2 µm	1
	> 4 µm	None	0	> 2 µm	None
B: Cladding 25-110 µm		No Limit		< 25 µm	No Limit
				> 25 µm	None

Fiber 2 of 12

PASS

Zone	Width	Scratches		Defects	
		Max number	Count	Max number	Count

Fiberscope MPO endface test viewed in an HTML browser

DI-3000 Auto-Focus Digital Fiber Inspection Microscope



DI-3000 Wi-Fi Autofocus digital inspection scope



WiFi support requires host device/test set has built-in WiFi capability. See the test set's data sheet on www.veexinc.com or contact [VeEX Customer Care](#) for more information.

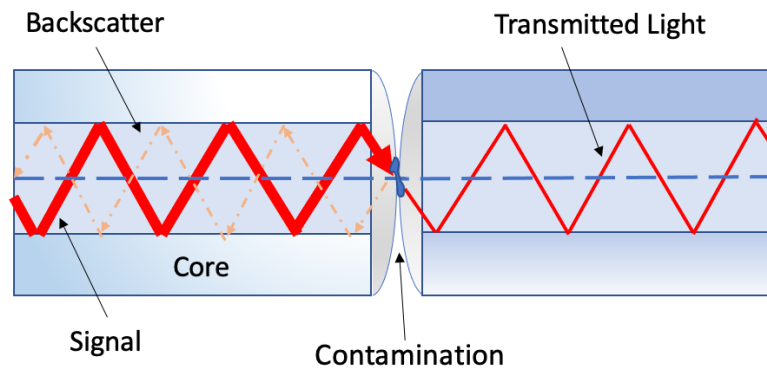
Test Fiber and Initial Preparation



For more information, including video instructions on inspecting a connector end-face, go to ["CLIC" - Clean to Maintain Optical Connector Quality](#).

Dirt, dust, and other contaminants severely impact high-speed data transmission in optical fibers and dirty connector end-faces are often the number one cause of link failures. High insertion loss and/or high back reflection can result in transmission loss or high bit errors and poor BER.

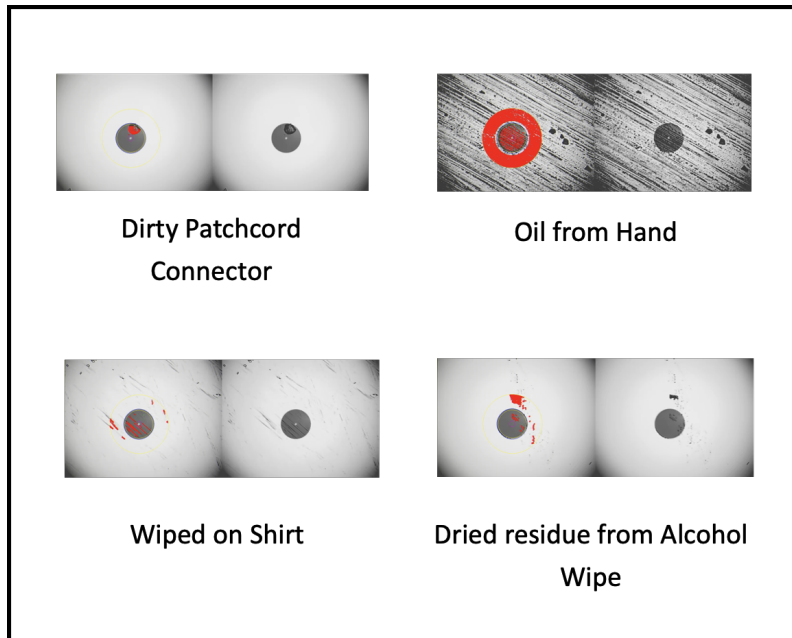
Most measurement variations and test repeatability conditions in fiber-optic systems can be traced back to the cleanliness of optical connections. Contamination of fiber end faces not only affects optical power levels but also impacts back reflectance performance and levels which is harmful to sensitive optical components.



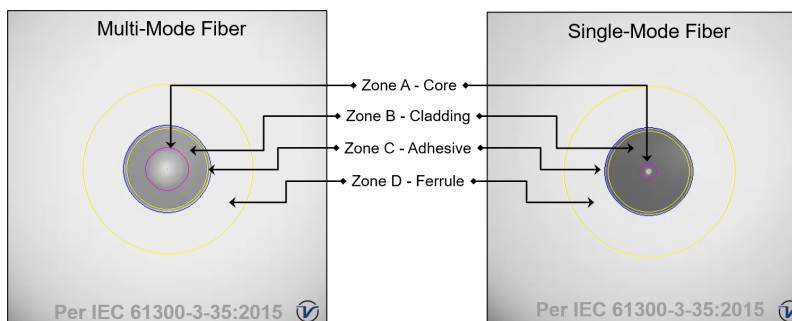
Dirty fiber end faces can cause back reflectance and insertion loss

Contamination

Optical connectors are susceptible to contamination from air borne particles and human body oils when exposed. Left over liquid residue from improper cleaning can also leave the fiber end face contaminated. The smaller the fiber core, the more severe the problem is likely to be, especially when considering that fiber core diameters can range from 62.5 microns all the way down to 8 microns in size.



Types of contamination viewed from a Fiber microscope



Cross-section-mode and multi-mode fiber zones

Inspection

Whenever possible, inspect the fiber-optic connection (connectors, bulkheads, and test interfaces) with a fiber microscope. It is recommended to wear laser safety glasses when working with fiber-optic connections. Always check that the laser or transmitter is disconnected before cleaning the connector end faces.

Cleaning Procedure

To ensure proper and effective cleaning of optical fiber connectors and interfaces, use the following cleaning materials:

- Isopropyl alcohol
- Lint free soft tissues
- Ferrule cleaners (1.25mm and 2.5mm versions)
- Connector reel cleaners (CleTop or similar)



Optical fiber cleaning materials clockwise from left--isopropyl alcohol, lint free soft tissues, connector reel cleaners, and a ferrule cleaner



Clean the connector end-face by rubbing it onto a lint-free wipe dampened with isopropyl alcohol

Procedure

1. Dab the contaminated connector end-face with a wipe that has been dampened with isopropyl alcohol - the solvent will dissolve and remove contaminants that have dried and attached to the connector or fiber end-face.
2. Rub the fiber end-face perpendicularly against a dry lint free wipe several times.
3. Alternatively, use compressed air to dry the surface quickly. Do not blow or allow the connector end face to air dry as this may leave a residue behind which is often more difficult to clean and which can attract even more dirt.
4. Re-inspect the fiber end-face with an optical microscope to check that all the contaminants have been removed properly - if not, repeat the process.



Using Compressed Air

In some clean air situations, filtered air is acceptable for use, which is free of oil and moisture to remove debris and clean a fiber optic connection. However, unless very strict cleaning procedures are followed, air-driven contaminants can cause more problems.

To use compressed air, hold the can upright. If the can is held at a slant, propellant could escape and dirty the optical device. First spray into the air, as the initial stream of compressed air could contain some condensation or propellant. Such condensation leaves behind a filmy deposit.

Best Practices

- Never touch the end face of an optical fiber connector with any hands or fingers.
- Always install dust caps on unplugged fiber connectors.
- Store unused dust caps in a resealable plastic bag to prevent dust accumulating.
- Never re-use optic cleaning swabs or lint free wipes. Always discard materials that have been used.
- Ensure all alcohol or solvent residues are removed after using wet cleaning techniques
- It is recommended to re-inspect the bulkhead receptacles and connector end face using a fiber microscope following the cleaning and prior to use.



Best practices for inspection and cleaning prior to connecting an optical fiber

Connectors

Connector Types

In fiber optic networks, you will come into contact with many different connector types, the most common being described below:

ST Connector

ST stands for Straight Tip-a quick release bayonet style connector developed by AT&T. STs were predominant in the late 80s and early 90s and are still one of the most commonly used fiber optic connectors in networking applications. They are cylindrical with twist lock coupling, 2.5mm keyed ferrule.



ST connectors are used both short distance applications and long line systems. The ST connector has a bayonet mount and a long cylindrical ferrule to hold the fiber.

FC Connector

FC stands for Fixed Connection - it is fixed by way of a threaded barrel housing. FC connectors are typical in test and measurement environments and for single- mode applications.



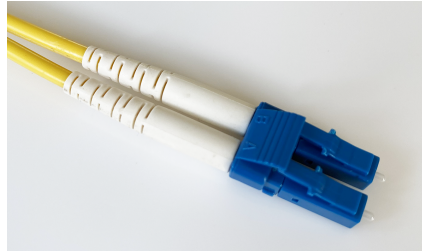
FC is the fiber optic connector standard for Nippon Telephone & Telegraph (NTT) installations, developed with Nippon Electric Co. (NEC).



The FC screws on firmly, but make sure the key is aligned in the slot properly before tightening.

LC Connector

LC stands for Lucent Connector. It is a small form-factor fiber optic connector that uses a 1.25 mm ferrule, which is half the size of the ST / SC connectors.



It uses a standard ceramic ferrule connector. The LC has good performance and is highly favored for both multimode and single mode applications, especially in high-density connector facilities. The LC connector is available in simplex or duplex cables.

SC Connector

SC officially stands for Subscriber Connector; however, some people believe that "Square Connector", is the correct name. It is a general purpose push/pull style connector. It was developed by NTT, which has an advantage in LAN/enterprise networks where duplex cabling to support TX/RX channels are commonly used.

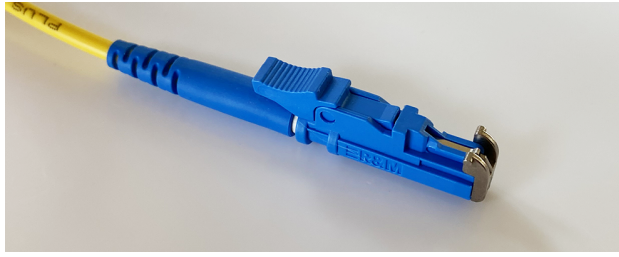


SC connector end face

SC Connectors are frequently used in network applications. The connector is square and keyed with push-pull mating, 2.5mm ferrule, and molded housing for protection. The SC is a snap-in connector that is widely used in single mode systems due in part for its performance; it latches with a simple push-pull motion.

E2000 Connector

Developed by Diamond, this connector has proven its performance worldwide in CATV and telecommunication networks. The connector features a spring-loaded shutter used to protect the ferrule from dust and scratches, and to provide increased safety protection. It uses a high precision Zirconia full ceramic ferrule with an insertion loss of 0.1dB. The APC version has a return loss of better than 85dB. The connector is especially suited for installation in global high performance networks.



The E2000 patchcords is available in simplex and duplex versions and comply with IEC 61 754-15 and TIA/EIA 604-16 standards.

Connector Performance and Polishing

Polishing of fiber optic connectors is the process of polishing the end-face of the ceramic ferrule within the fiber optic connector. The purpose is to improve the light transfer between the mating of connectors, in order to minimize optical losses and reducing reflections. This is an important aspect of fiber optic communications as losses affect the quality of the light signals.

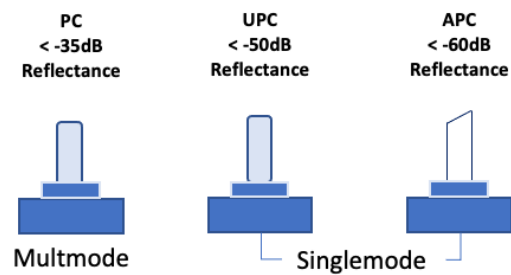
There are two main types of losses that are affected by the style and quality of polishing, which dictate the optical performance level of terminated fiber optic connectors:

- **Insertion Loss (IL)** - The most important performance indicator of a fiber optic connection. This is the loss of light signal, measured in decibels (dB), during the insertion of a fiber optic connector.
- **Return Loss (RL)** - Also known as back reflection, is the portion of the light signal that is reflected back to the original light source. This occurs as the light is reflected off the connector and travels back along the fiber to the light source. This indicator is measured in negative decibels (dB). When reading return loss figures, the higher the absolute value of the decibel unit means the better the performance of the interconnection.

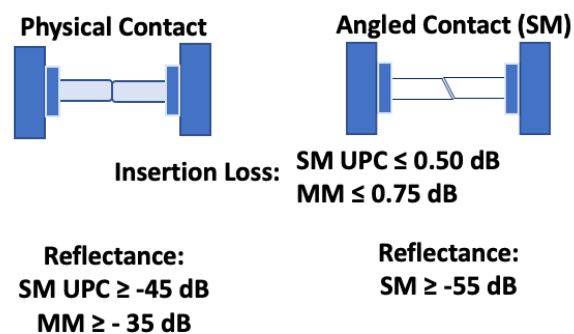
The amount of insertion loss is affected by fiber alignment, and/or the quality of the finishing on the end of ferrule, while reflectance is affected by the style of polishing on the ceramic ferrule in a connector. There are two different styles of polishing, reflected by the shape of their finish:

- **Ultra Physical Contact (UPC)** - The UPC style ferrule has the shape of the PC style, except they are polished with several grades of polishing film that allows for an ultra-smooth surface. The main difference between UPC and PC is that the former have lower return loss.
- **Angled Physical Contact (APC)** - The APC style produces the lowest return loss when compared to other styles. The ferrule is polished to an angle of 8 degrees. The angle is calculated so that it is less than the critical angle, which ensures light is not propagated back along the fiber.

Connector Polish and Performance



UPC and APC back reflection



UPC and APC return loss

Typical Return loss values are:

- Polished Connector ~ -45dB
- Ultra-Polished Connector ~ -55dB
- Angled Polished Connector up to ~ -65dB

Fiber Cables and Fiber Patchcords

Styles of Fiber Optic Cable vary in outer appearance, materials, application, features, and benefits. In OTDR applications, you will regularly come across the following types:

Bare Fiber

- Usually Spooled in 25km spools
- 250 to 400um acolyte buffer / polyimide
- PM Light Sensitive Bare
- Fiber Adaptor is a useful accessory and provides quick connection to check fiber length/continuity

PVC or Plenum Jacketed

- Many colors that mean very little
- Used mostly in internal applications

900um

- Patchcords
- Simplex (single fiber) or Duplex (two fibers) construction
- Singlemode or Multimode
- Pig tails
- Outer Diameter is usually 1.6mm, 2.0mm, and 3.0mm
- Duplex versions - Zip cord with outer diameters of 1.6mm, 2.0mm, 3.0mm

Break Out

- Both Multimode and Singlemode
- Indoor / Outdoor applications
- 1.6mm, 2.0mm, and 3.0mm subunits
- 2, 4, 6, 8, 12, 24, 48, 72 or greater fiber counts Outer Jacket can be of a variety of materials
- Terminated with all styles of connectors
- Often field terminated

Distribution

- Both Multimode and Singlemode
- Indoor / Outdoor applications
- 900um subunits

2, 4, 6, 8, 12, 24, 48, 72, 144 or greater fiber counts

- Outer Jacket can be of a variety of materials
- Usually longer runs and can be terminated with almost any style of connector

Ribbon

- Commonly used in LAN and PON applications with MTP/MPO connectors

Fiber Patch Cord

In a typical GPON network, a fiber is connected directly to the customer ONT/ONU. To test the GPON network, the fiber must be temporarily disconnected from the ONT/ONU and inserted into the MTTplus-420 OLT port. An additional fiber patch cord is then used to connect the MTTplus-420 ONU port to the ONT/ONU modem.

The patch cord and optical connectors play a critical role in fiber measurements. Ensure that a high quality patch cord is always used, as this can and will have profound performance on test results and traces.

Color Coding

The buffer or jacket on patch cords is often color-coded to indicate the type of fiber used.

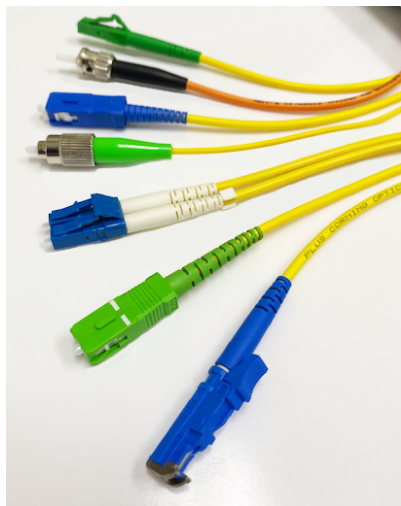
Connector boot

The strain relief boot that protects the fiber from bending at a connector is color-coded to indicate the type of connection.

Connectors with a plastic shell (such as SC or E2000) typically use a color-coded shell.

Color Code of Jacket	Definition or Meaning
Yellow	Single mode fiber
Orange	Multimode fiber
Aqua	10G laser-optimized 50/125um multimode optical fiber
Grey	Obsolete color code for multimode fiber
Blue	Sometimes used to designate polarization maintaining fiber

Color Code of Connector Boot	Definition or Meaning
Blue	Singlemode, Physical Contact (PC), 0°. Sometimes used for polarization-maintaining optical fiber.
Green	Singlemode only, Angle Polished (APC), 8°
Black	Singlemode, Physical Contact (PC), 0°
White	Singlemode, Physical Contact (PC), 0°
Red	High optical power. Also used to connect external pump lasers or Raman pumps.



Standard color coding for jackets and boots (or connector shells)

Inserting the Fiber

Carefully align the optical fiber connector to the port to avoid rubbing the fiber against the external part of the port or any other surface. If the interface of the connector has an alignment key, make sure to insert it correctly into the corresponding groove.

Push the connector in and make sure the optical cables are inserted to guarantee sufficient contact. If the connector has screw bushing, screw down the connector to fix in the optical fiber. Do not over- screw the connector or it will damage the optical fiber and the port.

Preventing Inaccurate Readings

To achieve maximum power and prevent false readings, clean the optical fiber connector interfaces before inserting them into the test port.

Please ensure the correct fiber connector type is used before inserting it into the test port or connector. Mismatched connector types will damage the optical end faces and the test set.



If the optical fiber is not aligned properly and/or completely connected, it will cause serious loss and reflection.

Connecting the Fiberscope



Use an USB-A OTG cable (optional with purchase) to connect a USB to the micro-B USB port. The port supports memory drives and USB add-on devices such as fiberscopes.



OPTICAL SAFETY

- Deactivate the laser before connecting or disconnecting optical cables or patchcord.
- Never look directly into an optical patchcord or optical interface while the laser is enabled. Exposure to optical radiation for an extended period can caused irreparable damage to eyes.
- Never use a fiber microscope to check the optical connectors when a laser source is active.

The operator is assumed to have received basic training in fiber optics and related testing and measurement practices.

Read the *"Safety Information" on page 10* before beginning using optical features of the test set.



Fiber Scope image view requires the Fiber Scope Expert option to be enabled on the chassis/platform except for the VS500 which can already include this option. This can be confirmed by viewing the device ID is either -1500 or -2500.

Attach the DI-1000/DI-1000MPO/DI-3000

Attach one end of the OTG cable (optional with purchase) to the microUSB port on the test set and the other end to the fiberscope USB port.



Older analog fiberscopes require a USB adapter.

The FX150+ will detect when a Fiber Scope is connected automatically. A shortcut icon will be displayed on the right-side menu.

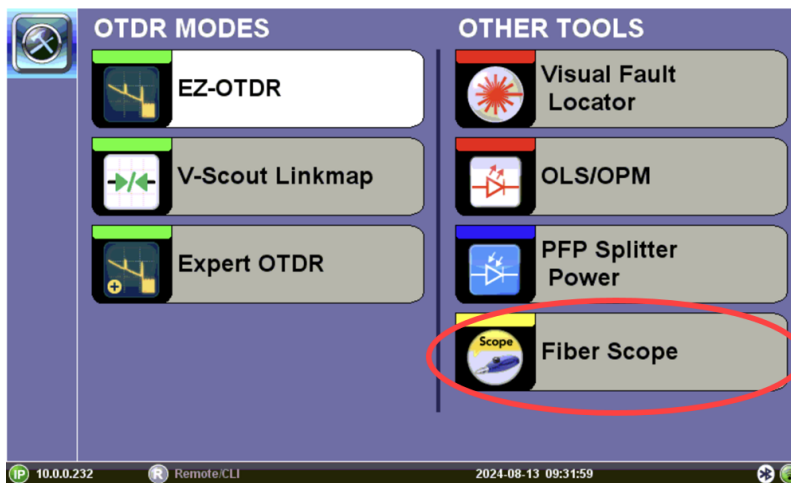
When the DI-1000, DI-1000MPO, or DI-3000 are powered, they will emit a blue LED. Select the tip that best matches the connector endface that is to be inspected (see *"Connectors" on page 49*). For more information about available connector tips, see the DI-1000 Digital Fiber Inspection Microscope Adapter Tips Guide on www.veexinc.com.

Scope tips are secured in place with a locknut. There is a slot (specialty tips may have more than one slot) that will ensure the tip is aligned properly to the top of the fiberscope prior to securing the locknut. Attach a tip by

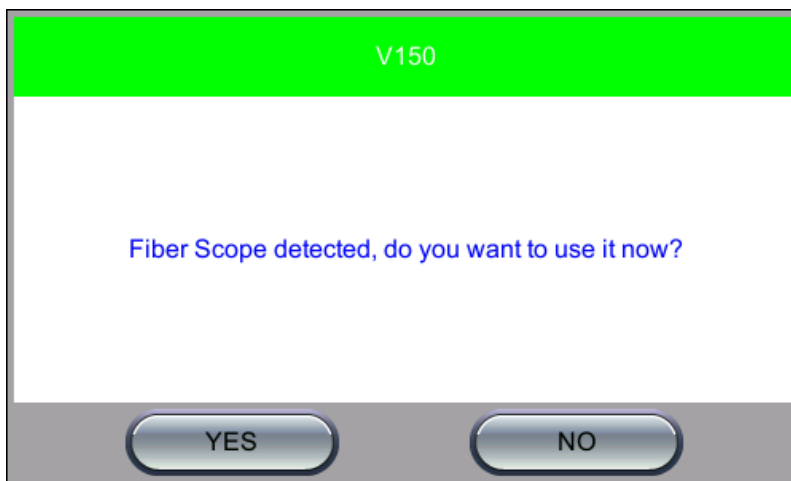
rotating the locknut clockwise (tip faced away). Remove a tip by rotating the locknut counterclockwise (tip faced away). With the correct tip fastened and secured, launch the Fiberizer application (PC, mobile, VeEX test set) and plug into an available USB interface or [connect to the WiFi network](#).

Rotate the round focus knob to manually bring the image into focus. For the DI-3000 scope, a built-in autofocus button can also be used.

Once the fiberscope is detected, tap **Yes** in the pop-up window to enter the Fiberscope menu.



Fiber Scope menu option (FX150+)

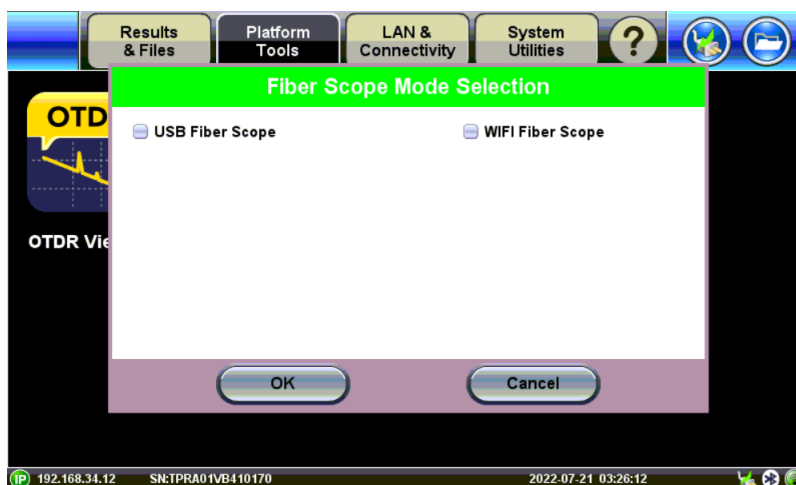


Fiber Scope Detected Message

Select the **FiberScope** application on the main menu. Alternatively, select  > .



Toolbox Menu - Fiberscope option



Fiber Scope Connection Mode Selection (USB for direct connection, Wi-Fi for DI-3000 AP)

Select the **USB Fiber Scope** checkbox for wired fiberscopes, such as the DI-1000, DI-1000MPO, VS500 (*discontinued*), or DI-3000 via USB.

Select **WiFi Fiber Scope** to initiate a scan for an available DI-3000. Refer to "[Wi-Fi Wiz](#)" on [page 198](#) for more information on setting up a WiFi Access Point if automatic scanning fails.



The WiFi Access Point password is: "veex" plus the last six digits of the serial number of the DI-3000 to connect with e.g. "veexA00700", where the serial number is SN:LA-3KA00700.

Fiberscope Setup

Captured patch cord image files are saved within a folder directory. In the **Setup** tab, name each folder and file in the directory and select a save increment.

The screenshot displays the 'Setup' tab of the Fiberscope software interface. The top navigation bar includes 'Setup', 'Capture', and 'Results'. The 'Setup' tab is active, showing a list of configuration parameters. On the right side, there are two buttons: 'Reset Con' (green) and 'Reset Setting' (red). The bottom status bar shows the IP address '10.0.0.232', 'Remote/CLI' status, and the date/time '2024-11-13 13:12:04'.

Setup	
IEC P/F Standard	V3
Analysis parameters	SM APC
Current Analysis Profile: IECv3 Visual requirements for single-mode angle polished (APC) connectors	
Connector Type	Ferrule (Male)
Connector Material	Ceramic (typical)
Field of View	Auto
Defects Indicators	Dots
Tip type	Standard
☐ Auto Freeze	☐ Auto center/Crop
Auto Save	Disabled
☐ Ask Before Save	

Fiber Scope Setup - Page 1

- **Reset Con:** *Reset Connection.* The Fiberscope software remembers whether a Wi-Fi or USB connection is selected and does not prompt the user again. This button forgets the previous selection and allows the user to select again.
- **Reset Setting:** Resets settings to their default values on the Setup screen.
- **Auto Save: Disable, Autosave on Tap, or Autosave after freeze:** Automatically saves the result when the video freezes (automatically or manually) or when the screen is tapped.

If **Autosave on Tap** or **Autosave after freeze** is enabled, the unit automatically saves and creates the filename using the Trace ID after the test. The file location and name will display. Auto Save is available for single fiber analysis only.

- **Disabled:** Turns off Autosave function. When Autosave is disabled, results can be manually saved on the Results tab after finishing the fiber endface inspection.
- **Autosave on Tap:** On the **Capture** tab, tap the screen to automatically save the captured image. "Tap screen to save" will appear to indicate that the feature is enabled.
- **Autosave after freeze:** Automatically saves the captured image upon freezing the image. (Auto-freeze enabled or normal Freeze.)

When **Ask Before Save** is selected, the **Save** menu will display with naming and comment options.

Setup	Capture	Results
Job ID	default	
Cable ID	default	
Fiber ID	default	
Test ID	default	
Increment	Fiber ID	

Fiber Scope Setup - Page 2

The details entered in the following fields can be used to pre-set the filename automatically and increment the fiber or test number automatically.

- **Job ID**, **Cable ID**, **Fiber ID**, and **Test ID** are nested folders that store saved results. Folders are nested in the following order: **Job > Cable > Fiber > Test**.

Tap the blank fields to edit the names.



The JobID/CableID/FiberID/TestID fields determine the location to which the results file is saved. If these settings are not set accurately, the file will not save to the desired location.

- **Increment**: Increments the selected ID name if the **Auto Save** option is selected.

Saved image files can be retrieved from [File Manager](#) or managed from the **Results** tab. Refer to "[Working with Saved Results, Profiles, Images](#)" on page 178 for more details.

Setup	Capture	Results
Company	default	
Customer	default	
Operator A	default	
Operator B	default	
Comments	default	
Location A	default	
Location B	default	
Direction	A->B	
Connector ID	default	

Page 3 / 3

10.0.0.232 Remote/CLI 2024-11-13 13:18:25

Fiber Scope Setup - Page 3

Include more specific details in the Test Report, such as Company, Customer, Operator(s), fiber segment direction, and Connector ID. This information appears on the Job Information portion of the Test Report.

Tap the blank fields to edit the names.

Analyze Fiber Connectors

Configure the settings on the **Setup** screens and select the **Capture** tab.

- **IEC 61300-3-35 P/F Standard:** The Pass/Fail analysis thresholds are defined by IEC 61300-3-35. This setting determines which version is used for analysis. The most recent version, Edition 3 (2022), is the default.
- **Analysis/Connector parameters:** The mode and polish of the connector being inspected. The analysis profile is based on the fiber endface connector inspected, as well as applicable to MTP™/MPO (multi-fiber) connectors.
- **Connector Type**
 - **Ferrule (Male):** Encompasses standard SC, FC, ST, and other ferrules.
 - **Panel/Coupler (Female):** Use when inspecting patch panels, MUX and test ports.
 - **MPO Female:** Use when inspecting SM or MM ribbon cables with MPO/MTP via coupler. When selected the MPO Fiber Count setting is enabled.

- **Connector Material:** Ceramic or Metal ferrules. Ceramic is the default and applies to most connectors.
- **Field of View:** Adjusts the viewing window.

The Standard field of view applies to the DI-1000, DI-1000MPO, and VS-500, while the Wide field of view applies to the DI-3000 and DI-1000MPO+.

The Auto settings will determine the field of view and set it to the proper value automatically.

For MTP™/MPO (multi-fiber) connectors, Auto adjustment of viewing window is not available.

- **Defects indicators:** Use Dots or Rectangles (Rects) to highlight scratches and defects in the inspection zone. Dots draw a red contour around scratches and defects. Rectangles highlight scratches and defects without obstructing the view. The selection between dots or rectangles does not affect the area calculation or the Pass/Fail results. Dots are set as default.
- **Tip type:** Some specialty tips, like extended tips for APC bulkheads, can slightly change the appearance of the connector on the screen. This setting allows the analysis to function with these changes. This setting is not needed for every connector type, since many specialty tips do not change the connector appearance. In these cases, this setting will appear dimmed.
 - **Standard:** Use with most tips.
 - **Extended:** Use with extended tips for inspecting hard to reach connector coupler/bulkhead.
 - **A6:** Use with 60° angle tips for inspecting hard to reach connector coupler/bulkhead.
 - **MPO APC 1:** Default analysis profile for MPO/MTP APC connectors.
 - **MPO APC 2:** Use when the MPO APC 1 setting cannot detect the fibers.



Panel/Coupler (Female) metal ferrule connectors use the APC Metal tip type only.

- **MPO Fiber Count:** For MPO Female connectors, select 8, 12, 16, or 24 ribbon.
- **Auto Freeze:** Freeze the video once analysis is completed on the fiber. Use when the probe image is unsteady, such as when inspecting a female connector or bulkhead. It minimizes significant vibrations and unsteadiness generated from the fiberscope being held. Typically, this function is not

always needed with the use of image focusing.



When inspecting MPO/MPT connectors, it is recommended to set Auto Freeze to ON.

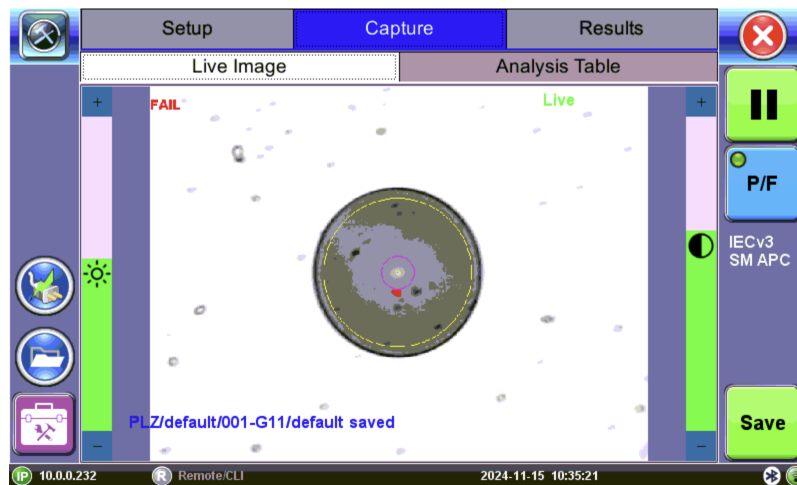
- **Auto center/Crop:** Digitally zoom in on the fiber once it is found. Select to take the current video frame and center it by the detected fiber image inside the program window, i.e. in case of long (extension) tips or handshaking. Initially, a blank screen will display. This is ideal for APC images. This is recommended when inspecting Angled bulkheads/couplers with Auto Freeze ON.

Capture Images (View)

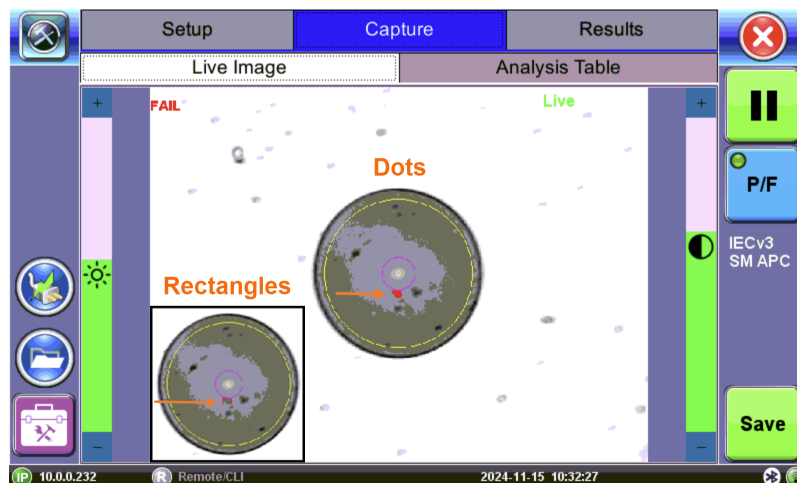
The **Capture** tab is the main user interface for the connector end face inspection and analysis. It presents a real-time view of the connector's end face allowing for alignment and focus. The capture screen displays a live image of the connector face and features analysis and freeze tools.

The fiber end face image will normally display near the middle of viewing window area. The exception will be when inspecting bulkhead/couplers or APC connectors or using A6 type tips. The end face image will appear off-center. AutoFocus and Shake OFF setting is recommended when inspecting couplers. Gently adjust centering while manually focusing the image and image will freeze as soon as focus is achieved.

For the DI-3000, press the autofocus (red target) button when the image is out of focus to enable the device's automated focusing operation. With a steady hand, the end face will be promptly autofocused and ready for capture.



Real time video of the connector face. Red contours indicate scratches and defects.



Fiber Scope Capture - Dots vs Rectangles



Press to begin or pause the live video capture. If the optional Auto Freeze feature is enabled on the Setup tab, the test set will automatically freeze the image when it comes into focus. Once the image is frozen, tap the image or Save to save it.



Press for automatic P/F analysis with thresholds defined by IEC standards.



Press to save scope image and analysis results.



Use the brightness slider bar on the left side of the image to brighten or dim the image. It can't be used for a frozen frame.



Use the contrast slider bar on the right side of the image to increase or decrease the color contrast of the image. It can't be used for a frozen frame.

To save the image on the screen, tap the screen after freezing or **Save**.

After saving, go to **Results** to push to the cloud. To view the Test Report, go to > **Results & Files**.



Fiber Scope Capture - PASS

When "Tap screen to save" appears on the image, it indicates that the **Autosave on Tap** option was enabled on the **Setup** tab. If **Autosave after freeze** were selected, the "Tap screen to save message" would not appear.

The **Analysis Table** displays all numeric results from defect and scratch events found for all four zones. These are used for the evaluation of the Pass/Fail criteria, according to the IEC 61300-3-35 standard. (Scratch requirements refer to width.)



This table will also be included in the reports.

Setup

Capture

Results

Live Image

Analysis Table

	Scratches			Defects		
	Criteria(μm)	Thresholds	Count	Criteria(μm)	Thresholds	Count
A:Core 0-25 μm	[3;4] (4;∞)	4 0	0 0	[2;3] (3;∞)	1 0	0 1
B:Cladding 25-110 μm	-	-	-	(25;∞)	0	0

FAIL

P/F

IECv3
SM APC

Save

IP 10.0.0.232

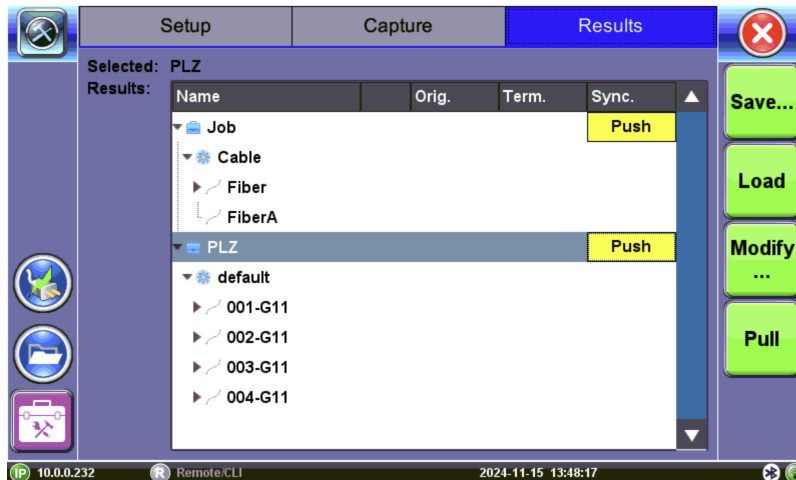
Remote/CLI

2024-11-15 12:12:10

Pass/Fail IEC analysis table

(Measured scratches and defects compared with threshold criteria for each fiber layer)

Fiberscope Results/Reports



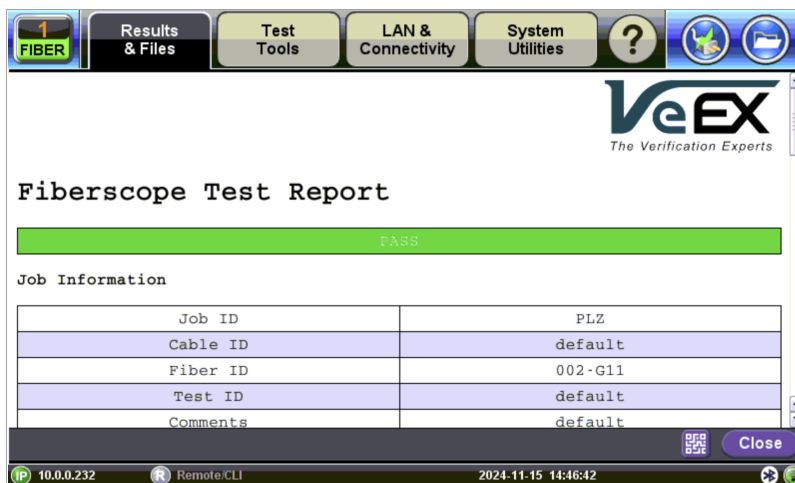
Fiber Scope Results Files

The results screen is used to view previously saved results. Test results can be pushed/pulled from Fiberizer Cloud. The directory displays the location of stored files. Connect to Fiberizer Cloud, then select the file(s) by tapping them.

- **Push/In Sync:** Uploads locally saved results to Fiberizer Cloud. *In Sync* indicates the results have been saved to Fiberizer Cloud successfully.
- **Load:** Loads the selected results file for viewing.
- **Save:** Manually saves and names the results file (autosave is disabled). Once saved, the files can be accessed in the ["File Manager" on page 177](#) or ["R-Server" on page 218](#).
- **Modify:** Select a file or folder in the directory to modify. Options to **Name**, **Delete**, and upload the selection to Fiberizer **Cloud** are available.
- **Pull:** When connected, pulls file from Fiberizer Cloud onto test set.

Test Analysis Report

To view the report files, tap  > **Results & Files**. The Fiber Scope test report can be viewed in JPG format or exported to PDF. In addition, all fiber optic test results can be viewed using Fiberizer Cloud or the Fiberizer Desktop Plus PC software. For more information on viewing result files, see "[Working with Saved Results, Profiles, Images](#)" on page 178.

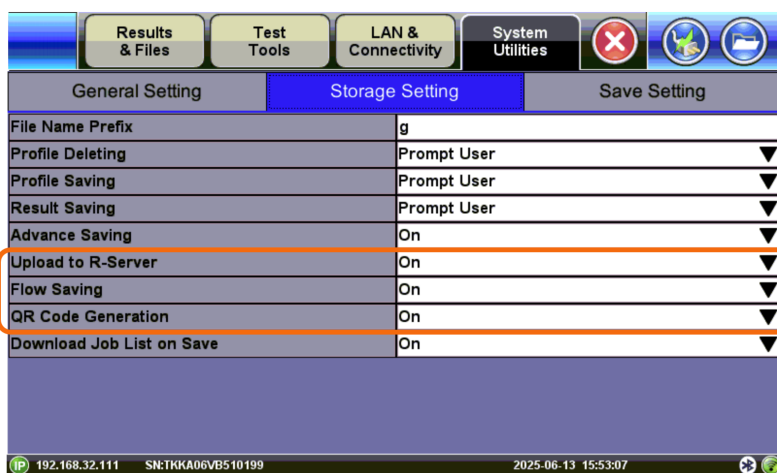


Fiberscope Analysis Report

View Fiberscope Reports on Mobile Device

To view Fiberscope Reports on a mobile device, turn on the setting in the test set's platform settings.

Go to  > **System Utilities** > **Global Settings** > **Storage Settings** and make sure **QR Code Generation** is turned **ON**.



Enable QR Code Generation

VeEX's NoApp® (US Patent 12,190,199)*¹ cloud service enables basic meters and advanced test sets to quickly and easily transfer test results' KPI to a phone or tablet, to instantly generate test reports and allow sharing and uploading to centralized R-Server or cloud. [See short video about the VeEX NoApp® Wireless Test Results Transfer via NFC.](#)



Internet connectivity is required (e.g., Wi-Fi, LTE, 5G, etc.).

Immediately after saving results, a screen with a QR code appears. To view the test report via mobile device, scan the QR code with the mobile device's camera. Tap **OK** to exit the screen on the test set.

Alternatively, tap the QR code icon  on the [File Manager](#) screen.

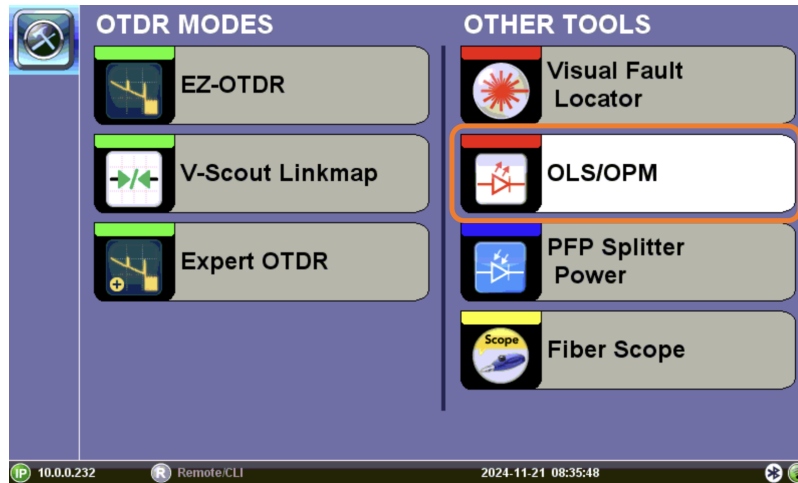


Test Report QR Screen

¹*This product is protected under U.S. Patent No. 12,190,199 and may be covered by additional patents. Any unauthorized reproduction, sale, or distribution is strictly prohibited and may result in legal action.

Optical Power Meter (OPM)

The VeEX Inc Optical Power meters are made with fast and accurate testing in mind. They are used to measure the power running through a cable at a given wavelength, and interface with phone, PC, or other VeEX devices to save and generate reports on the findings. This information is used to verify that the cable span is working correctly and to find the source of the problem when it's not. When paired with a VeEX Optical Light Source (OLS) or as part of a VeEX Optical Loss Test Set (OLTS), which includes both, WaveID can be used to quickly test several wavelengths without having to adjust the OPM settings.



Optical Power Meter

To access the OLS/OPM from the Test Application screen, select  > .



Toolbox Menu - OLTS/OPM Viewer option

Use the  **Toolbox** icon to toggle between active tests (OTDR, Fiberscope, OLS/OPM, VFL, FLOW).



Only optical power meters (e.g. Built-in or FX4x/8x OPM series meters) approved by VeEX are supported. WaveID will work with OLS in CW mode only. Accessing the Optical Power Meter module shuts down GPS and the atomic service.



Do not connect the fiber before opening the OPM application. First, zero the meter with the dust cap closed before making any measurements.

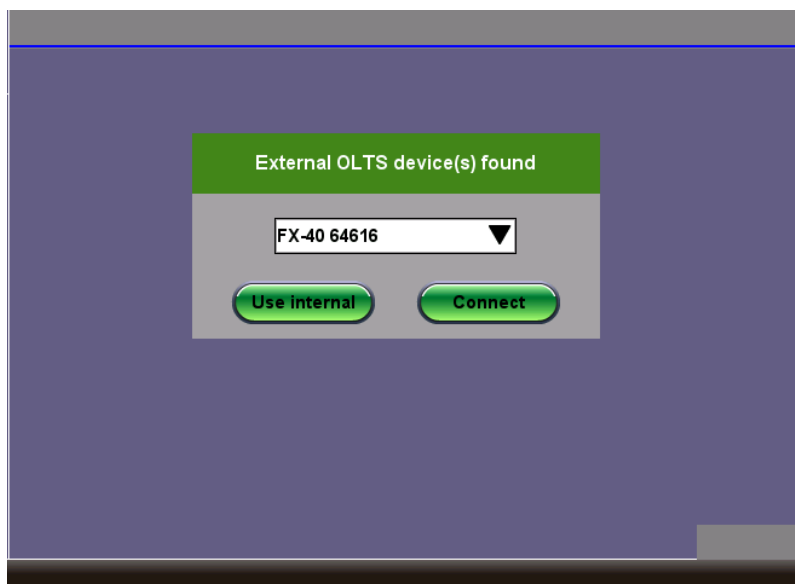
Connecting to the internal (built-in) OPM

1. Tap the **X** icon to close OTDR mode. The **Fiber main menu** appears.
2. Tap **OLS/OPM** on the main menu. The **OPM** screen appears with the **Caution** warning.

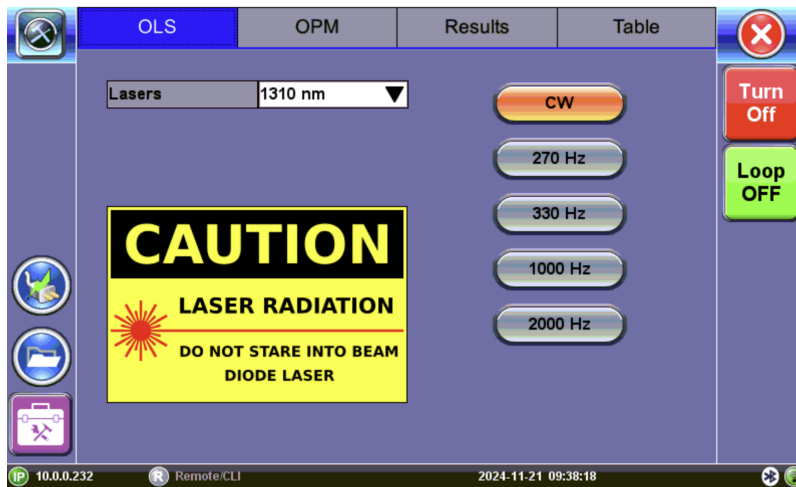
Alternatively, access the OPM screen by selecting **Optical Power(USB)** from the Platform menu.

Connecting an External OLTS Device

1. Insert USB dongle into the test set's microUSB port and connect it to a VeEX Inc. supported Optical Light Test Set (OLTS) device before launching the application.
2. Power on the external meter. Then, tap **Optical Power Meter** on the menu. The **External OLTS device(s) found** screen appears.
3. Select the connected external meter and tap **Connect** to proceed to the external OPM menu or **Use Internal** to use the built-in OPM menu if it supported by the test set. The **OPM** screen appears with the **Caution** warning.

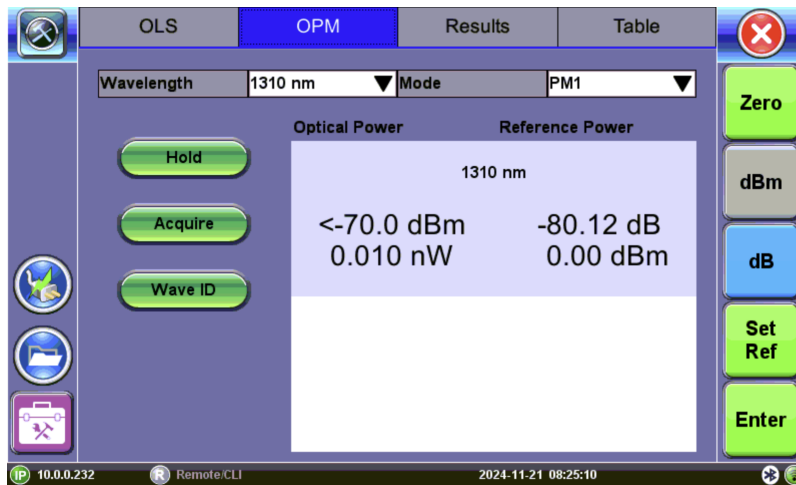


The Name of the External OLTS device is Displayed Once Detected



OLS Menu

Setup and Measurements



OPM Menu



- **Wavelength:** Matches the calibrated wavelength to the signal being measured.
- **Wave ID:** Detects the incoming wavelength automatically from a supported VeEX Inc.OLS. Use when operating the OLS in continuous wave (CW) mode with or without Loop enabled.
- **dB/dBm:** Switches between dB and dBm measurement units. A Green dB button shows absolute power level in dBm. A Blue dB button measures relative power loss in dB. Use the Set (Reference) and Enter (edit Reference) to set Reference, edit Reference, and view measurements in three units: dBm, dB, and Watts.
After toggling to the dB button to blue, the Set and Enter buttons appear.
- **Set:** Sets the reference value for the current wavelength.
- **Enter:** Edits current wavelength reference value.
- **Hold:** Freeze measurement to the last power or loss reading on the screen. “HOLD” appears next to “Optical Power” when tapped. Tap **Hold** again to unfreeze it.
- **Acquire:** Loads current measured value into the **Table** tab. The **Table** tab indicates how many new records have been temporarily saved into memory. In manual IL test mode, the **Acquire** button must be used to capture each individual reading (e.g. same fiber at different wavelengths) unless Loop is turned on.



If your device is equipped with a built-in clock, the saved measurement result will have a time stamp.

To permanently save the table of results, you must save into a test file.

- **Zero:** Recalibrates the OPM to treat current conditions as zero. Used when measurement conditions change significantly or to re-calibrate the OPM. Make sure the cover is shut on the OPM test port before tapping **Zero**. When in doubt, recalibrate prior to making any measurements, e.g, when testing in cold outdoor temperatures and then moving testing into a heated building.



Put the cover over the OPM test port BEFORE recalibrating.

- **OPM Server On:** *Remote control feature not currently supported.* Broadcasts the IP address on the current network for users to connect to the test set module's built-in optical power meter through Ethernet/TCP/IP using **Fiberizer LTSync Windows Desktop** software for remote control and access.
- **Mode:** Designates the measurement specification built-in: PM1 (-70 to +10dBm), PM2 (-50 to +25dBm), or PM3 (-65 to +15dBm). For specific information on the PM1, PM2, and PM3 specifications, see the platform's datasheet at www.veexinc.com.

Calibrating to Laser Source

To perform loss (dB) testing, the meter must be referenced (calibrated) to the Laser Source output.

To measure reference cable loss using the built-in light source (Loopback Referencing):

1. To begin testing, zero the meter by closing the dust cap and pressing the **Zero** button.
2. Connect the OLS (OTDR port) with the reference patchcord to the OPM port using a patchcord.
3. Turn on dB measurement by toggling the **dB** button to **blue**.
4. Select the **OLS** tab, select the laser wavelength, and turn **ON**. Press **Loop** to select and cycle through all desired wavelengths.
5. Select the **OPM** tab and select the measurement wavelength or press **Wave ID** to automatically detect the correct wavelength.
6. Tap **Set** to record the 0.00 dB point for each wavelength. A reference point is established and the calibrated LS can be connected to one end of the fiber with another OPM connected at the other end to measure the fiber link loss. Tapping **Set** will overwrite previously saved reference value(s).

To measure reference cable loss using an external light source:

1. Connect the OLS to the OPM port using a patch cord.
2. Turn on dB measurement by toggling the **dB** button to **blue**.
3. Select the measurement wavelength. If using a supported VeEX light source in CW mode, pressing "Wave ID" automatically selects the correct wavelength.

4. Tap **Set** to record the 0.00 dB point. A reference point is established and the calibrated LS can be connected to the far-end of the fiber to measure the loss. Tapping **Set** will overwrite previously saved reference value(s).

Measuring Power (dBm)

1. To begin testing, zero the meter by closing the dust cap and pressing the **Zero** button.
2. Insert the fiber being tested into the OPM port.
3. Select the measurement wavelength. If using a supported VeEX light source in CW mode, pressing "Wave ID" automatically selects the correct wavelength.
4. Tap **Acquire** to record a result. Acquired results can be viewed from the **Table** tab and saved from the **Results** tab.

Measuring Loss (dB)

1. Set reference values for all testing wavelengths (refer to [Calibrating to Laser Source] for more details).
2. Remove the reference cable and connect fiber to the OPM port on the unit.
3. Tap **Acquire** to record a result. Acquired results can be viewed from the **Table** tab and saved from the **Results** tab.

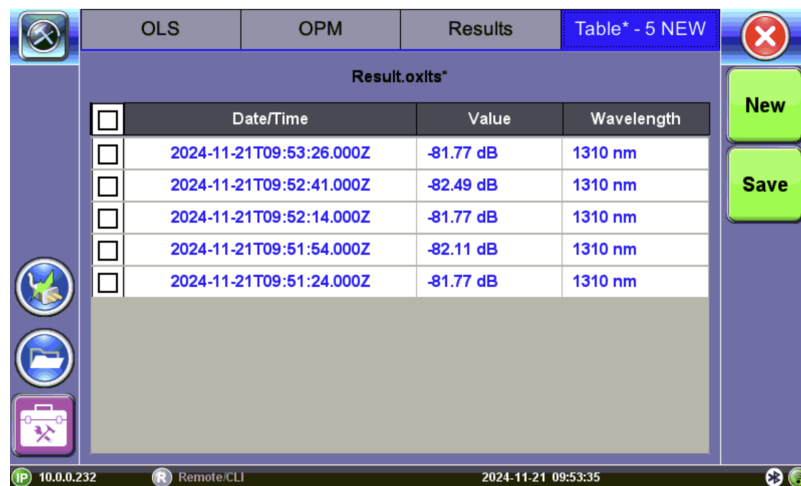
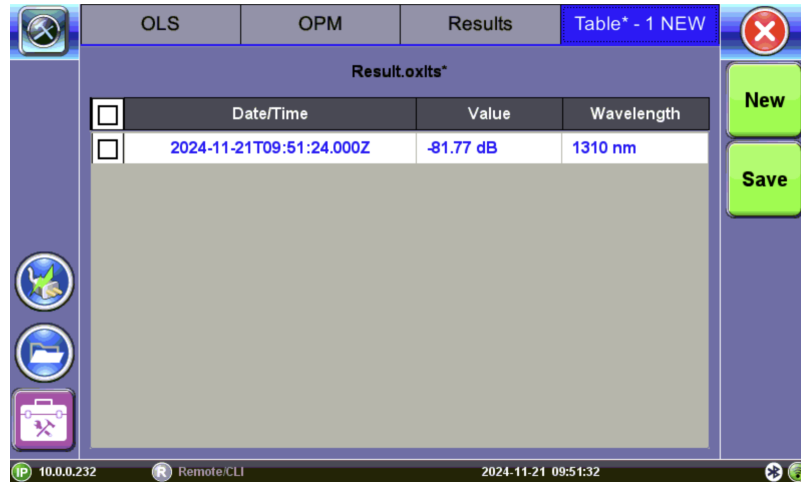
Readings (Table tab)

OPM readings appear in the **Table** tab. Saving readings will permanently write data to the **Results** tab. More than one reading can be saved at a time. Use this function to organize/filter results in project batches, so that the correct set of results are grouped together appropriately. Pressing **Remove** will permanently remove the readings from the current list.

To view and save (enter) test results into the Results table:

1. Select the OPM tab. Verify the insertion loss (IL) values are acceptable, then tap **Acquire** to load values into the **Table** tab. The **Table** tab title shows how many fiber records have been temporarily saved in the format **Table*-n NEW**, where n is the number of new records.

- To view the active results table, select the **Table** tab.



Press Save to Save Results

- To permanently save the fiber record locally, select the record(s) and press **Save**. The **Result saving** screen appears. The filename will default to the date/time stamp unless a specific file name is entered.



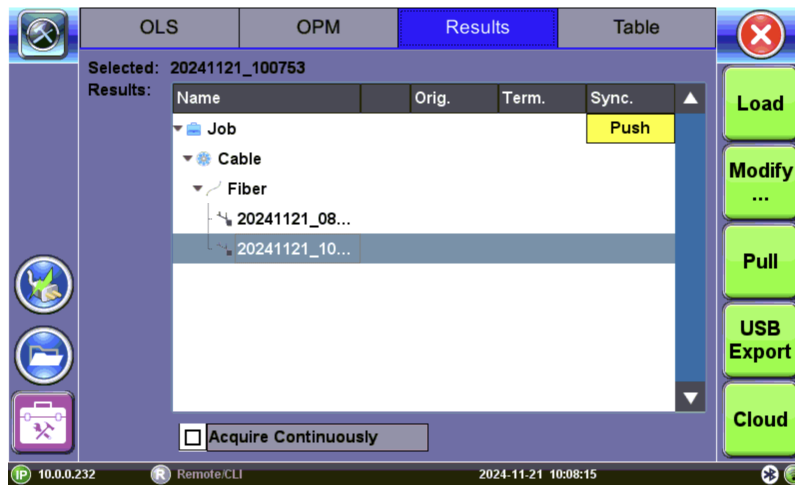
The JobID/CableID/FiberID/TraceID fields determine the location to which the trace is saved. If these settings are not set accurately, the trace will not save to the desired location.

- Tap **OK**. The readings are saved to a file and the table resets.

To remove results before saving, select the checkbox next to the reading(s), then tap **Remove**. After saving power or loss readings to a file, access the file in the **Results** tab.

Results

Results can be saved to the test set, exported to USB, or uploaded to Fiberizer Cloud.



Results Management Menu

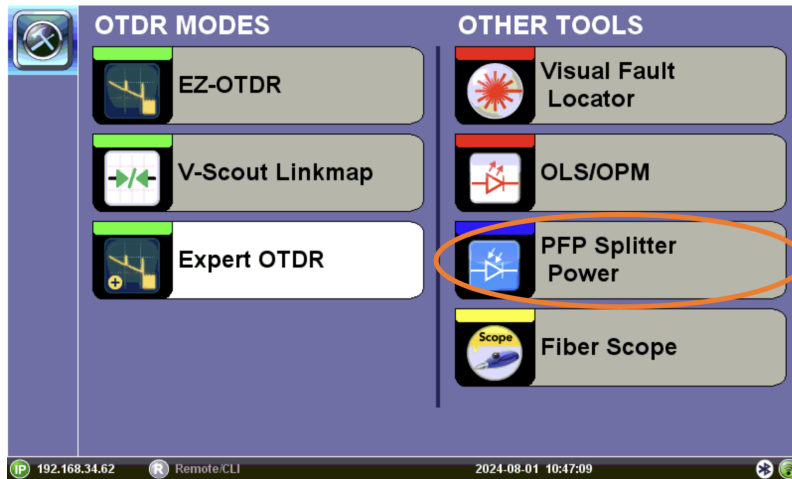
The results screen is used to view previously saved results. Test results can be pushed/pulled from Fiberizer Cloud. The directory displays the location of stored files. Connect to Fiberizer Cloud, then select the file(s) by tapping them. Refer to ["Fiberizer Cloud" on page 162](#) for details on connecting to Fiberizer Cloud.

- **Push/In Sync:** Uploads locally saved results to Fiberizer Cloud. *In Sync* indicates the results have been saved to Fiberizer Cloud successfully.
- **Load:** Loads the selected results file for viewing.
- **Save:** Manually saves and names the results file (autosave is disabled). Once saved, the files can be accessed in the ["File Manager" on page 177](#) or ["R-Server" on page 218](#).
- **Modify:** Select a file or folder in the directory to modify. Options to **Name**, **Delete**, and upload the selection to Fiberizer **Cloud** are available.
- **Pull:** When connected, pulls file from Fiberizer Cloud onto test set.

Save continuously: To autosave results at a specified interval (1 to 60 seconds). Use this option to check power drift.

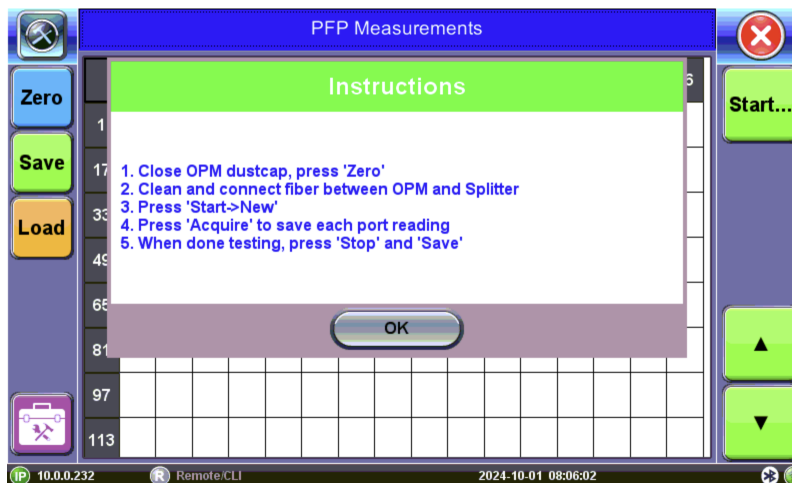
PFP Splitter Power

The PFP Splitter Power analysis provides a way to measure insertion loss for every fiber strand in sequence and readings saved and loaded later, if needed. The process is secured with a graphical display, limiting the risk of errors.



PFP Splitter Power analysis option

Process



PFP Splitter Power Introduction Screen

To use the PFP Splitter Power Analysis feature:

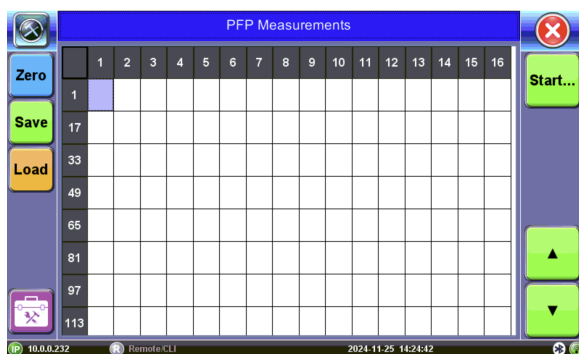
1. Close the dust cover tightly to the **OPM** port.
2. On the test set, press **PFP Splitter Power** and then on the Introduction box tap **OK**.

3. Press **Zero**. This recalibrates the OPM to treat current conditions as zero and is used before making measurements or when conditions change significantly e.g, when there are sudden temperature changes.
4. Thoroughly clean the pathcord connector. For instructions, see ["CLIC" - Clean to Maintain Optical Connector Quality](#).

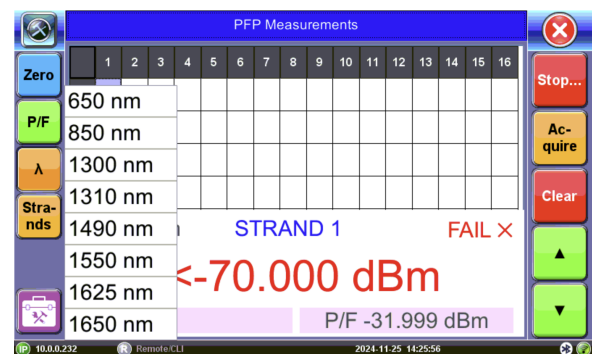


Dirty connector end-faces are often the number one cause of poor performance, link failures and even connector damage. Clean and Inspect your Connectors (CLIC) as it is important to keep the end face clean and un-blemished to prevent excessive loss and return loss.

5. On the test set, press **Start** and then press **New**.
6. Test splitter output port, tap corresponding panel port # and then press **Acquire** to log the power measurement.
7. After completing the power measurement for the last strand, press the **Stop** button and then press **Save** to end the test and save the results or **Stop** to stop the test without saving the results. Pressing **Save** will generate a POPM file containing the information collected for the splitter/cabinet. Refer to ["Working with Saved Results, Profiles, Images"](#) on page 178 for details on exporting the POPM file.



PFP Measurements



PFP Measurements
Wavelength Selection



Put the cover over the OPM test port BEFORE recalibrating.

- **Save:** Saves all acquired test results to a file.
- **Load:** Loads previously saved test results.
- **Start:** Begins a new test or resumes and earlier test.
- **Up/Down:** Selects an active cell.
- **P/F:** Sets the threshold for pass/fail indicator.
- **Wavelength:** Matches the calibrated wavelength to the signal being measured.
- **Strands:** Sets the first and last strand # to test.
- **Stop | Save/Stop:** Save creates a test file to save all cell results. Stop ends the test without saving cell results to a file. The next time the application is opened, previous cell results will be reloaded into cells.
- **Acquire:** Loads current measured value into the **Table** cells. The **Table** cells indicate pass/fail and how many new records have been temporarily saved into memory. The **Acquire** button must be used to capture each individual reading.
- **Clear:** Clears content from a cell.

Results

Results can be saved to the test set POPM file and exported to USB. Refer to ["Working with Saved Results, Profiles, Images" on page 178](#).

Optical Light Source (OLS)

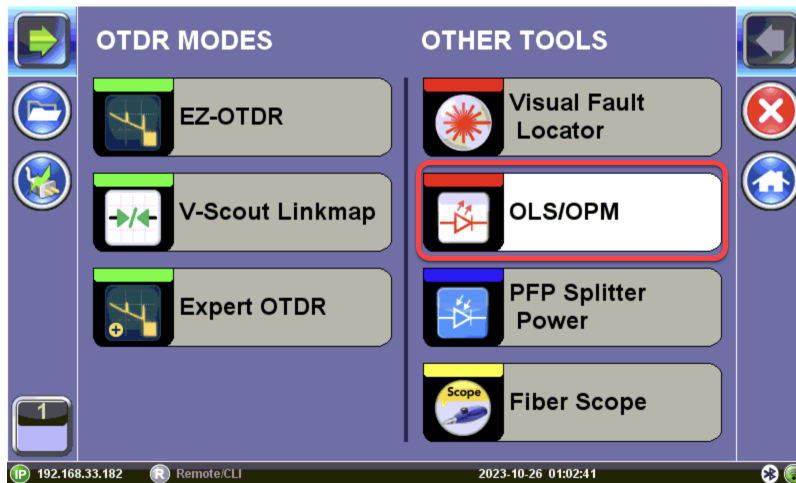
The unit can be equipped with an optional Optical Light Source (OLS) to use in conjunction with any OPM to measure link loss. The OLS radiates continuously or in pulses with modulation. For multi-laser OLS (except DWDM laser), the Loop mode enables the selection of a wavelength to use in Loop test mode.

To see the most recent OLS specifications, go www.veexinc.com.

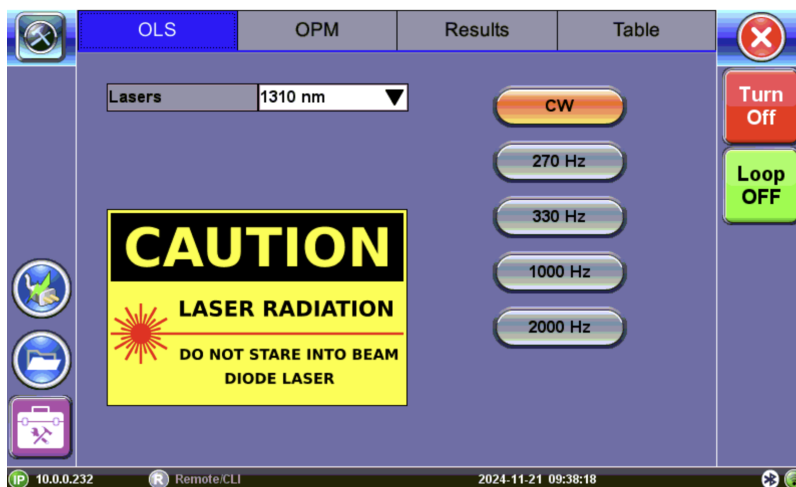


PROTECT YOUR EYES!

Never look directly into the OLS test port. The laser radiation emitted can be harmful to your eyes.



Optical Light Source menu option



OLS Setup

Using the Optical Light Source

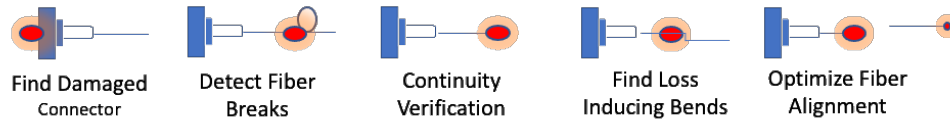
1. Make sure that the Optical Light Source option is installed on the test unit.
2. Connect a patchcord between the OLS and an OPM test port, then power on the unit.
The Fiber Main Menu is loaded by default.
3. Select **OLS/OPM** from the main menu and then select the **OLS tab**.
4. On the **OLS** screen, select the operation mode for the test, then tap **Turn On**.
 - **CW (Continuous Wave)**: Select to continually measure level, loss, and reflectance in optical components.
 - **270 Hz, 330 Hz, 1000 Hz, 2000 Hz (Pulse)**: Select this option to send intermittent light pulses.
5. When testing is complete, tap **Turn OFF** to power off the OLS, and then disconnect the cable and replace the port cover.

Visual Fault Locator (VFL)

The unit is equipped with an optionally built-in Visual Fault Locator (VFL) to trace and visually identify breaks in ODFs, bare fibers (900 µm), and patch cords that are typically hidden in the OTDR dead zone.

The VFL works by injecting a 650nm visual red light into the fiber (up to 5 kilometers/3 miles) to bend a single fiber strand and force light to exit the center of the fiber. It traces it to identify faults through light leakage. It identifies fiber strands, connectors, breaks, bends and other potential problems or anomalies on events.

Top 5 ways to use VFLs



To see the most recent VFL specifications, go www.veexinc.com.



PROTECT YOUR EYES!

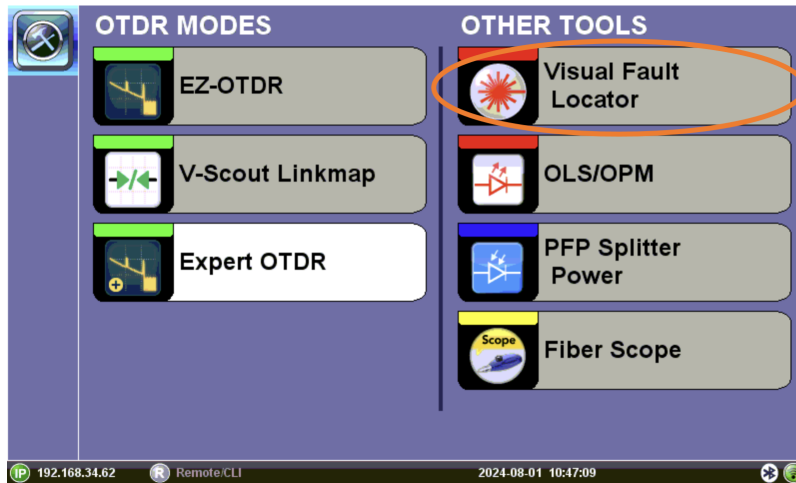
Never look directly into the VFL's light. It is a Class II laser and emits laser radiation that can potentially harm your eyes with extended exposure. It is good practice to never look directly into any fiber connector for any reason.

Use the  **Toolbox** icon to toggle between active tests (OTDR, Fiberscope, OLS/OPM, VFL, FLOW).

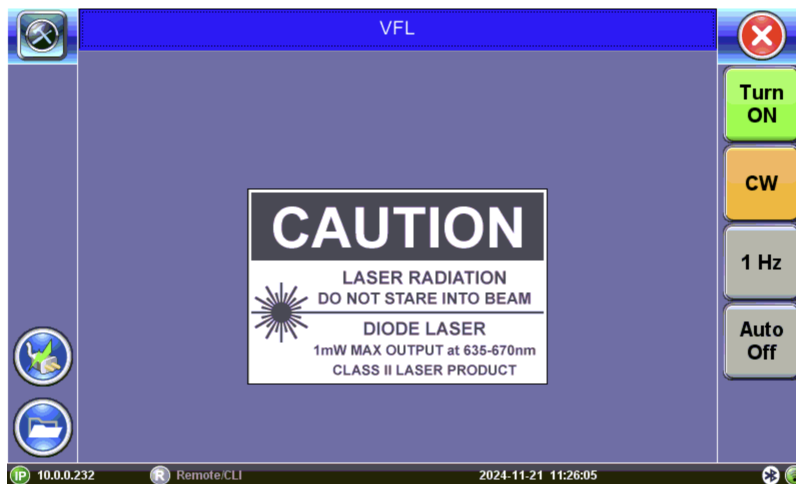
VFL can be used with OTDR simultaneously.

Using the VFL

1. Make sure the laser is turned off, remove connector covers from the cable, then connect the fiber to the VFL port located at the top of the unit. The VFL interface is fitted with universal 2.5mm sleeve accepting all 2.5 mm connector ferrules. Use a 2.5 to 1.25mm converter to check MU or LC connectors.
2. Power ON the unit, and then tap the **X** icon to close OTDR mode and display the **Fiber Main Menu**.
3. Tap **Visual Fault Locator** on the main menu. The **Caution** screen appears.



Visual Fault Locator menu option



VFL: Caution screen

4. Select the operation mode.
5. **CW:** (*Continuous Wave*) Select this option to turn on the VFL continually to check for faults.
1 Hz: (*Pulse*) Select this option to send intermittent light pulses. In some cases, this makes it easier to identify faults (than continuous light). It can also be used with audible detectors (toners) that can identify faint light or in well-lit (bright) environments.
6. Tap **Auto Off**. When VFL application is exited, the VFL powers down automatically.

7. Tap **Turn ON** to power the laser. The **Caution** box turns yellow. You will observe that a red light emits from the end of the fiber to confirm continuity. This red light will also appear at splices, joints, connectors, macrobends, etc. if any light is leaking.
8. Tap **Turn OFF** and disconnect the cable and replace covers.



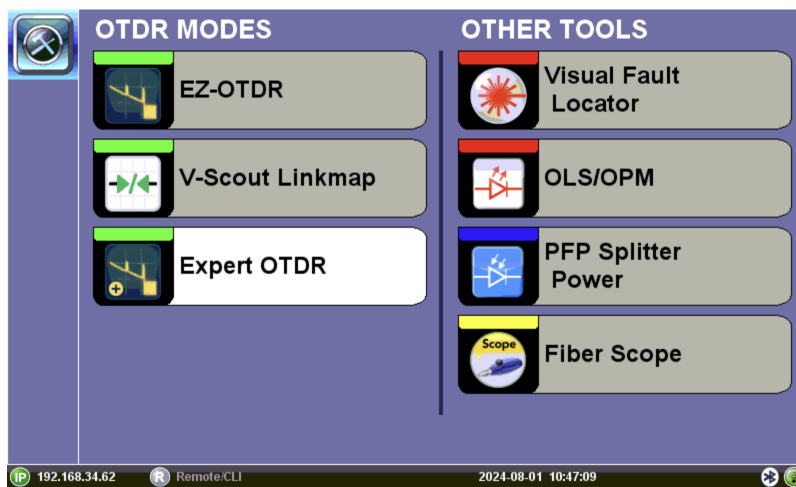
When not in use, disconnect the cord from the port, replace dust covers, and keep the port cap securely closed. VFL may not work with G.657 bend insensitive patchcords or cables with dark jacketing material or armored cables.

OTDR

Setup Screen

The Fiber Menu is loaded automatically. On the **Fiber Main Menu**, there are three *possible* OTDR test modes:

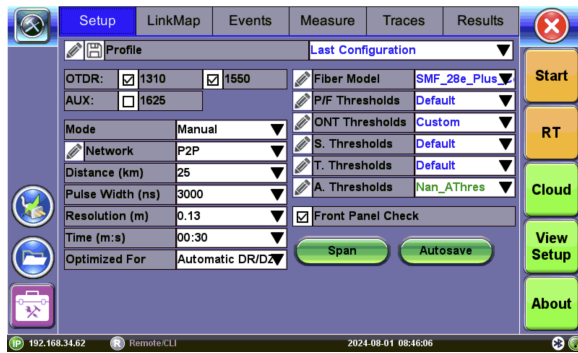
- **EZ-OTDR**: Select this option for Automatic setups only.
- **V-Scout Link map(optional)**: Default Auto profile. Select this option to use factory or user defined multi-pulse test profiles with summary results displayed on a link map.
- **Expert OTDR**: Select this option to customize setups and/or manually override the default options. Realtime, Manual, Auto, and V-Scout are all available from this option.



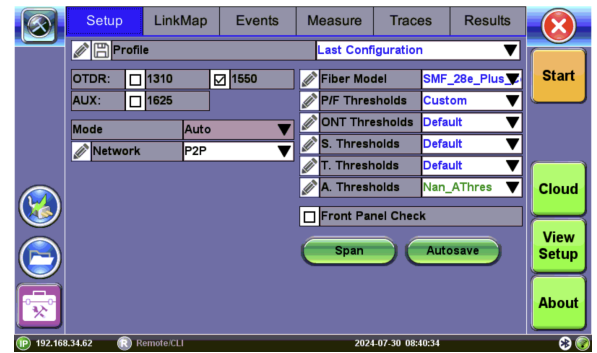
OTDR Menu

To access the OTDR application from the Test Application screen, select  > .

Use the  **Toolbox** icon to toggle between active tests (OTDR, Fiberscope, OLS/OPM, VFL, etc.).



OTDR Setup: Expert (Manual) Mode



OTDR Setup: EZ-OTDR/V-Scout (Auto) Mode

Profiles

Profiles store test configurations including, but not limited to wavelengths, modes, network, test parameters span, thresholds, and fiber model. The "Last Configuration" profile uses the same test settings that were used in the previous test. A "Default" profile is provided with standard manufacturer settings.

Select the desired profile that contains pre-configured settings. If needed, create a new profile.

Lock a Profile

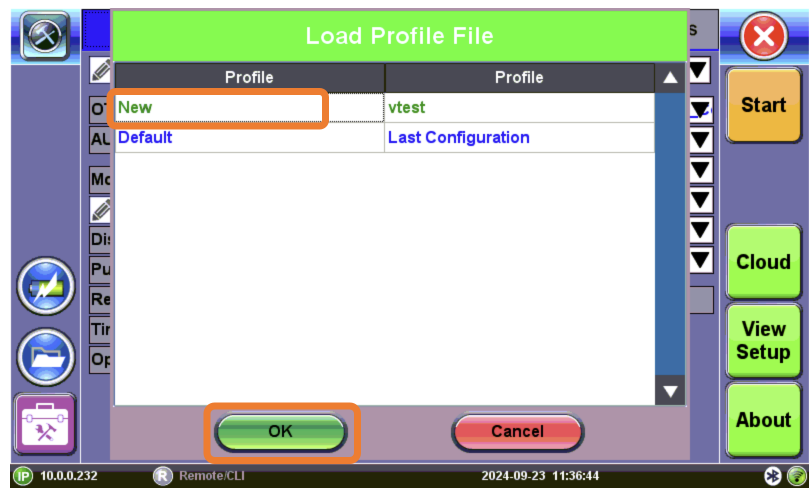
Profile settings can be locked from editing. Tap the pencil icon  next to the profile, then on the **Profile Editing** screen, select **Locked** for each item to be locked. Tap **OK** when finished.

Create a Profile



It is not recommended to edit the factory Default settings. Create a new profile instead of changing the Default profile.

1. Tap the **Profile** drop-down to open the **Load Profile File** window. Select **New** and tap **OK**.

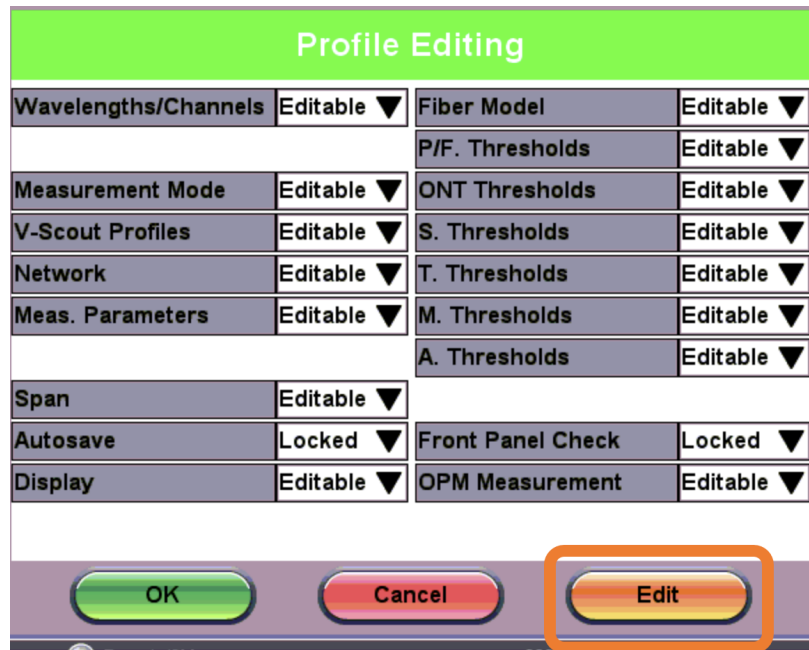


Load [New] Profile File

The **Setup** screen will show "New" in the **Profile** drop-down.

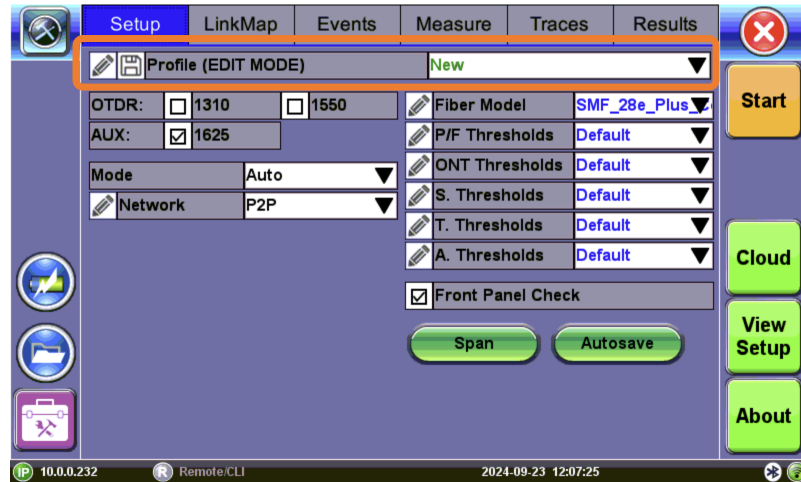
2. Next to the **Profile** field, tap the pencil icon .

At the bottom of the **Profile Editing** screen, tap **Edit**, then tap **OK** on the **Profile Unlocked** screen.



Profile Editing

The **Setup** screen will now show "EDIT MODE" next to **Profile**.



OTDR Setup - Profile EDIT MODE

3. After making changes on the **Setup** screen, tap the **Save** icon  next to **Profile**.
4. On the **Profile Saving** screen, tap **Save As**. Tap in the **Name** field, enter a name for the new profile and tap **Apply**. Then, tap **OK**.

Wavelengths

Select desired wavelength for fiber properties:

- **OTDR:** If the OTDR contains both single and multi-mode optical fiber test ports, selecting a single-mode OTDR wavelength (SM1310, SM1550, SM1625) will automatically prevent the selection of multimode OTDR wavelengths (MM 850, MM 1300) and vice versa.
- **AUX:** The OTDR AUX port is reserved for:
 - In-service filtered testing at 1625nm or 1650nm.
 - Multimode testing (OTDR must be equipped with both singlemode and multimode capability.)

Test Parameters

Select the type of test to perform from the Mode drop-down menu: **Manual**, **Auto**, **Manual Real Time**, **Auto Real Time**, **V-Scout** or **MPO Auto** (with OX-MPO-12 optical switch connected).

Expert OTDR (Manual) Mode

To set OTDR test parameters manually, under **Test Parameters** select **Manual** from the **Mode** drop-down menu.

Setup	LinkMap	Events	Measure	Traces	Results
Profile: Last Configuration					
OTDR: ☒ 1310 ☒ 1550		Fiber Model: SMF_28e_Plus			
AUX: ☐ 1625		P/F Thresholds: Default			
Mode: Manual		ONT Thresholds: Custom			
Network: P2P		S. Thresholds: Default			
Distance (km): 25		T. Thresholds: Default			
Pulse Width (ns): 3000		A. Thresholds: Nan_AThres			
Resolution (m): 0.13		☒ Front Panel Check			
Time (m:s): 00:30		Span Autosave			
Optimized For: Automatic DR/DZ					

Start RT Cloud View Setup About

IP 192.168.34.62 Remote/CLI 2024-08-01 08:46:06

OTDR Setup: Manual Mode

EZ-OTDR (Auto) Mode

To set OTDR test parameters automatically, select **EZ-OTDR** from the Fiber Main Menu or on the **Test Setup** screen, select **Auto** from the **Mode** drop-down box. In this mode, the OTDR performs a measurement and analysis of the fiber and determines optimal test settings automatically.



Auto mode is intended for inexperienced operators and uses single pulse per wavelength. The type of network to be tested must be specified.

Setup	LinkMap	Events	Measure	Traces	Results
Profile: Last Configuration					
OTDR: ☐ 1310 ☒ 1550		Fiber Model: SMF_28e_Plus			
AUX: ☐ 1625		P/F Thresholds: Custom			
Mode: Auto		ONT Thresholds: Default			
Network: P2P		S. Thresholds: Default			
Distance (km): 25		T. Thresholds: Default			
Pulse Width (ns): 3000		A. Thresholds: Nan_AThres			
Resolution (m): 0.13		☐ Front Panel Check			
Time (m:s): 00:30		Span Autosave			
Optimized For: Automatic DR/DZ					

Start Cloud View Setup About

IP 192.168.34.62 Remote/CLI 2024-07-30 08:40:34

OTDR Setup: Auto Mode

- **Network:** Type of network in which fiber is being tested. (Use the 'Pencil' icon  to select the Network configuration.)
 - **P2P** - Point-to-Point. Use to test non-PON fiber lines.
 - **PON /B (2 SPL)** - PON Balanced. Use to test ONT to OLT. Select up to three balanced splitters.
 - **PON/U** - PON Unbalanced (Advanced PON Test Mode). Use to test ONT to OLT. Tests up to eight unbalanced splitters and/or taps. A manual link definition is recommended.
 - **PON/T** - PON Taps. Use to test ONT to OLT. Tests up to 20 taps. A manual link definition is required.
 - **Splitter to ONT** - Use to test Splitter to ONT. This is similar to P2P, but measures Reflectance at End. If Re_{fl} is -30dB to -40dB, the ONT icon appears on the link map. If there is no Reflectance or Reflection is outside of the range, then the link map will show the End icon and add a message that NO ONT was detected.
 - **ONT to Splitter** - Use to test ONT to Splitter. This is similar to P2P, but the analysis stops at the Splitter. The Splitter icon will appear on the link map if scatter after the 1st splitter is detected; otherwise, the link map will show the End icon and add a message that no splitter was detected, which could indicate a cut or bend in the drop fiber. If needed, use the second larger pulse width so scatter after the splitter is detected, but only displays the short pulse width trace.
- **Distance range (km, m, miles, kilofeet, ft) [manual mode]:** maximum value of measured distances; the value of distance range should exceed the expected length of the fiber under test (20% more). The distance unit type can be set by clicking the **View Setup** button.
- **Pulse Width, ns [manual mode]:** the value of the optical pulse duration; the range of available optical pulse values depend on the selected distance range and is set by the OTDR software automatically (10 ns pulse ~ 1 meter). Short pulse widths provide better resolution and produce the best event and attenuation dead zones. Short pulse widths, however, inject less optical energy into the

Fiber-Under-Test (FUT), resulting in a noisier trace and lower dynamic range. Longer pulse widths provide the highest dynamic range and are used to test long fibers.

- **Resolution, m [manual mode]:** distance between two data points (sampling interval) of the trace; values depend on the selected distance range. Select smallest value to measure events spaced close together and use largest value to for longer ranges. Auto mode will determine best value for Fiber Under Test.
- **Time, min:sec [manual mode]:** determines the duration of measurement process with averaging. Use Live mode to perform monitoring of the fiber in Real Time. Longer averaging time improves the SNR and produces a "smoother" trace.
- **Optimized For [manual mode]:** test modes - Automatic DR/DZ, DR (maximize dynamic range), or DZ (best dead zone, sacrifice range).

Other Parameters

- **Fiber Model:** Select the type of fiber to be tested to auto populate Index of Refraction (IoR) and Backscatter co-efficient (BS) values. To modify values, click the pencil icon  to the left of the Fiber Model field to access the Fiber Models screen. Then, tap **Modify** to **Add**, **Rename**, or **Remove** values.



An incorrect Index of Refraction can affect measured length results. Incorrect Backscatter values can affect Reflectance and ORL results.

Load Fiber Model File

G.655 SM	G.657 SM	Other SM
G.650 SM	Multi-Mode	G.652 SM
		G.654 SM
AIWave_OFS		AIWave_ULL_OFS
AIWave_ZWP_Low_Loss_OFS		AIWave_ZWP_OFS
Enhanced_SM_BendBright_A1_Pr...		G.652_D_ATT
G.652_SM_Default		G.652_SM_TI
Radhard_SMF_Prysmian		SMF_28e_Corning
SMF_28e_Plus_Corning		SMF_28e_Plus_LL_Corning

OK Cancel

Fiber Models

λ (nm)	RI	BC
1310	1.4674	-77.0
1550	1.4679	-82.0
1625	1.4679	-82.0

Save Save As Cancel

OTDR Setup: Fiber Models



*These settings apply to the next measurement only. To edit RI and BC for a previously measured fiber trace, use the **Information** button on the **Traces** tab. Refer to "Measurements" on page 123 for details.*

- **RI (Refractive index, N):** Setting for each available wavelength (also known as group index) is used to convert time to distance. Setting proper value (1.2000-1.8000) determines accurate distance measurement.

Refractive index can be changed for any stored trace. Enter a custom value or select fiber type to populate corresponding values by selecting file(s) using the **Traces** tab.

- **BC (Backscattering coefficient, BC):** Represents level of backscattering in a particular fiber. It is used for Reflectance and ORL measurement and can be obtained from the fiber manufacturer. Backscattering coefficient can be changed for any stored trace.



Use the Refractive Index (IoR) and Backscatter coefficient as provided by the cable or fiber manufacturer.

- **Thresholds** - Refer to "Thresholds" on page 100 for details.
- **Front Panel Check:** Tests OTDR connection and displays warning indicating when the launch level is 1.5 dB lower than expected or if initial reflectance is too high (-35dB is default fail threshold). If needed, stop and clean connectors, or proceed with the bad connection.

For OTDR with built-in internal launch fiber, (G.657), the OTDR connector insertion loss will depend on the fiber type connected to the test set. Mismatched fibers can result in higher connection loss than expected connector loss. Use the **Span** button to enter fiber mismatch compensation or de-select **Include Event Loss**. Mismatch fibers should not impact Reflectance if the correct Fiber type is selected.

Reports Insertion Loss and Reflectance, and also advises if acceptable or not. When testing PON or xWDM MUX, use a launch fiber between the test set and Splitter or MUX or disable this feature.

When connected to a fiber with traffic (live), a warning is displayed. As long as the signal exceeds the threshold, the test will continue. IF the signal is removed, press OK to resume testing. Pressing Abort will permanently disable the test, requiring the need to close OTDR application and reboot the test set.

Span Settings

Tap the **Span** button to configure Span settings. After configuring the Span settings, click **OK**.

Use the **Span Settings** to offset the length of an external launch fiber or patchcord, which is connected to the fiber under test; otherwise, it becomes part of the fiber span and analysis. The launch fiber can be offset or compensated in any of the following ways:

- Entering the known distance manually.
- Entering the index # based on the event table.
- On the Event table, position the left marker at the event and tapping **Span start** in the right side menu. Refer to "[Events Tab](#)" on [page 135](#) for more information on setting span on the Event table.

Launch and Receive Cable Calibration	
Span Begin (Launch)	
☐ Length (km)	0.00000
☒ Index	1
☐ Include Event Loss	
☐ Compensated Loss (dB)	0.000
Span End (Receive)	
☐ Reverse Len. (km)	0.00000
☒ Reverse Index	1
☐ Include Event Loss	
OK Cancel Measure	

OTDR Setup: Span settings

- **Span Begin (Launch):** Enter Length or Index. Used to identify where a launch cable ends and test fiber begins. Defines the start of the Fiber Under Test. This appears as a green bracket with arrows pointing right on screen.

If **Event #1** is the end of the launch fiber, set the **Span Begin Index** to "1".

- **Span End (Receive):** Enter Reverse Length or Reverse Index. Defines the end of the Fiber Under Test. This will appear as a large green arrow pointing left on screen. If a launch fiber is used at the

far end of the test fiber, set the **Span End Index** to the **Event #** associated to the location where the far end launch fiber starts.

- **Include Event Loss:** Check to not include connector loss in Total Loss Summary.



If Event Loss is not checked, the link map will state that the event loss is not included.

- **Compensated Loss (dB):** For OTDR with built-in internal launch fiber, (G.657), the OTDR connector insertion loss will depend on the fiber type connected to the test set. Mismatched fibers can result in higher panel loss than expected connector loss. Use the **Span** button to enter fiber mismatch compensation. Mismatch fibers should not impact Reflectance.

The same procedure for offsetting Launch Fibers applies to offsetting Receiver fibers which are often used in Fiber to The Antenna (FTTA) applications.

To measure cable length:

1. Click the **Measure** button. The **Launch and Receive Fiber Measurement** screen is displayed.
2. Select which cable (**Launch only**, **Receive only**, or **Launch and Receive**) to measure. To measure both cables (Launch and Receive), connect the cables together, but this requires a connection to have -55dB reflectance. Then, click **OK**. The **Launch and Receive Cable Measurement** screen is displayed.

OTDR Setup: Auto Measure Cables

3. Tap **Measure** to begin. After the measurement is completed, the measured lengths will populate the fields automatically. To reject the values, click **Cancel**. To accept the values, click **OK**. The new measured length(s) populate the **Launch and Receive Cable Calibration** (Span settings) screen.



If the Launch and Receive option is selected and the cables are not connected, you will receive a "Can't find the $R \geq -55\text{dB}$ coupling event; try measuring each cable individually".

AutoSave Button

Use the **Autosave** option to configure options for saving results automatically with default information in the file-name. Refer to ["Autosave Parameters" on page 106](#) for details.

Cloud Button

Use the **Cloud** option to store test results and files to the cloud. Refer to ["Fiberizer Cloud" on page 162](#) for details.

After setting up the Cloud Parameters, test results can be pushed to the account on the Cloud. Refer to ["Results Tab" on page 147](#).

View Setup

Tap the **View Setup** button to access the **Display Settings** screen and set display options.

Display Settings	
Grid Division	Fixed ▼
Grid Color	Light ▼
☒ Trace Antialiasing	
☒ Show Fiber Sections	
Event Selection	Focus and Zoom ▼
☒ Auto Zoom Trace	
Distance Unit	Kilometers ▼
☐ Cleanup Trace Tab Before New Measurement	
☒ Real Time Button	
After Test Display View	Auto ▼
OK Cancel	

Display/Interface Settings

- **Grid Division:** Fixed (even integer) or Auto (variable values)
- **Grid Color:** Light (grey) or Dark (red)
- **Trace Antialiasing:** Check for thinner trace line.
- **Show Fiber Sections:** Check to display details such as length and loss (dB/kM) of fiber between events on the Event table.
- **Event Selection:** Select to focus or focus and zoom on an event.
- **Auto Zoom Trace:** Use this mode to auto zoom in to view Span Begin to End in the viewing window at the conclusion of the test.



*Disable this feature when using **Real Time** test mode.*

- **Distance Unit:** Select the distance unit type for fiber length (Kilometers, Meters, Kilofeet, Feet, or Miles).

- **Cleanup Trace List Before Measurement:** Select to delete OTDR traces saved in temporary buffer before beginning measurements to avoid buffer overflow. The OTDR can display up to ten traces simultaneously (i.e., an active trace and nine additional traces).
- **Real Time Button:** Select to show the **RT** button and take Real Time measurements. Real Time measurements are not available for EZ-OTDR (auto) measurements.
- **After Test Display View:** Select the tab to display after taking a measurement.

Thresholds



Microbends require two different wavelengths. When setting the thresholds, enter the loss difference between the two wavelengths. The trace will report when the loss exceeds the macrobend threshold and be displayed in the link map.

Select the **Thresholds** drop-down arrow and select factory default settings (Default) or the profile with threshold values that match test requirements. Choose **Custom** to create a new profile with custom settings. Events will be placed into the table only if the threshold is met/exceeded. Events that fail to meet the pass/-threshold will be flagged and highlighted as red in the event table.

Pass/Fail Thresholds

Events exceeding the Pass/Fail Thresholds are highlighted in Red in the Event table. Different Pass/Fail Thresholds values can be set for each test wavelength.

Event Loss (splice, connectors, mux) and Reflectance threshold settings determine if a detected anomaly should be reported and included in the event table including its event type (reflective or non-reflective).

Pass/Fail Thresholds					
	850	1300	1310	1330	
☒ Spl. Loss (dB)	0.100	0.100	0.100	0.100	0
☒ Conn. Loss (dB)	0.750	0.750	0.500	0.500	0
☒ Refl (dB)	-35.0	-35.0	-45.0	-45.0	-
☐ Att (dB/km)	2.300	0.600	0.500	0.500	0
☐ Tot. Loss (dB)	6.500	4.500	8.500	8.500	8
☐ Tot. ORL (dB)	28.0	28.0	28.0	28.0	2
☐ Fib. Length (km)	2.00000	5.00000	21.00000	21.00000	2

Save Save As Cancel Modify...

OTDR Setup: Pass/Fail Thresholds

Each column heading displays the wavelength to which the Pass/Fail Thresholds apply.

- **Splice loss (dB)** - Non-Reflective Event Loss. The range for this parameter is 0.001 dB to 9.99 dB in 0.001dB increments. For mated APC connectors, if there is no reflection, the loss reports as Splice.

- **Connector Loss (dB)** - Reflective Event Loss (connectors and mechanical splices). The range for this parameter is 0.001 dB to 9.99 dB in 0.001 dB increments.
- **Reflectance (dB)** - Events in the Event table exceeding the set Reflectance value. The range for this parameter is -50.0 dB to -10.0 dB in 0.1 dB increments.
- **Attenuation (dB/km)** - Average Fiber Section Loss in dB/km that exceeds the set value.
- **Total Loss (dB)** - Total fiber loss in dB for Fiber-Under-Test (FUT) that exceeds the set value.
- **Total ORL (dB)** - Total Optical Return Loss in dB for Fiber-Under-Test (FUT) that exceeds the set value.
- **Fiber Length (km, miles)** - Total fiber length that exceeds set value.

To modify values, select the P/F threshold from the drop-down list. Then, tap **Save As** and enter a new name for the thresholds profile.

ONT Thresholds

ONT Thresholds define the reflectance threshold value for the ONT side. The default ONT Thresholds are locked from editing.

ONT Thresholds	
ONT Min. Refl. (dB)	-40.000
ONT Max. Refl. (dB)	-25.000
Save Save As Cancel	

ONT Thresholds

To define new ONT Thresholds:

1. Tap the pencil icon  to the left of the **ONT Thresholds** field showing **Default** in the drop-down.
2. Tap **Save As** and enter a new custom name.
3. Then, select the new custom thresholds from the drop-down and tap pencil icon  to the left of the **ONT Thresholds** field to access the **ONT Thresholds** screen.
4. Tap the field to assign new values for the thresholds and tap **Save**.

Splitter Thresholds

Splitter Thresholds define the splitter loss values to be applied when building the link map.

Click the pencil icon  to the left of the **S. Thresholds** field to access the **Splitter Thresholds** screen and enter custom threshold settings.

Balanced Splitter Thresholds					
	Min (dB)	Max (dB)		Min (dB)	Max (dB)
1x2	3.000	4.500	2x2	3.000	4.800
1x4	6.000	8.100	2x4	6.000	8.400
1x8	9.000	11.700	2x8	9.000	12.000
1x16	12.000	15.300	2x16	12.000	15.600
1x32	15.300	18.300	2x32	15.600	18.600
1x64	18.300	19.500	2x64	18.600	19.800
1x128	21.300	24.500	2x128	21.600	24.800

Splitter Thresholds

Tap Splitter Thresholds

The T. Thresholds field define loss values at the tap. Select the pencil icon  to the left of the **T. Thresholds** field to access the **Tap Splitter Thresholds** screen and enter custom threshold loss values. The **Term Tap** field appears to balance remainder.

Tap / Unbalanced Splitter Thresholds

1	2	4	8		
Ratio	Thru (dB)	Tap (dB)	Ratio	Thru (dB)	Tap (dB)
99/1	0.250	23.250	80/20	1.700	9.100
98/2	0.320	21.150	75/25	1.900	7.600
97/3	0.400	18.050	70/30	2.250	6.650
95/5	0.550	15.900	65/35	2.600	5.700
93/7	0.700	13.800	60/40	3.100	5.000
90/10	1.000	12.300	55/45	3.600	4.400
85/15	1.250	10.700	50/50	4.000	4.000

Save

Save As

Cancel

Tap Splitter Thresholds

Analysis Thresholds

Tap the pencil icon  to the left of the **A. Thresholds** field to access the **AnalysisThresholds** screen and enter custom threshold settings.

The Fiber End default value is 5dB.

Analysis Thresholds	
Splice Loss (dB)	0.100
Reflectance (dB)	-65.0
Fiber End (dB)	5.000
Macrobend (dB)	0.500

Save Save As Cancel

Analysis Thresholds

Events that exceed the Analysis Threshold settings are reported in the Event table. These parameters include:

- **Splice Loss (dB)** - The setting range for this parameter is 0.01 dB to 9.99 dB in 0.01 dB increments. The default value is 0.020dB.
- **Reflectance (dB)** - Defines the lowest Reflectance value that will be reported by the analysis. The setting range for this parameter is -70.0 dB to -20.0 dB in 0.1 dB increments. The default value is -65.0dB.
- **Fiber End (dB)** - Defines the value which will be reported in the Events analysis. The setting range for this parameter is 1 dB to 99 dB in 1 dB increments. The default value is set to 20dB but for non-

PON spans, a 3dB value is recommended.

- **Macrobend (dB)** - Defines the detection value with a default value 0.200dB.



A non-reflective event will be reported as a macrobend if its loss at a longer wavelength exceeds its loss at a shorter wavelength. Macrobend detection requires at least two singlemode wavelengths being tested - 1310 nm and another either at 1550 nm or 1625 nm. The range for this parameter is 0.3 dB to 2 dB in 0.1 dB increments. The default value is 0.2dB.

Autosave Parameters

Use Autosave to save results automatically with default information in the filename. On the **Setup** screen, press **Autosave** to open the Autosave Parameters window.

Autosave Parameters		
Fiber	Common	Report
☒ Auto Save	☒ Ask Before Save	
Increment	Trace ID ▼	
Job ID	Job	
Cable ID	Cable	
Fiber ID	Fiber	
☒ Add Index		☐ Add Date/Time
Trace ID	Trace	
☒ Add Index	009	☐ Add Date/Time
☒ Wavelength	☒ Pulse Width	☐ S/N
OK Fiber Index... Trace Index... Cancel		

OTDR Setup: Autosave Parameters - Fiber

Auto Save: To enable/disable autosave. Disabled, Enabled, Enabled+Report or Enabled+V-Scout Report. (Choose the Report options to be able to export results to PDF.)

Ask Before Save: Check this to be prompted to save after measurement is completed.

The following information can be pre-set to create a name and increment fiber or trace number automatically. The filename will begin with the Index value, Trace ID, Wavelength, Pulse Width, and S/N, if checked.

- **Increment:** Choose to increment Fiber ID or Trace ID (recommended).
- **Job ID:** Select the field to enter a default value that will be included in the filename.
- **Cable ID:** Select the field to enter a default value that will be included in the filename.
- **Fiber ID** - Select **Add Index** to auto-increment or select **Add Date/Time**. The filename will include details entered in this field automatically. The fiber count can be incremented in Trace ID or Fiber ID.

- **Add Index (Fiber):** Test counter. When saving test results, count auto increments and is added to filename. To change the value, click **Fiber Index** and select **Force** to enter a specific value or **Reset** to reset the counter.
- **Trace ID:** Select **Add Index** to auto-increment or select **Add Date/Time**. The filename will include details entered in this field automatically. The fiber count can be incremented in Trace ID or Fiber ID.
- **Add Index (Trace):** Test counter. When saving test results, count auto increments and is added to filename. To change the value, click Fiber Index and select Force to enter a specific value or Reset to reset the counter.
- **Wavelength:** Includes test wavelength used for each trace.
- **Pulse Width:** Includes pulse width used for test.
- **S/N:** Includes test unit serial number.

Autosave Parameters				
Fiber		Common		Report
Node ID				
Account				
Orig. Location	end	Term. Location	origin	
Comments				
Tech ID				
Tech Name				
☒	GPS	GPS receiver disabled...		
OK Fiber Index... Trace Index... Cancel				

OTDR Setup: Autosave Parameters - Common

The following information can be pre-set and automatically saved in the file.

- **Node ID:** Node ID
- **Account:** Account number

- **Orig. Location:** (Originating location) where fiber starts
- **Term. Location:** (Terminating location) where fiber ends
- **Comments:** Add information about the fiber ends, comment about the result, status or any other meaningful information about connector, application, or case. This information will be included in the report.
- **Tech ID:** Operator ID (automatically populated when synchronized with R-Server)
- **Tech Name:** Operator name (automatically populated when synchronized with [VeSion® R-Server](#))

The screenshot shows a dialog box titled "Autosave Parameters" with a green header bar. Below the header is a tabbed interface with three tabs: "Fiber" (grey), "Common" (grey), and "Report" (blue). The "Report" tab is selected. Inside the "Report" tab, there are two rows of settings, each with a checkbox and a label:

- ☒ **Generate PDF Report**
- ☒ **Save Current Trace View**

 Below these settings is a large empty white rectangular area. At the bottom of the dialog, there are four buttons: "OK" (green), "Fiber Index..." (orange), "Trace Index..." (orange), and "Cancel" (red).

OTDR Setup: Autosave Parameters - Report

- **Generate PDF Report:** Check to generating a results report in PDF automatically. The PDF report can be exported from the File Management option. Refer to "[Working with Saved Results, Profiles, Images](#)" on page 178 for details.
- **Save Current Trace View:** Saves the current trace to the PDF report

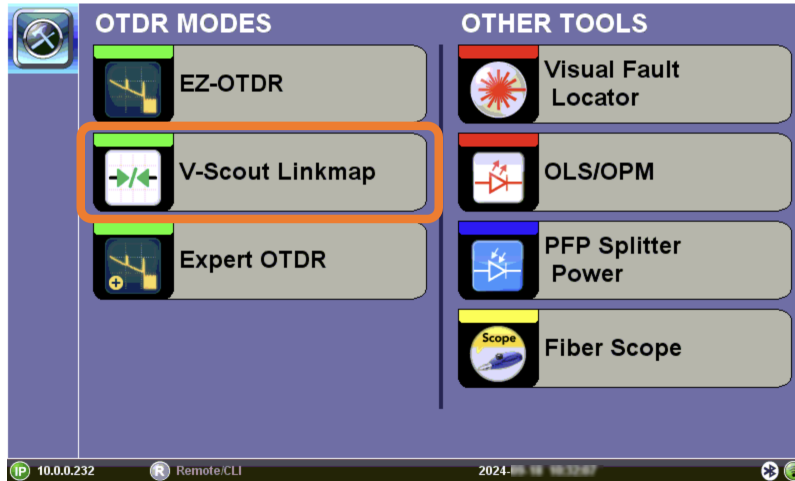
View Autosaved Results

To view or export a saved result, select the **Results** tab. Refer to ["Measurements" on page 123](#).

Alternatively, files can be accessed by selecting the **Results & Files** tab on the platform **Home** menu. Refer to ["Working with Saved Results, Profiles, Images" on page 178](#).

V-Scout

V-Scout™ is an innovative OTDR trace optimization feature that utilizes various pulse widths during testing to deliver highly accurate results and enhance event identification. It presents events in the form of intuitive icons accompanied by essential data. Along with the [link map visualization](#), the intuitive interface significantly reduces the risk of misinterpretation when reading test results. The V-Scout test mode is an add-on (paid) license for any of the OTDR models, with the exception of VeEX PON-optimized OTDRs which include V-Scout test mode at no extra cost.



In addition to the default factory test profiles, V-Scout test plans can be created to further optimize the V-Scout automated testing feature. Unique profiles can be created for specific test environments, depending on network type or application (e.g. PON, Access Fiber, FTTA test plans). These auto test profiles evaluate separate test acquisitions comprising of multiple wavelengths to detect anomalies. Traces are analyzed, compared, and merged into a single symbolic link map. Multiple OTDR trace files (.sor) are saved in a single file folder for simplified archiving and easy future analysis. The custom profiles can be distributed by email or R-server to OTDR users.

Selecting the V-Scout profile will apply the test plan using that profile for every fiber test automatically. When the V-Scout Mode is selected as a Test Parameter, wavelength options are greyed out. Specify wavelengths on the **V-Scout Profiles** screen (shown below). The wavelengths you assign to the profile are selected for the Test Parameters for the V-Scout Profile automatically; however, Pulse Widths (PW) must be selected AND enabled on the profile screen.

V-Scout Profiles	
V-Scout Profile	PON_1x4_1x16
Wavelengths	Test Parameters
OTDR:	☒ 1310 ☐ 1550
AUX:	☐ 1625
Save Save As Cancel	

V-Scout Profiles

Using V-Scout Mode

V-Scout mode can be accessed by selecting **V-Scout** in the **Mode** drop-down of the **Setup** screen.

To setup or modify V-Scout custom profiles:

1. After selecting V-Scout mode, on the **Setup** screen, tap the **V-Scout Profile** drop-down to see the **Load Profile File** screen.

Load Profile File	
New_Auto_P2P	Auto_ONT_Splitter
Auto_P2P	Auto_PON_B
Auto_PON_U	Auto_Splitter_ONT
P2P_Long	P2P_Medium
P2P_Short	P2P_X_Long
P2P_X_Short	P2P_XX_Short
PON_1x32	PON_1x4_1x16
PON_1x8_1x8	PON_U_Claro
OK Cancel	

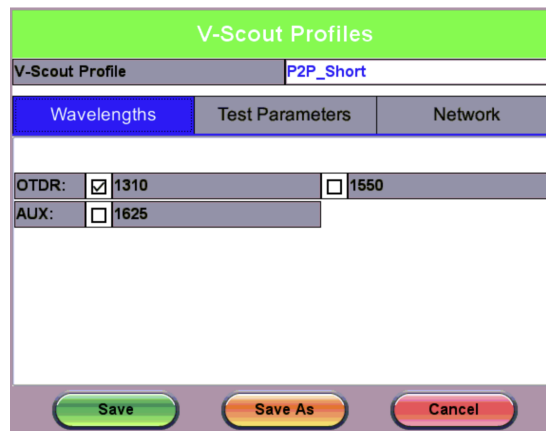
Load [V-Scout] Profile File

2. Select a profile to modify and/or base the new custom profile, and tap **OK**.



Selecting an Auto profile will use single pulse/wavelength only.

3. On the **Setup** screen, tap the pencil icon  next to **V-Scout Profile**. The **V-Scout Profiles** screen for the selected profile shows configured settings.



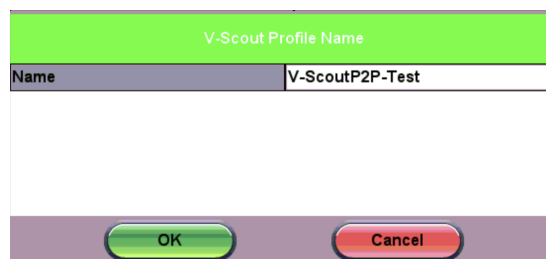
The screenshot shows the 'V-Scout Profiles' screen. At the top is a green header with the text 'V-Scout Profiles'. Below it is a white bar with 'V-Scout Profile' on the left and 'P2P_Short' on the right. Underneath are three tabs: 'Wavelengths' (highlighted in blue), 'Test Parameters', and 'Network'. The 'Wavelengths' tab contains two rows: 'OTDR:' with a checked checkbox and '1310' next to it, and 'AUX:' with an unchecked checkbox and '1625' next to it. To the right of these is a checkbox and '1550'. At the bottom are three buttons: 'Save' (green), 'Save As' (orange), and 'Cancel' (red).

V-Scout Profiles screen for the selected profile

4. To modify the existing profile, adjust the wavelength and/or pulse width and tap **Save**.

--OR--

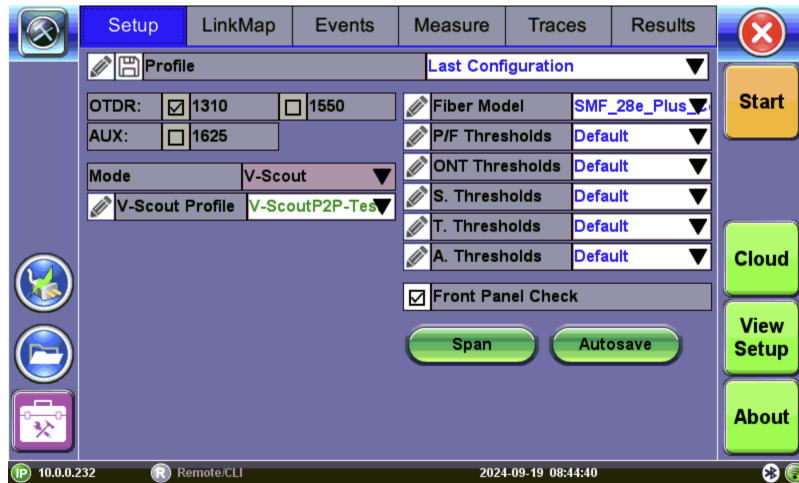
To create a new profile, tap **Save As**. Enter a new profile name and tap **OK**.



The screenshot shows the 'V-Scout Profile Name' screen. It has a green header with the text 'V-Scout Profile Name'. Below it is a white bar with 'Name' on the left and 'V-ScoutP2P-Test' on the right. At the bottom are two buttons: 'OK' (green) and 'Cancel' (red).

V-Scout Profile Name

The newly created V-Scout profile now appears on the Setup screen as the selected profile.



OTDR Setup Screen: V-Scout Profiles mode

5. On the **Setup** screen, tap the pencil icon  next to the newly created profile.
6. Configure the new V-Scout profile using the information below, then tap **Save** to accept the changes or **Cancel** to not accept the selections.

V-Scout Profiles									
V-Scout Profile					V-ScoutP2P-Test				
Wavelengths			Test Parameters			Network			
Distance (km)					2.0				
*3 ns	5	10	*25	100	*200	300			
500	1000	3000	10000	20000					
Enable And Use Next Parameters:					☒				
Resolution (m)					0.03				
Time (m:s)					00:15				
Optimized For					DZ				
Save					Save As				
Cancel									

Settings for newly created V-Scout profile

- **Wavelengths:** OTDR - 1310 or 1550; AUX: - 850, 1300, or 1625
- **Test Parameters**
 - **Distance:** Select the length and pulse. Select a test range value 25-30% longer than actual length of test fiber. Select 1-10 pulsewidths that you wish to use to build V-Scout link map. An

asterisk will mark any Pulse Width that you have already selected for use in your new test plan.

- **Pulse Width:** Select pulse width for test.

Pulse Widths (PWs) must be selected and enabled for both custom and default profiles. A profile allows up to 10 PW per wavelength.

- **Enable And Use Next Parameters:** Check this to enable this profile and use test parameters set on this screen.
- **Resolution:** Auto, high value, or low value, depending on distance range
- **Time (m:s):** Select the time to use in each test. (The more pulsewidths, the longer the total test time will be).



For record keeping, using short test times is not recommended. Bellcore recommends up to 3 minutes per test.

- **Optimized For:** DR, DZ, or Automatic DR/DZ
- **Network**
 - **PON Type:** P2P (Point-to-Point)- Not a PON, PON/B (Balanced), PON/U (Unbalanced), Splitter to ONT, ONT to Splitter.

Refer to "[Thresholds](#)" on page 100 for more information about the following network fields:

- **Splitter Type Detection (if PON/B selected):** Auto or Manual
- **Number of Splitters (if PON/B selected):** 0, 1, 2, or 3
- **Number of Taps (if PON/U selected):** up to eight taps
- **Taps and Drops (if PON/U selected)**

7. Tap **Save** to accept the changes or **Cancel** to not accept the selections.

To set up and use the automated V-Scout mode:

1. Select the **Autosave** parameters in the **Setup** tab. Refer to "[Autosave Parameters](#)" on page 106 for details.
2. Tap the **Start** button. Elapsed time and acquisition wavelength are indicated below the **Stop** button.
3. When the test is complete, the **Stop** button will revert back to a **Start** button. If needed, tap **Stop** to terminate the measurement manually.
4. If Autosave is enabled with **Ask Before Save** checked in the **Autosave Parameters** screen, a **Result AutoSaving** window appears asking if the results should/how be saved. If **Ask Before Save** was not checked, results will be saved automatically using the parameters previously set for AutoSave.
5. After saving results, a screen with a QR code appears. To view the test report via mobile device, scan the QR code with the mobile device's camera. Otherwise, tap **OK**. Refer to "[OTDR Test Reports](#)" on page 157 for details on viewing test reports.
6. When the V-Scout test plan is complete and OTDR traces performed, view the V-Scout link map on the [Link map tab](#).

MPO Fiber Testing

Increasing bandwidth requirements for enterprise data centers have resulted in Multi-Fiber Push-On (MPO) cabling because they are pre-terminated and compact. These cables can handle up to 100 Gbps.

Testing the performance of MPO fiber can be time consuming and error prone. The OX-MPO-12 optical switch is designed to make MPO testing easier, faster, and more accurate.

OX-MPO-12 Optical Switch Overview

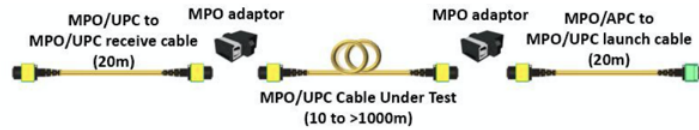
The OX-MPO-12 optical switch is an ultra-compact, 12 fiber optical switch designed to operate with VeEX OTDRs via USB interface. It is optimized for high-density fiber test applications where MPO/MTP or ribbon cables need to be tested using an OTDR equipped with a single fiber output. It is powered by the test unit's serial interface.



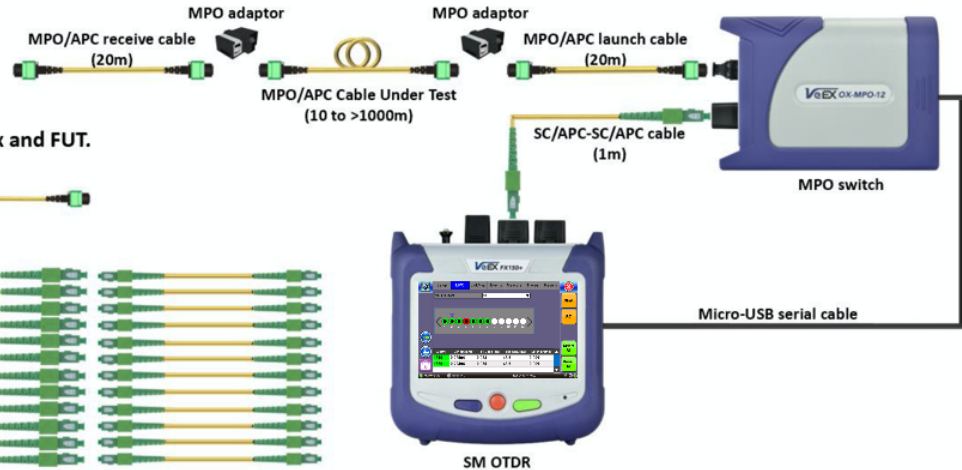
OX-MO-12 connected to FX150 test unit

OX-MPO-12 Connections/Ports

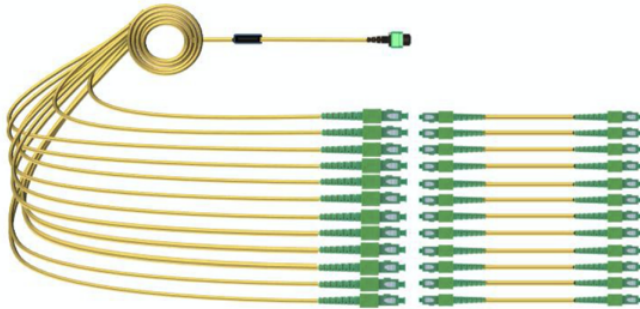
a.) MPO/APC to MPO UPC (hybrid) with MPO UPC on remaining ends.



b.) MPO/APC ends for FUT, launch, receive ends.



c.) MPO/APC to simplex fanout 2x and FUT.



OX-MPO-12: Example of Connections



The MPO switch is detected automatically when powered on. However, the switch can be connected at any time; close and re-open the OTDR application and begin MPO testing.

To connect OTDR to Optical Switch:

1. Use the **Micro-USB (B) to Micro-USB (B)** cable to connect the **switch interface** to the **OTDR** port.
2. Close and reopen the OTDR application to detect the switch.
3. Attach one end of the **1 m SC-APC to SC-APC** simplex patch cord from the **OTDR** port to the **SC-APC** port of the switch.
4. Attach Launch and Receive patchcord cables to the **output** port of the **OX-MPO-12** switch.



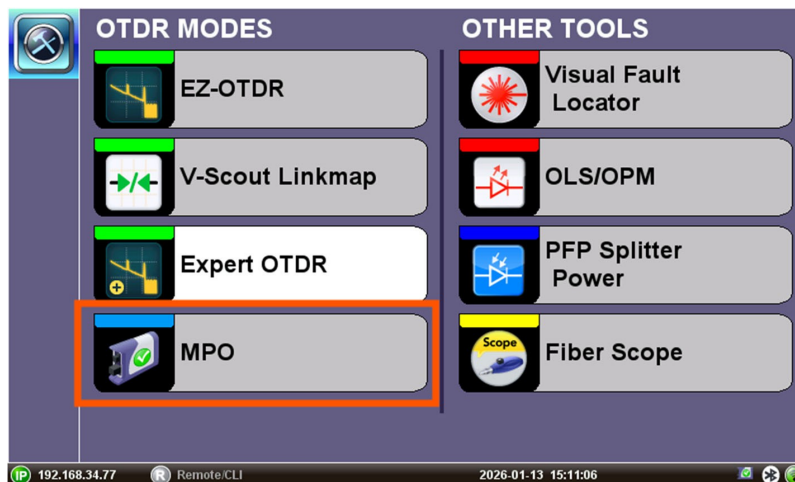
Test Kit Cases to use with the MPO switch are available for purchase from VeEX Inc..

- MPO/APC to MPO/UPC hybrid cable to test MPO/UPC FUT (Fiber under test) and receive cable.
- MPO/APC on both ends (MPO/APC FUT).
- MPO/APC to simplex cable fanout 2x (SC-APC, SC-UPC, FC-APC, FC-UPC, LC-APC, LC-UPC...) to test simplex FUT cable.

Contact [VeEX Customer Care](#) for more information.

Using the MPO Switch

Select the **MPO** option to test one or all fibers in the ribbon cable in sequential order (minimum 1 up to 12 fibers depending on the strand count in the ribbon).



Expert OTDR option

Testing all MPO Fibers



The **MPO** tab appears **ONLY** if the MPO switch is connected to the OTDR's microUSB port and recognized as being connected.

In the **Setup** menu, select **MPO Auto** from the **Mode** drop-down list. Then, tap **Start** and the **Measure** tab screen appears. The measurement will begin according to the test parameters entered in the **Setup** menu. Refer to "[Setup Screen](#)" on page 87 and "[Measurements](#)" on page 123.



MPO Auto Setup

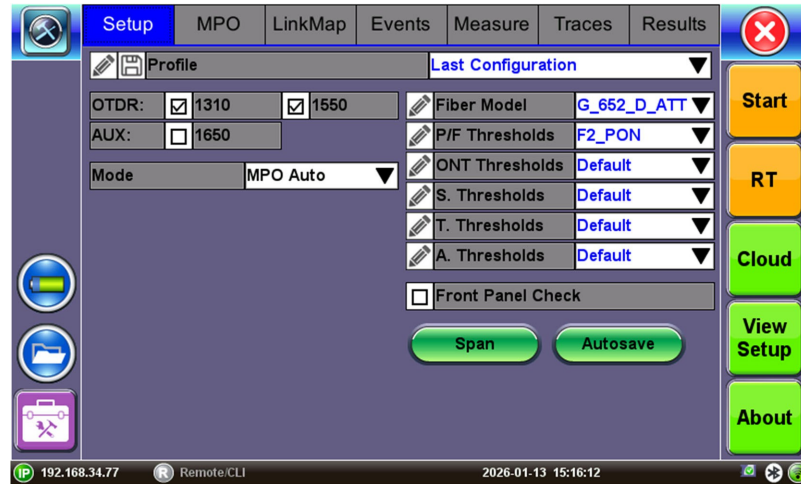
After the ports are selected and a new MPO test is initiated, each strand will be tested sequentially and displayed one at a time in the **Measure** tab. Refer to "[Measure Tab](#)" on page 125.

At the conclusion of the MPO test or at any time during testing, go to the **Traces** tab and select each strand to overlay all tests simultaneously. However, each test will clear the display and only show the current test. Refer to "[Traces Tab](#)" on page 143.

Testing Individual MPO Fibers

To test individual MPO fibers:

1. On the Fiber Main Menu, select **MPO**.
2. Select the wavelengths to test (1310 and/or 1550 nm).



MPO Setup



It is recommended that you indicate the MPO fiber under test in the Autosave options (e.g., the Cable ID).

Autosave Parameters

Fiber	Common	Report
☒ Auto Save	☒ Ask Before Save	
Increment	Trace ID ▼	
Job ID	PMtest6	
Cable ID	4MPOof12tested	
Fiber ID	F3765	
☒ Add Index 003	☐ Add Date/Time	
Trace ID	Trace	
☒ Add Index 009	☐ Add Date/Time	
☒ Wavelength	☒ Pulse Width	☐ S/N

OK
Fiber Index...
Trace Index...
Cancel

MPO Autosave Parameters

3. In the **MPO** tab, tap the **No. of Fibers** drop-down arrow and select the MPO connector fiber count, **8** or **12**. Each fiber strand is represented by a circle. A black inner circle indicates an active fiber strand and a gray inner circle means inactive.
4. Move the blue arrow above the circles left or right and tap to enable testing for this MPO group.

λ (nm)	Length (km)	Tot. Loss (dB)	Tot. ORL (dB)	Latency (ms)
1310	0.22504	0.083	43.6	0.001
1550	0.22494	0.055	48.6	0.001

MPO tab

5. Tap **Start MPO** to begin the test. An error message will appear if NO fiber was selected. When the strand test finishes, the outer circle changes to green (PASS) or red (FAIL), depending on the Pass/Fail thresholds previously set, and moves to the next strand until all selected strands are tested.
6. To view all MPO strands, select the **Traces** tab and then select all fibers under the MPO group to overlay results for the ribbon. Refer to ["Traces Tab" on page 143](#).
7. Select the **Results** tab to save results and compile reports. Refer to ["Results Tab" on page 147](#).

Measurements

When a new measurement is started, only those traces will be displayed on the screen in the **Measure** tab (refer to "[Measure Tab](#)" on page 125). Any previous traces can be accessed via the **Traces** tab until the unit is switched off. Refer to "[Traces Tab](#)" on page 143.

Upon completion, the view will initially default to the selected test mode viewing screen (V-Scout, Event (Auto), or Measure (Manual)).

Use the  **Exit** icon to return to the Fiber Main Menu.

Run a Trace

1. Select the **Autosave** parameters in the **Setup** tab. Refer to "[Autosave Parameters](#)" on page 106 for details.



2. Tap the **Start** button and the [Measure tab](#) screen appears. The measurement will begin according to the test parameters entered in the **Setup** menu. (See "[Setup Screen](#)" on page 87.)



Elapsed time is indicated below the **Stop** button. For V-Scout measurements, the acquisition wavelength is also displayed. Refer to "[V-Scout](#)" on page 110.



*If multiple wavelengths are selected in the **Setup** menu, the measurement will be performed using all selected wavelengths one after another without stopping and will be overlaid on the screen for comparison and review. V-Scout multi-pulse traces are also overlaid and displayed automatically.*

3. When the test is complete, the **Stop** button will revert back to a **Start** button. If needed, tap **Stop** to terminate the measurement manually.
4. If Autosave is enabled with **Ask Before Save** checked in the **Autosave Parameters** screen, a **Result AutoSaving** window appears asking if the results should be saved. If **Ask Before Save** was not checked, results will be saved automatically using the filename parameters previously set for AutoSave.

Result Autosaving		
Fiber	Common	Report
Job ID	Job	
Cable ID	Cable	
Fiber ID	Fiber	
Trace ID	015-Trace	
WL	1310	
TP	400	
L	2.28060	
Save Cancel Manually		

Autosave Results screen

5. Tap **OK** to autosave with the default settings. Tap **Abort** to exit the screen.
6. When the test plan is complete and OTDR traces performed, view the link map on the [Link map tab](#).

Trace Analysis

The system analyzes traces automatically, according to the thresholds selected in the alarm profile. OTDR measurement results can be represented in traditional trace and event table, or shown as an event diagram.

A link map is an intuitive link and events representation feature. It identifies events and produces automatic and simplified OTDR analysis in a block diagram.



The combination of V-Scout testing and the link map diagram view of results is especially useful for technicians because it simplifies and accelerates OTDR testing. Refer to "V-Scout" on page 110 and "Link map" on page 140.

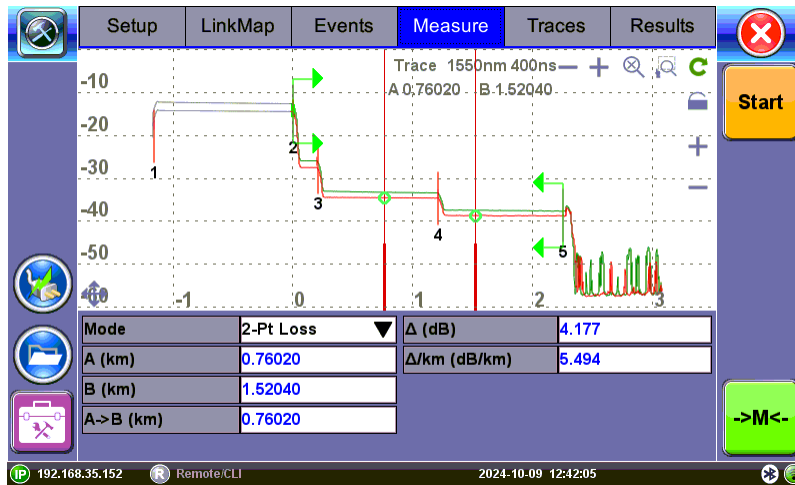
The cleanest trace is usually a combination of long averaging time, large pulse width, and a low resolution. Using the auto mode setting in the system provides the best possible balance of these parameters when measuring the FUT.

After finishing the analysis, generate a report and/or save the trace .SOR file.

Measure Tab

When a new measurement is started, only those traces will be displayed on the screen in the **Measure** tab. Any previous traces can be accessed via the **Traces** tab until the unit is switched off. Refer to "[Traces Tab](#)" on [page 143](#).

There are several methods available to manually measure fiber characteristics. Prior to performing manual measurements, it is important to become familiar with the Markers and Zooming capabilities of the unit.



Measure tab

Marker Controls

Markers are provided to measure distances accurately. Depending on the measurement mode and viewing window, one or more markers are available for use. The Markers can be moved using the touchscreen.

The Markers display the following:

- Distance from the start of the trace to Marker "A"
- Distance from the start of the trace to Marker "B"
- Distance between Marker "A" and Marker "B"



As you move the Markers, the distance information updates automatically.

The active Marker is depicted by two small arrows pointing inwards at the base of the Marker.

The Marker is divided into a thick (bottom) and thin (top) line. To move Marker A or Marker B individually, select and drag the Marker on the thin portion of the marker. To move both Markers together, select and drag any Marker on the thick portion of the line.



If the Markers appear off screen, use the **Markers** button on the right side bar to display the Markers on screen.

If a marker is moved too close to another, both will move together to ensure minimal distance between them.

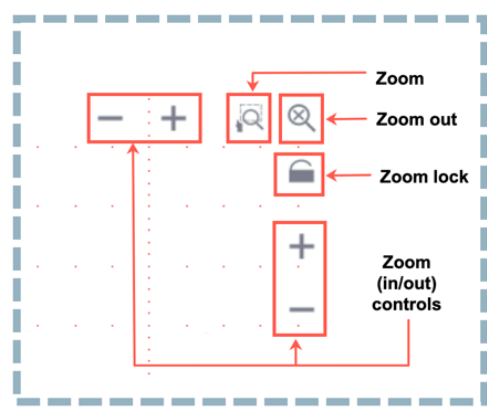
The markers can be moved separately or in tandem (or 5 markers simultaneously in the LSA attenuation measuring mode).

At the top of the screen next to the markers, the position of the marker with respect to the beginning of the optical fiber is indicated in kilometers, miles or feet.

The parameters of the trace corresponding to the markers' position and measurement mode will be displayed at the bottom of the screen.

Zoom/Scroll Controls

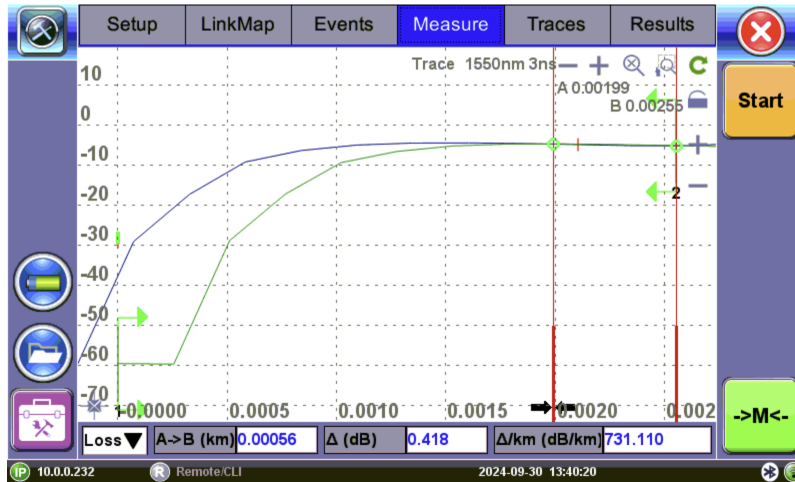
Zooming operations are possible in both Events and Measure mode.



Zoom Operations

- **Zoom/Scroll icon** - Toggle between and enables Zoom/Scroll mode.
 - **Zoom mode** - Magnifying glass icon appears on screen. Draw a rectangular box over the trace with the stylus to create a zoom area. Visible part of the trace in Preview window is marked with dotted rectangle.
 - **Scroll mode** – Trace can only be scrolled after zooming. After the Hand icon appears on screen, the trace can be dragged in any direction. **The mode resets to Zoom immediately after one scroll operation has been completed.**
- **Zoom Out** - Resets display area.
- **Zoom Lock** - Locks horizontal and vertical controls so zoom aspect is kept uniform.

Distance Measurements



Distance measurement -measure expanded trace view

Tap  in the lower left corner of the graph to display an expanded view. When a trace is displayed as shown above, the fiber length is automatically measured from the start of the trace (or Span Begin) to each of the two markers and in between the markers. Proper marker placement is critical for accurate measurements. To position the marker/s accurately, expand the trace horizontally and vertically (using the Zoom Controls) and position the marker on event's left edge (first rising or falling pixel).

The distance (km, miles or feet) will be indicated next to the top of the marker.



The distance accuracy depends on the correctness of optical fiber refraction index value setting.

Loss Measurements

Loss Modes - Several Loss modes are available for manual measurements depending on measurement application:

- 2-Pt Loss
- 2-Pt LSA

Two Point Loss measurement

- Reflectance
- ORL (Optical Return Loss)
- Splice Loss

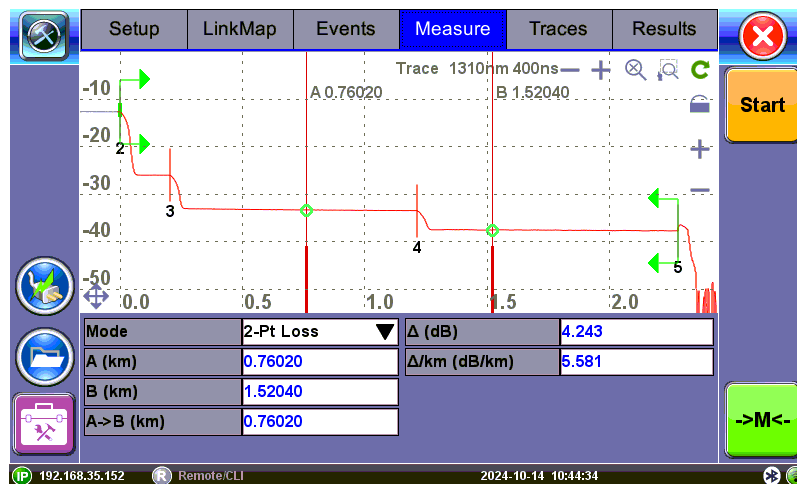


Good Measurement Tips

- Use a longer section of fiber to use as a baseline and measure against.
- When measuring using the 2-Pt Loss mode, stay away from splices and connectors to prevent reflective noise from the instrument. If measuring splices, use 2-Pt LSA calculation to mitigate noise, especially at fiber ends.

Two Point Loss (2-Pt Loss)

The 2-Point Loss mode is the default view. It uses a data point at Marker A and Marker B to calculate the dB level difference between the two points. Usually the backscatter level value of Marker A is greater than the level of Marker B and a positive loss measurement is displayed. If the loss value is reported as a negative quantity, it is termed a "gainer".



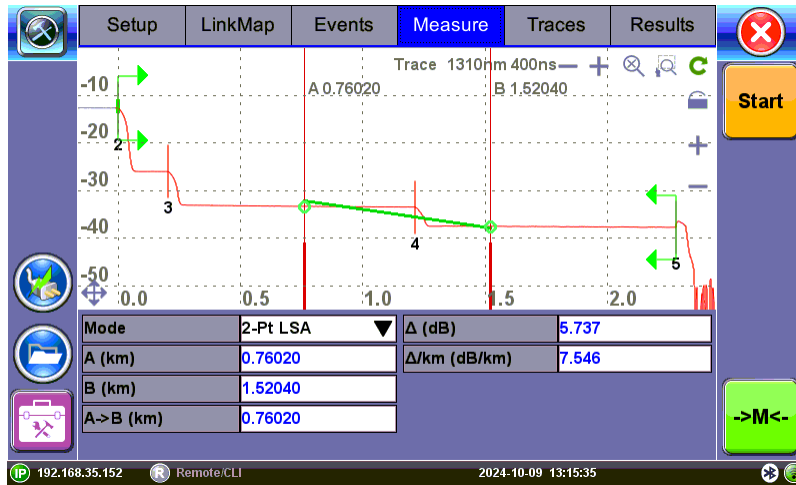
2-Pt Loss measurement

The data at the bottom of the screen displays:

- Distance between markers A-B
- Loss between markers A-B in dB
- Attenuation between markers A-B

Two Point LSA (2-Pt LSA)

To increase the accuracy of a loss or attenuation measurement, a section of the trace preceding and following the marker A and marker B can be approximated by a straight line. In this mode, a Least Squares Approximation technique is used to determine the best intercept values based on the marker positions. The length of these LSA sections is user selectable.



Splice Loss using 2-Point LSA method

Select LSA from drop-down list. An approximation line will appear on the screen between markers. The data box at the bottom displays:

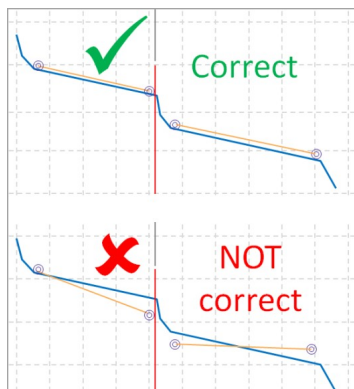
- Distance between marker A and B (km, miles, feet)
- Level difference in dB
- Attenuation based loss/distance



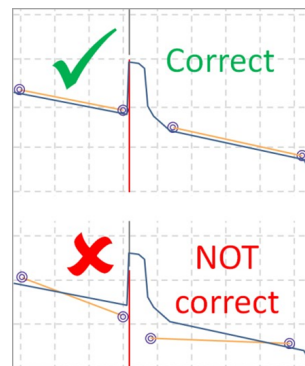
When using **Realtime** test mode, use the 2-Point LSA method to stabilize loss values.

Splice Loss Measurement (5-Marker technique)

To measure the loss of a splice or a connector, the 5-marker technique is recommended. The system calculates loss by looking at the fiber traces on each side of the event, instead of using fiber length as a factor. It uses the advanced Least Square Approximation (LSA) as a default, to mitigate noise. To use LSA, set markers at each end of the fiber segment, one marker on the peak, and two markers near the event.

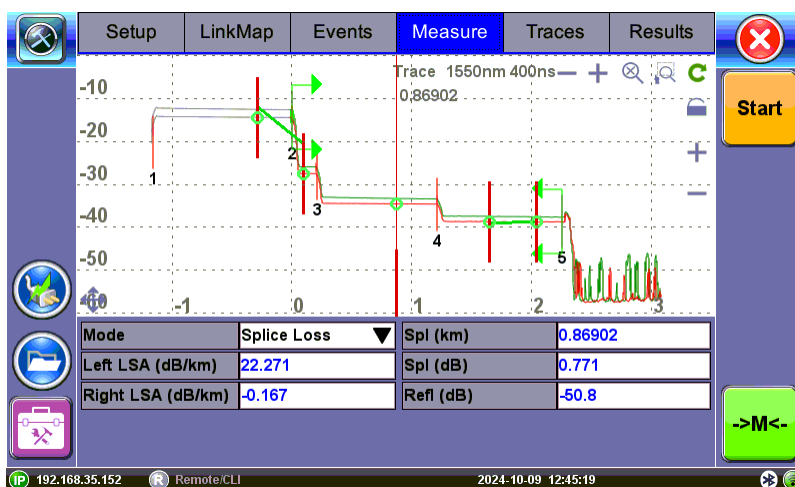


5-marker technique (simplified view)



Marker placement for a connector (simplified view)

To manually apply the markers, select the longest straight sections and approximate the fiber under test as closely as possible. Avoid sections where the trace is rounded. Keep the lines strictly on the backscatter, even if it is noisy. The central marker must be placed at the very beginning of the event (see the example below).



Splice Loss using 5-Point LSA method

To view the Splice Loss:

1. Select trace for measurement (if multiple traces are displayed on screen). The trace to be measured can be selected using the green arrow in the trace overview window.
2. Select **Splice Loss** from drop-down list.
3. Expand or zoom the trace horizontally and vertically (using [Zoom Controls](#)) and position event in the middle of the screen using the scroll function. Always ensure that a part of the trace is visible on either side of the event so you can place markers properly.
4. Position center marker on the event's rising or falling edge. You can use the rubber keypad to place the marker exactly, if needed.
5. Position the first two LSA interval indicators on a linear section of backscatter preceding the event and position the last two LSA indicators after the event, ensuring that only pre/post backscatter is used to make the measurement. The entire event including transition should not be included in either LSA intervals.



All four LSA interval indicators can be positioned independently in relation to the center Marker.

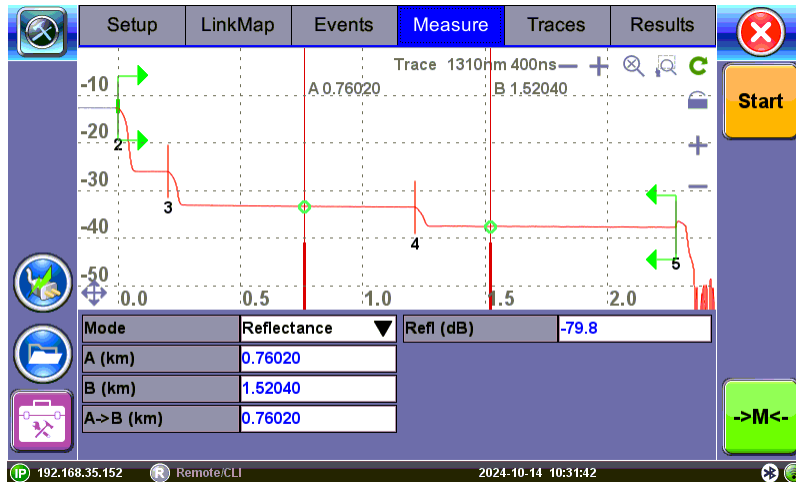
When the center Marker is moved, the intervals will move simultaneously to maintain relative.

The sections between the first two markers and the last two markers are approximated by straight lines (LSA). The value of event loss is defined by the position of the center marker.

The bottom of the screen displays:

- Spl (km, meters, miles or feet) - distance of center marker
- Loss of the event in dB based on the pre/post LSA sections and center marker
- Reflectance in dB if event is reflective

Reflectance Measurement



Reflectance measurement

Reflectance is measured in -dB (negative decibels). A smaller negative value (-65dB) indicates a smaller reflection whereas a larger negative value (-45dB) indicates a larger reflection. Larger reflectance will appear as a higher spike or peak on the trace and shorter EDZ measurement.

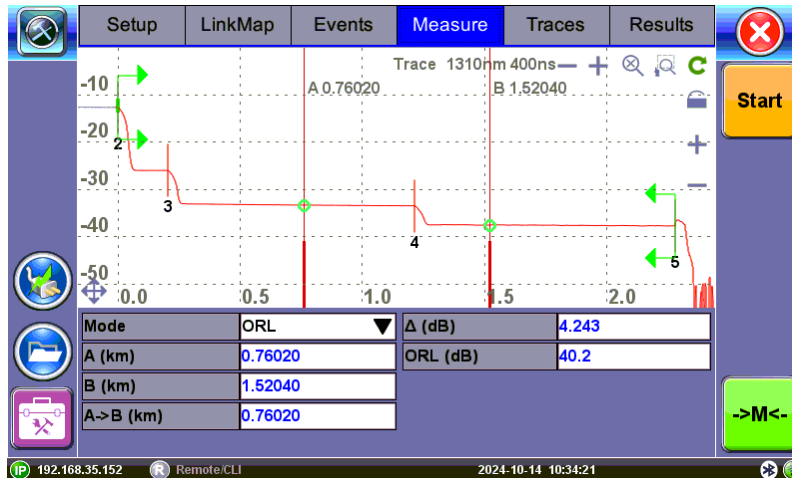
To view the Reflectance:

1. Select trace for measurement (if multiple traces are displayed on screen). The trace to be measured can be selected using the green arrow in the trace overview window.
2. Select **Reflectance** from the drop-down list at the bottom of the screen.
3. Expand the trace horizontally and vertically (using Zoom Controls) to display the reflection correctly. The entire reflection will be displayed including a small section of the trace preceding and following the event.
4. Place the left marker on the base of the event's rising edge. The right marker is placed on the peak of the reflection or after the peak. The software will look for peak value.

The bottom of the screen displays:

- Distance of A cursor (reflection) from Start of test fiber
- Distance of B cursor (top of reflection) from Start of test fiber
- Distance between markers A->B
- Reflection for this even (-dB)

ORL Measurement



ORL measurement

ORL is the total amount of light being reflected back towards the transmitter or source. This includes all backscatter and all reflections.

To calculate ORL:

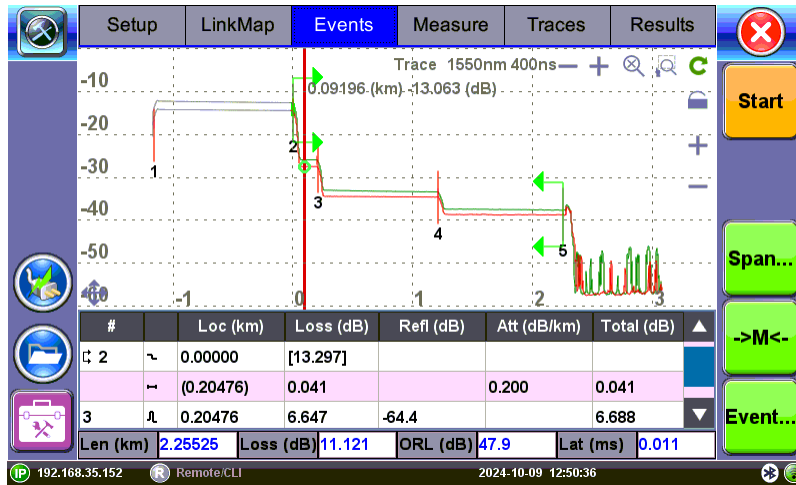
1. Select the trace for measurement (if multiple traces are displayed on screen). The trace to be measured can be selected using the green arrow in the trace overview window.
2. Select **ORL** from the drop-down list.
3. Place marker A at the beginning of the fiber under test and marker B at the end of the fiber span under measurement (just before end reflection, if available). Moving marker B beyond the end will not change the span ORL; moving marker B to less than the end will result in a change in ORL.

The bottom of the screen displays:

- Distance to A cursor
- Distance to B cursor
- Distance between markers A-B
- Loss between the markers A-B (dB)
- Optical Return Loss (ORL), dB

Events Tab

The analysis results are trace events. They are marked on the trace with the marks showing the event types (f for fiber beginning, L for splice loss, J for fiber end, etc.) Full event details are provided in the event table on the bottom, the span beginning and end are marked with brackets (see below).



Events Tab: Trace with event table

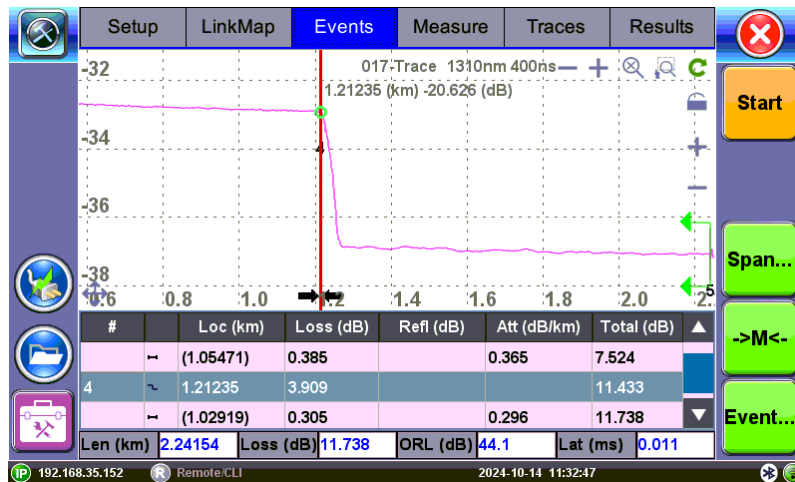


A measuring pulse is extended in time and hence along some fiber span. As a result, there is always a dead zone at the beginning of the fiber where an OTDR cannot detect any events. A longer pulse width increases the dynamic range because it is more powerful, but it also results in a longer dead zone. To eliminate the dead zone effect, connect a launch cable between the OTDR and the fiber under test (FUT), if possible.

Events Table

The Events table is available in all measurement modes. Select the **Events** tab to display the trace with events. The Event table displays all events found during the analysis including those added manually.

To view contents of a merged event, double-tap the Event table.



Events table with failed event highlighted

The Events table is displayed automatically when the Events tab is selected. It can be minimized by tapping the plus symbol just above the left of table. This optimizes the display area and allows better viewing of the OTDR trace.

Use Up/Down arrows to navigate the event table and to display or move to the highlighted event.

Use the green Left/Right arrows to move the marker between the start and end of fiber being tested.

To maximize the Event table, select the cross symbol again.



The right green brackets (Span Start) indicate the 0km location and the left (Span End) is the end. The reported total loss and ORL is from this area of the trace only. For example, if there is a 1000m launch cable between the OTDR and FUT, then the Span Start of 0km is set at the end of 1000m.

Event Types

Symbol	Event Type	Description
┌	Start of fiber	Start of the fiber under test.
└	End of fiber	End of the fiber under test.
─	Fiber section	Fiber section with attenuation.
┐	Reflective Event	Event with both loss and reflectance – typically caused by a crack, connection, or mechanical splice.
~	Non-reflective Event	Event with loss but without reflectance – typically caused by a fusion splice, macrobend, or PON splitter.
└─	Gainer	Event with 'negative loss' as viewed by the OTDR – typically occurs when two fibers with different backscatter coefficients are spliced together. Usually a gainer will be seen as a normal event with 'positive' loss when tested from the opposite end of the fiber.
Σ	Merged Event	Event that consists of two or more real events that are spaced too close together to be resolved or measured by the OTDR.

Event Type Descriptions

Event Editing



To make changes permanent, you must re-save the trace.

Adding events:

1. Ensure the Trace menu is active and the Event table is shown on the screen.
2. Position marker at the point where a new event will be inserted.
3. Tap **Event<Add** on the right sidebar. A new event number will appear on the trace and in the event table.

4. Select the new event in the event table and tap **Event<Edit** on the right sidebar. Position the splice loss markers to measure the new event accurately. Once markers are positioned, tap the **Accept** button.

To analyze the new event, tap **Analysis** before accepting.

Tap **Cancel** to exit the menu without saving changes.

Deleting events:

1. Select the event in the event table.
2. Once selected, tap **Event<Delete** on the right sidebar. The event will be deleted from the event table and the event number will no longer appear on the trace.

Modifying events:

1. Ensure the Trace menu is active and the event table is shown on the screen.
2. Select the event in the event table.
3. Tap **Event<Modify** on the right sidebar. A marker with two small markers will appear on the trace. When markers and measurement is performed, click the **Accept** button on the right sidebar. To analyze the event, click **Analysis** before accepting. Click **Cancel** to exit the menu without saving changes.

- **Span Begin** – Position the marker at the end of the Launch fiber and tap the green **Span Begin** button to set the beginning of fiber under test (indicates 0km location).
- **Span End** - Position the marker at the end of the fiber under test and tap the green Span End (if launch box is used).
- **Span Edit** - Edit launch and receive cable information (length, event loss, compensated loss).
- **Markers** - Displays marker.
- **Event** – Add, delete, or make manual adjustments to the event table and reanalyze.

Event Troubleshooting

If a KNOWN event does not appear, try the following:

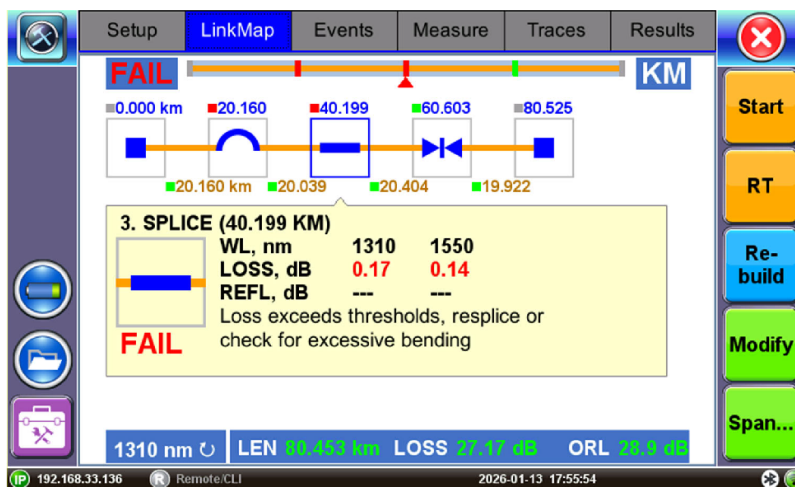
- Check and adjust Analysis threshold levels.
- If testing Long Fiber, make sure the range > FUT (fiber under test); increase time to 3 minutes. The range should be set at about twice the length of the FUT to prevent ghosts caused by reflections.
- Change the test mode for which to optimize. For example, if optimizing for DZ mode, change to DR and vice versa.
- Use V-Scout. (Refer to ["V-Scout" on page 110.](#))

Link map

Select the **Link map** tab to view details for all events found on the fiber.

The link map view presents a simplified view of measurement results by analyzing all the event table results for each pulse, whether using single or multiple pulse widths, and all test wavelengths. A span summary is displayed, in the form of a block diagram, for each test wavelength shown at the bottom of viewing window.

Select an icon to obtain more information about that specific event on the fiber, as shown below. For example, event 4 represents a connector with excessive loss, which is common when connectors are not cleaned prior to mating or if they are damaged.



Link map showing splice with excessive loss



The link visibility can be significantly improved by using multiple pulse widths to provide better event details.

Link map symbols

The table below summarizes the symbols used to represent various events on the fiber link.

Icon	Description
	Span start (OTDR port) Indicates start of analysis section, as defined in setup.
	Fiber section
	End of Span end Indicates start of analysis section), as defined in setup (distance or event index).
	Optical Connector/Physical contact (reflective event)
	Unknown Event - Distance Range or Dynamic Range inadequate to detect TRUE end.
	Blank Node
	Optical Connector - APC (Angled Polish) (reflective event)
	Splice (non-reflective event loss or gainer)
	Macrobend
	UPC connector

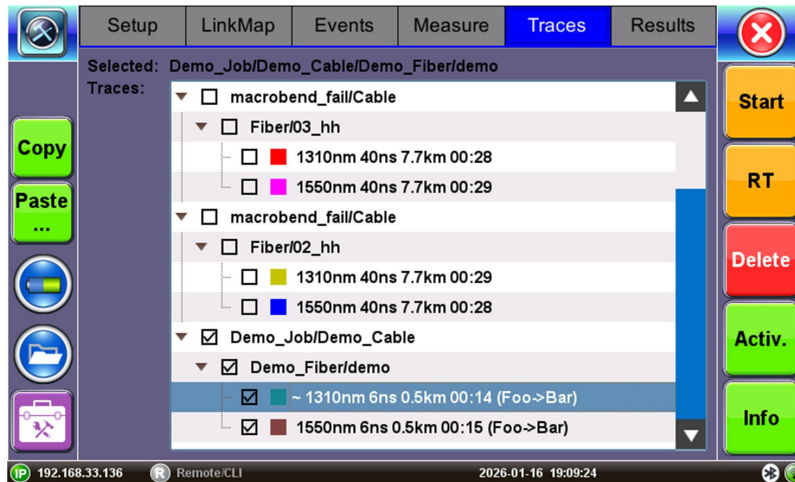
Icon Descriptions

Icon	Description
	WDM Network
	MUX-Generic
	MUX-DWDM
	PON Network
	Co-existence Filter
	Splitter - Balanced
	Splitter - Unbalanced/Asymmetric
	1xN Splitter (from OLT side)
	Tap - Generic with Drop
	Tap - Terminal (Terminated)
	End of Link (ONT detected; end user)

Icon Descriptions

Traces Tab

After running a test, select the **Traces** tab to view the active or measured OTDR traces. The color-coded blocks represent the corresponding trace viewed in the OTDR display. The OTDR can display up to ten traces simultaneously (i.e., an active trace and nine additional traces).



Traces tab

Traces are displayed along with the name, pulse width, distance range (LMax), and acquisition time used for the test. To view any trace, select the file(s) using the check box. All selected traces will be overlaid and can be viewed using the **Results/Traces** tabs.

Trace Properties

The traces in the memory are saved in BELLCORE, version 2.0 format. The OTDR trace files have the extension .SOR which means Standard OTDR Record.

If the measurement was performed at several wavelengths simultaneously, the traces are saved as a group i.e. they will share the same common name but with wavelength added (e.g. 01_meas_1310, 01_meas_1550).

To edit information for an already measured trace, tap the **Information** button on the right sidebar to open the **Trace Information** window, containing the following information relating to the saved file:

- **Device:** OTDR supplier name, Mainframe ID and serial #, and optical module serial # (if applicable)

Trace information	
Device	General
Supplier Name	VeEx
Optical Module ID	SM/1310/1550/1625
OTDR Mainframe ID	FX150+/PRO-16LIVE
Optical Module S/N	1606621
OK Cancel	

Trace Information - Devices

- **General:** Date/Time, Job ID, Cable ID, Fiber ID, Group ID, Fiber Type, Originating/Terminating locations, and Comments
- **Setup:** Profile, Measurement Mode, Network Type used to make the measurement.

- **Measurement:** Test parameters used to make the measurement.

Trace information				
Device	General	Setup	Measurement	Thresholds
Accurate Wavelength (nm)			1310.00	
Refractive Index - n			1.4677	
Distance - Lmax (km)			0.50248	
Resolution - dL (m)			0.26	
Pulsewidth - Tp (ns)			12	
Time (m:s)			00:00	
Optimal Dead Zone			No	
Automatically Set Params?			No	
OK Cancel				

Trace Information - Measurement

- **Thresholds:** Analysis thresholds used to analyze the trace, as well as PON identification for link map.

Trace information	
Device	General
Setup	Measurement
Thresholds	
Backscattering Coefficient	-80.0
Splice Loss - LT (dB)	0.100
Reflectance - RT (dB)	-65.0
End of Fiber - ET (dB)	5.000
OK Cancel	

Trace Information - Thresholds



For more information on Span settings and Launch/Receive cable offset, see [Span Settings](#).

To edit the Refractive Index (RI) and Backscattering Co-efficient (BC) for an already measured trace:

1. Select the trace you want to edit, then tap the **Information** button.
2. On the **Measurement** tab, change the RI as needed.
3. In the **Thresholds** tab, change the BC as needed.
4. Tap **OK** to apply changes. All changes will be applied immediately.
5. After carefully noting the **JobID/CableID/FiberID/TraceID** fields, save the trace. The Job/Cable/Fiber/Trace determine the location to which the trace is saved.



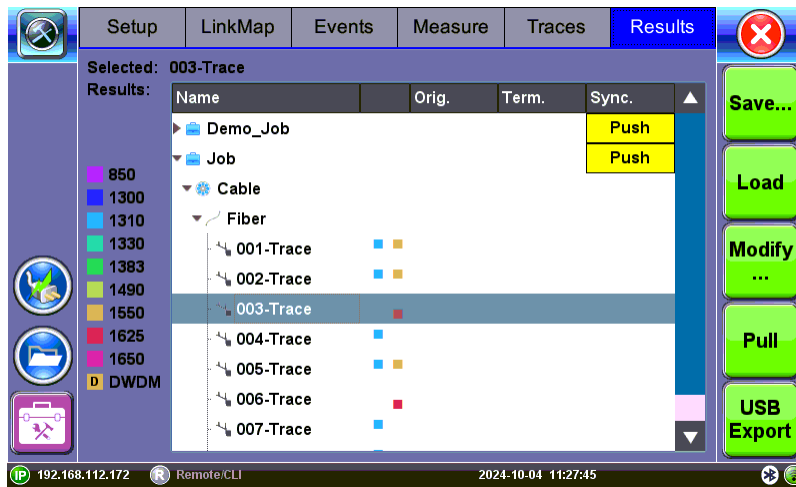
For multi-wavelengths/multi-pulsewidths, edit trace separately.

Results Tab

The **Results** tab is used to view previously saved OTDR test results. OTDR traces can also be manually saved using the Results tab.

The traces are saved in the following folder directory hierarchy:

- Job ID
- Cable ID
- Fiber ID
- Results – Traces



Results tab

To expand the selection or folder directory, tap on the arrow. An arrow pointing to the right indicates the branch is collapsed whereas an arrow pointing downwards indicates the branch is expanded.

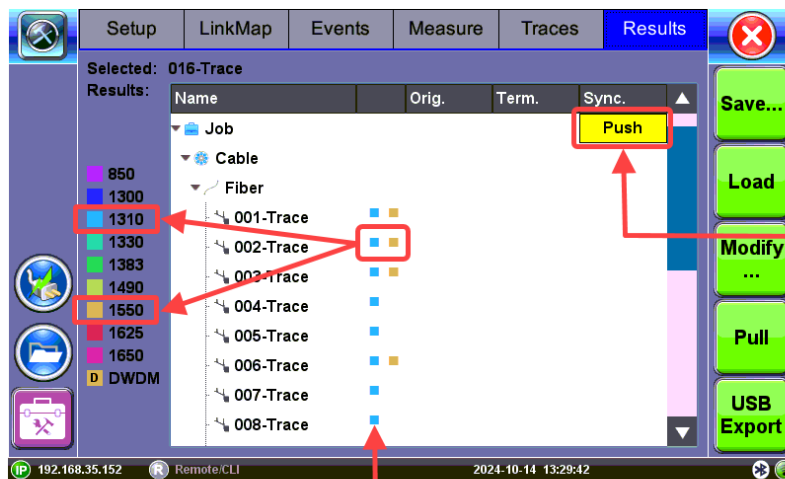
To push test results to your Fiberizer Cloud account, select the **Push** command for the folder that you wish to upload to the Cloud. Refer to "[Fiberizer Cloud](#)" on page 162.

- **Save:** Manually enter details when saving results or save using details entered in the autosave settings menu.
- **Load:** Displays selected trace for active viewing.
- **Modify:** Renames or removes selected file.
- **Pull:** When connected, pulls file from Fiberizer Cloud onto test set.

- **USB Export:** Exports selected test results to USB stick using the "MyVeEX" tree directory format or a flat file when all files should be saved in a single folder. The files can be found on the USB stick in the **OTDR Export** folder.



Alternatively, access and export files to a USB memory device by tapping **Utilities>Files>Saved**, then **To USB**. Each trace will be saved in a separate file folder. Refer to "File Manager" on page 177.

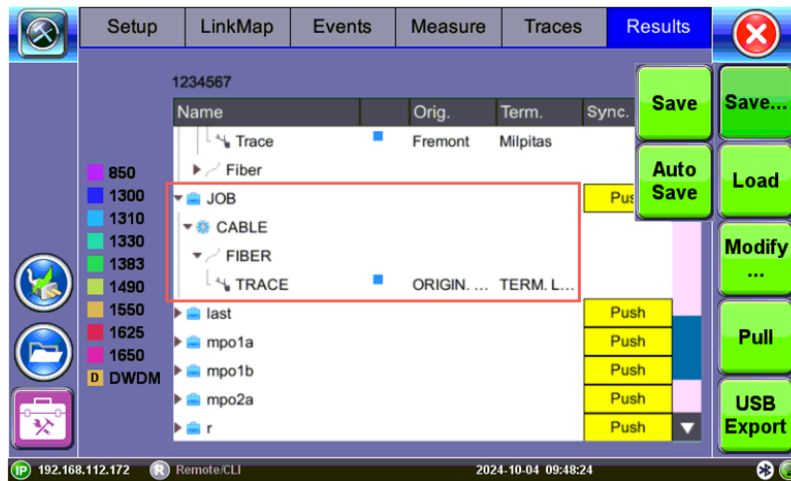


Color coded blocks indicate test wavelength.

Results tab: Wavelength/Trace

Saving OTDR Traces

Configure **Autosave** in the **Setup** screen or save OTDR traces manually from the **Results** screen. The Auto-save options can also be configured from the **Results** screen. (See "Autosave Parameters" on page 106.)



Results tab: Save options

The traces are saved in the following folder directory hierarchy:

- Job ID
- Cable ID
- Fiber ID
- Results – Traces



The JobID/CableID/FiberID/TraceID fields determine the location to which the trace is saved. If these settings are not set accurately, the trace will not save to the desired location.

To save Traces:

1. On the **Results** tab, select the trace you want to save.
2. Click **Save**, then click **Save**. The **Result Saving** window appears.

Result Saving		
Fiber	Common	Report
Job ID	Job	
Cable ID	Cable	
Fiber ID	Fiber	
Trace ID	Trace	
WL	1310	
Tp	3	
L	0.00300	

OTDR Traces: Result Saving Window

3. If needed, change the default information on the tabs and enter a filename in the **Traces ID** field.
Then, click **Save**.

To view or print reports, use the File Management feature or one of the Fiberizer software applications. Refer to "File Manager" on page 177.

Third Party Viewers

When third party viewing is checked, the OTDR saved results include a filter so that third party software will display OTDR traces identical to how VeEX test sets display them.



Once saved in this format with the third party filter applied, it cannot be changed afterwards.

To save a trace for third party viewing:

1. In the **Results** tab, tap **Save**. The **Result Saving** window appears.

Result Saving					
Fiber		Common		Report	
Node ID		NODE			
Account		ACCOUNT			
Orig. Location	ORIGIN LOCATIO	Term. Location	TERM LOCATION		
Comments		COMMENTS			
Tech ID		JD123			
Tech Name		jdoe			
☒		Compatible with 3rd-party viewers			
Save Cancel					

OTDR Trace: Saving file for Third Party Viewer

2. Select the **Common** tab, and then check the **Compatible with 3rd-party viewers** checkbox.
3. After making any other changes, as needed, click **Save**.

To view and print test reports, refer to ["OTDR Test Reports"](#) on page 157.

Bidirectional OTDR Testing (X-view)

When Bidirectional fiber testing results are available, the OTDR can be used to view the results using the X-format. The OTDR results table will be unidirectional, meaning results can be viewed from one trace at a time. Use the green arrow in thumbnail view to switch active trace/even table results.



In some cases, a more detailed analysis may be needed. This can be accomplished by averaging the test results of both traces. Results are averaged to counteract variation in attenuation at connector junctions between fiber sections.

[Fiberizer Cloud](#) or [Fiberizer Desktop Plus](#) software is recommended to:

- Generate test reports that will include the results table that shows both individual results and averaged bidirectional results, along with traces in an X-view format.
- Automate bidirectional test reports for a batch of fiber strands, instead of individual strands at a time.

Refer to "[Fiberizer Cloud](#)" on page 162 for information on using Fiberizer Cloud. For more information on Fiberizer Desktop Plus, go to <https://veexinc.com/products/fiberizer> or contact [Customer Care](#).

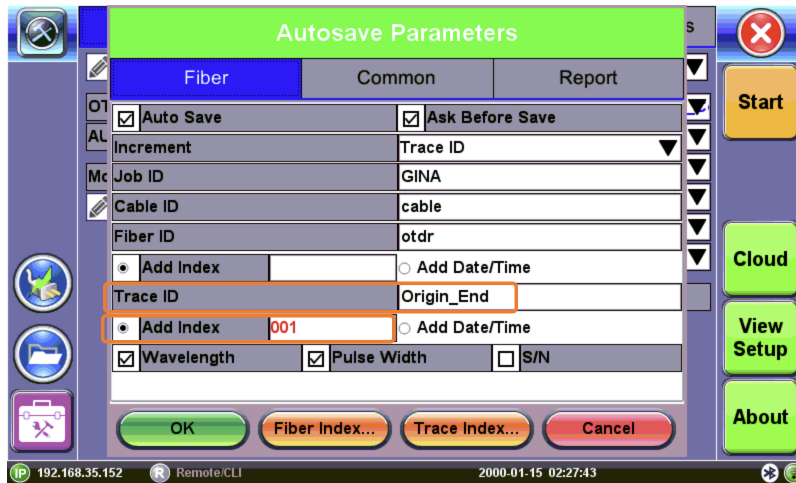
To create a bidirectional X-view screen:

1. Before saving bidirectional test results, configure **Autosave** settings so that it is easy to track bidirectional results. In the **Setup** tab, tap **Autosave**. The **Autosave Parameters** window appears.
 - a. Set **Increment** to **Trace ID** and **Common** tab to enter *Origin* and *Termination* sites. The **Trace ID** label should reflect the physical location for each direction (e.g. first trace labelled "origin_end" and the second opposite end labeled "end_origin").



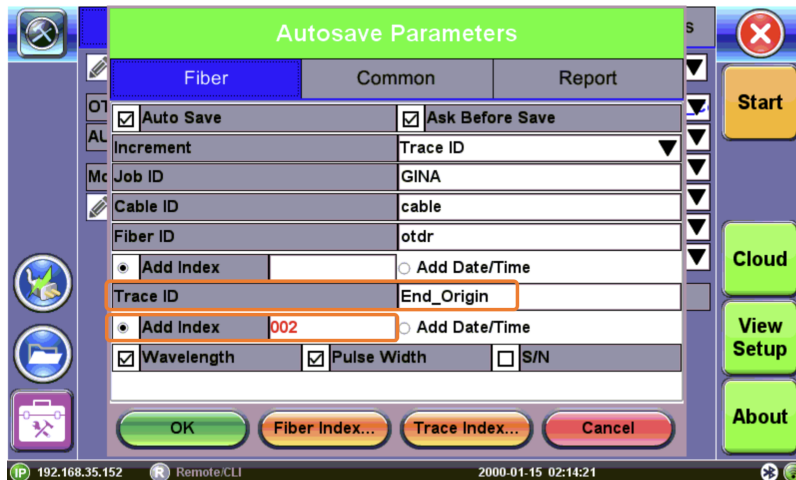
*Do not use "-" in the **Trace ID** field.*

- b. Reset or Force the **Trace Index** counter number to the fiber port you are testing at; otherwise, it will continue incrementing from the previous test. To change the number, tap **Trace Index**.



Bidirectional Trace - First Fiber to Test

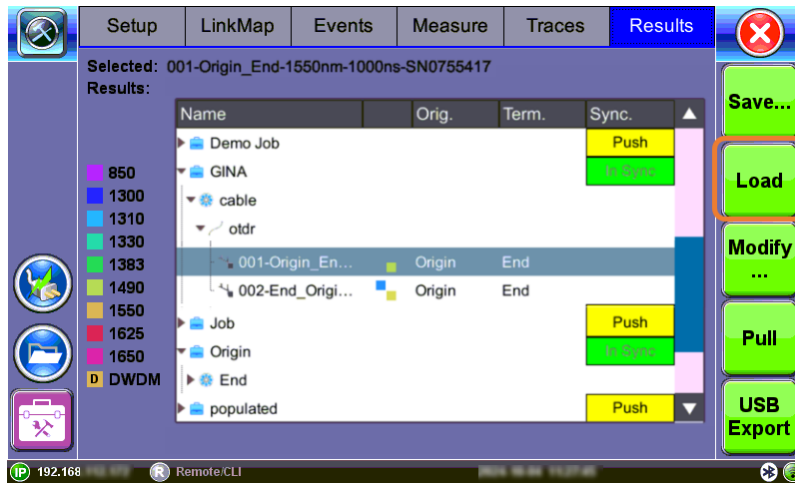
2. Before testing from the opposite direction, re-configure the **Autosave Trace ID** settings to reflect the new test direction so the filename will be correct with the first trace.
 - a. The **Trace ID** label should reflect the physical location for the opposite direction (e.g. first trace labeled "origin_end" and the second opposite end labeled "end_origin").
 - b. Reset or Force the **Trace Index** counter number to the fiber port you began testing at; otherwise, it will continue incrementing from the previous test. To change the number, tap **Trace Index**.



Bidirectional Trace - Reverse Direction testing

c. To view bidirectional test results, load the bidirectional traces previously saved from opposite direction testing (e.g. load "Origin_End" and "End_Origin"). See **Step 3**.

3. On the **Results** tab, select the required traces and tap **Load**.



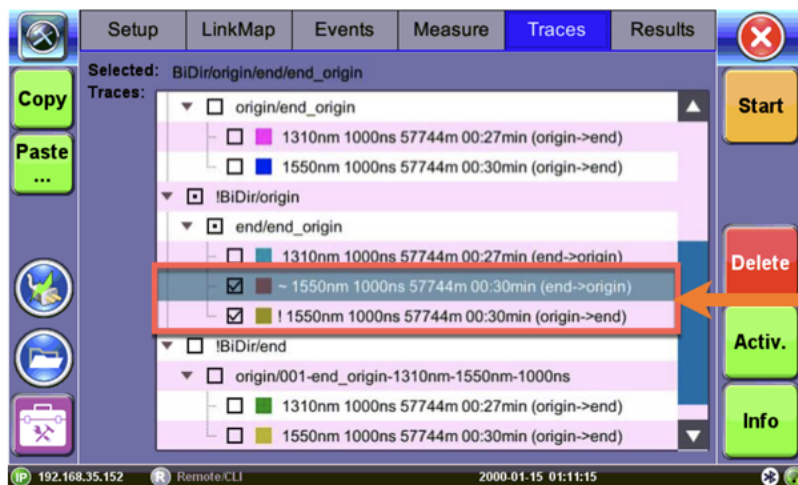
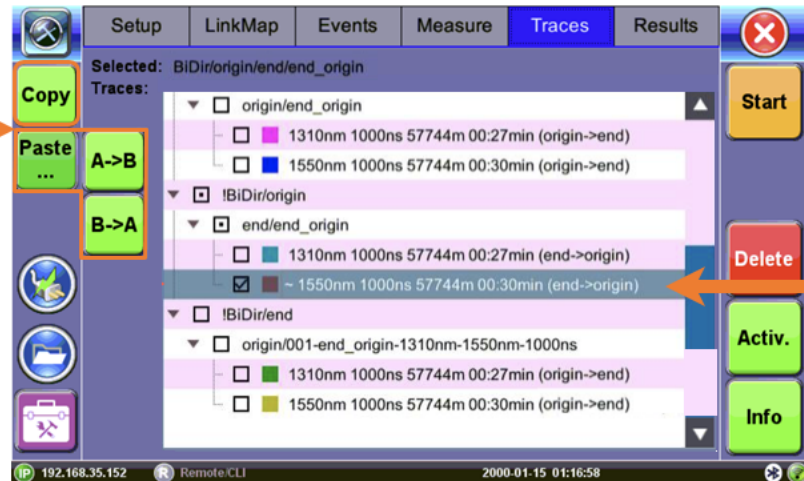
Bidirectional testing: Results



Bidirectional View: First Trace loaded (before selecting reverse direction trace)

4. On the **Traces** tab, select one trace (End_Origin) and tap **Copy**. Then, select the target tree node and tap **Paste>B->A**. The reverse direction file copies into the same folder. Select two files (Origin_End) and (End_Origin) to view results. **Bidirectional testing: Traces tab**

After loading traces in the Results tab, copy the trace to reverse. Then, select the target tree node and tap Paste.



5. View the bidirectional trace in X-format on the **Measure** tab and **Events** tab.



Both traces must be checked (selected) in the **Traces** tab to view the bidirectional trace.



Bidirectional test: Events view

OTDR Test Reports

Test reports can be accessed from the test set's files or from a mobile device by scanning a provided QR code. Refer to "[File Manager](#)" on [page 177](#) for more information on accessing the test set's files. For more information on viewing reports on mobile devices, refer to "[Working with Saved Results, Profiles, Images](#)" on [page 178](#).

View Test Report from Platform Files

To access the test results stored in the test set:

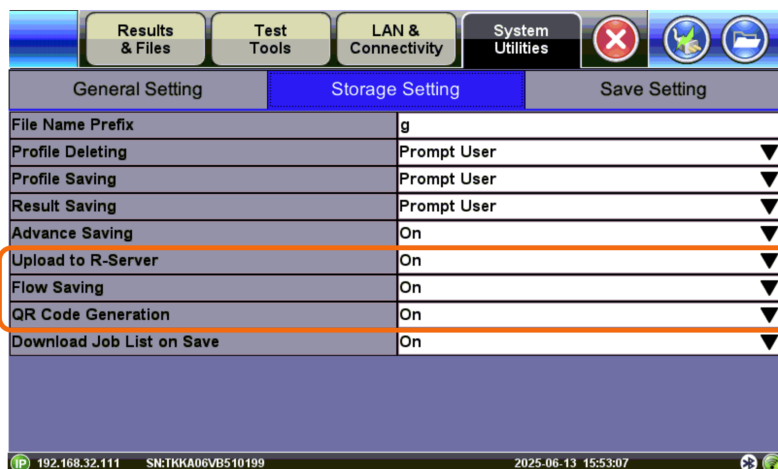
1. Select the **Results & Files** tab. The **File Management** screen is displayed.
2. Select the desired results file to open the test report.

To navigate the test results report, use the links in its Table of Contents and the right rocker switch to scroll Up and Down. Refer to "[OTDR Screen Navigation](#)" on [page 32](#).

View Test Reports on Mobile Device via QR Code

To view OTDR Test Reports on a mobile device, turn on the setting in the test set's platform settings.

Go to  > **System Utilities** > **Global Settings** > **Storage Settings** and make sure **QR Code Generation** is turned **ON**.



Enable QR Code Generation

VeEX's NoApp® (US Patent 12,190,199)*¹ cloud service enables basic meters and advanced test sets to quickly and easily transfer test results' KPI to a phone or tablet, to instantly generate test reports and allow shar-

¹*This product is protected under U.S. Patent No. 12,190,199 and may be covered by additional patents. Any unauthorized reproduction, sale, or distribution is strictly prohibited and may result in legal action.

ing and uploading to centralized R-Server or cloud. [See short video about the VeEX NoApp® Wireless Test Results Transfer via NFC.](#)



Internet connectivity is required (e.g., Wi-Fi, LTE, 5G, etc.).

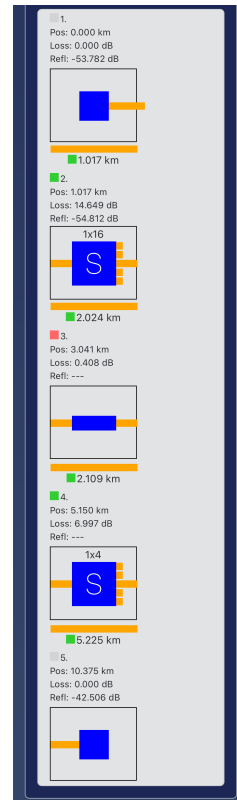
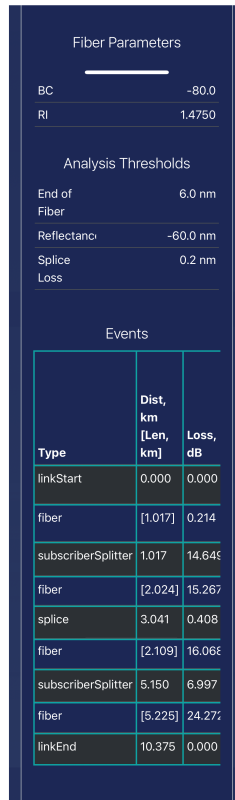
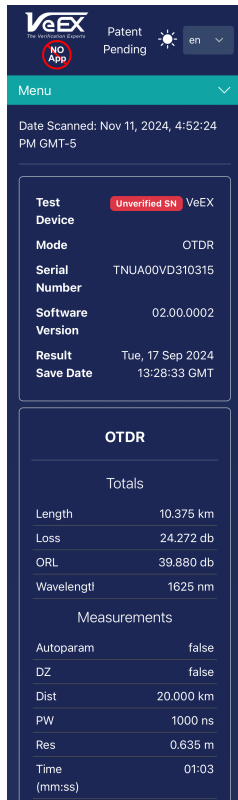
Immediately after saving results, a screen with a QR code appears. To view the test report via mobile device, scan the QR code with the mobile device's camera. Tap **OK** to exit the screen on the test set.

Alternatively, tap the QR code icon  on the [File Manager](#) screen.



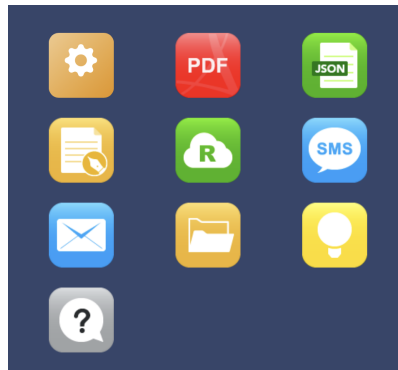
Test Report QR Screen

After transferring results to a mobile device via the QR reader, the browser launches automatically and displays them.



The top of the screen shows the device type, mode, serial number, and software version, and the date results were saved on the device.

Export options appear at the bottom on the screen. Alternatively, tap the **Menu** drop-down menu to view the options.



Results - Mobile View Export Options



Adds/Removes location (GPS coordinates) from results report; customize report with logo.

-  Generates complete report in PDF format, which can be shared with the customer (subscriber) or emailed to a supervisor.
-  Exports to JSON format, for third-party integration or processing.
-  Adds extra job-related information to the report (e.g., Job ID, tech's information, comments, pictures, etc.).
-  Uploads results to R-Server (for R-Server users).
-  Texts results via SMS protocol.
-  Emails current test report.
-  Creates a new project for results so multiple test results, from the same or different test sets, can be combined into a single job report.
-  Opens knowledge base.
-  Opens documentation resources for test set.

OTDR About

The OTDR **About** button displays the OTDR model, firmware type and build, platform serial number, and OTDR wavelengths. On the OTDR Setup screen, tap **About** on the right panel.



OTDR About: FX150+

- **OK:** Closes window.
- **Server:** Places OTDR or OPM in Server mode.
- **Version:** Displays OTDR versions and builds for support purposes.
- **Restore:** Restores to previous version.

Fiberizer Cloud

Fiber test results, e.g. Fiberscope images, OTDR traces, OPM readings, can also be uploaded to a registered Fiberizer Cloud account. Registration is free. The Cloud account can be synchronized with [Fiberizer DT+ Windows PC](#) software, if needed.

Connecting to Fiberizer Cloud

To connect the test set to Fiberizer Cloud, you must be a registered user. For new users, go to <https://cloud.fiberizer.com> to register.

1. After registering, tap **Cloud**.
2. Enter the username and password, then tap **Check**. If the message **Connection has been successfully verified** does not display, recheck the username and password.
3. Tap **Select** to choose a project folder to upload files and tap **OK**.
4. Tap **Save** or **Discard**, respectively, to save or cancel the cloud login details.

Cloud storage credentials setup	
User	user@domain.com
Password	
URL	http://fiberizer.com
Check	
Project	
Select	
Reset	
Please proceed to fiberizer.com web site from your PC Internet browser to register.	
Discard	Save

Settings to connect to Fiberizer Cloud

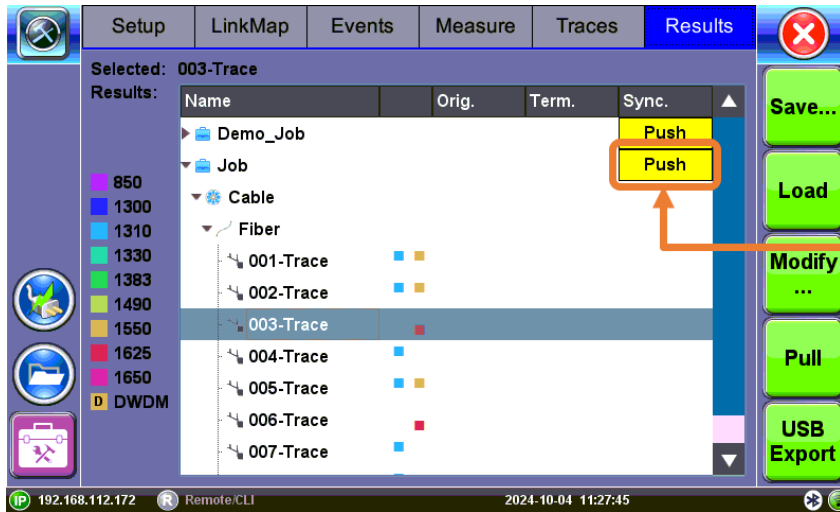
The Project selection defines the project folder location on the Fiberizer Cloud account to which to save the results. It is limited to three projects. This allows the creation of a private or shared Project folder. The default setting on the test set uploads to the global root folder.



For a project folder to appear in the project list, it must be created in Fiberizer Cloud first. The test set cannot create Fiberizer Cloud project folders.

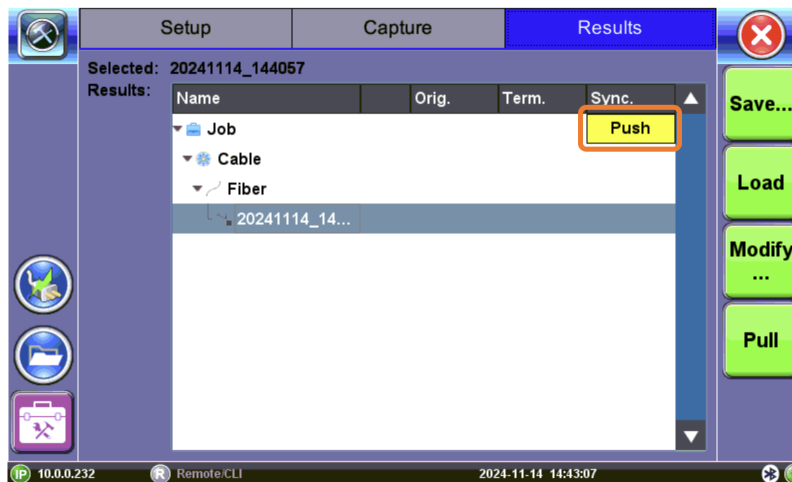
Uploading/Downloading Files with Fiberizer Cloud

Before attempting to upload or download, ensure that the test set is successfully connected to Fiberizer Cloud. Tap **Push** next to a directory item to upload it into Fiberizer Cloud. Tap **Pull** to download the directory collection from Fiberizer Cloud.

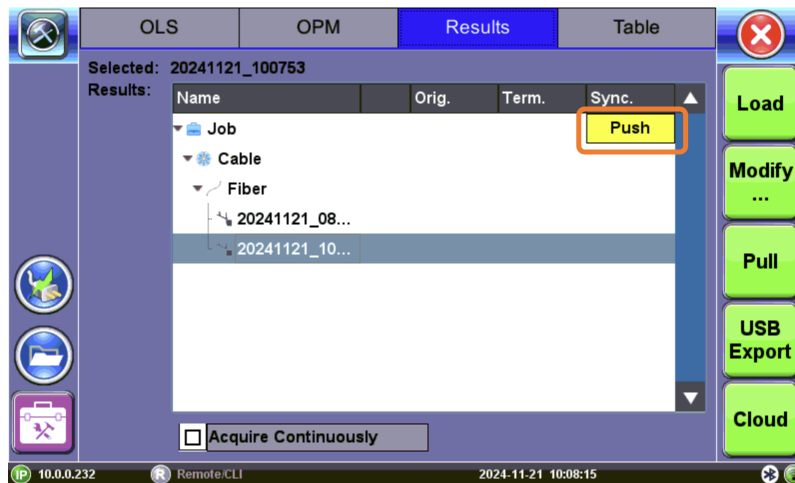


Tap **Push** to upload results to Fiberizer Cloud. In this example, the trace will be saved to: **Job>Cable>Fiber** both on Fiberizer Cloud and when files are exported to a USB stick from the test set.

OTDR Trace Result Files

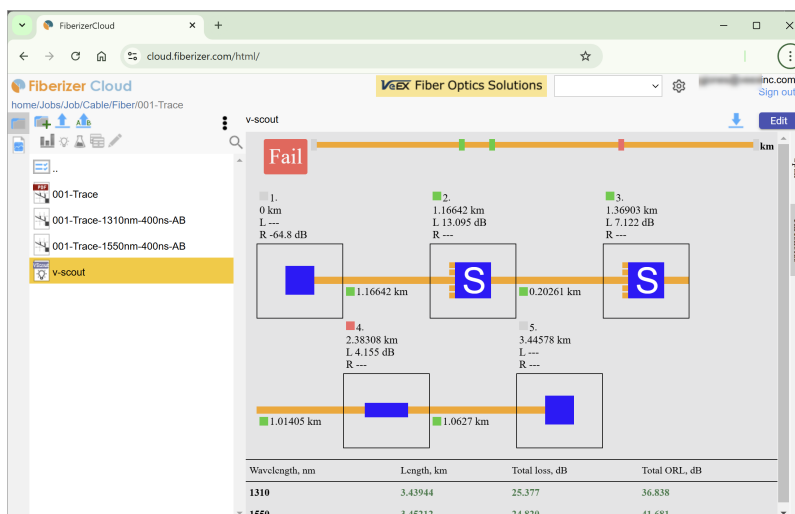


Fiberscope Result Files



OPM Result Files

After pushing results to the Fiberizer Cloud project, check the Jobs folder to which the saved cable folder was uploaded. Use Fiberizer Cloud to create professional reports or serve as an online storage backup. The example below shows a link map for OTDR trace results on Fiberizer Cloud.



Fiber View on Fiberizer Cloud

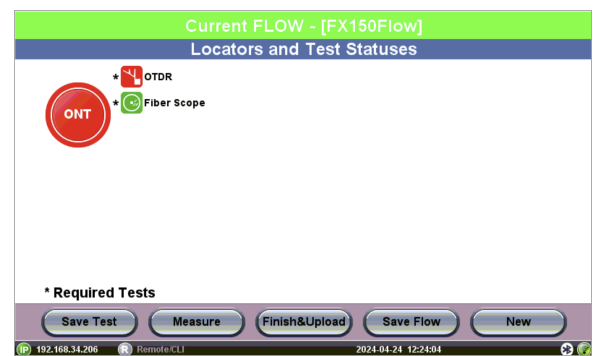
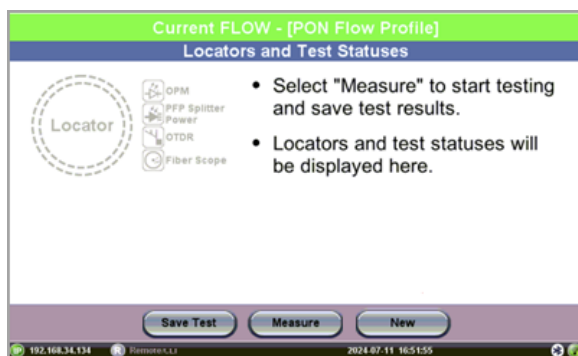
Flow® Tests

Use the Flow® Toolbox application to save a series of tests and compile them into a full Flow® Test Report. Create a basic Flow® job test profile to guide workforce with making multiple tests. Implementation of Flow® allows technicians to use multiple test tools to build and properly certify various fiber networks by applying Pass/Fail indicators into a consolidated Job test report. Flow® supports multiple test applications.

If the test set is registered with R-Server, the R-Server controls whether Flow® profiles can be created using the test set. When allowed by R-Server, the test set's Flow® application includes a Default profile. The Default profile can then be used to dynamically create and test Locators without the need of an R-Server defined Flow® profile.



If R-Server does not allow the test set to create profiles, the only profiles available for selection will be R-Server defined Flow® profiles.

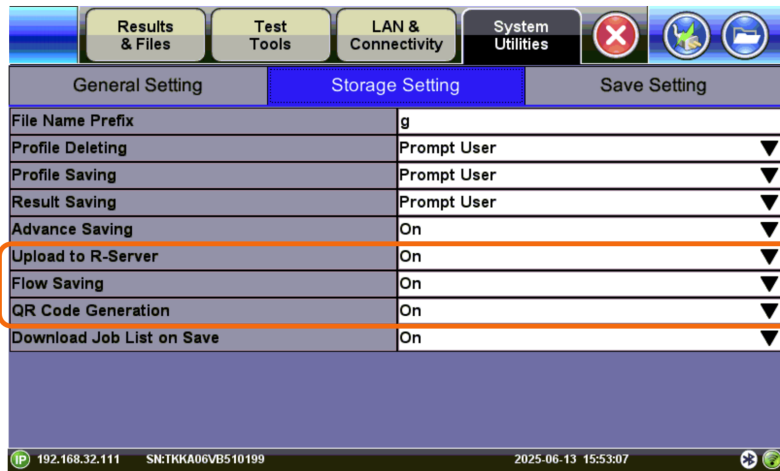


Flow® toolbox application

Configuration Settings

Before performing any measurements using the test set, do the following:

1. Go to  > **System Utilities > Global Settings > Storage Settings** and make sure **Flow Saving** is turned **ON**.



Storage Settings for Flow

- If the Flow® Test Report needs to be uploaded to R-Server, go to > **LAN & Connectivity** > **R-Server Client** and make sure the test set is connected and registered with R-Server. Refer to "R-Server" on page 218 for more details.



R-Server Registration

Flow® Measurements

1. On the test set up screen, select  >  on the bottom left.
2. On the Flow® screen, tap **New** to create a new Flow® session and enter details to identify the new Flow® report, such as job number, account, address, and GPS location. Select Let's GO to begin measurements.

New FLOW - Please enter the info below

Job ID/Work Number	ABC					
Account #	123					
Type	Installation					
Profile	Default					
Node/Fiber/Drop ID	VG					
Address	123 Main					
Comments						
Tech ID	JD123					
Tech Name	jdoe					
☐ GPS Position	Latitude		Longitude		Altitude	

Let's GO
Abort

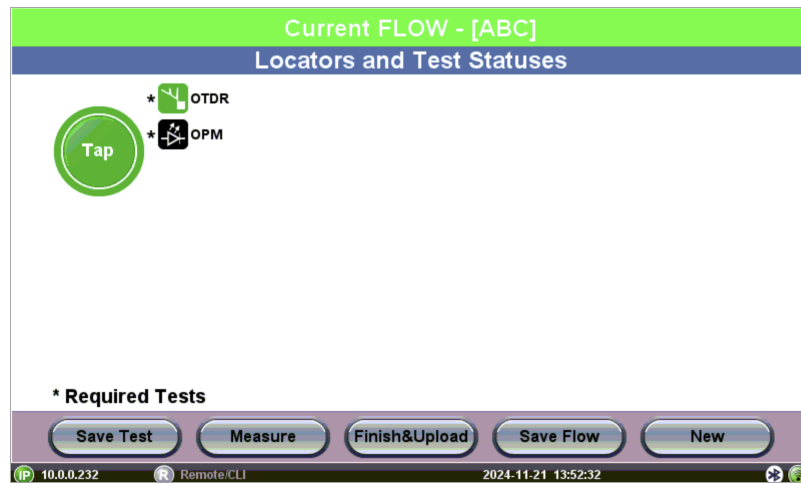
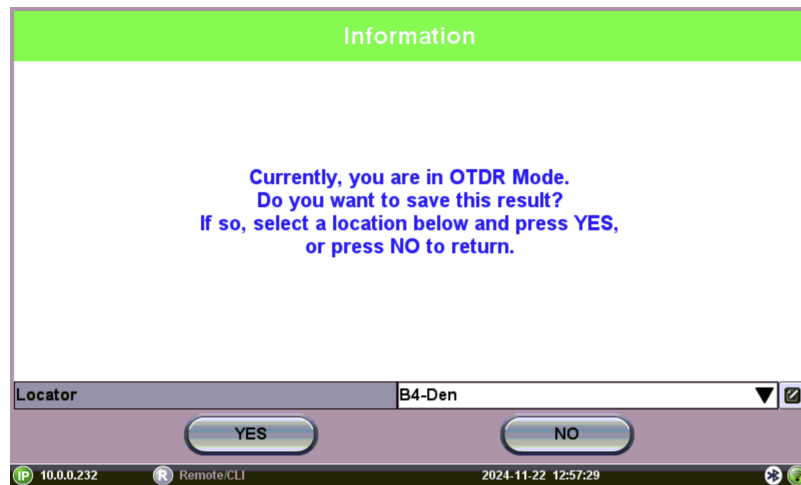
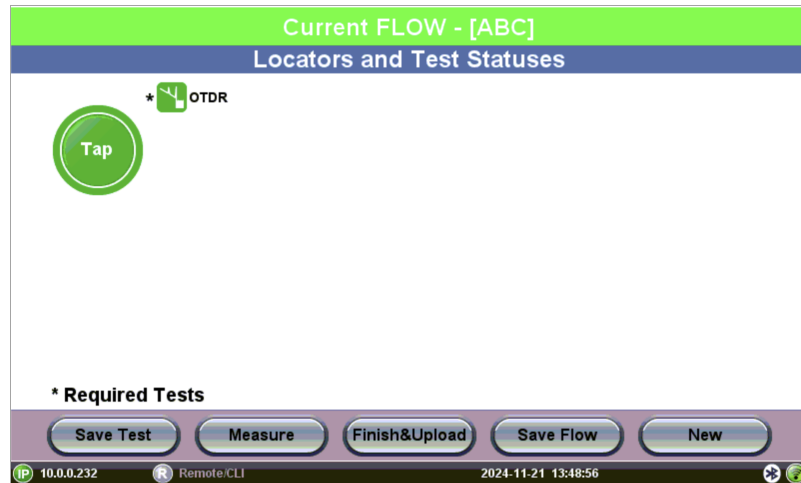
10.0.0.232
 Remote CLI
 2024-11-21 13:27:46

New Flow® Job Information

3. Select **Measure** and then choose the Locator and type of test (in sequence) to add to the Flow® Test Report. Select **Save Test** between each test/application.

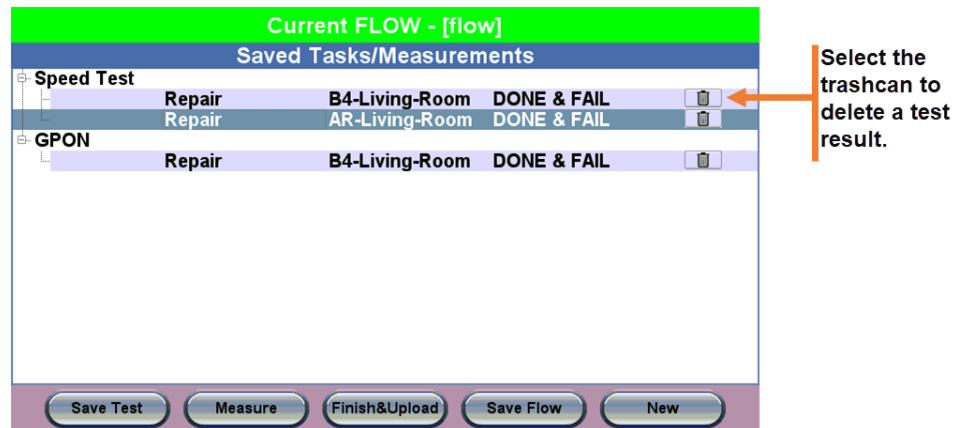


 *Locators/Test Locations can be selected from a list or a Custom Locator can be created. The list depends on the type of work selected.*



Adding tests to Flow®

- After adding all tests, select **Save Flow** to save results. Select **Finish & Upload** to save results to the Flow® report and upload it to R-Server. An Upload Successful screen appears if upload completes. The test set then automatically synchronizes jobs with R-Server. If no jobs are available, a prompt appears. Select **Continue**. The test set then automatically synchronizes profiles with R-Server. If there are new Flow® profiles, they are downloaded automatically.

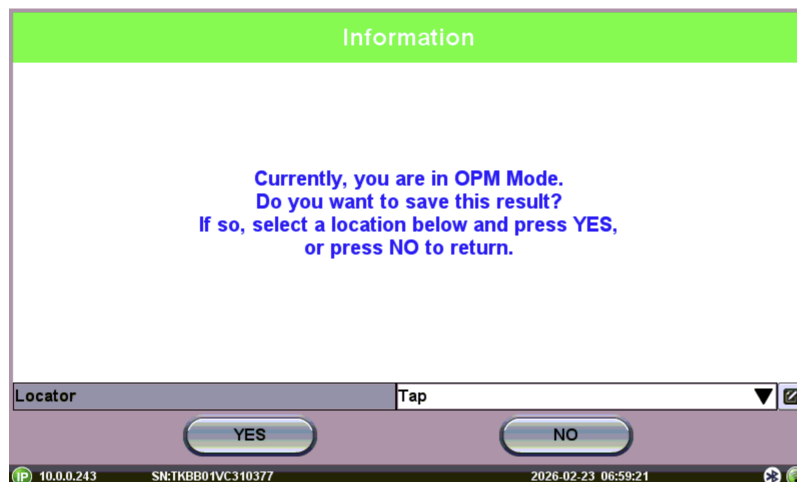


Flow® Results

Locators

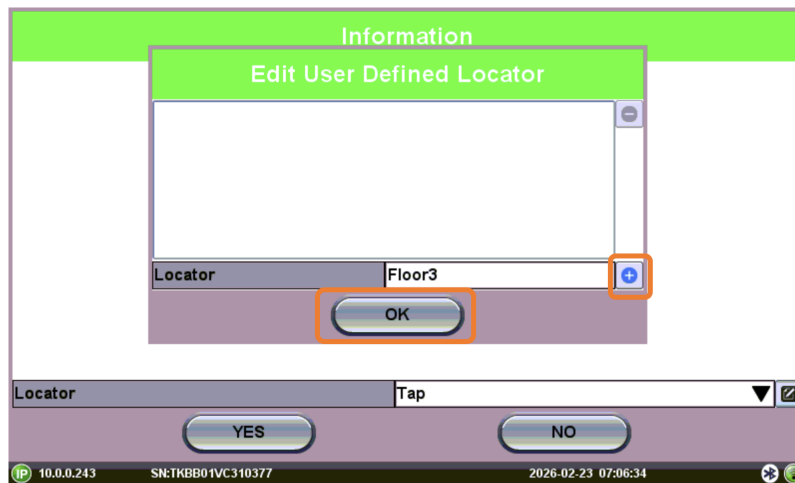
Create a New Locator

- After selecting **Save Test**, select the pencil icon to the right of the Locator dropdown.



Save Test

2. On the Locator Editor screen, enter the new custom Locator name in the **Locator** field.
3. Select the blue plus sign  to add the new Locator to the Custom list, then select **OK** to return to the Flow® screen.



Add Locator

The newly custom Locator can now be used.

Delete a Locator

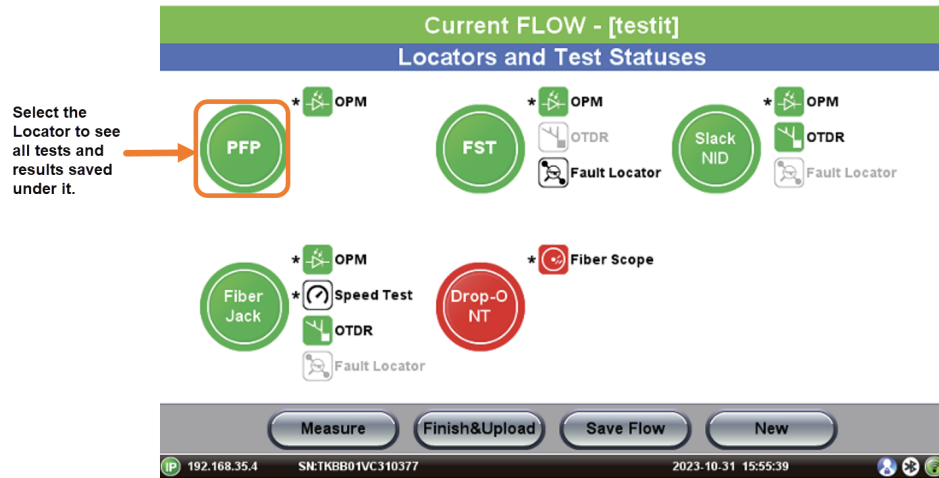
- On the Save Test screen, select **Delete Locator**, then select **YES** on the confirmation screen.
- Delete a custom Locator by selecting the red minus sign  on the Custom List, then selecting **OK**.



ALL test results saved to that Locator will be deleted.

Locator Tests

Select the Locator to see all measurements saved under it.



Locators and Tests

Flow® Report

The report can be accessed:

- From the test platform's files. Refer to ["Working with Saved Results, Profiles, Images" on page 178.](#)
- From R-Server. Refer to ["R-Server" on page 218.](#)

View Result - 7788-11

FLOW PROCESS



Powered by **VeEX™**

Job Information

Job ID/Work Number	7788
Account #	624-4230
Address	123 Main
Type	Repair
Tech ID	JD123
Tech Name	jdoe
Node/Fiber/Drop ID	TW2

General Information

Date and Time Results Were Saved	2024-11-22 12:17:58
Test Platform	FX150+
Serial Number	TRFA10UB112319
Software Version	02.00.0000-demo.33

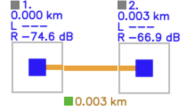
PASSED

Summary

OTDR (B4-Drop-ONT)

PASS

LinkMap



OTDR SOR



Fiber Scope (B4-Drop-ONT)

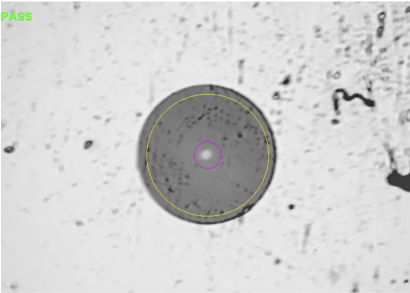
PASS

Fiber Scope | B4-Drop-ONT (PASS)

Test Characteristics

Pass/Fail Standard	IECv3 SM APC
Connector Type	Ferrule (Male)
Connector Material	Ceramic (typical)
Optical Tip/Polish	Standard

Fiber



Thresholds

Zone	Scratches			Defects		
	Criteria, um	Threshold	Count	Criteria, um	Threshold	Count
A: Core 0-25 um	[3; 4]	4	0	[2; 3]	1	0
	(4; ∞)	0	0	(3; ∞)	0	0
B: Cladding 25-110 um	-	-	-	(25; ∞)	0	0

OTDR | B4-Den (PASS)

Totals

Sample Flow report (viewed in R-Server)

Download and Use Flow® Profile from VeSion® R-Server

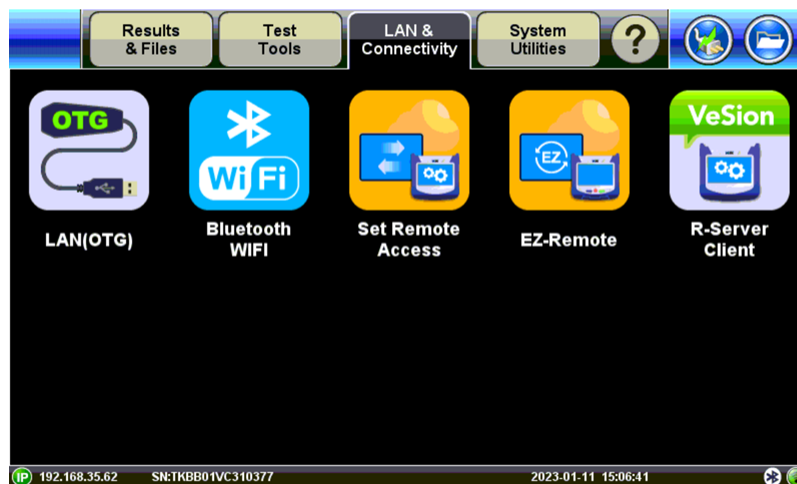
1. Go to  > **LAN & Connectivity** > **R-Server** and select the **Download** tab. The Flow® Profile displays **New** if the meter detects any new Flow® profile assigned to it.
2. Press **Download** to download the Flow® profile(s).
3. To use the new Flow® profile, navigate to the Flow® application by selecting  >  on the bottom left.
4. The new Flow® configuration screen will be displayed. If not, press the **New** button to start a new Flow®.
5. On the new Flow® screen, select **Installation** from the **Type** drop-down and select the newly downloaded Flow® profile from the **Profile** drop-down.
6. Select **Let's Go** to start testing. The order and results message of each Locator will reflect the configurations of the Flow® profile as configured on the R-Server.

Platform Functions

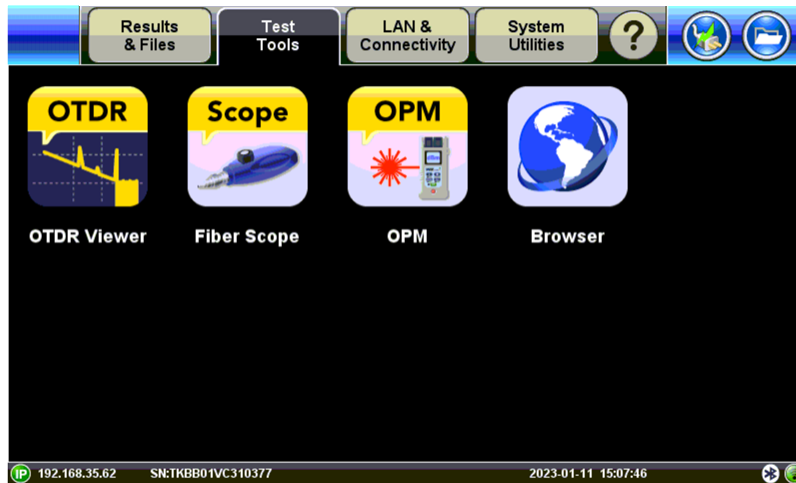
To access platform functions tap on tools icon .



System Utilities



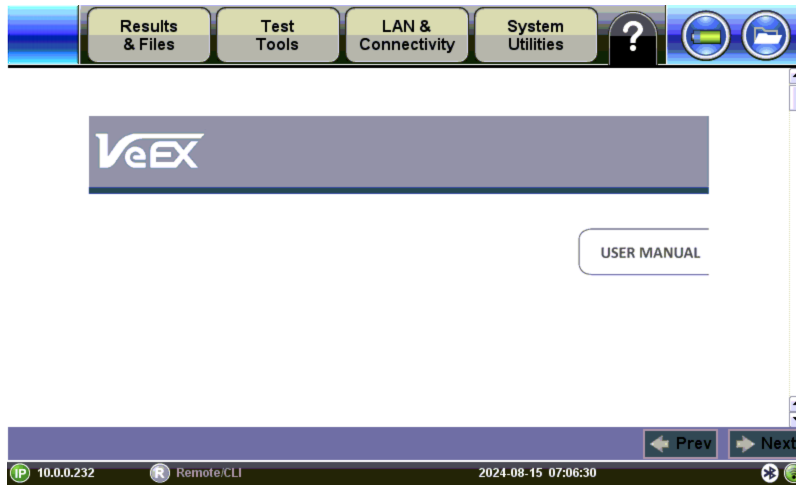
LAN & Connectivity



Test Tools

Results & Files							
Test Tools							
LAN & Connectivity							
System Utilities							
?							
Column Show All Advanced							
☐	Name	Mode	Test	Port	Date	Type	
☐	qqq	OTDR	SCOPE	Cable	2023-01-11 10:58:26	SCOPE	  
☐	eee	OTDR	SCOPE	Cable	2023-01-11 11:32:58	SCOPE	  
☐	default	OTDR	SCOPE	Cable	2023-01-10 21:28:23	SCOPE	  
☐	default	OTDR	SCOPE	456	2023-01-10 21:34:34	SCOPE	  
☐	default	OTDR	SCOPE	123	2023-01-10 21:34:17	SCOPE	  
☐	default	OTDR	SCOPE	Cable	2023-01-10 21:31:56	SCOPE	  
☐	autosave	GPON	G-PON		2023-01-10 21:27:34	Profile	  
☐	www	GPON	OPM		2023-01-11 11:20:58	Result	  

Results & Files



Guides and Manual



Results & Files

File Manager

☐	Name	Mode	Test	Port	Date	Type			
☐	001-Trace	OTDR	SORS	Cable	2023-01-14 10:03:44	PDF+sors			
☐	demo_deadZone	OTDR	SORS	Demo_Cable	2023-01-14 09:31:51	SOR			
☐	demo_Pulse1mks	OTDR	SORS	Demo_Cable	2023-01-14 09:31:49	SOR			
☐	demo_PON	OTDR	SORS	Demo_Cable	2023-01-14 09:31:47	SOR			
☐	demo_1u	OTDR	SORS	Demo_Cable	2023-01-14 09:31:44	SOR			
☐	demo	OTDR	SORS	Demo_Cable	2023-01-14 09:31:53	SOR			
☐	default	OTDR	SCOPE	Cable	2023-01-14 10:08:17	SCOPE			
☐	default	OTDR	SCOPE	123	2023-01-14 09:29:22	SCOPE			
☐	autosave	GPON	G.PON		2023-01-17 02:16:12	Profile			

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PDF [Navigation Icons]

192.168.33.108 SN:TKBB01VC310377 2023-01-17 05:36:22

Results & Files: File Management

The **Results & Files** tab displays files stored in the test set, including profiles, test results, and screen shots. When managing files, use the check box ☒ to select the desired file(s). The File Management system offers backup **To USB** and restore **From USB** functions to preserve user data.

Test Results

To access the test results stored in the test set:

1. Select the **Results & Files** tab. The **File Management** screen is displayed.
2. Select the desired results file to open the test report.

To navigate the test results report, use the links in its Table of Contents and the right rocker switch to scroll Up and Down. Refer to ["OTDR Screen Navigation" on page 32](#).

For more information about Test Reports, see ["OTDR Test Reports" on page 157](#).

Working with Saved Results, Profiles, Images

All test results and files stored on test set.

Tap the column header to sort by that criterion.

Select a file to display it.

Select a file and tap PDF to export the file to PDF.

Import and Export file to USB stick.

Export file to device via Bluetooth.

Return view to files on test unit.

Display files on USB stick.

Column: Filter results by column.
Show All: Display all results.
Advanced: Filter by criteria (JobID, Prefix, Name, etc.)

QR: Transfer results to mobile device via NoApp QR code.
Paper/Pen: Rename file.
Lock: Lock/Unlock file so it cannot be changed or deleted.
Trashcan: Delete file.

Navigate to next page of files.

☐	Name	Mode	Test	Port	Date	Type			
☐	001-Trace	OTDR	SORS	Cable	2023-01-14 10:03:44	PDF+sors			
☐	demo_deadZone	OTDR	SORS	Demo_Cable	2023-01-14 09:31:51	SOR			
☐	demo_PulseTrkms	OTDR	SORS	Demo_Cable	2023-01-14 09:31:49	SOR			
☐	demo_PON	OTDR	SORS	Demo_Cable	2023-01-14 09:31:47	SOR			
☐	demo_fu	OTDR	SORS	Demo_Cable	2023-01-14 09:31:44	SOR			
☐	demo	OTDR	SORS	Demo_Cable	2023-01-14 09:31:53	SOR			
☐	default	OTDR	SCOPE	Cable	2023-01-14 10:08:17	SCOPE			
☐	default	OTDR	SCOPE	123	2023-01-14 09:29:22	SCOPE			
☐	autosave	GPON	G-PON		2023-01-17 02:16:12	Profile			

Page 1 / 3

PDF

192.168.33.108 SN:TKBB01V 310377 2023.01.17 05:36:22

File types include:

- OTDR traces saved as SOR files.
- Fiberscope images saved as PNG files.
- OPM results saved as text/xml files.

Access the File Manager by selecting **Results & Files**. Files can be viewed, edited, or exported to a USB dongle, Windows PC, SD card, or a PDF file (using a FAT32 USB Memory stick). Use the check box ☒ to select the desired file(s) or choose all files by selecting the check box in the top header row.

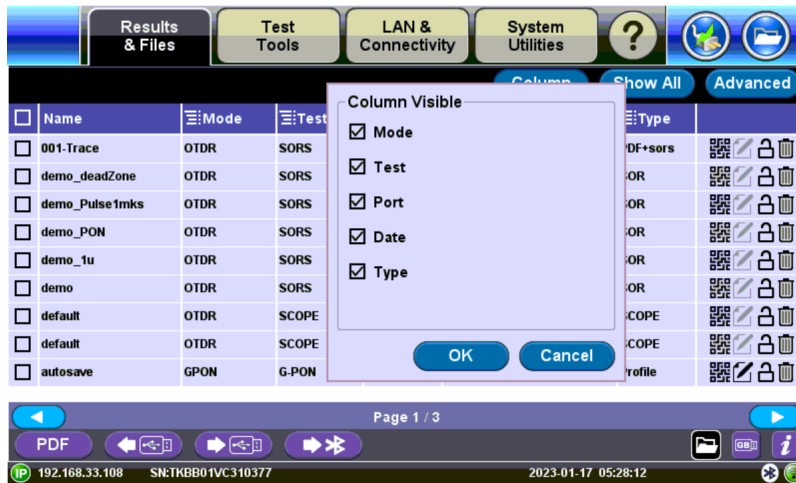
Table Sorting

Tap a column header to sort the table in ascending or descending order by the column selected.

Tap the list icon  in the column header row to filter for specific test results stored on the unit.

At the top of the screen, tap the blue buttons for view options.

- Column** Select columns to make visible.
- Show All** Displays all records.
- Advanced** Search for specific file(s) using advanced search terms.



Selecting columns to make visible

Viewing and Managing Files

Use the options at the bottom of the screen to manage selected file(s).

Tap the file to open and display it.

-  Navigates right and left to view all files.
-  Closes the current test report and goes back to the File Manager.
-  Exports the selected test report to mobile device via QR Code. Results that do not support QR codes will display a "Result not supported." message.
-  Deletes all unlocked test reports that are selected with checkmarks.
-  Renames the selected test report (one).
-  Unlocks or Locks test reports. Locked reports are identified by a red padlock icon. Locked test reports cannot be deleted or renamed.
-  Generates a PDF copy of the test report and stores it in an attached USB memory stick (required) for distribution (e.g., via email).
-  Imports (restores) all test results, test profiles and screenshots stored in an attached USB Memory Stick. The included On-The-Go (OTG) micro-B USB to USB-A adapter cable is required for the USB memory stick.
-  Exports (backup) all selected test results, test profiles and screenshots stored to an attached USB Memory Stick. The included On-The-Go (OTG) micro-B USB to USB-A adapter cable is required for the USB memory stick.
-  Transfers selected test results, test profiles and screenshot files to a paired Bluetooth® smartphone, tablet or PC.

Enabling To USB and From USB Functions

1. Insert a USB Memory stick (FAT32 file format) into a USB port on the side of the unit.
2. Wait for the USB memory to be detected. After the unit detects the USB memory stick, files can be downloaded to or restored from USB. See ["USB Memory Browser" on page 186](#) for details about using a USB memory stick with the test set.

Downloading Files To USB

1. Select the test results, test profiles, screen capture files to be saved. For a full backup, tap the check box in the top header row to select all files.
2. At the bottom of the screen, tap the **To USB** button  to initiate the file transfer procedure and wait for the progress bar to finish. Original files won't be deleted from the test set. Each file is saved into it's own folder using the "MyVeEX" tree directory format.
3. When all files have been copied to the USB, tap the folder icon (top-right corner)  or tap  to make sure all cached data is transferred to the USB drive, especially when transferring small files.

Exporting Files to Mobile Devices via Bluetooth



Applies to test sets with optional built-in Bluetooth or compatible Bluetooth USB dongle attached.

1. Select the test results, test profiles, screen capture files to be exported. For a full backup, tap the check box in the top header row to select all files.
2. At the bottom of the screen, tap . The test set scans for Bluetooth devices automatically.
3. After pairing the device, tap **Send** to export the selected files. Original files won't be deleted from the test set. Each file is saved into it's own folder using the "MyVeEX" tree directory format.

Exporting Results to PDF

1. Select the test result files to be exported.
2. At the bottom of the screen, tap **PDF**. A "PDF file will be generated to USB disk" message appears.
3. Tap **Yes**.



Alternatively, when saving results, select the **Enable+Report (pdf)** or **Enabled+V-Scout+Report** options. The PDF report will appear in the File Manager list.

Transferring Results to Phone/Tablet via NoApp® QR Code

VeEX's NoApp® (US Patent 12,190,199)*¹ uses NFC and QR code technologies to process and consolidate test results data, from small meters to more advanced test sets, efficiently as part of our vision to streamline workflow and reporting.



Test Results QR Transfer and Report Generation

Once the test report is displayed, company information, logo, job ID, geolocation, comments, picture, other test results, etc. can be added. The test results can also be uploaded directly to the centralized/cloud server (for R-Server subscribers). PDFs can also be generated and results shared using email or SMS.

¹*This product is protected under U.S. Patent No. 12,190,199 and may be covered by additional patents. Any unauthorized reproduction, sale, or distribution is strictly prohibited and may result in legal action.

Multiple tests reports, from the same or different testers, can be combined into a single report. For example, a PON Internet access activation may require some optical power measurements at the drop, an optical fault locator measurement to verify the length of the drop, a PON signal analysis test, and an Internet speed test to verify the QoE. Since they all belong to the same job, with NoApp, they can be assembled and filed on a single comprehensive report.



QR Code generation must be enabled on the test set and mobile device, or it can be launched later, from the File Manager by tapping on the QR icon. QR Result generation is only supported by some test applications.

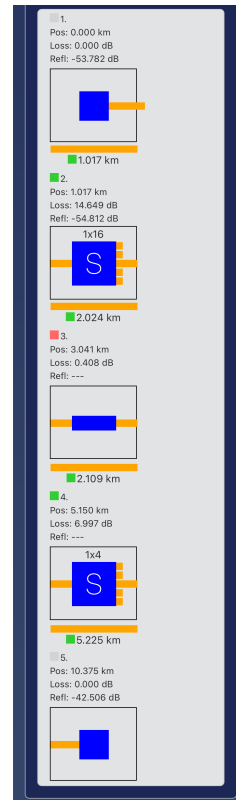
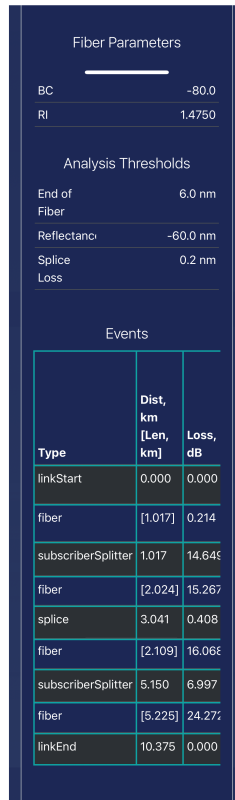
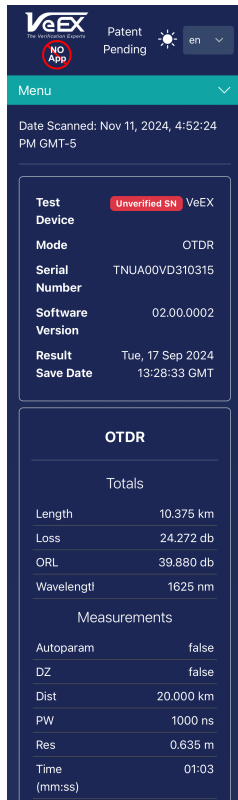
To transfer results to mobile device:

1. On the **Results & Files** tab, select the test results to view.
2. Tap . The QR transfer screen displays. Results that do not support QR codes will display a "Result not supported" message.
3. Using the mobile device's camera, focus on the **QR code** and tap it. The results appear in the browser.



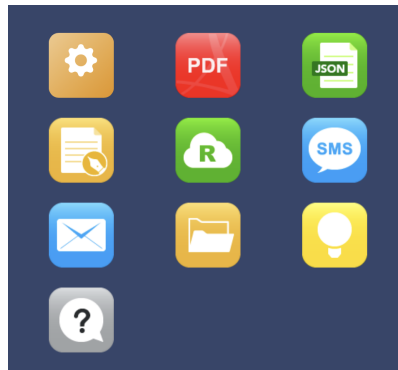
Viewing Results on Phone

After transferring results to a mobile device via the QR reader, the browser launches automatically and displays them.



The top of the screen shows the device type, mode, serial number, and software version, and the date results were saved on the device.

Export options appear at the bottom on the screen. Alternatively, tap the **Menu** drop-down menu to view the options.



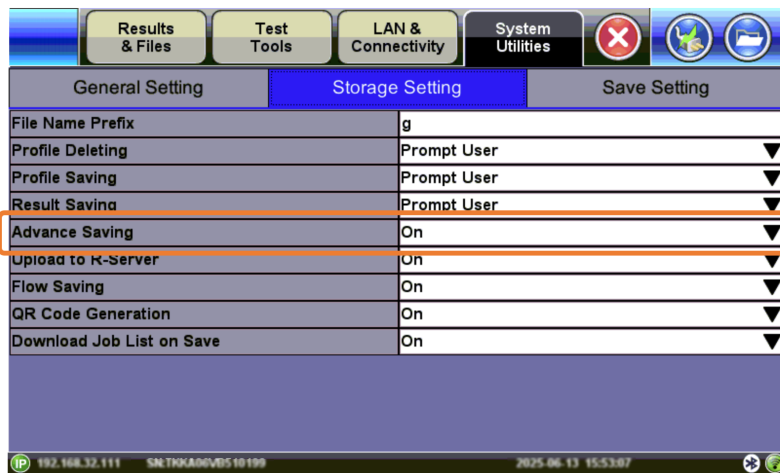
Results - Mobile View Export Options



Adds/Removes location (GPS coordinates) from results report; customize report with logo.

-  Generates complete report in PDF format, which can be shared with the customer (subscriber) or emailed to a supervisor.
-  Exports to JSON format, for third-party integration or processing.
-  Adds extra job-related information to the report (e.g., Job ID, tech's information, comments, pictures, etc.).
-  Uploads results to R-Server (for R-Server users).
-  Texts results via SMS protocol.
-  Emails current test report.
-  Creates a new project for results so multiple test results, from the same or different test sets, can be combined into a single job report.
-  Opens knowledge base.
-  Opens documentation resources for test set.

Advanced Saving of Test Results



Prepend Test Result Filenames

To add information to test results filenames:

1. Press , then press  on the top left of the screen.
2. Select the **System Utilities** tab, then select **Global Settings**.

3. Select the **Storage Setting** tab and set **Advance Saving** to **ON**.

USB Memory Browser



Use an USB-A OTG cable (optional with purchase) to connect a USB to the micro-B USB port. The port supports memory drives and USB add-on devices such as fiberscopes.



The File Manager provides basic USB memory stick management tools to browse and manage files without the need of a PC. If needed, use the micro-B USB to USB-A adapter to connect to the USB memory stick.



Shows the test results, test profiles, protocol PCAP and screen shot files stored on the test set.



Displays files on USB memory stick.



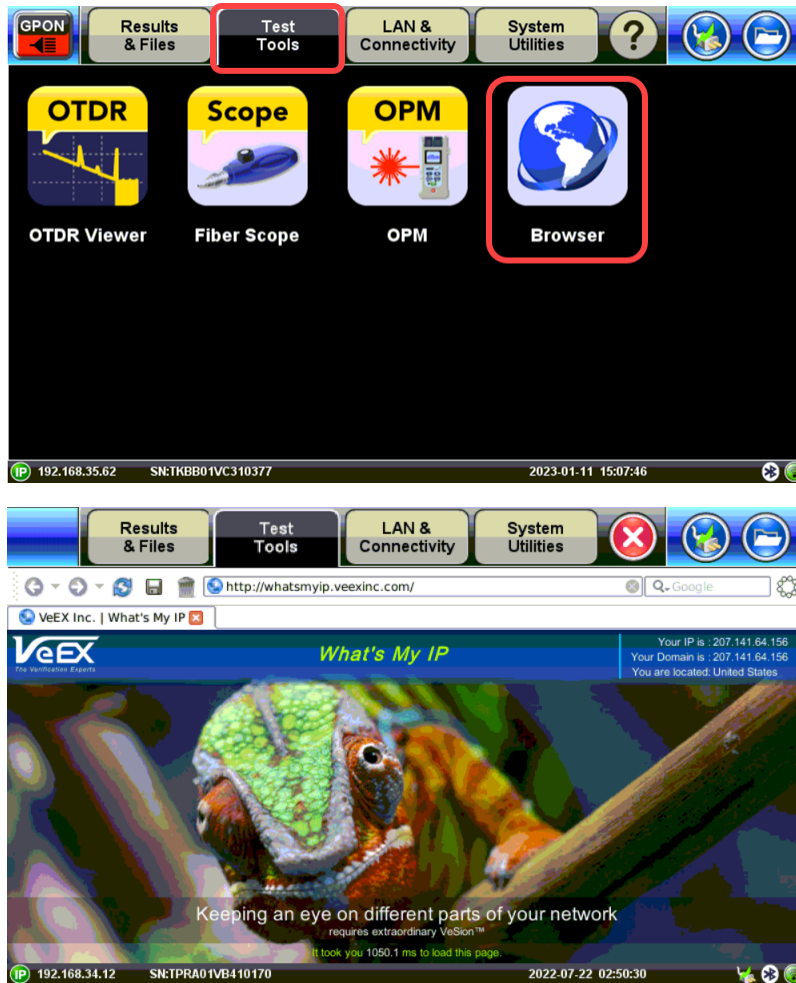
Displays space used/available on internal SD card.

Test Tools

Web Browser

A web browser is available in the **Test Tools > Browser** menu and can be used to quickly verify Internet connectivity.

The built-in web browser uses the management port IP connection. An active IP connection can be established either through Ethernet or Wi-Fi. The web browser defaults to VeEX's test website. Use the Web browser's navigation bar to enter the name of the website you wish to reach. Navigation capabilities may be limited.



Browser

LAN & Connectivity

LAN (USB OTG Adapter)

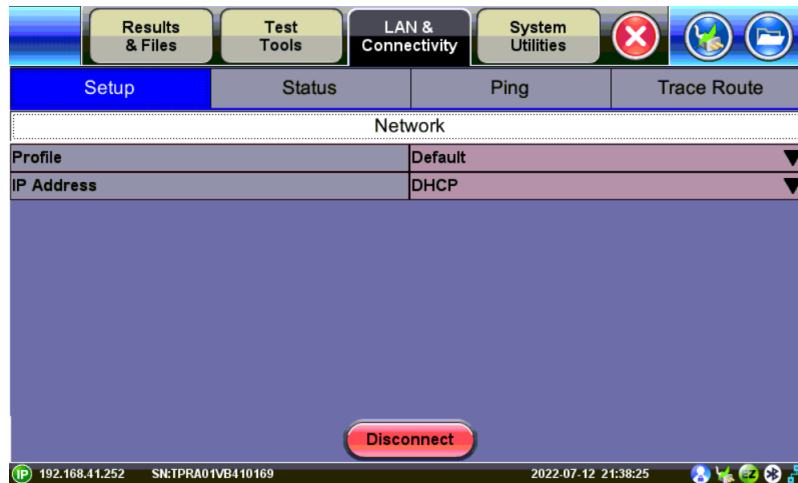
The LAN port, also known as Management Port, is used by the test platform functions, to communicate with remote clients, Internet, cloud applications and run some basic connectivity tests. Network parameters must be configured prior to performing any connection dependent measurements. An IP connection needs to be established in order to perform a Ping or Trace Route test. An (optional) external USB OTG to 10/100BASE-T adapter is required for LAN connection.

You can access the management port configuration on the **LAN & Connectivity > LAN(OTG)** menu.



Setup

Network configuration settings are available in the **Setup** menu.



Setup

By default, the IP configuration is set to DHCP and the unit will automatically attempt to connect. Additional fields will vary depending on Static or DHCP connection:

- **Profile:** Default, Delete, Save, Save as..., Default, or Last configuration
- **IP Address:** Select from Static or DHCP
 - **Static:** If Static is selected, enter the Local IP, Gateway address (if Gateway and DNS are set to Enable), and Subnet. All Static fields can be filled by tapping on the section to access an alphanumeric keypad.
 - **DHCP:** If DHCP is selected, the unit will obtain IP address parameters from the DHCP server
- **Local IP:** IP address of the test set
- **Subnet:** Enter the subnet mask
- **Gateway and DNS:** ON or OFF
 - **ON:** If enabled, enter the IP address of the Gateway and DNS server in Static mode, or use the IP address provided by the DHCP server in DHCP mode



If DNS is set to Primary or Primary & Secondary, a DNS IP is required in order to use the

URL as a destination.

- **OFF:** If disabled, no Gateway or DNS server will be used for the tests

Enter all parameters then press **Connect** to start the test.

IP Connection Status

Ensure the Status is **PASS** before continuing with any IP tests. If the connection fails, go back to the setup screen to verify that the parameters are entered correctly. Verify that the Ethernet cable is properly connected on the management port on the left hand side of the unit.

Setup	Status	Ping	Trace Route
Local IP	192.168.34.235		
Subnet Mask	255.255.252.0		
Gateway	192.168.32.3		
DNS IP	192.168.32.3	Second IP	9.9.9.9
IP:	PASS		
Gateway	PASS		
DHCP:	PASS		
DNS1:	PASS		
DNS2:	PASS		

Disconnect

192.168.34.235 SN:TPRA01VB410471 2022-08-19 11:32:50

Status

- **DHCP:** PASS indicates that an IP address has successfully been assigned.
- **IP:** PASS indicates that the IP address assigned has been verified to be unique in the network.
- **Gateway:** PASS indicates that the gateway IP address is valid.
- **DNS:** PASS indicates that the DNS IP address is valid.

Ping Testing

The Ping Result provides the number of Sent, Received, Unreach, Missing, and the Round Trip delay.

Ping is a popular computer network tool used to test whether a particular host is reachable across an IP network. A ping is performed by sending an echo request or ICMP (Internet Control Message Protocol) to the echo response replies.

Setup		Result	
Profile	Default		
Destination	www.veexinc.com		
Number of Pings	☐ Continuous Ping		
	5		
Length	64	Pings/Sec	1
Time Out (ms)	1000		

Ping Setup

Ping Setup

- **Profile:** Delete, Save, Save as..., or Default.
- **Destination:** Press the drop -down menu and enter the destination IP address or URL to ping.
- **Number of Pings:** Enter the number of ping attempts (up to 10000) that will be performed to reach the network device.



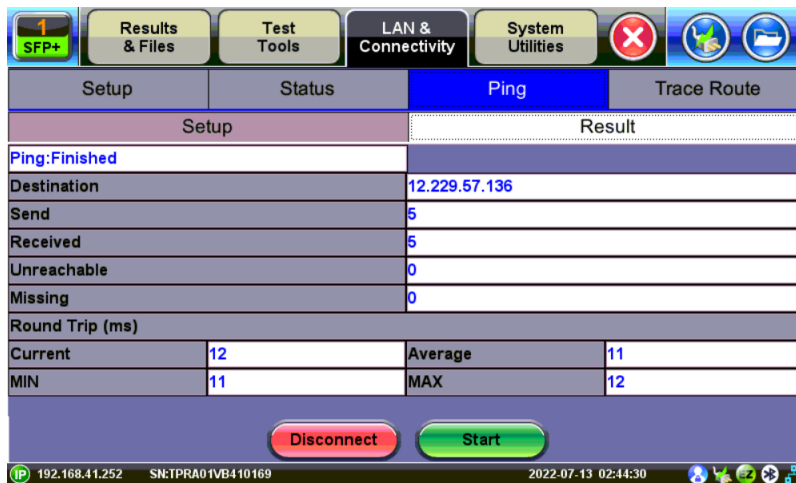
*If Continuous Ping is selected, the user is not required to enter the number of pings. The test set will continuously ping the target host until the user presses **Stop**.*

- **Length:** Enter the length of the ICMP echo request packet transmitted.
- **Ping/Sec:** Enter the Ping repetition rate (Ping/second).
- **Time Out:** Time-to-Live (TTL) in milliseconds. Enter the maximum time allowed (in ms, up to 99999 ms) between an ICMP ping and echo response.

Once the parameters are configured, press **Start** to begin the test.

Ping Results

Pressing Ping will take you to the **Result** tab and start the Ping test.



Ping Result

- **Destination:** Indicates the destination IP address.
- **Ping status:** In Progress, PASS, or FAIL.
- **Sent, Received, Unreach, Missing:** Number of pings sent, received, unreachable or missing. A Ping is counted missing if no response is received before timeout. A Ping is counted unreachable if an echo response is received with host unreachable set.
- PING also estimates the round-trip time in milliseconds.
 - **Current:** The current time for a Ping request to be answered.
 - **Average:** The average time recorded for a Ping request to be answered.
 - **Max:** The maximum time recorded for a Ping request to be answered.
 - **Min:** The minimum time recorded for a Ping request to be answered.

Trace Route

Trace Route is a common method used to find the route to the destination IP address or URL. It is often used to identify routing problems and unreachable destinations. All the remote IP addresses and their response times are displayed indicating possible network congestion points.

The screenshot shows a software interface for configuring a trace route. At the top, there are tabs for 'Results & Files', 'Test Tools', 'LAN & Connectivity', and 'System Utilities'. Below these are sub-tabs for 'Setup', 'Status', 'Ping', and 'Trace Route'. The 'Setup' sub-tab is active, showing a configuration table. The table has two columns: 'Setup' and 'Results'. The 'Setup' column contains fields for 'Profile', 'Destination', 'Time Out (ms)', and 'Max Hop'. The 'Results' column is currently empty. At the bottom of the window, there are 'Disconnect' and 'Start' buttons. The status bar at the very bottom displays the IP address '192.168.41.252', the serial number 'SN:TPRA01VB410169', and the date and time '2022-07-13 02:49:45'.

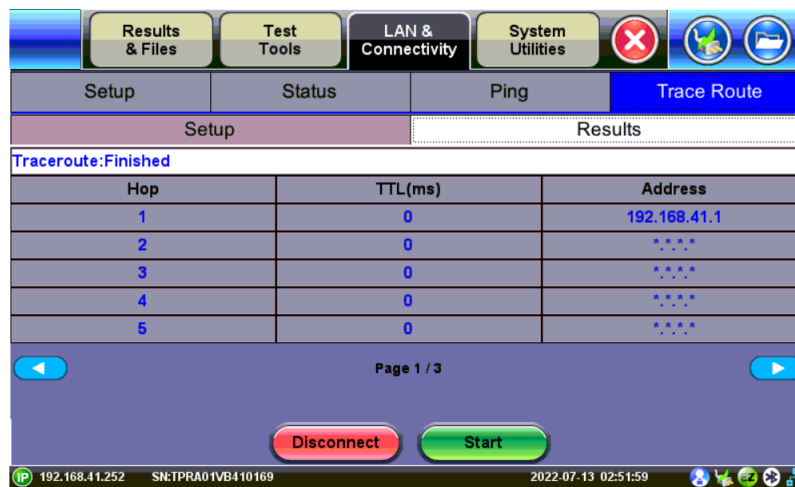
Setup	Results
Profile	Default
Destination	www.veexinc.com
Time Out (ms)	5
Max Hop	10

Trace Route - Setup

Trace Route Setup

- **Profile:** Delete, Save, Save as..., Default. Select Default to recall a trace route file or create a new test.
- **Destination:** Enter the IP address or URL of the network device to be detected.
- **Time Out:** Enter the maximum time allowed between an ICMP echo and response at each hop.
- **Max Hop:** Enter the maximum number of network devices the packet is allowed to transit.

Once the parameters are configured, press **Start** to begin the test.



Trace Route - Results

Results

- **Hop:** Order of the routers on the route.
- **TTL:** Time to reach each router on the route.
- **Address:** Address of each router on the route.



If there is no response from a particular hop, an asterisk will be displayed.

Bluetooth/WiFi Wiz

Bluetooth

Built-in Bluetooth support offers wireless connectivity up to 10 meters (30 feet), providing an untethered connection between the tester and other Bluetooth compatible devices such as a PCs and smart phones, enabling users to transfer test results and other files.

A **Bluetooth** icon  displayed on screen indicates the Bluetooth connectivity status. A grey icon indicates no Bluetooth connectivity, while a green icon indicates a successful Bluetooth connection.



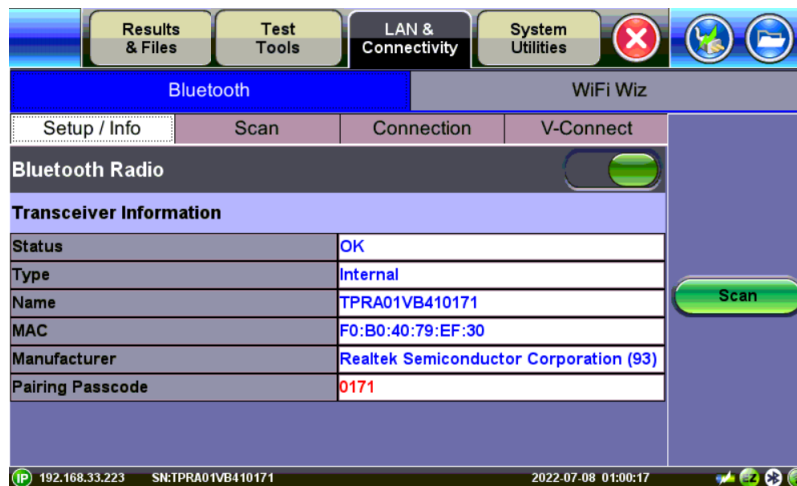
Bluetooth Adaptors - Compatibility

Not all Bluetooth adaptors on the market are supported. Please use adaptors that have been tested and supplied by VeEX only to ensure compatibility and correct operation.

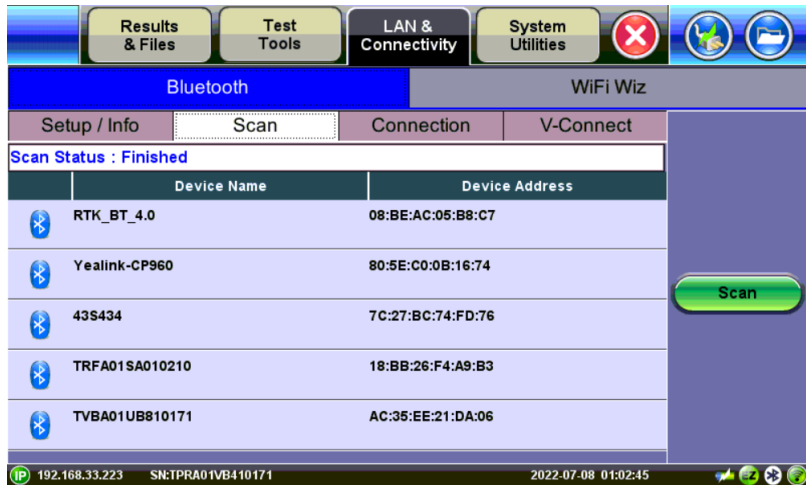
Setup/Info

Bluetooth details will be displayed including the MAC address of the device and the last 4 digits of the test set serial #. The last 4 digits of the test set will be the pairing code between the unit and the external device.

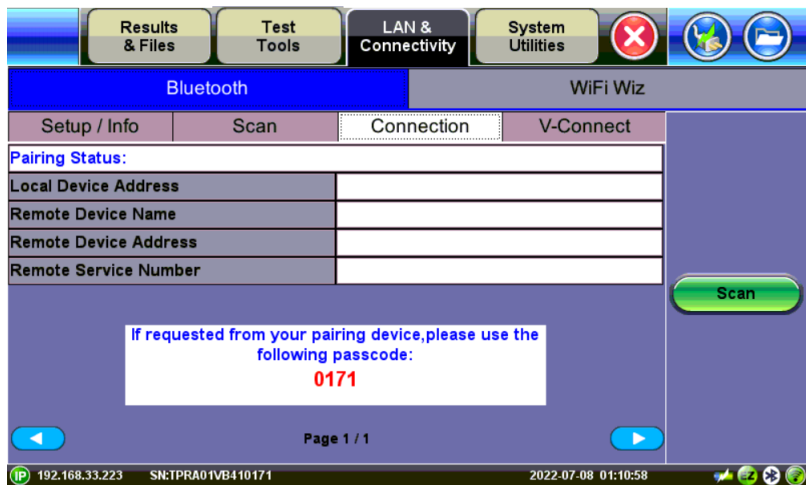
To turn on/off built-in Bluetooth on the test unit, use the **Bluetooth Radio** toggle switch.



Bluetooth Setup/Info



Scan



Bluetooth - Connection - Passcode

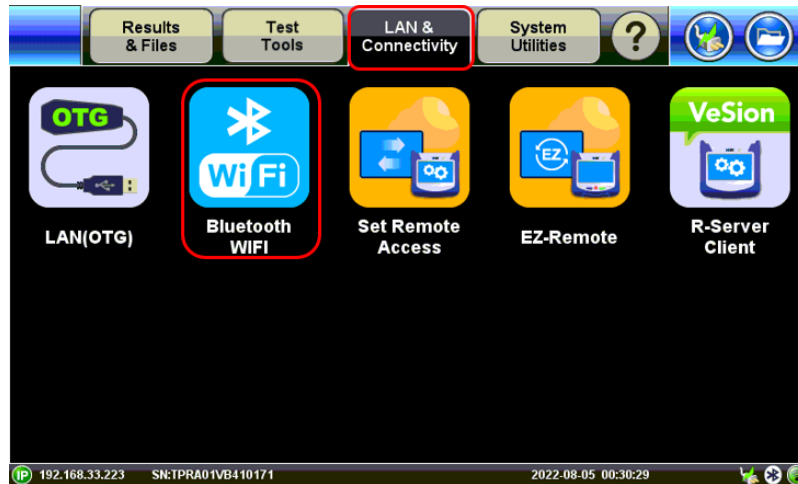


V-Connect/VxConnect

Bluetooth Setup

1. Press **Scan** to check for available Bluetooth devices. Once scanning is complete, a list of discovered Bluetooth devices will be listed. Please ensure the peripheral device is set to **Discoverable** during Scanning and Pairing operation.
2. Press **Pair BT** to begin the pairing process. During the pairing operation, you will be prompted to enter a code on the peripheral device (PC or Mobile Phone) in order to pair successfully. Enter the last 4 digits of the test set's serial number as shown in the **Connection** tab.
3. Once paired, click the **Services** button at the bottom of the screen to check the service attributes. To upload test results via Bluetooth, full data upload service will be required.

Wi-Fi Wiz



The Bluetooth/Wi-Fi option is available as an optional built-in feature in the test set, allowing the transfer of OTDR traces and software upgrades on the unit.



Built-in web browser remote control is available when Wi-Fi is enabled.



Passwords are case sensitive. If the wrong network key is entered, the test set will still connect to the Access Point but will not be able to connect to the web or perform the Ping test.

The Wi-Fi Wiz function can be used to provide Wi-Fi connectivity to the unit. Depending on the unit's model, it supports 802.11 b/g/n (2.4 GHz frequency band) connectivity or 802.11 a/b/g/n/ac (2.4 GHz and 5 GHz frequency bands) connectivity. Refer to the unit's specification sheet for details.

The Wi-Fi Wiz function supports:

- WEP, WPA, WPA2 Encryption
- Scanning
- SSID broadcasting and report
- Signal Strength
- IP Connection and Ping Test

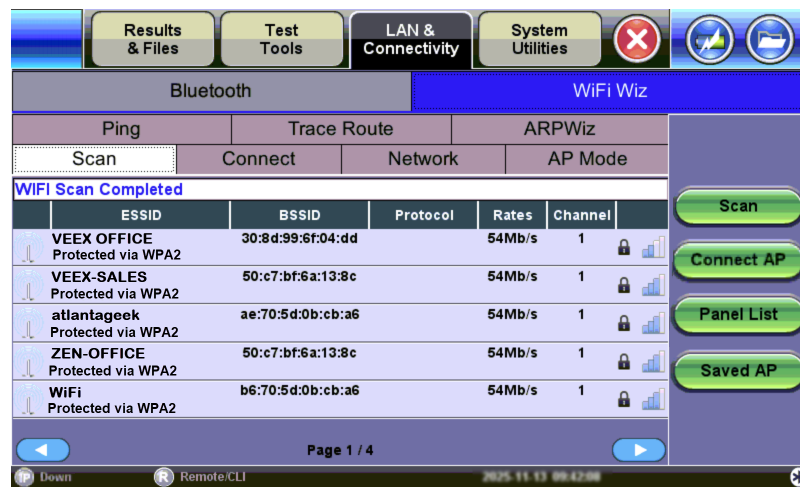
Wi-Fi Procedure

If using an adapter, plug the Wi-Fi adapter into the USB port. Allow at least 30-45 seconds for the unit to detect the wireless adapter and for the software driver to load.



Products support USB wireless adapters supplied by VeEX only and have the necessary software driver built into the test set.

1. To access the Wi-Fi option, tap **Tools** or press , and then tap **Bluetooth/Wi-Fi**.
2. Select the **Wi-Fi Wiz** tab.
3. Tap **Scan** to scan the list of available Wi-Fi APs.



Wi-Fi Wiz - AP List

Tapping **R-Server** will attempt to connect the test set to the R-Server Workflow and Asset Management System. See for "[R-Server](#)" on page 218 more information.

AP List

The following information is displayed for each AP:

- SSID name of the AP
- BSSID (MAC address) of the AP
- AP's radio channel number

- Lock symbol indicates if security is set on the AP (WEP, WPA or WPA2).

When the AP is unsecured, no lock symbol is displayed.

- Signal strength of the AP

4. Select one of the Access Points (AP) to start a connection. If the AP is locked, a network key is required to complete the connection. The key can either be 10 characters or 26 characters. Once selected, an **Edit Settings** function key appears.



If the wrong network key is entered, the test set will still connect to the Access Point, but will not be able to connect to the web or perform the Ping test.

5. Tap **Edit Settings** or **Connect AP** to change the Encryption Type and enter the Wi-Fi Key.

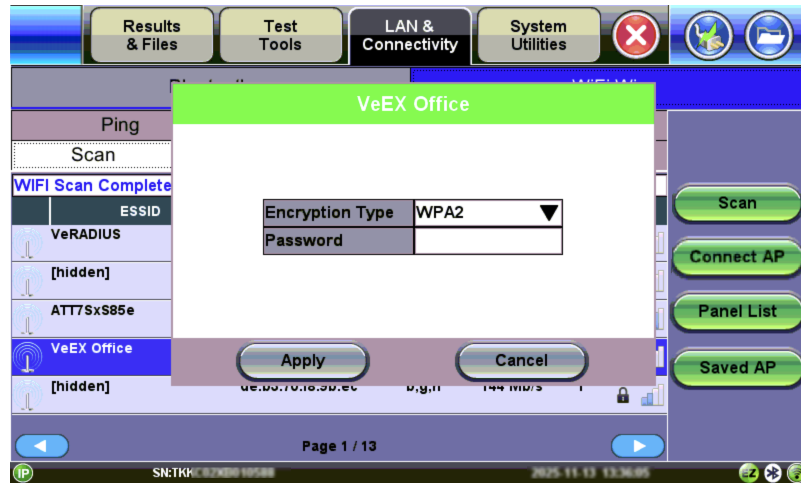
- **Encryption Type:** Supported encryption types include WEP, WPA, and WPA2.
- **Password/Key:** Security phrase or password necessary to access SSID and network. Tap the **Password** field to enter the AP password on the pop-up keypad.

- ASCII formatting supported
- The password/phrase can be hidden (**Global Settings > Show Password > Yes/No**).



*Passwords are case sensitive. For a list of saved access points, tap **Saved AP**.*

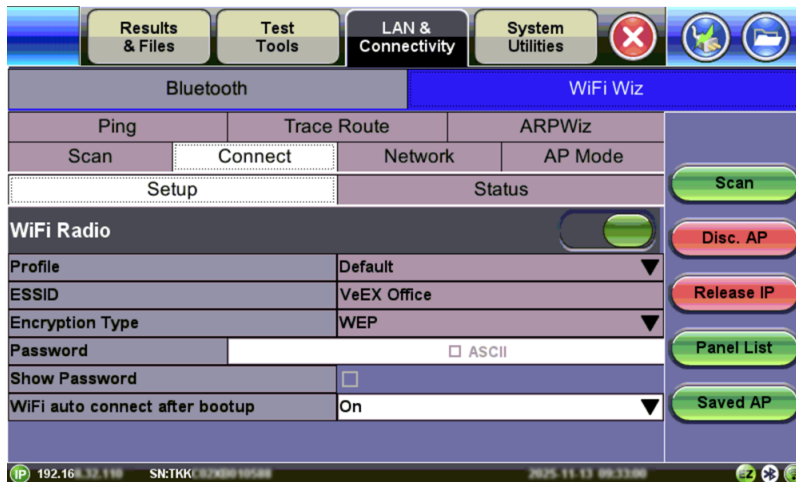
6. Tap **Apply** after selecting the Encryption Type and entering the key/password. The **Connect AP** button will change to **Disc. AP** upon successful connection and the **Connect Net** key will appear.



Wi-Fi Wiz - AP Encryption Settings

Connect

The **Setup** tab displays the Profile, ESSID, Encryption Type and Password.



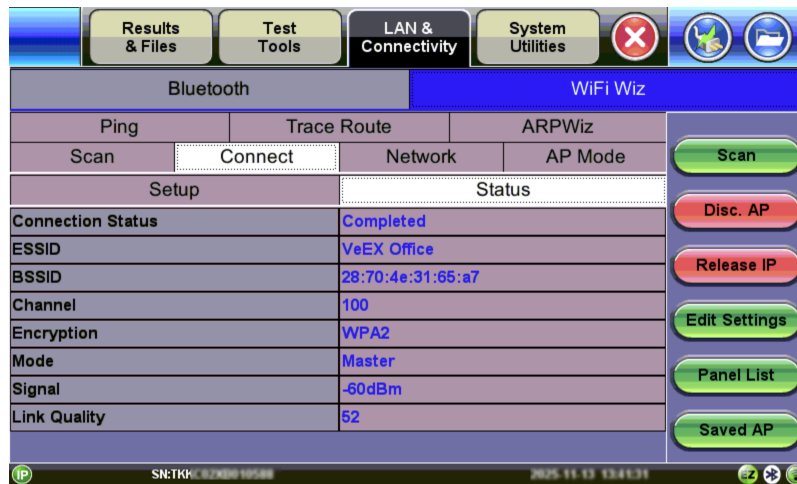
Wi-Fi Wiz Connection Setup

Status

The Status Tab displays the following information on the connection:

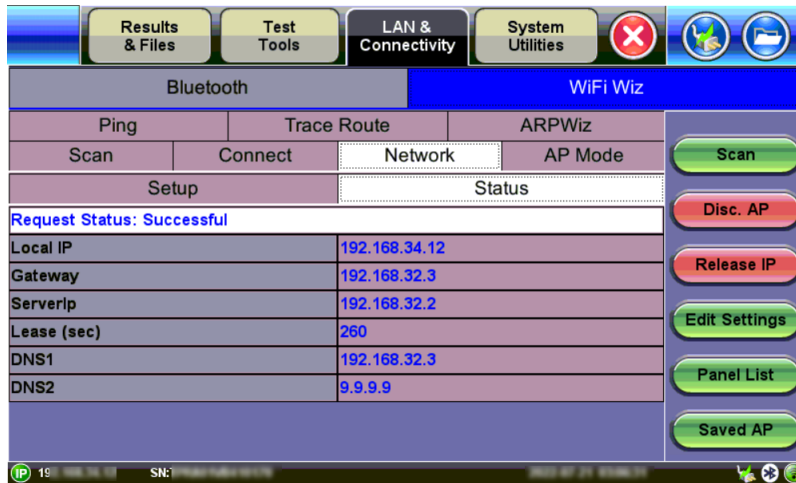
- **Connection Status**
- **ESSiD:** Name connected to
- **BSSiD:** MAC address of wireless router/device connected to

- **Channel:** Wi-Fi Channel # connected to
- **Encryption:** Encryption type
- **Mode**
- **Signal:**
 - Radio signal level (dBm)
 - Link quality score



WiFi Wiz Connection Status

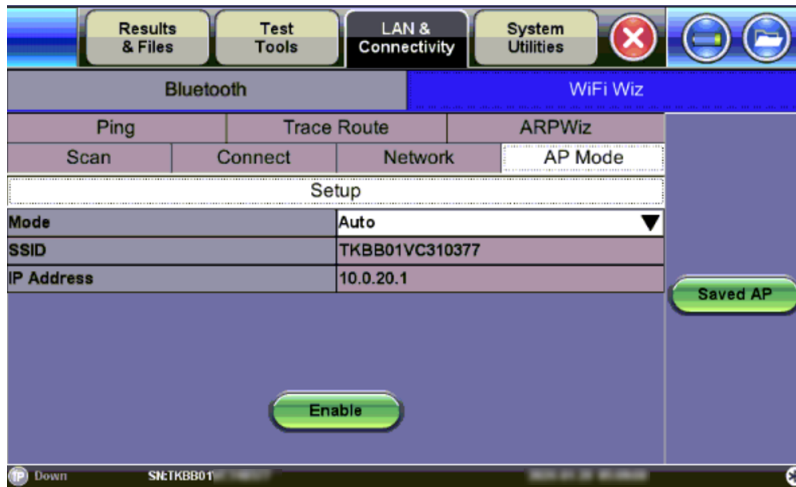
After a successful connection to the Access Point, tap **Connect IP** to obtain an IP address and access the additional IP tests like Ping, Trace Route etc.



Wi-Fi Wiz Connect IP

AP Mode

In AP Mode, the unit emulates a Wi-Fi access point/DHCP server and allows Wi-Fi Clients (PC/Phone/Tablet) to connect to the unit.



WiFi Wiz AP Mode

- **Mode:** Auto, Manual
 - Auto mode uses the default SSID and IP range
 - In Manual mode, the user can configure AP SSIDs and the IP range used by the DHCP server
- **SSID:** Displays the default SSID or the manually configured SSID used by the AP
- **IP Address:** Displays the default or manually configured IP address range used by the AP

Press **Enable** to enable AP Mode. After pressing enable, the test set will broadcast its SSID, which any Wi-Fi client device can connect to.

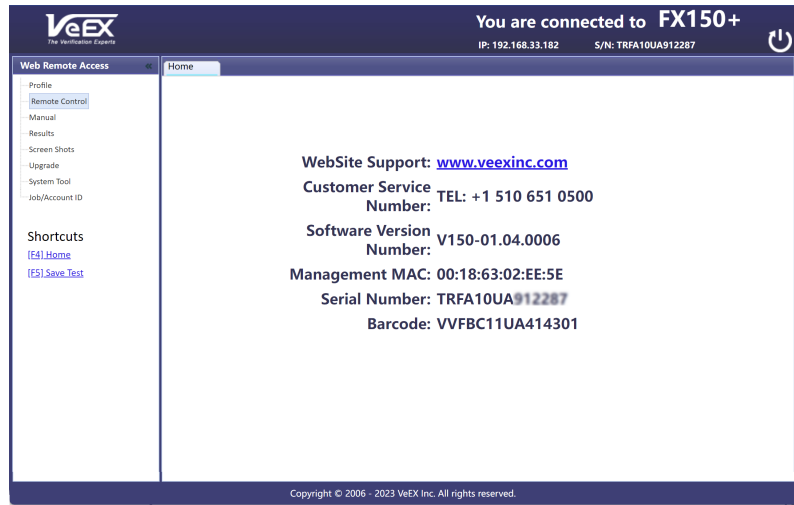
Remote Access

There are different ways to control or access the test set and the information it contains, from a local (LAN) or remote (WAN) connected PC.



The EZ Remote service provides public registration servers to help users and test sets establish remote sessions, without having to get IT departments involved. It is considered a convenient on-demand service, for quick/temporary collaboration tasks. It should not be used for long-term applications (VeEX offers other remote tools for long-term applications). Refer to "EZ Remote" on page 209 for more information.

After accessing the test set remotely, a tab will open up for each selection made, allowing for quick access to each function.



Profiles

Test Profiles are configurations saved by the user that can be retrieved and reapplied to the test set. For example, commonly used configurations and test limits/thresholds can be saved as test profiles, for different types of services.

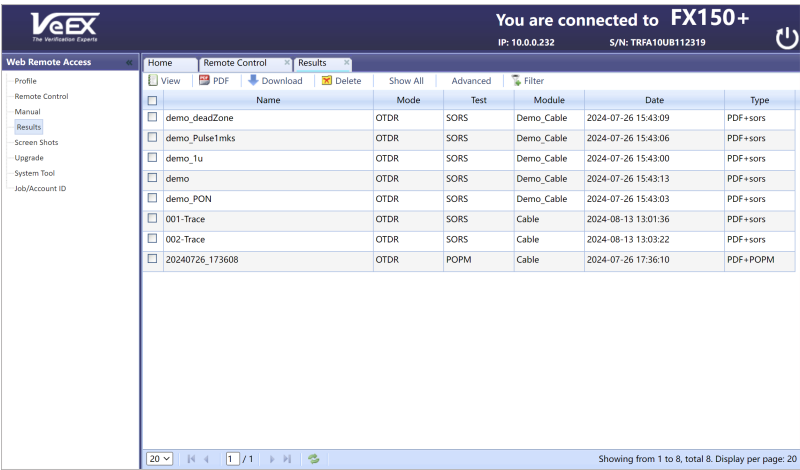
Manual

The feature provides access to the user manual that is built into the test set. In this application, the use of a local copy of the PDF file is recommended as the PDF client in the local computer is most likely faster than accessing the remote one and may offer better tools and function, including search capabilities. User manuals can be downloaded from the Product Resources page on the VeEX Inc website at resources.veexinc.com.

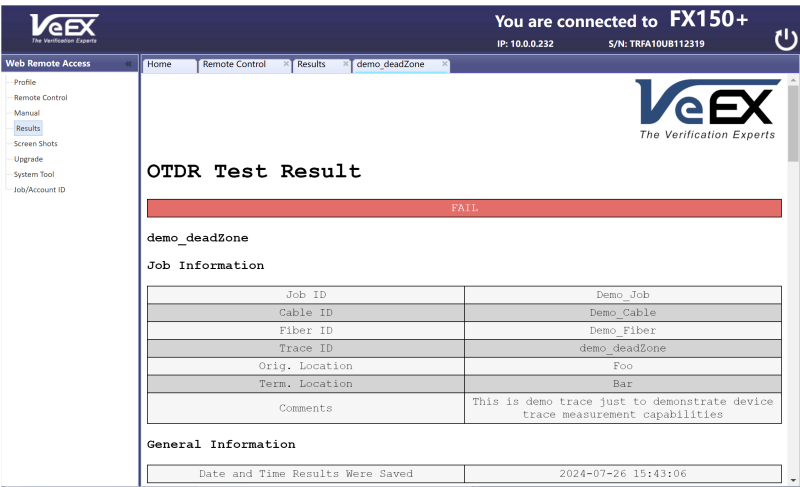
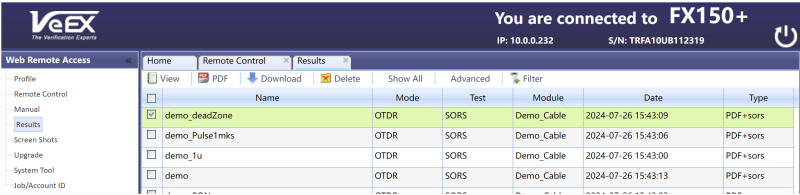
Results

Results list all the test results files currently stored in the remote test set. Users can **View**, **Rename** and **Delete** files stored in the remote test set, as well as **Download** selected files to the local computer or convert them to

PDF and download.



To open a test results file, select it from the list and tap on **View**.



Files can be downloaded by clicking on **Download** (original file format) or **PDF**.

Screen Shots

Pictures (PNG) taken of the screen can be accessed from this link and sub-tab. Pictures can be viewed or downloaded to the local computer.

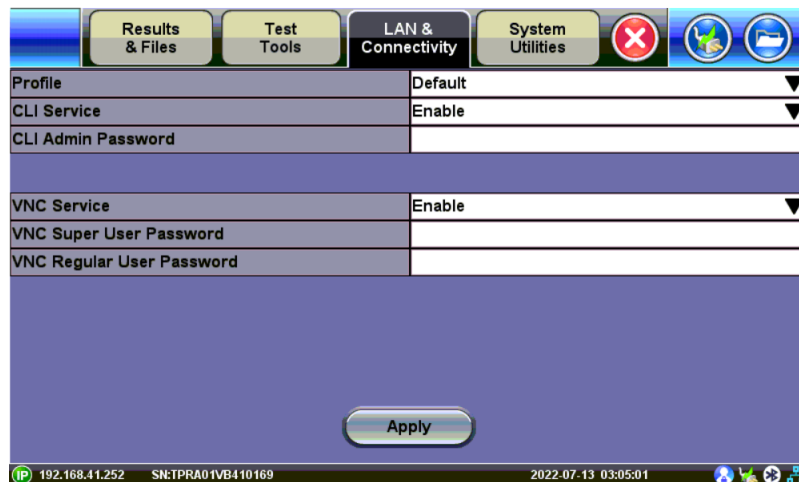
Screen captures can be made using the **Right side button +**  on the test set or from the remote computer, using the links provided or the respective F-key on the computer's keyboard.

The screen capture function can be enabled in  **>Global Settings>Save Settings**.

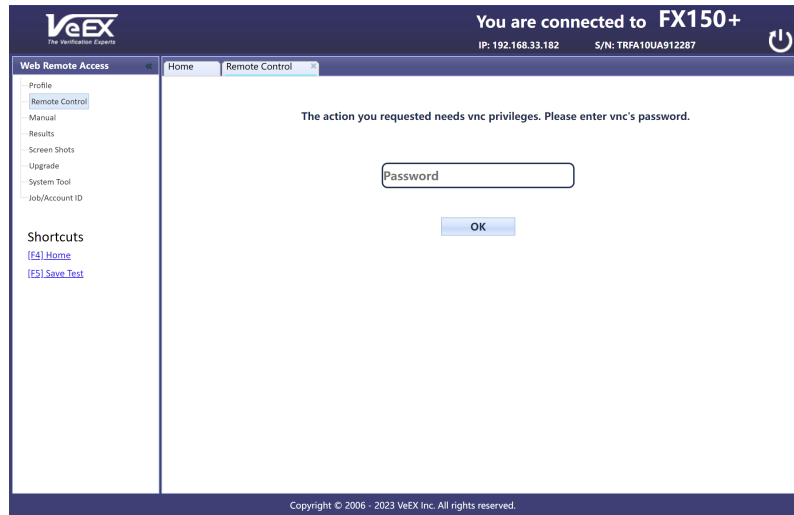
Remote Control (Screen Mirroring)

It is similar to using VNC, but in this case no VNC client installation is required. It uses standard Java-based web browser as a client. It mirrors the screen, mouse inputs and the rubber buttons available in the front panel of the test set.

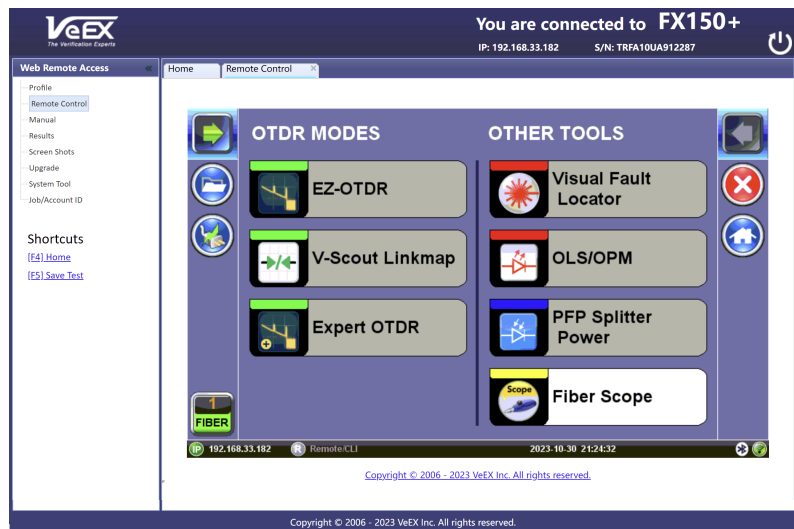
1. On the test set, select the **Remote Access** option and enter the following information:
 - **VNC Service:** Enable or disable the remote access through remote web-browser clients running on PCs, Macs or certain tablets. The web browser must support Java (tm).
 - **Web Super User Password:** Defines the password for users allowed to control the test set via standard web browser clients
 - **Web Regular User Password:** Defines the password given to users who are only allowed to view the test set current screen via standard web browser clients, but not make any changes to test or test set.



2. In a web browser, enter the test set IP address. To locate the test set local IP address, refer to ["Wi-Fi Wiz" on page 198](#).
3. Click **Remote Control** and enter the Super/Regular password when prompted for a password. Use the buttons and icons on the right to navigate the test set remotely.



Web Browser - Password Prompt



Web Browser - Remote Access

EZ Remote

The EZ Remote functionality allows users to quickly and securely connect to VeEX test sets all over the world, without the need for VPN, port forwarding or public IP addresses. This VeEX hosted service and user interface take care of all the complex tasks required, and present users with a simple application. Connect online any-time anywhere with any computer, tablet or smartphone, using standard web browser clients for screen-sharing, remote control and access to test results. Use it for remote control, collaboration, technical support or training purposes.



The basic EZ Remote service is offered by VeEX free of charge. It provides public registration servers to help users and test sets establish remote sessions, without having to get IT departments involved. All you need is internet access for the test set and a remote user. Feature location and functionality may vary from product to product.

VeEX's EZ Remote provides:

- **Remote Control** functionality to give users full control of remote test sets (screen mirroring and control).
- **Remote Access** functionality allows users to View, Download, Rename, Delete, Export and Convert results (PDF).

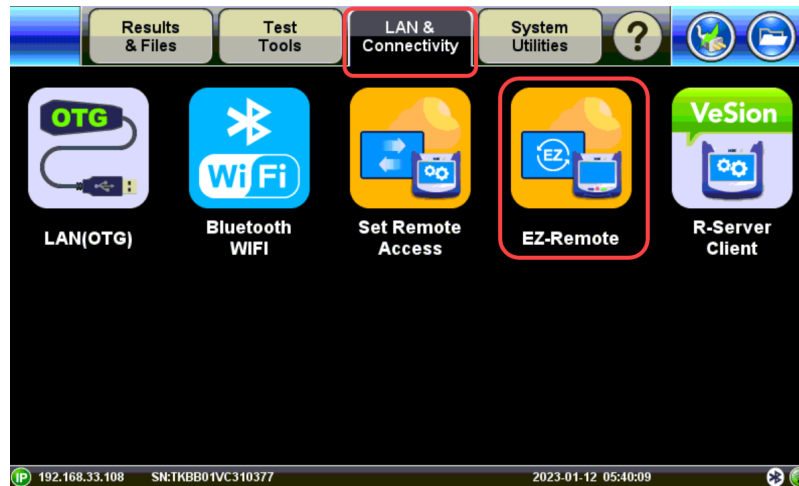


EZ Remote is considered a convenient on-demand service, for quick/temporary collaboration tasks. It should not be used for long-term applications (VeEX offers other remote tools for long-term applications).

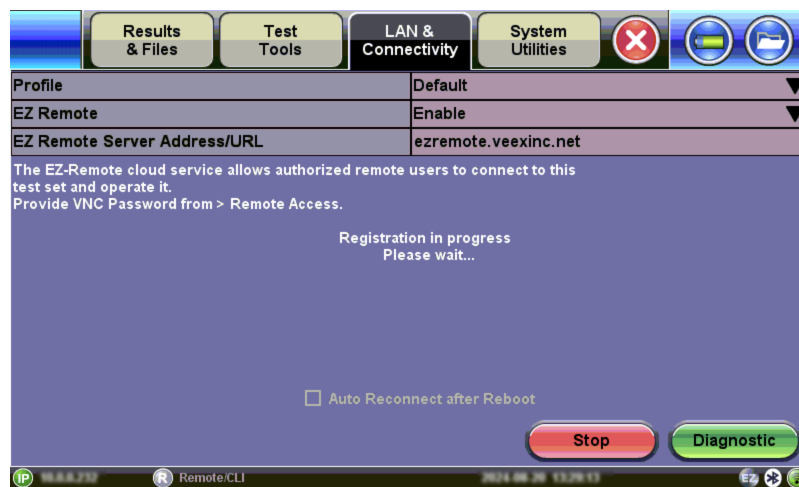
Initiate an EZ Remote Session from the Test Set

1. Use the [IP Tool](#) to connect the test set to a LAN using the RJ45 Ethernet management port (or using the micro-B USB OTG to 100BASE-T adapter), located on the side of the unit (recommended), or use [WiFi Wiz](#) to connect to a WLAN (using built-in Wi-Fi or a compatible external USB dongle). Make sure the test set gets a local IP address and that the LAN/WLAN provides access to the public internet (web).

2. Go to  > LAN & Connectivity> EZ-Remote.



3. On the EZ Remote screen, set **EZ Remote** to **Enable**, confirm the **URL** is **ezremote.veexinc.net** (without www.), and tap on **Apply** to connect and establish a session with the EZ Remote server.



4. Provide the resulting **URL** and **Session ID** or scan the QR codes to Email or SMS/Test to the intended remote user.



5. You may continue to use the test set until a remote user logs in, then both will share control over the unit. Make sure the test set remains connected to the LAN/WLAN/Internet and that the **EZ remote session indicator** at the bottom of the screen stays green.



6. When finished, use the **Stop** button to terminate the EZ Remote session and disconnect from the server.

Connect to the Remote Test Set from a Computer, Tablet or Phone

Establish a Remote Access Connection

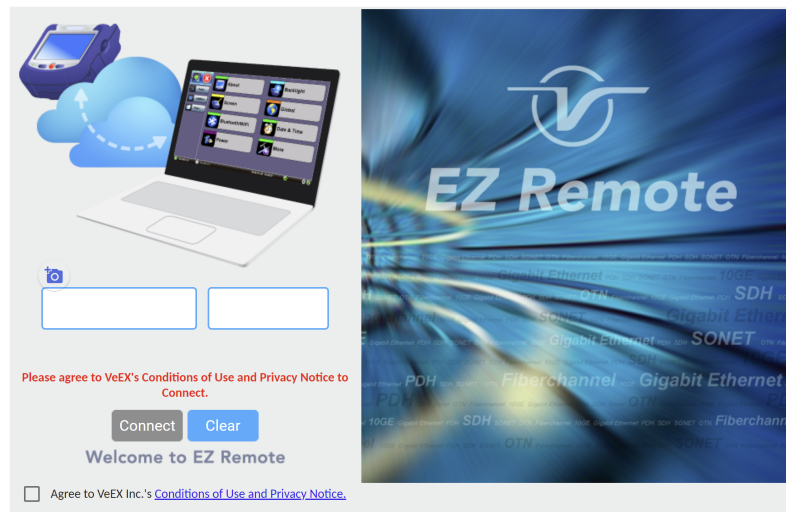
EZ Remote provides two types of services:

- **Remote Control** (screen and mouse/touch mirroring) to operate a test set from a different location.
- **Remote Platform Access** to access information stored in the remote test set, such as Test Results, Profiles, User Manual, Screen Captures (screen shots), information about the test set (Home) and its local IP address.

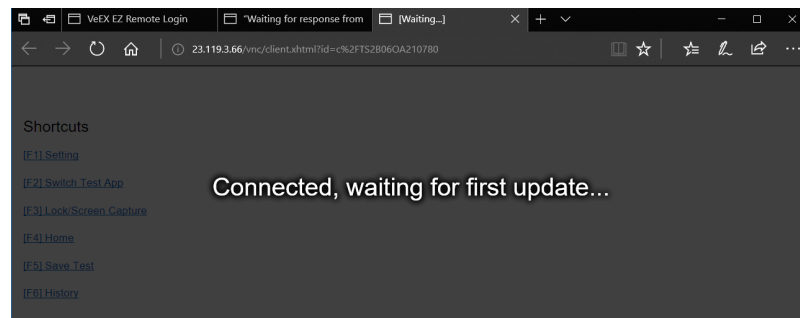


Although multiple users could simultaneously log-in to the same test set, they would be sharing the same mirrored GUI image and mouse control. This is not recommended since it is equivalent to having multiple users trying to operate one test set at the same time (also known as “mouse fight”). Nonetheless, it may be effective for training purposes with one or two extra users.

1. From a PC, Mac, Tablet or Smartphone launch an industry-standard Web Browser application and enter the URL <http://ezremote.veexinc.net> (without the www.). Enable pop-ups for your browser and be sure to authorize access to the site, if confirmation is requested by the browser or OS.
2. Enter the **Session ID** provided, making sure not to confuse zeroes (0) with Os. Click **Search** to find the target test set and establish a peer-to-peer connection.



- Once verified and connected, wait for the remote user interface to refresh. This may take a few seconds.



- Shortcut buttons are provided below the mirrored screen, allowing access to functions provided by physical buttons on the instrument, such as **Settings**, **Home**, **Save Test** results. Click or tap on the shortcut to activate it.

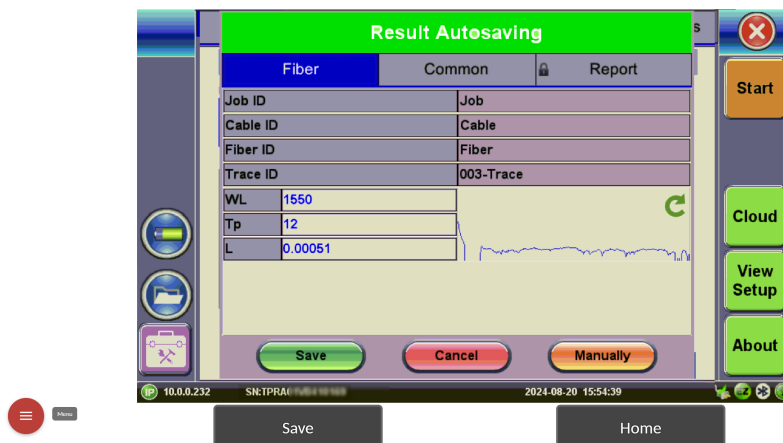


- Once the remote GUI appears, you can use the **Remote Control** tab to operate the test set in the same way you would control a local unit from its touch screen.



Save Test Results

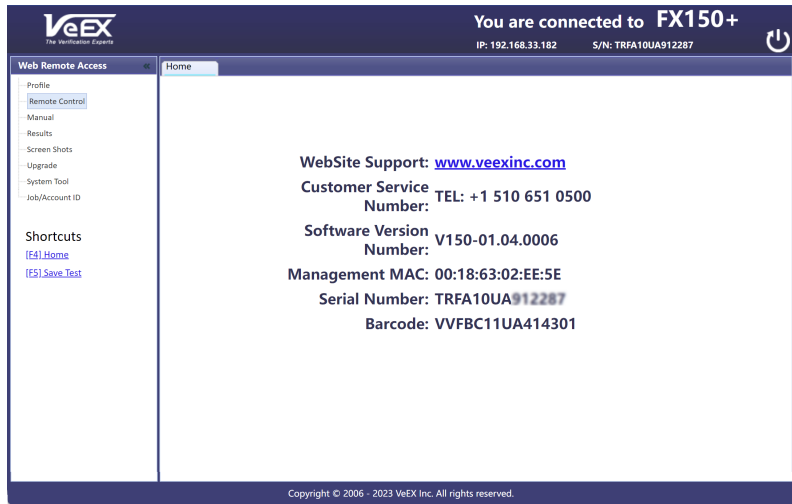
To save the results of a test, from the remote computer, press the **Save** button below the screen image. Then use the pop-up keypad and/or the PC keyboard to enter the file name and add any extra details (if [Advanced Save](#) is enabled).



Access Remote Test Result Files

The **Remote Platform Access** tab provides links to access test results, test profiles, screen shots, the user manual and other information stored in the test set.

After accessing the test set remotely, a tab will open up for each selection made, allowing for quick access to each function.



Profiles

Test Profiles are configurations saved by the user that can be retrieved and reapplied to the test set. For example, commonly used configurations and test limits/thresholds can be saved as test profiles, for different types of services.

Manual

The feature provides access to the user manual that is built into the test set. In this application, the use of a local copy of the PDF file is recommended as the PDF client in the local computer is most likely faster than accessing the remote one and may offer better tools and function, including search capabilities. User manuals can be downloaded from the Product Resources page on the VeEX Inc website at resources.veexinc.com.

Results

Results list all the test results files currently stored in the remote test set. Users can **View**, **Rename** and **Delete** files stored in the remote test set, as well as **Download** selected files to the local computer or convert them to **PDF** and download.

You are connected to **FX150+**
IP: 10.0.0.232 S/N: TRFA10UB112319

Web Remote Access

Home
Remote Control
Results

View
PDF
Download
Delete
Show All
Advanced
Filter

Name	Mode	Test	Module	Date	Type
☐ demo_deadZone	OTDR	SORS	Demo_Cable	2024-07-26 15:43:09	PDF+sors
☐ demo_Pulse1mks	OTDR	SORS	Demo_Cable	2024-07-26 15:43:06	PDF+sors
☐ demo_1u	OTDR	SORS	Demo_Cable	2024-07-26 15:43:00	PDF+sors
☐ demo	OTDR	SORS	Demo_Cable	2024-07-26 15:43:13	PDF+sors
☐ demo_PON	OTDR	SORS	Demo_Cable	2024-07-26 15:43:03	PDF+sors
☐ 001-Trace	OTDR	SORS	Cable	2024-08-13 13:01:36	PDF+sors
☐ 002-Trace	OTDR	SORS	Cable	2024-08-13 13:03:22	PDF+sors
☐ 20240726_173608	OTDR	POPM	Cable	2024-07-26 17:36:10	PDF+POPM

20
Showing from 1 to 8, total 8. Display per page: 20

To open a test results file, select it from the list and tap on **View**.

You are connected to **FX150+**
IP: 10.0.0.232 S/N: TRFA10UB112319

Web Remote Access

Home
Remote Control
Results

View
PDF
Download
Delete
Show All
Advanced
Filter

Name	Mode	Test	Module	Date	Type
☒ demo_deadZone	OTDR	SORS	Demo_Cable	2024-07-26 15:43:09	PDF+sors
☐ demo_Pulse1mks	OTDR	SORS	Demo_Cable	2024-07-26 15:43:06	PDF+sors
☐ demo_1u	OTDR	SORS	Demo_Cable	2024-07-26 15:43:00	PDF+sors
☐ demo	OTDR	SORS	Demo_Cable	2024-07-26 15:43:13	PDF+sors

You are connected to **FX150+**
IP: 10.0.0.232 S/N: TRFA10UB112319

Web Remote Access

Home
Remote Control
Results
demo_deadZone

OTDR Test Result

FAIL

demo_deadZone

Job Information

Job ID	Demo_Job
Cable ID	Demo_Cable
Fiber ID	Demo_Fiber
Trace ID	demo_deadZone
Orig. Location	Foo
Term. Location	Bar
Comments	This is demo trace just to demonstrate device trace measurement capabilities

General Information

Date and Time Results Were Saved	2024-07-26 15:43:06
----------------------------------	---------------------

Files can be downloaded by clicking on **Download** (original file format) or **PDF**.

Screen Shots

Pictures (PNG) taken of the screen can be accessed from this link and sub-tab. Pictures can be viewed or downloaded to the local computer.

Screen captures can be made using the **Right side button + ** on the test set or from the remote computer, using the links provided or the respective F-key on the computer's keyboard.

The screen capture function can be enabled in  **>Global Settings>Save Settings**.

R-Server

Use the R-Server option to manage test sets and store test results.



R-Server

Part of VeEX's VeSion® centralized monitoring and management solutions, the VeSion® R-Server Workflow and Asset Management system provides crucial tools to manage fleets of technicians, test equipment, standardized test profiles, thresholds, centralized test results collection, reporting, jobs/ticketing, and software update delivery to create coordinated and efficient disciplined workforce and test procedures. R-Server enhances the workflow to achieve the level of quality and repeatability required by telecommunications service providers, MSOs and their contractors. The flexible R-Server can be deployed in cloud, hosted, and corporate networks, on physical or virtualized servers.

Supervisors can preset and upload test parameters which are provided to the test sets as profiles. Technicians can download profiles, run tests, and upload results to a centralized system that stores and secures the data.



A test set must register to an R-Server (establish IP connection) before it can upload results to the server; otherwise, a reminder message will pop up. Use the Diagnostic button to show a chronological record of events performed when connected to R-Server (e.g., registration, download profiles, etc.).

Register a test set (establish IP connection)

Results & Files	Test Tools	LAN & Connectivity	System Utilities
Register			
Server Address/URL		207.141.64.136	
Tech ID		JD123	
Tech Name		jdoe	
Company		VeEX	
Supervisor ID		7788	
Not registered.			
Client: 2.0.4.9			
IP: 10.0.0.232 Remote/CLI 2024-09-05 15:31:13			

R-Server on test set



*If you are unsure if a test set has already been registered, press **Check**. If it has not been registered, complete the steps to register the unit.*

1. Contact the R-Server administrator and/or supervisor to get and enter the following information in the corresponding fields.
 - **Server Address/URL:** IP address or URL of the R-Server
 - **Tech ID:** Registered Tech ID
 - **Tech Name:** Registered Tech Name
 - **Company:** Company name. If no name is specified, the company name will be pulled from the supervisor's profile.
 - **Supervisor ID:** Supervisor ID; ties the test set to a specific Org Chart.
2. Press the **Register** button to register the test set on the R-Server. The test set sends the request to register to R-Server and a message appears saying that the registration is complete. Next, the registration must be authorized and approved by the R-Server manager in order to allow access.
3. When the test set registration is complete and approved by the R-Server manager, press the **Check**

button to verify that the test has been authorized for use. Once authorized, results can be uploaded. If authorized, a message appears saying the test set has been registered and authorized.

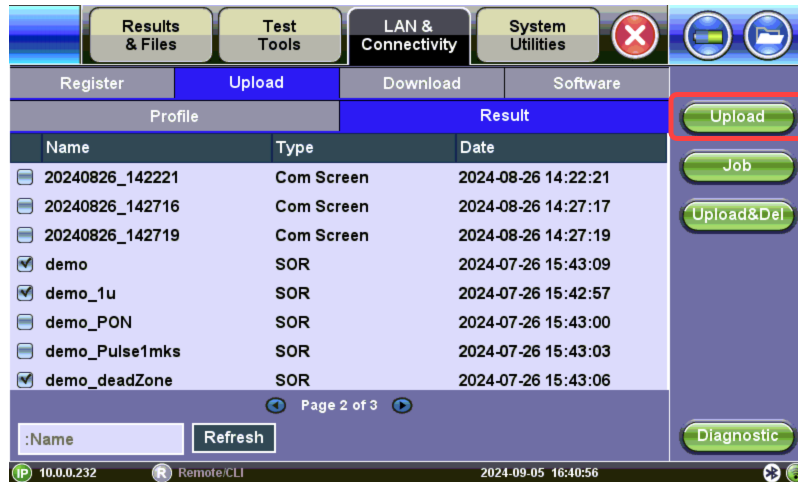
The screenshot displays the R-Server registration window. The 'Register' tab is active, showing a confirmation message: 'Registration Approved. Currently registered with Fremont Test Server 2'. The form contains the following fields and values:

Register	Upload	Download	Software
Server Address/URL		207.141.64.136	
Tech ID		JD123	
Tech Name		jdoe	
Company		VeEX	
Supervisor ID		7788	
Registration Approved. Currently registered with Fremont Test Server 2			
Region		SK	
District		California	
System		Bears	
Client: 2.0.4.9			

On the right side of the window, there are buttons for 'Register', 'Unregister', 'Check', 'Job List', and 'Diagnostic'. The status bar at the bottom shows 'IP 10.0.0.232', 'Remote/CLI', and the date/time '2024-09-05 15:43:08'.

 To unregister a test set from a R-Server account, press the **UnRegister** button. Pressing the **UnRegister** button once will move the test set to Inventory Management. Pressing the **UnRegister** button the second time will remove the test set from R-Server completely

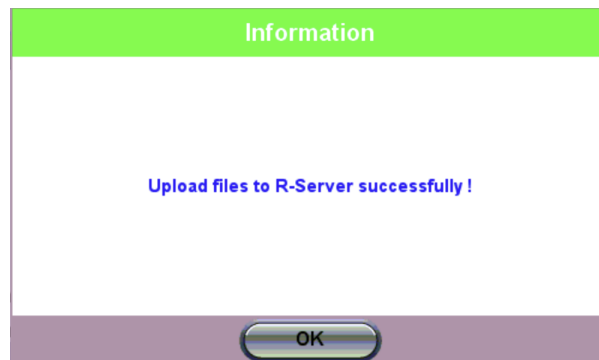
Upload Profiles and Results to R-Server



Uploading results to R-Server

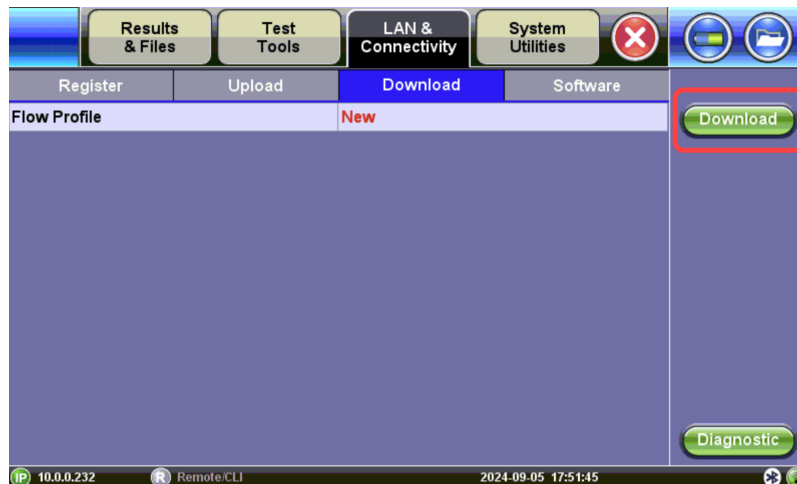
1. Select the **Upload** tab, then select the desired files to upload. To filter displayed result files by Job ID and/or Location, select **Job**.
2. Tap **Upload** or **Upload&Del** for results.
 - **Upload**: Transfers the selected profile and result file(s) and keeps the file(s) in the test set.
 - **Upload&Del**: Deletes the result file(s) from the test set after uploading them.

Upon successful upload, a confirmation message is displayed on the test set.



R-Server Upload Confirmation Message

Download Profiles from R-Server



Downloading Profiles from R-Server

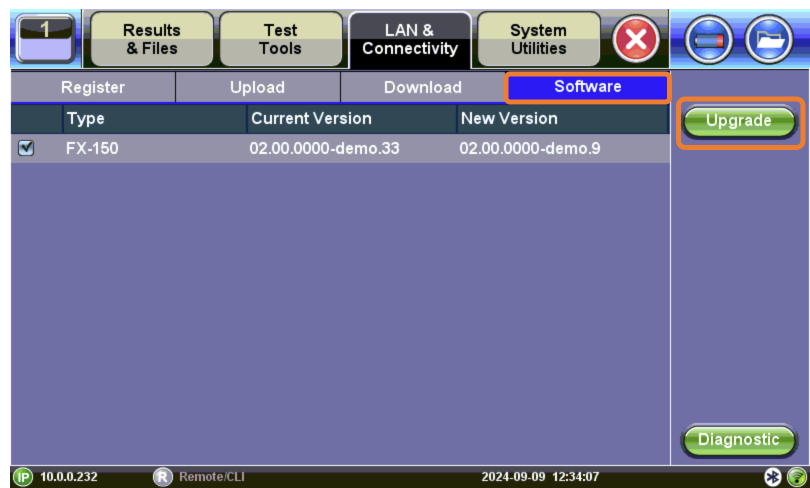
Select the **Download** tab to download all new profiles. If there are files that need to be downloaded, a message will appear at the bottom of the screen.

Tables, profiles, and software are listed as **NEW** or **Current**.

Upon successful download, a confirmation message is displayed on the test set. Press **OK** to restart the unit.

To use the new profile, select the toolbox , and then select **Flow®** . Refer to "Flow® Tests" on [page 165](#).

Download Software from R-Server



Updating Software from R-Server

Select the **Software** tab to see if there is a new version of the test set software. If there is a new version, select the **Upgrade** button. The new version of the software will download to the test set from R-Server and begin the update process. After the update process finishes, the test set reboots automatically.

See "[Software Update Process](#)" on page 243 for alternate methods of updating test set software.

Download Job Lists from R-Server

If workforce automation is used by your company, job lists are available for download/upload. Use the [VX-Connect mobile application](#) to synchronize job lists directly from R-Server, including GPS coordinates for birth certificates for troubleshooting, validation, and re-certification.

- 1. On the R-Server screen, select **Job List**. A **Job Information** screen lists jobs available .

Job Information...				
Job ID	Account Number	Address	Date	Job Code
aaa	aaa	123	2026-02-13 15:52:16	12345
bbb	bbb	456	2026-02-13 15:52:31	12345



Job Lists Download from R-Server

2. Select **OK**. Job information is downloaded. The test set will download the job list from R-Server. Jobs are matched by the registered Tech ID.
3. When creating a new Flow® test, a Select button will be available showing the job list downloaded previously. Select the job and then select **OK**.

Job ID	Account Number	Address	Date	Job Code
aaa	aaa	123	2026-02-13 15:52:16	12345
bbb	bbb	456	2026-02-13 15:52:31	12345

Page 1 / 1

OK Abort

Let's GO Abort

IP 192.168 SN:TKI

Select Job on New Flow® Test screen

The job information, such as the Job ID, Account number, Address, etc. will be populated automatically. Select **Let's GO** to continue the Flow® test. Refer to "[Flow® Tests](#)" on page 165.

Job ID/Work Number	aaa	Select
Account #	aaa	
Type	Installation	▼
Profile	Default	▼
Node/Fiber/Drop ID		
Address	123	
Comments		
Tech ID	JD123	
Tech Name	jdoe	
☐ GPS Position	Latitude	Longitude Altitude

Let's GO Abort

IP 192.168 SN:TKI

Job Information from Job List on New Flow® Test

System Utilities Overview

The **System Utilities** tab provides settings for the global parameters of the test set or platform (system settings).



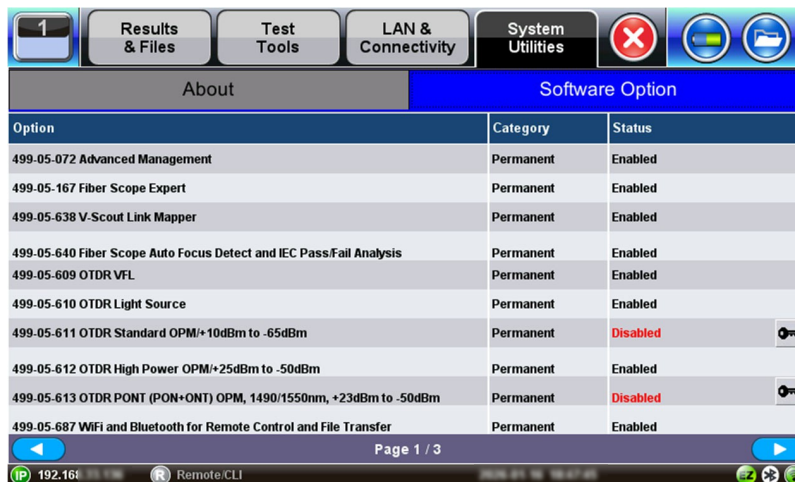
System Utilities/Settings Menu

About/Software Options

This section provides information about the software platform version, serial number, and other information relevant to the test set, which may be required when contacting Customer Support. The Software Option tab provides a list of software licenses (optional test features) currently loaded in the test set.



About Tab



Software Options Tab

Activating New Licenses: Features and options marked as 'Expired' or "Disabled" (not currently loaded into the test set) can be purchased at any time and activated via VeExpress using an internet connection. Upon order confirmation, connect the test set to the internet via LAN or Wi-Fi, go to **>System Utilities >VeExpress** and press the **Check** button. The test set will download all newly added features and options from VeExpress servers and install them automatically.

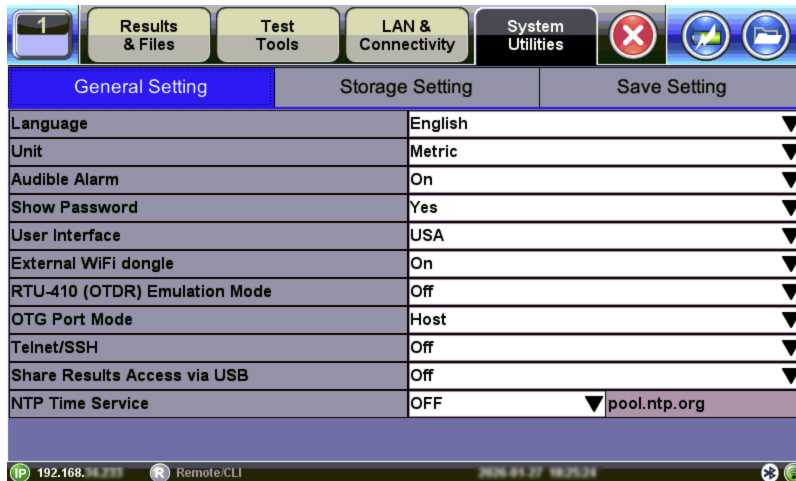
If company policy doesn't allow access to the public internet or the test sets are used within a secured network, request License Keys for manual activation. License keys must be requested at the time new options are

purchased. To activate new features, tap on the **expired item** and enter the Activation Code received from VeEX, VeEX partner or manager. Press **Activate** to complete the licensing process. Each activation code is specific to a test set and a feature. If multiple features are ordered, individual activation codes will be sent for each of them. Manually activated features are specific to a test set and can't be shared with other test sets.

Global Settings



General Setting



Utility Settings - General Setting

- **Language:** An alternative language for the user interface (if available). The device must be rebooted to fully activate the new language.
- **Unit:** Measurement system (English - feet or Metric - meter).
- **Audible Alarm:** When enabled, the test set's buzzer will sound (beep) when alarms and errors are being detected (if supported by the test application).

- **Show Password:** Hides/unhides username and password information associated with FTP and related IP functions.
- **User Interface:** The USA user interface version presents SONET/DSn application-oriented menus, while the International setting is more open to all settings.
- **External WiFi dongle:** Enables WiFi router dongle.
- **Wi-Fi Auto Connect:** After successfully connecting to a Wi-Fi access point, the unit will attempt to automatically connect to the same AP after the unit is turned off and turned back on.
- **Auto Color Scheme:** Sets the color scheme for the GUI.
- **RTU-410 (OTDR) Emulation Mode**(FX150+ only): Enables remote control of the FX150 OTDR using API commands.



Turn OFF RTU-410 (OTDR) Emulation Mode when not being used. It can conflict with the OTDR Server button in the OTDR app.

- **OTG Port Mode:** Configures how the micro-B USB port will appear to any USB device connected to it via an USB [on-the-go \(OTG\) cable](#). Later models may detect and configure the OTG port to host or device mode automatically.
 - **Host:** Enables the micro-B USB port to connect with USB devices, dongles, or accessories, such as a USB memory stick or Fiberscope. USB devices (dongles) will not be recognized if the OTG port is not set to Host mode.
 - **Device:** Enables the test set's micro-B USB port to connect directly with a Windows® PC and act as a storage device (like a memory stick), for the [Share Results](#) function.
- **Telnet/SSH:** Allow or disallow telnet connection to the unit (e.g., remote terminals, Customer Support troubleshooting, CLI or automation via scripts).
- **Share Results:** Enables direct transfer of saved results from a unit to a Windows PC. To directly transfer files, connect the unit to a PC via an OTG cable, set the OTG port to [Device mode](#) and turn Shared Results ON. In this mode, all new saved test results are copied to a shared partition that the PC can see as a drive.

If Share Results is turned OFF, results are saved to the internal partition of the unit and can only be transferred to a USB memory stick using the File Manager.

- **NTP Time Service:** Turn ON to allow the test unit periodically to obtain the current time from a public time server. Whenever the test set is connected to the Internet, the time will be updated.



If R-Server is used, the time service option can be made unavailable by the R-Server administrator. This ensures that all test sets have the same time, which is set by the R-Server.

Storage Setting

General Setting		Storage Setting		Save Setting	
File Name Prefix	g				
Profile Deleting	Prompt User ▼				
Profile Saving	Prompt User ▼				
Result Saving	Prompt User ▼				
Advance Saving	On ▼				
Upload to R-Server	On ▼				
Flow Saving	On ▼				
QR Code Generation	On ▼				
Download Job List on Save	On ▼				

IP 192.168.32.111 SN:TKKA06VB510199 2025-06-13 15:53:07

Utility Settings - Storage Setting



Storage Settings are not currently supported for OTDR, OPM, and Fiberscope results.

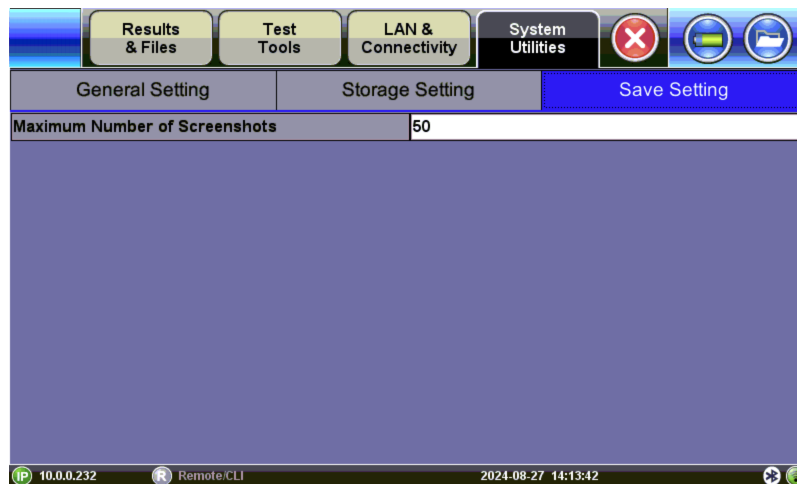
- **File Name Prefix:** Tap on the box to enter the file name prefix using the pop up alphanumeric keypad. Not used for OTDR file naming.
- **Profile Deleting:** Auto Delete or Prompt before deleting profile.
- **Profile Saving:** Auto Overwrite or Prompt before saving profile.
- **Result Saving:** Manual or Prompt before saving results.
- **Advance Saving:** Turn ON to add extra information to the results file to be uploaded to a centralized R-Server.



Requires Advanced Management Option

- **Upload to R-Server:** Turn ON for saved test results to be automatically uploaded to a centralized R-Server.
- **Flow Saving:** Turn ON to save test results to a FLOW test report.
- **QR Code Generation:** Turn ON to generate a QR codes for FLOW test reports.
- **Download Job List on Save:** Download work orders from R-Server.

Save Setting



Utility Settings - Save Setting

- **Maximum Number of Screenshots:** Sets the maximum number of screenshots that can be saved on the unit. Each time the lock key on the keypad is pressed, a screen shot will be saved in memory.

The screen shots can be recovered under **Results & Files**. Refer to "[Working with Saved Results, Profiles, Images](#)" on page 178.

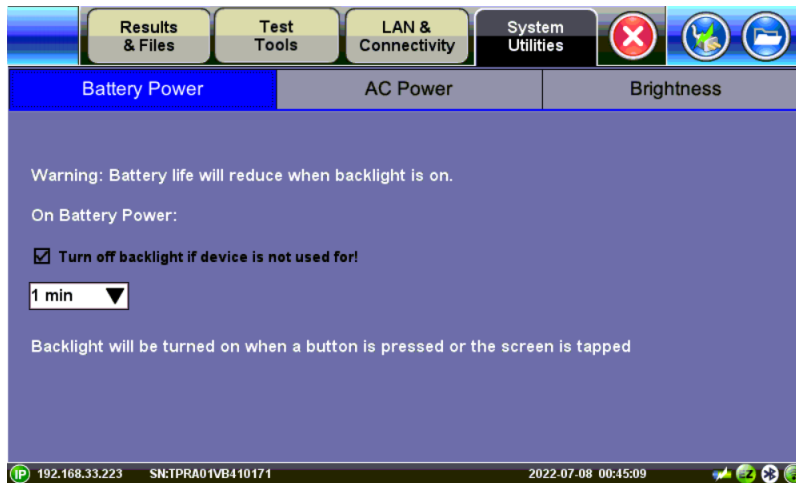
Backlight

This section provides backlight control of the unit. There are two intensity settings:

1. Battery power and
2. AC power.

On Battery Power

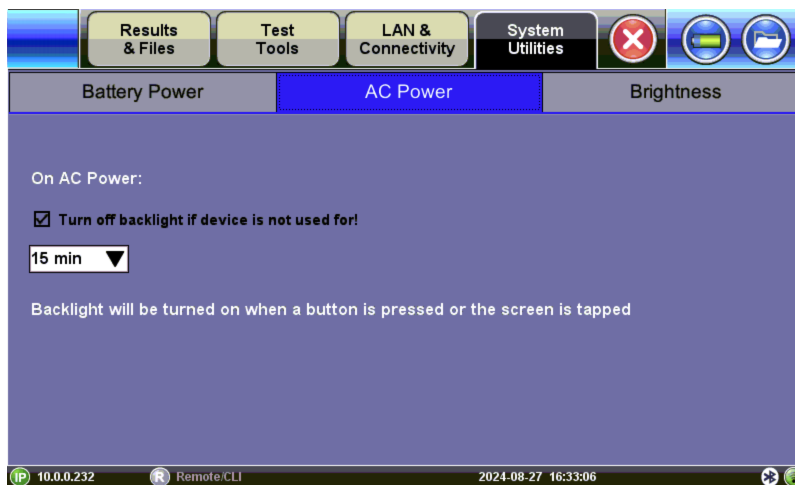
- Select a timer to turn off the backlight if the unit is not in use. This function helps improve the battery autonomy and preserve LCD life.
- To enable the timer, check "Turn off backlight if device is not used for" and with the drop-down menu, adjust the duration of the idle time before the backlight is turned off.
- Once the timer is active and the backlight turned off, any action on the test set (touch screen, keypad) will turn on the backlight again.



Backlight - Battery Power

On AC Power

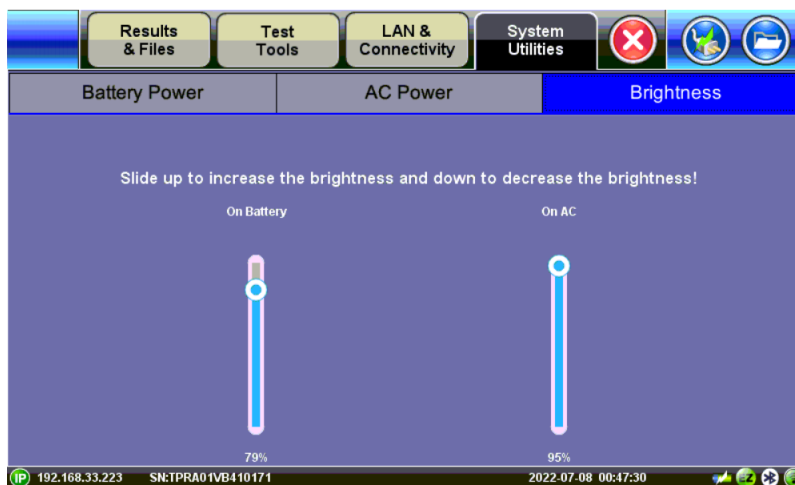
Similar settings can be applied for when the test set is operating on **AC Power**.



Backlight - AC Power

Brightness

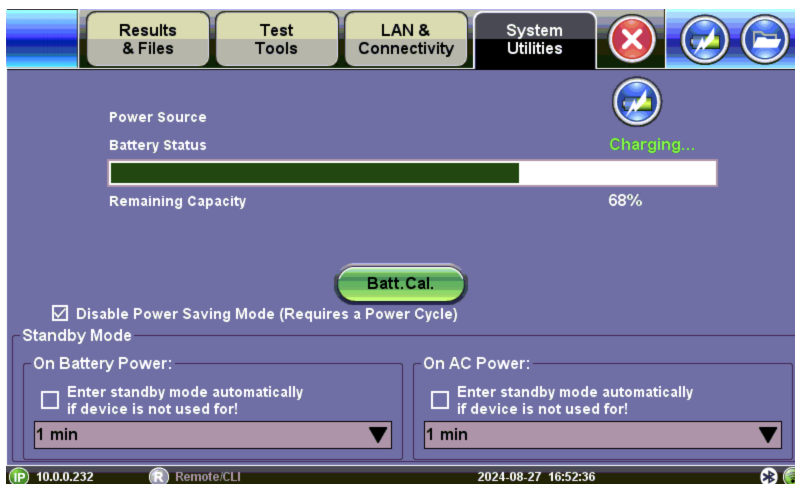
Select the brightness level for Battery and AC operation modes.



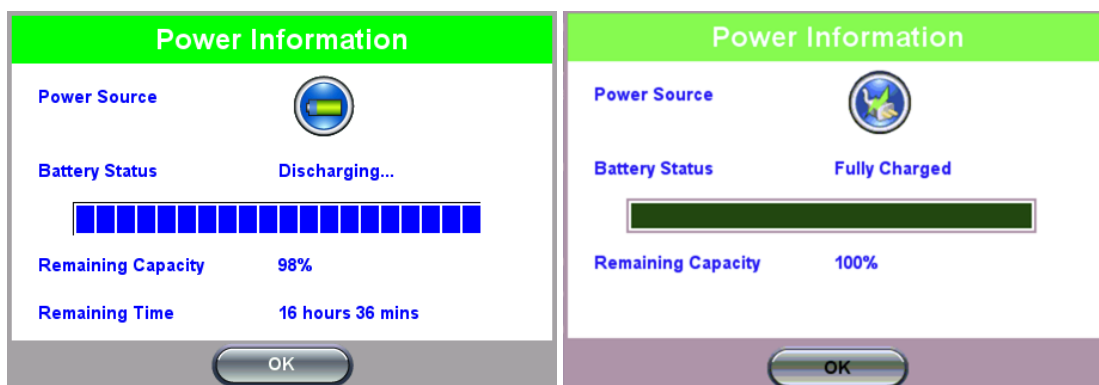
Backlight - Brightness

Battery Status

This screen provides information about current power source and information about the battery's charge level and estimated autonomy (under current load conditions). Tap the **battery icon** on the top bar to bring battery charge and estimated autonomy information. To recalibrate the battery, tap **Batt. Cal.**

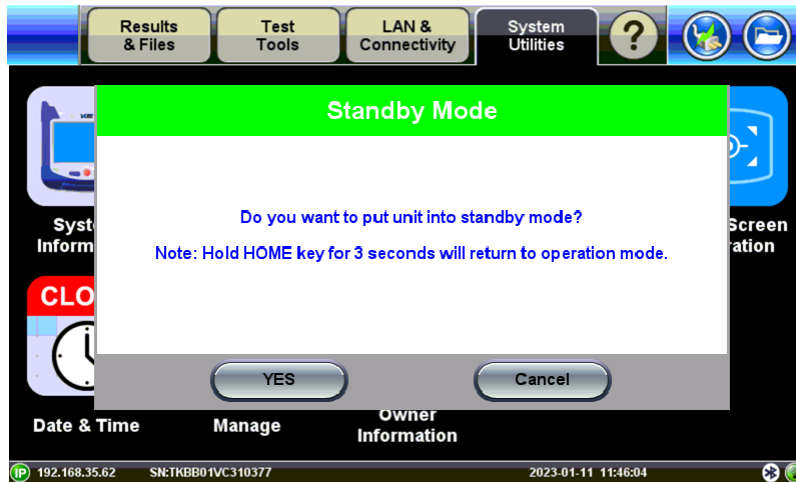


Power Settings



Battery Charge Information

Standby Mode



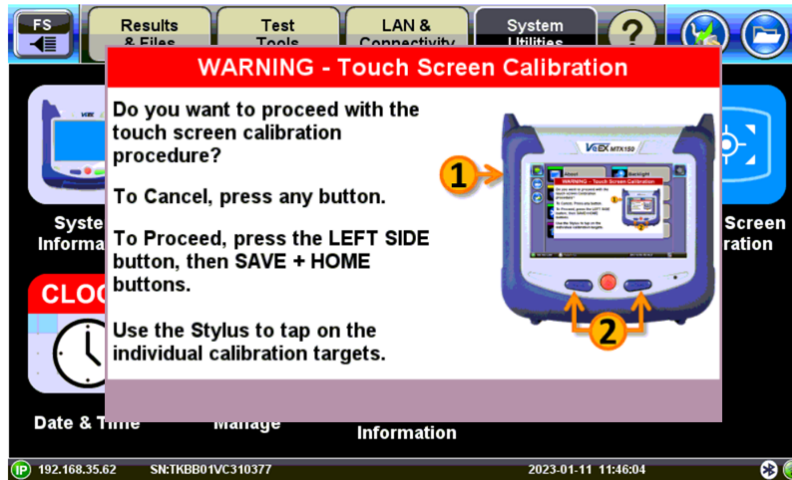
Standby Mode Message

Standby Mode puts the unit to sleep, so that it wakes up faster than pressing **Power** to turn on the unit. To enter standby mode, press and hold the **Home** key for 3 seconds until the unit beeps, then tap **YES**. The screen will be off, but the power LED will blink. Press **Home** to view battery life and standby mode run time. Pressing and holding **Home** for 3 seconds again will return the unit to normal operation.

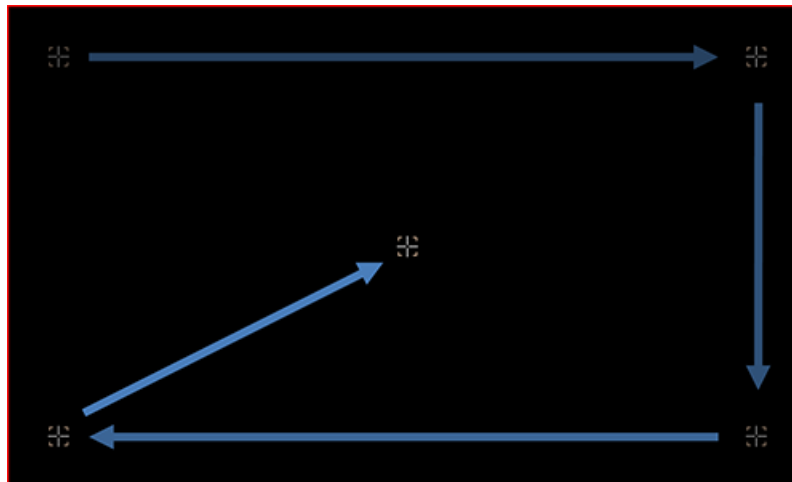
To configure automatic standby settings, select the Power option on the platform main menu. Refer to "[Battery Status](#)" on the previous page.

Touch Screen Calibration

Screen calibration can be accessed from **System Utilities > Touch Screen Calibration**.



Press the **Save** and **Home** buttons simultaneously, until you hear a tone (beep), quickly press the **LeftSideButton** + **Save** + **Home** combination to confirm. Then the touch screen calibration procedure starts.



Once the touch screen calibration sequence has been started, it must be completed. Accurately touch the calibration points with the tip of the stylus.



If the above procedures do not fix the touch screen issues, go to the VeEX website's [Contact Us](#) page, select [N] Customer Service/Tech Support, then provide the Product Type, Serial Number and a brief description of the behavior being experienced. If it is related to colder ambient temperatures, please state the approximate temperatures.

Date and Time

This screen allows the date and time to be set. Daylight Savings Time (DST) is enabled automatically.



The date and time cannot be changed when the test set is synchronized to R-Server with Date & Time Lock enabled.

Date & Time	
Date:	
Month	July
Day	29
Year	2024
Time:	
Hour	06
Minute	02
Second	17
<button>Apply</button>	

IP 192.168.35.163 Remote/CLI 2024-07-29 06:02:17

Date and Time Setup

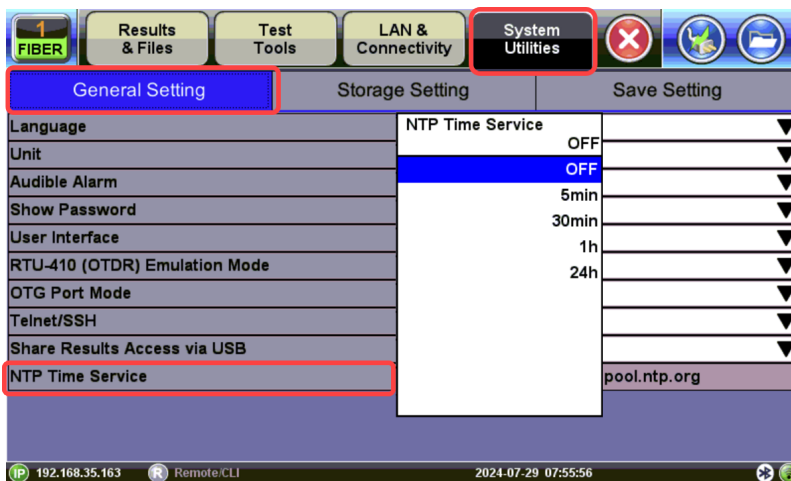
Using NTP Server

For automatic time of day (ToD) synchronization, go to **>System Utilities>Global Settings>General Settings**, and enable the **NTP Time Services** field by selecting a synchronization period (e.g., 1 hour).

Click [here](#) for a list of local, regional and global public NTP servers.



An internet connection (Wi-Fi or LAN) is required to reach the selected public or private NTP server.



General Setting - NTP Time Service

Manage Internal SD Card



Internal SD Card Format

The SD card tool (**System Utilities > Manage**) provides Internal SD card's partition capacity information. All saved files, such as profiles, test results, and screen shots, are stored in the Data partition 3(data). If the data partition is nearly full, use the [File Manager](#) to backup files to USB, then delete selected files.



The **Format** function is exclusively a maintenance tool. Use **ONLY** when instructed by a VeEX Customer Care representative. **It erases all the information stored in the test set!**



- *The internal SD Card contains the System OS, all the Test Applications (Apps) and user's data.*
- *Only the Data partition is accessible to users, through the test set's functions.*
- *Do not remove or reformat the SD Card outside of the test set.*
- *The SD card can only be accessed by opening the test set.*

Owner Information/Test Report Customization

Customize user profile and enter owner information to include on test reports, including name, address, phone, company logo, etc.

Tap the **Include** box and enter information to include on reports.

To add a logo, tap the **Company Logo** dropdown to import an image from a connected USB drive.

Owner Information	
User Profile	Default
Company Name	
Company Info1(e.g. Street address)	
Company Info2(e.g. City,State)	
Company Info3(e.g. Phone,Email,URL)	
☐ Include Company information in test reports	
User Name	
User Info1(e.g. Title)	
User Info2(e.g. ID)	
User Info3(e.g. Location ID,Email,Phone)	
☐ Include User information in test reports	
Company Logo	Default
☐ Add Company Logo to test reports	

Owner Information - Test Report Customization

Software Update Process



Back up all the test results and test profiles before performing software upgrades. Refer to "Working with Saved Results, Profiles, Images" on page 178.

Step 1: Download Software

Download the software from www.veexinc.com any of the following ways:

- Go to the **>Support > Software Updates** (<https://www.veexinc.com/support/software>) and enter the first four characters of the product's serial number, to obtain the software installer package specific to the product.
- Enter the full product name in the **Search** box, click on the **Software** section to expand it, and download the appropriate software installer package.
- Go to **>Products**, then click on **>Product Finder** or **>Product List**, to access the product's page. The links for the software installer package and release notes are under **>RESOURCES**.

Step 2: Unzip File

Unzip the downloaded file(s) to the file. The resulting install file should end in **.tar**.



Do NOT uncompress them any further.

Step 3: Prepare Test Set

Power down test set, connect it to the AC/DC power charger, and plug in the power cord. The unit must remain connected to the AC/DC charger during the entire update process.

Step 4: Install Update

Install the update in one of the following ways:

A) Install update from USB memory stick.

1. Copy unzipped .tar file to the root directory of a FAT32 USB memory stick.
2. On the powered down test set, plug the USB memory stick into a USB-A to micro-B USB [OTG adapter](#) and connect the adapter to the test set's [micro-B USB port](#).
3. For a clean install (clears data and settings), press and hold the  and  buttons. To keep data and settings stored in the unit, press and hold the  and  buttons. This process will update both the platform's system and test engine.



A clean software update will erase all user settings, test profiles and saved results. Use the "USB Memory Browser" on page 186 in the >File Manager to back up all data prior to performing a clean software update.

4. Wait until the test unit beeps, then release the buttons to begin the update.
5. After the update process finishes, the test set reboots automatically.

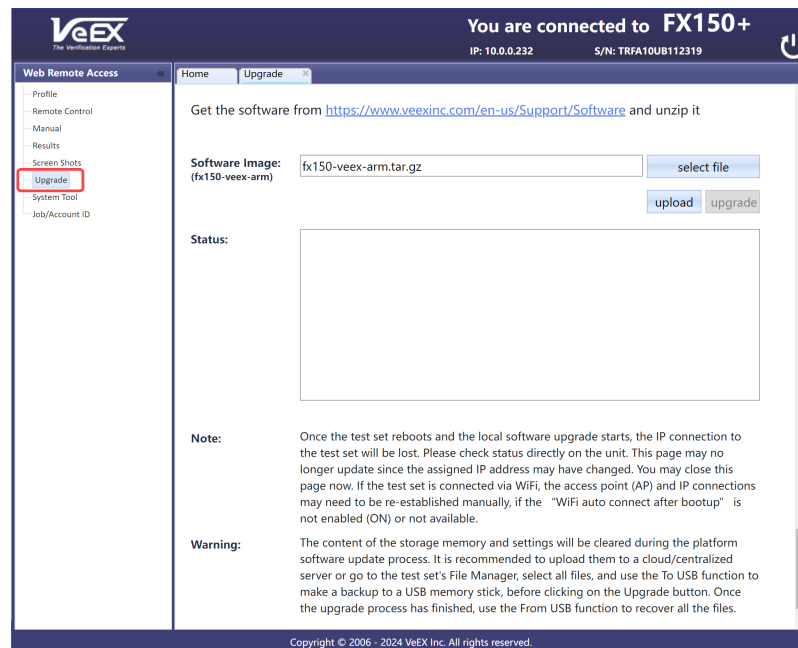
B) Install update via Web Remote.



PCs and reliable wired connections are recommended for this task. In DHCP environments, the remote test set may get a different IP address after a reboot (static or reserved IPs are recommended).

1. Make sure the test set is ON and connected to a LAN, WLAN (Wi-Fi), or configured as a Wi-Fi access point (AP Mode). Refer to ["Wi-Fi Wiz" on page 198](#).
2. Open a web browser and enter the test set's IP address into the address/search field (e.g., 192.168.0.113). The test set's current IP address is usually displayed on the bottom-right corner of the screen. Refer to ["Remote Access" on page 205](#) for more information about connecting via Remote Access.

3. Once the test set's Web Remote Access page loads, select **Upgrade** on the left side of the browser window.

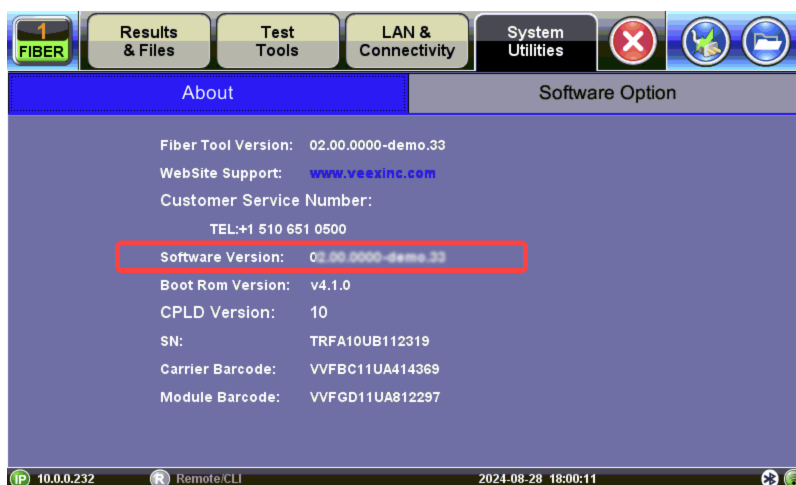


Web Remote - Upgrade option

4. Click **Select File** and use the file browser to point it to the appropriate .tar file previously unzipped in **Step 2**.
5. Click **Upload** to transfer the .tar file to the test set. Depending on the file size and connection speed, this may take a few minutes.
6. After the file upload is complete, click **Upgrade**. If a reboot warning message is shown, click **OK**. Let the test set go through the process, uninterrupted. This will take a few minutes. If the file verification fails, due to link or transmission errors, try uploading it again.
7. Additional ROOTFS and/or low-level CPLD upgrade notifications may be presented, on the test set screen, after the reboot. Tap **OK** to proceed with these updates.
8. Reboot the test set, if required.

Step 5: Confirm Software Version

After the software upgrade is completed, go to the **Utilities >Settings >About** menu to confirm the software version.



Software Version is displayed in the About section.

Certifications and Declarations



Declaration of Conformity

What is CE?

The CE marking is a mandatory European marking for certain product groups to indicate conformity with the essential health and safety requirements set out in European Directives. To permit the use of a CE mark on a product, proof that the item meets the relevant requirements must be documented.

Use of this logo implies that the unit conforms to requirements of European Union and European Free Trade Association (EFTA). EN61010-1

For a copy of the CE Declaration of Conformity relating to VeEX products, please contact [VeEX customer service](#).



ROHS Statement

RoHS ComplianceVeEX QUALITY AND ENVIRONMENTAL POLICY

Our quality and environmental policy is to limit and progressively eliminate the use of hazardous substances and chemicals in the design and manufacture of our products.

VeEX products are classified as Monitoring and Control Instruments under Article 2, Section (1), Category 9 of the WEEE 2002/96/EC Directive.

RoHS and WEEE Position Statement

The Council of the European Union and the European Parliament adopted Directive 2002/95/EC (January 27, 2003), to Reduce the use of certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment, and Directive 2002/96/EC on Waste Electrical and Electronics Equipment (WEEE), with the purpose of reducing the environmental impact of waste electrical and electronic equipment. Both were later recast by Directives 2011/65/EU and 2012/19/EU respectively. All VeEX products being placed on the EU market conform with these directives.

Additional RoHS substance restrictions for the Monitoring and Control Instruments were adopted by EU Directive 2015/863 (March 31, 2015). These new restrictions will take effect from July 22, 2021. VeEX has established a program to ensure that from July 22, 2021, all its products to be sold and shipped into the EU market will conform with (EU) 2015/863.

VeEX Inc. is committed to comply with RoHS and WEEE Directives to minimize the environmental impact of our products.

For more information about RoHS as it relates to VeEX Inc, go to www.veexinc.com/company/rohscompliance.

About VeEX

VeEX Inc., a customer-oriented communications test and measurement company, develops innovative test and monitoring solutions for next generation telecommunication networks and services. With a blend of advanced technologies and vast technical expertise, VeEX products address all stages of network deployment, maintenance, field service turn-up, and integrate service verification features across copper, fiber optics, CATV/DOCSIS, mobile 4G/5G backhaul and fronthaul, next generation transport network, Fibre Channel, carrier & metro Ethernet technologies, WLAN and synchronization.

Visit us online at www.veexinc.com for the latest updates and additional documentation.

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Customer Care

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Email: customercare@veexinc.com

FX150+ OTDR Quick Guide

The FX150+ mini OTDR can be incorporated with power meter, light source, fiber inspection probe and VFL test options. When powered on the test set automatically loads the Fiber Applications Menu.



[Step 1: Power On Test Set.](#)

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Step 1: Power on Test Set

Press and hold the **Power** button  for two seconds, until a confirmation tone (beep) is heard, and the VeEX logo appears on the screen, then release the power button. The test set will take a few seconds to boot up and automatically start the **Fiber Application Tools** menu.



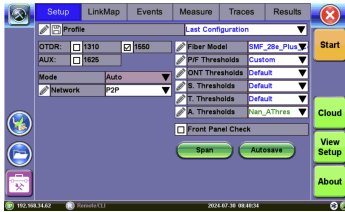
To turn the test set OFF, press and hold the Power button  until two confirmation tones (beeps) are heard.

Step 2: Configure Test Profile

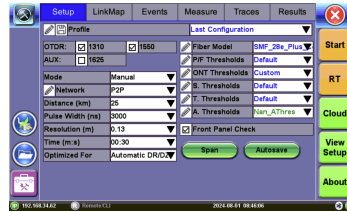
On the main menu, select the OTDR option:

- **EZ-OTDR:** Performs a measurement and analysis of the fiber and determines optimal test settings automatically.
- **Expert OTDR:** Allows customization of setups and/or manually overrides the default options.

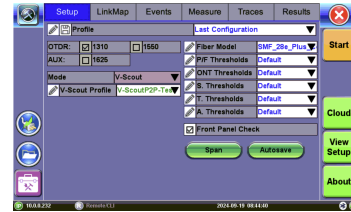
- **V-Scout Link map:** Uses factory or user defined multi-pulse test profiles with summary results displayed on a link map.



EZ-OTDR (auto mode)



Expert OTDR (manual mode)



V-Scout Link map (multi-pulse test mode)

Select the test wavelength (SM1310, SM1550, SM1625 or MM 850, MM 1300), network type, fiber model, and thresholds. For manual mode, choose the additional options for distance, pulse width, resolution, and time.

Auto mode is intended for inexperienced operators and uses single pulse per wavelength. The type of network to be tested must be specified.

Fiber model settings apply only to the next measurement. To change refractive index (RI) and backscatter coefficient (BC) for a previously measured fiber trace, use the **Information** button on the **Traces** tab.



Use the Refractive Index (IoR) and Backscatter coefficient as provided by the cable or fiber manufacturer. An incorrect IOR can affect measured length results. Incorrect IoR and Backscatter values can affect Reflectance and ORL results.

Thresholds define the threshold values that match test requirements. Choose the default values or **Custom** to create a new profile with custom settings. Events will be placed into the table only if the threshold is met/exceeded. Events that fail to meet the pass/threshold will be flagged and highlighted as red in the event table.

Front Panel Check tests connection and displays warning indicating when the launch level is 1.5 dB lower than expected or if initial reflectance is too high (-35dB is default fail threshold). If needed, stop and clean connectors, or proceed with the bad connection. For OTDR with built-in internal launch fiber, (G.657), the OTDR connector insertion loss will depend on the fiber type connected to the test set. Use the **Span** button to enter fiber mismatch compensation or de-select **Include Event Loss** in the Span settings.

Autosave saves results automatically with default information in the filename, such as Job, Cable, and Fiber IDs, and with settings to increment the trace or fiber, as needed. It can also set additional information in the test file, like the node, account, location, and technician.

Cloud settings contain Fiberizer Cloud information, so test results and files can be pushed to the Cloud account.

View Setup settings contain trace display options such as units, 3rd party save format, RealTime button on menu, grid color, etc.

Step 3: Connect Patch Cord to Test Port

Inspect and clean the test ports and patch cord connectors. Then, connect the patch cord to the main **OTDR** test port. This is the main OTDR and secondary OTDR PON-capable OTDR port. Selectable single-mode (1310, 1490, 1550 nm wavelengths) or multimode wavelengths. (41dB dynamic range is recommended to support PON with up to two splitters with 1x128 splits total.)

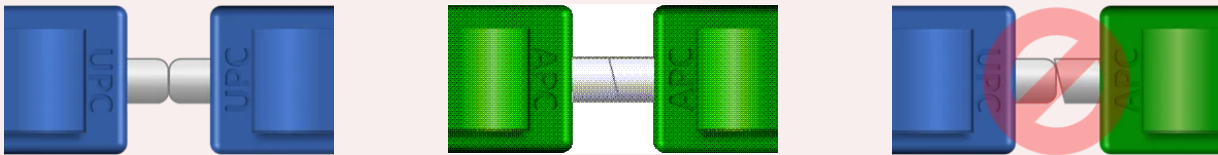


Warning: Never look directly into the beam of an active optical source as this may result in harmful eye damage from radiation exposure.

Before Connecting: Know the difference between APC and UPC connectors.

Angled Physical Contact (green body) connectors' end faces are polished at an 8° angle, while Ultra Physical Contact (blue body) connectors are polished flat. They are not compatible.

If the connector on the device, patch panel or fiber is green, has a green base, dot or marking next to it, it indicates it is an APC connector and requires the use of matching APC test cords. The use of APC connectors is common in modern OTDRs due to their lower optical return loss.



For more information, including video instructions on inspecting a connector end-face, go to ["CLIC" - Clean to Maintain Optical Connector Quality](#).

Step 4: Run Test

1. Tap the **Start** button  and the [Measure tab](#) screen appears. The measurement will begin according to the test parameters entered in the **Setup** menu. (See "Setup Screen" on page 87.) Elapsed time is indicated below the **Stop** button .



If multiple wavelengths are selected in the **Setup** menu, the measurement will be performed using all selected wavelengths one after another without stopping and will be overlaid on the screen for comparison and review. V-Scout multi-pulse traces are also overlaid and displayed automatically.

- When the test is complete, the **Stop** button will revert back to a **Start** button. If needed, tap **Stop** to terminate the measurement manually.
- If Autosave is enabled with **Ask Before Save** checked in the **Autosave Parameters** screen, a **Result AutoSaving** window appears asking if the results should be saved. If **Ask Before Save** was not checked, results will be saved automatically using the filenaming parameters previously set for AutoSave.
- Tap **OK** to autosave with the default settings. Tap **Abort** to exit the screen.
- When the test plan is complete and OTDR traces performed, view the link map on the [Link map tab](#).

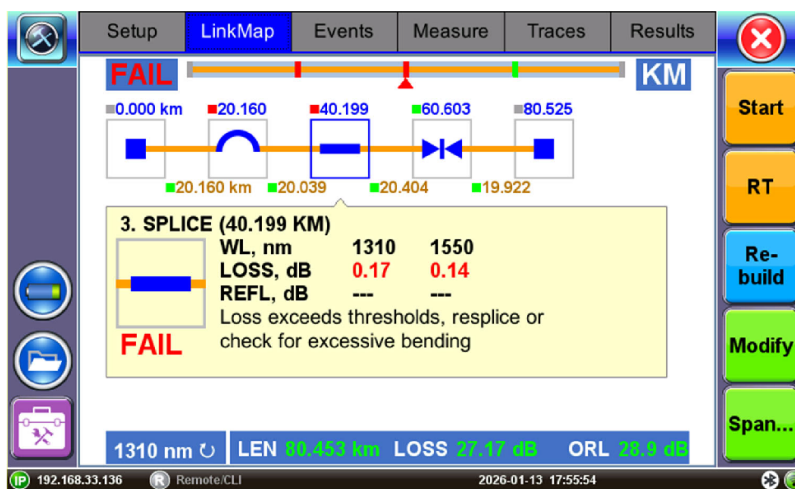
Events

The analysis results are trace events. They are marked on the trace with the marks showing the event types (↑ for fiber beginning, ∟ for splice loss, ∟ for fiber end, etc.) Full event details are provided in the event table on the bottom, the span beginning and end are marked with brackets (see below).

Link map

The link map view presents a simplified view of measurement results by analyzing all the event table results for each pulse, whether using single or multiple pulse widths, and all test wavelengths. A span summary is displayed, in the form of a block diagram, for each test wavelength shown at the bottom of viewing window.

Select an icon to obtain more information about that specific event on the fiber, as shown below. For example, event 4 represents a connector with excessive loss, which is common when connectors are not cleaned prior to mating or if they are damaged.



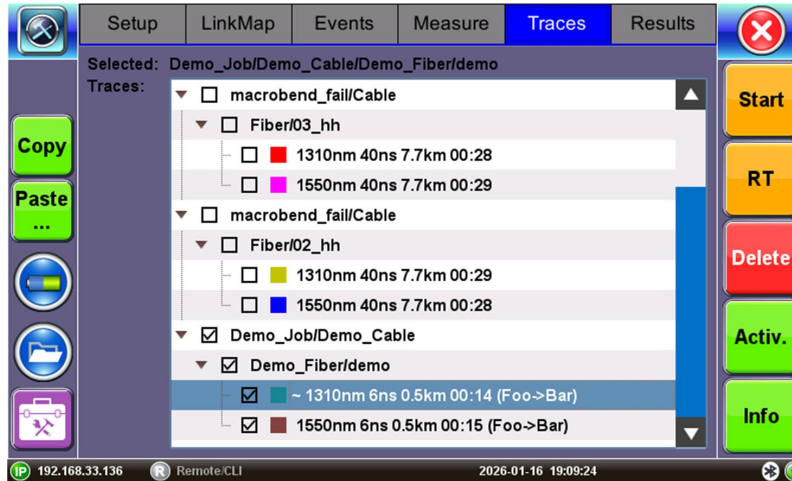
Link map showing splice with excessive loss



The link visibility can be significantly improved by using multiple pulse widths to provide better event details.

Traces

After running a test, select the **Traces** tab to view the active or measured OTDR traces. The color-coded blocks represent the corresponding trace viewed in the OTDR display. The OTDR can display up to ten traces simultaneously (i.e., an active trace and nine additional traces).



Traces tab

Traces are displayed along with the name, pulse width, distance range (LMax), and acquisition time used for the test. To view any trace, select the file(s) using the check box. All selected traces will be overlaid and can be viewed using the **Results/Traces** tabs.

Results

The **Results** tab is used to view previously saved OTDR test results. OTDR traces can also be manually saved using the Results tab.

The traces are saved in the following folder directory hierarchy:

- Job ID
- Cable ID
- Fiber ID
- Results – Traces

To manually save Traces:

1. On the **Results** tab, select the trace you want to save.
2. Click **Save**, then click **Save**. On the **Result Saving** window, change default information on the tabs as needed and enter filename in the Traces ID field, and then click **Save**.

To view or print reports, use the File Management feature or one of the Fiberizer software applications. Refer to "[File Manager](#)" on page 177.

Step 5: View Test Report

Test reports can be accessed from the test set's files or from a mobile device by scanning a provided QR code. Refer to "[File Manager](#)" on page 177 in the User Manual for more information on accessing the test set's files. For more information on viewing reports on mobile devices, refer to "[Working with Saved Results, Profiles, Images](#)" on page 178.

View Test Report from Platform Files

To access the test results stored in the test set:

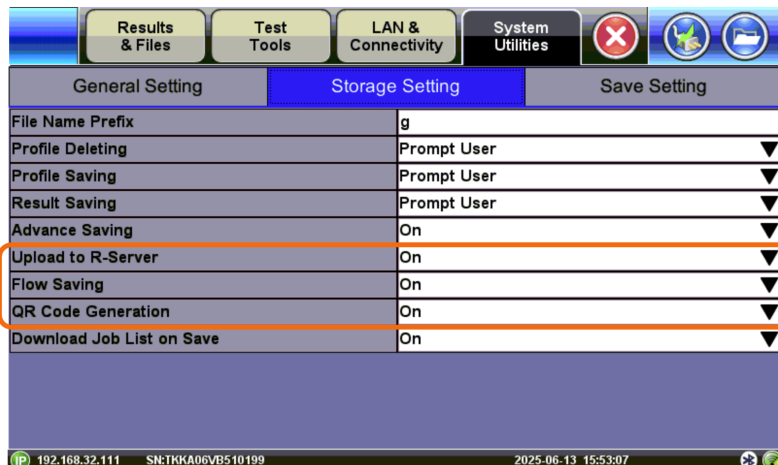
1. Select the **Results & Files** tab. The **File Management** screen is displayed.
2. Select the desired results file to open the test report.

To navigate the test results report, use the links in its Table of Contents and the right rocker switch to scroll Up and Down. Refer to "[OTDR Screen Navigation](#)" on page 32.

NoApp®: View Test Reports on Mobile Device via QR Code

To view OTDR Test Reports on a mobile device, turn on the setting in the test set's platform settings.

Go to  > **System Utilities** > **Global Settings** > **Storage Settings** and make sure **QR Code Generation** is turned **ON**.



Enable QR Code Generation

VeEX's NoApp® (US Patent 12,190,199)*¹ cloud service enables basic meters and advanced test sets to quickly and easily transfer test results' KPI to a phone or tablet, to instantly generate test reports and allow sharing and uploading to centralized R-Server or cloud. [See short video about the VeEX NoApp® Wireless Test Results Transfer via NFC.](#)



Internet connectivity is required (e.g., Wi-Fi, LTE, 5G, etc.).

Immediately after saving results, a screen with a QR code appears. To view the test report via mobile device, scan the QR code with the mobile device's camera. Tap **OK** to exit the screen on the test set.

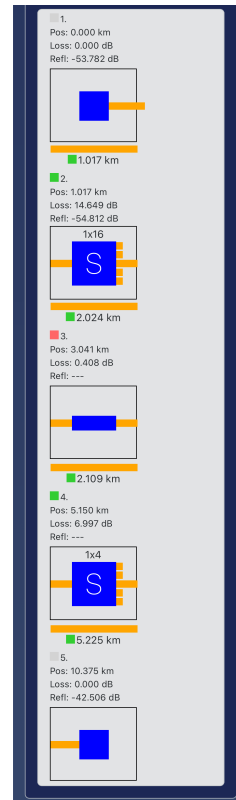
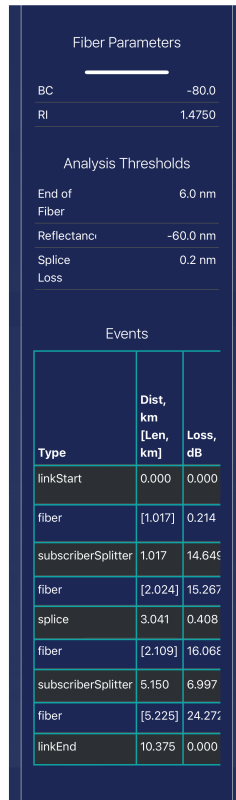
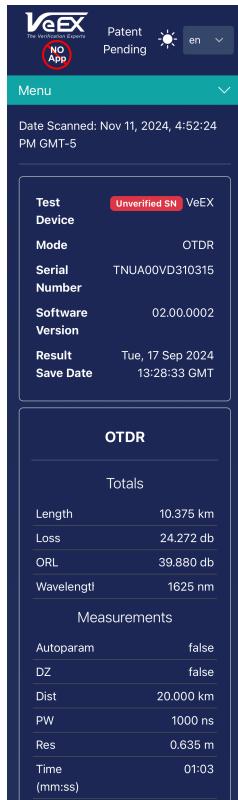
Alternatively, tap the QR code icon  on the [File Manager](#) screen.



Test Report QR Screen

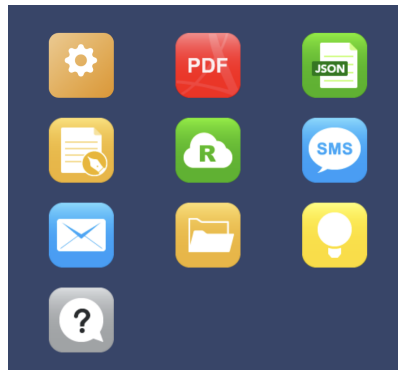
After transferring results to a mobile device via the QR reader, the browser launches automatically and displays them.

¹*This product is protected under U.S. Patent No. 12,190,199 and may be covered by additional patents. Any unauthorized reproduction, sale, or distribution is strictly prohibited and may result in legal action.



The top of the screen shows the device type, mode, serial number, and software version, and the date results were saved on the device.

Export options appear at the bottom on the screen. Alternatively, tap the **Menu** drop-down menu to view the options.



Results - Mobile View Export Options



Adds/Removes location (GPS coordinates) from results report; customize report with logo.

-  Generates complete report in PDF format, which can be shared with the customer (subscriber) or emailed to a supervisor.
-  Exports to JSON format, for third-party integration or processing.
-  Adds extra job-related information to the report (e.g., Job ID, tech's information, comments, pictures, etc.).
-  Uploads results to R-Server (for R-Server users).
-  Texts results via SMS protocol.
-  Emails current test report.
-  Creates a new project for results so multiple test results, from the same or different test sets, can be combined into a single job report.
-  Opens knowledge base.
-  Opens documentation resources for test set.

Other Test Features

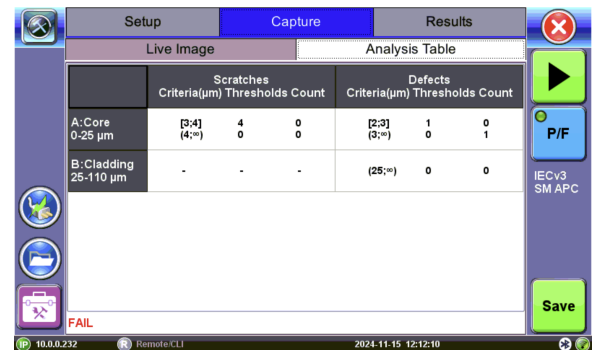
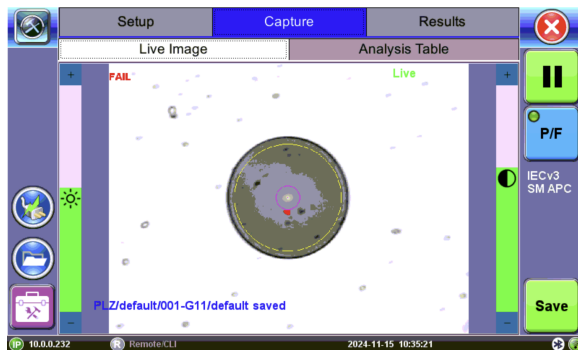


PROTECT YOUR EYES!

Never look directly into the optical test ports and VFL's light. It is a Class II laser and emits laser radiation that can potentially harm your eyes with extended exposure. It is good practice to never look directly into any fiber connector for any reason.

Fiberscope

The Fiberscope test application can be used in conjunction with any VeEX Digital Fiber Inspection Microscope. It presents a real-time view of the connector's end face allowing for alignment and focus. The capture screen displays a live image of the connector face and features analysis and freeze tools.



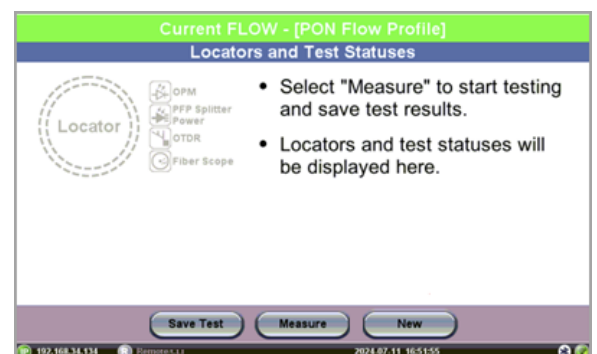
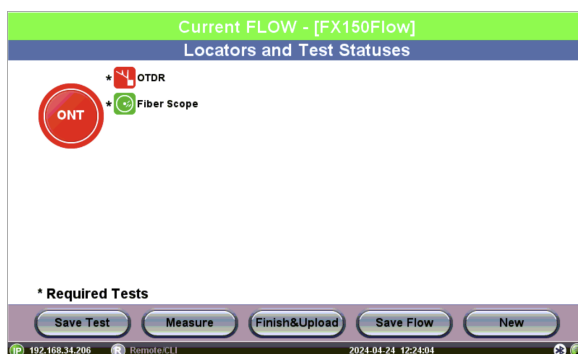
FLOW®

Use the Flow® Toolbox application to save a series of tests and compile them into a full Flow® Test Report. Create a basic Flow® job test profile to guide workforce with making multiple tests. Implementation of Flow® allows technicians to use multiple test tools to build and properly certify various fiber networks by applying Pass/Fail indicators into a consolidated Job test report. Flow® supports multiple test applications.

If the test set is registered with R-Server, the R-Server controls whether Flow® profiles can be created using the test set. When allowed by R-Server, the test set's Flow® application includes a Default profile. The Default profile can then be used to dynamically create and test Locators without the need of an R-Server defined Flow® profile.



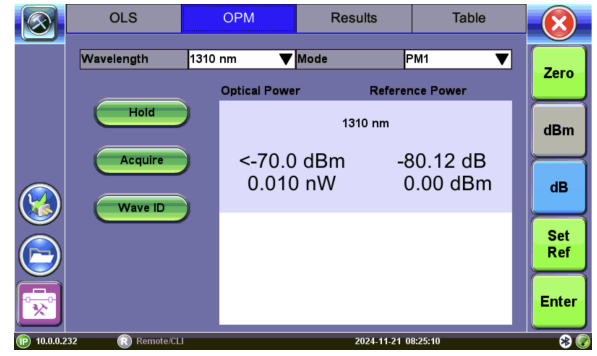
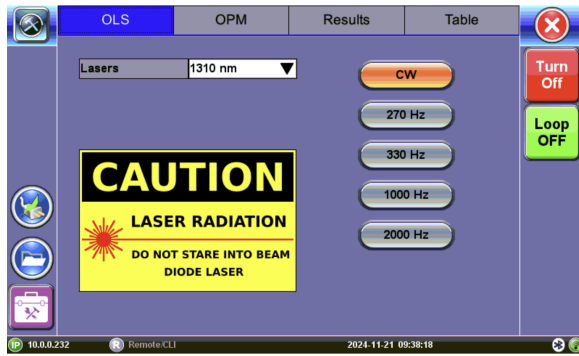
If R-Server does not allow the test set to create profiles, the only profiles available for selection will be R-Server defined Flow® profiles.



OLS/OPM

The unit can be equipped with an optional Optical Light Source (OLS) to use in conjunction with any OPM to measure link loss. The OLS radiates continuously or in pulses with modulation.

It can also be equipped with an optional built-in Optical Power Meter (OPM). It can also access an external Optical Power Meter using the Micro-USB port. The OPM tests output power from a fiber and can be used to measure the span loss of optical fiber systems in real-time.



Visual Fault Locator

The unit is equipped with an optionally built-in Visual Fault Locator (VFL) to trace and visually identify breaks in ODFs, bare fibers (900 μ m), and patch cords that are typically hidden in the OTDR dead zone.

The VFL works by injecting a 650nm visual red light into the fiber (up to 5 kilometers/3 miles) to bend a single fiber strand and force light to exit the center of the fiber. It traces it to identify faults through light leakage. It identifies fiber strands, connectors, breaks, bends and other potential problems or anomalies on events.

Top 5 ways to use VFLs



PFP Splitter

The PFP Splitter Power analysis provides a way to measure insertion loss for every fiber strand in sequence and readings saved and loaded later, if needed. The process is secured with a graphical display, limiting the risk of errors.

