

# Spirent Wi-Fi Automated Test System

The Wi-Fi Automated Test System (ATS) is a fully automated solution for Wi-Fi data throughput performance testing of smart phones or other Wi-Fi devices. It measures and characterizes the end-to-end data throughput at the application layer using Wi-Fi as the radio access mechanism, providing deeper insights into device performance while realistically representing user experience in the live network.

## Applications

- Research & Development
- Performance Analysis
- Benchmarking
- Device performance specific to carriers
- Software regression test
- User experience evaluation

Operators today are facing capacity challenges and looking to take advantage of Wi-Fi technology as an effective offload mechanism from LTE networks. In order to ensure that devices can deliver comparable data throughput performance over Wi-Fi as that over LTE networks, it is imperative to test Wi-Fi data throughput performance of devices. As a result, Wi-Fi data throughput testing is an area that is rapidly gaining prominence among operators, OEMs and chipset manufacturers.

The Spirent Wi-Fi Automated Test System is a powerful, fully automated solution for data performance test. With Spirent's VR5 wireless channel emulator supporting new Wi-Fi channel models such as 802.11n/ac and MIMO, this solution can simulate dynamic Wi-Fi environments to accurately reproduce real-world network conditions, yielding consistent and repeatable test results.

Dashboard		Summary										
Indicator	Values	Test #	Description	Test Case	Test Folder	Status	Avg High Pwr	High Limit	Avg Medium Pwr	Medium Limit	Avg Low Pwr	Low Limit
Test Status	Percentage	1	WiFiATS Test 1	CS8 Developer Tem...	CS8 Development Libr...	Pass	23.3	24.0	23.3	24.0	15.5	15.0
Fail	12 of 22 (54%)	2	WiFiATS Test 2	CS8 Developer Tem...	CS8 Development Libr...	Pass	25.8	24.0	25.8	24.0	16.5	15.0
Pass	3 of 22 (13%)	3	WiFiATS Test 3	CS8 Developer Tem...	CS8 Development Libr...	Fail	17.0	24.0	16.8	24.0	16.4	15.0
Pending	0 of 22 (0%)	4	WiFiATS Test 4	CS8 Developer Tem...	CS8 Development Libr...	Fail	0.8	20.0	0.8	20.0	0.8	0.0
Other	6 of 22 (27%)	5	WiFiATS Test 5	CS8 Developer Tem...	CS8 Development Libr...	Fail	0.8	6.0	0.8	6.0	0.8	6.0
Elapsed Time	HH:MM:SS	6	WiFiATS Test 6	CS8 Developer Tem...	CS8 Development Libr...	Pass	5.3	3.0	5.3	3.0	5.3	3.0
Session	13:50:20											

Type	PC Timestamp	Description
Result	3/25/2015 9:56:20 PM	Pathloss: 82dB - Upload Throughput Result: 25825.3106031746 - Tx Rate Percentages - MCS 7: 100.0
Result	3/25/2015 9:58:55 PM	Pathloss: 83dB - Upload Throughput Result: 25827.1433650794 - Tx Rate Percentages - MCS 7: 100.0
Result	3/25/2015 10:01:30 PM	Pathloss: 84dB - Upload Throughput Result: 25828.8670476191 - Tx Rate Percentages - MCS 7: 100.0
Result	3/25/2015 10:01:30 PM	Average Upload Medium Band: 25828.3505015873
Result	3/25/2015 10:01:39 PM	STARTING LOW POWER BAND TEST - TARGET: 15000
Result	3/25/2015 10:04:24 PM	Pathloss: 85dB - Upload Throughput Result: 16472.891047619 - Tx Rate Percentages - MCS 7: 100.0
Result	3/25/2015 10:07:07 PM	Pathloss: 86dB - Upload Throughput Result: 16472.581968254 - Tx Rate Percentages - MCS 7: 100.0
Result	3/25/2015 10:09:42 PM	Pathloss: 87dB - Upload Throughput Result: 16472.7165894127 - Tx Rate Percentages - MCS 7: 100.0
Result	3/25/2015 10:12:16 PM	Pathloss: 88dB - Upload Throughput Result: 16472.5553015873 - Tx Rate Percentages - MCS 7: 100.0
Result	3/25/2015 10:14:51 PM	Pathloss: 89dB - Upload Throughput Result: 16472.708253968 - Tx Rate Percentages - MCS 7: 100.0
Result	3/25/2015 10:17:29 PM	Pathloss: 90dB - Upload Throughput Result: 16472.581968254 - Tx Rate Percentages - MCS 7: 100.0
Result	3/25/2015 10:20:10 PM	Pathloss: 91dB - Upload Throughput Result: 16470.3834520635 - Tx Rate Percentages - MCS 7: 100.0
Result	3/25/2015 10:22:46 PM	Pathloss: 92dB - Upload Throughput Result: 16472.581968254 - Tx Rate Percentages - MCS 7: 100.0
Result	3/25/2015 10:25:23 PM	Pathloss: 93dB - Upload Throughput Result: 16472.5572063492 - Tx Rate Percentages - MCS 7: 100.0
Result	3/25/2015 10:27:58 PM	Pathloss: 94dB - Upload Throughput Result: 16472.5644444444 - Tx Rate Percentages - MCS 7: 100.0
Result	3/25/2015 10:27:58 PM	Average Upload Low Band: 16472.4122920635
Result	3/25/2015 10:28:00 PM	Test Passed

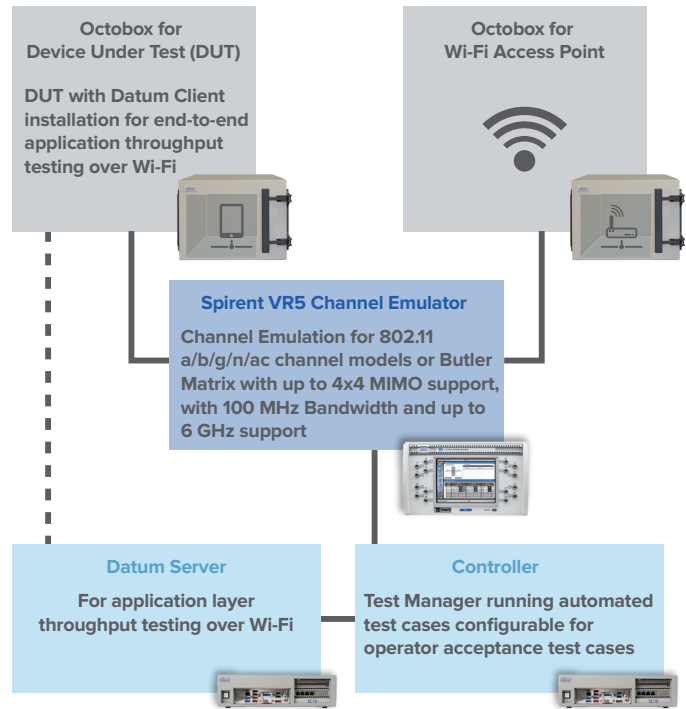


# Spirent Wi-Fi Automated Test System

## Features

- Support for different Wi-Fi models including 802.11a/ b/ g/ n/ ac
- Easy use and execution – get test cases running in minutes
- Real-network simulation of data throughput performance
- Data throughput with power range
- Data throughput with SNR
- High isolation and shielding with the Spirent Octobox
- Realistic simulation of user experience with Datum application
- Support Android /Windows mobile/ IOS for Device Under Test (DUT)
- Transmission mode support for transmit diversity and 2x2 MIMO

## System Components



## Octobox (for Device Under Test and Wi-Fi AP)

The Spirent Octobox is a portable anechoic chamber that offers high RF isolation in excess of 80dB, with 20dB isolation on the internal absorber. It has a filtered Gbit Ethernet interface and USB for data connection, electrical power and a fan cooler. Supporting a wide frequency range from 700MHz – 6GHz, it also supports a variety of Cellular Testing (2G, 3G, LTE), A-GPS Location Testing and Wi-Fi Testing (802.11n, 802.11ac). A variety of Devices Under Test (DUTs) can be placed inside the Octobox.

## Spirent VR5 Channel Emulator

The Spirent VR5 Channel Emulator supports a variety of channel models for 802.11 a, b, g, n and ac or Butler matrix with up to 4x4 MIMO support. It also supports a wide bandwidth of 100 MHz and frequencies all the way up to 6 GHz, making it well-suited to set up the Over The Air (OTA) environment needed for Wi-Fi testing.

## Wi-Fi Access Point

The Wi-Fi Access point provides the radio access medium for running the automated Wi-Fi ATS test cases. The Spirent Wi-Fi ATS solution can support any 3rd party Wi-Fi Access Point (AP) that supports Wi-Fi 802.11n and 802.11ac.

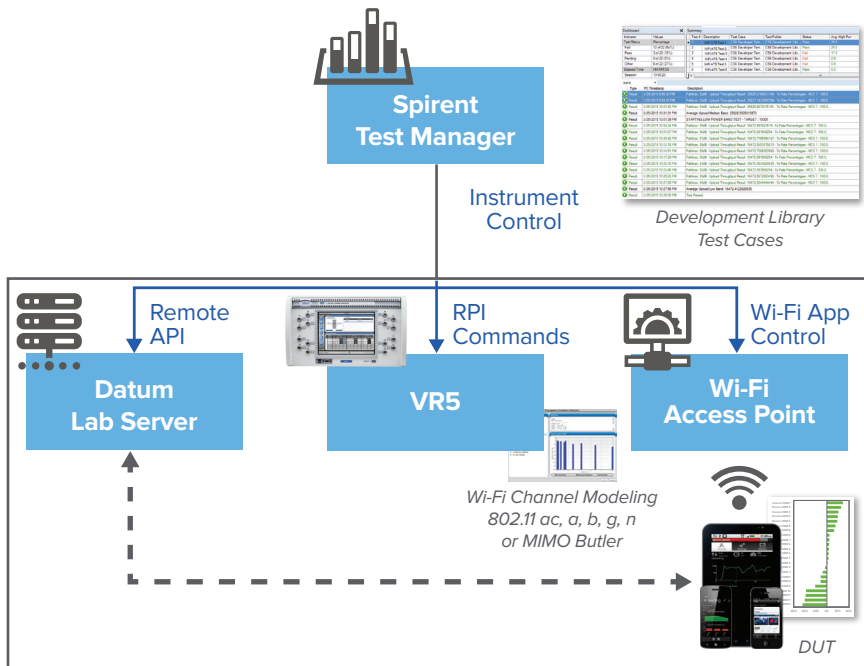
## DatumLab Server and Client

DatumLab is Spirent's industry leading application-layer data throughput testing application. The DatumLab server is hosted on one SC10 as a virtual machine and the client is installed on the Device Under Test (DUT) to run end-to-end data throughput tests. One of the key differentiators of this application is that it supports iOS, Android and WindowsMobile OS and is a "true" end-to-end data throughput test application. This is valuable for accurate representation of device performance.

## Controller SC10

The second SC10, which acts as the Controller, hosts the controller software including Test Manager and all the instrument drivers. The software supports full automation of test cases. Report collection and generation are made very simple through the easy-to-use Graphical User Interface. A variety of channel models can also be configured for the VR5 through Test Manager, making it an easy-to-use single point of control.

## Spirent Wi-Fi ATS Software Architecture



Spirent's Test Manager software is the central test executive that controls all the different test components of the Wi-Fi ATS test architecture. The Datum Lab Server, the VR5 Channel Emulator and the Wi-Fi Access Point are controlled through API support by the Development Library test environment. Shell commands or SCPI Commands can be executed on Test Manager depending on the type of control needed by the Wi-Fi Access Point.

Error reporting capability comes built-in with the Development Library test environment and can be setup at every test point or as needed for ease of debugging test scripts and to fix run-time errors. In addition, the flexibility allows customization of the whole test procedure, including test pass/fail limits. In addition to test script configuration, Test Manager simplifies post-test execution log collection by providing easy access to results and reports.

This layer of abstraction from underlying components make it easy for even relatively new users to write test scripts without having to know intricate details and configure every component separately.

# Spirent Wi-Fi Automated Test System



## Technical specifications

Platform	<ul style="list-style-type: none"><li>▪ Frequency: 380MHz ~3850MHz , 4100MHz ~6000MHz</li><li>▪ Bandwidth: 40MHz, 100MHz ( optional)</li><li>▪ Wi-Fi Modes: 802.11a/b/g/n/ac</li><li>▪ Connection: TX Diversity, 2x2 MIMO, ( Capable to upgrade to 4x2MIMO and 4x4 MIMO)</li><li>▪ Channel emulation: AWGN, Bypass, MIMO Butler, Channel models</li><li>▪ Isolation Boxes</li></ul>
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Isolation box	<ul style="list-style-type: none"><li>▪ AC power and Fan Cooling system</li><li>▪ Filtered High Speed Data Connections: Gbit-Ethernet , USB</li><li>▪ RF ports: 4</li><li>▪ Isolation: &gt;80dB (Fully cabled setup , 380MHz ~6GHz)</li><li>▪ Absorption: &gt;20dB( 1.3GHz to 40GHz) , &gt;15dB(700MHz to 1.3GHz)</li></ul>
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## Ordering Information

Part number	Product Name
VR5 Wireless Channel Emulator	
VR5-4C08D2-40MA	4 Channel Wireless Channel Emulator with 8 Links
VR5-OPT-BDPLX	Integrated Duplexer License
VR5-OPT-100M	100 MHZ RF Bandwidth License
VR5-OPT-6.0GHZ	6.0 GHZ Band License
VR5-OPT-Wi-FiCM	Wi-Fi Channel Model License
Octobox (isolation boxes)	
SPT-OB-26-BASE	Stackable Base with Wheels for OB 26L
SPT-OB-26-L	Octobox Anechoic Isolation Chamber (Optional for DUT isolation)
Wi-Fi Test System Platform (options and accessories)	
VR5-Wi-Fi-KIT	Wi-Fi ATS Platform Kit
DATUMLAB (data server)	
VR5-SYS-DATUMLAB-BASE	DATUMLAB-BASE
VR5-SYS-DATUMLAB-IOS	DATUMLAB-IOS
VR5-SYS-DATUMLAB-ANDR	DATUMLAB-ANDR
VR5-SYS-DATUMLAB-WIN	DATUMLAB-WIN
Test SW	
Wi-Fi-TP	

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