

# Spirent TestCenter™

## WLAN AP Emulation for Device Testing

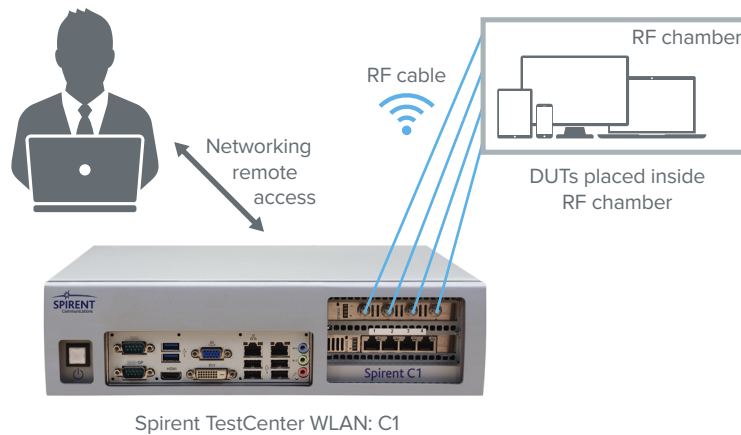
### Applications

- Multi-AP emulation for device testing
- Device personal and enterprise security type testing
- Device stability testing
- Device interwork testing with legacy mode APs
- Association processing and timing testing under various authentication selections
- DHCP performance testing
- Benchmark or baseline testing for UDP and TCP traffic throughput
- RFC2544 testing to examine throughput performance vs different packet size
- DFS testing mode support
- Rate vs. range (RSSI, pathloss) testing
- Adjunct or co-channel interference testing

Spirent TestCenter supports the highest performing and most realistic wireless local area network (WLAN) interface emulation for direct functionality and performance testing of WLAN devices with a focus on data traffic throughput. Multiple Spirent TestCenter WLAN platforms are available to emulate multiple access points (APs) with realistic 802.11 a/b/g/n/ac WLAN interface to support from legacy IEEE 802.11 a/b/g/n to the latest IEEE 802.11ac Wave-2 standard. These testers enable users to easily build up a testbed involving the emulated APs with a validated golden performance and the devices under test (DUTs), a task that was previously one of the most challenging ones in wireless interface testing.

The DUTs can be a wide range of portable WLAN devices such as smartphones, tablets, laptops, internet of thing (IoT) devices, etc. The feasible connections between the emulated APs and DUTs can be either directly RF cabled conductive connection or a shielded RF environment such as a RF isolation chamber for OTA link for both WLAN functional and data traffic experiment. The solutions cover basic WLAN connectivity and data throughput testing containing advanced RFC style network traffic and throughput performance test methodologies for convenient manual trials or fully automated test suites. This tool ultimately enables testing engineers to perform a comprehensive and scalable test suite for either lab performance testing or a more formal certification testing for WLAN device products.

These Spirent TestCenter WLAN test platforms consist of multiple IEEE 802.11 radios, providing the maximum user configurability and flexibility to emulate various IEEE 802.11ac Wave-2 APs with user selected parameters and capabilities. They deliver best in class traffic generation and analysis capabilities for testing functionality, performance, and scalability. They are equipped with both Spirent TestCenter signature traffic and iPerf traffic generation, as well as analytical tools for UDP and TCP throughput performance in uni-directional or bi-directional testing. Other portable performance metrics such as CPU and battery utilization and impact with the maximum possible throughput may also be examined along with benchmark or baseline performance testing.



## Features & Benefits

- Support IEEE 802.11ac Wave-2 Standard and 2.4GHz and 5GHz dual band concurrently
- Support either cabled conductive or OTA mode testing environment
- Support multiple SSIDs (up to 16 on the same radio)
- Support 80 MHz channel bandwidth for MIMO up to 4x4 on 5GHz band
- Support 40 MHz channel bandwidth for MIMO up to 4x4 on 2.4GHz band
- Support 80+80 MHz and 160 MHz channel bandwidth for MIMO up to 2x2
- 802.11ac explicit transmit beamforming (TxBF) and legacy implicit TxBF for beamformee
- Internal channel attenuation up to 31.75dB for both TX and RX with 0.25dB resolution
- Support various MU-MIMO client configurations for MU-MIMO grouping testing
- Support full dynamic data rate adaptation with user selectable MCS index for various different protocol rates
- Support configurations for CTS/RTS, beacon interval, guard time Interval, LDPC, HT20/40
- Support different MAC frame-aggregation configurations for A-MPDU and A-MSDU
- Support various channel selection plan for different geographic regions globally
- Best-in-class realistic traffic generation and analysis with Spirent TestCenter signature traffic and iPerf traffic
- Support various RFC style test cases (RFC2544) for throughput, routing, forwarding performance testing
- Each emulated SSID supports 802.11 MAC configuration independently
- Support IEEE 802.11 packet capture with filters for a real-time Wireshark decoding or post processing
- Extensive 802.11 stats, counters, and statistics report in either real-time or periodically

## Technical Specifications

WLAN NIC Technical Specifications	
802.11 Protocols	IEEE 802.11 a/b/g/n/ac on 2.4GHz and 5GHz frequency band
Number of Emulated SSIDs per Radio	16 per radio
MIMO Supported	Support various MIMO configurations 1x1, 2x2, 3x3, and 4x4
MU-MIMO Supported	Support MU-MIMO for 802.11ac Wave-2 on 5GHz
Beamforming Support	802.11ac explicit transmit beamforming (TxBF) and legacy implicit TxBF for beamformee
Coding Support	Supports Spatial Multiplexing, Cyclic-Delay Diversity (CDD), Low-Density Parity Check (LDPC), Maximum Ratio combining (MRC), Space Time Block Code (STBC)
Frequency Band	2.4GHz (802.11 b/g/n/ac) and 5 GHz (802.11 a/n/ac)
Guard Interval	Guard interval selection - 800/400 ns for 802.11 n/ac
PHY Rates	PHY rates - 6.5 Mbps (802.11b) to 800 Mbps (802.11n, 40MHz, 4x4, MCS31, 802.11ac 40MHz, MCS9) and 1734.2 Mbps (802.11ac, 80MHz, 4x4, MCS9, or 80MHz+80MHz/160MHz, 2x2, MCS9)
MCS Type	Full MCS index support in 802.11 n/a: <ul style="list-style-type: none"> <li>• all 0-31 MCS index for 802.11n</li> <li>• all 0-9 MCS index for 802.11ac</li> </ul>
Rate Adaptation	Support full rate adaptation by default
Coding Rates	FEC coding rates - 1/1, 2/3, 3/4, 5/6
Channel Bandwidth	20 MHz, 40 MHz, 80 MHz, 80 MHz+80 MHz, 160 MHz
Frame Aggregation	802.11 n/ac Aggregation types: Both Tx and Rx A-MPDU, A-MSDU, and Block ACK
Maximum TX Power (5GHz)	Maximum default TX power per chain: 5dBm (+-2dB tolerance) on 2.4GHz and 0dBm (+-2dB tolerance) on 5GHz band
RX Sensitivity	< -90 dBm
Transmit Power Control	Transmit power control: 16dB range in 1 dB step
Channel Attenuation	Programmable RX/TX attenuation up to 31.75dB with 0.25dB*
Channel and Frequency	Operation Channels: <ul style="list-style-type: none"> <li>• 2.412 to 2.484 GHz: 1 to 14</li> <li>• 5.180 to 5.320 GHz: 36, 40, 44, 48, 52, 56, 60, 64</li> <li>• 5.500 to 5.700 GHz: 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140</li> <li>• 5.740 to 5.825 GHz: 149, 153, 157, 161, 165</li> </ul>
Interface Connector	<ul style="list-style-type: none"> <li>• Antenna interface connectors:</li> <li>• SMA female connector, standard thread, AC coupled, 50 Ohms</li> </ul>
Enterprise Authentication Support	802.1x - EAP/TLS, TTLS, PEAP, and AKA
Encryption Support	WEP-40 and WEP-104, TKIP (WPA), AES-CCMP (WPA2)

\*Applicable to supported platforms only.

### 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](http://www.spirent.com)

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### Product Information

For purchasing a new Spirent TestCenter WLAN C1 Appliance, the following C1 Bundle with AP Emulation Support is available:

Description	Part Number
C1 4-PORT 10/5/2.5/1G/100M, Wave-2 WiFi NIC, 2.4/5GHz, AP and Client Emulation, and Full C1 Protocol Pack	C1-KIT-11-2015-11AC

For existing Spirent TestCenter WLAN platforms, the following part numbers provide the AP Emulation feature upgrade:

Description	Platform	Part Number
WIFI AP EMULATION PACKAGE FOR SPIRENT TESTCENTER	Spirent Test Module	BPK-5001
WIFI AP EMULATION PACKAGE FOR SPIRENT TESTCENTER C1	Spirent C1 Appliance	C1-SW-B5001
WIFI AP EMULATION PACKAGE FOR SPIRENT TESTCENTER C50	Spirent C50 Appliance	C50-BPK-5001

*A full suite of Spirent protocol and test packages are available with perpetual and subscription licensing options.*

*Please contact your Spirent sales representative to select the right option for your testing needs.*