MPX100

Intelligent Ethernet Test Probe

Product Description

VeEX™ MPX100 Metro Probe Expert is an intelligent probe that can be deployed at any strategic network demarcation point or customer location where network service and performance assurance is critical. The MPX100 is compatible with the MX100+ and MX120+ products, or with another MPX100 device to perform on-demand measurements, loopback control, and in-service monitoring. With the intuitive PC software, multiple MPX100 devices can be remotely controlled to perform back to back testing or collect long-term performance measurement results.

Compatible with the MX100+ or MX120+ field instruments, or another MPX100.

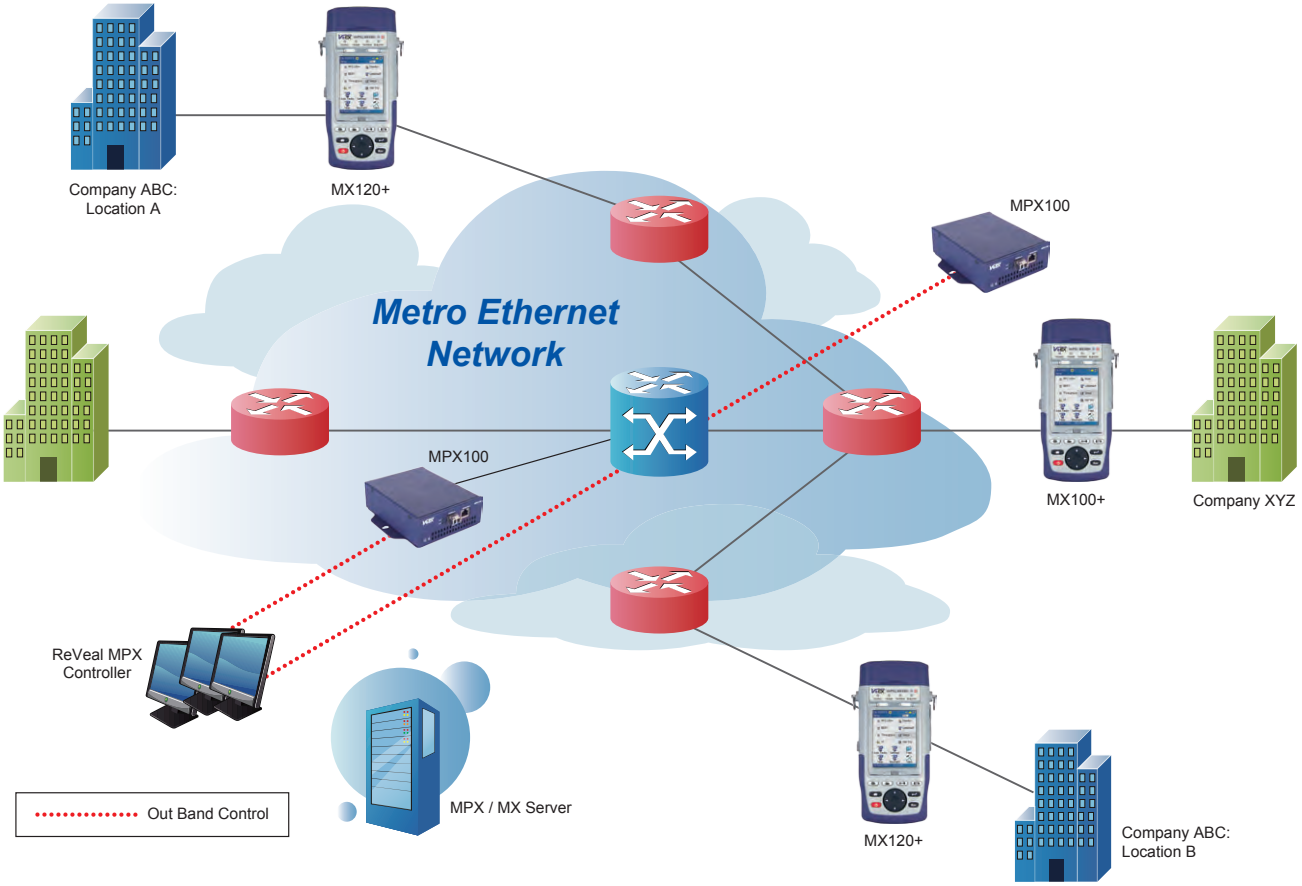
Key Features

- All-in-one Ethernet and Gigabit Ethernet testing
- Full Ethernet testing features on each operating port
- Throughput, latency, frame loss, and back-to-back measurements per industry-standard RFC2544 tests
- RFC2544 Asymmetric mode for testing over asymmetric services such as ADSL
- Ethernet BER testing at Layer 1, Layer 2, Layer 3 and Layer 4, with or without VLAN and MPLS tags
- Q-in-Q (VLAN stacking) and multiple MPLS tag support
- VoIP MOS and R-Factor measurements
- Multiple stream traffic generation and analysis for end-to-end QoS verification of multiple services
- IEEE 802.3ah OAM device discovery and loopback control configuration
- Intelligent device discovery mode; discover other MPX100, MX100+, or MX120+ on the network for quick and easy loopback control configuration
- Smart Loop mode for Layer 1, Layer 2, Layer 3, and Layer 4
- Remote control capability through ReVeal PC software

Ethernet

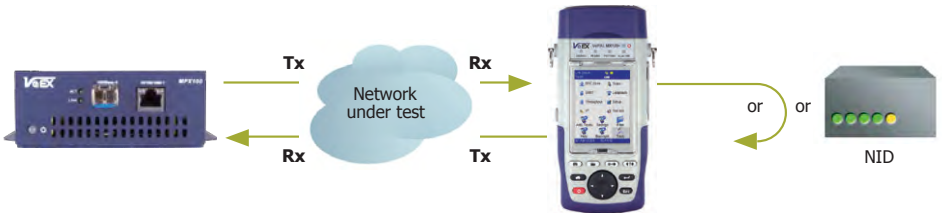
Carrier Ethernet Distributed Testing

When the MPX100 Intelligent Ethernet Probe solution is combined with the handheld MX100+ and MX120+ test sets, a complete end-to-end and distributed test solution becomes available 24/7/365 for on-demand testing and troubleshooting. One or multiple MPX100 can be controlled from the same MPX controller to test from one MPX in the network to another, or to test from the MPX100 to an MX100+ or MX120+ in the field.



End-to-End Performance Testing

Irrespective of Ethernet service being installed, it is always necessary to verify that the network can carry out and cope with the allocated bandwidth required by the customer. Service Level Agreements (SLA) thus compel service providers to measure network throughput and other performance characteristics to ensure that bandwidth associated with different service types conform to customer expectations.



Network Troubleshooting

Service providers constantly face the hard challenge of troubleshooting poor or unsatisfactory network performance. In these circumstances for example, the service provider must determine whether the poor performance is associated with it's own or the customer network. Network monitoring tools like Traffic monitoring play an important role in this troubleshooting process.

Ethernet

Intelligent Network/Device Discovery

Easily discover and select another MX100+ or MX120+ on the network under test for loopback testing applications. The local device will control the operation of the far end device, in either loopback or peer-to-peer mode (or symmetrical or asymmetrical traffic generation mode). This feature greatly simplifies field testing since there is no need for a second technician to be at the far end configuring the test partner device.

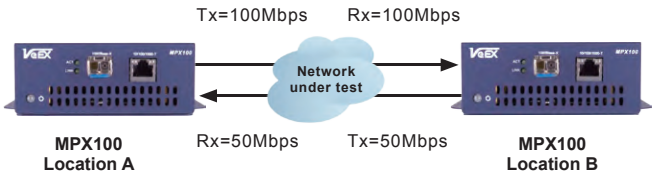
BERT

Layer 1, 2, 3, and Layer 4 BER testing is supported. The BER test can be configured to use regular PRBS test patterns, stress patterns or user defined test patterns to simulate various conditions. All patterns are encapsulated into an Ethernet frame to verify bit-per-bit performance of circuit under test.

One traffic stream is transmitted across the network under test and bit-per-bit error checking is then performed on the received traffic. Service disruption measurements as well as CRC error checking are also performed. The BER test can be performed with a physical loop (or plug) at the far end (for a layer 1 circuit), or a second test unit or intelligent loopback device in Smart Loop or in Peer-to-Peer mode.

RFC2544 Compliance Testing

Perform the RFC2544 automated test suite at all recommended frame sizes including user configurable frame sizes and up to full line rate. The test suite can also be performed with the far end test partner in loopback mode or peer-to-peer mode - the latter allowing for symmetrical/asymmetrical testing. Thresholds may be configured for accurate SLA assurance and verification. The automated tests supported are throughput, latency, frame loss, and back-to-back frames.



Multiple Streams Generation - Throughput Test

Up to eight traffic streams can be independently configured with CoS (VLAN priority) and QoS (TOS/DSCP) prioritization. This traffic feature, simulates multiple service conditions (e.g. Triple Play), and facilitates end-to-end QoS performance verification. The multiple stream throughput test may be performed with a second test unit at the far end in Smart Loop mode or Peer-to-Peer mode.

MAC Flooding

The MAC flooding feature is used in an end-to-end scenario, either for testing a single switch or testing across several switches. Generate up to 4096 MAC addresses sequentially, to verify the performance Ethernet switches MAC learning capabilities and queuing capabilities.

VLAN Flooding

The VLAN flooding feature is used in an end-to-end scenario, either for testing a single switch or testing across several switches. Generate up to 4096 VLAN IDs sequentially, to verify the performance Ethernet and VLAN ID handling.

Smart Loopbacks

Four modes are available for looping back test traffic. At Layer 1, all incoming traffic is looped back unaltered. For Layer 2, all incoming unicast traffic is looped back with the MAC source and destination addresses swapped. For Layer 3, all incoming unicast traffic is looped back with the MAC and IP source and destination addresses swapped, and for Layer 4, all incoming unicast traffic is looped back with the MAC, IP, and UDP/TCP ports swapped.

IEEE 802.3ah OAM Support

Ethernet in the First Mile (EFM) OAM discovery and loopback controls are supported. This allows for the discovery of IEEE 802.3ah OAM-enabled devices and the ability to loopback these devices.

MPLS Measurements

Multiple Protocol Label Switching (MPLS) is a technology that allows for a more efficient routing of Ethernet/IP packets via the use of MPLS routers in the network. MPLS labels reside between the MAC (Layer 2) and IP layers (Layer 3). Up to three MPLS tags can be configured in the traffic stream with user configurable Label, CoS, and TTL fields.

Delay and Jitter Measurements

Frame delay and frame delay variation - Jitter measurements are performed on the test traffic during BER tests or throughput tests.

Q-in-Q (VLAN stacking)

For Metro and Carrier Ethernet applications, VLAN stacking, also known as Q-in-Q, is supported. This feature makes a provision for carrier/service provider assigned VLANs, but also retains the VLAN of customer traffic.

VoIP

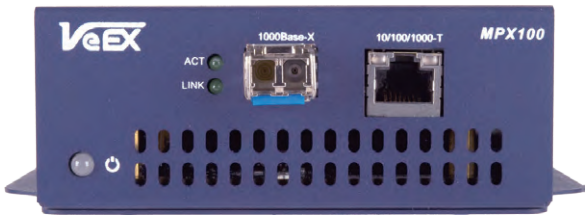
VoIP Expert

The VoIP Expert software option is an effective tool for pre-qualifying VoIP service and verifying triple play implementations. It generates industry standard wave files that allows the user to assess end-to-end VoIP QoS under simulated or live network conditions where packet loss, latency, jitter, and bandwidth congestion all play a role. Compatible with all VeEX testers including VX1000 VoIP server software.

Ethernet

Ethernet Interfaces

Single 10/100/1000Base-T Port: RJ45 connector, IEEE 802.3 compliant
Single 1000Base-X SFP Port: SFP, LC connector



1000Base-SX

Wavelength: 850nm
TX level: -9 to -3 dBm
RX level sensitivity: -20 dBm
Max reach: 550m
TX bit rate: 1.25, 1.0625, 2.125 Gbit/s
RX bit rate: 1.25, 1.0625, 2.125 Gbit/s
Jitter Compliance/Ethernet Classification: Per IEEE 802.3 rec.
Eye Safety: Class 1

1000Base-LX

Wavelength: 1310nm
TX level: -9.5 to -3 dBm
RX sensitivity: -22 dBm
Max reach: 10 km
TX bit rate: 1.25 Gbit/s
RX bit rate: 1.25 Gbit/s
Jitter Compliance/Ethernet Classification: Per IEEE 802.3 rec.
Eye Safety: Class 1

1000Base-ZX

Wavelength: 1550nm
TX level: 0 to +5 dBm
RX sensitivity: -22 dBm
Max reach: 80 km
TX bit rate: 1.25 Gbit/s
RX bit rate: 1.25 Gbit/s
Eye Safety: Class 1

Ethernet Features

Auto Negotiation, Full and Half Duplex, Flow Control

Modes of Operation

Terminate, Monitor, Loopback

Traffic Generation

IEEE 802.3 and Ethernet II (DIX) frames
Configurable MAC, Ethernet Type, VLAN, MPLS, IP, UDP header fields
Constant, Ramp, and Burst traffic profiles
Jumbo Frame Support (10,000 bytes)
Fixed, multiple, and random frame size generation
Traffic prioritization via VLAN priority field, MPLS CoS field and the IP TOS/DSCP fields
Up to 3 VLAN and MPLS tags can be added to each user configured traffic stream

RFC2544 Compliance Testing

Automated tests with configurable threshold values and maximum transmit bandwidth settings
Throughput, Latency, Frame Loss, and Back-to-Back (burst) tests
Frame sizes: 64, 128, 256, 512, 1024, 1280, and 1518 bytes including 2 user configurable frames

Bit Error Rate Testing

Patterns: PRBS 2^31 -1, PRBS 2^23 -1, PRBS 2^15 -1, PRBS 2^11 -1, CRPAT (Layer 1 only), CSPAT (Layer 1 only), CRTPAT (Layer 1 only), Normal and inverted patterns
Error Injection: Bit, CRC, Symbol, IP Checksum
One configurable stream with one fixed frame size

Traffic Filters

Up to eight traffic filters can be configured with MAC, VLAN, and IP fields for Monitor and Loopback modes

Multiple Streams Throughput Testing

Up to eight independent traffic streams with configurable MAC, VLAN, MPLS, and IP fields including traffic prioritization via the VLAN tag priority field and the IP header TOS/DSCP field
% of bandwidth allocation is configurable for each stream
Different traffic profiles may be configured for different streams
Different frame sizes are user configurable per stream

Smart Loop

Layer 1: loops back all incoming traffic
Layer 2: all incoming unicast traffic is looped back with MAC source and destination addresses swapped
Layer 3: all incoming unicast traffic is looped back with MAC and IP source and destination addresses swapped
Layer 4: all incoming unicast traffic is looped back with MAC, IP, and UDP/TCP ports swapped

Key Measurements

Error Measurements: Bit, CRC, symbol, IP checksum, jabber frames, runt frames, collisions, late collisions
Alarm Detection: LOS, pattern loss, service disruption
Frame/Packet Statistics: Multicast, broadcast, unicast, pause frames, frame size distribution, bandwidth utilization, frame rate, line rate, data rate, frame loss, frame delay variation

VoIP

VoIP Expert

MOS and R-factor measurement
Packet Statistics: packet loss, jitter, delay

General Specifications

Size	45 x 110 x 140 mm (H x W x D) 1.75 x 4.25 x 5.5 in
Weight	Less than 1 kg (less than 2.2 lb)
AC Adaptor	Input: 100-240 VAC, 50-60 Hz Output: 15VDC, 3.5A
Operating Temperature	-10˚C to 50˚C (14˚F to 122˚F)
Storage Temperature	-20˚C to 70˚C (-4˚F to 158˚F)
Humidity	5% to 95% non-condensing
Interfaces	USB 2.0, RJ45, 10/100-T Ethernet

Ordering Information

Z03-00-003P	MPX100 Intelligent Ethernet Test Probe

Interfaces/Test Options

499-05-020	MPX100 1000Base-T (enable 1000T copper interface rate; no additional item required)
499-05-021	MPX100 1000Base-X (enable optical interface, requires separate SFP)
499-05-022	MPX100 Multi Stream Test
499-05-023	MPX100 MPLS Tags
499-05-024	MPX100 Jitter Measurements
499-05-026	MPX100 MAC Flooding
499-05-027	MPX100 Asymmetric Testing
499-05-029	ReVeal MPX Server Package (software only)
499-05-033	ReVeal MPX Server Maintenance Contract (required per year after the first year)
499-05-094	MPX100 VLAN Flooding
Z33-00-001	VoIP Expert

SFP Transceiver Options

301-01-001G	850nm SX (550m) SFP - 1GE, 1G/2G FC
301-01-002G	1310nm LX (10km) SFP - 1GE, 1G/2G FC
301-01-003G	1550nm ZX (90km) SFP - 1GE, 1G/2G FC

Recommended Accessories

F05-00-001G	LC-LC-M Patch Cord
F05-00-002G	LC-LC-S Patch Cord
F05-00-003G	LC-SC-M Patch Cord
F05-00-004G	LC-SC-S Patch Cord
Z77-00-004G	Single Unit - Wallmount Brackets
Z77-00-005G	Four Unit - Rackmount Brackets

Replacement Items

A01-00-002G	AC Adaptor (3-prong) for metal box
C01-00-001G	Carrying Case for V100
F02-00-001G	Ethernet Cable RJ45 to RJ45 2 m (6 ft)
F04-00-004G	Power Cord - US 2 m (6 ft)
F04-00-005G	Power Cord - EU 2 m (6 ft)
F04-00-006G	Power Cord - UK 2 m (6 ft)
Z99-99-002G	SFP Container

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