



Spirent **Advanced Channel Modeling Software**

Create Complex 5G Scenarios Using
a Simple Graphical User Interface

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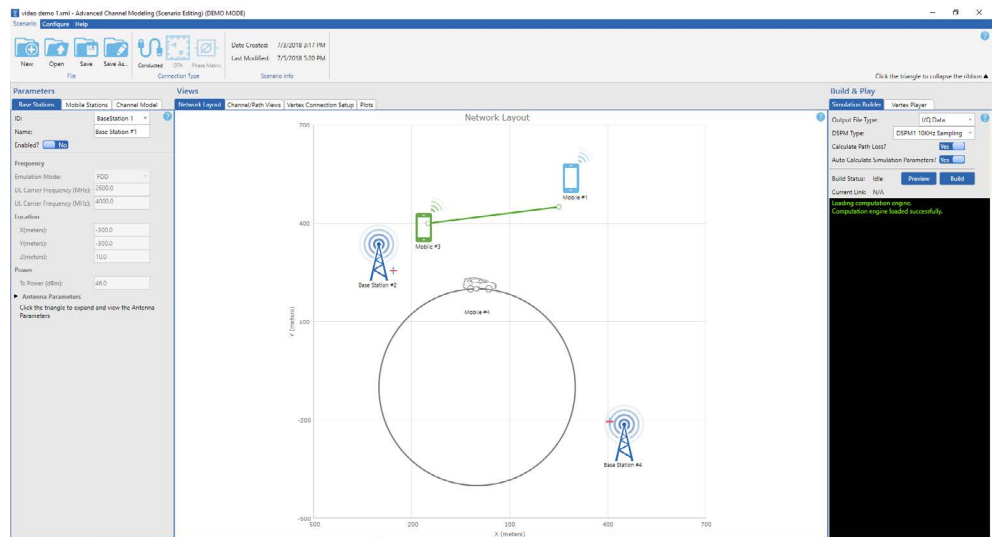
Create Complex 5G Scenarios Using a Simple Graphical User Interface

As telecommunications networks move toward 5G, scenarios for radio frequency and millimeter wave propagation continue to increase in complexity. One of the complexities occurs as a result of massive MIMO, a key physical layer technology for 5G applications that involves the use of large-scale base station (gNB) antenna arrays, which contain as many as 256 elements. Similarly, end user devices will have to accommodate large internal antenna arrays with as many as 32 elements. This combination of high-order antenna arrays results in extremely complicated and intricate environments that are difficult to model in a lab setting for testing purposes. Not anymore.

Design, View, Build and Play Real-World 3D Propagation Scenarios

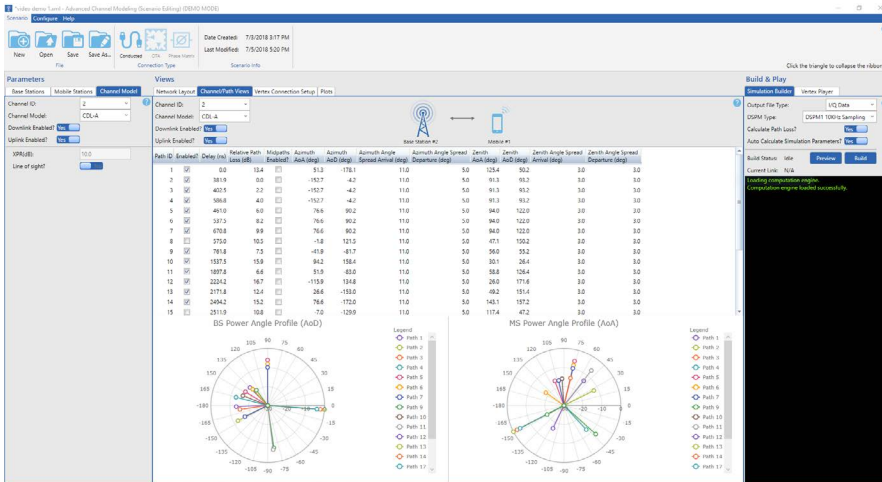
Spirent's Advanced Channel Modeling (ACM) Software Release 3.0 allows **simple creation of highly complicated scenarios** without the need to fully understand all the involved channel model propagation characteristics. Simply select from an intuitive menu of parameters for various aspects of the scenario (or import any or all of them such as gNB and device antenna models or chamber design) and then build the desired environment in a few clicks. Users can select from a variety of real-world propagation scenarios, including end-user mobility:

- **Circular:** Basic scenario where one or more devices are moving in a circle around a gNB; useful to test beam tracking and beamforming algorithms inside a gNB
- **Linear:** High speed scenario with either a train or other vehicle; allows testing of beamforming, beam tracking, power control, handover, or other algorithms
- **Static:** Classical performance testing of gNB or end-user devices



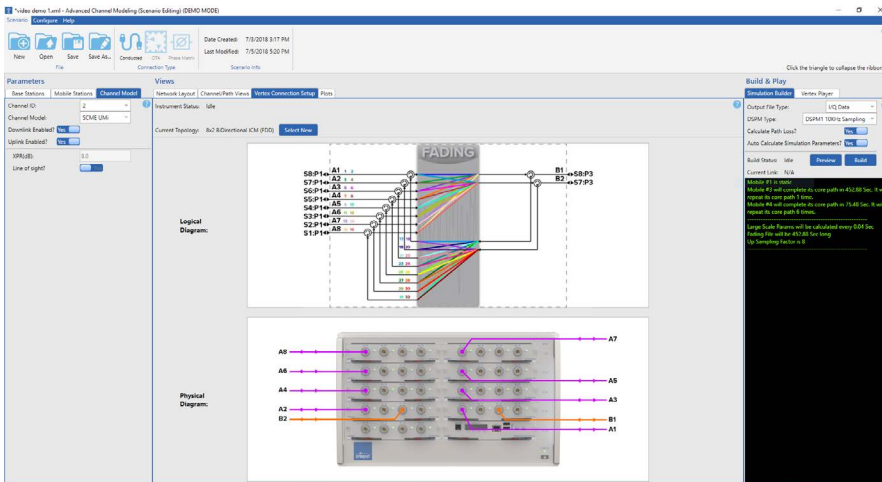
Intuitive graphical user interface simplifies creation of complex 3D propagation scenarios

With simple and streamlined visual aids, ACM lets users quickly design any of these complex 3D propagation scenarios, then **automatically creates and downloads channel samples** to the Vertex channel emulator in accordance with the indicated test environment. Initial environment templates include scenarios for massive MIMO over-the-air (via an anechoic chamber) and massive MIMO conductive testing (via a phase matrix instrument). Future releases include air-to-ground propagation scenarios involving aircraft communicating with ground base stations.



Powerful Visualization of Channel Models

Users can visualize the power angle profiles of both the base station and mobile device, relative path loss, delay, and expected path direction of every emulated channel path.



Automatic Creation of Connection Setups

ACM automatically creates and displays the required connection setup based on the elected system configuration to assist with Vertex cabling implementation.

Create Realistic 3D Channel Models for Prototype Design and Beyond

ACM produces a text file output that can be used directly in any software simulator. With this capability, developers can create realistic field-like tests for early system simulations, even before formal gNB or device prototypes exist. As a result, field tests can be performed earlier in the development cycle, reducing or preventing defects that typically don't appear until the design is in hardware and changes are difficult or nearly impossible. Later, the same channel models can be used in every stage of R&D testing, enabling faster overall time to market.



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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

Smooth Integration with Vertex Channel Emulator for Real-World Testing in the Lab

The Vertex channel emulator is an advanced platform that replicates the comprehensive noise and spatial conditions of even the most complex wireless channels. Its cutting-edge capabilities enable users to emulate a real-world radio frequency (RF) environment in the lab, making it possible to isolate and identify performance issues early in the development cycle.

Incorporating a modular RF front-end with a powerful signal processing core, Vertex achieves an unprecedented level of scalability and flexibility, enabling it to efficiently address a broad range of applications from low channel density such as 2x2 MIMO to high channel density such as MIMO beamforming, MIMO OTA, carrier aggregation, massive MIMO and antenna array systems (AAS). Vertex can support frequencies from 30MHz to 6000MHz with a single hardware platform (add the Vertex High Frequency Converter to address channel emulation needs in the millimeter frequency range). Each RF channel can support up to 200MHz bandwidth.

For further information, reference the *Vertex Channel Emulator Datasheet and the Massive MIMO Test Solution | Sub 6GHz Solution Brief*.

ACM 3.0 requires a Windows 7 (64-bit) or Windows 10 operating system with a minimum 16GB RAM.



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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