



Spirent TestCenter SERIES 1000 AND SERIES 2000 GIGABIT ETHERNET TEST MODULES

Spirent TestCenter offers a variety of test modules and a high-density chassis or portable chassis to meet all core technology testing needs. There are Series 1000 and Series 2000 modules with copper only, fiber only, or dual media interfaces. The dual media interface has both copper and fiber interfaces on a single module. 1 Gigabit Ethernet port densities range from 2 ports up to 144 ports in a single chassis.

GET IT DONE FASTER WITH SPIRENT TESTCENTER

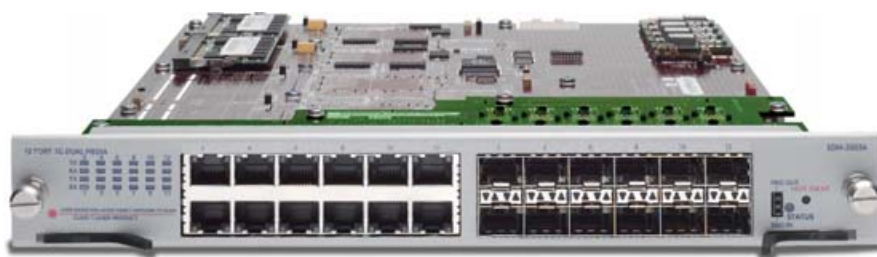
- Series 1000 for cost effective Layer 2/Layer 3 scalability and routing
- Series 2000 for high performance, advanced Layer 2/Layer 3, Layer 4 to Layer 7 and routing testing
- Hot swappable
- Multiple users per test module for greater efficiency of resources

In addition to the 1 Gigabit Ethernet test modules, Spirent TestCenter also offers Series 1000 and Series 2000 10 Gigabit Ethernet modules, creating a full spectrum of Ethernet test modules from 10Mbps to 10GbE.

All Spirent TestCenter hardware components can be used to perform testing for intelligent high-density enterprise switches and routers at an economical price. Each port can generate realistic traffic at different layers and analyze specific metrics for each layer. The Spirent TestCenter modules can simultaneously correlate data plane tests with control plane traffic such as routing, to provide the most realistic performance measurements.

The Series 1000 Gigabit Ethernet test modules suit customers that are looking for cost effective, high density Layer 2/Layer 3 scalability with routing capabilities. The Series 1000 modules can emulate up to 13,822 streams per port. These attributes make Series 1000 Test modules a very cost-effective solution for production test environments or research and development environments where high scalability performance testing is not required. The Series 2000 Gigabit Ethernet Test modules suit customers with total flexibility ranging from Layer 2/Layer 3 scalability with routing through advanced Layer 3 and advanced routing capabilities.

Additionally, the Series 2000 GigE modules can be used to measure performance of Layer 4 to 7 devices such as firewalls, load balancers, IDS/IPS systems, SSL accelerators, web accelerators and SSL and IPSec VPNs. Series 2000 modules can scale up to 32,767 streams per port. When combined with high-scale Spirent TestCenter software components, they offer the complete high performance testing solution.



EDM-2003A



CPR-2001A

APPLICATIONS

Spirent TestCenter customers use Series 1000 modules combined with the SPT-5000A or SPT-9000A chassis to achieve high volume production testing where high-density, low cost Ethernet ports are required.

Users can test devices from various manufacturers to benchmark their scalability and limitations at a cost-effective price. Develop and test your device in the lab with the Series 1000 or Series 2000 Test modules, then carry them to your customer site installed in an SPT-2000A portable chassis to prove your device's performance.

Compare and validate network equipment to determine the suitability of a specific application prior to deployment. The modules help to compare and validate equipment for compliance to product specifications prior to deployment, and ensure that advanced features such as host client capacities, QoS class prioritization, VLAN tagging, routing protocol scalability/performance, security protocols and IP Multicast will perform as expected. Customers can also use the test modules to verify routing control and converged network capabilities.

BENEFITS

- *Reduce lab space and test equipment costs:* High port density modules that support multi-user operation provide maximum efficiency on utilization of hardware resources
- *Protect your investment for future projects:* Dual media test modules provide both copper and fiber Ethernet interfaces (10/100/1000 Mbps and Gigabit fiber)
- *Ease of service:* All Spirent TestCenter modules are hot swappable for easy service or replacement while the chassis is fully operational. They can easily be managed remotely through an IP network. The Spirent TestCenter Administration Application provides a single software tool to manage your entire investment in Spirent TestCenter components.
- *Leverage test equipment purchases:* Use the same hardware platform to perform research and development using the interactive capabilities for pinpointing potential issues, performing comprehensive functional testing and high scale performance testing
- *Single Automation API:* All Layer 2 and 3 protocols for data plane and routing control plane testing can be accessed via a single, common automation framework user interface. The automation interface spans all network interfaces at all speeds, reducing your overall test automation while increasing test reuse.

KEY FEATURES

- High port density modules with per-port group reservation, providing multi-user capability
- Dual media test modules provide 10/100/1000 Mbps and Gigabit Ethernet fiber
- Wire-rate and beyond wire-rate traffic generation and analysis at Layers 2 and 3
- Compatible with all Spirent TestCenter software applications for comprehensive functional testing and performance analysis all in one system
- Supports automated industry standard RFC 2889 LAN switching performance and RFC 2544 L2/L3 performance tests
- Supports all core technologies required to test Enterprise L2/L3 switches, including QoS, IPv4/v6, multicast, routing, spanning tree, VLAN, and DHCP. Simultaneously runs multiple protocols per port to emulate large routed networks
- Series 2000 GigE modules support testing of application level protocols such as HTTP, SSL, FTP, Telnet, DNS, IPv6, IPSec, Capture/Replay, SIP, SMTP and POP3.
- Custom packet and frame editing is facilitated by a graphically driven field editor that allows the user to edit templates for a wide variety of preconfigured control and data plane packets
- Real-time per stream statistics, such as minimum, maximum, and average latency per traffic class
- Real-time event log allows user to view actual protocol messaging on a per-port basis
- Hardware is field-programmable. The module can be upgraded on site in its chassis as new features and technologies become available.

TECHNICAL SPECIFICATIONS

Transmit Generator Specifications

- Up to 32,767 unique streams on a port
- Set packet rate per stream
- Edit up to 6 variable fields per stream
- Test duration: continuous, time burst, frame burst
- Load units: frames/second or % of line rate
- Burst size in frames
- Loads: fixed, stepped, or random with minimum and maximum
- Frame sizes: fixed, stepped, or random with minimum and maximum

Stream Encapsulations

- Ethernet II, VLANs, stacked VLANs
- MPLS label stack, mixed VLANs / MPLS labels
- IPv4, ToS, Diffserv, TTL
- IP QoS settings per ToS or DSCP
- IPv6-neighbor discovery protocol, header extensions, dual stack
- TCP, UDP
- User defined frames (12 - 16K bytes)
- Error injection

Routing Protocol Emulation

For specifications on all unicast and multicast routing protocols or specifications for Layer 4 to Layer 7 tests that can run on the Ethernet test modules, please see separate Spirent TestCenter software datasheets.

Transmit Counters

- Total frame count
- Total byte count
- IPv4 frame count, ARP requests, ARP replies, PING requests, PING replies
- IPv6 frame count, PING requests, PING replies
- Protocol stack frame count
- Transmit frames per stream counter

Series 1000 Specifications					
Feature	CPR-1001A	FBR-1001A	EDM-1000A	EDM-1002A	EDM-1003A
Ports per module	8	8	4	2	12
Connector type	10/100/1000 RJ-45 Copper	1G SFP Fiber, LC connector	2 connectors per port. 10/100/1000 RJ-45 Copper and 1G SFP Fiber, LC connector		
SFP laser wavelengths*	N/A	850nm, 1310nm, 1550nm			
Cabling	4 pair CAT5 UTP	Multi-mode, single mode fiber	4 pair CAT5 UTP or Multi-mode, Single mode fiber		
Signal rate	10/100/1000 Mbps	1 Gbps	10/100/1000 Mbps and 1 Gbps		
CPU memory	256MB				
Variable fields per stream (VFDs)	4				
Minimum frame size, including CRC	44 bytes				
Maximum frame size	16 Kbytes				
Maximum transmit streams	13,822				
Maximum receive streams	65,535				

* SFP Transceivers ordered separately

Series 2000 Specifications						
Feature	CPR-2001A	CPR-2002B	FBR-2001B	EDM-2001B	EDM-2002B	EDM-2003B
Ports per module	8	8	8	4	2	12
Connector type	10/100/1000 RJ-45 Copper		1G SFP Fiber, LC connector	2 connectors per port. 10/100/1000 RJ-45 Copper and 1G SFP Fiber, LC connector		
SFP laser wavelengths*	N/A	N/A	850nm, 1310nm, 1550nm			
Cabling	4 pair CAT5 UTP		Multi-mode, single mode fiber	4 pair CAT5 UTP or Multi-mode, Single mode fiber		
Signal rate	10/100/1000 Mbps	10/100 Mbps	1 Gbps Mbps and 1 Gbps	10/100/1000 Mbps and 1 Gbps		
CPU memory	1GB					
Variable fields per stream (VFDs)	6					
Minimum frame size, including CRC	44 bytes					
Maximum frame size	16 Kbytes					
Maximum transmit streams	32,767					
Maximum receive streams	65,535					

* SFP Transceivers ordered separately



FBR-2001A

RECEIVE ANALYZER SPECIFICATIONS

Per Port Receive Counters

- Total frame count
- Total byte count
- IPv4 frame count, ARP requests, ARP replies, ICMPv4 destination unreachable frames, PING requests, PING replies
- IPv4 checksum error count
- IPv6 frame count, ICMPv6 destination unreachable frames, PING requests, PING replies
- Protocol stack frame count
- VLAN frame count
- MPLS frame count
- Frames with Spirent signature count
- Jumbo frame count
- Undersized frame count
- Oversized frame count
- FCS-32 error count
- Receive trigger counter – Eight 4 byte triggers

Analyzer Results per Stream

- Up to 65,535 streams analyzed per port in real time
- Latency average, minimum, maximum
- Total packet count
- Packets with Spirent signature
- IPv4 checksum errors
- Packets in-sequence count
- Packets out of sequence errors

Analyzer Results Per Stream - Real time viewing

- Total packet count
- Total byte count
- Receive frame rate, per stream, per customized tracking group, IPv4 QoS group (with or without VLAN), MPLS label group
- Average latency
- Packets in sequence count
- IPv4 packet count
- IPv6 packet count

CHASSIS SUPPORT

- The following modules are supported in all of the Spirent TestCenter chassis — SPT-2000A, SPT-5000A and SPT-9000A
 - CPR-1001A and CPR-2001A/B
 - CPR-1002A
 - EDM-1001A and EDM-2001A/B
 - FBR-1001A and FBR-2001A/B

Note: These modules require the Carrier Card (ACC-2090B) when used in SPT-2000A or SPT-9000A chassis.

- The following modules are supported in the Spirent TestCenter SPT-2000A and SPT-9000A chassis only
 - EDM-1002A and EDM-2002A/B
 - EDM-1003A and EDM-2003A/B



SPIRENT TESTCENTER CHASSIS AND OTHER MODULES

Spirent 2U Chassis and Controller
(P/N SPT-2000A)

Spirent 5U Chassis and Controller
(P/N SPT-5000A)

Spirent 9U Chassis and Controller
(P/N SPT-9000A)

Carrier Card for 2U/9U chassis
(P/N ACC-2090B)

1000 Series: 10G XFP, 1 Port
(P/N XFP-1001A)

2000 Series: 10G XFP, 1 Port
(P/N XFP-2001B)

1000 Series: 10G MSA Host module, 2 Port
(P/N MSA-1001A)

2000 Series: 10G MSA Host module, 2 Port
(P/N MSA-2001B)

REQUIREMENTS

- Pentium® or greater PC running Windows® 2000 Professional SP4 or XP Professional SP1/1A/2 with mouse/color monitor required for GUI operation
- For test automation system requirements refer to the Spirent TestCenter Automation data sheet (P/N 79-000037)
- Layer 4 to 7 testing requires 2000 series revision B modules
- Operating system languages supported: English, French, German, Japanese, Korean and Chinese (traditional and simplified)
- One Ethernet cable and one 10/100/1000 Mbps Ethernet card installed in the PC
- Fiber ports require separately ordered SFP transceiver

ORDERING INFORMATION

10/100/1000 Copper RJ-45, 8 port
(P/N CPR-1001A)

10/100/1000 Dual Media, 4 port
(P/N EDM-1001A)

1G Fiber SFP, 8 port (P/N FBR-1001A)

10/100/1000 Dual Media, 2 port
(P/N EDM-1002A)

10/100/1000 Dual Media, 12 port
(P/N EDM-1003A)

10/100/1000 Copper RJ-45, 8 port
(P/N CPR-2001B)

10/100/1000 Dual Media, 4 port
(P/N EDM-2001B)

10/100/1000 Dual Media, 2 port
(P/N EDM-2002B)

10/100/1000 Dual Media, 12 port
(P/N EDM-2003B)

1G Fiber SFP, 8 port (P/N FBR-2001B)

10/100 Copper RJ-45, 8 port
(P/N CPR-2002B)

SFF card carrier/adaptor for SPT-2000A/
SPT-9000A chassis (P/N ACC-2090A)

1000Base-SX Gigabit Ethernet SFP
transceiver, multimode, 850nm, LC
connector (P/N ACC-6025A)

1000Base-LX Gigabit Ethernet SFP
transceiver, single mode, 1310nm, LC
connector (P/N ACC-6026A)

1000Base-ZX Gigabit Ethernet SFP
transceiver, single mode, 1550nm, LC
connector (P/N ACC-7000A)

SPIRENT GLOBAL SERVICES

Spirent Global Services provides a variety of professional services, support services and education services — all focused on helping customers meet their complex testing and service assurance requirements. For more information, visit the Global Services website at www.spirentcom.com/gs or contact your Spirent sales representative.

Spirent TestCenter

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