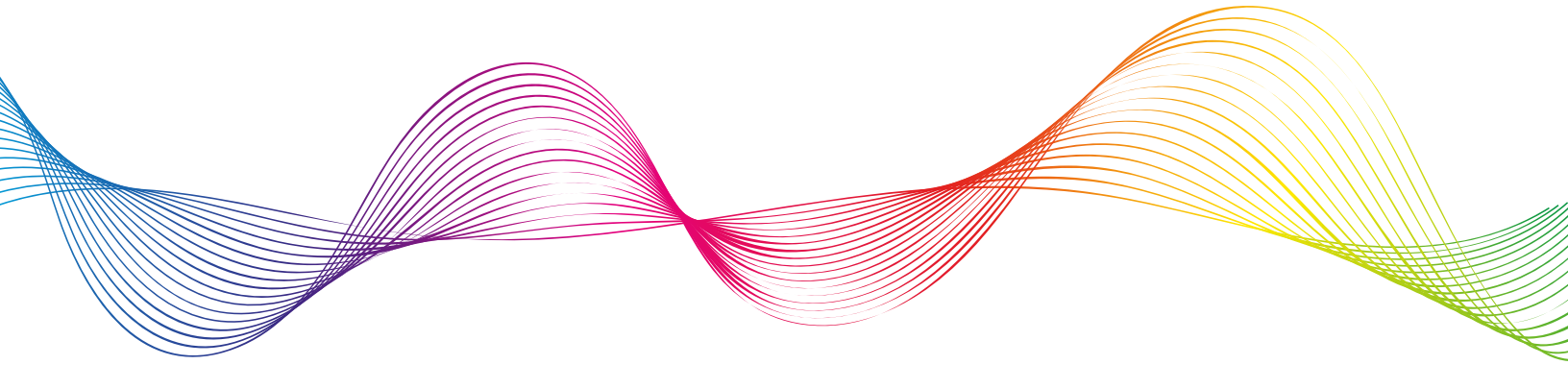
PRODUCT CATALOG

VeEX
The Verification Experts



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 service verification features across Fiber Optics, CaTV/DOCSIS, Mobile, Next-Generation Transport Network, Fibre Channel, IPTV, WiFi, Synchronous, Datacenter and Carrier Ethernet technologies.

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 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 100 Gigabit Ethernet, coupled with V-SAM, RFC2544, RFC6349, and broadband speedtest applications address all aspects of converged IP networking.

Transport

RXT, TX 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.

TELECOM SOLUTIONS

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 asset 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. VeExpress secure cloud-based environment manages the test sets and licenses. 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, 40GE option
- 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
- OBSAI: 768 Mbps to 6.144 Gbps
- Ethernet: 10/100/1000BaseT, 100Base-FX/1000Base-X, 10GE
- Fibre Channel: 1/2/4/8/10/16G
- SyncE & 1588v2 PTP: Master and Slave Clock emulation, protocol monitoring and decoding, wander analysis
- OTDR/LS/OPM option
- Built-in Precision Clocks: Atomic Clock and GNSS receiver
- EZ-Remote™, Web Remote, VNC, and SCPI
- Up to two test modules (hardware options)

TX340SM Dual Test Port Hardware Option

TX320s Dual Test Port Hardware Option

TX300s-100G Hardware Option

TX300s-OTDR Fiber Optics Hardware Option

RXT™

Modern Modular Test Platform with VeExpress™

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 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.

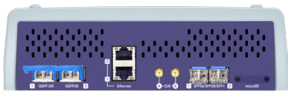
- Flexible Test Module design accommodates different module sizes allowing future growth of the RXT Platform into more complex technologies and high-end applications
- Multi-technology: Ethernet, Fibre Channel, Fiber Optics, WDM, OTN, SDH/SONET, PDH/DSn, CPRI/OBSAI
- Supported Modules: 400G, 100G, Multi-Service (64k to 16G), OSA, OTDR

RXT-3400 Multi-Service

RXT-6200 and RXT-6000e 100G

- Ethernet: 10/100/1000BaseT, 100Base-FX/1000Base-X, 10 GE (Up to 25 GE 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

RXT-6400 400G



- 100G & 40G Ethernet and OTN with RXT-6000e/RXT-6200
- 400 GE with RXT-6400
- OTN: OTU1/2/1e/2e, ODU0, ODUflex
- SONET/SDH/PDH/DSn up to 10G
- 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

UX400

Multi-Service Universal Test Platform up to 100G

The robust UX400 and UX400R Universal Expert are the most versatile portable multi-service transport test solution to offer test capabilities ranging from DS1/E1 all the way up to 100GE network speeds, in a compact chassis with battery backup autonomy at all rates. Its modular architecture supports up to six independent test modules, multiple concurrent tests, and a browser-based multi-user remote interface for accessing and operating different test modules at the same time, maximizing the use of resources. Test modules can also operate in a centralized rack-mounted version, when portability or battery operation is not required.

AVAILABLE TECHNOLOGIES

- 100G/40G Ethernet and OTN
- 40G OTN/SONET/SDH
- 10G Ethernet, OTN, SONET/SDH
- STM-16/4/1/0, OC-48/12/3/1, DSn/PDH
- Ethernet 10/100/1000Base-T, 100Base-FX, 1000Base-X, ITU G.8261 SyncE, IEEE 1588v2 PTP
- 16/10/8/4/2/1G Fibre Channel

PLATFORM OPTIONS

- Optional Atomic Clock
- Optional GNSS receiver card
- Portable and rack-mount version
- Remote Control and SCPI commands for automation
- High-capacity Li-Ion battery for uninterrupted testing

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-320 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.

MTX150

Multi-service Installation & Maintenance Test Set

The MTX150 is a fully-integrated and self-contained multi-service test solution for OTN, SDH, SONET, PDH, DSn, C37.94, Ethernet, SyncE, Mobile Backhaul, 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.

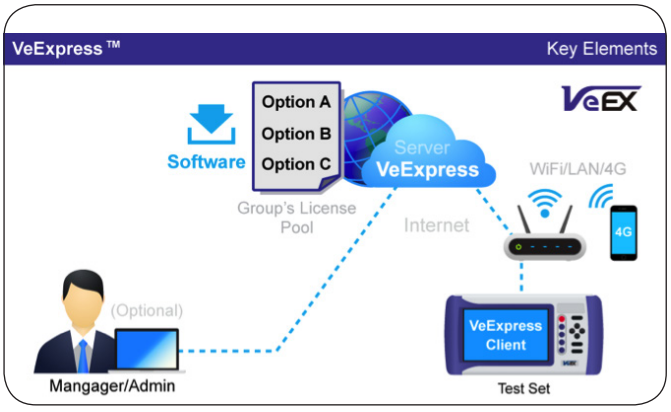
- Ethernet, Fibre Channel, OTN, SDH/SONET, PDH/DSn, Datacom and G.703 64K Codirectional Testing
- SFP Optical Interface for 100/1000Base-X, SyncE, 4/2/1GFC, OTU1, STM16/4/1/0, STS48/12/3/1, IEEE C37.94
- RJ45 for 10/100/1000Base-T
- BNC (75Ω unbalanced) for E1, E2, E3, E4, DS1, DS3, STM1, STM0, STS1 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.

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



CaTV/MSO SOLUTIONS

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

CX350s-D3.1 Advanced Business Services Meter

- Home Installation Process/ Certification Auto Tests
- Advanced SLM with QAM analysis
- DOCSIS 3.1 Cable Modem with V-TEST Throughput
- DOCSIS 3.1 OFDM Analysis
- Return Path and Forward Path Ingress
- TDR for Drop Certification
- Ethernet up to 10 GigE with SLA Validation tests including RFC2544 and Y.1564 SAM
- Advanced T1 testing
- ISDN PRI with Call Loading
- VoIP SIP with Call Loading
- VoIP PESQ tests with far end VeEX Voice Quality Server

CX310 Handheld DOCSIS 3.1 Installation Test Set

Equipped with a DOCSIS 3.1 cable modem supporting true OFDM analysis and V-TEST throughput measurements, VeEX's new 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 CaTV/Satellite/Over-the-Air HDTV Multi-Standards Test Solution

Designed for digital cable TV, OFDM signal analysis for D3.1, Satellite and over-the-air digital TV signal analysis and measurements, 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 and MPEG analysis. Other features include Fast Full Band and real-time plant level scan, Tilt, Headend Check and FCC/Digital POP.

- 3 GHz high sensitivity professional grade spectrum analyzer with built-in automatic filters for increased dynamic range
- Annex A, B, C, DOCSIS 3.1 OFDM analysis, ISDB-T, DVB-S, DVB-S2, DVB-T, DVB-T2
- 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
- Complete set of CaTV measurements including CCN, CSO, CTB, ICR, DOM, Hum, carrier frequency

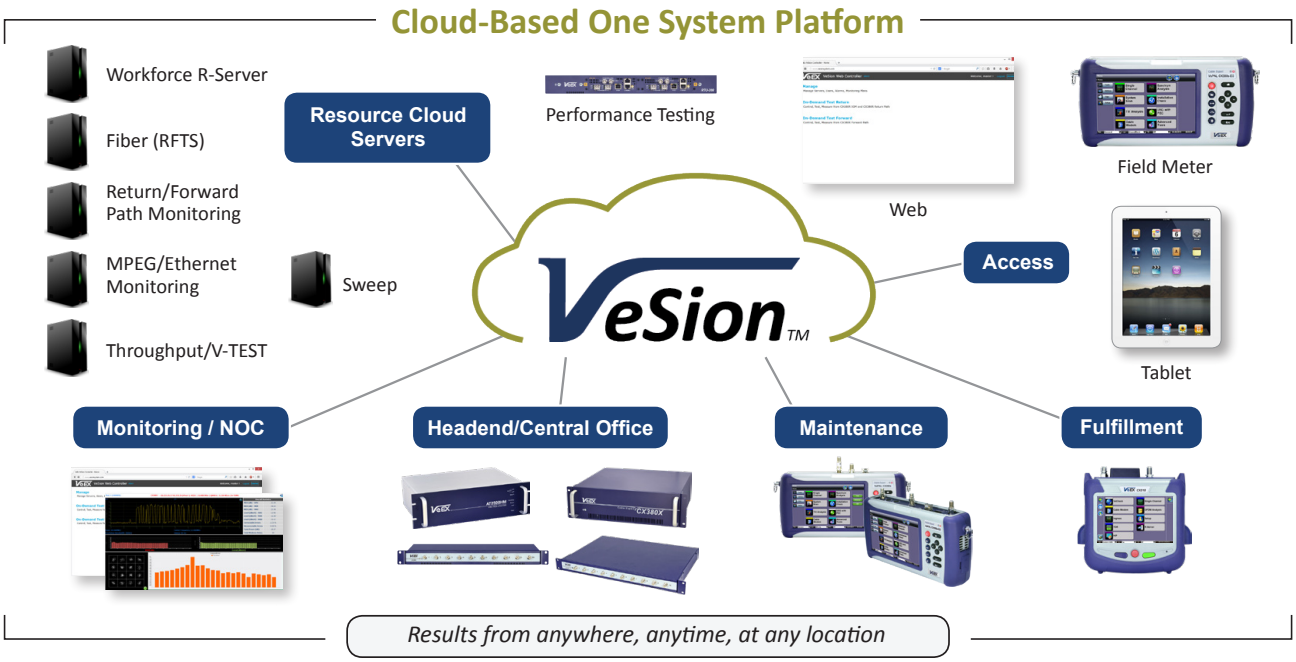
Sweep for DOCSIS 3.1 with Calan 3010H+ and CX380s-D3.1

- Calan Sweep-based technology up to 1.8 GHz when used with the new CX380s-D3.1
- Supports CM2800, CM3800 and CX380s-D3.1 with Calan Sweep to 1 GHz
- 1U Rack mount chassis
- Software control with VeSion via Ethernet connection
- Future-proof platform using advanced DSP technology

VeSion™ *Compatible with VeSion*

VeSION™ PLATFORM

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.



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.

CX180F Forward Path Monitoring System

The CX180F rackmount monitoring system checks the performance of analog and digital channels being transmitted downstream or toward customers across a CaTV HFC network. Equipped with ten test ports and multiple test engines. The key signal parameters including level, BER, MER, and Constellation are scanned continuously and non-intrusively.

CX380X Preventative Network Monitoring

The CX380X Advanced Test Probe for Forward and Return Path monitoring, features advanced Spectrum Analysis, QAM Health, MPEG Monitoring (Priority 1 and 2 per ETR 101-290 standards) and Burst QAM Demodulator capabilities.

VeSion RFTS

- RTU-4000/4100+ Active Test head combining OTDR, optional OPM (Various wavelengths and Dynamic Range 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
- 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-320 Ethernet Performance Testing and Monitoring

The RTU-320 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-320s are supported via VeSion, this allows for a distributed network of RTUs in the service provider network for effective service provisioning, activation, and assurance.

- 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)

FIBER OPTICS SOLUTIONS

VeEX offers a complete set of Test and Measurement solutions for Business Services, Access, Metro, Core, Transport and Fiber networks. VeEX's optical test solutions are optimized for today's FTTx, GPON, 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

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

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 (OPM or OLS versions only)

FX100 Optical Loss Test Set (OLTS)

- Fully automated bi-directional loss testing < 10 seconds
- On-board wizard to guide patchcord referencing
- Built-in, full duplex digital Talkset
- Up to 4 laser wavelengths

FX82 Optical Power Meter (OPM)

- Wavelength Range 800 to 1650 nm
- Calibrated wavelengths for major lambdas
- Wide dynamic range 1mm, InGaAs photo detector

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)

FX84 Optical Loss Test Set (OLTS)

- OPM and OLS functions in one unit
- Uni-directional insertion loss testing
- Singlemode and Multimode configurations
- VFL option

FX85 Optical Loss Test Set (OLTS)

- OPM, OLS & ORL functions in one unit
- Bi-directional insertion loss testing with FX100 OLTS
- Singlemode and Multimode configurations

Fiber Inspection

DI-1000 Digital Fiber Inspection Scope

- Compatible with Fiberizer Mobile/PC software and VeEX testers
- Fast dial focus adjustment
- IEC 61300-3-35 analysis with pass/fail limits
- Industry standard connector tip support

DI-1000 MPO Digital Fiber Inspection Scope

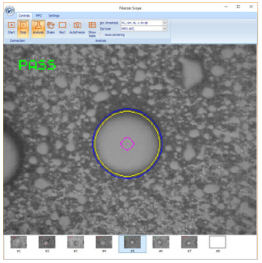
- Compatible with Fiberizer, PC software and VeEX testers
- Fast dial focus adjustment
- IEC 61300-3-35 analysis with pass/fail limits
- Industry standard connector tip support

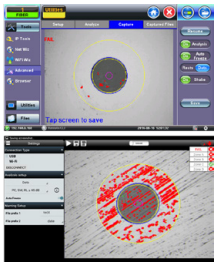
VS-500 Digital Fiber Inspection Microscope

- Compatible with Fiberizer Mobile/PC software and VeEX testers
- Fast dial focus adjustment
- IEC 61300-3-35 analysis with pass/fail limits
- Brightness adjustment, 30-90%

Compatible Host Platforms/Software*

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





**Some limitations may apply.*

OTDRs - General Purpose

OPX-BOXe Mini OTDR

- Up to 43 dB Dynamic Range and 1/4 m Dead Zones
- Optional Light Source and Visual Fault Locator (VFL)
- Multimode and Singlemode wavelength options - up to 128,000 sampling points
- WiFi & Bluetooth (wireless) and USB & Ethernet (wired) remote control

MTTplus410+ Fiber Optics Test Module

- Fiber Optics test module for the MTTplus platform
- OTDR, OPM, Light Source and VFL support
- Singlemode and Multimode configurations
- Geo Tagging of test data using built-in GPS
- Built-in camera option to document test site

FX150+ Mini OTDR

- Multimode and Singlemode configurations
- Filtered 1625 or 1650 nm port for in-service testing
- Live fiber detection with embedded power meter
- Dynamic range up to 43 dB
- Up to 256,000 sampling points

TX300s with Optics Option

- Optics option adds OTDR test functionality to the TX300s multi-service tester
- Singlemode and multimode OTDR configurations with OLS option
- Filtered OTDR port for in-service testing
- OPM and VFL options

RXT-4100+ OTDR Module

- Fiber optics test module for the RXT platform
- OTDR, OPM, OLS and VFL support
- Singlemode and Multimode configurations

xPON

FX80 PON Optical Power Meter

- FTTx power meter for B/E/G-PON applications
- ONU and OLT test ports with pass-through design
- Fixed SC/APC Interface for ONU and OLT test ports
- Concurrent measurement of Upstream and Downstream signals
- 1310 nm Upstream CW/Burst signal support
- 1490/1550 nm Downstream signal support
- Non-volatile storage for > 930 measurements

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 OCMI 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-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)

FX87 DWDM Tunable Laser Source (TLS)

- Full C-Band tuning (> 80 channels @ 50 GHz spacing)
- Wavelength Range: 1528.77 to 1563.86 nm
- Frequency Range: 191.70 to 196.10 THz

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

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 ± 2.5 GHz

RXT-4114 CWDM OTDR Module

- CWDM - supports all 18 ITU-T 694.2 wavelengths
- OLS option with WaveID
- 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

RXT and UX400 with OSA Module

Using superior micro-optic design and MEMS tuning technology, the RXT and UX400 OSA test modules measure 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 33 GHz
- Channel and Span power measurement
- High wavelength accuracy: ± 50 pm
- Continuous sweep with min/max hold
- In-band OSNR measurement
- High dynamic range: > 50 dB
- OSNR measurement: > 35 dB

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).

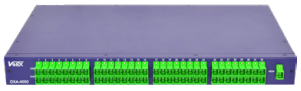
RTU-4000 Modular Platform

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

RTU-4100+ Optical Test Module

- 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
- Up to 50 dB dynamic range

OXA-4000 Optical Switch



- 1x8, 1x16, 1x32 and 1x128 configurations available
- Compact and powerful, 1U tall and 280 mm deep for 1x32
- Low insertion loss
- Wide and flat passband
- Fast switching time, < 8 ms for adjacent channels
- Protocol and bit-rate independent
- Single mode fiber support

OX-MPO Multi-fiber Optical Switch

- 12-fiber optical switch for testing MPO/MTP 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.

Remote Test Solutions

VeExpress is a powerful and secure web-based asset management system for VeEX's new all-inclusive test sets, allowing them to be customized on demand, anywhere, any time. Share test options, purchased or leased, among multiple devices or purchase a base unit and rent the interfaces or options as required. VeExpress keeps track of software versions and delivers updates to test sets, so everyone is on the same page. Minimize CAPEX and optimize OPEX by managing your VeEX testers with VeExpress.

- **Fiberizer Desktop** – Windows PC software for remote connect via USB, Bluetooth or WiFi with OPX-BOX+. Initiate OTDR test, view trace/event table and save test results.
- **Fiberizer Mobile Android –** Remote connect via Bluetooth or WiFi with OPX-BOX; Remote connect via USB or WiFi to FiberScope; Remote connect via USB and view of FX40/45 series OPM results.
- **Fiberizer Mobile iPad®** – Remote connect via Bluetooth or WiFi with OPX-BOX; Remote connect via USB or WiFi to FiberScope; Remote connect via USB and view of FX40/45 series OPM results.
- **Fiberizer Mobile iPhone®** – Remote connect via Bluetooth or WiFi with OPX-BOX; Remote connect via USB or WiFi to FiberScope; Remote connect via USB and view of FX40/45 series OPM results.

Post Processing Solutions

Fiberizer Expert Bundle Windows PC software includes:

- **Fiberizer Desktop Plus** – Post-Processing software package intended for data post-processing and management of optical test data and report generation to integrate

  OTDR, link map, GPS coordinates, OLTS (loss and ORL), connector inspection captured images.
- **Fiberizer Desktop** – PC software that supports Remote control of OPX-Box+ OTDR trace view and event table in addition to printing out 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.
- **FX40 series driver** – driver required for FX40/45 series 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 – Use Cloud technology to create an online repository and a new way of managing and viewing all of your Fiber Optics test results (OTDR, OLTS, Fiberscope). 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 even generate a professional PDF report. Register at www.fiberizer.com for your free VeEX Fiberizer Cloud account. 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 Desk- top Plus. Share project test results with your team and/or even with your customers.

Fiberizer Mobile Apps – Fiberizer Mobile Apps available for Android and Apple devices. Click the links below to see a comparison of current features.

NEM SOLUTIONS

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

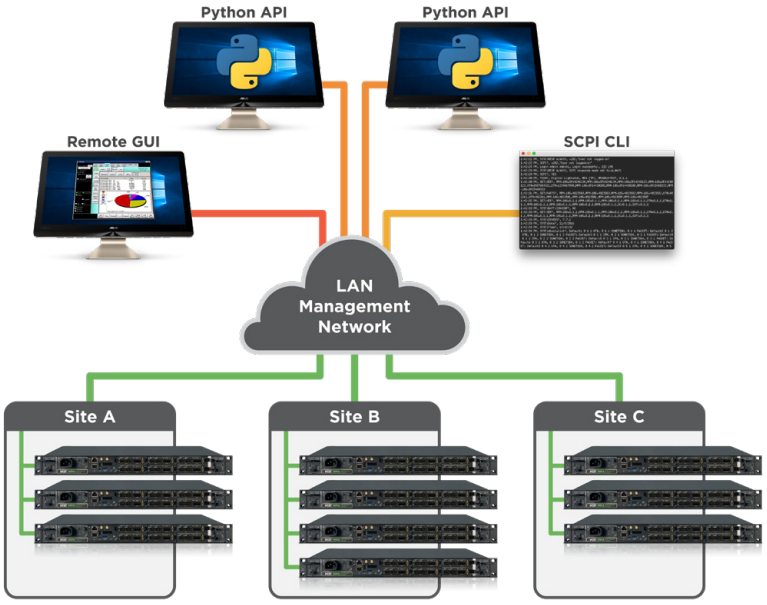
- Full line rate throughput, frame loss, latency and BERT characterization
- FEC layer testing
- Fibre Channel switch login and performance verification with FLOGI/PLOGI
- Buffer-to-buffer credit and flow control analysis
- Service disruption time measurement

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^2C 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-400AR

- 2x 400G port Ethernet testing per IEEE 802.3bs
- QSFP-DD transceivers and cables with I2C read/write
- 8x50G PAM4 400GAUI-8 electrical interface
- Comprehensive KP4 FEC layer stressing and analysis
- MAC/Ethernet/IP layer throughput & traffic verification
- Multi-Lane Unframed BERT/PRBSQ PAM4 pattern testing
- 2x QSFP56 ports & 2x SFP56 ports for additional testing capability
- Hardware ready for Ethernet Fan-out, FlexE, FlexO, OTUCn and other applications

MPM-400G

- 400G Ethernet per IEEE 802.3bs
- Advanced KP4 FEC stress testing and analysis
- Physical, PCS/FEC, and Ethernet layer verification
- CFP8 Port

MPM-100AR

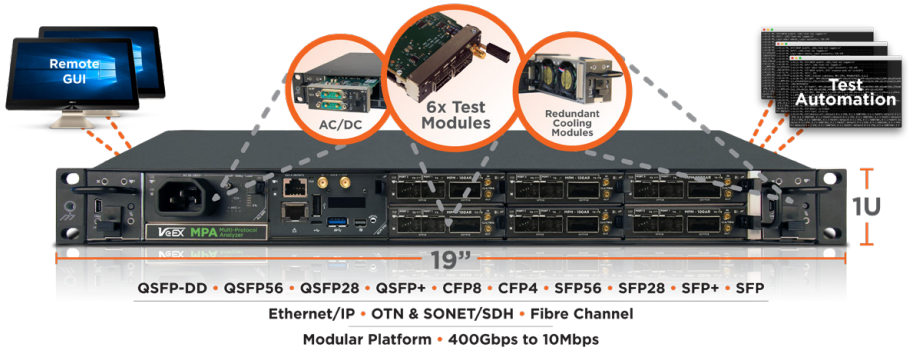
- 100GE, 100GE IEEE 802.3bj Clause 91 RS-FEC for SR4, & 40 GE
- Dual port 10/25/25G RS-FEC Ethernet
- OTUCn (n=1-6), OTU4, OTU3, OTU3e1, & OTU3e2
- Dual port OTU2, OTU2e & OTU1e
- STL256.4 STM256/OC768
- Dual port 10/16/32G FEC Fibre Channel
- CPRI Unframed L1 BERT 24.33024G
- QSFP28 and dual SFP28 ports

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



WiFi SOLUTIONS

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

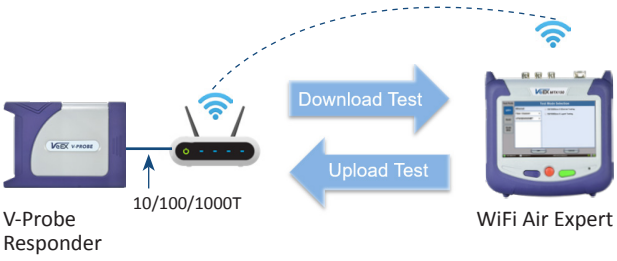
- Wireless Standards: 802.11 a, b, g, n, ac
- MIMO channels: 3x3:3
- WiFi security standards: WEP,WPA/WPA2 Personal, WPA/WPA2 Enterprise, Splash page/Captive portal webpage login
- WiFi Spectrum Analyzer (Optional):Frequency Range: 2.400 to 2.495 GHz and 5.150 to 5.850 GHz
- 802.3 Ethernet test ports (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

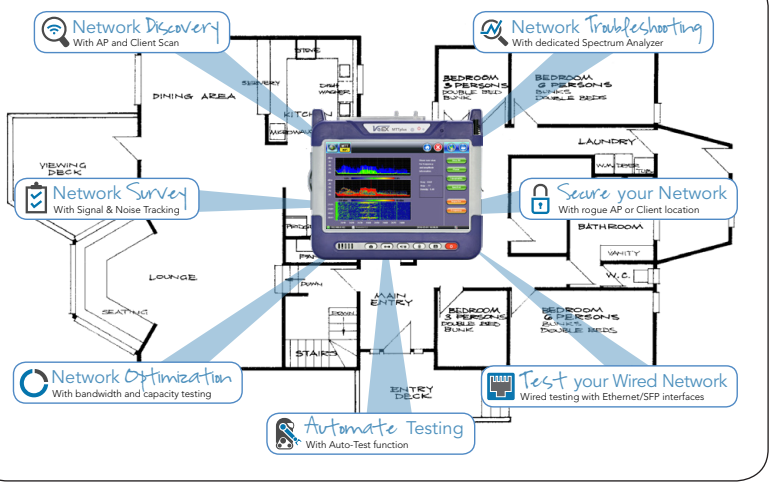
The WX150 test set has the same features and highlights as the MTTplus-900, all in a compact standalone form factor. Perfect for site surveys, the lightweight WX150 supports standby and instant wake-up operations. It also features eight hours of continuous operation on a full battery charge.

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.



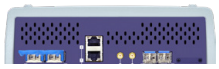
- V-Perf TCP/UDP Responder/Server (compatible iPerf3)
- 10/100/1000Base-T support
- Measure the true Quality of Experience (QoE) on the WiFi network across the AP/Router
- Ready to use on boot-up
- Easy V-Probe discovery by a WiFi Air Expert module for quick test initiation
- Static and DHCP (default)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



400G/100G SOLUTIONS

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.

RXT-6400 400G Advanced Test Module



- First portable 400GE test set ready to help with Lab-to-Field transition
- Native QSFP-DD PAM4 interface for 400GE (no adapter required)
- Supports IEEE 802.3bj KP4 RS-FEC
- Flexible future-proof logic design
- Dual QSFP56, QSFP28, QSFP+, SFP56, SFP28, SFP+, SFP, RJ45 ports

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, 10GEBase-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

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 Ethernet per IEEE 802.3bs
- Advanced KP4 FEC stress testing and analysis
- Physical, PCS/FEC, and Ethernet layer verification
- CFP8 Port

MPM-400AR

- 2x 400G port Ethernet testing per IEEE 802.3bs
- QSFP-DD transceivers and cables with I2C read/write
- 8x50G PAM4 400GAUI-8 electrical interface
- Comprehensive KP4 FEC layer stressing and analysis
- MAC/Ethernet/IP layer throughput & traffic verification
- Multi-Lane Unframed BERT/PRBSQ PAM4 pattern testing
- 2x QSFP56 ports & 2x SFP56 ports for additional testing capability
- Hardware ready for Ethernet Fan-out, 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, and 40 GE
- OTUCn (n=1-6), OTU4, OTU3, OTU3e1, & OTU3e2
- STL256.4 STM256/OC768
- CFP4 and QSFP28 ports

UX400/100G

Test Modules

The UX400-100G modules, with physical interfaces for OTU3, 40GE, OTU4, and 100G Ethernet testing, are a perfect complement to the UX400 Platform when combined with other test modules. The UX400's full range of link and service testing capabilities offer complete DS1 to OTU4 and 10 Mbps to 100GE, Transport and Carrier Ethernet testing in a single compact, multi-port, and multi-user platform.

- CFP, CFP2, CFP4, QSFP28, QSFP
- Up to six 100G CFP2, CFP4, or QSFP28 modules in one UX400, for up to 600 Gbps traffic generation
- Independent multi-test and multi-user environment
- SCPI-based control for scripting

NET-BOX Advanced Ethernet Test Solution

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 that offers a low cost, reliable, high performance FPGA-based alternative to expensive high-end laptops often used for enterprise and speed tests. With a multi-test port architecture, with four 1GE, one 2.5GE test and 4 Gbps full line rate capability, the NET-BOX can truly test the limits to verify Quality of Service (QoS) and assure QoE for the ever-growing high-speed internet service at and beyond 1 Gbps.

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

- App-based Client (iOS and Android)
- Cost-effective: high-end laptops are no longer required for simple QoE home tests
- NET-BOX: 4 RJ45 ports for up to 4GE speed and SFP cage for 1GE and 2.5GE copper
- Simple easy to use UI
- Integrated Bluetooth/WiFi dongle
- Quick and easy QR code pairing
- Ethernet, WiFi, and Bluetooth connection methods available
- Always ready to pair on startup
- Configurable network management settings for connecting through LAN
- Fast boot up time
- Kensington lock
- U-shaped metal for the holder to provide shoulder support carrying capacity
- R-Server compatible
- Built-in step by step testing process and troubleshooting guide
- 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

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