

# 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. However, in order to provide a consistent user experience, the data throughput performance of a device must be tested over Wi-Fi to ensure it is comparable to what is achieved over LTE. 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 testing. With Spirent’s VR5 wireless channel emulator supporting 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 Par	High Limit	Avg. Medium Par	Medium Limit	Avg. Low Par	Low Limit
Test Status	Percentage	1	WiFi ATS Test 1	CSB Developer Tem.	CSB Development Libr.	Pass	25.8	24.0	25.8	24.0	16.5	15.0
Fail	12 of 22 (54%)	2	WiFi ATS Test 2	CSB Developer Tem.	CSB Development Libr.	Pass	25.8	24.0	25.8	24.0	16.5	15.0
Pass	3 of 22 (13%)	3	WiFi ATS Test 3	CSB Developer Tem.	CSB Development Libr.	Fail	17.0	24.0	16.8	24.0	16.4	15.0
Pending	0 of 22 (0%)	4	WiFi ATS Test 4	CSB Developer Tem.	CSB Development Libr.	Fail	0.8	20.0	0.8	20.0	0.8	0.0
Other	6 of 22 (27%)	5	WiFi ATS Test 5	CSB Developer Tem.	CSB Development Libr.	Fail	0.8	6.0	0.8	6.0	0.8	0.0
Elapsed Time	HH:MM:SS	6	WiFi ATS Test 6	CSB Developer Tem.	CSB 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: 25227.1433650794 - 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 10:01:31 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: 16472.7165984127 - 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: 16472.7088253968 - 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: 16472.3834920635 - 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 - have test cases running in minutes
- Real-network simulation of data throughput performance
- Data throughput with power range and Signal-to-Noise (SNR) ratio
- High isolation and shielding with the Octobox
- Realistic simulation of user experience
- Supports Android/Windows mobile/IOS for Device Under Test (DUT)
- Transmission mode support for transmit diversity and 2x2 MIMO

## 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 100MHz and frequencies up to 6GHz, making it well-suited to house the Over-the-Air (OTA) environment needed for Wi-Fi testing.

## Octobox (for DUT and Wi-Fi access point)

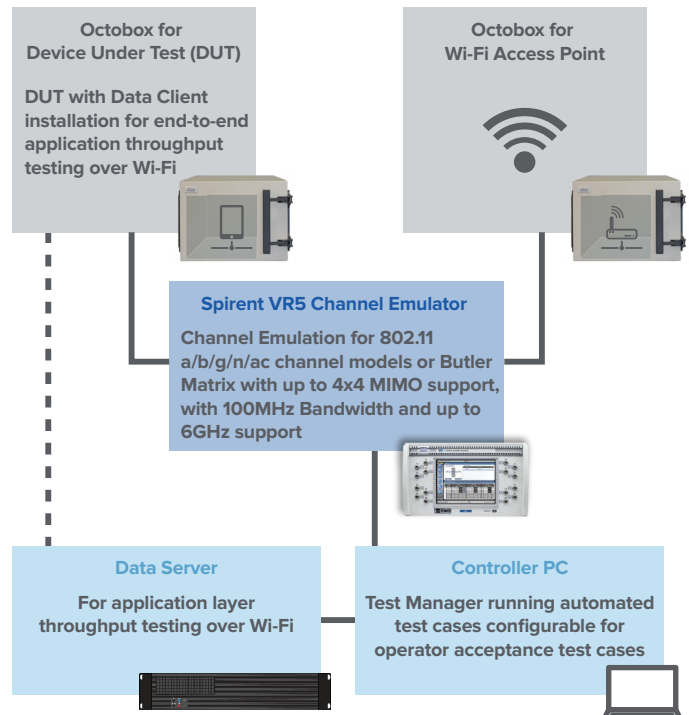
The Octobox is a portable anechoic chamber that offers high RF isolation in excess of 80dB, with 20dB isolation on the internal absorber.

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 DUTs can be placed inside the Octobox.

## Wi-Fi Access Point

The Wi-Fi access point (AP) 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 AP that supports Wi-Fi 802.11n and 802.11ac.

## System Components



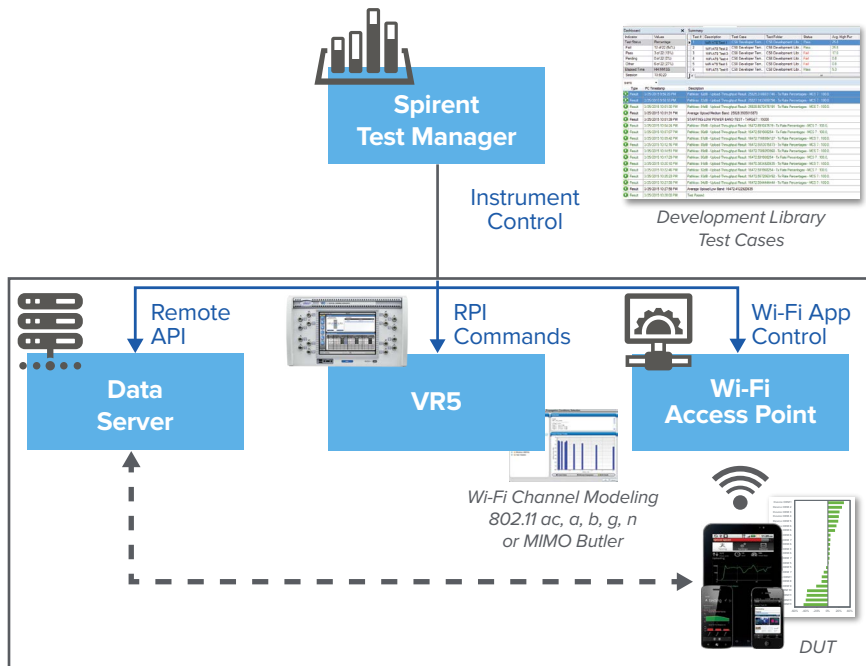
## Athena Data Server and Client

The Athena data server and client perform application layer data throughput testing. The data client is installed on the DUT to run end-to-end data throughput tests. One of the key differentiators of this application is that it supports iOS, Android, and Windows universal platforms and is a "true" end-to-end data throughput test application. This is valuable for accurate representation of device performance.

## Controller PC

The Controller PC 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 the different test components of the Wi-Fi ATS test architecture. The Data Server, the VR5 Channel Emulator and the Wi-Fi AP 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 AP.

Error reporting capability comes built-in with the Development Library test environment and can be set up 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 makes it easy for even relatively new users to write test scripts without having to know intricate details and configure every component separately.

## Technical Specifications

<b>Platform</b>	<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 4x2 MIMO and 4x4 MIMO)</li> <li>• Channel emulation: AWGN, Bypass, MIMO Butler channel models</li> <li>• Isolation boxes</li> </ul>
<b>Isolation box</b>	<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>

## Ordering Information

Part Number	Product Name
<b>VR5 Wireless Channel Emulator</b>	
VR5-4C08D2-40MA	4 channel VR5 Wireless Channel Emulator with 8 links
VR5-OPT-BDPLX	Integrated duplexer license
VR5-OPT-100M	100MHz RF bandwidth license
VR5-OPT-6.0GHZ	6GHz bandwidth license
VR5-OPT-WIFICM	Wi-Fi channel model license
<b>Wi-Fi Test System Platform (options and accessories)</b>	
VR5-WIFI-KIT	Wi-Fi ATS Platform Kit
<b>WI-FI Data server and client</b>	
WIFI-DATA-SERVER	Data Server Platform for Wi-Fi ATS
WIFI-DATA-SERVER-ANDR	Data Server option for Android OS
WIFI-DATA-SERVER-IOS	Data Server option for IOS
WIFI-DATA-SERVER-WIN	Data Server option for Window universal platform
<b>Test Software</b>	
WIFI-TP1	Wi-Fi performance test pack 1, 20MHz bandwidth test cases
WIFI-TP2	Wi-Fi performance test pack 2, 40MHz and 80MHz bandwidth test cases

*Octobox anechoic chamber is orderable directly from the manufacturer.*

### Contact Us

For more information, call your Spirent sales representative or visit us on the web at [www.spirent.com/ContactSpirent](http://www.spirent.com/ContactSpirent).

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