Spirent **C1 Appliance**

Portable Layer 2-7 System

Solution Overview

Test a network or device with a solution that reproduces anything less than a realistic environment and you risk slower product development and deployment, and lower network service quality. Spirent C1 minimizes your risk by mirroring actual network scenarios and traffic patterns so networks, services and individual network elements can be quickly validated.

The C1 lowers the barrier to entry and enables companies of all sizes to test smarter and optimize their test investment by leveraging industry-leading test capabilities Spirent offers. The Spirent C1 supports Spirent TestCenter™, Avalanche Commander™, and Spirent CyberFlood™.

Whether you are a network engineer, manufacturing production line technician, product developer, or systems engineer, Spirent will empower you to better manage your solutions and deliver on the promise of next-generation services.

Applications

The C1 is an ideal fit for:

- Network element engineering development, design and test groups requiring physical access to a test port on the workbench
- Network equipment manufacturers doing burn-in and production line tests requiring low port count and compactness
- Technical and field marketing groups needing a portable test solution
- Network engineers and technicians performing pre-deployment testing and troubleshooting and service rollout testing
- University computer science departments and technical training organizations requiring a hands-on test tool

The Spirent C1 offers the power of Spirent's award-winning Layer 2-7 router, switch, and application and security test solutions in a portable form factor.

With support for line-rates 10G, 5G, 2.5G, 1G and 100M test ports and the complete suite of Spirent test solutions, the C1 offers the power of a professional test tool used by the world's top network equipment manufacturers, service providers and Fortune 100 at an affordable, entry level price point.

A complete Layer 2 to Layer 7 test tool is now available to replace the multiple open source utilities and ad-hoc testing methods. Test smarter by moving up to Spirent C1.

Features & Benefits

Spirent sets the standard for testing the network environment with unparalleled realism and test packages for:

- Mobile and fixed infrastructures
- Cloud infrastructures
- Cloud applications
- Enterprise campus and WAN networks
- Data centers

Realism

- Hyper realistic Layer 4-7 user emulation to test applications and application infrastructure
- Realistic Layer 2-3 traffic to test Quality of Service (QoS) mechanisms

Productivity

- Intelligent Results™ allow users to quickly confirm positive results and identify problematic areas
- Real-time traffic and protocol controls enable the tester to validate and troubleshoot problems by altering the test configuration while the test is running
- Real-time results views allow the user to see how the network responds to changes in specific test conditions without having to stop the test and save the results
- Built-in wizards and automated test scenarios reduce test setup and execution times
- Easy NoCode™ Automation for novice programmers

Technical Specifications

- Four 10/100/1000BASE-T ports
- Two 10G SFP+ ports—10GBASE-SR, 850nm, MMF; 10GBASE-LR, 1310nm, SMF
- Four 10/5/2.5/1G/100M Ports
- 2U (3.5 inches) height x 13 inches wide x 10 inches deep
- 100-240V AC input, 300W max
- Supports Spirent TestCenter and Avalanche Commander
- NBASE-T and IEEE 802.3bz compliant

Spirent C1 Appliance

Ports per chassis	• Four 1G or two 10G • Four 10G or 5G or 2.5G or 1G or 100M
Optical transceiver	• 1G: 10/100/1000BASE-T • 10G: SFP+, 10GBASE-SR (standard) or 10GBASE-LR (optional)
Operational modes	• 10G, 5G, 2.5G, 1G, 100M • LAN, with DIC on (10 G)
Timing	• Internal Tx clock; optionally synchronized to NTP server or IEEE 1588v2 Grandmaster inter-chassis synchronization • Highly accurate internal hardware timestamp
User reservation	• Per appliance • Per port group, four ports per port group, selectable speed per port (C1-KIT-06-2015 only)

Layer 2/3 Generator and Analyzer

Frame transmit modes	• Port based (rate-per-port) • Timed • Stream based (rate-per-stream) • PFC support (10G only) • Burst
Real-time Tx stream adjustments	Change rate and frame length settings without stopping the generator or analyzer for truly interactive, cause and effect analysis
Advanced per-stream statistics available in real time	Over 35 measurements tracked in real-time for each received stream including: • Real-time loss and advanced sequencing (1G only) • Out of sequence • **Latency:** Avg, min, max and short-term avg; first/last frame arrival timestamp • **Latency modes:** LILO (forwarding delay per RFC 4689), LIFO (store and forward devices per RFC 1242) and FIFO (bit forwarding devices per RFC 1242) • **Data integrity:** IP checksum, TCP/UDP checksum, frame CRC, embedded CRC and PRBS bit errors
Supported Tx Signature Capability	Sequencing, Latency and Jitter

* Fully compatible with Spirent's Virtual test products.

Layer 2/3 Generator and Analyzer (cont'd)

Part Number	Port Speed	# Streams	Min/Max Frame Size	Packet Capture
C1-KIT-01-BASE-STC	1G	512	60 – 16,004	4 MB
C1-KIT-01-2014-STC	1G	512	60 – 16,004	4 MB
C1-KIT-01-2015-STC	1G	512	60 – 16,004	4 MB
C1-KIT-02-BASE-STC	10G	512	60 – 16,004	4 MB
C1-KIT-02-2014-STC	10G	512	60 – 16,004	4 MB
C1-KIT-02-2015-STC	10G	512	60 – 16,004	4 MB
C1-KIT-03-BASE-STC	1/10G	512	60 – 16,004	4 MB
C1-KIT-03-2014-STC	1/10G	512	60 – 16,004	4 MB
C1-KIT-03-2015-STC	1/10G	512	60 – 16,004	4 MB
C1-KIT-03-2017-STC	1/10G	512	60 – 16,004	4 MB

Layer 4-7 Application and Security*

Category	Details				
IP Version Supported	IPv4	IPv6			
Encapsulation Protocols	802.1Q	GTPV1, V2	802.1 Q-in-Q		
Transport Protocols	TCP, UDP	SSLv2, SSLv3	TLSv1, TLS v1.2	TLS v1.3	
Data Protocols	HTTP, HTTP2, HTTPS, FTP (Active/Passive)	DNS, DNSTCP, DNSSEC, TELNET	SMTP, POP3, IMAP4, CIFS	Radius, NFS, MM4, RTMP	ICMP, Capture/Replay, PPTP
Authentication Protocols	802.1x, Network Access Control (NAC), Radius				
Extended Protocols	BitTorrent, Gnutella, MSN, Yahoo, SKYPE	SQL, MYSQL, Oracle, SMB, NFS	Remote Desktop, Exchange, LDA		
Voice Protocols	SIP over TCP	SIP over UDP			
Voice Codecs	G711A, G711U	G.723.1, G726-32	G.728, G729AB		
Video Protocols	Adaptive Bitrate Streaming, Apple HLS, Flash Streaming using RTMP/RTMPT, Unicast Streaming Quicktime RTSP/RTP	Unicast Streaming RealNetwork RTSP/RTP, Unicast Streaming Microsoft MMS, Multicast Streaming IGMPv2, IGMPv3 and MLDv2 HTTP			
Video Codecs	MPEG-1, H.261	MPEG-2. H.262, MPEG-4. H.264			
Encryption Assessment	SSL, TLS 1.0/1.1/1.2/1.3, IPsec remote Access	IPsec Site to Site, IKE V1/V2, Deep cipher support			
Reporting	Integrated test Results Reporter(TM), Fully customizable report generation in PDF and HTML, Full set of raw test results available in CSV				

* Layer 4-7 support beyond HTTP, DNS, FTP, and Telnet requires optional All Protocols or Extended Protocols Kit. Please contact your Spirent sales representative for a complete list of supported protocols.

About Spirent

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

Technical Specifications (cont'd)	
Protocol Emulations*	
Enterprise and data center switch protocol support	• **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:** DCBX, FCoE, FIP, 802.1Qbb • **Stateful L4-7:** HTTP, SIP and FTP
Service Provider	• **Routing and MPLS:** All major IPv4 and IPv6 unicast and multicast routing protocols, RSVP-TE, LDP, VPLS-LDP, VPLS-BGP, BGP/MPLS-VPN, Fast Re-route, mVPN, P2MP-TE, BFD, TWAMP and PWE3 (RFC4447) • **Access:** ANCP, PPPoE, DHCP, L2TP, IGMPv1/v2/v3, MLDv1/v2, DHCPv6 and PPPoEv6, 6RD, Dual-Stack Lite • **Carrier Ethernet and bridging:** LACP, STP, RSTP and MSTP, 802.1ag CFM, Y.1731, PBB, PBB-TE, Link OAM • **Stateful L4-7:** HTTP, SIP and FTP, Unicast/Multicast RTSP and RAW TCP • **Mobile Backhaul:** MPLS-TP, 1588v2 and Synchronous Ethernet as supported protocols

Requirements
Windows Controller PC

Ordering Information
Flexible bundles with hardware and Spirent TestCenter software packages available for base traffic generation and analysis, or traffic generation and analysis with full protocol support. CyberFlood and Avalanche support is available as optional add-on software licenses.

Part Number	Description
C1-KIT-01-BASE-STC	C1 Kit w/ 4-Port 1G Copper and Base STC Protocol
C1-KIT-01-2014-STC	C1 Kit w/ 4-Port 1G Copper and 2014 STC Protocol Pack
C1-KIT-01-2015-STC	C1 Kit w/ 4-Port 1G Copper and 2015 STC Protocol Pack
C1-KIT-02-BASE-STC	C1 Kit w/ 2-Port 10G Fiber and Base STC Protocol SW
C1-KIT-02-2014-STC	C1 Kit w/ 2-Port 10G Fiber and 2014 STC Protocol Pack
C1-KIT-02-2015-STC	C1 Kit w/ 2-Port 10G Fiber and 2015 STC Protocol Pack
C1-KIT-03-BASE-STC	C1 Kit 4-Port 1G Copper 2-Port 10G Fiber & Base STC Protocol
C1-KIT-03-2014-STC	C1 Kit 4-Port 1G CPR, 2-Port 10G Fiber, 2014 STC Protocol Pack
C1-KIT-03-2015-STC	C1 Kit 4-Port 1G CPR, 2-Port 10G Fiber, 2015 STC Protocol Pack
C1-KIT-03-2017-STC	C1 Kit 4-Port 1G CPR, 2-Port 10G Fiber, 2017 STC Protocol Pack
ACC-0030	C19" Rackmount Accessory Kit

Includes most Spirent TestCenter Base Packages. Please contact your Spirent sales representative for a complete list of supported protocols.

1 year hardware warranty comes standard.

Extended warranty, software maintenance, and technical support packages are available.

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