Spirent **pX3 400G Appliance**

Native QSFP-DD Test Platform

Features

- 8 400GbE ports per 1U high appliance, delivers the highest density high speed Ethernet solution
- Each port supports 1x400GbE, 2x200GbE, 4x100GbE or 8x50GbE
- Optional 4 port versions
- Available single port upgrades
- Support for optical fiber, active optical cables and direct attach cable
- Support for Ethernet (FEC), (AN) and (LT)
- Protocol testing for L2/3 routing/switching and data center test cases

Benefits

- Industry's highest density QSFP-DD test appliance
- Conduct performance, stress, and industry standard benchmark tests
- Provides large capacity testing for a variety of services
- 4 to 8 port upgrade available via licensing

Network bandwidth needs continue to grow at a rapid pace. Network equipment manufacturers are developing highly flexible multi-rate products to support the latest generation of HSE devices. Service Providers and Hyperscale data centers are deploying multi-rate networking infrastructure solutions to meet this growing market.

With these multi-rate requirements, customers demand higher density test equipment. Flexibility is needed to validate the next generation of routers and data center fabrics.

Spirent pX3 400G Appliance was developed to meet these specific needs with its industry-leading 2x density advantage for QSFP-DD from nearest competitor. Spirent's native QSFP-DD platform is a 1U rack mountable appliance and can be configured to support up to four speeds per port: 400/200/100/50GbE. The pX3 Appliance supports Spirent's Smart Port Technology, a feature that allows single port upgrades for maximum value and flexibility.

Applications

Cloud Computing/Streaming Services–Validate data plane QoS on thousands of flows at line rate and test complex routing, data center and access protocols on switches and routers.

Data Center ToR and EoR Switches and Fabrics–Validate forwarding performance, latency, MAC capacity and functional capabilities of ultra-high-scale, next-generation enabled multi-terabit cloud data center fabrics. This platform will allow synchronized timing of 255 systems with no requirement for external timing devices or specialized cabling.

Terabit Routers–Test latest generation of core routers with high-scale, multiprotocol topologies.

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Productivity

- Intelligent Results™
- User definable Health Indicator views provide real-time health monitoring and error isolation capability that allows engineers to accurately and quickly pinpoint errors, even in the most complex test configurations. Customizable Time Series charts, overlaid with Events, provide correlation between real-time metrics and system events, allowing rapid debugging of problems and accelerating development
- High performance database underneath a modern web UI processes billions of real-time results to validate tests, identify problems, and provide customizable reports
- Delivers more results with tight correlation, and more information to find those obscure bugs. With more coverage and more information, Spirent answers questions faster, and in a single test run, where multiple runs are necessary with other test tools
- Interesting streams uses real-time results data mining to dynamically filter through mountains of data and display the results that matter
- Powerful automation with Command Sequencer (Visual Programming) and GUI to Script empowers the test operator to:
  - Construct sophisticated, stressful, automated test cases without programming experience
  - Combine numerous individual test cases into a single run to save regression test time
  - Develop a catalog of broad automated test cases in a fraction of the time
  - Export automated test cases to run from a command line for headless test execution that can be integrated with any automated regression system

Extensive, Flexible Reporting

Real-time statistics for critical variables across all protocols. Using Spirent's iTest platform, your device under test results can easily be correlated and compared with Spirent's results.

Technical Specifications	
Spirent pX3 400G Appliance	
Part Number	**Speed**
PX3-QSFP-DD-8-750A	400/200/100/50GbE
PX3-QSFP-DD-8-700A	400/200/100GbE
PX3-QSFP-DD-8-550A	400/100/50GbE
PX3-QSFP-DD-8-400A	400GbE only
PX3-QSFP-DD-8-350A	200/100/50GbE
PX3-QSFP-DD-4-750A	400/200/100/50GbE
PX3-QSFP-DD-4-400A	400GbE only
MSA Interface	QSFP-DD
Operational modes	400, 200, 100, 50GbE
Port CPU	Stackable multi-core CPU
User reservation	Per port
Test Port speed config	8 test port speed groups per rack mount unit
Line clocking and packet time-stamping	Stratum-3 rated oscillator is the default time source. Transmit line clock is at the precise nominal Ethernet rate ± < 1 PPM on initial shipment. Accurate to ± 4.6 PPM 15 years of operation • Frame time-stamp resolution of 2.5ns • GPS and CDMA-based external time sources are supported • IEEE 1588v2 and NTP packet-based external time sources are supported • TIA/EIA-95B-based external time sources are supported
Appliance time synchronization	Appliance Features • Spirent-patented self-calibrating inter-chassis timing chain using dedicated port on chassis control Appliance delivers precise synchronization ± 20ns • Ability to daisy chain up to 255 appliances for large density testing • Synchronization via external GPS or CDMA network • Using IEEE 1588 or NTP packet-based approaches • With TIS/EIA-95B timing inputs
Operating temperature range	Supported for 41° to 86° F (5° to 30° C) ambient temperature. 20% to 80% relative humidity
Max power draw	Maximum of 1600W per rack mount
Product Dimensions	92.62 cm L x 43.4 cm W x 4.28 cm H (1U)

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Native QSFP-DD Test Platform

Spirent TestCenter Layer 2-3 Generator and Analyzer	
Number of streams	• Stats/Streams @400G; Tx=32K Rx=32K • Stats/Streams @200G; Tx=32K Rx=32K • Stats/Streams @100G; Tx=32K Rx=32K • Stats/Streams @50G; Tx=16K Rx=16K • Stream fields can be varied to create billions of flows • 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 (rate per port), stream based (rate per stream), burst, timed, step transmission, manual scheduler mode, random frame size with unique seed
Min/max frame size (w/CRC)	60 to 16,004
Min/max Tx rates	1 packet per 3.43 seconds to 101% of line rate
Real-time Tx stream adjustments	Change rate and frame length settings without stopping the generator or analyzer for truly interactive, cause and effect analysis
Per-stream statistics analyzed in real time	Tx and Rx frame counts and rates • Tx and Rx Layer 1 byte counts and rates • Out of sequence errors • FCS errors and rate • Min, Max and Average Latency (4K streams) • Real Time Dropped Frame count • Adv Seq Stats
Flow Control	Support Priority Flow Control
Per-port statistics analyzed in real time	Tx and Rx frame counts and rates • Tx and Rx Layer 1 byte counts and rates • Out of sequence errors • PRBS errors • FCS errors and rate
Transmit timestamp resolution	2.5 ns Tx timestamp resolution with intra-chassis and inter-chassis synchronization
Supported encapsulations	• Layer 2: Ethernet II, 802.1Q, 802.1ad, FCoE • Layer 3/4: IPv4, IPv6, TDP, UDP
Supported Tx signature capability	Fully compatible with Spirent hardware; contains sequence number and highly accurate timestamp
Capture buffer size	8 MB per port
Capture buffer controls—Spirent TestCenter's unique capture capability allows maximum effectiveness when debugging hard to find hardware or protocol problems	Several modes of operation that include: Filter by protocol fields, filter by byte offset and range; store slices or full-frames; store signature or all frames; store tx/rx control plane with data plane; real-time mode for control plane traffic; wrap or stop buffer at end. User defined pattern definitions can logically combine 8 filters of up to 32 total bytes. Patterns can be applied to start, filter (quality) or stop capture. In addition to user-patterns, filtering, starting and stopping capture contains the following pre-defined events: FCS, PRBS, IPv4 checksum, TCP/UDP/IGMP checksum, and sequence errors; undersize, oversize, jumbo, and user-defined frame length; IPv4, IPv6, TCP, UDP and IGMP packets; test signature present and test stream ID match. Each event can be independently set to ignore, include or exclude. Support UDC (user defined counters), Capture byte offset mode, Capture pattern matching.
Latency modes	Benchmark tests support LIFO, LILO, FIFO or FILO latency calculation methods
Route Insertion Table (RIT) entries per port	32K 4-byte entries for dynamic label or random IP/MAC address assignments
RIT or List VFD entries per stream	8 RIT insertions per stream and 6 VFD insertions per stream
Layer 1 Functionality	
QSFP-DD, Interconnects	CR, SR, LR, FR, DR, PSM4 at multi-rate (400/200/100/50GBE)
Media support and FEC options	Support varies by speed mode • 400G: 400GBASE-SR8, 400GBASE-DR8, 400GBASE-LR8,400GBASE-FR8 plus additional MSA PMDs • 200G: 200GBASE-SR4, 200GBASE-PSM4, 200GBASE-LR/FR4, plus additional MSA PMDs • 100G: 100GBASE-SR2, 100GBASE-LR2, 100GBASE-DR2 plus additional MSA PMDs • RS-544 (KP4) FEC all speeds • Direct Access Copper breakouts
AN/LT (Enable/Disable)	Direct Attach Copper (DAC), AN/LT enabled supports 4x50G
Layer-1 debug tools & features	CR Tx Emphasis settings, Rx Eye view, FEC Counters, PRBS Gen/Check, Front-end L1 Summary Status, Xcvr MDIO access, PCS monitoring, PCS skew, FEC error injection, PCS random error injection

Technical Specifications (Cont'd)	
Layer 4-7 Application and Security	
IP Version Supported	IPv4 and IPv6
Encapsulation Protocols	802.1Q and 802.1 Q-in-Q
Transport Protocols	TCP, UDP
Data Protocols	HTTP, SIP and FTP, Unicast/Multicast RTSP and RAW TCP
Authentication Protocols	802.1x
Network Access Protocol	DHCP and PPPoE
Network Realism Fragmentation	Line speed limitation, network latency, packet loss and fragmentation
Video Protocols	RTSP/RTP, Multicast streaming, IGMPv2, IGMPv3 and MLDv2
Video Codecs	H.263 and H.264
Video Quality Measurement	MDI measurements along with additional statistics to detect picture quality
Voice Codecs	G711A, G711U, G.723.1, G726-32, G.728 and G729AB
Voice Protocols	SIP over UDP

Ordering Information	
Part Number	**Description**
Base Package Bundle Description	
PX3-QSFP-DD-8-750A	SPIRENT PX3 400/200/100/50G QSFP-DD 8-PORT
PX3-QSFP-DD-8-700A	SPIRENT PX3 400/200/100G QSFP-DD 8-PORT
PX3-QSFP-DD-8-550A	SPIRENT PX3 400/100/50G QSFP-DD 8-PORT
PX3-QSFP-DD-8-400A	SPIRENT PX3 400G ONLY QSFP-DD 8-PORT
PX3-QSFP-DD-8-350A	SPIRENT PX3 200/100/50G QSFP-DD 8-PORT
PX3-QSFP-DD-4-750A	SPIRENT PX3 400/200/100/50G QSFP-DD 4-PORT
PX3-QSFP-DD-4-400A	SPIRENT PX3 400G ONLY QSFP-DD 4-PORT
Hardware Upgrades (available as add on after purchase of initial base package bundle)	
HWO-PX3-QSFP-DD-8-400G	400G HARDWARE SPEED OPTION FOR PX3-QSFP-DD-8
HWO-PX3-QSFP-DD-8-200G	200G HARDWARE SPEED OPTION FOR PX3-QSFP-DD-8
HWO-PX3-QSFP-DD-8-100G	100G HARDWARE SPEED OPTION FOR PX3-QSFP-DD-8
HWO-PX3-QSFP-DD-8-50G	50G HARDWARE SPEED OPTION FOR PX3-QSFP-DD-8
HWO-PX3-QSFP-DD-8-PORT	SPIRENT PX3 QSFP-DD-8 SINGLE PORT UPGRADE
UPG-8X50-ANLT-8	UPGRADE QSFP-DD-8-ANLT

Requirements

- Windows-based workstation with 10/100/1000 Mbps Ethernet NIC; mouse and color monitor required for GUI operation
- Linux- or Windows-based workstation for scripting
- Mac-, Linux-, or Windows-based workstation for Rest API support

Contact Us

For more information, call your Spirent sales representative or visit us on the web at www.spirent.com/ContactSpirent.

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