

## TEST & MEASUREMENT SOLUTIONS

- TELECOM
- CATV/MSO
- VESION
- FIBER OPTICS
- NEM
- WIFI
- 400G/100G

# Orchestrate Your Network with Our Instruments



RF | DOCSIS 3.1 | R-PHY | xPON | xWDM | Fiber | PNM | Ethernet | OTN



# About VeEX Inc.

VeEX® develops innovative test and measurement solutions for next generation communication equipment and networks. Founded in April 2006 by test and measurement industry veterans, VeEX products blend advanced technology and vast technical expertise with the discerning measurement needs of customers.

## PRODUCTS & SOLUTIONS

VeEX products diligently 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.

### Cable TV

CX, AT, and Network Probe products are optimized for digital CATV signal validation while retaining legacy analog carrier measurement capability. Select models incorporate true DOCSIS 3.1 OFDM analysis to verify multi-gigabit services. Upstream QAM signal generation/analysis, TDR, Forward/Return path sweep, Forward/Return path monitoring systems, and MPEG analysis options streamline user test applications.

### Carrier Ethernet

RXT®, TX, MTTplus and MTX products help service providers, equipment manufacturers and installers perform efficient QoS assessment and SLA validation of Carrier Ethernet networks. Test interface rates ranging from Fast Ethernet to 400 Gigabit Ethernet, coupled with V-SAM, RFC2544, RFC6349, and broadband speedtest applications address all aspects of converged IP networking.

### Transport

RXT, TX, MTTplus and MTX products offer the widest range of legacy and next generation transmission test capabilities from Nx64 kbps to 400 Gbps condensed into the industry's smallest form factor. PDH/T-Carrier, SDH/SONET, OTN, Ethernet and Fiber Channel test functions can all be integrated via scalable hardware and software options ensuring a single "future-proof" multi-service test platform.

### WiFi

The WiFi Air Expert® series provides the tools for reliable, repeatable install procedures that go beyond RF layer analysis. It provides complete performance testing that measures end user's experience under traffic load.

### Fiber Optics

VeEX solutions are optimized for today's optical fiber networks. The FX series and fiber test accessories are perfectly suited for all the fiber plant challenges and complements the existing MSO, Carrier Ethernet, Transport, PON and Access testing solutions.

### NEM

VeEX is focused on serving the Network Equipment Manufacturer (NEM) segment effectively with its complete product line aimed at testing within the NEM specific environment and test cycle. We have a product for every testing group and depending on which phase of the testing cycle, a specific solution for qualifying the equipment within the R&D department, field turn up testing or post sales troubleshooting.

## GLOBAL PRESENCE

VeEX's multinational structure consists of specialized business units operating in different parts of the world. Management, finance, sales and marketing entities are headquartered in Fremont, California, USA, capitalizing on the advanced technical and commercial resources that Silicon Valley has to offer. Regional sales offices are located in Philadelphia, Pennsylvania; Shenzhen, China; Beijing, China; Bangkok, Thailand; Kuala Lumpur, Malaysia; Mexico City, Mexico; Guatemala city, Guatemala; and Seoul, Korea. R&D centers are strategically located in Fremont, California; Atlanta, Georgia; Tampa Bay, FL; Plymouth, UK; Minsk, Belarus; Beijing, China; ChengDu, China; and Montreal, Canada, with regional service centers in Plymouth, UK; New Taipei City, Taiwan; Tampa Bay, FL; and Fremont, CA, USA.

## CUSTOMER BASE

Over 150,000 units have been shipped since volume production began. AT&T, Verizon, AlcaLu, British Telecom, Claro, Comcast, Cox, Deutsche Telekom, Colt, TATA, Entel, Ericsson, Global Crossing, Nokia Siemens Networks, Optus, Relacom, SingTel, SKBB, Telecom Malaysia, Telefonica, Telekom Austria, TeliaSonera, Telkom SA, Time Warner, True, UPC, Virgin Media, Vodafone, China Mobile, Chung-Hwa Telecom, and many others comprise the growing reference list.

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VeEX offers a complete set of Test and Measurement solutions for Business Services, Access, Metro, Core, Transport and Utility networks. Versatile test platforms combine an unparalleled range of technologies to help optimize network performance and reliability. VeEX products address all stages of deployment and field service turn-up to deliver the highest quality services during installation, verification, maintenance, and troubleshooting of networks.

## TX300s Series

### Multi-Service Test Set with VeExpress™



The TX300s, with VeExpress license management, is a full-featured, field-configurable portable test solution for Carrier Ethernet, Backhaul, Mobile, Transport and field Synchronization testing. This flexible and multi-tasking platform supports OTN, SDH, SONET, PDH, DSn networks, and offers extensive support for Mobile Backhaul technologies with SyncE, 1588v2 PTP, Carrier Ethernet and CPRI/OBSAI testing. The all-inclusive hardware reduces CAPEX with no factory returns necessary for upgrades. Test features can be purchased, rented, leased and shared as needed. This allows proactive management of software and hardware assets, ultimately optimizing OPEX.

- Up to four (4) independent test ports
- OTU4, OTU3, 100GE, 50GE, 40GE, 25GE options
- OTU1/2/1e/2e, ODU0, ODUflex
- SONET/SDH up to OC-192/STM-64
- DSn/PDH: DS1, DS3, E1, E3, E4
- G.703 64k Codir & C37.94
- CPRI: 614.4 Mbps to 12.164 Gbps (up to 24.330 Gbps with TX300s-100GX)
- OBSAI: 768 Mbps to 6.144 Gbps
- Ethernet: 10/100/1000BASE-T, 100BASE-FX, 1000BASE-X, 10GEBASE-X
- Fibre Channel: 1/2/4/8/10/16G (up to 32G with TX300s-100GX)
- SyncE & 1588v2 PTP: Server and Client Clock emulation, protocol monitoring and decoding, wander analysis
- OTDR/LS/OPM option
- Built-in Precision Clock Options: Atomic Clock and GNSS receiver
- EZ-Remote™, Web Remote, VNC, and SCPi
- Up to two test modules (hardware options)

### TX340s Dual Test Port Hardware Option



### TX300s-100Gx Hardware Option



### TX300s-OTDR Fiber Optics Hardware Option



## RXT®

### Modern Modular Test Platform with VeExpress™

#### RXT-3400 Multi-Service



#### RXT-6200 and RXT-6000e 100G



#### RXT-6400 400G



With extreme modularity and an open platform concept, the RXT continues to define the test set of the future. The RXT's capability to combine multiple technologies, from legacy 64k to state-of-the-art 400G, into a rugged modular platform increases the productivity of technicians who are responsible for the installation, verification, and maintenance of today's complex services. Its intuitive user interface also boosts productivity by helping technicians and field engineers to make their job easier, accelerating the learning curve, and reducing training requirements.

- Flexible Test Module design accommodates different module sizes allowing future growth of the RXT Platform into more complex technologies and high-end applications
- Multi-technology: Ethernet, Fibre Channel, Fiber Optics, WDM, OTN, SDH/SONET, PDH/DSn, eCPRI, CPRI/OBSAI
- Supported Modules: 400G, 100G, Multi-Service (64k to 16G), OSA, tunable OTDRs
- Ethernet: 10/100/1000BaseT, 100Base-FX/1000Base-X, 1000BASE-X with RXT-3400. Plus 25GE, 50GE with RXT-6000e and RXT-6200)
- Fibre Channel: 1/2/4/8/10/16G (Up to 32G with RXT-6000e and RXT-6200)
- CPRI: 614.4 Mbps to 24.330 Gbps
- eCPRI: 10G and 25G
- OBSAI: 768 Mbps to 6.144 Gbps
- 100G & 40G Ethernet and OTN with RXT-6000e/RXT-6200
- 400GE PAM4 OSFP and QSFP-DD with RXT-6400
- OTN: OTU1/2/1e/2e, ODU0, ODUflex
- SONET/SDH/PDH/DSn up to OC-192/STM-64
- SyncE & 1588v2 PTP: Master and Slave Clock emulation, protocol monitoring and decoding, PDV measurements wander analysis
- Built-in Precision Clocks: Atomic Clock and GNSS receiver



400G

## MTX150

### Multi-service Installation & Maintenance Test Set



The MTX150 is a fully-integrated and self-contained multi-service test solution for SDH, SONET, PDH, DSn, C37.94, Ethernet, SyncE and Fibre Channel (SAN). This all-in-one, rugged and ultra-portable field hand-held test set can be configured with interfaces and technologies required by field technicians to install, verify, maintain and troubleshoot Transport, Metro, Access communication links and services, including legacy applications.

- Ethernet, Fibre Channel, SDH/SONET, PDH/DSn, Datacom and G.703 64K Codirectional Testing
- SFP+ Optical Interface for 10GBASE-X, 100/1000Base-X, SyncE, 1/2/4GFC, STM-0 to 64, OC-1 to 192, IEEE C37.94
- RJ45 for 10/100/1000Base-T
- BNC (75Ω unbalanced) for E1, E2, E3, E4, DS1, DS3, STM1, STM0, STS1 and STS3
- RJ48 (120Ω) or Bantam (100Ω) balanced for DS1, E1 and G.703 64K Codirectional
- Datacom interface for RS232 async, RS232/V.24 sync, X.21, V.35 and RS449/ V.36 (422/423), with DTE, DCE and Monitor modes

Optimized for field technicians installing, verifying, troubleshooting and maintaining Transport, Carrier Ethernet, Metro, Storage Area and legacy Networks, as well as fiber, backhaul, microwave and datacom links.

**MTX150x****Ethernet Services Installation Test Set**

The MTX150x is a fully-integrated and self-contained Ethernet services test solution for Layer 1-to-4+ applications and Fibre Channel (SAN). This rugged and ultra-portable field hand-held test set can be configured with interfaces and technologies required by field technicians to install, verify, maintain and troubleshoot Metro Ethernet links, Business services, Internet Access and other packet-base services up to 10 Gbps.

- Smallest and most affordable full-featured Ethernet test set
- Dual SFP+ and Dual RJ45 test ports
- Dual-port testing capabilities
- Throughput, BERT, Loopback
- RFC2544 Throughput, latency, frame loss and back to back tests
- V-SAM test suite compliant with ITU-T Y.1564 standard
- Q-in-Q (VLAN stacking), MPLS, MPLS-TP, PBB, and PPPoE support
- IPv4 and IPv6 support
- Layer 4+ test suite: V-TEST (speed test), V-FTP, RFC6349 V-PERF upload & download tests
- SyncE with ESMC/SSM and Wander Measurement
- L2CP Transparency

Optimized for field technicians installing, verifying, troubleshooting and maintaining modern Transport, Carrier Ethernet, Metro, Storage Area, as well as fiber, backhaul networks.

**MTTplus Compact Modular Test Platform and Modules**

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 addresses the challenges of communication service providers to increase efficiency and productivity while lowering operational and capital expenditures associated with handling multiple technologies required to address today's Access, Business, Carrier Ethernet, Transport and Core services.

- Modern, modular test platform with a growing range of available test modules covering legacy and modern Access (copper and fiber), FTTx, Metro, Carrier Ethernet, WLAN and Transport technologies
- Multi-technology: Fiber Optics, C37.94, DSn/PDH, SONET/SDH, OTN, Ethernet, Fibre Channel, CPRI/OBSAI

**MTTplus-260 SHDSL Module**

Provides CPE installation, CO emulation pre-qualification, and IP/ATM services testing capabilities for service installation and verification.

**MTTplus-340 Multi-Service Test Module**

A full-featured test solution for OTN, SONET, SDH, PDH, DSn, 64k Codirectional, C37.94, Carrier Ethernet, Fibre Channel, SyncE, PTP and CPRI/OBSAI.

**MTTplus-410+ Fiber Optics Test Module**

The unit adds a full range of optical test features that support OTDR, OPM, Light Source and VFL. Geo Tagging of optical test data and picture capture allows technicians to fully document any test location.

**MTTplus-420 GPON Test Module**

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 combines key copper verification features with optional DSL/G.fast modem emulation. It is designed for Service Providers deploying broadband services over a DSL or G.fast access network.

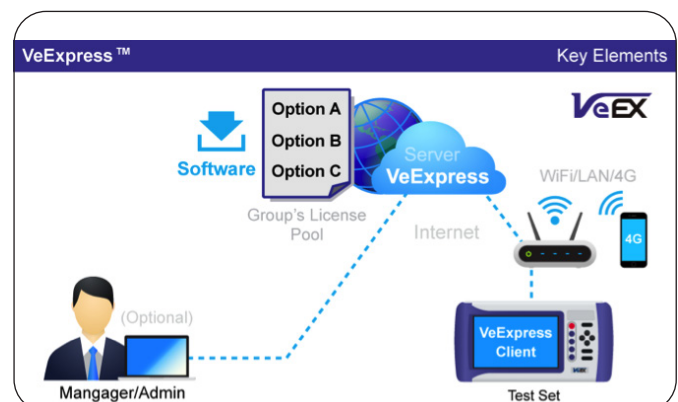
**MTTplus-900 WiFi Air Expert® Module**

The most complete and compact tool for WiFi networks discovery, survey, optimization, performance testing and troubleshooting. With the V-Probe Responder accessory, technicians can quickly verify that upload and download speeds meet SLA requirements between wired Ethernet and WiFi interfaces.

**VeExpress™ Cloud-based Software and License Management Service**

VeExpress is a centralized (cloud) service hosted by VeEX, which allows its customers to seamlessly manage the software licenses for their geographically-dispersed fleet of test equipment and users. The basic service is provided free of charge, with the purchase of supported test sets, and allows users to:

- Purchase licenses: Retrieve newly purchased test features directly to the test set (new functions become immediately available)
- License sharing: Release existing licenses from one test set, back to the company's common pool, so it can be immediately retrieved by another user who needs it
- Rent licenses: Temporary licenses can be leased from VeEX to support special projects or for newer technology trials
- Keep test sets up-to-date: Download and update platform and modules' software directly from the server to the test set





As the demand for multi-gigabit services increases, operators face major deployment challenges that can affect service delivery and reliability. VeEX offers a comprehensive cable product portfolio to fully characterize every aspect of the cable network, from headend to the home, and from Access to the Core. This enables operators to quickly deliver next-generation services, optimize network quality and reliability, and ensure SLA and end-to-end QoS compliance during the installation, verification and maintenance of business-oriented services.

## CX380s-D3.1

### Expert Meter

- True Spectrum Analyzer with 1.8 GHz frequency range
- Comprehensive SLM
- DOCSIS 3.1 Cable Modem with V-TEST Throughput
- Sweep (with Calan® 3010H/H+)
- Return Path QAM analysis
- USG+FEC
- Remote View
- MPEG Explorer
- DOCSIS 3.1 OFDM Analysis
- Headend Check auto test for all configured Analog and Digital channels
- Ethernet up to 10 GigE with SLA Validation tests including RFC2544 and Y.1564 SAM



## CX380C Budget Friendly Advanced Maintenance



- Fast 1.8 GHz Spectrum Analyzer
- VeCheck Full Band Scan
- DOCSIS 3.1 Cable Modem with V-TEST Throughput
- DOCSIS 3.1 OFDM Analysis
- Comprehensive SLM
- CaLan Sweep: 1.8 GHz Forward Path & 204 MHz Return Path
- In Service Sweep
- Layer 4+ V-Perf and V-TEST Throughput
- Cable Toolkit with TDR and DMM
- Built in Optical Power Meter

## CX310 Handheld DOCSIS 3.1 Installation and Fulfillment

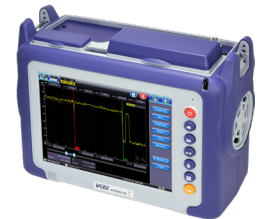
Equipped with a DOCSIS 3.1 cable modem supporting true OFDM analysis and V-TEST throughput measurements, the CX310 offers unrivaled price and performance in a lightweight, ultra-portable form factor. Key features include VeCheck Full Band Scan, OFDM Subcarrier Scans and HIP Home Certification.



- Frequency range from 5 to 1218 MHz
- DOCSIS 3.1 Cable Modem with true OFDM Analysis
- Key SLM features include fast VeCheck Full Band Scan and Single Channel QAM analysis
- MER and Pre/Post BER measurements of QAM carriers
- Return Path and Forward Path Ingress Scan
- V-TEST Throughput tests
- Home Installation Process/Certification Auto Tests
- Single 10/100/1000-T/X and 10 Gigabit Ethernet port (BERT, Throughput, RFC2544, and Loopback testing)
- TDR for Cable Fault Location

## AT2500-3G Next Generation Headend Maintenance

The AT2500-3G is the industry's most complete 3 GHz Advanced Spectrum Analyzer and multi-standards test solution. Incorporating a high-resolution color touch-screen, the AT2500-3G features spectrum analysis, digital channel, VeCheck, MPEG analysis and Ethernet test capabilities. Comprehensive SLM measurements include Single Channel, Fast Full Band and real-time plant level scan, Tilt, Headend Check, and FCC Digital POP tests.



- 3 GHz high sensitivity professional grade Spectrum Analyzer with built-in automatic filters for increased dynamic range
- Annex A, B, C, DOCSIS 3.1, ISDB-T, DVB-S, DVB-S2
- Superior QAM demodulation capability, with excellent BER performance and MER range up to 47 dB
- MPEG Explorer: QAM channel MPEG-TS analysis
- DOCSIS 3.1 OFDM analysis and Subcarrier Scan
- Headend Check auto test for the entire selected Channel Table lineup
- Expansion slot to support a DOCSIS 3.1 Test Module
- FCC Proof test and report automation
- Upstream spectrum persistence to capture transient and bursty signals hiding under QAM subcarriers
- Advanced Analog Channel measurements

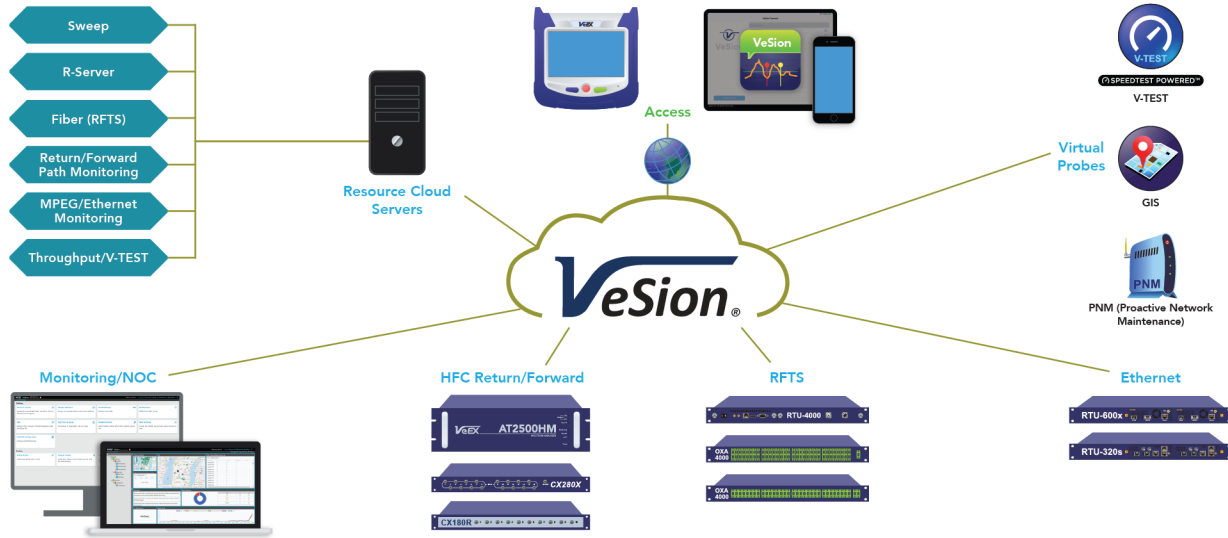
## Sweep System for DOCSIS 3.1 with Calan® 3010H+, CX380s-D3.1 and CX380C

- CaLan Sweep technology supporting Forward Sweep to 1.8 GHz, Return Sweep to 204 MHz
- 1U Rack mount chassis
- Software control with VeSion via Ethernet connection
- Future-proof platform using advanced DSP technology



VeSion® Cloud-Based One System Platform represents the next step in innovation for Network Monitoring. VeSion integrates RF monitoring, MPEG, Fiber, Sweep, PNM, advanced DOCSIS Monitoring, DOCSIS Burst Demodulation, Carrier Class Ethernet Performance testing and monitoring, as well as Workflow and Asset Management systems all under one umbrella. The VeSion system reduces network troubleshooting and problem resolution time significantly and is accessible anytime, anywhere, via web browser or mobile apps.

## Cloud-Based One System Platform



Results from anywhere, anytime, at any location

### VeSion RF Probes

#### CX180R-240 MHz Return Path Monitoring System

The CX180R's compact 1U rackmount chassis supports simultaneous and continuous ingress scanning of all 10 ports at a fast sweep rate of 200 ms and return path spectrum monitoring rate up to 240 MHz.

#### CX280X All-in-One RF Monitoring

The CX280X rackmount monitoring system is a cost-effective RF switching solution for Forward Path monitoring. With 16 built-in RF ports, the CX280X can be deployed as a direct stand alone, or combined with AT1702/AT1602-3G series switches to any Forward Path system for monitoring, troubleshooting, on demand test and auditing needs.

- 1.8 GHz Spectrum Analysis
- Fast MPEG Monitoring
- DOCSIS 3.1 OFDM Analysis and Monitoring
- VeCheck Full Band Scan
- Advanced SLM
- QAM Health
- ISDB-T Analysis and Monitoring

### VeSion RFTS

VeSion Remote Fiber Test System (RFTS) is a continuous solution for monitoring/testing fiber routes. RFTS relies on the RTU-4000/4100 test set to provide reliable communication with the VeSion cloud system to read/write data to a centralized storage point. Artsy dashboard KPI's and a simple yet efficient integrated GIS system make VeSion RFTS a convenient platform for not only monitoring and testing fiber but visualizing and storing the data as well.

- RTU-4000/4100+ active test head combining OTDR (various wavelengths and dynamic ranges available)
- OX4000 and OXA-4000 series optical switching matrix (1x8, 1x16, 1x32, 1x64 or 1x128)
- Integrated in VeSion Eco-system
- Provides real-time fiber network health with alarms and analysis

### VeSion R-Server™

The VeEX R-Server workflow system is a comprehensive application suite for managing and optimizing workflow for centralized engineers, managers and field technicians.

- A complete, centralized workflow and asset management system
- Dynamic testing result navigation for both quick analysis and in-depth compliance verification
- Flexible distributed architecture for easy expansion
- Secured IP connection and V-Connect app tethering for access from any location with Internet connection or phone service
- Attach GPS location data to results for physical GIS mapping through V-Connect
- Reduce OpEx by ensuring the job is done right the first time; Lower CapEx by integrating multiple test solutions that improve workforce productivity
- Upgradeable solutions protect investments and address future needs

### VeSion Ethernet

#### RTU-300 Ethernet Performance Testing and Monitoring

The RTU-300 is a centralized remote test unit for performance testing of Carrier Ethernet and high-speed broadband networks. With a strong feature set for Layer 2 and Layer 3 testing, combined with Layer 4 stateful TCP testing, it is the ideal solution for both Telco and MSO applications. Multiple RTU-320 modules are supported via VeSion, allowing for a distributed network of RTUs in the service provider network for effective service provisioning, activation, and assurance. The RTU-600 module extends the testing range to 100 Gbps.

- 10/100/1000Base-t, 100Base-FX, 1000Base-X ports; 10GE, 40GE, 100GE ports
- Full line rate traffic generation and analysis for all supported interfaces
- Acts as a responder for field portable units
- V-SAM (Y.1564), RFC2544, Loopback; VPERF (RFC6349)

VeEX offers a complete set of Test and Measurement solutions optimized for today's FTTx, xPON, DWDM, CWDM and Metro networks and are perfectly suited for demanding outside plant environments. The fast growing optical product range complements existing VeEX Transmission and Ethernet testing solutions.

## General Purpose

### FX10+ Pen Style Visual Fault Locator

- Output power: 1 mW or 10 mW versions
- Wavelength: 650 nm ± 20 nm
- Connector: 2.5 mm universal



### FX82 Optical Power Meter (OPM)

- Wavelength Range 800 to 1650 nm
- Calibrated for major wavelengths, CWDM optional
- Wide dynamic range, PM1/PM2 versions



### FX15 Optical Fiber Identifier

- Traffic detection and direction
- Supports 250 um, 900 um and 3 mm fiber types
- Tone detection LEDs (270 Hz, 1 kHz, 2 kHz) with audible warning



### FX83 Optical Light Source (OLS)

- Single, Dual, Tri and Quad wavelength options
- Multimode - 850, 1300 nm
- Singlemode - 1310, 1490, 1550, and 1625 nm
- Modes: CW or Modulated (270/330/1000/2000 Hz)



### FX40/FX45/FX48 Optical Power Meter & Light Source

- Singlemode and Multimode testing
- OPM & OLS configurations
- OLTS (FX45 only) configurations
- Date/Time stamping of test results (FX45/48 only)
- VFL optional (selected OPM versions only)



### FX84 Optical Loss Test Set (OLTS)

- OPM and OLS functions in one unit
- Uni-directional insertion loss testing
- Singlemode and Multimode configurations
- WaveID when paired with VeEX OLS
- Bluetooth option to transfer results to mobile device or PC



## Fiber Inspection

### DI-1000 Digital Fiber Inspection Scope

- Optimized for single fiber inspection
- Powered by USB connection from host device
- Manual focus adjustment with auto-focus capture
- IEC 61300-3-35 pass/fail limits analysis
- Single and Multi-fiber (MPO/MTP®) connector tip support



### DI-3000 Digital Fiber Inspection Scope

- Optimized for single fiber inspection
- WiFi and USB operation with host device
- One touch auto-focus with focus indication on probe
- IEC 61300-3-35 pass/fail limits analysis (host software)
- Single and Multi-fiber (MPO/MTP®) connector tip support



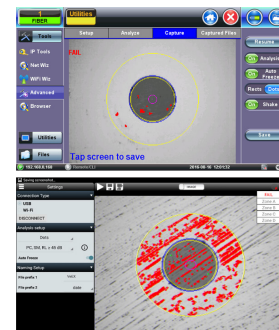
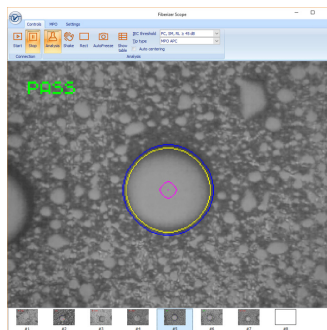
### DI-1000 MPO Digital Fiber Inspection Scope

- Optimized for multi-fiber (MPO/MTP®) inspection
- Powered by USB connection from host device
- Manual focus adjustment with auto-focus capture
- Focus and X/Y tip controls built-into device
- IEC 61300-3-35 pass/fail limits analysis
- Single and Multi-fiber (MPO/MTP®) connector tip support



### Compatible Host Platforms/Software\*

- Fiberizer Mobile software (Android & iOS)
- Fiberizer Scope PC software (Windows)\*
- VeEX Testers (Linux)



\*Some limitations may apply.



OTDRs - General Purpose

**OPX-BOXe Mini OTDR**

- Multimode and Singlemode configurations
- Up to 43 dB Dynamic Range and 0.8/4m Dead Zones
- Up to 128,000 sampling points
- Optional Light Source and Visual Fault Locator (VFL)
- WiFi & Bluetooth (wireless) and USB & Ethernet (wired) remote control



**FX150+ Mini OTDR**

- Multimode and Singlemode configurations
- Up to 43 dB Dynamic Range and 0.8/4m Dead Zones
- Up to 256,000 sampling points
- Filtered 1625 or 1650 nm port for in-service testing
- Live fiber detection with embedded power meter



**RXT-4100+ OTDR Module**

- Fiber Optics test module for the RXT platform
- Multimode and Singlemode configurations
- Up to 50 dB Dynamic Range and 0.8/4m Dead Zones
- Up to 500,000 sampling points
- OTDR, OPM, OLS and VFL support
- Geo Tagging of test data using GPS option of RXT platform



**MTTplus410+ Fiber Optics Test Module**

- Fiber Optics test module for the MTTplus platform
- Multimode and Singlemode configurations
- Up to 50 dB Dynamic Range and 0.8/4m Dead Zones
- Up to 500,000 sampling points
- OTDR, OPM, Light Source and VFL support
- Geo Tagging of test data using GPS option of MTT platform
- Built-in camera option to document test site



**TX340s with Optics Option**

- Optics option adds OTDR test functionality to the flexible multi-service tester
- Multimode and Singlemode OTDR configurations with OLS option
- Up to 45 dB Dynamic Range and 0.8/4m Dead Zones
- Up to 500,000 sampling points
- Filtered OTDR port for in-service testing
- OPM and VFL options
- Geo Tagging of test data using GPS option of TX340s



xPON

**FX80/81 PON Optical Power Meters**

- Power meter for 1G and 10G xPON applications
- ONU and OLT test ports with pass-through design
- Concurrent measurement of Upstream and Downstream power levels
  - 1270/1310 nm Upstream CW/Burst signal support
  - 1490/1550/1577 nm Downstream signal support



**MTTplus-420 GPON Test Module**

- GPON test module for the MTTplus platform
- Service activation and advanced troubleshooting at the ONT location
- Verify downstream & upstream optical power levels
- Non-intrusively capture and decode OMCI and PLOAM messages exchanged between OLT and ONT



xWDM

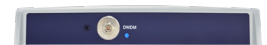
**FX86 CWDM Quad Optical Light Source (OLS)**

- Quad output, stabilized DFB laser source
- Supports any four CWDM wavelengths
- Outputs can be activated and modulated independently (270 Hz, 330 Hz, 1 kHz and 2 kHz)



**RXT-4111 DWDM OTDR Module**

- Test DWDM Mux/Demux at ITU-T G.694.1 wavelengths
- C-band tuning (89 channels at 50 GHz spacing)
- Optional extended band tuning to Channel 62
- Integrated wavelength locker stable to within  $\pm 2.5$  GHz



**FX87 DWDM Tunable Laser Source (TLS)**

- Full C-Band tuning (97 channels @ 50 GHz spacing)
- Wavelength Range: 1527.60 to 1566.31 nm
- Frequency Range: 191.40 to 196.25 THz
- ITU-T G.984.1 Wavelength grid compliant
- Broadband OPM optional



**RXT-4112 CWDM OTDR Module**

- Characterize CWDM networks at ITU-T G.694.2 wavelengths
- End-to-end continuity testing using stabilized CWDM light source (via OTDR port)



**RXT-4113+ CWDM/DWDM OTDR Module**

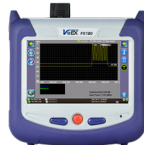
- DWDM - 89 (C-Band) ITU-T 694.1 channels at 50 GHz spacing
- CWDM - supports all 18 ITU-T 694.2 wavelengths
- Single optical output connector



## OSA

### FX180 Mini Optical Spectrum Analyzer

- CWDM or DWDM configurations
- Precise Wavelength, Level and OSNR measurement
- Measures up to 96 channels @ 50 GHz
- Table/Spectrum View, Channel Drift Analysis
- Sweep time < 5 seconds



## OCC

### FX180X Optical Channel Checker

- CWDM or DWDM configurations
- Bar graph display of ITU-T channels measured
- Adjustable signal threshold with color coding
- Precise Level and Wavelength measurement
- Table of detected ITU-T channels with wavelength Pass/Fail



## RXT with OSA Module

Superior micro-optic design and MEMS tuning technology enables measurement of key optical parameters such as wavelength, channel power, and OSNR.



- S, C and C+L band wavelength ranges
- Fast scanning - full spectrum in < 5 s
- Simultaneous measurements - up to 160 channels
- DWDM channel spacing down to 25 GHz\*
- Channel and Span power measurement
- High wavelength accuracy:  $\pm 50$  pm
- Continuous sweep with min/max hold
- In-band OSNR measurement
- High dynamic range: > 50 dB
- OSNR measurement: > 40 dB\*

\* module dependent

## Remote Fiber Test System (RFTS) / Optical Switches

The Remote Fiber Test System (RFTS) comprises the RTU-4000 platform with the RTU-4100 OTDR optical test module. A modular architecture and a wide range of test modules supports live or dark fiber testing in either point to point or FTTx networks. Advanced analysis algorithms along with state of the art OTDR technology ensures fiber faults or anomalies can be detected quickly and accurately for troubleshooting and restoration purposes, improving workflow and reducing Mean Time to Repair (MTTR).

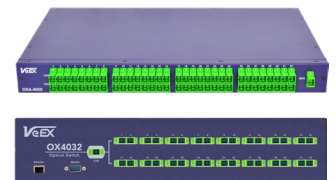
### RTU-4000 Modular Platform

- Small 1U, 19" or 23" rackmount profile and construction
- Compatible with VeEX's OXA-4000, OXC-4000 and OX4000 optical switches
- Supports RTU-4100 OTDR module
- Connectivity via 10/100 Base-T Management interface



### OX/OXA-4000 Optical Switches

- 1x8, 1x16, 1x32 and 1x128 configurations
- Compact form factor
- Wide passband and low insertion loss
- Protocol and bit-rate independent
- Single mode fiber support
- Fast switching time, < 8 ms for adjacent channels
- OX4000 series
  - Ethernet control via VeSion™
  - Cascading of switches to achieve higher port count
- OXA4000 series
  - RS232 control direct from RTU-4000
  - Built-in FWDM option for in-service testing



### RTU-4100 Optical Test Module

- Up to 50 dB Dynamic Range
- Up to 500,000 sampling points with 3 cm resolution
- OTDR test port equipped with live fiber detection for monitoring P2P or PON networks
- Built-in launch fiber to verify first connection to fiber under test

### OX-MPO-12 Multi-fiber SM Optical Switch

- 12-fiber singlemode optical switch for testing MPO/MTP® and ribbon fiber cables using VeEX OTDRs
- SC/APC input for OTDR connection
- Pinned MPO/APC output for MPO/MTP® cable under test



## Fiberizer® Fiber Optics Test Data Management, Remote & Cloud Applications

Software solutions for remote optical testing and data post-processing for managing test data and generating reports that integrate OTDR, link map, GPS coordinates, OLTS (loss and ORL), connector inspection, and captured images. Available for Window PC, Mobile Apps (Android, iPhone and iPad devices) and Fiberizer Cloud.



### Mobile Host Software

- **Fiberizer Mobile Scope (FMS)** – supports both DI1000, DI1000MPO and the new DI3000 version (Android only)
- **Fiberizer Mobile Android (FMA)** – supports DI1000 only (no DI1000MPO or DI3000 support)
- **Fiberizer Mobile Android** – Remote connect via Bluetooth or WiFi with OPX-BOX series; Remote connect via USB or WiFi to FiberScope; Remote connect via USB and view of FX40/80 series OPM results.
- **Fiberizer Mobile iPad®** – Remote connect via Bluetooth (BLE) or WiFi with OPX-BOX series; Remote connect via WiFi to FiberScope
- **Fiberizer Mobile iPhone®** – Remote connect via Bluetooth (BLE) or WiFi with OPX-BOX series; Remote connect via WiFi to FiberScope
- **Fiberizer Mobile Apps** – Fiberizer Mobile Apps available for Android and Apple devices.
- **Fiberizer Mobile OLTS** – Remote connect Android mobile device via Bluetooth with FX80 series (OPM versions only)

### Post Processing Solutions

Fiberizer Windows PC software family:

- **Fiberizer Desktop Plus** – Post-Processing software for optical test data (OTDR .sor, link maps, GPS coordinates, OLTS, and connector inspection images) including report generation.
- **Fiberizer Desktop** – PC software supporting Remote control of OPX-BOX+ OTDR. Includes trace analysis, event table and print out of test results.
- **Fiberizer Scope** – PC software to use with VeEX FiberScope: connector image and Pass/Fail results.
- **LT-Sync** - PC software used to transfer OLTS and ORL results from FX40/45/8x series product for storage, report generation on PC or push to Fiberizer Cloud.
- **OPX-BOX driver** – driver required for OPX-BOX+ OTDR USB to PC communication.
- **Sor Shell utility** – utility that allows user to view thumbnail view of OTDR trace file (.sor) in the directory using Microsoft Explorer.

**Fiberizer Cloud** – Advanced Cloud technology to save, manage and view all of your Fiber Optics test results in a single online repository. You can conveniently organize your traces into custom collections, compare traces from the same cable or analyze and edit them with the help of advanced 2-point or 5-point modes with or without LSA. You can customize report templates and generate professional PDF reports. Back up test data from your PC to your personal Cloud account or PUSH test data directly from the field. Synchronize test data between your Cloud account and your PC using Fiberizer Desktop Plus. Share project test results with your team and/or with your customers. Register at [www.fiberizer.com](http://www.fiberizer.com) for your free VeEX Fiberizer Cloud account.

VeEX provides the global communications and data networking industry with test and measurement products and services that enable efficient development, deployment and management of high-performance optical networks. Network Equipment Manufacturers (NEMs) can benefit from advanced traffic generation and analysis specifically designed for R&D, SVT/QA, production, remote, and automated testing environments. In addition, VeEX offers field portable solutions for NEM pre and post sales support.

## MPA® Multi-Protocol Analyzer

The MPA Multi-Protocol Analyzer is an advanced packet optical transport traffic generation and analysis platform specifically designed for the demands of R&D, SVT, and manufacturing testing environments. The MPA modular platform provides simultaneous independent multi-port testing from 400 Gbps to 10 Mbps for Ethernet/IP, OTN & SDH/SONET and Fibre Channel.



### Simultaneous and Independent Multi-Port, Multi-Rate, Multi-Protocol, & Multi-User Testing

QSFP-DD • QSFP56 • QSFP28 • QSFP+ • CFP8 • CFP4 • SFP56 • SFP28 • SFP+ • SFP

Ethernet/IP • OTN & SONET/SDH • Fibre Channel

## Applications

- Network equipment, systems, and IC development
- Signal integrity verification
- Transceiver validation
- Design verification and system testing (SVT)
- Production and manufacturing test
- Network verification and service delivery

## Features

### Ethernet/IP Traffic Generation & Analysis

- Full line rate layer 1-4 multi-stream, throughput, frame loss, latency, packet jitter, and BERT characterization
- PCS & RS-FEC layer testing
- RFC 2544 and Y.1564 compliance testing
- Service disruption time (SDT) measurement

### OTN Traffic Generation & Analysis

- OTL and FEC layer testing
- Multi-Channel OTN testing with support for parallel testing of up to 80xODU0s
- Advanced multi-stage OTN multiplexing with Ethernet, GFP, Fibre Channel, SDH/SONET, & PRBS clients
- Complete overhead/trace generation and analysis with byte capture
- Thru mode with error & alarm stimulus testing
- Service disruption time and delay measurements

### SONET/SDH Traffic Generation & Analysis

- Multi-Channel SONET/SDH testing with support for parallel testing up to 192 channels
- PRBS and GFP/Ethernet mapping clients
- Complete overhead/trace generation and analysis with byte capture
- Thru mode with error & alarm stimulus testing
- Pointer & APS sequence generation and analysis
- Service disruption time and delay measurements

### Fibre Channel Traffic Generation & Analysis

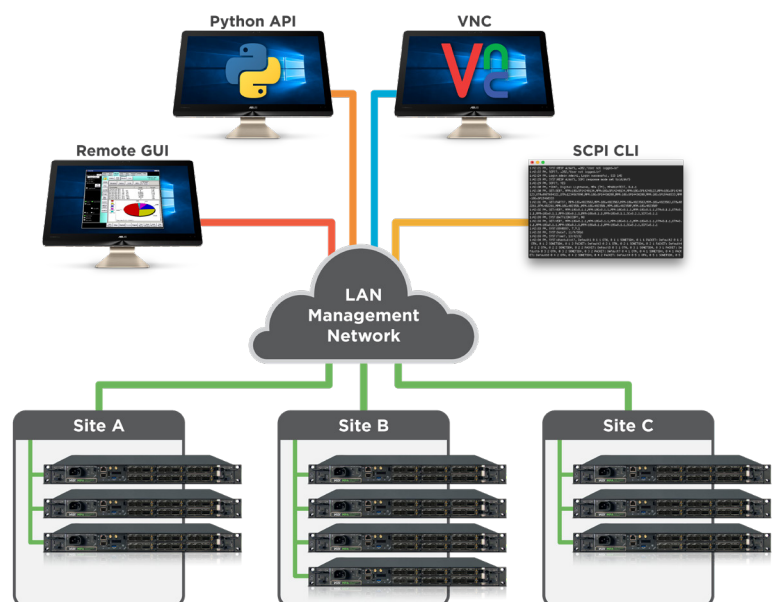
- Full line rate throughput, frame loss, latency and BERT characterization
- FEC layer testing
- Fibre Channel switch login and performance verification with FLOGI/PLOGI
- Buffer-to-buffer credit and flow control analysis
- Service disruption time measurement

### Transceiver, Physical, and Layer 1 Testing

- QSFP-DD, QSFP56, QSFP28, QSFP+, CFP8, CFP4, SFP56, SFP28, SFP+, & SFP module verification
- Multi-Lane Unframed BERT - PAM4 PRBSQ & NRZ PRBS test patterns for signal integrity validation
- Pre-FEC & Post-FEC BER analysis
- Transceiver and MDIO/I<sup>2</sup>C testing
- Transceiver module health check feature
- High speed lane clock stressing/analysis and optical power level verification
- Transceiver temperature measurement and 3.3V power rail adjustment and monitoring

### Test Automation and Scripting

- Full instrument control with native Python API or SCPI CLI
- Supports multiple independent tests and connections with mixed control types including GUI





**Test Modules**

Modules based on an advanced programmable FPGA designs which provide best signal integrity and future proof hardware to support current and emerging testing applications.

**MPM-600G**



- QSFP28-based module supports six independent 100G/40G Ethernet or OTN transport tests
- The MPA platform supports up to two MPM 600G modules, providing up to 12x 100G test ports
- Provides advanced test mode operation for next generation applications such as OTUCn which require multiple PHY ports to be used in parallel for a single test application
- 100GE, 100GE IEEE 802.3bj Clause 91 RS-FEC for SR4, & 40GE
- OTUCn (n=1-6), OTU4, OTU3, OTU3e1, & OTU3e2
- Flex Ethernet (FlexE) traffic generation and analysis with 100GBASE-R PHY, shim/calender overhead, and MAC layer control/testing

**MPM-400G**



- 400G KP4 FEC Ethernet 400GAUI-16 testing, CFP8 port
- Comprehensive FEC layer validation including symbol error per codeword analysis
- MAC/Ethernet/IP/UDP layer throughput & traffic verification
- Multi-Lane Unframed BERT pattern testing
- Transceiver and cable testing with MDIO read/write capability

**MPM-400AR**



- Dual Port 400GE, 200GE, 100GE, 50GE Testing
- QSFP-DD 4x100GE Break-Out application
- 100GE KP4 100GAUI-4 application for FEC analysis of 100GE QSFP28 DR/FR/LR1 transceivers
- 2x QSFP-DD ports, 2x QSFP56, & 2x SFP56 ports support both PAM4 and NRZ modes
- Independent port operation provides support for various types of network aggregation/wrap test applications
- Transceiver and cable testing with I<sup>2</sup>C read/write capability
- Comprehensive FEC layer validation including symbol error per codeword analysis
- MAC/Ethernet/IP/UDP layer throughput & traffic verification
- Multi-Lane Unframed BERT/PRBSQ PAM4 and NRZ pattern testing
- Hardware ready for FlexE, FlexO, OTUCn and other applications

**MPM-100AR**



- 100GE, 100GE IEEE 802.3bj Clause 91 RS-FEC for SR4, & 40 GE
- Dual port 10/25/25G RS-FEC Ethernet
- OTUCn (n=1-6), OTU4, OTU3, OTU3e1, & OTU3e2
- Dual port OTU2, OTU2e & OTU1e
- STL256.4 STM256/OC768
- Dual port 10/16/32G FEC Fibre Channel
- CPRI Unframed L1 BERT 24.33024G
- QSFP28 and dual SFP28 ports

**MPM-100G**

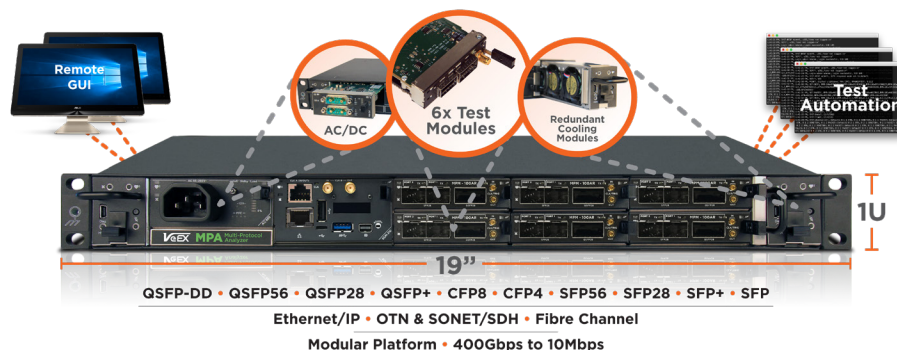


- 100GE, 100GE IEEE 802.3bj Clause 91 RS-FEC for SR4, & 40GE
- OTUCn (n=1-6), OTU4, OTU3, OTU3e1, & OTU3e2
- STL256.4 STM256/OC768
- CFP4 and QSFP28 ports

**MPM-10G**



- 10GE LAN/WAN, 1G, 100M, 2500BASE-X, 10M/100M/1000M/10GBASE-T Ethernet
- OTU1, OTU2, OTU1e, OTU2e, OTU1f, OTU2f
- SDH STM0/1/4/16/64 & SONET OC1/3/12/48/192
- Fibre Channel 1/2/4/8/10G
- CPRI Unframed L1 BERT 614.4M to 12.16512G
- Dual SFP+ ports



With countless WiFi deployments in homes, businesses and public spaces globally, WiFi is a source of great opportunities and challenges for carriers. The WiFi Air Expert series addresses challenges by combining many test tool functions into both a standalone, easy-to-use test set or swappable platform module. With WiFi and wired Ethernet interfaces, and a dedicated spectrum analyzer, it removes the need to carry multiple test tools, and covers all aspects of I&M from RF network discovery and survey, to troubleshooting, AP channel selection, and traffic load performance testing.

## MTTplus-900

### WiFi Air Expert® Module



The MTTplus-900 WiFi Air Expert is a module for the MTTplus platform. The MTTplus modular platform gives field personnel an all-in-one, low-cost tool for installing, verifying, and troubleshooting a wide variety of service technologies. The MTT family includes chassis configurations for diverse testing needs and budgets, and its upgradeable modular design means dramatically lower cost compared to purchasing separate dedicated test sets. Modules are available for multiple testing needs and applications, including Fiber Optics, Teleprotection, Datacom, DSn/PDH, SONET/SDH, OTN, Ethernet, Fibre Channel, CPRI/OBSAI.

#### MTTplus Platform Highlights

- Expand test functions with a growing list of test modules
- Future-proof cost-effective platform
- Fast and efficient test result transfer to USB memory stick
- Built-in GPS option
- Built-in Camera option for job site documentation, QR and bar codes
- Small package and light weight
- Field replaceable battery pack
- Large LCD Touch Screen and ambient light sensor

#### MTTplus-900 Highlights

- Wireless Standards: 802.11 a, b, g, n, ac
- MIMO channels: 3x3:3
- WiFi security standards: WEP/WPA/WPA2 Personal, WPA/WPA2 Enterprise, Splash page/Captive portal webpage login
- WiFi Spectrum Analyzer (Optional): Frequency Range: 2.400 to 2.495 GHz and 5.150 to 5.850 GHz
- 802.3 Ethernet test ports (Optional): RJ45 10/100/1000Base-T, SFP 100-FX/1000Base-X
- PoE Testing: Emulation of Powered Device, Detect pairs used, PoE voltage measurement

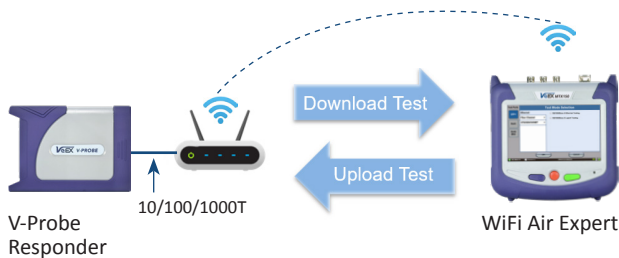
## WX150 WiFi Air Expert Test Set



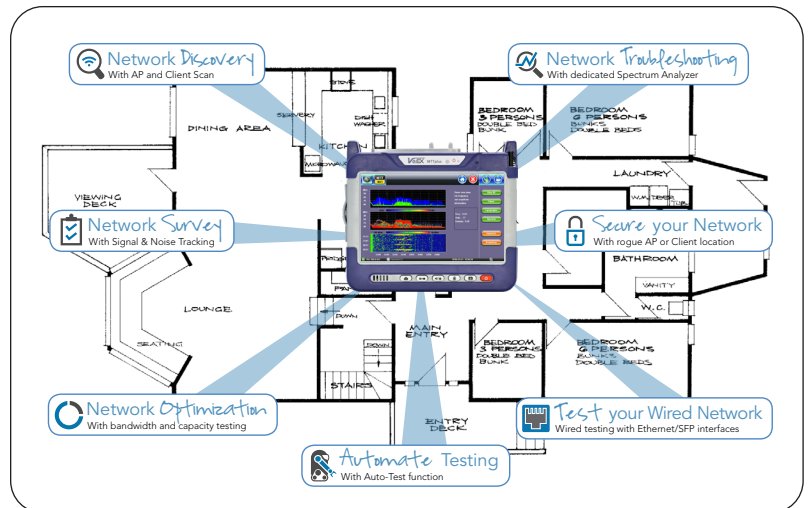
The WX150 test set has the same features and highlights as the MTTplus-900, all in a compact standalone form factor. Perfect for site surveys, the lightweight WX150 supports standby and instant wake-up operations. It also features eight hours of continuous operation on a full battery charge.

### V-Probe Responder Performance Testing Companion

The V-Probe Responder is a companion for the MTTplus-900 and WX150 WiFi Air Expert Modules to verify TCP and UDP throughput performance through a WiFi Access Point or Router.



- V-Perf TCP/UDP Responder/Server (compatible iPerf3)
- 10/100/1000Base-T support
- Measure the true Quality of Experience (QoE) on the WiFi network across the AP/Router
- Ready to use on boot-up
- Easy V-Probe discovery by a WiFi Air Expert module for quick test initiation
- Static and DHCP (default) IP addressing



With the exploding growth of high-speed and high-availability services, testing and verification tools must change to keep up. Not all 400G and 100G T&M applications are the same. From Field, CO, Datacenter, Manufacturing, to R&D environments, VeEX has the right tools to pinpoint your specific testing requirements and environmental needs. Whether it is a portable do-it-all handheld for the field, or a high port density rack-mount, VeEX solutions share a common user interface and feature set allowing seamless interaction between field and core network teams.

# 400G/100G SOLUTIONS

## RXT Modern Modular Test Platform

### RXT-6400 400G Advanced Test Module



- First portable 400GE test set
- Native OSFP and QSFP-DD PAM4 interface for 400GE (no adapter required)
- Supports IEEE 802.3bj KP4 RS-FEC
- Flexible future-proof logic design
- Transceiver verification test with variable voltage and frequency
- Power consumption monitoring
- Internal and external transceiver temperature monitoring
- QSFP56, QSFP28, QSFP+, SFP28, SFP+, SFP, RJ45 ports for lower data rates testing

### RXT-6200 100G Universal Test Module



- CFP4 and QSFP28 interfaces for 100GE, OTU4 and 50GE applications
- Independent Dual-Port testing, up to 2x 112G
- Supports IEEE 802.3bj Clause 91 RS-FEC
- QSFP+ for 40GE, OTU3
- SFP28 for 25GE, 32G FC, CPRI up to 24.330G (CPRI 10), 25G eCPRI
- SFP+ for 10GE/1GE/100M, OTU2/2e/1e/1, STM-64/16/4/1/0, OC192/48/12/3/1, and Fibre Channel 16/10/8/4/2/1G and CPRI up to 12.165G (CPRI 9) and 10G eCPRI
- Electrical interfaces for legacy 10/100/1000M, SDH/SONET and PDH/DSn testing

### RXT-6000e 100G Multi-Service Test Module



- CFP2 and QSFP28 interfaces for 100GE, OTU4 and 50GE applications
- Supports IEEE 802.3bj Clause 91 RS-FEC
- CFP4 support via CFP2-to-CFP4 adapter
- QSFP+ for 40GE, OTU3
- SFP28 for 25GE, 32G FC, CPRI up to 24.330G (CPRI 10), 25G eCPRI
- SFP+ for 100Base-FX, 1000Base-X, 10GBase-X, OTU2/2e/1e/1, STM-64/16/4/1/0, OC192/48/12/3/1, and Fibre Channel 16/10/8/4/2/1G and CPRI up to 12.165G (CPRI 9) and 10G eCPRI

## MPA Multi-Protocol Analyzer

### MPM-400AR



- Dual Port 400GE, 200GE, 100GE, 50GE Testing
- QSFP-DD 4x100GE Break-Out application
- 100GE KP4 100GAUI-4 application for FEC analysis of 100GE QSFP28 DR/FR/LR1 transceivers
- 2x QSFP-DD ports, 2x QSFP56, & 2x SFP56 ports support both PAM4 and NRZ modes
- Independent port operation provides support for various types of network aggregation/wrap test applications
- Transceiver and cable testing with I<sup>2</sup>C read/write capability
- Comprehensive FEC layer validation including symbol error per codeword analysis
- MAC/Ethernet/IP/UDP layer throughput & traffic verification
- Multi-Lane Unframed BERT/PRBSQ PAM4 and NRZ pattern testing
- Hardware ready for FlexE, FlexO, OTUCn and other applications

### MPM-600G



- QSFP28-based module supports six independent 100G/40G Ethernet or OTN transport tests
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- OTUCn (n=1-6), OTU4, OTU3, OTU3e1, & OTU3e2
- Flex Ethernet (FlexE) traffic generation and analysis with 100GBASE-R PHY, shim/calender overhead, and MAC layer control/testing

### MPM-100AR



- 100GE, 100GE IEEE 802.3bj Clause 91 RS-FEC for SR4, & 40 GE
- Dual port 10/25/25G RS-FEC Ethernet
- OTUCn (n=1-6), OTU4, OTU3, OTU3e1, & OTU3e2
- Dual port OTU2, OTU2e & OTU1e
- STL256.4 STM256/OC768
- Dual port 10/16/32G FEC Fibre Channel
- CPRI Unframed L1 BERT 24.33024G
- QSFP28 and dual SFP28 ports

### MPM-100G



- 100GE, 100GE IEEE 802.3bj Clause 91 RS-FEC for SR4, and 40 GE
- OTUCn (n=1-6), OTU4, OTU3, OTU3e1, & OTU3e2
- STL256.4 STM256/OC768
- CFP4 and QSFP28 ports

### MPM-400G



- 400G KP4 FEC Ethernet 400GAUI-16 testing, CFP8 port
- Comprehensive FEC layer validation including symbol error per codeword analysis
- MAC/Ethernet/IP/UDP layer throughput & traffic verification
- Multi-Lane Unframed BERT pattern testing
- Transceiver and cable testing with MDIO read/write capability



# NET-BOX™ High-speed Internet & QoE Assurance Testing

As Enterprise and Consumer internet access services surpass the 1 Gbps “barrier,” costly challenges can arise for Service Providers. With advertisements promising multi-Gig services, 32x8 DOCSIS, WiFi 6, Fiber, and 5G speeds, tech savvy consumers expect their broadband services to be delivered as promised. VeEX’s NET-BOX test platform offers Service Provider technicians a low cost, high performance solution for customer premises speed tests.

## NET-BOX Ethernet Speed Test Solution

The NET-BOX is an optimized Quality of Experience (QoE) testing platform for Gigabit services. It offers a low-cost, reliable, high performance FP-GA-based alternative to expensive laptops often used for enterprise and speed tests. It is truly scalable with a multi-test port architecture, with four 1000BASE-T ports for up to 4 Gbps full line rate capability and one SFP cage for 1000BASE-X and 2500BASE-X. The NET-BOX can truly test the limits of verifying Quality of Service (QoS) and assure QoE for the ever-growing high-speed internet service at and beyond 1 Gbps.



- Mobile app for iOS® and Android™ devices
- Cost-effective: high-end laptops are no longer required for simple QoE home tests
- Truly scalable: 4xRJ45 ports for up to 4GE speed and SFP cage for 1000BASE-X and 2500BASE-X
- Simple easy to use graphical UI
- Integrated Bluetooth/WiFi dongle
- Quick and easy QR code pairing
- Ethernet, WiFi, and Bluetooth connection methods available
- Fast boot up time and always ready to pair on startup
- Configurable network management settings for connecting through LAN
- U-shaped holder for easy transportation with shoulder strap
- R-Server compatible
- Built-in step by step testing process and troubleshooting guide
- Up to 8 hours of continuous use
- Supports 1m drop to concrete on all sides
- V-TEST Throughput test supports VeEX Mode and Speedtest Powered™ Mode based on Ookla® technology

*Low-cost, high-performance alternative to expensive laptops for high-end home speed tests.*

