

MTTplus User Manual

Modular Test Platform



P/N D07-00-096P Rev. C01

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-ion Battery Precautions

Lithium-ion (Li-ion) battery packs are compact and offer high capacity and autonomy, which make them ideal for demanding applications, like providing long lasting power to portable test equipment. For safety reasons, due to their high energy concentration, these batteries packs and products containing them must be used, charged, handled, and stored properly, according to the manufacturer's recommendations.

Li-ion battery packs contain individual Li-ion cells as well as battery monitoring and protection circuitry, sealed in its plastic container that shall not be disassembled or serviced.

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

- Always charge the unit's battery pack inside the test platform battery bay using the AC/DC adapter supplied by VeEX.
- Do not charge or use the battery pack if any mechanical damage is suspected (shock, impact, puncture, crack, etc).
- Do not continue charging the battery if it does not recharge within the expected charging time
- Storage: For long term storage, the battery pack should be stored at 20°C/68°F (room temperature), charged to about 30 to 50% of its capacity. Spare battery packs should be charged and used at least once a year to prevent over-discharge (rotate them regularly).
- It is recommended to charge and use battery packs at least every three months. Battery packs shall not go without recharging (reconditioning) for more than six months.

- After extended storage, battery packs may reach a deep discharge state or enter into sleep mode. For safety reasons, Li-ion batteries in deep discharge state may limit the initial charging current (pre-charge) before starting their regular fast charging cycle. The pre-charging state may take several hours.
- Air transportation of Li-ion batteries is regulated by United Nations' International Air Transportation Association (IATA) Dangerous Goods Regulations and by country-specific regulations. Please check local regulations and with common carriers before shipping Li-ion battery packs or products containing relatively large Li-ion battery packs.

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.

Safe Module Handling

While replacing test modules, all work on the open panel must be performed only by suitably qualified personnel who is familiar with the dangers both to people and to the instrument itself.

Modules are not hot swappable. The platform must be turned off and unplugged from VAC mains when removing or inserting test modules.

For safety and EMC (Electromagnetic Compatibility), empty module slots must be properly covered with blank panel covers.

Prevent foreign objects from entering the chassis, before, during and after module exchange or re-configuration process. They could create short circuits or damage internal fans.

Always store test modules by themselves in individual ESD protected packaging (with no loose elements, like screws or tools).

Electrical Connectors

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

ESD: Electrostatic Discharge Sensitive Equipment

Test modules could be affected by electrostatic discharge. To minimize the risk of damage when replacing or handling test modules, make sure to follow proper ESD procedures and dissipate any electrostatic charge from your body and tools and the use proper grounding gear.



- Perform all work at a workplace that is protected against electrostatic build-up and discharging.
- Never touch any exposed contacts, printed circuit boards or electronic components.
- Always store test modules in ESD protected packaging.
- Wear ESD protection and grounding gear when:
 - Inserting, extracting, or handling test modules.
 - Inserting or removing SFPs, XFPs, QSFPs, or CFPs from the platform.
 - Connecting or disconnecting cables from modules or platform.

Getting Started

Introduction to MTTplus Modular Test Platform

The MTTplus Modular Test Platform addresses the challenges of communication service providers to increase efficiency and productivity. The flexible test platform lowers operational and capital expenditures associated with handling multiple technologies required to address today's Access, Business, Metro, Carrier Ethernet, Transport and Core services.

The MTTplus platform is a modular test toolkit for wide ranging and evolving test needs.

MTTplus addresses the growing need of fiber test tools for the evolving hybrid FTTx / copper networks. Communication service providers can equip their field force with a test toolkit ranging from Ethernet, Internet, TDM transmission technologies as well as for FTTX/PON installation tools such as an Optical Power Meter and Fiber Inspection Scope.



Platform Highlights

- Modern, modular test platform offering a wide range of available test modules covering legacy and modern Access (copper and fiber), FTTx, LAN, WLAN, Metro, Carrier Ethernet and

Transport technologies

- Application-oriented GUI
- Multi-technology: xDSL, Fiber Optics, Teleprotection, DSn/PDH, SONET/SDH, OTN, Ethernet, Fibre Channel, CPRI/OBSAI, WiFi, PON
- Expand test functions by changing test modules
- Future-proof cost-effective test platform
- GUI familiarity across different test modules and other VeEX products reduces learning curve
- View test results and create detailed reports by region, area, system, and technician, using R-Server centralized management
- Test set connectivity via USB, Ethernet, and WiFi
- WiFi Client and Access Point (AP) modes for seamless wireless control, result access and software updates
- Four USB ports (3x USB A and 1x micro-B USB)
- Fast and efficient test result transfer to USB memory stick, PC or tablets
- EZ-Remote™ for remote testing/monitoring, assistance and training across Internet connections
- VeExpress™ for license management and software updates
- Built-in GNSS (GPS, GLONASS, Galileo, Beidou) option for timing measurements and tagging test results with coordinates, location map and time stamps
- GNSS SkyView antenna verification option
- Built-in Camera option for job site documentation, QR and bar codes
- Rugged, small package and light weight
- Field replaceable battery pack
- Large LCD Touch Screen and ambient light sensor

MTTplus Modules

MTTplus-260: SHDSL Test Module

MTTplus SHDSL Test Module provides CPE installation, CO emulation pre-qualification, and IP/ATM services testing capabilities for service installation and verification. The module is based on the industry leading Lantiq SOCRATES chipset, offering best-in-class SHDSL performance and interoperability. SHDSL is ideal for business class services, enterprise networks, and industrial communications that must rely on legacy copper-based networks where fiber remains cost prohibitive. Utilizing SHDSL's multiple pair bonding application enables robust data transmission over long copper lines.

MTTplus-320: Multi-Service Test Module

The MTTplus-320 Multi-Service Module is a full-featured test solution for OTN, SONET, SDH, PDH, DS_n, 64k Codirectional, C37.94, Carrier Ethernet, Fibre Channel, SyncE and CPRI/OBSAI.

MTTplus-340: Advanced Multi-Service Test Module

The MTTplus-340 test module offers advanced test solutions for Access, Metro and Carrier Ethernet, supporting OTN, SONET/SDH, PDH/DS_n, Fibre Channel, CPRI, C37.94 and basic Synchronization. This compact and flexible test platform helps service providers increase efficiency and productivity. It lowers OpEx and CapEx associated with handling multiple technologies required to address today's Access, Business, Carrier Ethernet, Transport and Core services.

MTTplus-410+: Fiber Optics Test Module

The MTTplus-410+ Fiber Optics test module for the VeEX® MTTplus platform has up to 500,000 data points with 3 cm resolution. It supports a full range of test functions including OTDR, OPM, Light Source and VFL. GPS coordinates and images can be embedded into the OTDR sor files and PDF test report provided the MTTplus platform is configured with GPS and Camera options. Fiberizer® software for Windows® Desktop, Android™, and/or Apple® mobile devices is available to assist in data transfer, record management, and report generation for various VeEX fiber optics testers. View the [Fiberizer webpage](#) for more details.

MTTplus-420: GPON Test Module

The new MTTplus-420 GPON test module for the VeEX® MTTplus platform is designed for service activation at the ONT location. The unit checks optical power levels and non-intrusively decodes the messages exchanged between the OLT and ONT allowing technicians to perform advanced troubleshooting.

MTTplus-522: OSP+ Test Module

The MTTplus-522 Outside Plant (OSP)+ Expert Module combines key copper verification features with DSL/G.fast modem emulation. It is designed for Service Providers deploying broadband services over a DSL or G.fast access network.

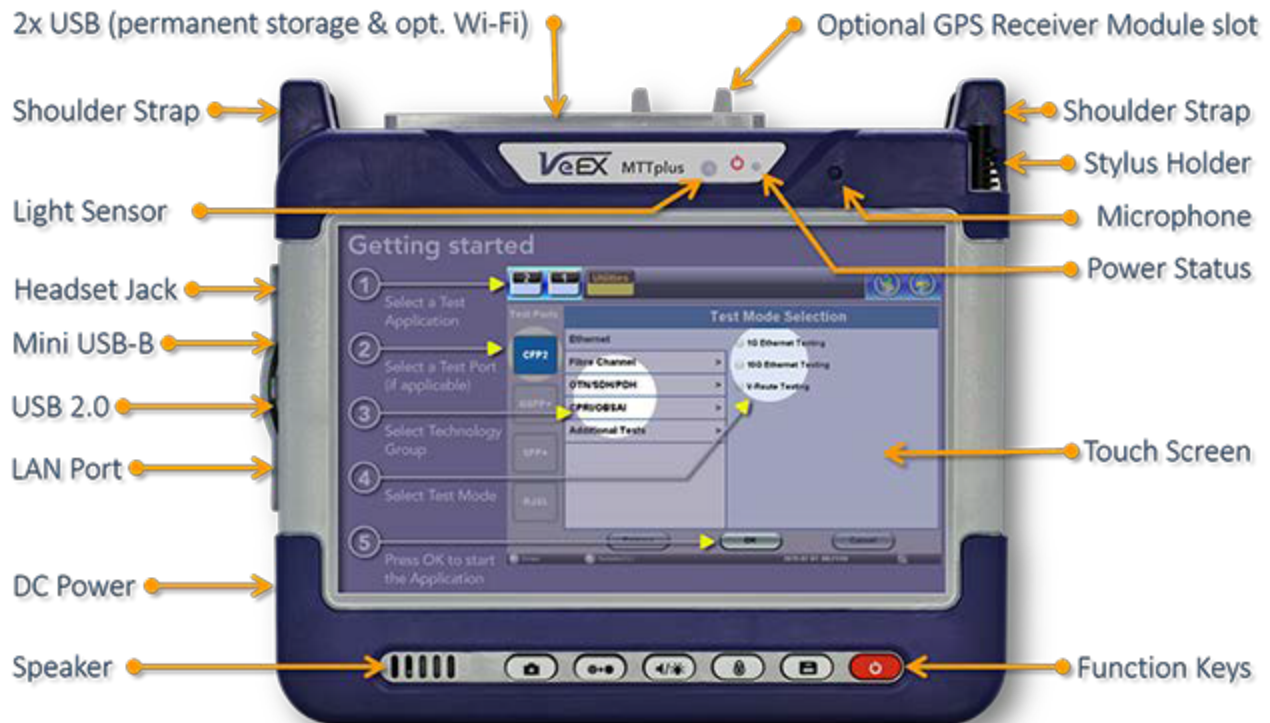
MTTplus-523: G.fast/DSL Test Module

The MTTplus-523 Module addresses key test requirements for IP based broadband services deployed over a G.fast or DSL Access network.

Hardware Configuration



Please refer to their individual test modules' datasheets and manuals for further details. For specifications and an up to date list of modules available for the MTTplus platform, go to <https://www.veexinc.com/products/mttplusseries>.



MTTplus Test Platform (a.k.a Chassis):¹

¹ The MTTplus platform provides a compact, powerful and cost-effective modular test toolkit for today's wide range of evolving test needs. The compact MTTplus Modular Test Platform addresses the challenges of communication service providers to increase efficiency and productivity. The flexible test platform lowers operational and capital expenditures associated with handling multiple technologies required to address today's Access, Business, Carrier Ethernet, Transport and Core services.

Modules/Hardware Options

MTTplus-260: SHDSL Test Module



- CPE Emulation for standard SHDSL and SHDSL.bis
- Standards SHDSL.bis line rates: Symmetrical 5.7 Mbps per pair
- Key DSL metrics including Data Rate, SNR Margin, and line errors
- EFM and ATM support
- SHDSL/EFM mode for Ethernet based services, offering higher data rates and superior reach for Enterprise and Industrial applications
- Legacy 4-Wire SHDSL/ATM Standard and Enhanced Modes
- EFM Bonding and ATM Bonding up to Four Pairs
- CO Emulation for line prequalification using real SHDSL signals
- Based on the industry leading Lantiq SOCRATES 4e SHDSL Chipset

MTTplus-320: Multi-Service Test Module



- All-in-one multi-service test solution, from 64 kbps to 10 Gbps
- Transport, Core, Metro, SAN, Backhaul and Fronthaul applications
- Supports independent and simultaneous measurements

OTN/SDH/SONET/PDH/DSn

- Advanced flexible OTN, SDH/SONET, PDH/DSn test payload map/mux, including EoOTN support (ODU0 and ODUflex)
- Overhead Monitoring and Byte decoding
- Automatic Protection Switching and Service Disruption
- Round Trip Delay on all interfaces and payload mappings
- Tandem Connection Monitoring
- Jitter and Wander (E1, E3, DS1, DS3, STM-1o, OC-3)
- Non-intrusive Pulse Mask Analysis at E1, E3 and DS1, DS3 rates

Fibre Channel

- Storage Area Networks (SAN) testing
- BERT and Throughput test
- RFC2544: Throughput, latency, frame loss, back to back tests
- Layer 1 and layer 2 loopbacks

CPRI/OBSAI Testing

- Common Public Radio Interface standard (CPRI): Unframed, Layer 1 Framed and Layer 2 tests (REC/BBU and RE/RRH emulation)
- Open Base Station Architecture Initiative (OBSAI): Unframed tests
- BER testing with PRBS stress patterns
- Latency measurements

SCADA and Teleprotection

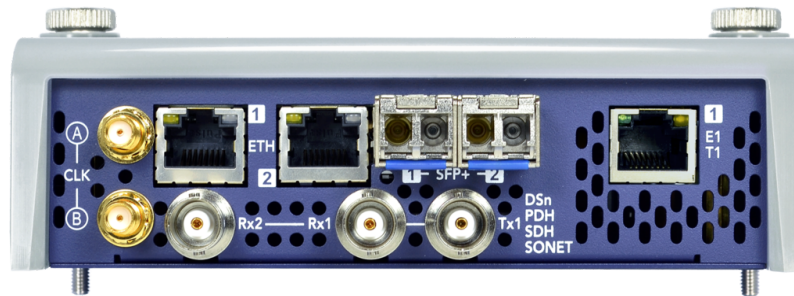
- IEEE C37.94 Testing
 - Terminal and bidirectional pass-through monitor modes
 - 64k to 768k (N: 1 to 12)
 - BERT, Alarms and Round Trip Delay
 - GPS-assisted one-way-latency (asymmetry)
 - MMF and SMF optical interfaces
- G.703 64k Codirectional Testing
 - Terminal mode
 - BERT, Alarms and Round Trip Delay

Ethernet

- RFC2544 Throughput, latency, frame loss and back to back tests
- V-SAM test suite compliant with ITU-T Y.1564 standard
- IEEE 802.3ah, ITU-T Y.1731, IEEE 802.1ag, MPLS-TP OAM support
- Q in Q (VLAN stacking), MPLS, MPLS-TP, PBB support
- RFC6349 V-PERF TCP test suite
- Layer 2 Control Protocol Transparency test
- In-service monitoring with frames capture and on-screen protocol decode
- One way latency with optional built-in GPS
- Fully integrated solution for synchronized packet networks
- Supports IEEE 1588v2/PTP and SyncE/ITU-T G.8261 standards
- Master Clock and Slave clock emulation
- IEEE 1588v2/PTP protocol monitor & decode, and PDV analysis

- Clock recovery from SyncE or PTP and output to physical port
- Wander measurement and MTIE/TDEV analysis
- ESMC SSM generation, monitoring, and decoding
- VoIP and IPTV testing

MTTplus-340: Advanced Multi-Service Test Module



- Flexible, all-in-one multi-service test solution, from 64 kbps to 14 Gbps
- Transport, Core, Metro, SAN, Backhaul, Fronthaul and Network Synchronization
- Offers two fully independent test ports for simultaneous measurements

Ethernet

- RFC 2544 Throughput, latency, frame loss and back to back tests
- V-SAM test suite compliant with ITU-T Y.1564 standard
- IEEE 802.3ah, ITU-T Y.1731, IEEE 802.1ag, MPLS-TP OAM support
- Q in Q (VLAN stacking), MPLS, MPLS-TP, PBB support
- RFC 6349 V-PERF TCP/UDP test suite
- Layer 2 Control Protocol Transparency test
- Advanced tests: IP Sec, LACP, L2CP, NAT Traversal
- In-service monitoring with packet capture and on-screen protocol decode
- One way latency with optional built-in GNSS receiver

- Fully integrated solution for synchronized packet networks
- Supports IEEE 1588v2/PTP and SyncE/ITU-T G.8261 standards
- Master Clock and Slave clock emulation
- IEEE 1588v2/PTP protocol monitor & decode, and PDV analysis
- Wander measurement and MTIE/TDEV analysis
- Wander measurement and MTIE/TDEV analysis
- VoIP and IPTV testing

Fibre Channel

- Storage Area Networks (SAN) testing up to 16G FC
- BERT, Throughput, and RFC 2544 test
- RFC 2544: Throughput, latency, frame loss, back to back tests
- In-service monitor, capture and protocol decode
- Layer 1 and layer 2 loopbacks

CPRI Testing

- Common Public Radio Interface standard (CPRI) Layer 2 tests (REC/BBU and RE/RRH emulation)
- BER testing with PRBS stress patterns
- Latency measurements

OTN/SDH/SONET/PDH/DSn

- Advanced flexible OTN, SDH/SONET, PDH/DSn test payload map/mux, including EoOTN (ODU2e, ODU0 and ODUflex)
- Overhead Monitoring and Byte decoding
- Protection Switching and Service Disruption Time (SDT)

- Round Trip Delay on all interfaces and payload mappings
- Tandem Connection Monitoring
- Jitter and Wander (E1, E3, DS1, DS3, STM-1o, OC-3)
- Pulse Mask Analysis at E1, E3 and DS1, DS3 rates

IEEE C37.94™

- Power/Utilities Teleprotection Network testing
- BERT, SDT/APS, RTC and transparency tests
- Passive bidirectional Monitoring and intrusive Pass-Through modes
- GNSS-assisted One-Way-Delay measurements
- Jitter and Wander Measurements

MTTplus-410+: Fiber Optics Test Module



Optical Time Domain Reflectometer (OTDR)

- Multimode Wavelength options - 850 & 1300 nm
- Singlemode Wavelength options - 1310, 1490, 1550, 1625 & 1650 nm
- Filtered 1625 or 1650 nm port for in-service measurements
- Live fiber detection to avoid service disruption of active subscribers
- Dynamic range up to 50 dB for long haul fibers and PON splitters
- Event dead zone < 1 m, Attenuation dead zone < 4 m

- Optional V-Scout/V-Profile - Intelligent Link Mapping
- Fixed or Universal optical connectors with UPC or APC interface options

Optical Power Meter (OPM)

- Optional OPM for LAN, Telco, FTTx and CATV networks
- Multiple calibrated wavelengths
- InGaAs detector for standard and high power levels
- Absolute (dBm, Watts) and Relative (dB) power measurements
- WaveID detection of incoming wavelength from compatible VeEX light source
- Industry standard optical adaptors available

Optical Light Source (OLS)

- Optional OLS function based on OTDR laser fitted
- Stabilized output for insertion loss testing
- WaveID/Loop mode to support multi-wavelength testing in a single operation
- CW or modulation modes for use with fiber identifiers
- Auto Off feature to conserve battery power

Visual Fault Locator (VFL)

- Visible laser for patch-panel troubleshooting or localized fault finding
- CW and 1 Hz operating modes

MTTplus-420: GPON Test Module



Basic Mode

- Two Port pass-through test mode for measuring downstream and upstream levels
- Three configurations available:
 - 1310 / 1490nm
 - 1310 / 1490 / 1550nm
 - 1310 / 1490 / 1577nm
- Simultaneous display and measurement of calibrated PON signals
- Automatic ODN class detection and power-level pass/fail analysis
- Rogue ONT detection
- Low insertion loss : ≤ 1.5 dB typ.
- User defined Pass/Fail thresholds
- Automated pass/fail fiber inspection analysis with optional fiberscope
- Easy Report generation and data transfer
- Upstream/Downstream LED status indicators for signal, Frame, Err/Alarm and TC Sync

Expert Mode

- PLOAM advanced ONU information
- Display OLT TX, PON Type, and Budget
- Common upstream and downstream Error detection: LOS, BIP, FEC, etc.
- GPON Wizard for commission report
- List all active ONT IDs and serial numbers
- PLOAM decoder and display PLOAM Control messages
- OMCI decoder and display OMCI messages

MTTplus-522: OSP+ Test Module



- XTU-R and FTU-R CPE Emulation for G.fast, VDSL2 up to Profile 35b, and ADSLx
- Key DSL/G.fast metrics including Data Rate, SNR Margin, and line errors
- Fault identification and location with TDR and RFL
- DC/AC Voltage, DC Current and Capacitance Open Meter
- Resistance and Leakage
- PSD Spectrum and Impulse Noise
- Longitudinal Balance
- Impedance Detection & Location
- Wideband Insertion Loss
- VF Noise

MTTplus-523: G.fast/DSL Test Module



- XTU-R and FTU-R CPE Emulation
- G.fast, full frequency band up to 106 MHz

- VDSL2, up to Profile 35b and ADSLx technologies
- Key DSL/G.fast metrics including Data Rate, SNR Margin, and line errors
- Latest DSL innovations including Vectoring and Retransmission
- IP Services Testing

Change language and user interface style

Before using the platform, set the language and user interface style as needed. By default, the user interface style is set to USA if the unit is shipped to North America and to International if the unit is shipped to outside North America.



To change the GUI language and user interface style:

1. Tap **Utilities** and then tap **Settings**.
2. Tap the **Global** option.
3. Select the language from the **Language** drop-down list box.
4. Select the user interface style from the User Interface drop-down list box.

- **International:** Provides layer-based SDH/PDH configuration menus with access to detailed settings.
- **USA:** Provides simplified application-based SONET/DSn menu with more automation. The **Advanced Mode** option displays the configuration menu for additional settings.

To manually change the Date & Time:

Go to **System Tools >Utilities >Settings >Date & Time**, to manually set the date, time and time zone. Then, tap **Apply**.



To enable daylight saving time (DST), manually select a neighboring time zone with a +1:00 relative to the standard time zone of the current location. Set it back to the standard time zone offset when DST ends.

Get Standard Time from GPS/GNSS

If equipped with the GPS/GNSS receiver (hardware option), manually copy the GPS time into the system.

Go to **System Tools >Utilities >Settings >GPS/High Precision Clock**, to configure the GNSS Receiver and turn it ON. Once it recovers time (ToD UTC) from the satellites, click the **Sync ToD** button to apply the standard time to the RTU. The standard time will be applied at the start of the next second (rise of the internal 1PPS timing signal). The local UTC Offset (Time Zone) setting is used to apply the correction for local time. This manual Sync ToD time setting function should not be used when NTP is enabled.

For more information on the atomic clock and relative phase monitoring, see "[High Precision Clock Sources](#)" on page 68 and "[GNSS/GPS & Sky View](#)" on page 144.

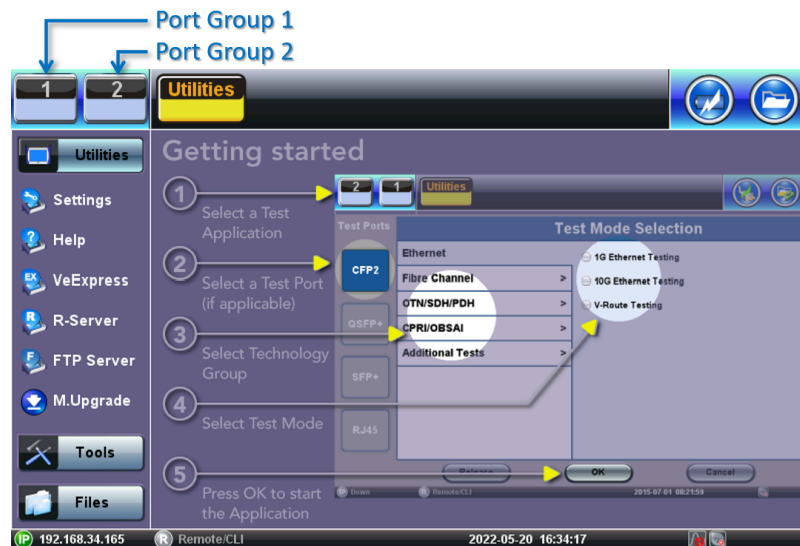
Launching Test Applications

A Quick Guide is always presented in the Home screen after boot up.

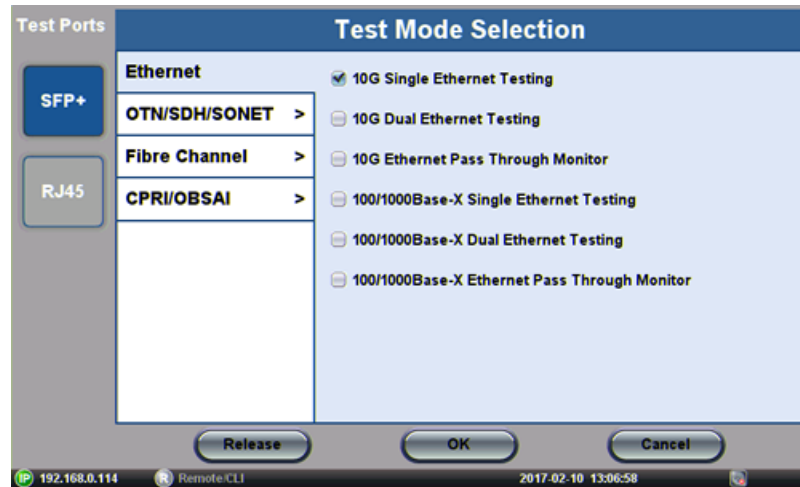


This procedure can be started at any time, from any screen or menu.

1. Select an empty **Test App** button. The **Test Mode Selection** menu is displayed. If applicable, select a **Test Port**.



- Up to two independent tests can run simultaneously (test set or test module dependent)
- Some test applications may require two port groups (e.g., router wrap-around test) and may not be supported by all test modules or test sets configurations.



2. **Protocol** (technology group or link type), using the vertical tabs. (The available selection will depend on the capabilities of the selected port type.)
3. **Test Application/Mode**, using the check boxes. (The available test functions will depend on the of the selected protocol and purchased licenses.)



If the Test Set shows a different Test Mode Selection menu, update its software to the latest version available using [VeExpress](#) or download the upgrade package from the product page on www.veexinc.com.

4. Press **OK** to launch the Test Application

The test port is assigned to the selected test application and the required software/firmware is loaded.

Understanding Test Application GUI



- A.  **System Utilities Button:** Tap this button access MTTplus Utility functions Or press the orange App rubber button to toggle.
- B.  **Active Test Application GUI:** Shows the Test Port Group being used and the Test App ID (Rate/Technology)
- Tap this button to release the Test App or change its Test Mode.
- C. **Test Application Menu**
- Lists all test Functions, Applications and Tools available for the selected test mode
 - Setup = Port and Test Signal configuration
- D. **LEDs** - Test Signal Status
- E. **History** - Clears past events reminder (blinking)
- F. **Current test interface line rates**
- G. **Action buttons** section

- This vertical section displays direct access functions applicable to each specific Test Mode, such as Start/Stop test, Laser control, Error and Alarm injection, Start protocol capture, etc.
- Most of these buttons offer immediate action. A few open a configuration menu.

Chassis Overview



To power on the test set, press  for approximately two seconds, until the test set beeps once. See "[Key Pad](#)" on the next page for more information on the test set's buttons.

LEDs

Power LED

A single LED indicates the power state of the unit.

- **OFF** : The LED is off when the unit is powered off
- **GREEN**: The LED is green when the unit is powered on and fully charged.
- **ORANGE**: The AC/DC adapter is plugged in and the battery is charging.

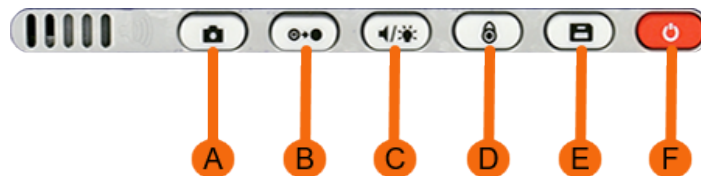
Audible Beeps

Low Battery status is indicated by a periodic beeping sound, every four seconds, and displaying a warning pop-up message on the screen.

When working on battery power, once the charge capacity reaches about 10%, the test set will start beeping to notify users to plug in the AC/DC adapter. A pop-up message may also be presented on the screen. When the charge level reaches 5%, the test set automatically initiates the shutdown process, to protect the battery.

To get information about the amount of battery charge and autonomy estimate (under current usage condition) tap the battery icon displayed on the top-right corner of the screen.

Key Pad



MTTplus Keypad

A. Camera App: Launches the optional Camera App to help document the job site, damage, connections, etc. Requires the camera (factory-installed options).

B. Clear History: Resets blinking LED reminders of past Errors or Alarms. Test results are not affected (not used in OTDR). The **F2** key on standard keyboards can be used when controlled via VNC.

C. Volume and Brightness Control: Brings up the Sound and screen Brightness controls; Use cursor buttons to adjust the levels. Speaker and microphone may be optional or no longer available in certain test sets.

D. Lock/Unlock Touch Screen: Can also be programmed to capture Screen Shots (>Utilities >Settings >Global >Save Settings). Use the **F3** in standard keyboards.

E. Save Test Results: Saves the current Test Results with customized or auto naming (yyyymmdd-hhmmss format). The **F1** key on standard keyboards can be used when controlled via VNC. Refer to ["File Manager" on page 152](#) for details on saving files.

F. Power: Press for 3-5 seconds to turn the test set ON or OFF (prevents accidental ON/OFF). FORCE OFF by pressing more than 10 seconds.

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 43 for instructions on how to recalibrate the touch-screen.

Battery

Overview

The test set platform is equipped with a smart Li-ion rechargeable battery pack, which is located on the rear of the unit. The battery will be partially charged upon delivery, so it is recommended to fully charge the battery before use. Please charge the battery at room temperature to preserve its life and to obtain maximum charge. The battery is charged during operation, provided the unit is connected to the AC Mains using the supplied AC/DC adapter. Removing the battery while the unit is powered on is not recommended - this may result in damage. Remove the rubber cover on the right side to connect the AC/DC adapter to the unit.

When battery capacity declines to 10%, an audible alarm and pop-up warning displays a notification to plug in the A/C adapter or shut down the unit. If this warning is ignored and the battery capacity is allowed to decline to under 5%, the unit will initiate a shutdown to protect the battery from damage and for safety.

If an event, such as the AC/DC adapter being unplugged, a power interruption occurs or some other event triggers the power load to exceed the 95W battery limit, the unit will initiate an emergency shutdown to protect the battery from damage and for safety.



*During an emergency shutdown all modules' power is switched off. **No test files (results or configurations) are saved.***

Battery Charging Time

The total charging time depends on the remaining battery capacity percentage and the actual current load in the test unit. An idle test unit would recharge faster than an active one.



Attention!

- *For safety reasons, the battery charging time is always limited to a maximum of three hours.*
- *If the unit is being used while charging and a full charge (100% capacity) cannot be achieved within three hours, the charging will stop automatically.*
- *To resume charging, unplug the AC/DC adapter and use the test unit on battery power for a couple of minutes before plugging the adapter back into the unit. This will reset the charging circuitry.*



Warning!

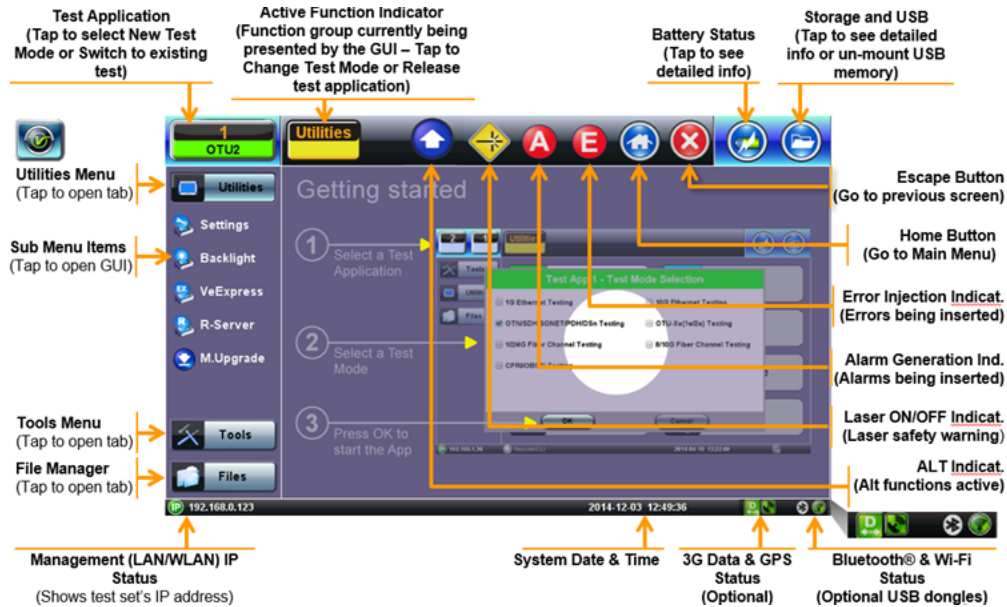
- ***DO NOT disconnect the AC/DC power supply when the unit is running under heavy load conditions (greater than the battery's current ratings), such as certain multi-module multi-test applications.***
- ***If the current required is too high, but still within the battery's limits, a warning message will be displayed when the AC/DC adapter is unplugged. All the tests are properly closed and the test unit shuts down.***
- ***Under overload conditions, the battery may not be able to supply enough current to keep the test scenario running and its safety mechanisms may shut the battery down without warning and test results may be lost.***

Battery Safety Precautions

For more information on safety precautions for batteries, see [Lithium-ion Battery Precautions](#) in "Safety Information" on page 8.

Home Screen

A Quick Guide is always present in the Home screen after booting up (actual image may vary with models and software version). *This screen can be displayed at any time from any screen.*



Menu Navigation

Navigate between test applications, setup menus, tabs, or active functions using the supplied stylus or by pressing ▲ / ▼ followed by ← on the keypad.

Quick Access Menu

This multi-tasking section provides convenient and immediate access to system features, connectivity, accessories, results, etc., always at your fingertip. Those features are always available, independently of whether tests are running or not.

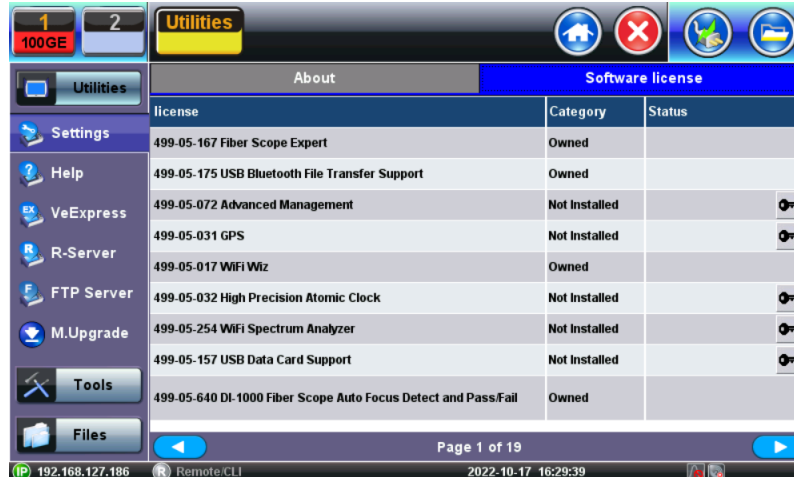


Platform Functions

Utilities

About/Software Options

This section provides information about the software platform version, serial number, and as well other information relevant to the test set, which may be required when contacting Customer Support. The tab provides a list of software licenses (optional test features) currently loaded in the test set.



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 **>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.

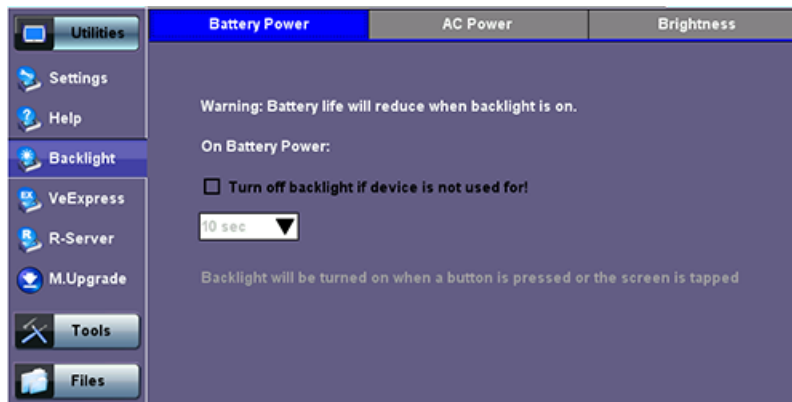
Backlight

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.



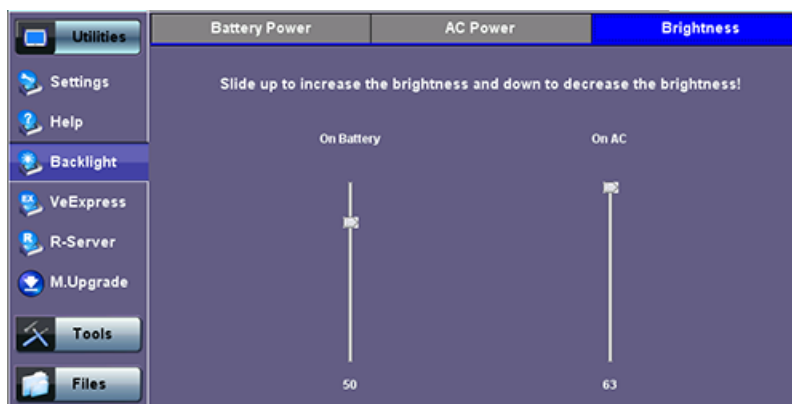
Backlight - Battery Power

Similar settings can be applied for when the test set is operating on **AC Power**.



Brightness

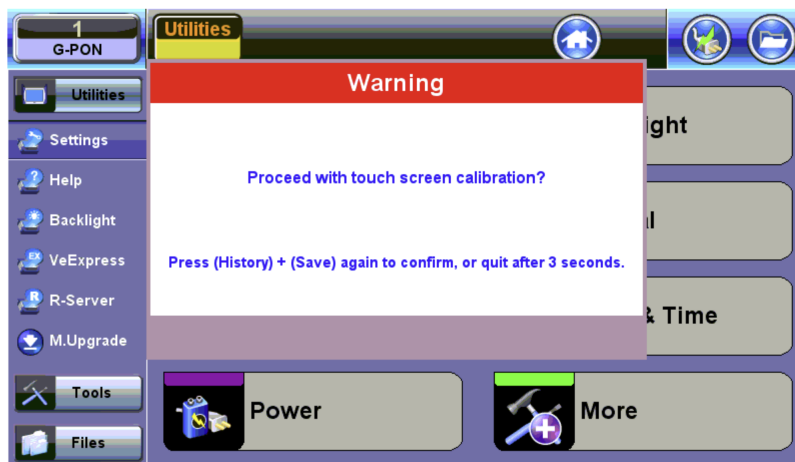
Select the brightness level for Battery and AC operation modes.



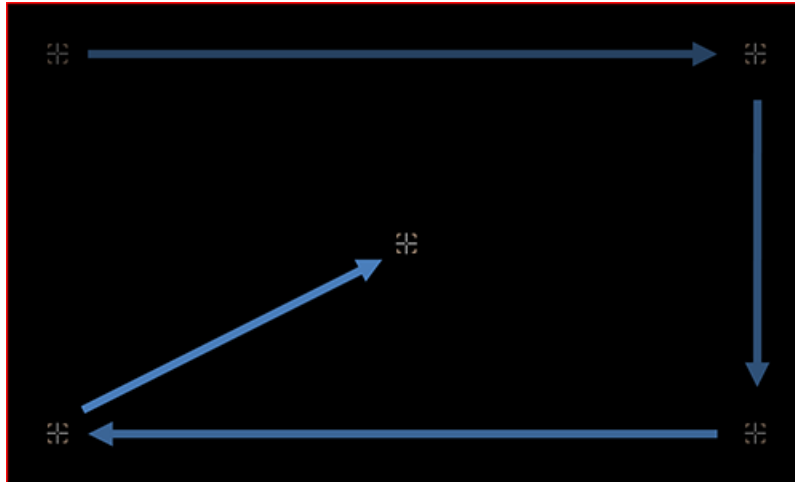
Backlight - Brightness

Touch Screen Calibration

Screen calibration can be accessed from the **Utilities > Settings > Screen**.



Press the  **History** and  **Save** buttons simultaneously to continue.



Once the touch screen calibration sequence has been started, it must be completed. Accurately touch the calibration points with the tip of the stylus.

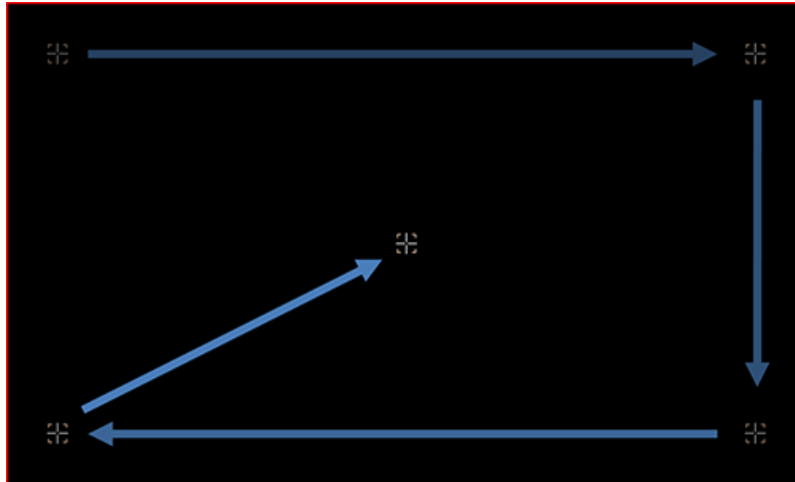
In the rare case that a VeEX product loses touch screen calibration, use the Web Remote function (*see below*) to launch the Screen Calibration.

Besides using the built-in screen and its graphical user interface (GUI) to launch the Screen Calibration directly from the test set, VeEX offers alternatives to correct stylus-to-cursor offsets when it is not possible from the touch panel.

Calibrate via Web Remote

If the test set can still be connected to LAN or Wi-Fi, users can just launch a web browser, from a PC, tablet or smartphone, enter the test set's IP address, select Remote Control, enter the password.

Then, use the mouse to go to the touch Screen calibration function in the system tools menu and launch it. Go back to the test set and use the stylus to tap on all the calibration points with the tip of the stylus.



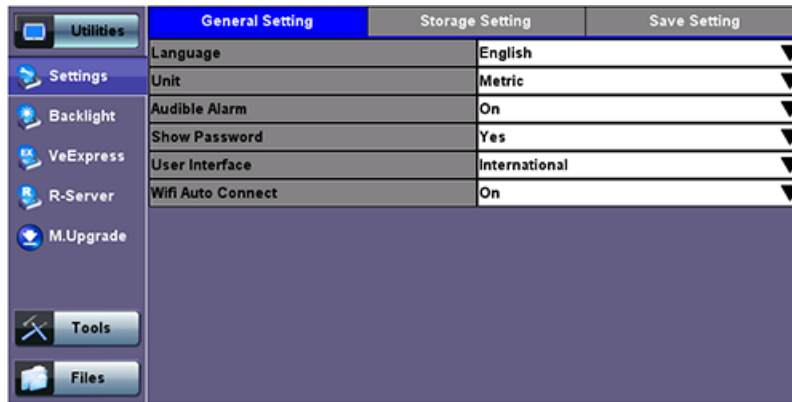
Special Hard Key Combinations for Calibration

Independently of the test module loaded on the MTTpluss chassis, press the  **History** and  **Save** buttons simultaneously, until you hear a tone (beep), quickly press the same  +  combination again to confirm. Then the touch screen calibration procedure starts.



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.

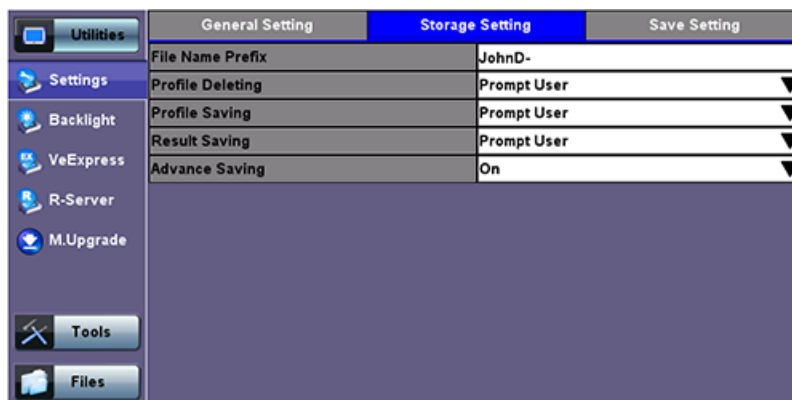
Global Settings



Utility Settings - General Setting

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).
- **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.
- **WiFi Auto Connect:** After successfully connecting to a WiFi access point, the unit will attempt to automatically connect to the same AP after the unit is turned off and turned back on.

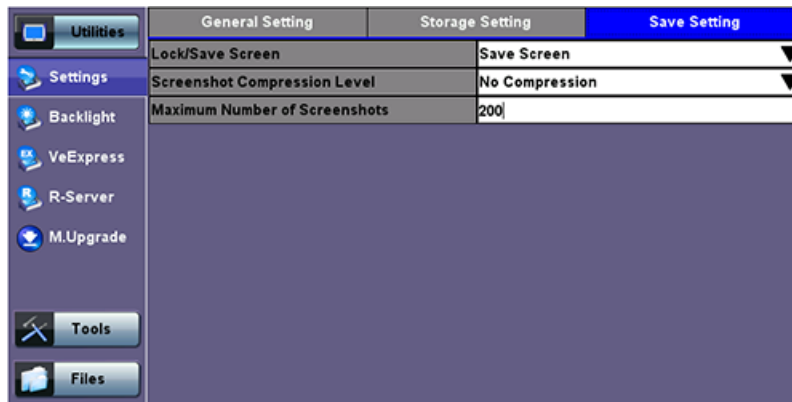


Storage Setting



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.
- **Advanced Saving:** Turn ON to add extra information to the results file to be uploaded to a centralized R-Server. *Requires Advanced Management Option..*



Save Setting

These options configure the behavior of the Lock key on the keypad. The Lock key can be set to do the following:

- **Lock/Save Screen:** Lock/Unlock the unit's screen to prevent accidental interruption during a long term test.
- **Screenshot Compression Level:** The compression level of the screen image (affects size of file and quality).
- **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 **Files>Saved**.

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.

Devices

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.

Utilities

Settings

Backlight

VeExpress

R-Server

M.Upgrade

Tools

Files

Devices	Scan	Connection
Status	OK	
Type	USB	
Name	CSR - bc4	
MAC	00:15:83:4C:E8:96	
Manufacturer	Cambridge Silicon Radio (10)	
Pairing Passcode	0183	

Scan

Bluetooth Devices



Bluetooth - Scan



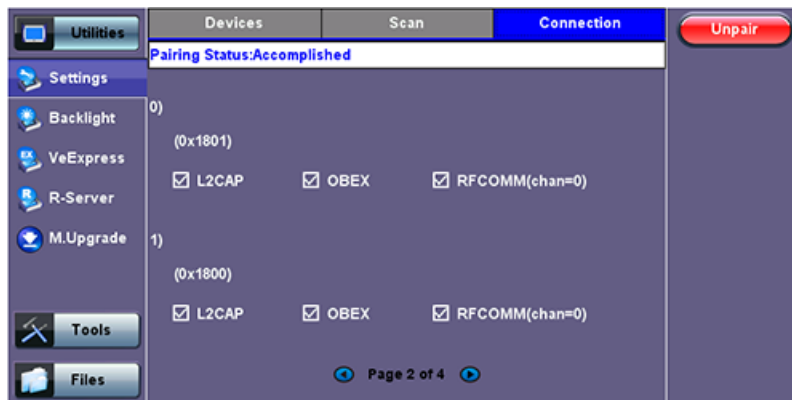
Bluetooth - Connection - Passcode

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.



Bluetooth - Connection Established



Bluetooth - Connection Page 2

Date and Time

This screen allows the date, time and time zone to be set. Daylight Daylight Savings Time (DST) is enabled automatically.



Date and Time Setup



Time Zone Setup

Using NTP Server

For automatic time of day (ToD) synchronization, go to **System Tools > Utilities > Settings > Global > 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 (WiFi or LAN) is required to reach the selected public or private NTP server.

To manually change the Date & Time:

Go to **System Tools >Utilities >Settings >Date & Time**, to manually set the date, time and time zone. Then, tap **Apply**.



To enable daylight saving time (DST), manually select a neighboring time zone with a +1:00 relative to the standard time zone of the current location. Set it back to the standard time zone offset when DST ends.

Get Standard Time from GPS/GNSS

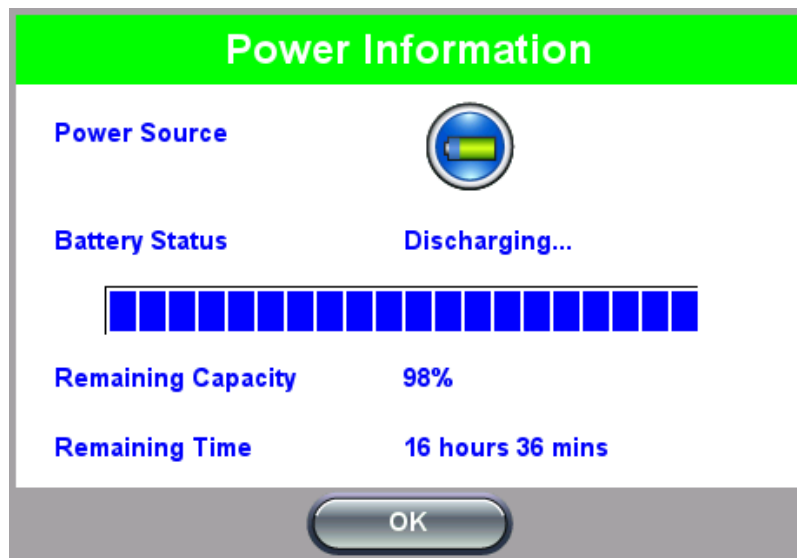
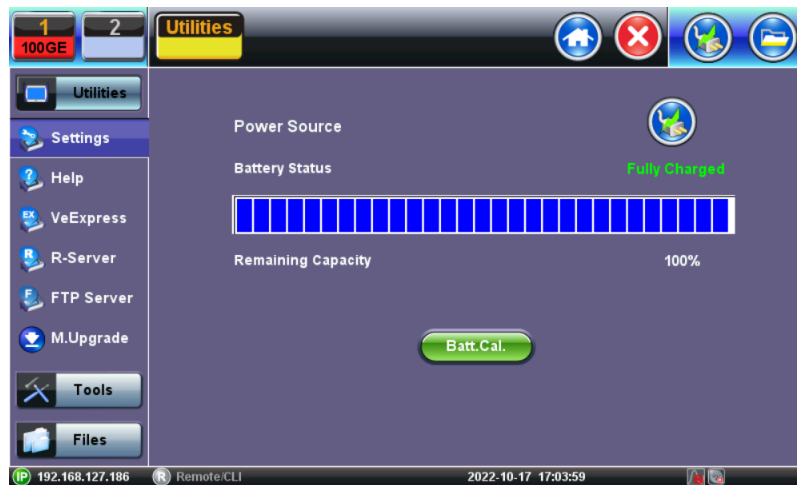
If equipped with the GPS/GNSS receiver (hardware option), manually copy the GPS time into the system.

Go to **System Tools >Utilities >Settings >GPS/High Precision Clock**, to configure the GNSS Receiver and turn it ON. Once it recovers time (ToD UTC) from the satellites, click the **Sync ToD** button to apply the standard time to the RTU. The standard time will be applied at the start of the next second (rise of the internal 1PPS timing signal). The local UTC Offset (Time Zone) setting is used to apply the correction for local time. This manual Sync ToD time setting function should not be used when NTP is enabled.

For more information on the atomic clock and relative phase monitoring, see "[High Precision Clock Sources](#)" on page 68 and "[GNSS/GPS & Sky View](#)" on page 144.

Power

This section 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.



Utility Settings - Battery Power

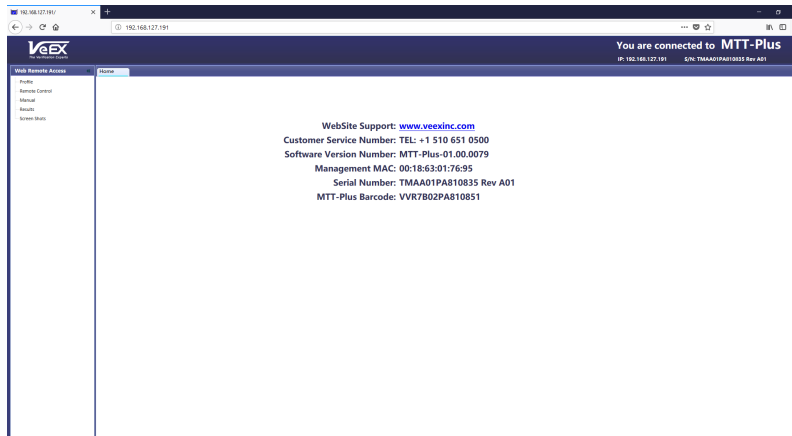
Remote Access

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 58 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/threshold can be saved as test profiles, for different types of services.

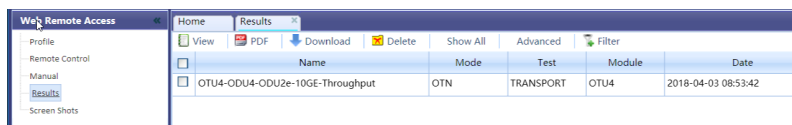
Manual

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 products' page at www.veexinc.com.

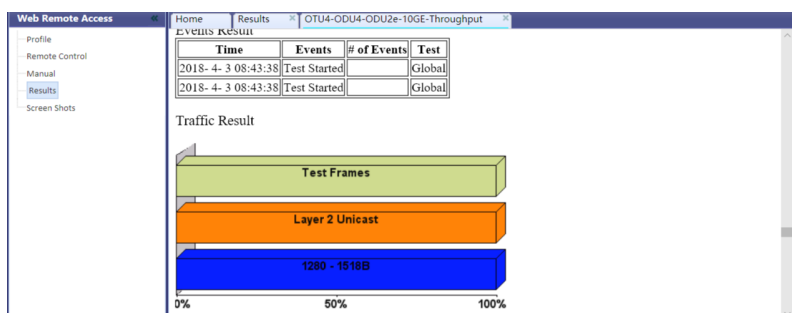
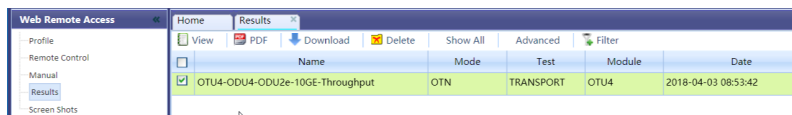
Results

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

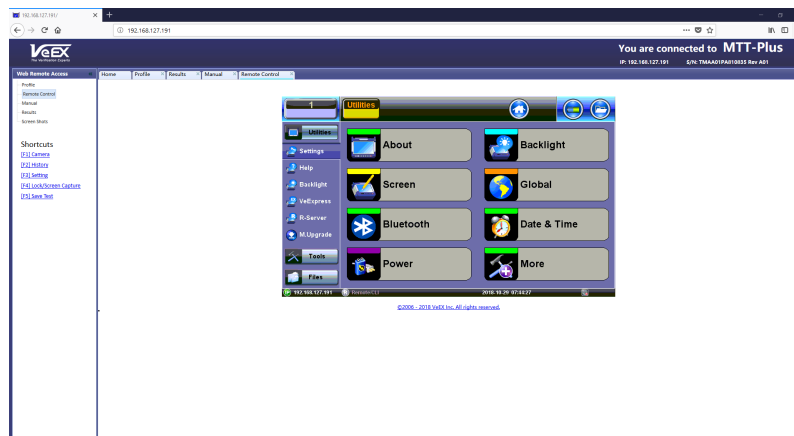
Pictures (PNG) taken of the screen can be accessed from this link and sub-tab. Pictures can be viewed or downloaded to the local computer.

Screen captures can be made using the Lock 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 .

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 ["WiFi Wiz" on page 91](#).
3. Click **vnc-home.html** 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 - Remote Access Menu

Name	Mode	Test	Module	Date	Type
20181024_005254		Screen		2018-10-24 00:52:55	
20181024_005254		Screen		2018-10-24 00:52:54	
20181024_005300		Screen		2018-10-24 00:53:01	
20181024_010004		Screen		2018-10-24 01:00:04	
20181024_010005		Screen		2018-10-24 01:00:02	
20181024_005306		Screen		2018-10-24 00:53:09	
20181024_004933		Screen		2018-10-24 00:49:54	
20181024_005308		Screen		2018-10-24 00:53:09	
20181024_005258		Screen		2018-10-24 00:52:59	
20181024_005256		Screen		2018-10-24 00:52:57	
20181024_005256		Screen		2018-10-24 00:52:57	
20181024_005001		Screen		2018-10-24 00:50:02	
20181024_005027		Screen		2018-10-24 00:50:28	
20181024_005031		Screen		2018-10-24 00:50:32	
20181024_010126		Screen		2018-10-24 01:01:26	
20181024_005013		Screen		2018-10-24 00:50:14	
20181024_010123		Screen		2018-10-24 01:01:26	
20181024_005029		Screen		2018-10-24 00:50:30	
20181024_005014		Screen		2018-10-24 00:50:15	
20181024_005256		Screen		2018-10-24 00:53:00	
20181024_005032		Screen		2018-10-24 00:50:32	
20181024_005015		Screen		2018-10-24 00:50:16	
20181024_004957		Screen		2018-10-24 00:49:58	
20181024_010003		Screen		2018-10-24 01:00:03	
20181024_005300		Screen		2018-10-24 00:53:01	
20181024_005255		Screen		2018-10-24 00:52:56	
20181024_005257		Screen		2018-10-24 00:52:58	

Test Set IP Address in Web Browser

The action you requested needs vnc privileges. Please enter vnc's password.
(Please input password of super user if you want to take full control, or input password of regular user if you just want to view screen.)

password

OK

Web Browser - Password Prompt

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).

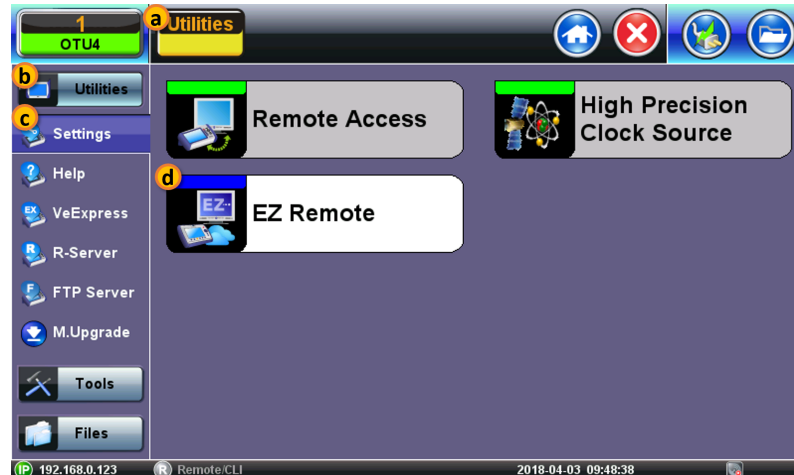


EZ Remote is considered a convenient on-demand service, for quick/temporary collaboration tasks. It should not be used for long-term applications (VeEX offers other remote tools for long-term applications).

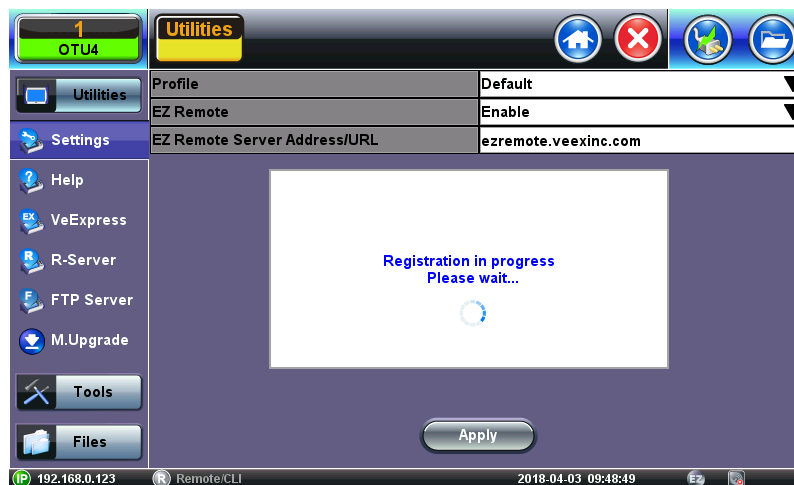
Initiate an EZ Remote Session from the Test Set

1. Use the [System Tools](#) to connect the test set to a LAN using the RJ45 Ethernet management port, 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).

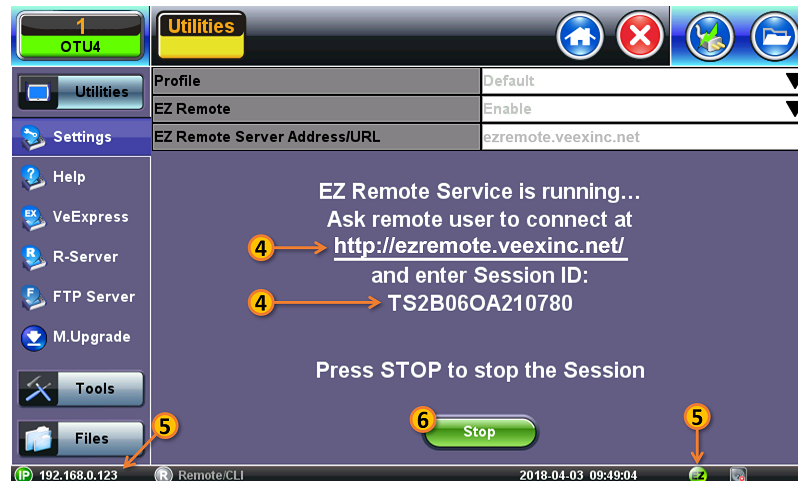
2. Go to >Utilities >Settings >More >EZ Remote.



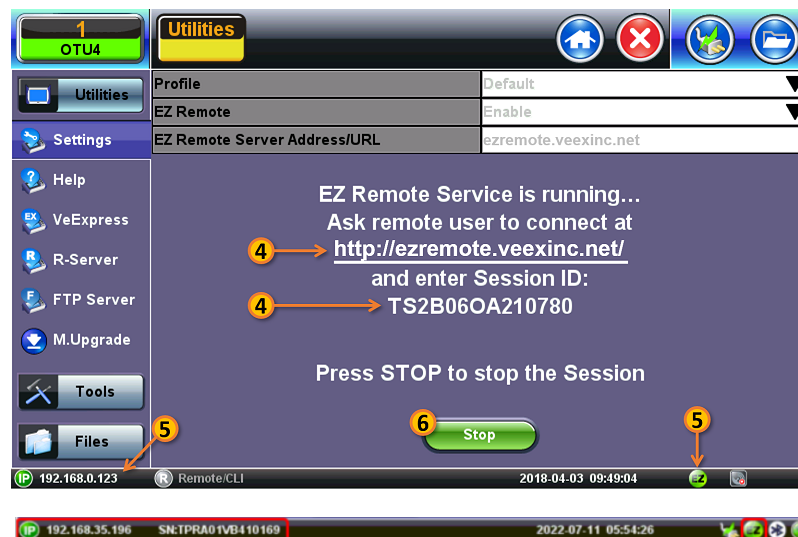
3. On the EZ Remote screen, set **EZ Remote** to **Enable**, confirm the **URL** is **ezremote.veexinc.net** (without www.), and tap on **Apply** to connect and establish a session with the EZ Remote server.



4. Provide the resulting **URL** and **Session ID** 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

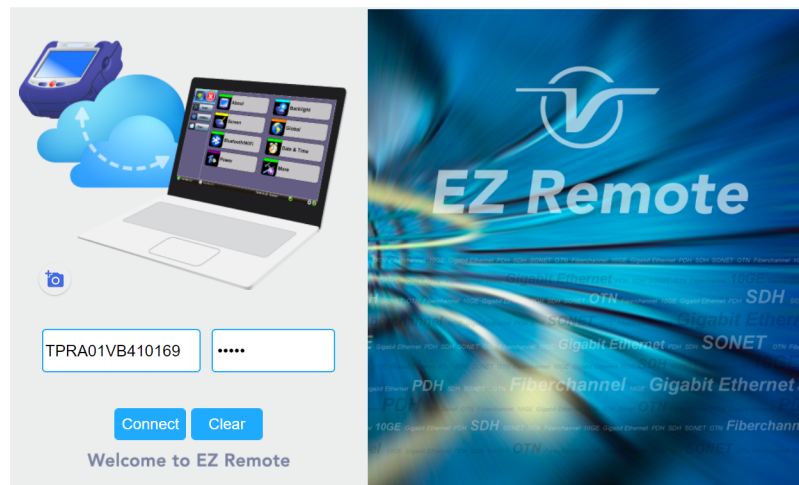
EZ Remote provides two types of services:

- **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.

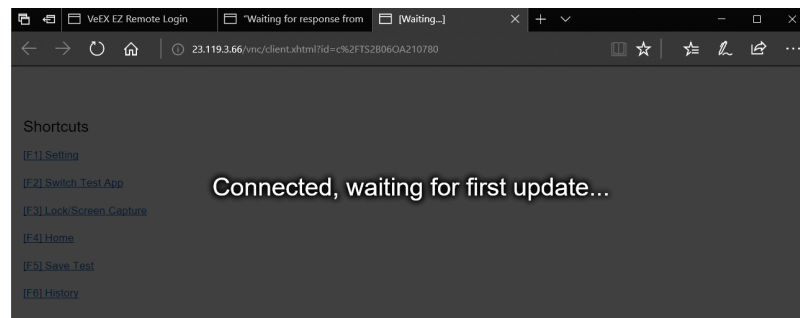


Although multiple users could simultaneously log-in to the same test set, they would be sharing the same mirrored GUI image and mouse control. This is not recommended since it is equivalent to having multiple users trying to operate one test set at the same time (also known as “mouse fight”). Nonetheless, it may be effective for training purposes with one or two extra users.

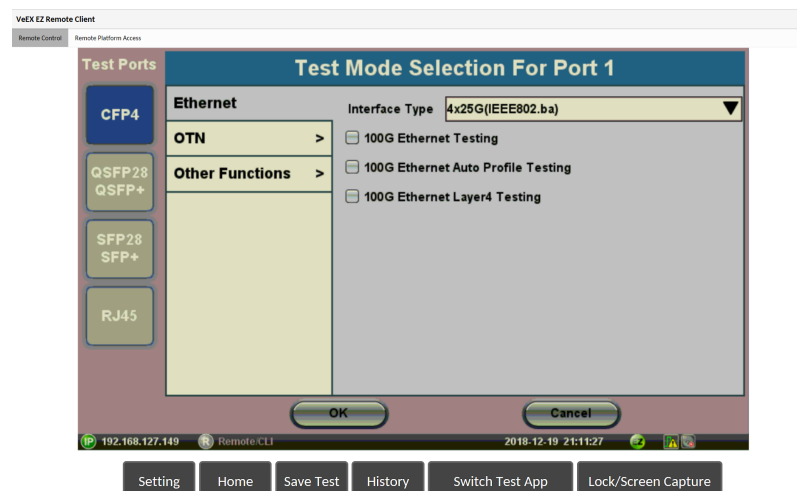
1. From a PC, Mac, Tablet or Smartphone launch an industry-standard Web Browser application and enter the URL <http://ezremote.veexinc.net> (without the www.). Enable pop-ups for your browser and be sure to authorize access to the site, if confirmation is requested by the browser or OS.
2. Enter the **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.



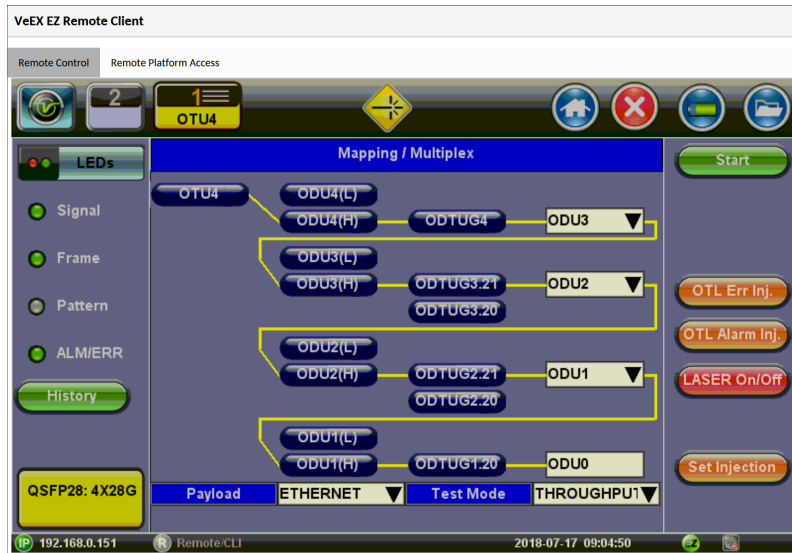
- Once verified and connected, wait for the remote user interface to refresh. This may take a few seconds.



- Depending on the type of test set used, shortcut buttons may be 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.



VeEX EZ Remote Client

Remote Control Remote Platform Access

OTU4

LEDs

- Signal
- Frame
- Pattern
- ALM/ERR
- History

QSF28: 4X28G

Summary	Signal	OTL	OTN	GFP-T	Ethernet
ST:2018- 7-17 09:08:27		ET:00:00:11			
Signal	LOS	No Alarm - OK			
	Frequency	111809973KHz			
	Rx Total Power	7.50 dBm			
OTL	Alarms	No Alarms - OK			
	Errors	No Errors - OK			
OTN	Alarms	No Alarms - OK			
	Errors	No Errors - OK			
GFP-T	Alarms	No Alarms - OK			
	Errors	No Errors - OK			
ETHERNET	Alarm/Error	No Alarms/Errors - OK			
	Pattern	No Errors - OK			

Stop

TX Stop

OTL Err Inj.

OTL Alarm Inj.

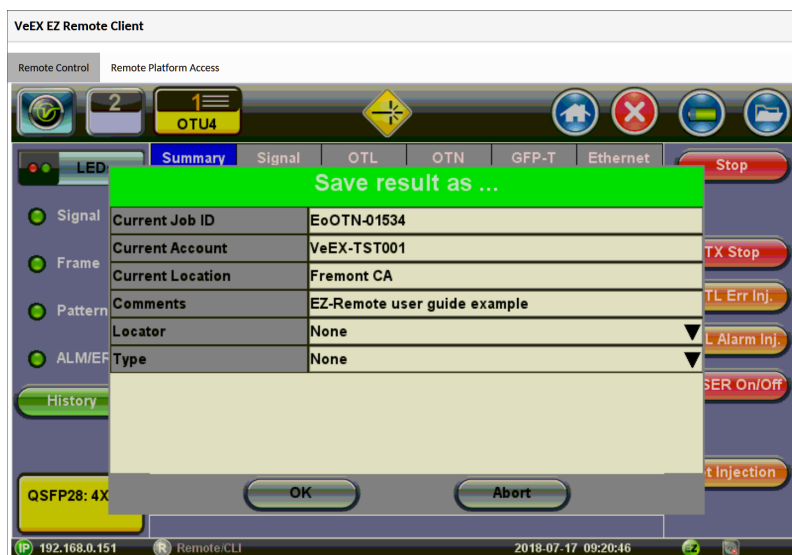
LASER On/Off

Set Injection

IP 192.168.0.151 Remote/CLI 2018-07-17 09:08:39

Save Test Results

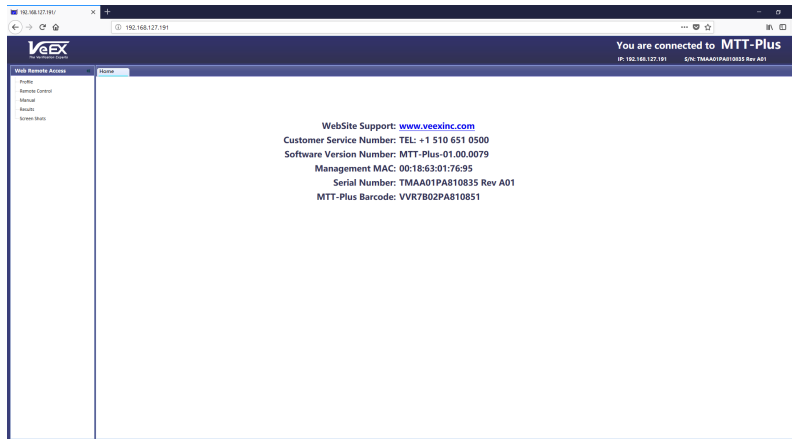
To save the results of a test, from the remote computer, press the **Save** button below the screen image. Then use the pop-up keypad and/or the PC keyboard to enter the file name and add any extra details (if Advanced Save is enabled).



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/threshold 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 products' page at www.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.

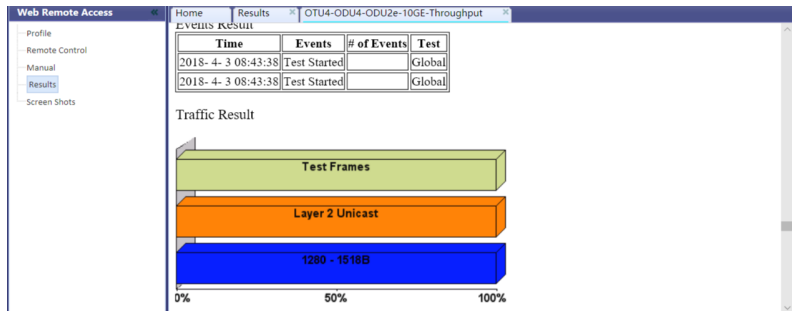
The screenshot shows the Results page in the VeEX MTT-Plus web interface. The left sidebar contains a menu with options: Profile, Remote Control, Manual, Results, and Screen Shots. The main content area displays a table with the following data:

Name	Mode	Test	Module	Date
OTU4-ODU4-ODU2e-10GE-Throughput	OTN	TRANSPORT	OTU4	2018-04-03 08:53:42

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

The screenshot shows the Results page in the VeEX MTT-Plus web interface with the first row selected. The left sidebar contains a menu with options: Profile, Remote Control, Manual, Results, and Screen Shots. The main content area displays a table with the following data:

Name	Mode	Test	Module	Date
☒ OTU4-ODU4-ODU2e-10GE-Throughput	OTN	TRANSPORT	OTU4	2018-04-03 08:53:42



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



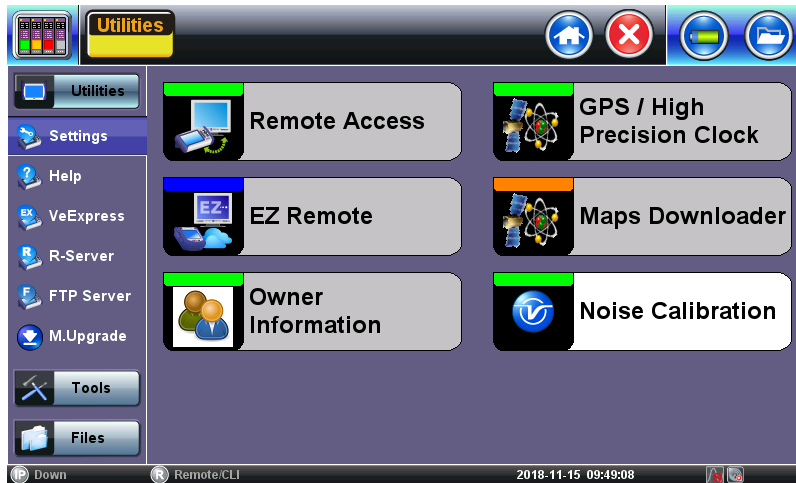
Screen Shots

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 Lock 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 .

VF Noise Calibration (Microphone)

The test platform offers ambient audio Noise Reduction for its built-in microphone, to improve voice quality in Voice Frequency (VF) applications like ISDN and VoIP calls. When the microphone noise reduction function is enabled, in **>Utilities >Settings >Global >General Settings >Mic Noise Reduction = ON**,



Users can calibrate it to remove typical environmental noise and improve voice quality. The test set must be recalibrated before use and when moved to a different environment (e.g. from the equipment room to an office). The Noise Calibration function can be found in **>Utilities >Settings >More >Noise Calibration**.



Stay silent while the calibration is in progress. If a headset is used for ISDN or VoIP calls, it must be plugged in during the calibration process.

High Precision Clock Sources

GPS/GNSS Receiver (HW Option)

The optional high-sensitivity GPS/GNSS modules (built-in) provide accurate Phase alignment and Coordinated Universal Time (UTC) synchronization to the test set, in the form of internal pulse-per-second (1PPS) clock synchronized to the standard second and timestamps. This is used to assure that two or more geographically-distributed test sets have the exact same time and can calculate delays. One example is the One-Way-Delay (Latency) tests used to identify asymmetry between each direction of a link.



The GPS Time of Day (ToD) can also be used to precisely set the local date and time in the test set, using the Sync ToD function, which will apply the local time zone correction before applying it to the test set system real time clock. This timestamp is used for reports and events, but not for time-sensitive testing.

GPS ToD is also used in One-Way-Delay (OWD) measurements and time is applied directly to each test set before the test starts, so they all have accurate time.

The GPS/GNSS receivers can be turned **OFF** if not used, to save battery power.

A satellite table, showing satellites in view, satellites being used and signal to noise density, is provided for information only, so the correct antenna installation can be verified. Geographical coordinates are also provided for information only and it could be used in the future to geo-tag some position-sensitive results. The GPS/GNSS antenna must have direct view to the sky. At least four satellites with SNR of 34 dB-Hz or better are recommended for accurate testing.

Warm Up Times

All precision reference sources require a “warm up” time to achieve high accuracy and stability. The warm up term is being used loosely because it is not just about attaining the right temperature. It also includes disciplining of a local oscillator, negotiating and stabilizing a clock through protocol messages, etc. Each of the tasks involved takes time to stabilize before it can be used for testing.

Operational Temperature

It is still a major player in the warm-up waiting time and it all depends on the ambient temperature and the initial temperature of the test set. For example, a test set left in the trunk of a car in a winter night will take longer to reach operational temperature.

GPS Lock

The time to get an stable clock output varies depending on the conditions, antenna type and installation, sky visibility and whether or not the test set has changed position. Using the test set for the first time on a new site (different geographical position) would increment the time to its first satellite lock. Users can follow the different stages (Searching, Sync 1PPS, and Lock) by checking the GPS status GUI at **>Utilities >Settings >More >High Precision Clock Source >GPS**.

Maps Downloader

The Maps Downloader can be found in **Utilities>More >Maps Downloader**.



Maps Downloader

 This function requires management port connection (Ethernet or Wi-Fi). Please see section ["IP Tools "](#) on page 80 for further information on how to connect via the management port.

1. Enter the city name in the search box.



City Location

The unit connects automatically to the database here: <http://www.openstreetmap.org/>. Open Street map is similar to Google maps, but the maps are open source and created by a community of cartographers that contribute and maintain data about roads worldwide.

2. Select a map from the list and tap the **Download** button.



Select Map



Downloaded Map

Downloaded Maps are included if the **Advance Saving** function is enabled (**Utilities>Settings>Global>Storage Setting**) and **GPS** position is acquired (**Utilities>Setting>More>GPS/High Precision Clock**).

Save result as ...						
Current Job ID	wifiscan					
Current Account						
Current Location	VeEX office					
Comments						
Locator	None ▼					
Type	None ▼					
☐ QR/Bar Code						
☐ Take Picture						
☒ GPS Position	Latitude	37°28'15" N	Longitude	121°55'56" W	Altitude	7.3 M
Date Time	2017-11-16 11:17:21					
Time Zone	GMT-08:00 Pacific Time (US & Canada)					
☒ GPS Map						
OK Abort						

Save Results

- Equipped with a camera and GPS antenna, the MTTplus platform allows to create a complete report of the Wi-Fi site survey results in HTML or PDF format.
- QR code reader to document equipment bar code and serial numbers.
- Camera function to document the AP location and installation.
- GPS Coordinates to identify test location and map.

VeExpress

VeExpress is a cloud-based asset management system. VeEX VeExpress cloud services is included with every test set. It allows the following services / functions:

- Delivers Software/Firmware Updates and Upgrades directly to the test set.
- Makes any new Purchased or Rented licenses (new functions) assigned to the test set immediately available for testing.
- Allow Managers to Share (float) purchased or rented test options among deployed test sets (fleet). Licenses can be temporarily assigned to the test set that needs it, for specific jobs, and later recalled to pass it on to the next test set.

Built-in VeExpress Client

- Lets users connect to VeExpress Cloud directly from the test set, from the field, using any available internet connection (e.g. LAN, Wi-Fi, Modem, CPE, Smartphone hot-spot, Cellular Data Card, etc.)
- View test features currently assigned to the test set and licenses available in the pool
- Activates new licenses and let users perform software (firmware) updates

Connecting VeExpress

Synchronization	Options-Enabled	Options-Available	Software Upgrade
Profile	ACME Telecom Inc ▼		
Server Address/URL	www.v-express.com		
Tech ID	1004		
Tech Name	JohnDoe		
Company	DEMOPOOL_USA		

Check

1. Connect the MTTplus to the Internet.
 - Use LAN, WLAN or Cellular Data Card.

2. Go to **>Utilities >VeExpress**. (The URL is: www.v-express.com.)
3. Tap the **Check** button.
 - Any tests must be stopped and released.
 - Confirm the Release of any active Test Application.
 - It gets the latest information related to the test set, directly from VeExpress Cloud.
 - Enables any new licenses assigned.
 - Releases any recalled shared licenses.
4. Wait for the Confirmation message: “Registered and Authorized”.
 - All Licenses have been updated and any new features should be ready to use.

Options Enabled (in Test Set)

Synchronization	Options-Enabled	Options-Available	Software Upgrade
Option Group		All	▼
ID	Description	Category	Remain (DD:HH)
499-05-563	TX300S 8G Fiber Channel	Permanent	
499-05-050	DS1 (1.5Mbps) Pulse Mask Analysis	Permanent	
499-05-051	DS3 (45Mbps) Pulse Mask Analysis	Permanent	
499-05-549	TX300S OC-192 Testing	Permanent	
499-05-552	TX300S 10/100/1000Base-T	Permanent	
499-05-553	TX300S 100Base-FX/1000Base-X	Permanent	
499-05-554	TX300S 10GE LAN/WAN	Permanent	
499-05-558	TX300S VoIP Call Expert	Permanent	
499-05-199	Service Level Ethernet OAM, IEEE 802.1ag and ITU-T Y.1731	Permanent	

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- Up-to-date list of licenses assigned
- Permanent = Purchased, owned (users can still share permanent licenses by releasing the option from one test set and assign it to another)
- Leased = Rented, temporary
 - Displays remaining time (Days and Hours)

- Countdown starts upon first assignment
- Both permanent & leased can be shared

Options Available (in the Cloud)

- Lists all options, permanent or leased, currently available in the company's or group's VeExpress account
- Users can check availability before requesting assignment of new function(s) to their VeExpress Managers

Software Upgrade

- Checks if newer version is available

Software Upgrade Procedure - Full Version

1. Open the **Software Upgrade** tab.
 - Larger Full Upgrade package is shown if the test set has not been updated for a while, when major new features are introduced or an OS update is required.
2. Attach the DC charger to the test set.
3. Insert a FAT32 USB Memory Stick into the left-side USB port (>300MB free).
4. Confirm IP connection (IP address).
5. Check the new software version box.
6. Tap the **Download** button.
 - a. Wait until the download process finishes. Install package is in the memory stick.
 - b. Power the test set **OFF**.
 - c. Leave the USB memory stick attached.
7. Initiate Software Upgrade process.

- a. Simultaneously press the App, and Power buttons, until it beeps.
 - b. Let the upgrade process finish (it could take a few minutes).
 - c. The test set reboots itself at the end.
8. The test set is now up-to-date.

Software Upgrade Procedure - Delta Version

1. Open the **Software Upgrade** tab.
 - A smaller Delta Update package could be made available between consecutive versions (e.g. from 1.2.5 to 1.2.6) for easier and faster field firmware update
2. Attach the DC charger to the test set.
3. Confirm IP connection (IP address).
4. Check the new software version box.
5. Tap the **Download** button.
 - a. Wait until the download process finishes.
 - b. The install package is in internal memory.
 - c. Turn the test set **OFF**.
6. Power the test set **ON**.
7. The test set software is now up-to-date.

R-Server

Use the R-Server option to manage test sets and store test results.

Part of VeEX's VeSion® centralized monitoring and management solutions, the 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.

Register a test set (establish IP connection)

Register	Upload	Download	Software
Server Address/URL	198.168.33.128		
Tech ID			
Tech Name			
Company			
Supervisor ID			

Client: 1.2.1.0

IP: 192.168.33.128 Remote/CLI 2023-05-09 13:46:33

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
 - **Supervisor ID:** Supervisor ID
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.



To unregister a test set from a R-Server account, press the **UnRegister** button. To select a network, press the **Network** button.

Upload Results

Register

Upload

Upload

Upload&Del

☐	Name	Size	Type	Date
☐	20150326_130447	46.91 K	Screen	2015-03-26 13:04:48
☐	20150326_130448	46.91 K	Screen	2015-03-26 13:04:48
☐	20150326_140348	58.02 K	Screen	2015-03-26 14:03:49
☐	20150319_113854	13.49 K	CPR/OBSAI	2015-03-19 11:38:56
☐	20150326_120746	102.55 K	RFC2544	2015-03-26 12:07:52
☐	20150326_121402	102.76 K	RFC2544	2015-03-26 12:14:18

⏪

Page 2 of 2

⏩

Uploading results to R-Server

1. Select the **Upload** tab and select the desired files to upload.
2. Tap **Upload** or **Upload&Del**.
 - **Upload**: Transfers the selected result file(s) and keeps the file(s) in the test set.
 - **Upload&Del**: Deletes the file(s) from the test set after uploading them.

Tools

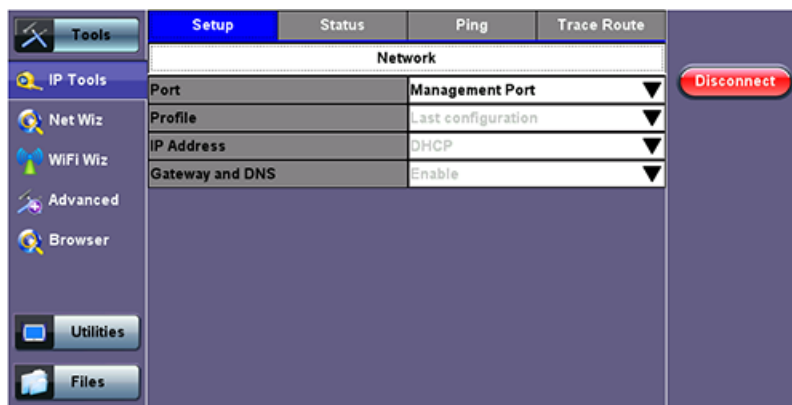
IP Tools

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 **Tools > IP Tools** 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:

- **Port:** Select Management Port from the drop-down menu
- **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



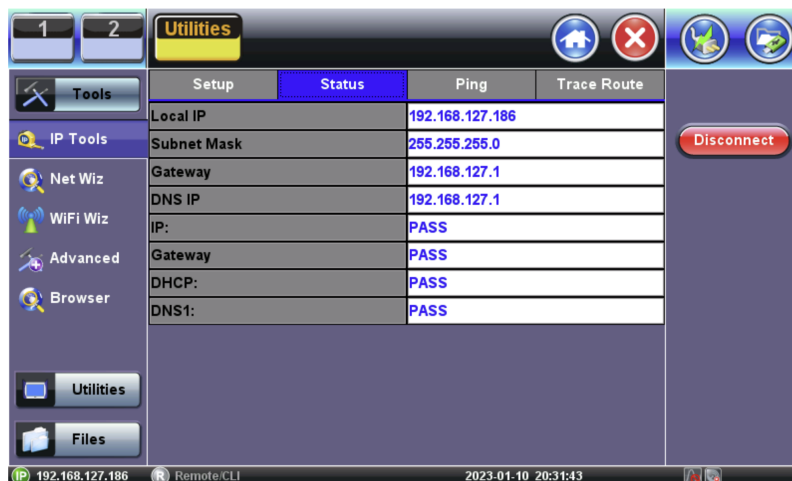
If DNS is set to Primary or Primary & Secondary, a DNS IP is required in order to use the URL as a destination.

- **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.



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.

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.

Tools	Setup	Status	Ping	Trace Route
IP Tools	Setup		Results	
Net Wiz	Profile	Default		Disconnect Start
WiFi Wiz	Destination	www.veexinc.com		
Advanced	Time Out (ms)	5		
Browser	Max Hop	10		
Utilities				
Files				

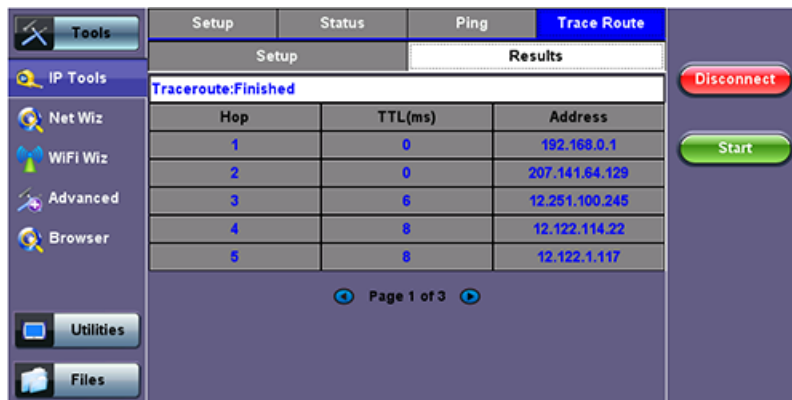
Trace Route - Setup

Trace Route Setup

The following setup selections are available:

- **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.



The screenshot shows a software interface for network tools. On the left is a sidebar with icons for 'Tools', 'IP Tools', 'Net Wiz', 'WiFi Wiz', 'Advanced', 'Browser', 'Utilities', and 'Files'. The main window has tabs for 'Setup', 'Status', 'Ping', and 'Trace Route'. The 'Trace Route' tab is active, showing a 'Results' section with the status 'Traceroute:Finished'. Below this is a table with three columns: 'Hop', 'TTL(ms)', and 'Address'. The table contains five rows of data. To the right of the table are two buttons: 'Disconnect' (red) and 'Start' (green). At the bottom of the table area, it says 'Page 1 of 3' with navigation arrows.

Hop	TTL(ms)	Address
1	0	192.168.0.1
2	0	207.141.64.129
3	6	12.251.100.245
4	8	12.122.114.22
5	8	12.122.1.117

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.

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		Status	Ping	Trace Route
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.

The screenshot shows a software interface with a sidebar on the left containing icons for Tools, IP Tools, Net Wiz, WiFi Wiz, Advanced, and Browser. Below these are buttons for Utilities and Files. The main window has four tabs: Setup, Status, Ping (selected), and Trace Route. The Ping tab is divided into two sections: Setup and Result. The Setup section shows 'Ping:Finished'. The Result section displays a table with ping statistics. To the right of the table are two buttons: 'Disconnect' (red) and 'Start' (green).

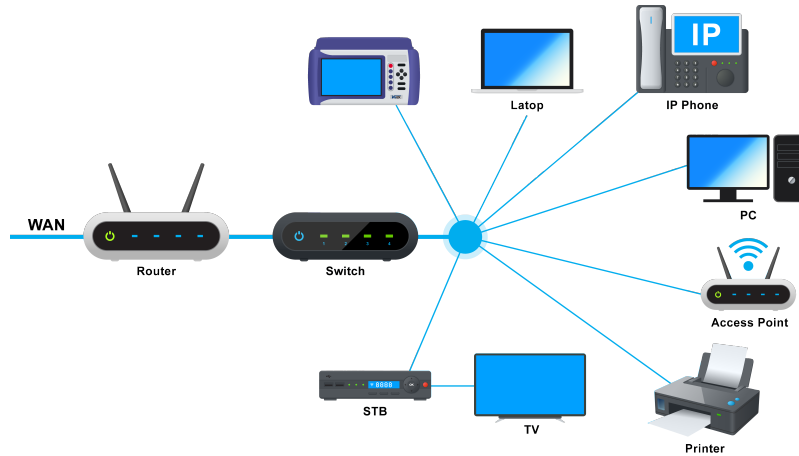
Setup		Result	
Ping:Finished			
Destination	210.66.102.20		
Sent	5		
Received	5		
Unreachable	0		
Missing	0		
Round Trip (ms)			
Current	137	Average	137
MIN	137	MAX	139

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.

Net Wiz

The Net Wiz function tests the Ethernet cable and associated network environment. A typical application is shown below.



Typical Net Wiz Application

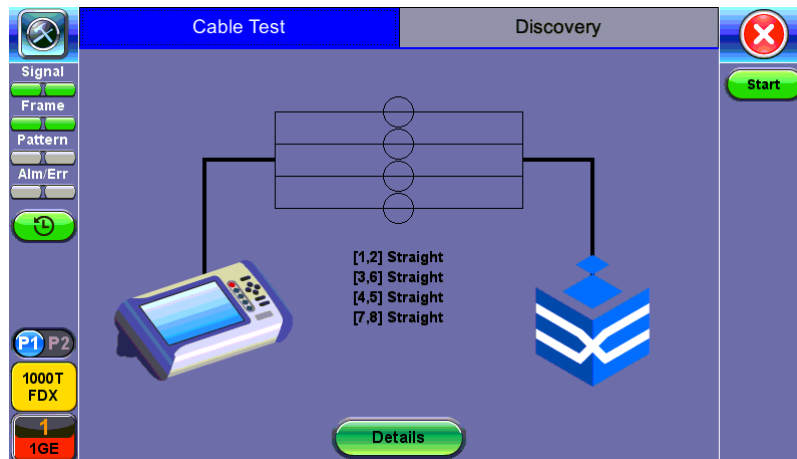
Net Wiz tests include:

- Cable Analysis with distance (Ethernet RJ45 Test port only, not available on Ethernet RJ45 Management port)
 - to switch with MDI mode (Straight or Crossover)
 - to fault, type of fault (Open, Short, Impedance Mismatch)
- Analyze the network and automatically report
 - Stations
 - Routers/Gateway
 - Printers
- Provide MAC and IP addresses of each device
- PING each device and verify the device is active
- Provide detected networks (NetBIOS, IPX, etc.)



Before proceeding with any Net Wiz tests, make sure that an IP connection has been established. Refer to [IP Connection](#) for more information.

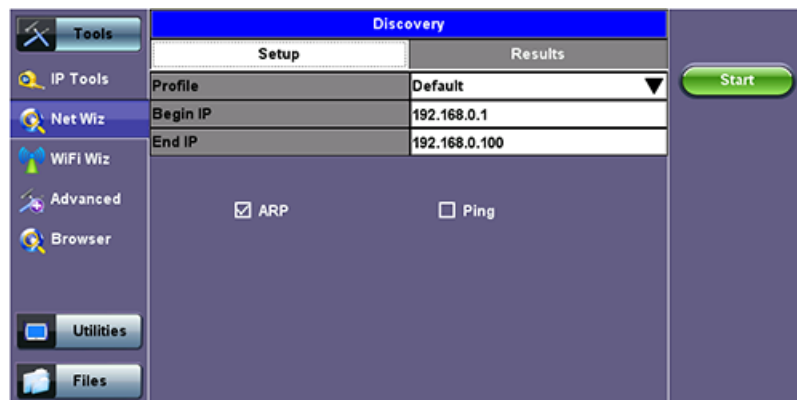
Cable Test



Cable Test

Press **Start** to begin the test. The test set will return the connection type (Straight or Cross Over) if connected to an end device. If fault is detected (Open or Short) the fault will be indicated as well as the distance to the fault.

Discovery Setup



Discovery Setup

- **Profile:** Drop-down selections are Default, Delete, Save, Save As...
- **Begin IP:** Set the start address for the desired IP range using the numeric keypad

- **End IP:** Set the end address for the desired IP range using the numeric keypad

Select by placing a check mark in the corresponding box of any of the following: ARP, SNMP, NetBios, Ping, Net.

Discovery Results

Tools

IP Tools

Net Wiz

WiFi Wiz

Advanced

Browser

Utilities

Files

Discovery

Setup

Results

Summary

Devices

Networks

Discovery:Pass

Tx Frames

Rx Frames

Rx Errors

Speed Advert.

Duplex Advert.

Device Found

99

41

0

100M

FULL_DUPLEX

41

Start

Discovery Results - Summary

Summary indicates the test status and reports:

- **TX/RX Frames:** Total number of TX (transmitted) and RX (received) frames
- **RX Errors:** Received frames in error
- **Speed Advert:** Speed advertised
- **Duplex Advert:** Duplex mode advertised
- **Devises Found:** Total number of Devices and Networks found

The **Devices** tab reports global and detailed device information.

Discovery	
Setup	Results
Summary	Devices
Global	Detail
Total Devices	41
Server	41
Host	41

Discovery Results - Devices - Global

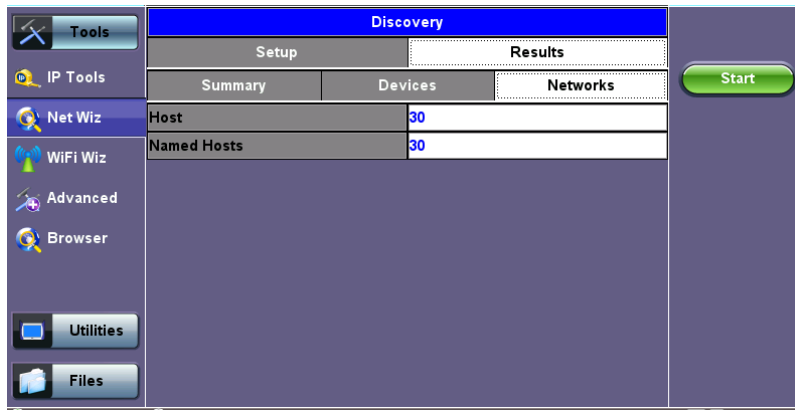
Global reports:

- Total number of devices found
- Number of devices (Routers, Servers, Hosts)

IP	MAC	Ping
192.168.0.1	10:56:ca:07:3d:f8	OK
192.168.0.2	00:15:17:f6:9c:7d	OK
192.168.0.3	00:02:3b:00:16:69	OK
192.168.0.4	00:14:38:92:7b:10	OK
192.168.0.5	00:21:9b:fb:3f:34	OK
192.168.0.6	c4:04:15:0c:79:83	OK
192.168.0.7	00:23:7d:33:77:84	OK

Discovery Results - Devices - Detail

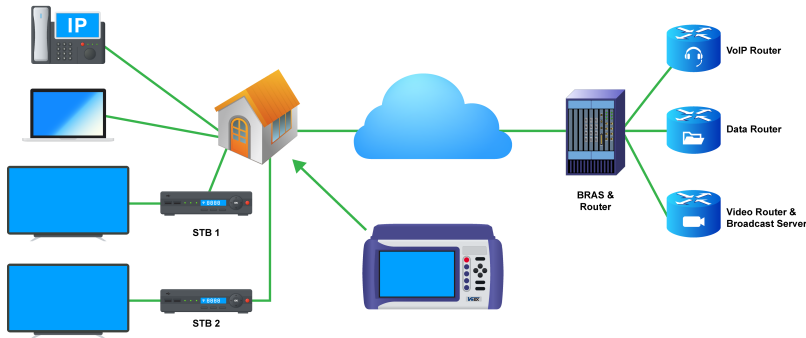
Detail displays the Attribute, MAC and IP Addresses, Group and Machine Names and Ping test results of each device discovered.



Discovery Results - Networks

Networks reports the number of IP Subnets, Hosts, Domain, and Named Hosts found.

WiFi Wiz



WiFi or Bluetooth options are available using WiFi and/or Bluetooth dongles.



Built-in web browser remote control is available when WiFi 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 WiFi Wiz function can be used to provide WiFi 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 WiFi Wiz function supports:

- 802.11 a/b/g/n/ac standards (WiFi USB adapter provided by VeEX)
- WEP, WPA, WPA2 Encryption
- Scanning
- SSID broadcasting and report
- Signal Strength
- IP Connection and Ping Test

WiFi Procedure

Plug the WiFi 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 WiFi option, tap **Tools**, and then tap **Bluetooth/WiFi**.
2. Select the **WiFi Wiz** tab.
3. Tap **Scan** to scan the list of available WiFi APs.

WiFi Wiz - AP List

AP List

The following information is displayed for each AP:

- SSID name of the AP
- BSSID (MAC address) of the AP
- 802.11 protocol version supported by the AP
- Max data rate supported by 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.



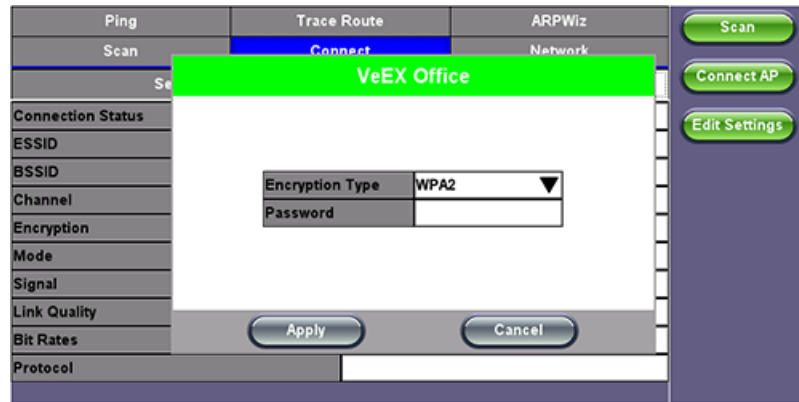
If the wrong network key is entered, the test set will still connect to the Access Point, but will not be able to connect to the web or perform the Ping test.

5. Tap **Edit Settings** or **Connect AP** to change the Encryption Type and enter the WiFi 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.

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.



WiFi Wiz - AP Encryption Settings

Connect

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



WiFi 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:** WiFi Channel # connected to
- **Encryption:** Encryption type

- **Mode**
- **Signal:**
 - Radio signal level (dBm)
 - Link quality score
 - Max data rate
 - 802.11 protocols supported

Ping	Trace Route	ARPWiz	Scan Disc. AP Connect Net Edit Settings
Scan	Connect	Network	
Setup		Status	
Connection Status	Completed		
ESSID	VeEX Office		
BSSID	C4:04:15:0C:79:83		
Channel	6		
Encryption	WPA2		
Mode	Master		
Signal	-35dBm		
Link Quality	34		
Bit Rates	144Mb/s		
Protocol	802.11bgn		

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.

Ping	Trace Route	ARPWiz	Scan Disc. AP Disc. Net Edit Settings
Scan	Connect	Network	
Setup		Status	
Request Status: Successful			
Local IP	192.168.88.161		
Gateway	192.168.88.1		
Serverip	192.168.88.1		
Lease (sec)	39315		
DNS1	192.168.88.1		
DNS2	N/A		

WiFi Wiz Connect IP

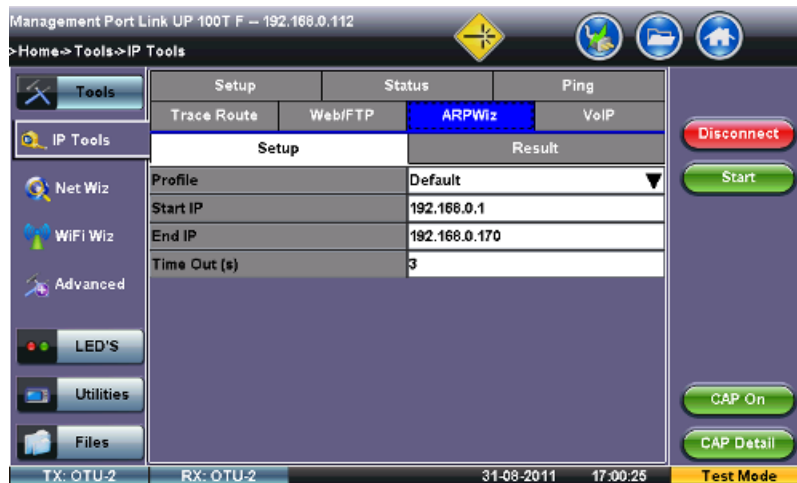
ARP Wiz

ARP Wiz uses the Address Resolution Protocol (ARP) to verify the status of each IP address in a user-selectable IP range. ARP is the standard method for finding a host's hardware address when only its network layer address is known. In other words, ARP is used primarily to translate IP addresses to Ethernet MAC addresses. ARP is defined in [RFC826](#).

ARP Setup

Configure the following parameters and press **Start**. The test will continue to run until **Stop** is pressed. A finished status indication will display when the test finishes.

- **Profile:** Default, Delete, Save, or Save As...
- **Start IP:** Starting IP Address.
- **End IP:** Ending IP Address.
- **Time Out(s):** Range from 1-99 seconds. Input using the numeric keypad.



ARP Wiz Setup

ARP Result

The MAC addresses associated with active IP addresses in the range are displayed. If no MAC address is associated with the IP address, a **FAILED** status is displayed.



ARP Wiz uses the ARP protocol and can only work within the same subnet as the IP address provided to the test set in IP Status

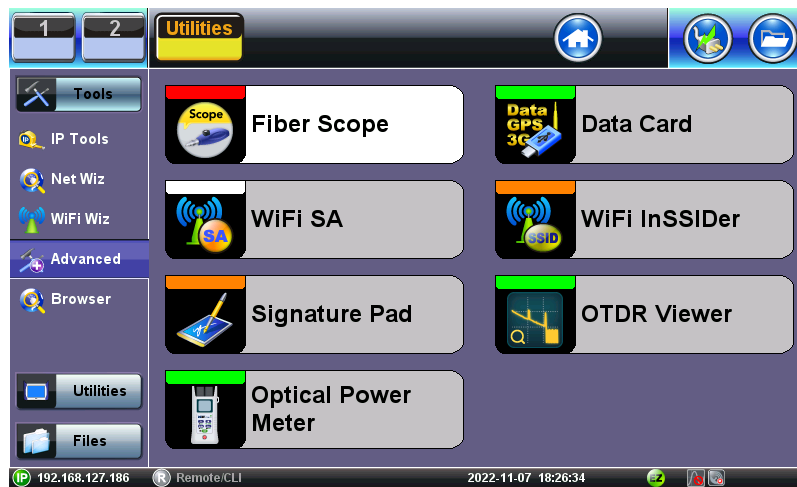
The screenshot shows the ARP Wiz web interface. The top status bar indicates 'Management Port Link UP 100T F - 192.168.0.112'. The navigation menu on the left includes 'Tools', 'IP Tools', 'Net Wiz', 'WiFi Wiz', 'Advanced', 'LED'S', 'Utilities', and 'Files'. The main content area has tabs for 'Setup', 'Status', and 'Ping'. Under the 'Status' tab, there are sub-tabs for 'Trace Route', 'Web/FTP', 'ARPWiz', and 'VoIP'. The 'ARPWiz' sub-tab is active, showing a table of results. The table has columns for 'Destination Address', 'Response Time (ms)', and 'MAC Address'. The results show five entries for IP addresses 192.168.0.1 through 192.168.0.5, all with response times between 0.441 and 0.757 ms and valid MAC addresses. A 'Page 1 of 2' indicator is at the bottom. On the right side, there are buttons for 'Disconnect', 'Stop', 'CAP On', and 'CAP Detail'. The bottom status bar shows 'TX: OTU-2', 'RX: OTU-2', the date '31-08-2011', the time '17:01:17', and 'Test Mode'.

Destination Address	Response Time (ms)	MAC Address
192.168.0.1	0.441	00:11:6E:02:12:2C
192.168.0.2	0.410	00:15:17:F6:9C:7D
192.168.0.3	0.965	00:1A:DD:A5:51:C0
192.168.0.4	0.757	00:14:38:92:7B:10
192.168.0.5		

ARP Wiz Result

Advanced Tools

Fiber Scope



- "DI-1000 Digital Fiber Inspection Microscope" on page 100
- "DI-1000MPO Digital Fiber Inspection Microscope for Single and Multi-Fiber Connectors" on page 101
- "DI-3000 Auto-Focus Digital Fiber Inspection Microscope" on page 105

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 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.

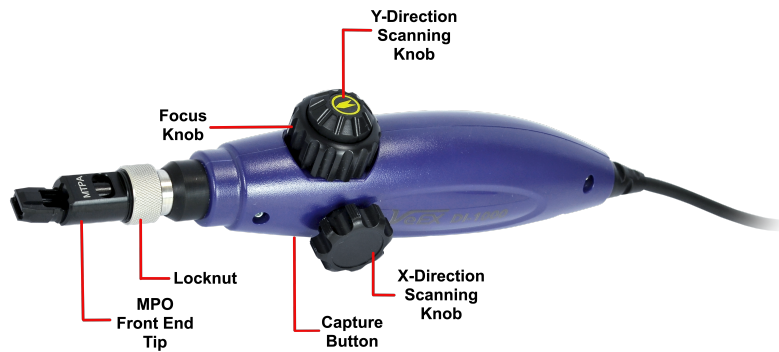
DI-1000 Digital Fiber Inspection Microscope



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 Digital Fiber Inspection Microscope Adapter Tips Guide on 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)

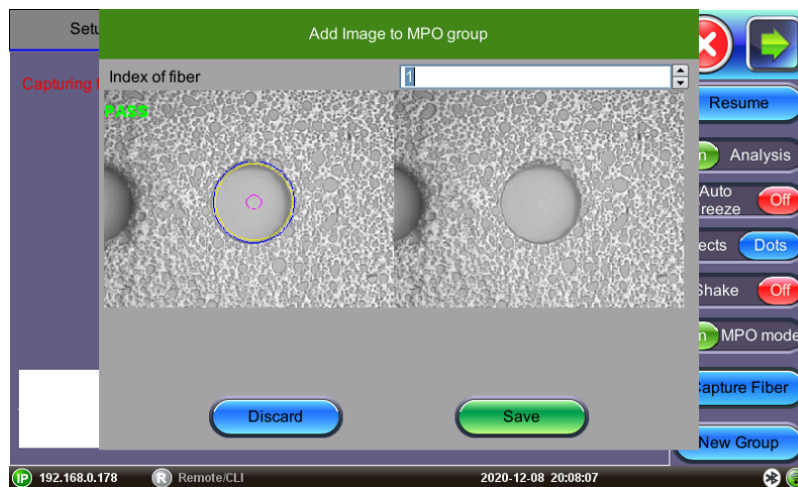
Press the **Capture Fiber** button on the touchscreen for every MPO fiber properly focused, analyzed, and scoped.

Press **OK** in the pop-up window to confirm the MPO fiber number, then adjust the scope controls (horizontal (x-axis) control only) to navigate to the next fiber.

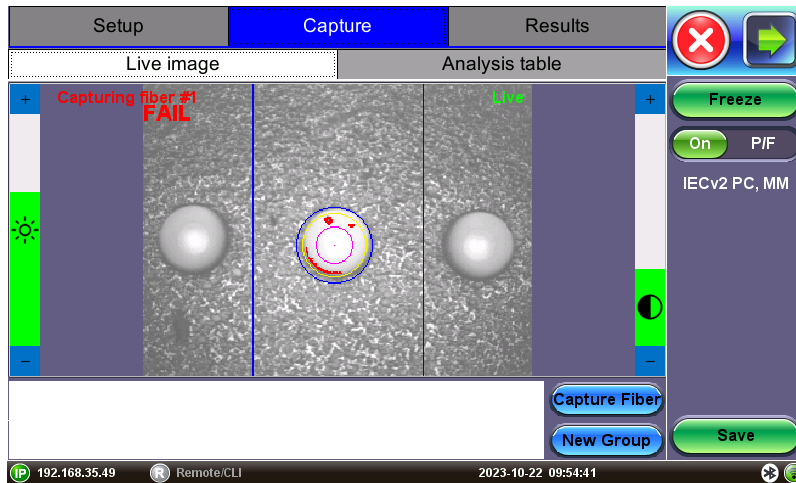
2. Fiber Scope button (fast)

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. As the x-direction (horizontal control) is rotated to the next consecutive MPO fiber the logging actions are done on the fiberscope itself. Scoping an MPO-12 fiber can be done under a minute.

Press **New Group** to create a new set of MPO images.



MPO Group - Add Image

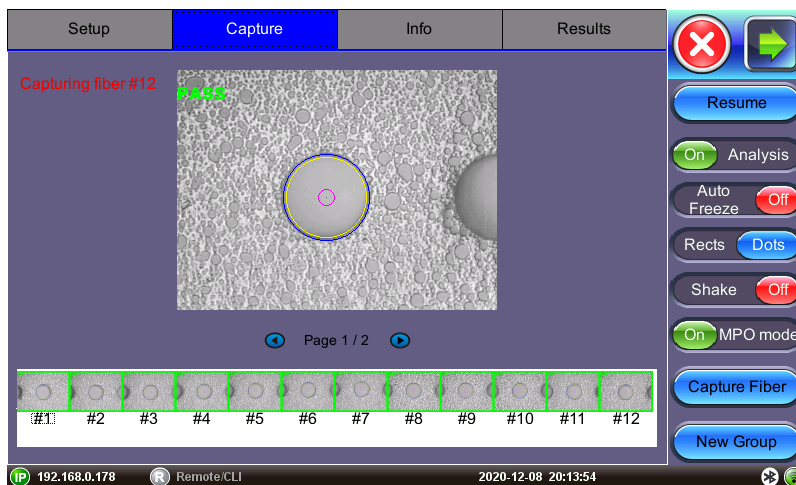


Aligning Fiber for Analysis

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.

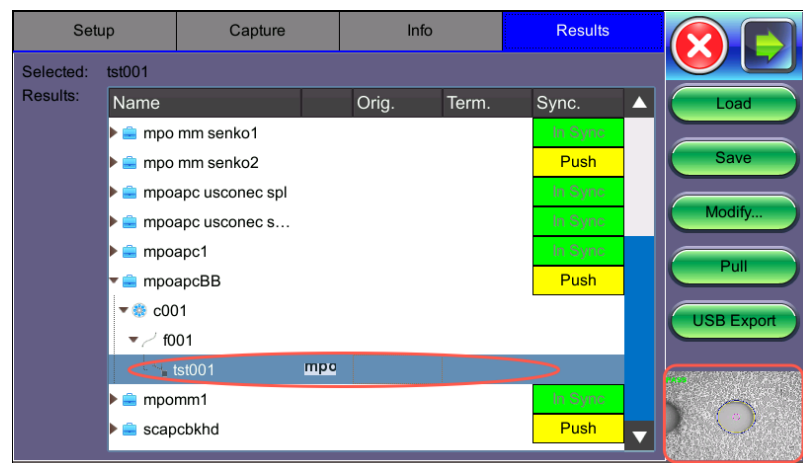
The key-up and key-down adapter that comes with the DI-1000MPO standard package is a straight-through connection so the MPO fiber # at the start matches the MPO fiber # at the end (not flipped). When using the adapter, fibers will be in the opposite orientation of the camera. In the below example, fiber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



MPO Group - Completed (PASS)

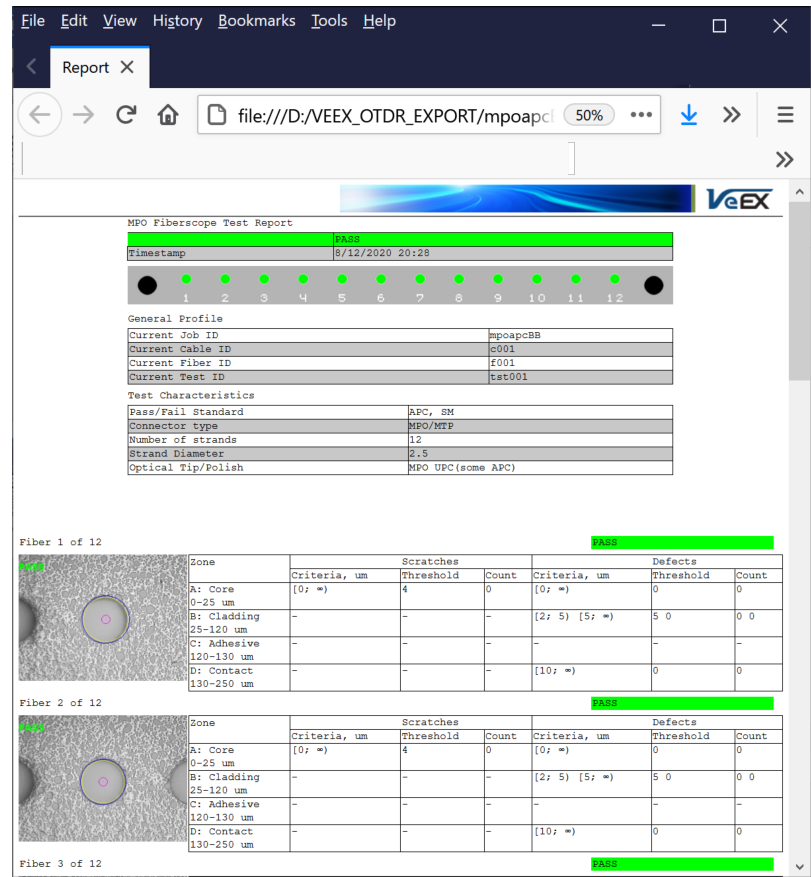
To save MPO results, navigate to the **Results** tab once all fibers have been captured and press the **Save** button.

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

(Scope image appears on bottom right corner of the screen.)



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.

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 8](#) 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 the fiberscope to an available USB Type-A interface on the test set.



Older analog fiberscopes require a USB adapter.



If using a DI-3000, WiFi can be used to connect to a platform with WiFi available. See below.

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.

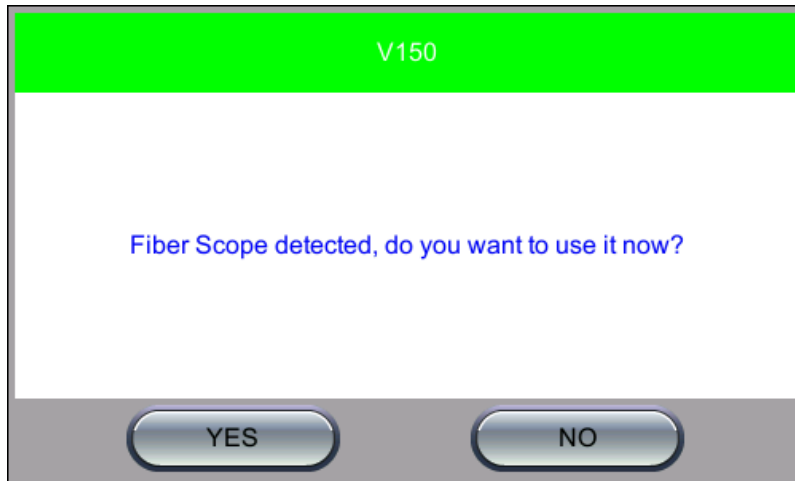
For more information about available connector tips, see the DI-1000 Digital Fiber Inspection Microscope Adapter Tips Guide on www.veexinc.com.

After powering on and setting up the fiberscope, select the tip that best matches the connector endface that is to be inspected.

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 Detected Message

Alternatively, select the **Test Application icon > Utilities > Fiber Scope**.





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.



See the *WiFi Wiz* section 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.



Fiber Scope Setup - Page 1

- **Scope mode:** Sets Fiber Scope connection method.
 - **Local:** Direct USB (wired) connection.
 - **Remote DI-3000:** Wifi connection to DI-3000.
- **Reset Con:** Resets connection method currently used (Remote or Local) with fiberscope, so another can be selected.
- **Auto Save:** **Disable**, **Autosave on Tap**, or **Autosave after freeze**. 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.

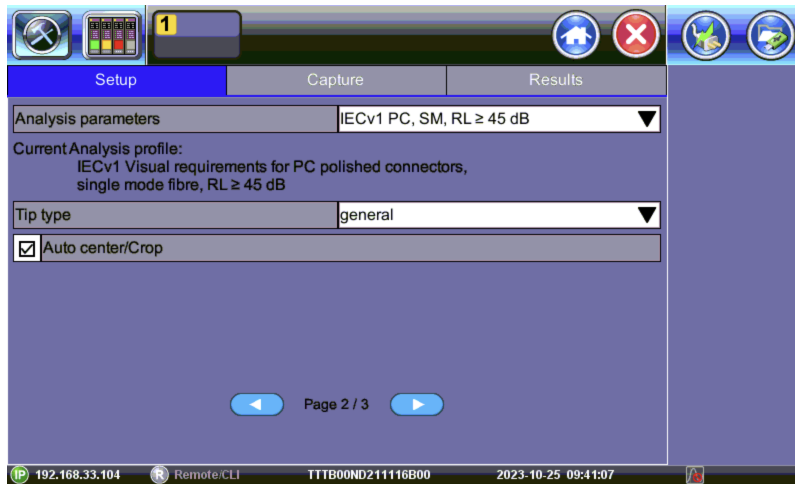
The details entered in the following fields can be used to pre-set the filename automatically and increment the fiber or test number automatically.

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

Tap the blank fields to edit the names.

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

Saved image files can be retrieved from [File Manager](#) or managed from the **Results** tab. Refer to "[File Manager: Working with Saved Results, Profiles, Images](#)" on page 153 for more details.



Fiber Scope Setup - Page 2

Field	Value
Company	default
Customer	default
Operator A	default
Operator B	default
Location A	default
Location B	default
Direction	A->B
Connector ID	default

Fiber Scope Setup - Page 3

Analyze Fiber Connectors

1. After assigning the scope mode and save options on Page 1, select the analysis profile from the **Analysis parameters** drop-down box on **Page 2/2** of the **Setup** tab.

The analysis profile is based on the fiber endface connector inspected, as well as applicable to MTP™/MPO (multi-fiber) connectors. .

- **PC, SM RL $\geq$ 45 dB:** SPC or UPC polished connector
 - **PC, SM RL $\geq$ 26 dB:** Older connectors with flat or PC polish (used with LC/MU)
 - **APC, SM:** Angled polished connector
 - **PC, MM:** Multi-mode connector
2. Select the **Tip Type** from the drop-down box. Tip Type is used to optimize Pass/Fail analysis for certain types of connector tips.
 - **General:** Encompasses standard SC, FC, ST, and other 2.5 mm ferrules. LC/APC and E2000/APC should not use general tip type.
 - **LC:** Lucent connector (male). Use on all 1.25 mm connectors with ceramic (LC/MU connectors).

- **LC female**: Lucent connector (coupler/bulkhead). Use when inspecting 1.25 mm type patch panels, MUX and test ports.
 - **E2000™**: Proprietary family of connectors invented by Diamond SA known for its low insertion loss characteristics and built-in (latched) shutter. Use when inspecting Diamond E2000 connector with ceramic ferrule.
3. After the image is frozen, select the **Auto center/Crop** checkbox 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 Shake OFF.
 4. Select the **Capture** tab.

Capture Images (View)

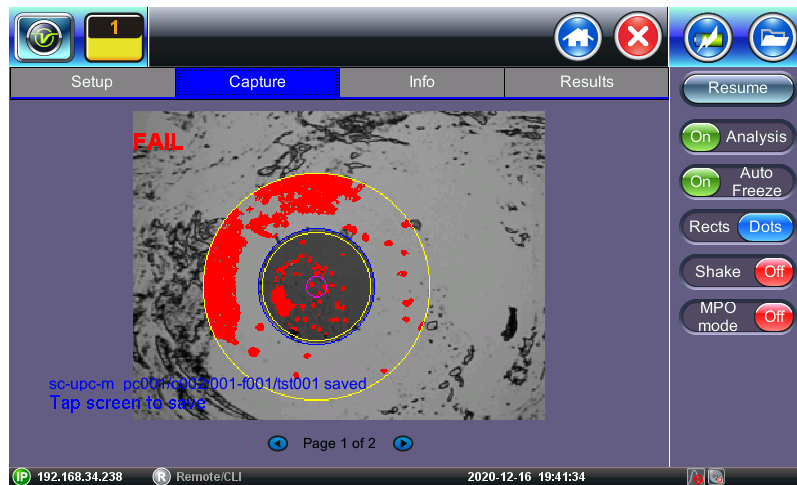
The **Capture** tab is the main user interface for the connector end face inspection and analysis. It presents a real-time view of the connector's end face allowing for alignment and focus. **Page 1** of the capture screen displays a live image of the connector face and features analysis and freeze tools.

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.

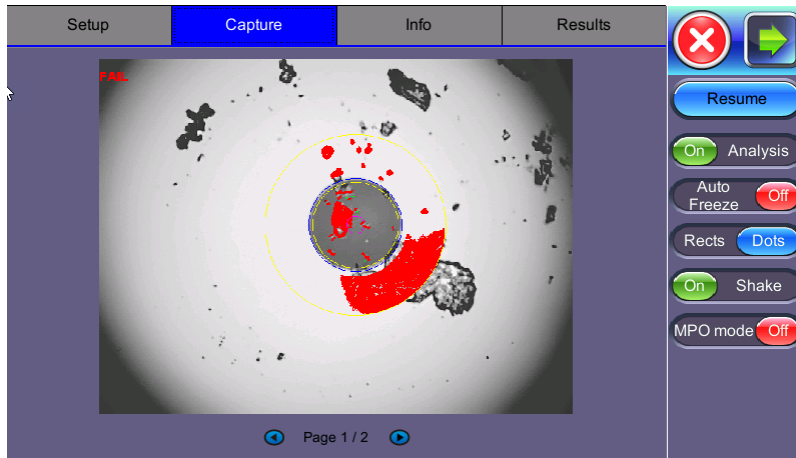
For the DI-3000, press the autofocus (red target) button when the image is out of focus to enable the device's automated focusing operation. With a steady hand, the end face will be promptly autofocused and ready for capture.



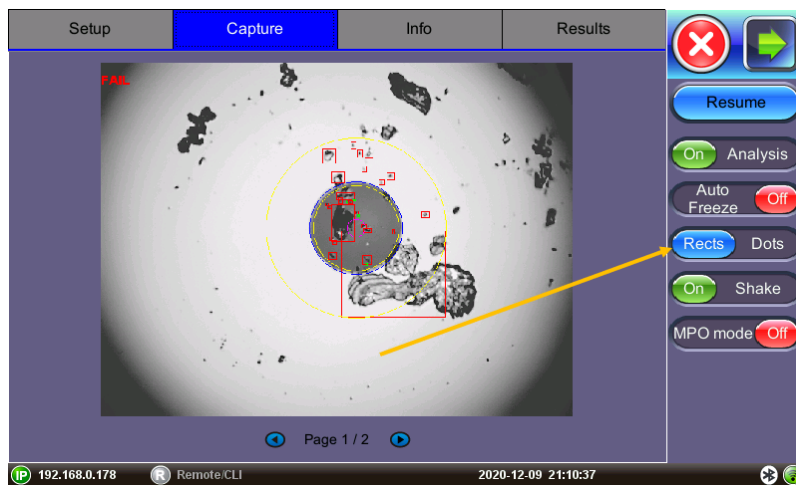
*Initially, there is no screen shown until **Resume** is pressed.*



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



Fiber Scope Capture - Dots vs Rectangles



Rects function highlighting overlay

The radio buttons on the right panel do not indicate the current state or setting, they indicate the action that would take place if pressed. For example, if “Analysis OFF” is tapped, the analysis function is turned OFF and the button displays “Analysis ON”.

- **Resume / Freeze:** Stops the video capture from the fiberscope. If the optional Auto Freeze feature is enabled, the test set will automatically freeze the image when it comes into focus. Once the image is frozen, tap the image to save it.
- **Analysis On / OFF:** Turn ON/OFF the automatic Pass/Fail threshold defined by IEC 61300-3-35.

- **Auto Freeze:** Turn ON/OFF the ability to freeze the video automatically, when in Focus. The default is set to OFF. To see the image after it freezes, tap **Resume**.



Auto Freeze may be useful when scoping certain angled polish fibers.

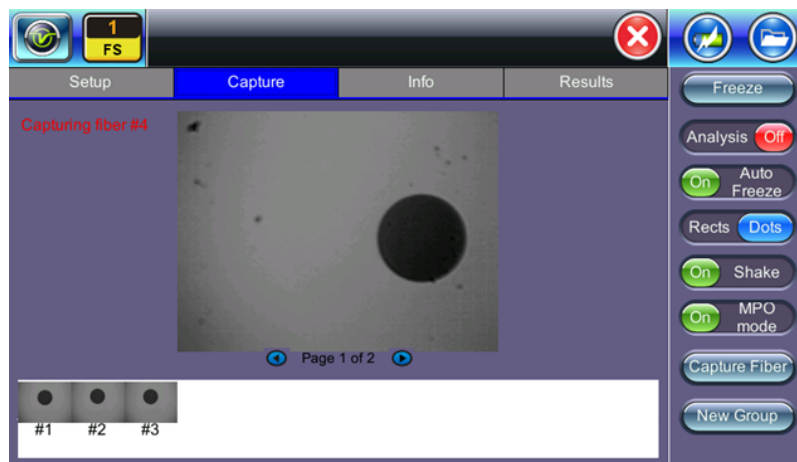
- **Rectangles / Dots:** Dots draw a red contour around scratches and defects. Rectangles highlight scratches and defects without obstructing the view. The selection between dots or rectangles does not affect the area calculation or the Pass/Fail results. Dots are set as default.
- **Shake:** Turn ON or OFF the ability to Auto Freeze or Analyze when 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 bulkhead couplers or MUX/transceivers set Shake to OFF.

- **MPO mode:** Turn ON when inspecting ribbon fibers (MPO/MPT connectors). Create a **New Group** for each MPO ribbon and **Capture Fiber** to save an image for each strand.



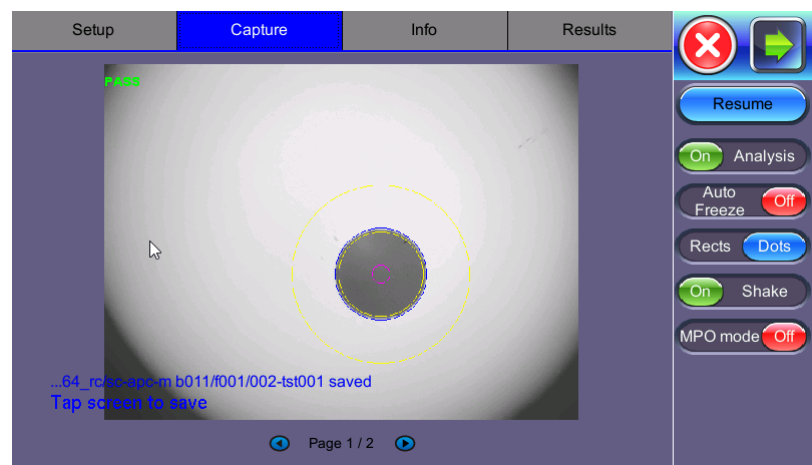
*When inspecting MPO/MPT connectors, it is recommended to set **Auto Freeze** and **Shake** to **OFF**.*



Fiber Scope MPO mode

To save the image on the screen, tap the screen after freezing.

After saving, go to **Results** or **> Utilities > FilesFiles** to view the report and export to PDF or USB.



Fiber Scope Capture - PASS

In the example above, the message in blue states that the image can be saved when tapped. This indicates that the **Autosave** on Tap option was enabled on **Page 1** of the **Setup** tab. If **Autosave after freeze** were selected, no message to tap the screen would appear.

Page 2 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

Info

Results

	Scratches			Defects		
	Criteria(μm)	Thresholds	Count	Criteria(μm)	Thresholds	Count
A:Core 0-25 μm	[0;∞)	0	0	[0;∞)	0	0
B:Cladding 25-120 μm	[3;∞)	0	0	[2;5) [5;∞)	5 0	0 0
C:Adhesive 120-130 μm	-			-		
D:Contact 130-250 μm	-			[10;∞)	0	0

◀

Page 2 / 2

▶

✖

➡

Resume

On

Analysis

Auto Freeze

Off

Rects

Dots

On

Shake

MPO mode

Off

IP

192.168.0.178

Remote/CLI

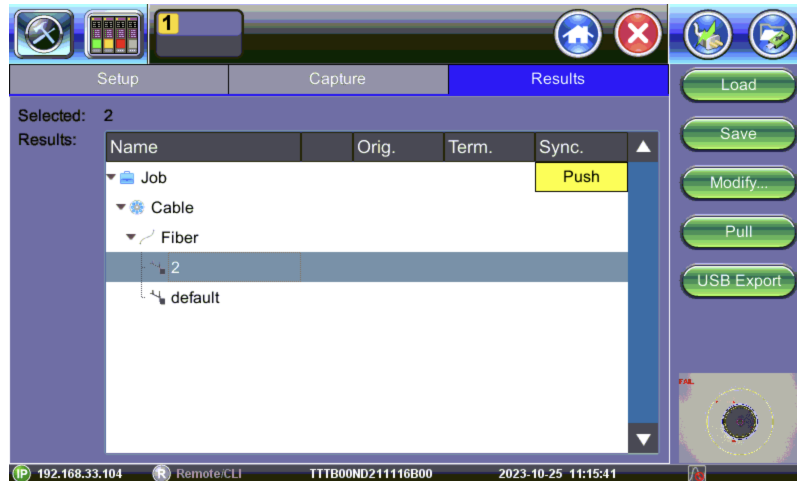
2020-12-10 01:52:59

⌂

🔍

Pass/Fail IEC analysis table

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



Fiber Scope Analysis

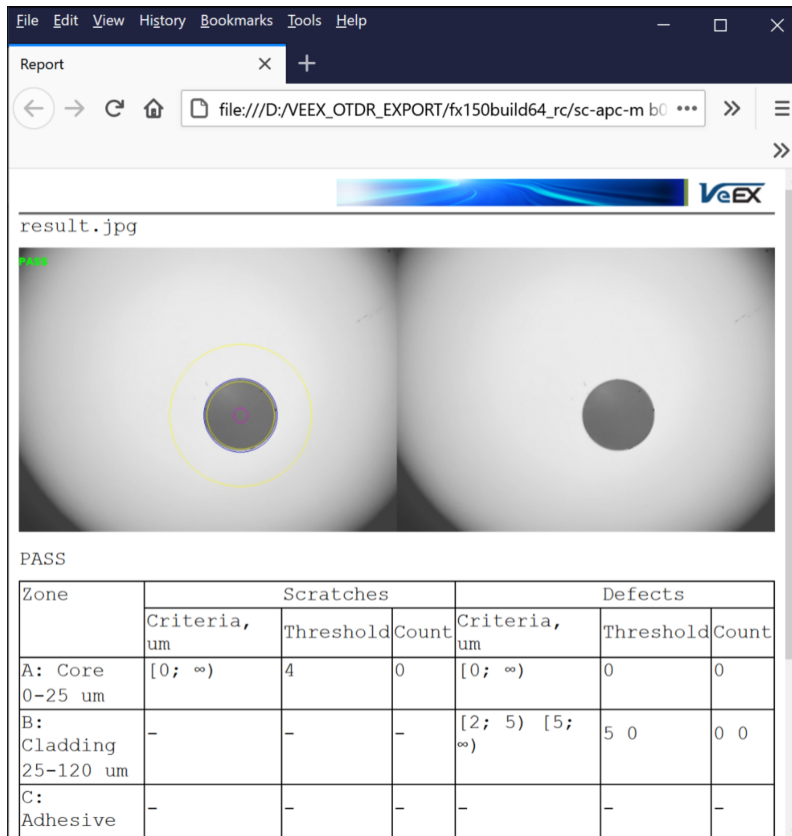
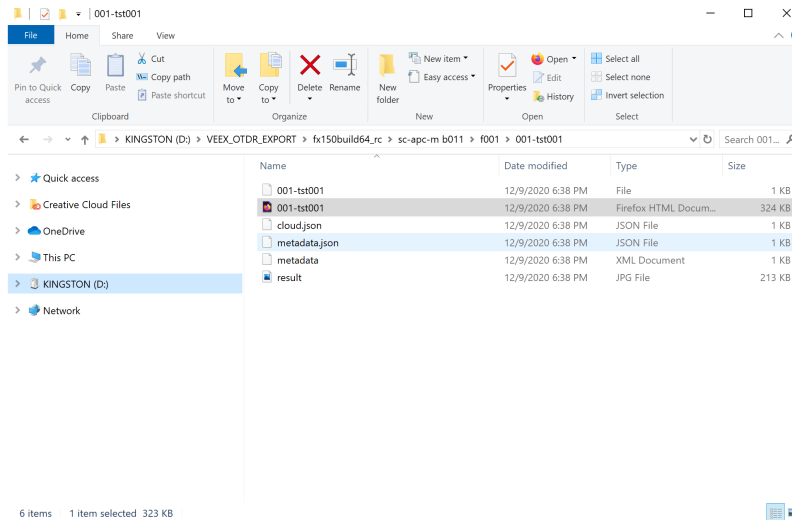
(For Fiberscope Results, Scope image appears on bottom right corner of the screen.)

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 image onto the Capture tab.
- **Save:** Manually saves and names the image displayed in Capture (autosave is disabled). Once saved, the files can be accessed in the ["File Manager" on page 152](#) or ["R-Server" on page 77](#).
- **Modify:** Select a file or folder in the directory to modify. Options to Rename, Remove, and upload the selection to Fiberizer Cloud are available.
- **Pull:** When connected, pulls file from Fiberizer Cloud onto test set.
- **USB Export:** Exports files to USB stick. Choose Export Group to retain the tree format (sub-directory) or Export Flat to create a single filename using sub-directories to build a name.

In the Result Files example above when choosing to retain the tree format, the highlighted 022-tst001 results file can be found in the following directory after exporting:

```
>fx150build64_rc > sc-apc-m b01.
```



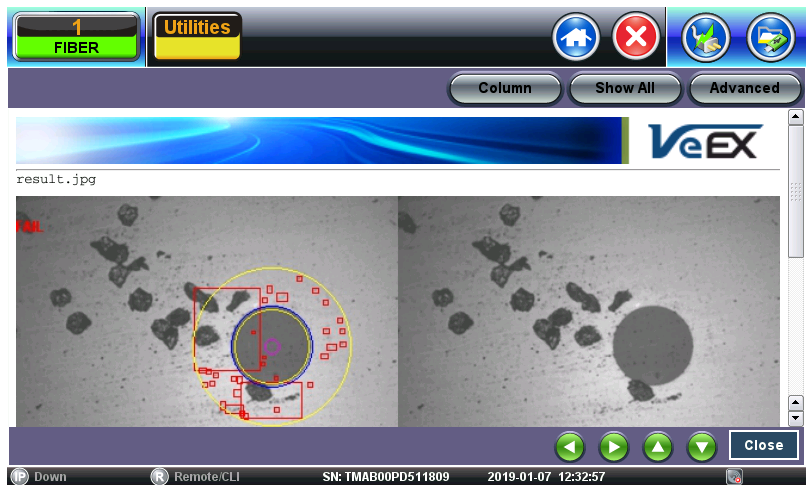
Fiberscope test viewed in an HTML browser



Reports can also be viewed as pdf files.

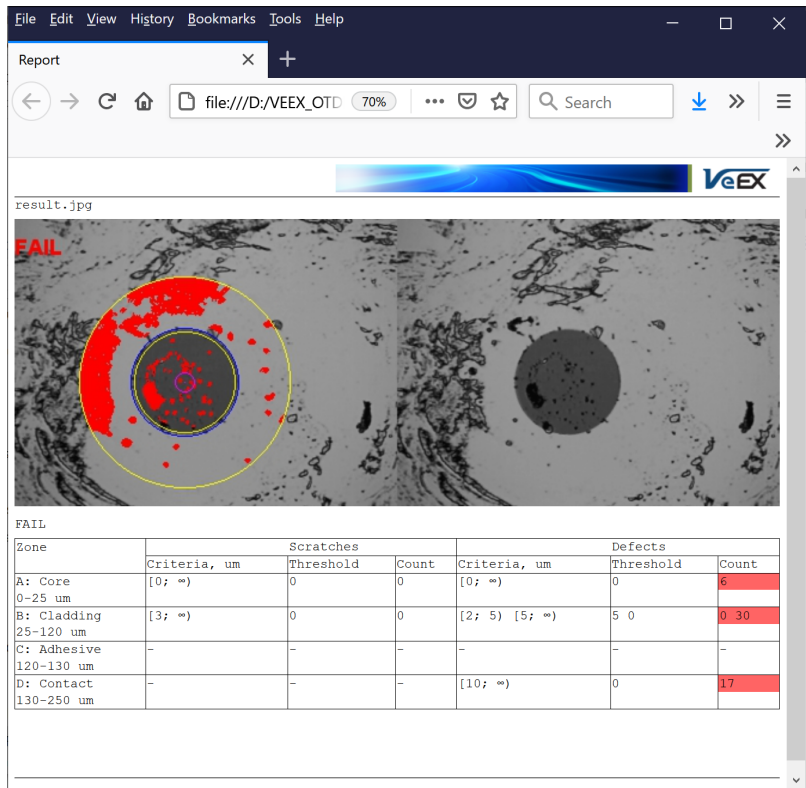
Test Analysis Report

To view the report files, tap **Utilities>Files>Save**. 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 reports, see ["File Manager" on page 152](#).



Analysis Report (.jpg format)

The test report can also be viewed in HTML format.



Test Report viewed in an HTML browser

Fiberizer Cloud

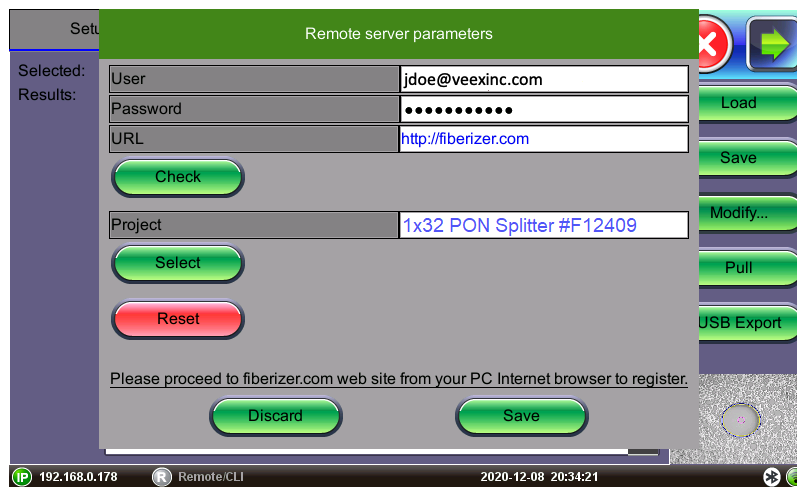
Fiber test results including Fiberscope images can also be uploaded to a registered Fiberizer Cloud account. Registration is free.

Connecting to Fiberizer Cloud

To connect the test set to Fiberizer Cloud, you must be a registered user. For new users, go to the fiberizer.com website from a PC Internet browser to register before proceeding with these directions.

Go to <http://fiberizercloud.com> to register.

1. After registering, tap on **Modify > Settings**.
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 to and tap **OK**.
4. **Save** or **Discard** the cloud login details.



Settings to connect to Fiberizer Cloud

Uploading/Downloading Files with Fiberizer Cloud

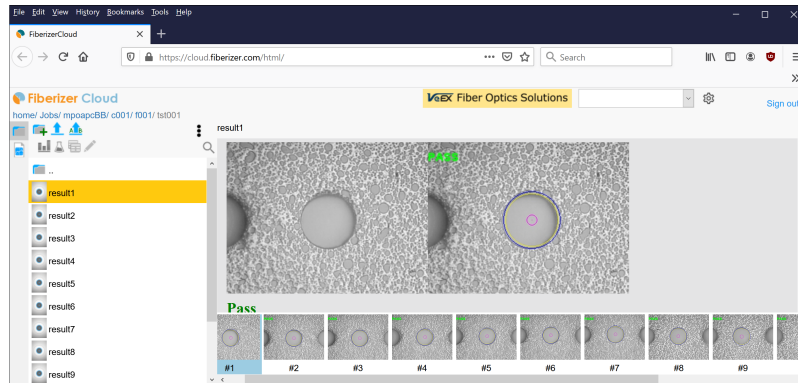
Before attempting to upload or download, ensure that the test set is successfully connected to Fiberizer Cloud. Tap **Push** next to a directory item to upload it into Fiberizer Cloud. Tap **Pull** to download the directory collection from Fiberizer Cloud.

The Project selection defines the project folder location on the Fiberizer Cloud account to which to save the results. The default setting 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.

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 MPO results on Fiberizer Cloud.



MPO Fiber View on Fiberizer Cloud

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.



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.

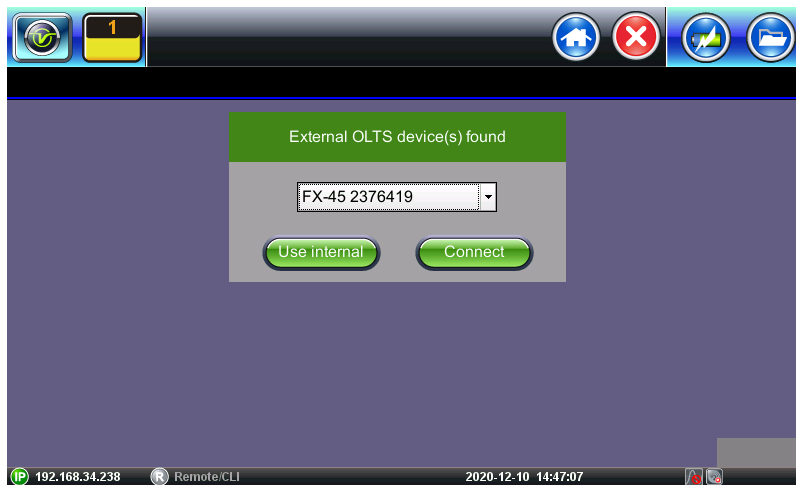
Connecting to the internal (built-in) OPM

1. Tap the **X** icon to close OTDR mode. The **Fiber main menu** appears.
2. Tap **Optical Power Meter** 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.

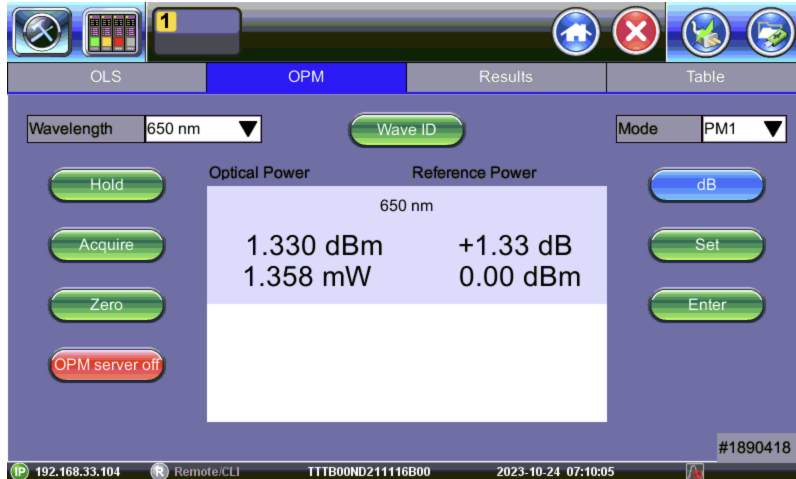


The Name of the External OLTS device is Displayed Once Detected



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. If beginning testing, zero the meter by closing the dust cap and pressing the **Zero** button.
2. Connect the port with the desired wavelength OLS to the OPM port using a patch cord.
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 cycle through all supported 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. 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).

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. If beginning 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.

The screenshot shows the 'Table* - 1 NEW' interface. At the top, there are tabs for OLS, OPM, Results, and Table* - 1 NEW. Below the tabs is a 'Save' button and a 'Resultoxlts*' label. The main area contains a table with three columns: Date/Time, Power, and Wavelength. There is one data row with a checkbox in the first column.

	Date/Time	Power	Wavelength
☐	2023-10-24T09:22:07.000Z	2.56 dB	1310 nm

At the bottom, there is a status bar with IP 192.168.33.104, Remote:CLI, TTTB00ND211116B00, 2023-10-24 09:22:29, and #1890418.

The screenshot shows the 'Table* - 3 NEW' interface. At the top, there are tabs for OLS, OPM, Results, and Table* - 3 NEW. Below the tabs is a 'Save' button and a 'Resultoxlts*' label. The main area contains a table with three columns: Date/Time, Power, and Wavelength. There are four data rows, each with a checkbox in the first column.

	Date/Time	Power	Wavelength
☐	2023-10-24T09:22:54.000Z	5.23 dB	1310 nm
☐	2023-10-24T09:22:49.000Z	4.37 dB	1310 nm
☐	2023-10-24T09:22:44.000Z	2.71 dB	1310 nm
☐	2023-10-24T09:22:07.000Z	2.56 dB	1310 nm

At the bottom, there is a status bar with IP 192.168.33.104, Remote:CLI, TTTB00ND211116B00, 2023-10-24 09:23:10, and #1890418.

- 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.



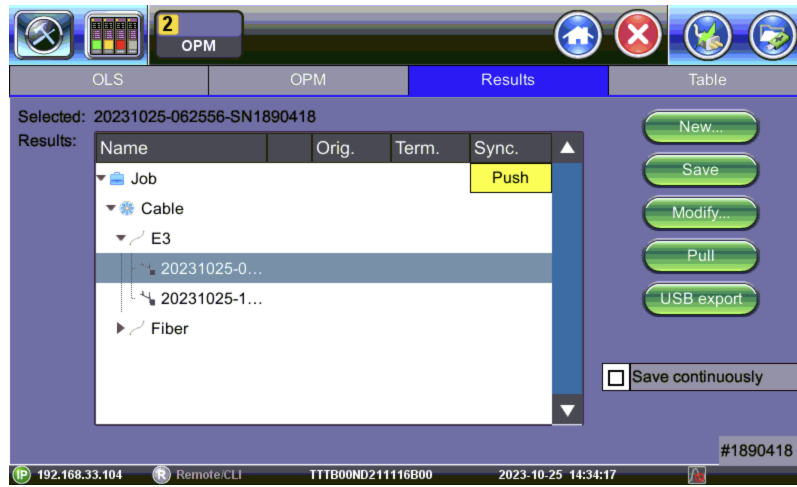
The JobID/CableID/FiberID/TraceID fields determine the location to which the trace is saved. If these settings are not set accurately, the trace will not save to the desired location.

- 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.

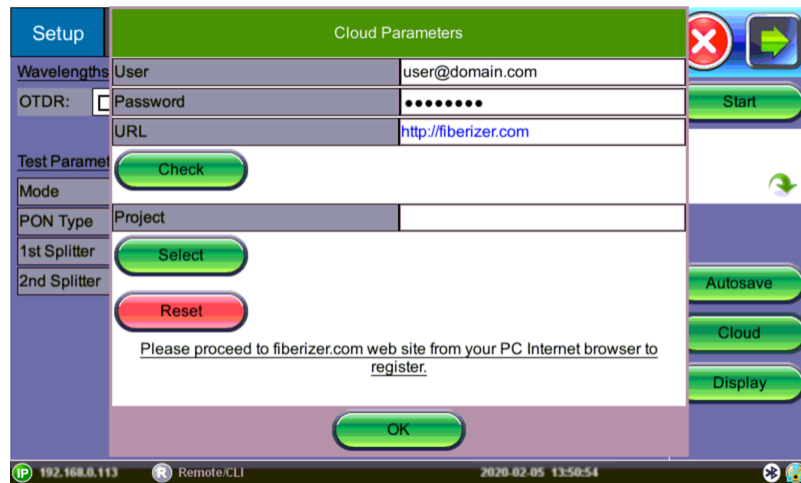


Results Management Menu

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 121](#) for details on connecting to Fiberizer Cloud. Refer to ["Results/Reports" on page 118](#) for more details on fiber test results.

Use the following options when using the **Results** screen:

- **Push/In Sync:** Uploads locally saved results to Fiberizer Cloud. *In Sync* indicates the results have been saved to Fiberizer Cloud successfully. To push the results to Fiberizer Cloud, ensure connection to the network via Ethernet or WiFi, and then tap **Modify>Settings** to sync with Fiberizer Cloud. Then, tap **Push** to sync saved files to the cloud.



Fiberizer Cloud set up screen

- **New:** To create a new folder.
- **Save:** Saves results. Once saved, the files can be accessed in [File Manager](#) and R-Server (if available). Refer to [Working with Saved Results, Profiles, Images and "R-Server" on page 77](#) for more information.
- **Modify:** Select a file or folder in the directory to modify. Options to Rename, Remove, and upload the selection to Fiberizer Cloud are available.
- **Pull:** When connected, pulls file from Fiberizer Cloud onto the test set.
- **USB Export:** Exports files to a USB stick. Choose Export Group to retain the tree format (sub-directory) or Export Flat to create a single filename using sub-directories to build a name.
- **Save continuously:** To autosave results at a specified interval (1 to 60 seconds). Use this option to check power drift.

Wifi Spectrum Analyzer



The VeEX WiFi SA USB dongle is discontinued and no longer supported.

WiFi SA was a portable spectrum analyzer on a USB dongle that displayed all RF activity in the WiFi bands (e.g., wireless networks, cordless phones, microwave ovens, Bluetooth devices, etc.).

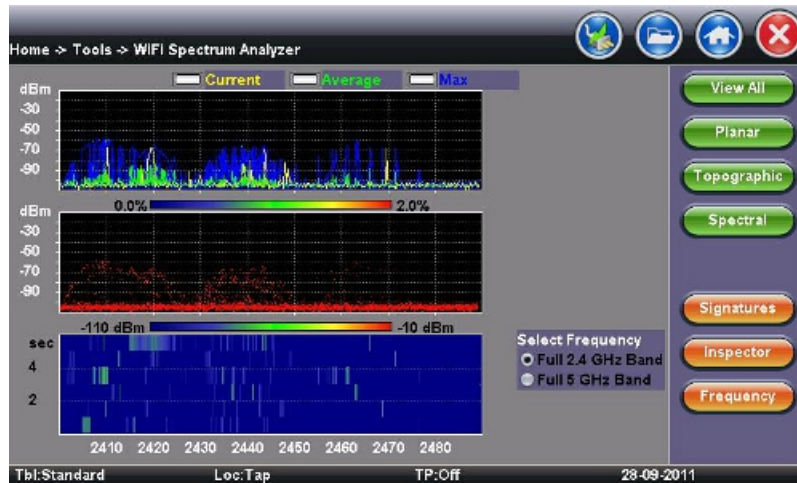
For users who still have the dongle, the feature offers the following capabilities:

- Helps determine the best available WLAN channels quickly for optimal performance
- Helps to visualize and locate RF signals in the 2.4GHz and 5GHz spectrums
- Discover and remedy competing access points
- Optimize WLAN networks by locating and eliminating interference sources

Parameter	2.4 GHz	5 GHz
Frequency range	2.4 to 2.495 GHz	5.15 to 5.85 GHz
Frequency resolution	26 kHz to 3 MHz	24 kHz to 3 MHz
Filter bandwidth	58 to 650 kHz	54 to 600 kHz
Antenna type	RP-SMA	
Amplitude range	-100 dBm to -6.5 dBm	
Amplitude resolution	0.5 dBm	

WiFi SA Specifications

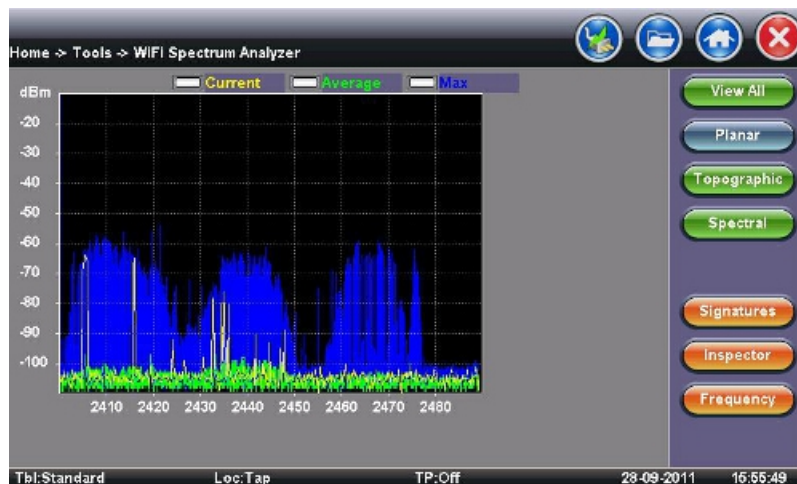
- Supports 802.11a/b/g/n networks
- Supports both 2.4 GHz and 5 GHz bands
- Equipped with RP-SMA antenna jack
 - Allows user to replace standard external Omnidirectional antenna with a higher gain or directional antenna as needed
- The WiFi Analyzer is a compact and portable USB dongle that plugs into the USB 2.0 port of the V300 series
- The WiFi SA test application menu is located in the Tools/Advanced Tools menu



WiFi Analyzer USB dongle

Display Summary

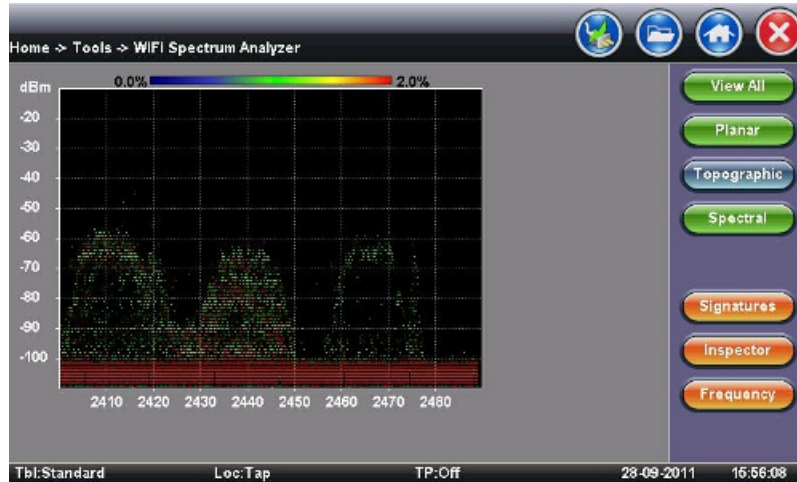
- **Planar view:** Reports current, average, and maximum signal amplitude for each wireless frequency
- **Topographic view:** Emphasizes which frequencies are the busiest across the entire spectrum
- **Spectral view:** Historical view of wireless spectrum use at a point in time



WiFi SA - Planar View

Planar View

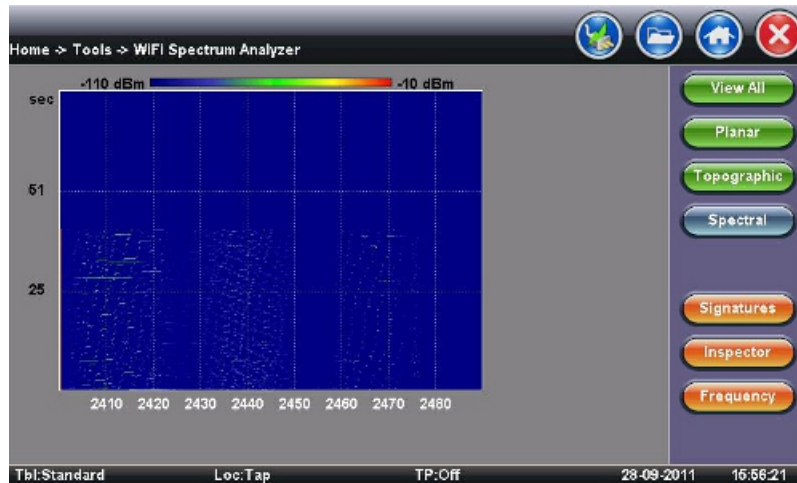
- Traditional Spectrum Analyzer view with Max, Average, and Current results
- Displays RF activity in real time and tracks average and max values over a given period



WiFi SA - Topographic View

Topographic View

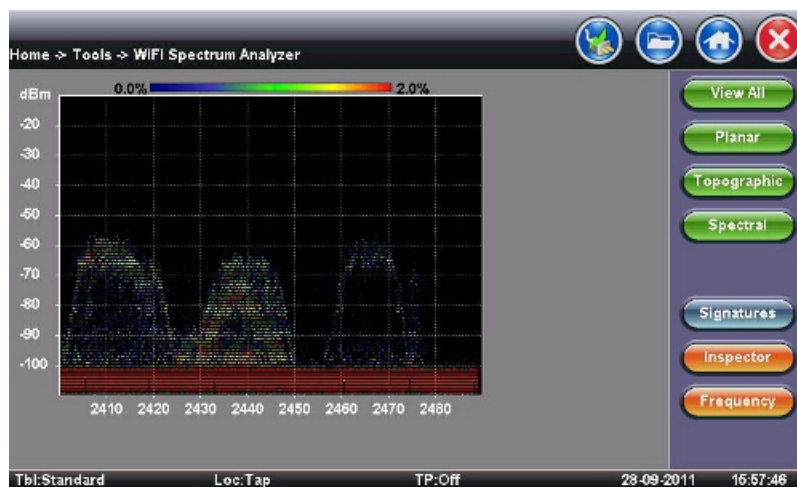
- Similar to a density map - plots frequency versus amplitude
- Uses a special color scheme to assign colors to frequency amplitude points and to identify how often a particular coordinate is recorded
- Great resource for identifying devices with very low duty cycles
- Leaving it running will give a good indication of the typical local network conditions



WiFi SA - Spectral View

Spectral View

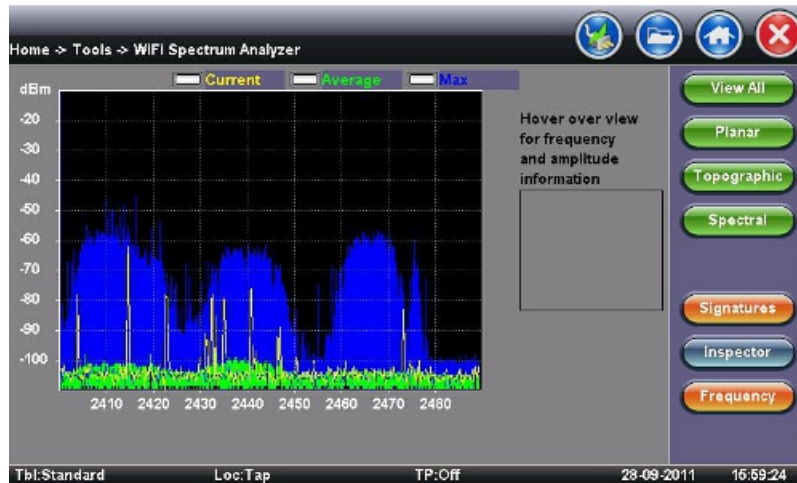
- Waterfall type view across the whole band - graphs amplitude levels over time
- Uses color to pick out the relative signal strength at each point in time
- Great tool for troubleshooting intermittent problems, since it highlights devices that are perhaps emitting only short bursts of noise
 - For example - discover microwave oven in the kitchen interfering with WLAN



WiFi SA - Signatures

Signatures

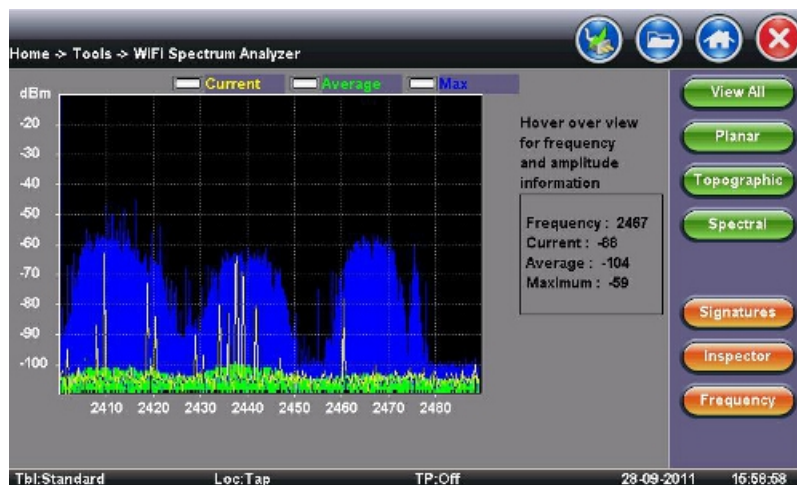
- The Signatures button presets are available to identify unknown sources of RF activity (e.g., microwave oven)
- Select a device in the sidebar and click the pattern in the Topographic view to identify a device



WiFi SA - Inspector

Inspector

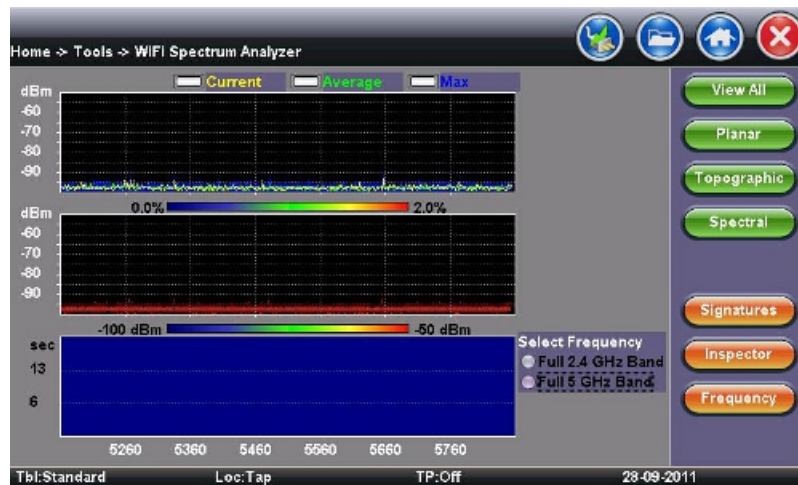
- The Inspector button setup allows the user to measure the frequency of the RF activity or interference of interest
- When selected, a prompt and result box appears



WiFi SA - Inspector - Result

Inspector Button - Result

- Current, Average, and Maximum amplitude values provide an indication of level fluctuation over measurement period



WiFi SA - Frequency

Frequency

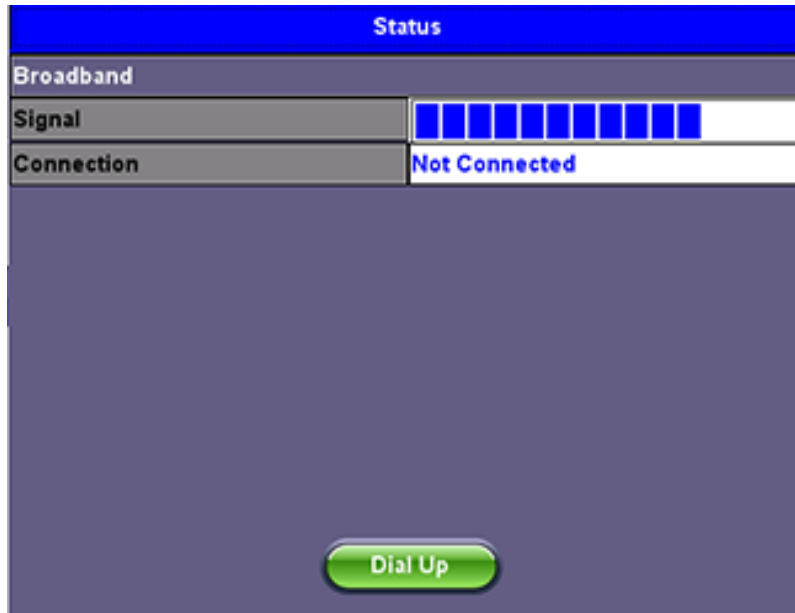
- This button allows the user to select frequency band for testing

Data Card (3G/4G Cellular Modem)

To establish an IP connection using a data card, the data card must be connected to the USB port. Once connected, the **Data Card** icon will appear at the bottom of the screen.



Only datacards provided by VeEX are supported and have the driver necessary for connection.



Data Card - Status

Press **Dial Up**. In the **IP Tools Setup** menu, **Port** will be displayed as "Datacard Port". The D for Data icon in the bar on the lower end of the screen will have a red cross to show that datacard is not connected . Select the **configuration parameters**, then press **Connect**.

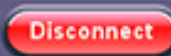
Setup	Status	Ping	Trace Route
Network			
Port	Datacard Port ▼		
Profile	Default ▼		
Service Provider	Custom ▼		
APN	3gnet		
User Name			
Pass Word			
			

Data Card - Setup

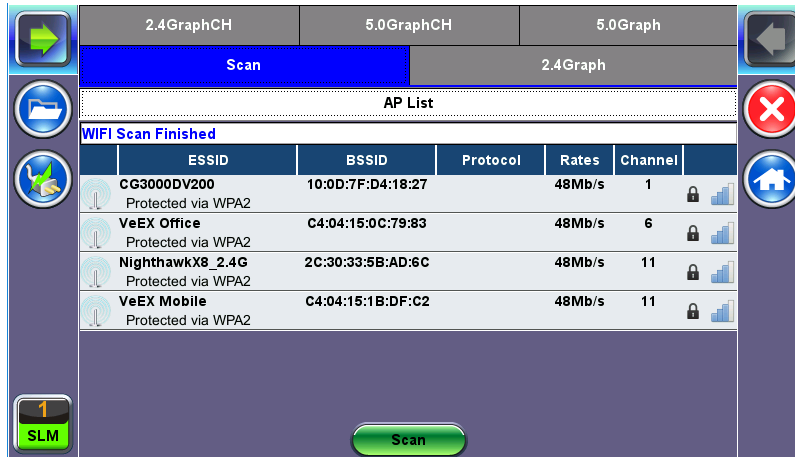
When a connection is successfully established:



If the test set is powered off/on and you are in a good reception area or if you enter a bad cell area and return to a good one, the test set will reconnect automatically.

Setup	Status	Ping	Trace Route
Connection Status	PASS		
Local IP	33.238.17.11		
Remote IP	33.238.17.11		
DNS IP	10.177.0.34		
Second DNS	10.166.208.148		
			

Data Card - Connection Established



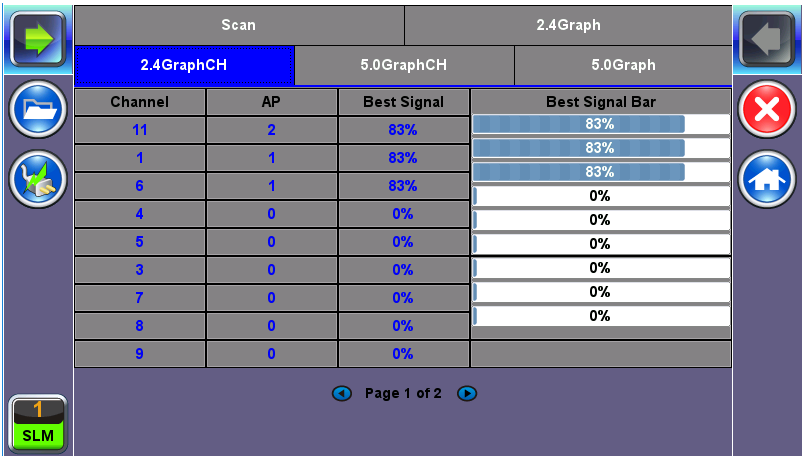
WiFi inSSIDer Home

The WiFi InSSIDer supports only the 2.4 GHz frequency band or 2.4 GHz and 5 GHz frequency bands depending on the V150 product model (refer to product specifications for details). The home screen has tabs to display test results for both frequency bands and also for graphical presentation of results for both.

1. Tap the **Scan** button on the right side of the screen. After the scan is completed, the unit displays the list of access points (AP) detected in the 2.4 GHz and 5 GHz bands.
2. The following information is displayed for each AP:
 - SSID name of the AP
 - BSSID (MAC address) of the AP
 - 802.11 protocol version supported by the AP
 - Max data rate supported by 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

Access Points in the 5.0 GHZ spectrum can only be displayed if the VeEX USB Wifi adapter supports 802.11a/n or 802.11 a/n/ac. Refer to the USB Wifi adapter specifications.

3. Use the 2.4GHz GraphCH and 5.0GraphCH tabs to view the number of Access Points detected for each channel in the 2.4GHz and 5GH bands and the strength of the strongest AP's signal for each channel.



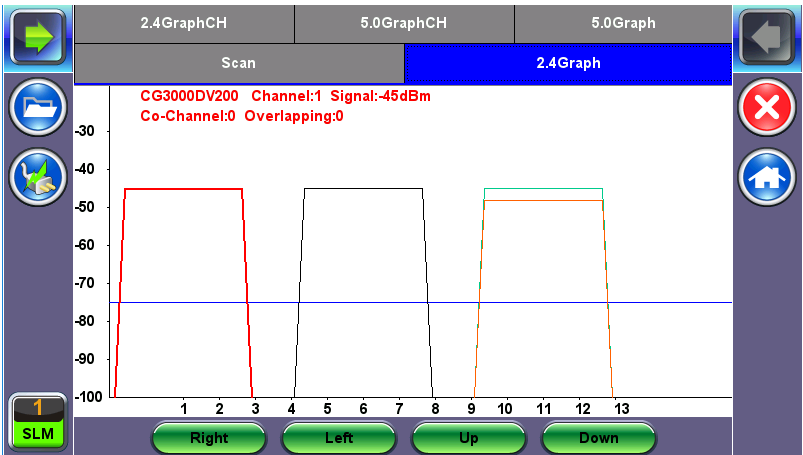
The screenshot shows the '2.4GraphCH' tab selected. It displays a table with columns: Channel, AP, Best Signal, and Best Signal Bar. The table lists 11 channels (11, 1, 6, 4, 5, 3, 7, 8, 9) and their corresponding AP counts and signal strengths. The 'Best Signal Bar' column shows a visual representation of the signal strength as a blue bar.

Channel	AP	Best Signal	Best Signal Bar
11	2	83%	83%
1	1	83%	83%
6	1	83%	83%
4	0	0%	0%
5	0	0%	0%
3	0	0%	0%
7	0	0%	0%
8	0	0%	0%
9	0	0%	0%

Page 1 of 2

2.4GHZ Channel

4. Tap the **Graph** tab of the respective Channel to view the results in a graphical presentation.



Graph

5. Use the Right/Left/Up/Down function keys or the arrow keys on the unit's keypad to navigate the graph and get additional information for the access points. Detailed information for each Access Point includes:

- SSID: name of the AP
- AP's radio Channel number
- Signal strength (dBm)
- Number of co-channel: Number of APs using the same radio channel
- Number of Overlapping APs: Number of APs using channels whose frequency band overlaps with the AP

OTDR Viewer

This built-in application allows the test platform to view previously saved .sor trace results and edit events, as needed. IF an OPX-BOXe is connected to the platform via direct USB connection, WiFi or Bluetooth®, this built-in application can also be used to control all OTDR test functions.

To access the OTDR Viewer from the Platform Screen, select **Tools > OTDR Viewer**.



Once paired or connected to the micro OTDR, the test set displays a virtual OTDR user interface that is used to control the OPX-BOXe and perform measurements.

- Traces and Events table view
- Loss calculations
- V-Scout Link Mapper option
- Compatible with Fiberizer Cloud (upload and download)
- Controls external OPX-BOXe OTDR

Since fibers are commonly placed in access, metro, and transport networks, having a companion add-on OTDR to inspect drop fiber reduces dependence on specialized fiber construction crews troubleshooting fiber related problems.

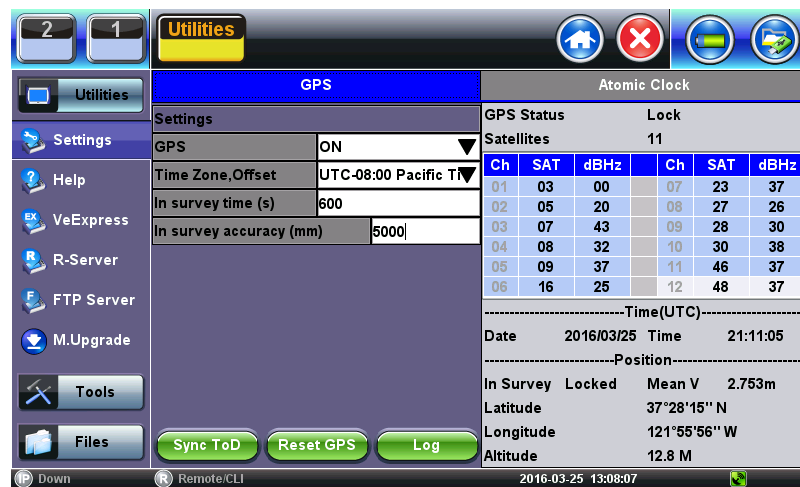
Refer to the [OPX-BOXe User Manual](#) for further details about OTDR operations.

GNSS/GPS & Sky View

GNSS Receiver Settings and Operation

This section explains the GNSS Receiver configuration and basic settings required to quickly verify proper module installation and operation. Refer to the tables at the end of this document for application-oriented settings.

1. Install the portable antenna facing up, on a stable surface or mounting, with a wide unobstructed view to the sky or use a professionally-installed in-building roof-top antenna feed.
2. Connect the active GPS or antenna to the GNSS Receiver module's SMA connector. If a BNC-to-SMA or TNC-to-SMA adapters is required, use flexible adapter cables (not rigid adapters) to prevent any mechanical stress.
3. Turn the **GNSS Receiver = ON**.



GNSS Receiver On

4. Go to **>Utilities >Settings >More >High Precision Clock >GNSS**.
5. Set the **Satellite System = GPS**
6. Set **In-survey time (s) = 600**, which is the time window used by the GNSS Receiver to assess stable location, using the specified accuracy (below). Having an accurate tri-dimensional location is required to calculate accurate time.
7. Set **In-survey accuracy (m) = 5**, which is a target of <5m for the Mean V accuracy reading. Smaller values tighten the location accuracy requirements, but the site survey process may take longer. It is

possible to get better than 1.5m location accuracy when using professionally-installed roof-top antennas.

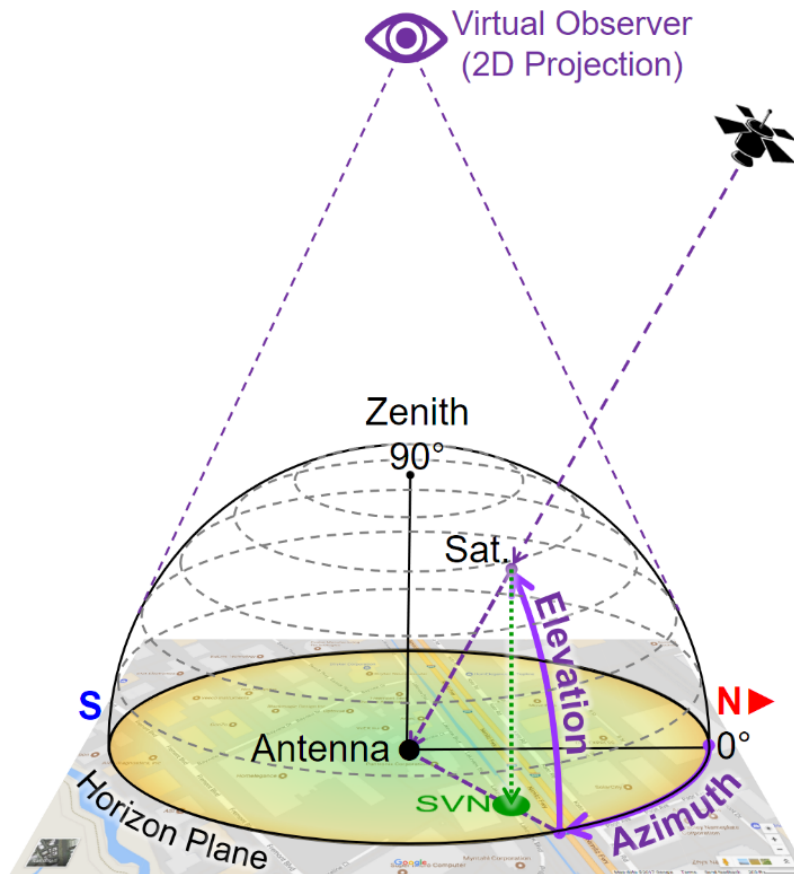
8. Enter any antenna cable delay that needs to be compensated for (velocity of propagation is cable dependent, their values are around 5ns/m or 1.2ns/ft). Enter **20ns** if using the 5m portable antenna.
9. Select the **Time Zone Offset** (it is used to calculate the local time of day).
10. Wait for GPS Status on top to show Lock and the  icon at the bottom of the screen turns green. It indicates that it is successfully tracking enough GPS and GLONASS satellites.
11. Wait for about 15 to 30 minutes for the **Mean V** value to be below **5.00m** and until the **In Survey** status also shows **Locked**. This indicates that the GPS position has reached the required accuracy (site survey finished) and that it has switched into Timing Mode.
12. At this point, the GPS Module should be providing accurate Time and Timing (1PPS).
13. Tap the **Sync ToD** button to synchronize the test set's (system) real-time clock.

Verifying the Antenna Field of View

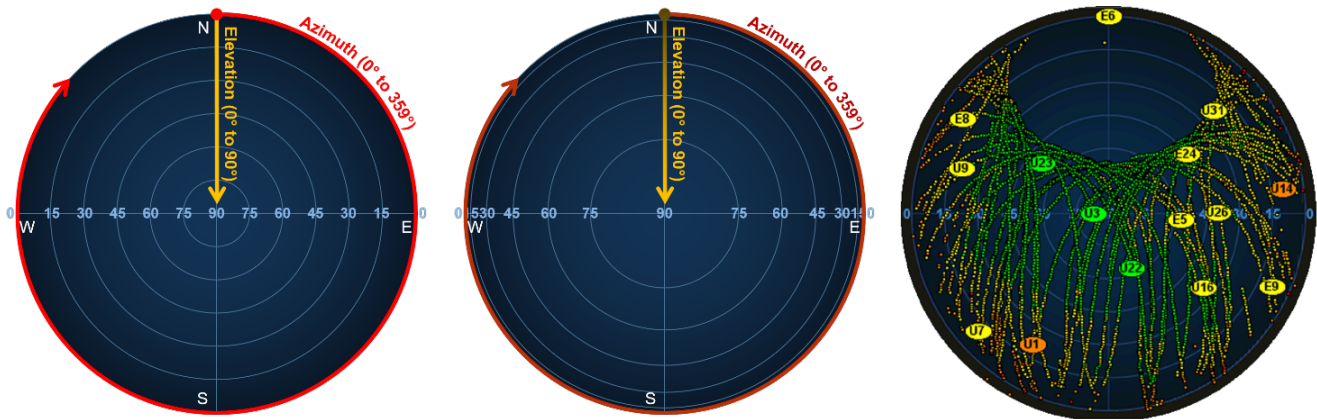
Not many of us would be tempted to get on the roof or climb to the top of a tower to perform a 360° visual inspection to identify any potential satellite signal obstructions. But even if you do, you won't be able to "see" interference, multi-path or other RF effects.

As all "visible" GNSS satellites move around their orbits, the directional vectors pointing at them form dome above the antenna. Their received signal qualities change over time, depending on their elevation angles, obstructions, reflections and other factors.

To track this, you need a tool that records the C/No of every satellite as they pass by the antenna's aperture (field of view), to create a flat (2D) projection of a 360° color-coded dome-shaped "heat" map representing the field of view of the antenna and the signal quality from every direction. These azimuthal graphs allow you to identify areas (directions) with degraded signal quality.



Building such maps usually takes **>24 hours**, to allow each satellite to complete one cycle over the antenna (not to be confused with their ~12-hour orbital cycles).

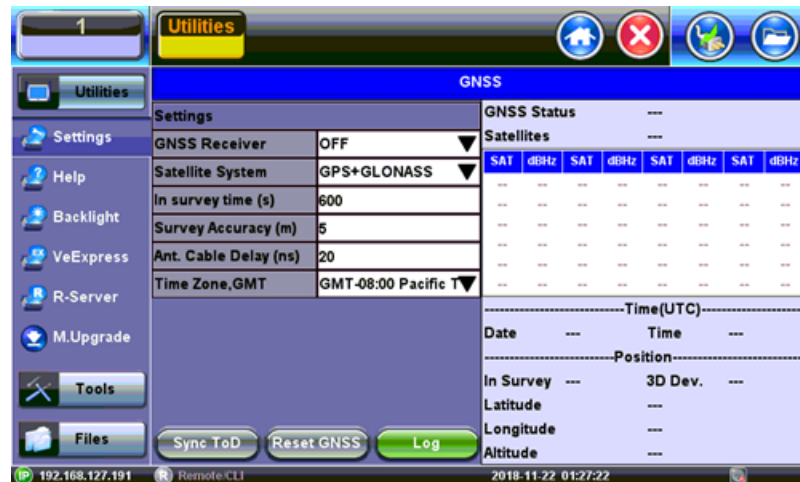


Examples of 2D Linear and Cosine projection (polar) grids, as well as actual satellite trails recorded

This type of tool can also be used to evaluate and benchmark different antennas in real life and under the same conditions. The areas in yellow indicate the directions with degraded satellite signals are, such as RF

“shadows” cast bet trees and buildings. They can also indicate interference. As the signal degrade even more they turn orange and red. The example below shows the correlation between the sky view map and a map of the area around the antenna.

1. Go to **>Utilities >Settings >More >High Precision Clock**.
2. Turn the **GNSS Receiver = OFF** and close the screen.



GNSS Receiver Off

3. Go to **>Tools>Advanced>More>GNSS**.
4. Select the **Time Zone** from the **Time Zone Offset:** drop-down list box.
5. Enter a **Test Name** from the **File Name:** drop-down list box.

6. Select the **Duration** of the test from the **Duration**: drop-down list box.



GNSS Setup

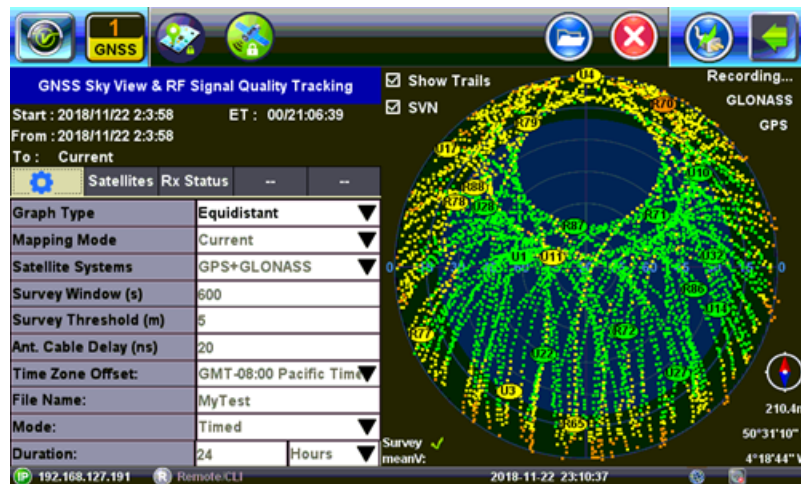
7. Tap on the **Arrow** to open the menu and tap on **Start**.



GNSS Start Menu

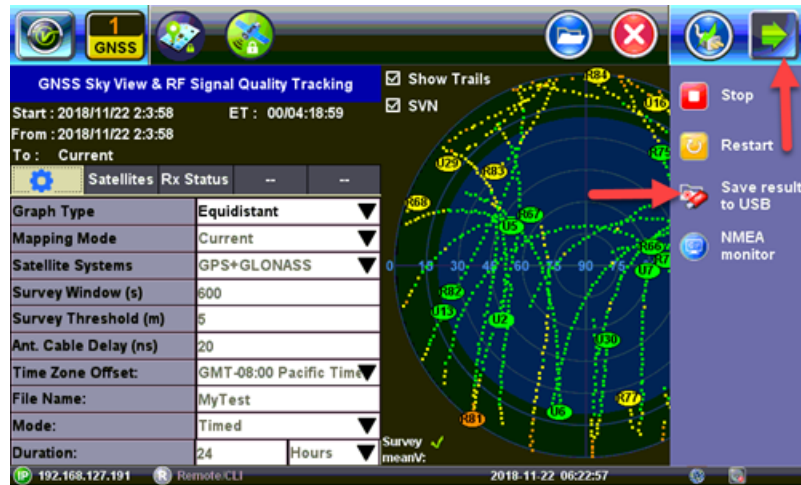


GNSS Start



GNSS Results

8. To save **Results to USB** tap on the **Arrow** and then tap on **Save Results To USB**.



GNSS Save Results

Web Browser

A web browser is available in the **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 WiFi. 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.



File Manager

The 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.

Tests Results/Reports

To access the test results stored in the test set:

1. Press , then press  on the top left of the screen.
2. Select . The File Management screen is displayed.
3. 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.

File Manager: Working with Saved Results, Profiles, Images

Tap the column header to sort by that criterion.

Select a file to display.

Select a file then tap a function to complete (View, Delete, Rename, Unlock/Lock, PDF, Import From USB, Export To USB, Bluetooth File Transfer).

Show Name: Displays full filename.
Column: Select columns to make visible.
Show All: Displays all results.
Advanced: Filter by criteria (Job ID, Account, Name, Prefix, Suffix)

Padlock indicates if the file is locked or unlocked.

☐	Name	Mode	Test	Port	Date	Type	Lock
☐	802_1AS	Ethernet	PTPv2	10G	2023-09-15 12:13:00	Profile	
☐	IEC 61850-9-3	Ethernet	PTPv2	10G	2023-09-15 12:13:00	Profile	
☐	IEEE C37_238	Ethernet	PTPv2	10G	2023-09-15 12:13:00	Profile	
☐	ITU-T G_8265_1	Ethernet	PTPv2	10G	2023-09-15 12:13:00	Profile	
☒	ITU-T G_8275_1	Ethernet	PTPv2	10G	2023-09-15 12:13:00	Profile	
☐	SMPT ST 2059-2+AES67	Ethernet	PTPv2	10G	2023-09-15 12:13:00	Profile	
☐	ITU-T G_8275_2	Ethernet	PTPv2	10G	2023-09-15 12:12:59	Profile	
☐	20230915_120654		Screen		2023-09-15 12:06:55		

Access the File Manager by selecting **Files> Saved** in the left panel of the platform menu. Files can be viewed, edited, or exported to a USB dongle 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 filter icon in the column header row to filter for specific test results stored on the unit.

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

- Show Name** Displays full filename.
- Advanced** Search for specific file(s) using advanced search terms.
- Show All** Displays all records.
- Column** Select columns to make visible.
- View** Opens the selected test report (one).
- Close** Closes the current test report and returns to File Manager.
- Exit** Exits the File Manager.
- Del** Deletes all unlocked test reports that are selected with checkmarks.
- Rename** Renames the selected test report (one).

	U/L	Unlocks or Locks test reports. Locked reports are identified by a red padlock icon. Locked test reports cannot be deleted or renamed.
	PDF	Generates a PDF copy of the test report and stores it in an attached USB memory stick (required) for distribution (e.g., via email).
	From USB	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.
	To USB	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.
	BT	Transfers selected test results, test profiles and screenshot files to a paired Bluetooth® smartphone, tablet or PC.
	Load	Loads the selected test profile, if supported.
	Load & Run	Loads the selected test profile and runs the test, if supported.

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 (the folder icon at the top-right corner will change to a green USB memory icon ). After the unit detects the USB memory stick, files can be downloaded to or restored from USB. See "[USB Memory Browser](#)" on page 156 for details about using a USB memory stick with the test set.

Downloading Files To USB

1. Select the test results, test profiles, or 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 its 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)  and select **Remove USB Drive** 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 compatible Bluetooth USB dongle attached.

1. Select the test results, test profiles, and/or 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 **BT**  **BT**. 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 its 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**  **PDF**. A "PDF file will be generated to USB disk" message appears.
3. Tap **Yes**.

USB Memory Browser



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.

Import OTDR When an OTDR module is used, OTDR test results (SOR files) can be imported.

Reload Refreshes the USB stick info.

Delete Erases the selected files or folders.

Up Exits the current folder and moves up to a higher folder in the file tree hierarchy. The current folder structure is shown in the top bar.

Open Opens certain file types.

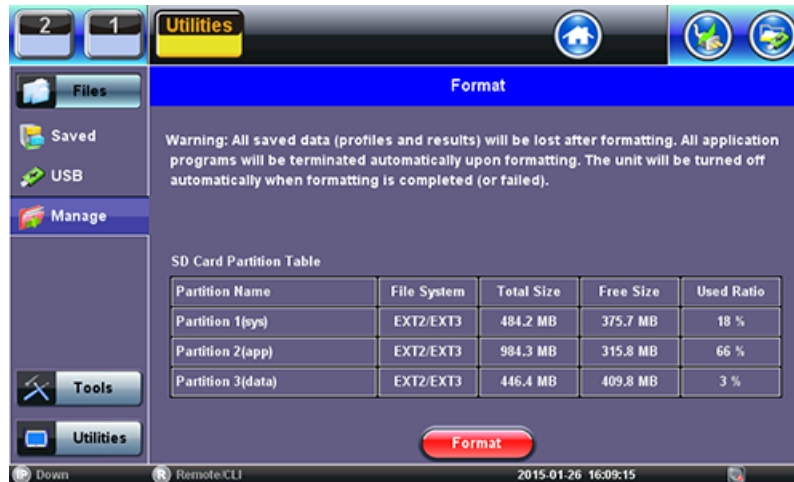
The USB tool supports one USB memory stick. If more than one memory stick is available, it shows the first USB memory stick recognized from any of the two ports.

The following file types are supported:

- **HTML:** Launches the browser to display its content (test results and OPM results)
- **TXT:** Launches a basic text viewer to display its content (test results and OPM results)
- **PCAP:** Launches the built-in Wireshark® protocol analyzer
- **MTIE:** Launches the optional built-in Wander Analysis tool

- **SOR:** Supported with OTDR module or built-in test set only.
- **PNG:** Screenshots (Fiberscope images)

Manage Internal SD Card



The SD card tool 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.



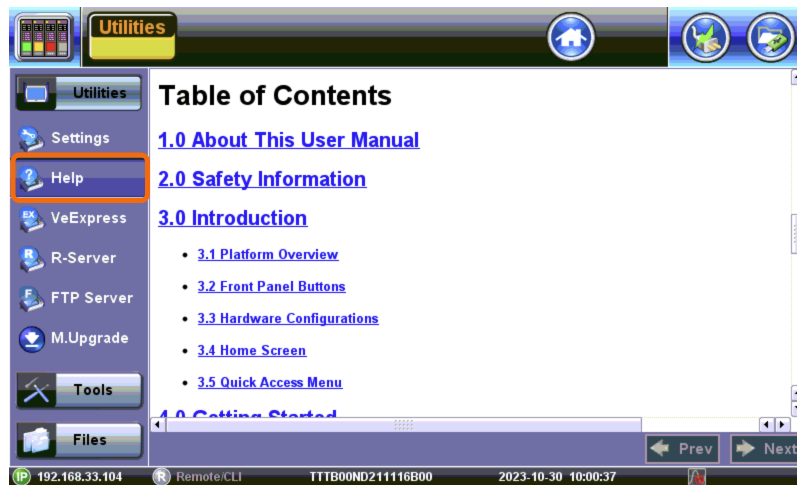
The **Format** function is exclusively a maintenance tool. Use **ONLY** when instructed by a VeEX Customer Care representative. **It erases all the information stored in the test set!**



- 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.

Help

The **Help** option opens up the user manual. Use the scroll bars, table of contents, and hyperlinks to navigate the content.



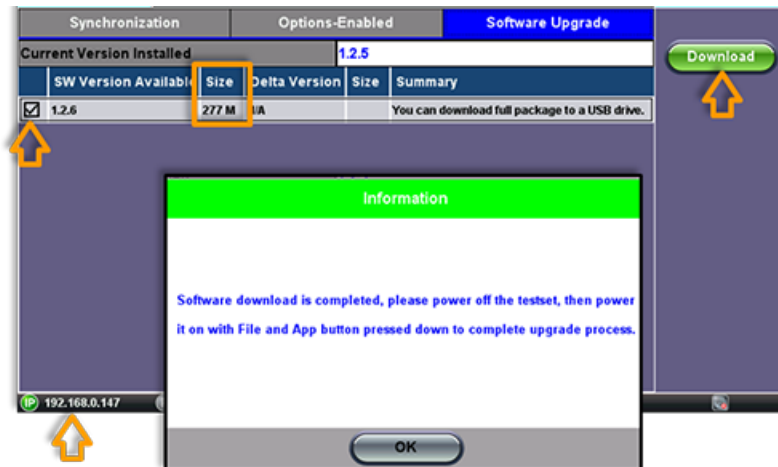
Software Upgrade

The MTTplus Platform includes the bootloader, OS and system-wide (common) features. Its software update package can be identified as mttplus-veex.arm.tar.gz. The software upgrade packages can be downloaded from www.veexinc.com, or using the test set's built-in "VeExpress" on page 73 client.

Platform Software Upgrade Procedure

1. Obtain the mttplus-veex.tar.gz system upgrade package.
 - a. Download it from www.veexinc.com, www.v-express.com, a link provided or by using the built-in VeExpress client.
 - b. Unzip the file and copy to the root of a FAT32 USB memory stick if necessary.
2. Insert the memory stick to the USB port located on the left-side of the unit.
3. Simultaneously press the Alternate Function, the Enter, **Camera** and **Power** buttons, until it beeps.

The update process may take a few minutes. Once it is complete, the test set reboots automatically.



Software Download



Buttons to be pushed simultaneously



After the System upgrade, the following pop-up message may appear if a module upgrade is required. Follow the module update procedure.



The built-in VeExpress client downloads the uncompressed tx300s-veex.tar.gz upgrade package directly to the root of the memory stick attached to the test set, so the System software upgrade process can be started right away.

Module Software Upgrade Procedure



1. Obtain the required mttplus-410-veex.tar.gz-300sm.tar.gz, -320sm.tar.gz and/or -OTDR.tar.gz, upgrade files.
 - a. Download them from www.veexinc.com, www.v-express.com, a link provided or by using the built-in VeExpress client.
 - b. Unzip the files and copy to the root of a FAT32 USB memory stick if necessary.
2. Insert the memory stick to the USB port located on the left-side of the unit.
3. Initiate Software Upgrade process.
 - a. Open the Utilities section Go to **>Utilities >M.Upgrade**.
 - b. Select new version and press **Upgrade**. The test set turns itself **OFF** at the end.



The built-in VeExpress client downloads the uncompressed mttplus-xxxx.tar.gz upgrade packages directly to the root of the memory stick attached to the test set, so the M.Upgrade process can be started right away



The process may need to be repeated if two different blade types are loaded.

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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MTTplus Quick Guide

The MTTplus Modular Test Platform addresses the challenges of communication service providers to increase efficiency and productivity. The flexible test platform lowers operational and capital expenditures associated with handling multiple technologies required to address today's Access, Business, Metro, Carrier Ethernet, Transport and Core services.

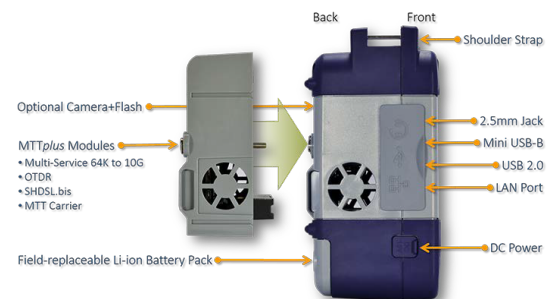
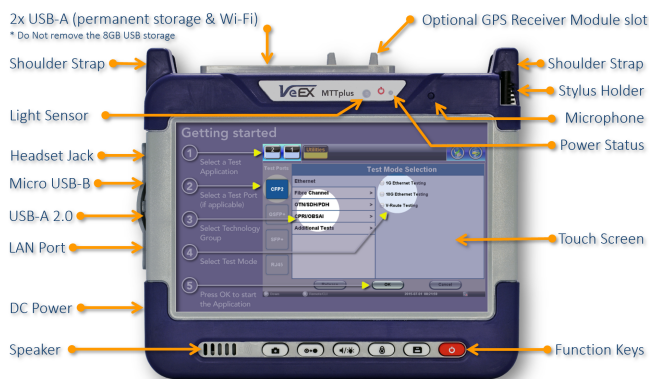
The MTTplus platform is a modular test toolkit for wide ranging and evolving test needs.

MTTplus addresses the growing need of fiber test tools for the evolving hybrid FTTx / copper networks. Communication service providers can equip their field force with a test toolkit ranging from Ethernet, Internet, TDM transmission technologies as well as for FTTX/PON installation tools such as an Optical Power Meter and Fiber Inspection Scope.

Power On Unit

Initial Settings

Launch Test Application



MTTplus Test Modules

MTTplus-260: SHDSL Testing

MTTplus SHDSL Test Module provides CPE installation, CO emulation pre-qualification, and IP/ATM services testing capabilities for service installation and verification. The module is based on the industry leading Lantiq SOCRATES chipset, offering best-in-class SHDSL performance and interoperability. SHDSL is ideal for business class services, enterprise networks, and industrial communications that must rely on legacy copper-based networks where fiber remains cost prohibitive. Utilizing SHDSL's multiple pair bonding application enables robust data transmission over long copper lines.

MTTplus-320: Multi-Service Testing

The MTTplus-320 Multi-Service Module is a full-featured test solution for OTN, SONET, SDH, PDH, DSn, 64k Codirectional, C37.94, Carrier Ethernet, Fibre Channel, SyncE and CPRI/OBSAI.

MTTplus-410+: Fiber Optics Testing

The MTTplus-410+ Fiber Optics test module for the VeEX® MTTplus platform has up to 500,000 data points with 3 cm resolution. It supports a full range of test functions including OTDR, OPM, Light Source and VFL. GPS coordinates and images can be embedded into the OTDR sor files and PDF test report provided the MTTplus platform is configured with GPS and Camera options. Fiberizer® software for Windows® Desktop, Android™, and/or Apple® mobile devices is available to assist in data transfer, record management, and report generation for various VeEX fiber optics testers. View the [Fiberizer webpage](#) for more details.

MTTplus-420: GPON Testing

The new MTTplus-420 GPON test module for the VeEX® MTTplus platform is designed for service activation at the ONT location. The unit checks optical power levels and non-intrusively decodes the messages exchanged between the OLT and ONT allowing technicians to perform advanced troubleshooting.

MTTplus-522: OSP+ Testing

The MTTplus-522 Outside Plant (OSP)+ Expert Module combines key copper verification features with DSL/G.fast modem emulation. It is designed for Service Providers deploying broadband services over a DSL or G.fast access network.

MTTplus-523: G.fast/DSL Testing

The MTTplus-523 Module addresses key test requirements for IP based broadband services deployed over a G.fast or DSL Access network.

MTTplus-900: WiFi Air Expert Testing (*discontinued*)

The now-discontinued MTTplus-900 WiFi Air Expert Module for the MTTplus platform is equipped with 802.11ac 3x3:3 WiFi capabilities to discover the network's Access Points, Clients and Channels. It surveys coverage problems with signal, noise levels and utilization tracking. A dedicated spectrum analyzer assists in the troubleshooting of WiFi and non-WiFi interference affecting performance and the V-Perf function provides traffic Download/ Upload test to a wired Ethernet responder to evaluate the WiFi network's capacity under load.

Basic Operations

- 
- **Power**
 - Press for 2 seconds to turn the test set ON or OFF (prevents accidental ON/OFF)
 - If a test is running when the power off is started, test is terminated and results may not be automatically saved
 - **Save Test Results**
 - Saves the current Test Results with customized or auto naming (Auto uses the `yyyymmdd-hhmmss` name format)
 - **Lock/Unlock Touch Screen or Screen Capture**
 - Can also be programmed to Capture Screen shots
 - Go to `>Utilities >Settings >Global >Save Settings` to set `Save Screen` and image compression option
 - **Volume and Brightness Control**
 - Brings up the Sound and screen Brightness controls
 - **Clear History**
 - Resets blinking LED reminders of past Errors or Alarms
 - Test results are not affected
 - **Camera App**
 - Launches the Camera App to help document the job site, damage, connections, barcodes, etc.
 - Requires the camera option (factory-installed)

Software Upgrades

To perform an MTTplus platform (system) software upgrade, insert a FAT32 USB memory stick, with the installer package, into one of the test set's USB ports and press the **camera** and **power** buttons simultaneously.



Platform and Module software upgrades can also be performed by pointing any standard web browser to the test set's IP address and selecting Platform Upgrade and Module Upgrade from the menu. The software upgrade packages can be downloaded from www.veexinc.com, or using the test set's built-in [VeExpress](#) client software.



DO NOT downgrade the software version currently installed in your test platform or module, unless specifically instructed by a VeEX Customer Care/Support agent. Your new test set may have been shipped with a newer version. For software upgrades, please check the current version(s) on your test set to confirm that the software posted here is a newer version and carefully read the **Release Notes** for the recommended platform versions. To find the Release Notes, go to the **Resources** tab of the module page on www.veexinc.com.

Turning the Test Set ON and OFF

- **Turn ON:** Press and hold the red **Power** button for two seconds, until a confirmation tone is heard, and the power LED turns green (in noisy environments, refer to the power LED).
- **Turn OFF:** Press and hold the red **Power** button for about two seconds, until two confirmation tones are heard. Then the shutdown process will start.
- **Forced Shut Down:** In the rare case of a malfunction, our Customer Support team may instruct to press and hold the Power button for approximately four seconds, until the screen turns off. Results, data or configurations are not saved.

Power LED

A single LED indicates the power state of the unit.

- **OFF** : The LED is off when the unit is powered off
- **GREEN**: The LED is green when the unit is powered on and fully charged.
- **ORANGE**: The AC/DC adapter is plugged in and the battery is charging.

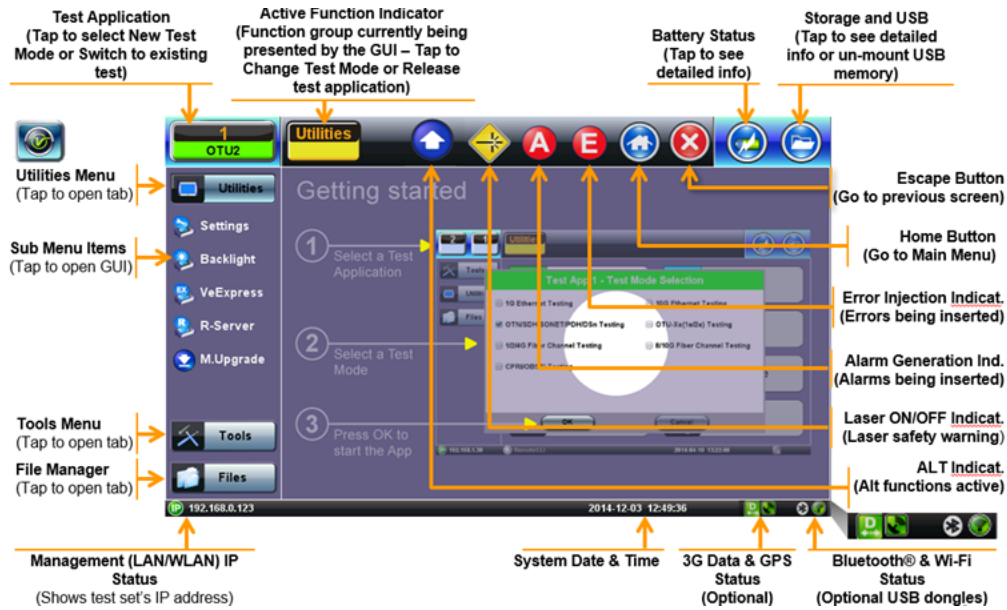
Audible Beeps

Low Battery status is indicated by a periodic beeping sound, every four seconds, and displaying a warning pop-up message on the screen.

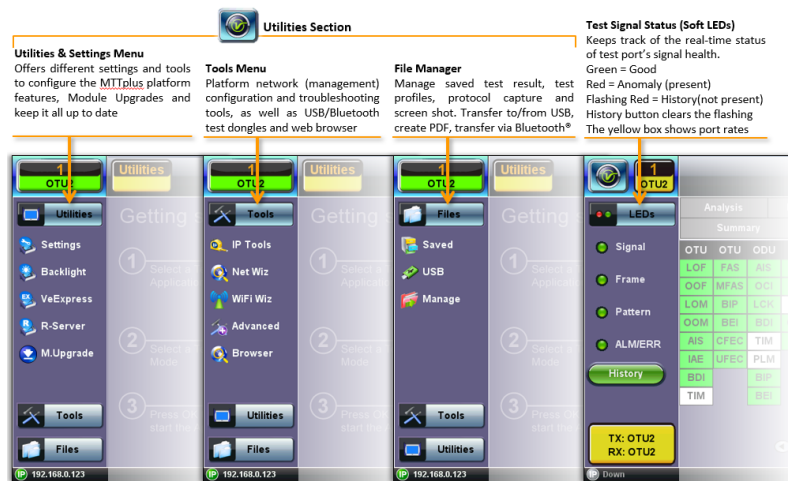
When working on battery power, once the charge capacity reaches about 10%, the test set will start beeping to notify users to plug in the AC/DC adapter. A pop-up message may also be presented on the screen. When the charge level reaches 5%, the test set automatically initiates the shutdown process, to protect the battery.

To get information about the amount of battery charge and autonomy estimate (under current usage condition) tap the battery icon displayed on the top-right corner of the screen.

MTTplus Platform Interface

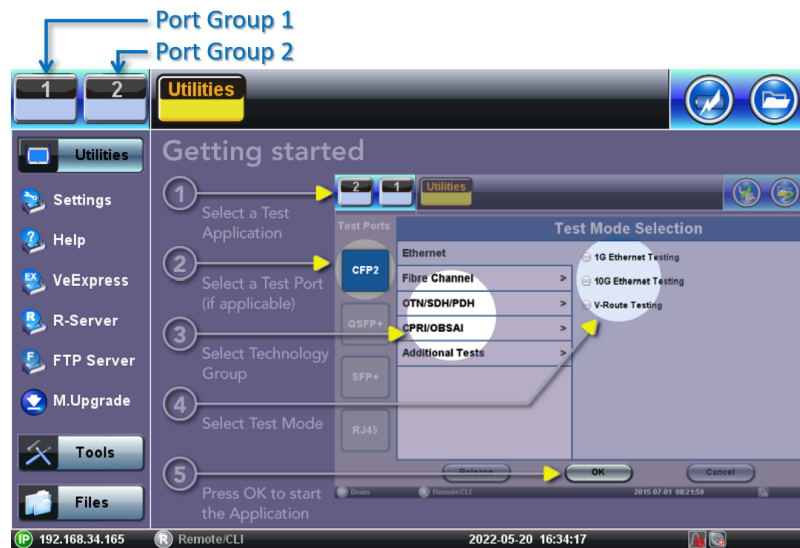


Quick Access Menus

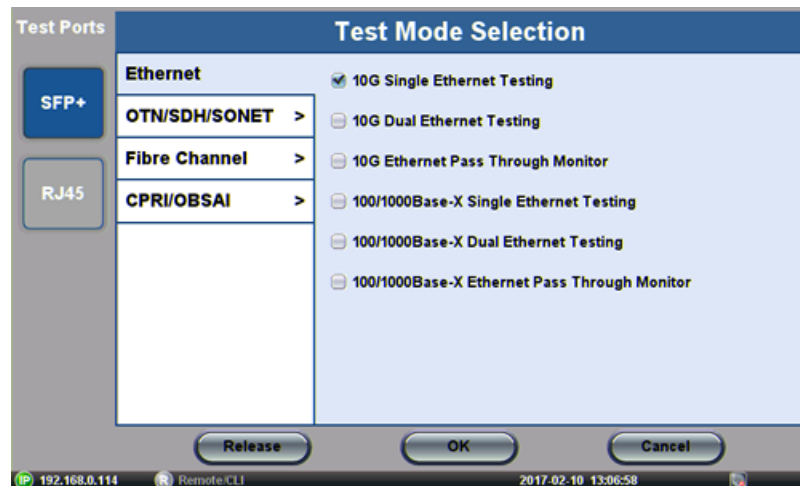


Selecting a Test Mode (Technology or Function)

1. Select an empty **Test App** button. The **Test Mode Selection** menu is displayed. If applicable, select a **Test Port**.



- Up to two independent tests can run simultaneously (test set or test module dependent)
- Some test applications may require two port groups (e.g., router wrap-around test) and may not be supported by all test modules or test sets configurations.



2. **Protocol** (technology group or link type), using the vertical tabs. (The available selection will depend on the capabilities of the selected port type.)

3. **Test Application/Mode**, using the check boxes. (The available test functions will depend on the of the selected protocol and purchased licenses.)



If the Test Set shows a different Test Mode Selection menu, update its software to the latest version available using [VeExpress](#) or download the upgrade package from the product page on [www.veexinc.com](#).

4. Press **OK** to launch the Test Application

The test port is assigned to the selected test application and the required software/firmware is loaded.

Understanding Common Test App GUI Elements



-  **System Utilities Button:** Tap this button access MTTplus Utility functions Or press the orange App rubber button to toggle.
-  **Active Test Application GUI:** Shows the Test Port Group being used and the Test App ID (Rate/Technology)
 - Tap this button to release the Test App or change its Test Mode.

C. Test Application Menu

- Lists all test Functions, Applications and Tools available for the selected test mode
- Setup = Port and Test Signal configuration

D. **LEDs** - Test Signal Status

E. **History** - Clears past events reminder (blinking)

F. **Current test interface line rates**

G. **Action buttons** section

- This vertical section displays direct access functions applicable to each specific Test Mode, such as Start/Stop test, Laser control, Error and Alarm injection, Start protocol capture, etc.
- Most of these buttons offer immediate action. A few open a configuration menu.

Initial Settings

Before using the platform, set the language and user interface style as needed. By default, the user interface style is set to **USA** if the unit is shipped to North America and to **International** if the unit is shipped to outside USA and Canada.



To change the GUI language and user interface style:

1. Tap **Utilities** and then tap **Settings**.
2. Tap the **Global** option.
3. Select the language from the **Language** drop-down list box.
4. Select the user interface style from the User Interface drop-down list box.

- **International:** Provides layer-based SDH/PDH configuration menus with access to detailed settings.
- **USA:** Provides simplified application-based SONET/DSn menu with more automation. The **Advanced Mode** option displays the configuration menu for additional settings.

To manually change the Date & Time:

Go to **System Tools >Utilities >Settings >Date & Time**, to manually set the date, time and time zone. Then, tap **Apply**.



To enable daylight saving time (DST), manually select a neighboring time zone with a +1:00 relative to the standard time zone of the current location. Set it back to the standard time zone offset when DST ends.

Get Standard Time from GPS/GNSS

If equipped with the GPS/GNSS receiver (hardware option), manually copy the GPS time into the system.

Go to **System Tools >Utilities >Settings >GPS/High Precision Clock**, to configure the GNSS Receiver and turn it ON. Once it recovers time (ToD UTC) from the satellites, click the **Sync ToD** button to apply the standard time to the RTU. The standard time will be applied at the start of the next second (rise of the internal 1PPS timing signal). The local UTC Offset (Time Zone) setting is used to apply the correction for local time. This manual Sync ToD time setting function should not be used when NTP is enabled.

For more information on the atomic clock and relative phase monitoring, see ["High Precision Clock Sources" on page 68](#) and ["GNSS/GPS & Sky View" on page 144](#).