

Spirent mX2

10/100/1000Mbps Ethernet Test Modules

The Spirent mX2 10/100/1000 Mbps Ethernet multi-speed test modules support the highest performing and most realistic Layer 2-7 control and user plane capabilities for validating systems at their limits. A single module is capable of generating and analyzing line rate stateful and stateless traffic from all ports simultaneously with high-scale routing, access, mobile and enterprise application traffic.

The Spirent mX2 10/100/1000Mbps Ethernet multi-speed test module architecture combines Spirent Cloud Core™ with high performing multi-core CPUs to intelligently distribute processing resources across ports. This enables superior scale testing involving multiple protocols running simultaneously on the same port--perfect for testing converged devices such as Provider Edge routers and application aware devices. By combining Cloud Core processing and the deep real-time analysis that Spirent TestCenter is known for, the mX2 delivers enhanced realism with scale and performance. The Spirent mX2 module is available in three port count variations to match your test needs and budget.

Applications

- **Cloud Infrastructure & Applications**—Ensures security devices, IDS/IPS, load balancers and applications meet their performance, availability, security and scale requirements*
- **SDN and Data Center**—Validate forwarding performance and functional capabilities of Software Defined Networks (SDN) with high scale ultra-low latency and flexible port density. Supports key technologies like VXLAN, EVPN, OpenFlow, PCE, Segment Routing and BGP-LS

- **Edge and Campus Routers & Switches**—Verify scale, reliability, and performance of Layer 2 & 3 services including data, multicast and video delivered via unicast routing, multicast routing, switching, Multicast VPN, EVPN and MPLS VPN technologies
- **Carrier Ethernet**—Verify scale, reliability, performance of Ethernet services delivered via Ethernet OAM (CFM IEEE 802.1ag and Y.1731), MPLS-TP, VPLS, PWE3 Pseudowires, bridged Ethernet, packet transport protocols or combinations of these technologies
- **Subscriber Emulation**—Verify setup & teardown of thousands of access subscribers using different services (including DHCPv4, DHCPv6-PD, PPPoX and L2TP) over various tunneling technologies (such as VLAN, L2GRE, MPLS, VPNs, and VPLS) under normal or exceptional traffic conditions



* Avalanche Commander release date for Spirent mX2-1G is TBD.
Please contact your Spirent sales representative for more information.

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Features & Benefits

- Line rate traffic with multi-protocol realism for stress-testing the most complex converged IP systems such as service provider MPLS networks and cloud-scale data centers
- Emulate “a city in a box” – Spirent Cloud Core CPU and FPGA-based Layer 2-3 architectures are combined to provide the highest density Layer 2-7 test module in its class
- Available test packages with integrated configuration wizards simplify and accelerate applicable test packages with integrated wizards simplify configuration of ultra-high scale mobility, mobile backhaul, routing, access and application test cases
- Choose from 16-, 12-, or 8-port versions to meet your density and performance needs
- SFP connector form-factor supports optical and BASE-T connectivity
- High-performance with low overall total cost of ownership compared to other test modules in its class
 - Intelligent power control to shut down unused test modules and allows faster boot time to bring capacity back on-line quickly
 - More total throughput than the competition for a given power footprint
 - Enhanced chassis software license value—Two to four times the device or end-user emulation per chassis with no increase in software costs
 - Topology emulation lowers Capex by eliminating the need for multiple DUTs in multiprotocol tests
 - Intelligent results gets answers in a fraction of the test time required by competitive products
 - Faster boot and firmware upgrade times mean less downtime in continuous running 24x7 regression test beds
- Spirent TestCenter’s industry-leading Layer 2-3 feature set
 - Stress ASIC and backplane designs with live traffic changes. The number of emulated devices, the traffic they emanate and the rate at which they send it can all be changed “on the fly” making for more realistic tests and faster troubleshooting
 - Best-in-industry for measuring ultra-low sub-microsecond latencies with 10ns precision and resolution
 - 19 different scheduling algorithms available for finding the right traffic to emulate the real world or tax the device’s ability to handle any traffic pattern—from micro-bursts to carefully timed sequences of “killer” frames
- mX2 modules support Spirent TestCenter’s deep analysis system
 - Port counts, rates, errors and protocol summaries provide a high-level view for quick drilldown to specific issues
 - Broadest set of per stream metrics with simultaneous control and data plane results allows most tests to be run in a single pass
 - Real-time traffic filters allow analysis down to specific fields. Multiple metrics can be simultaneously collected and instantly analyzed
 - Dynamic views feature multi-metric extraction, sorting and operation in real-time or post test. Full packet capture enables timing, sequencing and content analysis for individual packets. Powerful filters ensure the capture buffer is filled with relevant data

Technical Specifications

mX2 module specifications

Port density	16-, 12- and 8-port modules available
Media support See accessory table below for part numbers	1000MBASE-SX, 1000MBASE-LX, 10/100/1000MBASE-T (full-duplex only) (100BASE-FX and other 10/100 optical media not supported)
Line clocking and packet time stamping – modules get their transmit line clocking and time-stamping from the control modules on the SPT-N11U and SPT-N4U	<ul style="list-style-type: none">• 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 over 15 years of operation• Frame time stamp resolution of 10ns• 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
Inter-module and Inter-chassis Time Synchronization	Ports in the same chassis are phase-locked to the internal timing source. For separate systems: <ul style="list-style-type: none">• Timing chain synchronization with +/- 20ns• Synchronized via GPS or CDMA network• Using NTP or PTP packet-based approaches (requires supporting controller version)
User reservation	Per-port reservation
Transmit / receive streams per port	32k/64k
VFDs	6 VFDs available for each of 1024 stream templates
Scheduler Mode Support	<ul style="list-style-type: none">• Port Based – traffic scheduling handled at the port level• Rate Based – key parameters determined at the port level with division among the individual stream blocks• Priority Based – scheduling determined at the stream block level using user-assigned priorities. Precise scheduling of CBR and bursty traffic for QoS testing.• Manual Mode – manual control of stream sequence.
Frame length range and controls	100% line rate for 1GE frames of 58-16383 bytes controlled by fixed, increment, decrement, random and IMIX modes. 10/100 max frame length of 16350 when not using PPM adjust. 10BASE-T max frame length of 13000 when using PPM adjust.
Statistics	<ul style="list-style-type: none">• Nearly 50 transmit stats per port reported in real time. Includes L1-4 counters and rates and checksum and CRC errors• Over 40 real-time measurements per stream including advanced sequencing, latency, jitter and data integrity
Capture	16 MB per port with sophisticated trigger and filtering controls (8MB supported in first release)
Histograms	Port-level histogram modes for latency, jitter, interarrival time, frame length, sequence run length and sequence difference check
Operating temperature	15°C - 35°C, 20% - 80% RH (non-condensing)

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About Spirent Communications

Spirent Communications (LSE: SPT) is a global leader with deep expertise and decades of experience in testing, assurance, analytics and security, serving developers, service providers, and enterprise networks.

We help bring clarity to increasingly complex technological and business challenges.

Spirent's customers have made a promise to their customers to deliver superior performance. Spirent assures that those promises are fulfilled.

For more information, visit:
www.spirent.com



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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Technical Specifications (cont.)

Spirent TestCenter Protocol Emulation

Spirent TestCenter protocols available as separately licensed packages. Below is a sample list of supported protocols. Contact Spirent for a full list of capabilities and packages.

Enterprise and data center switch protocol support	<ul style="list-style-type: none">• OpenFlow 1.3 / 1.0: OpenFlow switch and controller emulation• Routing, multicast and bridging: All major IPv4 and IPv6 unicast and multicast routing protocols, IGMPv1/v2/v3, MLDv1/v2, LACP, STP, RSTP and MSTP• Data center: VXLAN, EVPN, DCBX, FCoE, FIP, 802.1Qbb• Stateful Layer 4-7: HTTP, SIP and FTP and LACP and LAG emulation
Service Provider protocol support	<ul style="list-style-type: none">• WAN SDN: PCE-P, BGP-LS (Link State), BGP Flow Spec and Segment Routing for ISIS, OSPF and BGP• NFV: Validate performance and scale of NFVI and VNFs including vSwitch, BGP vRouterReflector, vBNG, vCPE, and vRouter• Routing and MPLS: All major IPv4 and IPv6 unicast and multicast routing protocols, RSVP-TE, LDP, LDPv6, MLDP, VPLS-LDP, VPLS-BGP, BGP/MPLS-VPN, EVPN (RFC 7432), PBB EVPN, mVPN, NG MVPN, GTM, BFD, MPLS BFD, LSP Ping, TWAMP and PWE3 (RFC 4447)• Access: ANCP, PPPoE, DHCP, L2TP, L2TPv3, IGMPv1/v2/v3, MLDv1/v2, DHCP-PD and PPPoEv6• Carrier Ethernet and bridging: LACP, STP, RSTP, MSTP, 802.1ag CFM, Y.1731, PBB, PBB-TE, Link OAM• Stateful Layer 4-7: HTTP, SIP and FTP, Unicast/Multicast RTSP and RAW TCP and LACP and LAG emulation• Mobile Backhaul: MPLS-TP, 1588v2 and Synchronous Ethernet

Layer 4-7 Application and Security

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Ordering Information

Test Modules

Description	Part Number
SPIRENT mX2 10/100/1000ME SFP 16-PORTS	MX2-1G-S16
SPIRENT mX2 10/100/1000ME SFP 12-PORTS	MX2-1G-S12
SPIRENT mX2 10/100/1000ME SFP 8-PORTS	MX2-1G-S8

Accessories

1000Base-SX GigE SFP Transceiver, MM 850nm, LC Connector	ACC-6025A
1000Base-LX GigE SFP Transceiver, SM 1310nm, LC Connector	ACC-6026A
Copper transceiver, SFP, 1000BASE-T* RJ-45	ACC-6092A
Optical transceiver, SFP, 1300NM, 100BASE-FX MMF	ACC-6099A

* Full-duplex operation only

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