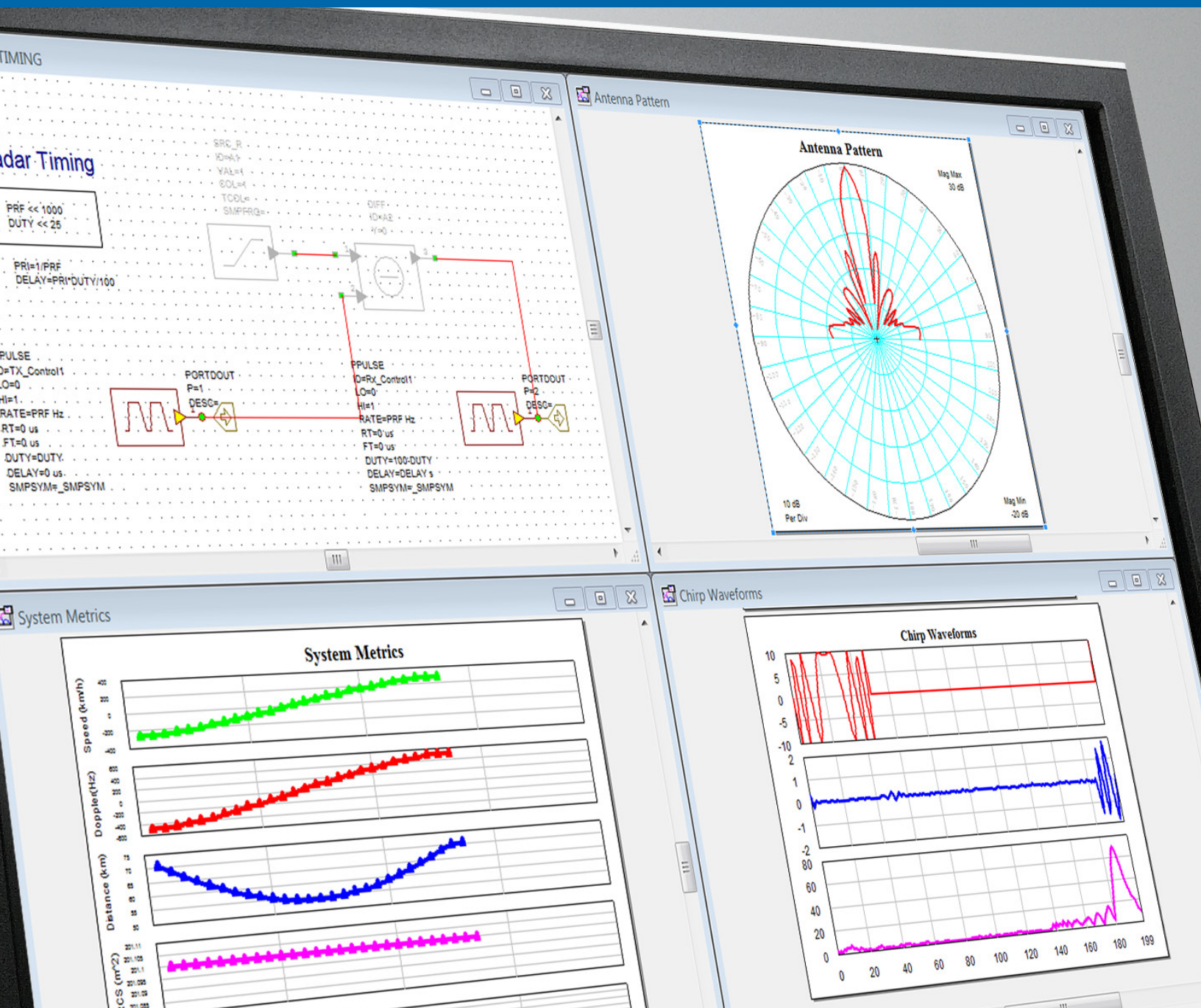


Visual System Simulator

RF Communications and Radar System-Level Design Software



Visual System Simulator

RF Communications and Radar System-Level Design Software

Visual System Simulator™ (VSS) is an RF/wireless communications and radar systems design solution that supports realistic measurements of mixed-signal (RF/digital) networks and cascaded RF blocks and helps identify the source of spurious products and system metrics such as bit error rates (BER), all from a single system diagram. Designers of commercial and military transmitters and receivers are then able to create subsystem architectures, specify component requirements, and optimize for best overall performance.

NI AWR Design Environment

Microwave Office

Visual System Simulator

Analog Office

AXIEM

Analyst

Advantages

Conceptualize Faster

Rapidly implement virtual LTE/5G and IoT communication and radar/EW systems using RF/microwave and signal processing blocks based on measured, simulated, or projected behavior to investigate new architectures and study overall system performance.

Account for Details

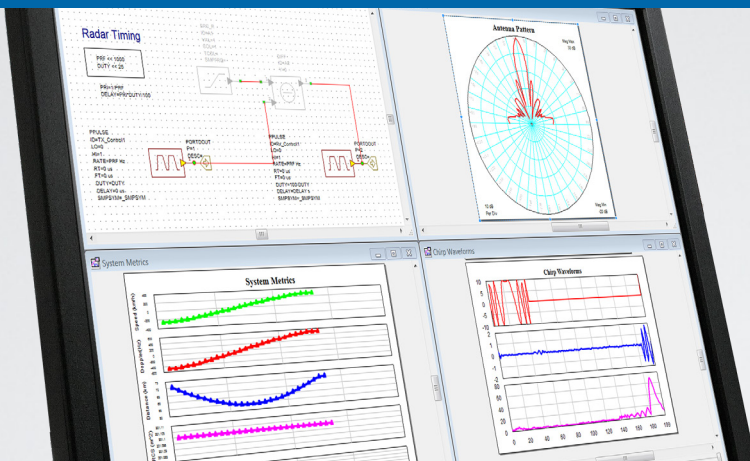
Co-simulate with Microwave Office and Analog Office for RF/microwave and analog/RFIC design, as well as AXIEM planar and Analyst™ arbitrary 3D EM solvers, to support communication measurements for individual components and accurate system performance verification.

Hardware in the Loop

Plug and play support for co-simulation with NI LabVIEW, MATLAB, and C++ expands modeling capabilities with custom models, automation scripts, and user-defined signal processing algorithms. For test and measurement compatibility, TestWave™ connects test and measurement equipment such as network and spectrum analyzers or signal generators to enable the flow of data between simulation environment and real-world DUTs.

“The unique, open, and integrated environment of VSS enabled us to study the effects of the nonlinear distortion on our communications link margin using real digital modulated analog waveforms.”

Stephan VanFleteren, General Dynamics



Features at a Glance

- RF Chain Impairment Analysis
- RFA System-Level Planning Tool
- Co-Simulates With Microwave Office
- EVM, ACPR, and Phase-Noise Measurements
- Wireless Communication Test Benches

Capabilities

Digitally-Modulated Systems – Design and simulate system architectures and components with IP libraries for wireless communication standards, including LTE-A, 5G, narrowband IoT, and more. Pre-configured test benches support transmitter conformance testing and receiver sensitivity analysis, as well as circuit co-simulation, for linearity measurements such as ACPR and BER of power amplifiers (PAs) operating under high PAPR.

Link Budgets – Perform RF-cascaded measurements such as gain, noise figure, and third-order intercept while accounting for impedance mismatch throughout the signal path, identifying the source of spurious products and intermodulation, and simulating system metrics such as EVM.

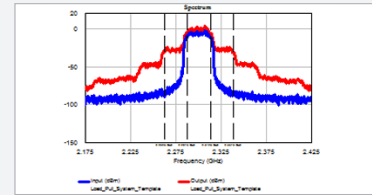
Phased-Array Systems – Simulate critical antenna performance in phased arrays with a re-configurable model supporting thousands of radiating elements based on measured or simulated antenna data for the development of beam-forming algorithms, evaluation of hardware impairments, and RF link analysis.

Libraries

Radar – The VSS radar library offers radar signal generation, radar-specific target and propagation modeling, and radar signal processing capabilities, including moving target indicator, moving target detector, and constant false-alarm rate calculator. The library provides easy access to all the needed capabilities for simulations such as RFI, third-party co-simulation, antenna arrays, and multi-path channels. The types of radars supported include military, medical, weather, and automotive applications.

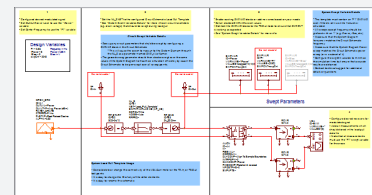
5G – The 5G communications library gives designers access to current 5G candidate signals and relevant test benches. 5G candidate waveforms, which include OFDM, GFDM, and FBMC, are implemented as a fully parameterizable block with adjustable parameters such as carrier frequency, sub-carrier spacing, number of sub-carriers, filtering, and sub-carrier mapping for swept simulations and user customization.

Test Benches – VSS test benches are pre-configured for common measurements such as ACPR, EVM, spectral, and many other types of measurements. One such bench within the 5G library implements the Verizon 5G signal generation and receiver functionality.



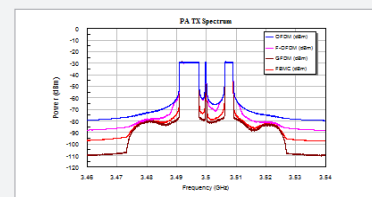
RF System Models

The RF system model library includes RF behavioral, file, and circuit-based models, DSP components for simulating different fixed-point formats, and channel and antenna models for OTA fading and propagation simulations.



Communication PAs

System-level load pull generates contours for communication performance metrics such as ACPR and EVM for designing impedance-matching networks for linear PAs used in wireless communication systems.



Wireless Standards

VSS supports multiple wireless communication standards with related test benches, enabling transmitter conformance testing and receiver sensitivity analysis inclusive of narrowband IOT.

Services and Support

Technical Support

Get started faster or work through tough issues by contacting NI AWR software support engineers who are ready to help via phone and email during normal business hours.

Technical Resources

Access volumes of self-help information at awrcorp.com/support-resources, including application tips, example projects, user forum, and more.

Online Training

Get a jump start with self-paced modular training videos on awrcorp.com/elearning that aim to educate new users on NI AWR software.

Academic Resources

NI AWR software donations are available to support academic institutions with an emphasis on teaching and/or non-proprietary research.



Learn more at ni.com/awr



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