



UX400 and UX400R

Universal Test Platform



Next Generation Modular Platform for Transport, Carrier Ethernet, Mobile Backhaul, and Legacy Testing

VeEX® UX400/R is the industry's most flexible, and future-proof rack-mounted test solution for OTN, SDH, SONET, PDH, T-Carrier, Carrier Ethernet, Mobile Backhaul, Core, Storage Area Networks, Fiber Optics, and WDM¹.



VeEX portable UX400 and UX400R rack-mount chassis offer test capabilities ranging from DS1/E1 to 6x 100GE and beyond, allowing any combination of test modules tailored for each particular application.

Its versatile and flexible hardware and software architecture optimize configurations to meet users' specific needs. This includes transport applications at rates ranging from DS1/E1 to OC-768/STM-256/OTU3 and OTU4 to Carrier Ethernet Transport applications from 10M to 40GE/100GE, Fibre Channel from 1G to 16G, CWDM/DWDM and beyond¹.

Its modular architecture allows for up to six independent test modules and up to twelve concurrent combination of tests. It also allows simultaneous users to share the platform and run independent tests, maximizing the use of resources.

Its browser-based multi-user remote access and an intuitive graphical user interface simplifies menu navigation, accelerates test setup, and enhances presentation of results.

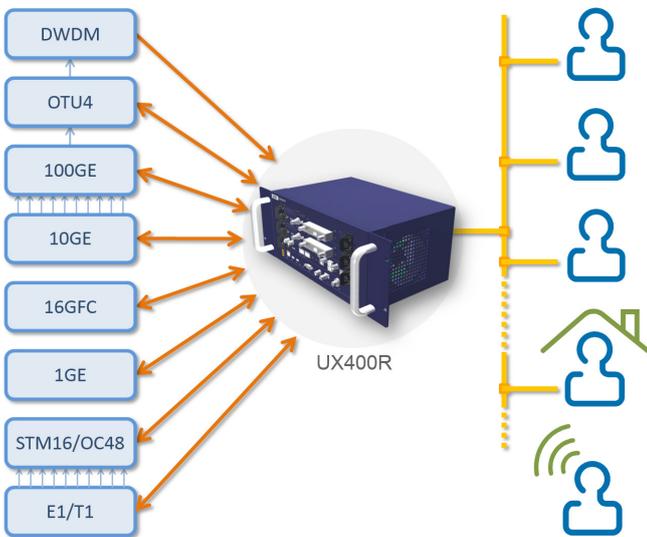
¹ Test interfaces, data rates, mappings, transmission protocols, and features depend on the availability of individual test modules.

Platform Highlights

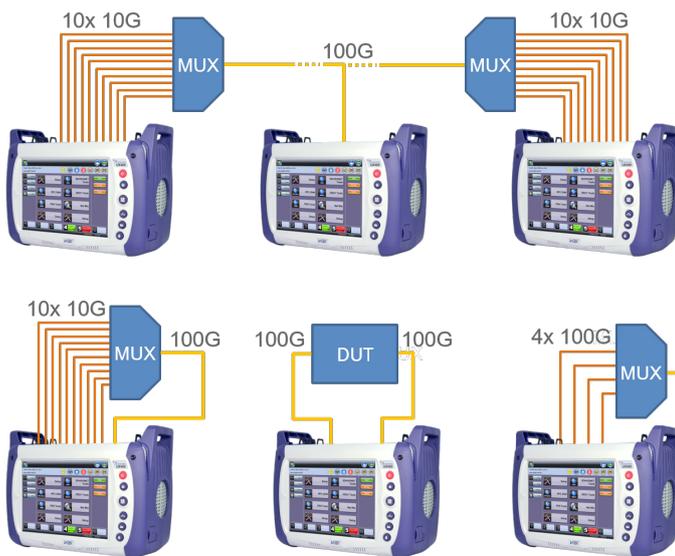
- Intuitive Multi-user graphical user interface (GUI)
- Multi-test - up to 12 independent concurrent tests, allowing virtually any combination of technologies and rates
- Robust chassis packed with powerful and flexible features for demanding test environments
- SCPI scripting/remote control and VNC® support
- Browser-based multi-user client for remote access
- Fast and efficient test result transfer to USB memory stick or FTP upload
- Built-in optical power meter and visual fault locator option
- Built-in GPS receiver option for system clock synchronization
- Built-in Atomic clock option, which can be disciplined and calibrated by the GPS signal
- Industrial grade SSD (Solid State Disk)
- Portable version includes a high capacity Li-ion battery pack for interrupted testing, portability and weighs less than 10 kg
- 19" Rack-mount version
- Built-in VGA monitor port for external monitor or projector connection
- Operate with USB mouse and keyboard
- Maintain instrument software, manage test configurations, process measurement results and generate customized test reports using included ReVeal™ software

Multi-port, Multi-tasking, Multi-user

A powerful combination offering a high density of test ports with the flexibility of individual or combined concurrent tests for local and remote users, in a compact package. The UX400R can replace a rack full of stationary test gear.



Up to 12 independent test ports: Six test modules with up to two independent test ports each, and more than 12 concurrent users provide great flexibility by allowing virtually any combination of technologies, rates and test scenarios. Such as, testing 100G and 400G multiplexers and muxponders or evaluating and troubleshooting network elements. All rounded up with various ways to interact with the system, from local touch screen to multiple ways to access it remotely.



Available Test Modules*

The UX400 family of test modules, with all their physical interfaces and data rates, enable a full range of link and service testing capabilities for a complete DS1/E1 to OTU4, 10 Mbps to 100G Ethernet, 1G to 16G Fibre Channel, CPRI/OBSAI, PTP and Fiber Optics testing in a single compact unit.

Fast troubleshooting and comprehensive analysis of physical, transmission and service problems can be performed using an intuitive interface, local or remote. Novice users will benefit from the easy-to-use GUI, while experienced users will appreciate the array of advanced features.

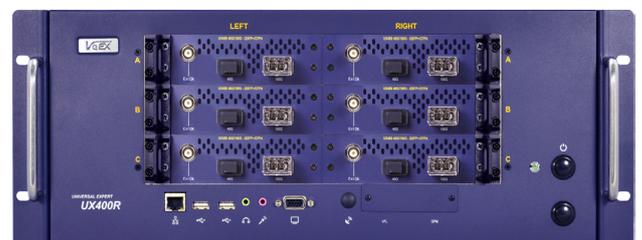
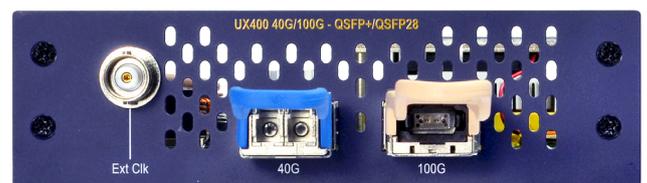
The modules can be housed in the UX400 Platform for portable, field test applications or can be mounted into a UX400R 19" rack-mount chassis for R&D lab or production environments.

**See individual module data sheet for more details.*

40G/100G Module (UX400-100G)

Available with native support for all pluggable optics form factors, this high-speed OTN, SDH and Ethernet test module offers all the standard installation, commissioning and maintenance tests, as well as advanced features such as OTL/PCS, CAUI/XLAUI Lane BERT, overhead monitoring and byte control, Tandem Connection Monitoring, protocol capturing and decoding, traditional BERT and throughput test, and much more.

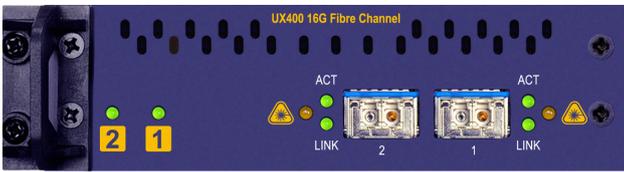
- 40GE and 100GE Layer2/3 Throughput/BERT, RFC2544, and PCS Layer testing
- OTU3, OTU4, STL-256.4 and STM-256/OC-768 testing
- IEEE 802.3ba and 802.3bj RS-FEC 100G Ethernet
- Available in CFP2, CFP4 and QSFP28 100G form factors and QSFP+ 40G
- No adapters required



Dual 16G FC Module (UX400-16G)

Offers multi-rate wire-speed traffic generation at all commercially available Fibre Channel rates with FC-2 BERT for link integrity testing. Also supports latency and buffer-to-buffer credit measurements for SAN installation, commissioning and troubleshooting tasks.

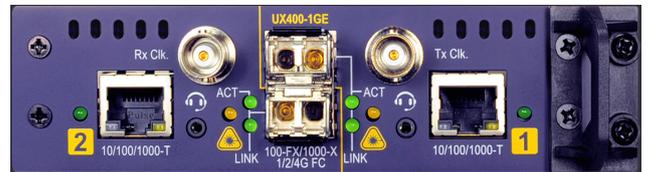
- 1/2/4/8/10/16G FC
- FC-1 and FC-2 BERT and Throughput testing
- RFC2544 Verification



Dual 1GE Module (UX400-1GE)

Provides testing for 10/100/1000M Ethernet and 1/2/4 G Fibre Channel technologies, with support for industry standard tests like RFC2544 and loopback tests. The Ethernet module also offers synchronization protocol testing tools with SyncE and 1588v2/PTP support.

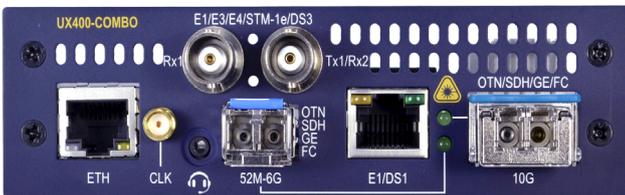
- 10/100/1000Base-T and 100Base-FX/1000Base-X ports
- Fibre Channel 1/2/4G
- IEEE 1588v2/PTP and SyncE



Multi-Service Module (UX400-Combo)

Convenient all-in-one test solution for OTN, SDH, SONET, PDH, DSn networks, combined with extensive support for Mobile Backhaul technologies such as SyncE, 1588v2 PTP, Carrier Ethernet, Fibre Channel, CPRI/OBSAI and Synchronization testing. Ideal for modern multi-technology end-to-end service verification.

- Ethernet 10GE-LAN and 10GEWAN
- IEEE 1588v2/PTP, SyncE, Wander and Phase
- Fibre Channel 1/2/4/8/10G
- CPRI/OBSAI testing
- OTN OTU1, OTU2, OTU1e/2e, ODU0, ODUflex
- SDH STM-0/1/4/16/64 and SONET OC-1/3/12/48/192
- PDH E1/E3/E4 and DSn DS1/DS3



Dual 2.5G Module (UX400-2.5G)

Adds lower rate testing for OTU1, SDH, SONET, legacy PDH and DSn/T-carrier interfaces, is a perfect complement to the UX400/R, increasing its port density and enabling a full range of link testing, capabilities from DS1/E1 to OTU4.

- OTN OTU1
- SDH STM-0/1/4/16 and SONET OC-1/3/12/48
- PDH E1/E3/E4 and DSn DS1/DS3



Dual 10G Module (UX400-10G)

Simplified installation, commissioning, monitoring and maintenance of OTU2/2e, STM-64, OC192, 10G Ethernet and 8/10G Fibre Channel networks, thanks to a combination of intuitive features and powerful test functions. Fast troubleshooting and comprehensive analysis of transmission problems can be performed using intrusive, non-intrusive and monitoring test modes. Its dual interface allows high port density testing (e.g. 10x 10GE into a 100G in a single UX400 chassis).

- Ethernet 10GE-LAN and 10GEWAN
- Fibre Channel at 8G and 10G
- OTN OTU2, OTU1e/2e, ODU0, ODUflex
- SDH/SONET STM-64/OC-192 with lower rate payloads



OSA Module (UX400-OSA)

Optical Spectrum and Advanced Channel Analyzer for CWDM and DWDM Networks. Using state-of-the-art micro-optic design and MEMS tuning technology, the UX400/R OSA module measures all key optical parameters with simplicity, accuracy and robustness. High reliability is achieved through a rugged mechanical design with no moving parts that does not require periodic calibration.

- Continuous fast-scanning spectrum analysis
- S, C and C+L band wavelength ranges
- Supports modulation schemes used for 10/40/100G
- Simultaneous measurements of up to 160 channels
- Wavelength, power and OSNR measurements



Optical Tools

Optical Power Meter

The optional OPM helps checking for proper output power from optical ports before safely making an optical connection or running a test

Wavelength Range: 800 to 1700 nm

Calibrated Wavelengths

- MMF: 850 nm
- SMF: 1310, 1490, 1550 nm

Power Range: -50 to 23 dBm

Accuracy: ± 0.5 dB

Display Units: dBm

Fiber types: 9/125 to 100/140 μ m

Connector: Universal 2.5 mm adapter

Visual Fault Locator

The optional built-in VFL provides a convenient tool for identifying fibers and checking them for bends, breaks or continuity

Modes: CW and 1 Hz

Visible Wavelength: 650 nm

Power output: 5 mW / 7 dBm

Connector: Universal 2.5 mm interface for quick and easy connection

Digital Fiber Inspection Scope

Digital video microscope probes* can connect directly to the UX400 platform through one of the USB2.0 ports. Featuring live video feed on the UX400 screen for visual analysis. It offers capture, compare (before and after), save and export files to USB flash drives.

Dirty connectors could damage or degrade the performance of expensive optical modules, or produce inaccurate results. Inspecting and cleaning patch cords and pluggable optics connectors before mating them is always recommended.

**Check with factory for supported models.*

Connectivity Tools

IP Tools (Management Port)

Built-in Ethernet port

Supports connection profiles (save and retrieve)

Modes: IPv4, IPv6, PPPoE

MAC Address: Factory default or user configurable

Network

- VLAN: Up to two tags
- IP Modes: Static, DHCP
- DHCP Modes: Unicast, Broadcast
- Host Name: user configurable
- Client ID: Auto, Manual, Disabled
- Client FQDN: Auto, Manual, Disabled
- Vendor Class ID: User configurable

Ping testing

Ping Test (Connectivity Check)

Configuration

- Supports test profiles (save and retrieve)
- Destination: IP address or URL (DNS)
- Packet Size: 46 to 1518
- # of Pings: 1 to 10000
- Ping Rate: 1 to 1000 ping/s
- Continuous generation (ON/OFF)

Ping Results

- Sent, Received, Missing, Unreachable

Round Trip Delay

- Current, Minimum, Maximum, Average
- Resolution: 0.001 ms

Wi-Fi Wiz (Wireless LAN)

Optional 802.11b/g/n USB dongle

Access Point Scan and Connection

- SSID, Encryption, channel, frequency, signal strength, link quality, MAC address
- WEP, WPA, WPA2
- 2.4 and 5 GHz (USB dongle dependent)

Network

- VLAN: Up to two tags
- IP Modes: Static, DHCP
- DHCP Modes: Unicast, Broadcast
- Host Name: user configurable
- Client ID: Auto, Manual, Disabled
- Client FQDN: Auto, Manual, Disabled
- Vendor Class ID: User configurable

Ping testing

Management & PC Tools

Web-based Multi-user Remote Access

UX400 offers flexible and convenient remote accessibility features by using standard web browsers as thin clients, with all functions served directly from the test platform itself. Remote users can start up to six independent GUI-based test scenarios from different computing platforms, including PC, MAC, Linux, as well as Android and iOS compatible tablets and phones. No software or app installation required.

Platform Remote Control

- UX400 screen mirroring (shared view)

Independent Remote Test Sessions

- Initiate/release sessions, assign/release modules, select test modes, start/stop test
- Up to six independent users
- Up to six independent test
- Users are allowed to run multiple tests
- Independent GUI for each user and test
- View available modules and ports
- View current test sessions and owners
- Individual test can be identified by their individual customizable name
- Each UX400/R can be labeled to identify its location

User Management

- Add/Remove users
- Administrator and Regular user groups
- User ID and Password

Test Profile Management

Test Results Management

- View, PDF, download, Filter

Access saved Screen Capture files

Remote UX400 System Reset

SCPI Remote PC Client & Command Line Reference

The optional multi-user remote control client and SCPI configuration generator provides an intuitive and complete interface to build test profiles and run independent tests. It also serves as the SCPI library reference tool to help users build individual typo-free commands as well as complete configuration batches that can be ported directly to scripting tools.

- Independent concurrent multi-user operation for more than 12 users
- Up to 12 concurrent and independent tests (depending on test modules installed)
- Individual user names and passwords
- Session management (start and release remote sessions)
- Assign and release test modules to a session
- Control individual parameters via user interface
- Generate SCPI commands
- Capture and copy SCPI commands
- Create test profiles
- Real-time results
- Save results
- Capture SCPI results

VNC® Server

The built-in VNC server provides easy and convenient remote operation with screen, keyboard and mouse mirroring. Supports most common VNC client apps providing platform-independent access from any PC, tablet or mobile device.

- Shared view multi-user environment
- Shared passwords
- View-only client mode

ReVeal™ UX400

Included standard with each test set, ReVeal™ PC software provides an easy-to-use and intuitive interface that allows you to take full advantage of your UX400 test platform by providing the following productivity tools:

- Remote software updates for system and modules
- Convenient test profile management
- Flexible test results management
- Powerful report generation

Compatible with Windows™ XP, Windows Vista, Windows 7, 8.1 and 10 on 32 bits or 64 bits operating systems.

Precision Timing References

The UX400/R platform offers two highly accurate and stable clock reference options to provide precise timing to all its test modules. The physical clock can be used as a reference for frequency and wander measurements and the UTC time of day (ToD) can be used for time-sensitive tests like one-way-delay measurements.

Disciplining: Combines the long-term accuracy of the GPS option, the stability of the Atomic clock option (the GPS receiver requires an exterior active antenna installation with full view of the sky).

Holdover: Combining the GPS, Atomic clock and battery operation, the portable UX400 can offer precision clock reference even in places where GNSS is not available or can't be trusted (e.g. in-building or urban canyon applications).

Built-in GPS Receiver

The optional high-sensitivity GPS module provides precise UTC synchronization to the UX400/R modules, in the form of internal 1PPS clock and ToD synchronized to the coordinated second and time stamps.

Note: Requires an exterior active (3.3V) antenna installation with full view to the sky and RF cable feed to the rack with flexible BNC termination or converter cable. Not supplied.

Frequency: L1 C/A, 1575.42 MHz

Channels: 20

Sensitivity:

- Cold start: -144 dBm
- Tracking: -159 dBm

Clock Output: 1PPS (internal)

Accuracy

- Time: 50 ns RMS (clear sky)
- Position: 5m

Acquisition Time

- Cold start: 35s
- Hot start: 1s

Recommended Antenna

- Type: Active
- Gain: > 15 dBi
- Noise: < 1.5 dB
- Connector: BNC, 50Ω
- Power: 3.3 VDC, 30 mA

Temperature range: 0 to 45°C

Atomic Clock Option

The optional built-in chip-scale Atomic Clock module provides a highly stable clock source to the test platform and its modules, in the form of internal 1PPS or 10 MHz signals. The Atomic Clock can also be disciplined by the GNSS (requires Z88-00-009P option) and later be used in holdover mode (e.g. temporary timing holdover or frequency reference for indoor usage).

Technology

- Cesium (Cs) Vapor Cell
- Coherent Population Trapping with VCSEL Laser Interrogation

Frequency Accuracy: $\pm 5 \times 10^{-11}$ (free-running at factory calibration)

Aging: $< 9 \times 10^{-10}$ /month

Short Term Stability

- 3.0×10^{-10} (TAU=1s)
- 1.0×10^{-10} (TAU=10s)
- 3.0×10^{-11} (TAU=100s)
- 1.0×10^{-11} (TAU=1000s)

Warm-up time: < 180s

Temperature range: -10 to 45°C

Modes of Operation

- Free run
- GNSS-discipline and PRTC-discipline (ext. 1PPS)
- Holdover

Programmable disciplining time constant up to 10000s

Programmable stability threshold

Precision References (internal)

- Frequency: Atomic 10 MHz
- Phase/Time: Atomic 1PPS

Low power consumption (<120mW) for full-featured battery operation

General

Display (portable)	TFT 10.4" full-color touch screen LCD
Monitor Port	Built-in VGA port
Interfaces	VFL - Visual Fault Locator (optional) OPM - Optical Power Meter (optional) Ethernet management port (RJ45) Wi-Fi 802.11b/g/n (optional USB dongle) Bluetooth 2.0 (optional USB dongle) 2x USB2.0
Audio	Standard headphone and microphone jacks (3.5 mm)
Languages	Multiple languages can be supported
AC Mains	Input: 100-240 VAC, 50-60 Hz
Dimensions (rack mount)	19 x 8.5 x 16 in (W x H x D) 483 x 216 x 406 mm
Dimensions (portable)	14.2 x 10.6 x 7.1 in (W x H x D) 360 x 270 x 180 mm
Weight (portable)	Less than 10 kg (22 lb) with battery Less than 15 kg (33 lb) fully loaded
Operating Temperature	0°C to 45°C (32°F to 113°F)
Storage Temperature	-20°C to 70°C (-4°F to 158°F)
Humidity	5% to 95% non-condensing



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