# BENCHMARK-XP SERIES L2-7 NETWORK TEST PLATFORM

The Benchmark-XP is a next generation test platform for the performance benchmarking of networks, systems, and underlying devices that forward traffic and ensure quality of service and reliability. Utilizing an easy-to-use UI, integrated test methodologies and simplified automation, Benchmark was specifically designed for engineers and operators for the testing of high-performance routers, data center switches and application layer devices.

With Benchmark-XP's modular design and robust architecture, each chassis can house up to 12 independent test modules and support many simultaneous users via the Renix user interface and a comprehensive and integrated API. Benchmark supports numerous variants of high-speed Ethernet technologies with a chassis ready to support the future, emerging requirements of 800GB 1.6TB standards.

The Benchmark-XP is a unified, Layer 2-7 test platform with the ability to emulate a compressive spectrum of protocols and applications needed for functional and performance testing. It is used extensively in R&D by Network Equipment and Component Manufacturers to ensure design and system performance and by Enterprises, Cloud Providers, Carriers, and Government Agencies to validate vendor performance prior to selection and deployment into their networks.

With the ever-increasing demand for bandwidth driven by both commercial and business OTT applications, services and expansion of remote user access, the need for speed and ensured QoS has never been greater. The Benchmark-XP platform is ready to support the complex test demands of today as evolving needs of the business world tomorrow.

## Features

- S12 slots per chassis within a 14U footprint
- Chassis can be fully populated and cascaded together for a larger, seamless, and synchronized test environment
- Speeds Supported: 400G, 100G, 50G, 40G, 25G, 10G, 5G, 2.5G
- Multi-user system allowing for independent test configuration and port reservation
- Emulation of complex network topologies, protocols and industry benchmark test scenarios
- GUI to script automation with support of TCL & Python

## Benefits

- Cost reduction with single platform capable of testing Layer 2-7
- Investment protection with platform that is able support emerging technologies
- Enhanced user productivity with simplified automation
- Robust, 24/7 operation with ability to hot swap line cards without interruption to other users


Module Options: 400G, 100G and 10G HSE

| Test Modules | X2-400G-4QDD-HQ | X2-100G-4QSFP28-HQ |
|---|---|---|
| Speed | 4*400/200/100/50GbE with high performance | 4* 100/40/25/10GbE with high performance |
| Port Density | 4 | 4 |
| MSA Interface | QSFP-DD | QSFP28 |
| Operational Modes | PAM4: 50/100/200/400G<br>NRZ: 10/25/40/50/100G | 100GbE: 100GBASE-SR4, 100GBASE-LR4; 40GbE: 40GBASE-SR4, 40GBASE-LR4; 25GbE: 25GBASE-SR; 10GbE: 10GBASESR; QSFP28 to SFP28 breakout cable options; Clause 74 BASE-R FEC, Clause 91 RS-FEC and Clause 108 RS-FEC |
| Port CPU | Multi-core CPU | multi-core CPU |
| User Reservation | Per port | Per port |
| Test Port Speed Config | 2 test port speed groups per rack mount unit | 2 test port speed groups per rack mount unit |
| Operating temperature range | Supported for 32°F to 95°F (0°C to 35°C) ambient temperature; 20% to 85% relative humidity | Supported for 32°F to 95°F (0°C to 35°C) ambient temperature; 20% to 85% relative humidity |
| Max power draw | 400 watts | 400 watts |
| Product Dimensions | 437mm×45.32mm×468.746mm (17.2ins×1.8ins×18.5ins) | 437mm×45.32mm×468.746mm (17.2ins×1.8ins×18.5ins) |

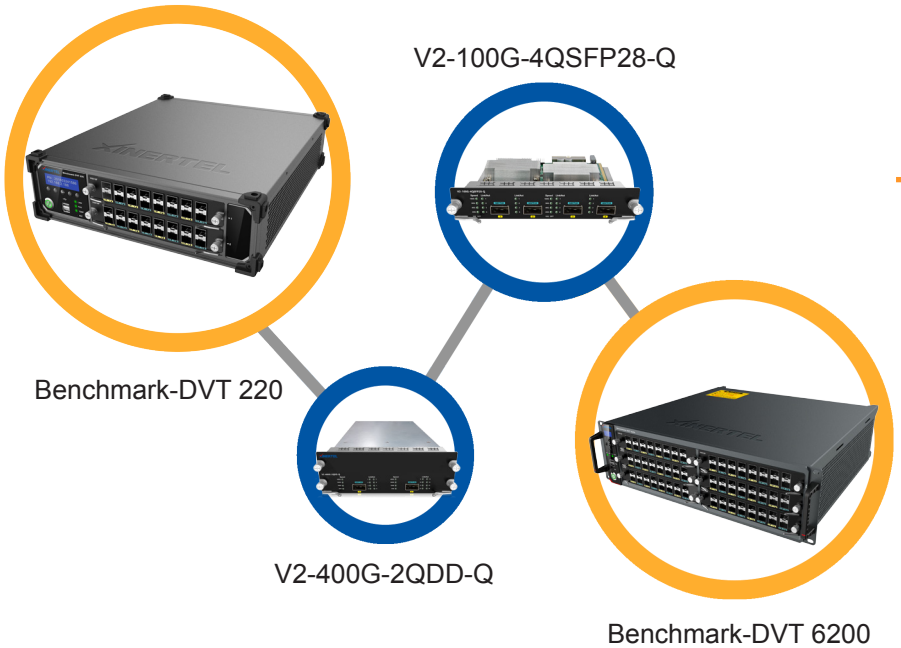
# Technical Specifications

| BENCHMARK-XP 12000/3000 400G, 100G Appliances | |
|---|---|
| Slots | BENCHMARK-XP 12000:12<br>BENCHMARK-XP 3000:3 |
| Size | BENCHMARK-XP12000: 442mm ×622.3mm ×815mm (17.4inches×24.5inches×32inches)<br>BENCHMARK-XP 3000: 482.6mm×178mm×686mm (19 inches×7 inches×27 inches) |
| Weight | BENCHMARK-XP12000: 108kg (238 lbs)<br>BENCHMARK-XP 3000 : 25 kg (55.1lbs) |
| **Generator and Analyzer** | |
| Number of Streams | • Stats/Streams @400/200/100/50/40/25/10GbE: Tx=32K, Rx=32K<br>• Stats/Stream: Tx Count (frames),Rx Count(frames), Tx Rate (fps), Rx Rate (fps), Tx Rate (bps), Rx Rate (bps), Rx Sig Count (Frames), Avg Latency (us), Min Latency (us), Max Latency (us) |
| Number of Paths/Raw Streamblocks | 512 |
| Frame Transmit Modes | Port-based: Continuous, Burst and Time<br>Stream-based: Continuous, Burst |
| Min/max Frame Size (w/CRC) | 58-16000 bytes |
| Real-time Tx Stream Adjustments<br>Per-stream Statistics Analyzed in Real Time | Change rate and frame length settings without stopping the generator or analyzer for truly interactive, cause and effect analysis<br>• Tx and Rx frame counts and rates<br>• Out of sequence errors, frame statistics, real-time packet loss statistics, out-of-order statistic<br>• FCS errors and rate<br>• Rx Filter Frames and custom statistics<br>• Real Time Dropped Frame count |
| Flow Control | Full duplex flow control |
| Per-port Statistics Analyzed in Real Time<br>Transmit Timestamp Resolution | Tx and Rx frame counts and rates<br>• Tx and Rx Layer 1 byte counts and rates<br>• Out of sequence errors, frame statistics, real-time packet loss statistics, out-of-order statistic<br>• PRBS errors<br>• FCS errors and rate |
| Transmit Timestamp Resolution | 2.5ns |
| Supported Encapsulations | • Layer 2: Ethernet II, 802.1Q, 802.1ad, FCoE<br>• Layer 3/4: IPv4, IPv6, TCP, UDP |
| Supported Tx Signature Capability | Fully compatible with hardware; contains sequence number and highly accurate timestamp |
| Capture Buffer Size | 8 MB per port |
| Capture Buffer Controls | Capture the Rx frame of data and control plane<br>Capture Tx and Rx frame of control plane<br>Capture frame based on filter template<br>Capture frame based on error message<br>Support loopback capture<br>Support downloading a specified number of captured message |
| Latency Modes | Benchmark tests support LIFO, LILO, FIFO or FILO latency calculation methods<br>Route Insertion Table (RIT) 1M 4-byte entries for dynamic label or random IP/MAC address assignments entries per port |
| VFD Entries per Stream | 6 VFD insertions per stream |
| **Layer 2-3 Additional Specs** | |
| Routing and MPLS | RIPv1v2, RIPng, OSPFv2, OSPFv3, ISISv4, ISISv6, BGP, BGP4+, LDP, MPLS L3VPN, VPLS, VLL, 6VPE and 6PE |
| Access | PPPoE Client/Server, DHCPv4 Client/Server, DHCPv6 Client/Server, DHCPv6 PD Client/Server, L2TPv2 and 802.1x |
| Multicast | IGMPv1/v2/v3, MLDv1/v2, IGMP/MLD Querier and PIM-SM |
| Data Center | VXLAN, OpenFlow, OVSDB, EVPN and LACP |
| Test suite | RFC2544, RFC2889, RFC3918, asymmetrical test and Smart Scripter |
| Other | BFD, 802.1ag, 802.3ah and IPv6 |
| **Layer 4-7 Application and Security** | |
| IP Version | IPv4 and IPv6 |
| Transport Protocols | TCP, UDP |
| Data Protocols | HTTP, HTTPS, TCP, FTP, DNS, Mail(SMTP/POP3/IMAP), SSH, TFTP, Telnet |
| Network Access Protocols | DHCP and PPPoE |
| **Software** | |
| Renix Test Platform: L2-3 traffic test and protocol emulation | Renix is Windows-based software that offers L2-3 efficient and convenient configuration wizards, statistical result views. test result analysis and supports TCL/Python automation test API |
| ALPS Software Platform: L4-7 application protocol emulation | ALPS has Web UI, L4-7 application protocol emulation and network security test platform |

# BENCHMARK-DVT SERIES L2-3 NETWORK TEST PLATFORM

The Benchmark DVT series network tester is a R&D test platform for middle and low-end routers, switches and other network forwarding equipment. Its modular design is comprised of chassis, test modules and a powerful and easy to use software UI and fully integrated API. This platform is available in either 2 or 6 slot configurations and can support any combination of test modules from 10M to 400GbE. This platform boasts a small lab footprint and is very efficient in power consumption.

Bring the test lab to the field!  With an added handle, the two slot DVT-220 is also ideal for use in the field to troubleshoot and demonstrate for field requirement. Our noise reduction technology makes this solution a great fit for work bench or office-based use. The DVT is supported by our Renix software is incredibly easing to use and provides Layer 2-3 traffic emulation, control plane protocol simulation and comprehensive test suites Designed to meet the complex requirements of hardware and software development for chip/component, telecommunications equipment test in a simplified way, this platform offers a unique mix of portability, usability, and affordability.




## Features

- Choice of either a 6-slot or 2 slot chassis, with full interchangeability of modules between chassis.
- Speeds Supported: 400G, 100G, 50G, 40G, 25G, 10G, 5G, 2.5, 1G,100MB,10MB
- Multi-user system allowing for independent test configuration and port reservation
- Emulation of complex network topologies, protocols, and industry benchmark test scenarios
- GUI to script automation with support of TCL & Python
- Quiet operation on 2U (just 65dBa)

## Benefits

- Cost reduction with single platform capable of testing Layer 2-3
- Low power consumption, providing a more environmentally friendly test platform
- Lightweight and portable - suitable for on-site/off-site testing
- Configure complex tests with just a few clicks

## Applications

- Validate both unit and system performance in R&D and preproduction verification
- Great for both fault isolation and end to end system performance
- Flexible platform allows for both on-site and off-site testing of infrastructure, network equipment, emulating complex test scenarios with ease

| Test Module | V2-400G-2QDD-Q | X2-100G-4QSFP28-HQ |
|---|---|---|
| Speed | 2*400/200/100/50GbE | 4*100/40/25/10GbE |
| Port density | 2 | 4 |
| MSA Interface | QSFP-DD | QSFP28 |
| Operational modes | PAM4 - 400/200/100/50GbE | 100GbE: 100GBASE-SR4, 100GBASE-LR4； 40GbE: 40GBASE-SR4, 40GBASE-LR4; 25GbE: 802.3by 25GBASE-SR; 10GbE: 10GBASE-SR; 100GbE FEC: 100GBase-SR4 RS-FEC91; 25GbE FEC: 25GBase-SR RS-FEC108, 25GBase-SR FEC CL74, 25GBase-SR RS-FEC CL91 |
| Port CPU | multi-core CPU | multi-core CPU |
| User reservation | Per port | Per port |
| Test Port speed configuration | Per QSFP-DD Port | 2 test port speed groups per rack mount unit |
| Max power draw | 133 watts | 48 watts |
| Product Dimensions | 196mm x 70mm x 271mm (7.7inches×2.8inches×10.7inches) | 196mm x 70mm x 271mm (7.7inches×2.8inches×10.7inches) |

# Technical Specifications

| BENCHMARK-DVT 6200/220 400G Appliance | |
|---|---|
| Slots | BENCHMARK-DVT 6200: 6<br>BENCHMARK-DVT 220: 2 |
| Size | BENCHMARK-DVT 6200: 446 mm × 413 mm× 132 mm (17.6inches×16.3inches×5.2inches)<br>BENCHMARK-DVT 220: 400mm×340mm×95mm (15.7inches×13.4inches×3.7inches) |
| Weight | BENCHMARK-DVT 6200: Empty chassis: 12.5kg (27.6 lbs) / Full chassis: 20kg (44.1 lbs)<br>BENCHMARK-DVT 220: Empty chassis : 6.6kg (14.6 lbs) / Full chassis: 9.2kg (20.3 lbs) |
| Max Power Draw | BENCHMARK-DVT 6200: 600W<br>BENCHMARK-DVT 220: 200W |
| **Generator and Analyzer** | |
| Number of Streams | • Stats/Streams 400G: 256; 200G:256; 100G:64; 50G:32<br>• Stats/Stream: Tx Count (frames),Rx Count(frames), Tx Rate (fps), Rx Rate (fps), Tx Rate (bps), Rx Rate (bps), Rx Sig Count (Frames), Avg Latency (us), Min Latency (us), Max Latency (us) |
| Frame Transmit Modes | Port-based: Continuous, Burst and Time (V2-400G-2QDD-Q only support Por-based)<br>Stream-based: Continuous, Burst |
| Min/max Frame Size (w/CRC) | 64-16000 bytes |
| Real-time Tx Stream Adjustments<br>Per-stream Statistics Analyzed in Real Time | Change rate and frame length settings without stopping the generator or analyzer for truly interactive, cause and effect analysis<br>• Tx and Rx frame counts and rates<br>• Out of sequence errors, frame statistics, real-time packet loss statistics, out-of-order statistic<br>• FCS errors and rate<br>• Rx Filter Frames and custom statistics<br>• Real Time Dropped Frame count |
| Flow Control | Full duplex flow control |
| Per-port Statistics Analyzed in Real Time<br>Transmit Timestamp Resolution | Tx and Rx frame counts and rates<br>• Tx and Rx Layer 1 byte counts and rates<br>• Out of sequence errors, frame statistics, real-time packet loss statistics, out-of-order statistic<br>• PRBS errors<br>• FCS errors and rate |
| Supported Encapsulations | • Layer 2: Ethernet II, 802.1Q, 802.1ad, FCoE<br>• Layer 3/4: IPv4, IPv6, TCP, UDP |
| Capture Bufer Size | 32 KB per port |
| Capture Buffer Controls | Capture the Rx frame of data and control plane<br>Capture Tx and Rx frame of control plane<br>Capture frame based on filter template<br>Capture frame based on error message<br>Support loopback capture<br>Support downloading a specified number of captured message |
| Latency Modes | Benchmark tests support LIFO, LILO, FIFO or FILO latency calculation methods<br>(V2-400G-2QDD-Q Benchmark tests support: LILO) |
| VFD Entries per Stream | 4 VFD insertions per stream |
| **Layer 2-3 Additional Specs** | |
| Routing and MPLS | RIPv2/RIPng, OSPFv2/v3, BGP4/4+, IS-ISv4/v6, SR for BGP, BGP SR TE Policy, LDP, BGP VPLS |
| Access | PPPoE Client/Server, DHCPv4 Client/Server, DHCPv6 Client/Server, DHCPv4 Option 60, L2TPV2 |
| Multicast | IGMPv1/v2/v3, IGMP/MLD querier, MLD, PIM, PPPoE over Multicast |
| Data Center | VXLAN IPv4/IPv6, VXLAN EVPN IPv4/IPv6, OpenFlow 1.3 Controller |
| Test Suite | RFC2544, Smart Script |
| Others | BFDv4/v6, 802.1ag, 802.3ah, Y.1731 |
| **Software** | |
| Renix Test Platform: L2-3 traffic test and protocol emulation | Renix is Windows-based software that offers L2-3 efficient and convenient configuration wizards, statistical result views. test result analysis and supports TCL/Python automation test API |

For more information on our promotions and products, please reach out to our partner for network infrastructure, instrumentation, testing and systems integration company, ATxTel or visit us on the web at www.ATxTel.com/Xinertel

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