MTX640

Dual 100G/400G Portable Test Set

400G Down to 10M Ethernet Testing

True All-in-One, from 10M to 400GE
Dual test ports for 100G and below, and single 400GE test port,
Up to two independent tests
Best-in-class intelligent cooling system

NEW



Compact 2x100GE and 1x400GE Multi-service Handheld Test Set

VeEX MTX640 is the industry's most compact dual 100GE portable test solution, upgradeable via software to single 400GE. With a 7-inch capacitive LCD and intuitive user interface, it is the fastest to operate, and most flexible 100/400GE solution. From boot-up to dual 100GE testing in under two minutes, the MTX640 is truly in a class of its own.

Highlights

The MTX640 is an advanced handheld test solution designed with dual test engines, enabling comprehensive support for both legacy and next-generation optical transceiver form factors across a broad spectrum of applications, including Transport, Core, Metro, P2P links, DCI, transceivers, AOC, AEC, ACC, and DAC. It also offers native RJ45 (copper) interface support for rates up to 10G BASE-T, addressing the requirements of modern multi-gigabit access services.

Optimized for fast field operations, the MTX640 goes from power-up to dual 100GE testing in under two minutes, making it exceptionally suited for time-critical tasks, such as troubleshooting transceiver, network equipment verification, installation, maintenance, and commissioning tasks. With the industry-wide adoption of 400GE, the MTX640 is easily upgradeable for 400GE testing via a software option. Its intuitive graphical user interface (GUI) helps streamline the test process, empowering users to perform advanced testing immediately with application-specific test applications.

Representing a new standard in high-speed Ethernet (HSE) testing, the MTX640 is designed for user accessibility, minimizing onboarding time and simplifying complex test procedures for operators at any experience level. As a result, it is an essential tool for professionals engaged in high-speed Ethernet deployment.

- Dual 100GE concurrent testing capabilities
- Single 400GE and 200GE (software option)
- Offers dual ports for all pluggable optics form factors, required for AOC/DAC, and wrap-around tests (from 10M to 100GE)
- Native PAM4 hardware for best-in-class signal integrity (no adapters required)
- Supports testing for all common form factors, including QSFP-DD, QSFP56, SFP-DD, and SFP56 transceivers, DACs, AOCs, network equipment and 400GE links
- Wide range of supported 100/400GE interfaces, including 400GBASE-SR8, FR8, LR8, DR4, FR4, LR4, 100G LR1, FR1
- Complete industry-standard Ethernet for Layers 2, 3 and 4
- Stateful TCP Performance Test up to 400GE
- I2C/MDIO registers Read and Write
- Per-lane PAM4 host pre-emphasis settings
- Signal integrity check with FEC codeword symbol errors distribution and Skew
- Transceiver power consumption monitoring (voltage, current) and variable voltage supply
- Internal and external (cage) QSFP-DD temperature monitoring with overheating protection
- Battery operation improves mobility and efficiency
- High-efficiency intelligent cooling system

Test Ports

Supported Test Interface (Ports)	MTX640
1x QSFP-DD/QSFP56	●
2X QSFP28/QSFP+	●
2x SFP-DD/SFP56/SFP28	●
2x SFP+/SFP	●
2x RJ45	●
1x SMA Clock Input	●
1x SMA GPS/GNSS antenna	●
Test Applications	
400GE	●
200GE	●
100GE	●
50GE	●
40GE	●
25GE	●
10GE	●
1000BASE	●
100BASE	●
10/100/1000BASE-T	●
2.5G/5G/10GBASE-T	●

Applications

- Bring-into-service, verification and troubleshooting of high-speed Ethernet links (Transport, Core, DCI, Node, Metro, Access, P2P)
- Optical transceivers verification
- DAC, ACC, AEC, and AOC verification, requiring full dual port capabilities
- Evaluation labs and field support
- Comprehensive test applications for layers 1-4, from 10M to 400GE
- Full rate 400GE Throughput and frame loss measurements
- PCS & RS-FEC layer testing
- PAM4 signal integrity testing with multi-lane unframed BERT
- I2C/MDIO verification and programming
- Advanced optical transceiver test
- Portable for field testing, evaluations, demonstrations, interop check, benchmarking, troubleshooting, link verification, etc
- Maintenance and troubleshooting of legacy transmission equipment, interfaces and links
- Robust construction and enhanced cooling for field applications





PAM4 Interfaces

- Native PAM4 support for 400G QSFP-DD, QSFP56, SFP-DD, SFP56, transceivers
- 400GBASE-SR8, FR8, LR8, DR4, FR4, LR4
- Supports IEEE 802.3bs and MSA compliant transceivers
- Cage temperature monitoring
- QSFP-DD high-temperature warning threshold, overheat protection and field-replaceable external QSFP-DD head cooling system
- Per-lane post and pre-emphasis settings
- Lane BERT with independent test patterns

MDIO Read/Write

- Complete MDIO I2C access
- Raw read/write capability for all MDIO registers
- Formal display of commonly used fields
- Module hardware control pin read/write access

Optical Power Measurement

- Global and per lane output enable/disable
- Received per lane and composite optical power level monitoring

Transmit Clock Sources

- Internal XO quartz oscillator and optional GPS 1PPS
- Recovered: from the incoming signal

Line Frequency Offset Generation

- Line frequency offset generation ±100 ppm in steps of 0.1 ppm

Line Frequency Measurement Capability

- Displays measured transmit line frequency in kHz
- Displays measured transmit line frequency offset from reference clock in current, min, max ppm
- Measures all lanes

Stress Test: Pre and Post-FEC Test Suite

- Simple one button pass/fail test for verifying all transceiver properties
- Advanced user defined thresholds
- Simple test report includes settings, Pass/Fail, and detailed results
- Frequency pulling range stress test
- Pre and Post FEC test

Advanced Optical Transceiver Test Suite

Applications

- Transceiver Check - A robust test suite for checking the health of optical transceivers, designed to validate the performance, reliability, and interoperability of high-speed transceivers such as QSFP-DD, QSFP56/28/+, SFP-DD, SFP56/28/+, and others. These tests help confirm signal integrity and module reliability under real-world conditions.
- Interoperability Assurance - Testing tools simulate various operating environments to ensure modules work across different platforms and vendors. This is especially important when integrating third-party components into existing systems. The I2C read/write access function also allows for deep diagnostics and settings to troubleshoot new vendors, models, early evaluation of samples (beta or alpha).
- Benchmarking different models and vendors

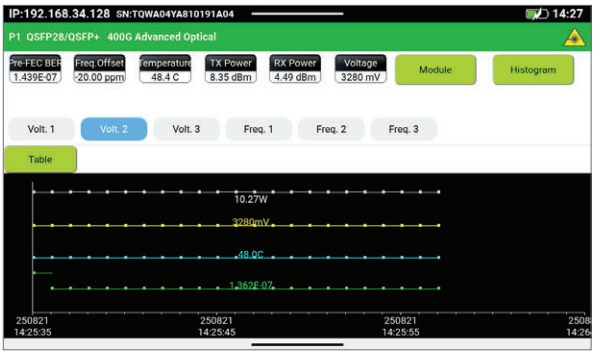
The Advanced Optical Transceiver Test Suite includes:

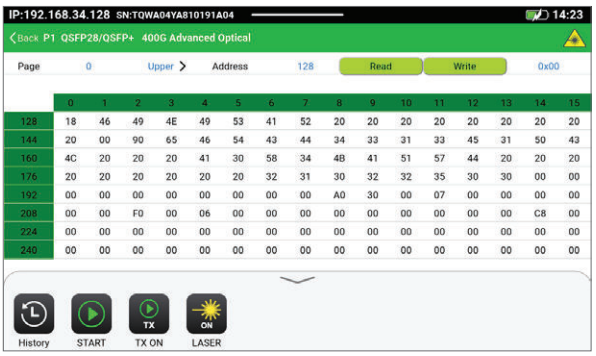
- Power Supply Voltage Sweep: ±5% range to test voltage tolerance
- BER (Bit Error Rate) Performance: Customizable thresholds to assess signal integrity
- Clock Frequency Pulling Range: ±100 ppm to simulate timing variations
- Pre-Emphasis Adjustment: For signal conditioning
- I2C Read/Write Access: For module diagnostics, settings and troubleshooting
- Temperature Monitoring: Transceiver (internal)l and cage (external)

The tests can be run manually or in sequence, with results displayed in summary tabs indicating pass/fail status and detailed diagnostics. By automating test sequences and providing clear pass/fail summaries, these tools reduce manual effort and speed up validation cycles.

Multi-lane Unframed BERT Testing

Per lane BERT testing for transceiver and equipment characterization and acceptance testing





Test Patterns
- PRBS, PRBS31Q, PRBS13Q normal or inverted
- Per lane test pattern selection
- Pre-FEC error threshold definition
- Error Generation
- Bit error per lane and global
- Insertion: Single

Error Measurement
- Per lane loss of pattern sync
- Per lane bit error count, average and current bit error rates
- Aggregate bit error results
- Events table tracking

Ethernet Testing

Reliability, scalability and Quality of Service are the attributes needed for Ethernet to turn into carrier-grade Ethernet. With standard features including RFC2544, Y.1564, Throughput, MPLS and VLAN support, this test set has all the tools necessary to truly ensure end-to-end carrier-grade Ethernet services.

Key Features
- Transmit frequency offset to stress the network up to 100 ppm
- Optical Lane BERT
- FEC Layer Testing with Skew generation/monitoring
- PCS Layer Testing with Skew generation/monitoring
- Throughput, latency, jitter, frame loss, and back-to-back measurements per industry-recommendation RFC2544
- ITU-T Y.1564 support
- Multi-stream testing with up to 32 fully independent and configurable streams
- IPv4 and IPv6 traffic generation
- MAC Flooding
- Q-in-Q (VLAN stacking) and multiple MPLS tag support
- BER testing at Layer 2 and Layer 3 with or without VLAN and MPLS tags
- Smart Loop mode for Layer 2, Layer 3, and Layer 4 with all key measurements on received traffic provided on the loopback port
- One-way latency measurement between remote devices (with GPS synchronization)
- Line rate packet capture with Wireshark™ decode

Test Interfaces
MSA compliant transceiver interfaces
QSFP-DD
- 400GBASE

QSFP56/QSFP28/QSFP+
- 200GBASE
- 100GBASE-R

SFP-DD/SFP56/SFP28
- 100GBASE-R
- 50GEBASE-R
- 25GBASE-R

SFP+/SFP
- 10GBASE-X
- 1000BASE-X
- 100BASE-FX

RJ45
- 10/100/1000BASE-T
- 2.5G/5G/10G BASE-T

400GE/200GE Testing
- Layer 2-4 support
- Throughput (16 streams)
- Service Disruption Time measurements
- RFC2544
- ITU-T Y.1564 (V-SAM)
- IP Functions: Ping, Trace Route, ARP
- Packet Capture (PCAP) and Decoding
- PCS/FEC Analysis
- Multi-lane Unframed BERT Testing

100GE/50GE/40GE Testing
- Throughput (32 streams)
- V-SAM (ITU-T Y.1564)
- RFC2544
- PCS analysis
- IP Functions: Ping, Trace Route, ARP
- Loopback: Layer 2 and Layer 3
- Multi-Lane Unframed BERT testing
- Packet Capture (PCAP) and Decoding

25GE/10GE/1GE Testing
- 10/100/1000/2.5G/5G/10GBASE-T
- Throughput (32 streams on 10GE and 25GE), 16 on RJ45
- V-SAM (ITU-T Y.1564)
- RFC2544
- IP Functions: Ping, Trace route, ARP
- Loopback: Layer 2 and 3
- Packet Capture

Transceiver Test Applications*

Information Display
- Displays commonly used transceiver information saved in the I2C registers such as vendor name, part number, serial number, HW/FW revisions, power class, etc.

QSFP-DD Application Advertising
- Provides the modules, programmed capabilities
- Programs the modules internal settings

Laser (ITLA) Tuning
- Grid spacing, channel number, frequency, wavelength
- Fine tuning offset
- Displays modules, internally reported frequency and wavelength measurements
- Displays modules, programmed capabilities

Coherent Optical Power
- Coherent optical power adjustment and measurement

Optical Power
- Global and per optical lane power output enable/disable
- TX and RX per lane and broadband optical power level monitoring
- Current, min and max measurements
- Verifies transceiver internal or user defined thresholds for high alarm, high warning, low alarm, and low warning alarms

TX Bias Current
- Current, min and max measurements
- Verifies transceiver internal or user defined thresholds for high alarm, high warning, low alarm, and low warning alarms

Coherent QSFP-DD C-CMIS Media and Host Performance Monitoring Stats (PM)
- Media Lane PM: Frames with Uncorrectable Errors, Corrected Bits, Frames, and Bits
- Data Path Host Interface PM: Frames with Uncorrectable Errors, Corrected Bits, Frames, and Bits
- Chromatic Dispersion
- Differential Group Delay
- Second Order Polarization Mode Dispersion
- State of Polarization Rate of Change
- Polarization Dependent Loss
- Carrier Frequency Offset
- OSNR
- eSNR
- Error Vector Magnitude
- TX Optical Power
- RX Optical Power
- RX Optical Signal Power
- Modulation Error Ratio

*Note: Features are dependent on the installed pluggable transceiver.

Temperature Monitoring
- Internal and cage temp monitoring
- Current, min and max measurements
- Verifies transceiver internal or user defined thresholds for high alarm, high warning, low alarm, and low warning alarms

Variable 3.3V ±5% Transceiver Power
- Each port supports a variable 3.3V transceiver power supply to qualify transceiver specifications
- Provides host estimated current, min, and max transceiver power, voltage, and current measurements
- Displays the transceiver internal current, min, and max voltage measurements
- Verifies transceiver internal or user defined thresholds for high alarm, high warning, low alarm, and low warning alarms

I2C
- Complete I2C register read/write access

Advanced Optical Transceiver Test Suite
- Pre-FEC BER validation on a per-lane basis, over operational voltage and frequency offset range to verify optical module integrity before FEC is applied to the PAM4 signal
- Pre-Framed BER (Lane BERT) validation for non PAM4 interfaces
- Voltage, temperature, and Pre-FEC BER are monitored and displayed for the duration of the test. A histogram function clearly displays all three measurements for easy correlation and tracking of any abnormal changes.
- Pre-FEC BER and Optical Power threshold settings for PASS/FAIL indication
- Pre-emphasis: Pre-taps, post-taps, and attenuation settings for PAM4 signal conditioning on the host side to help verify and stress transceiver tolerance and performance
- Supply Voltage Tolerance Verification: Sweep range from 3.135V to 3.465V (3.300V +/- 5%) to verify compliance with optical transceiver MSA standard
- Power Consumption Verification: Monitors the optical transceiver's power consumption (Watts), to verify conformance to its specified power class
- Temperature Monitoring: QSFP-DD module and cage temperature monitoring with built-in shutdown protection of the optical module if the temperature increases beyond a certain high temperature
- Frequency Tolerance Verification: Sweep range from -100 ppm to +100pm (in 0.1ppm/step)
- I2C Baud Rate Sweep: QSFP-DD and OSFP sweep range 100K to 4000K. QSFP28 sweep range (20K to 1000K).FEC & Skew Layer Analysis

FEC & Skew Layer Analysis

FEC Lane
- FEC lane identification
- FEC Codeword error distribution (signal integrity)

Skew Analysis
- Per lane skew analysis in bit time and picoseconds
- User defined alarm threshold for received skew measurement Error Measurement
- Supports counts, current and average error rates
- FEC Correctable Codeword
- FEC Correctable Symbol
- Correctable Bits, Ones, Zeroes
- FEC Uncorrectable
- FEC Symbol Error Distribution
- 256B/257B transcoding error

Alarm Measurement
- Per lane FEC alignment marker loss
- FEC LOA, LoAMPS
- High SER

Ethernet/IP

Traffic Generation/Test Stream Flow
Test flow is generated with a signature field in the beginning of the UDP payload area for traceability and measurement purposes
- MAC/IP/UDP formatted traffic generation
- IP Version: IPv4 or IPv6
- MAC/IP/UDP source and destination addressing
- User defined Ethernet Type, Traffic Class, Hop Limit, Flow label fields
- Frame sizes: 64 to 16,000 bytes
- Test Pattern: Variable
- VLAN tags up to 4 levels with user defined TPID, PCP/QOS, DEI, VID
- MPLS tags up to 4 levels with user defined label, TC, S(bottom), TTL

Traffic Rate Generation
- Full rate generation and analysis
- Constant rate by % BW and Mbps

Error Generation
Supports single and rate generation.
- Test pattern bit and sequence errors
- IP Checksum

Alarm Generation
- Remote and local fault alarms
- Auto reply to local fault

Results

Result Filtering
- Results can be filtered by VLAN tag TPID

Transmit and Receive Port Counts
- Packets, packets/second, bytes, Mbps, % BW
- VLAN packets, MPLS packets
- IPv4 & IPv6 packets

Receive Port Counts
- UDP, IGMP, ICMP packets
- Broadcast, multicast, unicast
- Jumbo, super jumbo packets (greater than 9000 bytes)

Distribution Results
- VLAN distribution by tag level and quality of service level
- MPLS distribution by tag level and traffic class
- Packet size distribution for 64, 65-127, 128-255, 256-511, 512-1023, 1024-1518, 1519–max byte ranges with support for counts, percentage and graphing

Utilization Counts
- Total, IPv4, IPv6, VLAN, MPLS
- Current, min, max, and average % BW, Mbps, and packets per second statistics for generated and received traffic

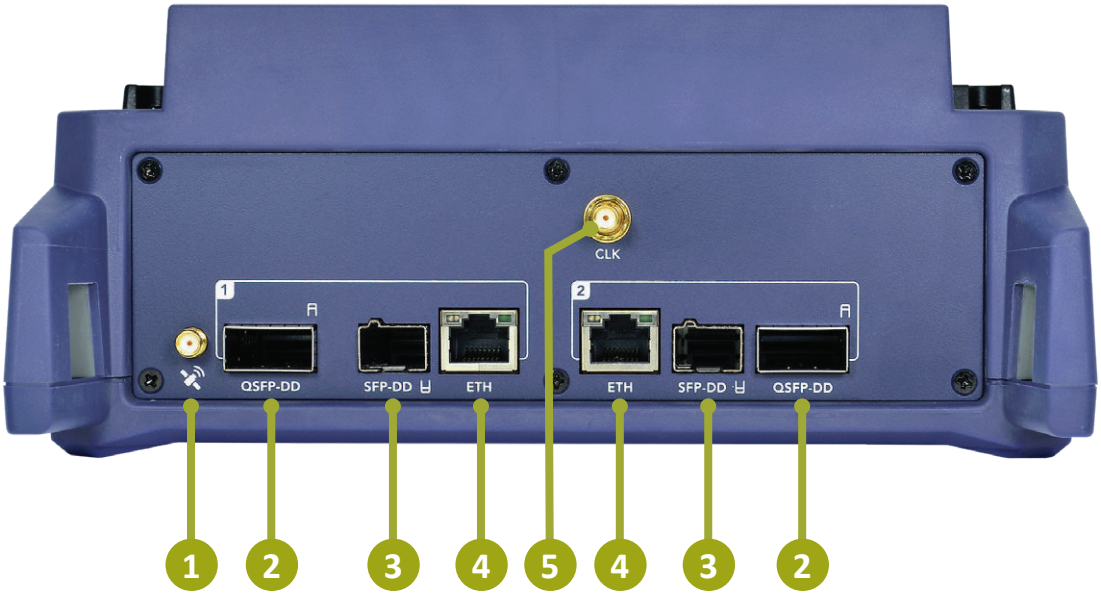
Errors
Displays counts, errored seconds, current and average error rates
- Code, undersized, invalid FCS, invalid IP

Alarms
- Loss of link, local fault, remote fault

Test Stream Results
- Transmitted and received packet counts, byte counts and rate in %BW
- Test stream sequence errors, bit errors and lost frame counts in errored seconds, current and average rates
- User-defined pass/fail threshold alarm from sequence errors, bit errors and lost frames
- Latency min, max, and average measurements in microseconds
- Packet jitter min, max, and average measurements in microseconds

Test Results & Reports
- LEDs and detailed statistical counters
- Graphs and Histograms
- Event log history showing event, count, day/time, and duration
- Test reporting options including PDF

Test Profiles
Supports save and restore of test profiles



1. **SMA, GPS/GNSS**
2. **1x QSFP-DD/QSFP56 (400/200G) Port 1**
   2x QSFP28/QSFP+ (100/50/40G), Port 1&2
3. **2x SFP-DD/SFP56/SFP28/SFP+**
   (100G, 50G, 25G, 10GE, 1GE)
4. **2x RJ45 10/100/1000BASE-T, 2.5G/5G/10GBASE-T**
5. **SMA External Clock**

General

Data Storage	
Internal	32 GB Flash storage
External[1]	USB Memory sticks and SSD dongles
Remote[1]	Upload via VeSion R-Server, Bluetooth and Browser
Connectivity/Management	
Ethernet	1x RJ45 10/100/1000BASE-T FDX
Wi-Fi[1]	Built-in, 802.11a/b/g/n
Bluetooth[1]	Built-in, v4.2
USB	1x USB Type-A
	1x USB Type-C (USB-C)
Precision Clock Sources	
GNSS Receiver[1]	SMA(f) antenna input with 5 VDC power
	Dual band GPS/GLONASS/ Galileo/Beidou
External Clock In	SMA(f)
Display (LCD)	
Size	7” (154.2 x 84.92 mm)
Type	TFT Color LCD, 1024 x 600 pixels
Input	Capacitive multi-touch
Dimensions[2]	
(W x H x D)	226 x 190 x 85 mm
	8.90 x 7.48 x 3.35 in
Weight[2,3]	2.3 kg (5.0 lb)
Battery	
Type	High-capacity Li-Ion
Autonomy	>1 hour running 2x 400GE tests
AC/DC Adapter	
AC Input	100-240 VAC, 50-60 Hz
DC Output	160 W, 24 VDC, 6.67 A
Environmental	
Operating Temp.[4]	0˚C to 40˚C (32˚F to 104˚F)
Storage Temp.	-20˚C to 70˚C (-4˚F to 158˚F)
Humidity	5% to 90% non-condensing
Compliance	RoHS, WEEE, CE

1 Optional.
2 Excludes transceivers, optional hardware, and accessories.
3 Depends on hardware configuration.

4 Performance for up to 100G applications. For 400GE applications it is recommended to be operated below 32°C (90°F).

**All trademarks are property of their respective owners*

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