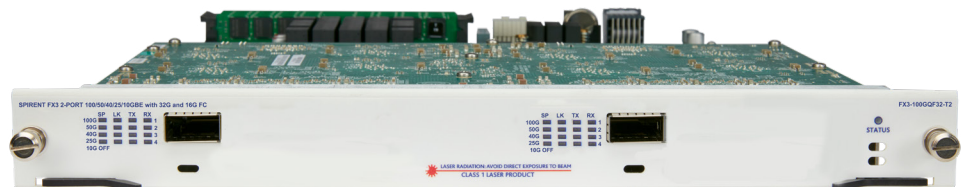# Spirent **TestCenter**™

7-Speed Fiber Channel / Ethernet Test Module

The efficiency, cost and potential performance benefits of converged data center networks are driving rapid adaptation of 16/32G Fiber Channel over Ethernet. With data center and cloud based applications pushing the need for faster storage access times and higher transfer rates it is vital to test and benchmark the performance of new converged FCoE and native Fiber Channel networks and switches.
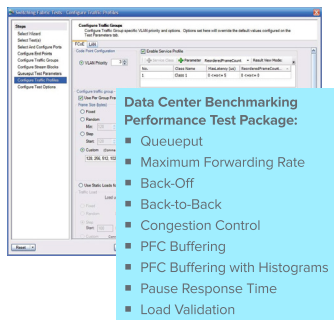

Spirent TestCenter's Converged Fiber Channel (FC) in conjunction with the new Spirent TestCenter 7-Speed 16/32G (FC) / 10/25/40/50/100G Ethernet module is the industry's first L2-7 converged data center performance benchmarking test solution. Based on the award-winning and industry-leading Spirent TestCenter architecture, the new 7-Speed Fiber Channel / Ethernet module enables data center network equipment vendors, system integrators, enterprises and data center cloud operators to test every aspect of tomorrows converged networks pre and post deployment.

The Spirent single system solution allows the user to simulate and test the full datacenter environment and understand the complete QoS performance for applications, storage, and datacenter virtualization. Spirent TestCenter offers a consistent end-to-end FC to FCoE solution that provides datacenter benchmarking for all layers of FC and FCoE in one application.
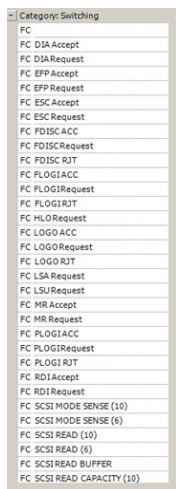
Spirent TestCenter also supports full FCoE functionality including standard compliant FIP, PFC with eight queues, DCBX, NPIV, FDISC, and FCoE benchmarking. Now the test engineer can design end-to-end FC to FCoE tests such as verifying the guaranteed delivery of data from a lossless FC environment to a PFC controlled FCoE environment.

Spirent's automated solutions contain a set of proposed IETF standard benchmarking methodologies that enable you to quickly and easily get started and characterize the performance of your Fiber Channel infrastructure with a comprehensive set of tests. The automated tests are easy to configure and produce a full results report.

Spirent TestCenter Offers a Comprehensive Set of Data Center Benchmarking Test

Data Center Benchmarking Performance Test Package:
- Queueput
- Maximum Forwarding Rate
- Back-Off
- Back-to-Back
- Congestion Control
- PFC Buffering
- PFC Buffering with Histograms
- Pause Response Time
- Load Validation

Hundreds of Frame Templates for Negative Testing

Benefits

- **Reduce TCO:** Complete FC to FCoE testing in a single system with a single unified user interface eliminates complexity of multiple systems and significantly shortens learning curve.

- **Industry expertise:** Spirent has an extensive history with Fiber Channel and Ethernet testing. Leverage Spirent's expertise to hit the ground running with a comprehensive set of tests to give you a complete picture of the performance of your implementation.

- **Understand complete end-to-end QoS performance:** Spirent's unparalleled statistics and consistent solution give the engineer a complete picture of the end-to-end performance across the FC to FCoE boundary.

  – Compare FCoE versus native Fiber Channel data center network performance.

  – Understand performance problems before they impact your implementation when it goes live.

  – Measure and validate low latency performance required by data storage applications from FCoE to FC and FC to FCoE at various rates up to the throughput limit.

  – Validate lossless data transfers under congestion between FCoE per Priority Flow Control (PFC) and Fiber Channel buffer and credit mechanisms.

- **Spirent TestCenter architecture:** This new module inherits all of the advantages of the Spirent TestCenter solution including HyperMetrics™ multi-core processing, NoCode™ Automation, Intelligent Results™ and Spirent Topology Emulation.

- **Scalability:** Test fabric scale with hundreds of Fiber Channel and Ethernet ports in a single test to understand the performance at true data center scale.

Ordering Information

Hardware

Description	Part Number
SPIRENT FX3 2-Port 100/50/25G Ethernet with 16/32G FC QSFP28	FX3-100GTNF32-T2*
SPIRENT FX3 2- Port 100/50/40/25/10G Ethernet with 16/32G FC QSFP28	FX3-100GQF32-T2*
SPIRENT FX3 2- Port 16G/32G FC QSFP28	FX3-F32O-T2*
SPIRENT MX3 2- Port 100/50/25G Ethernet with 16/32G FC QSFP28	MX3-100GTNF32-T2*
SPIRENT MX3 2- Port 100/50/40/25/10G Ethernet with 16/32G FC QSFP28	MX3-100GQF32-T2*

* Quantity of 2 ACC-1046A breakout cables are included with each of the above *test cards*

Accessories

Description	Part Number
Optical Fiber Breakout Cable MPO TO 2 LC Pairs MM OM4 3M	ACC-1046A
Optical Fiber Breakout Cable MPO TO 2 LC Pairs MM OM4 10M	ACC-1048A
Optical Transceiver QSFP28 100G. 16/32GB FC 850nm	ACC-7100A

Software

Description	Part Number
Data Center FCOE DCBX Base Package	BPK-1081A
Data Center Benchmarking Test Package	TPK-1059
DCBX Test Package (CTS)	TPK-1052
FIP Test Package (CTS)	TPK-1053
Fiber Channel Link Services Test Package (CTS)	TPK-1066
Fiber Channel Framing And Signaling Test Package (CTS)	TPK-1067
Fiber Channel Switching Test Package (CTS)	TPK-1068

Spirent TestCenter™

7-Speed Fiber Channel / Ethernet Test Module

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

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Features

- 4-port 16/32G Fiber Channel interface (up to 48 ports per chassis and 240 ports per rack; 2 ports per QSFP28 interface)
- Port speed can be set independently per QSFP28 interface (2 ports for each QSFP28 interface)
- Transmitter Training Signal (TTS) feature (32G mode); link adaptation and speed negotiation are not supported
- Internal and external clock
- Internal clock supports PPM adjustment per QSFP28 interface
- Frame size: minimum 36 bytes, maximum 2148 bytes
- Supports Class 2 and Class 3 FC traffic
- Real-time TX stream adjustments
- SCSI capability
- Advanced packet scheduler generates line rate FC and FCoE traffic with realistic bursty SCSI traffic patterns
- Per port user reservation
- Hundreds of frame templates for negative testing
- FC port state machine data frames and responses:
  - Basic link services and extended link services
  - Class 2 and 3 operation
  - Name identifier formats: IEEE 48-bit address, IEEE extended address, locally assigned address, IEEE register address
  - Exchange, sequence, sequence count management
  - Credit and credit count
  - End-to-end flow control
  - Buffer-to-buffer flow control
  - Connection management
  - Error detection and recovery
  - Stacked connect requests
  - Clock synchronization service
- FC per port statistics:
  - Total frame count and total byte count received
  - Count of frames with CRC errors
  - Count of oversized and undersized frames
  - Frame count (and byte count) of Class 2 and Class 3 received frames
  - PRBS bit errors
  - Tx credit unavailable over time
  - Tx credit (current value) over time
  - Frame loss, latency, and jitter (real-time and logged)
  - Latency histograms

Rev C | 02/19

Spirent
Promise. Assured.