

Spirent dX2 16 Port GbE Test Modules

BASE-T Test Modules

Features

- High-density 16-port value-priced GbE test modules
- The modules support line rate Layer 2-3 test traffic and 100M / 1GbE / 2.5GbE / 5GbE / 10GbE Copper Ethernet interfaces
- Spirent combined with Intel Inside® maximizes performance and scale of emulated topologies
- NBASE-T and IEEE 802.3bz compliant
- Supports NBASE-T Downshifting

Benefits

- Complete Test Coverage—Generate stateful multi-play traffic over emulated network topologies
- Orchestrate high scale test beds
- Lowest cost of ownership

The industry is moving to the next generation of [WiFi] 802.11ac - Wave 2. 1 Gbit/s [wired Ethernet] links between the access point and switch are no longer sufficient. A need for higher speeds like 2.5/5G is necessary over wired Ethernet.

Today's enterprise and datacenter servers and switches require diversity. The need to have multiple speeds supported on these products is becoming a necessity. The main drivers for this need include end user applications and advancements in hardware performance.

Solution Overview

The new Spirent BASE-T test modules were developed to address these very specific industry needs. The Spirent DX2 test modules deliver both high density and several multi-speed options to address these new market requirements. These modules support 16 copper RJ45 ports with the ability to support up to 5 different speeds from a single module, 10GbE, 5GbE, 2.5GbE, 1GbE and 100M.

Spirent understands the need for fully testing BASE-T equipment and what it takes to ensure complete end-to-end testing of compliant devices. With that in mind, an additional product, Spirent BASE-T Noise Generator is also necessary. It addresses Physical Layer noise testing related to NEXT/FEXT crosstalk, impulse, RFI, and functionality testing. CAT 5e and CAT 6 cables are unshielded and very susceptible to alien crosstalk (NEXT/FEXT) noise. When operating in conjunction with the DX2-10GQ-C16 series of test modules, IEEE 802.3bz ALSNR, Downshift, and "6 around 1" NEXT/FEXT modeling test cases are also supported. Trying to mimic this traffic and noise environment by cutting endless cable lengths is time-consuming and lacks repeatability. Users can now simulate these noise environments, allowing BASE-T device manufacturers to quickly isolate, pinpoint and correct problematic noise-related issues.

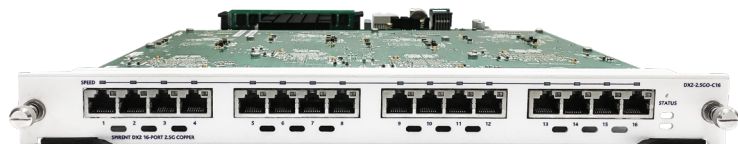
These Spirent modules use less power than comparable test modules available today and support smart power control and fast boot to reduce test time and eliminate wasted power. With the combination of processing and the deep real-time analysis that Spirent is known for, these modules deliver enhanced realism with scale and performance.

Spirent high density—Spirent BASE-T test modules deliver an industry leading 16 ports per module and combine Spirent's TestCenter's world class network emulation and traffic generation.

Enhanced realism—With scalability and performance scales in three dimensions: ports, network emulation and application traffic

Complete test coverage—Generate stateful multi-play traffic over emulated network topologies.

Dynamic multi-core processing—CPU resources can be allocated across the ports to meet the scale, performance and functionality required.



Productivity

Intelligent Results™

- The most accurate and comprehensive set of real-time results to validate tests and identify problems, giving engineers the insight they need to eliminate customer found defects
- Delivers more results, the tightest correlation and more information when bugs are found to provide more coverage in a single pass than can be done in multiple passes with other test tools
- Interesting Streams uses real-time results data mining to validate test cases and identify issues quicker

Technical Specifications				
Spirent DX2 module				
Maximum support	Speed	Maximum ports per slot	Maximum ports per STP-N11U chassis	Maximum ports per SPT-N4U chassis
DX2-10GQ-C16	10G/5G/2.5G/1G/100M	16	192	32
DX2-5GD-C16	5 G/2.5 G	16	192	32
DX2-2.5GO-C16	2.5 G	16	192	32
Operational modes	10G, 5G, 2.5G, 1G, 100M			
Port CPU	Stackable multi-core CPU			
User reservation	Per port group, 4 ports per port group, selectable speed per port			
PPM adjust	+/-100ppm, adjustable per port group			
User interface	Windows-based GUI and Tcl API			
Line clocking and packet time-stamping Spirent modules get their transmit line clocking and time-stamping from the control modules on the SPT-N11U and SPT-N4U	<p>Stratum-3 rated oscillator is the default time source. Transmit line clock is at the precise nominal Ethernet rate $\pm < 1$ PPM on initial shipment. Accurate to ± 4.6 PPM 15 years of operation</p> <ul style="list-style-type: none"> • 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 			
Inter-module and inter-chassis time synchronization	<p>Modules in the same chassis are phased-locked to the timing source of the control module. For more modules in separate chassis:</p> <ul style="list-style-type: none"> • Spirent-patented self-calibrating inter-chassis timing chain using dedicated port on chassis control module delivers precise synchronization ± 20ns • Synchronization via external GPS or CDMA network • Using IEEE 1588 or NTP packet-based approaches • With TIS/EIA-95B timing inputs 			

Electro-Mechanical specifications	
Module weight	2.45 kg, 5.375 lbs.
Module predicted MTBF	72,956 hours. Hours of continuous operation
Operating temperature range	Supported for 59° to 95° F (15° to 35° C) ambient temperature. 20% to 80% relative humidity.
Max power draw per module	Maximum of 201W per slot.

Technical Specifications (cont'd)

Spirent TestCenter Layer 2-3 generator and analyzer

Number of streams	8191 transmit and 8191 trackable receive streams; stream fields can be varied to create billions of flows
Frame transmit modes	Port-based (rate per port), stream-based (rate per stream), burst, timed
Min/max frame size (w/CRC)	60 to 16,004
Min/max Tx rates	1 packet per 3.43 seconds to 103% 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	<p>Tx and Rx frame counts and rates</p> <ul style="list-style-type: none"> • Tx and Rx Layer 1 byte counts and rates • Out of sequence errors • FCS errors and rate • Min, Max and Average Latency (2047 streams) • Dropped/In-Order/Reordered/Duplicate/Late and Jitter measurements
Per-port statistics analyzed in real time	<p>Tx and Rx frame counts and rates</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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: 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. Filtering, starting and stopping capture contains the following pre-defined events: FCS, PRBS, user-defined frame length, and test signature present. Each event can be independently set to ignore, include or exclude.
Latency modes	Benchmark tests support LIFO, LILO, FIFO or FILO latency calculation methods.
Route Insertion Table (RIT) Entries per port	7692 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 4 VFD insertions per stream

Requirements

- Spirent chassis and controller (see table)
- 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

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	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

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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

AMERICAS 1-800-SPIRENT
+1-800-774-7368
sales@spirent.com

US Government & Defense
info@spirentfederal.com
spirentfederal.com

EUROPE AND THE MIDDLE EAST
+44 (0) 1293 767979
emeainfo@spirent.com

ASIA AND THE PACIFIC
+86-10-8518-2539
salesasia@spirent.com

Ordering Information

Part number	Description	Spirent application		
		Spirent TestCenter	Avalanche Commander	Landslide
Test modules				
DX2-10GQ-C16	SPIRENT DX2 16-PORT QUINT speed 10G/5G/2.5G/1G/100M copper	X		
DX2-5GD-C16	SPIRENT DX2 16-PORT Dual speed 5G/2.5G copper	X		
DX2-2.5GO-C16	SPIRENT DX2 16-PORT 2.5GbE copper	X		
Related products				
C1-KIT-11-NG	Spirent BASE-T Noise Generator			
Spirent chassis				
SPT-N11U-110	Spirent N11U chassis and controller with 110VAC power supplies			
SPT-N11U-220	Spirent N11U chassis and controller with 220VAC power supplies			
SPT-N4U-110	Spirent N4U chassis and controller with 110VAC power supplies			
SPT-N4U-220	Spirent N4U chassis and controller with 220VAC power supplies			