Spirent **Vertex® Channel Emulation Solutions for Defense & Aerospace**

Testing Critical and Highly Complex RF and mmWave Cellular Communication Scenarios for LTE and 5G

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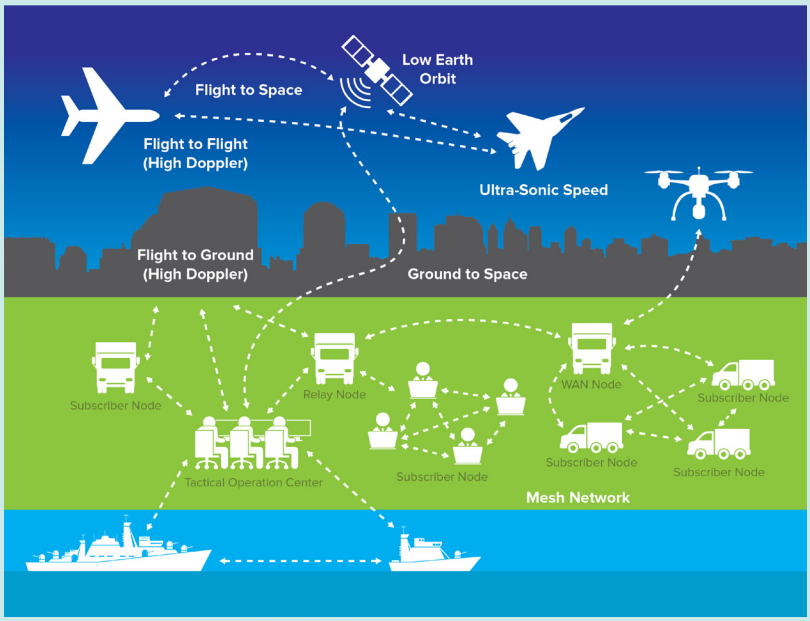
Clear communication is of utmost importance with military tactical operations, when a broken link or missed signal can mean the difference between a successful or failed mission. The only way to ensure critical communication systems are performing as required is through rigorous testing over many typical real-world scenarios, and recreating these complex scenarios in the field is not always practical or possible. Alternatively, conducting repeatable tests in a laboratory environment can achieve the analysis and results needed to ensure field communication success.

Spirent Vertex® channel emulation solutions are uniquely capable of accurately addressing the testing needs of these critical military communication systems within lab environments, before risking issues with deployment in the field. With Spirent's solution portfolio, defense and aerospace organizations can replicate the comprehensive impairment and spatial conditions of even the most complex wireless channels, to test:

- **Mesh Networks:** *Ensure constant communications for high priority applications even if individual links fail.* Test up to 16 nodes under a variety of independent channels, network configurations and usage scenarios.
- **Wideband frequency hopping:** *Test spread-spectrum signals for interference and interception vulnerabilities.* Vertex provides up to 200MHz bandwidth per channel, with 1GHz+ widths via concatenation, to accommodate a wide array of spread-spectrum signals.
- **5G readiness:** *Convert RF to millimeter wave (mmWave) to test 5G implementation scenarios on base stations or end devices.* The Vertex High Frequency Converter (Vertex HFC) upconverts RF signals to the 28GHz frequency range and vice versa, or can be customized for other frequencies.
- **A myriad of real-world scenarios:** *The dynamic emulation environment enables realistic scenario modeling for a variety of complex environments.* Ultrasonic Doppler shifts as high as 12kHz and mmWave communications allow for flight to ground, flight to space, and high speed vehicle test scenarios.

Application Scenarios



Vertex channel emulator solutions can replicate the comprehensive impairment and spatial conditions of even the most complex wireless channels

Spirent Vertex channel emulation solutions include the following portfolio of instruments and software components:

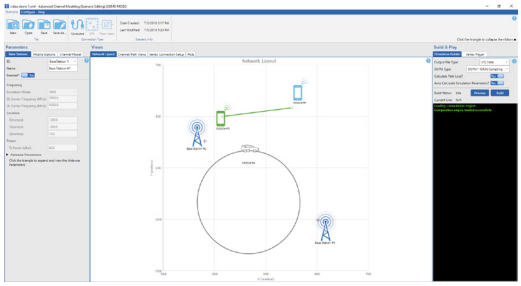
Spirent Vertex Channel Emulator provides the modularity, flexibility and high density needed for a myriad of test configurations for SISO and MIMO beamforming, mesh networks, advanced MIMO OTA, carrier aggregation, and massive MIMO applications. With up to 256 digital radio links in a single instrument, an inherent frequency range from 30MHz to 5925MHz, bandwidths up to 200MHz (combine channels for 1GHz+ bandwidths), and the ability to handle supersonic Doppler speeds, Vertex accurately simulates the complex effects of signal fading on wireless propagation in any scenario.

Vertex channel emulator combines modularity, scalability and ease-of-use into a powerful test and measurement solution

Vertex HFC converts between RF and mmWave frequencies and is available in a 4-channel or 20-channel capacity instrument

Spirent Vertex High Frequency Converter takes the Vertex channel emulator a step closer to 5G by converting the traditional RF range of 2GHz to 3GHz to the mmWave range of 27.5GHz to 28.5GHz and vice versa, allowing channel characteristic simulation in millimeter band scenarios required for 5G applications. The Vertex HFC can be used in various scenarios, such as injecting RF channel emulation between a mmWave band base station and mmWave band device, or upconverting from an RF band network emulator or eNodeB to a mmWave band device.

Spirent Advanced Channel Modeling Software simplifies the design of the 3D propagation scenarios required for LTE and 5G applications, in accordance with the latest 3GPP standards. Combine with the **Spirent IQ Playback** fading engine installed on the Vertex system to provide hundreds of sinusoidal runs per cluster of channel model, which ensures better accuracy and repeatability over other modeling methods.



Advanced Channel Modeling software allows the creation of downloadable 3D channel models

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

Spirent Expertise

A trusted provider for over 25 years, Spirent has led the definition of complex fading with multiple radios spanning several generations of mobile technologies. Spirent's team of world renowned experts are highly regarded in the industry and are active contributors to the 3GPP working groups and standards. Spirent often draws on this expertise when working with key clients to offer customized channel modeling solutions to meet the needs of unique complex environments.

Please refer to the Vertex Channel Emulator and Vertex HFC datasheets for detailed technical specifications.

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Promise. Assured.

Contact Us

For more information, call your Spirent sales representative or visit us on the web at www.spirent.com/ContactSpirent.

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