# RF Channel Modeler

High-Fidelity Wireless Channel Modeling in Dynamic Virtual Terrestrial Environments.

Ansys RF Channel Modeler offers a streamlined workflow for RF systems engineers to model large scale dynamic RF systems simulations while considering the effects and impacts of complex urban environments. With the incorporation of high-resolution terrain, buildings, and other geospatial data, network engineers can realistically evaluate their RF systems designs and analyze high frequency signal propagation effects to anticipate real world performance.

Dynamic simulations produce high-fidelity channel data which you can further analyze, export, and share to understand a modeled system's capabilities at the channel level.
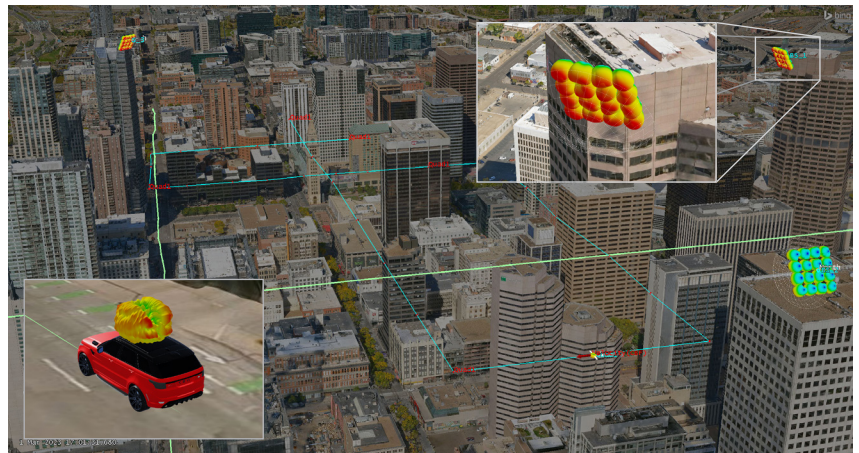
Use Cases

- Wireless component and device design
- Wireless networking protocol and system development
- Platform planning and design
- Wireless network design and planning
- Network reliability testing and evaluation

Key Value Points

Ansys RF Channel Modeler delivers an innovative network planning and optimization solution to RF systems engineers across the telecommunications industry. The combination of advanced systems simulation capabilities using Ansys STK's dynamic, physics-based, digital simulation environment provides network engineers with the ability to realistically evaluate advanced communications and RF systems performance in urban environments ahead of expensive physical deployments and product development efforts.

- Scalable, GPU Enhanced Processing
- Include Detailed Terrain and Structures
- Import Advanced RF Antenna Patterns
- 5G/6G Network Modeling
- Analyze Scattering and Coupling Data Results
- Include Multi-path and Diffraction Effects
- Support Array Designs and Beamforming
- Optimize Infrastructure Asset Placement
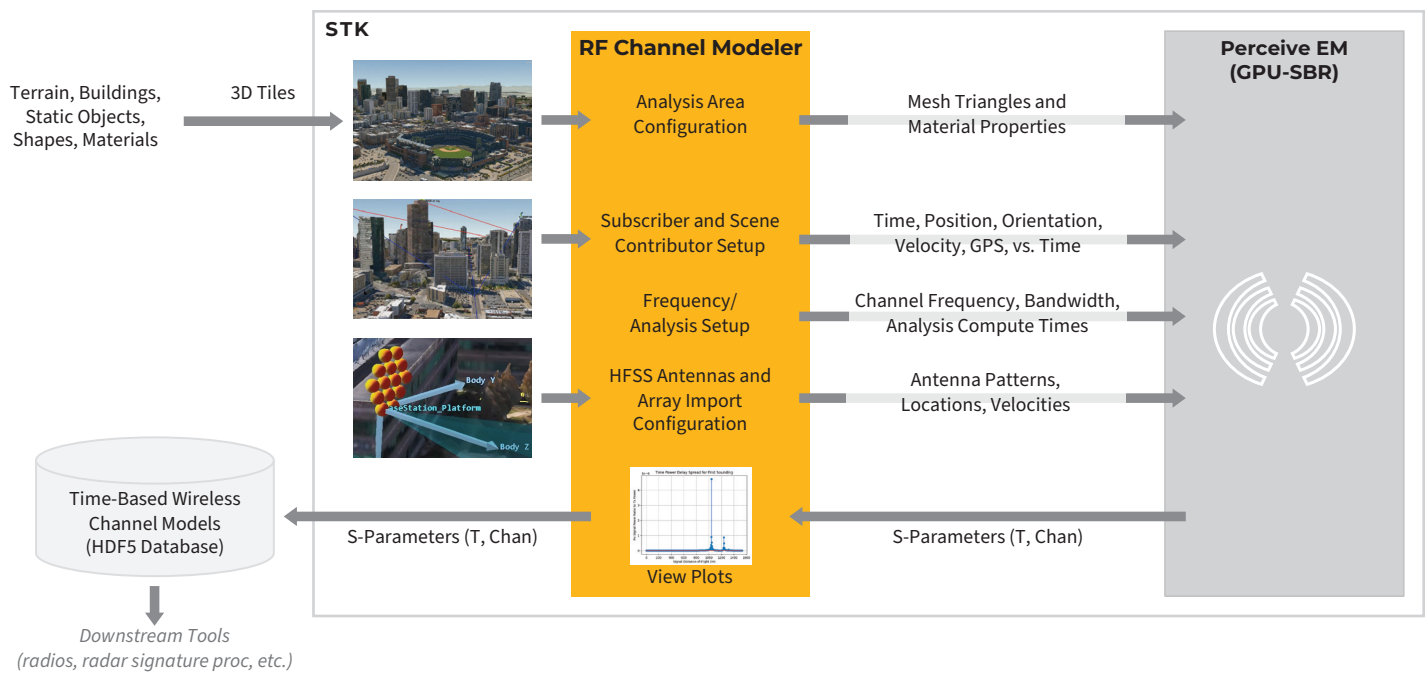- Time-Dynamic Physics Engine

Core Capabilities

Use a model-based design approach to represent RF systems within a physics-accurate digital environment. Explore and test designs across simulated situations and conditions which would otherwise be difficult to replicate under real-world field-testing scenarios by following a streamlined modeling and simulation workflow:

- **Model the Operating Environment**. From general underlying terrain and topography data to high resolution building models, RF Channel Modeler's workflow starts by defining an accurate digital simulation environment. With support for OGC 3D Tiles standard, RF Channel Modeler makes it easy to consume large geospatial data sets, ideal for highly detailed meshed 3D models such as urban cityscapes
- **Model Platforms in Motion**. RF Channel Modeler provides a physics-based motion and orientation modeling engine. Whether your RF systems are stationary base stations or user equipment installed on vehicles, aircraft, or other platforms, you can create simple representative routes or import existing trajectory data and quickly put your models in motion.
- **Model RF Systems**. Easily create representative models of transmitter, receiver, or even radar systems necessary for your simulations. Get started with built-in models of common designs or import existing complex antenna designs directly from Ansys HFSS and configure the desired channel spectrum analysis settings. Load complete HFSS phased array base stations with a single click, simplifying the workflow and enabling high-fidelity antenna designs to be easily integrated into the simulated environment.

- **Analyze and Explore**. The engine ingests the terrain, buildings, objects, and materials contained in the 3D Tiles data as meshed triangle geometry facets and material properties and leverages advanced GPU capabilities for scalable simulation execution. Analysts can explore the resulting data containing scattering parameter (s-parameter) antenna-to-antenna coupling data between all antennas considered in the modeled scenario over the specified analysis period. This data is also available for external post-processing and scripting as needed, making this a flexible solution for large, extended simulation data exploration and analysis efforts.

Learn more
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