DATASHEET

octoBox® iGen Interference Generator

Generates 802.11a/b/g/n/ac traffic and common sources of interference, including Bluetooth and radar waveforms for DFS testing; supports 802.11p band to test Wi-Fi/DSRC coexistence

The octoBox® iGen™ interference generator creates realistic interference conditions for testing wireless devices and systems. iGen supports 802.11a/b/g/n/ac with the ability to generate traffic or waveform interference in the 2.4 and 5 GHz bands, including in the licensed DSRC (direct short range communications) band to test coexistence between Wi-Fi and automotive networks. Waveform interference includes tones or radar waveforms for DFS (dynamic frequency selection) testing.

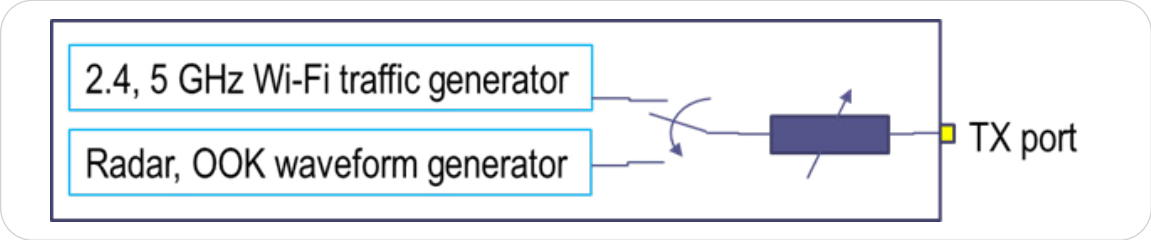
Applications

- Wi-Fi (802.11a/b/g/p/n/ac), Bluetooth and cellular testing in the presence of interference
- DFS (802.11h) functional testing
- Throughput vs. range measurements under interference conditions using octoBox testbed
- Adjacent channel interference (ACI)
- Co-channel interference (CCI)
- RX interference handling

Features and Benefits

- 802.11a/b/g/n/ac traffic generation in the 2.4 or 5 GHz band, including the licensed DSRC band
- 20, 40 and 80 MHz wide channels
- Replay traffic captures (PCAP files) with configurable traffic load and priority
- 2 GB of storage for captures; supports standard Wireshark PCAP format files
- Programmable channel frequency, channel width (20, 40, 80 MHz), MCS (modulation coding scheme) and WMM (wireless multi media) priority
- Built-in frequency synthesizer for generating On/Off Keying waveforms in the frequency range of 500 to 6000 MHz
- Built-in programmable attenuator: 60 dB range, 0.5 dB steps
- Convenient single cable Ethernet/PoE power and control interface, filtered for isolation
- DSRC and Wi-Fi coexistence

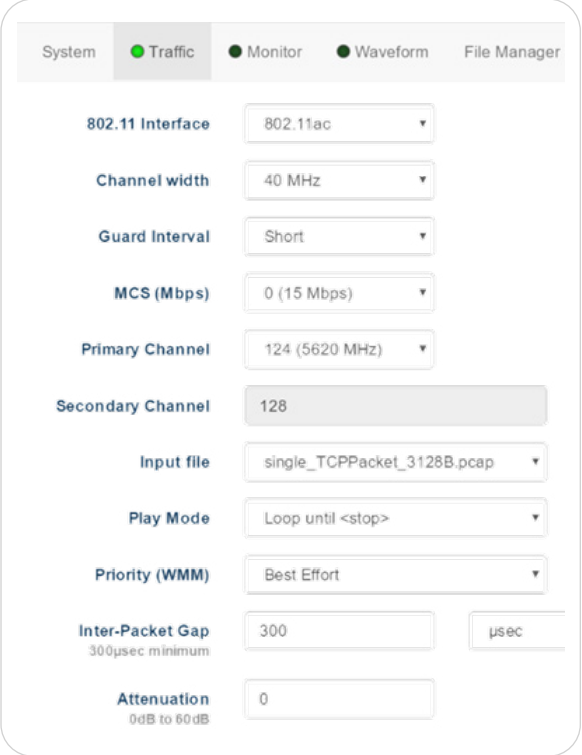
The iGen interference generator can generate either traffic or waveform interference, enabling you to perform throughput and other wireless tests in the presence of interference.



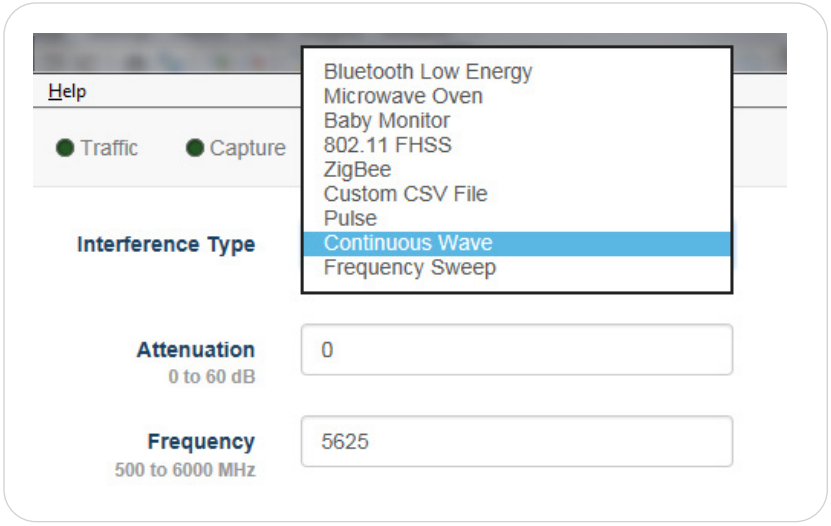
iGen block diagram

A built-in programmable RF attenuator controls the level of interference with 60 dB of dynamic range and 0.5 dB steps. A built-in RF switch selects either traffic or waveform interference.

Powerful browser-based user interface for configuring traffic and waveform interference controls the iGen via an open API (applications programming interface). The API enables you to automate interference generation during the test.



Traffic interference menu

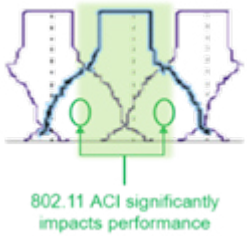


Waveform interference menu

iGen replays standard Wireshark captures as a sequence of packets transmitted in a specific frequency channel, channel width, MCS and WMM priority. Traffic can be replayed in the DSRC (direct short range communications) channels for testing coexistence of DSRC and Wi-Fi traffic.

Interference is generated using a built-in frequency synthesizer and includes frequency hopping and On/Off Keying (OOK) based waveforms, including radar, Bluetooth LE, microwave oven, baby monitor, 802.11 FHSS, ZigBee and custom interference waveform.

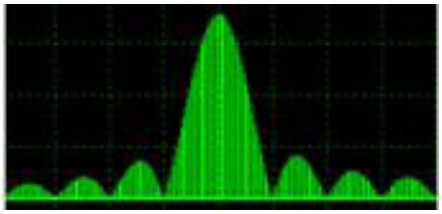
Use multiple iGen modules to inject ACI (adjacent channel interference) and CCI (co-channel interference) channels plus waveform interference, including tones or pulse-train based radar waveforms.



Traffic Interference, example of 2 adjacent channel interferers

Traffic load is generated by replaying Wireshark PCAP files, allowing you to generate a variety of traffic patterns. When replaying captured traffic, you can configure:

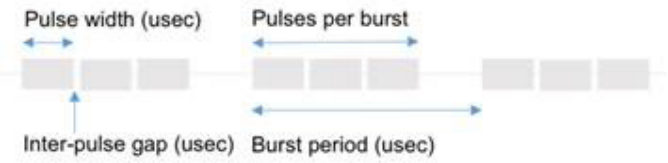
- 802.11 interface (a/b/g/p/n/ac)
- MCS (modulation coding scheme)
- WMM priority
- Channel frequency
- Channel width



Waveform interference, example of a radar pulse-train

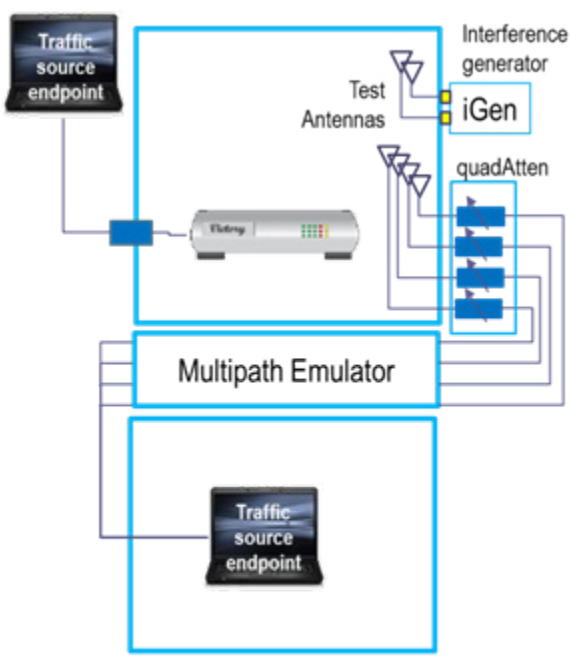
For waveform generation, you can configure

- Tone frequency
- Pulse train parameters as shown below



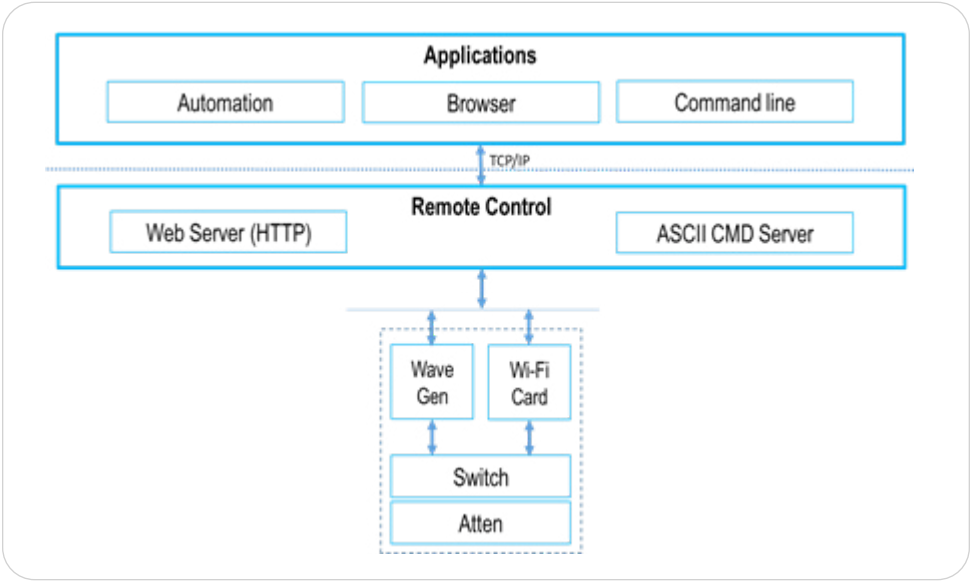
iGen can be used stand-alone or as part of the octoBox wireless testbed. A typical octoBox throughput test configuration has the iGen mounted on the side, as shown below.

The octoBox wireless testbed has the device under test (DUT) and one or more partner devices connected through quadAtten™ programmable attenuator module in series with the multipath emulator (MPE). The traffic is sent between the DUT and the partner devices. quadAtten adds path loss while the MPE adds multipath, simulating typical home or office conditions in the airlink.



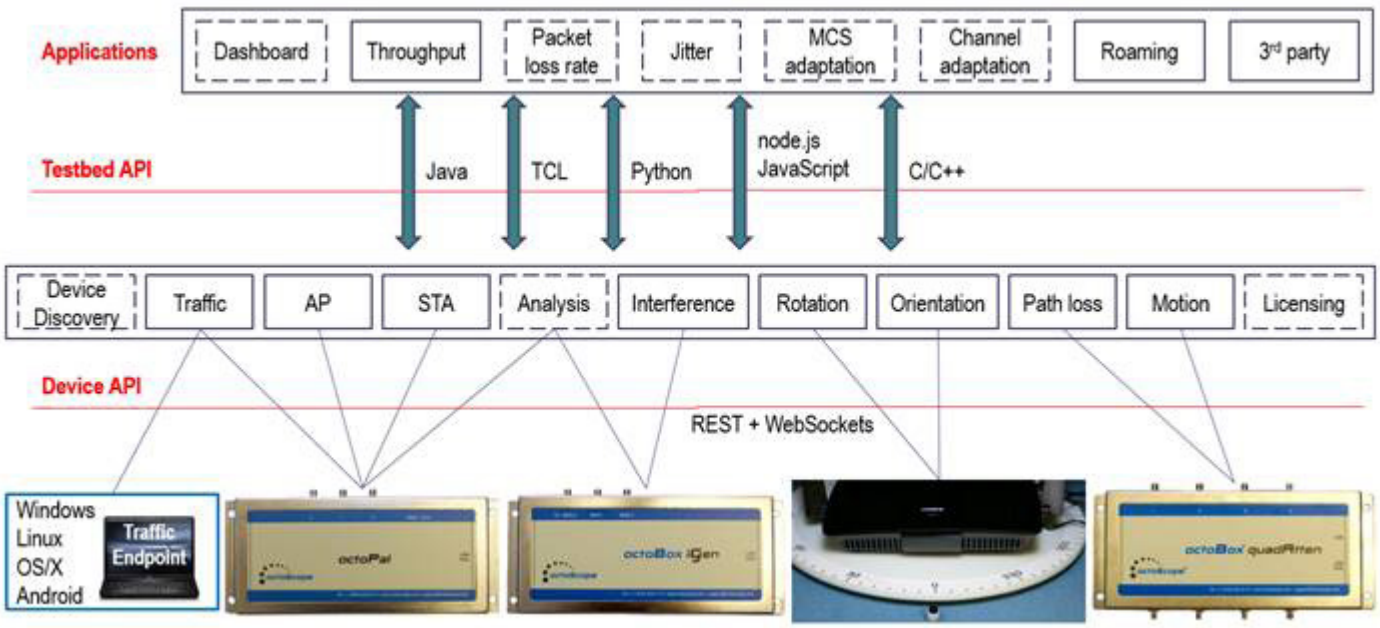
iGen Architecture

iGen is controllable via its filtered Ethernet interface. The choice of control protocol includes browser and command line.



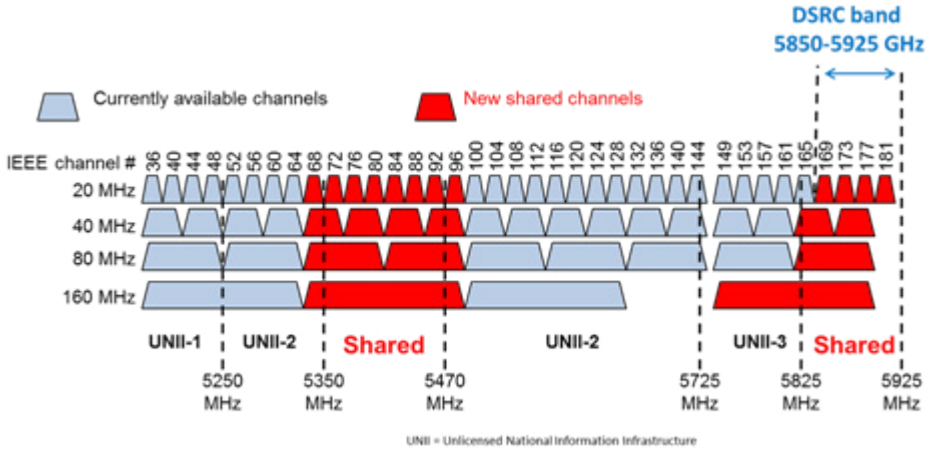
octoBox Testbed Architecture

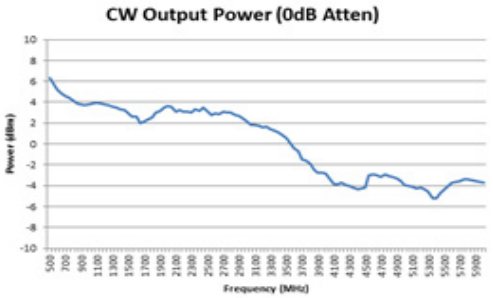
The system block diagram of the octoBox testbed, including the iGen interference generator, is shown below.



Specifications

Parameter	Specification
Traffic channels	All 2.4 and 5 GHz international 802.11 channels 20/40/80 MHz wide; Wi-Fi operation on 20 MHz wide DSRC channels 173, 177, 181 and 40 MHz wide DSRC 173/177 channel combo
Waveform frequency range	500 to 6000 MHz
TX max power, traffic	+15dBm in the 2.4GHz band; +10dBm in the 5GHz band, typical
TX max power, waveform	+6 dBm to -4 dBm, typical frequency dependent
TX power range	60 dB of in-line programmable RF attenuation; 0.5 dB steps
RF connectors	2 SMA connectors, one for transmitting and one for monitoring
Programming and control	Ethernet
Power	Power over Ethernet (same cable as programming and control)
Dimensions	
Power consumption	Idle: 4.5W Waveform: 4.9W Traffic: 5.2W





About octoScope

octoScope, a Spirent Company, is the market leader in automated testbeds for accurate, repeatable testing of Wi-Fi and 5G network functions and devices. Our highly-realistic, automated test suites save service providers, and device and network vendors millions in troubleshooting and customer care costs by enabling them to identify problems early in the development cycle before customers are impacted. Our patented testbed technology recreates real-world conditions in controlled testing environments to evaluate the performance of the latest Wi-Fi 6 and 6E, and 5G network equipment and devices. The combination of our solutions with Spirent's test portfolio enhances our automation and emulation capabilities, bringing even greater realism to our test suites and helping our customers innovate with unprecedented speed and efficiency.

Software Controls

Traffic Generation	
Select captured PCAP file	Captured by a sniffer (e.g. Wireshark); pre-captured sequences provided
Available storage	2 GB
WMM	Background, best effort, video, voice
802.11 contention	ON/OFF; when OFF traffic is transmitted with no back-off
Channel frequency	<primary channel number>
Channel width	10, 20, 40, 80 MHz

Waveform Generation	
Interference profiles	Bluetooth LE Microwave oven Baby monitor 802.11 FHSS (frequency hopping spread spectrum) ZigBee Custom profile (CSV file) Pulse Continuous wave Frequency sweep
Set frequency	Set carrier frequency of the tone or pulse; 500-6000 MHz
Enable radar mode	Generate trains of pulses (bursts of tones) to emulate a radar waveform
Enable CW mode	Generate CW at the set frequency
Set the pulse width	Set the duration of each pulse (tone burst); 1-100 microseconds
Set the gap between pulses	Set the duration of the inter-pulse gap; 1-256 microseconds
Set # of pulses per burst	Set the number of pulses per burst; 1-30
Set the period of each burst	Set burst period; 150 to 5000 microseconds

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**

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