

FL150 FaultScout User Manual

Optical Link Qualification Test Set



P/N D07-00-161P Rev. A01

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, 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 production 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

LiPO 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 LiPo 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 LiPo battery ages during storage is based on both storage temperature and state of charge. For optimum battery life always store your LiPo's 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 LiPo 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.

Introduction to FL150 FaultScout

The FL150 FaultScout is designed to aid technicians who need to activate service or trouble shoot service issues. Verify 1G/10G-PON 1490/1577nm downstream signal levels and measure drop fiber within 15-30 seconds. Measure Point-to-Point fiber spans up to 60km for length, events, and total span loss, and ORL within 5-75 seconds. This rugged, compact, handheld test set is ideal for test and verification of all SM access fibers, such as: FTTx drop fibers, Mobile front and backhaul, and LAN/WAN Data Center.

The FL150 includes:

- 1650nm In-Service FaultScout with LinkMap
- In-line dual 1490/1577nm PON-T meter
- Optical Light Source option available
- Visual Fault Locator option available
- Optical Fiber Inspection option available
- Optional R-Server support for uploading test results to a central server.

Platform Highlights

Features are subject to change. See the product's data sheet for current features and specifications. For further instructions on platform specific operations, refer to the product's user manual at www.veexinc.com. Robust, compact handheld design for demanding field test environments. High resolution, 5-inch TFT color touch-screen viewable in any lighting condition 30-second boot-up time with internal 8G SD card; 3.6G allocated for data storage; Micro-USB interface and Micro-USB female to USB-male OTG dongle to support: USB flash drive, Fiber inspection scopes (requires OTG cable). Additional options include RJ45 Ethernet dongle and OTG Micro USB-Micro USB female to USB male cable and Built-in Wireless and Bluetooth® option to support software upgrades and uploading test data via wireless connection; Pairing applications with Mobile Smartphones and Tablets Rechargeable Lithium Polymer 10,000 mAH battery with capacity indicator, low voltage alarm and Auto-off function with operation of >9 hours; Remote control access using built-in Web browser, VNC, or EZ Remote. Web browser can be used to transfer fiber test data, upgrade software and perform remote control (check with factory on availability and R-Server Advanced Management option is also available).

Key Features



Features are subject to change. For current product features and specifications, see the product data sheet at www.veexinc.com.

Handheld FaultScout for quick and easy testing on Access, FTTx last mile installation and Metro fiber links FaultScout with in-line 1490/1577nm PON-T meter Filtered 1650nm port for auto in-service measurements with Pass/Fail Link indication in 15 to 75 seconds Simplified setup and events detection Link Map representation of test results using intuitive icons SC/APC connector Optional built-in WiFi/Bluetooth Optional fiber inspection probe Optional R-Server.

Package Contents

- FL150 FaultScout test set
- Micro-USB male to USB-A male OTG dongle
- AC/DC adaptor
 - Input: 100-240 VAC (50/60 Hz), 1.5A max
 - Output: 12VDC
- Li-Polymer battery
- Carrying Case (PN: C01-00-013G)

Theory of Operation

The FL150 FaultScout can support Fault Location and in-line dual PON-T power measurements using a single test port. The PON-T meter is designed to either measure a single wavelength or 1490 and 1577nm downstream signals simultaneously.

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

The FL150 FaultScout PON meter has a single fixed SM SC/APC connector port designed to measure GPON 1490 nm and 10-GPON 1577 nm downstream signal power and perform fault location without the need to swap test ports.

Basic Operation

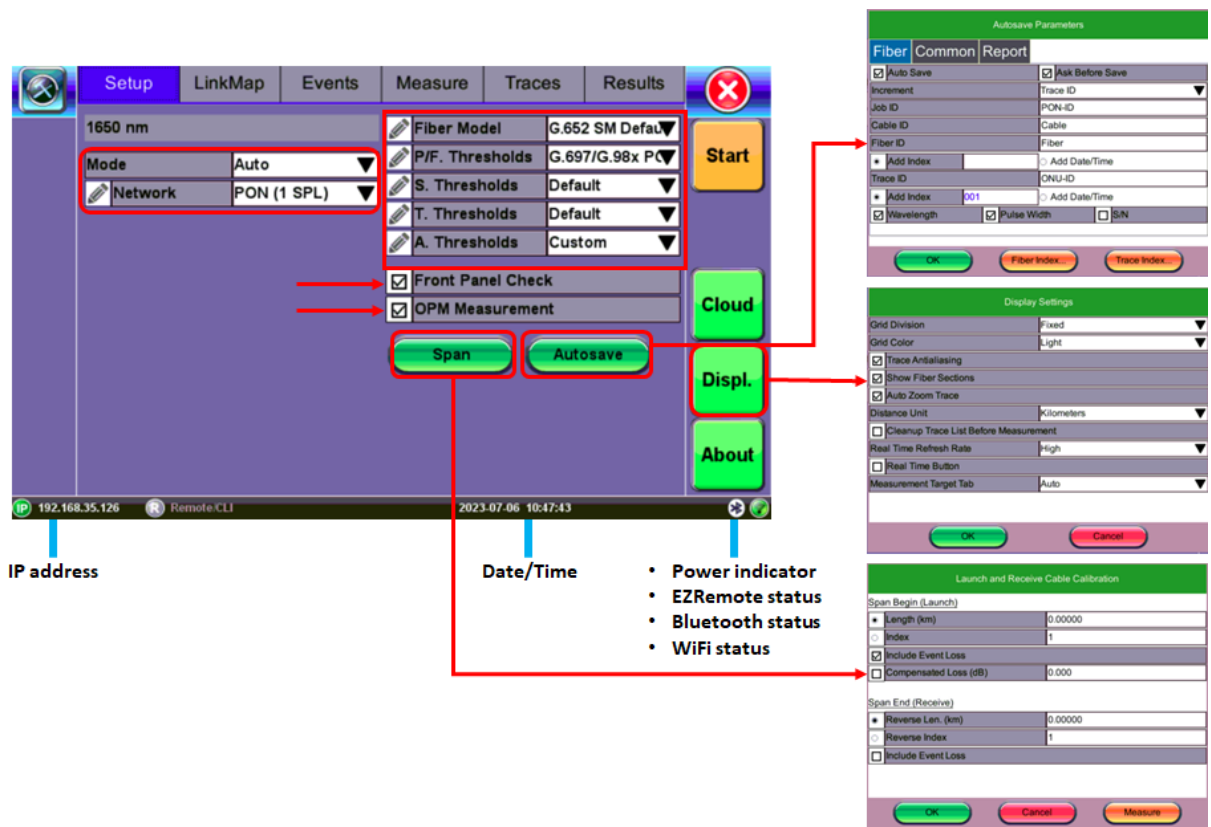
The FL150 will power up to the FaultScout Setup screen. Default setup assumes user wants to perform Auto (single pulse) with V-Scout available (multi-pulse). Network default is ONT to Splitter test on a PON drop fiber. Splitter to ONT, PON (1SPL) and P2P also available. Other test parameter and factory default settings are:

- **Fiber Model/Type:** G.652 SM
- **Pass/Fail Thresholds:** G.697/G.98x PON
- **Splitter Thresholds:** Default
- **Tap Thresholds:** Default
- **Analysis Thresholds:** Default

Select other Parameter profiles or create customer profiles using the pencil icon to edit.

Other Parameter default settings are:

- **Front Panel Check:** warns user that signal level is low or reflection level is excessive
- **OPM Measurement:** measure incoming signals using in-line dual PON 1490/1577 prior to testing PON network.
- **SPAN:** Used to setup launch or receive fibers, default = NONE; Initial event loss is excluded in Total Link Loss
- **Show Section Loss:** Do not show dB/km between events in Event table view
- **Auto Zoom:** Expand link in viewing window to show start to end.



Setup and additional tools such as FiberScope can be accessed by tapping the applicable System button and selecting the **Tools** options.

For more details about System Settings, see the *V150 Common Functions Manual* on www.veexinc.com.



System Setting – Utilities/Tools/Files Menu

Test Ports and Interfaces

FaultScout testing: The optical fiber under test is connected to the FaultScout port on the top panel (a SC/APC connector). Closing the dust cap when the meter is not in use will minimize dust ingress or air pollution contamination.

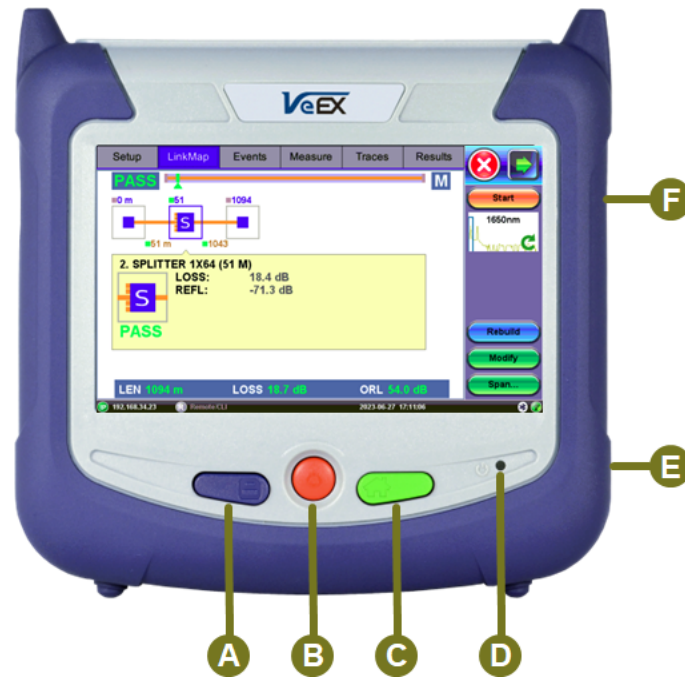


Optical Connections

*Connector contamination/damage is the main reason test sets have to be returned for repair. Daily inspection and cleaning of the FL150 test port is recommended. Always clean 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**, activating **Front Panel Check** can alert you to abnormal connection to meter.*

Front Panel Layout

FL150



FL150 FaultScout

A SAVE current test results

B POWER button

C HOME button

A+B Clean Software Update Installation

- Starts software update process, wipes internal storage restore factory setting

B+C Software Update Installation

- Keeps test results, test profiles and user setting

A+C Invokes the Screen Calibration Procedure

- Provides touch screen calibration if it can't be accessed by GUI

A+F Screen Capture function

F Slider Button provides Page Scroll function

Others:

D Power ON and Battery Charge Indication LED

E micro-B USB interface (includes USB-A OTG adapter cable)

LED Indicators

Power/Charge LED: indicates battery charging is in progress. LED turns off when battery is fully charged.



The device is powered from the built-in Li-Ion battery and can be operated with the AC/DC adaptor plugged in.

Keypad



- **Save:** Saves the test results.
- **Power:** Press for 2 seconds to turn the test set ON or OFF (prevents accidental ON/OFF).
- **Home:** Resets user interface to Main menu.
- **Right side + Save:** Saves the screen (bmp).
- **Right side + Home:** Hibernates device.
- **Power + Home:** Updates software.

Quick Start Guide

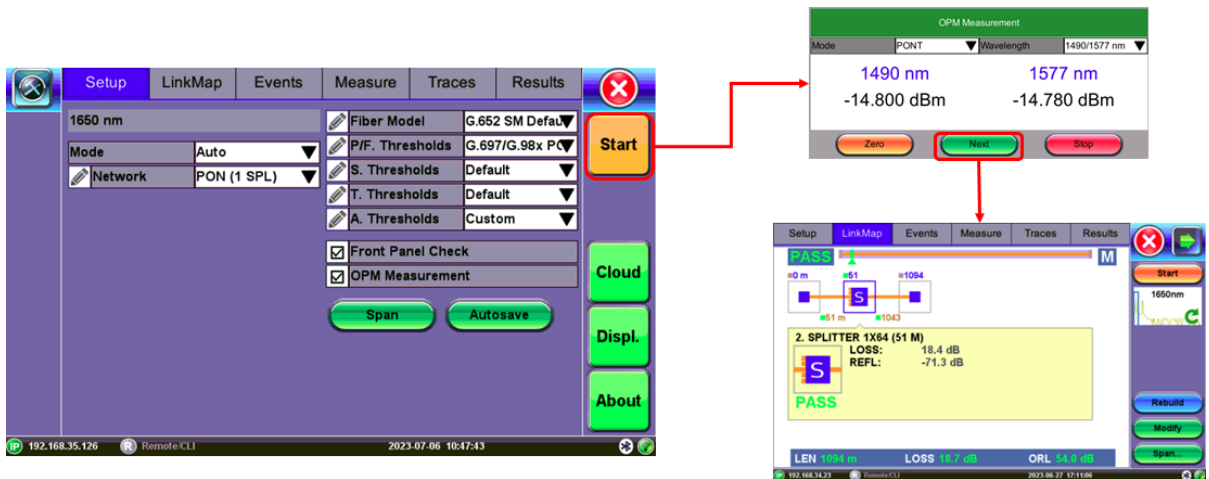
FaultScout

The FL150 test set can be used to test PON or P2P fiber. For PON, set up to view PON-T downstream signals prior to starting Fault Location.

The steps to running the test set are:

1. Power on the test unit to display the **FaultScout** screen.
2. Select **Setup** and then select **Auto ONT to Splitter**, **Splitter to ONT**, **PON (SPL1)** or **P2P** for single pulse tests. Use V-Scout mode for multi-pulse tests.
3. Tap the **pencil** icon to edit test profiles. Check **Front Panel Check** or **OPM Measurement**, if desired.

4. To begin test, press **START**, close dust cap and tap **Zero** in the **OPM** window.
5. Inspect and Clean FaultScout test port and patchcord connectors before connecting test fiber.
6. Tap **Next** if optical signals are acceptable to continue with checking the fiber. The results are displayed in the LinkMap. Span Length, Event Type/Loss, and RL. Pass/Fail indication depends on P/F Thres setting profile entered in the **Setup** Menu. Use **Events** or **Measure** view traces.
7. Tap an event icon to view more details.



Screen Navigation



Touch Screen Navigation

The unit is equipped with a state of art, full color, LCD TFT touch screen. When used properly, the screen is designed to give years of reliable and precise operation. Always use the stylus supplied with the unit to operate the touch screen. Never use any sharp object such as a ballpoint pen, screwdriver, or similar item as this will damage the screen and void the warranty. The touchscreen can be recalibrated when needed.



Each test mode has their own Setup which may look different.

Inserting the Fiber

Match connector alignment key to test port slot before attempting to insert connector into the test port; avoid rubbing the fiber against the external part of the port or any other surface.

Push the connector in and you will hear a click. Make sure the optical connector is inserted fully to guarantee good contact.

Preventing Inaccurate Readings

To achieve maximum power and prevent false readings, always clean test port and the optical fiber connector before inserting it into the test port and bulkhead connectors.

Confirm the correct fiber connector polish type is the same as the test port, before inserting any connector into the test port. Mismatched connector polish may damage the optical end faces of the test set or the Connector Saver plug.

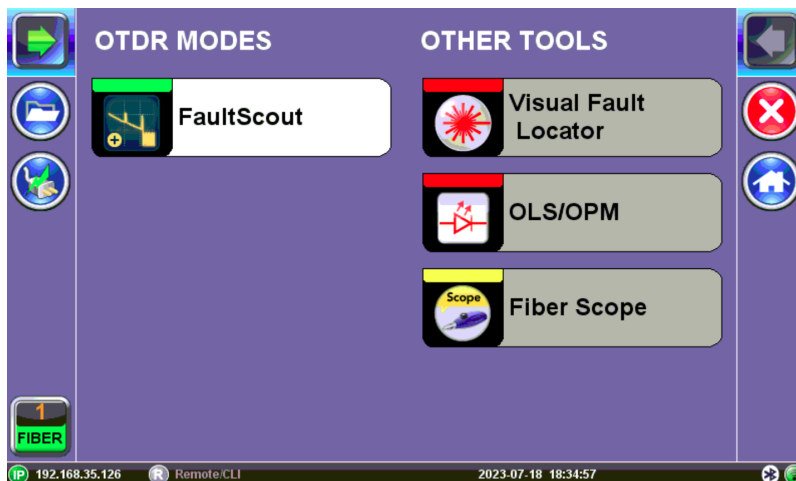


If the optical fiber is not aligned properly and/or completely connected, it will cause serious loss and reflection. In addition, contaminated or damaged connectors can impact performance and result in false event detection.

Working with FL150

The main application mode, FaultScout, is loaded by default when the test set is powered on.

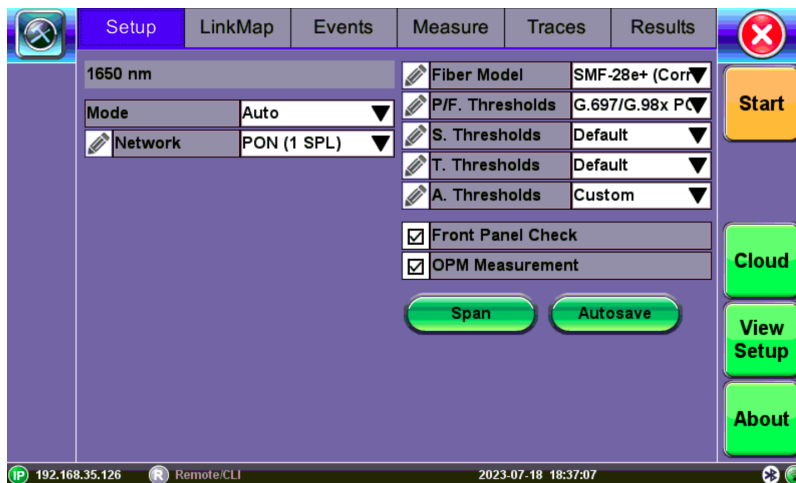
The other test modes can be accessed via the **Fiber Menu**.



FaultScout Fiber Menu

FaultScout Test Setup

Available wavelengths are displayed.



FaultScout Setup Screen

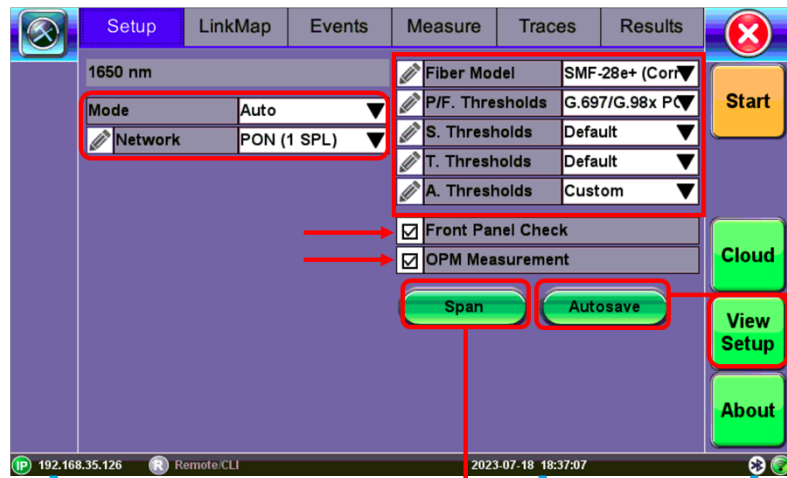
Test Parameters

Select the **Mode** from the drop down menu: **Manual**, **Auto**, **V-Scout**, **Manual Realtime**, and **Auto Realtime**.

- **Manual**: Use this mode when user wants total control over test parameters for average test results
- **Auto**: Use this mode for automated single pulse test mode for average test results
- **V-Scout**: Use this mode for multi-pulse, averaged test mode. Ideal for for high loss spans with events close to test set.
- **Manual Realtime** : Use this mode for live view with limited average. Select desired refresh rates -- faster means more noisy waveform
- **Auto Realtime**: Use this mode when user needs help with setting distance range

Select **Network** tests using the drop-down menu: **ONT to Splitter**, **Splitter to ONT**, **PON (1SPL)** or **P2P**.

- **ONT to Splitter**: For drop fiber test when connected at Customer site. A splitter icon will show at far end if scatter is detected after splitter
- **Splitter to ONT**: For drop fiber test when connected at last splitter location. An ONT icon will be shown at far end if ONT is connected.
- **PON (1Spl)**: Use this mode when testing ONT-OLT up to single 1x64 Splitter. (Connect at Customer site or FDP/FDT.)
- **P2P**: Use this mode for testing point-to-point fiber spans, not PON.



IP address

Date/Time

- Power indicator
- EZRemote status
- Bluetooth status
- WiFi status

Autosave Parameters

Fiber	Common	Report
☒ Auto Save	☒ Ask Before Save	
Increment	Trace ID	
Job ID	PON-ID	
Cable ID	Cable	
Fiber ID	Fiber	
+ Add Index	+ Add Date/Time	
Trace ID	ONU-ID	
+ Add Index	+ Add Date/Time	
☒ Wavelength	☒ Pulse Width	☐ SIN

OK Fiber Index Trace Index

Display Settings

Grid Division	Fixed
Grid Color	Light
☒ Trace Antialiasing	
☒ Show Fiber Sections	
☒ Auto Zoom Trace	
Distance Unit	Kilometers
☐ Cleanup Trace List Before Measurement	
Real Time Refresh Rate	High
☐ Real Time Button	
Measurement Target Tab	Auto

OK Cancel

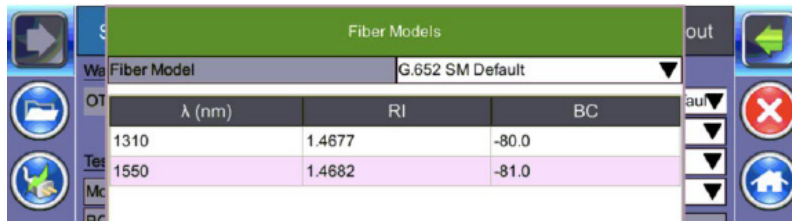
Launch and Receive Cable Calibration

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

Other Parameters

Fiber Model: Select the type of fiber to be tested, G.652D (feeder line) or G.657A2(dropfiber), 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.



λ (nm)	RI	BC
1310	1.4677	-80.0
1550	1.4682	-81.0

Fiber Model

- **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.
- **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.



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



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



These settings apply to the next measurement only.

Thresholds

Select one of several factory default settings (**Default**) or enter a custom settings (**Custom**). Events that exceed the Pass/Threshold will be flagged and highlighted as **red** on the linkmap.

Pass/Fail Thresholds:

Events exceeding the Pass/Fail Thresholds are highlighted in Red in the link map. Different Pass/Fail Thresholds values can be set for each test wavelength. For PON testing, it is recommended to use G.697/G.98x P/F Threshold profile.

Event Loss (splice, connectors, mux) and Reflectance threshold settings determine if a detected anomaly should be reported.

Pass/Fail Thresholds	
P/F. Thresholds	Default
	1650
☒ Spl. Loss (dB)	0.300
☒ Conn. Loss (dB)	0.500
☒ Reff (dB)	-45.0
☐ Att (dB/km)	0.250
☐ Tot. Loss (dB)	5.830
☐ Tot. ORL (dB)	28.0
☐ Fib. Length (m)	21000.00

FaultScout Setup: Pass/Fail Thresholds

- **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.
Recommended 0.5dB or 0.75dB for Singlemode fiber.
- **Reflectance (dB)** - Events in the Event table exceeding the set Reflectance value. The range for this parameter is -65.0 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.

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

To modify values, click the pencil icon to access the P/F threshold from the drop-down list. Then, tap **Modify** to **Fill**, **Add**, **Rename**, or **Remove** values.

- **Front Panel Check:** Tests FaultScout connection and displays warning indicating when the launch level is 1.5 dB lower than expected or if initial reflectance is too high (-45dB is default fail threshold). If needed, stop and clean connectors, or proceed with the bad connection.



Mated APC connectors should not exceed -50dB Reflectance.

- **OPM measurement:** For dual PON 1490/1577nm, measure downstream signal before verifying drop fiber.

Setup About



About button

The **About** button shows the model, firmware version, and test wavelength.

Autosave Parameters

Use Autosave to save results automatically. It can also create file directories and automatically create test file-names using TraceID, Wavelength, and Pulsewidth information and test # using Trace ID index.



Although defaults are used if no content for Job ID, Cable ID, Fiber ID is entered, it is highly recommended that a unique entry in the Trace ID field be created and the start # entered in the Index field.

The screenshot shows the 'Autosave Parameters' dialog box with the 'Fiber' tab selected. The dialog has three tabs: 'Fiber', 'Common', and 'Report'. The 'Fiber' tab contains the following fields and controls:

- ☐ Auto Save
- ☒ Ask Before Save
- Increment: Trace ID (dropdown menu)
- Job ID: FL150
- Cable ID: P2P
- Fiber ID: Fiber
- Add Index (radio button) []
- Add Date/Time (radio button)
- Trace ID: test
- Add Index (radio button) [005]
- Add Date/Time (radio button)

At the bottom of the dialog are three buttons: 'OK' (green), 'Fiber Index...' (orange), and 'Trace Index...' (orange).

Autosave Parameters - Fiber

Auto Save: To enable/disable autosave result.

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 result number automatically. The filename will begin with the Index value, Result 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 the 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 test count can be incremented using Trace ID or Fiber ID, but Trace ID is recommended.
- **Add Index (Result):** Test counter. When saving test results, count auto increments and is added to the filename. To change the value, click **Fiber Index** and select **Force** to enter a specific value or **Reset** to reset the counter.

Autosave Parameters - Common

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

- **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 test report.
- **Node ID:** Node ID
- **Account:** Account number
- **Tech ID:** Operator ID (automatically populated when synchronized with R-Server)
- **Tech Name:** Operator name (automatically populated when synchronized with R-Server)

- **PDF Report:** The PDF report can be exported using the System File Management.
- **Autosave Results:** To view or export a saved result, select the **Results** button. Files can be accessed by selecting **Files Saved** or **USB** in the **Results** menu.

View Setup

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

Display Settings	
Grid Division	Fixed ▼
Grid Color	Light ▼
☒ Trace Antialiasing	
☒ Show Fiber Sections	
☒ Auto Zoom Trace	
Distance Unit	Kilometers ▼
☐ Cleanup Trace List Before Measurement	
Real Time Refresh Rate	High ▼
☐ Real Time Button	
Measurement Target Tab	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.
- **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.

- **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 Refresh Rate:** Select how often screen is refreshed for live viewing.
Select a *low* refresh rate when doing a quick length and loss measurement of short fibers without saving results. A low refresh rate allows more averaging between display update so the fiber loss can be measured without needing to stop the test.
Select a *high* refresh rate to detect live changes on the fiber between display refresh (less averaging between refresh updates).
- **Real Time Button:** Show the RT button on the right side menu.
- **Measurement Target Tab:** Select the tab to display after taking a measurement.

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:

The image shows two side-by-side screenshots of the FaultScout Span Settings interface. The left screen, titled "Launch and Receive Fiber Measurement", has a green header and a white background. It contains the text "Please select the cable measurement mode" and a list of three radio button options: "Launch Cable Only" (selected), "Receive Cable Only", and "Launch and Receive Cable (requires R>=-55dB event)". At the bottom are "OK" and "Cancel" buttons. The right screen, titled "Launch Cable Measurement", also has a green header and a white background. It contains the text "Please connect the launch cable to the unit and press the [Measure] button." and "Recommended cable lengths:" followed by two bullet points: "SM APC: 20 meters" and "SM/MM UPC: 60 meters". Below this is a "Launch Length (km)" input field with the value "0.00000" and a "Measure" button. At the bottom are "OK" and "Abort" buttons.

FaultScout 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 LinkMap will state that the event loss is not included.

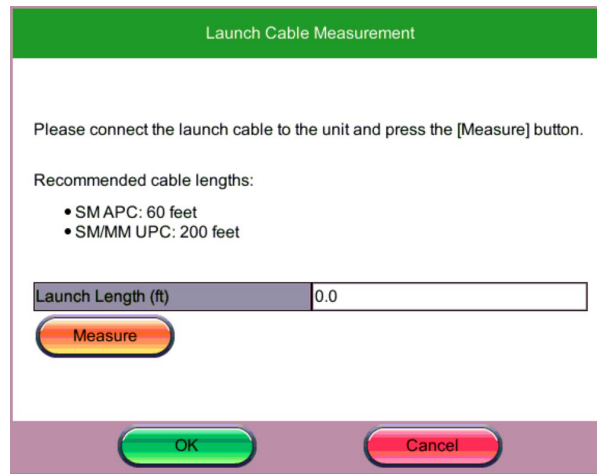
The same procedure for offsetting Launch Fibers applies to offsetting Receiver fibers which are often used in Fiber to The Antenna (FTTA) applications.

Measure Cables

Use the Measure button to measure the Launch/Receive cables and populate the result into the Length field automatically.

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.



FaultScout Setup > SPAN: Auto Measure Launch Fiber

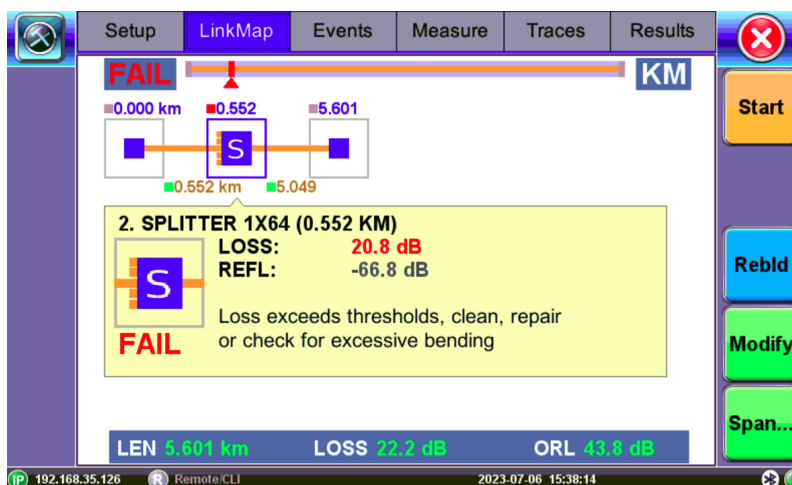
3. Tap **Measure** to begin. After the measurement is completed, the measured lengths will populate the fields automatically. To reject the values, click **Abort**. To accept the values, click **OK**. The new measured length(s) populate the **Launch and Receive Cable Calibration** (Span settings) screen.



If the Launch and Receive option is selected and the cables are not connected, you will receive a “Can’t find the R>=-55dB coupling event, try measuring each cable individually”.

LinkMap

After a FaultScout test is complete, a LinkMap will be displayed to provide details for all events found on the fiber that was tested. Below is an example of how a single splitter PON fiber might look.



FaultScout PON LinkMap Screen

LinkMap symbols

The LinkMap Icons facilitate quick fiber diagnosis so that technicians can fix issues quickly and efficiently which ensures fast turnaround time and reduced truck rolls.

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

Icon	Description
	Span start (indicates start of analysis section) – as defined in Test Setup
	Span end (indicates start of analysis section) – as defined in Test Setup (distance or event index)
	Splice Loss >0.02 dB
	Connector Reflectance > -65 dB
	1xN Splitter from the ONT (end-user) side Loss > 4dB, Reflectance not applicable
	ONT/ONU -30 dB < Reflectance < -40 dB

LinkMap Icon Descriptions

Events



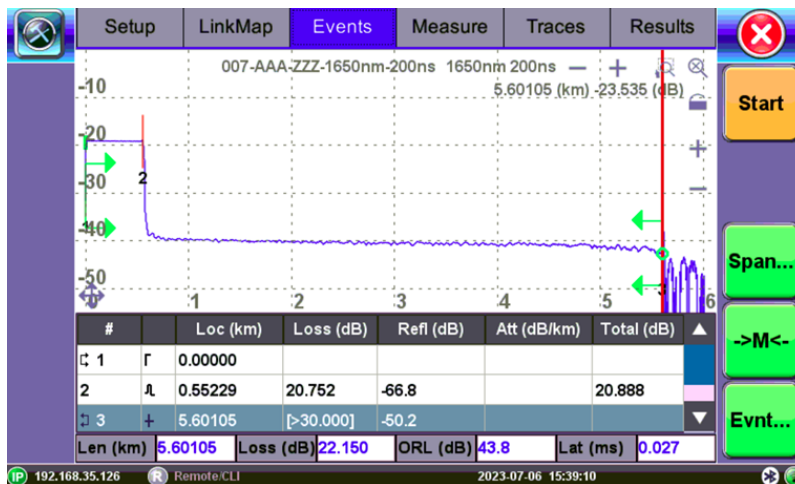
If a **KNOWN** event does not appear, try the following:

- Check and adjust Analysis threshold levels.
- If testing Long Fiber, make sure the range > FUT (fiber under test); increase time to 3 minutes.
- Change the test mode for which to optimize. For example, if optimizing for DZ mode, change to DR and vice versa.
- Use V-Scout.

Event 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.

Merged event details follow in Event table and are tagged with an asterisk *.



Event Table

The Event 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 arrow green brackets (Span Start) indicate the 0km location and the left arrow (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.
	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

The Event is color coded depending on Threshold settings defined in the test setup (see [Thresholds](#)).

- **Red** indicates the event fails or exceeds the Pass threshold criteria.
- **Green** indicates the event passes the Fail threshold criteria.



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 click **Event<Modify** on the right sidebar. Position the splice loss markers to measure the new event accurately.
5. Once markers are positioned, click the **Accept** button.
6. To analyze the new event, click **Analysis** before accepting. Click **Cancel** to exit the menu without saving changes.

Deleting events

1. Select the event in the Event table or by using the marker on the trace.
2. Use the left/right arrows to position the marker more accurately, if needed.
3. Once selected, tap **Event<Delete** on the right sidebar. The event will now be deleted from the event table and the event number will no longer appear on the trace.

Modifying events

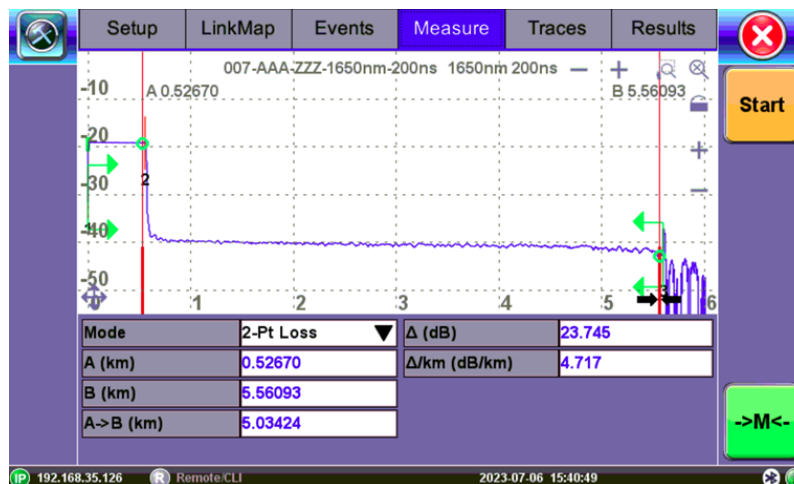
1. Ensure the **Trace** menu is active and the Event table is shown on the screen.
2. Use the left/right arrows to highlight the event on the Event Table. Tap **Event<Modify** on the right sidebar. A marker with two small markers will appear on the trace.
3. When markers and measurement is performed, click the **Accept** button on the right sidebar.

4. 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).
- **Markers** - Brings a marker onto the visible area of the display.
- **Event** – Add, delete, or make manual adjustments to the event table and reanalyze.

Measure

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



Measure

Markers 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 or using side rocker button to move the Active Marker.

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.

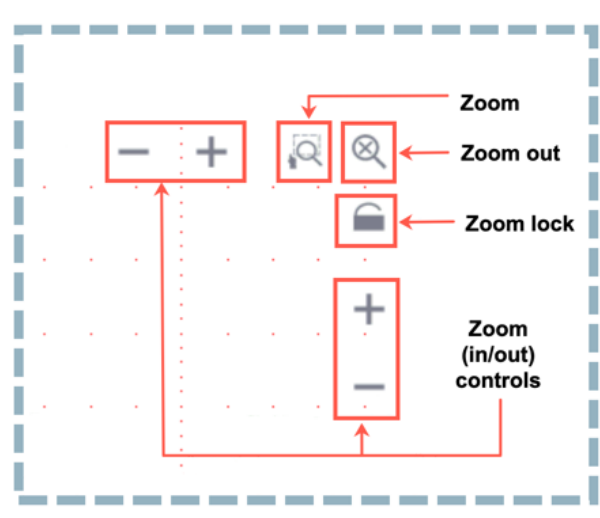
The markers can be moved separately or in tandem (or 5 markers simultaneously in the LSA attenuation measuring mode).

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

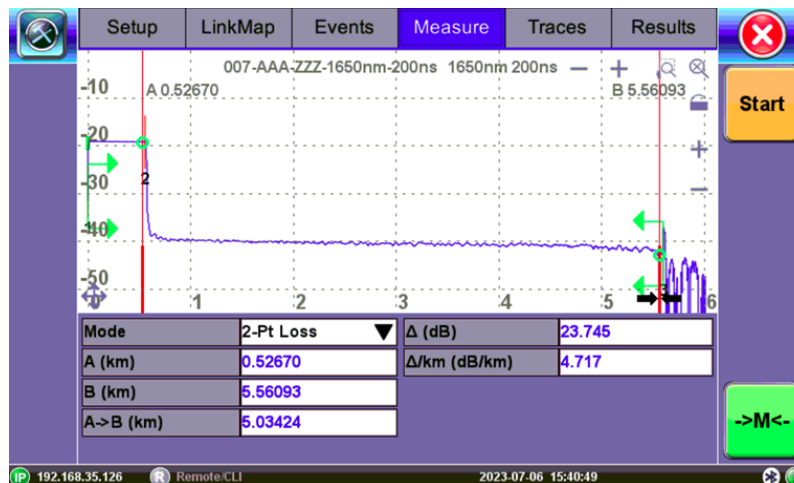
Zooming operations are possible in both Events and Measure mode.



Zoom Operations

- **Zoom/Scroll icon** - Toggle between and enable Zoom/Scroll mode. Zoom can also be performed using the left side rocker button.
 - **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



The distance accuracy depends on the accuracy 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

Two Point Loss (2-Pt Loss)

The 2-Point Loss mode 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". Measure loss between two points using the Loss (2-point) mode (using two markers):

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 on a section of the trace 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.

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. To reduce noise, change Display Real Time Refresh Rate to Low.

Splice Loss Measurement

Determines the Splice Loss in the optical fiber connection using the five markers method.

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 (Spl)** 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 position.

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

To calculate ORL:

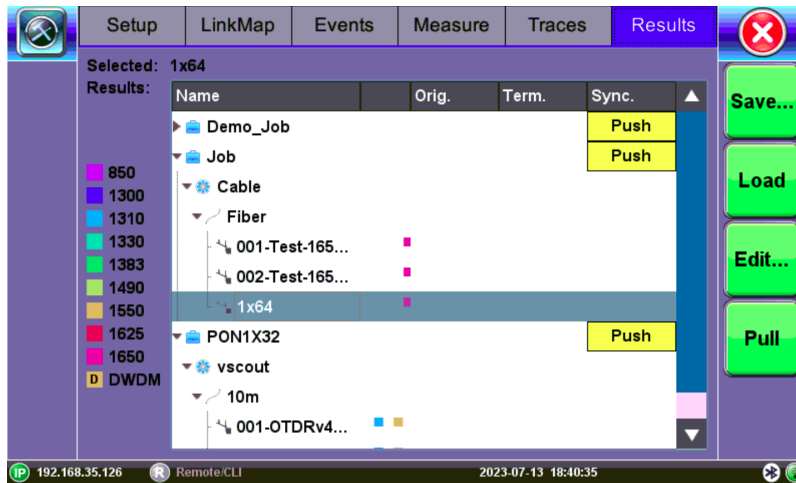
1. Select the trace for measurement (if multiple traces are displayed on screen). The trace to be measured can be selected using the green arrow in the trace overview window.
2. Select **ORL** from the drop-down list.
3. Place marker A at the beginning of the fiber under test and marker B at the end 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

Traces

Select the **Traces** tab to view the most recent tests. The Fault Locator can display up to ten tests simultaneously (i.e., an active test and nine additional tests).



Traces

Recent test results saved or not can be viewed using Traces. All results are organized by by Job/Cable/Fiber/Trace directories. Each test show filename, pulse width, distance range (LMax), and acquisition time used for the test. To view any test, select the file(s) using the check box. All selected tests will be overlaid and can be viewed using the **Event/Measure** tabs. When unit is power cycled, these **results will be permanently removed from memory** and further viewing can only occur if tests were saved and re-loaded using **Results**.

Trace Properties

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

To view information for previously saved tests or edit IOR and thresholds (requires resaving test). Tap the **Info** button on the right sidebar to open the **Trace Information** window to view all relevant information pertaining 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
OTDR Mainframe ID	FL150
Device S/N	SM1650
Optical Module S/N	1479820

Start, Delete, Activ., Info, OK, Cancel

192.168.35.126 Remote/CLI 2023-07-13 19:15:55

Trace Information - Device

General: Date/Time, Job ID, Cable ID, Fiber ID, Group ID, Fiber Type, Originating/Terminating locations, and Comments

Trace information	
Device	General
Date/Time	Thu Jul 13 18:45:50 2023
Fiber Type	[G.652] SMF
Originating Location	
Terminating Location	
Operator	
Comments	
Node ID	
Account	
Tech ID	
Tech Name	

Start, Delete, Activ., Info, OK, Cancel

192.168.35.126 Remote/CLI 2023-07-13 19:17:14

Trace Information - General

Measurement: Test parameters used to make measurement.

Device	General	Measurement	Thresholds
Measurement Mode		Auto	
Accurate Wavelength (nm)		1650.00	
Refractive Index - n		1.4686	
Distance - Lmax (km)		6.72518	
Resolution - dL (m)		0.26	
Pulsewidth - Tp (ns)		400	
Time (m:s)		01:00	
Optimal Dead Zone		off	
Automatically Set Params?		yes	

Trace Information - Measurement

Thresholds: Analysis thresholds used to analyze the trace, as well as PON identification for LinkMap.

Device	General	Measurement	Thresholds
Backscattering Coefficient		-81.0	
Splice Loss - LT (dB)		0.100	
Reflectance - RT (dB)		-65.0	
End of Fiber - ET (dB)		30.000	
Slope - CT (dB/km)		0.250	

Trace Information - Thresholds



For more information on Span settings and Launch/Receive cable offset, see ["Span Settings" on page 30](#).

Change the Refractive Index (RI) and Analysis Thresholds like Backscattering Co-efficient (BC) for the selected 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.



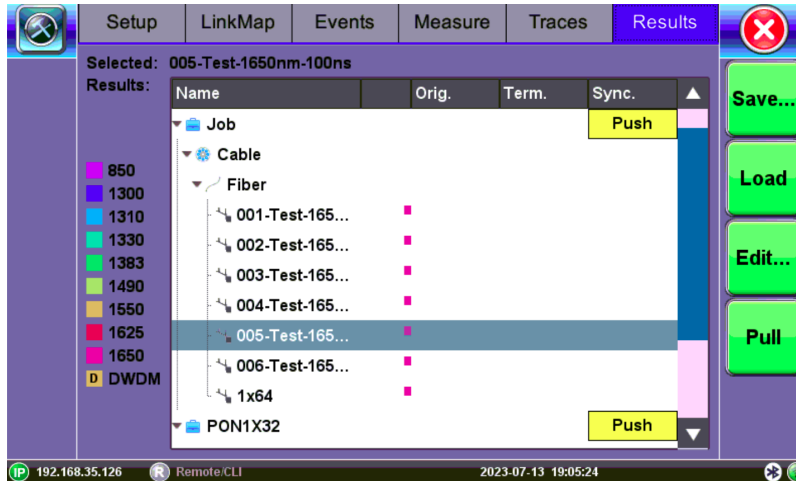
For multi-wavelengths/multi-pulsewidths, edit/change each trace separately.

Results

View all saved test results using this tab.

Saving FaultScout Results

Configure Autosave in the Setup screen or save results manually in the Results screen. The Autosave options can also be configured from the Results screen. See ["Autosave Parameters" on page 26](#) for more information about Autosave options.



Results: Save options

The tests 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 the current/active test:

1. On the **Results** tab, click the **Save** button.
2. Select **Save** to enter the filename manually (shown below) or **AutoSave** to use pre-defined filename format and auto increment test number counter.
3. If desired, enter additional details using the **General**, **Other** or **Report** tabs before tapping the **OK** button.

Result Saving		
Fiber	Common	Report
Job ID	PON1X32	
Cable ID	Cable	
Fiber ID	Fiber	
Trace ID	20230713_190722	
WL	1650	
Tp	400	
L	5.60054	

To view or print reports, use the File Management feature or one of the Fiberizer software applications. For more information, see *File Management* in the [V150 Common Functions User Manual](#) on www.veexinc.com.

Third Party Viewers

When third party viewing is checked, the unit will save filtered .sor results so that third party software will display any trace identical to how it appears on VeEX test sets.



Once saved in using 3rd party format, unfiltered data cannot be viewed afterwards.

To manually save a trace for third party viewing:

1. In the **Results** tab, tap the **Save** button, then tap **Save** again. The **Result Saving** window appears.
2. Select the **Common** tab, and then check the **Compatible with 3rd-party viewers** checkbox.
3. After making any other changes (especially Fiber tab) as needed, click **OK**.

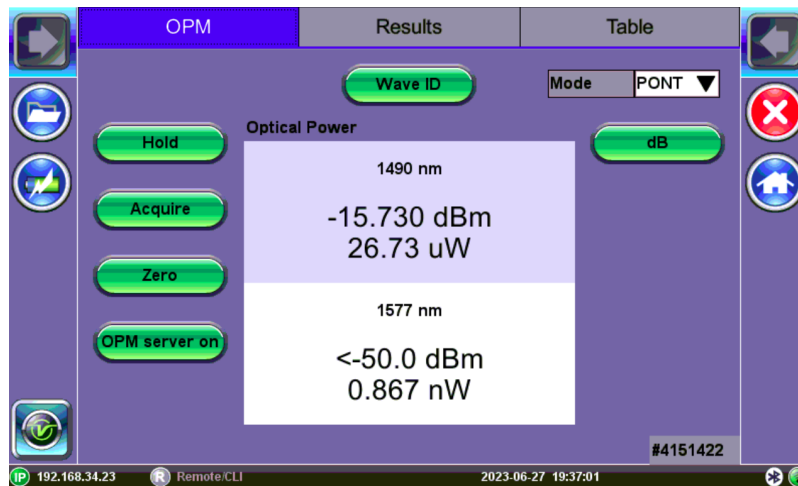
The screenshot shows a 'Result Saving' dialog box with a green header. It has three tabs: 'Fiber', 'Common' (selected), and 'Report'. The 'Common' tab contains several input fields: 'Node ID', 'Account', 'Orig. Location', 'Term. Location', 'Comments', 'Tech ID', and 'Tech Name'. Below these fields is a checkbox labeled 'Compatible with 3rd-party viewers', which is checked. At the bottom of the dialog are 'OK' and 'Cancel' buttons. On the right side of the dialog, there is a vertical stack of buttons: 'Save...', 'Load', 'Edit...', and 'Pull'. The status bar at the bottom shows the IP address '192.168.35.126', the text 'Remote CLI', and the date and time '2023-07-13 19:27:23'.

Optical Power Meter (OPM)

An in-line, dual wavelength selective meter shares the FaultScout test port, which allows the measuring of live 1490/1577nm signal levels. The OPM can be operated in standalone mode or in conjunction with the FaultScout mode.

Access the PON meter in standalone mode

Using the Fiber Menu, select the **OLS/OPM** icon to open OPM screen. Tap **Mode** to select **PONT** (dual WL view) or **PM4** (single WL view) meter results and select desired wavelength.



OPM Screen

- **Hold:** Freezes the last power or loss reading on the screen. Hold appears on the white screen when tapped. Tap Hold again to unfreeze it.
- **Acquire:** Records instantaneous power or loss readings in the **Results** tab. The **Table** tab must be used to record these individual readings (e.g. same cable at different wavelengths). Use the **Folder** button to save the complete set of results. This is useful when measuring multiple fibers or testing one fiber with multiple wavelengths.

- **Zero:** Recalibrates the meter zero value level. Recommended when measurement conditions change significantly. When in doubt, perform this procedure prior to making any measurements. For example, when you are testing in cold outdoor temperatures and then move testing inside to a heated building.



Put the cover over the OPM test port BEFORE recalibrating.

- **OPM server on:** for factory use only

Optical Light Source (OLS)

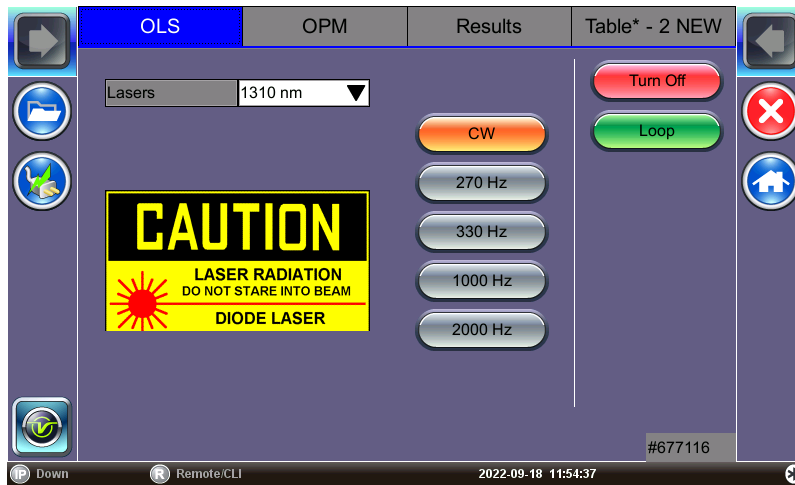
The unit can be equipped with an optional Optical Light Source (OLS) to use in conjunction with any OPM to measure link loss. The OLS radiates continuously or in pulses with modulation.

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.



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 **Optical Light Source** from the main menu. The **OLS** screen appears.

4. 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 **Laser 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.



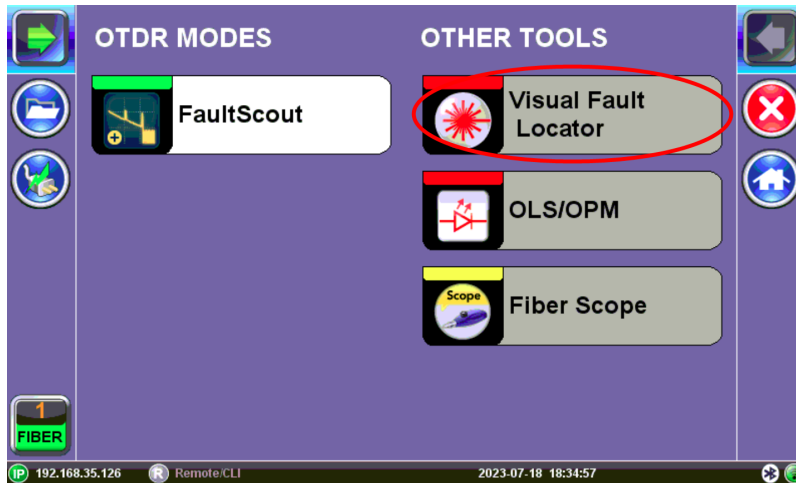
PROTECT YOUR EYES!

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.

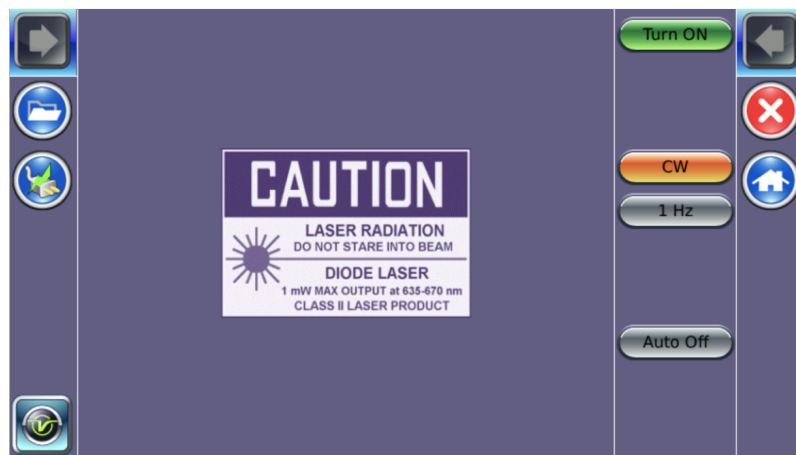
VFL can be used with OTDR simultaneously.

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

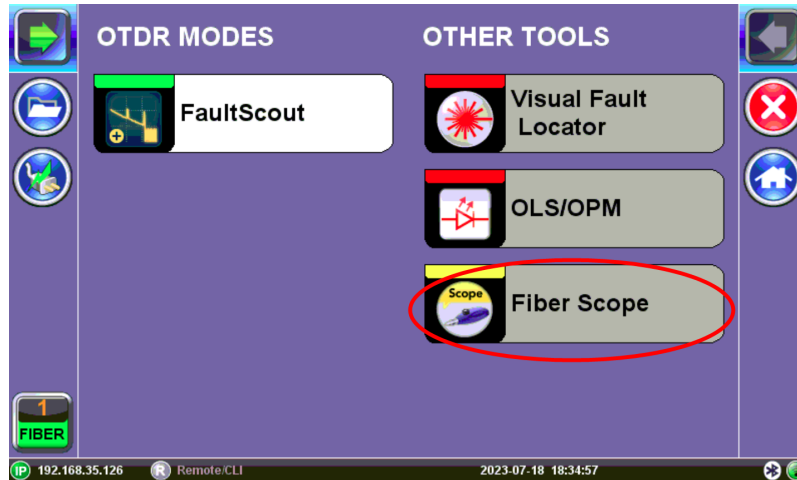
4. Select the operation mode.
5. **CW:** (*Continuous Wave*) Select this option to turn on the VFL continually to check for faults.
1 Hz: (*Pulse*) Select this option to send intermittent light pulses. In some cases, this makes it easier to identify faults (than continuous light). It can also be used 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, ODLs, 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.

Fiber Scope



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/WiFi 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 VS-500 is no longer offered but is still supported by VeEX test sets.

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.



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.

Refer to the *V150 Common Functions User Manual* on www.veexinc.com for more information.

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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