

## SPIRENT

# C1 PORTABLE LAYER 2-7 SYSTEM

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-rate 1 GE or 10 GE 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.

### 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™ and Avalanche Commander™.

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



**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**

- 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

Fully compatible with Spirent’s Virtual test products

**TECHNICAL SPECIFICATIONS**

- Four 10/100/1000BASE-T ports
- Two 10 GE SFP+ ports—10GBASE-SR, 850nm, MMF; 10GBASE-LR, 1310nm, SMF
- 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

**Spirent C1 Appliance**

<b>Ports per chassis</b>	Four 1 GE or two 10 GE
<b>Optical transceiver</b>	1 GE:10/100/1000BASE-T 10 GE: SFP+, 10GBASE-SR (standard) or 10GBASE-LR (optional)
<b>Operational modes</b>	LAN, with DIC on (10 GE)
<b>Timing</b>	<ul style="list-style-type: none"> <li>• Internal Tx clock; optionally synchronized to NTP server or IEEE 1588v2 Grandmaster inter-chassis synchronization</li> <li>• Highly accurate internal hardware timestamp</li> </ul>
<b>User reservation</b>	Per appliance

**Layer 2/3 Generator and Analyzer**

<b>Number of streams</b>	512 transmit and 511 trackable receive streams; stream fields can be varied to create billions of flows
<b>Frame transmit modes</b>	<ul style="list-style-type: none"> <li>• Port based (rate per port)</li> <li>• stream based (rate per stream)</li> <li>• burst</li> <li>• timed</li> <li>• PFC support (10G only)</li> </ul>
<b>Min/max frame size (w/CRC)</b>	60 to 10,240
<b>Min/max Tx rates</b>	1 packet per 3.43 seconds to 101% of line rate
<b>Real-time Tx stream adjustments</b>	Change rate and frame length settings without stopping the generator or analyzer for truly interactive, cause and effect analysis

**TECHNICAL SPECIFICATIONS (CONTINUED)**

**Layer 2/3 Generator and Analyzer**

<b>Advanced per-stream statistics available in real time</b>	<p><b>Over 35 measurements tracked in real-time for each received stream including:</b></p> <ul style="list-style-type: none"> <li>• Real-time loss and advanced sequencing (1G only)</li> <li>• Out of sequence</li> <li>• <b>Latency:</b> Avg, min, max and short-term avg; first/last frame arrival timestamp</li> <li>• <b>Latency modes:</b> LIFO (forwarding delay per RFC 4689), LIFO (store and forward devices per RFC 1242) and FIFO (bit forwarding devices per RFC 1242)</li> <li>• <b>Data integrity:</b> IP checksum, TCP/UDP checksum, frame CRC, embedded CRC and PRBS bit errors</li> </ul>
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<b>Supported Tx Signature Capability</b>	Sequencing, Latency and Jitter
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<b>Packet Capture</b>	<ul style="list-style-type: none"> <li>• 4 MB (first 128 bytes of each frame)</li> <li>• Stateful capture/replay for extended protocol support</li> </ul>
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**Layer 4-7 Application and Security\***

<b>IP Version Supported</b>	<ul style="list-style-type: none"> <li>• IPv4</li> <li>• IPv6</li> </ul>
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<b>Encapsulation Protocols</b>	<ul style="list-style-type: none"> <li>• 802.1Q</li> <li>• 802.1 Q-in-Q</li> </ul>
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<b>Transport Protocols</b>	<ul style="list-style-type: none"> <li>• TCP</li> <li>• UDP</li> <li>• SSLv2</li> <li>• SSLv3</li> <li>• TLSv1</li> </ul>
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<b>Data Protocols</b>	<ul style="list-style-type: none"> <li>• HTTP</li> <li>• HTTPS</li> <li>• FTP (Active/Passive)</li> <li>• DNS</li> <li>• DNSTCP</li> <li>• DNSSEC</li> <li>• TELNET</li> <li>• SMTP</li> <li>• POP3</li> <li>• IMAP4</li> <li>• CIFS</li> <li>• RADIUS</li> <li>• NFS</li> <li>• MM4</li> <li>• RTMP</li> <li>• ICMP</li> <li>• Capture/Replay</li> </ul>
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<b>Authentication Protocols</b>	<ul style="list-style-type: none"> <li>• 802.1x</li> <li>• Network Access Control (NAC)</li> <li>• Radius</li> </ul>
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**TECHNICAL SPECIFICATIONS (CONTINUED)**

**Layer 4-7 Application and Security\***

<b>Extended Protocols</b>	<ul style="list-style-type: none"> <li>• BitTorrent</li> <li>• Gnutella</li> <li>• MSN</li> <li>• Yahoo</li> <li>• SKYPE</li> <li>• SQL</li> <li>• MYSQL</li> <li>• Oracle</li> <li>• SMB</li> <li>• NFS</li> <li>• Remote Desktop</li> <li>• Exchange</li> <li>• LDA</li> </ul>
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<b>Voice Protocols</b>	<ul style="list-style-type: none"> <li>• SIP over TCP</li> <li>• SIP over UDP</li> </ul>
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<b>Voice Codecs</b>	<ul style="list-style-type: none"> <li>• G711A</li> <li>• G711U</li> <li>• G.723.1</li> <li>• G726-32</li> <li>• G.728</li> <li>• G729AB</li> </ul>
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<b>Video Protocols</b>	<ul style="list-style-type: none"> <li>• Flash Streaming using RTMP/RTMPT</li> <li>• Unicast Streaming Quicktime RTSP/RTP</li> <li>• Unicast Streaming RealNetwork RTSP/RTP</li> <li>• Unicast Streaming Microsoft MMS</li> <li>• Multicast Streaming IGMPv2</li> <li>• IGMPv3 and MLDv2 HTTP</li> <li>• Adaptive Bitrate Streaming</li> <li>• Apple HLS</li> </ul>
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<b>Video Codecs</b>	<ul style="list-style-type: none"> <li>• MPEG-1</li> <li>• H.261</li> <li>• MPEG-2. H.262</li> <li>• MPEG-4. H.264</li> </ul>
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<b>Encryption Assessment</b>	<ul style="list-style-type: none"> <li>• SSL</li> <li>• TLS 1.0/1.1</li> <li>• IPsec remote Access</li> <li>• IPsec Site to Site</li> <li>• IKE V1/V2</li> <li>• Deep cipher support</li> </ul>
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<b>Vulnerability Assessment</b>	<ul style="list-style-type: none"> <li>• L2/L4 DDOS Attacks</li> <li>• 3500+ L4/L7 Application Attacks</li> <li>• SANs Top-20 Internet Security Attacks</li> </ul>
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<b>Reporting</b>	<ul style="list-style-type: none"> <li>• Integrated test Results Reporter(TM)</li> <li>• Fully customizable report generation in PDF and HTML</li> <li>• Full set of raw test results available in CSV</li> </ul>
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\*Layer 4-7 support beyond HTTP, DNS, FTP, and Telnet requires optional All Protocols or Extreme Protocols Kit. Please contact your Spirent sales representative for a complete list of supported protocols.

**TECHNICAL SPECIFICATIONS (CONTINUED)**

Protocol Emulations*	
Enterprise and data center switch protocol support	<ul style="list-style-type: none"> <li>• <b>Routing, multicast and bridging:</b> All major IPv4 and IPv6 unicast and multicast routing protocols, IGMPv1/v2/v3, MLDv1/v2, LACP, STP, RSTP and MSTP</li> <li>• <b>Data center:</b> DCBX, FCoE, FIP, 802.1Qbb</li> <li>• <b>Stateful L4-7:</b> HTTP, SIP and FTP</li> </ul>
Service Provider	<ul style="list-style-type: none"> <li>• <b>Routing and MPLS:</b> 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)</li> <li>• <b>Access:</b> ANCP, PPPoE, DHCP, L2TP, IGMPv1/v2/v3, MLDv1/v2, DHCPv6 and PPPoEv6, 6RD, Dual-Stack Lite</li> <li>• <b>Carrier Ethernet and bridging:</b> LACP, STP, RSTP and MSTP, 802.1ag CFM, Y.1731, PBB, PBB-TE, Link OAM</li> <li>• <b>Stateful L4-7:</b> HTTP, SIP and FTP, Unicast/Multicast RTSP and RAW TCP</li> <li>• <b>Mobile Backhaul:</b> MPLS-TP, 1588v2 and Synchronous Ethernet as supported protocols</li> </ul>

\*Protocol emulation requires optional All Protocols Kit. Please contact your Spirent sales representative for a complete list of supported protocols.

**REQUIREMENTS**

Windows Controller PC


**ORDERING INFORMATION**

Flexible bundles with hardware and Avalanche Commander and Spirent TestCenter software packages available for base traffic generation and analysis, or traffic generation and analysis with full protocol support.

Description	Part Number
<b>C1 KIT W/4 PORT 1G COPPER AND BASE PROTOCOL</b>	C1-KIT-01-BASE
<b>C1 KIT W/4 PORT 1G COPPER AND ALL PROTOCOL SW**</b>	C1-KIT-01-ALL
<b>C1 KIT W/2 PORT 10G FIBER AND BASE PROTOCOL SW</b>	C1-KIT-02-BASE
<b>C1 KIT W/2 PORT 10G FIBER AND ALL PROTOCOL SW**</b>	C1-KIT-02-ALL
<b>C19" RACKMOUNT ACCESSORY KIT</b>	ACC-0030
**Includes most Spirent TestCenter Base Packages and the Avalanche Extreme software bundle. Please contact your sales representative for more information.	
1 year hardware warranty comes standard.	
Extended warranty, software maintenance, and technical support packages are available.	

**SPIRENT 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.spirent.com](http://www.spirent.com) or contact your Spirent sales representative.



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